NEW

October/November 1988

YOUR

AMIGA

£1.50



Wordprocessor Roundup

Making Music with Dr T

AMIGA ART COMPETITION

REVIEWED

Pandora

Bards Tale II

Carrier Command

K-Gadget

Series:

Starting with Amiga Basic

Using the Amiga Libraries

Learning 68000

C Programming

ONLY £1.50

LAN COMPUTER SYSTEMS

SHOW ROOM OPEN MON TO SAT 10.30am to 5.30pm

ONE OF EUROPES LARGEST AMIGA CENTRES
WE ONLY SELL GENUINE U.K. SPEC AMIGA

AMIGA PACKAGE

AMIGA 500

Free 20 programmes condensed onto 2 disks for your convenience.
FREE MOUSE MAT *FREE* DUST COVER *FREE* DELUXE PAINT I *FREE* MOUSE CONTROLLER *FREE* £100 OF SOFTWARE OF YOUR CHOICE AT RRP

SAVE OVER

£200.00

YES YOU CHOOSE THE SOFTWARE YOU WANT WITH YOUR AMIGA (£100 RRP) IF YOU WISH TO ORDER A TV MODULATOR THEN YOU WILL HAVE **£75.00** TO SPEND ON SOFTWARE (£399 INC. VAT)

COMMODORE PC's

PC1 £259; PC1 Monochrome Moitor £279; **PC1 C4A Col. Mon.** £439; PC10 **C.S.O; PC20** C.S.O.

AMIGA COLOUR PRINTER PACKAGE

AMIGA 500. Free Mouse Mat, Free Dust Cover, Free Deluxe Paint 1, Free Mouse Controller, Free Works (a wordprocessor database and spreadsheet), Free 20 programmes condensed onto 2 disks for your convenience. Also includes Okmate 20 colour printer

SAVE OVER £300.00
£499 INC VAT

AMIGA B2000

B2000 ..... £849.00
A2052 2MB Ram Board £299.00

A2090 AMIGA DOS 20MB

Hard + Controller Card £399.00
XT Bridge Board..... £399.00

* MONITORS *

1084 High Res Col monitor	£199.00+VAT
1084 monitor if purchased with computers	£189.00+VAT
Philips 8833 monitor	£219.00+VAT
Philips 8833 monitor (if purchased with computer)	£209.00+VAT
High resolution monochrome monitors from	£69.00+VAT

ACCESSORIES

A501 RAM expansion	£99.00 inc VAT
Mouse mat	£4.95 inc VAT
Amiga dust cover	£4.95 inc VAT
Philips/1084 dust cover	£4.95 inc VAT
3½" disk drive cleaning kit	£7.95 inc VAT
TV modulator	£23.75 inc VAT
10 Sony D/S 3.5 disks	£14.95 inc VAT 20
Sony D/S 3.5 disks in 80 capacity lockable box	£29.95 inc VAT
A501 Ram Exp	£99 inc VAT
Monitor stand	£17.00+VAT

DRIVES

Cumana CAX354	£99.95 inc VAT
LAN 5¼" drive includes Transformer and 10×5¼ disks	£119.95 inc VAT
Supra 20mb hard disk	£499.00 inc VAT

* PRINTERS *

Citizen 120D	£99.00+VAT
Panasonic KXP 1081	£139.00+VAT
Star LC 10 Printer	£159.00+VAT
Star LC10 Printer, Stand Paper + Cable	£169+VAT
Star NB24 – 1024 Pin Printer	£399.00+VAT
Nec 24 Pin Printer	£259.00+VAT
Epson LX 800	£179.00+VAT
256K Printer Buffer	£160.00+VAT
Printer Cable	£13.00+VAT
Box of Paper 2000 Sheets	£13.00+VAT
Printer Stand	£9.95+VAT
Printer Stand	£26.00+VAT
Printer Ribbons from	£3.00+VAT
New Star LC24-10	£279+VAT

SPECIAL OFFER

Star LC10 Colour Printer (Parallel Version) £199+VAT

LC10 Colour Printer Commoddore 64/128 £199+VAT

Okimate 20 Colour Printer £139.00 inc VAT

All prices exclusive of VAT + delivery unless otherwise stated

SUMMER CLEARANCE SALE

Cumara External 3½" drive.....£79.00+VAT
Citizen 120D .....£99.00+VAT
1084 Monitor .....££199.00+VAT
Philips 8833 (Stereo Sound) £219.00+VAT
High Resolution Monochrome Monitors .....£69.00+VAT
1581 CBM64/128 3½ Disk Drive £179 inc

COLOUR PRINTER

Okimate 20.....£149.95+VAT
Integrex.....£469.00+VAT
Xerox .....£975.00+VAT

APPLICATIONS SOFTWARE

The Works All For £69.00 inc VAT

A Wordprocessor + Database and Spreadsheet

The Works Is A Three In One Pack

Scribble 2 is the Word Processor
Analyse 2 is the Spreadsheet
Organise is the Database

LANSOFT CLUB

The Club for St and Amiga users everywhere all prices include VAT.

* Special Introductry Prices *

* Membership – £20 – (per year) *

* Save up to 40% off Games Software *

* Up to 30% – Off Application Software *

* Special Club Prices on Cumana Disk Drive £89.00 inc VAT *

* A501 Ram Expansion £99.99 inc VAT *

01 597 8851
1063 HIGH RD, CHADWELL HEATH, ROMFORD, ESSEX, RM6 4AU

HOW TO ORDER

Enclose letter with cheque, postal order or credit card number for amount including VAT and delivery charge. Credit card holders may order by telephone. Contact sales desk. Dispatch normally in 24 hours.

Official Orders from Educational Establishments, Local Authorities and Government departments welcome. Contact Education Department.

FAX: 01-590 6057. Telex: 995548.
Telex: 995548.

NEW PRODUCTS

Excellence..... £189 inc
LC24/10 Printer ..... £279+VAT
CBM64 Yamaha Keyboard Walkman + Music Cassette
..... £199 inc VAT & delivery

ORDER NOW BEFORE THE RUSH STARTS

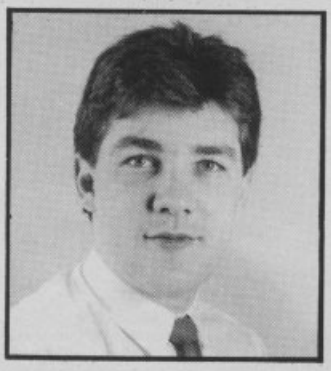
Editor: Stuart Cooke
Deputy Editor: Sue Joyce
Group Editor: Mark Webb
Ad Manager: Paul Kavanagh
Ad Copy Control: Andrew Selwood
Origination: Project 3
Designer: Kim Goodhew

Your Amiga is a bi-monthly magazine appearing on the third Friday of every second month. The contents of this publication including all articles, designs, drawings and programs and all copyright and other intellectual property rights therein belong to Argus Specialist Publications Limited. All rights conferred by the Law of Copyright and other international copyright conventions are specifically reserved to Argus Specialist Publications Limited and any reproduction requires the written consent of the company. ©1988
Distribution SM Distribution, 6 Leigham Court Road, London SW16 2PG. Printed by Redwood Web Offset, Trowbridge, Wiltshire. Origination: Project 3, Whitstable, Kent.

Your Amiga, Argus Specialist Publications Limited, Number 1, Golden Square, London W1R 3AB. Telephone: 01-437 0626 Telex: 8811896. Opinions expressed in reviews and the opinions of the reviewers are not necessarily those of the magazine. While every effort is made to thoroughly check items published for errors we cannot be held responsible for any mistakes that do occur. We regret that we are unable to answer readers letters on an individual basis.
Subscriptions are available from: Infonet Ltd, 5 River Park Estate, Berkhamsted, Herts, HP4 1HL. Rates are as follows: UK £9.00, Europe £11.80, Middle East £11.90, Far East £13.00, Rest of the World £12.10.
Above rates are for surface mail. For airmail rates please contact Infonet at the above address.

This month's cover by Lewis Tilley

ARGUS PRESS GROUP



Welcome

■ **Issue number three, and so soon! The Amiga** world is beginning to buzz. The price-shaving and software bundles are beginning to appear and Commodore's Christmas advertising is going to be something to behold.

Commodore's financial fortunes continue to improve worldwide and in the UK Steve Franklin (Commodore MD) and his merry men are in a fighting mood. Let's hope their obsession with the Commodore PC clones does not dampen their enthusiasm for their 'main machine'.

In the USA, the Amiga has been accepted by true computer enthusiasts as the machine built for them. Amiga computer clubs are remarkably active and they take great pride in their own magazines produced on disk or by Amiga desktop publishing. Many of the public domain programs produced by these enthusiasts have found their way into PD libraries here. If you have formed a group, publish a newsletter or disk then send up details for our news page.

But where's the homegrown talent? The lack of good documentation, with official manuals at over £20 a throw, doesn't encourage talented programmers. But Your Amiga won't let you down. Our great series on 68000, C and BASIC will help you start programming the exciting Amiga, whatever your standard. If you stick with us you may not just be playing the blockbusters, you may be writing them!

Artistic talent certainly abounds amongst Amiga users and we've decided to give you a real incentive. Your work could appear on the front cover of Your Amiga. You will earn a fat fee and we'll frame the original for you too! The Amiga gallery awaits your submissions.

Stuart Cooke

Contents

FEATURES

Strictly for Beginners 19

Music on the Amiga 20

Street Fighter 31
Travel the world, meet exciting exotic people and hit them

Pandora 39
The box of evils goes space age

Scrabble 42

Thundercats 47
Darrin Williamson assesses whether Elite's latest TV conversion comes up to scratch or ends up in the litter tray

Forgive and Forget 65
Some things are best forgotten. Is this one of them?

Have Car Will Travel 66

Helter Skelter 68
If you've ever fancied yourself as a bouncing ball, then this is the game for you

YOUR AMIGA

PROGRAMMING

First Words in C 14
Writing C programs on the Amiga

Amiga Basic for Beginners 44

Assembly Language Programming 53
68000 for beginners

Deluxe Video 32

K-Gadget 46
Kuma make gadgets simple

Amiga Interlude 48

Wordprocessors for the People 58

REGULARS

Welcome 3

Amiga Update 8
The latest goings on in the world of Amiga

Laser Printing on the Cheap 27
Our follow-up look at 'lower' priced laser printers

Calling All Authors 36
Written any good programs or articles lately? Well send them in!

Competition 37
Your chance to win tickets to Alton Towers

Gallery 40

Book Reviews 62
This month's look at what's around on the book shelves

ENTERTAINMENT

Bard's Tale II 11
The role-playing game lives on

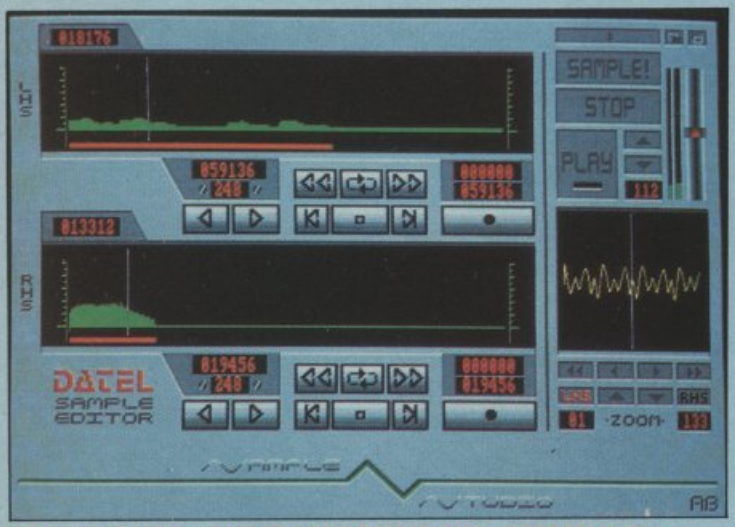
Carrier Command 12

Black Lamp 26

CONTENTS


Project Windows Bool Gad. Prop Gad. Str Gad. Other
Flags
Activation
Position
Str Flags
Str Value
GRELRIGHT
GRELBOTTOM
GRELWIDTH
GRELHEIGHT
LEFTBORDER
RIGHTBORDER
TOPBORDER
BOTTOMBORDER
Parts
OK
CANCEL
15
R G B
Edit
Workbench release 1.2. 398080 free memory
KindWords
Systen
SuperDrivers
fonts
Examples
KindWords
Preferences
Trashcan
Kindtwo
example1
example1.backup
kindone
council.ltr
KindWords
score high speed car bonus
446673 2790558 239 01 0600
POCKETS
CARRYING
Bank manager
LIFE
DISK
TURBO PRINT
by RSEESOFT
Printer-Selection
Settings
Aspect Ratio
Save
TURBOprint:printers
:DRIVES
/PARENT DIR
[Canon]
[Epson]
[Nec]
[Okidata]
[Seikosha]
[Star]
Fix Printer
Fix Prefs
Custom Ratio
W/H=1.060
Call Prefs
Save Settings
Utilities
Colorscale Patterns
Use
Install Hardcopy
Normal Pattern
Ok
Fastmen Last
No

DATEL ELECTRONICS





AMIGA PRO SAMPLER STUDIO

- A top quality sound sampling system at a realistic price.
- All the usual features of a sampling system plus many more.
- 100% machine code software for realtime functions.
- Hires sample editing.
- Realtime frequency display.
- Realtime level meters.
- Files saved in IFF format.
- Adjustable manual/automatic record trig level.
- Variable sample rate and playback speed.
- Separate scroll line waveform windows plus zoom function with Edit windows for fine accurate editing.
- Hardware compatible with many other software packages.
- Software files can be used within other music utilities.
- Reverse, copy, mix, clear plus other edit facilities.
- Microphone and line input 1/4" Jack and Din connections.
- 3D shot of sound waveform. Wave editor to design your own waveforms or adjust existing ones.

ONLY £69.99 COMPLETE SYSTEM, PLEASE STATE A500/1000/2000

DATEL JAMMER

To complement the Sample Studio the Datel Jammer gives you a 5 octave keyboard to play and record your sampled sounds.

FEATURES:

- 2 and 3 note chords.
- 4 track sequencer up to 9999 events.
- Tempo and Beat Controls.
- Mixer Controls on Instruments.
- Load and Save sequence.
- Works on standard IFF file sounds.





MIDI MUSIC MANAGER

● At last a truly professional Midi package for the Amiga at a realistic price.

- 8 realtime Midi tracks for record/playback
- Works with standard IFF files
- Adjustable track length – limited only by available memory
- Use as a multi-track Midi recording studio
- Works with many Midi interfaces including Datel Midi Master (see Ad) and Nimetics
- Editing facilities for corrections and track joining etc.
- Internal or External Midi clock control
- Play sampled sounds on Amiga from any Midi track
- Full dubbing – listen to one track while recording another
- Perfect companion for Pro Sampler Studio or any music application

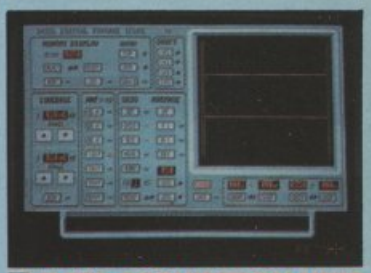
ONLY £39.99 COMPLETE



MIDIMASTER

- Full Midi Interface for A500/2000/1000 (Please state model)
- Compatible with most leading Midi packages (inc. D/Music)
- Midi In – Midi Out x 3 – Midi Thru
- Fully Opto Isolated
- No need to pay more – Full Midi standard

ONLY £34.99



DATA ACQUISITION UNIT

- Turn your Amiga into a sophisticated measuring instrument capable of measuring a wide range of data inputs.
- Sample and display events from microseconds to hours – with amplitudes from millivolts to 50 volts.
- A Hardware/Software package with very high spec including: –

DIGITAL SCOPE DISPLAY – 2 channel inputs. Manual or continuous display. Timebase 500ms/div to 20μs/div. – accurate to 5%

- 6 bit flash conversion gives 2 millions samples/sec.
- Adjustable trigger level. 5 x zoom function. Memory scan
- Load/Save functions, waveform enhancement, graph displays.
- Hardware contains onboard RAM and Crystal dividers

PLOTTER DISPLAY

- 2 channel display
- Memory recall display
- Timebase range 1 seq to 10hrs per plot.

All features found on units costing thousands of pounds!

ONLY £89.99 for hardware/software/please state A500/1000/2000



ROBOTARM – Full Function – 5 Axis Movement

- Explore the fascinating science of Robotics with this full feature Robot Arm.
- Human like dexterity – with 5 Axis of movement it is so versatile. It can manipulate small objects with amazing ability.
- Easily controlled using 2 Joysticks (any 9 pin type) or connect to your Amiga with our Interface + Software to give Computer/Robotic control (see Interface offer).
- Comes with Accessories including 'Finger' Jaws, Magnetic Attachment, Shovel Scoop, 4 Stabilizing Suction Base Legs, etc.
- Uses 4 HP2 batteries (not supplied) to power motor movement so uses no computer power.
- Self contained, ready to use (except batts, joysticks).

ONLY £49.99

INTERFACE OFFER

- Unique Software/Hardware package to allow you to interface your Amiga with the Robotarm.
- Train mode allows you to store and then repeat movement sequences.
- Very easy to use.
- This Interface is not needed to use the Robotarm but interfacing with your Amiga has great possiblities.
- Please state Amiga model

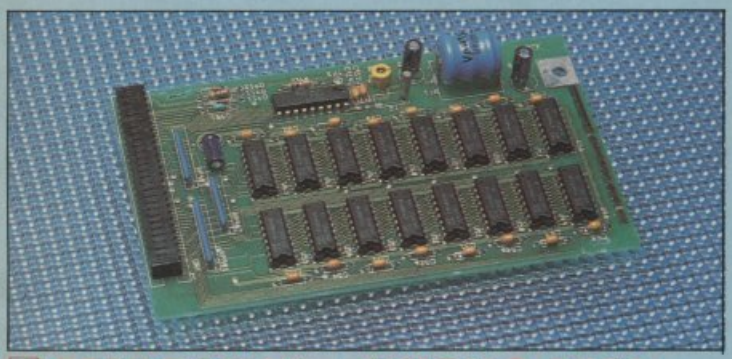
ONLY £24.99
COMPLETE WITH CABLES.

DATEL ELECTRONICS

EXTERNAL 3.5" DISK DRIVE

- Single or twin drive models available
- Slimline extra low profile – only 6" long!
- Top quality NEC drive mechanism
- Throughport allows daisy chaining other drives
- Superbly styled case in Amiga colours
- Fully compatible
- 1 meg unformatted capacity per drive
- Good cable length for positioning on your desk etc.
- Twin drive model takes up very little space
- Value for Money – before you buy a drive please compare the features – these drives have NEC mechanisms housed in superb cases. Some products are built to a price and not a standard. Don't spend a few pounds less and end up with 'rubbish' – and remember you are buying from the manufacturer.

ONLY £99.99 SINGLE DRIVE – OR £199.99 FOR TWIN DRIVE
(PLEASE ADD £5.00 IF COURIER DELIVERY REQUIRED)

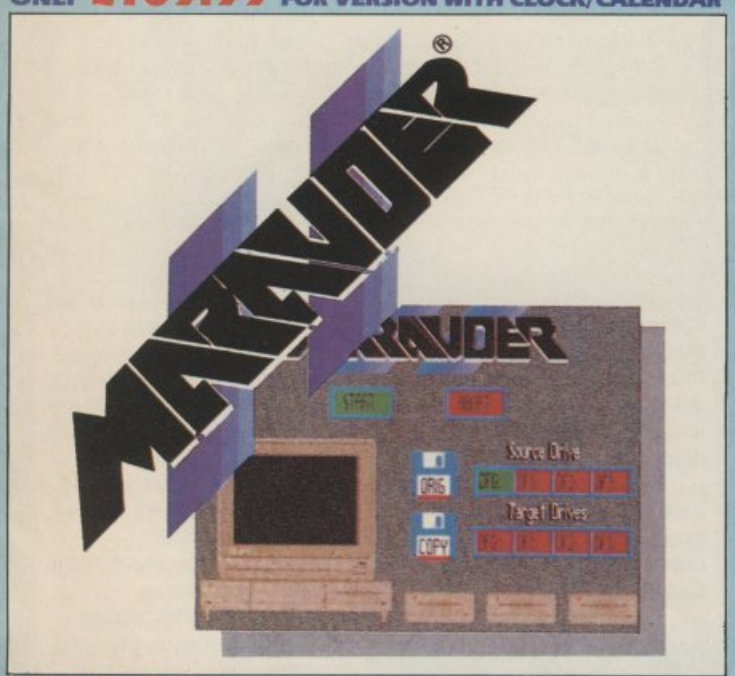




512K RAM EXTENSION ● A500

- Available with/without calendar clock option
- Simply plugs internally into a A500 slot
- Switch in/out with switch supplied
- Fitted in minutes – no soldering etc.
- With calendar/clock onboard time/date automatically booted
- Battery backed to retain time/date

ONLY £99.99 FOR STANDARD 512K CARD OR
ONLY £109.99 FOR VERSION WITH CLOCK/CALENDAR



MARAUDER II

- **Quite simply the best disk copier available for the Amiga (all models)**

- Superfast disk copier will copy almost any commercial disk
- Friendly user Interface – Mouse driven throughout.
- Completely compatible with Amiga multitasking system
- Even decrypts many encoded programs including D.Print/Video/ Paint/Music/II etc.
- Special 'Strategy Files' cope with even the most advanced protection schemes
- Supports upto 5 drives simultaneously for multiple copies
- Regular updates available – we always ship the latest
- Fast operation – typically around 80 seconds
- USA's top selling copier

ONLY £29.99



DISK/STORAGE BOX OFFERS

- DD40 holds 40 3½" disks lockable.

ONLY £6.99

- DD80 holds 80 3½" disks lockable.

ONLY £8.99

- Disks – 3½" D/DS/D.
- Top quality, bulk packed with cables.

ONLY £24.99 FOR 25.

PRINTER CABLES

- 25 pin 'D' to 36 way Centronics parallel lead.
- A 500 or 1000 please state.
- 1.2m length.

ONLY £8.99



DATA/SWITCH BOXES

- A/B type connect two printers to one computer or (vice-versa).
- Centronics connections or RS232 (Serial) connections (25 pin) please state.

ONLY £24.99

- ABC type connect three printers to one computer (or vice versa).
- Centronics or RS232 connections.

ONLY £34.99

- Intelligent Printer Sharer.
- Share one Printer between four computers.
- Automatic switching – no need to leave your computer.
- RS232 serial or Centronics connections – please state.

ONLY £89.99

- 25 pin 'D' to 25 pin 'D' – serial printer lead.
- A500 or 1000 – please state.
- 2m length.

ONLY £8.99

ALL ORDERS NORMALLY DESPATCHED WITHIN 48 HRS

HOW TO ORDER . . . .

BY PHONE	BY POST	FAX
0782 744707 24 hr Credit Card Line	Send cheques/POs made payable to 'Datel Electronics'	0782 744292 UK ORDERS POST FREE – EUROPE ADD £1 OVERSEAS ADD £3

DATEL ELECTRONICS

DATEL ELECTRONICS LTD., FENTON INDUSTRIAL ESTATE, GOVAN ROAD, FENTON, STOKE-ON-TRENT, ENGLAND.

SALES ONLY	TECHNICAL ONLY
0782 744707	0782 744324

AMIGA UPDATE

Chicago

My kind of *Computer Show*

This months news takes on a slight difference from the usual new product from type story, instead we'll take a look at a number of companies who were exhibiting at the recent AmiExpo in the US. Unfortunately there are two many producs/companies to mention everything but we'll see what we can fit in.

The show itself came as a bit of a surprise. Being American you would expect it to have been HUGE, after all isn't everything that comes from the States BIG. Well it wasn't it was in fact much smaller than our own humble *Commodore Show* with just over 70 exhibitors. When I saw the entry price for the show I was horrified, more than one British journalist commented that "They're not going to get any visitors with a price like that", $20 for a day ticket, $25 for two and $30 for all three days.

Well, we were all wrong the show was a resounding success, it was packed every day and the 70 odd companies exhinbiting all had a wide range of products, both new and old, to show off to the public.

One major difference between the show and our British counterpart was the lack of games companies. Oh, there were some, and they had some excelent games to show us. However, the ratio of games on show to serious/hardware products was exactly the opposite to what we would expect in the UK, there were very few games companies. Maybe the high entry price had something to do with it, but most of the people visiting the show were just as interested in the hardware on show as the games, and boy, were they spending!

Any way, enough reminising, onto the exhibitors:

READYSOFT P.O.Box 1222, Lewiston, NY, 14092. Fairly well known within the UK through sales of their C64 Emulator for the Amiga being sold through Robtek. A new version of this was available. Now you can not only turn your Amiga into a Commodore 64 but now you can use a Commodore 64 printer with just about any Amiga software, new drivers included on the disk.

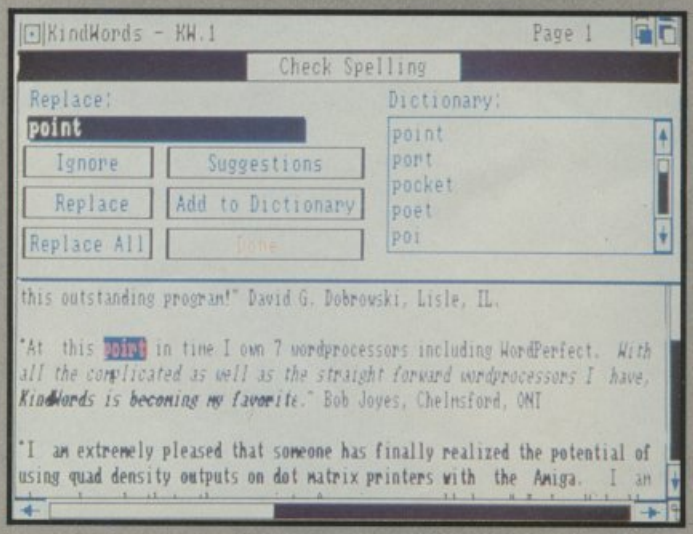
Also being exhibited by ready soft were a number of new games titles Watch out for reviews of *GANYMED* and *BOMB BUSTERS* in the near future. Bomb Busters won't need any introduction if you have ever heard of *Bomb Jack*. Ganymed has you flying around a horizontal scrolling screen trying to stop the advance of the enemy walkers any similarity to a certain part of *Star Wars* purly intentional!

Watch out for *Readysofts* version of *Dragons Lair*, an early copy was shown and it looks stunning.

Abacus 5370 52nd Street SE, Grand Rapids, MI 49508. Publishers of numerous books on computing. Their latest two *Amiga Tricks and Tips and Amiga Machine Language* both available and I must say that I was very impressed with them. Available in the UK through *Adamsoft*, watch for a review in the near future.

The Disc Company 3, Rue Pelouze, 75008 Paris, France. Watch out for the new productivity bundle *Critics Choice* from these guys. Included in one box set are *KindWords* (reviewed this issue) a wordprocessor with graphics capability,





Maxiplan 500 an advanced electronic spreadsheet and *Microfich Filer* an excelent database that allows you import graphics into a database.

All of these products have recieved good reviews as a package they could be unbeatable.

Discovery Software 163 Conduit Street, Annapolis, MD 21401, Canada.

This company are probably best known for their copy program *Marauder* as well as their picture grabber *GRABBIT*. Well they've put copying behind them know and are using their experience to produce some excelent products.

Virus Infection Protection (VIP) allows you to set up a database file of all of your amiga disks. In this file is stored the boot tracks of the disks. Should your boot track become corrupted, which VIP can check, you can simply use the program to take the original boot track from the database and put it back onto the infected disk Such a simple idea, but did you think of it?





ZOOM is an incredibly addictive game based around an old idea, work your way around a grid colouring squares while being chased by the nasties. If the game sounds familiar it should, versions have been around for years. Don't let this put you off the game is addictive and is a must for your disk collection if only for the superb intro.

Watch out for Discovery's new *smashemup* barbarian type game, an early preview looked extremely impressive. *Gold Disk P.O.Box 789, Streetsville Mississauga, Ontario, Canada L5M 2C2.*

The long awaited, and advertised, *Comic Setter* was previewed yet again. Once completed, which doesn't look far off, this package will allow you to produce your own comics in the comfort of your own home. The results are extremely impressive.

Professional Draw was gloated over by a number of artists and the package looks as though it could give Adobe Illustrator on the Mac a good run for its money.

An untitled graphics animation package was previewed. This, unlike many similar packages, is extremely easy to use. The programmer said that a 9 year old could use it. I'm not quite sure what a 9 year old would get out of the program but I'm sure looking forward to playing with it. *NEWTEK 115 W.Crane Street, Topeka, Kansas 66603.* Probably the most popular and impressive stand of the whole show, at least it was impressive when you could get through the crowd of people who were WOWing at the effects that the realtime video image manipulator can do, seeing a picture of yourself bouncing and twisting around an Amiga screen can be pretty unnerving.

DigiDroid, a motorized fileter wheel that works with digiview looked impressive. The droid automatically turns the filter wheel for you, making digitising faster and easier. *CLtd 723 East Skinner, Witchita, Kansas 67211.* Probably one of the most novel, yet useful devices, on show came from this company the *Timesaver*.

This neat piece of hardware fits inbetween the keyboard an Amiga 1000 or 2000 (not A500). The battery backed hardware has a real time clock, 7K RAM buffer that remembers what you have typed, built in ROM macros that can be called up by pressing the function keys and much more. Review under way so keep watching.

Also being shown by CLtd were various video leads to allow you to connect you Amiga to older model Commodore monitors and colour composite monitor or video recorder.

For those with larger pockets than my own then you may be interested in CLtds hard drive, SCSI controller for CD ROM and WORM drives and *Jet Set* a range of printer utilites for the HP LaserJet+. *ACTIONWARE 38 W 255 Deerpath Road, Batavia, Illinois 60510.* Judging by the number of European distributors hanging around this stand the range of excelent games from this company should soon be appearing in the UK. *Capone, POW and Creature* can all be played normaly but with the addition of the *Actionware PHASER* gun they take on a whole new dimension. The gun is essentially one of the old light rifles that came with the pong games a few years ago, however, the gun is accurate and is great fun. *HAITEX RESOURCES 208 Carrollton Park, Suite 1207, Carrollton, Texas 75006.* For me this company had the treat of the show with *XSpecs 3D*. This consists of a pair of glases that instead of lenses has highspeed liguid crystal shutters. This allows your computer to control what each eye sees at 30 frames per second. True 3D games are now possible using these glasses, new life can be given to presentations and CAD, and modelling displays can turn around in true 3D representation. I must admit I was a little sceptical as to what the results would be until being forced to try the glasses out on a games program. Then I was hooked!

BrownWagh Publishing 16795 Lark Ave, Suite 210, Los Gatos, CA 95030.
A company that seem so prolific that I couldn't mention all of the products that they were showing, the following deserve a special mention:
Express Paint Not only allows you to produce pictures but also lets you use text as well. No, not sentences every paint program lets you do that With Paint you can load in text and place it anywhere, even use it to fill a shape on the screen. The print options are staggering, not only can you send your masterpiece to a normal dot matrix 24pin and laser printers (including PostScript) can be used. You can even print your picture at up to six times its normal size for producing posters.
Softwood Write & File This is a fully integrated Wordprocessor and database manager, it allows multiple font styles, has a spell checker. The display is of the much loved WYSIWYG variety so that what you see on the screen is what comes out on the printer.

The integration between the two packages allows you transfer information, such as a mailing list with ease. *SOFTWOOD FILE IIsg* is another database program, however, this one allows you to store not only text data but also pictures and sound. Examples of use include pictures of houses for estate agents, recipes with colour photographs and foreign language programs with the correct pronounciation stored on disk.

Well there you have it, a quick round up of just a little bit of the AmiExpo. Appologies to all of those companies that I couldn't fit in but I simply ran out of room maybe next time!

Removable Storage

Burocare Computer Systems has launched a removable hard disk drive for the Amiga. Costing £1695 the drive is for power users who wish to add-on a number of 20Mb slices which cost a remarkably low)£50 each.

The drive interfaces internally on the 2000 and through the use of an external card cage for the 500 and 1000. Each cartridge can be formatted for AmigaDOS or MSDOS, when used with the XT bridgeboard on the 2000, or a mixture of both.
Details on 01 907 3636

Flicker Fixer

MicroWay, experts in PC co-processors, have added another string to their bow with a display board for the Amiga. The £345 + VAT Flicker Fixer allows the Amiga to display a stable, flicker-free picture in its high-resolution mode of 800 by 600 with 4096 colours. We all know the squinting that normally goes on when in this mode!

The board is designed to allow the Amiga to be used in its higher resolutions for computer aided design or desktop publishing. The fully interlaced high resolution mode further lifts the performance of the Amiga for video graphics.

Simon Shute, Managing Director of MicroWay says "The Flicker-Fixer is our first ever product for the Amiga and as such is a new departure for us. But it fits in very well with our strategy of offering upgrades which make genuinely useful improvements to system performance. The Flicker-Fixer allows the Amiga display to achieve its true potential — something it has never done before".
Details on 01 541 5466.

Games Machine

Virus- not what you think — is the new game from David Braben, one of the authors of Elite. Virus is a conversion of the game Zarch, already released for the Acorn Archimedes. It is played over a 3D landscape which undulates below your hoverplane as you skim across the planet halting the assault of aliens who pollute the surface with a red virus.
Price £19.95.

Corruption is Magnetic Scrolls next adventure. Can it be another masterpiece or will the inspiration have run out? Set in the modern day, you'll be plunged headlong into the shark like world of high finance wher ecommerical intrigue and double dealings are commonplace. You are framed by your partner and threatened with concrete boots by the irate drug baron.

Previews

Various hybrids of the Amiga range have been previewed around the world in the past three months. There's the A2500, a 68020 based machine with new higher resolution display. The A3000 is purported to be a 68030 based 20MHz machine. It's amazing no-one has invented a number for a mythical 68040 Amiga yet!

Of course add-on boards have been demonstrated and that includes a transputer card running under Perihelion, the operating system created for transputer by AmigaDos' author Tim King. Unix is naturally associated with the 68000 processor series and will surely appear for those who need it. Equally interesting for business is the 80286 board for A2000.

The only certainty about these high-powered upgrades is that they will cost many times over what we paid for our A500s.

Precision Hit The US

Precision Software, that surrey based dealer for everything Amiga (including their own well known Superbase range of products.) are going Stateside. *Precision Incorporated* has opened its own offices in Dallas, Texas. It will assume direct responsibility for the distribution and servicing of its own products within Northan America. Contact: D. Browning, Precision Incorporated, 8404 Sterling Straat, Suite A, Irving, TX 75063. TEL (214) 9294888

Amiga Centre

Martin Lowe, that intrepid hunter of American Software for the *Amiga Centre Scotland*, has come up trumps once again with a range of programs licensed at the recent AmiExpo in Chicago. The products are as follows:

ARexx A multi tasking implementation of the REXX language.

WShell A powerful command shell including piping. This software also interfaces with ARexx mentioned above.

Fancy 3D Fonts A range of 3D fonts for use within 3D animation packages such as *Sculpt* and *Animate 3D*.

Animation Flipper A utility that will allow you to test any animations that you have produced. The program is designed to work in any resoloution, including HAM and overscan.

Updates

Roger T. Young has been appointed vice president of Mindscape.**British Telecom** have introduced their own Hayes compatible modems for personal computers.**Aegis** have shipped an update to their Videotitler software. Registered owners can get a free upgrade by sending in their original disk.**Fuji** have published a handy sized booklet on floppy disks and data storage, explaining how it all works.**Commodore** now have their own brand name disks marketed through RPS one of Europe's largest disk manufacturers.

Education bid

by Ann Owen

Thirty percent off is Commodore's current offer in their bid to make the Amiga big in education. Atari have tried, Apple are still trying and now Commodore are stepping up their efforts to capture a decent share of the important education market.

Education not only brings in revenue, it creates familiarity amongst young children with the Commodore name. The A500 is a natural introduction to a 68000 based computer but Transformer isn't really up to introducing MSDOS. The specification of the Amiga 2000 with PC bridgeboard almost reads like the Department of Education's guidelines except for the important lack of compatibility with BBC Micro software, the established favourite in schools.

Commodore is trying to combat this software shortage by encouraging developers while trying to give them the incentive of a decent hardware base.

Compunet Modem

Amiga owners now can buy a Pace Linnet V21/V23 modem, cable, Compunet terminal software and one month's guest membership for £135 plus VAT.

The Linnet allows full use of the Compunet system at 1200/75 but for developers and others who wish to upload large files onto Compunet, the new modem provides 1200 transmission.

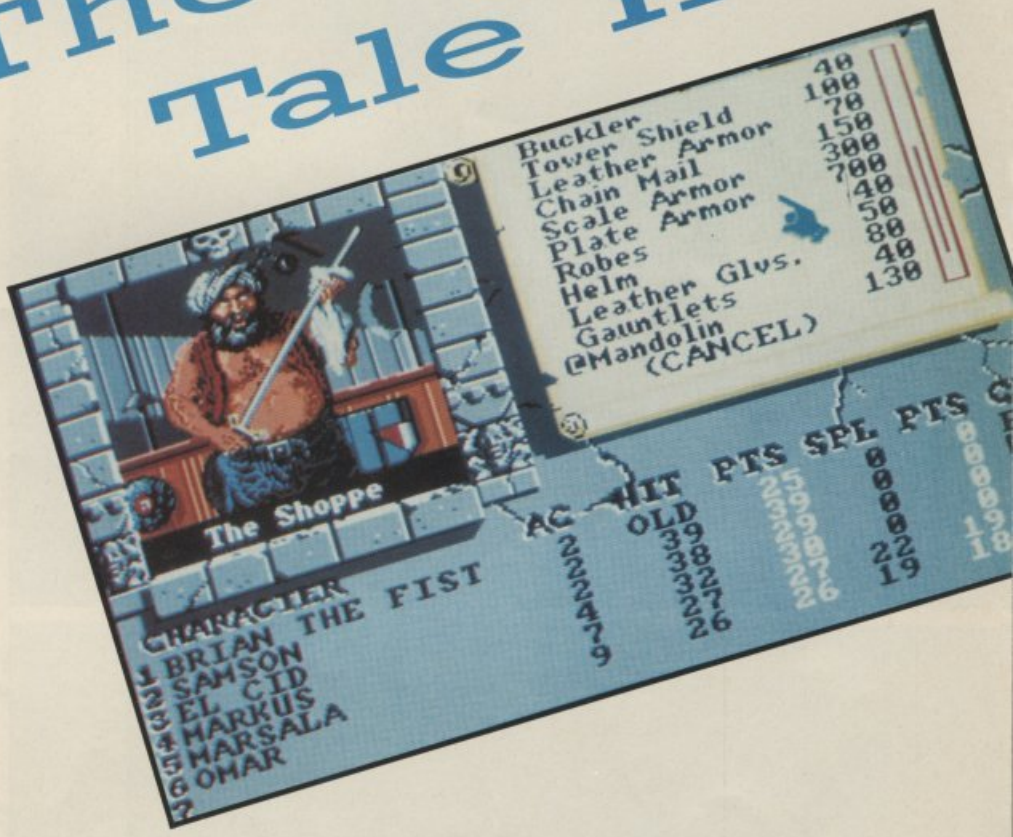
Meanwhile Compunet members are getting into a new multi-user game, Federation II. It is set in a future of insterstellar commerce and exploration. Compunet claim that the game has a fully worked out background with a viable galactic ecomomy. Players are in full communication with each other in real time in the game and are competing against each other as well as against market forces.

Details on 01 997 2591.

The Bard's Tale II

The role-playing game lives on and no-one was more surprised than Fin Fahey — our master adventure player.





I've encountered this game from a rather naive point of view. Until now, I've somehow managed to avoid running into a single role-playing game in my career as a review (I thought RPGs were nasty little bits of military equipment that us Europeans sold indiscriminately to the Third World).

I've always assumed, having played the primitive progenitors of the modern RPG, that they were just primitive hack-and-slash. I'm afraid I have to admit that I was wrong. *Bard's Tale II* has me firmly converted to the genre, and I have to agree with my learned colleague Gordon Hamlett: 'The adventure is dead, long live the roleplaying game'.

Bard's Tale combines its role-playing element with the best elements of the traditional adventure quest. It's also a hell of a big game. The scenario is that you are seeking the seven fragments of the shattered Destiny Wand across The Realm, which consists of six cities, each of which has a dungeon, plus a wilderness outside, in which there are even more dungeons.

There are many aims in the game. The ultimate one is of course to unite the Destiny Wand leading the demise of Lagoth Zanta, the villain of the peace. That's going to take a long time — until you've gained many, many experience points for your characters, large areas of the game are totally no-go.

But there are minor sub-quests such as the starter dungeon, where you can seek to release a captured princess. Even this is far from being a cinch (I haven't done it yet).

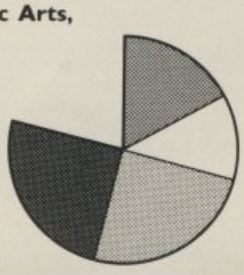
Throughout the action, The Bard is probably one of your most important classes of characters. Provided you keep this dissolute folkie tanked up with ale, he's able to produce songs to hold monsters, increase your armour points, and so forth. Always protect your Bard.

A final point is that this is definitely a game that benefits from the Amiga. The little animations that accompany the pictures of each character really help the atmosphere, and the screen is very pleasing to contemplate — it's not half as soothing looking at the C64 version.

Definitely my favourite game of the month. I'll probably still be playing it this time next year!

THE BARD'S TALE II

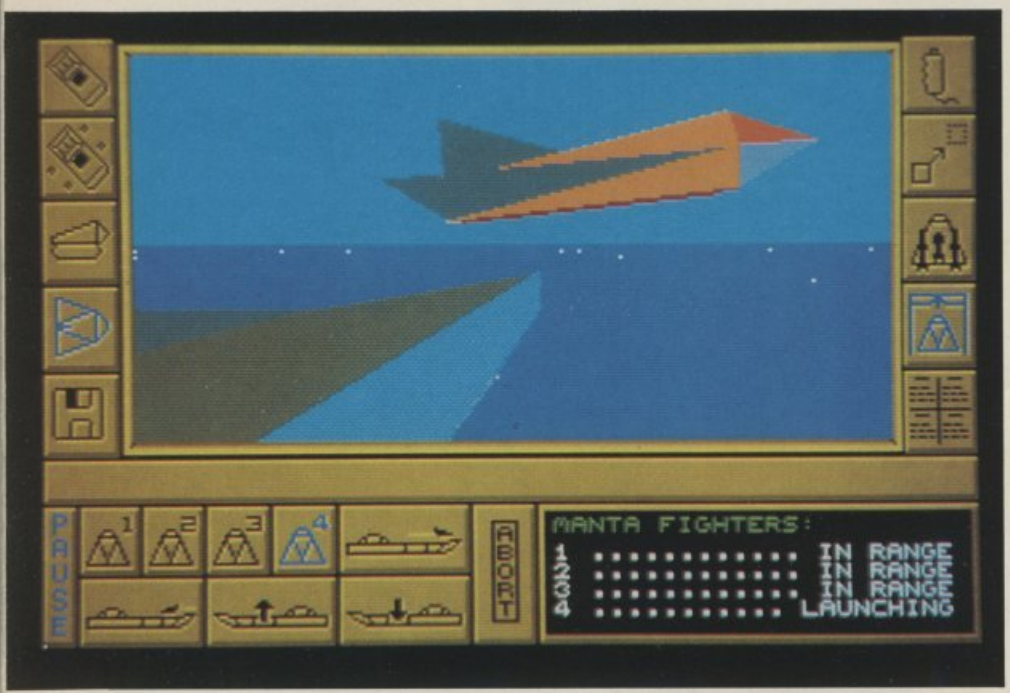
Supplier: **Electronic Arts,**
11-49 Station Road,
Langley, Berks
SL3 8YN
Tel: **0753 49447**
Price: **£24.95**

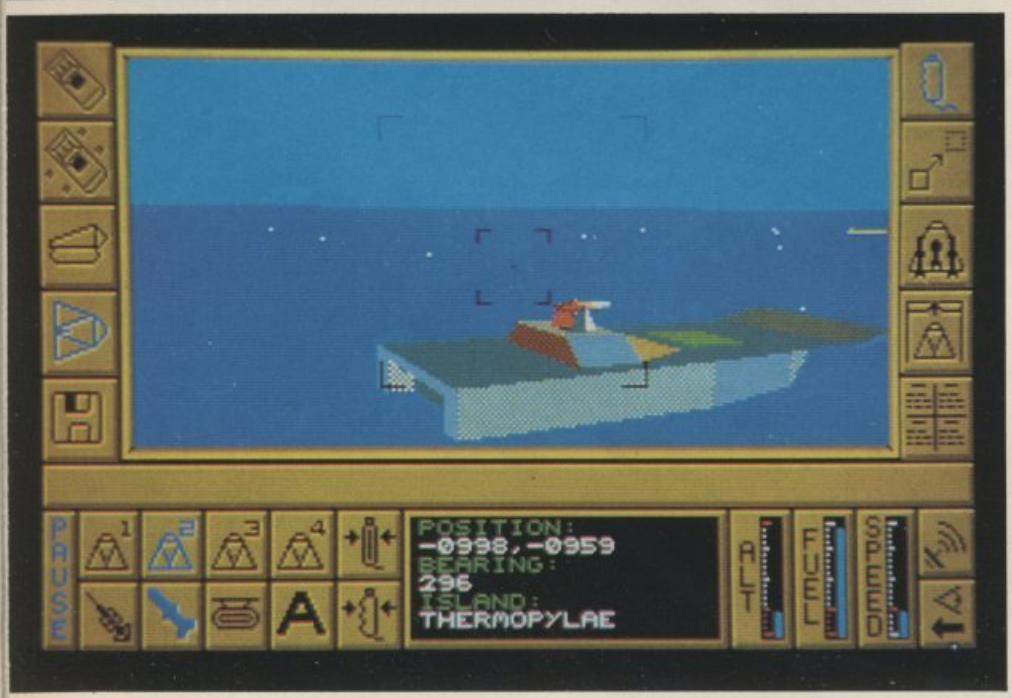


Graphics: **17**
Sound: **12**
Playability: **25**
Value: **25**

Carrier Command

Duncan Evans takes to the sky with this recent release from Rainbird — a high tech arcade wargaming extravaganza of incredible complexity and stunning 3-D graphics (I think he likes it)





So, you thought *Starglider* was fast, you thought *Flight Sim 2* was clever, and *F/18 Interceptor* was the neatest thing since *Defender of the Crown*. Fah! Achievements such as those pale into insignificance beside what is now rolling off the runway at Rainbird in the form of Carrier Command.

Cutting to the bone of the matter, you control one carrier at one end of a chain of islands, while the computer runs the opposing team from the other end. First one to take control of all the islands, or destroy the other carrier, is the winner.

At your disposal are Manta fighters, Walrus amphibious assault vehicles (AAV's), and various weapons pods and missiles to kit them out with. You also have control over a carrier mounted ass kicking laser, which is difficult to control, but can wreak havoc.

However, if you think that winning the game is a simple matter of capturing island after island, and simply swanning up to the enemy carrier, think again. For one thing your carrier will run out of fuel every other island, and for another once you've exhausted your original supply of equpment you have to replenish it. And if you simply embark on an orgy of destruction then the war effort is going to ground to a halt pretty damn quick.

On the map front there is also the option to see the nitty gritty info about the island. Such facts as position, size, who is in control, island type (fairly crucial — see further on for why), distance to base island and distance to stockpile.

While controlling the carrier there are a huge number of features to behold. Radar, depth, fuel, speed and the like are to be expected, but you can get in some target practice with the onboard laser gun. Although it's difficult to see anything while the carrier is moored off a beach, it is possible to magnify the view by a factor of eight. At this point you can make out the various structures on an island, and blow the hell out of them if you can line up the laser targeting crosshairs, which is pretty difficult.

While the laser packs a fair old punch the carrier can defend itself by deploying decor drones, who will swim to assigned positions and wait to get in the way of a low level Exocet style missile attack. Talk about dedication!

For anything coming in higher, pump up a fiew decoy flares, or launch a remote viewing drone, and while it's in the air let loose with a Hammerhead surface to surface missile of your own.

Should the worst happen and the ACC Epsilon takes a few blows on the chin then in the fine tradition of ships at sea, damage control swings into action. A damage status screen shows a rotating wire frame carrier, with percentage rates for individual systems, and the option of graphically cycling through them.

So to the offensive. The Epsilon has arrived at her destination and you're eager to kick the computer commie mutant scum back into the sea. The Mantas are the obvious first choice weapon —

run a few low level strikes over an island to soften up the resistance before sending in the Walrus's (or is that Walri).

Before you do there is an exciting range of goodies to tool it up with. There's the obligatory laser gun to strap on the nose, Assasin air to air missiles for the wings, the fiendishly devastating Quaker cluster bomb which gives its own rendition of Apocalypse Now, and a long range communications pod which extends the range of your craft (as they all are remotely controlled).

After making sure that the Manta has some fuel, because otherwise it just keels over into the sea, take it up onto the deck and launch. Initially it will simply fly round in circles until you take manual control.

This is the part of the game that action junkies will love. It's a solid 3-D world out there, and it's brilliant. Click on top speed and hurtle into combat, laser lashing, missiles mangling, Quaser quashing. But you're just as likely to be blown out of the skies by the missile and aircraft defences. Or even volcanic rock, as some islands have active volcanoes which spew rocks into the sky.

Then there's always the Walrus, which comes complete with ye bog standard laser, Harbinger missles, virus bombs, and automated command centre builders.

Once an island is yours we come to the wargaming crux of the game, and it's at this point the arcade and strategy players begin to turn off.

There are five island types, although there is only one Base island and one Stockpile island. The idea is to create resource islands which will construct mines, rigs, fuel dumps and storage huts before shipping the stuff on to Factory islands. Naturally these take the raw elements and turn them into shiny new weapons and most importantly, carrier fuel.

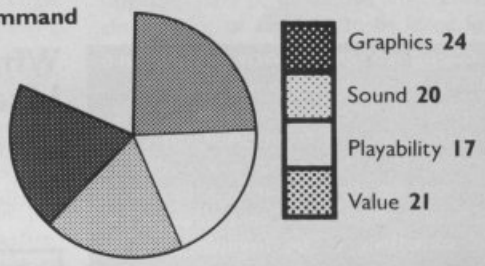
These islands then ship the supplies to the Stockpile island which stores it all. A supply drone then runs continuously from her to the carrier. Unlike the Base, you can nominate any island to be the Stockpile, at any time.

So, as well as directing operations on the assault front, you have to build up a viable network of interacting islands to supply the war effort, and indeed one of the options on the map screen is that of showing the resource network.

Make no mistake, *Carrier Command* demands a high level of commitment from the player, possibly too high for some people, but then it is a seriously fab game and does deliver high lever action and excitement and shows something of what an Amiga is capable of.

CARRIER COMMAND

Title: **Carrier Command**
Supplier: **Rainbird**
Tel:
Price: **£24.95**



Lattice

Lattice AmigaDOS C Compiler, V4.01	£115
Fast and efficient compiler, which includes over 250 standard library functions, macro assembler, and overlay linker	
Lattice AmigaDOS Development System	£215
Includes Compiler, Compiler Companion, Lattice Screen Editor, and Metascope Debugger	
Lattice Compiler Companion	£60
Unix-like Utilities, including GREP, EXTRACT, BUILD, TOUCH, FILES, CXREF, LMK (make), DIFF, SPLAT, and WC	
Lattice Screen Editor (LSE)	£60
Lattice dBC III Library	£85
Lattice dBC III Library with source	£295

(All prices listed include postage but exclude VAT)

Roundhill Computer Systems Limited
Axholme, London Road, Marlborough, Wiltshire SN8 1LR
Tel: 0672 54675 Fax: 0672 54436

For the *AMIGA* MONTHLY MAGAZINE ON A DISK **SEP '88**
Vol. 3, Issue 9, No. 26

JUMPDISK©



"Lou, hold page one! JUMPDISK is here!

and it looks like they got the VIRUS beat! With this radical new virus protection ability you can copy boot blocks of commercial software to a 'safekeeping' disk! What. Lou? Yes of course thate's a program to spot the new virus. VirusX1.5 is the latest and the greatest. And say Lou did you know JUMPDISK is available from George Thompson Services, Freepost, Dippen, Brodick, Arran, Scotland KA27 8BR and still costs only £8.50 inc.

13 PROGRAMS ON THESE DISKS

ANNOUNCING – MEGA DEMO PACK VOL. I
Yes. It's now available! A pack of 7 disks 'brim full' with the latest and greatest demos. The Sound and Visual Effects in this original colleciton are stunning'? The MEGA DEMO PACK will sell an Amiga to even the most ardent ST fan! All for only £19.99 in.

PUBLIC DOMAIN STARTER PACK
Consisting of JUMPDISK DIRECTORY DISK, BEST OF AMICUS (4 disks) and GOLDFISH (3 disks) is still available at only £19.99 inc. There is no better way to find out about Amiga PD.

GEORGE THOMPSON SERVICES TEL: (077082) 234

FIRST WORDS IN C

Mark Burgess continues with his overview of C and explains how to understand structured programs using the basic tools which C provides

Getting to grips with a new programming language means learning to think about programming in a new way. For readers making the transition from BASIC to C this is especially true.The natural way of thinking in C is removed from the immediate and go-ahead nature which BASIC encourages. This is not something to be frightened off by though, learning to program in C is a very rewarding experience and can probably illuminate more about computer programming than years of BASIC program could ever do.

The basic tools of C strongly suggest a way of going about programming which is very straightforward.

The Structure Of a Program

Think about what a computer program is. A program is the solution to some problem coded in such a way that a computer can be made to carry out the spade work of the problem.

Irrelevant details aside, any task can be broken down into a collection of black boxes which each perform some part of the whole task and go together in some way to make up the whole operation. In the same way a computer program can be split up into routines and subroutines which may be thought of as black boxes. One simple way of visualizing a computer program is as a collection of these boxes connected together in the style of an office block. (See figure 1) The boxes may be connected together by pipes so that one box can pass information to another box and vice versa.

Inside each box is a 'manager' who has the task of carrying out his part of the problem. Since this manager is the embodiment of part of a computer program, he (or, of course she) solves the particular part of the problem required and produces some result. Occasionally one manager in a particular box might refer a difficult problem to one of its menials who lives in the floor below. The menial may even refer the job to a sub menial to carry out before the finished task is eventually handed all the way back up to the top level.

A C program works in precisely this way although the jargon for the machinery is different. The 'menials' which perform the basic tasks are called *functions* and the pipes connecting them are made by function calls (*Function* is the standard name for any kind of subroutine in C). Information passed down these pipes is transmitted by variables or parameters and is handed back by what is described as *returning* a value.

What a Function Looks Like

In C, each function has a name and contains a list of commands or statements which are enclosed by curly braces. The basic template is:

```
function__name ()
{
/* statements */
}
```

The opening curly brace signals the start of what is defined to be the function "function__name". The end brace marks the end of the definition.

An important feature to notice about the syntax of such a function declaration is the round brackets (parentheses) after the function name. These brackets must be included whenever a function is referred to in C since they are a way of distinguishing functions from variables. This is the same convention which is used in BCPL. There are many things to be learned about functions: functions are the most important objects in C (It is impossible to write C without knowing the ins and outs of functions.) so we shall be returning to the details

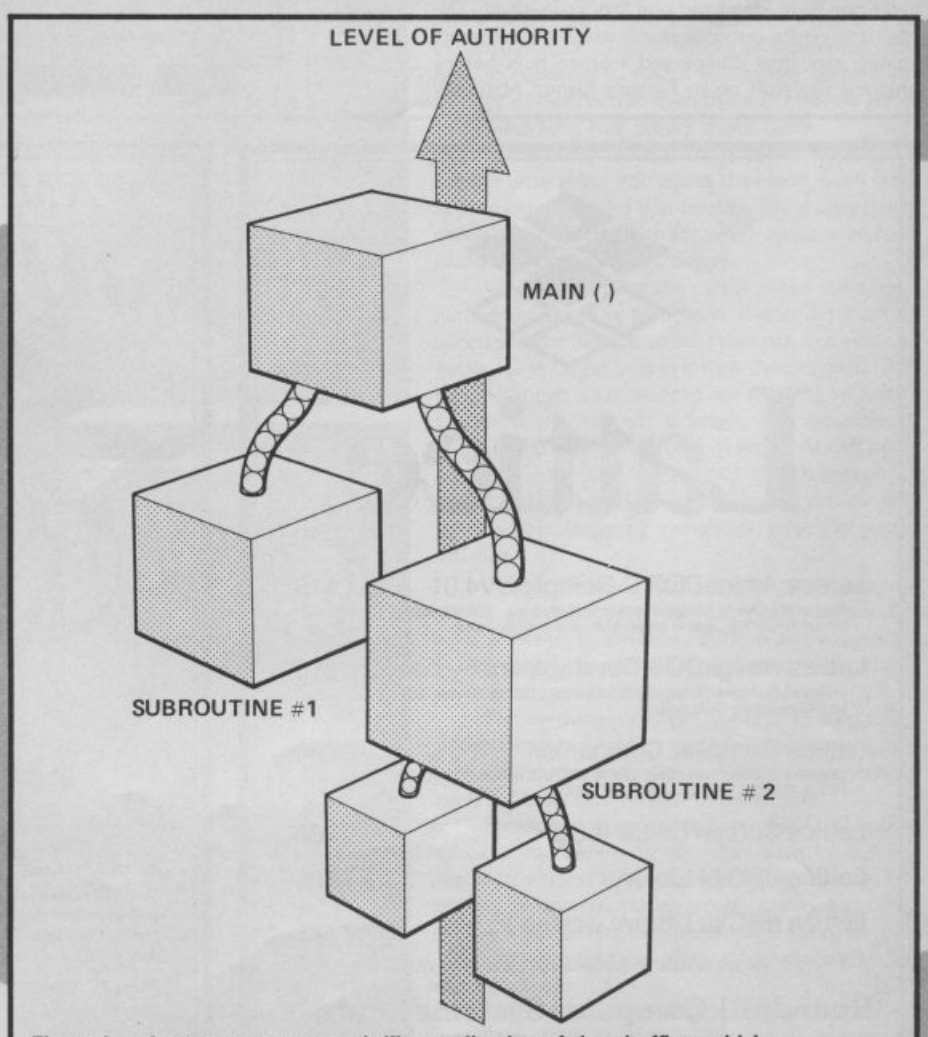


Figure 1 — A computer program is like a collection of closed offices which pass information via pipes. The main program is like the head office.

of functions in due course. Before this it is more useful to consider the rough essentials of a C program.

The Bare Necessities

In order to create a C program there is a basic core of essentials which must be included in order for a program to make sense. The first thing is that a program must contain at least one function. This is an idea which has no parallel in BASIC, because there subroutines are only called in order to branch away from something called a main program. In C, every part of a program is a function, including the 'main program' and so the rule is that every program must have at least one function which has the name 'main()' so that it is clear where the program will start. The very simplest C program which can be written is therefore:

```
main ()
{
}
```

This program is perfectly legal and will compile and run on any Amiga although it does exactly nothing. The next simplest program is one which contains a statement. Statements are listed between the curly braces and every statement must be terminated by a semi colon, which the compiler uses as a double check for nonsensical statements.

```
include <stdio.h>
main ()
{
printf ("Hello world V.99999.../n");
}
```

This program begins at the opening curly brace, prints out the message followed by a 'n' (newline) character and then quits at the closing curly brace. Another simple program is the following:

```
include <stdio.h>
main ()
{
printf ("2 + 2 = %d ",2+2);
}
```

This program and the one before it have something in common,
namely that they contain the include <stdio.h> preprocessor command. This is actually a command to the compiler which means 'include the standard input-output definitions file when you compile this program'. The input-output file is necessary in order to use the printf() standard function. Since input-output is the most useful thing a program can do, include <stdio.h> is usually the first line of every program, apart from comments. Comments are written between by enclosing text between the following combinations of a star and a forward slash:

```
/* ..text... */
```

For example, it is normal to make a banner which describes what a
program is for:

```
/*****************************/
/*                           */
/*    Hello World — V.999 1988    */
/*                           */
/*****************************/

include <stdio.h>

main () /* Geordie version */

{
printf ("Allreet son");
}
```

Variables and Values

In any language it is necessary to have variables which can hold information. Data come in many different kinds: they may be integer numbers, floating point numbers, single characters or strings and a programming language has to know what types data are so that it can use the appropriate code to add them together or to print them out or whatever. In BASIC types are usually indicated by a naming convention: for example the % suffix indicates an integer value and the $ symbol implies a string. C does not use this convention, instead the user must 'declare' what type a variable will be by actually making a list of all the variables and what types they are. Moreover this must be done before the variable is used. For example:

```
include <stdio.h>

main ()

{ int i,j;

i = 21;
printf ("%d/n",i);
}
```

The 'int i,j;' statement means: create two variables called i and j which will hold integer values. Character and floating point variables would be declared as follows:

```
include <stdio.h>

main ()

{ int i,j;
  char ch;
  float x;

i = 21;
ch = 'Q';
x = 2.1;

printf ("%d %c %f/n",i,ch,x);
}
```

String variables are much harder to use in C so will be ignored for the time being.

There are several important points to notice in the program above: the first is that variables must be declared just after the opening curly brace of the function in which they are to be used. The second is that they may be assigned values by using the '=' assignment operator, provided that the thing which stands on the right hand side of the equals sign is of the same type to match the variable on the left hand side of the equals sign. If the objects are of the wrong type the C compiler will complain with a 'type mismatch' error or warning. In fact this might not be a serious error at all, since it is possible to convert variable values from one type to another, but for now you should be cautious about assigning the right kind of value to a variable. For example:

```
float x;

x = 'z';
```

would be nonsense.

Declaring variables is something which programmers who work with compiler languages have to do all the time. There are always a lot of variables to be listed for the compiler and there are several different places in which variables must be declared which imply different things about their nature.

Following a Function Call

Most programs which are not just trivial need to make use of more than one function. Moreover, many functions will need to be supplied with some information in order to operate. Consider the following simple program which makes use of a function called "AddTen()" whose only purpose is to take a value and to add ten onto it and then to hand the value back to the main program. It is useful to follow the events which take place upon running this program.

```
/*****************************/
/*                           */
/*          Add Ten Demo         */
/*                           */
/*****************************/

  include <stdio.h>

  main ()

  { int a,b;

  a = 5;
  b = AddTen(a);

  printf("%d",b);
  }

/*****************************/

  AddTen (number)

  int number;

  { int new__number;

  new__number = number + 10;
  return (new__number);
  }
```

When the program is executed the sequence of events is something like this. Execution begins at the opening curly brace of the function main(). The first thing which happens is that some memory is allocated for two variables a and b. The values of these variables are garbage at this stage, but the next statement assigns the value of 5 to a. The statement after a=5; is slightly more complicated than this: it's main purpose is to give the variable b a value, using the = assignment operator, however it has a sub-meaning also, because the statement contains a reference to a function called AddTen(). This means that, in order to work out the value which is to be assigned to b, a temporary diversion must be undertaken to work out the function AddTen (). At this point then execution passes to the start ofthe function AddTen(). Notice that in the command which calls the function a number is enclosed in the brackets: actually it the the value of the variable a. This value is to be handed directly to the function AddTen() as a so-called 'parameter'. A parameter is a value which the function requires in order to work out its particular part of the program. The first thing which is done on calling a function like AddTen() is that the values of all the parameters which are passed to the function are copied into new 'dummy' variables so that the function only works with a copy which can be altered and abused liberally without affecting the original variable (a in this case). The new variable (into which the value is copied) does not need to have the same name as the original variable: it only needs some name and that name must be written inside the brackets in the definition of the function, so that the compiler knows which variable maps to which new variable.

Once the parameter values have been copied to the function, execution begins at the opening curly brace, whereupon a 'local' variable called new_number is defined. The statement which follows makes new_number equal to the value of number plus ten. Then the statement return(...) tells the function to return the value in the brackets to the place which called it. At this point, control is returned to the function main(), right back on the line in which b is being assigned. Having worked out the value of the function, the expression analyser then calculates a value and assigns it to b. Finally the value of b is printed out and the program ends on the closing curly brace.

In summary, when a function is called, whether it happens to be the main() function or some other subroutine of the main program, the computer follows a basic pattern of behavior.

- Parameters are copied into local storage.
- Space for local variables is created by declarations.
- Statements are executed.
- The function returns to the place which called it, possibly handing back a value.

The Vocabulary of C

One of the quickest ways to 'get going' with a programming language is to look at example programs which others have written. This requires a basic appreciation of the vocabulary which C uses. Tables 1 and 2 tabulate some of the words which are used in C programs.

Programmers of BASIC will be used to a very rich set of words and commands being a part of the programing language. C possess very few words, in fact. The philosophy is to provide only the basic loops and variable mechanisms for the raw language, but then to build up utilities and higher level commands from those basics, supplying them as standard 'libraries' of functions and utilities which programmers can incorporate into their programs. The overall effect is much the same as if the special functions were a part of the language but there is marginally greater flexibility in C's approach, since the user is allowed to write his or her own functions to replace standard ones with restrictions.

Table 1 lists a group of words which form the core of C. They are listed in mainly alphabetical order so that they can be referred to easily. C requires all of these words to be in *lower* case. This does mean that, typed in upper case, the reserved words could be used as variable names, but this is not recommended.

Operators and Arithmetic

A glance at Table two reveals that C's basic arithmetic operators are almost identical to those in BASIC. The integer division uses the single symbols ('/' and '%') resembling the normal '/' divide slash, instead of the words 'div' and 'mod' but they are otherwise the same. A notable exception in Table 2 is the equal symbols. C has two different equals symbols: a single '=' and a double '=='. This is no mistake: do not be fooled into believing that these two objects are just the same thing: they are quite different things. In BASIC, the distinction between the two equals signs is hidden, since BASIC chooses to use the same symbol for two different meanings. In BASIC '=' is used to mean 'let the value of something become equal to....' and also 'true if two things are equal and false otherwise'. One use gives a variable a value, the other compares two values. It is common for compiler languages to use separate symbols for these two meanings of 'equals' since it makes programs slightly simpler to decode. In C a single equals is an assignment statement and the double equals is the comparison. Take care to learn this distinction: there are few cases in C in which advanced uses of these operators could not be mistaken for each other: C allows some unusual constructions which mean that a seemingly illegal use of '=' or '==' could well be valid C statements.

C has a large number of operators for performing arithmetic, bit manipulation and logic algebra. There are far too many operators to list in this article. One simple operator which BASIC does not have is the double plus: ++. For example: the statement

```
i++;

is short for:

i = i + 1;
```

Although this may seem like a trivial addition to the list of operators, it is actually pure beauty in a modest disguise! This simple operator, used in the right context can reduce several lines of ugly looking C code in a single neat line effortlessly. This is an operator which is very common in C programs and one which we shall return to.

Loops

Loops are mechanisms which control the repetition of tasks within a program. All loops, in whatever language, have essentially the same structure: a sequence of commands which is to be repeated a number of times and a condition which decides when the loop will or will not execute statements. C has three specific kinds of loop, listed in Table 2. They are called 'while', 'do..while' and 'for'. The FOR loop is familiar in BASIC, though the syntax of C's for loop is slightly different. The structure of the for loop in C is:

```
for ( statement1; condition; statement2)
{
/* commands ... */
}
```

Statement1 and statement2 may be any statements at all, but in normal usage they represent an initializer expression and an increment expression respectively. For example, the BASIC loop:

```
FOR i = 0 TO 10 STEP 0.01


NEXT i

would translate to

for (i = 0; i <= 10; i = i + 0.01)
{
/* statements */
}
```

Statement1 is executed only once at the start of the loop. Statement2 is executed after every cycle of the loop. Notice that the condition part of the for loop is a condition which is to be true while the loop should execute, as opposed to a condition to say when the loop will stop. The condition is tested at the start of every loop so that, if the test fails, the loop will not even be executed once.

The simplest loop in C is the while loop. This has the simple form of:

```
while (condition)
  {
  /* statements */
  }
```

Here the statements are executed only while the condition in the brackets is true. For example:

```
while (i < 10)
  {
  printf ("words...");
  i = i + 1;
  }
```

This example starts a loop which prints words as long as i is less than 10. If i is not less than ten before the loop begins then the statements enclosed by the curly braces are not even executed once. This is in contrast to the final loop variant called 'do..while'. The only difference between the while loop and the do..while loop is that the do..while loop tests for a conditional termination at the end of the loop, rather than at the start. This means that a do..while loop is always executed at least once. The form is:

```
do
  {
  /* statements */
  }
while (condition)

For example:

do
  {
  i++;
  printf ("words...");
  }
while (i < 10);
```

Decisions

Table 2 shows that C has an 'if' construction similar to that of BASIC. BASIC's

```
IF ... THEN ... ELSE

statement is replaced simply by:

if (condition)
  {
  /* statements */
  }
else
  {
  /* condition */
  }
```

If the condition is found to be true then the contents of the first pair of curly braces are carried out, otherwise the second pair of curly braces is executed. The short form of the if statement is simply:

```
if (condition)
  {
  /* statements */
  }
```

Where C departs from BASIC is in the inclusion of a 'switch' statement. This is a tool for picking one or more cases of an integer or character out of a list of possibilities. The form of a switch statement is:

```
switch (int__variable)

  {
  case 0 : /* statements */
           break;
  case 1 : /* statements */
           break;
  case n : ..
  default: /* statements */
  }

or
switch (char__variable)
  {
  case 'x' : /* statements */
           break;

  }

Switch only applies to integer
variables or character + 1;
```

Although this may seem like a trivial addition to the list of operators, it is actually pure beauty in a modest disguise! This simple operator, used in the right context can reduce several lines of ugly looking C code in a single neat line effortlessly. This is an operator which is very common in C programs and one which we shall return to.

Loops

Loops are mechanisms which control the repetition of tasks within a program. All loops, in whatever language, have essentially the same structure: a sequence of commands which is to be repeated a number of times and a condition which decides when the loop will or will not execute statements. C has three specific kinds of loop, listed in Table 2. They are called 'while', 'do..while' and 'for'. The FOR loop is familiar in BASIC, though the syntax of C's for loop is slightly different. The structure of the for loop in C is:

```
for ( statement1; condition; statement2)
{
/* commands ... */
}
```

Statement1 and statement2 may be any statements at all, but in normal usage they represent an initializer expression and an increment expression respectively. For example, the BASIC loop:

```
FOR i = 0 TO 10 STEP 0.01


NEXT i

would translate to

for (i = 0; i <= 10; i = i + 0.01)
{
/* statements */
}
```

Statement1 is executed only once at the start of the loop. Statement2 is executed after every cycle of the loop. Notice that the condition part of the for loop is a condition which is to be true while the loop should execute, as opposed to a condition to say when the loop will stop. The condition is tested at the start of every loop so that, if the test fails, the loop will not even be executed once.

The simplest loop in C is the while loop. This has the simple form of:

```
while (condition)
  {
  /* statements */
  }
```

Here the statements are executed only while the condition in the brackets is true. For example:

```
while (i < 10)
  {
  printf ("words...");
  i = i + 1;
  }
```

This example starts a loop which prints words as long as i is less than 10. If i is not less than ten before the loop begins then the statements enclosed by the curly braces are not even executed once. This is in contrast to the final loop variant called 'do..while'. The only difference between the while loop and the do..while loop is that the do..while loop tests for a conditional termination at the end of the loop, rather than at the start. This means that a do..while loop is always executed at least once. The form is:

```
do
  {
  /* statements */
  }
while (condition)

For example:

do
  {
  i++;
  printf ("words...");
  }
while (i < 10);
```

Decisions

Table 2 shows that C has an 'if' construction similar to that of BASIC. BASIC's

```
IF ... THEN ... ELSE
statement is replaced simply by:
if (condition)
  {
  /* statements */
  }
else
  {
  /* condition */
  }
```

If the condition is found to be true then the contents of the first pair of curly braces are carried out, otherwise the second pair of curly braces is executed. The short form of the if statements is simply:

```
if (condition)
  {
  /* statements */
  }
```

Where C departs from BASIC is in the inclusion of a 'switch' statement. This is a tool for picking one or more cases of an integer or character out of a list of possibilities. The form of a switch statement is:

```
switch (int__variable)

  {
  case 0 : /* statements */
       break;
  case 1 : /* statements */
       break;
  case n : ..
  default: /* statements */
  }

or
switch (char__variable)
  {
  case 'x' : /* statements */
         break;

  }
```

Switch only applies to integer variables or character variables because it is necessary to actually list the separate cases which switch is to respond to. (This is not reliably possible if the variable is a floating point type.) When a variable is 'switched' into a a switch statement, C looks at all of the 'case' declarations in the list and tries to match one case with the current value of the variable. If it succeeds, execution of statements begins after the 'case n:' statement and finishes at the nearest 'break' statement. If none of the specific cases match then no statements are executed at all. Having said that though, C provides a 'default :' case which automatically stands for anything which has not been listed explicitly in 'case n:' type statements.

Switch is a way of branching out to a given number of expected possibilities. One obvious use of the switch statement is in processing menu selection responses from a menu with options, say, 1 .. 10. ***YA***

Table 1 : Reserved Words

Note that a "d" by the word implies that it is used as part of a declaration.

auto	d
break	
case	
char	d
continue	
default	
do	
double	d
else	
entry	(Reserved for future.)
extern	d
float	d
for	
goto	
if	
int	d
long	d
register	d
return	
short	d
sizeof	
static	d
struct	
switch	
typedef	d
union	d
unsigned	d
while	

also in some implementations:

enum	d
void	d
const	d
signed	d
volatile	d

Table 2 : BASIC vs C

C	BASIC	Meaning
=	=	assign equals
==	=	compare equals
*,/	*,/	multiply,divide
+,-	+,-	add, subtract
/,%	DIV, MOD	integer division
printf ("...");	PRINT "..."	print output
scanf ("...",a);	INPUT a	scan keyboard
for (x = ..;...;)	FOR x = ...	for loop
{ }	NEXT x	
while (..) { }	N/A	while loop
do { } while (..);	N/A	variant of while
if (..) ..; else ...;	IF .. THEN.. ELSE	decisions
switch (..) { case : }	N/A	multiple choice
/* .... */	REM	comment

Input/Output

Input/output is the most important part of programming. A program which has no input and generates no output is about as useful as a chocolate teapot! In spite of this, C does not contain any input/output commands as part of the basic core of C. The reason for this is that input/output (I/O) is a very machine dependent thing and so instead of creating a rigid and useless set of I/O functions (as Pascal has, for example) C provides a cutsom implementation of 'standard library functions' for every system independently. The I/O library contains dozens of I/O functions for writing to console screens or to files and so on. They are too numerous to list here and now. The two main I/O commands are called printf() and scanf() which are high level utilities for creating or scanning formatted data. printf() is capable of generating any kind of console codes, formatted text, numbers in decimal, hexadecimal and octal. scanf() on the other hand can scan a random mixture of strings, integer numbers, floating point numbers or hexadecimal/octal numbers while still being flexible enough to allow the user to trap input errors. The flexibility of scanf() makes it a difficult beast to tackle though: it is easy to lose track of all the information which scanf deals with unless precautions are taken, so that task is deferred to the next installment.

Next Time

Having stretched from the basics of how a C program is put together to some of the main tools which are there on offer it is time to look at some concrete example programs to illustrate the ideas in practice. In the next issue input and output will be examined in detail so that interactive programs can be created, bringing C into the world of real programs.

Strictly for Beginners

Allen Webb starts of a new beginners series by showing you how to design and animate your own icons

■ **Having discussed with you my *trials*** *and tribulations* as a newcomer to the Amiga in the first issue of *Your Amiga* a number of people contacted us to say they were having similar problems getting started. Hence the birth of this series which is intended to give the beginner some quick and dirty ways to get at some of the Amiga's facilities. For the real enthusiast with loads of money, a full set of reference books will provide all the needed information. The average user, however, simply wants to get to grips with the machine and the information provided with the computer simply doesn't help!

In this part I intend to look at icons. I tend to think of icons as a quick and simple method of handling programs or data files. You can easily perform operations such as copying or deleting on files simply by acting on the relevant icon.

So what is an icon? In real terms it is simply a block of data representing a shape along with some other data. This collection of information is stored as a *.info* file. If you look at the contents of an Amiga disk directory, you will observe a number of files with the suffix *.info*. The icon linked to a file has the same name as the parent file with the suffix. The data stored with the icon shape performs a number of functions. First it determines how the icon is highlighted when selected. This can be a simple complementing of the icon colours or a completely different design — more on this later. The data also decides how the icon functions. Several means of operation can be identified:

■ Disk — This type of icon represents a disk (floppy,hard or RAM). When selected it opens the window to the disk and shows its contents.
■ Drawer — This opens the window of a sub-directory or drawer and displays its contents.
■ Garbage — The garbage icon is of a special type. Linked to the icon is a drawer. When you drag icons over the garbage icon, the relevant files are transferred to the garbage drawer. If you click the garbage icon twice, you can see the files held in it. When you click the icon once and select empty trash from the disk menu, the files are discarded.
■ Project — This is a data file created by a program. For example an IFF picture file or a wordprocessor file.
■ Device — Accesses devices on the Amiga.
■ Kick — Activates a non-dos disk.
■ Tool — This activates an executable file.

Most of the time, you will probably be interested in tool,disk, drawer and project files.

In addition to the icon type, it is possible to include a CLI string to configure, for example, the window linked to the icon. This has the form of the NEWCLI instruction or the WINDOW command in the info screen, see pages the manual for more information. You can also change the size of the stack, again from the info screen.

The most important requirement is to establish the function of the icon. If you click the relevant icon and select info you will be able to see which program the icon is linked to.

One useful form of configuration is that you can instruct a project icon to run the application which created it. This approach can often be seen in "Read me" files which call up the Notepad to function. This is simply achieved by inserting the name of the "parent" program in the default tool gadget on the info screen. All programs written in Amiga BASIC, for example, have the default tool ":AmigaBASIC".

Having Fun

Ok, enough of the heavy theory, how can we mess about with icons? There is a wide range of flexibility available to the icon designer — I have seen icons roughly three inches square. Some aids are provided on the disks sold with your Amiga. Firstly, on the *Workbench* disk there is rather rudimentary icon editor. In the tools drawer of your Extras disk there is a program called Iconmerge. I also use a program called Iconmaker sold in the *Gizmoz* package. There are also a number of public domain editors available.

So let us try a sample design session. My preferred method of working is to format a disk and transfer Iconed and Iconmerge to it. To give us something to play with, transfer the Clock icon to the disk. When you use iconed you soon discover its weaknesses, for example, the only way to define the icon type is to load another icon of the same type. This means that you have to mess about getting an icon of the right type before you start work.

Enter iconed and load the clock. Create a new design and save it with a different name — say *Mask.1*. Change the design to give an animation sequence and save the second design as *Mask.2*.

Leave Iconed and enter CLI by double clicking on its icon in the *SYSTEM* drawer. Delete the file *clock.info*. I suggest that you refer to either *Your Amiga's* series on CLI or refer to the manual if you are unsure of how to use it. Exit CLI by entering the *ENDCLI* command.

Start the *iconmerge* program once again by double clicking on it and select *Mask.1* as the first design and *Mask.2* as the second. Save the result to disk as *clock*.

Re-enter CLI and delete *mask.1* and *mask.2*. This step is necessary since the new icons are displayed at the same place on the screen. If you now click the clock icon you should see the designs that you created in action.

Moving Icons

If you use an existing icon to design a new icon, once you save the new icon it will occupy the same screen space as the original icon. You therefore need either delete the old icon as we did above or rearrange the icons.

The Snapshot option in the *Special* pull-down menu that appears when you hold down the right-hand mouse button allows you to do this. This is how:

■ Open up the window to give you room to work.
■ Reposition the icons by dragging them to the required position. Resize the window to that required.
■ Using *extended selection* mode select all icons. (If you don't know how to do this, hold down a shift key as you click each icon letting go of the shift key *only* when all of the icons have been selected. All of the icons will then remain in selected mode.) Also, at the same time as using extended selection mode for the icons select the icon relating to the window. This is necessary to save the window size and position.
■ Select Snapshot from the pull-down menu. The details of the window size, window position and the positions of the icons will be saved. Should you omit to select an icon, it's position will not be saved.

If you want a bit of style you may wish to use drawings created from other packages. *Digipaint*, for example, stores its data files with icons which are miniatures of the original. Again, there are programs around which allow you to do this. The icon maker program mentioned earlier allows you to convert an IFF file (generated by *Dpaint* or *Digipaint* etc.) into an icon. This can then be tweaked using *iconed* to give the result you seek.

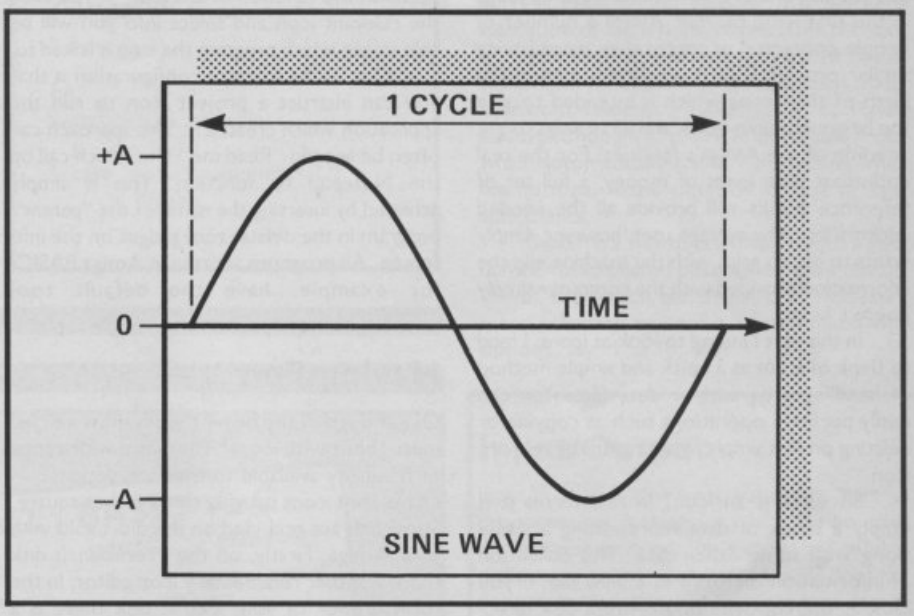
Pretty Pictures

The redesigning of icons may seem a touch self indulgent, but it's surprising how much can be learnt from a little dabbling and if you remember to use a work disk and keep your original safe you aren't likely to do any harm. The use of carefully designed icons also has the bonus of enhancing the user friendliness of your software and appearance of your own software and disk collection. *YA*

FEATURE

Music On The Amiga

In this and succeeding articles Peter Lawrence will be having a look at how to use the Amiga's audio capabilities to produce music. This time he takes a look at the principles of digital audio and how the Amiga handles it.



■ **In order to make the most of sound** and music projects on the Amiga we should first take time out to examine, in a physical sense, just what we mean by sound and music. Although we will be discussing musical concepts in these articles they are not designed to serve as a tutorial in music theory. Should you feel a need to brush up on formal music theory then you should consult one of the thousands of books published on the subject.

Sound, as detected by the human ear, is a rapid variation in air pressure which results in vibration of the ear drum. This is true of all sound but to describe what constitutes music requires this definition to be refined. In general, musical sound requires that these variations in air pressure follow a repetitive pattern. If we plot a graph of the variation of air pressure with time then the resultant *wave* pattern over a short period of time (typically around 0.1 — 10 mS) would repeat itself over a longer period of time (.1 — 1 Second). The classic, and arguably most important example of this, is the sinusoidal (sine) wave shown in Figure 1. If this pattern is repeated continuously at any rate between about 20 and 20 000 times a second it will produce an audible, musical (although perhaps quite dull) note.

Musical sounds can be broadly categorized via three characteristics which can in turn be related to the character of the sound wave and its rate of repetition. Theses three characteristics are Amplitude, Pitch and Timbre and will be treated individually.

Amplitude

The sound wave shown in Figure 1 represents variations in air pressure. The zero level represented by the horizontal line is normal air pressure when no sound is present. This wave causes the air pressure to vary about this normal value by +/- A and this value "A" is said to be the waves amplitude — a measure of how great the air pressure variation is. Amplitude directly relates to the loudness of the sound. The greater the amplitude the louder the sound — although this relationship is not linear. This means that if the amplitude is doubled the sound will not be twice as loud.

Pitch

Pitch is primarily what distinguishes musical sound from noise. The fact that the waveform repeats through time means that the resultant sound will have a pitch — it will produce a musical note. Perhaps the best way to get an idea of pitch is to strike several keys on a piano one at a time and listen to the difference between the sounds produced. Each key produces a different pitch and the further to the right the key is then the higher the pitch produced. Similarly, keys to the left are saidto have lower pitches. This variation in pitch is fundamentally produced by changing the rate or frequency at which the waveform is repeated. The greater the frequency the higher the pitch. Nowadays, musical instruments are tuned to a standard known as A=440. This means that the A above middle C (usually the first A to the right of the keyhole on a piano) should be tuned to a frequency of 440 Hz (Hz = Hertz = cycles or repetitions per second). Thus if the sine wave in Figure 1 is repeated 440 times per second it will produce an A.

A further point on musical notation. As you are probably aware, musical notes are referred to by letters A, B, C etc., but the series does not cover the entire alphabet. Only the letters A to G are used after which they are repeated. There is a reason for this. Although this is not the place to go into a tutorial on harmony suffice it to say that all notes assigned the same letter name have a very special musical relationship — the ratio of their frequencies will always be an integer power of 2. This means simply that if the frequency of an A is 440Hz then the notes whose frequencies are 1/4, 1/2, 2 or 4 times this (110, 220, 880 or 1760 Hz) will also be of pitch A. The difference in pitch between two notes one of which has a frequency double that of the other is what is known in musical terminology as an octave.

Timbre

This is the quality of a sound — whether the note is dull or bright sounding. A good way to get an idea of this is to play something on your stereo and alter the tone or graphic equalizer controls. The character of the sound changes without effecting the pitch of each note (note that tone controls will also alter amplitude). Another way to understand the effect of timbre is to imagine you are listening to a continuous note being played on either a flute or a saxophone. You should be able to tell the difference and identify which is the flute and which is saxophone because these instruments have different timbres.

The thing that most directly effects timbre is the shape of the sound wave. Two notes of equal amplitude and pitch but where one is a sine wave and the other a square wave will sound quite noticeably different.

Representing Sound Electrically

So far we looked at sound only in the form

of pressure waves but clearly when audio is being processed electrically in equipment such as amplifiers and tape decks it is not handled directly in this form. In fact, the audio signal must first be converted from a pressure wave to an electrical wave where, for example, voltage is made to vary with time in the same way that the sound wave varies air pressure. This conversion of pressure wave to voltage wave is exactly the function performed by a microphone and the reverse conversion, back into a sound waves, is the function of a loudspeaker.

Voltage variations are not the only way to represent sound electrically, variations in current or magnetic field can also be used but for our purpose it is sufficient to consider only voltage waves here.

There are two fundamentally different ways to handle anelectrical signal such as this: analogue and digital.

Analogue

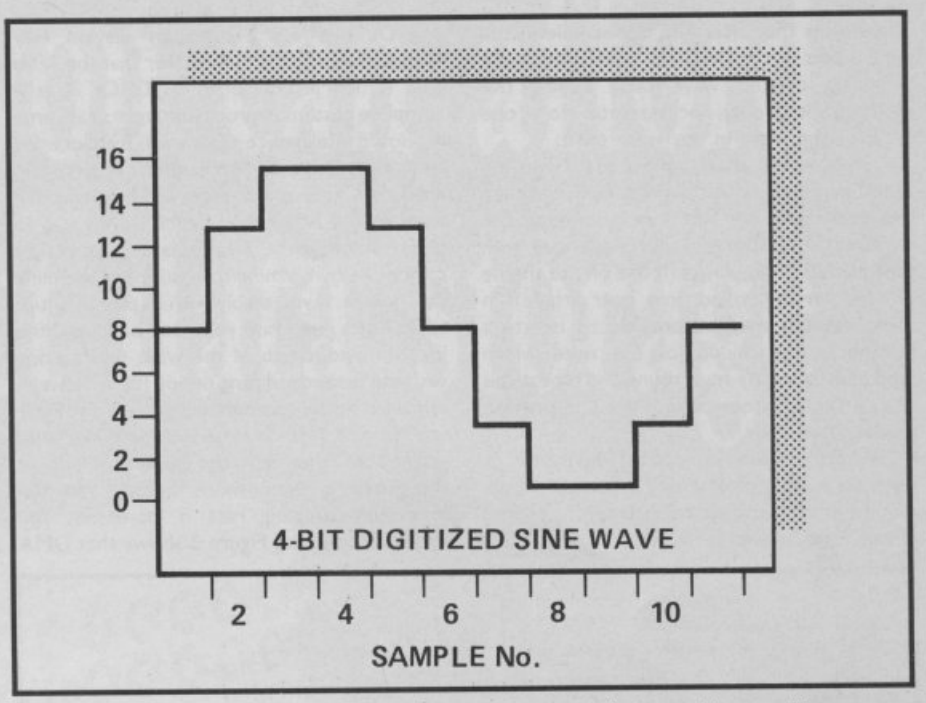
In analogue equipment circuits represent sound waves as actual voltages which vary smoothly with time. If the sine wave of Figure 1 were to be converted into an electrical signal with an amplitude of 1 volt then as the wave passed through the system the voltage level would change smoothly between the two extreme limits of +1 volt and -1 volt. The analogue circuit is capable of representing an infinite number of voltages between these limits. Computers store information in a finite number of discrete bits and bytes and can thus not use this technique.

Digital

Digital is, however, a different approach altogether. A sound is represented not as a continuous wave but as a finite series of numbers. This is done by measuring the voltage/pressure of the wave at regular intervals, converting that into an integer and storing these numbers into an array often referred to as a wave table. This process of conversion is known as sampling.

As an example, if we take a sine wave of frequency 100 Hz and take 10 samples within one cycle of the wave (sample at a rate of 1 KHz) and store the samples as 4-bit numbers the wave would look something like Figure 2.

It doesn't look much like a sine wave anymore and your first reaction might be to think that this is a lousy way to represent sound. The fact is that, were this wave to be output to a loudspeaker it would not be a faithful reproduction of a sine wave. The wave has been distorted due to the "quantization error" — caused by the fact that digital sounds must contain a finite number of samples. However, it is important to realize that as the sampling rate and the number if bits used to store each sample are both increased this quantization error becomes smaller. Although it is true that a digital system can never reproduce the infinite variation of an analogue circuit, this is not significant because the human ear has only limited ability to resolve small differences in sounds. In fact, if samples are taken at 50 KHz using 14 bits then the quantization error will



be indetectable to the human ear. This is why nobody complains that compact discs (digital) have less faithful reproduction than conventional gramophone records (analogue).

Given the upper frequency limit of human hearing is about 20 KHz a sampling rate of 50 KHz may seem small, being only 2.5 samples per cycle. Surprisingly this is not so and, in general, sampling rates in excess of twice the frequency of the audio signal give satisfactory results.

Playback

Up till now we have talked mainly about converting sounds into digital samples but what we are really concerned with here is making music and so we will now look at converting this digital data back into sound.

The normal procedure for doing this is to convert the digital data into an analogue voltage wave and then pass this onto an amplifier/speaker system. This process of conversion is achieved using a digital to analogue converter (DAC). This is a device which receives a binary input of a fixed number of bits and putsout a voltage which is, usually, directly proportional to the value of the binary number.

If the individual binary samples are consecutively applied to the input of a suitable DAC at the same rate at which they were sampled the resultant analogue output can be fed into an amplifier and will reproduce the original sound.

Varying Pitch

While this technique alone can be useful it is rather limiting because it only allows you to reproduce the sound exactly as it was heard originally. However, suppose we have a sampled saxophone playing middle C but we also want a saxophone playing an octave above middle C (i.e. at twice the frequency). We could get another saxophone sample playing the appropriate note but if we were trying to play an entire musical piece with several instruments the memory required to store all of the samples would not be available — unless your bank balance just happens to be about twice as long as your telephone number.

The simple solution is to use the same sample but alter the output rate of the samples. In this case send the samples to the DAC twice as fast as they were collected. In this way any frequency could be simulated. Well... not quite. The problem is that finding the next sample in memory, sending it to the DAC and waiting for the DAC to convert it all take time and so there is a maximum frequency at which the samples can be put out. This places an upper limit on the frequency of the note being simulated. If we have a middle C sampled at 10 KHz but the maximum output rate of the computer happens to be 15 KHz then the note one octave above middle C cannot be simulated in this way.

If this ever becomes a problem then there is another trick that can be used. We could solve the problem by taking an original sample either of a higher frequency or at a lower sampling rate, say 5 KHz. However, this is not really necessary since the same effect can be achieved by using the 10 KHz sample, sending the samples to the DAC at 10 KHz but only sending every second sample. The resultant note would be one octave higher than the original.

Varying Duration

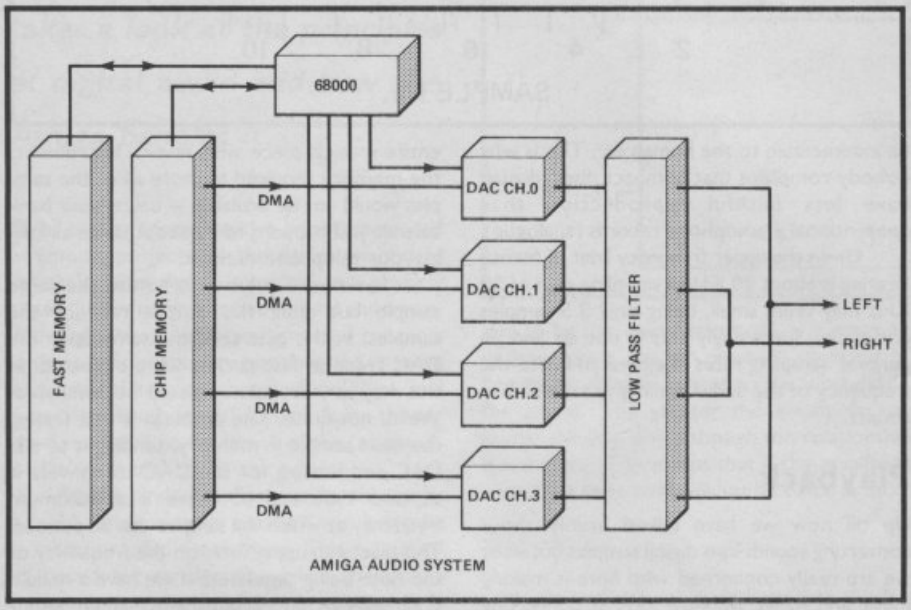
Another problem that can arise is that of playing a note whose duration is different from that of the original sample. The best way to handle this depends upon the nature of the original wave sample. If the sample is a simple repetitive waveform whose pitch amplitude and timbre do not vary then notes of virtually any duration can be played. Notes shorter than the sample are achieved merely by stopping the output of samples before the end of the wave table is reached. Longer notes can be played by wrapping the wave table around on itself.

This means that after the last sample in the table is sent to the DAC just start again at the beginning of the wave table. Using this technique it is only necessary to store one cycle of the wave in the wave table.

If, however, the sample is a real digitized sound such as a note from a saxophone then this technique will not work because the characteristics of the sound are changing with time as thenote is played (more on the theme of time varying sounds in a later article). In some cases it may be possible to isolate a section in the middle of the note which represents a steady-state sound and repeat this several times before playing the end portion of the wave table.

Unfortunately, a detailed discussion of ways to handle real sampled sounds would require much more space than can be spared in this brief article.

DMA offers a cunningly elegant way around this problem. Remember that the Paula chip is not just a series of DACs, it is a complete custom coprocessor and so has some on-board intelligence of its own. By allocating this chip its own DMA channel it is given the ability to access memory without working through the 68000 and hence leaving it free to do other things. The Paula chip also takes care of its own timing to ensure the sampling rate is even. If you simply wish to play an entire sample at a given rate you need only send the location and length of the wave table, along with the desired sampling period (time between samples), to the appropriate registers and Paula will do the rest. In essence there are two processors running at the same time and so the work is done more quickly and the maximum sampling rate is increased. You should notice that Figure 3 shows that DMA channel. By writing an appropriate value to this register the volume may be varied from zero to maximum without altering the wave tables and hence without losing resolution.



AMIGA AUDIO SYSTEM

Amiga Hardware

Figure 3 shows a simple schematic overview of the Amiga music system. The Amiga contains four separate 8-bit DACs (part of the Paula custom chip) which are connected to the stereo audio output. Channels 0 and 3 come out on the left and channels 1 and 2 on the right. At the heart of the system is the 68000 processor which can shuffle and manipulate data between fast memory, chip memory and the DACs but an important point to notice in this diagram is that the DACs are also directly connected to chip memory via special paths which are marked DMA. DMA stands for Direct Memory Access and is a very powerful part of the Amiga's music system. The simplest way to get each sample to the DAC is to have the 68000 load it from memory and pass along at the appropriate time to one of the DACs. This, however, introduces a few complications. First of all you need to set up an accurate timing device to ensure that samples are sent at a regular rate. In addition, and perhaps more critically, while the processor is shuffling the data across it is not able to do anything else. This increases the time required to send a sample to the DACs and thus lowers the maximum possible sample rate.

paths connect only to chip memory (the lowest 512 Kb). This is why wave table data must be in chip memory as the custom chips cannot access fast memory using DMA. Of course it may be possible to get around this problem, should you run out of chip memory, by having some or all of your wave tables in fast memory and having the 68000 transfer it into chip memory as it is required.

There are a couple of other features of the Amiga music hardware which should also be mentioned here for completeness.

Varying Amplitude

We have looked at how to vary pitch and timbre but what aboutamplitude? Well, the simple way is scale down the size of the wave in the wave table by dividing each sample by a constant. The trouble with this is that it reduces resolution and hence increases the quantization error. If an 8-bit sample is divided by 4 to produce a quieter sound then the maximum value in the wave table will be reduced to 64 so our 8-bit sample has all of a sudden become a 6-bit sample. The Amiga offers a convenient way around this. Each of the four audio channels has a 6-bit volume register which sets the overall volume for that

The Low-Pass Filter

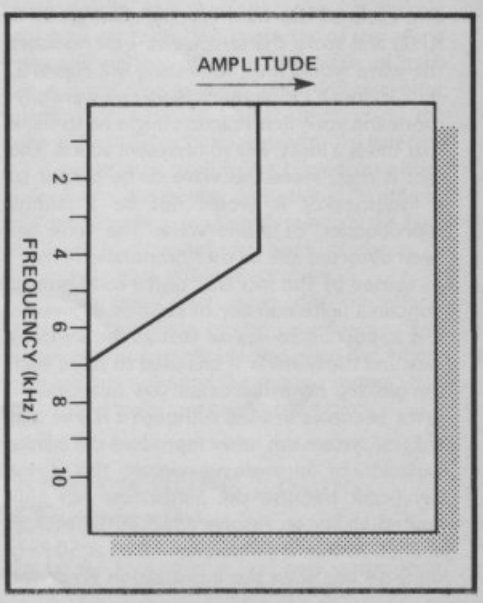
A problem with using sampling to produce sounds is that the sampling rate and the audio frequency being produced can interact (beat) with one another to produce a generally undesirable side effect known as aliasing. When this occurs two additional, unwanted frequencies will appear in the output. One will be the sum of the audio frequency and the sample rate and the other will be the difference. If a 4 KHz sound is produced with a sampling rate of 9 KHz then notes with frequencies of 13 KHz (the sum) and 5 KHz (the difference) will also sound which can end up sounding very nasty indeed.

To reduce this problem the Amiga passes its audio output through a device called a low-pass filter which only lets pass frequencies below a certain cut-off frequency. The frequency response of the Amiga's filter is shown in Figure 4. Any frequency below about 4 KHz is allowed through unhindered but higher frequencies become attenuated (quieter). The higher the frequency the greater the attenuation until about 7 KHz where the sound level is reduced to zero. Frequencies above 7 KHz never get out of the computer.

How does this help stop aliasing? Well the lower of these two undesirable frequencies will always be, naturally, the difference between the sample and audio frequencies rather than their sum. So if you always use a sampling rate which is at least 7 KHz higher than the audio frequency you are producing then the two extra frequencies will always be greater than 7 KHz and hence will be stopped by the low-pass filter. Cunning!?!

Next Installment

Now that we've got an overview of how digital audio works on the Amiga in the next article we look more specifically at how to access these features in your own programs.



Now you can afford perfect data storage



(Available in boxes of ten: 5.25" SS/DD at £7.95; 5.25" DS/DD at £9.95; 5.25" DS/HD at £15.95; 3.5" DS at £17.95; all inclusive of VAT)

The all new range of Commodore Diskettes

Don't risk losing your valuable data. The superb quality offered by Commodore Diskettes ensures perfect data storage, time after time at a price you can afford.

Available now from your local computer dealer



Commodore
The Original Diskette - Higher Quality, Lower Price

Trade enquiries only to SJB Disks Ltd., the officially appointed sole U.K. distributor.

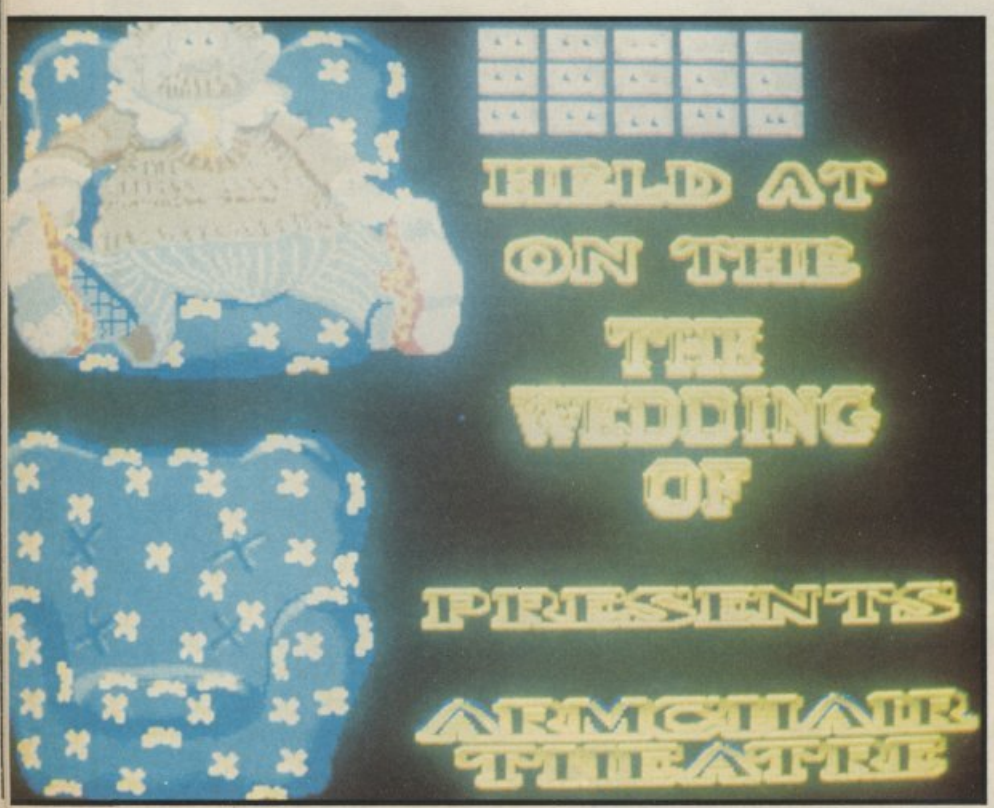
In the Right Direction

Iain Anderson takes a look at an unusual Amiga graphics package or should we say computer language

I have had an Amiga 500 since its introduction and for the last year have used it to produce video titling and videotaped computer graphics. I have made extensive use of Animator, Dpaint, Video titler and other similar packages and am constantly on the lookout for software which will either improve the quality of my output or increase productivity.

The Director is an unusual Amiga grahics package in as much as it makes very little use of the mouse/icon system during the creation of its output. It could in fact, be more accurately described as a language compiler. The language used by the Director is very similar in many respects to some forms of BASIC; it has several specialised commands designed to make full use of the Amiga's graphics abilities.

The Director allows as many screen buffers as memory will allow and you can then load these buffers with pictures from disk. You can switch the display smoothly from one buffer to another and perform a variety of operations on buffers. A lot of the effects possible such as fades and wipes work from a source buffer to a destination buffer and need not be performed on the displayed buffer. It is also possible to use commands on small areas of a buffer which allows, for example, a series of animation frames to be loaded as one single screen (Fig 1) and then areas of the screen. This technique is sometimes refered to as "Partial Page Flipping" and is a very memory cost effective way of creating an animation.



The Director also has commands which allow you to run many "ANIM" format files such as those created by Sculpt/Animate and Forms in Flight. It has the ability to use any Amiga font and this means that large amounts of text can be displayed without storing a bitmap screen for each page. It has built in commands to change fonts, colour and justification of text. It can also stop during the execution of a script and get input from either the keyboard or the mouse, you can then use the input to determine what the script does next.

Within minutes of opening the Director's manual for the first time I was somewhat dismayed as I quickly realised that this piece of software was not going to be the usual "Who needs a manual?" type of program. After skipping through the manual via the example listings I decided to abandon the tutorials given and tackle an outstanding graphics contract which I had been putting off for some time because of problems I had encountered.

The contract was for the production of video titles for a small video company in Edinburgh. The company wanted their logo, three initials, to roll out of the screen in 3D. I already had the thirty odd frames required which were produced with Dpaint and had initially put them together on Animator. The results were jumpy and stretched Animators memory to the limits.

I spent about half an hour with the Director manual finding out about the blit commands and how to load a screen only to discover that the parameters for the Blit command would take me hours to work out and would involve extensive use of graph paper, rulers, etc. I then spotted reference to BLITUTIL, which the manual claimed would handle all this tedious work for me. BLITUTIL is actually a Director script. It asks for background and foreground screen filenames and then allows you to specify with the mouse pointer, an area of the foreground screen to blit and a position on the background screen to place the patch in. The output appears on exit from this utility as a list of parameters in BLIT format which you then copy to a piece of paper.

I set about producing a "Bits" screen on Dpaint consisting of all the frames required for the animation. I decided to try this in the 32 colour Interlace mode, something not possible on most other packages. Having produced this screen I dusted off a copy of Micro Emacs, a public domain text editor from the EXTRAS disk, and got to work.

The first problem I encountered I personally think is a major failing of the director — not procedures. For those of you who are not familiar

with this term, a procedure is a section of a program which can be given a name and subsequently invoked with this name. The result is a much friendlier looking program and one which can be more easily understood. Readers who would like more information on procedures should refer to the Amiga Basic manual.

Where this lack of procedures does not adversely effect the output of your Director script, it does make the production rather more complex in the first place. For example, if you had a section of script which you needed to use at several points, you would assign it a label, e.g. "100" and call it at various points with the line "GOSUB 100". I found some degree of compromise by assigning gosub numbers to labels within the first few lines and using the "GOSUB LABEL" type of format. What this means to any non-programmers out there is that at the start of the script you would have a line "DOTHIS=100" and throughout the rest of the script you could use the routine at label "100" by the line "GOSUB DOTHIS".

This really requires that you always use REM lines at each gosub to help keep track of what is happening. For some people, coming to grips with a fairly unstructured language may not be a problem (EX 64 owners for example!) but any ex Beeb owner like me will cringe.

I used the Director manual for clarification or sintax where required but was surprised at how easy it was and how quickly my script grew. Within an hour or so I had the framework of my script. Labels were assigned, buffers were created and screens loaded. I then started on the gosub which would make use of the list of blit parameters which BLITUTIL had thrown onto the screen for me. This proved to be even more straightforward than I had first thought and with the inclusion of a pause statement between each one I was ready for my first trial run.

After a few hiccups by syntax or spelling errors, I managed to get the animation to run, after several trial and error alterations to pause statements I was happy with the results but disappointed to see some flashing during the multiple blit operations. Consultation with the manual revealed the "Double Buffering" technique, and about an hour later I had the double buffered version up and running with no flashing whatsoever.

The technique used to perform partial page flipping on the Director is very simple to use and can be applied to dissolves and wipes as well. I found BLITUTIL rather cumbersome, but customising this utility should present no problems to most people. I am currently in the process of altering BLITUTIL to allow set box sizes and some form of gridlock feature. I would be simple to get this utility to output to a disk file instead of the cli window, this would mean that the list of parameters could then be inserted into your script rather than having to go through the tedium of copying the numbers to paper and back through the keyboard.

The Director also has the ability to run ANIM format files, I found the running of these files difficult to master. It is easy to see the advantages and flexiblity of the method used to load and run this type of file but I would personally have preferred to have a simple "RUN" command included as an addition to the commands already given.

Some of the other fetures of the Director



which I have not had time to explore as yet could make the software even more powerful than I had at first thought. For example the ability to redirect input and output from the CLI window should, in theory, allow you to get any keyboard input from the RS232. This would then allow you to pass control of your Director script to another machine. You could also redirect CLI output to the RS232 and this should make the control of an active play laservision player also possible. Food for thought!

SUMMARY

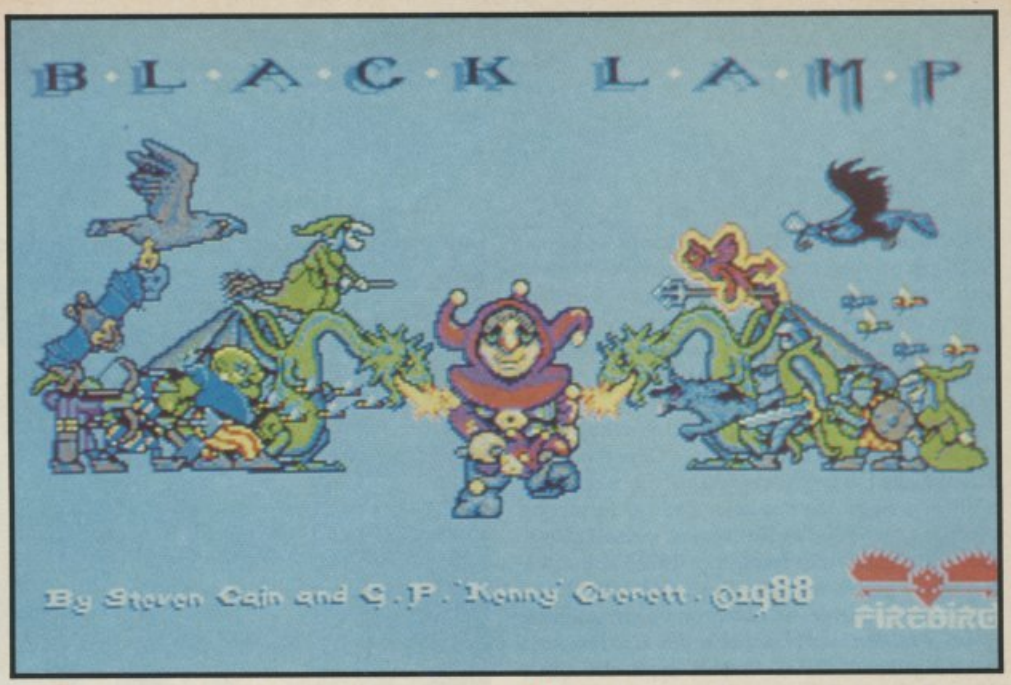
The Director is probably one of the most practical and powerful pieces of software I have seen and more than justifies its claim to be "Professional" display software for the Amiga. It is very reasonably priced and goes down in my book as an essential inclusion to the disk box.

The will no doubt be people who will buy a copy and then complain about the effort required to produce results (or indeed the lack of results!), the program is not magical and cannot create astounding graphcis from thin air. The script based language which many people will critisise as being difficult to master is the very thing that gives the program its versatility and the users who are prepared to invest the time requiredto learn the directors language will be amply rewarded for their effors.

The Director is capable of a very high standard of computer graphics and with the launch of PHOTON PAINT its ability to use HAM graphics will no doubt make it one of the more permanently installed pieces of software available. The ability of the director to interact with the user will also allow the less skilled Amiga owner the chance to buy director scripts which are customised to their own requirements.

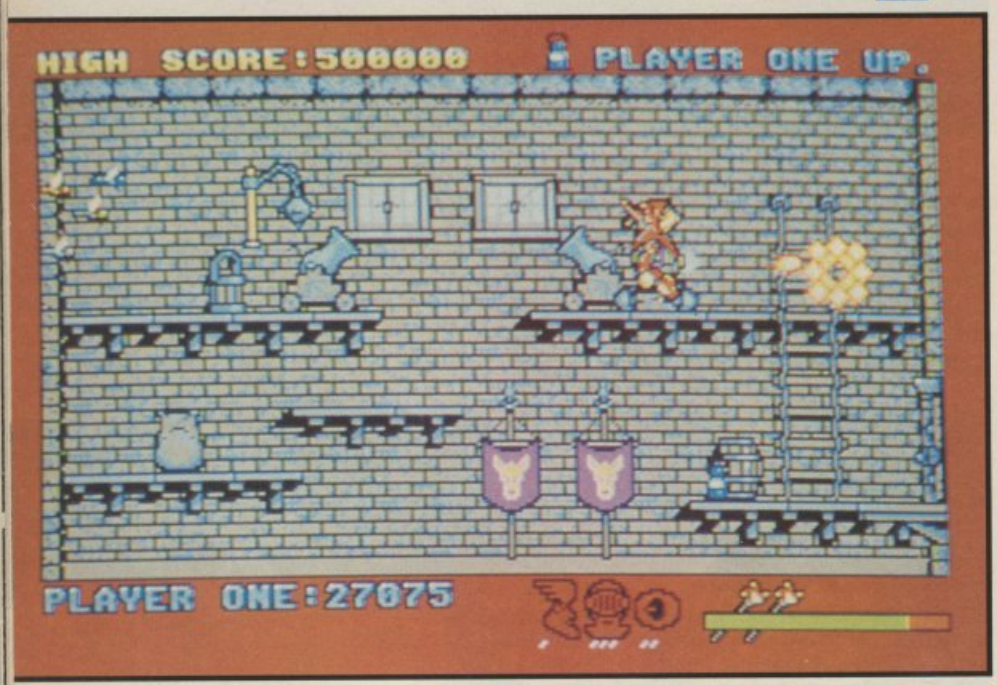
Amiga Centre Scotland
4 Hart Street Lane
Edinburgh
EH1 3RN
Tel: 031 557 4242

REVIEW



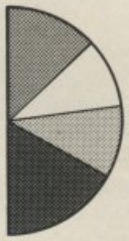
Jolly Jack and his Japes come together to make a jolly time! — at least Clive Grace seems to think so!

Black Lamp



Black Lamp

Publisher: **Firebird Software**
First Floor
64-67 New Oxford Street,
London
WC1A IPS
Tel: **01-379 6755**



Graphics: **13**
Sound: **10**
Gameplay: **10**
Value: **17**

I Must admit, I had actually played *Black Lamp* for quite a while on a friend's Atari ST before receiving my own version for my Amiga! I quite liked the game then but now... ah well, there lies a sorry tale....

You see the problem is that the Amiga version, whilst faster and more responsive to the joystick commands than the Atari ST version is still just an Atari ST conversion with the usual 16 colours, strange fonts (for the lettering) and crummy sound effects — I know Firebird software want to be regarded as the major source of 16 bit games software but really! Converting this sort of game should at least be done with a little subtlety don't you think?

Have a look at our Editor's comments at the front of last month's issue if you want to see what I mean, he has a lot of sensible things to say about the problem we Amiga owners face when presented with converted software. Anyway, onto the game.

An Original Plot?

Black Lamp centers around a character called Jack, he is a court jester by profession, and he is in love with the King's daughter, as is the case with so many fairy tales/computer games.

The problem is that the kingdom is overrun with all sorts of nasty types such as wolves, witches and warriors — all of which are rather nicely animated.

So, the Jester requests that he goes on a quest to find eight lamps, fit them into a grid and thus banish all the baddies from whence they came and thus marry the king's daughter!

All good stuff.

The game proceeds quite nicely when all of a sudden you come across a large dragon (on an Amiga 2000 there seems to be problems with this as it appears half black!) You have to pass him in order to get to the most important lamp — the Black Lamp, and no you cannot run past him, and no if you try, you will get severely frazzled!

The Game is controlled by joystick and the sound effects are pretty uninspiring to say the least, the problem is that I still enjoy playing this game... it has an element of fun added to the game, whilst not becoming too silly and there is certainly no shortage of baddies to ruin your day.

This game is good to play, but it could have been oh so much better had someone put a bit of effort into the conversion, and at least improved the screen a bit. ***YA***

Laser Printing on the Cheap

In the June/July issue I looked at three laser printers priced below £2200 in some detail. This month's article discusses a further five and gives a comparative table of features along with my own recommendations on which to buy.

Canon LBP-8II Laser Beam Printer

This uses Canon's own *LBP-SX* engine (Fig 1), most famouse for its use in the most recent model Hewlett-Packard *LaserJet Plus*. It is in general, well constructed on a substantial metal chassis although there are some fragile looking plastic lugs and some very skinny metal springs. However it is undoubtedly a much more substantial structure than the Ricoh engine. Moving parts are much smoother, such as the adjustable width envelope guides and the catch for opening the clam shell. The flush, membrane-type switches on the six switch main control panel have a pleasant positive click and there is a sixteen character display but you cannot vary its brightness or contrast and it is a little difficult to read unless the light is extremely good. The machine is quite and the paper feed mechanism makes little more than a purr.

There are two speeds on the cooling fan; for a short period after printing has taken place the fan runs extra fast and rather more noisily, but when the machine has cooled sufficiently, it dies back to a background whisper. Paper handling is excellent; even paper which I had deliberately crumpled up was fed smoothly through and ironed out, although inevitably the print quality suffered. I did not suffer a single paper jam while testing the machine even though I was working mostly on once-used scrap paper — a striking contrast to the Ricoh machine.

It sits on substantial rubber feet and comes with dual interfaces fitted as well as having space for two font cartridges (although none were provided for my test). Toner and drum come in a single unit, replacable after 4,000 copies at a cost of £95 which works out at just over two pence per copy (excluding paper and power). The engine itself is rated at a minimum 300,000 copies although Canon estimate it will provide better than this in life-cycle tests. The standard machine comes with half a megabyte of memory and £500 will buy you another megabyte, enabling you to handle A4 sized, bit-mapped graphics.



Figure 1 — the Canon LBP-8II

Features

From such a pleasant and well constructed machine it is therefore rather disappointing to find that it has very unspectacular features. The basic model comes with Diablo *630* emulation only, although if you are using an IBM PC you can get a "printility"disk, which will provided Hewlett Packard *LaserJet Plus* emulation. Likewise the range of built-in fonts is extremely modest: *Courier* (the fixed-pitch typewriter font), in Roman, Bold, Italic or a small-size footnote available in portrait or landscape orientation and in nine languages plus two IBM character sets. However the range of font cartridges is extensive; sixteen are already available plus another ten on the way, each costing £190.

More low cost laser printers to browse through.

Control Panel

The control panel is highly effective but not nearly so simple to use on the Panasonic. The buttons are: on-line/off-line, form-feed and four dual-purpose buttons which, in one mode continue printing after a stoppage caused by an error, print a test sheet or a list of fonts currently in the machine, reset the machine parameters and enter menu mode. And in the other moves through the menu tree, either up or down to another level of menu or "sideways" though the various options on a given level. Setting menu items would be much easier if the handbook was more adequate and gave for example, a menu "family tree".

It covers the basic operations such as selecting the interface, with baud rates ranging up to 19200 and choice of communication parameters, with **ETX** as an option in addition to **DTR** and **xon-xoff.** Saving current printer settings for resumption after switch-off, resetting to factory values, loading fonts from cartridges, switching "Daisy Wheel' which means, essentially, using a different national character set, switching between landscape and portrait orientation. If no bold font is present there is an internal macro that you can use instead and setting page margins and the number of print copies. This, which should be a straightforward task requires quite an elaborate journey around the menu tree and involves a total of some dozen switch pushes in all — most unergonomic!

The system has two niggling faults, firstly, there is no provision for choosing the setting at "switch-on". Instead it automatically stores the current setting when it is switched off. This is rather a nuisance. If the last task of the day is something special the first user the next day will need to reconfigure to normal settings. A better arrangement is one where you save the chosen settings, then need only switch off and on again to reinstate them. The second irritation is that the only way to exit from a given menu level is to find the "exit" menu item. No problem if there are only two or three choices on a menu level but when selecting one of twenty-three different character sets you may have to make twenty-two further button presses before you can escape.

Features

The machine has a generous variety of emulations and multiple character sets. However the range of built-in fonts is rather limited. Without

downloading fonts from your computer, or using font cartridges, you can only get three different type faces and only one of them, a fixed pitch *Brougham* has any variation in size, although it does go up to fourteen point for titles (slightly larger than the Star machine).

The only proportionally spaced type-face, called *Anelia*, is available in twelve point alone; it seemed to me a serious omission that you could not use a ten point, proportional spaced type face.

Font cartridges will cover Helvetica, Times Roman, Gothic, Caslon and Orator. There are not as yet available, although you could always use standard Hewlett Packard cartridges if you do not mind paying their rather high prices. There are few exciting features: you can do a bit-image graphics but no other type and there is no graphics language. This machine is strictly for the standard office environment where there is no demand for special work of any kind.

Conclusion

I felt that this was a good printer and I was not getting fully at its capabilities due to its poor documentation. It is well built and will stand up to all reasonable office conditions. Operating costs are low, but if you want more than the basic range of fonts you will actually pay nearer £3000 than £2000 for the machine with extra font cartridges and extra memory.

Star LaserPrinter 8

Star have performed very well in recent printer reviews so I was interested to see what kind of laser machine they would offer. They have gone for the Canon LBP-SX engine (Fig 2) and even retained Canon's standard control panel, with slight cosmetic changes. They have provided a generous megabyte of memory, with a second megabyte optional, in anticipation of a *PostScript* version, due in the summer. *PostScript* will come on a cartridge, so if you buy the basic machine now no investment will be wasted but prices of this, the memory board and the standard font cartridges have yet to be announced. At the moment bit-image is the only graphics available.

The range of resident type styles (Fig 3) is restricted to those required for standard office use, namely 12 point *Courier*, which is the largest, and 12 pitch *Prestige* as an alternative for office correspondence. There is a fully proportional *Times Roman* with italic and bold and also a 16.6 inch pitch line-printer type face, also available in italic, bold and bold italics. If you want anything more than this you have to gto one of the seven cartridges covering the standard Hewlett Packard range — Pica, Elite, Helvetica, Gothic, Script, Caslon and Orator.



Figure 2 — the Star Laserprinter 8

THE STAR LASERPRINTER 8 - TYPE STYLES

Without cartridges installed Courier

12 point is the largest available

and this is in 16.6 inch pitch Lineprinter typeface

Also available in italic; note the spacing is fixed

and this one is also available in bold *and bold italics*

TIMES ROMAN typeface: only available in 10 point

This is Times Italic; spacing is proportional

and now in bold *and also in bold italics*

PRESTIGE 12 pitch typeface

it can be in italic but not bold

Figure 3 — range of resident type styles on the Star Laserprinter 8

The cartridges will be 512K each, twice the size and holding more fonts than standard HP *LaserJet Plus* cartridges. However the range of sizes is rather limited (six point to eighteen point), with thirteen country character sets. For larger characters and some graphics, Star recommend you contact a company named Fontware, (Fareham 0329-221121) but I understand their product is only usable on a PC clone. The good points about this machine were the control panel and the handbook (I managed to master the former without opening the latter!). The sixteen-character liquid-crystal display, has intensity ranges between 1 and 7 of which 1, the strongest contrast, was readable in any of the lighting conditions in my office. Of the buttons, one is on-line and one is print, one resets after an error, one tests and one resets the machine without cutting power.

My only criticism was that the entry for setting the number of copies is embedded too deeply in the menu. You actually need nine separate key presses to get to that part of the menu. How much better if this could have been put right at the top of the menu tree, as it is so frequently used. Having said that, there are some excellent features on the menu: particularly that there are several ways of saving the settings; factory settings are held in ROM, thus can always be found within the menu structure.

Alternatively you can retain the settings in RAM (as long as the printer is on). You could also save them as the power-on set-up. Probably you would save the standard office correspondence settings in this way, so that unskilled office staff would not have to reset the machine at all. Or you could override all settings by sending software codes from your computer. The machine offers emulations of Diablo-*630*, IBM *Proprinter* or Epson *EX-800*. Most people will probably use the Hewlett Packard *LaserJet Plus* emulation, as it's the most versatile.

Conclusion

This is the best machine I have seen based on the Canon engine. For £2195 you get a first class engine, a very good controller with an excellent control panel and menu system, an intelligent selection of resident fonts for either

office work, detailed tabular work or simple typesetting.

If you need more than this then there is a wide choice of cartridges and the prospect of *PostScript* on cartridge in due course. Its only shortcoming, compared to the Brother *HL-8* is the absence of any resident font larger than 12 point for doing titles. Between the menu, its excellent display and a very good handbook the machine is particularly simple to use and I feel it's good value for money.

Brother HL-8

This is another machine that uses the excellent Canon engine (Fig 4) and again I was impressed

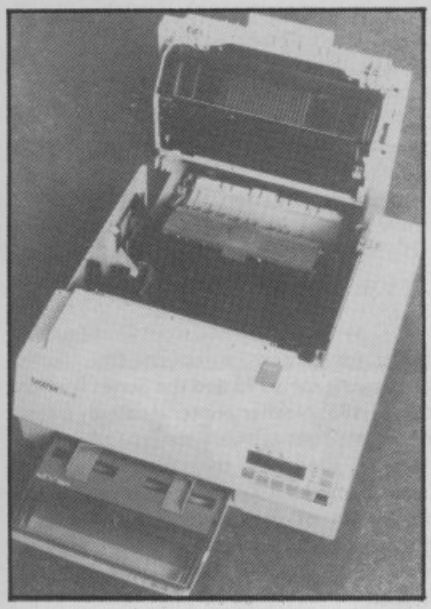


Figure 4 — the Brother HL-8

with its paper handling. Despite warnings in the handbook against doing so, it happily coped with a sheet of A4 paper which had been crumpled and then smoothed out. It also manually fed A4 envelopes, without any of the handbook's precautions (designed to prevent paper in the main cassette stack from being fed) being necessary. It achieved six fully printed sides of A4 in the first minute, taking seventeen seconds to deliver the first one which means the later ones arrives slightly slower than the claimed eight pages per minute.

Conclusion

I was disappointed that Brother, who are normally an enterprising manufacturer, should be so unambitious in customising the excellent Canon engine into a rather dull, featureless, "bog standard" printer. However if you never want to do anything except straightforward office correspondence you will not mind these limitations.

Control Panel

Brother have provided their own control panel with a sixteen character liquid crystal display and eight flush, membraine type switches, each of which has a satisfactory positive click. However the display gave me problems. Although there are seven degrees of contrast, none of them is adequate unless the control panel is directly facing a good light source. The panel is almost vertical so this is quite difficult to arrange.

British Telecom MP 2006

This machine missed the first half of this review due to pressures of time, etc. When put to the test it performed self-test satisfactorily but then manifested two serious defects. The paper select function on the control panel did not work, and if attempted, caused the whole control panel to cease functioning until it had been switched off and on again. The machine would not print. Both the file I transmitted to it and the serial connection were those which I had just used, successfully, on the Brother HL-8, with no hint of trouble, so I felt reasonably confident the machine and not myself was at fault.

You cannot set the printer parameters from the control panel; instead there are old-fashioned dip switches, on the serial interface cartridge. I confirmed that these were correctly set and informed British Telecom. They sent me a new "personality module" ("interface cartridge" in old speak), which corrected both errors and I was at last able to review the machine.

From the handbook I discovered that this machine takes badge engineering yet a further step. Not only does it employ the Ricoh engine (Fig 5), whcih I have criticised in the first part of this article (see last issue) for frailty, but it **is** actually the OKI *Laserline 6*, with a British Telecom badge replacing the OKI badge on the front.

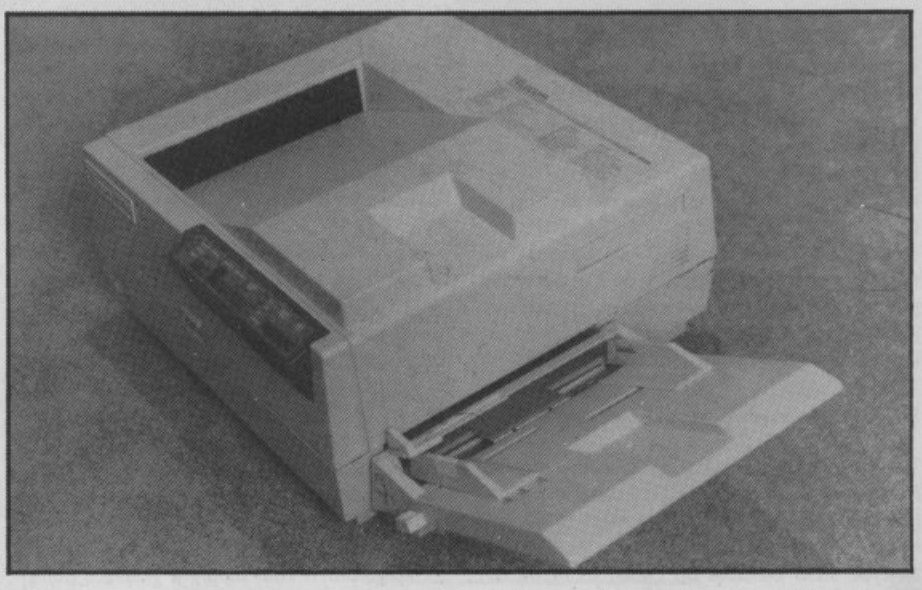


Figure 5 — the British Telecom MP 2006 is actually the OKI Laserline 6

Because it is in tended for use with British Telecom PC-compatible computers is not a wise choice for other users, for the following reason. If you want to alter the emulation, font, paper orientation or layout or any of a number of matters, then you either use a PC program called *Laser Control*, which configures the machine for you without tears or else you must transmit raw Hewlett Packard LaserJet Plus escape codes from your computer. There is no way of doing these things from the control panel. As explained above, the control codes are pretty nasty; you really want a bit of friendly software to handle them for you.

The control panel is the least versatile and least helpful of any of the printers I tested in this review. It contains nine indicator lights which show paper size, manual or automatic paper feed, whether the machine is ready to print, whether it is on line, whether toner or drum needs replenishment and whether a form feed signal is required. Then there are five buttons for: switching on and off line, to resume affairs after an error message, form feed, paper selection and self-test.

Conclusion

This machine combines the poor design and manufacturing quality of the Ricoh engine with extremely limited control functions and, if my personal experience is typical, chronic unreliability of operation. Yet it is priced at the £1900 mark. I would not recommend it for any would-be purchaser but it is particularly unsuitable for BBC or other non IBM PC compatible users.

And to sum up

I had expected that this review would be difficult to complete: with so many models of printer I had expected there to be little to choose between them. i could not have been more wrong. The Panasonic *KX-P4450* is the best by by a staggeringly large margin. It is priced within the same range as others and cheaper than many, yet operates at significantly higher speed, is much more solidly built, has two generous input cassettes, a superb menu-operated control panel with a liquid crystal display that you can actually read in normal office light and the promise of *PostScript* without loss of your existing investment within a few months.

Of the other machines, those what use the Canon engine, notably the Star *LaserPrinter 8*, the Brother *HL8* and the Canon LBP-8II are well made and operate well at or slightly above eight pages per minute. I regard the Star as the best of the bunch.

Epson GQ-3500

Jon Vogler regrettably had trouble getting a GQ-3500 from Epson. The following is therefore based on Jon's assessment from seeing the printer at the Which Computer Show and your own use of the GQ-3500 over the past six months.

Construction

The *GQ-3500* uses the same Ricoh engine as the Olympia, Oki and Ricoh models, but there have been some modifications, made to Epson's own specification. The moulded paper-out tray on the machine lid is distinctively grooved and the cooling louvres on the delivery end of the machine are altered. This makes the end-panel extremely flexible.

The machine has many of the defects that I have pointed out on the Ricoh engine, in particular those associated with the frailty and lack of smoth operation of the paper input hopper (See Figure 8 but not that it was taken on the British Telecom machine). The built-in interface is parallel and an RS-232 interface is optionally available.

Control Panel

The control panel is reduced to various indicator lights plus five buttons and a two-digit status display. One of the buttons is used in combination with an optional 250-sheet paper loading tray which can be used in combination with the standard 150-sheet tray, to give double-bin feeding. One of them controls **on-line** and **off-line** and the others operate **error recovery, form feed** and, in conjunction with the fifth shift key, a "Selec-Type" system, not dissimilar to that familiar from Epson dot-matrix printers. With these you can alter the print font, number of copies to be printed and paper size or orientation (portrait or landscape).

Fonts and Emulations

The only built-in emulations are HP *LaserJet Plus* (which comes on a ROM card or Epson (the LQ2300 not FX80); *Diablo 630* emulation is available as an option. There is a wide range of type sizes available on cards, from six to twenty-four point, but only four sizes built-in: *Courier* -12 and a compressed (8.5 point) line printer mode using HP LaserJet Plus emulation and ten point *Courier* and "EDP" mode using Epson emulation. All the other fonts: *Prestige, Helvetica, Times Roman* and various others require font cartridges and these are expensive. Like emulation cards they cost £125 each and do not necessarily contain very many extra fonts. For exmaple you pay £125 for Helvetica in sizes between eight and twelve point, plus Helvetica Oblique in ten and twelve point, but that only gives you landscape mode: if you want the same in portrait mode you have to pay another £125!

There is a vector graphics facility, as well as bit-image graphics, but its command range is strictly limited, production of circles or arcs, straight lines or boxes and the ability to paint an area with various sorts of in-fill. Standard memory is 640K with two megabytes optional memory upgrade available, which suggests that a *PostScript* version is planned. The two megabyte memory upgrade costs £440 extra, as does the 250-sheet input-tray. Price of the basic machine is £1795 with another £95 if you want a serial interface.

Conclusion

it is the cheapest laser printer currently available. Nothing that I have seen leads me to suppose that it is significantly superior to the other machines that use the Ricoh engine and the controller appears to offer far less than the excellent board on the Olympia *Laserstar 6*.

Datathorn Support

The Epson GQ-3500 is now the best selling laser printer in the UK, after the Hewlett Packard range, and it is therefore beginning to attract a range of support essential for BBC Micro owners. Due to the work done by Datathorn, BBC owners can obtain a range of downloadable fonts which compare very favourably in price with both Postscript and Hewlett Packard fonts sold to business users. The BBC Micro lacks the range of software which can directly call up these fonts but flexible programs such as Interword, in which *escape* code sequences can be edited, can select and swap fonts from within a document.

Datathorn provided us with an assortment of Times Roman and Helvetica style fonts, from a total of 39 now available. The data is sent to the printer via a loader program and the fonts are then available for selection. The larger font designs have real impact — there's nothing like them for dot matrix. The proportional fonts are very attractive. Tabulation in a word-processor will not work well but the printer's own tabulation facilities can be used to line up columns.

Datathorn also supply a graphics dump program which can get around the problem of having no FX80 emulation in the GQ. Your old graphics dumps won't work with the Epson GQ so Datathorn's QstDmp program (£12.50 + VAT and £3.50 P&P) is essential. Saved mode 1 screens (Mode 0 for the Archimedes) are sent to the printer memory for printing via the usual escape code commands. The dump can be scaled and positioned and initiated from within a text file. You can even overlay text onto a graphic. Like the fonts, QstDmp is easy to use via on-screen menu options.

Taking advantage of the GQ's line drawing abilities, is a neat forms program for both BBC Micro and Archimedes. Also announced is a label printing package. Upgraders will find that label printing programs designed for the "Epson compatible" dot matrix printers do not work so this product will be welcome for business users.

Using the Hewlett Packard LaserJet Plus emulation, it is possible to dump graphics from a PC package running on Master 512 or Archimedes PC emulation. Anyone wishing to use PC desktop publishing packages however will certainly need to invest in the memory upgrade for the GQ.

Details of BBC fonts and software from Datathorn Systems Ltd, George House, 50 Sprint Grove, Loughton, Essex IG10 4QD. Tel: 01-508 4904.

Crystalprint WP

From Crystalpring and also from Qume (under badege manufacture) comes the Crystalprint WP retailing for £995 and the Series II which costs £1,495. Neither printer is actually a laser printer but both use very similar technology.

Both models in the range employ the Casio liquid crystal Xerographic engines which sport many of the advantages of its laser counterparts but does the job in a much smaller space which makes the whole thing far cheaper.

The Crystalprint is straightforward to assemble and to use. The documentation is split up into two manuals; a 140 page getting started volume and a reference manual of similar proportions, both chock full of useful diagrams and charts.

Graphic resolution is 300 dots per inch and page speed is just under five pages per minute including start up time. The only obtrusive noise is the fan which soon fades into the background.

As I mentioned before this unit is much smaller than a laser printer as it measures some 16×13×9 inches and doesn't have loads of obtrusive trays for paper so the unit could sit quite happily next to your terminal just like a standard dot-matrix model.

Both versions feature Diablo 630 ECS and Qume Spirit emulation and have the option of further emulations and fonts via rom cards.

The Series II offers HP Laserjet series II emulation along with both Centronics and RS232 ports and has a 512K memory (expandable to 1.5 Mbyte) which, in effect gives you a Hewlett Packard equivalent and for about £500 cheaper.



Street Fighter

Around the world in eighty thumps with Darrin Williamson

After all the Kung Fu simulators that have been and gone we now have *Street Fighter*, yet another coin-op conversion based on yet another game that involves two people beating the hell out of each other.

Like *Fire and Forget*, *Street Fighter* tries to add variety and interest into a game by putting the same game into different areas around the world. In this case the UK, China, Japan and the good ol' U.S of A.

Each country has two adversaries which you must beat in order to move on to your next destination. To beat an opponent you must win two out of three bouts which simply entails draining his energy before he does the same to you.

As with most of these sorts of games you have 16 control options. Eight with the joystick button depressed, eight without. Not surprisingly your offensive options (punches, kicks, etc) are those that require the action button. One of the best tactics seems to be doing a forward flip and kicking the enemy in mid-air.

Each of your adversaries has different characteristics so that the combat doesn't become too robotic. Your sparring partners vary from little old men in Japan and Glave wealding Ninja in China to Head-butting Punks in the UK and powerful Black Bruiser on the streets of the States.

You can select which country you start your battle and have a bonus round with each subsequent nation which entails busting through as many roof slates as possible. The more slates you knock your way through the more bonus points you get (and what do points make?).

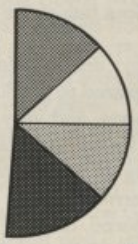
The backgrounds are nicely done. Each one is about three screens in length (scrolling horizontally) so you've got plenty of room for manoeuvre. The actual choice of backgrounds suggests to me that the programmer was from the East due to the fact that China and Japan are pictured with ornate Pagodas and the bright lights of a big city, whereas both the UK and the USA look like a demilitarised zone or something out of a Mad Max film.

My main criticism of this package was the slowness of the action and animation. This suggests to me that it has just been converted from ST format which means of course that none of the areas that the Amiga excels in have been utilised. This is a shame really because I would have thought that the public would want the best that their machine can offer, not the best of its next nearest rival.

In short an average game that is really only recommended to ardent fans of the coin-op or those without anything similar in their collection.

STREET FIGHTER

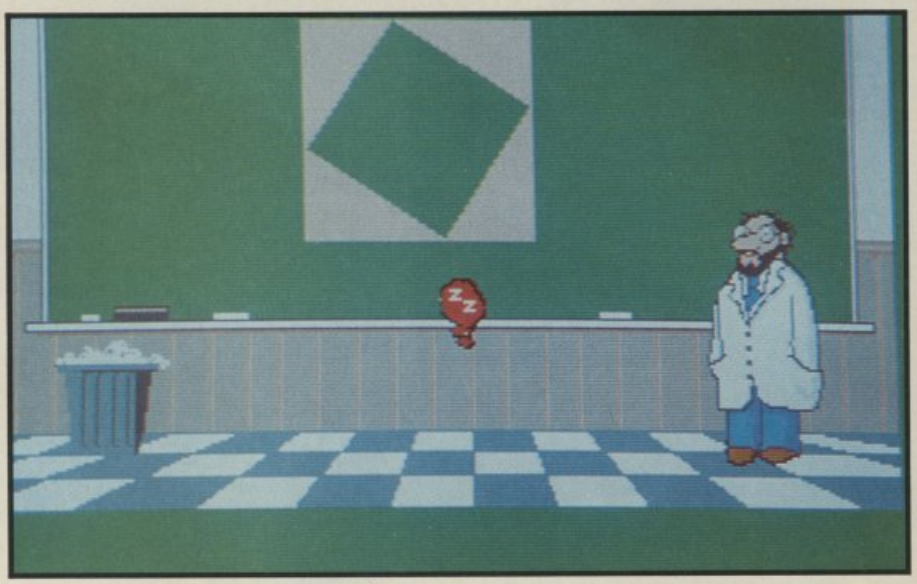
Title: **Street Fighter**
Supplier: **CapCom/US Gold Ltd**
Units 2-3, Holford Way,
Birmingham B6 7AX
Tel: **021 356 3388**
Price: **£19.95**



Graphics: **13**
Sonics: **12**
Gameplay: **11**
Overall: **15**

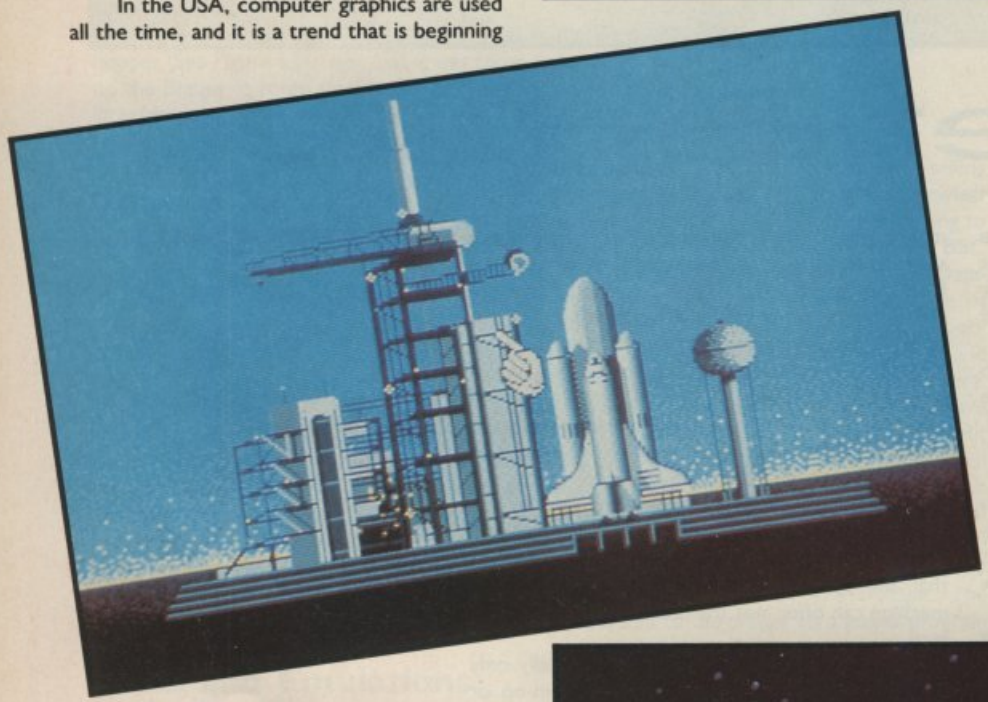
Deluxe Video

An in-depth look at Electronic Arts' latest package — Mary Branscombe finds out how the Amiga killed the video star!



Of the many applications the Amiga has really taken to like a fish to water, surely the most exciting application must be that of video production. The next time you watch the evening news, look out for the animated graphics in the weather reports, The BBC still use the more or less defunct Lisa system to control their system, whereas ITV and Channel 4 have a specific graphics workstation they use to generate their images — which is a good deal more flashy than the Beeb's!

In the USA, computer graphics are used all the time, and it is a trend that is beginning to filter through to some of the satellite TV channels. The channel identification numbers, film introductions, even the listing of what is to be shown that evening are often generated by computer, and why not? Drawing out the letters and overlaying them onto a video image is a time-consuming and tedious task at the best of times.



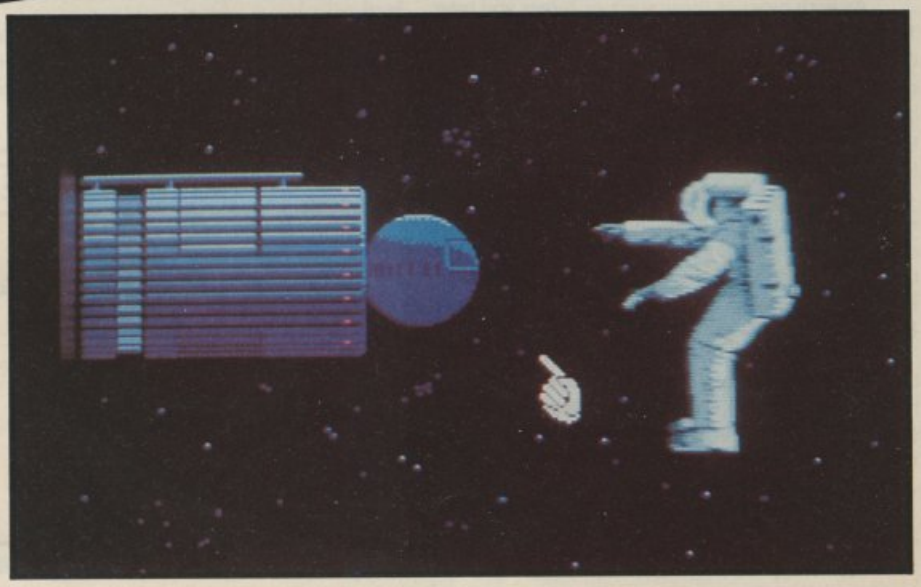
It is a job that is always understaffed as animation suites are more geared to producing advertising films and cartoons, and very few talented staff can be found demeaning themselves with something as uncreative as "intro drawing" (as the term is called).

As you may have gathered, drawing title images etc. is much like creating a cartoon image. The image is built up out of individual cels (jargon for cellulose sheets that are transparent), building up various "layers". Using this type of system items in the animation sequence can be changed without having to redraw the whole lot.

By using computer generated graphics, you can create effects in a fraction of the time it would take you using more traditional methods. For example, you can make a text string appear to spin or rotate in a representation of three dimensional space without having to calculate each and every angle change, and then draw them in in by hand.

You can use the computer to create more traditional video images, such as an image "wipe" without having to draw 25 frames for each second, calculating the density of "fogging cels" needed to wipe from one image to another, in cartoons, the wipe is possibly one of the most popular effects, and is used all the time on "hard cel" cartoons such as "Thundercats" or the many 'toons developed in the Walt Disney home entertainments suite.

To this end, *Electronic Arts* has created





a new productivity tool that makes it easier to create business presentation graphics, animation sequences, titles and credits for your home videos, you can use the package to create a variety of special effects for a multitude of applications. You don't even need a video camera, in fact, all you need is a reasonably good video recorder.

Deluxe Video is the title of the package, and it lets you use images from other graphic tools (such as *Deluxe Paint, Deluxe Print, Digi Paint, Sculpt 3D, Ray Tracer and Aegis Animate*) to make your own videos — you could even use the "Deluxe" family of packages together to create your own rock videos, and this is exactly what I started to produce after a solid month and a half "playing" with it, but more of that later!

Because Deluxe Video can do so much, it is important to be aware of its many capabilities. Even though you may have only one or two particular applications in mind. *Deluxe Video* is a big product and really needs at least two drives, a memory expansion, and a Genlock unit. A hard disc would be useful as well, but we can all dream can't we?

The Package

Deluxe Video is a three disc package dividing the video production system up into three different packages: Maker, Player and Utilities. Each disk is supplied crammed to the brim.

The Maker disc makes your Amiga behave as if it were a camcorder — it lets you record and play back images like a videotape.

The Player disc, as its name implies, is a playback-only utility, and lets you distribute your images to your friends or associates — it is very much like a "run time" system for your Maker images.

The third disc, *Electronic Arts* call it an added bonus, is the Utilities disc, containing an important package called the Framer. This is a simplified animation package that makes it possible to build up frame-by-frame sequences easily and quickly (in much the same was as the manual "Cel" animation I was talking about earlier).

Contrary to *Electronic Arts* belief that the Utilities disc is "an added bonus" I would say that this package is pretty damn useful, certainly more useful than some of the features in the Maker package!

On the Player disc are a number of demos, boot them up, play with them (using the manual's tutorial) and then delete them. On your copy of the disk of course (never use original disk always use copies whenever possible), they take up quite a bit of space on the disc, and you are going to need some spare discs when you start making your own videos.

The urge has never been so strong as to jump off into the deep end and make your own "The Last Starfighter" — type epic. The results, if you're really lucky, will look more like "Steamboat Willy"!

Booting up the Demo gives you a list of the possible uses for *Deluxe Video*. To the layman and the beginner alike, this package is a fine example of the Player package in action. You are given a selection of videos to load and run (all are quite heavily compacted, so that the fit on the disk.

One of the first things you will see is a small window — but with a difference! This window has no resize gadget, even though it has all the other usual ones (front to back, a drag bar and a close box gadget). This, ladies and gentlemen is the most important feature of the studio itself, this is the Remote Control window.

Like most domestic video recorders, the Amiga video production studio has a quick and easy way of queing the "tape" to the right place, there is a "skip" option as well as a fully blown "Timer", the system can have timecode numbers displayed on the screen, but as the number is irrevocably linked to the remote control unit, then I would just leave it on the remote control so as to make things easier.

With a little effort, this unit can be linked to the remote control on the interface port on your own VCR. This feature is only available on the more expensive video recorders, sadly, this feature is non-existent on the early English models (such as the first VHS and Betamax) but if you are really enthusiastic about making videos on your Amiga, then the U-Matic systems are tailor made for this kind of application.

There are some applications that do not really work at their best when using VHS or Beta such as "stop motion video" — although of the two domestic systems, I would really recommend that you use Betamax as the picture quality is better, the tape handling is far more reliable, and good (albeit secondhand) recorders are so much cheaper. You can pick up a a Sony C9 — the semi-professional model — for around £50! if you keep an eye out in your local papers. Of course Beta is no longer a viable domestic system in Europe some duplication labs are no longer set up to read Beta and some companies no longer release on Beta. A shame, but then that's life.

Speeding Up

If you have more than 512K of RAM on your Amiga, then *Deluxe Video* uses the additional memory as a RAM disc. This not only has the effect of speeding up access dramatically, but it also has the added advantage of ensuring that the files and data are all held in one place in memory at the same time. When finished with your production you can drag the whole RAM disc across to another disc and save all the files in one quick step.

The result of using a RAM disc is a video that runs faster and more smoothly, so make sure that videos written with the RAM disc in mind are loaded from your "User" disc back into a RAM disc. This is not difficult to set up from the CLI even though the manual doesn't help much here.

In order to bring across some of the fundamentals of video production, I am going to have to explain it in terms of video jargon. Have a look at the Glossary if you come across words you don't understand.

Deluxe Video, like all pre-production storyboards in an animation suite uses a hierarchial structure. This means that you can

move from the macroscopic to the microscopic through a series of layers, each with its own complement of tracks and effects.

The highest level of any hierarchy is the *Video Script* — in many studios, this is called the *storyboard*, but because what we are working with is, in fact the storyboard, some differences have to occur!

The Video Script is the basic blueprint of the story, and all film makers are using the storyboard technique these days — a good habit that has well and truly come back in fashion now that actors and sets are having to interact with special effects more and more. Take a look at a picture book called "The Art of The Empire Strikes Back" if you want to see how detailed a storyboard really is, and compare it to the finished film.

The Video Script consists of four types of blueprint window: Background, Foreground, Control and Music. Music is handled using Deluxe Music and can have four tracks within that group. Each track can be spliced onto the main video, so that the additional elements "round out" the visual display in much the same way that a video is "cut into shape" on the cutting room floor!

Each track is built up of *Scenes* — much like the scenes in a play, and can be opened up to reveal the Scene Script — the next level in the hierarchy.

The Scene Script plays a similar role to the Video Script in that it lets you storyboard the action as a function of *Time* and is built up of individual tracks that all come together at the end of the day to make elements of the final video. At the moment, *Deluxe Video* recognizes up to eight different kinds of tracks at the scene level which is normally more than enough for most applications.

Moving further down the hierarchy, the Scene Script is made up of Effects which, through the use of requesters, control the specific details of the action taking place on the screen; for example, the afore-mentioned *Wipe* effect replaces one image on the screen with another, but the particular way it does it is through its own requester.

If you thought all this is a lot of hard graft, then you would be right! There is a lot of work and planning to putting your video together for the first time, but imagine for a moment how many people it would take to hire just to put together a script and a storyboard with a complete inventory of effects that fit into the budget you have specified. With the use of requesters, you can, in effect, increase the "budget" of your video in specific places except the trade-off in this case is not money, it is speed.

The Utilities

Now we have looked at the Maker package in some detail, it may be a good idea to have a good look at the Utilities disc, and see what it has to offer the director.

The Framer was the first package I used. Essentially it is an animation utility that lets you create animated sequences using an IFF compatible package (such as Deluxe Paint or Digi Paint). You create the sequence of events and save them into the objects drawer and use it in your videos as you would any other object.

I found the Ray Tracing package "Sculpt 3D" to be very useful here, as I was able to set up a DNA molecule in Sculpt 3D, alter the camera and lamp exposures with great ease (just changing the pointer on the screen), wait for the image to be recalculated and redrawn (which took a few hours!) and then save the images again under a different name (and also as an IFF format file).

After putting all these images into the Objects Drawer I was able to incorporate the image into the Framer and — voila! A complete rotating image with the smoothness of any computer image on TV!

The only way of doing this previously, was to go through the mechanics of saving each individual frame as a "stop frame" on the video recorder, not a good idea.

The second utility is Unpack, this disassembles the parts of the existing videos for use in other videos thus you can use parts from the Demos inside other videos (objects, videos, sounds and so on...).

The final utility is called Vidcheck, which essentially lets you compress videos (by squeezing up unnecessary tracks and other superfluous parts) so that they take up less room on the disk. It also lets you print a description of the video file for your records — much like the header information on a piece of timecoded video, summarising use of memory, tracks, effects, parts and so on...

In Use

Sometimes *Deluxe Video* appeared to have run out of disc space, even though there was plenty of room on the disc, this was the first problem I noticed when using this package, and it essentially introduced me to the importance of prioritizing ones music or options so that the Amiga does not hang up for a couple of seconds!

Some applications (or parts) of the video image take longer to access than others, so it makes sense not to load the Amiga down with time consuming tasks all in one go — one must learn how to sequence the events not only dramatically, but also so that backgrounds are taken out of the tasks in hand until they need to be updated.

Also, some tasks can be put in the background that you would have thought should have been put in the foreground. For example, I was creating a house with a window that opened of its own accord whilst a plant pot on the ledge fell off and hit a passer-by! A simple enough image, but my problem was that the plant pot stopped in mid air, as the package re-used a walking man sequence, spoiling the whole effect as it was so jerky!

The problem (after an expensive call to the USA) should have been obvious!

The House was a foreground task, the trees and fields in the background were...ahem... background tasks, the plant pot was an animation sequence with a move, and the man walking was a seven position animation sequence that looped around three times, the problem was that the house was also a foreground object that needed too much looking after, so I redesigned the storyboard so that the house was a background, and the window (that opened of its own accord) was separate from the house, in fact it was hanging in mid air! The only difference was that you could not see that as the house was end-on to the viewer!

Such simple logistics and thinking out could have solved that problem — otherwise I would have fitted a 68020 co processor add-on!

Applications

Of the many applications (I)Deluxe Video has, some of the most stunning are in professional video and, sadly not for your home videos. While this is a testament to the usefulness and general wonderful things one can do with this package, this package is really only useful for small "entertaining" strips and for turning Auntie Nora's birthday party into a technicolour experience.

Animatics are essentially very rough and ready cartoons that are used to storyboard a concept or and idea for an advertising campaign or for a colour sequence. With the Amiga's very colourful palette you can design a colour co-ordinated room in a fraction of the time it would take poring over pots of paint — and with the right package to generate the images in the first place, it would be possible to have a look at the way various lighting conditions affect, the room and so on...

Real Animatics applications are used by advertising agencies for their presentations, showing to clients how they are going to spend their money! Because there isn't another commercial machine around with the same range of colours and screen resolution, the Amiga looks to be sitting pretty!

Designing TV Commercials is another option. As satellite TV becomes more popular over here, so advertising costs and requirements are going to tumble! It is also possible to create ads for local TV stations, although there is a quality control system in operation whereby an ad can be refused on the grounds of bad quality reproduction — so a U-Matic video recorder will be considered to be the bottom line as far as local advertising is concerned!

Mixing and Matching

The very end of the chain of video production is the video recorder itself! This will be the output device you finally put your hard work down onto and, assuming you are not wanting to overlay the computer image onto an existing image, then just a simple VHS recorder with no frill attached will be fine.

If, however, you want to use an image, be it a static one, or moving (for example, overlaying a sequence over a picture of fields in the countryside) or merely adding a series of track listings or credits to a rock video, (or even subtitles to a video film to be played for the hard of hearing — it happens), then you need a Genlock device that essentially generates a video image and locks on to the existing picture so that both pictures appear simultaneously on the screen.

Now I don't need to say exactly what applications there are with a hardware device like this, but some amazing special effects can be generated — ideal for a rock video and are designed to make an impact!

One effect I was working on for a band called The Warholas, was a rather nifty idea

Deluxe Video

I got from watching Peter Gabriel's "Shock the Monkey" video, Peter is holding on to the outside of a roundabout in a children's play park, and the camera is strapped to the middle. The result is the whole world spinning round, but with Peter (from the waist up) standing stock still — a great effect!

Now an easy effect for your Amiga is to film the world spinning round — but this time create an animated polygon by using Sculpt 3D and altering the camera position so that the camera is spinning around in the opposite direction by setting up an Animation sequence!

By overlaying the world spinning clockwise, and the polygon spinning anticlockwise, the effect is stomach churning, it is definitely one not to try out on older people.

I haven't yet had chance to use the package with a video digitiser but I can't wait to see what's possible.

The genlock system I used in testing this package was one very kindly loaned to me care of Triangle Television, specialists in this sort of hardware — they know their stuff about video, and they were a great help with my countless "*Help*" telephone calls while writing this article — thanks guys!

One For the Pros

Once we move beyond the basics of consumer VCRs, a whole world of expensive video hardware opens up. Editing desks, edit controllers, switchers, SFX boxes and even that most hallowed word — digital — has been heard to have been whispered in some of the halls of the video production studio.

If you are a pro and you are reading this article, then you already know what hardware you want and need, so I'll just cover what *Deluxe Video* is compatible with.

I have yet to see a SMPTE time code converter for the Amiga, I believe there is a very roundabout way of doing this by using a music application — use an Amiga MIDI interface with a SMPTE time-code converter, but this is far from satisfactory as there is no way of linking up to *Deluxe Video*.

To eliminate glitches on the tape, you can Black Stripe, as you would do with an Editing desk, it is pretty effective, but on the whole it is not sufficient for all situations as you will well know that the video sync will have to be in line or you will not properly receive the horizontal or vertical blanking period or the colour burst — although some of these problems can be alleviated by using a framing servo.

With a second desk, you will find that assemble edits are fine.

Cameras

A good camera can cost you £10,000, but I don't think many of us can afford that sort of budget. I used a JVC Handycam throughout, a simple model with manual focus, and it uses full size VHS tapes it costs *just* £900 and was loaned to me by my next door neighbor, thanks Bob!

The quality one can obtain from a small VHS recorder is phenomenal! It is almost good enough to make me want to take back my comments about VHS recorders!

I also used (albeit very briefly) a camera floating 'round the office — a CCD based camera, this was a Black and White security type camera and it was, again, good for the money. With such packages you will need special software that will read the image from the camera and display it on screen — *Digi View* is a particular case in point!

Conclusions

What seemed on the surface to be a very complex package is, in fact more straightforward than meets the eye — what Amiga users are not used to, is going through a particular package stage by stage, making sure the correct sequences are made to the right length, the correct fade ins and fade outs appear in the right place, that the sound effects appear in the right place, and that the animation sequences are all correctly angled and so on...

In effect, there's a whole lotta work involved here.

Deluxe Video has, in my mind managed to cram all of the important aspects of a video production studio into a piece of software, but without the usual worries of linking together expensive pieces of software that require even more expensive pieces of hardware!

Publisher **Electronic Arts**
Langley Business Centre
11-49 Station Road
Langley
Berks SL3 8YN Tel: **0753 49442**

MAIL ORDER
For all your software needs

Cottage Software

All prices include VAT and delivery

GAMES/STRATEGY

Aargh	£15.95
Annals of Rome	£19.50
Barbarian	£18.45
Bionic Commandos	£19.50
Bone Cruncher	£10.62
Brattacus & Arena	£21.27
Bubble Ghost	£19.50
Ebonstar	£19.50
Faery Tale Adventure	£31.60
Flight Simulator 2	£34.19
Into the Eagles Nest	£15.30
Jinxter	£17.08
Kampfgruppe	£23.00
Leaderboard	£16.75
Little Dragon	£15.95
Mind Fighter	£19.50
Moebius	£16.95
Obliterator	£17.72
Pinball Wizard	£15.95
Police Quest	£15.95
Spin World	£15.95
Stellar Conflicts	£21.95
Strange New World	£10.66
Strike Force Harrier	£17.77
Terramex	£13.60
Thexder	£15.95
Three Stooges	£23.95
Time and Magik	£14.17
Winter Olympiad 88	£14.16
Wizball	£17.74

BUSINESS/UTILITIES

Aegis Audiomaster Samp.Edit.	£33.65
Aegis Animator Images	£79.50
Aegis Sonix	£38.95
Aegis Videoscape 3D	£103.95
Aegis Videotitler	£77.25
Amiga Prosound Designer Comp.	£59.95
Amiga Ruby View/Term	£73.95
Amiga Synthia	£69.95
Award Maker	£28.95
Aztec C Compiler Prof.	£141.95
Beckertext	£87.73
Bulletin Board	£70.95
Businessware Pckge (Panmead)	£85.00
Butcher	£20.95
Calligrapher Colorfonts	£59.95
Cambridge Lisp	£96.95
City Desk Publishing	£79.95
De Luxe Music Constr. Set	£51.36
Digipaint	£42.95
Digiview 3 (NEW)	£124.95
DOD to DOS	£28.95
Expert Systems Kit	£51.15
Explorer: Debugger, Monitor	£36.50
Forms in Flight	£52.95
Futuresound	£158.85
Hi-Soft Devpak	£44.95
IntroCAD	£47.95
K-Seka 68000 Assembler V1.5	£26.95
K-Spread 2	£56.86
Kara Fonts	£42.95
Lattice AmigaDOS C V4.0	£131.65
Lions Fonts	£28.95
LOgistix	£84.11
Marauder 2	£28.74
Mathamation	£51.22
Maxi Plan Plus	£109.73
MCC Pascal	£62.95
MCC Shell	£37.95
Modula 2 Standard System	£74.50
PageSetter (Gold)	£69.95
Perfect Sound	£69.50
Photon Paint	£52.95
Power Windows 2	£51.95
Pro Video Font Lib. (1 or 2)	£50.26
Professional Page	£185.00
Publisher Plus	£72.50
Scribble 2	£39.95
Sculpt 3D	£55.95
Sculpt 3D Animate	£93.38
Silver Ray Trace	£87.73
Silver Ray Trace Turbo (3D)	£104.95
Soundscape Midi I/Face	£43.95
Soundscape Pronidi Studio	£125.95
Soundscape Sound Digitizer	£92.95
Superbase Personal	£74.95
The Director	£42.02
TV Show/TV Text (each)	£69.95
Word Perfect 4.1	£198.95
X CAD Designer	£335.00
Zuma fonts	£25.95

HARDWARE

Amiga A500 package	£385.00
Amiga Basic Inside & Out	£14.99
Amiga Machine Language	£11.50
Amiga Tricks & Tips	£11.50
AmigaDOS Manual (2nd Edit.)	£19.75
Baxall Camera	£199.00
Cherry A3 Digitizing Tablet	£540.00
Cherry Tablet Amiga Driver	£29.00
Digipic Frame Grabber	£249.00
Easyl Drawing Tablet	£279.00
Hitachi 650 Line Camera	£259.00
NEC Ext. 3.5" Drive	£92.95
Professional Genlock	£745.00
PAL Genlock	£259.00
Supra 20mb Ext. Drive	£599.00
Supra 60mb Ext. Drive	£1240.00
Supra 250mb Ext. Drive	£2699.00
Spirit 1.5mb Inboard RAM	£325.00
Canon 1080A Color Ink Jet	£499.00
Epson FX800 Matrix	£439.00
Epson LX800 Matrix	£285.00
Juki 5510P Matrix	£285.00
Juki 5520P Matrix	£460.00
MP135 Matrix	£159.00
MP135+ Matrix	£169.00
MP165+ Matrix	£209.00
MP200+ Matrix	£310.00
NEC P6+ (24 Pin)	£650.00
NEC P2200 (24 Pin)	£390.00
Xerox 4020 Color Ink Jet	£1150.00

★ ★ ★ ★ ★ ★ SPECIAL OFFERS ★ ★ ★ ★ ★ ★

THE POWER BUSINESS
Vizawrite
Logistix
Superbase Personnel
PACKAGE PRICE £174.95

COMPLETE DESKTOP PUBLISHING PROGRAMME
Vizawrite
City Desk
PACKAGE PRICE £132.95

PROFESSIONAL IMAGE PROCESSING
Digipic
Pixmate
Baxal Video Camera
PACKAGE PRICE £464.95

SOUND SAMPLING PACKAGE
Perfect Sound
ECE Midi Interface
PACKAGE PRICE £115.95

INTRODUCTORY GRAPHICS PACK
Express Paint Page Flipper
Introcad
PACKAGE PRICE £86.95

MORE MEMORY — MORE MANAGEMENT PACKAGE
Supra 20mb Hard Drive
Diskmaster
PACKAGE PRICE £597.95

Just because you don't see it — doesn't mean we haven't got it
For full details, send a large stamped addressed envelope
Please make cheques and postal orders payable to:
"COTTAGE SOFTWARE"
Please endorse cheques with bankers card number
P.O. Box No. 8, Shaw, OL2 8QN Telephone: 8706 845365

AMIGA AMIGA

Calling All Authors

Even though *Your Amiga* has a number of regular contributors we are of course always looking for more.

You may have an intimate knowledge of the machine that you would like to share it with others, perhaps you've written a program that you think may be of some use to other readers of *Your Amiga*, or maybe you have an idea for a stunning series of articles. In fact if you have something that you think could be of use to other Amiga owners we want to hear about it.

Sending it in

Should you want to send something to us then please follow the guidelines below. Submissions that do not follow the guidelines mentioned may be automatically rejected.

Of course we don't expect everybody to be the next William Shakespeare but if you do follow the simple rules below it will make our job a lot easier.

■ All text and programs should be sent on a standard Amiga 3.5inch disk. Please state which wordprocessor that you have used. If you don't have a wordprocessor don't forget that you can always use the memopad supplied on your Workbench disk to enter the text.

■ Include the following information in all text files on the disk:

Name of article;
Special requirements (memory expansion etc.);
Your name;
Your address;
Your telephone number.

The above information should also be reproduced on the disk to ease identification.

■ If you have access to a printer please supply a printed copy of all relevant material.

■ Try and write in clear concise English. It does not have to be a work of art but it must be comprehensible.

■ Any program examples under 10 lines in length can be included within your text.

■ Should your article require artwork then supply clear examples of what is needed. We can get professional artists to produce the finished product. Try to suggest any ideas that you have for illustration, after all *a picture's worth a thousand words*.

■ Submissions of any length are welcome. If you have a five line routine you think may be of use to someone else it will be just as welcome as a full blown series.

■ Payment varies quite a lot and depends on quite a number of factors such as complexity of program, presentation etc.

■ All payments are made following publication of the article, usually around 2-3 weeks after publication date.

■ If we do find your submission suitable for publication in the magazine, we will inform you of our terms either in writing or by telephone.

■ If you want the program returned to you, should it be found unsuitable for use, then you must enclose a stamped,self addressed envelope for return of the disk.

■ Only items that you hold the rights for should be submitted.

■ We do not accept articles that have been sent to other magazines.

■ We do not accept unsolicited reviews.

■ All items sent to the magazine are done so with the understanding that they may be published in the magazine.

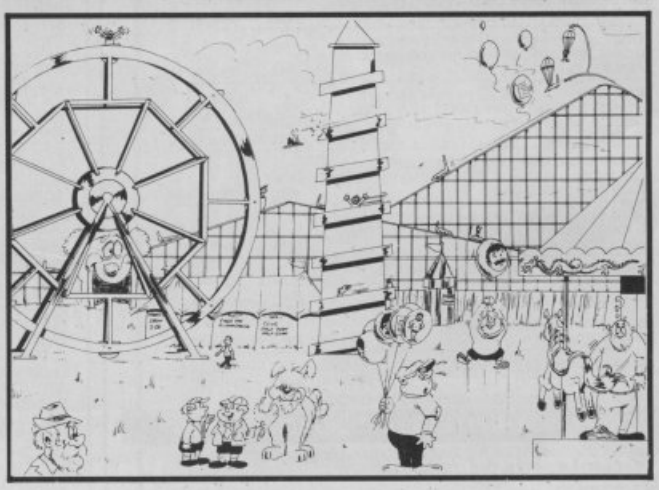
■ *Your Amiga* will not be held responsible for any loss/damage of items sent to the magazine.

Would you like to share your knowledge of the Amiga computer with others? Have you written any software that you'd like to have published? Read on and find out what to do.

WIN A DAY AT THE FAIR

It's up, up and away with this issue's competition. Your chance to win tickets for Alton Towers Pleasure Park plus £50 spending money





■ **This issue we've teamed up with** Audiogenic and our lucky winner of our spot the difference competition will win four tickets to the Alton Towers Christmas festival which runs from November 11th to December 23rd — plus an extra £50 in your pocket. Ten runners up will each receive a copy of Impact for the Amiga. So what are you waiting for — spot the differences and send your entry in by October 31st.

How to Enter

Study the two cartoons on this page: there are a number of differences between them. Once you have decided how many differences there are, complete the entry coupon and send it to the editorial address (see coupon). Write the number of differences that you have found on the back of the envelope. If you don't your entry will not be accepted.

The Rules

Entries will not be accepted from employees of Argus Specialist Publications and Audiogenic. This restriction also applies to the employees' families and agents of the companies.

The How to Enter section forms part of the rules. The Editor's decision is final and no correspondence will be entered into.

Alton Towers Entry Coupon

Name _____

Address _____

_____ Postcode _____

Number of differences found _____

Post to: Your Amiga
Alton Towers Competition
ASP Ltd
1 Golden Square
London W1R 3AB

NEW FROM TRILOGIC

PRINTLINKS

PRINTER CONVERTERS, BUFFERS & SHARERS

new

All PRINTLINKS enable you to use your CBM Serial printer eg MPS801 with most home computers eg AMIGA, ATARI, IBM PC/AT/XT ETC.

All make use of your redundant COMMODORE 64 OR 128 as both buffer and interface and consist of an interface cartridge with integral software.

PRINTLINK 1B also drives most PARALLEL PRINTERS as well as CBM Serial ones to give you all the features of a 60K PRINTER BUFFER at a FRACTION of the cost.

PRINTLINK 1 — PARALLEL TO CBM SERIAL PRINTER CONVERTER

USE PRINTLINK 1 WITH MOST COMPUTERS & ONE CBM SERIAL PRINTER

- Parallel Input — connects to the computer printer port
- CBM Serial Output for Text Use on Commodore Serial Printers
- 60k Printer Buffer — frees computer while documents are printed
- Printer Buffer Commands — Pause, Repeat & Terminate etc.

ONLY £34.99

PRINTLINK 1B — SERIAL & PARALLEL CONVERTER & BUFFER

USE PRINTLINK 1B WITH CBM SERIAL PRINTERS OR WITH ANY PARALLEL PRINTER AS A STANDARD 60K PRINTER BUFFER

- Includes all the features of PRINTLINK 1 Plus ...
- Parallel Printer Output • Drives most Parallel Printers • Text & Graphics

ONLY £44.99

GET THE PICTURE? — IT'LL BE SHARPER, & CLEARER WITH A TRILOGIC AMIGA TO TV RGB LEAD & COULD SAVE YOU ££££s.

We have leads to connect all AMIGAS to your TV or colour monitor provided it has an RGB input socket. All leads give a much clearer picture than using the AMIGA MODULATOR, permit ALL 4096 colours to be displayed and include the audio lead (to give stereo with stereo tvs).

ORDER **AL 1** FOR TVs WITH 21 PIN EURO (SCART) SOCKET. FITS PHILIPS, FIDELITY, SONY, GRUNDIG, NORMENEDE, ETC. **ONLY £9.99**

ORDER **AL 2** FOR FERGUSON TV's WITH 7 OR 8 PIN DIN SOCKET. MODELS MC01 & MC05 ETC **ONLY £9.99**

ORDER **AL 4** FOR HITACHI & GRANADA TVs WITH 7 PIN DIN SOCKET MODELS CPT1444 ETC. **ONLY £9.99**

SORRY, LEADS ARE NOT AVAILABLE FOR THE FOLLOWING MAKES: MICROVITEC, AKAI, SEISHO & PHILIPS CF1114 WITH 5 OR 6 PIN TTL RGB SOCKETS.

LEADS ALSO AVAILABLE FOR ATARI ST RANGE. PLEASE CONSULT US IF IN DOUBT.

ATTENTION 1901 MONITOR OWNERS.

WHY NOT HAVE YOUR 1901 MONITOR CONVERTED TO WORK WITH THE AMIGA ?

Our conversion enables your 1901 to display all 4096 colours and gives a really excellent picture. We have converted hundreds of 1901s with 100% satisfaction. Price including the lead is **ONLY £29.95**- for callers. Phone to arrange an appointment or we can collect, convert & return your monitor ALL WITHIN 4 DAYS for the all inclusive price OF **£53.95**

OTHER INEXPENSIVE AMIGA LEADS

	PART NO.	PRICE
2ND DRIVE SWITCHED LEAD — DISABLES EXTERNAL DRIVE TO PERMIT PROGRAMS TO LOAD.	ADE2	ONLY £9.99
new **JOYSTICK PORT EXTENDER** — FED UP WITH GROPING AROUND THE REAR OF YOUR AMIGA — THEN YOU NEED THIS LEAD.	JPE1	ONLY £3.99
MOUSE/JOYSTICK SWITCHER & PORT EXTENDER — EXTENDS THE PORT & HAS SOCKETS FOR MOUSE & JOYSTICK. WITH PUSH-BUTTON SWITCH FOR MOUSE OR JOYSTICK SELECTION	DJA1	ONLY £8.99
new **3 & 4 JOYSTICK ADAPTORS** — SOME GAMES USE 3 OR 4 JOYSTICKS — YOU'LL NEED THIS LEAD TO USE MORE THAN 2 JOYSTICKS.	JEL1	ONLY £7.99
new **AMIGA 64 EMULATOR LEADS** — CONNECTS 1541 ETC TO YOUR AMIGA. THERE ARE SEVERAL PROGRAMS WHICH NEED THIS LEAD.	AEL1	ONLY £4.99
new **MODULATOR EXTENSION LEADS.** 30CM LONG, BRINGS MODULATOR TO A MORE CONVENIENT POSITION.	MEL1	ONLY £8.99
new **RS232 TO MODEM LEAD.** 25WAY PLUG TO 5PIN DOMINO PLUG.	AML1	ONLY £4.99
AMIGA PRINTER LEAD. PARALLEL TYPE — 1.5M LONG	AMP1	ONLY £6.99
3.0M LONG	AMP3	ONLY £9.99

PLEASE STATE WHICH AMIGA YOU HAVE WHEN ORDERING.

NEW — AMIGA HI-FI LEADS & AUDIO ACCESSORIES

TAKE FULL ADVANTAGE OF THE AMIGA'S AMAZING SOUNDS BY CONNECTING IT TO YOUR HI-FI SYSTEM. OUR STEREO LEADS FIT MOST HI-FI, MIDISYSTEMS ETC.

new **STEREO PHONO PLUG TO PHONO PLUG** (RCA JACK) 3M LONG	AHL1	ONLY £3.99
AS ABOVE BUT 5M LONG	AHL2	ONLY £4.99
new **STEREO MINI AMP/HEADPHONE BOOSTER** — LISTEN TO YOUR AMIGA IN STEREO VIA YOUR WALKMAN HEADPHONES	AMA1	ONLY £14.99
HIGH QUALITY STEREO HEADPHONES FOR USE WITH MINIAMP.	PHS1	ONLY £4.99
new **STEREO ECHO UNIT.** ADD ECHO TO YOUR AMIGA'S AUDIO OUTPUT GREAT FOR USE WITH AMIGA MUSIC UTILITIES & SAMPLERS MAINS OPERATED. CONNECTS BETWEEN AMIGA AUDIO OUTPUT & HIFI. (OR TV/MONITOR IF YOU USE ONE OF OUR AMIGA RGB TV LEADS)	AEU1	ONLY £89.99

SUNDRY ITEMS — BARGAIN PRICES

31/2" DISKS. QUALITY DS/DD BULK PACKED DISKS. MIN ORDER = 10. ONLY 92P EACH		
3/12" DISK BOX FOR 40 DISKS. SMOKED LID. LOCKABLE	DSB4	ONLY £6.99
31/2" DISK BOX FOR 80 DISKS. SMOKED LID. LOCKABLE	DSB5	ONLY £8.99
31/2" DISK BOX FOR 120 DISKS. SMOKED LID. LOCKABLE	DSB6	ONLY £11.99
QUICKSHOT 2 JOYSTICK WITH AUTOFIRE	QSJ1	ONLY £7.99
PRO 5000 JOYSTICK — NON AUTOFIRE TYPE	PRJ1	ONLY £10.99
A500 DUSTCOVER, FLAMEPROOF MATERIAL	ADC1	ONLY £4.49
A1000 DUSTCOVER	ADC2	ONLY £5.99
1081/1084/CM8833 MONITOR DUSTCOVER	ADC3	ONLY £6.99
23pin 'D' SOCKETS WITH PLASTIC COVER	DPS1	ONLY £4.99
23pin 'D' PLUG WITH PLASTIC COVER	DPS2	ONLY £4.99

TRILOGIC

Trilogic Dept Y.A ,Unit 1, 253 New Works Road Bradford, BD12 0QP. Tel. 0274 691115

EXPRESS DELIVERY £1.95

Fax 0274 600150

FAST MAIL ORDER SERVICE - PROMPT DESPATCH ALL PRICES FULLY INCLUSIVE PLUS 10 DAY MONEY BACK GUARANTEE ON ALL ITEMS. PAYMENT BY CASH, CHEQUES PAYABLE TO TRILOGIC BY POSTAL ORDER ACCESS OR VISA. ADD £1 EXTRA FOR EXPORT ORDERS. PAYMENT IN STERLING ONLY PLEASE

TRYBRIDGE

TITLE	AMIGA	TITLE	AMIGA
ADV ART STUDIO	16.95	JOE BLADE	6.95
ALT REALITY	13.95	JINXTER	15.95
ALIEN SYNDROME	13.95	JEWELS OF DARKNESS	13.95
AAARGH	16.95	KARATE KID 2	16.45
ARMAGEDDON MAN	16.95	KING OF CHICAGO	19.95
AUTODUEL	17.50	KICKSTART 2	7.00
ARCTIC FOX	15.95	KNIGHTEOG	13.95
ADV CONS SET	11.95	LAND OF LEGENDS	16.95
ARMY MOVES	16.95	L'BOARD BIRDIE	16.95
ARKANOID	19.95	LEVIATHON	13.95
BETTER DEAD THAN ALIEN	13.95	LEATHER GODDESS	19.95
BOMBJACK	16.95	LEGEND OF THE SWORD	16.95
BUGGY BOY	16.95	LEATHERNECKS	13.45
BUBBLE BOBBLE	13.95	MARBLE MADNESS	13.95
BIONIC COMMANDO	16.95	MARS COPS	13.95
BERMUDA PROJECT	15.95	MERCENARY COMP	16.45
BEYOND ZORK	16.95	MICKEY MOUSE	13.95
BEYOND ICE PALACE	16.95	MINDFIGHTER	17.45
BLASTABALL	13.95	MACH 3	13.95
BARBARIAN PSYGNOSIS	16.95	MEAN 18 GOLF	17.95
BMX SIMULATOR	10.45	1943	16.95
BLACK LAMP	13.95	NEBULUS	15.95
BARBARIAN PAL	13.95	NETHERWORLD	13.95
BARBARIAN 2 PAL	13.95	NIGHTRIDER	16.95
BALLRAIDER	13.95	NORD & BERT	15.95
BATTLESHIPS	16.95	OBLITERATOR	16.45
BALANCE OF POWER	19.95	OOPS	13.95
BAD CAT	16.95	OVERLANDER	16.95
BOB WINNER	16.95	PETER BEARDSLEY SOCCER	13.95
BARDS TALE 1 OR 2	16.95	PHANTASM	13.95
CORRUPTION	16.95	POWERDROME	17.45
CALIFORNIA GAMES	16.95	POWER STRUGGLE	10.45
CAPTAIN BLOOD	q6.95	PHOTON PAINT	49.95
CARRIER COMMAND	16.95	PLANETARIUM	29.95
CHUBBY GRISTLE	15.95	PLUNDERED HEARTS	16.45
COMBAT SCHOOL	16.95	POOL	6.95
CRACK	13.95	POOL OF RADIANCE	16.95
CRASH GARRETT	16.95	PLATOON	15.95
CRAZY CARS	13.95	PINK PANTHER	13.95
CHESSMASTER 2000	16.95	POLICE QUEST	13.95
DALEY THOMPSON 88	16.95	PANDORA	13.95
DESTROYER	17.45	PAWN	15.95
DICK SPECIAL	15.95	QUADRALIEN	17.45
DARK CASTLE	16.50	Q BALL	13.95
DEFENDER OF CROWN	19.95	QUIZAN	21.50
DEJA VU	19.95	ROCKET RANGER	17.45
DELUXE VIDEO	39,95	ROAD BLASTERS	13.95
DELUXE PRINT	15.95	ROLLING THUNDER	16.95
DELUXE PRODUCTION	79.95	ROCKFORD	13.95
DELUXE PAINT 2	39.95	RETURN TO GENESIS	13.95
DUNGEON MASTER	15.95	RETURN TO ATLANTIS	16.95
DELUXE MUSIC CON SET	39.95	ROADWARS	13.95
EAGLES NEST	13.95	SARGON 111 CHESS	14.95
EBONSTAR	15.95	SKYCHASE	13.95
ECHELON	15.95	STAR RAY	17.45
EMERALD MINES	13.95	SOCCER SUPREMO	10.45
EMPIRE (INTERSTEL)	17.45	STOCKMARKET	13.95
ENLIGHTENMENT	15.95	STORMTROOPER	13.95
EXOLON	15.95	SPACE HARRIER	16.95
EPT	15.95	STRIP POKER 2	10.45
EARL WEAVER BASEBALL	16.50	SUMMER OLYMPIAD	13.95
ECO	16.95	SHERLOCK RIDDLE	16.95
FLIGHT SIM 2	26.95	SHADOWGATE	16.95
SCENERY DISC 2	26.95	SENTINEL	13.95
SCENERY DISC 7 OR 11	15.95	SCRABBLE DELUXE	13.95
SCENERY DISC EUROPE	15.95	SILENT SERVICE	16.95
SCENERY DISC JAPAN	15.95	SINBAD	19.95
FAIRY TALE ADV	29.95	SKYFOX	11.95
FLIGHTPATH 737	6.95	STARFLEET	16.95
FLINTSTONES	13.95	SEVEN CITIES OF GOLD	11.95
FOOTBALL MANAGER 2	13.95	STAR GLIDER	15.95
FERRARI FORMULA ONE	16.95	STAR GLIDER 2	15.95
FOUNDATIONS WASTE	16.95	SDI	19.95
FRIGHTNIGHT	13.95	STAR WARS	13.95
GARFIELD	13.95	SPACE QUEST II	14.95
GIGANOID	10.45	S F HARRIER	15.95
GRYZOR	16.95	SIDEWINDER	7.00
GUNSHIP	16.95	TERRAMEX	13.95
GT GIANA SISTERS	16.95	THEXDER	15.95
GOLDEN PATH	13.95	TIME BANDITS	13.95
GOLDRUNNER	17.95	TRACERS	16.95
GOLDRUNNER 2	13.95	TETRIS	13.95
GUILD OF THIEVES	16.95	TERRORPODS	16.95
GEE SEE AIR RALLY	16.95	THUNDERCATS	16.95
GARRISON	16.90	THREE STOOGES	19.50
GARRISON 2	16.95	TRINITY	10.00
HELTER SKELTER	10.45	TESTDRIVE	16.95
HEROES OF LANCE	16.95	TIME & MAGIK	13.95
HITCHHIKER	19.95	UNIV MILITARY SIM	16.95
HOTSHOT	13.95	UNINVITED	16.95
HOLLYWOOD HIJINX	10.00	VIRUS	13.95
HOLLYWOOD POKER	13.95	VROOM	13.95
HUNT FOR RED OCTOBER	16.95	VAMPIRE EMPIRE	13.95
INTERCEPTER	16.95	VYPER	13.95
INDOOR SPORTS	16.45	VERMINATOR	15.95
IMPACT	10.45	WRATH OF NIKADEMUS	17.45
IKARO WARRIORS	16.95	WHIRLIGIG	13.95
INSANITY FLIGHT	16.95	WINTER OLYMPIAD	13.95
INSTANT MUSIC	19.95	WIZBALL	13.95
INTELLITYPE	21.00	XENON	16.95
INTERNATIONAL SOCCER	13.95	ZORK 2	12.95
JET	24.95	ZYNAPS	13.95
JINKS	15.95		

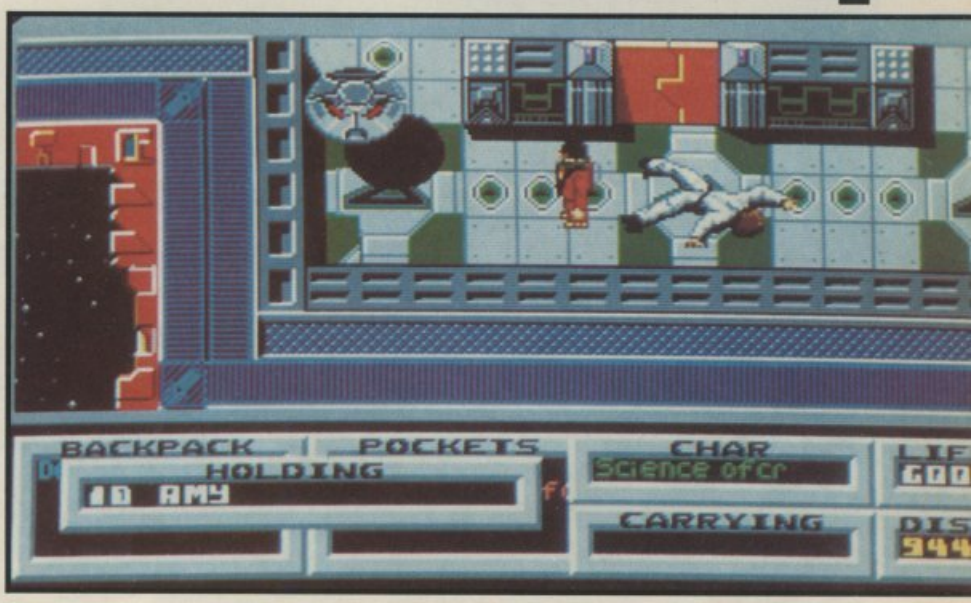
SPECIAL: ELECTRONIC ARTS, MEGAGAMES, INTERCEPTOR OR POWERDRIVE ONLY £17.45 EACH

Trybridge Software Distribution,
72 North Street,
Romford,
Essex RM1 1DA 0708-765271



Pandora

Pandora's box of evils and all that goes space age with this recent release from Firebird Fin Fahey investigates the wiles of the world



■ ***Pandora*** **is a starship, with a certain** degree of sentience and a large measure of low cunning. Like the traditional Box, it also carries a cargo of evils to be delivered on an unsuspecting humanity. Your job is to prevent the machine achieving its nefarious end — it's now approaching the Solar System after a lengthy mission to the stars.

The crew, many of who have been afflicted with varieties of madness or just killed outright by the rampaging starship's brain, may be able to help or hinder you in the quest to hit the self-destruct button, provided they're still alive that is. . .

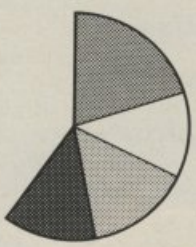
This is a classic non-realtime graphic adventure. I didn't know they made them anymore. The puzzles involved, usually take the form of finding a variety of coded passes allowing access to different areas of the ship. What saves the game really is the quality of the graphics, which are sharp and stylish. The C64 version is, of course, much more blobby.

Pandora could be classed as an introduction to the genre. I solved the original version in a few hours play, which without undue immodesty means it can't be too hard. This, unfortunately means that the game has a rather limited lifetime, unlike, say, role-players of the likes of *Bard's Tale II*, where you can reckon gameplay lifetime as being in the order of weeks.

For all that, this is a neat, stylish if somewhat limited adventure. It even strikes a high ethical posture, in that you are not at all encouraged to go around topping people. Just one thing, when you set the self-destruct mechanism going, don't go back for the cat. *YA*

PANDORA

Supplier: **Firebird,**
64-74 New Oxford Street,
London
WCIA IPS
Tel: **01-379 6755**



Graphics: **20**

Sonics: **12**

Gameplay: **15**

Overall: **13**



So You Think You're An Artist

We all know that the Amiga has superb graphics facilities. If you're using them why not send us your pictures — we may even use them

■ ***Your Amiga*** **quite often carries shots of** Amiga graphic screens as front covers. This is a wonderful way of showing the World just what the Amiga is capable of graphically.

As you can see on this page we do have a couple of extremely talented artists who supply us with an unending amount of creative work for us to use. Well now it's your turn.

This issue of *Your Amiga* sees the start of the **Amiga Gallery**.

Every month we will be printing what we consider to be the best pictures sent to us in the Gallery pages. If there is a picture that we find really outstanding then we may even use it on the front cover.

Should your picture be used on the cover then we will not only pay you for it but we will also present you with a framed cover proof impress your friends/family with.

What To Do

Should you see yourself as the next budding *Your Amiga* artist then you should do the following:

■ Put your superb Amiga picture file onto a 3.5 inch disk.
■ Mark the disk clearly with your name,address, telephone number and the name of the picture that you want us to look at.
■ Send it to:

Your Amiga
Amiga Gallery
1 Golden Square
London
WIR 3AB

That's all there is to it, get sending those pictures in - you could even become famous.


1541
YOUR
AMIGA



Scrabble
Scrabble
Scrabble
Scrabble

The perennial game Scrabble has finally been computerised! Clive Grace has a look at it

Do you remember the game of Scrabble? It was the after-dinner game we all used to play before we moved to trivial pursuits.

For those of you who can't remember the game it is played on a board with up to four players holding a random selection of seven tiles — on each tile is a letter and a number — and the object of the game is to make words, English words, out of these tiles and thus gain points.

Scrabble is probably one of the best examples of a board game that we all thought would never be computerised! Being based on abstract word skills (such as playing crosswords or decoding anagrams), the game is not only human orientated (for wont of a better term), but it is also a damned difficult game — there are lots of rules that do not really apply themselves to the computer's logic — after all, when does the computer know when to throw out a word because it is foreign or if it is a jargon word?

Baby Brother

A couple of years ago, Computer Scrabble was released for the Sinclair Spectrum; boasting a dictionary of 2000 words (officially that's just under a third of the diction required to read a newspaper like "The Sun")I must admit it didn't play very well, nearly always losing in the endgame by placing words like "its", "that" and "the" in places I would not have considered in my quest for higher points.

Not much has changed since the original release of the Spectrum game, Leisure Genius have made good use of the Amiga's graphics capabilities, and by using the 512K memory map of a standard Amiga - they have managed to squeeze around 20,000 words into the machine — that's well over 14-15,000 more than your average Sun reader requires.

Operating Computer Scrabble Deluxe is easy! By typing in your choice of name and using the mouse to point to where you want to place the letters on the board, the process is very easy to master and no joystick is required, although you can use one if you like. When you want to use up one of your blank tiles, you merely press the space bar within the sequence of letters you have chosen and then carry on. The program automatically calculates the scores for you.

It's Easy To Cheat

If the word you entered isn't in the computer's vocabulary, then it will question your move; out of 20,000 words in the dictionary, the Computer Scrabble program doesn't question too many words



unless, of course, they are based on specialist words or jargon words. Understandably, there is quite a bit of colloquial computer terminology such as "byte" and "disk" in the dictionary. On the other hand, latin words are not allowed unless their integration into the language is as a root form and is used elsewhere in the language — perhaps as a compound verb or noun — very much like the original rules of the game.

If you agree with the computer's querying your entry, the word isn't, unfortunately, added to the dictionary — vis any spellchecking program. Like the Spectrum's dictionary the Amiga's is memory resident and this makes the computer checking of your entry very quick.

If you reply "no", to the query then the computer makes you miss a move, which is pretty strict playing by the rules if you ask me!

There is a time delay option enabling the user to force the computer to play after a certain period of time — this can be quite useful if you are playing up to four computer opponents as it means that you don't have to wait five minutes between rounds.

Playing the game is immense fun, scrabble games often last thirty or so minutes if you are playing between two opponents (one computer and one human), but if you want to play human versus human, you can do this as well. Should you do this you will either have to stick a piece of card on the screen obscuring your own tiles when it comes to playing, or you will have to ask your opponent to look away — personally I gave up and just started to play without the element of secrecy, and to be quite honest this adds another dimension to the whole game.

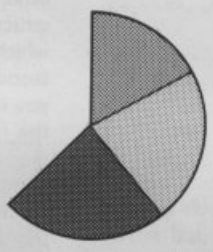
A Familiar Board

The use of colour on the screen is standard, the triple word, double word/letter and double word/letter squares are all there and there is no doubt in my mind that Leisure Genius have done their best to transfer the complete rules of the game across to the Amiga.

So if you want a pleasant night's relaxation and you are not into saving the universe, blasting aliens, then Computer Scrabble Deluxe is most certainly a pleasant way of using your grey matter - ideal for all people, Computer Scrabble Deluxe is just as much fun as the original game and it certainly plays a good game. ***YA***

SCRABBLE

Supplier: **Leisure Genius,**
2/4 Vernon Yard,
London,
W11 2DX.



Graphics: **17**
Sound: **N/A**
Gameplay: **22**
Value: **24**

HUMGOLD COMPUTERS LTD
for your AMIGA requirements

Commodore Amiga Games	RRP	Our Price
Bards Tale I	£ 24.94	£ 20.21
Bards Tale II	£ 24.94	£ 20.21
Earl Weaver Baseball	£ 24.94	£ 20.21
Eco	£ 24.94	£ 20.07
FA-18 Interceptor	£ 24.94	£ 20.21
Ferrari Formula I	£ 24.94	£ 20.21
Hitch Hikers Guide To The Galaxy	£ 29.99	£ 24.13
Knight Orc	£ 19.95	£ 16.05
Marble Madness	£ 19.95	£ 16.17
Ports of Call	£ 39.95	£ 32.36
Silicon Dreams	£ 19.95	£ 16.05
Starglider	£ 24.94	£ 20.59
Testdrive	£ 24.94	£ 20.21
Commodore Amiga Software		
AC Basic	£ 194.99	£ 158.44
AC FORTRAN	£ 295.00	£ 243.37
Aegis Animator/Images	£ 103.50	£ 85.39
Aegis Audiomaster	£ 46.00	£ 37.38
Aegis Impact	£ 62.36	£ 52.19
Aegis Video Titler (PAL)	£ 110.40	£ 89.70
Aegis Videoscape 3D (PAL)	£ 143.75	£ 116.81
AiRT V 2.0	£ 55.00	£ 46.07
C64 Emulator	£ 69.95	£ 62.96
City Desk	£ 99.95	£ 82.46
DeLuxe Music Construction Set	£ 69.95	£ 56.66
DeLuxe Paint II	£ 69.95	£ 56.66
DigiPaint (PAL)	£ 40.00	£ 34.99
Express Paint (V 2.0)	£ 57.99	£ 48.58
FACC II	£ 24.00	£ 20.10
GOMF 2.0	£ 29.95	£ 24.33

	RRP	Our Price
Kind Words	£ 49.00	£ 40.42
Lattice C V4.0	£ 172.50	£ 142.31
MaxiPlan Plus	£ 149.95	£ 123.71
Photon Paint	£ 69.95	£ 57.75
PixMate	£ 49.94	£ 41.20
Professional Page	£ 249.00	£ 202.32
Quarterback	£ 49.94	£ 40.58
Sculpt 3D (PAL)	£ 85.00	£ 70.13
Sculpt 3D Animate (PAL)	£ 125.01	£ 101.57
Superbase Personal	£ 99.95	£ 77.46
Superbase Professional	£ 249.94	£ 206.21
Turbo Silver 3D	£ 139.94	£ 113.71
TV*Show (PAL)	£ 69.95	£ 56.84
TV*Text (PAL)	£ 69.95	£ 56.84
VizaWrite	£ 99.95	£ 82.46
Word Perfect 4.1	£ 228.85	£ 194.52
Public Domain Disks	Each	£ 2.75
	For 10	£ 20.00
10 Branded DS DD Disks		14.95
Commodore Amiga Hardware		
1 MB NEC External 3.5 inch Drive	£ 99.95	£ 91.21
5.25 Inch External Drive with Power Supply Unit	£ 201.25	£ 166.04
A1084 Colour Monitor	£ 349.99	£ 319.37
Philips 8833 Colour Monitor	£ 314.95	£ 283.46
Amiga 500	£ 399.99	£ 365.02

Please send your orders (cash/cheque only) to:
HUMGOLD COMPUTERS LTD (Mail Order Dept.)
85 Longhurst Road, Lewisham, LONDON SE13 5NA
01-852 3992 (ansafone) for full price list

SOFTVILLE PD SERVICE
55 HIGHFIELD AVENUE, WATERLOOVILLE
HAMPSHIRE PO7 7PY, ENGLAND. Tel 0705-266509

A selection from over 150 disks for the
AMIGA

SOF2 TUTORIAL DISK. Over 30 articles plus 24 programs in C & Assembler, including source. Get more from your Amiga, get this disk today.
SOF3 MULTI-TASKING demo featuring "Roses Flower Shop" & "Fred the Baker". A brilliant animated graphics demo disk.
SOF6 A disk full of "Boing!" type demos. Includes Bouncer, Circ, DK1 and loads more. Plus dozens of replacement pointers like Garfield, heart, santa etc.
SOF7 THE BEST DEMO YET PRODUCED ON THE AMIGA!, "PROBE". You are receiving video signals from a remote probe sent to find life in outer space. This was shown on TV, brilliant!
SOF9 PERFECT SOUND, a great recorder/editor/player. Disk includes over 24 sounds & instruments plus instructions. Create the sounds and music you've always envied!
SOF10 MIDI UTILITIES. Contains MIDIutil1, MIDIutil2, PANL1.2, CZ101, .CZL. The last two contain dozens of patches for CZ synths. Plus plans to build your own MIDIbox etc. etc.
SOF12 PERFECT SOUND effects. 40 sound effects include alert, bagpipes, boom, swoosh, panflute, sputter, saxycomputer, spacedoors, smash and loads more.
SOF21 PAGESETTER CLIP ART. Dozens of clip-art files for use with this program.
SOF26 TELECOMMUNICATIONS. Contact the outside world! Includes Aterm13, Starerm2, Argoterm, Kermiterm etc. Great package, the low cost way to get started.

Plus hundreds of DEMOS, PICTURES, UTITLITES, GAMES etc. and the full range of FRED FISH-AMICUS disks, we get them monthly as they are released. The catalogue is growing all the time, get yours now!

All the above disks are only £3:00 each or £2:75 each for six. Make cheques/po's payable to SOFTVILLE. We promise return of post service, great prices on blank disks, boxes, paper, labels, printing, mouse mats etc. etc.

SEND AN 18p STAMP NOW! for our FREE 20 page catalogue, state CLEARLY the name of this magazine and make/model of your computer, or phone Rod or Carol Gearing for further details. Find out what thousands of delighted users already know;-

PUBLIC DOMAIN SOFTWARE
COULD BE THE ONLY SOFTWARE YOU'LL EVER NEED!
GET YOUR'S FROM
BRITAINS' No1 PD SUPPLIER

AmigaBASIC for

With all the high level languages around for the Amiga the humble Basic is quite often left out in the cold. Not now with this new series from Alan Webb

■ **Within the pages of *Your Amiga* and** other magazines you will find series describing such languages as Assembler and C. Bearing this in mind, you might be tempted to question the relevance of a series on AmigaBASIC. I can give a number of reasons why such a series is of value:

■ C and Assembler are fine for the experienced user who has a knowledge of the Amiga's complex architecture. What about the beginner?

■ Notwithstanding it's failings, AmigaBASIC is quite a decent language which offers a relatively safe environment for programming.

■ The language has certain similarities to PASCAL and offers a useful route to the learning of structured programming. This is something which, in my opinion, the much praised BBC BASIC doesn't really achieve.

■ Basic is easy to learn and isn't intimidating to the beginner.

Having made these points, I would quickly add that not everything about AmigaBASIC is sweetness and light. Some aspects are messy and over complex. Additionally, true to their normal policy, Commodore have produced a totally appalling manual.

In this series I intend to explore a number of areas:

■ I will discuss structured programming and provide an introduction to its use.

■ I will describe the features which are offered by AmigaBASIC.

■ I will attempt to fill some of the holes left by the normal manual.

In order to save time I will assume that readers are aware of the essentials of programming in BASIC such as looping structures (FOR...NEXT loops, GOTO), Input and output statements, data types and subroutines.

It's a whole new ball game

To those of you who have used Microsoft BASIC on other Commodore machines, I wish to make a particular request. Please forget the short cuts and wheezes that were used to achieve speed at the expense of programming structure. In this series I want to develop ideas which will lead to programs of readily understood structure. A fast program is no use if you or another cannot follow it's structure in the future when it is time to amend it!

In the Amiga we have a rather new beast compared to the old 8 bit machines. Firstly, we have a complex architecture built around the *Intuition* system and the *Libraries* of routines. Whilst much of this structure is best suited to the use of C, AmigaBASIC provides some routes to accessing these facilities. This leads to inherent complexities which are, in my view, inappropriate to BASIC. Certainly a grasp of these aspects will allow you to perform some clever tricks, but it takes both effort and cash (to buy additional manuals) to gain this expertise.

Next, the use of the intuition WIMP system gives the BASIC it's own rather strange feel. Finally, we are dealing with a 16 bit machine with the ability to access a large amount of RAM. This makes the BASIC a powerful beast.

Understanding Variables

A useful start is to consider the use of variables in AmigaBASIC. In most of the 8 bit BASICs. Variables are the life blood of any high level language and in most of the 8 bit BASICs three types of variable are supported:

■ Integers, usually occupying 16 bits. Allowing for the sign bit, these are limited to -32767 to 32767.

■ Floating point variables. These usually occupy 5 bytes and are limited to between approximately -2.9E-39 to 1.7E+38.

■ Strings. These are normally limited to 256 bytes in length.

Due to the enhanced power of the Amiga, a wider range of variables are supported.

■ *INTEGERS*. These can be either short or long. Short integers are identical to those used in 8 bit machines and occupy 16 bits. Long integers occupy 32 bits and can take values between -2147483648 and 2147483647.

■ *FLOATING POINT*. Two levels of precision are supported. Single precision are stored to 7 digits of accuracy and are essentially the same as those in 8 bit machines. And double precision values are stored to 16 digits and range between E-308 and E307. The use of double precision is an interesting move.

As an engineer, I have rarely encountered raw data which is more accurate than 4 or 5 decimal places. Any calculations which operate to a greater degree of accuracy are simply not valid. This being the case, I cannot see many occasions which would justify the use of double precision. As a final point, arithmetic operations involving double precision are slower than single precision. Additionally, double precision variables require more RAM for storage.

■ *STRINGS*. A maximum string length of 32767 characters is allowed.

Certainly this range of variables offers a rich choice. You should not, however, allow it to cloud your judgement. Long integers and double precision require an a greater overhead of memory storage and will only infrequently be of real value. Choose them with care!

The type of variable is denoted by the use

Table 1

Type	Suffix
Single precision floating point	None or !
Double precision floating point	#
Short integer	%
Long integer	&
String	$

Beginners

Amiga
Amiga
Amiga
Amiga
Amiga
Amiga

of a suffix, these are given in *Table 1*. If no suffix is used, single precision floating point is assumed .

Naming Variables

One of the most tedious aspects of 8 bit BASICs is the limitation of variable names to two characters. This allows a limit of about 936 variable names but the use of two characters only doesn't ease the identification of the function of variables. One important feature of writing structured programs is the need to describe variables clearly. AmigaBASIC allows the use of up to 40 characters in variable names. Both upper and lower case letters are allowed although they are treated identically.

The use of different number systems is facilitated by inserting a prefix before the number these are given in *Table 2*.

At risk of sounding awkward, I would have liked to have had the ability to use binary — but we can't have everything.

To my mind, one of the satisfying features of AmigaBASIC is the system for entering and editing code. Certainly not all of the necessary facilities are provided but it's not bad. Most BASICs assign numbers to each line of code so ensure the sequence of the program is correct and to allow GOTO commands to have a destination. AmigaBASIC does not require line numbers. Lines are executed in the sequence that they are entered and looping is performed by reference to alphanumeric labels or numbers. If numbers are allowed, they are not used as a basis for sorting the program. My advice to you is to stick to labels, they are much clearer. As with variable names, labels can be up to 40 characters long although they must be suffixed with a colon to differentiate them from variables. A sample program is given in *Figure 1*.

"Again" is a label used for looping, "Variable" is a variable name.

The main problem with the use of line number systems is that reorganising the program and copying portions can be a real pain. The AmigaBASIC editor acts rather like a text editor. As an aid to structuring your programs indenting of program lines is allowed and the last tab position is remembered to make things simpler. Changing of the program is achieved by standard COPY, CUT and PASTE commands and the area involved is highlighted in the cursor colour. The cursor position can be altered by use of the mouse or the cursor controls. Moving around the program is quite simple. Shift with the cursor keys performs Page up and down and moves you around in increments of screen widths. Alt with the cursor keys moves you the end and start of the program and to the start and end of each line. I have heard some say that it's not the best text editor around but I have found it to be easy to use and flexible enough.

The final aid to clear and structured work is the REMARK. This is catered for in most BASICs by the REM command. This form is carried forward to AmigaBASIC but is supplemented by the use of apostrophe. I prefer the latter because it is neater. *Figure 2* gives a trivial example.

Table 2

Number	System	Prefix	Example
Decimal	none	value	= 22
Hexadecimal	&H	value	= &H16
Octal	&O or &	value	= &O26

Again you will need to use a degree of circumspection to ensure that you choose names which convey the required meaning without using too much memory.

AmigaBASIC allows you to use the same names for more than one type of variable. So that the following would be permissible within the same program:

```
Variable = 1.2
Variable = 1.23456789
Variable% = 12
Variable& = 40000
Variable$ = "Wombat"
```

A particularly satisfying facet of the variable system is that several number systems are supported. Both hexadecimal and octal systems are supported above and beyond the normal decimal system.

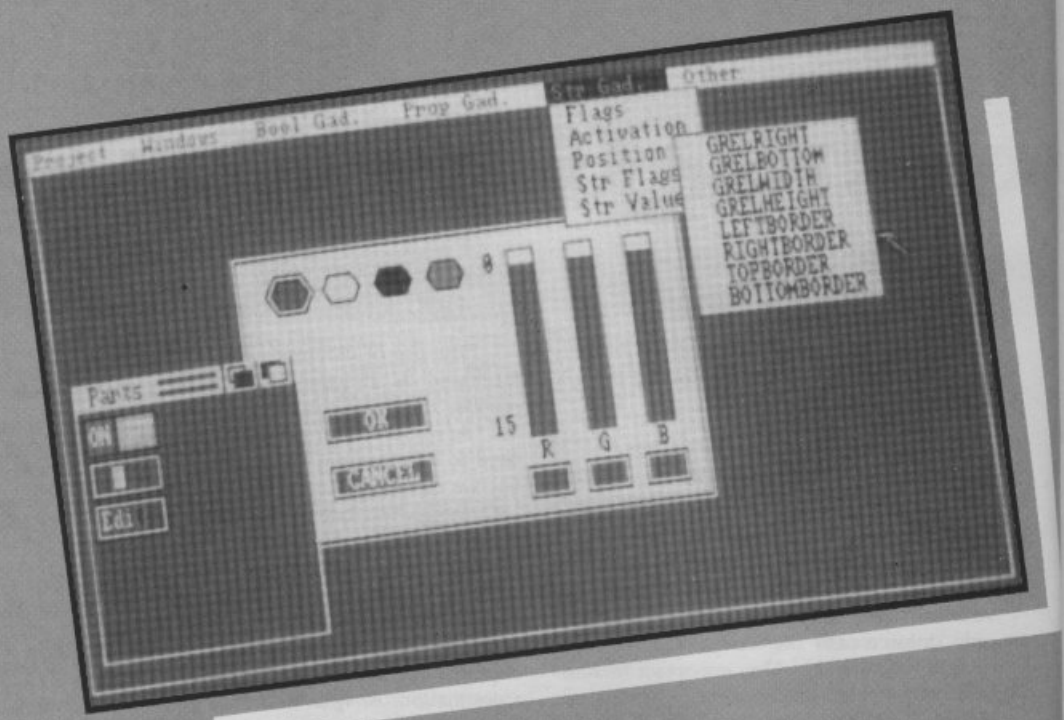
Figure 2

```
CheckEnd:  'Check for end of program
    IF Total < 100 THEN END
```

Figure 1

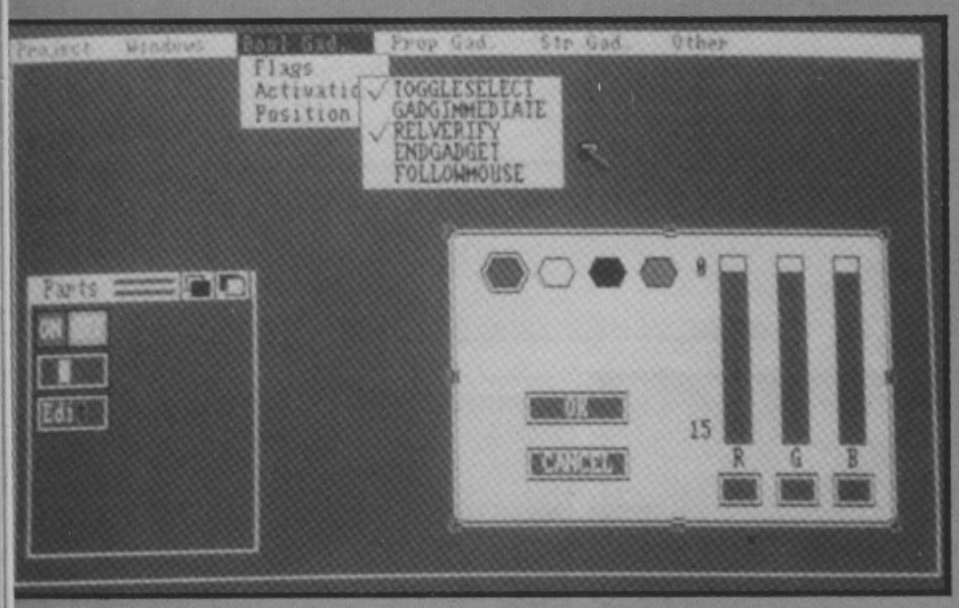
```
Again:
    Variable = Variable+1
    PRINT Variable
    IF Variable < 10 GOTO Again
END
```

This completes my preliminary comments on AmigaBASIC. Next time I will look at the various looping and subprogram structures provided in the language and show how you can develop a clear and structured approach to programming. This will be particularly directed at showing the alternatives to GOTO — a command which you should never need to use.



For all you C programmers out there Fin Fahey takes you through a package that will put a stop to the endless tidying up of programs — by doing it for you

KGadget



■ **This is a deeply specialised piece of software.** It's also a very ingenious one. *KGadget* is aimed at the C programmer who also has a need to knock out gadgets and requester boxes.

It aims at making this a straightforward process, by allowing the programmer to design the box onscreen, so that at each stage of the design process, it becomes apparent how the box is progressing.

Gadget boxes can be produced by combining a surprisingly small number of design elements. Toggle switches, sliders and a little text, and you've got a gadget. However the positioning and appearance of all of these can be varied endlessly, and this is what *KGadget* makes possible.

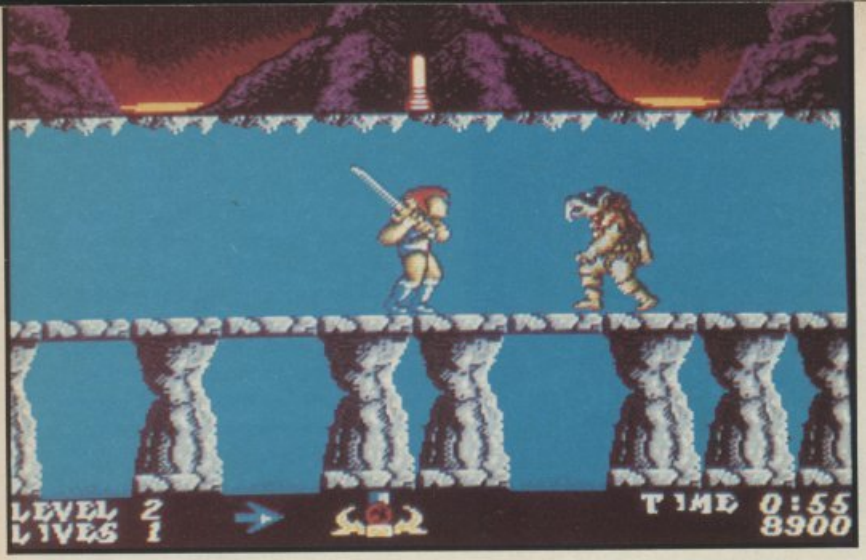
The first stage in the design process is to drag 'archetypal' parts across into your gadget box from a parts box. Once you've done this you can resize them and position them more precisely. Then, an image editor lets you change the appearance of each.

Frankly, I thought the image editor was primitive. You cannot store images, so each toggle switch, say, must be re-edited individually. If you wanted four hexagonal switches, you would have to painstakingly produce four hexagons.

Along the way, you are asked to enter various source names and specifications for each element. This is highly relevant to the eventual end, which is to produce a screen of C coding which can be incorporated into your own programs. Hence you have to specify whether or not your requester will have a size box, how it will interact with the mouse, and so on — a host of details.

It's all worth it though. Anyone who's been a professional programmer will know that 95 per cent of time is spent tidying up the appearance of things, the rest on the real number-crunching. Productivity tools like *KGadget* pare huge chunks off this 'wasted' time, and that I can only applaud.

KGadgets is an excellent piece of software, and I can see that it's going to be a must for every software house, though they're going to moan a lot about that slow image editor. As with much otherwise excellent systems software, is there enough demand in the wider market to make it a viable product? ***YA***



and Water). You can take these in any order you like before moving on to Castle Plun-dar for the final assault.

Not a bad little game really; the graphics seemed to bear a close resemblance to the characters, the scrolling reasonable and the variety of gameplay adequate although more could have been made of the Amiga's facilities, such as sampled sound from the cartoons.

Whether it is faithful to the series or not I couldn't tell you , however I would have liked to have seen something a little more ambitious than just another Pitfall/Vixen-style jump and shoot 'em up. ***YA***

Thundercats Ho!

Darrin Williamson puts the wind up Thundercats.

The latest kiddie's cartoon series to get the games treatment from Elite is *Thundercats* which, for those of you who don't know, is a sort of feline *Masters of the Universe*. In the game you are Lion-o who is the leader of the 'cats (and not a washable floor covering found in kitchens as you might think!).

It's down to you to trek across the horizontally scrolling landscape slicing and dicing a variety of nasties sent from the dreaded Mumm-Ra, who has not only kidnapped all of Lion-o's chums but has only stolen the magical jewel from the legendary Sword of Omens (gasp!) and stashed the lot in Castle Plun-dar (Mumm-ra's pad), which is where we have to get to.

Personally, this doesn't exactly instill faith in the Thundercats as a crack team of good guys if the whole group bar one manages to get kidnapped from their own base.

Go Cat Go

The first level puts you in the forest just by Cats-Lair. Here you must jump over boulders and rivers while hacking away at furry little gremlins and vultures in armour. The slightest physical contact with any of these chaps results in instant death which struck me as being a little odd.

Surely a small furry creature wouldn't have the same power as an armour-clad, man-sized bird, still, maybe I shouldn't underestimate little furry gremlins.

Scattered between both ends of the level are trees which have caskets containing point-generating treasures.

Once you've made it from one end of the forest to the other you're awarded time and kill bonuses before moving on to the next level. Here we find ourselves on what appears to be a stone bridge over a big lake or possibly the sea. The bridge is obviously in need of repair as it is prone to crumble under foot (or is it paw?) in certain places.

On the plus side, however, you can pick up better weaponry in the form of a laser rifle which is a bit handier than a broad sword. This can be found behind one of the shields hanging up along the way. On the minus side this level does have a few annoying quirks like one of the small pillars of the bridge already having an occupant, which means that you have to forfeit a life to continue.

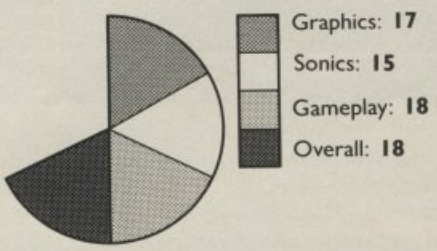
Once level two is complete you then go on to a bonus level in which you must move in the opposite direction avoiding large eyes and other such niceties. To complete this wave you must not lose any lives at all which will get you those all important extra points.

Then it's on to the choice of four levels which correspond to the four elements (Earth, Wind, Fire



THUNDERCATS

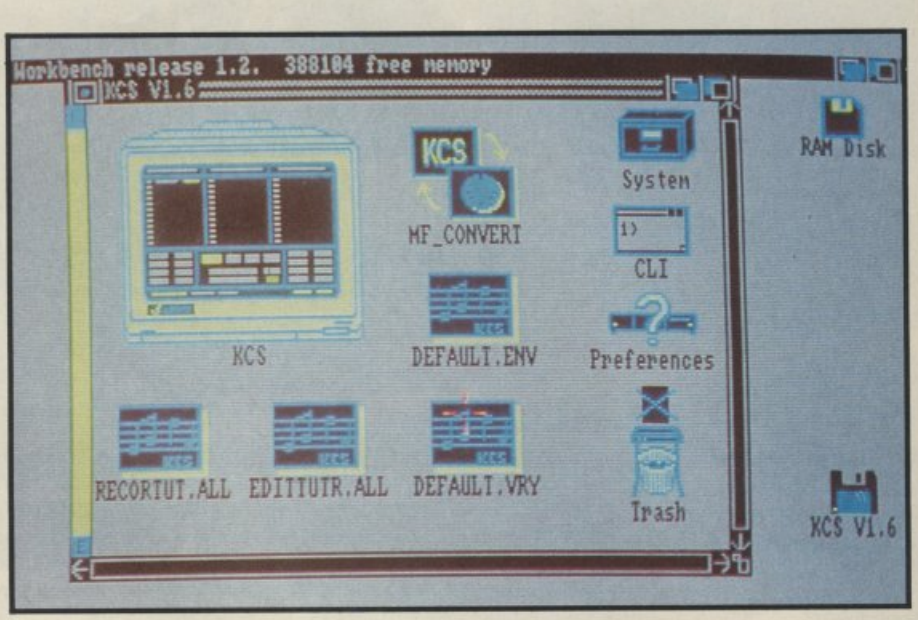
Title: **Thundercats**
Supplier: **Elite**
Eastern Avenue,
Litchfield,
Staffs, WS13 6RX.
Tel:
Price: **£19.95**



REVIEW

Amiga Interlude

Mary Branscombe looks at the latest American MIDI software just in from the States

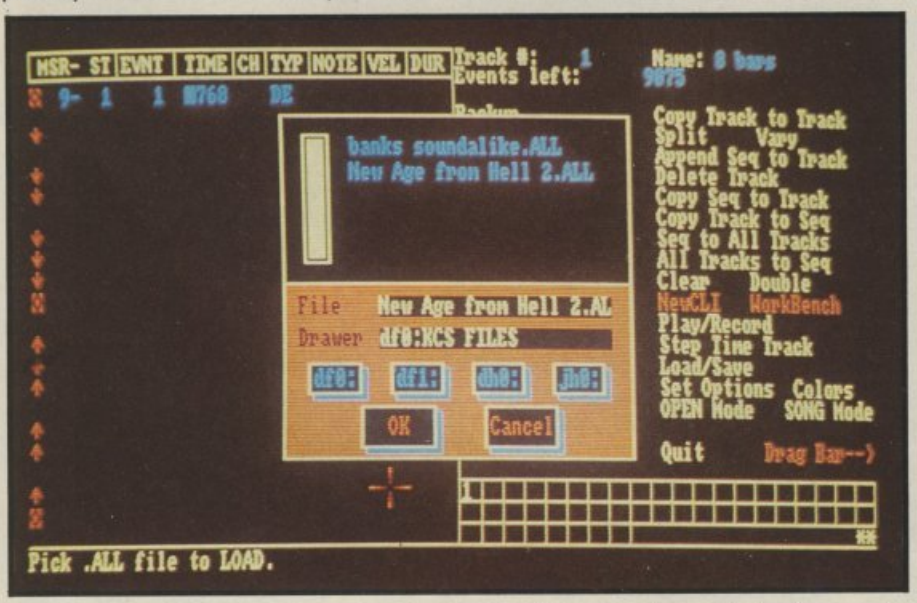


Although the Amiga doesn't have a port on the back that states it is MIDI compatible, that doesn't mean to say that the Amiga cannot be an excelent MIDI sequencer if it tries.

I have, in the past looked at a great many sequencers and music composition packages for the Amiga, ranging from the so so, to the very good,and I must admit I have never come across a sequencing package that takes advantage of the Amiga's multitasking capabilities quite as well as the one I am writing about now.

The Background

Computers and music have always been a rather strange combination. Nevertheless, some very good things have come out of the marriage between high technology and musical instruments. Certainly at the very top end of the spectrum we have the CMI Fairlight and, probably the most established computer music system, the Synclavier. Both have been with us for some seven years.



The problem with linking a computer to a musical instrument is one of communications; this is why in the early eighties, a group of musicians, instrument makers and scientists grouped together to create a communications protocol enabling computers and musical instruments to be linked to each other. Information was to be sent between the devices in the same way that some networks communicate with each other, via wire links in a chain.

The communications standard was called MIDI and stood for the Musical Instrument Digital Interface. It was partly responsible for the dramatic increase in sales of synthesisers after 1983 when the standard really started to catch on, and musicians saw just how useful MIDI was.

Computers have always been considered a good medium with which to write and store music. There have been many packages released for the smaller 8 bit computers that achieve this, but none of the ones I have seen have ever managed to achieve the simplicity with which we associate the sheer power of the Synclavier or the Fairlight.

Composition — The Next Big Thing?

Music composition languages (MCL) are very useful if you are programming music with a rigid structure. Many songwriters studios have at least one MCL for assisting the composition process. This is because many traditional "pop" songs are very repetitive. Many songs in the top 40 are based around the standard *verse, chorus, verse, chorus* formula. Indeed, some "early" examples of music from around the 18th century can be similarly classed as formulaic, but without the rigidity of popular music. Most pop songs are in the key of C and very often conform to a 4/4 variant such as 2/4 or 4/8).

The computer has made the composing process so much more easier, it has rationalised the whole song writing process in much the same way that the word processor has revolutionized the way words are entered into a word processor rather than a typewriter. The MCP's and the DR T's package which we will look at here, can be seen as the first major packages for the 16 bit computers to rival the Steinberg software, now famous on the Atari ST.

Amiga Advantages

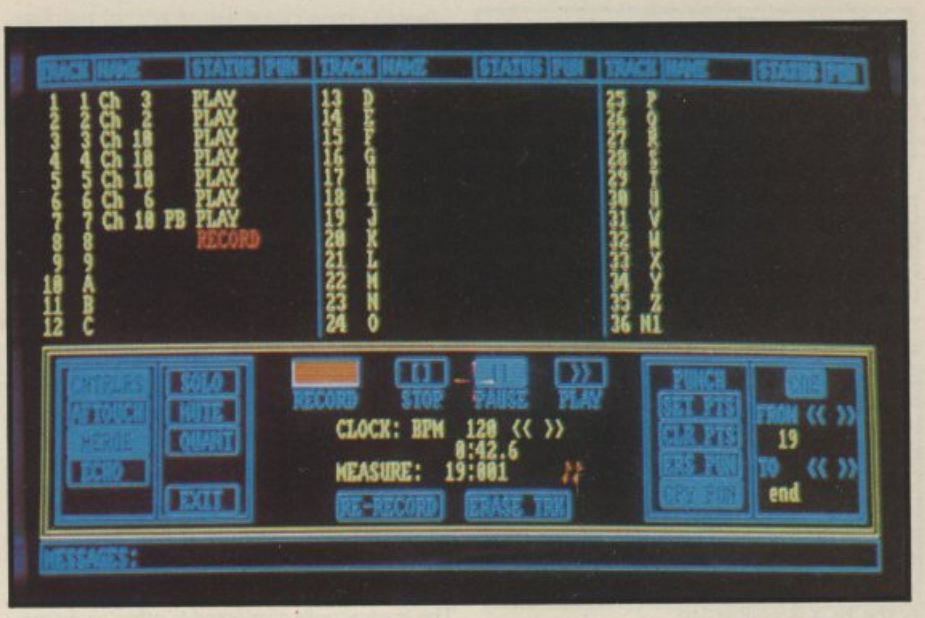
The advantages of using an Amiga for music composition rather than a Fairlight are obvious — the price/performance level are far superior.

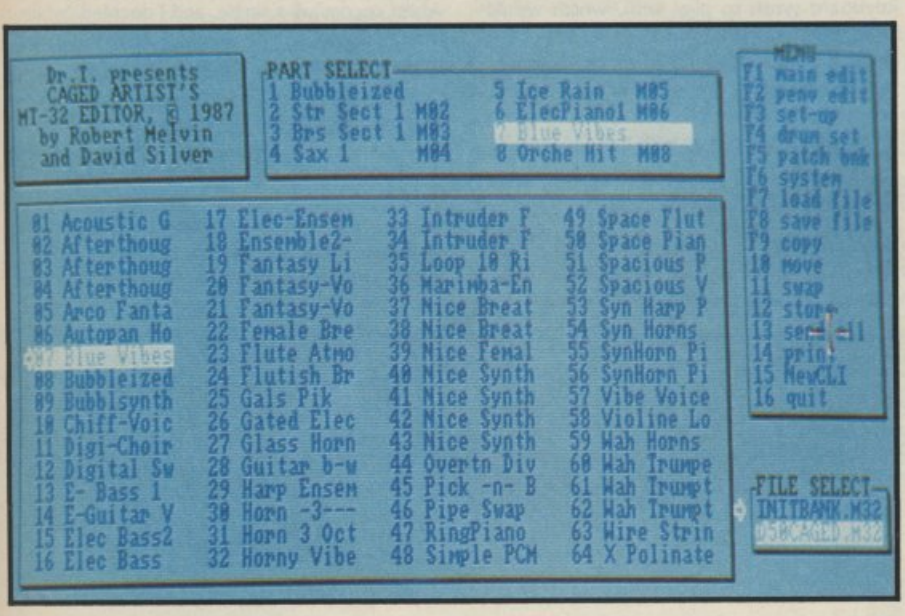
Another item that musicians and studios are just discovering is the fact that the Amiga is a multitasking machine. In order to run more than one package on the Workbench, all you have to do is load up a program and shove it

away in some part of memory which is all done for you by the Intuition interface. To run more than one package on an Atari ST, you have to buy an expensive piece of software called a switcher, this essentially rewrites part of the Atari's operating system enabling it to run various packages in a *sort of* multi software environment. The problem with this is that the software can only support four packages running at one time and this is not with any real multi tasking, as the software halts as soon as you exit the application.

Stupid isn't it?

Musicians and Studio engineers are starting to discover just how good the Amiga is by comparison to the Atari ST in a studio situation. The company that has done a great deal of the groundwork is DR-T, a bunch of committed musicians and software programmers in the states who originally cut their teeth programming C64's.





The KCS

The first package I will mention here is the KCS. KCS is acronym for Keyboard Controlled Sequencer, and what an apt name it is! It operates in all MIDI modes and performs several independant, yet inter-related functions. DR T's philosophy is to give facilities that a musician would want, not a computer hack, not a complete beginner, but what a professional songwriter or keyboard player requires.

The program operates in three different modes, these are Track mode, Open mode and Songmode.

In Track mode, the program acts like a 48 track tape recorder with a great many facilities not found on a tape deck, so it behaves in many ways like a MIDI dedicated digital recorder.

Open mode enables the user to simply bash out an idea onto the sequencer and "get it in there". This is significantly different to the other modes as it enables looping facilities and such like. Song mode on the other hand is used to take all the sequences, and chain them into a song.

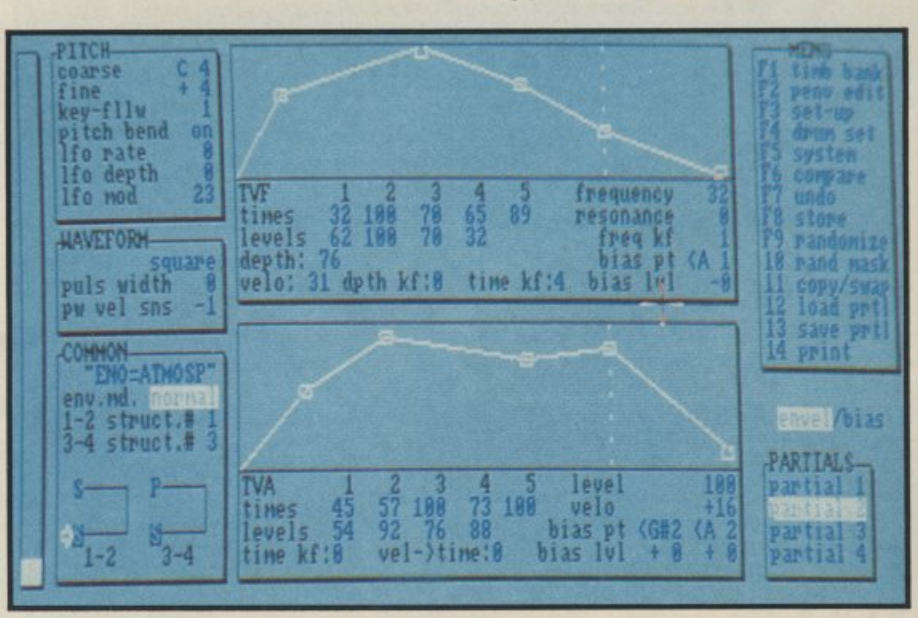
It is possible to write whole songs in either Track or Open modes, and you can "bounce"the sequences from one mode to another with relative ease.

The songwriter will probably find that various parts of the music will be written in all three different modes, being pulled together at the end to form a complete song.

Sequences of data can contain any sort of MIDI information including note data, continuous controllers (that eat upmemory!), pitch bend, after touch, system exclusive messages and real time commands.

Each Mode has its own edit/play record screens and, although each screen has its own features that are unique to the requirements of the mode, many of the editing commands are similar. The three play screens each have their own special methods for interfacing with a sequence as it is playing.

The KCS has a number of load and save facilities making it a very flexible package to connect with other Amiga based software. Most of the time you will want to save the file with the .ALL file designator as this saves all the MIDI information the sequencer uses including patch changes and dynamics. You can



save files as an IFF format, but this is rarely used and is not really a worthwhile option as the KCS can do it all without leaving the package and moving into another.

Your Midi Setup

Naturally one person's MIDI setup is going to be different to the next, and indeed many people will have only one multi timbral synthesiser to play with. This is fine, the KCS works just as well with either one synth, or a veritable cornucopia of rack mounted sound generators, MIDI effects, and synthesisers. In testing the setup in my studio at home, I limited the use of the sequencer to a Roland MT-32 synthesiser, a Roland D-50, a Sequential Drumtrax, and a retro fitted Prophet Pro One (The ProOne was was borrowed from a friends studio providing that I demothe software for him later on!). This is quite a substantial setup, but still represents a very small network as far as the KCS is concerned.

I would recommend using a MIDI patch box with this software ,and indeed any MIDI software on such a large network, as there canbe some rather sluggish timing problems when it comes to running all this hardware. There are plenty of cheap patch boxes around, and they are all perfectly compatible with each other.

The MIDI interface I used was the Mimetics Corp's interface. Basically this is a flimsy bit of wire that can be shoved out of the way, it worked fine, and I am still using it to this day! Although I have my eye on the nice new Datel model with more inputs and outputs.

I was particularly impressed with the auto-correct facility which is used to round off all of the time and/or duration values in a track or sequence to multiples of a number (selected by you), You do this to smooth out the timing of a less than perfect recording. What is even more wonderful is the fact that the Auto Correct can be undone too.

All the usual functions are there, including a rather nifty TimeReverse facility, enabling events to be rearranged so that they play in reverse order. Ideal for creating variations of a piece of music. If you re-edit the score so that the chords are inverted, then the music generated is weird to say the least! Naturally this facility will not preserve the relationship between the notes, but this is to be expected.

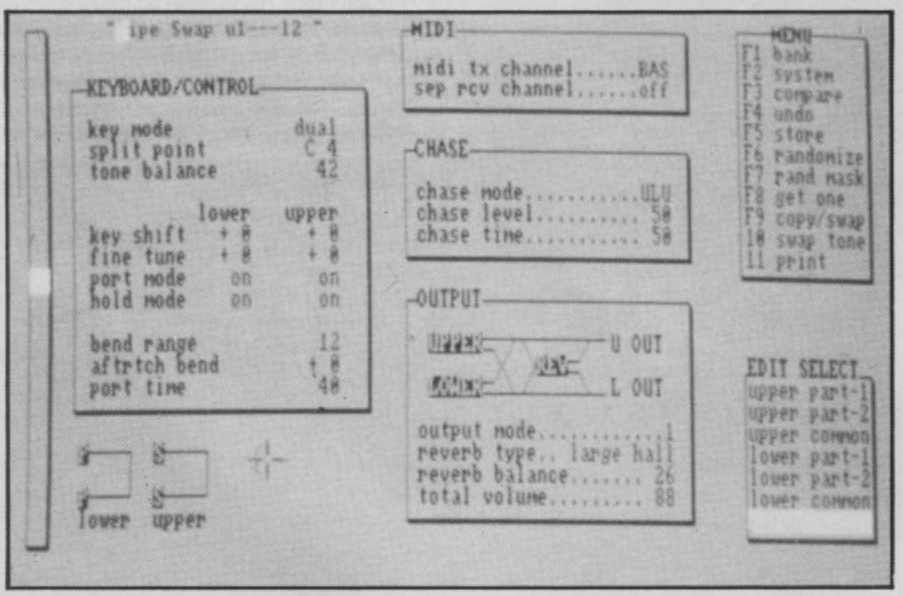
Unlike a great many packages, you can MIDI Merge your instruments, so you can have a keyboard controller (such as the Cheetah Mk 5vII) and a rack mounted or free standing synthesiser module such as the Roland MT-32. This is admittedly supported in other packages on the ST, but I have not found a great many MIDI packages in England that support this option. It may be that writers assume one has a keyboard synth to play with, which would be fine, but many pros and beginners alike are turning to the potentially more compact system of modules, they are easier to access, much easier to bring on tour, and they are a God send to those of you with racks in studios.

Four Years Hence

In the four years since the release of the KCS on the *Commodore 64*, there have been thousands of musicians who have come up with numerous suggestions for the Amiga version. These have, where possible, been added, which is why there isn't a whole lot of difference between the screens of the C64's version and the Amiga version. Loopback recording, transferring sequences from one sequencer to another is easier, and I have dumped a great deal of my Steinberg sequences written in studios across to the KCS' environment with ease.

In the days of the Commodore 64 version, one had to physically wire a conection across the opto-isolators of a MIDI interface in order to achieve this (or at least dump the raw code to a multitrack tape ,a similar trick was done on Simple Mind's "Live in the City of Light" album.

Many users who have upgraded from the C64 will find a number of similarities in the way the package interacts with itself, it is a bit like seeing an old friend you haven't met for ages move in next door!



Caged Artist Editors

Remember at the beginning of this review I said something about multitasking? Well, Dr T has come up with a great many sound and waveform editors in the past, but the ones for the Amiga haveto be seen to be believed!

The Roland MT-32 synthesiser has 128 sounds built into it's plastic case, but the Caged Artist Editor expands this number by a further 256 and they too work on the same principle of offering totally mouse driven environments with two banks of 128 different sounds, so, for your money you get a stunning 256 sounds, some of which strongly resemble the sounds on the D-50.

In fairness, I also used the Roland D-50 whilst recording a single, and I decided (whilst the D-50 was in my possesion) to try out that package as well — heaven!

The Patch Editor

To describe a patch editor, the only way is to explain the way it works. You have to simply access the innards of the synthesiser by software alone, this means that the computer is talking directly to the synth using "system exclusive" commands (a series of commands that are specific to the synthesiser.These commands don't generate any notes). Both packages for the D-50 and the MT-32 are naturally similar, because they use something called LA (Linear Algorithm) Synthesis and the D-50 can be seen as the big grand daddy of the MT-32. Other than that, the principle is the same between other synths like Yamaha's FB01 or theTX8-1Z or even the Ensoniq ESQ 1.

If you have a synth that DR T's have supported with their patch editors, then I stronly urge you to go out and buy one, simply because the quality of sounds I have heard on a selection of their discs are of the very highest quality — certainly much better than some of the "official" sounds marketed by the likes of Roland and Yamaha!

The idea is simple, you are presented with a graph on screen, you merely draw out the sounds, or alter a number of parameters using the graph, and there you have it! A sound of your very own! Of course with complex synthesisers such as the MT-32, there are specific routes and ways in which a sound is created, and if you own a DX-7 or any of the DX synths, then you would be crazy to program the synth from anything other than a computer.

Running the software in a multi-user environment is certainly possible if you have the memory. I tried it out on a 512K Amiga 1000 and the thing crashed, likewise I tried it on an Amiga 500 and the software just barely made it (I used Kickstart 1.2). When it came to loading it on an Amiga 2000, I was able to load not only the KCS and the MT-32 editor,

K2 Using the Package

This review was to have appeared in the last issue of *Your Amiga*. Had it not been for the fact that the KCS is so much more complex than I had originally expected it would have done. To call it a big package is anunder statement — it is huge! There are more features on this system than I have ever seen in my life and supporting functions I have not seen on any package other than Steinberg's software, although you have to fight a bit harder to get to it!

but also the D-50 editor! The trick is in working out how much memory you need for the KCS and making sure you have about three drives free to put discs into.

It is possible to use this package with a hard disc, but due to the nature of the software protection, you will have to shove in the original floppy disc as you boot off the KCS or the Caged Artist icons, sorry, but if people hadn't pirated and distributed s oftware in the past, then this stupid situation would never have arisen.

Using The KCS

I have used this package solidly for about three months in a more or less perfect studio environment. I have written about 20 songs using the package, and all of them make some use of the MT-32's Caged Artist sounds. The KCS is a particularly responsive sequencer, harking back to the days of the 8 bit systems running on Commodore 64s and Beebs, albeit with a great deal more grace and speed when it comes to processing notes and sequences.

That the KCS also supports multitasking operations is an ideal reason to go out and buy both sequencer and sound editor/librarian at the same time. Some people may be put off by the rather bohemian appearance of the sequencer. It doesn't look like Steinberg's software because the programmers have taken the space used on pretty graphics and icons and have crammed in every last feature I can think of, especially the networking facility that makes the KCS literally the heart of a family of packages all running from the same machine!

This is the Rolls Royce of sequencing packages for the Amiga. It isn't pretty to look at, but when you are in a studio or at home writing your latest piece of music, you don't actually look and marvel at how pretty the icons are, you just get on with it!

I would like to express his thanks to MCM for their help in supplying the KCS for this review.

Publisher: **Dr T's Music Software**
220 Boylston Street
Suite 306
Chestnut Hill
MA 02167.

UK Supplier: **MCMXCIX**
No 9 Hatton Street
London NW 8.
Tel: **01 724 4104/01 258 3454**

Setting up your Own MIDI System

■ Should you be interested in starting using your Amiga in a MIDI studio below are a list of three different systems that I think are ideal for getting started:

1st..
Aegis Sonix
Mimetics Midi Interface
Casio CZ230s

This system has a lot going for it. You can use the Amiga to play various instruments and with channels four through to eight, you can use the Casio's sounds — there are drums built in too!

2nd..
Deluxe Music Construction Set
Datel/Mimetics Midi Interface
Casio 230s

This system (much like the above) is more expandable. More useful if you can write music for yourself, the choice of the Datel Midi Interface is wholly dependant on your descision to expand and get more synths.

3rd..
Deluxe Music Construction Set
Dr T's KCS Midi Composition Package
Datel Midi Interface
Caged Artist Editor
Cheetah MK 5vII Midi only Keyoard
Roland MT-32
Sequential TOM

This is an ideal semi-pro setup. With the Deluxe Music Construction Set, you can write your ideas, and play them in a MIDI environment. KCS is more ideally suited to playing by ear.

The Midi Interface is suitable for hooking up a number of instruments and the MT32 is ideal for the best sounds under £400. The MT-32 has drums, but the Sequential TOM sounds are the best drums I have heard in a long while.

To control the lot, just get a Cheetah MK 5vII keyboard controller — very good value for money, and excellent if you don't want to buy a complete synth.

High Quality 2nd Drive for the Amiga
- at a price that makes sense!

Evesham Micros



NEW LOWER PRICE !
£89.95
including VAT and delivery

✔ Offers full compatibility with A500 and A1000
✔ Top quality Citizen drive mechanism
✔ 880K formatted capacity
✔ Very quiet
✔ Slimline design
✔ Throughport
✔ Long cable for location either side of computer
✔ Full 12 months guarantee

All prices VAT/delivery inclusive. Next day delivery £5.00 extra.

How to order...
Send cheque P.O. or ACCESS/VISA details
Phone with ACCESS/VISA details
Govt., educ. & PLC official orders welcome
Same day despatch whenever possible
Callers welcome, open 6 days 9.30-5.30
All offers subject to availability, E.&O.E.
TELEX: 333294 FAX: 0386 765354

Evesham Micros Ltd
63 BRIDGE STREET
EVESHAM
WORCS. WR11 4SF
Tel: (0386) 765500

ALSO AT: 1762 PERSHORE RD., COTTERIDGE, BIRMINGHAM, B30 3BH. TEL: 021 458 4564

To find out all you need to

Know

about the Amiga computer

it

pays to subscribe to 'Your Amiga'

all

you need to do is fill in the coupon

U.K. £9.00, Europe £11.80, Middle East £11.90, Far East £13.00, Rest of the World £12.10 Airmail rates on request.

Please commence my subscription(s) to YOUR AMIGA with the ..... issue.
I enclose my cheque/money order for £..... made payable to Argus Specialist Publications Ltd.
or debit £..... from my Access/Barclaycard No. ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐ valid from..... to .....
Signature ..... Name .....
Address .....
..... Postcode .....

Send this form with your remittance to:

INFONET LTD. 5 River Park Estate, Billet Lane, Berkhamsted, Herts HP4 1HL

Assembly Language Course

No programming series is complete without a practicle example. Peter Lawrence provides followers of this series with their first real 68000 program.

■ **Over the last couple of instalments of** this series we have taken a close look at the Amiga as a machine for Assembly language programmers. This issue we produce our first program. The rest of this article will concentrate on an example. A reasonably detailed description of the program is given as comments included in the listing. A description of all of the structures and library calls required by the programs is presented below.

The structures we'll be looking at from now on fall into two basic categories. The first is structures such as the IntuiText structure which have to be created by the user and so will be discussed in fair detail. The second is structures which the system creates and maintains. These usually contain far more data than you will ever need to handle and so I will not be giving a detailed account but rather a general description and a look at a few of the more useful data elements.

Example 1

The following structures are used in this example program:

NewWindow Structure — required when you wish to open a window.

WORD	nw_LeftEdge, nw_TopEdge	{0,2}
WORD	nw_Width, nw_Height	{4,6}
UBYTE	nw_DetailPen, nw_BlockPen	{8,9}
ULONG	nw_IDCMPFlags, nw_Flags	{10,14}
APTR	nw_FirstGadget, nw_CheckMark	{18,22}
APTR	nw_Title, nw_Screen, nw_BitMap	{26,30,34}
WORD	nw_ MinWidth, nw_MinHeight	{38,40}
WORD	nw_MaxWidth, nw_MaxHeight	{42,44}
UWORD	nw_Type	{46}

LeftEdge, TopEdge, Width & Height — define the location and size of the window when it first appears.

DetailPen — Pen number used for details such as text in title bar. A -1 means use the screen's default pen.

BlockPen — Pen number used for blocks such as title bar. A -1 means use the screen's default pen.

IDCMPFlags — Stands for Intuition Direct Communication Message Port Flags which are used to pass messages between the window and the program which opened it. When a flag is specified Intuition creates message ports to communicate with your program (which will be explained later) and sends your program messages when an appropriate event occurs. Just what constitutes an appropriate event depends upon which IDCMP Flags you set here. The following options are available.

Note that this list is not exhaustive but includes those flags which I consider to be most often useful.

NEWSIZE (=2): Send a message whenever the user resizes the window.
REFRESHWINDOW (=4): Send a message whenever the window needs to be refreshed (redrawn). This depends upon which type of refresh you have specified (see below).
MOUSEBUTTONS (=8): Sends message whenever a mouse button is used that means nothing to Intuition. This last qualification is important because if you click the left button while pointing to the gadget then Intuition handles this and does not send a message to your program.
MOUSEMOVE (=16): To use this the REPORTMOUSE flag must also be set in the window's nw_Flags field or if FOLLOWMOUSE is specified in a gadget structure. It causes all mouse movements to be reported to your program.
GADGETDOWN (=32): Messages are sent whenever a gadget within the window is selected. That is, when the left mouse button is pressed down while pointing to a gadget.
GADGETUP (=64): Similar to GADGETDOWN except the message is sent when the mouse button is released. The gadget must have its RELVERIFY Flag set.
MENUPICK (=256): Sends data about menu items which have been selected. We will learn how to use this in detail in a later article.
INTUITICKS (=$00400000): Regular messages are sent, approximately 10 times per second whenever the window is active. INTUITICK messages will not be queued so they will not build up if you can't reply fast enough.
CLOSEWINDOW (=512): When the close window gadget is selected your program will hear about it.
ACTIVEWINDOW (=$00040000), *INACTIVEWINDOW (=$00080000)*: Lets you know when the window is activated and deactivated.

Flags — controls various parameters which describe the window's characteristics. The following are valid.

WINDOWSIZING (=1): Adds the sizing gadget to the window.
WINDOWDEPTH (=4): Adds the depth arrangement gadgets.
WINDOWCLOSE (=8): Adds the window close gadget.
WINDOWDRAG (=2): Adds the drag bar gadget.

When part of a covered window becomes uncovered then the display must be redrawn in the newly revealed area (refreshed). Just when this is necessary depends upon the following flags.

SIMPLE_REFRESH (=64): The application program is always responsible for refreshing the display.
SMART_REFRESH (=0): The application program only needs to worry about refreshing after the window sizing gadget has been used to increase the window's size.

Other Flags:
BACKDROP (=$100): This flag ensures that the window created will always be at the back of all other windows no matter what you do with depth arrangement gadgets. However, the only standard gadget which you can attach to such a window is the close gadget.
REPORTMOUSE (=$200): Causes mouse movement messages to be sent.
BORDERLESS (=$800): Creates a window without the usual border padding.
ACTIVATE (=$1000): Activates the window as soon as it is opened.
NOCAREREFRESH (=$20000): Ensures your program will not receive refresh messages.
RMBTRAP (=$10000): Tells Intuition that the window does not have any menus associated with it and thus that all right mouse button activity is to passed as MOUSEBUTTON events and ignored by Intuition.

FirstGadget — Points to a gadget structure (the first in a list) which will be automatically drawn when the window is opened.

CheckMark — As you have probably seen, some menu items, when selected, are marked in some way — usually a tick. This tick is the default but you may actually use any image you like simply by setting this pointer to the Image structure which describes your check mark.

Screen — If this window is in the workbench screen then ignore this field. If you are using a custom screen then this field should point to the corresponding screen structure.

BitMap — This field is only used if you have a Super Bit Map Window, which is sadly beyond the scope of this course.

MinWidth, MaxWidth, MinHeight & MaxHeight — These set the limits on the window's size and are only meaningful if the window has a sizing gadget.

Type — Contains the screen type to which the window is attached.

The options are:

WBENCHSCREEN (=1) and CUSTOMSCREEN (=15)

Gadget structure — describes a custom gadget.

NextGadget — Pointer to the next gadget in the list — another Gadget structure.

LeftEdge, TopEdge, Width & Height — By now these should be self explanatory although there are some special cases considered below.

Note also that the gadgets position is relative to the upper-left corner of the element which contains it (e.g the window) and not the absolute coordinates of the screen.

Flags — Define the gadgets characteristics. The first four flags describe how the gadget's appearance should change when it is selected.

GADGHCOMP (=0): The gadgets bits are complemented.
GADGHIMAGE (=2): An alternate image is displayed.
GADGHBOX (=1): A box is drawn around the gadget.
GADGHNONE(=3): Nothing happens.

Other Flags,

GADGIMAGE (=4): Set this if the visual appearance of the gadget is defined by an Image structure (as opposed to a Border structure).
GRELBOTTOM (=8): If this is set then the gadgets TopEdge will be interpreted relative to the bottom of the window.
GRELRIGHT (=16): Causes LeftEdge to be relative to the right edge of the window.
GRELWIDTH (=32) & GRELHEIGHT (=64): Causes Width and Height to be relative to the window's width and height.

Note that the last four flags usually require that the corresponding spatial parameter (gg_LeftEdge, gg_Height, etc.) be a negative number. That is if GRELWIDTH is set and gg_Width is -30 then the gadget will be 30 pixels shorter than the window it is in no matter what you do with resizing the window.

SELECTED (=$80): This allows you to specify a gadget as already selected when it is first drawn.

```
APTR    gg_NextGadget                          {0}
WORD    gg_LeftEdge, gg_TopEdge                {4,6}
WORD    gg_Width, gg_Height                    {8,10}
WORD    gg_Flags, gg_Activation, gg_GadgetType
                                               {12,14,16}
APTR    gg_GadgetRender, gg_SelectRender       {18,22}
APTR    gg_GadgetText                          {26}
LONG    gg_MutualExclude                       {30}
APTR    gg_SpecialInfo                         {34}
WORD    gg_GadgetID                            {38}
APTR    gg_UserDate                            {40}
```

GADGDISABLED (=$100): Means that the gadget will be drawn but will not work. This state may be changed with the Intuition routines OnGadget (LVO=-186)and OffGadget.(LVO=-174)

Activation — Describe how the gadget behaves when activated.

TOGGLESELECT (=$100): Each time it is selected it switches state between on and off.
GADGIMMEDIATE (=2): A message will be sent to your program as soon as the mouse button is pushed.
RELVERIFY (=1): The message is sent only if the pointer is still over the gadget when the button is released.
FOLLOWMOUSE (=8): When the gadget is selected the program will get messages concerning all mouse movements.
The following flags apply to string gadgets (for text entry).

STRINGCENTER (=$200): The text string in the gadget will be centred.
STRINGRIGHT (=$400): Text is right justified.
LONGINT (=$800): The gadget will only accept an integer as the input string and will return it to your program as a 32 bit number rather than as ASCII.

GadgetType — This may be either *BOOLGADGET (=1)*, Boolean gadget or Button, *STRGADGET (=4)*, a string gadget or *PROPGADGET (=3)*, a proportional gadget (potentiometer).

GadgetRender — Pointer to the Image or Border structure used to draw the gadget. A NULL means nothing is drawn.

SelectRender — Points to the Image or Border used when selected (if the GADGHIMAGE flag is set).

GadgetText — Pointer to an IntuiText Structure which will be rendered when the gadget is drawn. Note that the text position specified by the IntuiText structure will be relative to the top-left of the gadget.

MutualExclude — Not yet implemented.

SpecialInfo — If the gadget is other than Boolean it needs more info. This field points to that info.

GadgetID & UserData are ignored by the system and are supplied purely for your own use. UserData could, for example, point to the subroutine to call when this gadget is selected.

IntuiMessage Structure — Contains all of the required information to pass messages to and from Intuition.

```
STRUCT  im_ExecMessage                         {0}
ULONG   im_Class                               {20}
UWORD   im_Code, im_Qualifier                  {24,26}
APTR    im_IAddress                            {28}
WORD    im_MouseX, im_MouseY                   {32,34}
ULONG   im_Seconds, im_Micros                  {36,40}
APTR    im_IDCMPWindow, im_SpecialLink         {44,48}
```

ExecMessage — This is an example of something we have not met before, one structure (STRUCT) which is imbedded into another. The first thing which appears in the IntuiMessage structure is an ExecMessage structure which contains the essential information required by all Amiga messages. This ExecMessage structure is itself divided into various data elements but it will not be necessary to look at that in detail here.

Class — Tells us what kind of message this is (i.e. CustomGadget, CLOSEWINDOW). its bits correspond directly to the IDCMP Flags described earlier.

Code — The meaning of this field varies depending upon the type of the message. It can contain a menu number or a keycode or sometimes it has no meaning. We will look at this in more detail in the future as we treat individual cases of IntuiMessages.

Qualifier — This is useful if you are reading raw keycodes (not ASCII codes) from the keyboard as it contains information about qualifying events such as whether or not the shift key was also pressed. It's use is, however, beyond the scope of this introductory course.

IAddress — The address of the Intuition object involved. If, for example, the message reports a gadget to be selected then this field points to the Gadget structure.

UserPort — As you may have already realized, with so many messages being sent around between so many concurrent tasks there needs to be some way of knowing which messages are intended for which programs. An integral part of this system is the message port which is essentially an address to which messages are sent. If a program wants to receive messages then it must have created a MessagePort structure and informed the task sending the message where this Port is.

When a program opens a window Intuition automatically creates such a MessagePort which it will use whenever the window wishes to communicate with your program. This UserPort field contains the address of this MessagePort.

Screen Structure — When Intuition opens a screen (a topic we will look at next month) it creates a Screen structure to describe it.

At the moment the only element of this structure of interest to us is:

```
STRUCT  sc_ViewPort                    {86}
```

MouseX, MouseY — The mouse pointer's coordinates relative to the upper left-hand corner of the window.

Seconds, Micros — The system time when the message was sent. This is expressed in seconds and microseconds where zero corresponds to midnight on December 31 1977. For an example of how this can be converted to a conventional date and time take a look at the article "Setting the Amiga System Time" published in *Your Amiga*.

IDCMPWindow — Points to the window involved in the message.

SpecialLink — is used only by the system and is of no interest to applications programmers.

ViewPort — The entire picture which you see on your monitor is referred to in Amiga terminology as a view and is described by a View structure. However, the Amiga display can have many different areas with different characteristics. A simple example of this is if you have created several screens and you use their drag bars to bring all three of them into partial view. Each of thesedifferent viewing areas is known as a ViewPort and has a corresponding ViewPort structure.

You should be aware that, while an Intuition screen is an example of a view port it is not the only possible type. In fact, the concept of a Screen is not generally recognized outside of the Intuition Library and so if you wish to use a Graphics Library routine to operate on a screen then knowing the location of the Screen structure is not enough. You must know where to find its lower level data structures such as the ViewPort.

The ViewPort structure associated with a screen is imbedded into the Screen structure and this offset points to its beginning.

Other Structures

In addition to the structures already given a few more are required to fully understand the program in example 1. However, at this point no detailed description will be given of these structures but rather just an explanation of those data elements which are of direct interest here.

Window Structure — This is created by Intuition whenever a new window is opened and it contains the information necessary to describe the window.

```
APTR  wd_WScreen                       {46}
APTR  wd_UserPort                      {86}
```

WScreen — A pointer to the Screen structure of the screen into which the window is drawn.

Library Routines

The following additional routines are required for example 1. The offset values are given in the {} brackets after the routines name.

Exec Library:

WaitPort {-384} — Waits for a message to arrive at a given Port. If a message is already there it will return immediately, otherwise it puts the program to sleep until a message comes. Before the routine is called A0 must point to the MessagePort. Upon returning D0 will contain the address of the Message.

GetMsg {-372} — Gets a message from a Port (pointed to by A0). Unlike WaitPort this routine will not wait for a message. If no message is present at the Port then it returns with a zero in D0. However, this routine removes the message from the Port thus either emptying it or allowing the next message to come to the head of the queue. WaitPort does not do this so repeated calls to WaitPort would return pointers to the same message.

ReplyMsg {-378} — Since a message occupies memory it is a good idea to free this memory once the message is finished with. This is the responsibility of the sender but it can't do this until it knows you are finished with the message. To communicate this put the Message's address into A1 and call this routine.

Intuition Library:

OpenWindow {-204} — Given a NewWindow structure (pointed to by A0) this routine opens the described window. It returns with D0 containing the address of the Window structure. If D0 contains zero then the window failed to open.

CloseWindow {-72} — Closes the window whose Window structure is pointed to by A0.

Graphics Library:

SetRGB4 {-288} — Allows an individual colour to be changed to any of the 4096 available. Upon calling this routine A0 must point to the ViewPort structure whose colour you wish to change, D0 should contain the pen number and D1, D2 and D3 must each contain values between 0 and 15 which correspond to the desired red, green and blue intensity respectively.

Given the wealth of information above you should now be ready to study and understand the example program. You should look at it in detail and know how and why every line functions as it contains many techniques which we will be using again and again in the future.

Although the program is fairly simple and is, in itself, useful only as a didactic exercise, nevertheless take an objective look at what it does. If you've had much experience with 8 bit micros you'll realize that manipulating windows, gadgets and screen colours, even at this simple level, is quite an achievement for our first sample program.

Once you get the hang of it you'll be surprised at how easy the Amiga is to program.

Next Time

Having got ourselves started with the basic principles, next installment we'll take more in depth look at the Intuition Library including how to create custom Screens, more on Windows and Gadgets, plus menus and a few other goodies. See you then.

```
*******************************************************
*              Example Programme #1                   *
*******************************************************

*  Constants and Flags  *

AbsExecBase       = 4
LIBRARY_VERSION   = 33                          ;Kickstart 1.2
GADGETUP          = 64
GADGHCOMP         = 0
RELVERIFY         = 1
BOOLGADGET        = 1
CLOSEWINDOW       = 512
JAM1              = 0
GADGET0           = 0
WBENCHSCREEN      = 1
NOCAREREFRESH     = $20000
ACTIVATE          = $1000
WINDOWCLOSE       = 8
WINDOWDEPTH       = 4
WINDOWDRAG        = 2

*  Library Offset Vectors  *

*-Exec Library-*

LVOOpenLibrary    = -552
LVOCloseLibrary   = -414
LVOWaitPort       = -384
LVOGetMsg         = -372
LVOReplyMsg       = -378

*-Intuition Library-*

LVOOpenWindow     = -204
LVOCloseWindow    = -72

*-Graphics Library-*

LVOSetRGB4        = -288

*  Offsets Into Structures  *

wd_WScreen        = 46
wd_UserPort       = 86
im_IAddress       = 28
gg_UserData       = 40
im_CLASS          = 20
sc_ViewPort       = 44
bc_Red            = 0
bc_Green          = 1
bc_Blue           = 2

*  Main Programme  *



CODE

Start:          lea       IntuitionName,a1      ;Open Intuition
Library.
                move.l    #LIBRARY_VERSION,d0
                move.l    AbsExecBase,a6
                jsr       LVOOpenLibrary(a6)
                move.l    d0,IntuitionBase      ;Save the node.
                beq.l     IntuitionFail           ;Did the library
open?

                lea       GraphicsName,a1         ;Open Graphics
Library.
                move.l    #LIBRARY_VERSION,d0
                jsr       LVOOpenLibrary(a6)
                move.l    d0,GraphicsBase       ;Save the Node.
                beq.l     GraphicsFail            ;Did the library
open?.

                lea       NewWdw,a0               ;Load pointer to
NewWindow.
                move.l    IntuitionBase,a6      ;Load library node.
                jsr       LVOOpenWindow(a6)     ;Open the window.
                move.l    d0,Wdw                  ;Save pointer to
window.
                beq.s     WindowFail              ;Did the window
open?

Waiting:        move.l    Wdw,a0                  ;Find the window's
user
                move.l    wd_UserPort(a0),a0    ;message port.
                move.l    a0,MPort                ;Save a pointer to
it.
                move.l    AbsExecBase,a6          ;Load Exec Library
node.
                jsr       LVOWaitPort(a6)       ;Wait for a message.
                move.l    MPort,a0              ;When it comes point
to the
                jsr       LVOGetMsg(a6)           ;port and get the
message.
                cmpi.l    #0,d0                   ;Was there a
message?
                beq.s     Waiting               ;If not go back and
wait.
                move.l    d0,a1                 ;Otherwise,
                move.l    a1,Message            ;Save the pointer to
it and
                move.l    im_CLASS(a1),d1       ;find out what type
it is.
                cmpi.l    #GADGETUP,d1            ;Was a gadget
released?
                beq.s     CustomGadget          ;If so then branch.
                move.l    Message,a1              ;Otherwise reply to
it
                jsr       LVOReplyMsg(a6)       ;to free it and then
                move.l    Wdw,a0                  ;assume it was a
message
                move.l    IntuitionBase,a6        ;from the Close
gadget so
                jsr       LVOCloseWindow(a6)    ;close the window.

WindowFail:     move.l    GraphicsBase,a1       ;Close down the
                move.l    AbsExecBase,a6        ;Graphics Library.
                jsr       LVOCloseLibrary(a6)

GraphicsFail:   move.l    IntuitionBase,a1      ;Close down the
                move.l    AbsExecBase,a6        ;Intuition Library.
                jsr       LVOCloseLibrary(a6)

IntuitionFail:  rts                             ;End the programme.

CustomGadget:   move.l    im_IAddress(a1),a1    ;Find address of
                                                ;Gadget.
                move.l    gg_UserData(a1),a1    ;Pointer to the new
                                                ; colour.
                move.b    bc_Red(a1),d1         ;Load the Red,
                move.b    bc_Green(a1),d2       ;         Green
                move.b    bc_Blue(a1),d3        ;     and Blue
                                                ;components.
                clr.l     d0                    ;Pen number zero.
                move.l    Wdw,a0                ;Find the address of
                                                ;the
                move.l    wd_WScreen(a0),a0     ;Screen structure,
                adda.l    #sc_ViewPort,a0       ;then its ViewPort
                                                ;structure.
                move.l    GraphicsBase,a6       ;Load Graphics
                                                ; Library node.
                jsr       LVOSetRGB4(a6)        ;Set the new colour.
                move.l    AbsExecBase,a6        ;Load Exec Library
                                                ;node.
                move.l    Message,a1            ;Reply to the
                                                ;original
                jsr       LVOReplyMsg(a6)       ;message.
                bra.l     Waiting               ;Go back and wait
                                                ;for another.

*-------------------------------------------------------------*

*  Initialized Data  *

IntuitionName:  dc.b 'intuition.library',0  ;Library names.
GraphicsName:   dc.b 'graphics.library',0

                EVEN

WdwFlgs = WINDOWCLOSE ! WINDOWDRAG ! WINDOWDEPTH ! NOCAREREFRESH


! ACTIVATE

NewWdw:         dc.w 250,60,136,82
                                                ;LeftEdge,TopEdge,
                                                ;Width,Height.
                dc.b -1,-1                      ;Default pens.
                dc.l CLOSEWINDOW!GADGETUP       ;IDCMP Flags (see
                                                ;note below).
                dc.l WdwFlgs                    ;Flags.
                dc.l Gadget1,0,WdwTitle         ;FirstGadget,Default
                                                ;CheckMark,
                                                ;Pointer to title.
                dc.l 0,0                        ;Null for Screen and
                                                ;BitMap.
                dc.w 0,0,0,0                    ;Null for size
                                                ;limits since
                                                ;there is no sizing
                                                ;gadget.
                dc.w WBENCHSCREEN               ;Using the
                                                ;workbench.

;Note: the ! symbol performs a logical OR operation which is how
;more than one flag is set.

WdwTitle:       dc.b 'Ex 1a',0                  ;The window title
                                                ;string.

;What follows is an example of a macro (everything between the
;MACRO and ENDM statements).  When the macro is called, using the
;name assigned as a label in front of the MACRO statement, it may
;be followed by a number of operands.  The first of these will be
;used to replace the ?1 in the body of the macro definition, the
;second replaces the ?2 and so on.
;This macro creates a Gadget structure when it is called.

GadgetStruc:    MACRO                           ;Gadget No., Next Gadget,
                                                ;Left, Top.
                EVEN                            ;Forces the next line to
                                                ;be assembled at an even
                                                ;address.

Gadget?1:       dc.l Gadget?2                   ;The next gadget,
                dc.w ?3,?4,56,24                ;The size and position.
                dc.w GADGHCOMP                  ;Highlight by complement.
                dc.w RELVERIFY                  ;Send message upon
                                                ;release.
                dc.w BOOLGADGET                 ;A Boolean gadget.
                dc.l 0,0,Text?1,0,0             ;No rendering except text
                                                ;and no special info.
                dc.w 0                          ;Not used.
                dc.l BackColour?1               ;Points to the
                                                ;appropriate bc struc.

                ENDM
```

```
*  Invocations of the Gadget structure macro  *

                GadgetStruc 1,2,8,18
                GadgetStruc 2,3,72,18
                GadgetStruc 3,4,8,50
                GadgetStruc 4,0,72,50

*  A macro to create IntuiText structures  *

IntuiTextStruc:  MACRO    ;Text No., Left, Top
                 EVEN

Text?1:          dc.b 1,0,JAM1,0          ;Pens and DrawMode
                                          ;(and Pad).
                 dc.w ?2,?3               ;Location.
                 dc.l 0,String?1,0        ;Default font,
                                          ;pointer to the
                                          ;text and null
                                          ;pointer.
                 ENDM

*  Invocations of IntuiText macro  *

                 IntuiTextStruc 1,16,10
                 IntuiTextStruc 2,8,10
                 IntuiTextStruc 3,12,10
                 IntuiTextStruc 4,8,10

*  The Gadget Text Strings  *

String1:         dc.b 'RED',0
String2:         dc.b 'GREEN',0
String3:         dc.b 'BLUE',0
String4:         dc.b 'BLACK',0

*  Our BackgroundColour Custom Structures  *

BackColour1:     dc.b 14,1,1
BackColour2:     dc.b 3,10,3
BackColour3:     dc.b 2,5,10
BackColour4:     dc.b 0,0,0

*  Storage for Programme Generated Data  *

                 DATA

                 EVEN
.fo=//ENDS.

IntuitionBase:   blk.l 1
GraphicsBase:    blk.l 1
Wdw:             blk.l 1
MPort:           blk.l 1
```


It's easy to complain about an advertisement. Once you know how.

One of the ways we keep a check on the advertising that appears in the press, on posters and in the cinema is by responding to consumers' complaints.

Any complaint sent to us is considered carefully and, if there's a case to answer, a full investigation is made.

If you think you've got good reason to complain about an advertisement, send off for a copy of our free leaflet.

It will tell you all you need to know to help us process your complaint as quickly as possible.

The Advertising Standards Authority.
If an advertisement is wrong, we're here to put it right.

ASA Ltd, Dept 1 Brook House,
Torrington Place, London WC1E 7HN

This space is donated in the interests of high standards of advertising.

2ND AMIGA DISK DRIVE

VISA

NEC mechanism
880K capacity



By selling direct we can provide the best price and maintain the highest quality. Rest assured that if, for any reason, you do not wish to keep the item, then return it to us within 14 days of purchase and we will refund your money in full. Should any item purchased from us fail during the first 12 months then we will repair it free of charge.

2ND PRINTER INTERFACE



Use your Amiga's serial port to drive a second Centronics compatible printer. A 3 metre cable is included - no extras required.

MIRACLE SYSTEMS
NBC, Dean Road, Yate, Bristol BS17 5NH
Telephone orders welcome on (0454) 317772

EEC LTD.

PRINTERS 1/2 PRICE
FOR AMIGA & DEDICATED PRINTERS
FOR COMMODORE USERS

★ BROTHER HR10C £120 INC VAT

Daisy wheel 80 col 12 CPS 2K Buffer, includes TRACTOR FEED - BOOKS IN ENGLISH, GERMAN & FRENCH - CENTRONICS & SERIAL VERSIONS also available.
IDEAL FOR WORD PROCESSING
Previously List Price £343.00



AMIGA OPTIONS
HR10 SERIAL/CENTRONICS VERSION £10 EXTRA
HR5 PORTABLE (4lbs) 80 COL 30 CPS VERY QUIET, USES THERMAL OR PLAIN PAPER, GOOD GRAPHICS, BATTERIES, MAINS SUPPLY, 2 SPARE RIBBONS, PAPER ROLL INCLUDED
£50 ONLY **(MAS £159.95)**

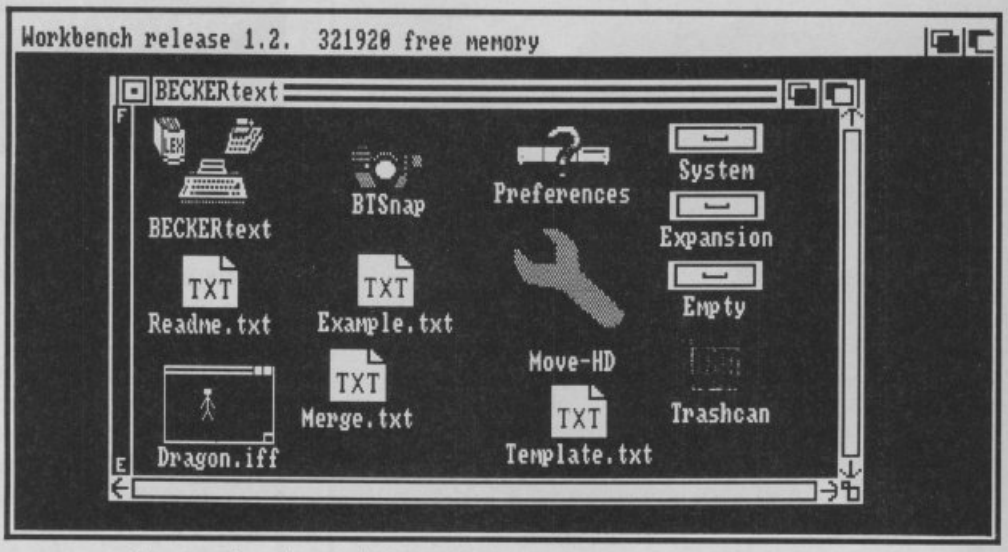
All prices inc. VAT. Add £6 postage for printer, £2 other item. Tel. orders. VISA or cash with order. Ansaphone orders ANYTIME. Please leave telephone number for acknowledgement.

18-21 Misbourne House, Chiltern Hill,
Chalfont St Peter, Bucks, SL9 9UE
Tel: 0753 888866

VISA

Wordprocessors

You would think that one wordprocessor would be much like another. Not so, finds Anne Owen, in her look at the latest two imports, KindWords and Beckertext. Plus a roundup of what is now a vast choice of Amiga wordprocessors and accessories



■ ***BeckerText is marketed as a professional*** *wordprocessor designed for writers, businesses and, interestingly, C programmers.*

BeckerText is a German product which comes back to us via the USA! It features strong editing facilities, comprehensive keyboard shortcuts for mouse-haters and fair printer support.

There are indeed a number of professional features in BeckerText: automatic formation of a table of contents and index, mail merging with a form letter, a dictionary for spell checking, a mini spreadsheet format for numbers in your documents and IFF file handling for the company logo on the masthead or a personalising self-portrait.

Editing

BeckerText starts up in overwrite mode in one of two available screen fonts, formatting text as you enter it. Because of the way it works, changes to text in the middle of a document can leave text strangely laid out. Paragraphs then have to be reformatted manually by pressing the HELP key. On screen, BeckerText displays the spaces it has used to format the text as dots.

Editing can be carried out with a mouse via pulldown menus or via the keyboard. Functions can be called with Amiga (or Commodore) key plus the mnemonic key (eg l for load) or by pressing ESCAPE followed by the mnemonic key. Text can be highlighted quickly before carrying out a cut or paste operation. The whole text can be highlighted with a single key press and there are quick key combinations for editing whole words, lines and sentences. There's also an UNDO feature just in case.

There's full cut and paste between documents if you can get more than one into memory. BeckerText is yet another application which expects a megabyte of memory or more. It works at its bare minimum level, a page or so with single graphic in a 512K Amiga. Trying to open a second document gets a "cannot" message on screen.

Layout

The page layout, margins, indents, paper length, header and footer positions, printable height and width, column width and number of columns and linespacing are set from the format menu. Super and subscript are supported and you can set characters per inch. Special cartridge fonts on printers (especially the new 24 pin printers) are also provided for.

Although it is not exactly straightforward to set up, multiple column text can be achieved.

BeckerText has a neat method of pagination, automatically inserting a page break according to the page size parameters but allowing you to insert your own "absolute" page break with the click of a mouse button.

Graphics

IFF graphics can be imported to the cursor position. Colourpictures can be converted to grey shade or "raster" — a set of pattern shades representing different colours. This feature can clearly be used to incorporate diagrams and charts as well as the more entertaining types of clipart. Thoughtfully provided with BeckerText is a separate BTsnap utility which can be used to take snapshot pictures of any screen and save them in a suitable IFF format. Once loaded into a document, the graphic can be moved horizontally or deleted.

Filing

File suffixes are used for the different types of file that BeckerText has to handle. For instance there's MSK for template files — forms to fill on your screen. There's DIC for dictionary files, TXT for text and so on. When loading or saving a file there is always an intermediate requestor stage to specify which type you are interested in and the file menu displays accordingly. If you are trying to load an IFF file and the .IFF suffix convention has not been observed then there's an obvious problem: no file is displayed!

One other slightly less professional feature worth mentioning is that BeckerText doesn't save the last line unless it's ended by a RETURN! There is a warning in the manual to this effect.

Options, such as TAB settings, assignments to function keys etc can be saved independently.

Printing

BeckerText invokes its own printer drivers, not those of Preferences. You can choose from a list of supported printers which include Epson, IBM and Commodore. There is no laser or colour driver and the general impression is of lack of support here. It is therefore good news that the printer drivers are editable text files. So, using BeckerText, you can load and change a driver to suit your printer. There is a detailed appendix on printer control in the chunky manual which comes with the program. Abacus are well known for their books and the BeckerText manual resembles one of them! Abacus also state that they will create a printer driver on request for registered owners of BeckerText although you may have to wait a while for Grand Rapids to respond!

Documents can be printed outright or sent to a file for batch printing at a later stage from an output list. A form letter can be used

s for the people

with a merge list. Contents and index files are generated at the printing stage, any markers in the text being picked up and separate lists created. The document can be printed vertically or horizontally.

I like the fact that printing can start at any page and that page numbers can be assigned at the print stage. You can also choose to have multiple copies.

Features

The spellchecker allows custom dictionaries and offers batch or online checking. There are two dictionaries, which are loaded into memory. Only the smaller one can be used in a 512K machine.

You can mailmerge and create templates with "protected" text for form-filling activities. Date and time can be inserted at the cursor.

Other unusual features are the ability to configure the RS232 for input and output of text from within the program — useful if you own a portable micro — and a C-Source mode (with automatic indenting) for programmers.

it justifies the difference in price.

Kind Words

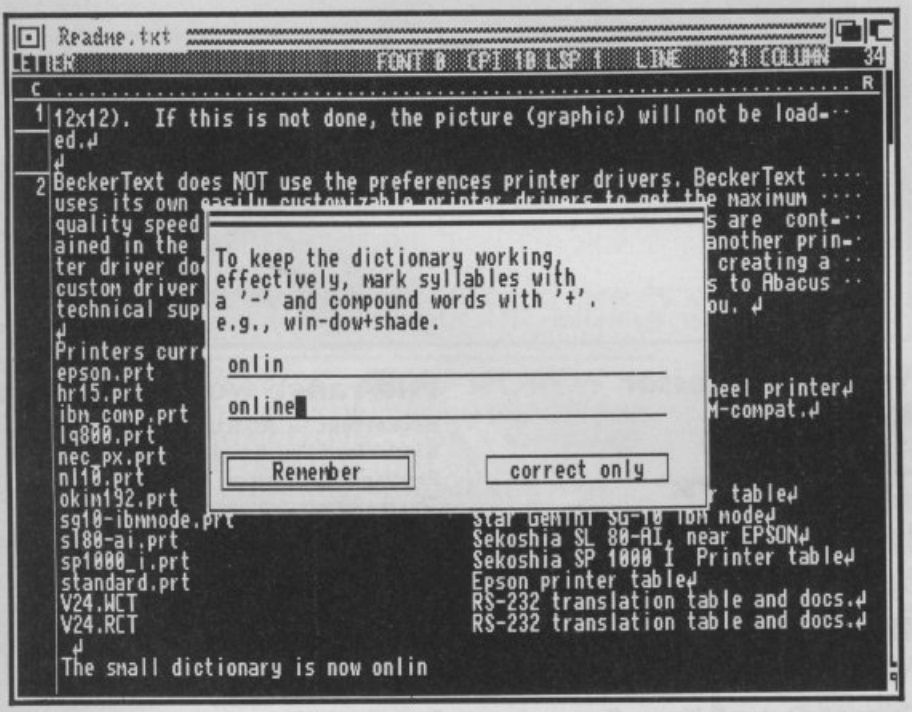
Kind Words from the Disc Company in the USA has been two years in the making and this effort is reflected in the design and range of features, which includes a unique Superfonts capability for dot matrix printers.

Kind Words has the "look" but not the "feel" of the original Amiga wordprocessor from Commodore, *Textcraft*. The ruler, line spacing and text alignment icons and some of the Mac-like requestors are similar and I wondered whether the similarities went more than just skin deep.

I soon discovered that Kind Words can incorporate graphics, it has a 90,000 word dictionary for spell checking and its filing habits are likely to be to everyone's liking. It certainly isn't a Textcraft clone!

No ifs about IFF

The most exciting prospect is the mixing of text with graphics so I'll dive straight in. You



Conclusions

BeckerText allows the combination of text, figures and graphs and charts. When combined with contents/index generation and spell-checking, it proves very suitable for report writing. It has a good bold display with fast update and excellent editing features. Priced at £125, BeckerText lies midway between most other Amiga wordprocessors and the top of the range WordPerfect. Unless you need one of the features in particular then I'm not sure

can insert a low, medium or high resolution graphic in IFF — standard Amiga — format. The latter is converted down to medium resolution. If the picture has more than 16 colours they are recomputed down to 16 for the purposes of Kind Words. The graphic appears, just as when text is imported, at the current cursor position. The graphic block can be manouevred, cropped (a new box cut from the original) and resized, proportionally if required.

Coloured text and graphics make sense if used in conjunction with the Epson JX80 compatible printers supported by Kind Words. If the results are to be in black and white then graphics should be produced in grey shades to get the best results.

Conventional

Kind Words also offers more conventional ways of giving impact to text. When you type at first the text is Roman, 12 point, plain. You can highlight with bold, italic and underline in any combination. Text can include different fonts in any combination, including boxes and special characters from a symbol font set.

Editing and block operations such as delete and copy are performed in characteristic Amiga fashion. Text which you wish to manipulate is highlighted before selecting the operation from the pulldown menus. Keyboard shortcuts are implemented for all functions.

Formatting is controlled by the ruler at the top of the page.Margins, indentations, tab stops, line spacing and text alignment are all adjustable at the click of a mouse button. The ruler settings act on the current paragraph so a variety of layouts can be incorporated into a single document.

The page size can also be fine-tuned and headers and footers defined. Although normally invisible, format markers can be revealed in the text so that you can judge their combined effect. There's an easy to use search and replace facility.

Checking up, mailing out

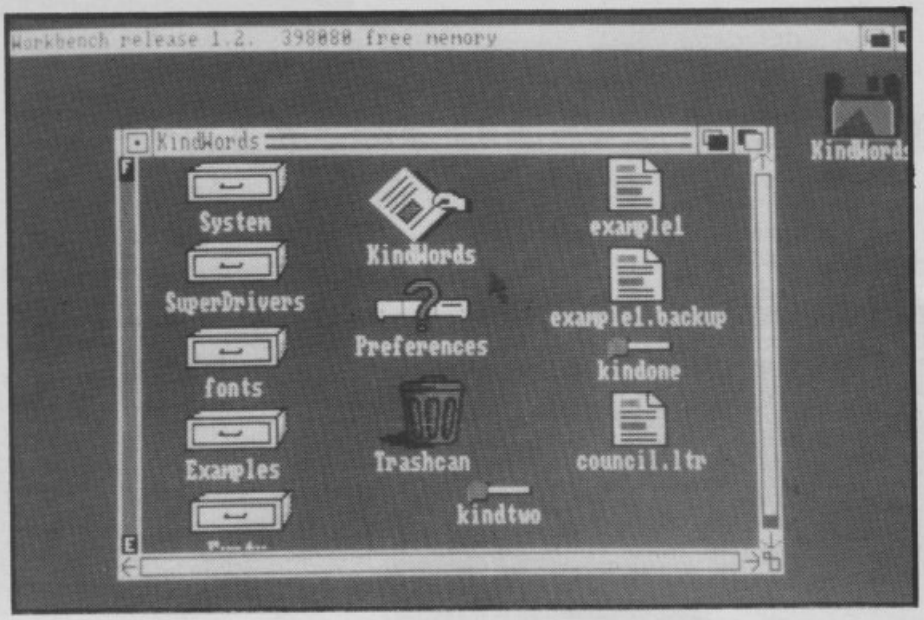
If you are using technology to help you write then you want to make sure that the finished product is right up to scratch. A good spell-checker is practical enough in operation to make you happy to use it. It is an unfortunate fact that disk based dictionaries on the Amiga are slow in use. Kind Words sensibly lets you load the dictionary into memory for checking should RAM be available.

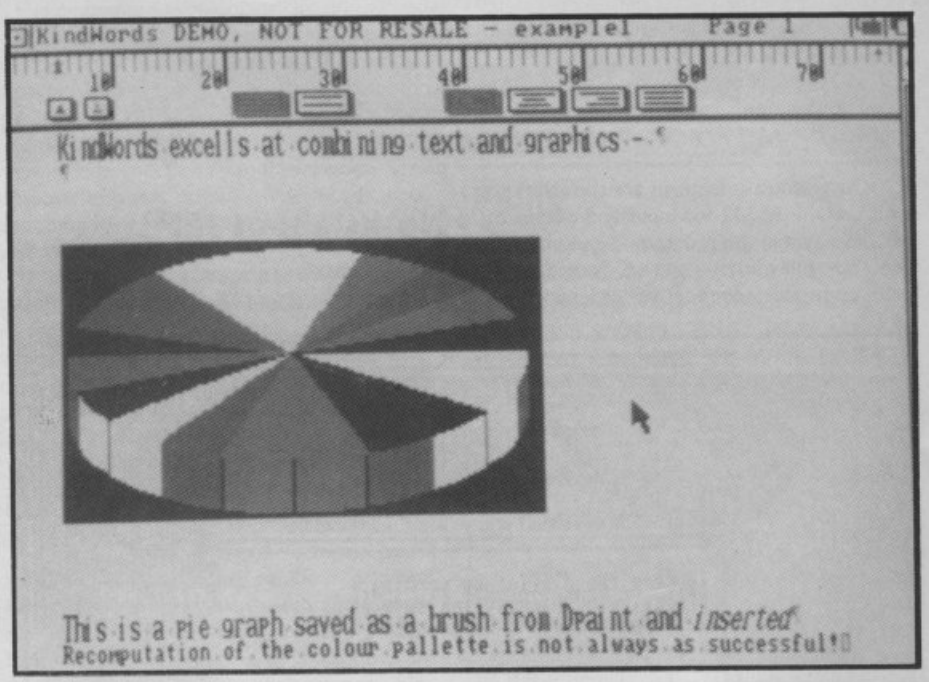
The Kind Words spellchecker has that most useful of features, a "suggestions" box. If the word is wrong you don't want to have to reach for the dictionary if you can help it. You can add words of which the dictionary is ignorant to any number of supplemental dictionaries for future use.

Kind Words provides a standard mail-merge facility. A list of items is created in a separate file, each separate set of data being incorporated into multiple versions of the same standard document at the printing stage. It's a vital part of any wordprocessor and Kind Words offers nothing new in this respect.

Superfonts

For the standard dot matrix printer owner these fonts offer the sort of looks expected of Near Letter Quality. The special character sets and super/sub script are accessible too.





Nor does Kind Words tie you down to Superfonts. If your printer has its own NLQ or you want to proof a letter in draft then you can choose to use them.

Amiga Centre Scotland, who is distributing Kind Words in the UK, has promised Superfonts for Hewlett Packard laser printers so we could be reconsidering Kind Words in the DTP category in the near future.

Extras

Kind Words will run in a 512K machine but the dictionary will have to stay on disk and document size will be restrictive. This is another piece of software which the RAM add-on manufacturers will learn to love. Even trying to print a two page document with graphics proved impossible with 512K. One megabyte should prove adequate for most. The screen contents is rewritten in about three blinks of an eye, two blinks longer than acceptable if you are trying to get on with some typing.

The Kind Words manual is adequate, clearly laid out but perhaps a bit brief on some topics and with few visual reminders of what should be happening on screen. There is a quick help facility if required.

Conclusions

The way Kind Words incorporates graphics is common sensical and effective. You will have no trouble processing pictures in *Deluxe Paint* for use in an advertising flyer or news sheet. DTP is overkill for many purposes when there are wordprocessors like Kind Words around. Superfonts can add the required professional finish. If you print with Superfonts or your printer's NLQ font and reduce on a photocopier, the results can be very satisfactory.

Finally you are not being asked to pay a fortune for a copy, which will set you back just £45.00. Kind Words' main rival for your favour is *ProWrite*, the original graphics handling wordprocessor. Try and see them side by side in your local dealer before deciding.

Wordy Processor Roundup

Typing tutors:

Inteletype — Electronic Arts

Beginners' wordprocessors:

Textcraft/Textcraft Plus — Commodore
Textcraft is a beginners wordprocessor with templates for business letters and Macintosh style screens in which you set up the layout of your document for screen and printer. It was fatally flawed however in the filing department. Its successor has addressed some of the problems and included a spell checker but Textcraft Plus can still not incorporate graphics, which one feels should naturally be part of an Amiga wordprocessor.

Textpro — Abacus

K-Text — Kuma

Mid-range wordprocessors:

Beckertext — Abacus

Kind Words — Amiga Centre Scotland

Precisely — Central Coast Software
This is a new budget wordprocessor from the USA. It retails in America for $79.95. It hasn't had much exposure here yet but doesn't appear to offer anything outstanding, certainly not graphics handling. It supports different font sizes and claims fast screen update, background printing, online help and unlimited document size as well as its own printer drivers.

Prowrite — New Horizons

Prowrite 2 — New Horizons(Amiga Centre Scotland)

Scribble!- MSS
Scribble! Supports different styles on screen but not colour or alternative print drivers. Mailmerge and spelling checker included. Block copy and move. Formatting achieved with good old-fashioned embedded commands. Somewhat superceded by the latest software but a worthwhile wordprocessor if you can get a good price.

Vizawrite — Viza Software (Precision)

Advanced wordprocessors:

Excellence — Brown-Wagh
Yet to be seen finished this side of the Atlantic. WordPerfect basher from MSS, the writers of The Works! Includes PostScript output.

WordPerfect — Sentinel Software
Currently the wordprocessor with the mostest. Multiplecolumns (newspaper or fixed style), mini spreadsheets within a document, spell checker and thesaurus, mailmerge and incredible printer support go to make it the best for business at the moment. Cut and paste between multiple documents but no support for graphics.

Outliners:

Flow -New Horizons

Specialist wordprocessors:

Eartype — (George Thompson Services)
For sight-impaired users

Integrated packages:

The Works! — Micro Systems Software
Write and File — Brown-Waugh

Spellcheckers/Thesauari:

Computer Requirements Spelling Checker —
Computer Requirements
Goldspell — Gold Disk (Haba Marketing)
K-Roget — Kuma
Promise — The Other Guys (Robtek)

Fonts:

Jetset (HP laserjet) — Precision
Zuma fonts 1,2,3 — Brown-Waugh

Captions
(C) BeckerText filing requestor
BeckerText print job in action

BeckerText graphic in place

Example of alternative font sets and colour graphics in Kind Words

Superfont quality on Epson FX

Superfont quality on Citizen HQ40 24 pin

Imported colour graphic printed on Citizen HQ40 with colour option fitted

Imported colour graphic processed into grey shades and printed via Citizen HQ40

1. processed by Kind Words

2. preprocessed in Pixmate and then imported

AMIGA CENTRE SCOTLAND

4 HART STREET LANE, EDINBURGH. EH1 3RN
Tel. 031-557-4242 : FAX 031-557-3260

MAKE THE MOST OF YOUR AMIGA WITH THE LATEST SOFTWARE AND HARDWARE RELEASES

KIND WORDS KIND WORDS
THE FIRST FULL FEATURE WORD PROCESSOR FOR THE AMIGA COSTING UNDER 50 POUNDS
FEATURES INCLUDE HAM GRAPHICS, SPELLING CHECKER, MAILMERGE AND SUPERFONTS FOR HIGH RESOLUTION PRINTING.

ANNOUNCING THE AMAZING HANDY SCANNER
AT LAST AN INEXPENSIVE AND EFFECTIVE SCANNING DEVICE FOR THE AMIGA



SCANNED IMAGES



UK REGISTRATION AND PRODUCT SUPPORT FOR MOST OF OUR PRODUCTS.
SOFTWARE FULL PAL VERSIONS
(Where available)

PLEASE SEND LARGE STAMPED ADDRESSED ENVELOPE FOR A COPY OF OUR LATEST BROCHURE.

THE COUNTRIES' LEADING AMIGA SOFTWARE SPECIALISTS

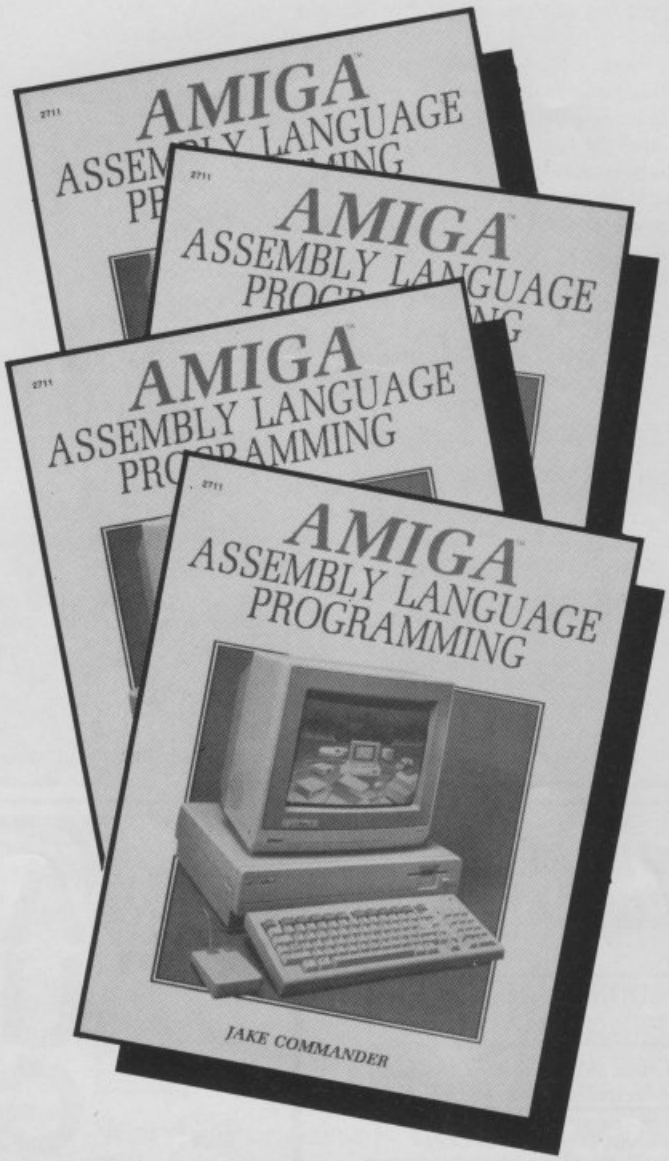
AMIGA Users Group

- ★ Bimonthly Newsletter
- ★ Technical Information
- ★ Discount on all products
- ★ Users Bulletin Board
- ★ Massive P.D. Libraries with over 200 discs at £3 each for members
- ★ Allied with U.S.A. Amiga Groups
- ★ Special introductory modem offer
- ★ Send S.A.E. for details

AMIGA USERS GROUP
66 London Road, Leicester LE2 0QD
or Tel: (0533) 550993

Book Reviews

A wealth of information about your Amiga can be gained from reading books — We take a look at some of the latest to appear on the market



Amiga Assembly Language Programming

■ **Good books about** assembly language programming are often hard to find when it comes to the Amiga. Good books about programming the machine are even harder to find, often falling into the two rough categories of simplistic tutor or advanced reference manual.

I was very pleased to receive *Amiga Assembly Language Programming* by Jake Commander, an American publication brought to my attention via the Publisher, TAB books.

The 231 page book is quite clearly printed, originally laser printed, it is also very well annotated with figures and tables, but sadly, very few illustrations dealing with really important parts of the book such as stack organization and register shifts something that is often better dealt with through the power of the picture and not, I must say, through devoting a chapter to the subject(s).

Still, I opened up the book ready for the worst, but I was pleasantly surprised at the amazing way Jake Commander has set out all of the most important 68000 commands and functions first, and dealt with them in a methodical and systematic way.

To program the Amiga, you will have to know quite a bit about the machine's internal facilities such as Paula, Fat Angus and the Blitter, in other words, you will have to be pretty familiar with the machine's hardware. This subject is not dealt with until some pretty stodgy chapters and the subject of the 68000 instruction set is not even looked at until chapter five at least this book has decided to set a precedent with all of the more modern 68000 programming books and look at the chip's unique and edifying addressing mode system before the instruction set is looked at all!

On the subject of programming the Amiga as a machine, all the most important details are dealt with first; Processes and Tasks are dealt with equanimity as is the Executive. Intuition is pretty well covered, as is the subject of Module hierarchy.

After a short chapter dealing with the software interface for the Amiga (and thus dealing with the Editor, the Assembler, the Linker the Debugger and the Utilities, the books goes helter skelter into the process of designing a program. Pretty basic stuff I admit, but newcomers to the world of 16 bit programming will very often need a frame of reference a model on which to build their first programs. My hat goes off to Jake for including the subject of program structure and coding discipline. Documentation and program maintenance are not so important in the home programmer's environment, but if you are a programmer then this section will come in extremely handy. A program is supplied, but very few of the examples throughout the book amount to anything constructive otherwise it is simply a case of take notes and think out a few applications for yourself, in much the same way as programmers were forced to do many years ago on the old 8 bit systems.

All in all, I found this book enjoyable because it plants itself firmly between the highly technical manuals and the beginners example books a good one to have as a companion to, say, *Zax's Programming the 68000* (From Sybex) or any of the proprietary beginners 68000 books that are general, and non specific to any computer system.

Elementary Amiga BASIC

■ Compared to the book mentioned above this one is a very simple, no nonsense BASIC guide to the programming language supplied with your Amiga computer system. Published by *Compute!*, this book represents what *Compute!* have been doing for the past ten years with regards to programming computers from a first timer's point of view.

This book is far from technical, and its simplicity may be its downfall — after all, ten pages devoted to the PRINT statement seems to me to be going a bit over the top. The quality of the artwork and photography in the book is of a high standard and examples are listed in "computer printout" form, and not some alternative character set so listings are legible whilst still having the added flexibility of slashed zeros, and a half-way sensible listing format.

One thing though, Amiga BASIC for all it's quirks and ghastly omissions, is still a structured language, so why the hell have *Compute!* seemed it fit to add GOTO to the list of words covered in the book — yes I know we are talking about very simple programs, yes I know the book actively suggests that the programmer approach a program from the structured point of view, but nevertheless; a

BASIC program can be written whereby it has **no** GOTO statements whatsoever. The addition of line numbers in Amiga BASIC is also very odd, as very few beginners will be aware of the fact that you have to set up Amiga BASIC to accept line numbering. As it stands, AmigaBASIC works without line numbers, thus ramming home the fact that Amiga BASIC is, at heart, a structured programming language.

199 pages may seem like a lot, but the typeface is large, there are copious listings, very few of which are actually useful, and the chapters are all separated by brightly coloured spacers (like those you use in a file).

In 14 chapters, a wide set of commands are covered, and I do accept the fact that this book will appeal only to the complete and utter beginner a point that is made clear inside the book.

For $14.95, you are not getting a great deal of value for money out of this one, but the inventive spiral binding method makes it very easy to use next to a more worthy tome, such as the AmigaBASIC manual supplied with the Amiga system.

I have very strong doubts as to whether this book will have any uses after you have exhausted all 199 pages so I expect few people will buy this book as it is so... so... disposable, it really is useless to anyone after they have finished with it which is a bit of a shame as it is the sign of a poorly thought out manuscript.

Despite my own moans about the book, should you be a complete novice to using Amiga BASIC then this book will certainly get you on your feet and lead you onto more informative titles.

Published By: **Compute! Publications Inc**
PO Box 5406
Greensborough
North Carolina.
Price:**$14.95**
ISBN: 0-87455-041-6

Advanced Amiga BASIC

■ *Advanced Amiga BASIC* from Tom Halfhill and Charles Brannon is a more useful book .This is more of a BASIC tutorial offering a great many ready to use programs and utilities, something budding programmers are always after. The listings are all small enough to understand and modify should you feel fit.

The book makes no bones about the fact that it attempts to teach the reader advanced functions of the Amiga using AmigaBASIC. On the surface, this is not a very clever idea as some of the programs could be written faster in another language, but the possibility of typing in rows and rows of hex numbers (a la many C64 programs) is a daunting a task for the beginner. Anyway, who types in those sorts of programs on an Amiga?

Being 465 pages long, the book has a lot to say for itself, and it does it methodically and precisely. The price of $17.95 is a little surprising as Compute!'s other book reviewed here (Elementary BASIC) is a mere $3 cheaper but half the size!

There are still plenty of subjects the beginner could try to use, and certainly many of the examples are small enough to type in and learn from!

A nice addition comes right at the end of the book with the addition of a program called MouseSketch a pretty laughable doodling package, but, as is the case with this sort of program, you can take what you have learned, and apply it to your own programs.

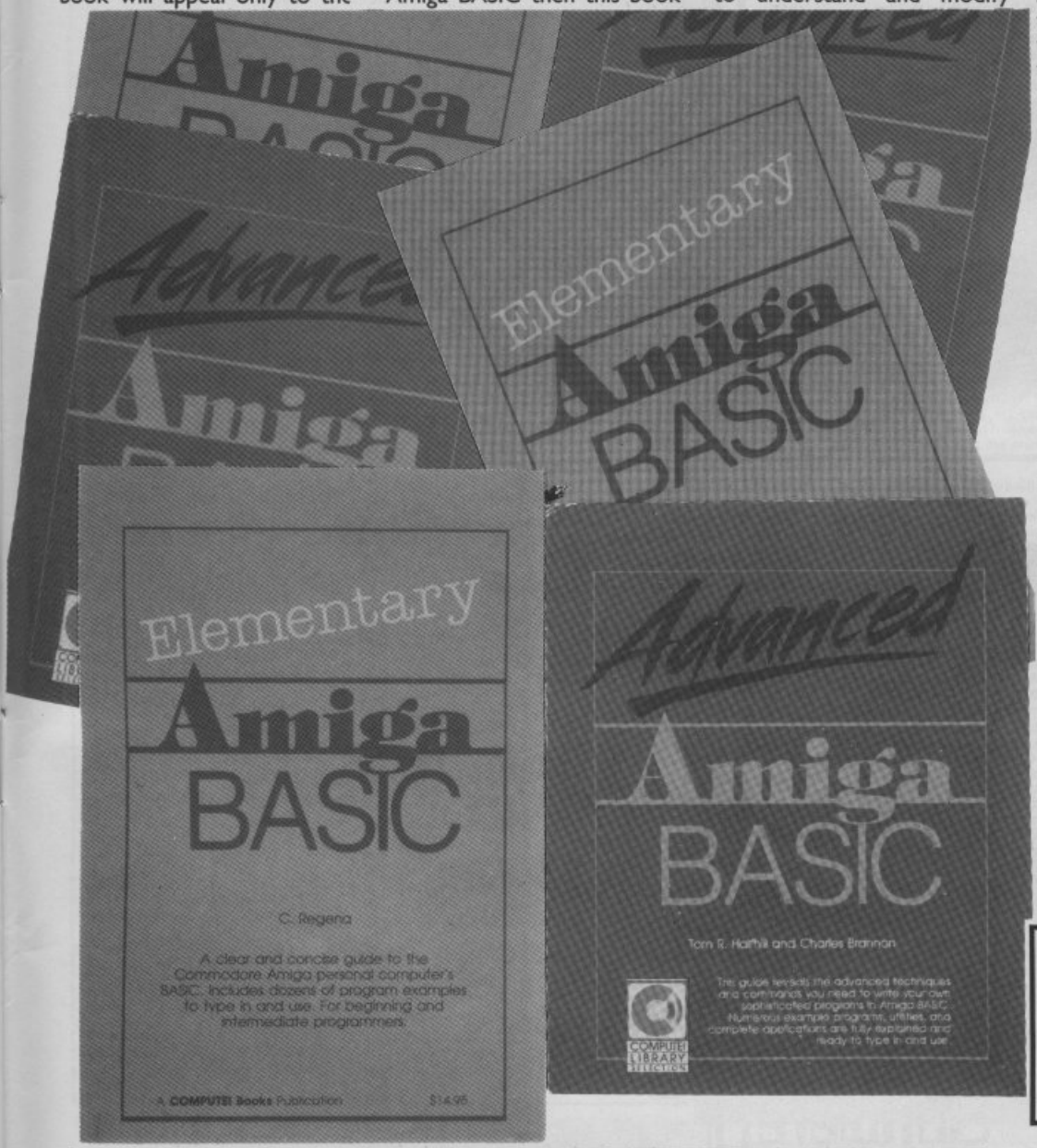
Unlike *Computes!* other book on Basic programs in this publication have a complete absence of line numbers and GOTO's (well, almost).

This book is rigorously structured in both content and delivery so you will not really be able to take a chapter out in isolation. The upshot of this must surely be a more tedious book to read and use — if you use it properly.

For all its quirks, *Advanced Amiga BASIC* is a thoroughly good read, it is well presented (as are all Compute! books), and the price is not excessive for what it contains within its pages.

A reference book it is not, but there is a hell of a lot of juicy material inside, it just takes some hard work finding it that's all!

Publisher: **Compute! Publications Inc**
PO Box 5406
Greensborough
North Carolina.
Price: $17.95
ISBN: 0-87455-045-9



commodore

FROM £375!
AMIGA

Amiga A500 complete, now only	£375
Amiga A500 with TV modulator	£399
Amiga A500 with 1900M high-res mono monitor	£465
Amiga A500M with A1084 high-res colour monitor	£615
Amiga B2000 with 1MB RAM, 880K 3.5" disk, mouse, software	£1095
Amiga B2000M As above, plus A1084 hi-res colour monitor	£1245
Amiga B2000 XTM As above, plus PC-XT bridge board & floppy	£1695
Amiga B2000 XTMHD As above plus A2090PC 20MB hard disk	£2145

Prices include 15% VAT, FREE delivery to your door, and 1 year manufacturer's warranty. Add £12 for next day delivery. All systems are tested before despatch. On-site maintenance option available.

PERIPHERALS
AMIGA

512K plug-in RAM/clock (A500)	£115	A2092A 20MB internal hard disk with Amiga DOS controller	£599
A1081 high-res colour monitor	£225	A2092PC 20MB internal hard disk with MS DOS controller	£499
A1084 high-res colour monitor	£249	A2088 PC-XT bridge board with 5.25" internal disk drive	£475
1900M high-res mono monitor	£99	Citizen 120D 120 cps, F/T, NLQ	£149
A1010 3.5" external disk drive	£149	Star LC10 120 cps, F/T, NLQ	£215
3.5" twin-port external drive	£115	Star LC10C as above, colour	£245
3.5" internal drive (2000 only)	£99	Canon PJ1080A colour, 80 dpi	£499
Genlock PAL Rendale	£275	HP DeskJet 300 dpi inkjet, B/W	£795
Genlock PAL Rendale Pro	£799	HP PaintJet colour, 180 dpi	£995
A2052 2MB internal RAM card	£375	Xerox 4020 colour, 240 dpi	£1095
Micron 2MB internal RAM card	£399	Handy Scanner 240 dpi scanner	£299
Supra 20 MB external hard disk	£675	DigiPic fast frame grabber	£225
		Easyl A4 drawing tablet A500	£275
		Easyl A4 drawing tablet A2000	£325
		Cherry A3 digitizing tablet	£599

CREATIVITY
AMIGA

De Luxe Paint II (PAL)		£59.95
DigiPaint (PAL) 4096 colours		39.95
De Luxe Music (PAL)		59.95
Page Setter		79.95
City Desk		79.95
Excellence!		179.95
The Works	Analyze + Organize + Scribble, integrated desktop	59.95
VizaWrite Desktop	High performance desktop publishing wordprocessor	69.95
ProWrite (V2.0)	Wordprocessing fully integrated with graphics	79.95
Word Perfect	Amiga version of the No.1 best selling wordprocessor	179.95
Publisher Plus	Enhanced version of the original desktop publisher	99.95
Professional Page	Includes WP, Desktop, colour separations, CAD	199.95
DeskTop Pack	VizaWrite Desktop + City Desk	149.95
Flow	The Idea Processor from New Horizons Software	49.95
De Luxe PhotoLab	Print & manipulate photo quality images	59.95
PixMate	Professional image enhancement straight from NASA!	44.95
Prism Plus	4096 HAM colour paint pack 1024 x 1024 (needs 1MB)	54.95
Express Paint	Overscan PAL + 64 colour Extra Half Brite, text merge	49.95
Photon Paint	HAM with overscan, special effects, enlarged fonts	59.95
TV Show	PAL image presentation in IFF or HAM with overscan	69.95
Graphics Pack	Express Paint + PageFlipper + IntroCad	99.95
Calligrapher	Professional font editor, fonts up to 160 x 256 pixels	74.95
De Luxe Video II	Create all types of video presentations with ease	59.95
De Luxe Productions	Definitive high-res graphics animation package	129.95
Aegis VideoScape	Full 3D animations in all resolutions with overscan	124.95
Pro-Video CGI	Professional video titler with fonts, extra fonts available	159.95
Intro Cad	Entry level CAD package, printer or plotter output	49.95
X-Cad	Professional CAD system (needs 2MB)	399.95
Art of Chess	The best Amiga chess yet, packed with features	15.95

Superbase
PROFESSIONAL

If you can think of it, **SuperBase Professional** can do it! With its unique combination of incredibly simple data management, massive processing ability and high-level program language, **SuperBase Professional** is the only choice for your Amiga! And with text, sound and graphics management, plus relational data handling, **SuperBase Professional** is essential for both beginner and expert...

PRODUCTIVITY
AMIGA

SAM Basic		£89.95
A/C Basic		154.95
A/C Fortran		229.95
Lattice C 4.0		124.95
Lattice C Professional		299.95
MCC Pascal 2.0		69.95
64 Emulator	Use your C64 programs and files! Includes cable	49.95
PC Emulator	The Transformer (MS-DOS not supplied)	29.95
SuperBase Personal	Relational database power, without programming!	69.95
SuperBase Professional	With Forms Editor and DML program language	179.95
Acquisition (V1.3)	Relational database with programming language	174.95
Maxiplan 500	Ultimate Amiga spreadsheet, + text/graphics/speech	89.95
Maxiplan Plus	As Maxiplan 500 above, plus powerful Macro language	129.95
VIP Professional	1-2-3 compatible spreadsheet + database & graphs	99.95
Logistix	2048 x 1024 spreadsheet, database, graphs & calendar	99.95
Power Business Pack	SuperBase Personal + VizaWrite + Logistix	199.95
Businessware Accts 1	Invoicing, Sales Ledger, Stock Control, by Panmead	129.95
Businessware Accts 2	General Ledger, Purchase Ledger, by Panmead	129.95
MCC Assembler	Professional development system with linker & libraries	59.95
K-Seka Assembler	Efficient memory-resident assembler	29.95
MCC Shell	Enhanced CLI by the authors of AmigaDos	29.95
Ultra Dos Utilities	High speed disk backup, ideal for hard-disk users	34.95

■■■ IF YOU WANT IT TOMORROW... CALL US TODAY! ON 01-546-7256 ■■■

Prices are POST FREE & include VAT. Order by phone with your credit card, or send cheque/PO or your credit card number. Official orders welcome. We despatch same day by FIRST CLASS post. Please allow 5 days for delivery of hardware orders. Prices are quoted subject to availability. Ref. A58

Access VISA

Calco Software

LAKESIDE HOUSE, KINGSTON HILL, SURREY, KT2 7QT. TEL 01-546-7256

35 LONDON ROAD, TOOTING, LONDON SW17 9JR

TIMESOFT

TEL: 01-685 9849

VISA

ARCADE

ARCADE

AARGH	£14.95	Peter Beardsley Soccer	£14.95
Army Moves	£18.95	Rolling Thunder	£14.95
Bubble Bubble	£14.95	Sidewinder	£7.95
Buggy	P.O.A.	Strangeworld	£14.95
Dungeon Master	£19.95	Star Wars	£14.95
Ferrarri F1	£18.95	Soccer Supremo	£12.00
Flinstones	£14.95	Terromax	£14.95
Footman	£12.00	Thunderboy	£14.95
Interceptor	£18.95	Vyper	£12.00
Jet	£26.95	Whizzball	£18..95
Jinks	£18.95	The Wall	£14..95
Obliterator	£18.95	Xenon	£15.50

ADVENTURES/SIMULATIONS

Adv Con Set	£12.00	Jinxter	£18.95
Bardstale	P.O.A.	Jet	£26.95
Battleships	£12.00	King of Chicago	£22.95
Beyond Zark	£17.95	Return to Atlantis	£19.95
Chessmaster 2,000	£18.95	Shadowgate	£18.95
Dark Castle	£19.95	Sinbad	£22.95
Destroyer	£19.95	Strike Force Harrier	£19.95
Dèja Vue	£13.95	Strip Poker II	£12.00
Interceptor	P.O.A.	Spitfire 40	P.O.A.
Flight Sim II	£29.95	Tertrious	£14.95
		XR 35	£7.50

UTILITIES

Analyze	£127.95	Organize	£79.00
BBS PC	£79.95	Publisher 1000	£175.00
Graphic Tablet	£295.95	Pascal	£75.00
Lettic C	£109.00	Scribble	£75.00
Lettic C Proffe	£275.00	TV Text	£79.00
Lisp	£125.00	Zema Fonts 1-3	£29.00 each

A WIDE RANGE OF IMPORTS AVAILABLE

ACCESSORIES & HARDWARE

Pro 5,000 Joystick	£14.95
Speedking Joystick	£12.95
Quickshot II Joystick	£19.95
Mousemat	£5.95
Disc Box (80)	£12.95

PLEASE MAKE ALL CHEQUES PAYABLE TO TIMESOFT!

IF YOU DO NOT SEE WHAT YOU REQUIRE PLEASE PHONE FOR A LOW PRICE.

VISA

PHONE FOR LOW PRICES ON AMIGA A500

COMMODORE 64 COMPENDIUM PACK £75

(496)



Darrin Williamson tries to forget, Fire and Forget.

Forgive and Forget

Poor old Titus must have called their latest offering *Fire and Forget* for a bet or something. After all they must have realised what the likes of us games reviewers would do to a name like that, particularly when the game is, at best, nothing special.

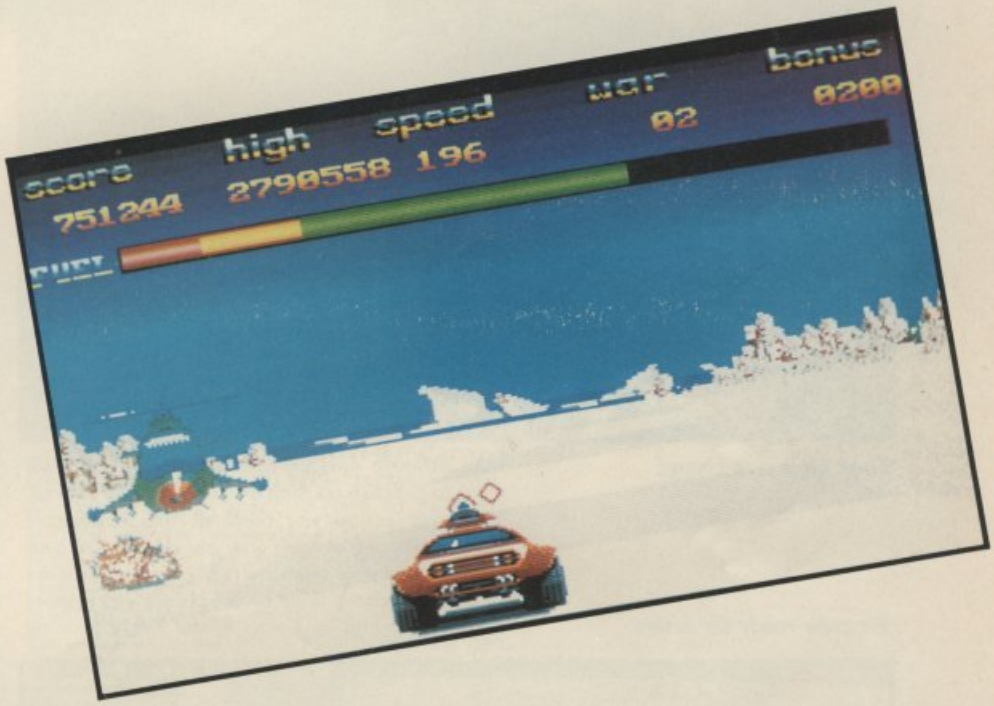
Into Battle

As the driver of an armoured battle car it's up to you to travel the world driving along roads even more perilous than Lewisham High Street at two in the morning. You have six locations to plough through around the globe, ranging from the dry dirt tracks of South America to the frozen wastes of Russia. Each chock full of tanks, mines, Helicoptor gunships, roadside cannons and barbed wire obstacles all of which make your car explode if your steering and reactions aren't up to scratch which raises a couple of interesting points.

Firstly why has the enemy placed what looks like sea mines in the middle of their roads? Surely some nice inconspicuous little land mines would have been a bit more apt.

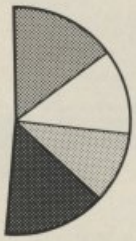
Secondly, where do you buy barbed wire that spontaneously combusts on impact? All the areas of the world look surprisingly similar, the only real difference being the colour of the terrain. How much of an improvement it would have been if the various roads handled differently and had not been constructed from alternate light and dark shades of one colour. After all we do have a few more to choose from on the Amiga (unlike certain 16 bit micros I could mention!).

In its favour I should say that the graphics were quite clear and the animation was as good as you're likely to find on a car game such as this. However it still struck me as yet another excuse to rehash the old Pole Position source code. Still, if you enjoyed the Atari Coin-Op Roadblasters then you'll probably enjoy playing *Fire and Forget* although personally, I tended to adhere to the instructions carried in the title. Nuff said.



FIRE AND FORGET

Title: **Fire and Forget**
Supplier: **Titus**
Unit 4 Stannets,
Laindon North Trade Centre,
Basildon, Essex SS15 6DJ
Tel:
Price: **£19.95**



Graphics: **15**
Sonics: **12**
Gameplay: **10**
Overall: **15**

Have Car Will Travel

There is a plethora of motor racing simulations already on the market; Pole Position, Revs, Pit Stop and a multitude of clones. Gorden Hamlett takes yet another for a test ride and finds that there has never been anything like it before.

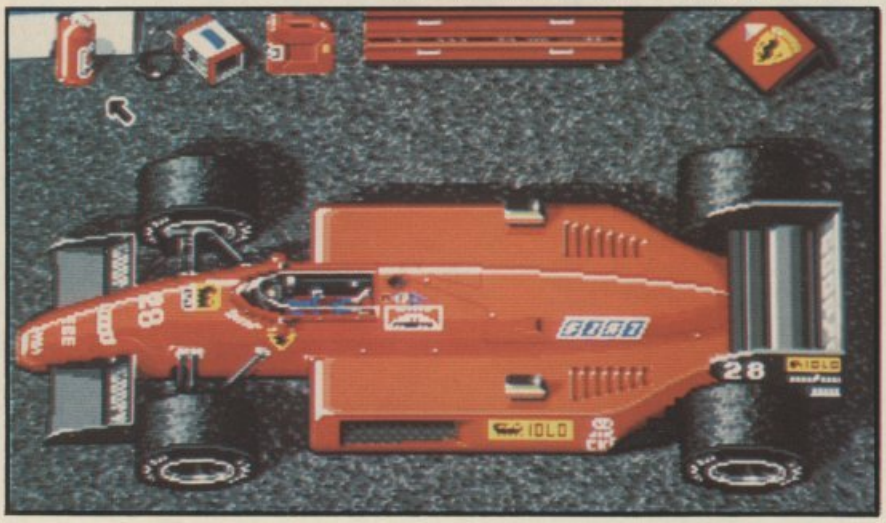
Even though we have seen many racing games in the past *Ferrari — Formula One* not only gives you the opportunity to go racing for an entire Grand Prix season, but also play the part of chief mechanic as well, fine tuning your vehicle to meet the various demands of a gruelling series of races.

Becoming a top Grand Prix requires a wide variety of skills — lightning fast reflexes, a sharp analytical mind and the ability to calculate risk against possible gain. But that is only part of the story. For in the end, a driver is only as good as his car.

Before You Race

You have your home test track at Fiorano in Italy where you can fine tune the engine and test the aerodynamics of your car to your hearts content. It also gives you the chance to perfect your driving skills although on a general level only, as you will need to practise on each individual course as well. Whatever action you perform though takes a certain amount of time and you must make sure that you and your team are ready for Rio in plenty of time. All this is done by selecting the transport icon. This brings up a map of the world showing the location of the various Grand Prix tracks. It also shows the local weather conditions. You can change these at will if you are just practising to make things easier.

A lot of work to be done before you actually get to race. There are two practice sessions for you to become better acquainted with the layout of the track, working out the best line through bends etc. Then there are the two qualifying sessions when you attempt to go around the track as quickly as possible in order to obtain a better position on the starting grid. The adjustments made to your car here are likely to be quite different from those on race day as you are striving purely for speed over one lap and not for settings to last the entire race.



Time for a tyre change

Pit crew ready for action



Race Day

During the morning before the race itself, there is a thirty minute warm up session giving you a chance to make a final track inspection and also suss out the opposition. The race itself lasts for two hours or 315 kilometres but if you are not that dedicated, you can set the distance to be much shorter.

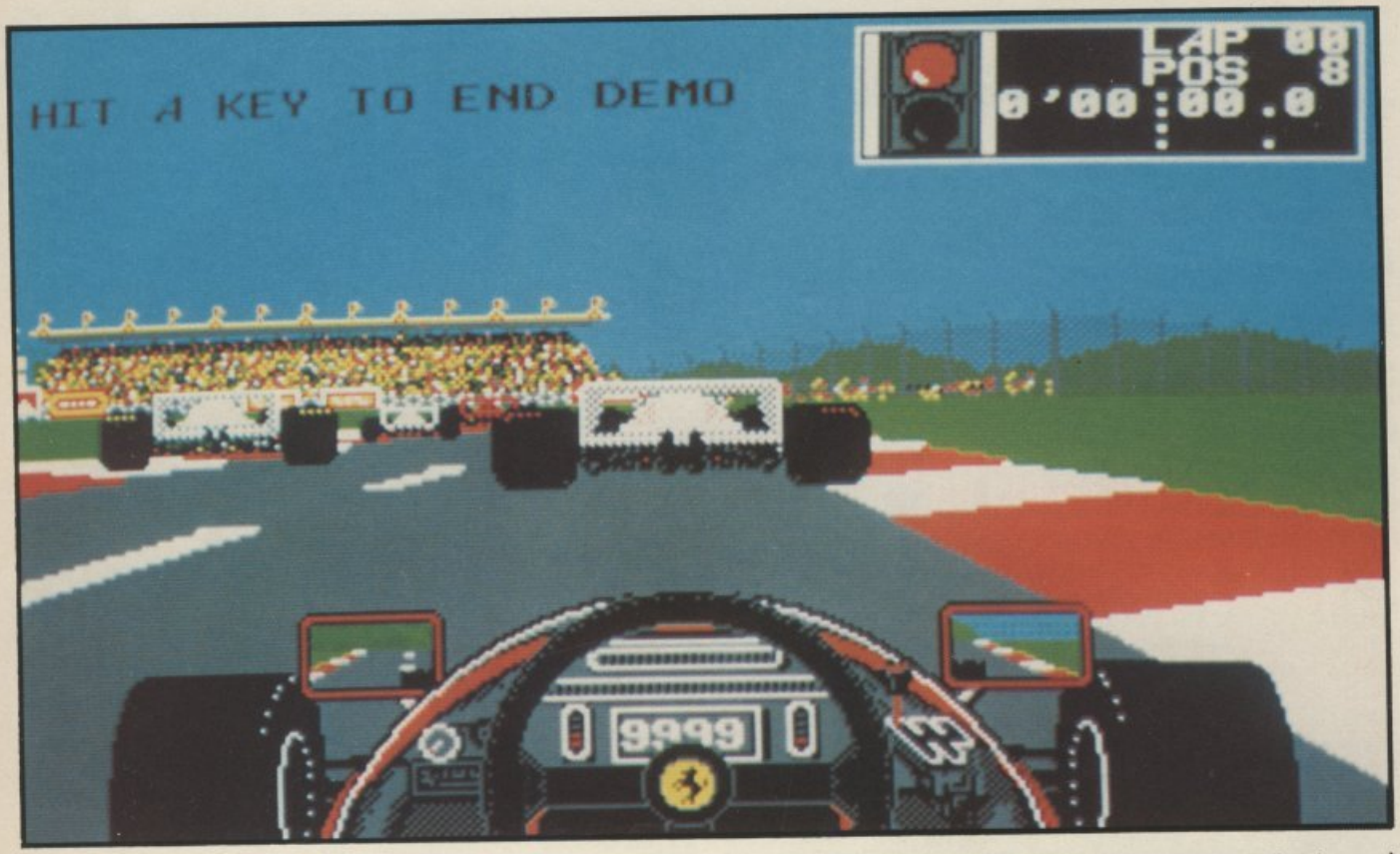
Once the green light has come on and the race is under way, you now have the task of trying to finish in one piece. If you happen to be ahead of most of your rivals, so much the better.

There are three skill levels for you to choose from. At the hardest (formula one) level, your opponents drive with a greater degree of skill, you are more likely to suffer from mechanical failure and you will also have to change gears manually.

Steering your car is controlled via the mouse which might upset some people who would have preferred to use a joystick.Certainly, the mouse is very responsive and you will quickly find yourself veering from one side of the track to the other. The right hand button is the accelerator, the left one the brake. Changing gears and playing with the turbo-boost is all controlled via the keyboard. Any crash will keep you out of action for a certain number of days. The example in the manual says four but my first shunt effectively sidelined me for the rest of the season. If you prefer the mechanical side of things and couldn't really care less about the driving, you can always get the computer to drive for you.

At first sight, it appears that the main qualification for playing this game is a degree in physics, closely followed by one in engineering. It is easy to understand why as you try to grapple with wind tunnel results and sort out the correct suspension to use. Never fear, help is at hand in the form of Mauro, your computerised car chief, who is quite happy to suggest the settings that he thinks are the right ones. As you practise and race, the chosen settings will change colour to indicate the amount of wear that they have received.

When you are at Fiorano, there are seven different areas of the paddock that you can go to. Race control allows you to alter the length of the race, skill level and advance the clock, etc. The wind tunnel is used to adjust your wings, showing how the car will handle at various speeds. The pit allows



On the road

for fine tuning the changes made in the garage. The test track shows you what a mess you have just made of changing the various settings.Finally, you can check on the seasons standings and move round the world as you prepare for the various races.

In The Garage

Most of the work though is done in the garage. Here you can change the car's most important systems — engine, gearbox, tyres, suspension and wings. There is no such thing as an optimum setting as it will vary from track to track and depend on other factors such as the weather.

The engine consists of five sub-systems which can just be replaced when you want to. The only setting that you need to worry about is the Engine ROM system which governs the ratio of fuel to air burnt. You can check how well the engine is running by paying a visit to the dyno room. This facility is only available at Fiorano.

How you adjust your gearbox is likely to be determined by the course that you are racing on and how many tight corners it has. As with all the settings, some affect fuel consumption more than others and while it is all very well being able to go that little bit faster, it is no use if you don't have enough fuel left to finish the race as Formula One rules prohibit refuelling.

Choice of tyres can make a huge difference to your performance on the track. It is not unusual to have up to three different compounds in four tyres. Not only do you have to consider the weather, but also whether the curves are mainly left or right handers. What you are striving for is the best grip which in turn will give you the best lap time. There are six different compounds for you to choose from including a special one for qualifying laps.

Suspension works in conjunction with your tyres and your wings. Choice of setting will determine whether you understeer or oversteer going into bends. Again, the shape of the track is likely to be important as well as you own style of driving.

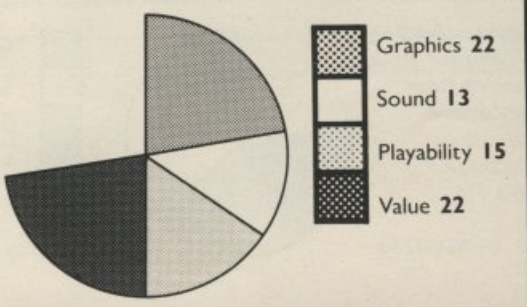
The wings are judged to be second in importance after tyres in governing the performance of your car. On twisty courses, you may need a setting that forces the car down onto the road more and so increase your cornering performance. Once all your settings have been chosen, you should then make best use of the dyno room, wind tunnel and test track to see how your car actually performs in practice.

To Drive Or Not To Drive

It is difficult to think of anything that has actually been omitted from this simulation and that in a curious way may prove to be the game's undoing. Any motor racing fanatic is going to be in his element here and will probably never buy another computer game. To anyone without the same passionate interest though, *Ferrari — Formula One* is probably somewhat over the top. Superb though the simulation is (and there is no denying that), they might find that they are happier with just an ordinary run of the mill racing game. ***YA***

Ferrari Formula One

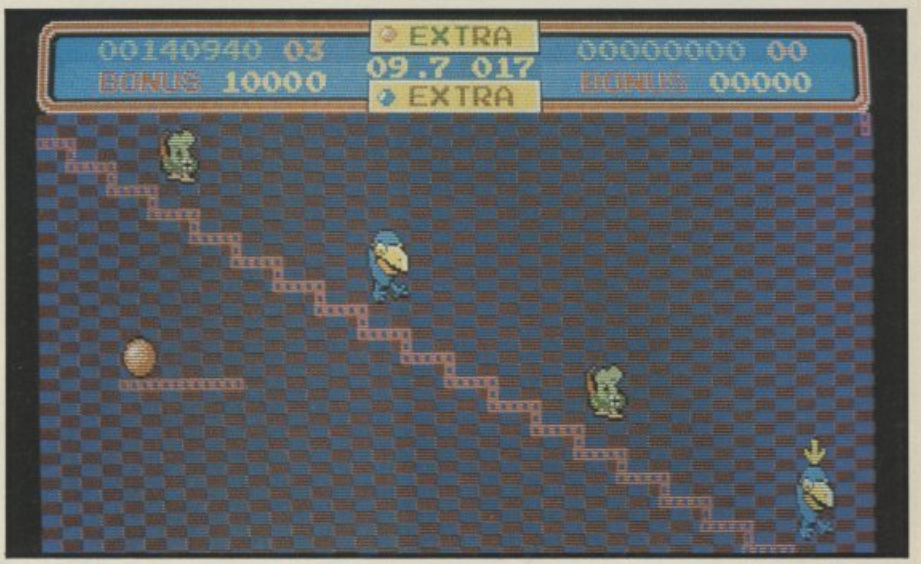
Publisher: **Electronic Arts**
11/49 Station Road
Langley
Berks
SL3 8YN
TEL: **(0753) 49442**
Price: **£24.95**



REVIEW

Helter Skelter

Have you ever fancied yourself as a bouncing ball? Well Duncan Evans did so we let him play with the latest release from Audiogenic



Audiogenic is not a company that could be accused of pushing back the frontiers of Amiga gaming but it came up with a little gem in the form of *Impact*, and could do the business again with the release of *Helter Skelter*. Contrary to what the title might infer, *Helter Skelter* is not a fairground attraction but rather a perfect little game involving a bouncing ball, dashing sprites, sampled sonics and irksome icons.



Simplicity is the order of the day here, as the object is to bounce your ball onto, and thus horribly squashing, a series of galloping sprites.

Identifying said victim is easy enough because there's a big arrow above it, indicating 'squash here'. Not wanting to be party to this, the ball fodder moves around at a fair lick, and usually complicates matters by running with a crowd of pre-squashable mates. If you hit the wrong one then it splits into two, thus giving you even more to squash later.

So it doesn't sound that tough so far, a little tricky but no great shakes. The problems start when the sprites are running on ledges which have to be bounced up to, or lurking inside little enclosures which are hell to get into. The hardest screen I've seen has no floor, just ledges, and when you disappear off the bottom of the screen, your ball reappears at the top, but going faster than an England batting collapse.

To compound the difficulties time ticks away inexorably, and when it's all gone, your ball blows a puncture — scratch one life. On some screens the time allotment is stingy to say the least, so unless you get lucky, by encountering the relevant icon which gives more, then you'll have your work cut out to make it.

The various icons appear, to the accompaniment of sampled voices or wacky effects, and endow extra time, freeze the sprites or count towards gaining an extra life, when you have collected all the letters that make up the word EXTRA. Okay, so we're not talking top marks for originality in any department, but it is quite addictive, and there are enough nice touches to compensate.

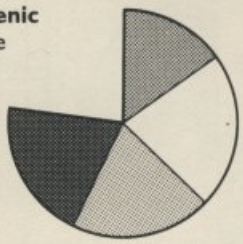
Just in case the thought of playing through 60 odd screen is a little daunting, another feature from Impact has been incorporated. After every ten screens a password is provided so that you can start from that point in future. And if you manage all of the screens the game won't be collecting dust just yet thanks to a built in screen designer.

If you are looking for something that pushes your Amiga to the limits, that extends the final frontier of computer gaming, forget it. If on the other hand you want a simple yet addictive, fun filled game then you're in the right city.

Helter Skelter

Supplier: **Audiogenic**
Winchester House
Canning Road
Wealdstone
Harrow
Middlesex
HA3 7SJ

Tel: **01-861 1166**



Graphics: 15
Sonics: **22**
Gameplay: **20**
Value: **18**

YOUR AMIGA 01-437 0699 extension number 281

CLASSIFIED ADVERTISEMENTS

Lineage 58p per word (including VAT) — Minimum £8.70
Semi-Display £10.80 (plus VAT) — Minimum 3×1

Send your requirements to:
Alan Cole, Classified Department,
Your Amiga, ASP LTD, Golden Square,
London W1R 3AB

VISA Access

VIDEO GRAPHICS

WE SPECIALISE IN GRAPHICS, ANIMATION AND DRP SOLUTIONS

BUROCARE

Burocare Computer Systems
211 Kenton Road, Harrow, Middlesex
Tel: 01-907 3636 Fax: 01-907 0027

TRIANGLE TELEVISION
The Amiga Specialists

- ★ FOR ALL YOUR VIDEO AND AUDIO VISUAL REQUIREMENTS
- ★ A500 AND A2000
- ★ FULL RANGE OF PERIPHERALS
- ★ FULL RANGE OF SOFTWARE
- ★ RGB CONVERTERS
- ★ TRAINING COURSES
- ★ COMPUTER GRAPHICS DESIGNED TO ORDER

TRIANGLE TELEVISION
130 Brookwood Rd
London SW18 5DD Tel: 01-874 3418

FOR SALE

AMIGA software originals bought and sold. SSAE for lists. Jervis, 19 Portree Drive, Nottingham NG5 5DT.

SPECIAL OFFERS

T.C. COMPUTERS
TEL: Wantage 02357 60177

AMIGA A500	£369.99
AMIGA A500 & Colour Monitor	£610.00
AMIGA A500 & High Res Colour Monitor	£665.00
AMIGA System 500	£759.00
AMIGA System 500+	£2600.00
COMMODORE PC1 - mono	£369.00

Also Atari ST & PC Compatibles including Amstrad available
ENQUIRIES WELCOME
SAE for details to:
19 Havenvale, Wantage, Oxfordshire OX12 7AJ

PUBLIC DOMINION SOFTWARE

PUBLIC DOMAIN SOFTWARE
400 DISKS AVAILABLE FOR THE AMIGA
Fish 1-145, Amicus 1-26, Slipped Disk 1-40, Faug Hotmix 1-60 **£3.00 each.** Panorama 1-62, Auge 1-17, APDL 1-21 **£4.00 each.** Two Catalogue disks available at **£3.00 each**

THE AMIGA PD LIBRARY,
Dept YA, 140 Rushdale Road, Sheffield S8 9QE
PD Hotline: 0742 588429 (9am-9pm)

TO ADVERTISE HERE RING ALAN COLE ON 01-437 0626

HARDWARE

MICROWARE COMPUTER SERVICES

Amiga 500 with FREE TV Modulator, Software Pack & DPaint	NOW ONLY £399		
Amiga 500 with FREE Software pack, DPaint and A1084 Colour Monitor	£599		
Amiga System 500 with A1084 Colour Monitor, Printer, Software	£769		
Amiga 2000 with A1084 Hi-res Colour Monitor, 1MB RAM, 880K Disk	£1299		
PC1 IBM Compatible with Able Software and Citizen 120D Printer.....	£519		
Cumana 880K Disk Drive	£89* £95	5¼" Disk Drive IBM/ST Comp	£139
1.5MB Internal RAM for A500	£369	Digiview 3 with A500 adaptor	£159
Star LC10C Colour Printer.....	£239	Citizen 120D Printer & Cable	£159

*** Price when ordered with computer, also deduct £15 from any of above when purchased with any computer. Just a tiny selection of the 100s of products we can offer, just phone or send SAE for details.**

P.O. Box 2, Skegness, Lincs. PE25 2QL
Telephone (0754) 610217
Proprietor: T. Monahan

REPAIRS

AMIGA
REPAIRS AND SPARES — SEND YOUR FAULTY AMIGA FOR A FREE ESTIMATE TO:
OASIS
Dept. YA, 14 RIDGEWAY ROAD, SALISBURY, WILTSHIRE, SP1 3BU
TELEPHONE (0722) 335061

MAIL ORDER

AMIGA P.D. LIBRARY
Public Domain Disks at £2.50 each
For free list send S.A.E. to PO BOX 155 CARDIFF CF5 4YA

YOUR AMIGA 01-437 0699 extension number 281

Write your advert in BLOCK CAPITALS in the grid below, ticking the section you wish it to appear under, INCLUDING YOUR NAME AND ADDRESS IN THE WORD COUNT and send it to: **YOUR AMIGA, CLASSIFIED ADVERTISEMENT DEPARTMENT, NO: 1 GOLDEN SQUARE, LONDON W1R 3AB.**
Lineage 58p per word (inc. VAT). Minimum charge £8.70. Semi-display box rate £10.80 per single column centimetre + VAT. Minimum size 3×1cm, no reimbursements for cancellations. All advertisements must be pre-paid.

☐ For Sale ☐ Wanted ☐ Special Offers ☐ Services ☐ Software ☐ Amiga ☐ Other: Please State

CLASSIFIED COUPON

ALL CLASSIFIED ADVERTISEMENTS MUST BE PRE-PAID. THERE ARE NO REIMBURSEMENTS FOR CANCELLATIONS.

I enclose my Cheque/Postal Order* for £..... for..... insertions, made payable to Argus Specialist Publications.
(*Delete as necessary) or please debit my Access/Barclay card No.

Expiry Date

£..... for ..... insertions .....

Name .....
Address .....
.....
..... Post Code .....
Day-time Telephone No: .....

Signature ..... Date .....

DEALER GUIDE

BERKSHIRE

CSE COMPUTERS
HORSESHOE PARK
PANGBOURNE
RG8 7JW
Tel: (07357) 4774
Contact Mr John Arkill
THE AMIGA SPECIALISTS

CORNWALL

ABC Computers
THE SOUTH WEST AMIGA SPECIALIST
SHOWROOM & MAIL ORDER
Duchy House,
6 Lower Aylmer Square,
St Austell,
Cornwall PL25 5LQ
Tel: St Austell
(0726) 64463

HERTFORDSHIRE

ASK THE EXPERTS...
- ★ We stock a comprehensive range of Amiga Hardware, Software & Accessories
- ★ Wide selection of peripherals
- ★ Guaranteed media at competitive prices
- ★ Ruby-Comm Viewdate & VT100 Terminal software. The Complete Comms Pack for your Amiga or ST

Y2 COMPUTING
111 St Albans Rd, Watford WD1 1RD
Tel: 0923 50161

KENT

COMPUTER LEISURE CENTRE
117 High Street,
Orpington BR6 0LG
Tel: 0689 21101
Large range of 16-bit software in stock
Plus mail order service.

LONDON

AMIGA A2000 SPECIALIST DEALERS
Video and interactive video programmers and consultants
ARIADNE SOFTWARE LTD
273 Kensal Road,
W10 5DB
Tel: 01-960 0203
Contact: C West

GREATER MANCHESTER

MIGHTY MICRO
Sherwood Centre,
268 Wilmslow Road,
Fallowfield,
M14 6WL
Contact Steven
Tel: (061) 224 8117
COMMODORES PREFERRED
EDUCATIONAL DEALER
PERSONAL EXPORT SPECIALIST

EAST SUSSEX

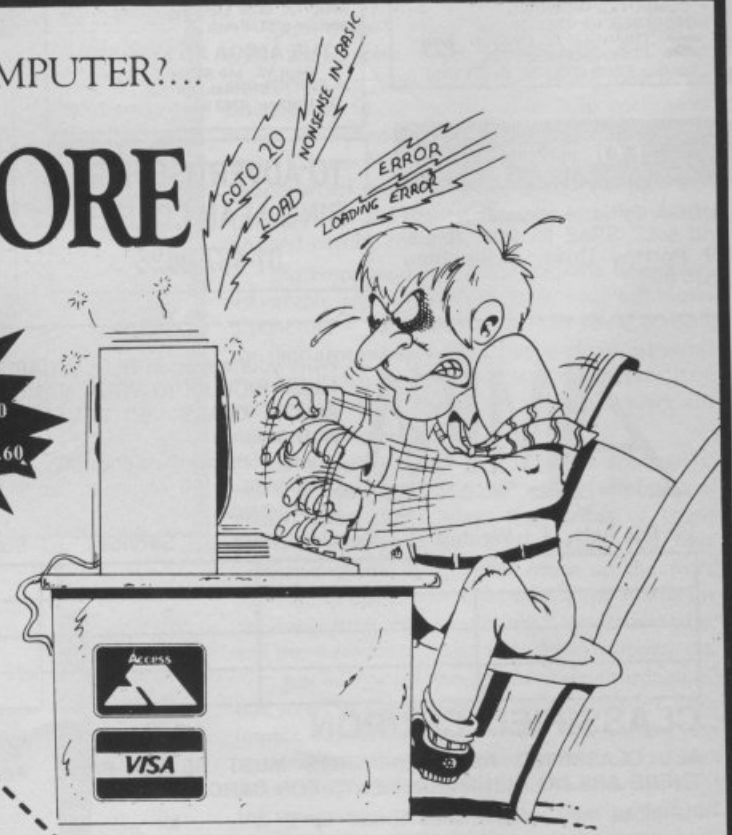
GAMER PERSONAL COMPUTERS
71 EAST STREET
BRIGHTON BN1 1HQ
TEL 0273 728681
Full range of Amiga Hardware and Software in Stock

DEALERS

Do you specialise in Computers? This space could be yours Call Alan Cole on 01-437 0699 today

TRYING TO USE YOUR COMPUTER?...

YOUR
COMMODORE
CAN HELP.



12 issues UK £13.20
12 issues Europe £20.90
12 issues Middle East £21.20
12 issues Far East £24.00
12 issues Rest of World £21.60

Please begin my subscription(s) to YOUR COMMODORE with the ..... issue.
I enclose my cheque/money order for £..... made payable to Argus Specialist Publications Ltd.
or debit £..... from my Access/Barclaycard No.
valid from ..... to .....
NAME (Mr/Mrs/Miss) .....
ADDRESS .....
.....
Postcode .....
Signature .....
Date .....
Please use BLOCK CAPITALS and include post codes

Send this form with your remittance to:
INFONET LTD., 5, River Park Estate, Berkhamsted, Herts HP4 1HL

3½

Lifetime Guaranteed, double sided, double density, 135 TPI, bulk wrapped discs with labels

Quantity	Price
10	£9.25
20	£18.00
25	£22.99
50	£45.00
105	£89.99

5¼

Lifetime Guaranteed, double sided, double density, 48 TPI, bulk wrapped discs with labels

Quantity	Price
10	£3.50
20	£6.50
25	£7.99
50	£15.50
105	£31.00

VERBATIM

Fully guaranteed 3.5" 135TPI Verbatim discs

Single Sided Discs

Quantity	Price
10	£11.99
20	£23.49
30	£34.99
50	£57.99
100	£114.99

Double Sided Discs

Quantity	Price
10	£13.49
20	£25.99
30	£37.99
50	£63.49
105	£125.99

LOCKABLE DISC STORAGE BOXES

3.5"		5.25"	
40 Capacity	£5.49	50 Capacity	£5.49
80 Capacity	£7.49	100 Capacity	£7.49
120 Capacity	£9.99	140 Capacity	£9.49

Plastic Storage Box — holds 10 (State 3.5" or 5.25" 75p

AT LEAST 30% OFF ALL 16 BIT SOFTWARE

30% OFF ALL JOYSTICKS
e.g. Pro 5000 £11.99

30% OFF ALL CABLES AND ACCESSORIES

SPECIAL!!!
Premium Quality Mouse Mat Now only £3.49

HARDWARE
AT LEAST 10% OFF ALL HARDWARE

Amiga A500 with Software	£429.00
Star NL 10	£189.00
Seikosha SP 180 NLQ Printer	only £149.99
Cumana 1mb Amiga Disc Drive	£117.99
NEC 1mb Amiga Disc Drive	£99.00

★ While stocks last

P&P Free on all orders over £15, under £15 add 75p P&P (UK Only)
Overseas Disc Orders Add £3 P&P. All prices include VAT

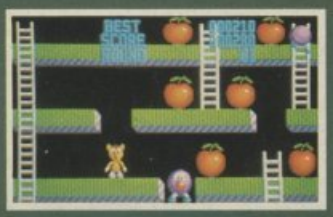
Cestrian Software

2 WATERLOO ROAD, OFF LIVERPOOL ROAD,
CHESTER CH2 2AL
0244 371952
24 hour Access Hotline

UNBEATABLE PRICES



ROBBEARY
Bertie, an agile and clever bear has targeted a famous 24 floors store for his last and most daring ROBBERY. With no alarms or visible guards and fabulous treasures, yet it has been avoided like the plague by the criminal fraternity. Bertie soon discovers why?
AMIGA £19.95



HIGHWAY HAWKS
Grand Prix driving skills is essential to negotiate the crowded highway at speed. Obliterate the assassins cars and the ones that get in your way but keep the tiger in your tank fed, the engine cool and the tyres and steering intact. Acquisition of faster cars and lethal weaponary depends on your driving and trading skills.
AMIGA £19.95 (2 DISCS)





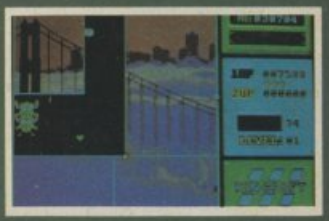
EMERALD MINE
A giant arcade adventure which has received rave reviews. Each level has its own unique solution and requires ingenuity and dexterity to complete. One player or two players TEAM action for added enjoyment.
AMIGA £14.95
CBM64-PLUS 4 £7.95 (D) £9.95







MANIAX
Maniax relentlessly pursued by the creature undertakes to clear the thick fog engulfing the world capitals. An addictive game requiring quick thinking and action.
AMIGA-ST-IBM £19.95
CBM64-PLUS 4 £7.95 (D) £9.95





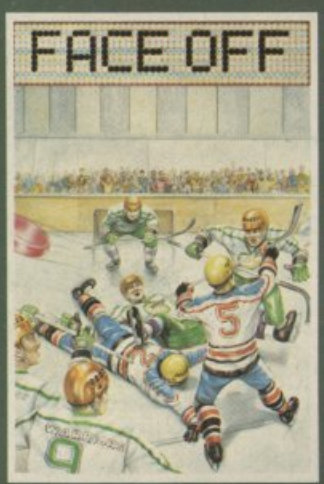
QUANTOX
Progress through 24 levels of this fast and furious action. Lightning responses are secondary to the strategic choices between better weaponry or better defence.
AMIGA £14.95

FACE OFF
Experience the sheer pace and exhilaration of ICE HOCKEY. Be prepared for the body checks, fouls and rough play. League competition, 1 or 2 player option.
AMIGA-ST-IBM £14.95



STRIP POKER II PLUS
A sizzling evening with Sam & Donna
AMIGA-ST-IBM-ARCH. £14.95
SP-AMS-MSX-BBC-ELECTRON
CBM64-PLUS 4 £7.95





STRIP POKER II PLUS DATA DISCS
Requires Strip Poker II Plus disc to load
Disc 1 Beverly & Dawn
Disc 2 Lee & Roy
Disc 3 Suzanne & Bianca
Disc 4 Rachel & Kim
AMIGA-ST £9.95



DAWN

MICRO TEXT **MICRO BASE**
Ideal for home and business use. Menu driven to enable a novice to use powerful capabilities with minimal reference to the tutorial manual.
Micro base - a powerful data base with fast SEARCH and SORT facilities includes a very flexible label printer. Sorted files can be used by the Micro Text word Processor to send personalised letters. A boon to any Club Secretary.
AMIGA £19.95 EACH



BEVERLEY

ANCO

ANCO SOFTWARE LTD, UNIT 9-10 BURNHAM TRADING ESTATE
OFF LAWSON ROAD, DARTFORD, KENT DA1 5BH TEL: 0322 92513
MAIL ORDER HOTLINE: 0322 522631 FAX NO: 0322 93422
PAYMENT BY CHEQUE, P.O., VISA OR ACCESS