

ATARI ST USER

*The
top-selling
Atari ST
magazine*

Volume 2
Number 7
September 1987
£1.50

Forecast a fortune!

PRIZES

Win a graphics tablet
and Advanced Art Studio
in our competition

LISTINGS

Play Code Breaker . . .
Speed up your discs

ADVENTURES

Hints and tips, plus
Stationfall explored

GRAPHICS

See the best ST art
in Gallery, experiment
with our Kaleidoscope

REVIEWS

HiSoft Basic compiler,
Advanced OCP Art Studio,
Easy-Draw, Assempro-ST,
CAD 3D-2, Transputer

SOFTWARE

Jupiter Probe, Hardball,
Barbarian, 221b Baker
Street, Hades Nebula



I predict that the following matches will result in:

Arsenal	-v-	Watford
Aston Villa	-v-	Fulham
Everton	-v-	Liverpool
Man. Utd.	-v-	Man. City
Wolves	-v-	Tottenham
Bristol City	-v-	Bristol Rovers
Burnley	-v-	Rochdale
Glasgow Celtic	-v-	Glasgow Rangers
Perth	-v-	Hamilton
Queen/South	-v-	Partick Thistle

Press any key to return to Menu

OF FILE--

THE POOLS

Pay Anne O'Neil
One million
pounds £1,000,000
[Signature]

OUT OF THE ARCADE..

Stunning colour. Exhilarating action. Unbelievable realism and nerve shattering excitement. Qualities of entertainment most normally associated with the arcade halls, but no longer the sole reserve of the coin-op machine. The masters of entertainment software have directed their talents towards the outstanding qualities of the Atari ST to present a series of sensational hits that bring the legendary features of the coin-op out of the arcade and into your home.



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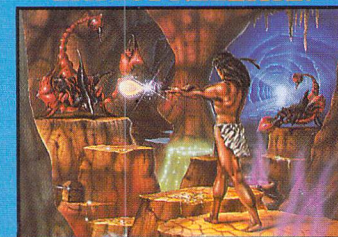


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Vol. 2 No. 7 September 1987

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FEATURES

News

All the latest news, views and developments on the ST scene.

5

Gallery

See the best graphics around, created by top computer artists.

20

Kaleidoscope

Create amazing, swirling patterns of colour on your screen.

34

Comms

A guided tour of MicroLink, Telecom Gold and Prestel.

38

Adventures

Hints and tips plus a full review of Infocom's Stationfall.

40

Mailbag

Another selection of lively letters from our bulging mailbag.

66

Competition

Win Eidersoft's graphics tablet and Advanced OCP Art Studio.

22

REVIEWS

Art Studio

Painter, sprite editor, background designer or map maker?

19

Software

Barbarian, Hades Nebula, Hardball and Jupiter Probe tested.

27

Easy-Draw

This impressive drafting tool is given a thorough workout.

32

Code Breaker

Improve your powers of logical thinking with this brain teaser.

47

Assempro-ST

A Gem-based text editor, assembler and monitor is tested.

50

CAD 3D-2

A report on a package producing true stereoscopic images.

52

K-Max

We assess a plug-in-and-go transputer add-on for your ST.

65

HiSoft Basic

A preview of the fastest compiled Basic available for the ST.

71

PROGRAMMING

Speed-up

This clever formatter dramatically improves disc access speeds.

10

Databases

A chance to win up to £1,000,000 with our pools predictor.

14

Machine Code

Our guide for beginners examines the 68000 instruction set.

23

Sound

A simple guide to transcribing sheet music to ST Basic.

44

3D Graphics

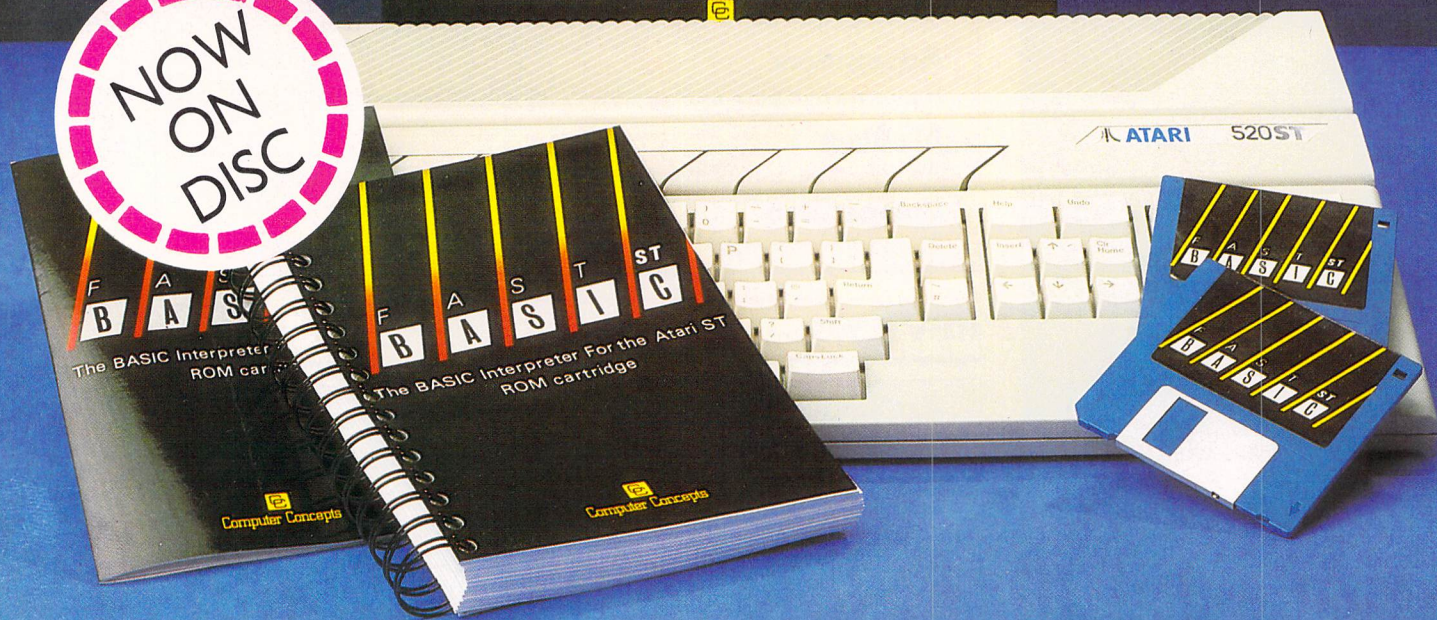
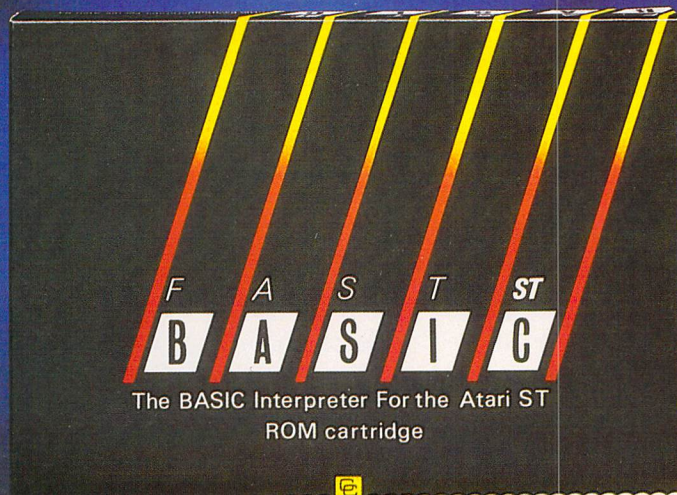
We show how to fly round a wireframe model of your house.

55

Scrapbook

A selection of hints, tips and short program listings.

63



FAST BASIC

JUST LOOK AT THE REVIEWS IT HAS RECEIVED IN THE PAST—NOW IT'S HALF THE PRICE!

REVIEW

Computer Concept's Fast ST BASIC is the most powerful of the currently available BASICS. It sports a tremendous number of commands, giving the user unprecedented control over the program. It is also simple to use, provided on cartridge and totally GEM-driven...Fast BASIC also has the best GEM support of any of the BASICS.

START, the ST Quarterly

REVIEW

BASIC really is phenomenal value for money. 'If you need a good programming language for home, business or educational use, buy FAST BASIC. If you would like to program GEM applications but do not feel competent enough to tackle C, buy FAST BASIC. If you need a macro assembler with a good editor and environment, buy FAST BASIC.'

ST User magazine—Oct 86

REVIEW

'The execution speed has to be seen to be believed. If you own an ST even if you are a C or machine code programmer you should own a copy of FAST ST BASIC. I don't know of a BASIC on any other machine which is so feature packed and yet still easy to use.'

Atari User—Nov 86



Computer Concepts Ltd

Gaddesden Place, Hemel Hempstead, Herts, HP2 6EX

England, Telephone (0442) 63937



Fast BASIC has now
been released on disc
at the amazing price of
£39.00 + VAT
(£44.85 incl.)

DTP gets its own Oscars

THE UK desktop publishing industry – where the Mega ST and its laser printer are poised for a major role – is to have its own version of the Oscars.

Among them will be a special award for the best example of desktop publishing produced on an Atari ST.

Pira, the UK technology centre of the printing and publishing industries, will sponsor the new awards.

Winners will be announced at The Desktop Publishing Show 1987 at London's prestigious Business Design Centre from October 15 to 17.

There will be three main categories – newspapers and magazines, company reports, and leaflets-newsletters-brochures.

All the work must have been produced predominantly by a desktop publishing system.

A panel of judges from the design and print fields will make the final decisions.

Entries – consisting of one example of desktop publishing accompanied by full details of the production methods used – must be received no later than noon on Thursday, October 1.

They should be sent to The Desktop Publishing Awards 1987, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY.

"Desktop publishing is revolutionising the way we communicate in print", says Tom Hunter Craig of Pira.

"With these awards we hope to ensure that the standard of excellence so long demonstrated in the UK publishing field is maintained".

520 STM PRICE SLASHED

ATARI is to cut the price of the 520 STFM by £100, bringing it down to £299.

The cut is a direct result of improved production techniques and increased demand for the product.

"We expect the lower priced machines should start trickling through to the retailers by September. The new pricing policy should help Atari to achieve an ST user base of 100,000 by the end of the year", said Peter Walker for Atari.

Mega spearhead for Atari drive

ATARI'S big push into the middle market range and quality desktop publishing field has begun in earnest with the arrival of the Mega STs and SLM 804 laser printers.

Scare stories of delays and problems have been dismissed by Atari as so much hot air. The recent joint release of the Mega ST on both sides of the Atlantic will be followed by volume shipments in about a month.

"We're on target – just as president Jack Tramiel said we would be back in April", said an Atari UK spokesman.

Together the two new pieces of hardware represent a unique launch combination, bound to take desktop publishing by storm.

The Mega ST is compatible with all present STs and their software. It has a built-in 720k floppy disc drive, a detachable keyboard, battery-backed clock/

calendar and open architecture for easy expansion.

It costs £999.95 for the 2Mb version and £1,295.95 for the 4Mb, both with a monochrome monitor.

The SLM 804 relies on the large memory capacity and fast processor speed of the Mega ST, making it a perfect partner.

It also means that the actual construction of the printer is able to be simplified since the computer does most of the work.

All this produces high quality output giving a resolution of 300 dots per inch, at a speed of eight pages a minute – higher speed printing than a daisy wheel of comparable quality but with graphics output on top.

The SLM 804 can output any graphics, a wide range of fonts and any picture in high resolution.

ST database takes Germany by storm

A BRITISH database for the ST is sweeping across Europe.

Already a hit in the UK, top award winner in the US and said a certainty to become the French standard, Superbase Personal from Precision Software is now wowing computer journalists in Germany.

Once again it was the very visual nature of the package which captured the attention. A panel of German journalists voted Superbase top of the databases.

Marcus Wolfram, an editor with the Markt and Technik computer magazine

group based near Munchen said they were impressed by the variety of functions available and the ease with which they could be accessed.

"Because it is Gem based, the program is easy to comprehend. To be able to manipulate data so easily through clicking the mouse on symbols is most useful", he said.

The journalists were more than willing to acknowledge the power of the database and applauded its ability to create an unlimited number of fields with records of any size.

"It's number one as far as we are concerned", said Herr Wolfram.

THE words His Master's Voice and the picture of the dog Nipper with or without a gramophone are registered trade marks of EMI Records. We apologise unreservedly to EMI Records for the misuse of these trade marks on the cover of Atari ST User, Volume 2, No. 5.

Atari plans a show village

ATARI plans a major presence at this year's PCW Show with a special village packed with the very latest in hardware and software.

To be called Atari World, the area will have more than 50 stands of specially selected support companies, including your own *Atari ST User*.

The new Mega STs and PCs will be on show alongside a vast array of business and games software and the latest add-ons.

Amid the 1,000-square metre Atari World will be a recording

studio and a satellite weather picture receiving system.

German programming language producers Epsilon, digitiser makers Start Systems and Vital Match, the desktop publishing software and hardware firm will be in the pavilion.

Atari boss Jack Tramiel plans to fly over to the show, at London's Olympia, to complete the high level of presence the company plans there.

"They'll certainly know we've been", said a spokesman.



The ST weatherman

WEATHERLINK – the unique daily pictorial record of satellite transmissions provided on MicroLink – is now available to ST users.

Thanks to new software devised by MicroLink subscribers Andrew Brown and Mike Cuff, any ST owner can become a weather forecaster – able to predict sunshine or showers just like the Met Office.

MicroLink uses an aerial situated in Kent to intercept signals from the NOAA9 satellite and convert them into electronic data.

The new software will allow ST users to download this data and turn it into satel-

lite pictures just like the ones on TV.

Pictures – like the one of the British Isles, Western France and Northern Spain shown here – can be captured on-screen in black and white or colour and printed out.

Andrew and Mike are currently working on an enhanced version which will store the files in a format that can be read by the art package, Degas. This will let users zoom in and, manipulate, parts of the picture.

A full report on the new ST software and how to use it will appear in next month's *Atari ST User*. Details of how to join MicroLink are on Page 49.

ADVENTURE IN SPACE

AN animated graphic adventure for the Atari ST – Addicta Ball – has been released by Alligata software (0742 755796).

The player is in charge of a space ship which has to fight through eight different screens of increasing difficulty. On the

voyage through the various levels lasers, booster units, food and ammunition have to be picked up.

To make things even more difficult aircraft and death stars have to be fought off as well as escaping destruction by a Super Nova. Price £14.99 on two discs.

MicroProse fights ban

PRODUCER of top Atari ST entertainment software MicroProse has suffered a triple KO from touchy West German authorities.

Three months ago its ST best-selling submarine simulation *Silent Service* was banned because it was considered "too warlike".

The Germans outlawed the game – re-titled *Das U Boot* – under legislation known as the Youth Dangerous Publications List, designed to protect youngsters from pornography and "any material likely to encourage antisocial behaviour among German youth".

Now the West German Government has added two more MicroProse titles to its hit list – banning popular air warfare simulations *F-15 Strike Eagle* and *Gunship*.

As MicroProse produces little else but war-type simulations it means big problems for its German distributor Rushware. But a spokesman said the company intends to appeal against the rulings.

Solo bridge updated

AN improved version of *Bridge Player 2000* with tutor for the Atari ST has been released by CP Software (099382 3463).

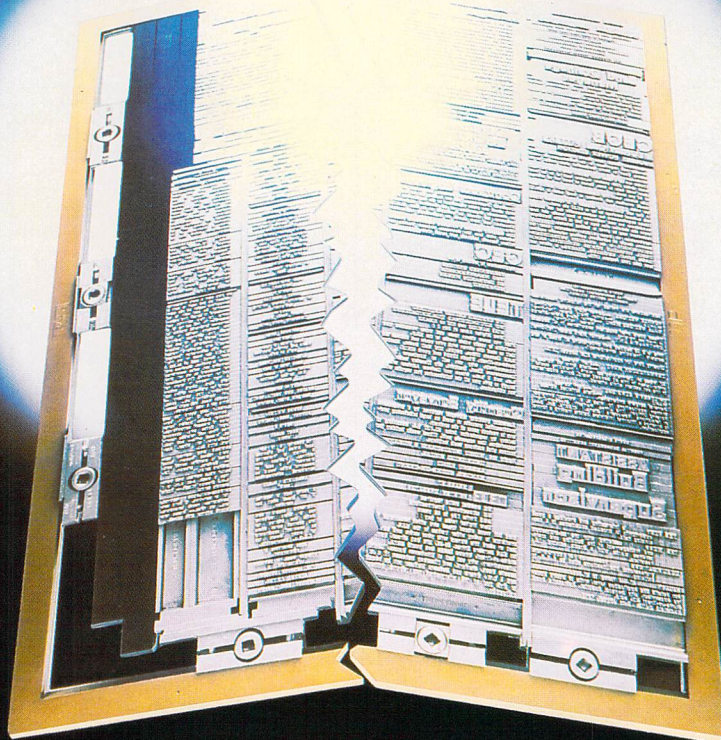
The game allows anyone to play bridge without the need for three other players. For those who have never played the game before a tutor is included along with a text commentary by a professional. It costs £19.95.

Graphics problems had been experienced with the earlier release when used with certain domestic TV sets but a CP Software spokesman says they have all been sorted out.

Owners of the earlier version can upgrade free of charge by returning the original disc.

The old technology is dead.

Join the revolution!



The printing industry has been rocked to the core by an ever-growing series of developments in the exciting new field of Desktop Publishing.

Traditional ways of producing the printed page have been revolutionised.

Now anyone can use a home or office micro to design and typeset anything from books and newsletters to advertisements and company reports.

With the latest methods it can all be done at a fraction of the conventional cost. And much quicker and easier than ever before.

Here's a unique opportunity to find out more about this bustling new industry – the first Desktop Publishing Show. All the major companies will be demonstrating their latest products. And there will be seminars throughout each day to tell you exactly how you or your company can benefit most from the Desktop Publishing revolution.

In addition, each visitor will receive a free copy of the Desktop Publishing Yearbook, worth £5 – packed with facts and figures on the most fascinating development in print technology since Caxton.

Desktop Publishing 1987 SHOW

October 15, 16 & 17

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Islington, London N1**

Organised by Database Exhibitions



*Sponsored by Pira, the UK technology centre
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No admission charge. Please complete this coupon for your tickets.

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Please send me _____ FREE tickets to
The Desktop Publishing Show 1987

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NO PERSONS UNDER 18 ADMITTED

SHOW HOTLINE: 061-480 0171

A080

Howard's prize pack

YOU'RE never too young to be an ST user. Nine-year-old Howard Caswell from Worthing is getting to grips with the Atari STFM he won in the recent Prize in Every Pack competition organised by Mirrorsoft and PSS in conjunction with W H Smith stores.

Howard (centre) is pictured with brother Philip after receiving his prize from John Rowlands, merchandise controller at W H Smith.



Driving a better bargain

THE range of Supra hard disc drives for the ST has been reduced in price by Frontier Software (0423 67140).

"SupraDrives have been selling exceptionally well since they were first introduced to the UK in February", said Dave Fields, Frontier Software's sales manager.

"The recent rise of the pound against the dollar and increased volume of shipments has meant that the drives are costing us less and we are happy to pass this on to the customer".

There are three units available – 20Mb, 30Mb and 60Mb. All are housed in a case which is very similar in size to an ordinary ST floppy disc drive.

The SupraDrive is completely hardware and software compatible with the Atari ST and will even run concurrently with other DMA bus devices.

Prices: £629.95 for 20Mb, £929.95 for 30Mb and £1799.95 for 60Mb.

Printer in a hurry

THE days of waiting for a slow printer to finish before being able to use the ST again may be over.

Usually a large print buffer is needed to free the computer, but now Precision Software (01-330 7166) has launched a high speed, top quality, low cost dot matrix printer.

The Precision 4010 printer is capable of speeds of up to 252 lines per minute in draft mode and 55.8 lines per minute for near letter quality.

There are nine different fonts to choose

from including high resolution graphics. It comes with a Centronics interface.

In addition to its high speed an 8k print buffer ensures that the ST is tied up for the shortest possible time.

The 4010 is also available bundled with a choice of either Precision's own best selling relational database Superbase Personal, Gem and a mouse, or with Wordperfect Executive which is a combined wordprocessor, spreadsheet and library. Price £369 for the printer and £469 with the bundled software.

Gem of a database

A GEM-based database for the Atari ST has been released by Kuma (07357 4335).

K-Data is not a relational database but its comprehensive capabilities enable users to merge, class and sort data quickly, carrying out the vast majority of functions previously reserved for more powerful databases.

The number of records per file is limited only by the capacity of the hardware. The operation of the program is disc interactive which automatically saves

data to disc as it is entered.

From two to four data files can be open simultaneously depending on the hardware configuration.

K-Data incorporates a powerful report generator which lets data be printed out in user defined formats, including labels, to screen, printer or a datafile.

The new package is compatible with K-Spread 2, K-Graph 2 and K-Word 2 enabling data to be transferred between packages. Price £49.95.

Interpreter's price lopped

SUMMER price cuts for Atari ST products have been announced by Glentop Press (01 441 4130).

Their GFA Basic Interpreter and GFA Basic Compiler have both been reduced in price from £59.95 to £45.95.

Glentop expects that the new pricing

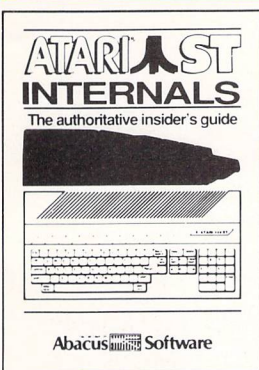
policy will make GFA Basic highly competitive in the home user market.

The interpreter and compiler will form the key members of a family of inter-related software which will be backed and fully supported by a series of new books.

Authoritative!
Comprehensive!

Atari ST Reference Books from Abacus Software

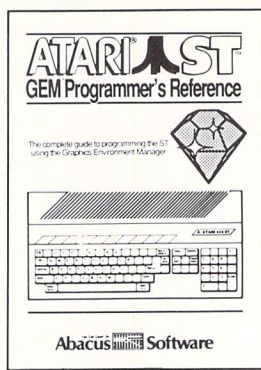
Definitive!
Instructive!



ST Internals

(Formerly Anatomy of the Atari ST)
An essential guide to the insider's information on the ST. Written for the programmer wanting a thorough, complete description of the inner workings of Atari's outstanding ST computers. Detailed descriptions of graphics and sound chips, hardware, the Centronics and RS-232 ports, GEM, important system addresses and much more. Included is a commented BIOS assembly listing. This reference work is a required addition to your ST library. Third printing.

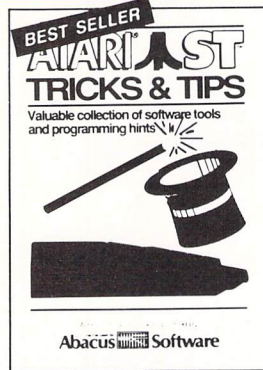
AB 450 446 pages **£14.95**



GEM Programmer's Reference

An indispensable guide for the serious ST programmer needing detailed information on GEM. Written especially for the Atari ST, it has an easy-to-follow format. Covers choosing the right programming language, introduction to C and assembly languages; a study of the Editor, C-compiler, Assembler & Linker; programming the Virtual Device Interface (VDI); Application Environment Services (AES); Graphics Device Operating System (GDOS); and interfacing to TOS. Many example programs, Cross-referenced VDI/AES calls.

AB 470 412 pages **£14.95**



Tricks & Tips

Fantastic collection of ST program tools and techniques for the ST. Programs include a super-fast RAM disk; time-saving print spooler; colour print hardcopy; plotter output hardcopy; accessories construction - all of these programs and more are included in the price of the book! Learn how to create brilliant graphics, use the VDIO/S commands, and master the powerful GEM applications. Refine your BASIC, assembler and C programs with advanced programming techniques.

AB 455 260 pages **£14.95**



ST BASIC Training Guide

An educational, well-written introduction to Atari ST BASIC. You'll learn to program your ST quickly with the BASIC commands, problem analysis, and algorithms presented in the first few chapters. Quizzes throughout the book help you learn to "think in BASIC" while you get a practical grounding in the language at the same time. Topics include data-flow and program flowcharts, menus, multi-dimensional arrays, sort routines, file management, BASIC under GEM, advanced programming techniques, and much more.

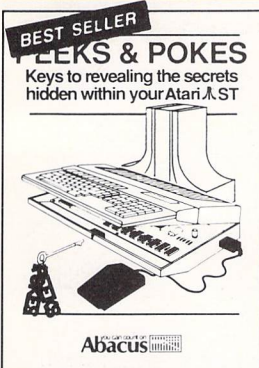
AB 485 312 pages **£12.95**



Introduction to MIDI Programming

Your ST's built-in Musical Instrument Digital Interface (MIDI) lets you control any MIDI-equipped digital synthesizer - and the results can be phenomenal! This book covers the fundamentals of MIDI operation on the ST - how a synthesizer is actually interfaced with the ST's MIDI ports. Includes C sourcecode listings for comprehensive MIDI editor, driver and animated player for any of the Casio CZ series, etc. Written by the authors of XLENT Software's ST Music Box™ package.

AB 520 250 pages **£14.95**



Peeks & Pokes

Enhance your programs with the PEEK and POKE examples in this book. Clearly explains a number of the most important POKES and their uses. At the same time, you'll get a good look at the architecture of the Atari ST. Topics include: the ST's configuration and interfaces, its "intelligent" keyboard, the mouse, pointer and stack, diskettes; TOS, GEM, interpreter/compiler, choice of programming languages, input and output; much more.

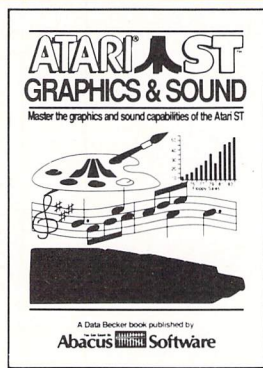
AB 480 175 pages **£12.95**



ST Machine Language

Learn 68000 machine and assembly language to make the fullest use of your ST. Takes a systematic approach in presenting number systems, logical operations and bit manipulation; use of registers, structure and details of the 68000 instruction set and the ST system routines; explains the functions of the editor, assembler, linker, etc. Contains many sample programs.

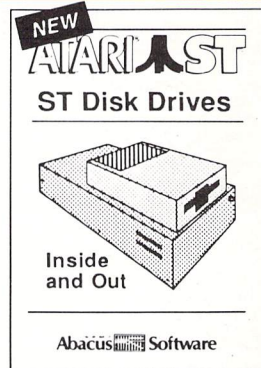
AB 465 280 pages **£14.95**



Graphics & Sound

An in-depth look at creating sophisticated graphics and surprising music and sounds on the ST. Detailed guide features step-by-step introduction to graphics in all resolutions: 2-D and 3-D function plotters, Moiré patterns, graphic memory, various resolutions, fractals, recursion, sound waveform generation, MIDI. Example programs written in C, LOGO, BASIC and Modula-2 ST. See and hear the audio-visual possibilities built into this remarkable computer.

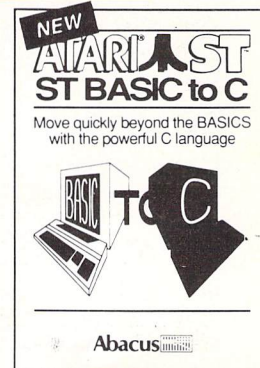
AB 460 255 pages **£14.95**



ST Disk Drives: Inside and Out

The definitive guide to the ST disk drives, including the Atari ST Hard disk. This exhaustive volume not only covers files, file structures and data management, but details both the programming and technical aspects of the floppy drives, hard drive and RAM disk. Includes program listings for several full-length utilities and programming tools that allow you to further explore the capabilities of these drives. Available first quarter '87.

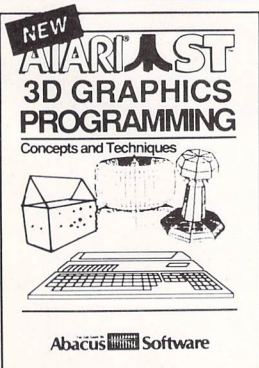
AB 445 375 pages **£16.95**



ST BASIC to C

Move up from BASIC to C - in a hurry! If you're already a BASIC programmer, you can learn the fundamentals of C language programming all that much faster, usually in less than one day. Parallel examples demonstrate the programming techniques and constructs in both languages. Topics include variables, pointers, arrays, data structures, more.

AB 515 250 pages **£14.95**



3-D Graphics

Teaches ultra-fast 3-D graphics techniques in 68000 machine language. Axial rotation, zooming and shading of 3-D objects. Learn the mathematics and data structures behind 3-D graphics. Topics include transformation and projection of one dimensional figures to 3-D, hidden line removal, shading, introduction to 3-D CAD. Complete with 3-D patternmaker and animator.

AB 550 351 pages **£16.95**



Optional Program Diskettes

Available for all of our ST Reference Library titles. The diskettes contain most of the programs found in the text of the book, saving you the time and trouble of typing them in on your keyboard.

Each diskette **£9.95**



Available from your local dealer or directly from
**Precision Software Ltd. 6 Park Terrace,
Worcester Park, Surrey KT4 7JZ
Telex 8955021 PreciS G
01-330 7166**

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Signature _____

Full speed ahead

THE ST isn't particularly fast at reading and writing to discs and it is possible to greatly improve disc input/output speeds.

Program I shows a simple C program which times the read and write operations of the ST's disc system: A 128k block of memory is first saved to the disc and then read back. The output gives the time for this operation. Program II is the same program written in Fast Basic.

The listing is intentionally simple to keep down the proportion of time spent in overheads. It was written to run on a single, double-sided disc system so the first section is to allow a request for the input of disc B before timing starts. This permits a completely clean, freshly formatted disc to be inserted for the test.

The system clock is used for timing. It is rather coarse, measuring in 2 second increments in the C version, but even so it is sufficient to demonstrate the speed improvements possible. The program as written takes 36 seconds to run on a double sided drive with a newly formatted disc.

The ST's disc contains nine sectors each of 512 bytes, or 4.5k per track. Spinning at 5 revs per second means that bytes pass the read/write head at a rate of 22.5k per second. Program I is timed writing a 128k block from memory and then reading it back. A total of 256k

Andrew Donald proves you can enhance your ST's performance

passes through the read write head, so at 22.5k bytes per second this should take a theoretical 11 secs. Why then 36 seconds in practice?

The reason is that two system flags are set for all read/writes. The first is the write verify flag, a word located at address \$444. The normal value at this address is \$FF00. Resetting this to \$0000 turns off write with verify, and the time for Program I reduces to 24 seconds – but at the cost of verifying.

Programs III and IV are small routines which will allow you to toggle this flag. Although setting the flag to off gives a dramatic improvement in speed it is still a factor of two away from the theoretical optimum.

The reason for the remaining delay requires more consideration. The system sets a verify flag on track seeks. Unlike the "write with verify", this flag is not available to the user. Although the flag is difficult to switch, its effects on the system are alterable.

Files are not necessarily saved in con-

tiguous sectors on the disc but the probability is high that after reading the last sector on one track, the next required sector is the first one on the next track.

It is here that the problem arises. Having read sector 9 on track *n*, the controller issues a command for the head to step in one track and then verifies that it is on track *n*+1.

This is done by reading the first sector identity which comes past the head and checking the track. Having come from sector 9, and taking only 3 msecs to step, the first sector to appear on the next track will be sector 1. It reads, confirms the track and then starts looking for sector 1 to read the data.

Sector 1 is now a full revolution – 200 msecs away. It therefore takes well over 200 msecs to move across what are essentially contiguous sectors. This will happen every nine sectors in a large file. Every 200 msecs there will be an added

```
\ Program II
\ I/O Time Test Program in Fast Basic
BSAVE"B:TTEST", $40000, $100
TIME=0
BSAVE"B:TTEST", $40000, $20000
BLOAD"B:TTEST", $40000
PRINT TIME/200
DIR
```

Program II

```
/* Program I */
/* I/O Time Test Program in C */

#include <osbind.h>
char f_name[] = "B:TTEST";

main()
{ int handle; long ret;
  handle = Fcreate(f_name, 0);
  ret = Fwrite (handle, 0x00100L, 0x40000L);
  ret = Fclose (handle);
  Settime(Gettime() & 0xFFFFFE0L);

  handle = Fcreate(f_name, 0);
  ret = Fwrite (handle, 0x20000L, 0x40000L);
  ret = Fclose (handle);

  handle = Fopen (f_name, 0);
  ret = Fread (handle, 0x20000L, 0x40000L);
  ret = Fclose (handle);

  printf("%4ld", (Gettime() & 0x1FL)*2);
  printf(" secs to write 128k & read 128k \n");
  ret = Cconin();
  Pterm0(); }
```

Program I

```
/* Program III */
/* Write Verification Flag Control in C */

#include <aesbind.h>

main()
{ char fa_str[100]; int fa_xbtn, fa_dbtn; appl_init();
  strcpy(fa_str, "[1][WRITE VERIFICATION] IDefault indicates");
  strcat(fa_str, "I current state.[ ON I OFF ]");
  fa_dbtn = 2; if (peekb(0x0444L)) fa_dbtn = 1;
  fa_xbtn = form_alert(fa_dbtn, fa_str);
  pokeb(0x0444L, 255); if (fa_xbtn > 1) pokeb(0x0444L, 0);
  appl_exit(); }
```

Program III

```
\ Program IV
\ Write Verification Flag Control in Fast Basic

fa_str$ = "[1][WRITE VERIFICATION] IDefault indicates"
fa_str$ = fa_str$ + "I current state.[ ON I OFF ]"
IF PEEK($444) THEN fa_dbtn% = 1 ELSE fa_dbtn% = 2
fa_xbtn% = ALERT(fa_str$, fa_dbtn%)
IF fa_xbtn% > 1 THEN POKE $444, 0 ELSE POKE $444, $FF
```

Program IV

```

/*Program V */
/* RE_FORMAT in C
   This program lifts track data, re_formats for fast access
   and restores the data. Operates on drive B.
   Do NOT use on an important disc unless a backup exists */

#include <vdibind.h>
#include <aesbind.h>
#include <osbind.h>

int contrl [128], intin [128], ptsin [128], intout [128],
    ptsout [128], work_in [128], work_out [57],
    handle, fo_aexbbtn, sec_buf[0x900], fmt_buf[0x1000];
char out_str[] = " Track 00 completed ";

open_work()
{ int i; appl_init();
  for(i = 0; i < 10; work_in[i++] = 1); work_in[10] = 2;
  v_opnvwk(work_in, &handle, work_out); }

close_work()
{ v_clswwk(handle); appl_exit(); }

alarmbox()

{ char fo_ast[150]; strcpy(fo_ast, "[3][This program reformats");
  strcat(fo_ast, "ldrive B, hopefully without destroying data!");
  strcat(fo_ast, "***** Take care *****][QUIT1OK]");
  fo_aexbbtn = form_alert(1, fo_ast); }

relay_track(no)
int no;
{ int ret, side; for (side = 0; side < 2; side++)
  /* for single sided drive ^ side < 1 ^ */
  { ret = 1; while (ret > 0)
    ret=Flopdr (sec_buf, 0, 1, 1, no, side, 9);
    ret = 1; while (ret > 0)
    ret=Flopfmt(fmt_buf, 0, 1, 9, no, side, 11, 0x87654321L, 0xE5E5);
    ret = 1; while (ret > 0)
    ret=Flopwr (sec_buf, 0, 1, 1, no, side, 9); } }

main()
{ int no; open_work(); alarmbox(); if (fo_aexbbtn < 2) goto done;
  for (no = 0; no < 80; no++)
  { relay_track(no); v_gtext(handle, 240, 100, out_str);
    out_str[9]++; v_hide_c(handle);
    if (out_str[9]>'9') {out_str[8]++; out_str[9]='0'; } }
  done: close_work(); }

```

Program V

delay of a further 200 msecs – the missing delay factor of 2.

It is possible to overcome this delay neatly. Instinct is to turn off seek verification but in a rom based system this is not a practical proposition. There is, however, an alternative.

The delay occurs in the gap between sector 9 and sector 1. On the ST it is a rather large gap and can in fact hold about another sector and a half of data. Some people have used it to extend the disc capacity, putting 10 sectors on the track and changing byte 24 of the boot sector from 9 to 10 so that the system recognises its existence.

It's better to use the space to eliminate the track-to-track delay. If the disc is formatted so that this gap has one full extra sector (10), and the header for another (11), but without informing the system of their existence, then the following happens: At sector 9 the head steps on to the next track taking 3 msecs.

This will put it past the header marked 10 but before the one marked 11.

It then picks up header 11 for track identification. The fact that only half a sector exists behind the header will not matter; it is never going to try to read the sector. It has now verified the track is correct and starts to look for sector 1. This will be the next sector along, so the wasted revolution has been removed.

Running Program I or II on a disc formatted this way, you will find that execution time has reduced from 36 to 20 seconds. This is with all seek and write verification still active. If you are prepared to live with uncertainty and switch off the write verify then the time becomes 12 secs. Allowing a little for Gem overheads in this period brings us

very close to the theoretical 11 secs.

The production of discs with this special format is possible using the system routines. XBIOS function 10 is a track formatter which will normally produce discs with the sector 9-1 gaps filled with a value of \$4E.

Fortunately, it is possible to persuade this routine to produce discs of the type required. This saves having to write a special formatting routine. Input parameters to this function include number of sectors per track and an interleave constant.

The temptation is to set the number of sectors to 11 and format but this unfortunately overwrites the start of sector 1 with the end of 11. Instead we have to use the interleave factor. Normally,▷

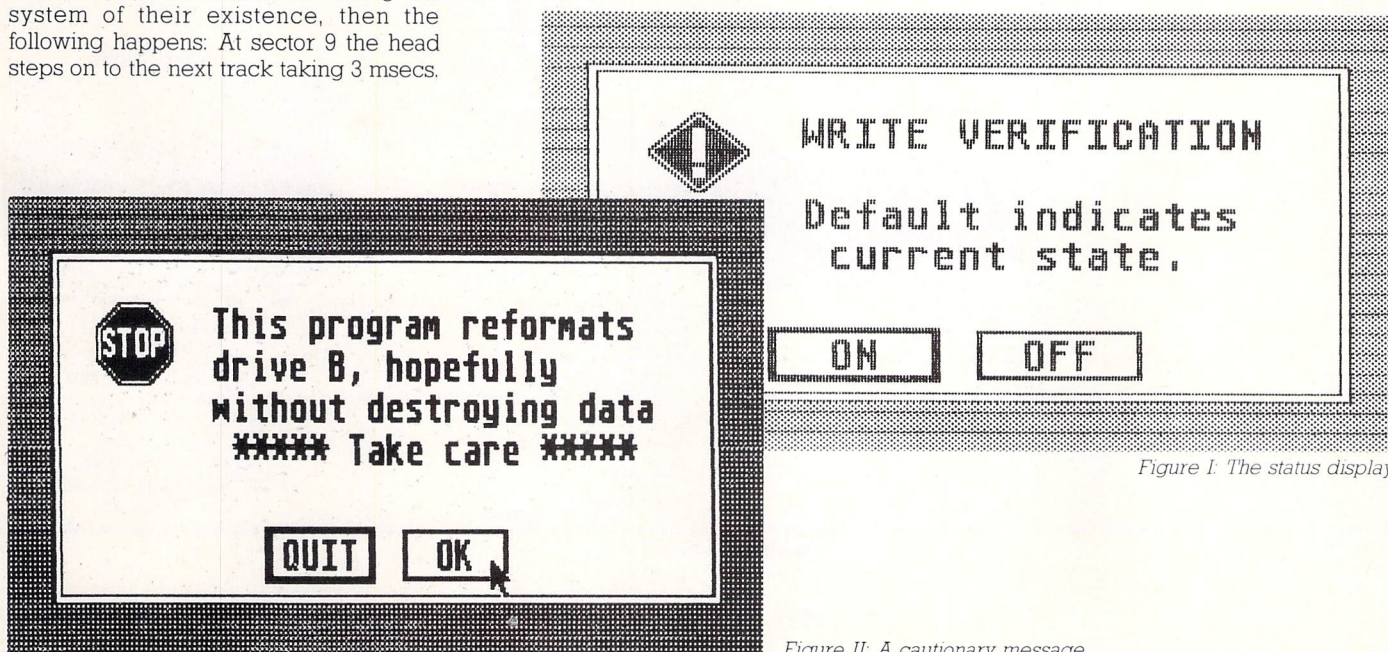


Figure I: The status display

Figure II: A cautionary message

```

\ Program VI
\ RE-FORMAT in Fast Basic
\ This program lifts track data, re-formats for fast access
\ and restores the data. Operates on drive B.
\ Do NOT use on an important disc unless a backup exists.

```

```

RESERVE code%,$200:RESERVE sec_buf%,$1200:RESERVE fmt_buf%,$2000
FOR pass=1 TO 2:[ OPT pass,"L- W-":ORG code%
secs%
MOVE #9,-(SP):MOVE @side%,-(SP):MOVE @track%,-(SP)
MOVE.W #1,-(SP):MOVE #1,-(SP):CLR.L -(SP):PEA sec_buf%
MOVE.W @io%,-(SP):TRAP #14:ADDA.L #20,SP:TST D0:BMI secs%:RTS
fmt%
MOVE #$E5E5,-(SP):MOVE.L #$87654321,-(SP)
MOVE #11,-(SP):MOVE @side%,-(SP):MOVE @track%,-(SP)

```

```

MOVE.W #9,-(SP):MOVE #1,-(SP):CLR.L -(SP):PEA fmt_buf%
MOVE.W #10,-(SP):TRAP #14:ADDA.L #26,SP:TST D0:BMI fmt%:RTS
]:NEXT

```

```

SETWINDCOORDS 1,0,11,640,189:TXRECT 1,22,615,167:CLS
foa_str$ = "[3][This program reformats drive B, hopefully without"
foa_str$ = foa_str$ + " destroying data! ***** TAKE CARE *****]"
foa_str$ = foa_str$ + "[QUITIOK]"
foa_xbtn% = ALERT(foa_str$,1):IF foa_xbtn%<2 THEN END

FOR T%=0 TO 79:track%=T%:FOR S%=0 TO 1:side%=S%
\ for single sided drive ^ S%=0 TO 0 ^
io%=8:CALL secs%:CALL fmt%:io%=9:CALL secs%:NEXT:HIDEMOUSE
PRINT;TAB(30,10);"Track ";T%;" completed ":NEXT:SHOWMOUSE
DIR

```

Program VI

◁ interleaving the sectors on this system has no effect except slowing down read/writes.

Operation is fast enough to handle consecutive sectors. If the sector count is kept at 9 and the interleave factor is made 11, it will be found that sectors 1 to 9 will be written consecutively as normal, but the filler gap at the end of the track has now been overwritten with images of sectors 10 and 11.

The images get moved to the disc as end of track fillers after the 9 active sectors are written, giving exactly the format required.

Program V is a routine written in C which will read the sectors from a standard format disc, reformat the tracks and rewrite the information. Program VI is the same routine written in Fast Basic. Reformating discs with this routine will significantly decrease future average read/write times.

It is advisable to first test it on unimportant discs to ensure the integrity of the transfer. To the system, discs will appear to be perfectly normal standard discs.

It is tempting to use the 10th sector for extra data storage, but the track delay would reoccur going from 10 to 1. It

requires two separate identity headers after the last used sector for this method to work.

To run these programs on a single sided drive, only programs V and VI require alteration. Comments are included in the listings to show where to change the side count to permit this.

The speed improvements due to changed format will be available even with all write and seek verifications taking place. For those who wish to sacrifice write verification in exchange for even more speed, the verify flag may be switched off. □



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DESKTOP PUBLISHING AWARDS 1 · 9 · 8 · 7

Desktop Publishing is the biggest growth area in microcomputing today. Many of the UK's top graphic designers have embraced it, harnessed its tremendous potential, and produced extremely eye-catching layouts.

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What you have to do

Supply two copies of the submission, together with a disc containing any relevant files and the completed entry coupon.

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How to make a million!

MENTION "database program" to a computer user and he'll automatically think of business applications. In this part of our series on writing your own tailor made databases, we will see how they can be used for fun, too.

By the end of this article you will have a file which will hold all the football teams – with their points – in the four English and three Scottish League Divisions.

As there isn't much point in storing information unless there is a use for it, we will use the data to predict which football matches are likely to end in a draw.

First, we must create a data file containing the required details. You will need a copy of the league tables for the start of the 1987/88 football season.

You can now enter the teams and their

Ken Hughes rounds off his guide to writing databases with a pools predictor

points, in alphabetical order, division by division.

To do this, once you have typed in and saved Pools Predictor, run it and at the main menu enter 1 for "Enter team data" and then 1 again for "Create new data file".

You will be prompted for the team name and points. If you are entering this data before the start of the season, all points will be zero.

Once you have completed this marathon task, the disc file will be created and the data written to it.

We have used drive B in the program to show the method of forcing the file on to a drive other than the default. To use the default drive remove the drive letter

and the colon. To use a different drive, change the B for the required drive letter.

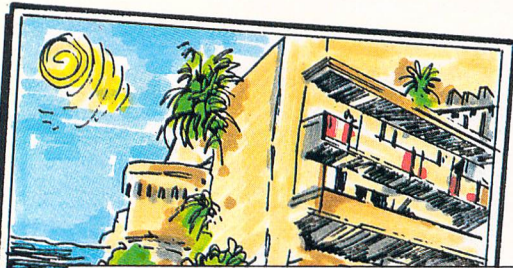
As strange things can – and do – happen to discs, it would be prudent to leave the program at this stage and make a backup copy of the file "team.dat".

If you made any errors when typing in the data you can amend it by entering 1 once again at the main menu but this time at the sub-menu enter 2 for "Amend existing file".

The teams, points and their numbers will be displayed on the screen in batches of 30. To amend a name or points enter the team number when prompted. To see the next screen-full press Return, or 0 to return to the main menu.

During the forthcoming weeks you will need to alter the number of points scored by each team. This is done by entering 2 at the main menu. You will be shown the teams with their current points and be asked for the new ones. Once all these have been dealt with, you will be returned to the main menu screen.

Because the majority of the teams are going to have their points changed, the data entered is stored in an array and the mass



```

10 REM *****
20 REM * Pools Predictor *
30 REM *   by Ken Hughes   *
40 REM * (c) Atari ST User *
50 REM *****
60 REM
70 REM Written in ST Basic
80 REM
90 GOSUB set.up
100 GOSUB menu
110 END
120 set.up:
130 nme$=" WIN £1,000,000 "
140 POKE SYSTAB+24,1
150 a#=GB
160 GINTIN=PEEK(a#+8)
170 POKE GINTIN,PEEK(SYSTAB+8)
180 POKE GINTIN+2,2
190 s#=GINTIN+4
200 POKE s#,VARPTR(nme$)
210 GEMSYS(105)
220 POKE SYSTAB+24,0
230 CLEARW 2
240 FULLW 2
250 RANDOMIZE 0
260 DIM team$(130),points%(130),draw
$(70),s%(70),dpoint%(130)
270 DIM play%(74),play1%(74)
280 spac$=STRING$(39,32)
290 GOTOXY 0,6
300 x=FRE("")
310 PRINT "Pools ForecaSTer"
320 PRINT "from Atari ST User"

```

```

330 FOR delay=1 to 1000
340 NEXT
350 CLEARW 2
360 gotoxy 1,1
370 RETURN
380 menu:
390 WHILE sel%<>4
400 GOTOXY 5,5
410 PRINT "Selection Menu"
420 PRINT
430 PRINT TAB(5);"1. Enter Team Data
"
440 PRINT TAB(5);"2. Enter Points Da
ta"
450 PRINT TAB(5);"3. Run Predictor"
460 PRINT TAB(5);"4. Quit"
470 sel%=0
480 WHILE sel%<1 OR sel%>4
490 sel%=INP(2)-48
500 WEND
510 ON sel% GOSUB team.dat,points.da
t,run.prog
520 CLEARW 2
530 WEND
540 RETURN
550 team.dat:
560 WHILE waitfor%<>3
570 CLEARW 2
580 GOTOXY 5,6
590 PRINT "Select your option"
600 PRINT
610 PRINT TAB(5);"1. Create new data
file"

```

```

620 PRINT TAB(5);"2. Amend existing
file"
630 PRINT TAB(5);"3. Quit"
640 waitfor%=0
650 WHILE waitfor%<1 OR waitfor%>3
660 waitfor%=INP(2)-48
670 WEND
680 ON waitfor% GOSUB enter.team,ame
nd.team
690 RETURN
700 WEND
710 RETURN
720 enter.team:
730 CLEARW 2
740 PRINT "Enter team names and poin
ts"
750 PRINT "for English League Div. 1
"
760 first%=1:last%=21
770 GOSUB data.in
780 CLEARW 2
790 PRINT "Enter team names and poin
ts"
800 PRINT "for English League Div. 2
"
810 first%=22:last%=44
820 GOSUB data.in
830 CLEARW 2
840 PRINT "Enter team names and poin
ts"
850 PRINT "for English League Div. 3
"
860 first%=45:last%=68

```

write routine is used to PUT the data on to disc.

Once the teams have been entered and their points allocated, we can run the draws prediction routine. There are two options here – one is by calculation and the other is by random choice.

We have included the random option because there are a few weeks, at the start of the season, when there is not enough calculable difference between the teams to give a balanced prediction.

There are also other weeks when FA Cup matches are being played and teams not in your file will be listed on your coupons. To run this program, select option 2 from the third sub menu – nothing else needs to be done.

A list of 10 numbers will be displayed on your screen. These correspond to the match numbers on your weekly football coupons. If you need more than 10, alter lines 2810, 2890 and 2990.

To use the calculated method, you will be asked to enter the teams playing each other in the order they appear on the coupon.

The data you have entered will be used to predict which matches are likely to result in draws. A list of teams with match numbers will be displayed. The matches nearest the top of the list will be the strongest possibilities.

Mark your coupons with Xs according to the numbers presented, fill in your postal order and post off your coupons to your favourite pools company.

Let's now have a look at the program in a little more detail. Pools Predictor runs in medium and high resolution and uses the same random access methods as last

month. In the procedure *write.file* starting at line 3680, the whole of the file is written to disc.

This method is used when the bulk of the file has been changed – either because we have entered the data for the first time or because we have updated the points scored by each team.

When we have changed just one or two items, it is as easy to write the data to disc as it changes. This is done in the *alter.name* and *alter.points* routines at lines 1430 and 1520.

Once we have our data stored safely in a file we can then modify it as necessary. Because in this particular program we need to have access to all the data at once, we read it into an array.

The routine *read.file* at line 3250 places the contents of the disc file "team.dat" in to two arrays *team\$()* and *points\$()*.

You will see the file is opened for reading in exactly the same way as we did for writing:

```
3280 OPEN "R",#1,"b:team.dat"
```

The "R" tells the system that we want to open a file called "team.dat" as random access with an identification of stream #1. If the file doesn't exist it will be created.

The data is read from disc into a memory buffer reserved by the FIELD statement in line 3300, exactly the reverse as when we wrote it to disc in the first place.

The first difference between a read and a write operation occurs in the following line where we use GET #1 instead of PUT #1.

We don't need to use LSET or RSET



when reading and we can read the data straight from the buffer as *a\$* or *b\$*.

One important point needs mentioning: When storing numbers they need converting into a special format otherwise errors will result between reading and writing.

The Basic commands to carry out these operations are MKI\$, MKS\$ and MKD\$ to convert integer, single precision and double precision numbers into string variables. CVI, CVS and CVD recovers the data into numeric format. Lines 3330 and 3750 show how these commands are used.

That just about sums it up. If you win £1,000,000 you may like to send us a postcard from your holiday home in the Bahamas – or even a bottle of champagne from the Cote d'Azur.

● Next month in Atari ST User we'll present a portfolio manager to help you invest your winnings wisely.

```

870 GOSUB data.in
880 CLEARW 2
890 PRINT "Enter team names and poin
ts"
900 PRINT "for English League Div. 4
"
910 first%=69:last%=92
920 GOSUB data.in
930 CLEARW 2
940 PRINT "Enter team names and poin
ts"
950 PRINT "for Scottish League Premi
er Div."
960 first%=93:last%=104
970 GOSUB data.in
980 CLEARW 2
990 PRINT "Enter team names and poin
ts"
1000 PRINT "for Scottish League Div.
1"
1010 first%=105:last%=116
1020 GOSUB data.in
1030 CLEARW 2
1040 PRINT "Enter team names and poin
ts"
1050 PRINT "for Scottish League Div.
2"
1060 first%=117:last%=130
1070 GOSUB data.in
1080 CLEARW 2
1090 GOSUB write.file
1150 RETURN
1160 amend.team:

1170 GOSUB read.file
1180 CLEARW 2
1190 q$="":r%=0
1200 WHILE LEN(q$)=0
1210 first%=1:last%=30
1220 GOSUB show.amend
1230 GOSUB check.amend
1240 IF retflag%=1 THEN retflag%=0:RE
TURN
1250 first%=31:last%=60
1260 GOSUB show.amend
1270 GOSUB check.amend
1280 IF retflag%=1 THEN retflag%=0:RE
TURN
1290 first%=61:last%=90
1300 GOSUB show.amend
1310 GOSUB check.amend
1320 IF retflag%=1 THEN retflag%=0:RE
TURN
1330 first%=91:last%=120
1340 GOSUB show.amend
1350 GOSUB check.amend
1360 IF retflag%=1 THEN retflag%=0:RE
TURN
1370 first%=121:last%=130
1380 GOSUB show.amend
1390 GOSUB check.amend
1400 IF retflag%=1 THEN retflag%=0:RE
TURN
1410 WEND
1420 RETURN
1430 alter.name:
1440 OPEN "R",#1,"b:team.dat"

1450 INPUT "Enter New Name ",team$(r%)
1460 FIELD #1, 20 AS a$,2 AS b$
1470 LSET b$=MKIS(points$(r%))
1480 LSET a$=team$(r%)
1490 PUT #1,r%
1500 CLOSE #1
1510 RETURN
1520 alter.points:
1530 INPUT "Enter New Points ",points
$(r%)
1540 OPEN "R",#1,"b:team.dat"
1550 FIELD #1, 20 AS a$,2 AS b$
1560 LSET b$=MKIS(points$(r%))
1570 LSET a$=team$(r%)
1580 PUT #1,r%
1590 CLOSE #1
1600 RETURN
1610 points.dat:
1620 CLEARW 2
1630 GOTOXY 0,0
1640 GOSUB read.file
1650 FOR r%=1 TO 130
1660 PRINT "Team is ";team$(r%);" wit
h ";points$(r%);" Points. "
1670 INPUT "Enter new points ";points
$(r%)
1680 NEXT r%
1690 GOSUB write.file
1700 RETURN
1710 run.prog:
1720 CLEARW 2
1730 GOTOXY 0,6
1740 PRINT "Do you want to make selec

```

```

tions based on:
1750 PRINT
1760 PRINT TAB(5);"1. Points difference"
1770 PRINT
1780 PRINT "or 2. Random Selection"
1790 PRINT
1800 PRINT TAB(5);"Please Enter <1> or <2>"
1810 base%=0
1820 WHILE base%<1 OR base%>2
1830 base%=INP(2)-48
1840 WEND
1850 ON base% GOSUB points.diff,random.select
1860 CLEARW 2
1870 GOTOXY 0,0
1880 PRINT "I predict that the games most likely to result in draws are:"
1890 PRINT
1900 IF base%=2 THEN PRINT "the following match numbers - "
1910 PRINT
1920 FOR shodraw%=1 TO 10
1930 PRINT TAB(5);draw$(shodraw%)
1940 NEXT shodraw%
1950 PRINT
1960 PRINT "Press any key to return to Menu"
1970 q$=INPUT$(1)
1980 RETURN
1990 points.diff:
2000 GOSUB read.file
2010 CLEARW 2
2020 INPUT "Enter number of matches or n Coupon ";mat%
2030 PRINT "English League, Div. 1"
2040 begin%=1:last%=21
2050 GOSUB set.matches
2060 PRINT
2070 FOR getin%=1 TO 10
2080 GOSUB tie.in
2090 NEXT getin%
2100 CLEARW 2:GOTOXY 0,0
2110 PRINT "English League, Div. 2"
2120 begin%=22:last%=44
2130 GOSUB set.matches
2140 PRINT
2150 FOR getin%=11 TO 21
2160 GOSUB tie.in
2170 NEXT getin%
2180 CLEARW 2:GOTOXY 0,0
2190 PRINT "English League, Div. 3"
2200 begin%=45:last%=68
2210 GOSUB set.matches
2220 PRINT
2230 FOR getin%=22 TO 33
2240 GOSUB tie.in
2250 NEXT getin%
2260 CLEARW 2:GOTOXY 0,0
2270 PRINT "English League, Div. 4"
2280 begin%=69:last%=92
2290 GOSUB set.matches
2300 PRINT
2310 FOR getin%=34 TO 45
2320 GOSUB tie.in
2330 NEXT getin%
2340 CLEARW 2:GOTOXY 0,0
2350 PRINT "Scottish League, Premier Div."
2360 begin%=93:last%=104
2370 GOSUB set.matches
2380 PRINT
2390 FOR getin%=46 TO 51
2400 GOSUB tie.in
2410 NEXT getin%
2420 CLEARW 2:GOTOXY 0,0
2430 PRINT "Scottish League, Div 1."
2440 begin%=105:last%=116
2450 GOSUB set.matches
2460 PRINT
2470 IF mat%<58 THEN mat1%=mat% ELSE

```

```

mat1%=57
2480 FOR getin%=52 TO mat1%
2490 GOSUB tie.in
2500 NEXT getin%
2510 IF mat%<58 THEN 2630
2520 CLEARW 2:GOTOXY 0,0
2530 PRINT "Scottish League, Div 2."
2540 begin%=117:last%=130
2550 GOSUB set.matches
2560 PRINT
2570 FOR getin%=58 TO mat%
2580 GOSUB tie.in
2590 NEXT getin%
2600 CLEARW 2
2610 GOTOXY 0,6
2620 PRINT "Calculating Draws"
2630 draw%=0:testdiff%=0
2640 WHILE draw%<11
2650 FOR getin%=1 TO mat%
2660 play3%=dpoint%(play%(getin%))
2670 play4%=dpoint%(play1%(getin%))
2680 IF ABS(play3%-play4%)=testdiff% THEN GOSUB read.team
2690 NEXT getin%

```

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MicroLink

```

2700 testdiff%=testdiff%+1
2710 WEND
2720 read.team:
2730 t1$=team$(play%(getin%))
2740 t2$=team$(play1%(getin%))
2750 draw%=draw%+1
2760 draw$(draw%)=STR$(draw%)+ "t1$"+ "v- "+t2$
2770 CLOSE #1
2780 RETURN
2790 random.select:
2800 INPUT "Enter number of matches or n coupon ";mat%
2810 FOR draw%=1 TO 10
2820 match%=INT(RND(1)*mat%+1)
2830 FOR chk%=1 TO draw%
2840 IF s$(chk%)=match% THEN drawflag%=1
2850 NEXT chk%
2860 IF drawflag%=1 THEN drawflag%=0:GOTO 2820
2870 s$(draw%)=match%
2880 NEXT draw%
2890 FOR in1%=9 TO 1 STEP -1
2900 flag%=-1
2910 FOR in2%=1 TO in1%
2920 IF s$(in2%)>=s$(in2%+1) THEN temp%=s$(in2%) ELSE 2960
2930 s$(in2%)=s$(in2%+1)
2940 s$(in2%+1)=temp%
2950 flag%=0
2960 NEXT in2%
2970 IF flag%=-1 THEN in1%=1
2980 NEXT in1%
2990 FOR draw%=1 TO 10
3000 draw$(draw%)=STR$(s$(draw%))
3010 NEXT draw%
3020 RETURN
3030 set.matches:
3040 FOR getin%=begin% TO last%
3050 dpoint%(getin%)=points%(getin%)
3060 IF getin%>9 THEN PRINT getin%;"... ";team$(getin%);GOTO 3080
3070 PRINT getin%;"... ";team$(getin%),
3080 NEXT getin%
3090 PRINT
3100 RETURN
3110 tie.in:

```

```

3120 GOTOXY 0,16
3130 PRINT spac$
3140 GOTOXY 0,16
3150 PRINT "Enter Teams in Match No." getin%;
3160 INPUT play%(getin%),play1%(getin%)
3170 RETURN
3180 data.in:
3190 FOR getin%=first% TO last%
3200 PRINT "Team No. ";getin%;
3210 INPUT "Name ",team$(getin%)
3220 INPUT "Points ",points%(getin%)
3230 NEXT getin%
3240 RETURN
3250 read.file:
3260 CLEARW 2:GOTOXY 0,10
3270 PRINT "Reading file .... Please wait"
3280 OPEN "R",#1,"b:team.dat"
3290 FOR n%=1 TO 130
3300 FIELD #1,20 AS a$,2 AS b$
3310 GET #1,n%
3320 team$(n%)=a$
3330 points%(n%)=CVI(b$)
3340 NEXT n%
3350 CLOSE #1
3360 RETURN
3370 show.amend:
3380 PRINT "No";TAB(7)"Name";TAB(29);"Points";
3390 PRINT TAB(40);"No";TAB(47);"Name";TAB(67);"Points"
3400 FOR getin%=first% TO last% STEP 2
3410 PRINT getin%;TAB(7);team$(getin%);TAB(29);points%(getin%);
3420 PRINT TAB(40);getin%+1;TAB(47);team$(getin%+1);TAB(67);points%(getin%+1)
3430 NEXT getin%
3440 PRINT "Enter Team Number, 0 to end or [RETURN] to continue ";
3450 r%=0
3460 INPUT q$
3470 CLEARW 2
3480 RETURN
3490 check.amend:
3500 IF q$="0" THEN retflag%=1:RETURN
3510 IF LEN(q$)=0 THEN RETURN
3520 r%=val(q$)
3530 CLEARW 2
3540 GOTOXY 0,0
3550 PRINT "Team is ";team$(r%);" with ";points%(r%);" Points"
3560 PRINT
3570 q=0
3580 WHILE q=0
3590 INPUT "N to alter Name, P Points or Q to Quit ",q$
3600 IF q$="q" OR q$="Q" THEN RETURN
3610 IF q$="n" OR q$="N" THEN q=1
3620 IF q$="p" OR q$="P" THEN q=2
3630 WEND
3640 q$=""
3650 ON q GOSUB alter.name,alter.points
3660 CLEARW 2
3670 RETURN
3680 write.file:
3690 CLEARW 2:GOTOXY 0,10
3700 PRINT "Writing file ... Please wait"
3710 OPEN "R",#1,"b:team.dat"
3720 FOR n%=1 TO 130
3730 FIELD #1,20 AS a$,2 AS b$
3740 LSET a$=team$(n%)
3750 LSET b$=MKI$(points%(n%))
3760 PUT #1,n%
3770 NEXT n%
3780 CLOSE #1
3790 RETURN

```


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Breaking new ground

WITH many excellent art packages already available for the ST, Rainbird is attempting to break new ground with the Advanced OCP Art Studio 2. It's both a sprite editor and picture designer and excels on the sprite designing side.

Bundled with my prerelease review copy was a well written, easy to understand and comprehensive manual. It explains all functions in detail and gives step by step examples as well as screen shots – a credit to Rainbird.

Once the program has loaded, the control screen is displayed which gives you a 39 icon-based environment. The screen looks very cramped and every single pixel is used.

The package uses the Neochrome file format so pictures drawn with either



system are compatible. The manual also gives details about the file format for Neo pictures, which I found to be very useful.

Art Studio 2 offers a variety of functions. First, there are the mandatory drawing commands, draw, line, triangle, box, circle and spray.

Other tools include the usual copy, fill, outline, magnify, exchange colour and colour selection. The fill has a useful additional option which allows you to fill with a brush or sprite allowing an endless number of different fill patterns.

The use of sprites is where Art Studio scores most points over its competitors. You design them on a large grid which sits on the left-hand side of the control screen. It gives good pixel clarity as each is magnified nine times normal size.

The most impressive feature of this grid editor is that most of the drawing functions available on the picture screen (line, fill, spray and so on) can be used within the grid, something that really should be in all art packages.

Once you are happy with your sprite design it can be placed into the storage

Richard Vanner reviews Advanced OCP Art Studio 2 – a combined art package and sprite editor

window along with other sprites and brushes.

If you store them as a sequence of animation frames, when complete, they can be set up to animate in the window at any speed. You can also animate the sprites on the picture screen to get an idea of what a sprite looks like in context.

Sprite data can be saved as an assembly language file and you can also select which colour planes are to be saved as well as the mask data. This allows for pictures to be saved in screen data format for various other micros such as Spectrums or Commodores. A truly amazing feature.

If anyone has an Amstrad CPC computer as well as an ST, you don't need to draw on your 8 bit Amstrad – use Art Studio. A drawing option puts the edit grid into fat pixel mode and this emulates the pixel format used in the CPC's screen memory.

All data can be saved to disc or sent direct via the RS232 interface. What more could you ask?

There is yet another feature that puts Art Studio in a class of its own and this is the MAP mode. A map of coordinates can



be set up and sprites placed within the map with a maximum of over 16,000 locations.

Again, the data can be saved as an assembly language file, a feature which makes designing games such as Gauntlet,

Time Bandits or other maze games very easy and much faster.

The package may seem perfect, but there are a few minor grumbles. The plotting cursor is the same arrow shape as Gem Desktop. Crosshairs would have made judging the pixel position easier.

There are no file selector boxes during load and save operations. The programmer has to use a line editor which has no visible cursor. A directory icon is used to select path and drive – a messy alternative.

The Undo feature scrubs all your work done with the present function. I prefer the way Neochrome implements it where the previous alteration is undone and not the last 20 or so line plots.

I will use Art Studio to design sprites



and do most other picture work with Neochrome, mainly because the picture screen is too far away from the icon selections for my liking, but this is just a matter of personal taste.

The combined functions of both make them a nice toolkit, but there are sizing considerations with sprites that must be kept in mind, if transporting from one to another.

Art Studio will be great for programmers designing maze games or any other package that requires sprite animation.

You won't get all the special features found on Mirrorsoft's Art Director but you do have a powerful development tool, especially if you're writing a game for more than one micro. Well done, Rainbird, keep up the good work.

Product: Advanced OCP Art Studio 2

Price: £24.95

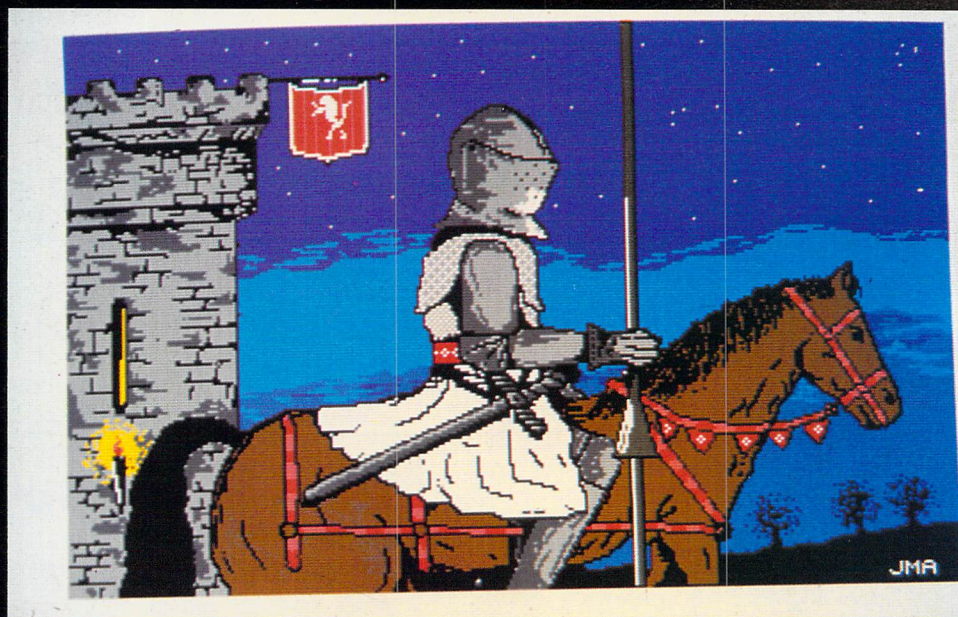
Supplier: Rainbird Software, Wellington House, Upper St. Martins Lane, London WC2H 9DL

Tel: 01-240 8838

ONCE again we have been deluged by your entries for the Gallery. It seems the Atari ST brings out the artist in our readers.

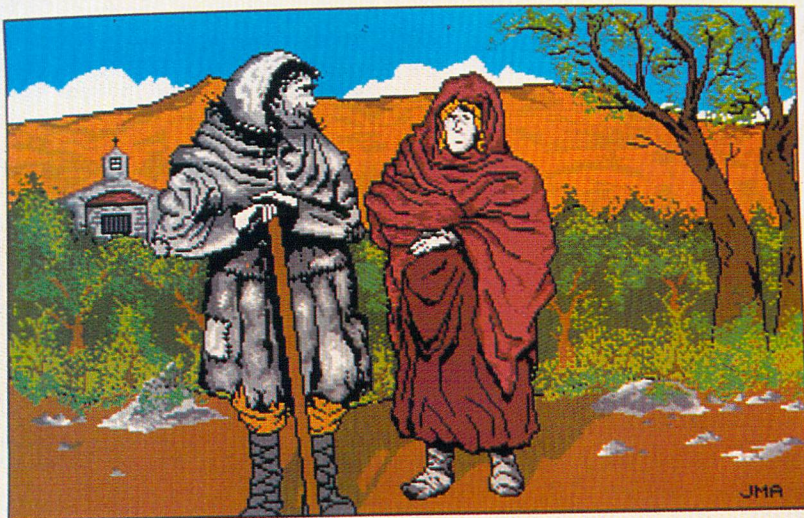
This month's montage of medieval miniatures, created using the Degas art package, was sent in by Jean-Marc Arpino of Eragny in France.

We welcome any pictures you may have drawn, but remember that the artwork must be all your own work and must not be copyright – so we can't use The Road-runner or similar subjects. It should not have been published, or offered for publication elsewhere.

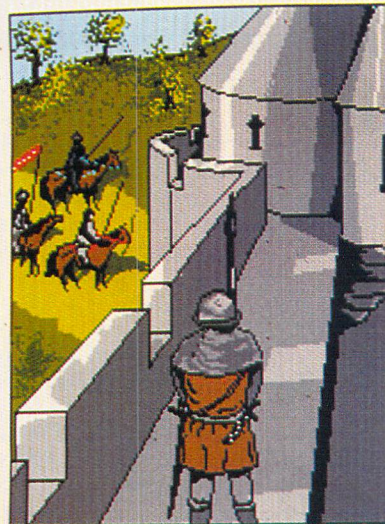


Knight mare

GALLERY



The two Renés



En guardé



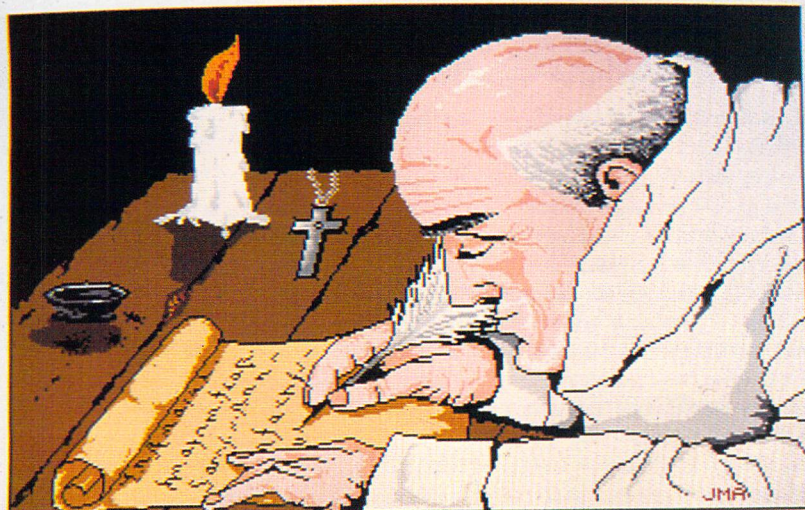
Framed and hung



Playing the Blues

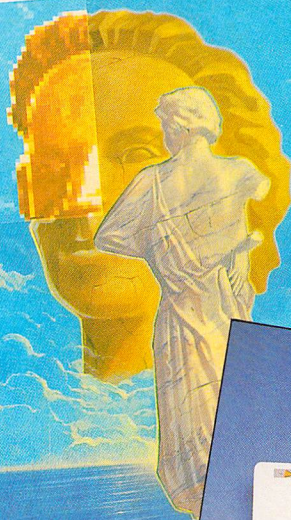
Please enclose an sae for the return of your discs. The address to send your Masterpieces is:

Gallery,
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Europa House,
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To celebrate the launch of Advanced OCP Art Studio, Rainbird is giving away a high-resolution graphics tablet and six copies of its impressive software, reviewed in this issue.

1st Prize

Eidersoft's Pro Draw graphics tablet plus Advanced OCP Art Studio. The tablet is a professional high-resolution device with a drawing area measuring 9in by 6in, which comes complete with power supply unit, software and stylus. It works like a dream with Advanced OCP Art Studio, making drawings that much easier to produce.

Total value of prize: £370

FIVE runners-up prizes

Advanced OCP Art Studio – worth £24.95



What you have to do

We can tell from the large number of submissions to the Gallery pages that ST owners have an artistic leaning.

Use your imagination to create, on paper, a macabre image along the lines of the artwork used on this page. You can draw a sceptre, a skeleton, the Grim Reaper (complete with scythe) – or whatever you can conjure up from the dark recesses of your mind.

Attach the coupon to your entry, and send it to the address below to arrive no later than September 30, 1987.

The six best entries will not only receive the wonderful prizes, but they will also be given pride of place in a future issue of *Atari ST User*

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Brick-by-brick programming

I BRIEFLY discussed the nature of 68000 assembly language last month, in Part 1 of the series, and illustrated the general format of instructions. But I didn't give details about the instructions themselves.

To make things as simple as possible, I will separate the instruction set into three distinct groups – arithmetic operators, data movement and program control.

The first contains all the standard arithmetic operations such as addition, subtraction, multiplication and division. These let you perform a wide variety of complex mathematical calculations.

This category includes the logical operations which allow you to alter individual bits of a number according to a simple set of rules. I will deal with this topic in detail in a future article.

The data movement instructions allow the movement of information in memory quickly and easily. They also give many useful facilities to manipulate long lists of data. You can, for example, copy entire screens from one place to another using just five instructions.

The final class of instructions are the program control operations. Some are like Basic's GOTO and GOSUB which allow transfer control from one part of a program to another.

Others are like the IF ... THEN struc-

In Part 2 of his assembly language series Stephen Hill introduces the 68000 instruction set

ture and allow your program to make decisions by executing different routines depending on the contents of one or more variables.

Finally, there are statements which give the ability to repeat segments of a program again and again using loops as in Basic's FOR...NEXT.

Assembly language provides many different ways of implementing these various types of operations.

It's important to understand that all these instructions are low level. I'll explain what this term means by using a simple analogy. Let's compare the process of writing a computer program with building a brick wall.

Think of each individual brick as a single instruction in our computer program. Assume for the sake of argument, that we are only allowed to use whole

bricks in our construction project.

A high level approach would involve using the largest bricks we could – to build the wall in the shortest possible time. But it would also stop us building it any size we wanted because we would be limited to a set of dimensions which were a multiple of those bricks.

If we used smaller bricks, although it would take rather longer to complete the job, we would have much greater say as to its final size and shape. This would be a low level approach.

So if we wanted the maximum flexibility we would, therefore, use the smallest bricks. The same is true of computer programs. For the widest possible choice, there is no real alternative to assembly language.

The practical upshot is that when you are writing programs in assembly language, you have to do things in very small and very simple stages. You can't say something like:

```
LET A=B+C
```

and expect the assembler to understand what you mean. You need to think in terms of much smaller steps.

Let's look at a simple assembly language program which is the equivalent of the basic statement:

```
LET D0=10
```

In assembly language the above statement would be in the form:

```
MOVE.L #10,D0
RTS
```

The MOVE instruction just copies a number from one place to another. In this case the source of our data is the value after the hash sign, and its destination is register D0.

The reason for the .L extension is that we want to load this number into the whole register. If we had used another extension such as .W or .B, we would only have loaded 10 into either the bottom half or the bottom quarter of D0 respectively. The rest of the register would have been unaffected.

The RTS instruction is used to return from a subroutine. Its action corresponds directly with that of the Basic RETURN instruction. You should, however, only use this statement if you intend to run

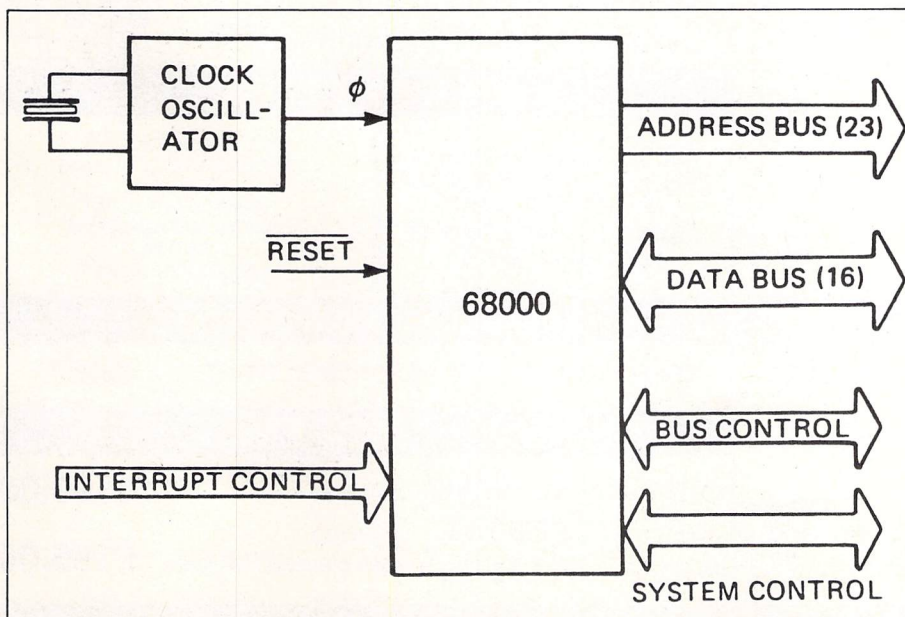


Figure 1: 68000 basic configuration

your program from within another one – such as an assembler or Fast Basic.

If you want to execute your program by double clicking it straight from the Gem Desktop, a simple RTS won't do and you will need to use the following procedure:

```
MOVE.W #0, -(A7)
TRAP #1
```

Don't worry about how this works for the moment. Remember that if you want to run any of my example programs directly from the desktop, you should replace the final RTS with the above code.

We have already seen how we could load a number into register D0. I will now show how to add together any two numbers initialised in the same way. First we must move our numbers into D0 and D1 using the MOVE instruction.

Assembly language	Basic
MOVE.L #10, D0	LET D0=10
MOVE.L #1000, D1	LET D1=1000

Notice how we have been able to use some quite large numbers in this instance because we have used the entire register to store our data. We now need to add D0

and D1 together using the ADD instruction like this:

```
ADD.L D0, D1      LET D1=D0+D1
```

We can use either RTS or our desktop return routine described above, to exit from the program. After our program has executed, D1 will contain the number 1010 (1000+10).

For a somewhat larger example, let us write a small assembly language routine roughly equivalent to the Basic statement:

```
LET D0=D1+D2*D3
```

The first point to note is this statement is in a high level language. If we want to write a program in assembly language with the same effect we will have to split it into a number of smaller, more manageable parts.

The obvious way would be to deal with each arithmetical operation separately. Here is some pseudocode to illustrate this:

- Multiply D2 by D3
- Add the result to D1
- Move the result into D0
- Return from wherever the routine was called from

As each line of our pseudocode now corresponds directly to one assembly language instruction, we can write our program like:

MULS D2, D3	LET D3=D2*D3
ADD D3, D1	LET D1=D1+D3
MOVE.L D1, D0	LET D0=D1
RTS	RETURN

Remember to use the correct return routine to get back to the desktop if required. It would not be a good idea to run this program as it stands because we have neglected to load registers D1 to D3 with any actual data.

The following lines of assembly language will accomplish this for us:

MOVE #10, D1	LET D1=10
MOVE #11, D2	LET D2=11
MOVE #12, D3	LET D3=12

We should place these lines before the first MULS instruction in our program. The register D0 will hold 10+11*12 or 142 after our program has run. Feel free to experiment with any other numbers you like and see what happens.

● In next month's article we will continue our look at the 68000's instruction set.

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TEMPUS

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Tempus is a new professional GEM based text editor for the Atari ST.

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*Megamax ed only handles files up to 32K

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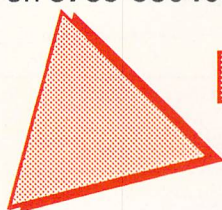
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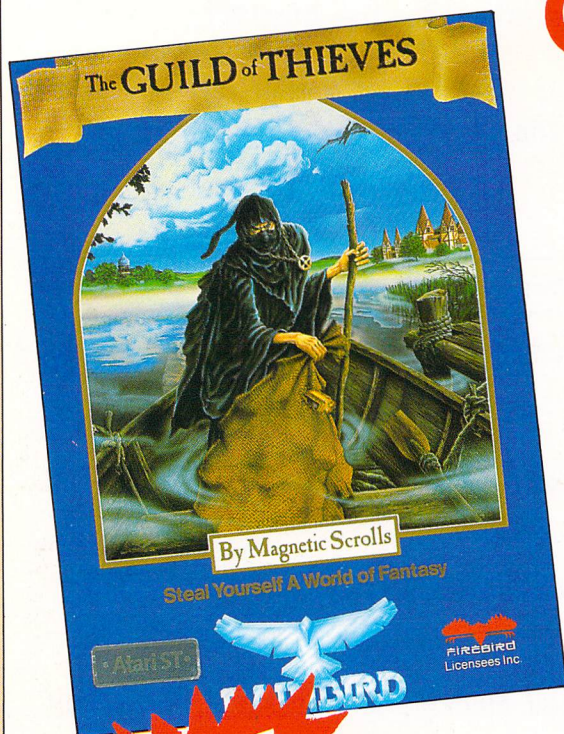


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Guild of Thieves – it's a steal!

GUILD of Thieves is the long-awaited follow-up to the award-winning adventure, The Pawn.

You're back in the fantasy world of Kerovnia, in the role of a novice thief who has applied to become a member of the illustrious Guild. To prove your worthiness you must ransack an island of all its treasures.

There are 29 beautiful illustrations, a massive vocabulary, and a text parser which is claimed to be more sophisticated than the parser in the Infocom adventures.



What you get:

- 400k disc
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- Adventure Guide
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“ Guild of Thieves is a cracking adventure, even better in my opinion than The Pawn. Rainbird and Magnetic Scrolls are charged with combining superior illustrations, gripping text, teasing puzzles, and general good humour to produce an irresistible adventure.”

– *Brillig, Atari ST User, August 1987*

Look at what the parser can understand:

Get all the bottles that are on the bar except the green one, open them and throw the contents of the bottle of whisky at the scar-faced man then quickly run through the door and hide under the bushes.

AND

Get the glass and the bottle and the shirt and use the shirt to tie the glass and the bottle together.

Suitable for	Product	Format	RRP	Special reader offer	YOU SAVE	Offer including subscription	YOU SAVE
Atari ST	Guild of Thieves	Disc	£24.95	£21.95	£3	£30.95	£9

TO ORDER, PLEASE USE THE FORM ON PAGE 69

All-Stars versus the Champs

THE rules of American football are about as clear to me as the collected writings of a Mongolian metaphysical poet. But not baseball. Even a sports illiterate like me can see that it is not much more than a wellie's throw away from the good old English game of rounders.

Even so, there are many sophistications in baseball and a good grounding in the rules would help to get the most out of *HardBall* – a graphically and atmospherically excellent baseball simulation from Accolade.

An impressive title screen, accompanied by some unmemorable music, signifies that battle is about to commence. An options screen lets you play for the All-Stars (red) or Champs (blue), home or away and against another player or the computer. Mouse or joystick may be used.

Once you have made your choice, the manager's decision screen appears. This can be called up at any time during the game. At the top is the basic scoreboard showing how the two teams are faring in each innings. Below this, the two teams (of 10 players each) are given – home team to the left, visitors to the right.

Beside each player's name is an indication of how they bat – left-handed, right-handed or ambidextrous, their position – pitcher, left field, catcher and batting or pitching average. In addition, for the batting side, you are also reminded who is at bat and who is on what base.

Further down the screen is a list of management options. Players can be substituted or their positions exchanged. When either of these two options is exercised, detailed information and statistics on each player is provided. There are plenty of spare players to pick from, all with their own strengths and weaknesses.

The batting side also has the option of determining whether any ambidextrous hitter will strike from the left or the right. For the fielding side, the outfield can be shifted to the left, right or moved to its normal position. You may also elect for normal or double play for the infield and force the batter to take an intentional walk to first base.



Program: HardBall

Price: £24.99

*Supplier: Accolade/US Gold, Units 2 & 3,
Holford Way, Holford, Birmingham B6
7AX*

Tel: 021-356 3388

It is at this point, that you are likely to look for a book on the laws of baseball. If you don't have the foggiest notion of what infield, normal or double play is or what intentional walking is all about, my advice is to have a suitable reference guide handy next to your ST.

It would have helped if Accolade had included a brief rundown of the rules of the game within the handsome packaging. After all, *HardBall* is not exactly cheap. Instead, all you get are the instructions for operating the game and they are not going to help you through some of the more obscure elements of the laws of the game.

Having made your selection, it's time for the action. The display changes to show a superb, almost full screen close-up from just behind the pitcher's shoulder as he faces the batter. No tiny matchstick-men for *HardBall*, these figures are big and look realistic. Score several home runs to Accolade for spectacular graphics.

To the lower right, a small inset gives a total view of the whole baseball diamond. At the bottom of the screen are options for both batter and pitcher, designed so that neither side is quite sure what the other has elected to do.

There are eight types of pitches, ranging from straight throws to fast, wide sweeping curves. Each pitcher has the ability to throw only four of these types from which one must be selected. The batter can elect to swing normally, bunt (gently thump) and steal bases (if any of the team's players are in a position to do so).

Once both sides have made their choices, another set of options are presented. The pitcher picks the direction of the throw – high, wide, and so on, while the batter decides where he will try to hit the ball.

All this picking and choosing may sound complicated but in practice it is very easy and remarkably quick, thanks to the neat player interface.

Final selections over, the pitcher winds himself up and hurls the ball at the batter who attempts to connect.

When batting, the player's timing is critical. Getting the hang of hitting the ball at the right moment is probably the most difficult part of the game. For more times than I care to remember, I was

struck out through bad button timing, flailing at pitches I should have left alone or failing to judge the flight of the ball.

If the ball is struck or there is an attempt by the batting side to steal a base, the picture changes to show either the left or right half of the field complete with smaller-sized sprinting batters and scurrying fielders.

The defender nearest the ball blinks on and off and can be controlled to chase, catch and throw the ball to a chosen base. Meanwhile, the batting side is directing its own operations – who should run where and when.

This part of the game gets the adrenalin flowing. Some brilliant home runs, catches and runouts can be achieved – likewise some shoddy and inept bungling from both batters and



fielders. It all depends on how quick you are.

When all the activity has died down, it's back to the pitching or manager's decision screen. If you choose the computer as your opponent, watch out, it plays a mean game.

The animation of the large-scale figures is marvellous, rarely bettered by any other sports simulation on the ST. And there are many quality touches – the desperate sliding of a batter as he attempts to avoid being run out and the ability to exchange the swirling Stars and Stripes banner for the Canadian flag for example.

For a spot of unique entertainment, you can even sit back with a hamburger and let your ST take the strain. *HardBall* allows the computer to control both sides so you can watch a baseball game whenever you please and to heck with Sports Night.

Provided you have some understanding or liking for baseball, you'll certainly get a great deal of pleasure from *HardBall*. The playability, design, variety and exceptional realism make it a sports simulation to remember. Heartily recommended.

Bob Chappell

Sound	7
Graphics	9
Playability	9
Value for money	9
Overall	9

Caveman capers

PSYGNOSIS has a reputation for producing games of excellent graphical quality, but generally missed the mark in the playability stakes. The slick animation and graphics of Brattacas, Deep Space and Arena reached new standards on the ST.

Unfortunately, due to bugs and general weaknesses in play, they failed to be as successful as they might have been.

With the release of the latest game, *Barbarian*, the question must be – has Psygnosis got it right this time? I think so, but must add that there is still room for improvement.

In the world of *Barbarian*, a single player game, you are the hero, Hegor. The object is to take him down through the dangerous caves and chambers of Durgan, carved out of the bowels of an active volcano.

The aim is to make your way to the centre of the volcano and destroy a crystal – the source of the evil power of Necron, the evil uncle who was responsible for the death of your father.

Once this has been done, your quest is only half over for the volcano begins to erupt. You must return the way you came, and reach the surface before the volcano finally bursts.

Points are scored for the time taken to destroy the crystal and the time taken to return to the surface. Having completed the game, you can then set about beating your previous best time.

Psygnosis is learning – control of the game is well thought out and the player can use mouse, joystick or keyboard in any combination at any time. Playing with the mouse is the easiest.

The game comes on two discs, the first booting in the main program before requesting you to insert the second disc.

This second disc must be left in place throughout since the program accesses it for new scenes and to restart a game when you've been killed off.

The title screens are first rate and set the scene for the splendid graphics to come. There is no music which is a pity since, properly used, it could enhance



Program: Barbarian

Price: £24.95

Supplier: Psygnosis, First Floor, Port of Liverpool Building, Liverpool L3 1BY.

Tel: 051-236 8818

the atmosphere.

Nevertheless, *Barbarian* succeeds in generating a genuine feeling of danger and menace through brilliant graphics and animation and the clever use of digitised spot sound effects.

The scenery is immaculate and I loved those bamboo bridges and ladders.

Hegor is a scantily-clad, muscular he-man, complete with flowing blonde tresses. The game commences with this Arnold Schwarzenegger lookalike armed with a gleaming sword and standing ankle deep in a marsh. He needs to locate a bow, arrows and possibly a shield if he is to triumph – but these finds won't come easy.

At the bottom of the screen is a row of large icons. These determine his actions – turn and walk/run to the left and right, go up or down at the next opportunity, attack, defend or flee.

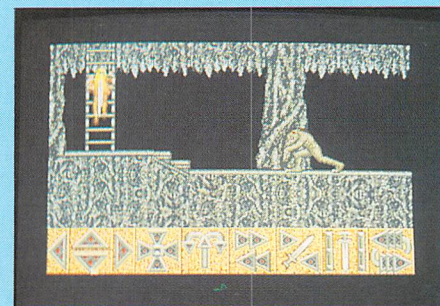
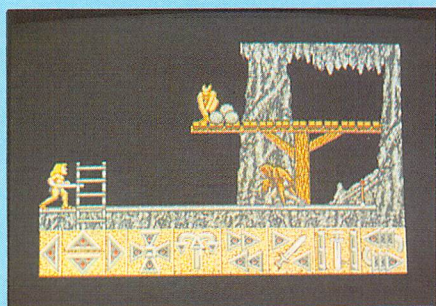
Pressing the right mouse button or space bar toggles another strip – the icons here cause Hegor to drop, pick up and use an object. Items being carried by

Hegor are shown here as well as an arrow count, number of lives remaining and score timer.

When Hegor loses a life, he continues on the same screen where the incident took place. When he has lost all three, the game is over and it's back to the beginning.

Hegor's movements are stunningly detailed and realistic, proving once again that Psygnosis is top-notch at animation. When and if, Hegor reaches the edge of a screen, the picture slides away to the left or right to be replaced by the next. This type of scene swapping is used in *Arena* but in this case works much better.

Psygnosis uses what it calls context-sensitive animation. This means that the same commands produce different effects depending on what situation



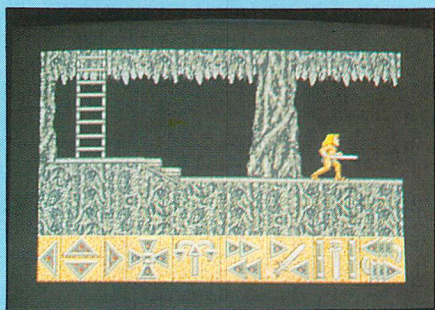
Hegor is in.

For example, the attack command produces a different assault on different foes, and running and standing jumps produce different results.

The game is basically one of overcoming the dangers, mainly in the shape of brutish monsters, present on each screen. The further you get, the greater the perils. There are many surprises and to reveal too much would spoil the enjoyment (and shock).

Here's a small taster to whet your appetite: Surprise number one comes on the opening screen – head west and you'll be sliced to ribbons before you've taken more than a couple of steps. Don't say I didn't warn you.

More excitement when you meet your first monsters – the imagination, animation and detail of each bizarre brute will make you gasp. The destruction of a monster



results in a spectacular and appropriate effect. And watch out for the metallic giant – he's a mean beast.

A large number of digitised, spot sound effects are used – grunts, creaks, groans, twangs, barks, clankings, roars and many an unearthly sound.

Listen to Hegor's yell of fear when you make him flee – he drops his weapon, turns wide-eyed, shouts and sprints in the opposite direction – usually straight into more trouble.

Barbarian is a superb game. The graphics, animation and sound effects are brilliant and the game is easy to play yet far from simple to conquer.

It marks a big step forward for Psygnosis who clearly demonstrates that it has the talent to produce the most sensational games on the market. I defy any ST games player not to be astounded by the dazzling quality of the graphics and imaginative flair.

For excitement, humour, surprise and a darn good challenge, combined with incredible graphics and the best use of sound yet heard on the ST, Barbarian is going to take some beating. If you were ever in danger of getting blasé about ST games, buy Barbarian and prepare to be electrified.

Bob Chappell

Elementary my dear Watson...

Program: 221B Baker Street

Price: £19.99

Supplier: Datasoft/US Gold, Units 2 & 3, Holford Way, Holford, Birmingham B6 7AX.

Tel: 021-356 3388

THE game is definitely afoot in Baker Street, though whether Dr Watson would consider it elementary is another matter.

Datasoft's interpretation of the Sherlock Holmes stories plunges you into a curiously smog-free London, revisiting the scenes of the crimes.

The name of the game is detection. Hunt the clues, find the murderer, name the weapon, identify the motive. But there's more to it than that.

With joystick or keyboard at the ready, select the numbers of players from 1 to 4. It's a case of the more the merrier as you can get in each other's way. You can't play against the computer, it's not that sort of game.

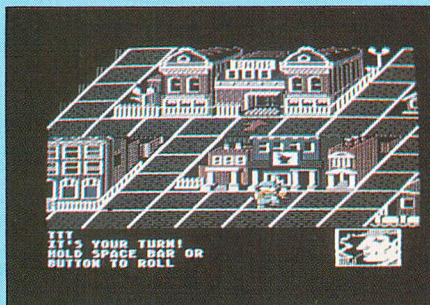
To make life complicated, you can opt to receive clues in code. Other players can crack the coding, but you can always change it later to throw them off the scent.

Your next task is to select a character from Holmes, Watson, Inspector Lestrade or Irene Adler.

Now select a case to crack from the 30 available (more if you have got the additional library discs) and read the casebook for clues.

At this stage it's advisable to have a pen and paper otherwise you'll lose track of what's going on.

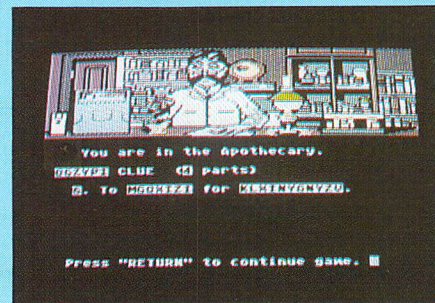
Groundwork done, move to the playing



screen – a scrolling view of London with the more interesting buildings picked out. This toggles with a stylised map which gives your opponents' locations and lets you plan tactics.

Each building contains a clue or a playing aid and your job is to do the rounds and collect as many clues as you need to solve the crime.

You'll also need to acquire a badge from Scotland Yard, otherwise you'll not



be able to get back into 221B.

Mission accomplished you head back to Baker Street as quickly as possible and announce your solution.

Take care in going underground. The secret passages are fast but unpredictable, dumping you out at random locations.

If any part of your solution is wrong you'll be back on the streets again and you won't know where you went wrong.

The concept is sound, but plodding round the streets for clues does get tedious.

There are distractions. You can lock buildings behind you to make life more difficult for the other players.

Bear in mind that you might need keys, when your opponents have beaten you to a location. But, you can always replenish your supply at the Locksmith's.

Speed of movement is determined by an on-screen die, which is perhaps too faithful a rendition of the original board game – surely something a little more sophisticated could have been contrived. It doesn't even have spots, just numbers.

The sound effects and graphics are competent and colourful but hardly exciting and the novelty of entering strange buildings soon wears off.

It does help to plan ahead and to choose economical routes between objectives. Strategy of a sort is called for in throwing your opponents off the scent.

But it's really a game for Holmes addicts. As a computer game it doesn't quite stand on its own two feet.

As a mental exercise, or as a board game, with the family clustered round getting in each other's way (intentionally) it works, but as an ST extravaganza it doesn't.

W.F. Wilberforce

Sound	9
Graphics.....	10
Playability	9
Value for money	9
Overall	9

Sound	4
Graphics.....	5
Playability	5
Value for Money	5
Overall	5

Devilishly difficult shoot-'em-up

TWO new shoot-em-ups have been released this month, Hades Nebula from Nexus and Jupiter Probe from the prolific Microdeal.

Both follow the same story line and are far from original – guide your spacecraft over a scrolling landscape and zap oncoming alien vehicles as fast as you can.

Hades Nebula has a full screen width ground base with superb graphics and a catchy tune.

As well as shooting airborne craft, you can destroy ground objects – some of which contain extra weapons which can be collected by flying over them.

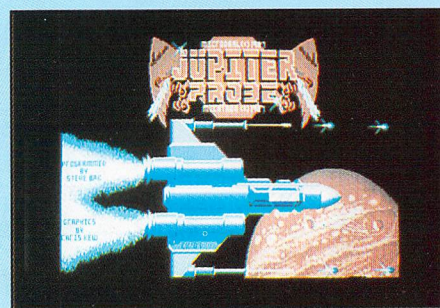
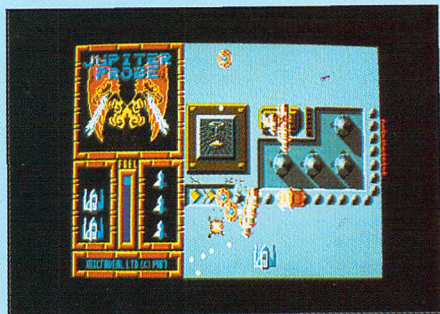
Be careful though, shoot the same weapons building twice and your bonus amourey is destroyed. Similarly, if your craft carrying the extra hardware is shot out of the sky, you lose all your additional weaponry.

During your flight you are attacked constantly by UFOs. If you miss them with your laser cannons they will sink off the bottom of the screen, but don't assume you're safe. When you least expect it a phaser bolt will come from below – real eye-watering stuff.

At certain points, a squadron of video nasties will swoop on your craft and unless your reactions are extremely swift, you face oblivion.

Assuming that you survive the first stage you are then cast adrift in a field of asteroids. These have some very annoying habits:

First, they travel at different speeds.



Program: Hades Nebula

Price: £19.95

Supplier: Nexus, DSB House, 30 The High Street, Beckenham BR3 1AY

Tel: 01-658 5723

Program: Jupiter Probe

Price: £14.95

Supplier: Microdeal, Box 68, St. Austell, Cornwall, PL25 4YB

Tel: 0726 68020

Second they seem able to detect your craft and aim straight for it and third, they are able to destroy your craft while still a good inch away from you on screen – a gap of at least three light years.

You can shoot the asteroids, but they merely split in half thus duplicating the original problem. If you can hit them enough times they will be too small to damage you.

Suddenly, the asteroid shower ceases. You relax waiting for the next level. A blue bolt comes from the top of the monitor screen followed by a massive space ship.

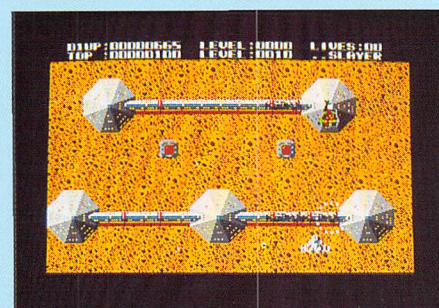
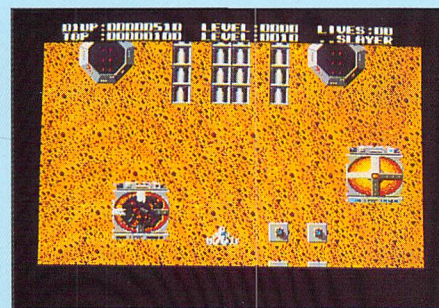
Unless you have come through the first level with your extra weapons intact, you will have to score about 50 direct hits to destroy the enemy. Then you are on to the next level.

On board the Jupiter Probe, you have to concentrate on the approaching enemy – the landscape remains unchartered by your laser bolts.

The graphics are less detailed than Hades but still well drawn. There is music available to soothe the savage breast and a digitised voice gives advance warning of hazards.

Again, you are approached by various flying objects all intent on sending you to infinity. You have the advantage of invincibility shields which last just long enough to get you out of immediate danger – if you activate them soon enough.

The writers have taken pity on the poor



pilot and given him autofire, so if you hold down the fire button, your guns will shoot away merrily until you release it. Mouse, joystick or keyboard can be used to control the onscreen actions.

Unlike Hades Nebula, where when you lose a life you start off at the point you perished, Jupiter Probe sends you right back to the start of the current level.

I found Hades Nebula far too difficult to be enjoyable. Even in cheat mode – with infinite lives – it was impossible to get through a level without losing any acquired weapons.

Without cheat mode it is virtually impossible to get through the first level at all. If you are a masochist you should buy this game. If you're a sadist buy it for a friend.

The main thing that sets Jupiter Probe apart from the dearth of Goldrunner look-alikes is its price – at £14.95 it's very good value for money.

Oh yes – the cheat mode in Hades Nebula. I promised Nexus I wouldn't reveal it this month, but because the game is so difficult I thought I would give you a sporting chance.

If you enter a certain seven letter word (beginning with M and followed by a full stop) at the top of the high score table you will be given infinite lives.

Peter Hartley

Hades Nebula

Sound	9
Graphics.....	10
Playability	2
Value for money	5
Overall	5

Jupiter Probe

Sound	8
Graphics.....	8
Playability	9
Value for money	10
Overall	8

VIP PROFESSIONAL

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Probably the most impressive program to have been released so far for the Atari ST range, VIP Professional is an extremely easy to use, integrated spreadsheet, database and graphics program which is identical both in features and commands to Lotus 1-2-3™. To give you the best program possible on your Atari ST, VIP Professional integrates the three essential applications of Lotus 1-2-3™ with the smart face of GEM. The same spreadsheet analysis, information management and extraordinary business graphics are all combined in one easy to learn, affordable package. What's more, VIP Professional not only has all the features of 1-2-3™, you can also type the same commands to do the same things. Or, better still, you can use a mouse to make it even simpler! VIP requires only one disk drive to operate and also works with a hard disk drive. It is compatible with both monochrome and colour systems. Probably the most surprising feature of VIP Professional is not its total compatibility with Lotus 1-2-3™, nor its ease of use with the GEM environment, but its price. Lotus 1-2-3™ for the IBM PC AT costs £395 (+VAT=£454.25), whereas VIP Professional for the Atari ST range of computers is a mere £199 (+VAT=£228.85). That's nearly HALF PRICE!

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WITH
LOTUS 1-2-3
COMPATIBILITY

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(+VAT=£228.85)



1 SPREADSHEET

VIP Professional was modelled after the powerful, best selling Lotus 1-2-3™ program. It has every feature, every command of that program. In fact, the experienced 1-2-3™ user will feel right at home using the same keystrokes. But this version is made even easier to use by adding the user friendly face of GEM, so the beginner can use it right away. If you want to do your home budgets, financial planning, or sophisticated business inventory control or budget modelling, VIP Professional will fit the bill. And you can freely use 1-2-3™ or VIP Professional files created on other computers in VIP Professional on your Atari ST. And Professional is not only flexible, it's powerful too, with a full 8,192 row by 256 column worksheet to use with up to a massive 4Mb of memory. (Note: Lotus 1-2-3™ has only 2,048 rows).

2 DATABASE

VIP Professional includes a powerful data manager to arrange, store and analyse your important information. It can be used to store your home or business records and do extensive searches, sorts and comparisons. It allows up to 8192 records, with up to 256 fields and queries and 256 search criteria. The database manager can be used in conjunction with the spreadsheet commands to add greater power to the database facilities including sorting specific ranges of the database. You can also specify how you sort files, from the highest value to the lowest value (or from the lowest to the highest), or alphabetically (forwards or backwards). The graphics part of VIP Professional can be used to show trends in the database or other information. With its powerful statistical functions, it has almost limitless power.

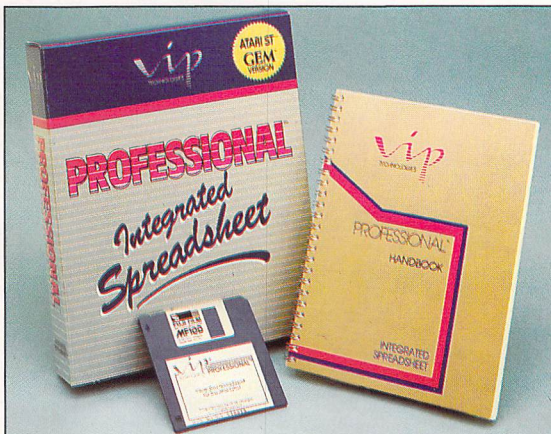
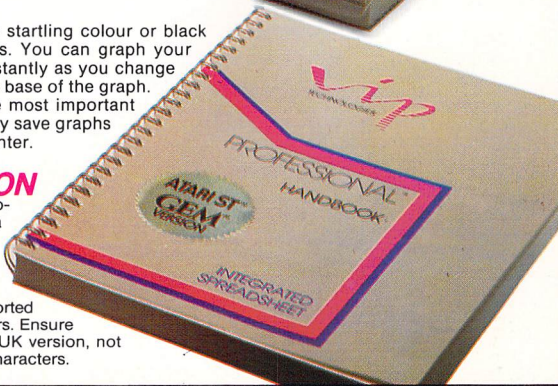
3 GRAPHICS

VIP gives shape to your figures by letting you graph your data into six different types of graphs, in startling colour or black and white. Pie charts, bar graphs, stacked bar graphs, line graphs, scatter graphs and X/Y graphs. You can graph your spreadsheet or database data to give instant professional presentations. Your graphs will change instantly as you change the data. When creating a graph you may specify a main heading, a sub heading and a third title at the base of the graph. The necessary scales can be defined either by the user or automatically created. In pie graphs, the most important section of the pie can be separated from the other sections to draw attention to its importance. You may save graphs individually on disk for use at a later date. You can also print your graph on any Epson compatible dot matrix printer.

- VIP Professional has 'Instant Help' so you can find more information instantly.
- VIP calculates to a full 300 digits against Lotus 1-2-3™ which only calculates to 100.
- VIP allows for 256 Query Fields against only 32 allowed by Lotus 1-2-3™.
- VIP has a complete GEM interface, for ease of use, unlike the text of Lotus 1-2-3™.
- VIP allows different fonts and has an on/off cell grid. Not found in Lotus 1-2-3™.
- VIP supports greater memory and larger spreadsheets than Lotus 1-2-3™.
- VIP graphs and worksheet can be viewed together. Pie charts can be exploded.
- VIP can accept any .WKS files from Lotus 1-2-3™ without modification.
- VIP displays all spreadsheet information in user-sizeable GEM windows.
- VIP can be manipulated using either the keyboard or the user friendly mouse.
- VIP is currently available for the AMIGA, ST and APPLE IIc, IIe and IIGS.

OFFICIAL UK VERSION

The official UK version of VIP Professional has a pound (£) sign as a standard part of its character set. Other versions have also been imported unofficially from the USA and have a dollar (\$) sign instead of a £ sign. These versions will not be supported by the UK distributors or their dealers. Ensure that the VIP you buy is the official UK version, not an unofficial import with incorrect characters.



VIP Professional is available from Atari ST Dealers throughout the UK. If your local dealer does not have VIP in stock, it can be obtained by mail order (P&P free) from:

SILICA SHOP Ltd, 1-4 The Mews, Hatherley Road, Sidcup, Kent, DA14 4DX
Tel: 01-309 1111

All comparisons made to Lotus 1-2-3™ are to version 1A.

E&OE

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Letterhead	Custom Stationery	Certificates
Logos	Garden Layouts	

Easy-Draw works with these printers: Epson FX80Graphics compatible, Atari SMM804, Gemini 10X

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39 Patterns - user definable
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**This Sheet was
 created entirely with
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Art for art's sake

**Mo Warden reviews
 Easy-Draw 2, a package
 designed for producing
 reports, theses and
 presentations**

ALTHOUGH Migraph's Easy Draw 2 has been available as a US import for months, it's now been released here officially by Electric Software.

It is supplied on two discs - master and drawings - and a 143 page manual bound in a sturdy A5 ring binder.

The software presents you with a drawing surface like a drafting table on to which you can place geometrical shapes, freehand lines or text.

This is not the same as a normal paint program, where any figure created on the graphics screen obliterates whatever was there before. With Easy Draw each

object has its own image plane and they can overlap or obscure each other without losing a single pixel, as if they were painted on to clear plastic sheets and overlaid.

It's a structured, well thought out system which makes excellent use of the Gem interface, although I found the design end a little awkward to use at first.

There are a lot of button commands and four different pointers which can cause some headaches. After a few hours with the help of the manual I got the hang of it.

The display works in either high or medium resolution, so the maximum number of colours you can use at any one time is four. To change these you need to access the Control Panel.

There are two Gem windows available and these can be moved, sized and dragged as usual. All the features of the pack-

age are available whichever one you're in.

While working in the first window, the second becomes a great aid as a sketchpad, or for loading object-filled screens so that an item can be captured or copied and dragged across.

The full picture can be viewed in portrait or landscape (sideways) mode and the pages can be measured in either metric or imperial units, with three standard sizes of each.

Two utility icons - trash can and clipboard - are present. The latter is useful for storing and retrieving an object while scrolling around the screen.

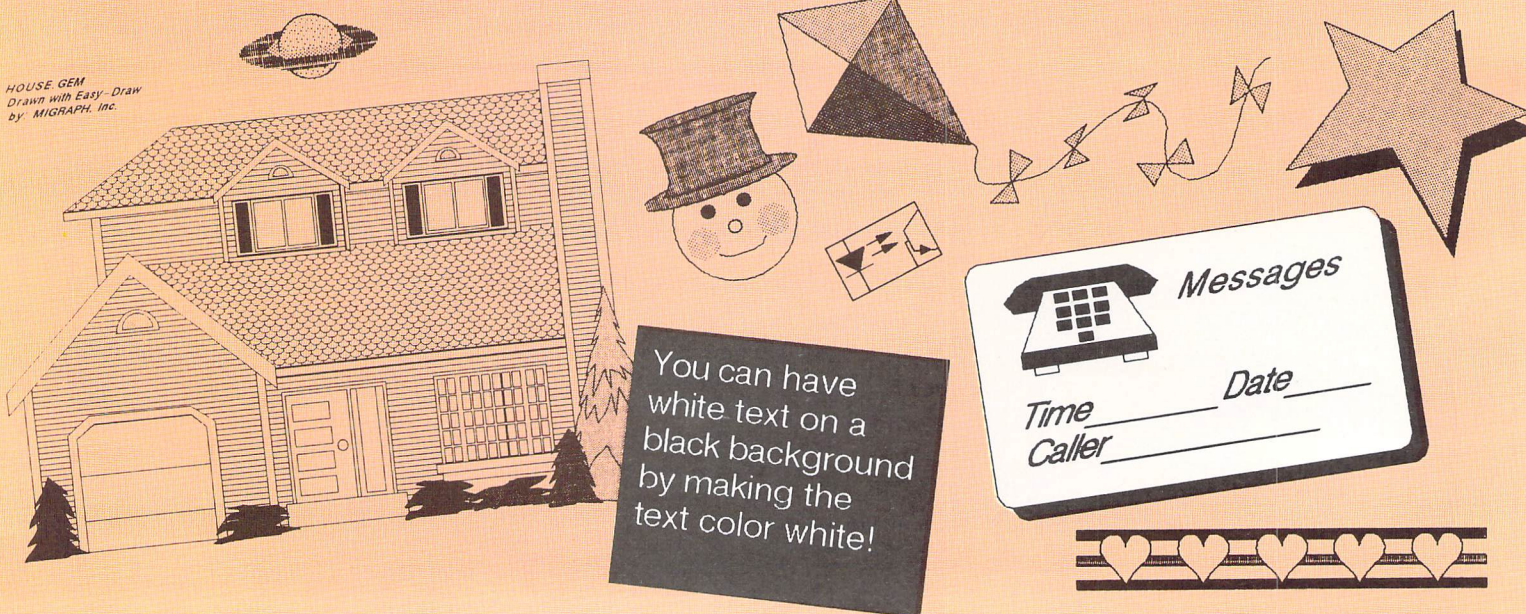
The design area on a 520ST can contain approximately 4000 objects while about 12000 can be held in a 1040ST. There's an object count utility under the Desk heading, as well as Dump Trash, which frees memory.

Product: Easy-Draw 2

Price: £79.95

Supplier: Electric Distribution, 8 Green St,
 Willingham, Cambs

Tel: 0954 61258



On the main screen there's a pull down menu with 12 tools including text, free-hand, box, circle, ellipse, polyline and various arcs. All rubberband except the first two.

When an object is drawn, clicking the right button forms a box round it. This can then be moved about, stretched, flipped, copied, rotated, re-scaled, mirrored or re-coloured. The line style and pattern can be altered and you're never entirely committed to an object's form because at any time it can be reselected and changed.

Objects can be merged to form a single large one or exploded so that a single element may be edited.

The text entry is simple with justification and a selection of font sizes and styles. Text can also be loaded as an Ascii file.

A text box can be treated like an object, with reselection for editing, recolouring, restyling and so on, but not for manipulation such as flip and rotate. Only one font is provided but more are planned.

The windows can have rulers with grid and snap installed, which means fairly accurate scale drawings can be achieved. There are four levels of zoom, from full page to area-within-area, at which the resolution is still 640 by 200 in medium resolution. One more magnify level would have been useful, but not essential.

Objects can be spaced out, arranged in priority and aligned to one another. Screens can be loaded as a straight replacement or as a merge of files and in addition to the 40 patterns, there's a user-definable one.

Output is from a separate program, which is handy when only a print run is wanted. There's a saveable printing list with space for up to 36 filenames and

more than one copy of each can be requested. Printer configuration options are available along with form feed settings, picture justification and full scale/best fit.

There are several printer drivers on the disc. It supports FX80 compatibles, Star SG10, Atari SMM804, Gemini 10X and the 15 inch carriage FX80. More drivers are planned, including HP LaserJet Plus. A Hewlett Packard standard plotter is also supported.

There are many uses for this package such as brochures, newsletters, posters, letterheads, landscape design, floor plans, multiple colour separations and bar, flow and pie charts.

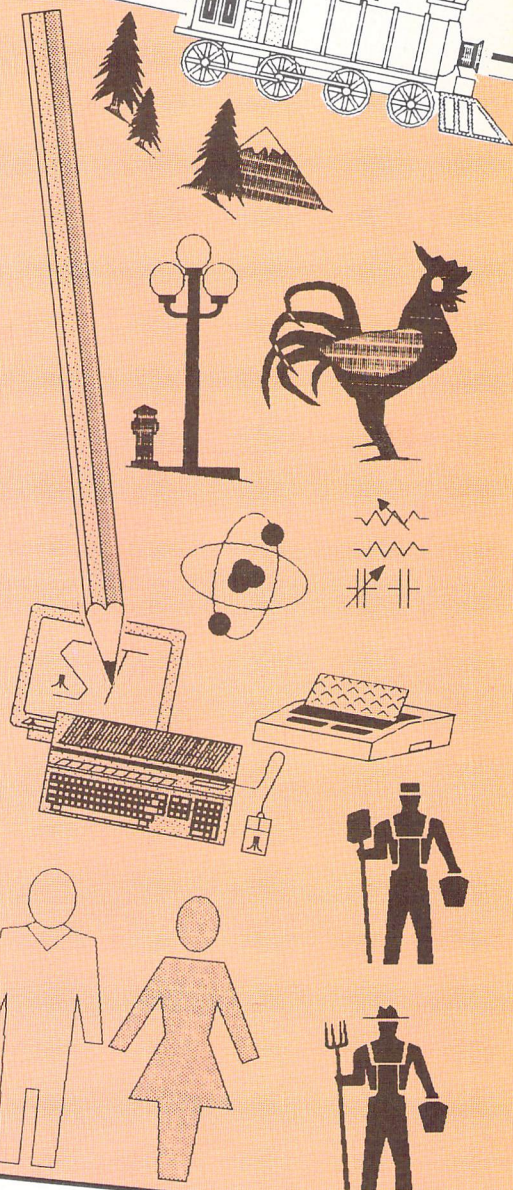
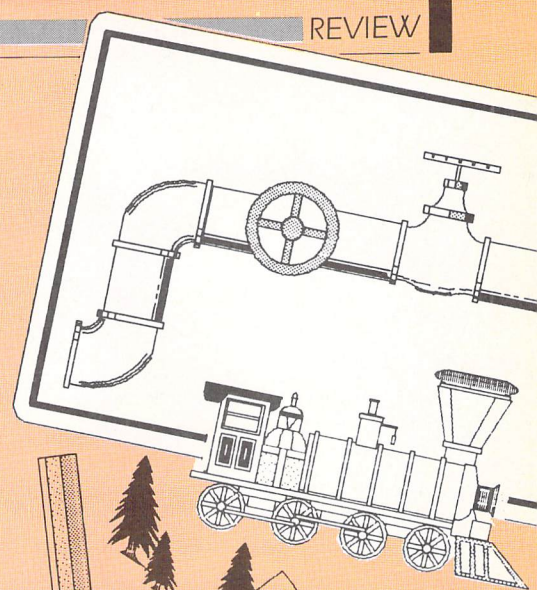
A screen slide-show can be put together quite easily to aid lectures, but it's in the print quality where this package excels. In my experience, only software costing more than twice as much can beat it outright.

If you have an artistic streak, drawing is not too difficult once you get the hang of it. If you can't draw for toffee there's still plenty you can build out of the geometrical shapes and by copying objects from the supplied examples.

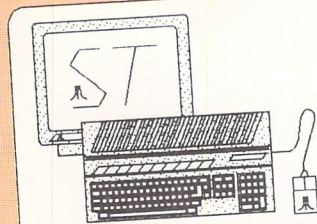
There are extra discs of personal and technical libraries available, the latter containing electronic, flowchart and hydraulic symbols for diagrams. The personal collection ranges from animals to transport to stars (and falling bombs).

I found the manual helpfully written and the program, for all my initial blundering, bug-free. The literature boasts that Easy Draw 2 is the affordable answer to desk-top publishing, and at £79.95 it's certainly good value.

After a few days of use I quite enjoyed this package. You don't need to be a great artist or draughtsman to get a satisfying result, but if you are it contains enough to keep you working efficiently.



Atari Club
News



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It's child's play...

Ken Hughes employs the ST's graphics to revive a popular childhood toy

ONE of the most absorbing toys I played with as a child was a kaleidoscope. The shapes, revolving round in a drum and mirrored manyfold, made myriads of patterns which, no matter how many times you used the instrument, never exactly duplicated themselves.

The outstanding graphics of the Atari ST seemed to be a perfect base from which to replicate my old childhood toy. The theory behind the program is exactly the same as in the original object: A pattern is drawn within a defined space on the screen, then mirrored around the rest of the area. The result is a graphics display of constantly changing shape and colour.

The program is written in Fast Basic and runs in any resolution, though low resolution with its 16 colours is best. The line numbers aren't necessary and you should ignore them when typing in the program.

PROCset_pal sets the colours, giving a black background and setting two other colours to black. If you want a different coloured background, the first three items in the first data statement should be altered. If a greater proportion of black is required in the pattern, set more of the colours to zero – the same value as the background.

PROCset_vars determines the size, position and colour of the shape to be drawn. You'll see that the majority of variables are random numbers. This ensures that the non-repeating attribute of the child's toy is carried over to the computer.

The kaleidoscope is made up of regular shapes which are in turn created from a series of straight lines. The variables *xinc* and *yinc* determine

whether the line will be drawn horizontally or vertically. If *xinc* is one, *yinc* is set to zero and vice versa. These figures are used to increment the start and end coordinates of the line being drawn.

The kaleidoscope is split into eight equal sectors, as shown in Figure I. PROCset_xy chooses the coordinates of the start and end of the line in the first sector. The formulae used to determine these are:

$$x = ac * \sin(d)$$

$$y = ac * \cos(d)$$

The maximum value of *d* is 45 degrees and the length *ac* is kept below 90 to ensure that the pattern stays within the screen boundary.

The eight LINE statements in PROCdrawit draw the shapes on the screen by reflecting the line into the other sectors. The origin is in the top left corner of the screen, so 160 is added to each *x* coordinate and 100 to each *y* coordinate to move the pattern to the centre.

The maximum width of the shapes can be varied by altering the limit of the FOR loop in PROCdrawit.

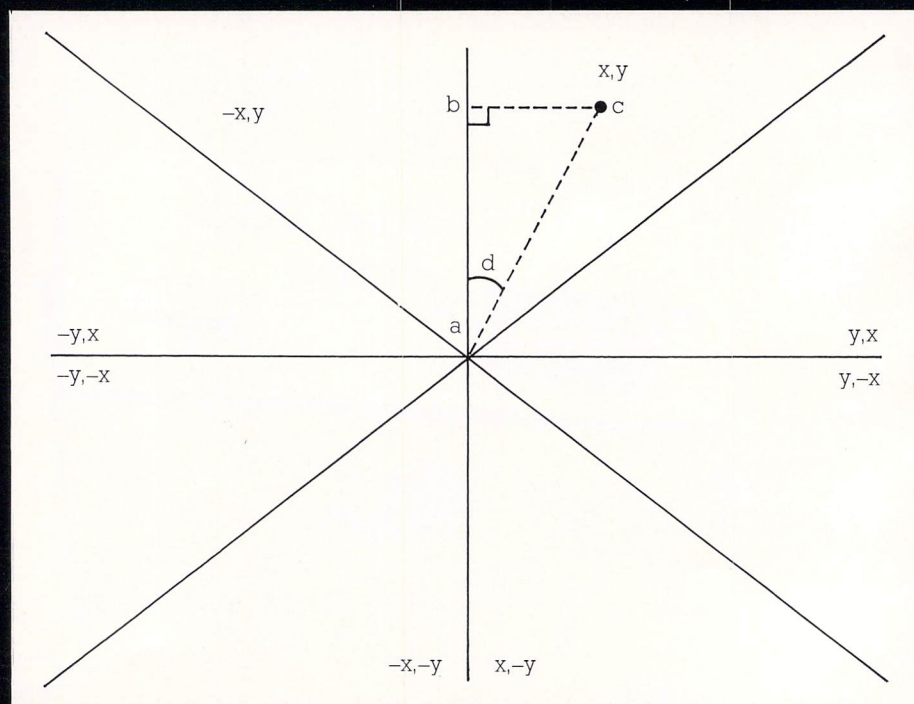
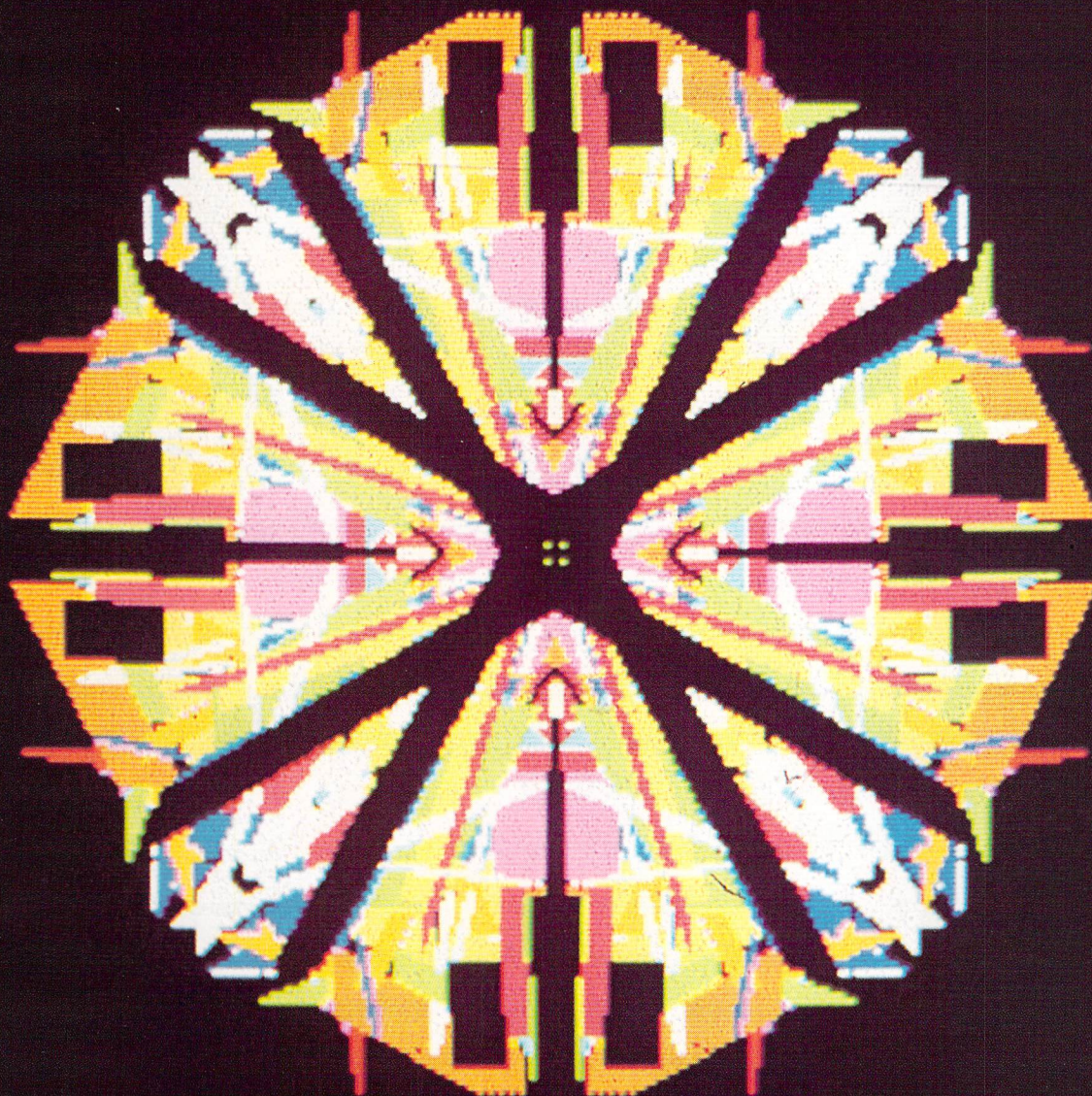


Figure I: The sectors making up the kaleidoscope



```

10 REM *****
20 REM * KALEIDOSCOPE *
30 REM * by Ken Hughes *
40 REM * (c) Atari ST User *
50 REM *****
60
70 REM You do NOT need to
80 REM enter Line numbers
90
100 PROCset_screen
110 PROCset_pal
120 REPEAT
130 PROCset_vars
140 PROCset_xy
150 PROCdrawit
160 UNTIL FALSE
170 END
180
190 DEF PROCset_screen
200 HIDEMOUSE
210 TXTRCT 0,0,SCREENWIDTH,SCREENHEI
GHT
220 GRAFRECT 0,0,320,200
230 CLS
240 ENDPROC
250
260 DEF PROCset_vars
270 xinc=RND(2)-1
280 IF xinc=1 THEN yinc=0 ELSE yinc=1
290 IF SCREENMODE=2 THEN col=RND(2)-1
ELSE col=INT(RND(16))-1
300 theta=RAD(RND(43))
310 hype=RND(90)
320 theta1=RAD(RND(43))
330 hype1=RND(90)
340 ENDPROC
350
360 DEF PROCset_xy
370 x0=hype*SIN(theta)
380 y0=hype*COS(theta)
390 x1=hype1*SIN(theta1)
400 y1=hype1*COS(theta1)
410 ENDPROC
420
430 DEF PROCdrawit
440 LINECOL col
450 FOR m=0 TO RND(20)
460 x0=x0+xinc
470 y0=y0+yinc
480 x1=x1+xinc
490 y1=y1+yinc
500 LINE 160+x0,100+y0 TO 160+x1,100+
y1
510 LINE 160+y0,100+x0 TO 160+y1,100+
x1
520 LINE 160-y0,100+x0 TO 160-y1,100+
x1
530 LINE 160+x0,100-y0 TO 160+x1,100-
y1
540 LINE 160-x0,100-y0 TO 160-x1,100-
y1
550 LINE 160-y0,100-x0 TO 160-y1,100-
x1
560 LINE 160+y0,100-x0 TO 160+y1,100-
x1
570 LINE 160-x0,100+y0 TO 160-x1,100+
y1
580 NEXT
590 ENDPROC
600
610 DEF PROCset_pal
620 inx=0
630 WHILE inx<16
640 READ red,green,blue
650 PALETTE inx,red,green,blue
660 inx=inx+1
670 WEND
680 ENDPROC
690
700 DATA 0,0,0,1000,1000,1000
710 DATA 1000,0,0,0,1000,0
720 DATA 0,0,1000,800,450,130
730 DATA 550,1000,0,800,130,300
740 DATA 800,1000,800,0,0,0
750 DATA 0,1000,1000,1000,0,1000
760 DATA 1000,600,0,850,1000,1000
770 DATA 0,0,0,1000,1000,0

```

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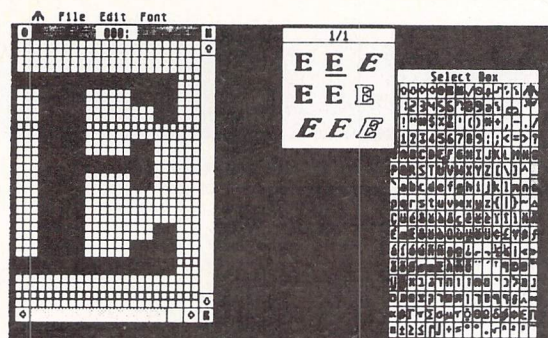
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INTERPRETER

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ST
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Review

'Computer Concepts have really made GEM work—it is certainly the best multi window programming environment on the ST.'

'Fast Basic, is supplied with a wide selection of sample programs which represent an invaluable source of reference.'

'The (GFA Basic) editor does its job well, but just can't compete with Computer Concepts' Fast Basic.'

ST USER

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A unique variable tracking facility allows constant monitoring of variable values. In addition, a program tracking feature moves the cursor through the BASIC program as it executes.

/B/A/S/I/C/

Modern structured BASIC

Based on BBC BASIC, but with extensions from languages such as Pascal and C.

CASE..ENDCASE and multi-line IF..THEN..ELSE, named procedures and functions, WHILE..ENDWHILE and REPEAT..UNTIL

Run time disc

This allows Fast BASIC programs to be run without the cartridge being present. Providing many of the advantages a compiler, this creates '.PRG' programs that can be double-clicked started from the desk-top like normal application programs. These programs can be given to others (or sold) and will run on STs with or without the cartridge being present.

ST features

Written specifically for the ST, FAST BASIC allows easy access to virtually all GEM and operating system features. For example a huge range of graphics commands are provided. It is also possible to write programs, using GEM, that present the user with a standard GEM interface with sizeable windows, pull down menus etc. Examples are included.

Example disc

This includes a range of demo programs including one using GEM with sizeable windows, pull down menus etc. The disc also includes a speech synthesizer machine code module that, when loaded, allows Fast BASIC programs to speak.

Documentation

A 400 page spiral bound manual details every keyword, and includes sections on the assembler, the editor, and using GEM from BASIC. A wipe clean quick reference card is also supplied.

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The following table compares some of the features of FAST BASIC and the German produced GFA Basic.

Feature	GFA Basic	Fast BASIC
Amount of RAM occupied by interpreter	55K	None
Size of BASIC interpreter	55K	128K
Multiple programs at once	✗	✓
Supports GEM desk accessories from the editor	✗	✓
Built in 68000 assembler	✗	✓
Start-up time	10 sec	Instant
Manual	300 page	400 page
Quick reference card	✗	✓
Speech synthesizer	✗	✓
Maths precision (No. of digits)	11	7 or 15
Integer size	32 bits	8, 16 or 32 bits
GEM based editor	✗	✓
Mouse controlled 'click & drag' cut/copy/paste	✗	✓
Variable tracking	✗	✓
Program cursor tracking	✗	✓
Number of keywords	260	400
Named multi-line functions	✗	
CASE/SWITCH construct	✗	✓
Package includes	1 disc Manual	2 discs Manual Quick ref. card ROM cartridge

Run-time disc
Now supplied free of charge with all packages.

Messages by micro

In Part II of his guide to telecommunications David Atherton looks at electronic mail

WHAT is electronic mail (email)? In essence it is very simple. As I briefly touched upon in the last article, email is simply a system where you send messages to other people using a computer.

You don't, however dial the other person directly. Instead you dial a central computer to which you both have access.

When you dial the central computer you are asked for an identity number and password. This is supplied upon joining the system, and is the method by which the computer identifies you for time billing, and, of course, to check whether there is any mail for you.

After giving these, the central computer will send messages to your screen and, where appropriate you type replies. An email system will tell you if there are any messages waiting and usually how many.

After typing a simple command the messages will appear on screen, one after the other – normally in date/time order with the oldest first. You can read these and, print them out straight away, or

save them on disc and print them out later.

Note that copying to a printer or a disc file is a function of your terminal software, not the online system.

Sending messages is just as easy. You type the name, or more usually the identity number of the person you want to write to. The email system will respond confirming that such a person exists and you type the message.

There is a special code to finish, .SEND on Telecom Gold, # on Prestel or Return on its own on bulletin boards. The system will then return to its standard mode. If you want to send another message you repeat the procedure.

When you've finished sending or receiving messages, another command – maybe BYE, LOGOFF or a selection from a menu – will disconnect you from the system. Now let's look at some of the available systems in detail.

Telecom Gold, of which MicroLink forms part, is the principal email service in this country. The system is run on a number of large computers, and claims a total of more than £40,000 subscribers. The email facilities are very powerful and this is overwhelmingly the most popular use of the service.

At its simplest level, just reading and sending messages without any frills is straightforward. You just type "mail read", and the system starts printing your mail out on the screen.

To send mail is equally straightforward. You type "mail send", the ID of the sender and the subject matter, then follow this with the text of the message.

For more experienced users, there are a number of extra features to improve mail efficiency. Typing EX after the recipient's ID invokes express mail and will allow you to 'jump the queue' so that your message is read first.

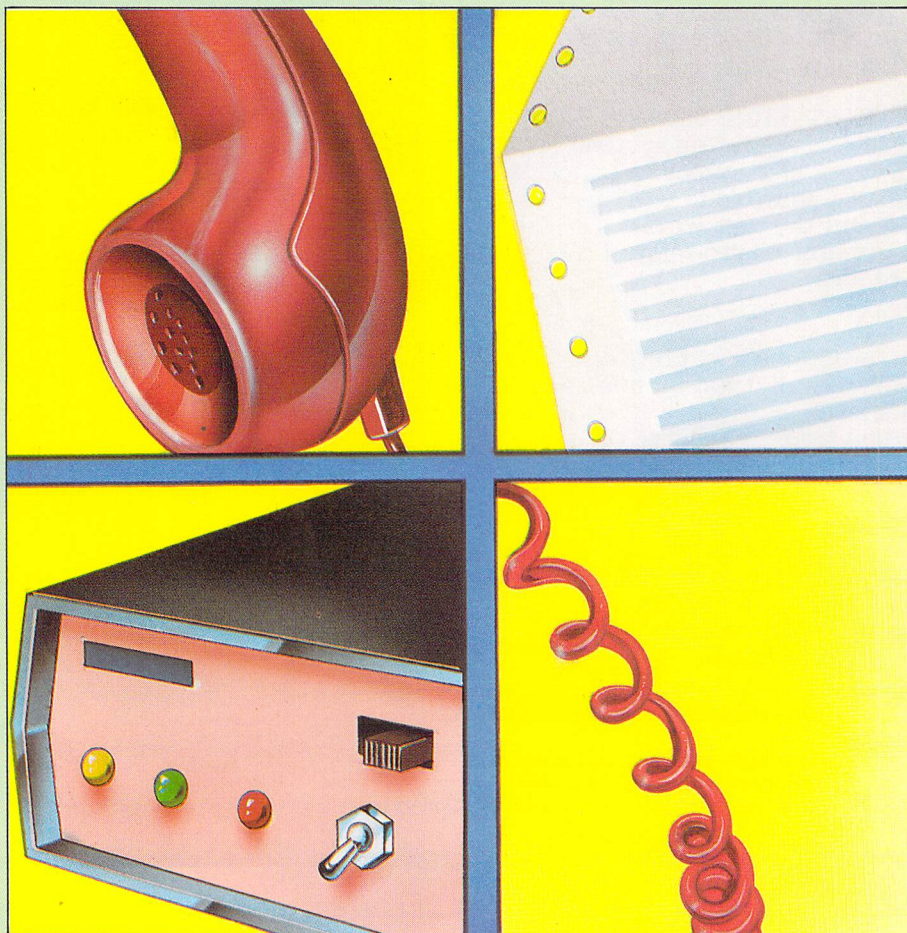
This must only be used when necessary otherwise it would have no effect. CC (carbon copy) and BC (blind copy) cause additional copies to be sent. All these things can be typed on the same line so:

```
To: 72:MAG12345 EX CC 72:MAG23456
    CC 72:MAG34567 BC 81:TNL020
```

will send an express message to the first mailbox and copies to the other three, but the last mailbox will not be identified in the copy list.

You can get the system to tell you when the recipient has read the message and you can ask for a reply by using the letters RR in the command line. Of course, you can also ask for a reply in the text of your message.

An interesting feature is that you can set the date and time that a message is to be transmitted. Telecom Gold holds the message until the required date and time, and then sends it. This could be used to send time-critical information, such as

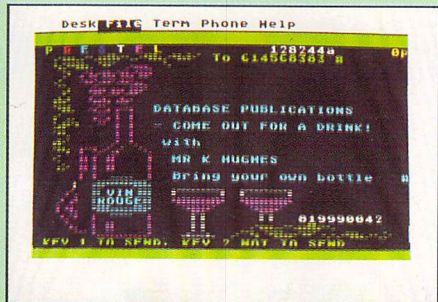


secret new product details to a number of people at exactly the same time.

Telecom Gold is part of the Dialcom network, an international group of computers and you can send messages to any of the other computers in the network. All you need is the full ID of the recipient, and it is as easy to send a message to Australia as it is to the next town.

MicroLink is a closed user group on Telecom Gold. It is the largest such group with 7,000 members. Unlike some closed user groups there is no additional charge – in fact registration costs only £5 compared with £40 for a Telecom Gold individual account.

In practice you rarely need to pay this £5, as it is often waived if you register at a show, or buy one of the many comms products which includes free MicroLink membership.



Like most closed user groups, you can use all the facilities of the main Telecom Gold system, but there are also many extra features available if you are a MicroLink member.

These extras aren't really email related. There is access to some international systems which allow you to read data, and leave messages on a bulletin board.

Interesting though this is – and I'll be covering the database features of MicroLink in the next article – it's not really email. However, MicroLink tell me that person-to-person email with other non-Dialcom systems is being worked on.

Prestel, British Telecom's other database system has a simple email system, known as Mailbox, but the features offered are very basic.

The principal limitation is that all messages must be sent in a fixed size frame which takes only 960 characters – about 200 words.

You can send a number of frames one after the other, but other than preserving the number of the addressee, you get no special continuation features.

This limit makes it virtually impossible to send reports and other long items. Of course, this is not what the system was designed for and for short personal messages it works well.

Prestel stores your incoming messages and advises you if any are unread when



you logon, logoff or when you type a special page number (930).

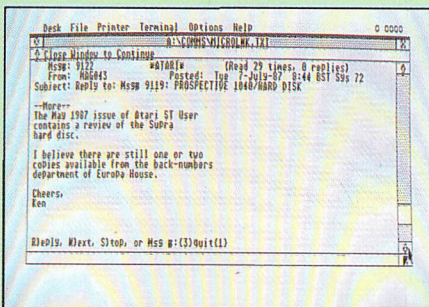
There is no limit to the incoming number, but you can only store six frames. To store longer items you must have your own storage, to disc or printer. Most terminal software allows you to do this.

There are a number of prepared mailbox frames on Prestel which are accessed by typing their page number. Some have ready made messages such as "Happy Birthday" and "Thank you" and simple graphics. The type of prepared frame available shows that this email system is mainly for home users.

Prestel works completely on this frame-based system known as viewdata and I'll be looking at it in more detail next month.

You can't access viewdata systems with the built-in VT52 emulator or any of the American public domain and shareware communications software that abounds for the ST because it's essentially a European system.

Also Prestel works at 1200/75 baud which means, as I explained in the last



article, that you need special software to handle the split baud rates, or a modem that will do it. All Prestel-compatible software such as Kuma's K-Comm, and AM Technology's Fastcom will do this.

Another way of using email, this time without any subscription or time charges, is through a bulletin board. These are usually run by private individuals as a hobby so there is no charge.

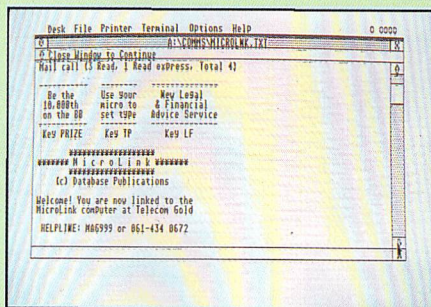
Most boards have email sections but obviously it is only useful where you are contacting people who you know will call that board.

Bulletin boards are very popular and getting through to one can be a haphazard business, so although this is a good method of talking to a few friends, it isn't reliable as a business communication.

Bulletin board email works in a similar manner to Telecom Gold, in that you select MAIL, name the recipient and the subject and supply the text. The usual systems don't have any special features such as multiple copies, delayed send and the like. Next time the recipient calls that board, they will be told that a message from you is waiting.

Email systems also offer a telex facility. A message sent as email can be routed into the telex network and appear on a telex terminal anywhere in the world.

This allows email users to link in with the more traditional and much larger



world of telex. The facility works both ways, and you can receive telexes as well.

Many people use email purely as a route into telex, especially as an Atari ST and printer is considerably less costly than a telex machine.

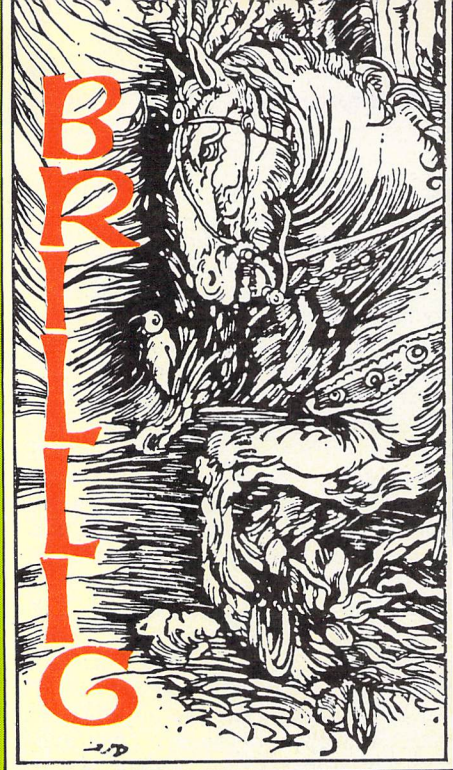
Are email systems secure? Computer hacking makes good news copy and we seem to read every week of some supposedly ultra-secure computer revealing it's secrets to an enterprising teenager.

But think about the enormous volume of email traffic every day and compare this to the number of reported cases.

In practice, the chances of unauthorised reading of your mail is very rare, provided that you don't tell anyone your password, don't leave it lying around – such as on an auto logon disc – and you pick a password that isn't too obvious.

In a magazine last year, a survey report gave the most common passwords as PASS, PASSWORD, FRED, COMPUTER, the well known four letter words, and users and their families names. So these are the ones the hackers will try first – you have been warned.

MicroLink – Contact: 061-456 8383
Prestel: Contact Freephone Prestel Sales



Puzzles — the stuff of adventures

AS the postman staggered over the drawbridge to my front door with yet another sack of your letters I felt warmly reassured.

Pausing only to give the good fellow a jar of bat liniment to rub in his aching joints, I reflected that ST adventures show no sign of losing their power to baffle, tease and bewilder. And that's how it should be.

What would be the fun if every bejewelled, but locked chest sprang open at a touch? Where's the joy in gaining entrance to dank dungeons

guarded by fearsome dragons if the beasties simply roll over and wait to be tickled at your approach?

What a bore if every moat was swimmable, every troll saintly, and every dark corner occupied by nothing more dangerous than a shy sausage?

No, puzzles and perils are the stuff of adventures and we wouldn't have it any other way.

But there comes a time in every adventurer's life when, tormented beyond measure and bamboozled beyond belief, there is simply no

recourse but to seek the assistance of a fellow adventurer.

For those wise enough to partake of *Atari ST User*, one such avenue of succour is this column where fellow adventurers share their woes and triumphs.

And so, bringing my philosophical musings to an end (I simply must ease up on this Old Warlock's White Whisky — it's beginning to make me sound like Clare Rayner, as well as turning my nose a volcanic red), we come to this month's hints and tips.

HINTS AND TIPS

Thanks to N J Ellor of Manchester for his tips on *The Pawn*, to J Holmes (address unknown — could it be 221b Baker Street?) for his advice on *Bureaucracy* and to David Gordon of London for counsel on *Hollywood Hi-Jinx*.

I am also grateful to Carl Jones of Kingswinford for help with *Guild of Thieves*. Now Carl would like some help with *Guild of Thieves*, as would many other readers and I am happy to oblige.

Gareth Davies of Coventry has used his initiative and found an unusual way to unravel the coded message in *Leather Goddesses of Phobos* — he asked his former maths mistress, Mrs Garbutt, to solve it for him. And she did.

What now intrigues me, Gareth, is how you managed to explain to the lady what this saucy adventure was all about. ("Well, Mrs Garbutt, it concerns a little known expedition made by Pythagoras to seek out seven cow hide statuettes which were reputedly buried

on the hypotenuse of the ancient triangular Greek isle of Phobos...."). The mind boggles so I think we'll draw a veil over that speculation.

Gareth has a few problems of his own in *Leather Goddesses*. For him and others there's some assistance in this month's hints and tips.

My appeal for help with *King's Quest II* did not fall on deaf ears. Kenneth Walraven, of the Isle of Man, supplied a number of tips while Allen and Mark Errington of Durham helped and supplied a useful map as well.

Further afield, Marcel Langezaal from Leiden in The Netherlands came up with four printed and detailed sheets of solutions. My deepest thanks to them all for their splendid response.

Allen and Mark would now like some guidance on the *Black Cauldron*. Should they give the pig to the fairy? Where do they use the magic word? Can the chest be opened? What of the lute and the little friend who keeps appearing? Can anyone throw some

light on these and other *Black Cauldron* problems.

Marcel needs another 32 points to complete *KQ II* and would appreciate information on *Batman*, the flying horse, the sugar and the stake and mallet. Any offers?

He would also like some tips for *KQ III*. How do you read a spell from the book of sorcery? How do you enter the cave with the spider's web? Is there anything useful to be done in the tavern besides buying a drink? Your tips would be most welcome.

As some of the hints are becoming quite long, I've decided that from now on I will print the tips in English instead of coding them. If you don't want to see a particular solution take care when reading the tips section. You have been warned.

That winds it up for the moment. Keep your requests and solutions rolling in and don't worry about the postman — the bat's liniment has worked wonders for his back.

Program: Stationfall

Price: £24.99

Supplier: Infocom c/o Activision, 23 Pond Street, Hampstead, London NW3 2PN.
Tel: 01-431 1101

LET'S play a game of Hider-and-Seeker. Now, think, who would say that?

Whose antics and chatterings could drive you to drink one minute and in the next elicit an overwhelming sense of affection?

Who never stopped behaving like a little child? Who would carry out an act of heroic proportions and lay down his life for you?

And who, if you were so unkind as to give him an undeserved kick, would mutter "Why did you do that? I think a wire's now shaken loose", and go off into a corner and sulk?

Floyd, the scatterbrained robot from Infocom's Planetfall, that's who. No one who has met Floyd is ever likely to forget him. And if you haven't had the pleasure, now's your chance.

Rejoice, ye stars Sing out, ye moon (Sorry, but that's the sort of effect Floyd has on you). That loveable, maddening mass of mischief returns with a bang in Steve Meretsky's brilliant sequel, Stationfall.

You don't need to have played Planetfall to enjoy Stationfall (but why play one superb game when you can play two?). As a result of your heroism in Planetfall, you have been promoted. Before you were just a scrubber of decks and



Floyd is back!

cleaner of grotch cages. In Stationfall you are now...

Well, actually, although you're a much higher rank, the job is just as mind-numbingly boring.

Your tedious scrubwork has been replaced with tedious paperwork. Forms,

forms and more forms.

Take today's thrill-a-minute assignment. You have to pop over to a Gamma Delta Gamma 777-G Space Station and pick up a supply of request forms for Stellar Patrol Issue Regulation Black Form Binders.

KINGS QUEST II

Mermaid a mystery?

She will appear on a rock in the sea, near the shore by the witch's cave. Find the door across the bridge and read the inscription. Give the mermaid a gift.

No keys to the doors?

Neptune will give you the first key in return for a trident. To get the second, rub the oil lamp from the antique shop and use the carpet to fly to the mountain. The last key is in the coffin in the castle - you'll need a cloak and ring to get there.

BUREAUCRACY

Don't know how to answer the intercom?

Say the same thing to the weirdo in the farmhouse and listen carefully to his response.

Stuck in jail with the weirdo?

Ask him to give you his pen-knife.

LEATHER GODDESSES OF PHOBOS

Message needs decoding?

Write it backwards and replace each letter with the third before it in the alphabet. Thus A becomes X, B becomes Y and so on.

Can't give the frog a smacker?

Close your eyes, put pin on nose, cover ears with hands and put balm on lips. Now you can kiss the frog.

Sultan's riddle a riddle?

Riddles!

THE PAWN

Cream door a puzzle?

When the Devil has removed the wrist band, go to the cream door and knock. Respond to the voice with a No and enter. When you are given some paper, type DEBUG and you can wander around the adventure without getting killed.

HOLLYWOOD HI-JINX

Can't get over the broken steps?

Try a spot of skiing.

Need a light in the underground cave?

Drip wax from the statuettes on to the green match to make it waterproof.

Film a bit fuzzy?

Remove the lens cap and run both the slide and film projector at the same time.

GUILD OF THIEVES

Want to make a fishing rod?

Tie the cotton to the cue. Put the maggot on the needle.

Can't find a secret laboratory?

Stand on the bed in the main bedroom. Press the top button with the cue.

Need the miller's lute?

Buy it from him with your winnings from the rat race. Bet on the race with the note hidden in the cushion.

Aboard your ship the SPS Duffy is your former arch-tormentor Blather (who has since been demoted to deck-scrubbing duties and whimpers at the sight of you) and a trio of robots in the robot pool. There's Rex and Helen and yippee, your old playmate, Floyd.

You can only take one robot from the pool and, of course, it's got to be Floyd. Try picking one of the others and see what happens.

Even were it technically right to pick Rex or Helen, could you bear to see Floyd's lower jaw begin to quiver as though he were about to cry?

You and Floyd are not alone on the station for long. In walks another robot, a bit of a bookworm apparently since he's reading a volume of poetry.

Turns out this is Plato who is rather like an older, wiser version of Floyd. Fortunately, he's just as friendly.

They are very much in the mould of all good comedy double-acts - R2D2 and C3PO spring to mind. It is one of the great pleasures of this game to watch them at work and play (which they do incessantly, mostly without taking any notice of you).

There are other inhabitants, too - an ostrich and an Arcturian balloon creature (shades of Dark Star?). Your mission is

certainly turning out to be a far cry from the prosaic paper hunt you thought it would be, even if it does seem to be lacking in mystery and mayhem.

It soon becomes apparent that all is not well. The Commander's log makes uneasy reading as it charts a gradual decline of the normally smooth running of machinery and procedures.

The problems all seem to begin with the arrival of a strange alien craft. You soon discover that things are indeed going very wrong.

Automatic sliding doors begin to open much slower as you approach, but slam shut with an alarming suddenness as you pass through, endangering your life.

Roving android mechanics start mistaking you for something that needs spot-welding. Even Floyd starts acting more strangely than normal - or should that be abnormal?

Stationfall has so much going for it. As usual there is the expected deep level of detail, fulsome prose, wide vocabulary, and superb parser. Add to that the usual high standard of Infocom packaging (a Stellar patrol patch and three pieces of bureaucratic bumph.

There are Footnotes to read (remember Hitch-hiker?) and even our old friends the Grues put in an appearance.

But above all, Stationfall has the single ingredient which, with one exception, no other Infocom adventure possesses Floyd.

Try to save your game position and Floyd's eyes will light up as he exclaims, "Oh boy. Are we gonna try something dangerous now?"

Attempt a Restore and Floyd looks disappointed, but understanding - "That part of the story was more fun", he sighs. He has equally cheeky comments about quitting, restarting and many other topics.

How do they do it? Just when you think Infocom must have reached a new peak in quality and humour, leaving the rest of the competition in the dust, it ups the stakes.

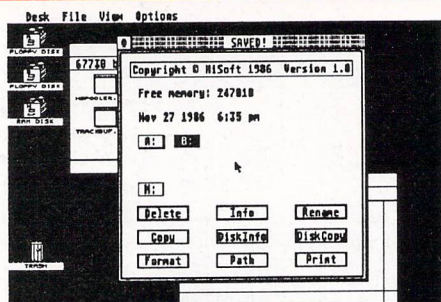
Stationfall will take some beating. Let the last word be Floyd's: When you next go into your local computer store and spy Stationfall, heed well these words, when you first clap eyes on him in the robot pool, "Oh boy, oh boy, oh boy, pick Floyd, pick Floyd, pick Floyd".

Brillig

Presentation	10
Atmosphere	10
Puzzlement	10
Value for money.....	10
Overall	10

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	PCW1	PCW2	PCW3	PCW4	PCW5	PCW6	PCW7	PCW8	Steve	Calc
HiSoft BASIC	0.05	0.06	0.20	0.26	0.26	0.54	0.94	1.42	0.88	1.37
GFA Compiler	0.05	0.10	0.22	0.28	0.30	0.61	0.99	2.19	1.27	3.33
Fast BASIC	0.15	0.58	1.13	1.55	1.51	2.58	4.11	2.73	15.3	7.14
ST BASIC	0.9	2.8	5.94	8.03	8.03	14.2	20.9	10.0	81.6	31.3

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DevpacST £49.95

DevpacST has done more to get me playing around with the ST than any other language or development system.
Bruce Webster, Byte Magazine Nov 86

Quite simply, DevpacST is the assembler development system for the Atari ST. DevpacST is supplied by Atari UK as part of their official development system. The amazing Starglider game was programmed entirely using DevpacST. Need we say more?

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The sound of music

WE saw last month how to use ST Basic's SOUND command. We now need to go a step further if we want to transcribe some more popular music scores to the ST.

First, we need to know a little about music and the way it is written. What follows is not a definitive description, merely a generalisation to allow you to write music for your ST – so purists, don't be offended.

Look at Figure I, which is the opening few bars of Greensleeves (ignore the numbers for the time being). Each of the musical notes is represented by a graphical notation – notes written on a staff.

Each note conveys three items of information – its pitch, the octave it is played in and its duration. To obtain these values you will need to be able to read musical notation. You can get details from any basic musical tutorial book and piano books are particularly good in this respect.

Figure II shows the notes on the staff and Table I lists their pitch values. The

In the second of his series Bruce Smith shows how to transcribe sheet music on to your ST

duration can be found from Table II where each type of note is listed along with its duration in 1/50ths of a second.

The durations are not the exact computer equivalents. For instance, the dotted demi-semiquaver is also referred to as a 1/32nd note.

To play this accurately would require the note to be played for a duration of 1.5 and the ST Basic SOUND command does not allow you to use anything other than integers.

If you look back at Figure I you will see that below each note is the correspon-

ding pitch, octave and duration value.

Once this has been worked out for a piece of music it can be converted into DATA statements and played using a simple WHILE...WEND structure. Program I does just this and will play the bars of Greensleeves shown.

Lines 50 to 130 will form the basis for any similar musical score you may wish to try yourself. Three items of data are required – note, octave and duration, and the last three data items should be 0,0,0 to terminate the playing loop.

One word of advice – if you plan to convert your own favourite tunes do it from the Song Book type publications.

These are much easier to use than traditional sheet music, which tends to be complicated by arrangements and accompaniments which makes life none too easy.

The Greensleeves listing plays at a rather fast pace or tempo. In consequence many of the notes seem to become slurred together.

The same is true in the conventional music world so rests are often incorporated into musical scores to put gaps between notes to stop them running into one another.

Not surprisingly there are musical notations for the rest notes and these are listed in Table III. These will occasionally appear in the sheet music that you are transposing to the ST.

To handle a rest we need to play nothing for the required length of time. That's not strictly true and we must play a note, but we turn the volume right down to 0, that is, off.

Look back to the Greensleeves listing. Line 100 turns each note off after it has been played (with SOUND 1,0). This line is not really needed in the main loop for reasons explained earlier – I have included it here though so that it can be edited to play a rest. Alter line 100 as follows:

```
100 SOUND 1,0,1,3,2
```

The loudness parameter is set to zero and I have chosen to use pitch 1, octave 3 to play – it can be anything as it won't be heard. Finally a semiquaver rest has been used so a duration of 2 is indicated.

Run the program and notice how the tune is more precise and not so slurred. Of course, you can experiment with other rests to see how it changes the sound of the music.

A section will often have to be repeated several times – a chorus for example.

```

10 REM ST Greensleeve Rap
20 REM by Bruce Smith
30 REM for Atari ST User
40 REM with ST BASIC
50 note=1:oct=1:dur=1
60 WHILE note<>0
70 READ note,oct,dur
80 IF note=0 THEN GOTO 120
90 SOUND 1,15,note,oct,dur
100 SOUND 1,0
120 WEND
130 END
140 REM Note,oct,dur
150 DATA 5,3,8
160 DATA 8,3,16
170 DATA 10,3,8
180 DATA 12,3,16
190 DATA 2,4,4
200 DATA 12,3,4
210 DATA 10,3,16
220 DATA 7,3,8
230 DATA 3,3,16
240 DATA 5,3,4
250 DATA 7,3,4
260 DATA 8,3,16
270 DATA 5,3,8
280 DATA 5,3,12
290 DATA 4,3,4
300 DATA 5,3,8
310 DATA 7,3,16
320 DATA 4,3,8
330 DATA 12,2,16
340 DATA 0,0,0
  
```

Program I

	5	8	10	12	2	12	10	7	3	5	7
Pitch	5	8	10	12	2	12	10	7	3	5	7
Octave	3	3	3	3	4	3	3	3	3	3	3
Duration	8	16	8	16	4	4	16	8	16	4	4

	8	5	5	4	5	7	4	12
Pitch	8	5	5	4	5	7	4	12
Octave	3	3	3	3	3	3	3	2
Duration	16	8	12	4	8	16	8	16

Figure I: Greensleeves

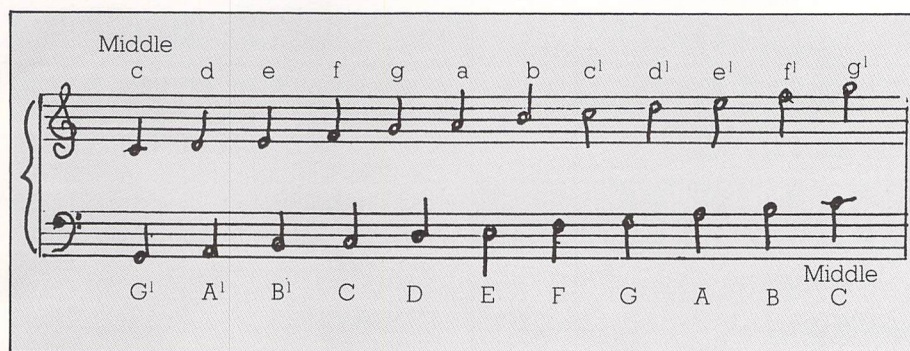


Figure II: The notes on treble and bass clefs

Note	Pitch
C	1
C#	2
D	3
D#	4
E	5
F	6
F#	7
G	8
G#	9
A	10
A#	11
B	12

Table I: The pitch values of notes

There is no need to re-key all the note information a second time, just include it as a subroutine of DATA statements. Use the RESTORE command to point the ST at the relevant lines of DATA before finally RESTOREing back to the original point in the DATA.

Such a program could be written as a series of subroutines or in a linear style by inserting marker bytes in the DATA. For instance a number such as 255 may be recognised by the program indicating it is to repeat the previous section.

You will also have to use a variable flag which can be tested to see if the marker DATA number has been used before and if so skip over it. Fail to do this and the music will play the same section over and over again.

Add the following lines to Green-sleeves to see how this technique is used to play the first half of the tune twice.

```
55 flag=0
82 IF note=255 AND flag=0 THEN
  RESTORE:flag=1:SOUND 1,0,1,3,
  2:GOTO 70
85 IF note=255 AND flag=1 THEN
  READ note,oct,dur
  235 DATA 255,255,255
```

Finally, we come back to the subject of that first parameter in the SOUND

Note	Symbol	Duration
Demi-semiquaver		1
Semiquaver		2
Dotted semiquaver		3
Quaver		4
Dotted quaver		6
Crotchet		8
Dotted crotchet		12
Minim		16
Dotted minim		24
Semibreve		32

Table II: The lengths of musical notes

command – the channel number. The ST has three sound channels and these are assigned numbers 1,2 and 3. By sending SOUND commands to each of the three channels it's possible to play more than one note simultaneously.

Program II is based on Program I and plays a well known theme on all three channels. When you run the program you will hear that the channels are not quite in harmony – the problem is one of timing.

Because each command has to be interpreted and executed by Basic there is a time lag, albeit a small one, when you can commence music on two or three different channels.

The notes can be fine tuned with some

Note	Symbol	Duration
Demi-semiquaver rest		1
Semiquaver rest		2
Quaver		4
Crotchet		8
Minim		16
Semibreve rest		32

Table III: Rest values

```
10 REM Three Channel Sound
20 REM by Bruce Smith
30 REM for Atari ST User
40 REM with ST BASIC
50 WAVE=7
60 note=0
70 WHILE note<>255
80 READ note,oct,dur
90 IF note=255 THEN GOTO 70
100 SOUND 1,15,note,oct,dur
110 SOUND 2,15,note,oct,dur
120 SOUND 3,15,note,oct,dur
130 WEND
140 SOUND 1,0
150 SOUND 2,0
160 SOUND 3,0
170 END
180 DATA 12,3,10
190 DATA 2,4,10
200 DATA 10,3,10
210 DATA 10,2,10
220 DATA 5,3,20
230 DATA 255,255,255
```

Program II

nifty programming and clever use of another sound command – WAVE. If you look at line 50 of Program II you will notice that the command WAVE 7 has been employed. This must always be used if more than one channel is required to output sound.

The WAVE command lets you manipulate the way in which SOUND is played. It is quite complex and is a subject that we will come back to in a future issue of *Atari ST User*.

For the time being you might like to have a look at its documentation in your ST manuals and play around using the techniques outlined here to compose some music.

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Crack that code

CAN you remember the game that was all the rage before the trivia quizzes? It was played in offices, homes and schools the length and breadth of the country.

All over our green and pleasant land people of all ages could be seen sticking little coloured pegs into a little coloured board.

The one problem was that unless you were a registered psychic you needed two people to play the game – one to set the colour code and a second trying to crack it.

The rules were simple. The code setter placed a number of coloured pegs in one end of the board and then covered them with a shield. The code breaker would then attempt to find the code by placing pegs in his side of the board one row at a time.

After each row had been entered, the setter would advise the player how near he was to breaking the code by placing black or white pegs in the board.

Each black peg meant that there was a correct colour in that row in the correct position, a white peg meant that there was a correct colour in the wrong position.

The problem of needing a partner to set the code and score can be avoided easily by using the Atari ST to carry out this part of the game, leaving the player free to tax his brain.

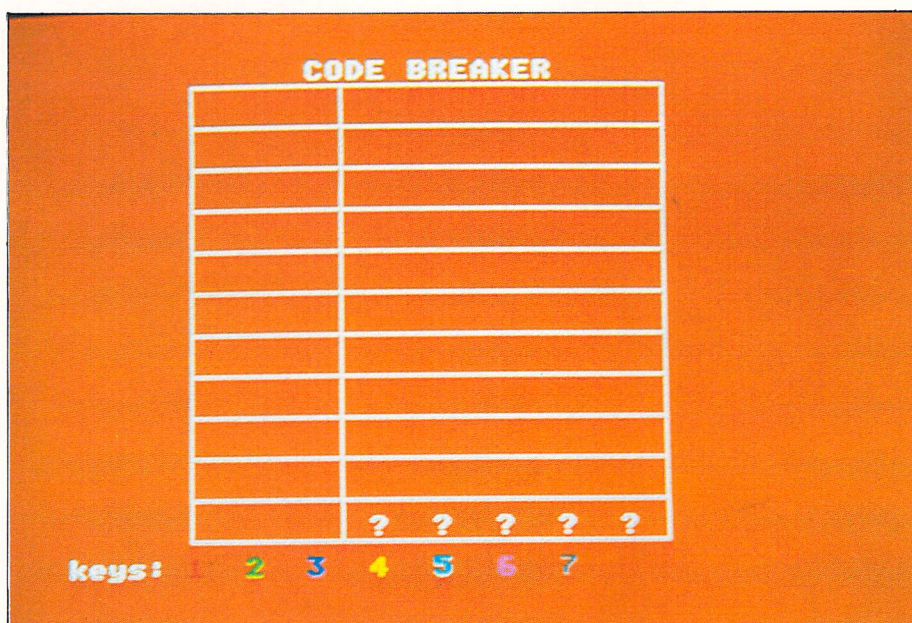
If you are tired of zapping aliens, trekking around haunted houses or piloting a jet plane over the Rocky Mountains, try typing in this game and let speed of reflexes make way for sheer concentration.

The program is written in Fast Basic and line numbers are included only to assist you to determine an end of line. They should not be entered when typing in the program.

Line 100 makes sure that your display screen is set to low resolution. If it isn't, an alert box appears on screen and asks you to use the correct mode.

The initialisation procedure called by line 110 sets the screen to maximum dimensions, hides the mouse pointer, dimensions arrays, sets the random number seed and loads the palette with the correct colours. Once this has been done the instructions are displayed and the program waits for the space bar to be pressed.

The main part of the program is controlled by procedures called between lines 130 to 230 – the first of which is *set_variables*. In this procedure, the



Peter Hartley converts a well known board game to the Atari ST

number of *guesses* made is set to zero, the number of colours that are to be used is entered and stored in *level* and the score in *correct* is also set to zero.

The second procedure in the main loop is *print_board* and this does exactly what you would expect. It draws the game board and places five question marks where the computer's pegs will be dis-

played at the end of the game. Note that there are two spaces between each of the question marks.

The final step before play commences is to set the hidden code in the ST's memory. This is done in *PROCset_code* and loads numeric array *code()* with five random numbers which translate into the colours used for the pegs (excluding black and white).

The program now loops until either the hidden code is discovered or until the maximum number of tries have been entered. You'll then be shown the correct answer. It's difficult, but great fun so get tapping and play Code Breaker.

```

10 REM *****
20 REM ** Code Breaker **
30 REM ** By Peter Hartley **
40 REM ** (c) ATARI ST USER **
50 REM *****
60 REM
70 REM Written in Fast Basic
80 REM do NOT enter line numbers
90 REM
100 IF SCREENMODE THEN PROCend_it
110 PROCinitialise
120 PROCinstructions
130 REPEAT
140 PROCset_variables
150 PROCprint_board
160 PROCset_code
170 REPEAT
180 PROCinput_guess
190 PROCcheck_guess
200 UNTIL correct OR guesses=10
210 IF correct THEN PROCgot_it ELSE

PROCfailed
220 PROCanother_game
230 UNTIL spac$="n" OR spac$="N"
240 PROCtidy_up
250 END
260 DEFPROCinstructions
270 CLS
280 INK 2
290 PRINT TAB(10); "CODE BREAKER"
300 PRINT TAB(9); "-----"
310 PRINT "This is a game in which y
ou have to""crack a secret code."
320 (SP)+RINT""The code consists of
different colours""and you can have 1
0 attempts at it."
330 PRINT""Pressing one of the numbe
red keys will""place a colour and bac
kspace will erase""it."
340 PRINT""A black star means that o
ne of the""colours is the right colou
r and in the""right place."

```

```

350 PRINT "A white star means that o
ne of the colours is the right colour
r but in the wrong place."
360 PRINT "Press the space bar to st
art...";
370 REPEAT
380 UNTIL GET$=" "
390 ENDPROC
400 DEFPROC initialise
410 TXTEXT 0,0,320,200
420 GRAFRECT 0,0,320,200
430 HIDE MOUSE
440 DIM code(5),guess(5)
450 DIM marked_answer(5)
460 DIM marked_guess(5)
470 rand=RND(-SYTIME)
480 FOR pal=0 TO 8
490 READ red,green,blue
500 PALETTE pal,red,green,blue
510 NEXT pal
520 DATA 700,300,0,0,0,1000,1000,1
000
530 DATA 1000,0,0,0,1000,0,0,1000
540 DATA 1000,1000,0,0,1000,1000,100
0,1000
550 DATA 900,600,0
560 ENDPROC
570 DEFPROC set_variables
580 CLS
590 guesses=0
600 PRINT TAB(1,15);"How many colour
s?";TAB(4,18);"Press 4 - 7 ";
610 REPEAT
620 level=GET-48
630 UNTIL level>3 AND level<8
640 correct=0
650 ENDPROC
660 DEFPROC print_board
670 CLS
680 LINECOL 2:INK 2
690 PRINT TAB(12,1) "CODE BREAKER"
700 PRINT TAB(15,23);"? ? ? ? ?"
710 PRINT TAB(0,24) "keys: ";
720 FOR i=1 TO level
730 INK i+2:PRINT;i;" ";
740 NEXT i
750 LINE 50,9 TO 50,185
760 LINE 110,9 TO 110,185
770 LINE 235,9 TO 235,185
780 FOR n=185 TO 9 STEP -16
790 LINE 50,n TO 235,n
800 NEXT
810 PRINT CHR$(7);
820 ENDPROC
830 DEFPROC set_code
840 FOR i=1 TO 5
850 code(i)=RND(level)
860 NEXT i
870 ENDPROC
880 DEFPROC input_guess
890 guesses=guesses+1
900 PRINT TAB(7,22-(2*guesses));
910 i=0
920 REPEAT
930 i=i+1
940 REPEAT
950 colour=GET-48
960 IF i>1 AND colour=-40 THEN i=i-1
:PROCcounter(0,14+i*3,22-2*guesses)
970 UNTIL colour>0 AND colour<=level
980 PRINT CHR$(7);
990 guess(i)=colour
1000 INK colour+2

```

```

1010 PROCcounter(colour+2,14+i*3,22-2
*guesses)
1020 UNTIL i=5
1030 CURSOFF
1040 ENDPROC
1050 DEFPROC check_guess
1060 INK 2
1070 FOR i=1 TO 5
1080 IF guess(i)=code(i) THEN PROCbla
ck_peg ELSE marked_answer(i)=FALSE:mar
ked_guess(i)=FALSE
1090 NEXT i
1100 IF correct=5 THEN ENDPROC
1110 correct=0
1120 FOR i=1 TO 5

```

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```

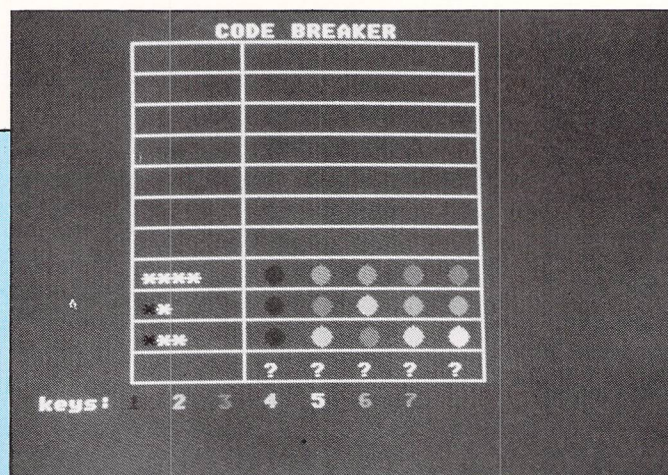
1130 FOR j=1 TO 5
1140 IF guess(j)=code(i) AND NOT mark
ed_answer(i) AND NOT marked_guess(j) T
HEN PROCwhite_peg
1150 NEXT j
1160 NEXT i
1170 ENDPROC
1180 DEFPROC black_peg
1190 INK 1
1200 PRINT CHR$(42);
1210 correct=correct+1
1220 marked_answer(i)=TRUE
1230 marked_guess(i)=TRUE
1240 ENDPROC
1250 DEFPROC white_peg
1260 INK 2
1270 PRINT CHR$(42);
1280 marked_answer(i)=TRUE
1290 marked_guess(j)=TRUE
1300 ENDPROC
1310 DEFPROC got_it
1320 FOR n=1 TO 20
1330 INK 1
1340 PRINT TAB(12,0);"CODE BROKEN ";
1350 PROCpause(50)
1360 INK 2
1370 PRINT TAB(12,0);"CODE BROKEN "
1380 PROCpause(50)
1390 NEXT
1400 PROCdisplay_answer
1410 ENDPROC
1420 DEFPROC failed
1430 FOR n=1 TO 20

```

```

1440 INK 3
1450 PRINT TAB(31,12);"FAILED! ";
1460 PROCpause(50)
1470 INK 6
1480 PRINT TAB(31,12);"FAILED !";
1490 PROCpause(50)
1500 NEXT
1510 PROCdisplay_answer
1520 ENDPROC
1530 DEFPROC display_answer
1540 PRINT TAB(15,22);" ";TAB(
14,22);
1550 x%=96
1560 FOR i=1 TO 5
1570 col=code(i)+2
1580 x%=x%+24
1590 PROCdisplay_end(col,x%)
1600 PROCpause(50)
1610 NEXT i
1620 PRINT TAB(5,24);" press space..
";
1630 REPEAT
1640 UNTIL GET$=" "
1650 ENDPROC
1660 DEFPROC another_game
1670 CLS
1680 INK 7
1690 PRINT TAB(3,4);"Do you want to"
;TAB(4,6);"play again ?"
1700 INK 6
1710 PRINT TAB(3,9);"(press Y OR N)";
1720 REPEAT
1730 spac$=GET$
1740 UNTIL INSTR("YyNn",spac$)
1750 ENDPROC
1760 DEFPROC pause(delay)
1770 TIME=0
1780 REPEAT
1790 UNTIL TIME>delay
1800 ENDPROC
1810 DEFPROC tidy_up
1820 SHOW MOUSE
1830 CLS
1840 ENDPROC
1850 DEFPROC end_it
1860 PRINT ALERT("[3][MUST BE IN I LO
W RES!][ OK ]",1)
1870 PROCtidy_up
1880 END
1890 ENDPROC
1900 DEFPROC counter(c%,x%,y%)
1910 FILLCOL c%
1920 CIRCLE x%*8-10,y%*8+2,5
1930 ENDPROC
1940 DEFPROC display_end(col,x%)
1950 FILLCOL col
1960 FRRECT x%,173,x%+10,183
1970 ENDPROC

```



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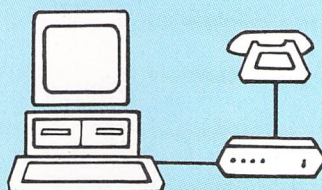


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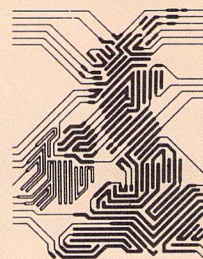
Typical comms packages

A	Haba: Miracle WS2000 V21, V23 modem + Kuma K-Comm software (£175)
B	Aaronfay: Pace Linnet V21, V23 modem + ST Easitalk software (£201)
C	Miracle: Miracle WS4000 V21, V23 modem + FaSTcomm software (£275)
D	Silica Shop: Miracle WS4000 V21, V23 modem + PC Intercomm software (£332)
E	Aaronfay: Trinitas Phasor V21, V22 modem + ST Datacomm II software (£413)

All you need – apart from your Atari ST – is a modem, which plugs into your telephone wall socket, plus suitable communications software.

We have provided a list of typical combinations (left), ranging from the very cheapest to ones which can automatically dial the MicroLink telephone number and connect you directly to the service – all you have to do is type in your personal security password.

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Innovative software

WHEN the ST was first launched, the feature it lacked was decent documentation about its operating system. This left users with a very nice computer which they were unable to program effectively.

Abacus answered every programmer's prayers by producing a comprehensive and generally well received range of books detailing the ins and outs of programming using both Gem and Tos.

Now they've branched out into software with a new range of utility programs. One of these is a complete 68000 assembly language development system called Assempro.

The package comes on one single sided disc and includes a number of example programs plus a powerful set of Gem and Tos macros. These make it almost as easy to access Gem within assembly language programs as from a high level language such as C.

Assempro incorporates an editor, a macro assembler and machine code monitor, integrated into one large program. The startup screen presents you with two windows. The top one is used by the assembler and the bottom one by the Gem-based text editor.

You can move between them by clicking on the appropriate window with the mouse. The monitor, like most of the other facilities, can be accessed directly from an on-screen menu.

Despite the size of Assempro you are still left with 250k to play around with on a standard 520ST.

This memory is divided into three separate sections. One holds the source text and another the labels and macros defined. The rest of the space is available to store your program once it has been assembled.

You can alter the length of these sections at any time although this deletes anything previously stored.

The file menu, apart from letting you select the type of file, provides numerous other facilities including file comparison, folder creation and file deletion. You can also save all the current assembler and editor settings into a special .INF file which is loaded automatically whenever Assempro is run.

The major emphasis throughout is ease of use. A notable illustration is the comprehensive set of help menus incorporated into the system. These can be called

Stephen Hill reviews Abacus' Assempro-ST assembly language development package

up at any time, even from within the monitor, thus saving you searching through the appropriate manuals.

Topics covered include effective addressing, the Bios, the XBIOS, Gemdos, the VDI and the AES. Although the information is a bit on the terse side, this doesn't really matter as most of them can be customised to your own requirements.

Probably the most serious limitation of the package is that it only supports medium and high resolution monitors. Since the machine code monitor is built in, it cannot be used to debug any programs written in low res.

Assempro's editor is the best I've seen. Not only does it provide all the usual features like block move and search/replace, it supports a wide range of facilities specifically tailored for the assembly language programmer.

One of the nicest is the ability to jump back and forth through the program from label to label by pressing two keys. You can also go directly to any specific label.

Most of these operations can be accessed with the mouse or from the keyboard using a special set of extended

commands. Lists can be assigned to a function key and saved as part of the .INF file making them permanently available.

My one quibble with the editor involved the speed of the repeat action on the keys, which was a bit on the slow side.

The macro assembler incorporates conditional assembly, the include directive and a host of other facilities. The complete Gem programming model is supported, so that you can set aside specific areas of your program for data storage.

Labels can be up to 125 characters long and can be either global, local or redefineable. The conditional assembly function includes the ability to request data from the user during assembly which can then be loaded into a label.

Assempro also lets you use symbols. These are different from labels in that they represent textual information rather than numerical data. When your program is assembled these are automatically replaced by their associated string of characters.

Confusingly, the method used to define such a symbol is the same EQU statement most other assemblers use to initialise labels.

One other thing which worried me slightly was that some of the assembler directives were not totally compatible with those used in my copies of the Abacus books.

One unfortunate omission from the assembler was the ability to produce

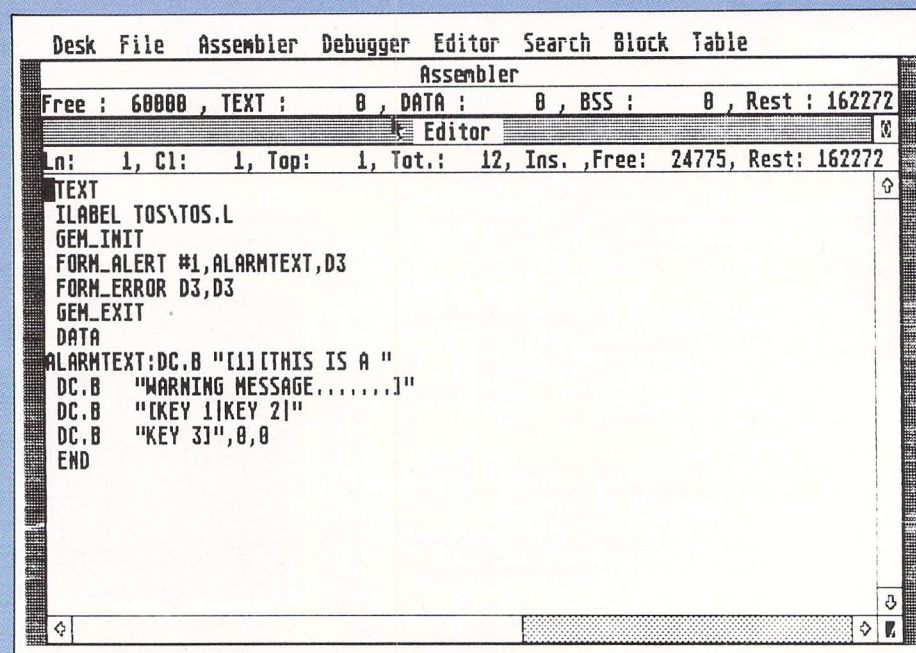


Figure 1 The Assembler

Product: Assempro

Price: £49.95

Supplier: Abacus, c/o Precision Software, 6 Park Terrace, Worcester Park, Surrey KT4 7JZ

Tel: 01-330 7166

object files in a format suitable for use by a linker. Although this probably precludes its use in conjunction with compiled languages such as C, in practice it would be very easy to use the package from within most versions of Basic.

To a large extent this is compensated for by the wide variety of effective facilities. These let you insert whole files of data at any point in your program during assembly.

You can for instance, incorporate entire screens produced by an art package such as Degas, or sprite information from an appropriate sprite generator directly into your assembled code.

It's also theoretically possible to merge separately compiled machine code routines into your programs and thus get around the linker problem altogether.

You can save all your labels and macros to a file which can be included into any program at assembly time. Assempro uses this technique to provide a library containing a useful set of standard Gem and Tos macros which simplifies access to the operating system.

Machine code monitors are notoriously difficult to use – especially for the beginner. In an attempt to get round this problem, Abacus has designed a system which is completely Gem based.

All the normal operations such as single stepping, breakpoints and search/replace can be performed with staggering ease directly from the screen.

Full symbolic disassembly is supported and you can page through the entire address space of the ST using a vertical scroll bar. You can also use the shift and cursor keys to list through a program in memory, one instruction at a time.

A slight problem I encountered was that sometimes when paging upwards, the disassembler got a bit confused. The standard solution to this situation – which is caused by the variable length of 68000 instructions – is to adjust the point at which disassembly occurs by one or two bytes.

Unfortunately, there didn't seem to be any easy way of doing this directly and you are therefore forced to load the memory pointer with the required value by hand.

At first glance it would appear to be very difficult to use this sort of system to debug programs which play around with the screen. That's why Abacus has included an option allowing you to use a separate screen for all the program's graphical output.

This function is slightly better than the equivalent in Devpac as it can be turned off and on as required, thus saving valuable storage space.

Another nice feature was the display of the condition code register. Individual bits could be set and unset by simply clicking on them with the mouse. In many debugging situations this can be extremely useful.

There's also a special facility to

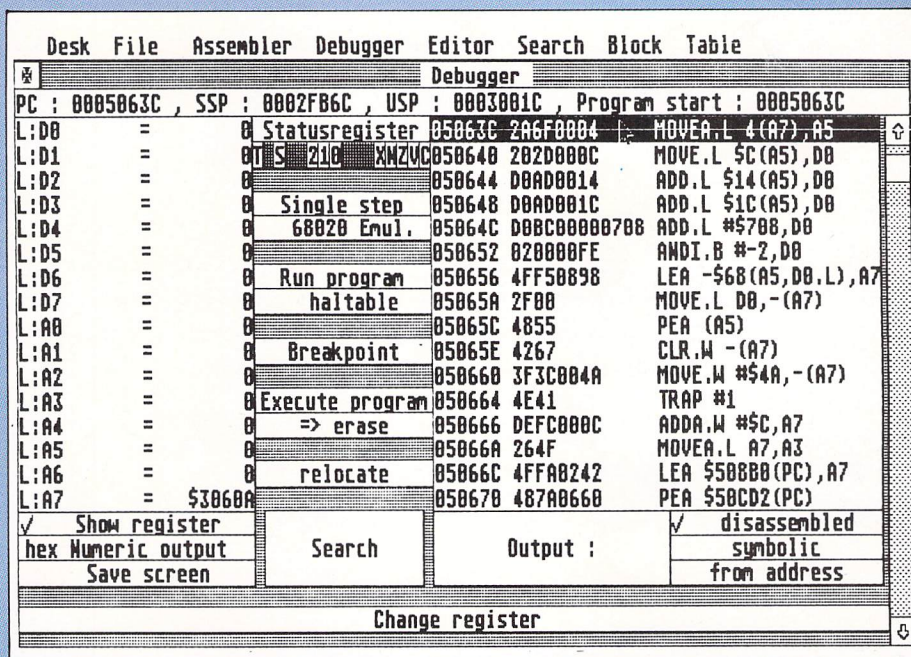


Figure II Assempro's debug screen

execute a program and then halt it at any point by pressing both shift keys simultaneously. This works fine, although it does tend to slow the program down considerably.

The really annoying thing is that it's only configured for use with one version of the operating system. The manual provides instructions to alter your copy of Assempro, but these are far too vague to be of real use to anyone but the most experienced assembly language programmer.

The only place where this monitor really fell down was in terms of reliability. Although most processor errors were intercepted and the monitor automatically invoked, in practice I found it fairly easy to crash the system.

Undoubtably some of these problems were due to the notable lack of robustness of the Gem environment itself. But others had to be due to insufficient error trapping on the part of the programmer.

Assempro will, for instance, let you run programs using the standard Tos relocation format without automatically relocating them for you first. It will also allow you to load and run Gem based programs before it initialises Gem.

To be fair, both these problems are documented and are quite easy to work around. There were, however, also a couple of bugs in the reassembler which sometimes crashed and returned you to the monitor for no apparent reason.

On the whole, despite the problems, I rather liked this debugging system. I found that, provided I kept backup copies of everything, the time saved by the user friendly interface more than made up for the few occasions when it let me down.

To anyone who has read Abacus' books, the documentation accompanying Assempro will seem familiar. The emphasis is on the features of the system, but there's not really enough about how they can be used in the development of actual programs.

This wouldn't be quite so important if the many example programs included on the disc were properly documented. Scanning through them the only information I could find was the occasional comment – sometimes in German.

There isn't even a description of what the routines are supposed to do. This is a pity as I think they provide an excellent demonstration of the power of the assembler and its associated library of macros.

Similarly the macro library isn't particularly well explained, but considering its size, this omission is understandable. Information on most of these functions can be found in one or more of the Abacus books – or indeed any other Tos and Gem reference work.

Assempro is a superb assembly language development system, let down slightly by vague documentation and reliability problems with the built in monitor.

It is full of clever, surprising and genuinely innovative features and in many respects, the sheer user friendliness of this system sets it apart from the competition.

The current inability of the monitor to debug programs running in low resolution will rule it out for some prospective buyers – which is a pity.

As it stands this package is extremely capable, but with fuller documentation and a bit more care it could have set a new standard for others to follow.

Optical extras

Kevin Bulmer reviews CAD-3D2, a three dimensional CAD package and tries out a pair of stereo glasses

IN the April 1987 issue of *Atari ST User*, I reviewed Cad-3D and said that I hoped Tom Hudson would return to the program as he did to Degas and produce CadElite. Well, he has.

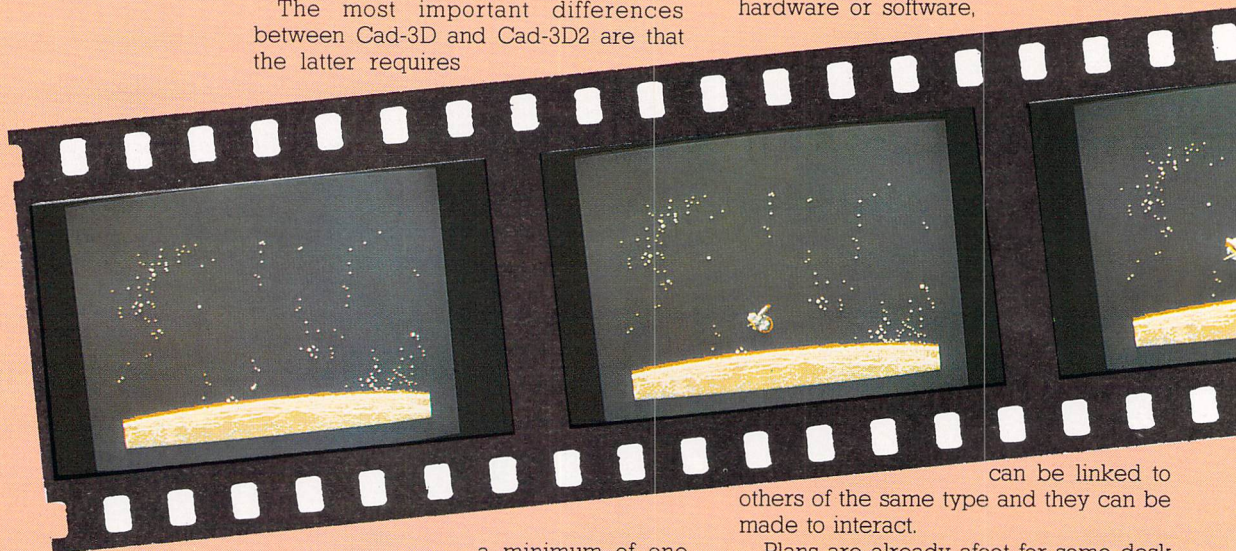
The package is called Cad-3D2 and is beautifully presented in a small, three ring, vinyl binder. Included is a well written manual and four discs which hold the main program, CyberMate, Space Probe which is a demo, and a public domain motion control language.

The most important differences between Cad-3D and Cad-3D2 are that the latter requires

becomes clear. Most icons replace drop down menus, and having them on screen speeds up development time.

Many functions can now be called from the keyboard. For example, Alt-L loads a file, Alt-S saves a file, S calls the spin tool and function keys select definable groups of objects.

A new feature of Cad-3D2 is its open architecture. Excited? No, neither was I until I found out what it means. Open architecture means that the unit, be it hardware or software,



can be linked to others of the same type and they can be made to interact.

Plans are already afoot for some desk top accessories to take advantage of this feature. These include an advanced rendering package with 512 colours, anti-aliasing, ray tracing and texture mapping. There's also a graftal/fractal builder which creates graphics fractals that can look like trees, lakes, mountains and so on.

Lighting is much more flexible than it used to be. There are still three light sources and one ambient source but the three light bulbs can now be dragged into place with the mouse. It is even possible to place a light source inside a group of objects.

Another nice change which relates to lighting is that the camera view now matches the light setting. In Cad-3D you had to rotate your viewpoint by 90 degrees to the left before the lighting controls made any sense.

Superview can now be in any mode, independent of the camera window. This means that you can manipulate an object in wireframe mode in the camera window for speed and then view it in solid mode and in full colour.

There are now two sorts of superview to choose from – draft and final, both

a minimum of one megabyte of ram in order to run and while Cad-3D files can be loaded into Cad-3D2, the process does not work in reverse.

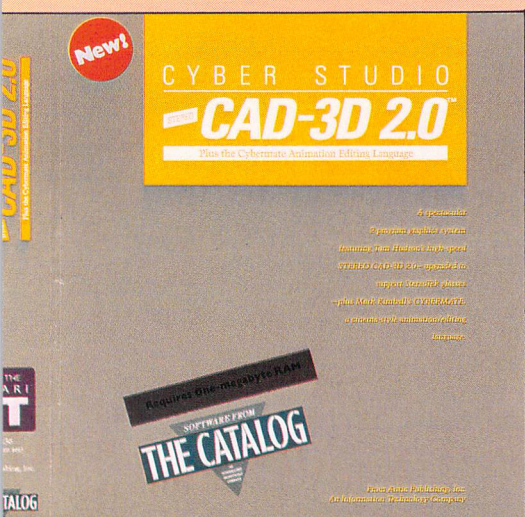
Several features of the original have been enhanced – lighting, superview, spin, and colour selection are some things to benefit from extra attention.

A new form of superview has been added and it is now possible to rotate a 3D object in wire frame mode in real time from the mouse. This routine uses the algorithms produced by Jez San, the author of Starglider.

The most exciting part of the package is the new stereo feature. This does not produce startling music to accompany your creations, but allows you to see objects as if they were sitting inside, or in front of, your monitor. More of this later.

On booting the program you are presented with a new screen layout. The four windows of Cad-3D (camera view, top, right and bottom) are slightly different because the unused margins have been removed, and they sit at the right of the screen.

On the left are a number of icons. While at first cryptic, their meaning soon



having a number of options.

Draft mode is the superview of original Cad-3D, but is much improved. However, it takes on average almost twice as long to draw the picture.

Z buffering, a more precise way of calculating hidden face removal, is used to draw the scene, and this eliminates the irritating glitches which sometimes appear in draft mode.



Degas pictures can now be loaded in as backgrounds to your objects and this opens up the possibility of making pictures of more than 20 objects (the maximum number of objects allowed by Cad-3D and Cad-3D2).

If the superview is set to wire frame, moving the mouse rotates the object being viewed in real time. Pressing Z allows you to zoom in and out. This addition is a real pleasure to use, and makes setting up a picture much swifter.

Also on the new superview menu is the ability to go into stereo mode. It is here that you decide whether your object is shown in front of, intersecting, or behind your television screen, also how exaggerated the perspective will be.

The most useful addition to the program is the scale feature, which allows you to specify sizes for objects in either metric or imperial units.

First generate a cube to use as a master object. Next click on the ruler icon and type in the dimensions of the cube.

This item is now used by the program for reference and all other objects are now scaled to this block. If you set up a one foot cube and then generate a second cube, you can type in its dimensions as three inches by 50 centimetres by six feet one inch and the program will change the object to match its size.

This allows for much more accurate

object creation. Spin has been enhanced to allow objects to be spun through a number of degrees instead of always a full circle.

The above additions to Cad-3D certainly make it a much more useful piece of software – until now its use has been limited to helping artists.

Now it can be used to show fitted kitchens or bathrooms for interior designers or architects and with the planned expansions it will become a professional quality development tool. However, I would still like to see some modifications.

It would be very nice to be able to mirror an object; when you have spent five hours joining objects together the prospect of repeating the task for another shape is rather daunting.

The join routine has not been improved. In the manual Tom Hudson says that it is the most complex piece of code he has ever written, and anyone who has tried any 3D programming will sympathise with him.

There are steps to take which make living with it much easier. These are clearly explained in a hints section of the manual.

An optional fonts and primitives disc includes a utility, called Super Extruder which allows you to extrude multi-colour objects with holes in, so bypassing most uses of the join facility.

It would have been nice to have this disc included with Cad-3D2 as standard,

but unfortunately it isn't.

Positioning objects in relation to each other still relies on the screen resolution. This is not too much of a problem if you are using a monochrome monitor and you make the window you are working in into a full screen, but it can be infuriating on a colour system.

Cybermate

Cybermate is an exceptional piece of software which really deserves a review of its own. In essence it is a video recording studio for Cad-3D written by Mark Kimball.

Using some awesome compression and real time decompression routines, it converts your one meg ST into a 10 meg frame buffer.

You can store up to 1000 frames of animation in memory and play them back at variable speeds up to 60 frames a second.

You can play music created with the G.I.S.T. sound editor with the movie, change the palette at any time, change the frame rate, set up loops and do all sorts of other things.

The manual for this complex piece of kit is all on disc and you are advised to print it out. This is a shame since not everyone has a printer and working through the manual from a disc file is almost impossible.

Cybermate produces standalone pro-

grams which can be distributed, and this is where the package may appeal to a larger audience than Cad-3D2 would on its own. Shop window displays or presentations for companies can be created relatively easily.

The program is not easy to use at first, but this is because it is so flexible. It is even possible to produce stereo demonstrations.

Included in the package are a number of animation sequences, the most impressive of which fills the third disc. It's called Space Probe and is an excellent advertisement for Cad-3D2 and Cybermate.

A gold and silver satellite hovers into view, rotates in front of a planet and then plummets to the surface. It can be slowed down or speeded up using the cursor keys. It has to be seen to be believed.

The stereo option in Cad-3D2 and Cybermate requires a pair of Stereo Tek glasses. Unlike the colour filter type of glasses, these plug into the cartridge port of your ST.

They work by alternately switching lenses to opaque and transparent in time with the computer's frame update, and at the same time the computer alternates between two pictures. The slight vari-

ations between the two images create the 3D effect.

The advantage of not using filters is that you can create full colour images and the effect is startling.

The glasses come with a desk top accessory which allows you to draw in 3D using Degaselite. Screens one and two are used to create the effect. There is a stereo slide show and source code and documentation so that you can easily write your own 3D programs.

The glasses work on a colour or monochrome system but before using them with colour, push the frame rate up to sixty Hertz otherwise you will see the screens flicker. To do this clear bit one of location \$FF820A. I have a small program which does this in an AUTO folder on my Degaselite and Cad-3D2 discs.

Several programs are available in America which have Stereo Tek options. A new version of Wanderer, and Maps and Legends are just two.

A demonstration included depicts a number of shiny, steel balls bouncing around a room which appears to be inside the case of your television set. Sit down in front of your ST wearing the space age specs and load this – you won't want to take them off for hours!

Unfortunately, the optical techniques employed in this hardware and the relatively small numbers likely to be sold, mean that these glasses are going to be expensive.

If you cannot afford a pair, find the Electric Software stand at the next exhibition and try the glasses out there.

Stereo Tek glasses are only available for the Atari ST and every ST owner should see them in action. Once you've seen them, you'll want them.

Product: CAD 3D II
Price: Provisionally £49.95
Requirements: 1040 ST

Product: Cybermate
Price: Provisionally £39.95

Product: Stereotactic Glasses
Price: Provisionally £150.00

Supplier: Electric Distribution, 8 The Green Street, Willingham, Cambridgeshire CB4 5JA
Tel: 0954 61258

Note: Cybermate and CAD 3D II may be only available in one package.

The truth about TELEX

How much does it cost to go on Telex?

You could go the conventional way and buy a dedicated Telex machine. The cheapest will cost you £1,604 (the Whisper), the dearest £2,892 (the Cheetah). You will also need a separate telephone line, costing £101 to install, plus £404 a year rental. That's a total outlay over the first year of a minimum of £2,109. (All prices include VAT.)

Or you could do what more and more Atari ST users are doing – use your computer to double as a Telex machine. And just use your ordinary telephone!

How do I turn my Atari ST into a Telex machine?

All you need is a modem and appropriate communications software (see the advertisements in this issue), a telephone, and a subscription to MicroLink. Telex is just one of a growing number of services available to Atari ST users on MicroLink. With MicroLink you can also read the news as it happens, go teleshopping, create your own closed user group, send telemessages and electronic mail right round the world, download free programs directly into your micro... and much more.

But why use Telex?

Because it's a standard means of instant communication between businesses. Today there are 150,000 Telex machines in use in Britain – and more than 2 million worldwide. Telex dramatically speeds up business communications – it's just as quick as using the phone but far more efficient, because you have a hard copy of every "conversation" for your records.

But there's a big bonus you get when you use MicroLink for Telex that the conventional way doesn't offer.

With MicroLink you don't HAVE to be in your office to send or receive Telex messages. You can just as easily use your computer at home (or even a portable). So now you can check whether there are any Telex messages waiting for you – anywhere, anytime. How's that for your business efficiency?

How to join
See Page 49

Fly round your house with the ST

WE have seen how rotating three dimensional images could easily be achieved in Fast Basic. This month we will continue by looking at some more advanced techniques. These will let you view a wireframe image from any point in space, instead of merely rotating the image round its own coordinates.

This means that if you have a three dimensional model of say, a building in the computer's memory, it is possible to view the model from any position. The ability to walk or fly round a model is very useful in CAD systems as well as having applications in games and flight simulators.

This month's program, written in Fast Basic, displays a model of a small house. Not very imaginative perhaps, but it serves to illustrate the program's power. Because the image is stored in the same format as those featured last month, it would be simple to paste images from one program to the other or to define your own.

On running the program, the opening display is a frontal view of the house. You can move your viewpoint around, using the cursor keys and the display is updated to show the new view.

The speed of the ST running Fast Basic means the screen display is updated fairly rapidly, allowing you to fly round like a helicopter and view the house from all angles.

The redrawing of the screen is hidden using the same screen swapping technique as last month, though I have tidied up the code a little in the interests of

In part 2 of his series Charlie Dancey shows how to use matrices in 3D programming

readability and elegance.

The position of the viewer is held as a set of X,Y and Z coordinates in the three variables *x%*, *y%* and *z%*. When one of the cursor keys is pressed the appropriate value is modified by adding or subtracting the variable *inc%* from it.

The increment value can be modified in the listing to speed up or slow down the motion of the viewpoint.

Type in the program and run it. You will notice that the display always shows the house in such a way that it seems to be upright. In other words, the view always corresponds to a real-life view. This is one of the remarkable features of the algorithm used.

The coordinates of the points in the image are stored in the array *true%()*. These are the true coordinates of each point with respect to a normal three-dimensional set of X, Y and Z axes.

The final set of two dimensional coordinates used to draw the image are stored in the arrays *a%()* and *b%()*. There is also an intermediate set of three dimensional coordinates stored in the array *our%()*, (our coordinates).

When the program is run, the first view

shown is from a position on the Z axis, directly in front of the house.

From this position it is simple to convert the true coordinates of the house into screen coordinates by merely running them through PROCperspective. This is because PROCperspective expects the viewer to be located on the Z axis.

As the program has to be able to view the image from any position, it must be able to cope with the viewer being located in positions other than on the Z axis.

This is achieved by first creating a new set of axes such that the new Z axis passes through the viewer and expressing the true coordinates in terms of these.

The coordinates of any point in the new system will be different to the true coordinates, so they are referred to as our coordinates, hence the array *our%()*.

Every time the viewpoint is changed a new set of axes is calculated. All the true coordinates are converted into our coordinates. The results are passed to PROCperspective which in turn feeds a set of screen coordinates to PROCdrawpic.

In order to do this the program uses a mathematical object called a matrix. This is an array of values, rather like a spreadsheet, which can have any number of rows and columns.

Matrices can be combined in a variety of useful ways according to certain rules. A 3 by 3 matrix looks like this:

```
A B C
D E F
G H I
```

where the letters A to I represent numerical values. A set of XYZ coordinates can be stored in a 1 by 3 matrix like this:

```
X
Y
Z
```

and it is possible to multiply the 1 by 3 matrix by the 3 by 3 matrix as follows:

```
A B C   X = AX+BY+CZ
D E F   x Y = DX+EY+FZ
G H I   Z = GX+HY+IZ
```

The result is a new 1 by 3 matrix – in fact a new set of coordinates. This process is called a transformation of coordinates.

Now suppose you are looking at the image of the house from a position on the Z axis and you rotate it and its coordinate system by a small amount. The axes of the

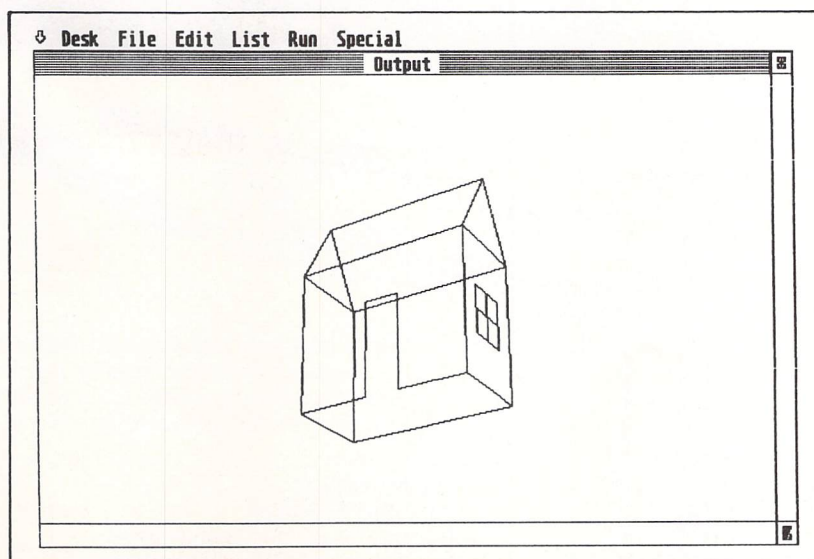


Figure 1: Wire frame house being rotated

system will now be pointing in new directions.

It is possible to define the direction of axes (in terms of the original axes) in the form of a 3 by 3 matrix. Each column will hold a unit vector representing one of the axes. The first will represent the X axis, the second the Y axis and the third the Z axis.

What is a unit vector? For the X axis this is the coordinate position of the point one unit along expressed in terms of the old set of axes.

It is called a vector because the three coordinate values represent a line that has magnitude and direction, while the length is one unit, hence a unit vector.

Let's imagine again that we are looking at the house. We rotate the entire image and calculate the unit vectors for the new axes. The next step is to store these in a 3 by 3 matrix.

If we now multiply all the true coordinates by our matrix, a set of coordinates result which show the position of the rotated image with respect to the old axes. This process performs a similar function to that of last month's program, that is to say it rotates an image around its axes.

It's not too difficult to see why this works. Take the unit vector for the X axis

— this set of three numbers shows what happens to an X coordinate during the rotation, just as the other vectors show what happens to the other coordinates.

The transformation merely applies this information to a coordinate set in a clearly logical way.

Of course, this type of rotation is not quite what we want the program to do. The effect we are trying to achieve is that of rotating the coordinate system so it points its Z axis towards us, leaving the model exactly where it was.

There is a significant difference here. What actually happens in the program is that a set of axes is calculated for each new viewpoint and stored in the array *m()* as a 3 by 3 matrix.

The true coordinates are then inverse-transformed by this matrix to produce our coordinates. Inverse transformation has the effect of expressing all of the true coordinates in terms of the new axes. An inverse transformation is very similar to the normal transformation, it goes like this:

$$\begin{array}{lll} A & B & C \\ D & E & F \\ G & H & I \end{array} \quad \begin{array}{l} X = AX + DY + GZ \\ Y = BX + EY + HZ \\ Z = CX + FY + IZ \end{array}$$

Both transformations and inverse trans-

formations are easily programmed. The tricky bit is working out the unit vectors making up the 3 by 3 matrix in the first place.

The process is clearly set out in PROC-findmatrix. First this procedure checks to see if the viewer is on the Y axis. (This is a special case and is dealt with as such).

Assuming we are looking from somewhere else, the program works out the unit vectors for each axis, starting with Z, which is relatively easy.

Next the X vector is calculated. One of the requirements of the program is that the X axis always lies in the horizontal plane. This means the image will always appear upright.

Working out the Y axis vector is not so simple and it is done on the basis that the Y axis is always at right angles to both the X and Z axes. Here another matrix technique is used:

$$\begin{array}{ll} A & D = B^*F - C^*E \\ B & x \quad E = A^*F - C^*D \\ C & F = A^*E - B^*D \end{array}$$

This has the effect of combining two vectors and producing a third at right angles to both of them. This is a very powerful function which illustrates the techniques using matrix arithmetic.

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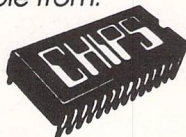
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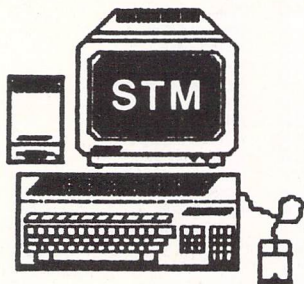
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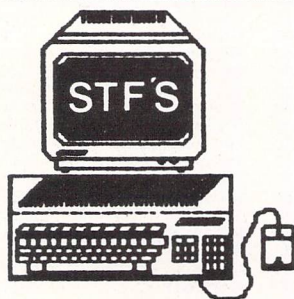


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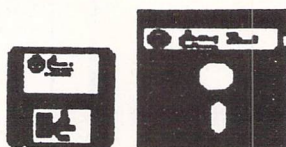
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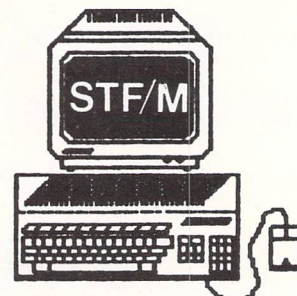
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The rest of the program is broadly similar to last month's listing. The array of our coordinates are passed to PROCperspective along with the value *viewdist%*, which is dependent on the viewers distance from the origin.

This is sufficient data to produce the screen coordinates of the image. The program draws the image using the set of screen coordinates and the line drawing sequence that is stored in the arrays *start%()* and *end%()*.

Three dimensional graphics programming can be difficult because it is not easy to visualise the system. The best approach, as with any programming, is to break the problem down into small chunks.

The uses of matrices in programming extend far beyond graphics. They are very powerful tools with applications in such diverse areas as accounting and topology.

They are well worth study by serious

programmers and are often the key to elegant solutions to complex problems.

I have not attempted to do more than explain the specific operations of this program in this article. If your interest extends beyond this then you would do well to check out some books on the subject.

● Next month I will combine the techniques developed so far to produce a working flight simulator shell in Fast Basic.

```

10 REM 3D Rotation Using Matrix.
20 REM By Charlie Dancey
30 REM (c) Atari ST User.
40 REM
50 REM Written in Fast Basic
60 REM Do NOT enter line numbers
70
80 PROCsetscreens
90 PROCcreatevars
100 PROCsetpoints
110 REPEAT
120 PROCcalc
130 PROCdrawpic
140 PROCswapscreens
150 PROCmove
160 UNTIL FALSE
170 END
180
190 DEF PROCsetscreens
200 HIDE MOUSE
210 screenone%=PHYSBASE
220 RESERVE screentwo%,33000
230 screentwo%=(screentwo%+256) AND
$FFFF00
240 gxb=GRAFXBASE
250 gyb=GRAFYBASE
260 gw=GRAFWIDTH
270 gh=GRAFHEIGHT
280 GRAFRECT 0,0,SCREENWIDTH,SCREENH
EIGHT
290 GRAB 0,0,SCREENWIDTH,SCREENHEIGH
T
300 LOGBASE=screentwo%
310 PUT 0,0,3
320 GRAFRECT gxb,gyb,gw,gh
330 showscreen%=PHYSBASE
340 writescreen%=LOGBASE
350 ENDPROC
360
370 DEF PROCcalc
380 PROCfindm(x%,y%,z%)
390 FOR i%=1 TO nopoints%
400 PROCinversetransform(i%)
410 PROCperspective(i%)
420 NEXT i%
430 ENDPROC
440
450 DEF PROCswapscreens
460 SWAP showscreen%,writescreen%
470 PHYSBASE=showscreen%
480 LOGBASE=writescreen%
490 ENDPROC
500
510 DEF PROCmove
520 REPEAT
530 flag%=TRUE
540 key%=INP(2)>>8
550 SWITCH key%
560 CASE 72:y%=y%+inc%
570 CASE 80:y%=y%-inc%
580 CASE 77:x%=x%+inc%
590 CASE 75:x%=x%-inc%
600 CASE 71:z%=z%-inc%
610 CASE 82:z%=z%+inc%
620 DEFAULT:flag%=FALSE
630 END SWITCH
640 UNTIL flag%
650 IF INPSTAT(2) THEN
660 REPEAT
670 key%=INP(2)
680 UNTIL key%=0 OR INPSTAT(2)=FALSE
690 ENDIF
700 ENDPROC
710
720 DEF PROCdrawpic
730 CLG 0
740 FOR i%= 1 TO nlines%
750 LINE a%(start%(i%)),b%(start%(i%
)) TO a%(end%(i%)),b%(end%(i%))
760 NEXT i%
770 ENDPROC
780
790 DEF PROCperspective(point%)
800 a%(point%)=oa%+(viewdepth%*our%(
point%,0))/(viewdist-our%(point%,2))
810 b%(point%)=ob%-(viewdepth%*our%(
point%,1))/(viewdist-our%(point%,2))
820 ENDPROC
830
840 DEF PROCfindm(x%,y%,z%)
850 viewdist=SQR(x%*x%+y%*y%+z%*z%)
860 IF (x%=0) AND (z%=0) THEN
870 FOR m%=0 TO 2
880 FOR n%=0 TO 2
890 m(m%,n%)=0
900 NEXT n%
910 NEXT m%
920 m(0,0)=1
930 m(1,2)=-1
940 m(2,1)=1
950 ELSE
960 m(2,0)=x%/viewdist
970 m(2,1)=y%/viewdist
980 m(2,2)=z%/viewdist
990 distxz=SQR(x%*x%+z%*z%)
1000 m(0,0)=z%/distxz
1010 m(0,1)=0
1020 m(0,2)=-x%/distxz
1030 m(1,0)=m(0,2)*m(2,1)
1040 m(1,1)=-m(0,2)*m(2,0)+m(0,0)*m(2
,2)
1050 m(1,2)=-m(0,0)*m(2,1)
1060 ENDIF
1070 ENDPROC
1080
1090 DEF PROCinversetransform(p%)
1100 FOR m%=0 TO 2
1110 our%(p%,m%)=m(m%,0)*true%(p%,0)+
m(m%,1)*true%(p%,1)+m(m%,2)*true%(p%,2
)
1120 NEXT m%
1130 ENDPROC
1140
1150 DEF PROCsetpoints
1160 RESTORE points
1170 READ nopoints%
1180 FOR i%=1 TO nopoints%
1190 FOR j%=0 TO 2
1200 READ true%(i%,j%)
1210 NEXT j%
1220 NEXT i%
1230
1240 points:
1250 DATA 22
1260 DATA 20,0,50
1270 DATA 100,0,50
1280 DATA 100,0,-50
1290 DATA -100,0,-50
1300 DATA -100,0,50
1310 DATA -20,0,50
1320 DATA -20,100,50
1330 DATA 20,100,50
1340 DATA -100,150,50
1350 DATA 100,150,50
1360 DATA 100,150,-50
1370 DATA -100,150,-50
1380 DATA -100,225,0
1390 DATA 100,225,0
1400 DATA 100,50,25
1410 DATA 100,100,25
1420 DATA 100,100,-25
1430 DATA 100,50,-25
1440 DATA 100,50,0
1450 DATA 100,100,0
1460 DATA 100,75,25
1470 DATA 100,75,-25
1480 RESTORE lines
1490 READ nlines%
1500 FOR i%= 1 TO nlines%
1510 READ start%(i%)
1520 READ end%(i%)
1530 NEXT i%
1540
1550 lines:
1560 DATA 27
1570 DATA 1,2,2,3,3,4,4,5,5,6,6,7,7,8
,8,1
1580 DATA 2,10,3,11,4,12,5,9,9,10,10,
11,11,12,12,9
1590 DATA 9,13,13,12,13,14,14,10,14,1
1,15,16
1600 DATA 16,17,17,18,18,15,19,20,21,
22
1610 ENDPROC
1620
1630 DEF PROCcreatevars
1640 DIM true%(100,2),our%(100,2),a%(
100),b%(100)
1650 DIM start%(200),end%(200)
1660 DIM m(2,2)
1670 oa%=GRAFWIDTH/2
1680 ob%=GRAFHEIGHT*0.75
1690 viewdepth%=1000
1700 x%=0:y%=0:z%=1000
1710 inc%=150
1720 ENDPROC

```

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The new 520 STFM from ATARI has been an instant hit since its announcement. The design has gained from experience with earlier ST and STM machines and the result is a practical and superbly engineered computer that will easily find its place in your home as well as in your business.

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The basic 520 STFM has a built-in single-sided disc drive. The MEGAPAC 520-STFM comes with two drives, one internal and one external. The latter is double-sided, offering twice the capacity (720K) of the built-in drive (360K). Your disc bill can be cut by almost half when compared with that of basic 520 STFM users.

PROCESSOR:

The Central Processor unit (CPU) is a Motorola 16/32 bit 68000 chip, running at a clock speed of 8 MHz. It is further enhanced by Atari's own custom ICs providing a Direct Memory Access (DMA) channel for fast data transfer with other peripherals such as the ATARI SH204 Winchester drive or the Atari Laser printer (available soon) and a real time clock.

DISPLAY:

The 520 STFM can display 40 or 80 column text on any domestic TV or colour monitor such as the Philips CM8533 or the dedicated ATARI SM125 high resolution monochrome monitor. Graphic is 600 x 400 pixels on the SM125, 600 x 200 pixels in 4 colours or 320 x 200 pixels in 16 colours on a colour monitor or TV. The colour palette contains 512 possible colours. Some ATARI software indeed uses the exceptional display hardware to produce stunning graphics with up to 256 colours at once.

MIDI INTERFACE:

The 520 STFM has 3 programmable sound voices and a Musical Instrument Digital Interface (MIDI) to allow direct connection to a wide range of musical organs and synthesizers such as the Casio CZ230S.

MOUSE:

The 520 STFM has its own dedicated mouse as part of its standard hardware.

PERIPHERAL CONNECTORS:

The 520 STFM can be easily expanded by plugging in 'add-ons' through its ports. They will accept printer (Centronics port), Modem (RS232 port), musical instruments (Midi port), sensors (joystick port) and fast intelligent devices such as network, Winchester, laser printer etc (SCSI port).

BUILT-IN SOFTWARE IN ROM:

The 520 STFM has 192K bytes of permanent software in ROM. This comprises GEMDOS, the disc operating software which is now becoming the dominating standard for 16 bit computers, and GEM, the Graphic Environment which uses pictures and drawing instead of cryptic messages to communicate with the user and the electronic Mouse in place of the keyboard to enter the user's commands.

SOFTWARE ON 5 DISCS:

The MEGAPAC 520 STFM comes with 5 discs, containing an impressive collection of software by any standard:
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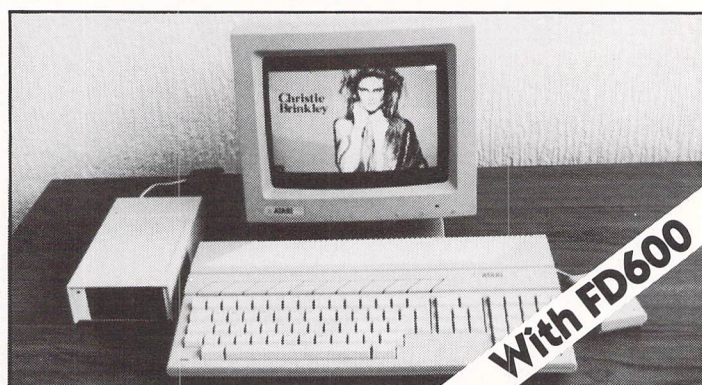
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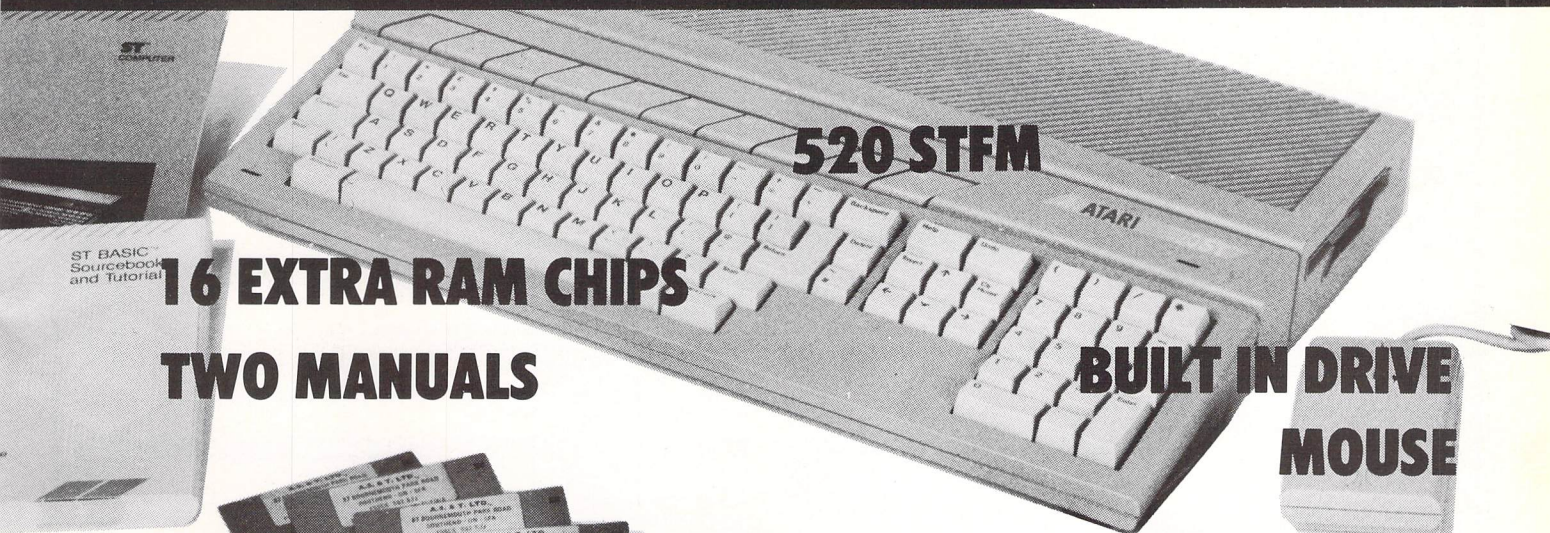
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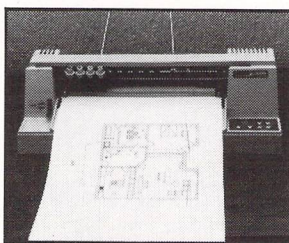
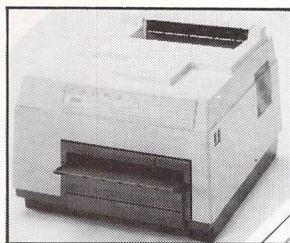


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SCRAP BOOK

OUR first program this month, from Peter Medrow of Storrington, West Sussex, makes line drawing as easy as one, two, three.

One: Enter in Program I.

Two: Press the right hand mouse button to set the starting point of the line.

Three: Press the left hand mouse button to mark the end of the line and draw it.

```
10 REM Line Draw
20 REM by Peter Medrow
30 REM (c) Atari ST User
40 REM Written in Fast Basic
50 X2%=0:Y2%=0
60 GRAFRECT 0,0,640,400:CLG 0
70 esc=0
80 WHILE esc<>1
90 REPEAT
100 MOUSE x%,y%,b%,k%
110 UNTIL b%=1 OR b%=2 OR k%=1 OR k%=2
120 IF b%=2 THEN PROCcentre
130 IF k%=1 OR k%=2 THEN CLG 0:GOTO by
pass
140 LINE x2%,y2% TO x%,y%
150 bypass:
160 WEND
170 DEF PROCcentre
180 REPEAT
190 MOUSE x2%,y2%,b%,k%
200 UNTIL b%=0
210 VDU7
220 ENDPROC
```

Program I

This isn't merely a simple line drawing routine, it actually draws sunburst patterns with rays streaming from a centre point.

When the program is run you will be presented with a blank screen except for the mouse cursor. Position the cursor where you want the centre of the sunburst to be and press the right hand mouse button.

When you hear the bell, release the button and move the mouse to the position where you want the first line to end. Press the left hand mouse button and a line will be drawn to this point.

You may now move the mouse with the button held down or released. Different effects will result depending on which method you choose.

The centre point can be changed at any time by relicking the right hand button. Pressing either of the Shift keys will clear the screen. Figure I shows an example of the sort of graphics that can be achieved.

The program, which works best in high resolution, is written in Fast Basic so the line numbers should not be entered when you type in the program. If you want to use it in medium resolution change line 60 to read:

```
GRAFRECT 0,0,320,200:CLG 0
```

SCRAPBOOK is a regular feature consisting of short, simple programs sent in by our readers. It's a place where we can publish all of the interesting little routines that don't end up in our regular features but are too good for us not to share with other readers.

If you have a short program which you think other readers would find useful, send it to:

*Scrapbook, Atari ST User,
Europa House, 68 Chester Road,
Hazel Grove, Stockport SK7 5NY.*

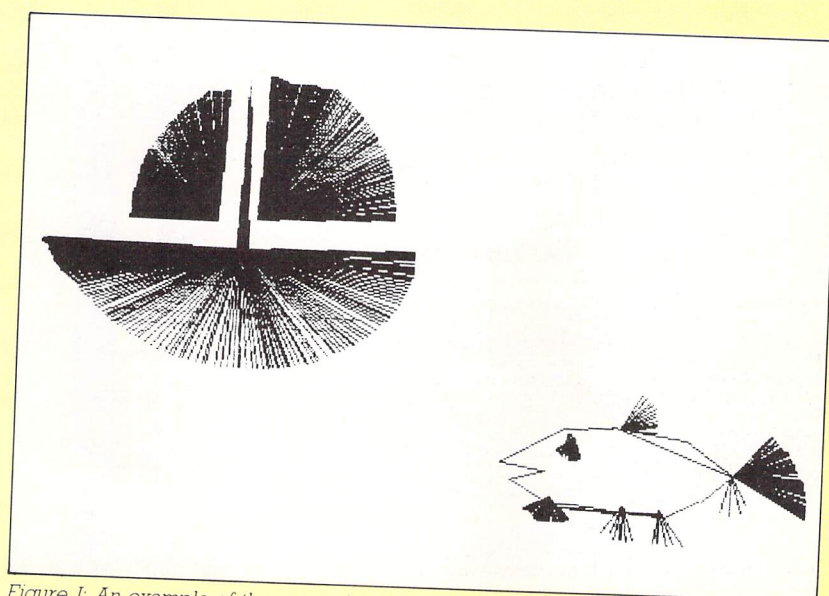


Figure I: An example of the output from Program I

C PROGRAMMER Peter Hartley of Haslingden, Lancs, has sent us a short Fast Basic routine to remove REM statements from within C source code listings.

It works by reading in the original file from disc and writing it straight back to disc (under another name of course) unless the combination "/" is found.

Once this pair of characters has been spotted, they, and the following characters, are not written to the new file until after the end of REM marker, "*/" has been read in.

Once again, the line numbers should not be entered.

```
10 REM C Rem Stripper
20 REM by Peter Hartley
30 REM (c) Atari ST User
40 REM Written in Fast Basic
50 TXRECT 0,0,320,200
60 f%=1:r%=2:flag=0
70 INPUT "Enter old filename",oldname$
80 INPUT "Enter new filename",newname$
90 f%=OPENIN oldname$
100 r%=OPENOUT newname$
110 WHILE NOT EOF#f%
120 byte=BGET#f%
130 IF byte=ASC("/") AND flag=0 THEN P
ROCcheck_next1
140 IF flag<>1 THEN BPUT#r%,byte ELSE
PROCno_write
```

```
150 WEND
160 CLOSE#f%
170 CLOSE#r%
180 END
190 DEFPROCcheck_next1
200 byte=BGET#f%
210 IF byte=ASC("*") THEN flag=1 ELSE
flag=0
220 IF flag=0 THEN BPUT#r%,ASC("/")
230 ENDPROC
240 DEFPROCno_write
250 REPEAT
260 byte=BGET#f%
270 UNTIL byte=ASC("/")
280 bye=BT#f%
```

OUR third useful little routine from Steve Cholerton of Ironville, Notts, was prompted by our article on Alert Boxes in the April 1986 issue of *Atari ST User*.

Steve noticed that there was no mention of accessing these boxes from within ST Basic so he sat down and wrote this short piece of code.

Before you use the alert box routine you have to set up a few parameters in the following format:

```
10 b$="Hello there I Nice to see you"
20 bu$="Go away I hello"
30 icon=1:l=2:gosub alertbox
40 on key goto .....
50 .....
```

The text to appear in the alert box should be contained in the variable *b\$* and should be no longer than 20 characters. Text to be split over two lines should be separated by the bar character.

The text to appear in the buttons should be put into the variable *bu\$*. Each button's text should be separated by the same character as above.

The variable *icon* should contain a value from 0-3 as follows:

- 0 - no icon
- 1 - exclamation mark
- 2 - question mark
- 3 - stop sign

The variable *l* is optional, but if used must contain a value of between 0 and 3. This sets which button has an enlarged border.

```
63000 REM Alert box Sub-routine
63010 REM by Steve Cholerton
63020 REM (c) Atari ST User
63030 REM Written in ST Basic
63040 alertbox:
63050 b2$=STR$(icon)+"["+"b$+"I"]+"bu
$+"I":b$b2$
63060 a#=gb:gintin=PEEK(a#+8):gintout=
PEEK(a#+12)
63070 n#=PEEK(a#+16):POKE gintin,l
63080 poke n#,varptr(box2$)
63090 gemsys 52:key=peek(gintout)
63100 RETURN
```

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STuff

By Timothy Purves & J. Weaver Jr.

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HEX - displays binary data and program files in hexadecimal

HIGH - allows other AUTO folder programs to run in medium rez mode

KEYCODE - displays keyboard scan and ASCII codes for selected keys

KEYCOMBO - sets up 4 "hot keys" for screen, printer and reset functions

ONEHAND - allows one-handed use of Alternate, Control and Shift keys

RESET - flushes memory completely whenever the system is rebooted

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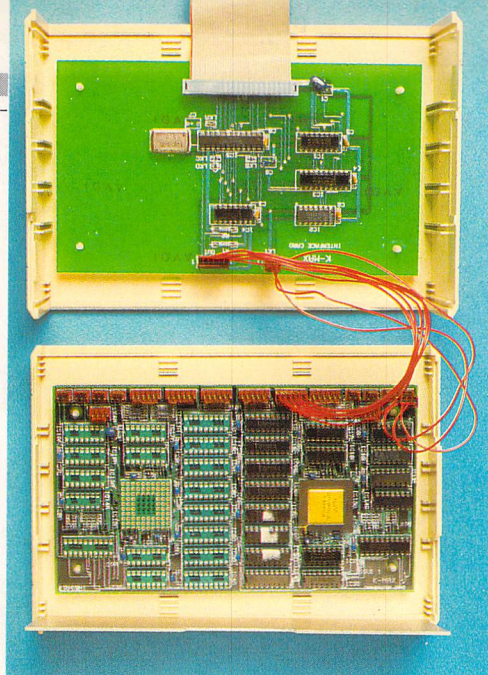
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THE Motorola MC68000 micro-processor at the heart of the ST is a very powerful chip. Its external 16/32 bit internal architecture, fast 8MHz clock speed and vast instruction set make it one of the most advanced to date.

So what can we expect from the next generation of processors? The trend has always been toward bigger, more complex chips with increasingly powerful instruction sets, and you may be forgiven for thinking that this will continue.

There has however, been a complete change of direction over the past year or so. As processors become more powerful they become physically larger and more complex. Production costs rise and the percentage yield falls.

From the programmer's point of view, a chip with a huge instruction set packed with every addressing mode and operation possible may be desirable. But the speed at which these can be decoded and executed is relatively slow compared to a simple chip with fewer instructions.

This was realised some time ago, so in a complete reversal of trend, some manufacturers abandoned these increasingly complex chips in favour of simpler designs.

Their objective is to produce a very simple chip with an extremely limited instruction set. The small number of instructions can be made extremely fast, in fact, the whole chip is tuned for performance and runs at incredible speed.

These super fast, simple chips are called Risc chips – Reduced Instruction Set Computer. In addition to their speed, their simplicity means that they are very cheap to manufacture and have a high yield.

For instance, a Motorola 68020 (the more powerful big brother of the 68000) costs around £3, yet the Acorn Risc chip, which outperforms the 68020 – costs as little as 44p. Clearly, this is the way ahead.

Inmos, Kuma and Andelos have put their heads together and produced a parallel 32-bit Risc processor development package for the Atari ST. While I wouldn't

Andrew Richards evaluates a plug-in- and-go transputer for your Atari ST

claim it to be an absolutely essential add-on (in fact, in its present form it isn't really that useful), you can be at the forefront of computer development and see the shape of things to come.

As the K-Max manual points out, these are early days and major advances in this area will occur over the next couple of years – both in hardware and software.

At present all that you receive with K-Max is a cross assembler and you must program in assembly language (Inmos T414 transputer mnemonics, not 68000). Occam, a language designed for transputers, should be available later in the year from MetaComco.

The old saying "Two heads are better than one" when it comes to solving a difficult problem is quite true of computers, and this is the theory behind the transputer.

They can easily be linked and the result is parallel processing. The K-Max system consists of just one transputer – an Inmos IMS T414 32-bit chip running at 15MHz with 256k of ram, but it is possible to add more.

The hardware is stored in a cream coloured box around 20cm long, 14cm deep and 8cm high. Protuding from the back is a short ribbon cable which plugs into the rom cartridge port (preventing you from using it for anything else).

Hardware experts will immediately realise that you can't write to the rom port (there isn't any point in writing to a rom). So, a clever technique has been employed to enable you to write to K-Max – the data is put on the address bus and occupies the lower 8 bits which are unused on read cycles.

The transputer combines a high speed processor with Risc like instruction set,

local memory and communications channels. Arrays of transputers can be built up to form the parallel architecture of a fifth generation computer system.

The assembler/disassembler isn't the best I've seen and closely resembles their K-Seka 68000 assembler, so K-Seka users will be quite at home with it. It doesn't use Gem or the mouse, but is fairly straightforward in operation.

The transputer has just 16 instructions, though there are various extensions, and three registers. I should imagine that many 68000 programmers' jaws will have hit the floor after reading that. Yet, the strength of the chip lies in its simplicity and speed (7.5Mips).

Many complex instructions can be emulated by combining many simple ones. For instance, the 68000 in the ST has the multiply instruction MULU, remember multiplying the hard way using shifts, adds and rotates on the simpler 6502 based 8-bit Ataris?

Although the code isn't difficult to get into, the manual is rather poor and lacks a proper explanation of the transputer instruction set. It's certainly not recommended for beginners.

To sum up: At the moment there isn't a great deal you can do with K-Max and it certainly won't improve your ST dramatically. In fact the only way of using it is with the assembler/disassembler/monitor supplied.

Transputers aren't a mere passing fad. They are here to stay. Who knows, the next micro from Atari could well be transputer-based.

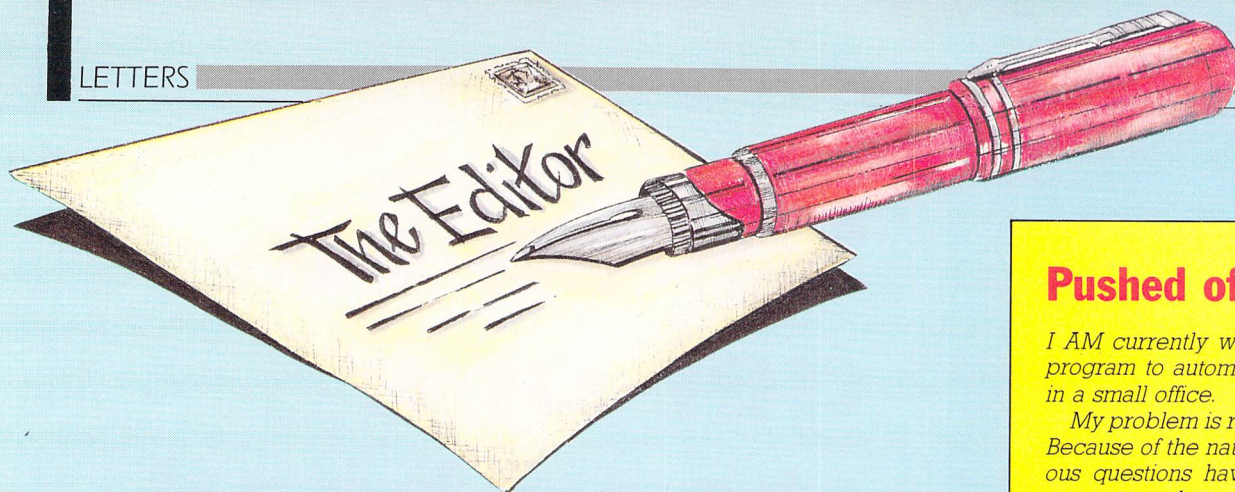
With the experience gained from experimenting with K-Max you could be one step ahead of the crowd when it comes to developing hardware/software for the next generation of computers.

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Basic queries

AT the moment I own an Amstrad CPC664 but am considering buying an Atari 520STFM. Does the disc drive accept double sided discs?

I've seen on your subscription offer that *Mercenary* and *Starglider* need Tos on rom. What is Tos, does it come with the 520STFM and why does it need to be on rom?

Could you also tell me what a blitter is? Does sound come through the UHF modulator or do I need an amplifier? And finally what type of printer connections does it have? – **Trevor Ship, Tullibody, Clackmannonshire.**

● The 520STFM, as supplied has a single sided, half Megabyte drive. It will accept double sided discs, but will only use one side. Unlike the Amstrad you can't flip them over and use the other side.

For around £60 extra, some dealers will supply you a 520ST fitted with a double sided, one Megabyte drive.

Tos stands for The Operating System and in the early models it was supplied on disc. All new machines have Tos in rom and the reason it's necessary is because the games you mention are so big that they need the full 512k of ram to run.

A blitter is a chip that "blits" and the name is derived from Block Image Transfer. It is designed for transferring large blocks of memory – such as parts of a screen image – very quickly.

Normally sound is sent through the modulator or the monitor output – depending on which device you are using. The printer connection is the standard Centronics parallel port, though the socket is different to the Amstrad CPC664 so you'll need a new printer lead. A serial port is also available.

Scart transplant

FIRST, may I make a technical comment. Since the ST monitor connection is Scart standard on the monitor side, it is possible to use a 520 or 1040 with colour TV provided that it has a Scart connector and does not interpret the standard too weirdly.

Second, a couple of comments about Atari ST User: When reviewing software it would be nice if you would state which resolution(s) it works in.

May I also suggest that your adver-

tisers supply this information.

Could items in the news pages announcing new products be accompanied by a telephone number for the company supplying the product? – **Karl Forsberg, Uppsala, Sweden.**

● There aren't many televisions with Scart available at the moment. The Fidelity CTM is one. TV dealers will be able to advise on the suitability of others.

The majority of games software runs in low resolution only. If we review a package that has alternative modes – it would certainly be mentioned in the review.

Telephone numbers are included in news items where appropriate. If there is no number given it implies that the company involved has no facilities for dealing with telephone inquiries.

In this event, your local computer shop should be able to supply relevant details.

The Marconi connection

THE article on interfacing an Atari Trakball to the ST was very interesting. We had a different problem: Interfacing a Marconi RB2 track ball originally supplied for connection to the user port of a BBC Micro.

I expect other ST users will have one of these devices and may wonder how to use it with their ST. No internal modifications are needed – all you have to do is make the right connections as shown below.

The Marconi device works well with the ST, having just about the right gain and resolution. – **Ray Taylor and Colin Mason, Aston University, Birmingham.**

Track ball PCB connector		20-way IDC connector for BBC user port		Atari ST mouse port	
Function	Pin	Wire colour	Pin	Pin	Function
XX	3	yellow	12	1	Xb
XX	2	orange	2	2	Xa
YY	5	blue	4	3	Ya
YY	4	green	14	4	Yb
–	–	–	–	5	–
left btn	6	black	6	6	left btn
mid btn	7	brown	8	6	left btn
+5V	1	red	1	7	+5V
0V	9	grey	5	8	0V
right btn	8	white	10	9	right btn

Marconi track-ball to ST wiring chart

Pushed off the top

I AM currently working on an ST Basic program to automate a quotation system in a small office.

My problem is related to screen layout. Because of the nature of the system, various questions have to be asked of the operator such as quantity and item codes.

I find that the relevant data is pushed out of the top of the screen with each successive question. Is there a Basic routine for displaying an input prompt on the same line at the bottom of the screen without moving all the other data up? – **Mark McBride, Omagh, Co. Tyrone.**

● There ought to be two or three ways to obtain the desired result, and indeed there are, but not with ST Basic.

The nearest you can get is the next to bottom line. This short demonstration will show you the method to use. Run it with

Conversion modes

I RECENTLY read Atari ST User magazine for the first time and was stunned by the high quality and user friendliness.

I currently own an Amstrad 6128 but I am thinking seriously about upgrading to an Atari 520STFM. Is there any way my Amstrad colour monitor can be made to work with the Atari?

I also have a DMP 2000 printer. Am I right in thinking that using a standard cable, it will work on the ST?

Finally, how long will it be before the ST drops in price? – **Neil MacDougall, Chipping Sodbury, Bristol.**

● The Amstrad monitor can be made to work with an Atari ST, but the problem is that you lose the sound output. An easy way round this is to use the Dk'ronics tuner which turns the Amstrad monitor into a television set.

The monitor plugs into the front of the tuner and you feed the signal from the UHF modulator of the ST into the aerial socket at the back. Tune to channel 36 and you have a full colour picture on your

the window fully open.

```
100 WHILE d$<>"quit"
110 GOTOXY 0,18
120 PRINT "Input Data ";
130 INPUT d$
140 GOTOXY 0,18
150 PRINT STRINGS(40,32);
160 WEND
170 END
```

If other ST Basic commands such as INPUT\$() or INP(2) worked in a proper manner you could input on the bottom line.

In fact, if you don't need to see what's being input and it's a set length, you could replace INPUT d\$ with d\$=INPUT\$(n) – where *n* is the length of the input element.

HiSoft's Basic compiler will compile ST Basic programs and fix all the bugs at the same time. The resulting program can be run from the desktop and is faster to boot.

monitor and sound from the tuner's built in speaker.

The unit costs £69.95, but it does give full TV facilities as well (for which you'll need a licence). Dk'tronics can be contacted on 0493 602926.

The DMP 2000 is Epson compatible and as such will work with the ST using the parallel output port and a standard printer cable. Note that the Amstrad CPC6128 cable has a non-standard plug so you'll need a new one.

Atari has just announced a price cut for the most popular model. The 520 STFM has been reduced to £299.99.

Barbaric incident

SOME users of the early version of *Barbarian* on the Atari 520ST may have experienced difficulty in loading the program.

Any of our customers experiencing this problem should return their discs (not the packaging) to the address below for immediate exchange. – **Psygnosis, Freeport, Liverpool, L3 3AB**

The price is right

I HAVE noticed that a number of questions have been asked in your Mailbag pages by ST owners who are considering upgrading from a TV set to a monitor.

The queries are mainly about compatibility and value for money. I investigated this question a couple of months ago and would like to pass on my findings.

Having tested Atari, Thompson, Sony and Philips monitors, I eventually

decided on the Sony KV-1440B RGB TV.

This monitor/TV is fully compatible with all models of ST and needs only the correct lead – widely available for about £12 – to get it up and running.

The picture quality is excellent and is equal to the Philips and superior to the Atari or Thompson.

As far as price goes, the Philips and Thompson retail at £299 while the Atari is £349 – all inclusive of the dreaded VAT. The Sony can be bought for £239.

All prices, other than for the Sony are for dedicated monitors only. A tuner is available for the Philips at £70. – **Simon Taylor, Clarendon Park, Leicester.**

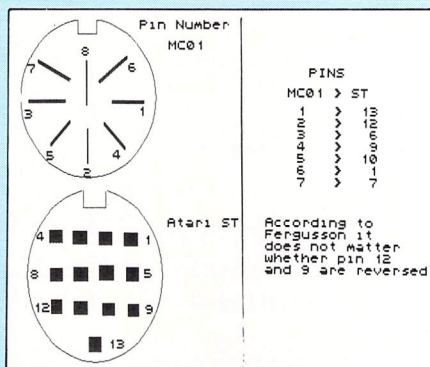
Good connections

WITH reference to Mr. A. Pemberton's letter, (July 1987), concerning the Ferguson MC01. I would advise him that the RGB socket on the back will happily connect to the ST.

He will, however, have to take the back off the set and adjust the input trimmers to give a satisfactory colour picture.

This should be done when the TV and ST are both on and displaying a test pattern – the colour chart from Degas or Neochrome is very useful in this respect.

As there are extremely high voltages in the back of a TV set, it would be advisable to get a qualified engineer to carry out this operation. The pin connections are shown below. – **J.W. Cook, Strood.**



Ferguson to ST connections

Trimbase is not protected

WE would like to thank you for publishing the interesting and accurate review of Trimbase in your July 1987 issue of Atari ST User.

In it you imply that the Trimbase program disc cannot be copied because it is protected. This statement is misleading to potential users.

The disc can be copied and we encourage the user to make backups and use them in preference to the original disc. The only operation where the original disc is used is as a security check when creating a new file. In

practice, this means that a legitimate owner of Trimbase will find the security check almost invisible since data input, file maintenance and interrogation and report generation can all be done from a backup copy. – **Andrew Colin, Talent Computer Systems, Glasgow.**

● We do say in the review that copy protection operates on the define module only. It is possible, however, that readers could have misunderstood the overall implications of that statement.

Ace of diamonds

I'M a proud owner of a 520ST. In your June 1987 issue, on page 60, you printed a program that drew dragon curves made up of recursive squares.

You suggested that it was possible to use diamonds instead of squares and that is exactly what I've done. It's nothing amazing, but I thought that you may like to have a look at it.

The program is exactly as published except for the following four lines:

```
230 LINE# x%,y%,x%-s%,y%+s%
240 LINE# x%-s%,y%+s%,x%,y%+s%*2
250 LINE# x%,y%+s%*2,x%+s%,y%+s%
260 LINE# x%+s%,y%+s%,x%,y%
```

If you remove the *2 from lines 240 and 250 it draws triangle upon triangle. – **Paul Stapley, Whitby, North Yorks.**

Chain mail

I HAD the same problem as Mr M. Thornton of Hull regarding daisy-chaining disc drives, described in the July issue of Atari ST user.

I phoned Eidersoft regarding the Triangle one Megabyte drive and they said it was not possible to daisy-chain this drive with an existing SF354. The Triangle drive can only be used as a stand-alone drive A.

I then rang Thoughts and Crosses of Heckmondwike and gathered that a Cumana one Megabyte drive could be used with an Atari SF354 – but only as drive B.

I hope that this information is of some use to your correspondent. – **D. F. Gordon, Sheffield, Yorks.**

WE welcome letters from readers – about your experiences using the Atari ST, about tips you would like to pass on to other users... and about what you would like to see in future issues.

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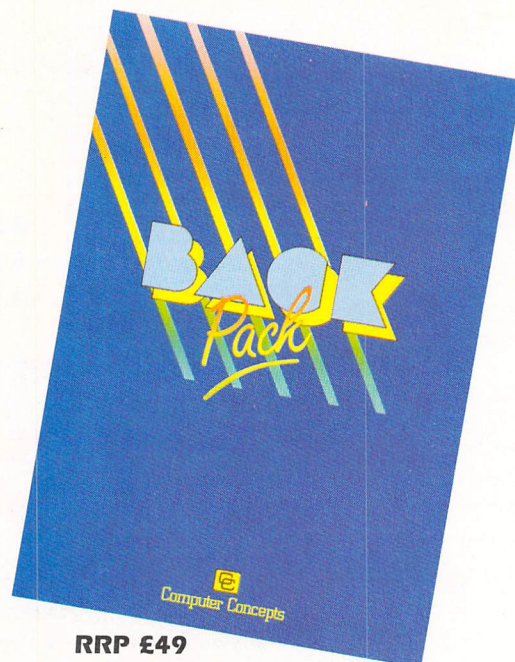
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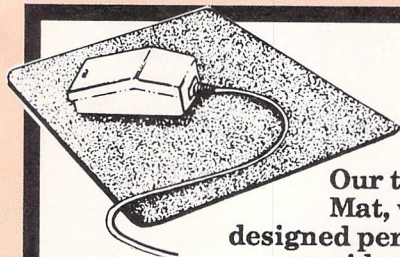
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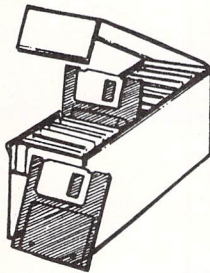
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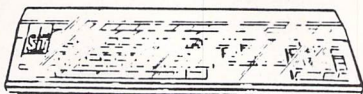


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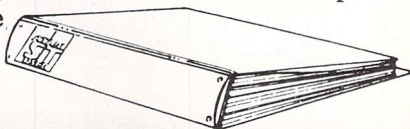
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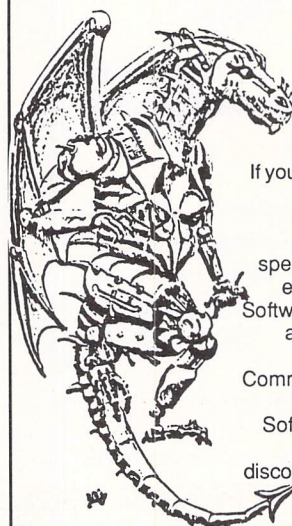
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High speed compiler

THERE is a fair bit of friendly competition to see who can produce the best Basic for the ST. It all started when it was discovered that Atari's ST Basic, supplied free with the micro, didn't quite live up to expectations.

We have a choice of several different versions and dialects. Now HiSoft has added its own compiled Basic to this ever increasing list. How does it compare with the others?

HiSoft Basic comes on two discs along with a smart plastic ring binder containing the manual. The discs contain a combined editor and compiler, a stand alone compiler, various libraries and several demonstration programs.

You are presented with the editing screen on loading Basic and the whole system is Gem based. You use the mouse along with pull down menus to select most of the various functions, although they are also accessible from the keyboard.

From here you can enter source code from the keyboard or load it from disc. As it's stored in Ascii form you can transfer programs between HiSoft, GFA and Fast Basic or use a text editor such as 1st Word to edit your listings.

Unfortunately, you can only use the editor and compiler in medium or high resolution mode, though you can run the Basic programs in any resolution. This means 520STFM owners who use a colour television will find it hard on the eyes.

HiSoft Basic appears to be very similar to Atari's ST Basic, sharing most, if not all of the commands, statements and functions. It is in fact, intended to be fully compatible, although the pre-production version I had was not quite perfect.

I compiled several ST Basic programs and found they needed very few modifications to get them running. The Golf game from the July 1987 issue of *Atari ST User* required just five minutes work.

Roland Waddilove previews HiSoft's Basic compiler

Hopefully the minor hiccups I encountered will be fixed in the final version.

I won't go into all the commands available, except to say that they are the same as ST Basic. There are however, several noteworthy extensions.

For instance, in addition to the usual subroutines there are also procedures and extended, multi-line functions. The procedures can be called by simply entering their name and parameters can be passed quite easily.

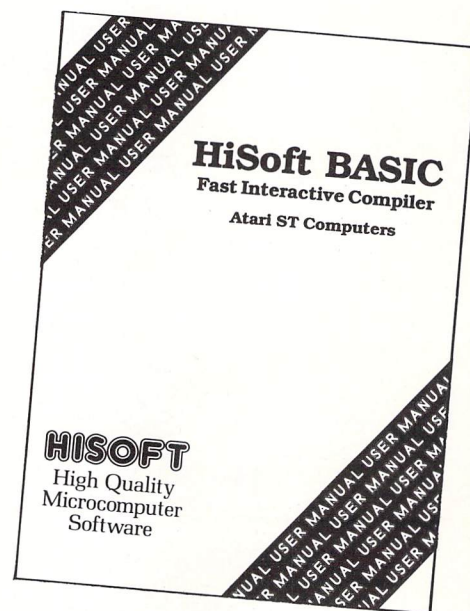
All variables inside procedures are assumed to be local by default. This enables recursive programs to be written quite easily. You aren't restricted to local variables though, any number of them can be defined as being global.

As if this wasn't enough, HiSoft has also provided static variables. These are local variables used within procedures that retain their value between procedure calls.

While on the subject of variables it is worth noting that they can be defined as being double or single precision floating point, long or short integer or string. Strings have no size limit.

There aren't any built-in Basic keywords to access Gem apart from window commands, but there are several libraries containing many predefined functions. Through these you can access the Bios, XBIOS, Gemdos, VDI and AES.

The documentation which is otherwise excellent, is quite poor in this area, though it must be said that the manual I have is far from finished. Hopefully, the final draft will contain more information.



Compilation is easy and Figure 1 shows most of the options available. You can compile a program to memory and run it, or compile it to disc as a .PRG file and run it from the Desktop. The compiled program can be freely distributed and there are no royalties to pay on the runtime routines included.

HiSoft Basic is the fastest I've seen. Table I lists the standard benchmarks for interpreted GFA and Computer Concepts Fast Basic, compiled GFA and HiSoft Basic. Forget ST Basic, the timings are nowhere near as good as these.

As you can see, HiSoft is far faster than interpreted Basic and is fractionally faster than compiled GFA Basic. If speed is essential, HiSoft Basic is the version to go for.

To sum up: HiSoft Basic is extremely fast, powerful and compatible with ST Basic. It has quite an extensive range of commands and encourages structured programming. In addition, its friendly environment make it a joy to use.

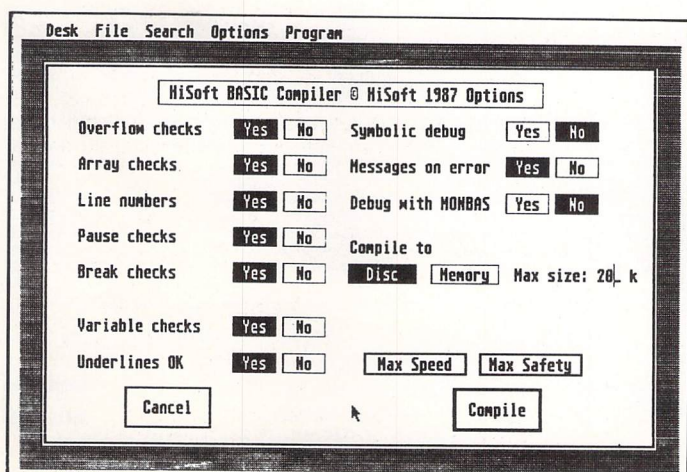


Figure 1: The compiler options

Product: HiSoft Basic
Price £79.95
Supplier: HiSoft, The Old School, Greenfield, Bedford MK45 5DE
Tel: 0525 718181

Benchmark	Interpreted Fast Basic	Interpreted GFA Basic	Compiled GFA Basic	Compiled HiSoft Basic
1	0.145	0.105	0.055	0.050
2	0.59	0.400	0.100	0.055
3	1.310	1.030	0.225	0.200
4	1.470	1.015	0.285	0.255
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Table I: Benchmark timings



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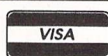
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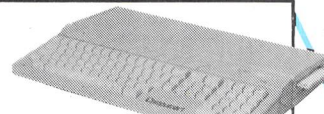
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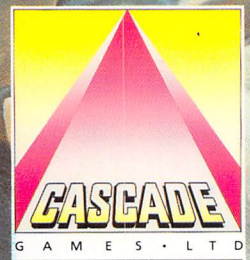


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