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MONTEIRO'S MONTH



Final releases seem to be the theme this month — and why not? The feature starting on page 62 raises some thought-provoking questions though. For instance, should all games — *Halfworld*, *Peter Phin*, *Leisure Software's* *Games of Phobos*, *Terrage Quest*, *Entertainment Culture*, *Soft* *Larry*, et al. — be available to under 18s? Some sort of certification akin to the film industry's system is definitely needed.

It's not a grade — far from it. In fact, I quite enjoy easy software. The Leisure Soft Larry series include some of the funniest — albeit rigger — scores of my software. As for strip games: games — well, everyone is allowed to indulge from time to time. However, I can sympathise with parents' points of view. Little Johnny should be disciplined as much as possible from the comic world during his formative years. But there's little chance of that with such lax regulations. Something must be done!

Accounting for LEF club members' income at the rate, retail outlets will presumably need to dial down their top shelves to make way for the rest. Now that would be interesting!

Hardware demos, available from several PC magazines dated round the country, are another thing all together. The intended reader usually break the three boundaries. Not how long will it be before someone breaks through it?

There's enough of my thoughts on the matter, what are yours? You know the address, to get writing!

US GOLD HERALD GAMES PRICE WAR

US Gold have announced that they are dropping the price of all their core games to £14.95. Forgotten Worlds is the only remaining licence to be priced at the old £19.95 price level. US Gold's PR executive, Daniele Woodcutt, stated: "This does not apply to games programmed outside the country, but hopefully even that will change."

Other major software houses appear reluctant to follow this lead, but a host of budget labels have made an appearance over the last few months. Software Horizons have been the latest to announce a budget label, going under the title of Rapid Software. Games will sell for £9.95 — the latest price as those slipping out of the left hand side Andrei Blizak and Super Golf Runner, for

► Former labels to appear
include a campaign to bring down the prices in games software. We would welcome your views and comments on current prices in the games scene to pass on to the software houses. Send your views to: FRANK SAMPSON, ST Amiga Forum, 4 Queen Street, Rush GAT 7BA.



instance. High Masterline have a number of products lined up for release on their budget label including *Bus* and *Menopony Deluxe*. Their original budget price was £9.95, but Andrew Wright, product manager, is currently discussing price points. High Masterline aren't getting the volume sales they want at £9.95.

US Gold are currently in the process of setting up their own budget label, announced at a recent promotional lunch in London. This label, entitled *Classic*, will be the start of a cam-

pany to re-release US Gold classic hits such as *Gladius* and *Legendborn* at £9.95. Daniele Woodcutt commented: "We hope other software houses will follow our lead and reduce their prices." As yet other software houses' reactions have been tentative. Grandson's *Darius* and *Leather* launched up the challenge: "We appreciate that cheaper games are the way forward, but we are reluctant to make any moves in that direction at the moment."

Everyone is waiting to see the outcome of US Gold's brave attempt.

HiSoft BASIC to be given away with ST

After last month's news story that Atari are to introduce a new ST bundle later in the year, HiSoft have confirmed that a cut-down version of their popular version of the BASIC programming language is to be included in the deal. The 5000IFM Superpack also comprises 20 games — *Amos*, *Doodle Dragon*, *Neludo*, *Eliminator*, *Darius*, *Gunster II*, *Super Haly*, *Afterburner*, *It*, *Flyin'*, *Prostator*, *Super Hang On*, *Black Lamp*, *Starfighter*, *Space Harrier*, *Stone Jack*, *Overlander*, *Pacmania*, *Starblaster*, *Star Key*,

and *Bombard* as well as *Mural Maker* (which is of the same is as *Basic Construction Kit* and *Organizer software*).

First BASIC, as HiSoft's cut-down BASIC is to be called, is to be included in *Power BASIC*. The major differences will be a lack of a complete-textbook option and fewer licences. First BASIC will work just like an interpreted language even though it compiles to memory. Virtually all ST BASIC programs should run under First BASIC — about much faster — without modification.

HiSoft's MD, David Luk, said: "A reason will be included with First BASIC allowing users to send off for a fully manual. The price will be around £14. There will also be a very attractive upgrade option to *Power BASIC* or *HiSoft BASIC*."

"We took a lot of pick over ST BASIC", confessed Steve Carr of Atari, "which is why we looked at what else was available. HiSoft's BASIC seems to be the ideal choice. Although First BASIC will only be available with

the Superpack bundle at first, there is the possibility that we might introduce completely to HiSoft's BASIC."

Power BASIC
HiSoft
PC

QUICKIES

■ **ST hard disk backup problems** have been solved with the introduction of **FA-ST Tape Backup** from Trend Computers. It's a tape drive that comes in either a stand-alone unit or fitted in the same box as one of Trend's hard drives. It's compatible with the Compaq, Next Coast, 38504, Megafile and Super ranges of hard drives. A 386-based for hard drives which have such a socket is included. Data capacities of 100MB capacity are available. 1788 (12418, 5588) 8140 and 9940s (81718, 745, 95105). Specs for 125 and Mega file partitions are all possible on the drive.

■ **Amiga 3000 owners** can now upgrade to Amiga 4200 models by fitting in their old machine. The new forward offer comes from **Frontier Peripherals** at Rowland House, 208-250 Watford Lane, Finchley, London, N12 8P (01-444 9611). Frontier will accept any 41000 in part exchange for the latest Amiga model from anywhere in the UK or overseas. The deal involves users sending their computer along with payment of £3999 to Frontier. In return they'll receive a 42000 with Frontal and Workbench 1.5.

■ **The Football Plus Anniversary Pack**, which lets you grab characters of images on screen and convert them to GEM font format, has been released by the ST Club. It costs £4.95 (£1.95 in registered Frontier Plus users). Also from the ST Club is the Football Series - a set of fonts on disk. Each disk costs £2.75. Details from 9 Sutton Place, 49 Stony Street, Nottingham N6 1LA (0532 435041).

■ **Amiga owners** can expect a boost in storage space thanks to Form Software's **SecureStation**. The kit comes with two 20MB 3.5in floppy disks and a trim amplifier which gets its power from the Amiga. Three hard drives are being given away with the package. SecureStation costs £79.99 and is available from 0480 Phoenix Court, Manchester M1 4AG (061 228 1841).

■ **Hard Drive Turbo Kit** from Microvital provides ST hard drive users with a set of handy utilities for optimising disk speeds, providing a file cache and, that old item, backing up data onto floppy. Price is £25.00. Further details from PO Box 56 10 Awood, Cornwall PL25 4PH 01726 686228.

HARD TIMES COMING

Suddenly everyone is releasing competitively priced hard disk drives or reducing prices of existing models. This is no bad thing, and it will continue. Originally manufacturers blamed low prices and expensive components on high retail prices. It seems those days are over. Andrew Bennett, Frontier's managing director, issued the verdict of many: "Market forces, volume sales and better deals from parts manufacturers means prices are falling". They also explain Frontier's £100 reduction on their 30MB Super ST hard drive.

CST of Seaton, Wiltshire, have come up with a 20MB drive for the ST for £294. Although the drive doesn't have a real time clock or auto-backing facilities, its price is remarkable. The next model up, the 40MB drive, goes for £399. Provisions for auto-backing is expected later in the month. Upgrading should cost around £10. According to Martin Daines of CST an Commodore version of their hard drive system will be available at the Commodore store. He firm retail price yet, but Martin hopes for a price of £209. The Amiga drive is more expensive than its ST cousin because it features an SCSI interface, auto test, DMA port and space for installing 2MB of RAM.

Applied Systems and Peripherals (ASAP) of Southouse, famed for the budget graphics device

Wigan, have finished work on an Amiga hard drive for under £400. The 40MB Amiga is available in two models - an external 4500 version with power supply and fan, and an internal 42000 version.

Currently only the 42000 model offers auto-backing with Kickstart 1.5. Chris Hargreaves of ASAP hopes to have an auto-backing 4500 model ready in a few months time. 4500 users will be able to trade in the existing version of the hard drive for the new model. Price for the upgrade hasn't been finalised, but is expected to be between £40 and £50. Auto-backing is only available with the Kickstart 1.3 ROMs - ASAP will replace the 4500 ROMs and upgrade the drive for around £25.

Amiga's £299 price is extraordinary when compared to Commodore's 4000 hard drive system for the 4500 (no official price yet, however, sources at Commodore reckon it will come in at between £400 and £450) and the 42000 hard drive for 42000s (£310). Both of Commodore's drives offer 20MB storage and auto-backing.

■ **Frontier**, PO Box 110, Monaghan, North Yorkshire, 018 554 0265 026777.

■ **CST**, The Multistory Centre, Ferry Street, Seaton, Wiltshire (0194 61544).

■ **ASAP**, Greenway Business Centre, 51pp St, Southouse, Wigan (0192 6924 0241).

TOP ATARI MAN JOINS GFA

Les Pleyer, Atari's technical manager, has been appointed to head GFA System's factory's operations in the UK. Les had been instrumental in ensuring the development of the Atari transporter and Pocket PC went some smoothly.

His first role of GFA will be to release GFA BASIC, GFA2 and GFA Compiler for the ST. Looking further ahead, there's GFA Compiler for the Amiga (due soon).

SIGNALS FROM SPACE



It's now possible to receive live weather satellite pictures beamed down from space using the latest Amiga enhanced adapter from Microvital. The pictures originate from orbiting satellites which circle high above the equator. The host system's computers capture the signal and process the picture to show the view appear to be in real time. However, the 16-bit color resolution enables accurate forecast to be displayed on the Amiga's screen. The adapter even enables the 1987, 1988 and 1989 models to pick up TV stations. The Microvital Teletext Adapter costs £164.95 and is available from 7 Sandy Close, Monaghan, Northmeath (0166 666664).

LIGHT BRIGADE ARRIVES

Trend Coast, renowned for their range of budget hard drives, have managed to hook a 3.5in read/write optical drive to an ST. The drive uses 12-inch CD-style disks capable of 50MB of storage. According to Jason Miller of Trend Coast access time is very fast - somewhere in the region of 10ms.

While having all that storage space sounds ideal, the price (£4,950) means that only large companies will be able to afford the device. One use for the drive would be as a file server in a network - it would have to be a large network to justify the expense though.

Also from Trend Coast is a

removal drive for around £799. This uses removable 444MB disks which cost £120 each. The removal drive has a 60ms access time which is on a par with fast hard drives.

■ **Trend Coast**, Unit 6, Bradley Court Trading Estate, Monaghan, Wigan, 01926 666664.

QUICKIES



AMIGA HELPS AT LOCKERBIE

Dumfries and Galloway police have installed an Amiga 2500 computer system to help process the many hundreds of hours of videotape taken during the aftermath of the Lockerbie air disaster.

The Amiga system is being used to reconstruct the site of the crash so that police can work out what happened prior to the incident. The system will allow experts to produce stills from video material as a digital format. The graphics capabilities of the Amiga are being used to enhance the finished pictures before they are sent to a Polaroid

freeze-frame film recorder.

Said Bob Ovens of the Dumfries and Galloway police force: "The Amiga 2500 system obviously gives us the potential for crime detection by using its excellent graphics and the ability to grab video images - so we can submit them as photographs and slides."

To help with the analysis of other disasters, the A2500 system is being used to produce overhead transparencies for demonstration purposes, as a video title, and to make animations of incidents.

Blunders from last month

Archipelagoes Drive - It works, but not all the time. Keep your fingers crossed.

QW Sound Sampler - In Figure 1, 2, 3 and 4 of the QW Q20 should be corrected. Also, the parts list failed to mention the type of diode necessary. Two general-purpose signal diodes, 1N4148, will do.

For his latest graphics offering, an off-line version using three custom-built real-time frame grabbers. You send them the photographs, slides or videos with the images on them and Grapico will transfer them to disk. Grapico will consider transferring to you and editing any objects that are too large to print. Each disk costs £1 - except for the first which costs £1.50. A quality print-out, like the one on the right, is available at extra cost.

Grapico's printing hardware, which includes a simple graphics device, is available for £525. Details from 141 London Street, Southam, Northants, PL17 7DN (0290 241665).



GET THE PICTURES

Commodore and Atari shows set for June with launches galore in store

SHOW OFFS

Software and hardware manufacturers are promising major launches at next month's Atari and Commodore shows.

The Commodore show takes place from Friday June 2 to Sunday June 4; the venue is the Novotel Exhibition Complex in Ramptonville, London.

Companies known to be attending the Commodore exhibition include HiSoft, who plan to have the developer version of *Breakout*, an Extended Library for their BASIC and something new on the C format; George Thompson Services will be there with their range of RAM expansions and external drives; Power

Computing are to demonstrate Video Magic and several hard drives; Amov will have the latest version of Protext; and M-Tension hope to have a 2560 20MB internal RAM expansion and S&T Master Professional.

There will be over 100 exhibitors attending the show which will feature presentations, advice stands and special events.

You can order tickets - £4 for adults and £2.50 for under 16s - on 051-3571990 and make a saving of £1 on the door price. Show times are from 10am to 6pm except for Sunday when the show closes at 4pm.

ATARI AT ALLY PALLY

The Atari show is later in the month - being held at Alexandra Palace in Wood Green, London - from Friday 23rd to Sunday 25th. Tickets are available on 051-3572661 and cost the same as the Commodore show.

Don't forget that the ST/OS Games Writer of the Year competition will be judged at the Atari

show. You've still got time to send your entries to Mandrake Software, Europa House, Allington Park, Allington, Macclesfield, SK10 4WR. First prize is funding your game marketed by Mandrake and £5,000 in advance royalties. Mandrake have already selected four games that they consider to be the best so far. These are *Big Strike*, *Battle Command*, *Mouth Trap* and *Arthur of the Britons*.

BIG PRIZES

Three fabulous holidays - worth £3,000 in total - have been put up by S&L and Database for the most innovative use of the ST. Winners to be announced in the show.

First prize, £1,500 from S&L in the form of Premieres Cheques (which can be cashed in for a luxury Mediterranean cruise) plus the cash equivalent from Database allowing the winner to take another person. Second prize is £1,000 in cheques plus the cash equivalent for a second person. Third prize is £500 in cheques plus the cash equivalent for another. Sounds confusing - but basically the three winners get prizes allowing them to take themselves and a partner on an exotic holiday.

All you need to do to enter is write a 1000-word description of the innovative way you use the ST and send the brief - along with any support material on disk - to ST Amiga Format, 4 Queen Street, Bath, BA1 1EA. The innovative way could fall into any category; anything from the bottle who has achieved a major breakthrough using the computer to the housewife who plans gourmet meals on the ST.



TRADE SECRETS

The European Computer Trade Show, held last month in Islington, was the launch pad for various new ST and Amiga products.

RICHARD MONTEIRO reports.

Leading computer traders from all over Europe lined up in Islington on a rainy April day to show off their wares to the assembled computer dealers, inspectors and the occasional punters at the European Computer Trade Show. Some interesting Amiga and ST products came to light during the course of the show.

Power Computing displayed an impressive number of new items including a wealth of hard drives. Offered at £2, 40, 80 and £208, the R2000 version is available with the ST drives start at £450 while the

hard impact. Two models are available - one running at 108882 and the other at 20882. Up to 885 of high speed, 12746, 9686 can be added via an optional daughterboard. Software and hardware selection of 68000 or 68010 is possible. There's a cache of for an optional 68881 or 68882 floating point coprocessor. Impact cards start at £995.

PC emulation on the ST will take a leap forward with Power Computing's announcement that they are to distribute Acorn's Gardner's PC Emu 8. The sports a

word, and either mono or colour screens are supported. Only eight-colour low-resolution CGA graphics can be used in colour - high-res EGA compatibility is planned later in the year. Only 640K of the ST's memory can be used for running programs - even with machines containing more than 385K. This is a fault of 800000. Power Computing are on 0238 273008.

Acorn presented Probel £620 for both the ST and the Amiga. Add-ons include a completely revised and reorganized manual, date and time insertion direct into a document, a reconfigurable cursor, a better procedure for installing printer drivers, a faster COMEAT program, provision for accessing Greek characters, scroll lock and status bar check. "Big changes", said Acorn's Mark Tills, "will only appear in 84.30". Probel V6.2 retails at £99.95. Upgrading from V5.0 costs £30, upgrading from V5.0 to V6.0 costs £20 and upgrading from V4.0 and V5.0 costs £15. More from Acorn on 0230 68909.

MSOft are now distributing Tempus 2 - the follow on to the speedy and editor Tempus - for £29.95. Tempus 2 is faster, includes facilities for editing up to four files simultaneously, three

■ Along with other hardware additions, Power Computing launched a selection of floppy drives, some of which are pictured above. For floppy-right-handers there's the "Straight-Enter" disk drive which features an internal cartridge and front ejection. The ST model is priced at £129.95 while the Amiga version goes for £119. The price difference is attributed to the fact the ST version comes with a power supply (Amiga drives take power from the computer). For the Amiga there's also the Multi-Disk which consists of both hardware and software. It retails at £105.

cursor modes, graphical search and replace functions, and conversion utilities, keyboard shortcuts, undoable undo and auto fill save.

Also new from MSOft is the JAV-85 C Interpreter. It's a package designed to take the hard work out of learning to program C. Rather than having to go through the tedium of compiling your programs, you can run it in situ. It's ideal for beginners.

Although Telecomms seem to flounder due to being taken over by Microspace, they made an appearance at the show. The follow up to Robbie Robbie, Warlord Islands, looks as addictive as the original. Also to look forward to are Quic, Savage, Word Dreams and Terminator.



cheapest Amiga model is £674. The Amiga version costs extra as it has room inside the case for an optional 2MB RAM board. An R2000 version is available with extra's memory.

The performance of the R2000 can be boosted to that of a workstation with Power Computing's 68030 accelerator



■ Add the cash and watch it go - Power Computing's impact board can super-charge your Amiga.

a £199 hardware/software combination that boasts a Norton 30 rating - the industry accepted PC speed rating - of 3. This compares favourably to the bottom of the range IBM PC. ST's rating of 1, the new fast low IBM PC-2 Model 30's 1.8, and the Smith £330's 2.6. Full use of the ST's 1/2 cache can be made, the mouse can be



■ Markus Paine II - the Amiga 500 evangelist - was demonstrated at the Trade Show, but not on the distribution stand as expected. Markus Mikkilainen, creator of Markus Paine, showed off the software's capabilities. Mikkilainen is thinking of distributing the package in the UK through a distributor which would have the current UK distributor, Activision, in a bad situation. Activision have a 12 month contract to supply Mikkilainen's software which, says Mikkilainen's UK boss, Rod Gossens, would be enforced if necessary.



ALL
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LET
LOOSE...



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Without Brains



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ATARI ST & AMIGA ONLY

An addictive and beautifully presented shoot 'em up of the highest calibre! GOLD MEDAL EXAM #4 COMCAST



■ Intel's 80486 (above) was the 32-bit processor, below, the 80586/60. The key is a 32-bit-wide bus with several cacheable (temporary) data and address local floating address cache ports and structures. It supports up to 100 pins. These cache chips can be made to operate in parallel to fetch around 50MB of raw processing power.



■ Intel's 80586 (the world's most powerful processor) is an absolute two-kill, big-pipe multiplier in one (200) cycle at 40MHz. The 80586 has 64 graphics memory - up to 32 million floating-point pixels are received with the same speed, and that's with 64-bit surface allocation. Put another way, 100,000 floating-point transformations per year - and it's not colour any possible!

PROCESSING PROGRESS

We've come a long way from the humble eight-bit microprocessor, but there's a lot more potential yet. JEFF LAWSON has been listening to the Silicon Valley buffoons' pipe dreams



Sixteen years ago there were no microprocessors. The rate of progress in the intervening years has been phenomenal. Although the techniques used to make them are truly amazing to contemplate, the underlying ideas are actually quite easy to understand.

All computers consist of three basic parts: the central processing unit, main memory (RAM or ROM) and input and output I/O devices such as disk drives, display units, and keyboards. Central processing units move data around in memory, and between memory and I/O devices, and perform arithmetic and logic operations on that data. In a micro-computer the CPU is a single integrated circuit called a microprocessor.

There are many microprocessors in use today, designated by a dazzling array of letters and digits: 68001, 280, 68000, 68002, 68003, 80086, 80386, 78000, ARM, Z180C, 6860... the list goes on.

When improving microprocessors, developers attack on four fronts: increasing the amount of data that can be processed at once; increasing the memory the chip can use; speeding up the data processing; and improving data manipulation facilities.

ON THE BUSSES

The microprocessor is connected to the memory by two groups of wires on a printed circuit board, each known as a bus. One group is responsible for feeding the data and is called the data bus. The other group specifies where in memory the data was read from or is to be written to and is called the address bus.

The size of the single piece of data a processor can hold on its data bus is called a word. The 280 based in the Spectrum and 8002 (the 80C micro's chip) have eight-bit data buses so their word length is eight bits. The 68000 - present model STs and Amiga - and 8008 have 16-bit data buses and are therefore known as 16-bit chips. The

68020, 68006, ARM, and 7800 address 32-bit words, and the 6801 is a 64-bit processor. It's not the amount of data that can be handled at any instant, each bit being dealt with simultaneously. Clearly data throughput, and therefore processor performance, improves with increasing word length.

REMEMBER, REMEMBER...

The 280 and 6801 eight-bit microprocessors have 16-bit address buses and so can use 65,536 bytes - 64K - of memory. The 68000 has a 24-bit address bus and can therefore use 16MB of memory. However, in the ST and Amiga much of this space has been reserved or assigned for memory-mapped I/O and for access to devices, such as letters.

With the coming of 32-bit microprocessors the limit on addressable memory has climbed to an impressive 4Gb (4,096Mb) of RAM for the 80086, 68020 and 7800. 4Gb of memory (chip would cost nearly a quarter of a million pounds at today's prices).

Because modern software often needs vast amounts of memory the PC's new operating system, OS/2, needs around 8MB to be comfortable, but gigabytes stretch the pocket a little. 32-bit microprocessors usually have virtual memory addressing. This is a hard-wire scheme to make the different parts of a system think they each have access to a large amount of memory. In reality chunks of data are saved out to disk and other chunks loaded from disk when necessary. In this way the 80086 can make each of up to 16,383 banks below they have access to 4Gb. This is a virtual address space of 64Tb (that's 65,715,476,736).

SPEED KING

All processors rely upon a clock signal to synchronise their activities. The faster the clock signal pulses the faster the processor runs. Clock speeds are measured in MHz (megahertz). 384 is one



JUST A SWEET TRANSISTOR

Over the years even powerful microprocessors have been developed as are manufacturing techniques have allowed even transistors to be crammed onto a piece of silicon. Today's Very Large Scale Integration chips contain more than 10,000 transistors. This is how the transistor count has increased.

| Processor | Transistors |
|-----------|-------------|
| 6801 | 10,000 |
| 6802 | 16,000 |
| 68000 | 22,000 (3) |
| 68010 | 161,000 |
| 68016 | 271,000 |
| 68020 | 594,000 |
| 6802 | 1,200,000 |

RISY BUSINESS

Up until four or five years ago new microprocessor designs enhanced the boundaries of the previous versions. Chips were produced that performed very sophisticated instructions in hardware that previously had taken many single-instruction. This progress is exemplified by the 68000 which is a programmable floating-point chip. The 6800 can execute many instructions like 68000 (68.00.00.00) which is the silicon memory read the instruction stored at the address formed by adding register 04, the contents of register 04 and the contents of 00 as calculated by two. In this segment add 16 and use the result as an address from which to read one 16-bit or an offset of 16 bytes. Now the ones that find the first word (offset) set bit and place its bit offset in register 04, and beginning to calculate the number you first thought of.

In the next figures it was realized that if transistors were more squeezed closer to a bus - through adequate - maximum, specialized on-chip hardware could make the resulting simple instructions run exponentially fast - usually, in one clock cycle plus 1000-transistor above rates in 14 clock cycles.

This strategy of moving to lower transistions gives reduced instruction set computers technology. RISC. The 6801, 68006, 800 and Amiga's ARM are all RISC microprocessors.

RISC technology is a step gap. All such as complicated instructions can be translated in one clock cycle RISC will disappear.



IT'S A PLANT

Many thanks to *Archieves* for providing the picture of a cross-section of a young oil palm tree infected with a fungal pathogen. The image in the *Computer* shows spores inside the infected vessels produced by neighboring cells to counteract infection. The dots on this page portray fungal deposits in the xylem vessels.



ADDITION DIVIDED

All general-purpose microprocessors perform simple addition and subtraction of integers. The 68- and 68000-series can multiply and divide as well.

Consider how arithmetic performance has improved: the 67 and 68000 range from 0.7-0.8MIPS that can execute a 64-bit by 64-bit integer multiply in an average of 54 clock cycles; the 670 has a 0.9MIPS 0.8MIPS capable of executing a floating-point multiply in 18-clock cycles; the 68000 performs can execute two floating-point multiplies in effectively one clock cycle at 40MHz.

cycle per second, so 3MHz is a million cycles per second. The 68000 in the ST is clocked at 8MHz and that in the Amiga at 7.16MHz. The fastest machine code instructions that a 68000 can perform execute in four clock cycles. Hence, a 68000 can run ten million of its fastest instructions per second (MIPS). However, many 68000 instructions take much more than four clock cycles to multiply, for example, can take up to 70 clock cycles for the fast setting of an 8MHz 68000 is much less than 7MIPS.

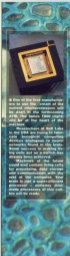
Motorola have produced several versions of the 68000 including processors running at 14MHz. The 32-bit processors such as 68008, 68008s and 7680 can run at 20MHz and more. PC compatibles are available with 30MHz 286 processors. The new Intel 486-64-bit microprocessor is expected to run at 40MHz.

TURN BACK THE CLOCK

Superficially, the short history of ever increasing clock rates looks as if it bodes well for the future; there's one big problem though. High-speed 64-bit chips are very expensive and, in general, dozens of these chips are used with every microprocessor chip. Over the past 10 years or so microprocessor speeds have increased by an order of magnitude while RAM speeds have only doubled. RAM capacity has increased dramatically but not its speed. This means that although a microprocessor is capable of running fast it may have to pause in order to let the RAM catch up; these pauses are called wait states.

Many PC clone manufacturers alleviate the waiting problem by combining a 'cache' of fast but expensive SRAM (static RAM) between the microprocessor and slower and cheaper DRAM (dynamic RAM).

The cache holds addresses and data of recently accessed memory. Whenever the microprocessor accesses instructions or data the memory management hardware checks to see whether the data is in the cache. If it is then fast access occurs, if not then the DRAM must be accessed which is slower. Because programs tend to repeat instructions in loops and access a small amount of data frequently the actual bit



One of the first microprocessors to use the concept of the internal cache, microprocessors will be found in the desktop PCs. ATX, the new 16-bit chip, will be at the heart of the machine.

Manufacturers of 8-bit chips in the IBM are looking to fabricate 16-bit chips. Computer companies are looking to use the new 16-bit chips to make some systems by adding floating units and a switch has already been ordered.

Manufacturers of the future could avoid complex logic units for processing data using and communicating with the rest of the computer. The idea is to use a microprocessor to control a variety of microprocessors at the same time to work.

rate with 17% of DRAM can be as high as 95 per cent, so caches can be very effective.

TEAMWORK

Specialist chips have been developed to act as co-processors - chips that run alongside the microprocessor to help it out with specific tasks. The Motorola 68881 and Intel 80387, for instance, provide trigonometric functions, square roots and logs.

Other graphics co-processors can draw lines and polygons, even produce shaded polygons and perform 3D calculations.

In more recent years it has become possible to fit more circuits onto semi-conductors and leads that had previously been required to co-processors are beginning to appear on microprocessor chips. The 80486 chip announced last month by Intel, for example, has its own on-board maths co-processor.

PARALLEL LINES

Faster and faster microprocessors run up against the brick wall of memory speed.

Improving instruction execution time would help, but the real key forward is in parallel processing where several processors can be linked together.

The out and out success is the field of parallelism is the Texas Instruments. This processor family was designed from the outset to run in parallel, large arrays of transistors all cooperating together. The Atari Transputer Workstation is currently the best computer to use Transputers. One ATX can hold up to 17 5800s thus giving 170MIPS. Many ATXs can be connected together providing an enormous processing facility. Intel has recently securing contracts for the development of a 100MIPS transputer.

You may be surprised to know that we, that you and I, used to own Intel. The company, which brought to market the world's most innovative microprocessors, the 7800, was set up by the last Labour government. The current Conservative government sold it off - it's now owned by the French and Italian. Politicians are supposed to be our representatives, unfortunately they seem to forget that most of the time that's enough politics - Ed.

INTERESTING TIMES

We are living in gloriously exciting times - digital computer technology is moving so fast we'll be in the middle of the next century in five years' time!

Intel have just released their new processor the 80486 and Motorola are due to follow shortly with their 68050.... The story continues. ■

COMING SOON ON YOUR SCREENS

Optical image read systems consist of glasses or silicon crystal coated with layers of stained materials filtering transmitters. Many thousands of transmitters are packed into a tiny area of silicon. Their emissions, which gain energy, will be used in enhancing leader communication devices in the near future.

Texas Instruments have announced a quantum effect transistor occupying only one 100 times smaller than a conventional transistor. These new transistors consume less power and are expected to last ten times longer than their silicon devices but aren't available for 18 years.

On a different track, recently discovered quantum hole

could allow for useful superconductivity at the temperatures of liquid nitrogen. Previously much lower liquid helium temperatures were necessary. It is hoped that superconductivity - where the resistance of a wire reaches zero - will be possible at room-temperature soon, if so this may revolutionize higher computing speeds, just to mention.

Moving away from electronic transmitters at Intel's Paul Petersen is illustrating an effort to construct an optical gate - a logic unit built on light signals. It is becoming possible to manipulate an analog signal with light as a signal rather than an electronics and the truly exciting story unfolding here is the next step.

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The hot news from Commodore US is that Mac (by president of Commodore's US operations, has resigned. The official line is that he has left to pursue "other interests" - which is the usual line when the company doesn't want anyone to know what's going on.

Bob's replacement is a disaffected former Commodore, a 40-year-old ex-employee of Apple Computer's Eastern US region. Before joining Apple in September 1987, Coppenham served with IBM for 20 years, so it looks as though he has some experience under his belt.

In an inaugural speech that pleased many US Commodore staffers, Coppenham said that he intends to concentrate on pushing the Amiga hard into US educational establishments. In addition, he plans to concentrate on an area that Atari seems to have left behind - dealer distribution. What does this mean for US Amigans? In the short term, very little. Coppenham will recruit only Commodore domestic US operations, leaving Commodore Europe - headed by Christian Heidegger - to run affairs over there.

Coppenham will, however, report directly to Frank Beaul, Commodore's chairman, so it's a far bet that most of Coppenham's strategies that succeeded in the US will find their way over to this side of the Atlantic. Furthermore, if Coppenham's plans to establish Amiga in US schools and educational establishments, it should see some good software becoming in about a year's time.

PIRATES ABOARD

On the other side of the coin from good software is bad software. Even worse still is pirated software that is compiled with vir-

GOLD DUST



You don't have to take a Greyhound bus to see America and discover what's new at Atari and Commodore - let STEVE GOLD do that.

programs. In the US, someone somewhere has cracked Contra Guard Software's Quarterback hard disk backup software for the Amiga. The present version is called Quarterback v3.0.

Quarterback v3.0 has been sighted on a BBS in Belgium. The bad news is that it is illegal and carries a number of viruses in it. Central Guard Software is currently in the process of tracking down the source of the cracked version (those serial numbers do have a way) and has confirmed that Quarterback v3.7 is the latest official version.

So, if you do get a public domain version of Quarterback on your local Amiga BBS or online system, you have been warned. If you don't think that software piracy is a bad thing, fire up Quarterback v3.0 and watch what happens...

Many software houses in the US are responding to the problem of piracy by protecting their packages - usually by taking advantage of some of the quirks of the Amiga's operating system. The

problem is that if the early software protection systems on the Amiga are not at all fancy with the latest Kickstart ROMs.

ROM, an 8-bit-based company, has come up with a novel solution to the problem: a Kickstart module. The 540.95 module fits inside the Amiga 4000 and 2000 series, and allows two sets of Amiga Kickstart ROMs to be fitted. Switching between the ROMs is simply a matter of flicking a switch. Further details from: The ROM Company, PO Box 140-47, West Milton, Ohio 45385.

There are a number of utility packages coming out to the market that allow users to modify the Amiga boot system. The problem utility packages are in the \$70 to \$100 price range on the side of the Atlantic.

In response to a number of requests, Andy Bartusko in Florida has updated the Hermes Kickstart package. The latest version (V1.2) - which costs a very reasonable \$30 - has all of the features of the previous packages, including the ability to split, cut, save and manipulate icons. It's even possible to work with eight-colour icon pictures. Most interesting of all, the package allows the icon data to be modified. Further details from: A G Bartusko, 8524 Casselton Island Drive, Temple Terrace, Florida 33637-7130.

Finally this month, there's no room to mention that the World of Commodore show takes place from the 29th to the 31st of May in Los Angeles.

POCKET ATARI

Over in the Atari corner meanwhile... even the most die-hard Amiga fans cannot have helped but notice Atari at Comdex in April. The reason? Why, the

Pocket Portfolio, of course. The Xerox were wowed by the Pocket MemoBook portfolio, which will retail for \$279.95 in the US. As mentioned in last month's column, rumors say that Atari have contracted with HP to produce a second version of the Pocket Portfolio. These rumors were amplified at the Portfolio's US launch at Comdex. The Mark II machine is now expected to be \$229.95 (monochrome-based) giving a PC/M compatibles and speed, and will feature an optional hardware font also claim. Two new disks have recently been provided by users of separate firms, the most notable of which is Citrus.

The Citrus unit is capable of being fitted inside the Pocket Portfolio's case, but it could add around \$280 to the unit's price. This should translate into a £200 price supplement on this side of the Atlantic, but it's likely that a \$60 \$60000-based Portfolio, with hard disk, will retail for around £300 pounds.

The good news for Atari fans at Comdex is that, although both the laptop ST and the above-mentioned Pocket Portfolio were only shown in glass cabinets to the public, Atari have now confirmed the specifications of the machine.

Stacy will feature TOS v1.4 fitted at standard, but - sadly - no battery. Sources suggest that Atari US is considering offering the battery as an optional extra.

Specifications, the entry-level Stacy will be like the J10457M with 2MB of RAM, and single 05-CDD drive. Some corners on the stand suggested that Atari are planning to use up all the 0240 components in the Stacy, now that news of the 1080 12's demise seems to be leaking to the public.

PASSING THE PORT

One of the (three) advantages of using a PC instead of an ST is that the PC has multiple serial ports. Double Disk Software have released a multiple-DiskPort for the ST called DD Port.

DD-Port is a serial expansion cartridge that plugs into any of the ST serial cartridge slots. The \$199.95 unit draws its power from the cartridge slot, so there are no messy leads hanging around. Furthermore, the unit is completely interrupt-driven, and can thus be accessed from within software.

If that's not your drawing, then just listen to this: the serial port on DC Port, which can be addressed conveniently alongside the ST's existing serial port, can handle 38,688 baud full duplex, with US Robotics labset modems working at 19,200bps, the boys of 38,400 Bps modems are not far off.

Double Disk is distributing the DC Port system via mail order in the US, and also via Matheson, so we should see the unit on this side of the Atlantic quite soon. If you can't wait, write to Double Disk Software at PO Box 701266, Houston, Texas 77234-0266, or call their 888 on 0121-715-044-0266.

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DIGITISED DAYDREAMS



■ The large image on this page (bottom left) was also a 4,000-resolution scan from an ST. The picture was originally grabbed on an Amiga and then transferred to the ST via the X-Box. The picture shows Renshi's 3-bit, 60-second feature from Star Wars: *Rebel Dawn*.

You hate some artwork or photographs that you want reproduced on your machine's screen; how do you go about it if you haven't the time, hardware or knowhow? Call Photofile! RICHARD MONTEIRO reports on the firm's activities.

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Put two machines side by side - for argument's sake, an ST and an Amiga - look a colour video digitiser to one of them and add a program that will let you read and write both ST and Amiga format disks. Supply a black and white or colour picture and get digitising. That, is a nutshell, is what PhotoFile got up to. You send them photographs and in return you get a disk containing the digitised images - in up to 4,096 glorious colours. So how's it done?

For digitising pictures, Carl Young at PhotoFile uses Capture on a 2M6 Amiga 5000. The extra 1,588 are provided by an internal Spirit RAM expansion board. Because most of the ST video grabbers on the market offer true-colour image capturing, PhotoFile decided to use the Amiga to do the digitising. That and the fact that the Amiga has a 4,096-colour mode is standard.

Capture uses three scan specific fast, normal and slow. The slower the scan rate the more accurate and sharp the picture. All pictures are scanned in slow mode regardless of whether they are colour or black and white. This process can take as long as five minutes for a high resolution interlaced colour picture. Such a picture deserves about 2M6 of memory. A standard 8000 or A5000 will force you back into workarounds with a "not enough contiguous memory" error if you try to grab pictures in anything more than interlaced



PhotoFile's digitising service at its best. The original artwork was grabbed by Carl at PhotoFile using Wanderer's Amiga video digitiser. The colour was a Yellow from Northern Imaging. The image shown here was grabbed by the Amiga in HAM mode - an interlacing mode a plain picture was done. Similar quality on the ST is possible when Quantum's 4,096-colour mode is used.

HAM PLUS

Not a double-stud-fence and four cowboy hats, but the new Network have given us the following technology used in their High-View video digitising software. The special effect makes GIFs in various colours look like HAM, HAM, like are identical to GIF files and can be edited using Picture Paint, Pixel and High-Point.

■ If you're interested in PhotoFile's services you can contact them at PO Box 219, Nottingham NG2 4GG (0532 281 444). Amiga digitised pictures can be saved in HAM, HAM+, palette-high-resolution colour and low-resolution colour. Each colour grab costs £1.50 while mono grabs cost £1. If the formats requested include RGB, PV, ARI, IAG, RGB, THY, and P&A ST prices are identical except for P&A (lower about 50p). For a limited period until May '88, normal readers will get a free picture digitised for every five they order.

GRAB 'EM YOUNG

This is Carl Young, PhotoFile's 29-year-old production manager. Originally PhotoFile provided an Amiga-only digitising service; it could well have stayed that way as Carl explained, "When we first decided to expand the service to include the ST, we looked the more popular ST digitisers and discovered they were all geared towards speed rather than accuracy. Near working, though, was the fact that no ST digitiser offered true-colour grabbing, the ones

talked with the results from these digitisers so we looked into the possibility of getting pictures from the Amiga to the ST. At first we thought that we would have to connect the two computers together via an IEEE, then we discovered the wonders of DOS in ROM."



■ Unbelievable but true! The picture above (taken from 'The Godfather' ST Mega image).



■ 4,096-colour superb enhanced HAM at its best. The picture is from 'The Godfather' art book image.



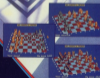
■ Even Amiga palette images look spectacular. This shot shows what's possible in the ST colour mode.



■ Who says the ST can't read Amiga graphics? 4,096 colours in Quantum Paint format. (Thanks).

COLOSSUS CHESS

X



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PUBLIC SPEAKING

ST SUPPLIERS

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ST UK - 0276 55460

The ST Club - 0492

08004

Commodore PCU - 0762

08000

Shopping ST - 0204

08000

Page 1 - 0768 23400

Katella - 0760 26000

Star UK - 0214 89824

St-Club - 0734 48490

St-Club PCU - 0734

48 020

Free software? Surely you jest - but no, the public domain holds a vast array of quality programs. JASON HOLBORN takes a look at some of the range of Amiga utilities this month - ST owners will have to wait until next month for their installment.

All the disks in this month's Amiga PD Update were taken from the Free Disk collection of public domain disks. Free disks are available from George Thomson Services.

All disk numbers quoted here, for reference to that particular library, although most can also be found in the other Amiga public domain libraries.

PLATINUM

SETPOINT: DISK 100

Does the standard Topaz system font bore you? Do you yearn for a more exciting font to liven up your Workbench windows, and your Commodore?

SetPoint is a little utility that allows you to change the default Topaz font for any

Amiga font of your choice. If you do not have any suitable fonts, you could design a more pleasant font using the FFD font designer tool on your Extra disk and then use SetPoint in your Workbench. SetPoint appears to automatically change to your new customised font.

Font sizes aren't restricted to the standard ones, although the screen

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■ Fractalus in action. Here we're in command. There's a more alien world to...

don't tend to get rather cluttered when using larger fonts.

FRACTELUS DISK 100

Adding to the vast number of complex memory letters and phone calls we received about the Scenery program on issue 48, you too certainly seem to be into the generation game. We are of course speaking about the fractal generator game and not Larry Grayson's 'That Door' variety!

Fractalus is another in the ever popular breed of fractal graphic generators that seem to be the current fad of the month in the PD libraries. This particular program is most certainly one of the several of these to use and the results can often be nothing short of astounding.

So you already know that both the ST and Amiga PD libraries are great for picking up quality utility and games software at next to nothing, but what else is available?

Big bang and you'll find a large number of programs that could rightly be deemed useless but are kept because of their aesthetic value. Be sure of course talking about the hugely under-rated range of demo programs available for both the ST and Amiga.

What are demos? Put simply, demos are programs written to show off one or more aspects of the hardware machines they were written for.

Probably the most famous examples of the genre are the Amiga Bouncing Ball and the Jaguar demo on the Amiga, and The 666 demo and



■ The starship Enterprise moves slowly forward into the cosmos.

DEMOS CORNER

The program on the ST.

Each month, we'll be writing through of the latest and greatest demos on both the ST and Amiga and picking one on each machine that we think best shows off the ST or Amiga. How will we judge each demo? Well, if it makes the video format team go "Wow!" and fall over backwards, then it's a winner. Other criteria will include originality and how much of the ST or Amiga's capabilities are exploited.

The demo featured this month was supplied by 1186 Software who can be contacted on 0625 268882. The disk number quoted therefore refers to that particular collection.

STAR TREK DEMO DISK 100

Animation has always been one of the Amiga's strongest points, and this demo certainly shows the Amiga hardware at its best. The demo shows a scene from the first Star Trek film in which the Enterprise moves slowly from out of the sky dock that orbits the Earth. The four different views of the action give an incredible quality to this excellent demo.

Star Trek needs at least 1MB.

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People PC - 0773 70242

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- **Mega 2:** Chip Art Pack 1, full of chip art suitable for most ST packages.
- **Mega 3:** Chip Art Pack 2, full of chip art suitable for most ST packages.
- **Mega 4:** Graphics Pack, desktop packages and utilities, Disk 1: 1000+ desktop backgrounds in colour only (single and double sided), Disk 2: a collection of features, icons, themes and colour art packages, Disk 3: full of colour wallpapers, Disk 4: two floppy printer's a brilliant monochrome package.
- **Mega 5:** Video Pack 1, King James version of the Holy Bible, Old Testament.
- **Mega 6:** Bible Pack 2, King James version of the Holy Bible, New Testament.
- **Mega 7:** Bible Pack 3, Old Testament and Apocrypha.
- **Mega 8:** Bible Pack 4, Genesis, Daniel and Esther.
- **Mega 9:** Bible Pack 5, Psalms, Daniel and Esther.
- **Mega 10:** Bible Pack 6, Genesis, Daniel and Esther.
- **Mega 11:** Bible Pack 7, Genesis, Daniel and Esther.
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It is just not possible to achieve the kinds of computer animation on the ST and Amiga which result with the larger machines. The French company technique produce software capable of broadcast-quality animation on the PC, although there are dedicated movies in the right direction on the ST and there are dedicated movies in the right direction on the Amiga and there are dedicated movies in the right direction on the Amiga and there are dedicated movies in the right direction on the Amiga.



THE
CAD

Electric CAD
Gold Disk 888
Marketing
EPL 90
Tel: 0800 444403
Amiga.

THE CASE FOR CAD

CAD offers exciting opportunities in the complex field of animation. We look at packages specifically aimed at ST and Amiga owners. MARK HIGHAM delves into the CAD caverns.

The progression of professional CAD from the likes of the Cray supercomputer down to the ST and Amiga has not been an especially easy one. Limitations in hardware have made the high end of the market inaccessible to even the Amiga, which boasts enough clever hardware to make it the most likely candidate for serious graphics-rendering packages. However, that is not to say that adequate CAD programs cannot be found on either machine.

CALCULATING CAD

Entry-level packages on the ST and Amiga are hard to come by. The requirements of even the simplest CAD software make dedicated and ultimately expensive packages the only real option, and even these lack the kind of professionalisation which might be expected.

Intro-CAD on the Amiga comes from H&B Marketing and, at £74.95, is perhaps the nearest thing to an entry-level package. It's simple enough to use and is designed to produce everything from illustrations for reports to floor plans and circuit diagrams.

Where Intro-CAD performs best is in its extensive library of pieces which permit parts to be grouped together so that an image may be designed using these different sections. This technique is not, however, nearly as extensive as that employed in Electric Distribution's Cyber Studio.

This package boasts a standard design style which is also reflected in Design 3D, a Gold Disk CAD product for the Amiga.

When Cyber Studio was first conceived it was intended to play the role of an entry-level package which could be

expanded with the aid of all sorts of extra packages to become a top of the range piece of software. This has been achieved brilliantly.

Cyber Studio contains the most popular ST CAD package - Cyber CAD as well as Cyber Misc, an animation program. But in addition, Electric have recently distributed Cyber Sculpt - probably one of the best design programs on the market for the ST - as well as a myriad of animation programs. These include the Cartoon Design Tools and the Model Design tool both reviewed in issue 111 which contain basic Bezier-style designs of the relevant bits and pieces of carriages and robots which may be imported into Cyber CAD and combined, shaded and coloured. Hence, an extensive library of objects may be created.

GOOD DESIGN

The equivalent Amiga package is the range 3 Design 3D from Gold Disk 888 Marketing. It offers a superior 3D environment and allows the extensive colouring routines capable on the Amiga so that all sorts of fixed 3D effects can be obtained and rotated at speed. It has also been accommodated in this package, a feature sadly lacking from Cyber Studio.

Cyber Studio is a GEM-based system with standard drop-down menus and clickable icons - the same technique as that employed in Design 3D. Setting screenmodes can be accessed in the usual way although they tend not take up too much space on the smaller memory machines.

Cyber CAD can run on a 1024 ST although at least a 1000K is recommended for serious use. Design 3D

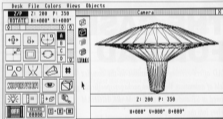
DESIGN 3D
Gold Disk 888 Marketing
EPL 90
Tel: 0800 444403
Amiga. 10% of memory required.



CYBER STUDIO
Electric Disk Worker
CD-ROM
Tel: 0444 434700
16.1 Mb maximum on
soft-charge.



■ Cyber Studio in action. The front screen shows the four different windows where all the action takes place. These are regularly updated.



■ The camera view can be blown up to give you an idea of the four panes of your image. Even and perspective controls can then be manipulated and these are applied to the "super" view - a 3D shaded and coloured view of the image.

requires at least 1 Mb of memory to use it properly.

FIRST DRAFT

CAD can be divided into two specific sections: drafting and 3D imaging. Cyber Studio and the Arispaq Design 3D fall into the latter category which refers to more interest in the artistic side of CAD.

The basic design screen is split into four windows which provide a view of the 3D image from several different angles. You only work on one design but the changes are reflected in all windows whenever they are updated.

The first step in creating any 3D image is to set up some basic shapes. CAD images tend to be in a very blocky style with hard, angular lines

scattered everywhere. This is because most designs must be constructed using polygons which can then be further manipulated.

The best way to go about getting your design into the machine is to draw a rough approximation of the idea and split it up into 3D blocks. So, for example, a house can be neatly converted into a set of block structures. These can then be very simply created using a CAD package and merged in together so that you can end up with the design that you originally planned. Any type of polygon can be created very easily using these techniques. Facilities to spline these lines will usually add an acceptable curve to complex shapes.

All sorts of features may be added to these blocks depending on the pack-

age used. It is this area which is dominated by the sophisticated Cyber Sculpt package, boasting all sorts of features including revolving user-created lines around any axis as well as dragging sections of a design and putting them out. (See issue 10 for full review.)

With both Cyber Studio and Design 3D the next step in the design is usually to set lighting sources and intensities as well as defining colour shades for specific appearances.

Both packages offer the facility to view the design as a simple 3D wireframe image and then render it through all manner of angles and perspectives. A special super-view supplies the perfect 3D picture of your design, boasting all kinds of colour shades from any selected viewpoint.



One of the most obvious advantages in the type of package is to provide a fast copy output of the design. The Amiga Design 3D is by no means suited to professional use in this area with output to plotters being an integral part of the software. Both packages do, however, offer output to Epson printers at the very least.

The ability to save screens is another important aspect and both offer the choice to save the design complete with colour palettes and lighting shades. The format that Cyber Studio saves its screen data into is accessible by all



■ ACAD is, without doubt, the most professional system on the Amiga today. The package allows its user to take full control of most frame buffers but adds to that the usual of all the standards - keyboard, hard drive, graphics tablet and plotter - and you'll wonder if you're playing with Monotype money.

offer Cyber products including their own package Cyber Paint.

These two packages make up the bulk of the CAD suite on the ST and Amiga as far as the less advanced systems are concerned. However, the wealth of facilities on the Amiga makes it a likely candidate for more intense professional competition. ACAD from

■ Campus CAD is a drawing package from Autodesk. At £250, it comes on one of the more expensive options to enhance the CAD. Being a 3D-based system, it allows for an immense range of possibilities and a host of screen update icons. Campus CAD is designed to present all images in a similar way to a painting area.



offers a similar package but with far more attention paid to the user. All sorts of finishing techniques can be made up for lack of colour but the real benefits come in automatic mirroring and rotation as well as a range of dimensioning features. Input can be via keyboard, mouse or digitising tablet and output can go to standard Epson-compatible printers. The short basic price and a range of plotters.

Autodesk expands immensely on these basic principles offering the type of professional CAD system required by those with specific interest in the business applications market.

The lightness and end of ACAD is reflected in the hardware which is required. The basic program needs 200k of memory and a hard disk to make it a viable proposition, and a graphics tablet and plotter can both be added to make input and output more acceptable. The graphics tablet is the input device used by the vast majority of professional CAD systems so it really does put ACAD out of the home user market.

The ACAD range is split into two packages - ACAD Designer and ACAD Professional. Each expands on the conventional techniques of its predecessors by including a range of additional features including easy-to-use isometric grids which can be used as a basis in the creation of less traditional designs.

Refining on the ACAD package is one of its best points since it is faster than on professional PC class machines, even on very complex designs. The high screen resolutions on an Amiga make such designs a possibility and with

colour implemented as well the results can be far superior to any other ST or Amiga CAD software.

FINISHING IT OFF

CAD on the ST and Amiga is usually aimed at the home enthusiast where animation is often the only serious aim. With these machines being very graphically orientated it's not surprising that such CAD packages have found a home among the scene. For ST owners there are a host of smaller CAD packages, but Cyber Studio is certainly one of the best. Besides being extremely well supported by animation disks and the whole range of Cyber products, Studio offers a very user-friendly environment particularly for the novice CAD fan. Design 3D is the equivalent Amiga package which has, without doubt, one of the clearest manuals with superb tutorial sections.

The pricing and hardware requirements of ACAD really put it out of the scope of all but the most serious user. However, if your main reason for buying your machine is CAD then the ACAD and ACAD is certainly worth the money. Commodore market both and are currently offering special discounts.

ACAD

Commodore

£250.00

See page 70 page

Amiga, 200k of memory required. Hard disk an advantage.

Professional three from £1000 then an excellent offering. 3D modelling environment for Amiga owners. It's more of a point package with a range of colour and point options. However it will offer exceptional quality with super-file lines an option.



■ Design 3D is capable of some brilliant results. 3D planes can be manipulated easily with views from four different angles available. Spinning and mirroring routines make the creation of the basic shape easy enough.



■ The icons down the side of the window control everything from grids, useful in precision work, to drawing and plotting features. It's the extensive use of colour in Amiga CAD packages which makes them more suitable for animation.



ST Amiga Format's unique dual-format disk gives you the best software from both ST and Amiga worlds. JASON HOLBORN is your guide through this month's pot-pourri of proggies.



DISK EXTRA

ST

AMIGA

New to the ST? See page 80 for full loading details.

New to the Amiga? See page 46 for full loading details.

FLAIR PAINT.....28

Get a fix at the art package that's making more than a few heads turn at the end of ST art. Flair contains the kind of features that previously you'd call into dream about.

EDIT.....28

Again remember the ResEdit disk editor we featured on our cover disk in your issue of Format? Of course you did! But here was a problem: it was for the Amiga only. EditIT does the job for frustrated Atari owners.

TYPEIT.....26

How do you rate your typing skills? If, like the Format team, your typing is restricted to the avoid-it 'hunt and peck' technique, then Typeit will help you (without slowing for a new beat) in no time at all.

SPRITE ST.....26

Designing and animating sprites is a task that many would-be games programmers try to learn sooner or later. With SpriteST, this process is made considerably easier.

TRACK IT.....28

Are you having problems trying to track down that rogue disk error that hits when you get out your floppy disk editor? With Trackit, those disk errors will have nowhere to hide.

COLOSSUS CHESS.....24

Do you think of yourself as bit of a Rarney where chess is concerned? But you can't beat Colossus? This needs fewer cannons, throwing stars and Fortes when you've got a game that is so utterly addictive as chess.

BOOT INTRO.....26

Add that little bit of extra sparkle to your work disks with this handy little program. Boot Intro allows you to put your own little sorry messages into the front of your disks.

VERBSE 3.1B.....24

Format, champion of the cause to completely eradicate all known viruses, presents the latest release of the program that is generally regarded as THE Amiga virus killer.

TANK CONTROL.....24

The Amiga's multitasking system is not exactly the most stable of working environments. With Tank Control, you can make those rogue tasks before they get a chance to get help from the guns.

TUNNEL.....26

Fun and thrills is what Format is all about particularly when the Editor isn't about and so we present our latest wunner but fun program that is guaranteed to send you running for your disk glasses!

FLAIR PAINT



Even more than those masterpieces with Flair Paint, by the way, the most advanced point package on the ST.

SPRITE ST



Sprite editors are a vital part of every games maker's arsenal, and SpriteIT is one of the best you can get.

COLOSSUS CHESS



Chess isn't quite only those sophisticated chess enthusiasts' old war game of choice. Colossus makes it into the fun.

WIN WIN WIN...



All you have to do to become wealthy is write the most superb program we've ever seen. Easy huh?



■ Select **VIEW** **3D?** from the menu and you can change the pieces to any one of four different styles.



AMIGA

COLOSSUS CHESS

PROGRAM: BY COS
MACHINE: ALL AMIGAs
FILES: CHES5

Do you rate yourself as bit of a Rappanov beast? Then why not try your hand at the latest, and most certainly the greatest chess program to appear on the Amiga. We at Format certainly find our best to beat Colossus but our pathetic attempts were miserably crushed in no time at all. Can you beat what is quite simply the ultimate chess program?

The demo version on this month's disk a cut down version of the full game. Our demo gives you 10 moves in which to either beat the computer or to beat yourself (as far, the latter has been more correct).

To move a piece, just click on it and then click on the square you wish it to be moved to. Alternatively, you can keep the mouse button depressed and then drag the



■ The more conventional 2D mode is also available for the purists among you.

piece across the board yourself.

One of the nice features of Colossus is the extent to which you can customise the chess board and all the different pieces. Even in our cut down version, you can change the appearance of all the pieces into any one of four different styles, ranging from oriental to futuristic.

You can also change the orientation of the screen, either from 2D or defaulting 3D. When in 3D mode, you can even change the angle at which the screen is viewed by clicking on the base of the board, and, while keeping the left mouse button depressed, moving it around with the mouse.

GETTING GOING

You can load the Colossus Chess demo in two ways. The first, and simplest method is to insert our cover disk at the 'Insert Workbench' prompt and Colossus will automatically boot up.

Alternatively, you can load Colossus by double clicking on the CHES5 icon on the Workbench. From Workbench, the computer will ask you to copy disks several times at the game loads; just follow the on-screen responses and everything should load OK.



VIEWUX 3.10
PROGRAM: PUBLIC DOMAIN
MACHINE: ALL AMIGAs
FILES: VIEWUX, VIEWUX.DOC
The constant fight against computer viruses has always been a bitter one. As new viruses are released upon the world, anti-virus writers frantically code new and more powerful virus killers. The



■ How could a title, seemingly innocent window be such a killer?



■ Click on the Viewux window bar and there allow the right mouse button and a complete rundown all viruses found will pop up.



■ Viewux also allows you to view the host base of a disk useful for identifying viruses.

latest, and certainly the most dangerous of Amiga viruses is the dreaded IQ. Who can save us from this menacing title of doom? Viewux 3.10 of course.

Viewux 3.10 is the latest, and most powerful release of the popular virus detector. Viewux is generally regarded as the best available. As well as the most mundane viruses such as the SCA and Byte Bomb strains, Viewux will also trap and kill the more obscure viruses such as the Byte Storm, North Star, System2 and even the elusive IQ virus.

Once loaded, Viewux sits in a title window in the Workbench title bar and monitors every disk that is inserted into the machine there after for any potential viruses.

When a virus is found, Viewux will instantly inform you of its presence and then give you the

option of exterminating the little blighter.

GETTING GOING
You can load Viewux by double clicking on the VIEWUX icon on the Workbench. Full instructions on using the program are included in the VIEWUX drawer.



TASK CONTROL
PROGRAM: PUBLIC DOMAIN
MACHINE: ALL AMIGAs
FILES: TASKCONTROL, TASKCONTROL.DOC

When the Amiga was originally released, the machine was hailed as a breakthrough in terms of price and performance. One particular area that received more than a few rave reviews was the Amiga's advanced message pending, multitasking operating system. The Amiga was the first personal computer to offer true multitasking at any price.

Unfortunately, these first rave reviews soon turned to bewilderment as the Amiga operating system showed its true, unvarnished colours. Most multitasking operating systems have two major features that the Amiga operating system lacks: task, memory management and task accounts. These two features are designed to stop a task that goes haywire from bringing the entire system down as well.

So what do you do when a task decides it wants to go out of control? Use TaskControl naturally!

TaskControl is a very nicely presented tool that allows you to meticulously list every task before they can do any harm whatsoever. Used in conjunction with a guru utility such as the Gem! utility box, you can even task disk #5.



■ Making a task in the Workbench



■ TaskControl's very handy user interface.

LOADING THE OTHER ST PROGRAMS

This month's demo of Flair Paint is set up so that it will automatically load when you insert your cover disk in drive A. To access the other programs on the disk, either reset your ST with a disk that stores your access to the Desktop in drive A or reset your ST with the *Format* cover disk in drive A while keeping the CONTROL key depressed and the Desktop will appear.

TaskControl will provide you with a genuine operating environment. Other features offered by TaskControl include:

- **SEND TASK TO SLEEP** Just point and click on a particular task, then select sleep and the task will be sent into immediate slumber.
- **KILL TASK** Tap that regular task before it gets a chance to waste its resources on the Amiga. Just click on the task to be "killed" and then select the kill gadget.
- **ST PRIORITY** Turbo charge any task by changing its execution priority. The higher the priority, the faster your task will run.

SETTING SOUND

You can run TaskControl by also clicking on the MAXCONTROL.COO in the Workbench. Full instructions are available within the MAXCONTROL, shown. This is a fairly lengthy program and therefore should be used with some caution.

AMIGA

BOOT INTRO

PROGRAM: PUBLIC DOMAIN
MACHINE: ALL AMIGAS
FILES: BOOTINTRO, BOOTINTRO.DOC

If you've seen any of the various demo disks that are available for the Amiga, then you'll have noticed that probably the most common is the classic scrolling message. With Boot Intro, you can do that personal touch to all your work disks.

Boot Intro, as the name suggests, writes a very fancy scrolling message to the boot track of your disk. All you have to do is enter a title for your demo and then enter the message text that is to be scrolled and then enter "SAVE" and your scroll message will be written to the disk in drive 0C. Once the mes-



ST

FLAIR PAINT

PROGRAM: BY DEMAGE
SOFTWARE: SONY
MACHINE: ALL COLOUR STS
FILE: FLOPPY DISK ONLY
FILES: FOLDERS: AUTO
FILES: COMPAG.CTOS,
FLAIR.DOC, FLAIR.PIC.BOX,
FLAIR.PACK, FLUPIC.DAT,
LOADPIC.COM,
DRAWPIC.COM

When Flair Paint was originally released, it was heralded as a milestone in the history of computer art on the Amiga. It's no other paint package can compete with the vast number of advanced paint features that Flair offers. Format, in conjunction with the authors



■ The customizable artwork gives you fine control over your printing.

and Database Software, bring you an exclusive demo of the paint package that every ST artist is talking about.

Your cover disk demo is a complete copy of the low-resolution version of Flair. The only difference between our demo and the complete program is that all save operations have been removed and a time restriction has been added. However, the program does allow you to have up to half an hour's doodling time before it stops execution.



■ The zoom feature allows fine editing of detail.

We think you'll agree that Flair is definitely a program to be reckoned with. The entire program is controlled through Flair's very easy to use pop-up menu system which is very quickly mastered. With all programs that are as complex as Flair, the best way to get the hang of it is to experiment.



■ Flair Paint - the ST's most exciting touch is when it comes to computer art.

GETTING SOUND

You can load our demo of Flair Paint by resetting your ST with our cover disk in the internal drive (A) and our demo will auto-load.

After a few seconds of disk access, the Flair Paint configuration menu will pop up giving the option of either loading the Flair Paint program or changing the configuration. Do not change the configuration on your original Format menu.



■ You can import Workbench's contents into Flair Paint with ease.



■ Flair Paint's the cat's whiskers.

for disk but instead, select 'Load Flair' to enter the main program. Make a backup if you want to change the configuration in any way (see page 40 for details of how to do this).



THE COMPLETE PROGRAM

After playing around with our exclusive demo, write quite sure you'll want to see the complete collection on our disk. Flair Paint is quite simply the best paint package yet to see the light of day on the ST.

You can buy the complete program, which supports all the major ST file formats (BMP, DIB, GIF, IFF, PNG) and works in both high and low-resolution modes for only £44.95 from Database Software. Database can be contacted on 091-957861.



■ **BootIntro** is written. Just enter the title and the overall text and then select where to view the Boot Intro.

page has been written, just select and the scroll message will pop up every time you boot.

GETTING GOING

You can load *Boot Intro* by double clicking on the BOOTINTRO icon on the Workbench. Full instructions (in both English and German) are included within the BOOTINTRO drawer.



■ The **Introdisk** intro. The **Introdisk** list is the scrolling menu page.

FORMAL WARNINGS

Boot Intro directly modifies the boot block of a disk and therefore the program should not be used on disks that use custom boot blocks. Nearly all commercial games utilize the boot block to load and therefore you should never write over these special boot blocks or the game will fail to run.



■ **SPRITE ST**
PROGRAM: BY C. GARDNER
MACHINE: ALL COLOUR STS
FILES: SPRITEST.PRG,
SPRITEST.DOC, BERTS.DAT

Just take a look around at the vast number of games on both ST and Amiga and by far the most widely used graphic technique used is the animated sprite. The quality of animated sprites can either make or break a game and if both the animation and definition of a sprite is right, the results can be very impressive indeed; just take a look at games such as *Blood Money* for a very good example.

As you're probably already guessed, the cover disk program *Sprite ST* is a very powerful tool designed to enable you to easily produce animated sprites to incorporate into your games and to inter-

utilize. Features offered by *SpriteST* include:

- **Movey sprites.** Sprites of up to 32 by 32 pixels can be easily created which utilize the full palette available in the ST's low resolution mode.

- **Intro large animations.** With *SpriteST*, you can design animated sprites that are made up of up to 128 frames and then string them together into a sequence of over 140 events.

- **Sprite in all languages.** *Sprite* designers for ST BASIC are all very well but what happens if you're an assembler programmer? Luckily, the *SpriteST* file format is explained in considerable depth and therefore incorporating sprites into your programs is very simple indeed.

The current version of *SpriteST* will only save and load its files from the top directory of a disk (A: or B:), even if you're



■ **SpriteST** editing an animated sprite.



■ The animation control screen. Enter the frame numbers in the order that they are displayed and *SpriteST* will do the rest.

entering a sub-directory within the program's file selector.

GETTING GOING

You can load *SpriteST* by double clicking on the SPRITEST.PRG icon on the desktop. Full instructions are available within the SPRITEST folder.

AMIGA

■ **TUNNEL**
PROGRAM: PUBLIC DOMAIN
MACHINE: ALL AMIGAs
FILES: TUNNEL,
TUNNEL.DOC

If you're expecting a description of *Tunnel*, then you've going to be disappointed as we're keeping our mouths firmly shut. *Tunnel* is another one of those 'fun' programs that occasionally breaks into the format disk and, as ever, the best way to find out what it does is to load it yourself!

Format Warning! *Tunnel* has already claimed the sanity of at least one member of the Format team (no names though, mind read) due to user excitement. (Sarkened glasses are an absolute necessity!)

GETTING GOING

You can load *Tunnel* by double clicking on the TUNNEL icon on the Workbench. Instructions (in your native tongue) are available in the TUNNEL drawer.

ST

■ **ZIP ST**
PROGRAM: BY R. HUGHES
MACHINE: ALL COLOUR STS
FILES: ZIPST.PRG,
ZIPST.DOC

Do you remember the classic Amiga file editor, *NEWDP*, that we featured on our cover disk number one? Unfortunately, the only complaint from an ST user's point of view was that it wasn't really of any great use to them.

It doesn't take a brain the size of a planet to guess that *ZipST* is the ST version of that classic tool. But unlike most conversions, *ZipST* looks so much like the original that you could be forgiven for thinking that it was actually running on an Amiga!

ZipST is an editor designed to allow you to edit binary files. For example, if you were writing a program in a language such as GFA BASIC and you had just completed it only to find out that you had made a spelling mistake in a particular item of text, using *ZipST*, you could change it without having to recompile your source.

GETTING GOING

You can load *ZipST* by double clicking on the ZIPST.PRG icon on the Desktop. Full instructions are available within the ZIPST folder.

ZipST looks so like the Amiga original, that it even uses pull-down menus. If you've never used an Amiga before, you may end up



■ **ZipST** in action. Here, **ZipST** is editing text.

being rather lost.

To access the pull-down menus, you must first press the right mouse button and the screen title bar will change. Now, while keeping the right mouse button depressed, move the mouse pointer up to the FILE option and a menu will drop down. All you now have to do is to click the left mouse button on the menu option that you require and you're away. The other two options, EDIT and SEARCH will not function until you have loaded a file.

ST

■ **TYPIST**
PROGRAM: BY G. NEAL
MACHINE: ALL COLOUR STS
FILES: TYPIST.PRG,
TYPIST.DOC, HD

Learning to touch-type can be a painful and very frustrating experience. If you are a member of the common 'hunt and peck' school, changing the habit of a lifetime can be hard work. How can you ease this pain? Oh you are to die for. *Typist* is a program that



■ Teach yourself touch typing with ease.

will make the transition almost painless.

Typist is a program designed to teach you how to touch-type using the traditional 'home key' technique. The program will take you through various exercises which are designed to aid the development of your touch-typing skills.

GETTING GOING

You can load *Typist* by double clicking on the TYPIST.PRG icon on the Desktop. Full instructions are available within the TYPIST folder.



■ TrackIt displays the current track, sector and side being accessed in the top right-hand corner of the screen.

TRACK IT
PROGRAM BY A HOUSE-MADE
MACHINE: ALL STs
FILES: TRACKIT.PRG, TRACK-
IT.MPG, TRACKIT.DOC

If you've seen any of the latest add-on disk drives for the ST and Amiga, you may have noticed that the latest "fashion accessory" for every computer disk drive is an LED display that shows the current track being read. All very nice indeed, but what happens if you've already bought a second drive or just can't afford the relatively high cost of such features? Use TrackIt instead!

TrackIt is a very handy little program that displays the current track, sector and side being accessed every time the machine reads or writes a file to a disk in the ST's internal drive (4.1). Just load the program and that's it: every disk access thereafter will be displayed by TrackIt.

GETTING SONGS

There are two versions of TrackIt included on the cover disk, one for colour users and another for those of you with monochrome monitors. To load TrackIt, just double click on the appropriate version of TrackIt for your machine (TRACKIT.MPG for colour and TRACKIT.PRG for monochrome). Full instructions are available within the TRACKIT folder.

Your programming skill could earn you £800

| | | |
|---|--|--|
| <p>Name _____</p> <p>Address _____</p> <p>_____</p> <p>_____</p> <p>Phone: _____</p> <p>(Daytime) _____</p> <p>(Evenings) _____</p> <p>My program name is _____</p> <p>For <input type="checkbox"/> ST <input type="checkbox"/> Amiga</p> <p>Approximate total size of files in kilobytes _____ K (we cannot use programs longer than 200K, shorter submissions, under 100K, stand the best chance of publication)</p> <p>It is a:</p> <p><input type="checkbox"/> Game <input type="checkbox"/> Technical tool</p> <p><input type="checkbox"/> Business utility <input type="checkbox"/> Art program</p> <p><input type="checkbox"/> Main program <input type="checkbox"/> Educational</p> <p><input type="checkbox"/> Novelty <input type="checkbox"/> Other _____</p> | <p>BRIEF DESCRIPTION:</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>(Checklist (please tick):</p> <p><input type="checkbox"/> Stamp(s) addressed envelope for return</p> <p><input type="checkbox"/> README.DOC explanation file on disk</p> <p><input type="checkbox"/> Printout of README.DOC file (if possible)</p> <p><input type="checkbox"/> Name, address, machine type written on label</p> <p><input type="checkbox"/> Disk certified virus free</p> <p>IMPORTANT - Please sign this declaration:</p> <p>This program is submitted for publication by ST Amiga Format magazine. It is my own work and has not been submitted for publication elsewhere. I claim any national name and glory.</p> <p>Signed _____</p> <p>Date _____</p> | <p>If you've got any suggestions for other ST or Amiga software which you think other readers would find useful, interesting or amusing, send me to Henry, and I will see if your program is featured in one.</p> <p>2. Create a file called README.DOC on the disk which contains exactly how to use your program.</p> <p>3. Fill in this form, sign it, and send it without delay to:</p> <p>Henry Hill, Software ST Amiga Format 4 Queen Street BATH BA1 1JU</p> <p>Subscribers are free if you don't want to receive this issue!</p> <p>The worth of a stamp of £800 goes towards the best programs each month.</p> |
|---|--|--|

HARD DISK SUBSYSTEMS

ATARI ST/PC1

SYSTEM AST 20/APC20

Atari Hard Disk Substation
inc 20MB Hard Disk and Utilities Software
suitable for either ST or PC1
£299 inc VAT & Delivery

SYSTEM AST 40/APC 40

Atari Hard Disk Substation
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HOW TO USE YOUR DISK

The ST Amiga Format cover disk is in a special format which can be read by both the ST and Amiga. Even if you are a seasoned computer user, please read these instructions carefully or you could damage your copy of it.

The first thing you must do is make a backup copy of the disk. Because of the special format, the normal disk-to-disk copying methods, as recommended in both the ST and Amiga manuals, won't work. Instead you will need to format a disk and copy the files individually. Don't panic... it's not at all difficult.

ON THE ST

Instructions for a single drive machine.

1. Take a blank disk and format it in the usual way.
2. With the blank disk still in the drive, double click on the A: drive icon to open up the blank contents window.
3. Now drag the icon for drive B: into the open window of disk A. This will copy all the files one by one off of the master disk onto your new disk. Make sure that the master ST/Amiga Format disk is write-protected (the sliding tab should be back to the hole) is open and put it in the disk drive when asked for drive B.
4. You will now be prompted at various times to insert disk A and disk B while copying takes place. There will be a lot of copying to do in a single drive ST.

Note that our special cover disk contains 204 more files than will fit on a standard single-sided ST disk. If you own an old 500, you'll have to be selective and copy only the files you want.

ON THE AMIGA

Instructions for a single drive Am500.

1. Start your Amiga up with your normal Workbench disk.
2. Take a blank disk and initialize it in the normal way.
3. Now enter the CLI by double clicking on the CLI icon that is on your System screen on a standard Workbench disk. Once the CLI window pops up, stretch it to full size using the window sizing gadgets at the bottom right hand corner of the CLI window.
4. Now enter the following CLI commands to set up our writing environment (remember to press **RETURN** after each):

```

FORMAT B: (disk)
COPY C:\COPY\DIRS\RELATIVE\WORKBENCH
DIR C:
COPY C:\LABEL\INSTALL.MAN;C
DATE 980201;ADD
PROTECT 980201;END
    
```

```

PROTECT 9806\COPY;END
PROTECT 9806\COPY;END
PROTECT 9806\COPY;END
PROTECT 9806\COPY;END
PROTECT 9806\COPY;END
PROTECT 9806\COPY;END
    
```

5. Once you have entered the commands and the drive light has gone out, take out your Workbench disk and put your ST/Amiga Format master disk in the internal drive (DFD0). To start the copying process, enter the following CLI command:

```

COPY DFD0:BY:ADD -Press RETURN-
6. During copying, the machine will display a list of the files being copied. Once copying has finished, remove your cover disk and insert your freshly formatted blank disk into the internal drive and enter the following commands:
COPY ADD BY:ADD -Press RETURN-
FORMAT (disk) BY:ADD -Press RETURN-
    
```

7. That's now the top level of your cover disk successfully copied. The next step is rather more complicated. Firstly, remove your copy disk and insert our cover disk into the internal drive and enter the following:

```

DIR DFD0:DIR C: -Press RETURN-
The Amiga should then display a list of all the directories on your cover disk which will look something like the following:
DIR0 (dir)
+ (dir)
+ (dir)
+ (dir)
+ (dir)
    
```

You should now write down this list onto a piece of paper (the TAB extension on each is not needed).

8. With your cover disk in the internal drive, each directory that was listed has to be copied individually from your cover disk onto your copy disk. For the sake of example, if our cover disk contained a directory called 'TRIG', you would enter the following commands:
COPY DIR0\TRIG ALL;ADD -Press RETURN-

Now remove our cover disk and insert your destination disk and enter the following:

```

MOVE DIR0\TRIG -Press RETURN-
COPY DIR0 ALL;DIR0;END -Press RETURN-
9. The final step in backing up your cover disk is to give it the same name as our cover disk and make it directly bootable using the following commands:
RENAME DFD0: 9806 -Press RETURN-
INSTALL DFD0: -Press RETURN-
    
```

USING THE PROGRAMS

All the programs on the cover disk have been set up so that they are as easy to use as possible. If you do have problems with a program, full instructions on loading and running a program are included in the disk copies and these should get you up and running. If you still have problems, read the documentation file (DOC) that is included with every program.

ON THE ST

To display the contents of a program's documentation file, double click on its icon and a display box will pop up which includes an option to allow you to display the file's contents on the screen. Select 'SCREEN' and the file will be displayed.

ON THE AMIGA

To display a documentation file on the Amiga just double click on the appropriate DOC file to be viewed and a window will open and the file's contents will be displayed. Pressing the space bar will advance a page at a time.

COPYING THE DISK

Unless specifically stated the programs on the cover disk are not public domain and the copyright remains with the author. Selling these programs without the authors' permission is against the laws of copyright and offenders will be hit with a big stick.

HAVING TROUBLE WITH THE DISK?

We have done our best to check that the programs on this month's disk are stable to use, and that you have no known issues. However, we cannot accept responsibility for using the software, and we cannot accept liability for any consequences of using the programs.

If your ST/Amiga Format disk is faulty or not read out of bins of programs displayed some are listed for you (you should send it back by Aug 91 for a new replacement to:

ST/AMIGA FORMAT, JANE COLE, GREGORY LANE, 28 JEFFRY CLOSE, BRACKNELL, MIDDLESEX HP10 8DQ.

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at the
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COMPUTER SHOW

MIDI

At the latest hardware and software is the rapidly expanding area of music made will be an display, including keyboards, samplers, sequencers and professional studio software.

With a Macintosh setup you can produce top-quality music, quickly and simply - editing out mistakes in a way that's impossible with live recordings. So if you're in any way interested in making music with your micro this is the place to come to find out all about it.

CAD

Computer Aided Design has grown to become one of the most important uses for modern computers. With a CAD system you can design houses, cars and electronic circuits - in a fraction of the time it would take you with pen and paper.

With the high speed and powerful graphics of fast micros it's hardly surprising that buyers and later CAD programs are pushing back the frontiers of the field.

And only at the Atari Computer Show can you see all the latest systems under one roof.

BUSINESS

Many companies will be demonstrating their latest software and hardware, especially designed to make the full business potential of Atari computers.

It's well as products for the 8-bit and 16-bit, you'll be able to try out applications for the powerful Atari PC-compatible range.

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DTP

That of combining text and pictures in big books no longer because, with a low-cost DTP program, you can create anything from a club's newsletter to a monthly magazine or book.

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Business

DTP

GAMES

GAMES

Atari computers are renowned for their ability to take fast-action arcade-quality games.

The range of new software-to-show will demonstrate how the power of these machines is continuously being stretched, producing faster and even more addictive games with superb graphics.

The winning entry in the STOS Gamewrite of the Year Award will be revealed, and several new exciting STOS memories will be shown for the first time.

If you're a keen game player, you'll find there's so much to offer at the show - you're guaranteed a real treat!

DON'T MISS IT

So far a great day out - whether you want to see what the future holds for Atari computer users, take advantage of the bargains on offer or get advice on specific applications - the Atari Computer Show is the place to go.

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INSTRUMENTAL CHANGES

The potential for computer-MIDI control of musical instruments is almost unlimited, so much so that many musicians have had customised controllers manufactured for them.

Less hip — perhaps the most famous example is the harp played by Bernard Sapiro and used by Jean Michel Jarre at the infamous 'Vendredi 13 with Starburst' Docklands concert last year. This works by translating the point at which a laser beam is broken by the hand, into MIDI pitch data. It's not too practical, but looks great!

Ultrasonic here — the Ultrahandbarkle is a more practical instrument designed by German New Age musician Hubert Bognermayr. It too uses lasers, but only as visual reference points for the musician. The real work is done by ultrasonic beams between the lasers, which detect the position and velocity of your hands and translate into MIDI data to drive a Fairlight. The tool has been used on stage in Vienna, and may well appear in a performance of Bognermayr's Blue City Orchestra in this country later year.

Distortion — manufactured by Proactive, the Andromeda console is a pair of hand-held tubes containing motion detectors. A control panel converts movements into MIDI note and velocity messages, so you just connect them to a drum machine and



drum. Oh, and for slowly persuasive sounds, Kenneth Soudwell — 2200 winner of the Soundbeam, from EMS, the ancient UK company responsible for the classic VCS3 synth and vocoder. The Soundbeam is a motion-to-MIDI laboratory. The idea is to move around inside the ultrasonic field and generate MIDI signals. Kitchwerk has bought one... Jean Michel has bought one... but will Joe Bagee use that one?

Synthesizers aren't the only things that you can connect to the computer via MIDI; there are all kinds of MIDI controllers — guitars, wind instruments, drums, microphones, even completely new types of instruments with which you can program your computer-MIDI system.

MIDI is the digital information standard, introduced almost five years ago, which lets you treat music like a word-processed document. Using a suitable MIDI software package and a MIDI controller — usually, but not always, a keyboard — you can record musical "events" with the computer, and have the computer replay them precisely. There are dozens of MIDI music packages for the ST and Amiga; some of them, like Steinberg Pro-24, Cubase Creator and Hybrid Arts MIDItrack, are used in top studios all over the world. Less expensive packages like Dr. T's RCS, Steinberg Yamaha and Hybrid Arts Easy Tracks are within the budget of most home musicians.

Eventide Soundboards on 286/386 PCs can sort you out with a copy of Pro-12 or Pro-24. MIDI kit 704 (2004), meanwhile, should be able to supply with any of the other products mentioned.

The ST, of course, comes with MIDI sockets built in. The Amiga requires an additional MIDI interface. Probably the best buy on the market is Data's 2092 (M4/201) MIDI Master, which offers one IN, three OUTs and a TRBU socket, and a high degree of software compatibility for EPOSS. It's available in different versions for the 4500, 41000 and 40000. But that's enough about MIDI.

HOT EAR

The Dugan MIDI-Mu — imported by organ manufacturers Farfisa — is a hand-held photo-MIDI controller which allows singers (or for that matter players of any monophonic instrument) to control MIDI equipment. Sleek, black and futuristic, the MIDI-Mu incorporates a small condenser microphone which picks up the



sound of your voice and attempts to convert it into a MIDI pitch signal. The soft-touch controls on the front allow you to set the MIDI channel, pickup sensitivity, velocity response, octave and so on. Then it's your job to sing as clearly as possible. £199 buys you the instrument.



So ya wanna play funky music or rock and roll? There's a huge range of inexpensive, entertaining MIDI hardware to let you make great music whatever your budget, your musical tastes or your musical ability. CHRIS JENKINS plays a medley of exotic MIDI instruments.

GOING MENTAL

If you're into MIDI controllers, here's how the subject of creative music pages April. Real events, but would you believe for an extensive review, just plug into your head and think your heart/limbs, somewhere, is probably working on it right now...

Used fairly recently, the only practical wind synthesizer was the Synclavier. The advent of MIDI has changed all that; now you can get into wind synthesis for less than \$1000.

Casio 04000-800 - The DR800 and DR600 horns may look like toys, but they've been used by bands such as Skarsare both on stage and in the studio. The DR0 horns are played like recorders - you blow into the mouthpiece and finger the keys as you would a recorder. Although

SOUND YOUR FUNKY HORN

you can flip a switch and do away with the recorder for any sort of horn parts, there's a number of mono-phonics preset electronic tones such as flute, sax, and oboe. These can be heard through the built-in speaker or through an external amplifier. You can also plug them into an external MIDI interface for amazingly realistic wind-synth sounds. By using Tempingr's, vibrato and tremolo techniques on the mouthpiece, you can create effects impossible to play on a keyboard - and, of course, your ST or Arrangerboard MIDI synthesizer package can record all this data for later use.

Yamaha 8007 - This evolving instrument is now available at a discount price of around £299. Though it doesn't make any sound itself, the instrument works by combining its MIDI output with the

breath-controlled signals recognized by most Yamaha synthesizers since the DR7. The 8007 is played like a saxophone, and has a six-piece transposition range using thumb-levers.

The saxlike mouthpiece has a plastic 'reed', the key layout is similar to... The response can be tailored to your individual playing style by adjusting patches made by the band. There's a fairly sophisticated MIDI loop which is particularly suited to Yamaha's DR12 multi-timbral FM tone module.



Casio MT-9000-10 - For more extreme guitarists, such as Vince Clarke of Erasure, the guys at BT, George Nitti, there's a genuine multi-faceted credible MIDI guitar, the MT-9000-10. The 900 is a traditional shape with the 440 in more substantial. Built from a composite urea and resin substrate, it has two sound outputs of guitar controls, an extra pair of MIDI controls, a 1000 Hz volume knob, a 1000 Hz sustain pedal, a 1000 Hz sustain pedal, and a 1000 Hz sustain pedal. One interesting aspect of the MT-9000-10's design is that to change MIDI parts you have to set the mode switch to a fixed position, then play a single note. Alternatively, the new patch is to 99. This system is fairly gimmicky, but by allowing an LED display or remote, beyond it helps to keep the price down to a reasonable £250.



Yamaha 8007 - This electronic synthesizer can be used in many ways equivalent to the DR000. It isn't a genuine guitar as the strings aren't fretted or tuned, so you can't strum chords. However, the strings do vibrate, so the guitar's own resonance can be detected by the position of your fingers on the fretboard.

The 8007 has an on-board polyphonic voice including acoustic and electric guitars, bass, trumpet and organ. These can be heard through the built-in speaker or sent to an amplifier. Some of these have built-in sustain, reverb and flanging effects built in. In addition, the 8007 has a rhythm generator with twelve 16th-note preset rhythms, sync-to-beat and auto-tune. There's also four drum pads which trigger drums, cymbals, bass and keyboard sounds.

The 8007 8007 features two pre-programmed auto-intensification which changes during the rhythm, large, MIDI clock and performance. Using a multi-timbral module you can assign a different synth voice to each string. By using your computer's software synthesizer it is available to record into different tracks at once - each on a different MIDI channel. Cost of the 8007 is around £299.



the operating system so that you can use it straight away.

Since there are 15 registers (R0 - R7 and R8 - R15) that may need to be saved on the stack at any one time the 68000 has a specific instruction for doing that: MOVEM MOVE (multiple registers). This instruction saves words or longwords, but not bytes.

The calling sequence in Figure 2 could be changed by using the command to:

```
MOVEM.L D0,D1,A0,-(A7)
CLR Clear Screen
MOVEM.L D0,D1,D0,D1,A0
```

The register list in MOVEM must specify data registers before address registers in the order D0 to D7 then A0 through A6.

If registers are saved all over time "Clear Screen" is called then a word must make faster sense to save program space and use them within the subroutine itself.

TWO AND TWO IS FOUR

The 68000 provides arithmetic instructions for addition, subtraction, multiplication and division.

So, addition instructions exist: ADD, ADD, ADDA, ADDL, ADDQ, and ADDX.

ADDD stands for Add Decimal (decimal numbers). Binary coded decimal (BCD) numbers have each nibble coding for a digit between zero and nine. A word, therefore, can hold the numbers 0000 to 9999. Although the convention seems arbitrary at first sight, there is little use for ADD. In fact, it's best to forget all about it.

ADD is used to add together bytes, words or longs - however, at least one of the operands must be held in a data register.

ADDQ (ADD immediate data) is used

to add immediate data bytes, words or longs to a data register or to someplace in RAM addressed by the destination operand. For example, ADDQ #71,566A0 calculates the destination address by adding 71 to a copy of the contents of register R0 then adds 72 to the word found at that address (R0 is not affected by the instruction of course). Remember that the host denotes immediate data.

ADDD and ADDL require a word of immediate data and ADDQ requires a longword of immediate data. Since the ADDQ opcode itself requires a word of machine code then several ADDQ's will occupy four bytes of memory and ADDL occupies six bytes of memory. Fortunately the 68000 provides an add instruction, ADDQ, that only takes up two bytes. With this instruction the immediate data is restricted to range from one to eight although this may be added to bytes, words or longs. ADDQ stands for ADD (quick) and is much faster than ADD.

ADDA (ADD Address register) is used to make an addition to an address register. ADDA, like all other instructions with an address register as a destination, doesn't alter byte-sized operands and sign-extends word data to the entire longword if affected (byte extension is explained in the last issue). ADDA #540,AR0 is interpreted by the 68000 as ADDA.L #540,0000540,AR0. The L denotes internally in the processor (a single word of immediate data 00042 appears in the machine code). Similarly ADDA #71,AR1 is ADDA.L #71,0071,AR1 (the way the chip handles negative numbers is also explained in the last issue).

Usually all 68000 instructions affect the condition flags. Hence, ADD, ADDA, ADDQ and ADDX all:

- Set Z if the result was zero (other-wise it is cleared).
 - Set C and X if a carry occurs.
 - Set V in an overflow occurs.
 - Set N if the result is negative.
- ADDD doesn't affect any flag. ADDQ, ADD, ADDA, ADDL, ADDQ and ADDX work in exactly the same way as the address instructions, except, of course, they subtract.

YOUR COMPARE TOMORROW...

Suppose we need to test whether the number 63 is present in a data register (a-should you)

```
AND #63,00
```

AND #63,00 (AND) (AND)

This is a reasonable thing to do so long as the data in 00 is not needed later as it is changed by 5A8 #63,00. You could get around this by adding 67 later, but that's a bit messy. To get around this the 68000 provides the compare instruction, CMP, which produces the condition flags as if you had subtracted the number, but leaves the data register unchanged.

```
CMPI #67,00
```

CMPI #67,00 (CMPI) (CMPI)

You can check the address register (operands with CMPI, which works on words and longs only, of course).

CMPI (CMPI) (CMPI) compares memory bytes, words or longs with address register indirect with postincrement addressing. In other English words, it addresses register points to where the data may be found in memory, and is increased by 1, 2 or 3 (for B, W or L) after the operation so as automatically points to the next data location in memory.

To multiply, the instruction

```
MULL #100,00
```

MULL #100,00 (MULL) (MULL)

takes the word from the effective address (0000) - 00 or 0000 (to multiply) - and multiplies it with the word contents of a data register (using the longword result in the data register). MULL takes no notice of the sign (it is, negative or overflow) of the numbers it is multiplying. MULL is similar but operates on signed data.

DMUL and DMUL divide unsigned and signed data respectively. The longword in the destination data register is divided by the source word and the resulting quotient is placed in the lower word of the destination register. The remainder (shown in the higher word of the destination register) is pure that the denominator (source operand) is not zero (a "divide by zero" exception) will occur - or not!

Multiples take a lot of processor time and have a look handy into the chip executes a divide, but it's a bit slow or just programming it longhand.

The cover disk holds a file called SOURCE2.5 which can be assembled to illustrate simple arithmetic. The example programs from last month which we will all the disk are also included.

SIGNING ON

The most phenomenally wonderful number system ever invented is known as two's complement. This simple system is used by virtually all computers. Negative numbers are represented by setting their most significant bit (MSB) - 1 (their MSB indicates a positive number. For bytes bit 7 is the sign bit, for words it is bit 31, and for longwords it is 31).

To convert a positive number to its negative counterpart subtract one and invert each bit.

| | | | | | | | |
|---|---|---|---|---|---|---|--------|
| 0 | 0 | 0 | 0 | 0 | 1 | 1 | 3 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0 | -1 |
| 1 | 1 | 1 | 1 | 1 | 0 | 0 | invert |

Hence -3 decimal can be represented by the byte 0FD. The 68000 instruction MOVEM (B, -3, -1) will perform the negation process for you.

To see why 0FD equals -3 by adding three - sure enough the answer is zero! Well, nearly. In fact the 1 produced as 00 0000 00 (in a byte and exists as a carry. This is ignored in two's complement arithmetic. Hence, we are left with zero.

The largest positive number available is 1 byte is 0FF (because anything greater would have the MSB set). The most negative number is 00. In bytes can hold 256 unsigned numbers from 0 to

255 inclusive or 256 two's complement signed numbers from -128 to 127. Similarly, unsigned words range from 0 to 65535 (5 to 65535 decimal) and signed words range from 32768 to 32767 (-32768 to 32767).

If you want to convert a signed byte to a signed word then the best would be using MOVEM to copy the sign bit (bit 7) to the MSB (bit 31) of the word (bit 31 to 16, for 001 becomes 0000 and 0FF becomes 0FFF). Similarly, for converting words to longwords bit 16 is copied across bits 16 to 31. So -3 is represented as 0FFFFFFF as a longword. The 68000 instructions EXT and EXT.L perform these operations.

How does a typical instruction such as ADD know whether the data involved is signed or unsigned? For example, if 000F holds 0007 and 010F holds 0040 will ADD (00,0F) produce (on decimal) 0107+0040 = 0007 or will it produce -007+0040 = -0007? Well it doesn't matter. How can it not matter you say, surely 0007 is rather different to -0007? Wrong in two's complement they are both identical - 0007.

It doesn't matter whether you think of data as being unsigned or signed as long as you use the two's complement representation all the time.

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You must have noticed how many games, business packages and even the Format cover disk have customised icons on the Workbench. They aren't essential - the standard Amiga icons are fine - but after a while you get sick of looking at the same boring old icons sitting there on your Workbench. Admittedly your Workbench disk has got an icon designer as it too, called Icon2D, but you can only draw in four colours. Many people will be satisfied with that, but if you can't live without 16-colour icons then IconPaint could be the thing for you.

DEWH OF THE ICEBERG

What can IconPaint do that Icon2D can't do you ask? Lots of things in the short answer, but they don't pay me to come up with glib answers like that. To reiterate, Icon2D can only produce four colour icons, but IconPaint can produce them in two, four, eight and 16. Why should you bother with two colours? Because that way less space is taken up by the Workbench which gives you more memory for your programs and applications that you want to use.

Also you can create the alternate icon which appears when the original icon is clicked on, a typical example of which is a dossier that slides open when you click on it. Both the normal icon and the alternate one can be copied at the same time and are both visible simultaneously.

Icons can be created up to 320 by 100 pixels, approximately a quarter of

Is your Workbench screen looking dull and lacking colour? Do you want 16-colour icons instead of boring old four? Then join GARY BARRETT with a copy of IconPaint



■ Designing icons is simplicity itself. Both normal and alternate icons can be designed at the same time.

the screen, icons that take up a fair chunk of memory though, especially in 16-colours.

IconPaint itself can be used to design the icons with no problems, but if you want a more powerful drawing tool you can use any art package that uses standard EP format for its pictures or brushes. Both can be loaded into IconPaint, but with pictures you must make sure that the section of image that you want is in the top-left hand corner of the picture. A maximum of 16 colours can be used and both the interface are not supported.

THE PRICE IS RIGHT

One of the most important considerations in any product, especially one with such limited use as an icon designer, is price. Fortunately for IconPaint the price

is no more than a typical game of around £20. Much more than that and it just wouldn't be worth the price, but as stands it's priced just right.

It has some really value for money your disks look different, but afterwards you'll give bonus of dragging on less icons, and you'll also make a lot of disk space with large multicolour icons.

The people that will gain most from it will be those that plan to release (publish) and want pretty icons on its Workbench and a few poor Amiga owners who just can't stand boring icons and have a craving for colour on the Workbench.

Strictly a product for the few but well done nevertheless.

INTO THE CLI

CLI users will find that they have some new commands at their disposal which allow them to use their own icons on disks other than the AmigaWorkbench disk.

Four of them simply alter the number of colours on the Workbench to 2, 4, 8 or 16. Given a few lines more to be entered in a disk if you want to other than four colour Workbenches, but this has been made easier by a single command used directly from the CLI.



■ A world of your Super Tips with IconPaint.

features

- Both normal and alternate icons can be designed at the same time.
- Brush and picture files from art packages can be loaded in.
- Create icons in 2, 4, 8 and 16 colours.
- Icons of up to a quarter of a screen in size.
- Limited in its usefulness, you can only design icons.
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- Shows colour icons on memory.

for

- Both normal and alternate icons can be designed at the same time.
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LIFE BEGINS AT THE HOP



Constructing characters and moving them in mysterious ways is the name of the game this month in part three of **MARK PICKAVANCE's** animation tutorial.

Have you ever tried to draw Mickey Mouse? I can't tell if you are going to create many minutes of animation with a reasonable number of frames your subject must be easy to draw; this was the thinking behind the design of Mickey. Animators studied his shape and construction to be as simple as possible so that animators could be concentrated on...

Over the page you will see Mickey at various stages of completion, which might give you an idea of how to go about creating a character. To get some practice either copy the design or find yourself a suitable cartoon. The object of the exercise is to produce a still image, so you can see any paint package...

You only need eight colours so if you can get higher resolution by reducing the number of colours then do it. The example was drawn in Deluxe Paint because it allows you the highest resolution and colour combination. Before using Deluxe get down on your hands and knees and use your hands to feel the surface to exploit it, the original line graphic was constructed on a 1240...

PC using

Pixel Paint is high resolution monochrome.

HEAD AND SHOULDERS

That wasn't too difficult was it? The key to drawing Mickey is to get those initial circles the correct size and in the right place. Having an art package which can do arcs is an advantage. Always draw Mickey's head first. It is the dominant part of his persona and once you can get the head right you are 80% of the way there. Once you know how he could draw Bugs Bunny so easily, Chuck Jones said: "First I draw a circle, then I attach a robot to it, then it's finished." Chuck wasn't being totally facetious; what he was trying to say was that all characters have a key component from which the rest of the design must radiate. He found that by analysing the correct - or the hard-to-draw - the correct - the rest of Bugs fell into place.

There's one last thing to note about Mickey. Like almost all toons, Mickey has five fingers and a thumb. This is because Disney's animators could not draw four fingers and a thumb without making the hand look like a hawk's or bovine's. If they couldn't do it there's no point you attempting it.

MAKE YOUR MOVE

Last month we introduced you more movement, so here goes with jumping, skipping and a double bounce walk. You can view the designs into whatever software you find yourself most at ease with. And to ensure that colour isn't everything, the jumping and skipping designs were generated in high resolution monochrome.

With a jump the entire body is treated as a bouncing ball. The arms give extra bounce to the action, project-

ing

the character's weight in the desired direction.

The six drawings created that make up this motion are designed to look, as you could repeat them to get a series of jumps across the screen. Another exercise could involve making the take-off and landing points different heights, this would mean you compressing or expanding the number of frames depending on what you wanted. If you desired a jump down you would need to add frames because the character has further to fall.

Below 'jumping' to 'slipping'. Slipping is not very different from jumping - in fact, it is jumping off one leg. The importance of this is that an very rarely jump with both legs simultaneously. You spring from one leg using the other as a counterbalance. Frame numbers three shows the key action. The front leg has been accelerated from the point that it was removed from the ground. Between frame three and four it crosses the centre of balance. The resulting momentum carries the character off the ground. This is supported by the throwing of the arms into the air, giving additional upward force. The rest of the pictures are concerned with maintain-

DUCK DOMINATION

In 1938 Donald Duck had become more popular than Mickey Mouse. His more natural abilities to get angry, grumpy and aggressive seemed to enable people to relate more easily to him. A writer for the Los Angeles Times said of Donald: "Being here in the middle of the last depression, Donald was a child of adversity and like so many of those, made his way by repackaging. His duck was always mad. Mickey was the spirit of fun and light and good moral principles. I believe this, but the duck seems to have won!"

SUPPORTING CAST

Mickey could not play centre stage without some support from other characters. The first were Horace Horsecollar and Charlotte Cow in *The Flow-Ray* (1935), then Sam Pato in *The Chain Gang* (1936), though he was not referred to as Pluto until 1951 in a film called *The Mouse Hunt*. A year later Goofy appeared in Mickey's *Beaver*. He was an instant success.

Goofy was designed and animated by Art Babbitt who, 30 years later, learned some of Richard Williams' animation. He created Roger Rabbit. Art said about his creation, "Goofy was the kind of character that thought very hard and long about everything that he did. And then he did it wrong!"

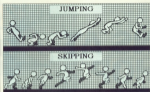
In 1934 Donald Duck made his first appearance. Originally he was much heavier than his figure of today. Though he did sport the sailor suit and cap which have been his trademarks since then, Goofy why he was dressed like this, is difficult to ascertain. His first story involved inventing gum and was called *The Wise Little Hen*.





WALT AND OSCAR

Have writers and directors have credit-as Oscar for their contribution to the art of motion pictures. *Mick Henry* was given a staggering 52. The most Oscars of them was the special award for Oscar #166 - it was one large Oscar and seven little ones.



ing balance for the landing and counterpoise that follows. If you want to treat this as a skip then draw only the first seven frames and then mirror the limb positions so that your character skips alternately on left and right legs.

NOTE: Characters that skip are not usually associated with acts of violence.

ICE SKATING.

You may often want to have characters walking around the screen rather than walking on the spot. Game programmers and designers do not see this as a problem; they just shift the sprite a few pixels and leave it that. This often leads to "ice skating" where the movement of the feet bears no relation to ground.

The simple way to deal with this is to use the heel of the foot in contact with the ground as a guide. Unless you are on ice or oil, a foot which is planted on the floor will remain in the same place until lifted. The problem with this is that virtually all animation packages move a sprite sequence by a set amount each frame. This is not what you want. The only solution is to position each frame by hand or use some way of offsetting each sprite by the correct amount.

Creators of games can build a data table of the correct offsets to make the walk look right, but this often conflicts with the requirements of the game's control. There is no simple answer.

JUST PLANE CRAZY

Mickey Mouse first appeared in 1928. The design originated out of another "toon", Oswald the Lucky Rabbit. He also underwent a name change from Mortimer to Mickey before the first film *Plane Crazy* was released. *Plane Crazy* was animated by one of the heroes of early animation, Ub Iwerks. He became famous not only for the quality of his animation but also for speed sets which he invented. *Plane Crazy* was completed in under two weeks. Ub producing over 100 drawings a day.

It was not until Mickey's third film, *Steamboat Willie*, that Mickey captured the public's attention. The change that made all the difference was sound. Walt had been inspired - after seeing *The Jazz Singer* - to test production and adapt for audio. The New York Times called the film an ingenious piece of work, and welcomed "a new cartoon character hereafter to be known as Mickey Mouse".

DOUBLE BOUNCE WALK

Previously you've been shown how to create a walk cycle. A standard variation on this is the double bounce walk. This is the technique Disney animators used to make Mickey's walk more expressive, giving him a more confident style by bouncing the head and body in the mid-stride.

The body dips more in frame 2 and comes up early in frame 3. The arms are much more expressive. Though not as extreme, they only move in the cross-

over process. The head bobs twice in the same time as one bob on a standard walk. Obviously you're avoiding the action from the side - it comes from the front the arms swing right across the body. The arms are held in a gathered position before moving into the swinging pose.

The legs extended at the upper body movement, the greater the displacement of the arms, the more the legs must swing.



MAKING THE MICK

Mickey Mouse



1 Draw a series of circles to show where the body, head and arms should be.

Mickey Mouse



2 Mark circles above the position of the feet and other key important features.

Mickey Mouse



3 Thinker lines give the body more substance, as does filling parts of the head with colour.

Mickey Mouse



4 Start applying some shading, clean lines and cleanup to the remaining area.

Mickey Mouse



5 Finish by rendering the graphics with the correct fill and make this generally appealing.

Mickey Mouse



6 The finished graphics, with all its details and a shadow in place.

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SILICON STIMULATION

*Should sex games be branded "over 18"? What about explicit animated demos? Do they break the Video Recordings Act? **FORMAT** investigates everything from sexist advertising to underground hardcore.*

BUCKY MARKETING

Marketing folk stuck for a creative idea have always turned to simplified, exact messages to sell their products — especially if those products are targeted at men. Advertisements, game trays, celebrity games and — in some cases —



game graphics, have all featured their fair share of the erotic. Admittedly, right for computers weren't able to offer the detailed images possible with magazines like the ST and Amiga, so

fit on screen reality was often a far down when compared to the packaging. But that sort of thing never makes marketing fail.

In the case of a straightforward shooting game, the Page 3 possibilities are obvious —

and a marketing genius like you can't deny that you can play cards to suit most of Mario Whitaker's over-amped charms on your computer screen, you can scolder over the prospects of doing so by studying interest form on the tray.

Breasts and bodies can be used as a selling image in advertising for non-erotic games too, causing a bit of a storm



last year when they appeared in ads, magazines and posters for Patagonia's *Barbarian*. (No one saw fit to complain about the scantily-clad, burly wife portrayed Maria, though.)

And should the cost of hiring a set of personality trainers for a photoreal genius beyond the marketing budget — or if the truly massive part your creative director has in mind simply can't be found on a human

chest, there's always the option of getting the artwork sent out of the

main hall directed on the wall of no cows, artists and a fair number of visual ill-effects have been experimenting the proportions of the female form in the odd names of art and sculpture. From *Charm Over 17* and *It's All About Me* through to *Defender of the Crown*, creators of magazines advertising may have taken the breast, sandwiched on the artwork compressor and inflated it beyond the conceptual limits of the real world.

Well, if there's what sells games...





« Employees are the standby of available good photographs and poker game programming. « During traditional dinner shifts under a video camera to one credit to easy access, but most of the people through excellent has been shot from videos, and left it to put in a fairly complete overview... In the left page - you can also see and a couple occasions on the TV. The page - more traditional Page 3 than this displayed on the strip.

Six plays a major part in life, and always has done. Merino, and in particular, man, has always been interested if not preoccupied by the act which gets him on the planet. Early man, since he had invented a few basic tools which led to increased leisure time, was found to idle his hand turning to cerebral matters: like art, using crude implements - twigs and scraps of animal fat - or cave-dwelling ancestors applied rudimentary pigments to the rocky walls of 'Cavestudy'.

And the subject of these early artists? Why, man himself of course. When going hunting, man working with his chains on the fire, and very well-to-do man working on his, when art was born it was delivered into the world with erudition, and an enduring tradition was created: as man invented new technologies he discovered that there was almost always a sex angle.

Mining in thousands of years, mankind got the language problem sorted out and invented a way of committing words to hardy surfaces like parchment, tablets of stone and papyrus. Soon, those with creative minds began to think about about writing things down that would amuse an entertained spouse smart enough to be able to read. Poetry and prose arrived - along with written erotica and graffiti.

When the letters' evaluation was being set up and everything was being given a Greek name, the word pornography was coined to cover an increasingly popular literary form. (Those with a Classical education along with pointers of etymological dictionaries will already know that pornography is derived from two Greek roots, *porne* - (prostitute) and *grapho* - write. Fortunately for the sake of sanity, Greek authors with smelly inclinations were found other things to scribble down, thereby widening the scope of the original term for posterity.)

As the centuries rolled on, the human race developed new technologies, new ways of recording and distributing information, records and images - printing, sound recording, telegraphy, still photography, movies, television, video, telephony... the catalogue continues to grow, and as each new medium evolved it was co-opted by commercial interests, artistic interests and by those interested in erotica - or pornography.

Computing technology, of course, offers a medium for the creation, storage and dissemination

POWER FOR STUDS

There's no tradition of strip background-in reality Meropoli which is probably the only reason why digital has not, as yet, been used to strip up fellows in their gaming or other leisure



activities. Every time a new strip poker game arrives in the offices of magazines for review, it is accompanied by a press release which features an endorsement about the gaming programming, the only endorsement and the all-round impact of the programming team responsible. The game plays an excellent game of poker, the reviewer stated. 'You could almost miss the fact that the main point of the game is to get the camera off the back of some strip-tease levels.'

Sam Fox, Mario Whistler and a host of anonymous females have featured in strip-tease and other programming. Perhaps the real test yet to be added to a strip game genre appears in *Intergames* game programming: *Intergames* that you have to play in the end to discover the man's more than you'd imagined under the hood.

Top marks for usability has to go to the presumably German programming behind traditional *Planet*. For a feeling to get the underside of a machine and Military enough, a slightly fancy allows the player to make over for from examining about in minute detail.





LADBROKE COMPUTING INTERNATIONAL



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Midistudio is a 20 track Multi Music Studio. This Midi software package is a realistically priced introduction to Midi music processing and includes the following features.

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Quick List Plus is a utility that converts a directory of your disks, hard or disk or even remote any drive, including local drives. Prints output for hard copy of diskettes.

Minimal is a formatter that optimises disk space, allows you structured notes and track beyond the conventional.

Flipping is a utility that explores all the part of a picture file for use in other programs, supports CMA, FASM, BSOFT and ST Basic and is Degas, Neochrome and all formats compatible.

TRILOGY £12.99



AB Animator £14.95

AB Animator is a utility for creating and animating graphics. It supports CMA, BSOFT and FASM formats and is compatible with Degas and Neochrome graphics files. Use the full line control to animate up to 20 key frames of 50 pixels wide by 50 pixels high.



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tion of information. As soon as software could be published a sea, and the supposedly central nature of computing didn't stop a reasonable chunk of this software being about sex. The concept of Pixel Porn was probably born in the colored vapors produced by EPAC's speaking editors, but there's little cause for and in abstract concepts like numbers, so may that punched cards or paper tape streamers could be harnessed for the purposes of writing about prostitutes.

To begin with, the exciting potential of the computer as an interactive medium was lost on the sex-oriented approach and computer operators, who were prepared to go to great lengths to get what they wanted out of their equipment. Using expressive, sliding techniques, generated by complex backspacing and overprinting commands programmed into teletypes, "naughty" calendars were produced in computer rooms throughout the world.

The elite band of computerists who had access to terminals in the early days began to find ways of entertaining themselves. Games such as Star Trek, Hunt the Wumpus and Colossal Cave Adventure came into being, but the minimal graphics capabilities of early multi-user mainframe systems meant that entertainment software was usually text-based. Of course, once the text adventure craze on these was no reason to keep things simple...

Around 10 years ago, home computing became possible and as inexpensive machines found their way into homes, people started writing and selling games for them. Soon boring versions of older were dropped up, or rather un-dropped, with suitably motivating graphics. Text-based adventures made the transition from mainframes and then went their own sweet, own way with titles such as Leather Goddesses of Frodo - and twin cartridge-based cousins got a bit of the sex action.

Sexual adventures, with or without graphics, have proved popular and the mainstream, respectable companies have been in on the act for some while.

Mojo's, tentatively offering, Leather Goddesses, is one of the best selling games ever produced by the company. Sex On Line have found the Leisure Suit Larry series - essentially the exploits of a pipsqueak - more than a little lucrative. More than a few operators closer to the sandy side of commerce have attempted to cash in on the sex adventure. Unfortunately Spectrum owners may have spent good money on games such as Solo Sex (just comically misnamed by a company by the name of Males, and even today similar offerings are still available. But not everyone wants to make money out of screen sex.

In much the same way that there's a whole world of "amateur" material circulating in the form of hard-stories, unedited or cheaply digitized art, there's a complete underground of virtual sex in the computer world. Mainframe your machine, whatever the format, there's bound to be some flexible erotica in the public domain for you - everything from digitized versions of peeing Page Three lookies to animated sequences lifted from hardware vendors. Some of the work is of a professional standard and achieves levels of polish that would suit a mainstream commercial release, some is fairly if obscene - like an early Spectrum joystick pornography by the title of DPH - but most of it is a just plain crude.

With the advent of 16-bit machines with advanced graphics capabilities and the processing power to achieve stunning animations, screen sex has taken a turn for the realistic. Owners of 3Dx and Amiga have some truly remarkable software available to entertain them. Programmers are doing much more imaginative things than writing about prostitutes.

The opportunities for interactive sex on screen will really take off when technologies like Digital Video Interactive and Compact Disc Interactive take off. There's a wealth of programming talent just waiting for the chance to blend code with exciting audio video footage. ■

▶ What the Editor Saw (PT)

TELEPHONE TITILLATION

The superheated jungle of small advertisements that is the mainstay of such publications as the Sunday Sport is not yet contained in the computer press. But there's still porno behind the telephone button if you've got a modem and aren't afraid to use it.



Computer bulletin boards offer major contributions to the computer pornography scene, so much of one in fact, that there are plans afoot to use the law to make them illegal. Some sections on the BBS we checked out offer stories ranging from vaguely fictional encounters to explicit adventure games as well as one-to-one personal contacts. If you fancy being chatted up by a transvestite from Tulsa or a horny young lady from Houston, there's sitting behind the modem waiting for you to log on. And of course there are the pictures.

Hardware porn pictures are being made available on some bulletin boards. Given the fact that animated sequences of digitized pictures are not hard to cobble together, it's easy to find real hardware movies to download for free. PIR's crew could send a modem letter value membership than their local video shop, despite high telephone charges.

Online sex games in the adventure vein are becoming popular. These days, if you fancy wandering around a fantasy world, chasing usually rampant goddesses (or even gods), going down to a short bout of fondling, followed by some heavy petting - then get on the phone.

Bulletin boards cater to the masses but some serve minority groups. Gay boards offer online mailing areas, gay sex stories and pictures. The Pink Triangle and Lambda BBS fall into these categories, both providing an excellent gay board, although others feature gay sections such as The Connection and Minimal-4. And Minimal's gay section, set up in 1981, is one of the most popular areas of the system.

A little devoted dating should cut up even more specialist boards that support sexual fetishes ranging from bondage to sadomasochism to TV (and we're not talking SNY channel here). Shortly after being propositioned by a transvestite, we left a board to log off and our investigations.



HARDCORE HOBBYISTS

So far there's no real trade in postal porn - some dealers in printed material have experimented with smutty software but there's little demand for a marginal customer who patronizes shops and mail order services that cater for traditional material. Even though the commercial opportunities are minimal, there's no shortage of home enthusiasts churning out material that spans all genres - from explicit chats to stuff that would see you blacked up if apprehended bringing it into the country.

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DIRTY DISKS AND THE LAW

The man who could be described as the founding father of pornography — the author of the work colloquially known as *Penny Hill* — was hauled up in front of the authorities and asked to justify his actions in writing what was the first book to describe sex acts in great detail. Perversity, it transpired, had been his motivation — so after an astronomical fine, the books let him off and granted him a pension from public funds to ensure he never wrote a script.

Nowadays, the powers that be are less likely to be so lenient. Obscenity laws lay down serious penalties for authors, artists, publishers and dealers in material deemed to be offensive, and the Video Recordings Act of 1984 clearly covers sequences of moving pictures generated from a magnetic medium, such as a floppy disc. Maybe local authority staff can be visited by the Obscene Publications Board or Public Domain libraries be obliged to confiscate all their offerings just like a video hire shop. Who knows? The volume of sex-related material on computer means it will take the attention of campaigners and the authorities.

One thing's clear though — just because it's on a computer doesn't mean the thing you or the law can't reach it, or indeed you if you're involved in disseminating material that is judged to be obscene.





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■ Since the introduction of the ball feature in the 1980s, the cabinet machine has made it's way out of the family corners of arcade galleries into public and clubs and may even be found in the institutional walls of schools, clubs, fitness clubs, etc. This shot shows the original arcade game on the left and Activision's contribution on the right.



Amiga - Enhanced only (CD32)

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STRAF

0 1 2 3 4 5

AMMUNITION

0 1 2 3 4 5

SCORE/STARS

0 1 2 3 4 5

LASTING INTEREST

0 1 2 3 4 5

OVERALL 97%



■ Additional to control panels have been included if you miss the ball with your flippers then it falls into another playing level.

TIME SCANNER

ACTIVISION

Activision's Timescanner is another addition to the already long line of computer pinball games. Such simulations have flooded the computer since almost since the computer first developed SHFT keys, way back in the distant age when babies weren't brought up on a diet of glass.

Since the simple bagatelle machines of the 1800s, the pinballs have progressed from simple machines with electric flippers to multilevel monstrosities boasting all sorts of unusual additions.

The home video version of the pinball machine has always had a funny side. One of the finest features of any pinball game has to be the ability to leap from

side to side as you tap the flipper with basic reflexes. Naturally, it's impossible to achieve this dexterity effect with the keyboard of any ordinary home video — without emulating off the disk drive anyway.

Timescanner makes no new innovations in this area but it does offer one of the more realistic simulations of ball movement. Shift

keys are used to control the left and right flippers with the main objective being, as always, to amass giant high-scores. Can a hit feature be available.

Four tables are split into ten so that if you miss one of the ball balls, then you face a second chance. You can get through to other levels by taking a try through the "Extra Level".

GRAPHICS AND SOUND

The backdrop in Timescanner have been very carefully designed to be as interesting as possible and provide the same kind of distraction as those found in the actual arcade machine. The contrast between the two are extremely high.

Before the game falls into its lack of animation, displays each time the ball hits a plunger. Far more could have been done graphically in these areas. However, this has been well compensated with some impressive sound effects which materialize regularly enough to keep your fingers twitching over the keyboard and certainly fitting to mirror the real arcade environment.



■ This different! feature include graphics and tables and so back down to a similar feature to those found on the real arcade games.



■ Looks simple enough but because of level it though — like in the Realworld video game it seems near impossible to complete.

It's not an original idea but is still the kind of game that is appeal to anyone with more than a passing interest in pinball games. Whether it will take the real pinball cabinet and drive it to the ground every time he sees an idle machine is doubtful.

Mark Nighan

CONCLUSION

From Field, the team behind SS, have with the Timescanner with the objective being to create the perfect pinball simulation.

The limitations of the game are those faced by any computer pinball sim. The keyboard just doesn't offer the right input for serious addiction but that aside, it offers a realistic challenge even though ball movement is distant at best.

It's not an original idea but is still the kind of game that is appeal to anyone with more than a passing interest in pinball games. Whether it will take the real pinball cabinet and drive it to the ground every time he sees an idle machine is doubtful.

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There was a time in history when matters of great import concerned the world and mankind failed to become a part of it, when wars were fought and not winning, but honor was what mattered most. Japan, that strange land bathed by the light of the rising sun, was one such place.

Consumers long renowned for the astounding Defender of the Crown have produced this new interactive movie, set in that 12th century land of honor and dignity.

AIM

The game sees two would-be emperors fighting for domination of one crumbling empire. Yet again, the consummate politician and strategist takes the battle-scaled battlefield in a legendary struggle to win control of the Japanese dynasty. You can select to play either of these characters, choosing the obvious advantages associated with each. The objective is to capture all 19 castles spanning the map of



■ Even an entire land has been turned to your side, there's no way of extracting it.

LORDS RISING

CINEMAWARE/MIRRORSOFT

Japan and still manage to stand up straight afterwards. Along the way you can build up your skill ratings depending on the outcomes of battles and your leadership abilities. Just to make sure the game isn't all blood and war, you can win the hand - and body - of a beautiful princess if you're lucky.

STRATEGY

The game is arranged as a giant map with monasteries, castles, cities and an imperial palace strategically positioned



■ Preparing for battle. You can decide to arrange your troops in specific patterns and then...

to keep the action going across the whole area. You initial take control of three noble who always begin the game in the same location. These 3 are directed around the map by selecting them whenever it comes to a standstill and directing them to their new location. They then follow the shortest path either on foot or by boat if they're beginning their journey at a port.

Different locations offer different features; monasteries are neutral territory and can often be relied upon to supply



■ It's off to war. Plans are often and strategies of things are seen by controlling separately.

Considering that this type of game is based largely around its strategy demands, the graphics have been remembered at every turn. There is a remarkable resemblance here with Cinemaware's previous hit, Defender of the Crown, but there's far more interaction with the player. All sorts of animated routines appear at opportune moments, from attacks by a King's assassin to tense battlefield occasions when you most participate in the bloody war.

The game's animation is supplemented in most circumstances by atmospheric musical effects to convey the impression of ancient Japan. Probably one of the best examples of this occurs during the opening credits of the game, although the music at other points is almost as good, if a little repetitive.

Guards, and grunts as you strike your enemies also appear at times as well as other tool effects to assist gameplay.



Guards, and grunts as you strike your enemies also appear at times as well as other tool effects to assist gameplay.

■ Think of home. You can dispatch your own assassins - but beware, sometimes they're an indispensable tool. If you've caught them you're only one murder - or two - away and there's a really painful way to go.



■ Movement period is a task. Look - you must spend all the money and time and still get time to make your moves.



■ Give them a few hours of your trusty steed and he goes down really enough.

SOFT OF THE GOLD



Most of the action takes place on the map where you can move your troops around 10th-century Spain with ease. Only a small section of the map can be shown at once at any one time but it can be further explored by clicking on the icons in order to scroll left or right.

land. Castles can either be attacked or an alliance suggested and the imperial palace is the place to go for imperial rights such as the Sacred Sword or Scepter.

As you make your journey, you encounter other troops of which you can interview and suggest forging an alliance with the leader or attacking them. Either is usually a good suggestion since your new castles are often laid to attack if you're not careful.

As you make your journey

there's often the need to stop for food to supply your troops. Visiting one of your own castles or a friendly monastery is advised for this task although the imperial palace is needed territory and will often give food.

The game is punctuated with moments of interaction where you must participate in all sorts of encounters or attacks. In these moments the map is frozen and you move into the interactive phase where skill is rewarded with extra troops or new territory.



The report reads exactly. Your enemies can see this before and you must act your best to defeat his menacing attack.



If you're attack enough to find your castle under siege then you must purchase the enemy with stress to survive the day.

In its day, *Defender of the Crown* was reckoned to be one of the finest strategy games ever, but *Lords of the Rising Sun* looks set to usurp that enviable position. In many ways, *Lords* could be viewed as the next logical step considering the progressions made with the *SI* and *Amigo* on the games scene over the intervening years.

The challenge, as ever in this type of game, is not one likely to appeal to anyone unprepared to play for a long time. It's very much of a strategy game so the action moves sufficiently slowly to give you time to think. In moments of tension this can often prove to be too slow despite a speedup option, although a save to disk feature is available. The game spans a wider battlefield than *Defender* ever did, and as such the gameplay is far deeper and potentially more appealing for the well strategist.

With the long shelf-life of this kind of game it's certain to become the same classic which *Defender* proudly claimed.

Mark Nighan

CONCLUSION

Amigo - Best EVER. Evered.

N' - They really are. EVER.

STYLISH



COMPARISON



REPUTATION



LASTING INTEREST



OVERALL 8-8%



BATTLE HAWKS

LUCASFILMUS GOLD

The land of the rising sun steals the home of McDonald's in Lucasfilm's latest game, a shoot-em-up simulation set in World War II.

All of the action takes place in the Pacific during 1942 between Japanese and American planes. You can either play the role of an American and take on a small group of onsets or try to get even with the tanks for the last food and rest of Mooringing. There are four options located

on the main menu: training, active service, review planes and review service record. The last of the four options allows you to use the preset plot or start one of your own; a maximum of five can be stored on disk at a time and the record is updated after each mission. If you review the planes then you can look through the two airframes and find out what your friends and foes are like.

Training is a good place to start; you can practise dogfight-

ing, dive bombing and torpedo attacks. The difficulty of the training missions can be easily varied from nonaggressive opponents through to deadly foes. Your plane may be customised to contain various arms, fuel and even take vulnerability. In addition, the combat skill of your opponent can be adjusted to what, say, or veteran level.

As soon as you've finished with the training exercise you can head for the skies in an active



11 The Hawks are set to give your cockpit with a perspective of the heavens. You have set in your Easy Flighter to launch an enemy and a daylight mission, in the case the Japan is OK to use a Yankee mode for the ocean.

MISSION. There are 18 missions in all and you can use the same customisation methods in these too, but your flight record is only updated if you play the mission without customisation. After each mission your record is updated on disk, unless you die of course, which case it's an obituary.

11. Monthly EAP Review

Edge: 8/100 (12/19/94) 8/10



12 Still in the Pacific there are American carriers and engaged to your commander in a large torpedo. Response really prefer better in the water as it might be an idea to get into and close to the carrier at low altitude and let your torpedoes go. Unfortunately the carrier will need to stay in one place and so there'll be lots of Yankee planes after your blood and plenty of fuel to judge.

GRAPHICS AND SOUND

Sound effects are limited to old-fashioned engine noises and bursts of machine-gun fire, with an occasional explosion. Second in the lack, the plane graphics are detailed enough for things to be recognisable, but little more.

In the cockpit there's plenty of detail included and the instrument panel is easy to read, which makes a change. There's a little disappointing, the action takes place at a sluggish rate and 16-bit machines are capable of working much faster.



13 Another only when they come to see and see the same way.

Edge: 8/100 (12/19/94) 8/10



CONCLUSION

Many flight sims fall into the trap of being far too technical for the first time user, but Battlehawks can just be looked and played. The control of the plane is possible for those that want it, but beginners only need a mouse to get started. There's also the added advantage that you can shoot down Americans and even be a traitor by going over your own airbase.

With 18 active missions and 12 training missions you have plenty of choice and the customisation can be used to make things easier or more difficult. There are plenty of planes to choose from too, which adds to the variety. A light one which is probably better for beginners, but still fun for more experienced pilots.

Gary Barnes



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It may be hard for you to believe, but poor old planet Earth is yet again in danger of being destroyed by an invading alien space fleet. In a situation like this there's only one thing that you can do — send out someone to

eradicate the menace, and 24-bit battle tanks are ideal candidates for doing the destruction.

There are 14 alien space stations heading your way and the only way to destroy them is reach the control centre and blow it up. The control centre is deep with the space station and you have to find your way through hordes of alien tanks, gun emplacements, mine fields and barriers before you can get there. Travel between levels is only possible when you have a key to the door and that's found somewhere on the level too.



The control console of a space station makes sure that you get out before it explodes.

Fuel, smart shells and shields can be discovered lying around and improve your survival chances considerably. Small star-like objects can also be found and these are used in-between levels to customise your tank with any of the following: extra speed, longer range shots, smart shots, extra shields and more powerful shots.

One of two players can play and this adds to the fun, because not only do you have to decide who gets what objects, but you can also help each other out by shooting each other (it transfers fuel from one tank to the other).

There are plenty of levels to go through and the gradual increase in difficulty will keep you busy with Vindicators for many hours.

Gary Barnett

IT - *Applied Review* APR

Large - *Star Wars* (PR)

VINDICATORS

DOMARK

STELLA 3.0

AMSTRAD 3.0

HERCULES 3.0

LEADER INTERACT 4.0

OVERALL 7.1%

System: **Amstrad 4** Price: **Cheap**

 12.25
 or Full 1250



It is vital around the mine in a *Smasher* that has just returned from the alien world. You're the human race's only hope that you have the responsibility.

Space is big, infinite even, and so the chances of a particular tank of air plunging into a certain planet are very slim. But in an infinite universe there are lots of big lumps of ice floating about and so the chances of being hit by one increase considerably. Earth is one of the lucky planets that just so happens to be in the path of a lump of ice which is bound of staying in the outer belt. After a false attempt to deflect the 20 billion tonnes asteroid, it plummeted into the Pacific Ocean and punched a hole through the sea bed. Millions upon

plunged out and vapourised a large portion of the Earth's seas. Life on earth ceased to exist.

The year is 2305AD and fortunately for the human race Earth isn't the only planet on which people live. There's a small colony on the Moon. You command the small lunar colony, Lunar 1, and must find a way to keep the lunar race alive.

There are seven sections to the game, each one controlling a different function. The seven are energy, life support, research, resources, production, defence and flight deck.

GRAPHICS AND SOUND

Most of the graphics are static screens with a small sprite of two, but every planet and satellite in the system has its own picture and some are excellently done. When your tank is under attack and you launch a fighter the screen display changes to a 3D view out of the cockpit with simple, but effective flat-3D enemy ships.

Sound effects vary according to which of the many menus that you're accessing. All sound right and add considerably to the atmosphere of the game.



Smasher provides power for the beam. There are 10 models of varying power. Some products require the most powerful generator before you can build them.

MILL



■ Before you can collect an object from the spirits, they have to capture the penalty zone balloons that you need to shoot down their boats and dump them in the water.



■ Return the object to the Spirit Guardians for an extra weapon and a new mission.



■ Shoot one of the balloons to get a Spirit out and shoot.

TYPHOON THOMPSON

DOMARK

Three feet always been too precious and twice travel especially so. The passengers of Flight 286 would agree with that, but unfortunately they're all dead. Well almost all anyway, one small child survived the disaster and is now somewhere on the water, placed at Agua. The child has been adopted by sea sprites and they won't give him back; you have to rescue the child.

Before the game truly begins a spaceship appears and a cat is dropped out, a clear sign and you walk out and look down. Consider it must not in the family because you run back inside again, only to be ferociously ejected from the ship by one of a variety of methods. Much better than just starting the game in the void.

In play there are occasional tutes, but no continuous ones. Sound effects are simple, but fun, especially the angry sea sprite king. The graphics are flat, smooth, colourful and most of all cute. There are many subtle touches that make the game more enjoyable to play. The little sprite king looks very good when he jumps up and down and stops his feet and your heroic character even shakes the water out of his hair when he appears from an underwater creature.



GRAPHICS AND SOUND

CONCLUSION

The first couple of levels are very easy to do, but once you get to the third you're certainly really begin. There are so many sprites to deal with that you'll feel yourself just screaming with frustration. Unfortunately for fortunate you'll end up hooked and there's nothing you can do to stop yourself from playing.

You're gonna need all those lives to stand any chance on the later stages of the game, and you will eventually capture all those little *****s, but before you do you'll have invented a couple more explosives and chosen your mouse through the window.

All in all it's an excellent game that will keep you frustrated and amused for a very long time.

Gary Barrett

| | |
|-----------------|------------|
| WATER | ██████████ |
| HEALTH | ██████████ |
| ENERGY | ██████████ |
| WEAPONS | ██████████ |
| LASTING WEAPONS | ██████████ |
| OVERALL | 86% |

IF: Best (100, 100%)

Edge: average player

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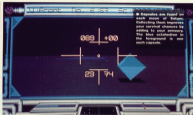
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DTP



VOYAGER

OCEAN

One year a time there was a little spaceprobe called Voyager II that went on a long journey. It left a blue-green planet called Earth and went for a look

around the solar system. After a while it left the solar system and drifted out into deep space. In the year 2022 it was picked up by a scout of the Ruler Empire and the

returned to her homeland where Voyager II was regarded with great interest.

Rather than accepting the friendly greeting from the Earth people the Ruler Empire decided that a bit of conquest was in order and set off to achieve the same objective. They set up bases in the vicinity of Saturn where they used its moons to create more and more powerful weapons for Earth's conquest.

Meanwhile, Luke Skywalker was on his way back to Earth after a 50 year criminal sentence of space exploration. No one wants to go home to freedom only to be outgated by an alien race and so once Luke became aware of the situation he decided to save the world so that he could have a



■ Enemy radar stations can be jammed temporarily by the use of a radar mine.

quiet rest. You'll never guess whose part you take.

There are 10 moons around Saturn that you must conquer and they get progressively more difficult. To conquer a moon you must eradicate all of the enemies on the planet, fill on the first one, Jovis. Enemies come in several types: tanks, lasers, mine jammers, mines and more. Tanks and lasers have the artificial habit of shooting at you and mine jammers will try to stop mines on the ground. Mines will turn you over and your mission will be brought to an abrupt end. Fortunately you can deal with these problems in the usual manner: blast 'em into 100 pieces.

Some pods and weapons can be found on the planet if you collect them then you'll improve your survival chances no end. They can be located with the aid of your navigational computer and a map of the planet.

Finding these is just as important as destroying the Ruler moons.

GRAPHICS AND SOUND

Voyager is viewed in solid 3D with simple shapes to make things fast, but everything is still easily recognizable. Speed is much more important than detail in plot storage and that's what this basically is. Animation is fairly limited on most objects, but the radar stations rotate well and there are the occasional other effects. In play you only get simple sound effects, but there's a nice piece of digitized music and speech on the title screen.



■ A Ruler tank passes on front of mine. It spins up and out to the mine. Unfortunately there are tanks out there.

Voyager looks like Starblaster and plays a little like Earthforce with you moving around a planet, blasting away at aliens and generally creating havoc. With 10 moons to conquer your work is going to be cut out for you, but you'll get plenty of



opportunity for gratuitous violence. It's not the sort of game that you'll complete or get bored of in an hour, more likely it's take you many weeks to complete and you're sure to get lots of enjoyment out of it in the meantime.

Gary Barrett

CONCLUSION

57 - Excellent (87% Review)

Rating: 1.94 out of 2.00

| | |
|-----------|-----|
| STYLING | 5 |
| ANIMATION | 5 |
| OVERSOUND | 5 |
| CONTROL | 5 |
| OVERALL | 76% |

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THUNDERBIRDS

GRANDSLAM



Level One shows you riding the Thunderbirds submarine by repairing the hole in its side. You must then destroy the nuclear reactor.



Level Three and the objectives is to hit the Bank of England and discover secret codes so only the real one missed in the first place.

Grandslam's latest license is going to recall memories for every self-respecting TV addict. The classic Anderson puppet hit sees its debut on the computer screen in the form of an anti-violence strategy game.

It's split into four levels with a different mission assigned to each. The only way of surviving these is to overcome the difficulty by using the correct object. Each level is played with two characters and at the start of a level you need to select two objects to carry from a list of six. You can

only carry two objects at any one time so anything you encounter during gameplay must be necessary for something you're carrying.

Being a strategy game, it takes hours of play to find out what to use and when, but practice is the best teacher. In level one for example, you'll need to carry the torch with you in order to make your way through any darkness systems.

Carrying objects is essential to survive other difficulties, very much in the same vein as Grandslam's former hit,

GRAPHICS AND SOUND

The animation in Thunderbirds has been so carefully polished that every detail has been remembered. When you load up the game one of the first things to strike you will be the way that characters walk behind objects, as well as in front of them. This feature even extends to the steel girders which allow to observe your character through the holes as he walks past. The effect of this is to give a very real impression of the landscape.

Digitalised pictures make up the start of each level accompanied with sampled sounds taken from the TV series so that the old 'two, five, three, two, one, Thunderbirds are go', greets you. Increased sound effects are promised for owners of double-sided drives.



With each level you're presented with two characters and you must select two objects to carry with you. There may then be exchanged for others during the game but beware, there are many set hurdles to be faced.

Explosion: Used to level five. You'll need to destroy the dark facility nuclear weapons systems.

Level one and the objectives is to save the trapped miners.



SQWEEK

LORICELUS GOLD

SqwEEK is the first game out of US Gold's new Loricelus stable and offers a funny orange hero who has to wander through a repetition of levels concerning blue fire pits and pink men. We control the mouse in his defence exploits to rid the world of blue fire but if that sounds easy then there's a host of problems forced in for

great measure. All sorts of icons appear for level reasons, granting you additional powers in your quest to change the fire and drop items in the fire first.

These icons get you both features as immunity from attacks, the ability to freeze the items and even a range of multi-repouser to use as weaponry. A chance icon

can be good or bad - one possibility is the unfortunate problem of converting pink squares back to blue.

Gradually the game doesn't provide anything particularly stunning and sound effects are so repetitive and digital that you'll turn them off as soon as possible but it's definitely addictive enough.

to see you coming back again and again.

The game is very much in the classic Pacman vein and is likely to appeal most to those gamers who seeking a rest from the usual intensive action gaming or strategy elements. It's simple enough to understand and all



Dodge the bluefire!

DERBIRDS



■ The game is played using two characters so that one character can watch the other. You can switch between them at any time but don't switch either in a dangerous position otherwise you could find his health suffers. Alternatively, if the character runs out of health, then your mission is aborted.

Terrance, however, it checks across a far wider terrain, thereby providing a more addictive and longer lasting challenge.

When Granddaddy was granted the Thunderbirds license, it was understood that they would not see any violence in the game. Faced with this problem, they turned to comedy instead and many of the animation routines reflect this. For example, Alan catches the trolley and gets carried away to it. Also, in the second level Gordon must employ his wits and Gordon must employ his wits to get through the loading bay and his attempt at swimming seems remarkably silly in a space ship.

In its day Terrance was acclaimed as a surprising addictive and unusual challenge but Thunderbirds is certain to appeal to an even greater audience. With an emphasis of amusing routines, the Thunderbirds characters and an addictive gameplay with four different missions, it's certain to stand the test of time and become one of the great classics.

If there's any concern to be voiced at Thunderbirds then it must be the complexity which will confound the first-time player. It's not the kind of game you'll pick up and win first time around but rather, it's appeal is likely to increase the more time you spend tackling the problems.

Thunderbirds seems certain to be a hit in which case Granddaddy has promised a version II - we'll keep you posted as to the near time. Thunderbirds addicts should watch out for next month's competition in which you can win Thunderbirds memorabilia, including models of the puppets.

Mark Higgins

CONCLUSION

5 - *Just a Little (JAH)*

Large - *Baron (JAH)*

STYLIS

5.00

MINIATURES

5.00

MINIATURES

5.00

LASTING INTEREST

5.00

OVERALL 77%

intended, even if it's hard at Christmas for relatives to play because they have neither the skill, intelligence or sheer desire to play anything as complex as Lords of the Rising Sun or Blood Money.

It's amusing then that Granddaddy is an addictive so often



■ The Granddaddy II is a challenge.

and although you might laugh each time you drag it from its packaging you can be certain you'll go back to it often enough.

Mark Higgins

5 - *Just a Little (JAH)*

Large - *Baron (JAH)*

STYLIS

5.00

MINIATURES

5.00

MINIATURES

5.00

LASTING INTEREST

5.00

OVERALL 52%



■ The story follows Granddaddy how he's got made his money but the right team doesn't make a regular appearance.

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PALACE



GRAPHICS AND SOUND

Movement across the landscape causes the screen to scroll sideways, but the humanoid robot is capable of running although the screen does tend to reflect his speed. Featureless mountains scrawl around looking more like translucent muggles than anything threatening. However, the end of level guardians are large and effective.

Sound on the ST version is limited to minimal spot effects but the Amiga version shows real promise in this area with superior effects including a lovely sound track. The gameplay and backgrounds are also offered on the Amiga version although more colours have been implemented.



Soundtrack can be any of six colours and gives additional game effects such as increased colour and tone.



What makes Bio Challenge a far better than average game is the usual playing features. It's not just a shoot-'em-up because it's more complex than that. Action is impressive with a difficulty level certain to sustain your interest for a long time. Whenever you overcome one problem - such as locating the versions of the smelt - you're immediately faced with a new one - defeating the end-of-level guardian. Lack of firepower keeps some getting used to but spinning soon compensates. Bio Challenge has already done well in France and looks set to be a real hit here with addictive gameplay certain to see your fingers pulsating with life.

Mark Hughes

CONCLUSION

It's official - there are problems with our games and the human race is getting weaker. Scientists have perfected a technique to graft the human brain into a robot's body - the same operation Norman Lubet had - and you're to be the recipient.

Your purpose is to collect sections of an smelt and fuse them together through the levels. The real difference from most multi-level games comes when sections of bio-like smelt appear in the scene. You must spin round faster than a biotic ballerina on an exercise wheel and then touch your enemies who evaporate. If you jump in the air at the same time you're able to break floating platforms to one side, which is important as the ground mountains are your real enemy. These shuffle around and are killed by the falling platforms at which point they deposit other metal or sections of the smelt. Once you've accumulated all four sections, you move through to the "guardian phase" where any collected metal can be used as firepower to defeat the resident monster.

ST - Jovial 1990

Logic - Inevitable



Each level has four sublevels accessed by jumping up towards the moving smelt.

STYLE

★★★★★

ANIMATION

★★★★★

SOUNDTRACK

★★★★★

PLAYING INTEREST

★★★★★

OVERALL 85%



DARKSIDE

INCENTIVE



Around 200 years have passed since the events that took place in Incentive's previous release, *Driller*. Now the Retars live on the moon Thorsipal which orbits your home planet of Earth.

On Thorsipal there has been a built a huge weapon called *Deploy One* (D1) you

know that Incentive are based at a place called *Deploy One's* with which the Retars intend to destroy Earth.

AIM

A massive amount of energy is required to fire the weapon and this is collected by a network of

interconnected solar panels called ECDs (energy collecting devices). All you have to do is destroy the network and save the world.

To help you in your mission you have a jet pack, a laser and a force shield. Unfortunately fuel and shields are in limited supply and you must find a way to replenish them during the game.

STRATEGY

In *Driller* the pace of the game was very sedate and you had lots of time to do things, but *Darkside* is much faster paced. Initially the ECD network is charging at 100% and if you're going to stand a chance at all of completing the

GRAPHICS AND SOUND

The main graphics in *Darkside* are very similar to those in *Driller*, buildings made up of blocks of colour with extensive use of shading to help enhance the three-dimensional effect. There's more animation in *Darkside* though and more of the Retar forces move around rather than just sitting there gathering power. Sound is a real improvement over *Driller's* which was definitely right let. There are not only some very very good sound effects, but also an atmospheric tune that goes on for ages before repeating.



It's a lot of ECDs in the simulation, but you have to shoot them from right to left so they're just impossible to spot.



It's power panel can stop you around the planet quickly.



▶ Some game packages offer puzzles created for a audience, such as the letter boxes. If you want to open the door...



▶ While the puzzles you'll find solutions to on your jet pack and power controls to change your shields - both are essential.

The team behind *Order* and *Contrast* are Nigon Developments. The main members of this infamous team are Ian (Ian Aycock) Andrew, Chris (Preescape) Andrew, Sean Hill, Kelly (Magpie) Gahan and Robin Chapman. All bracketed comments are found inside *Darkside* along with digitized pictures of some of the above. Ian doesn't want us to tell you how to find them though, you'll have to do that for yourself.

As a game with the plot for the game and to brother Chris is responsible for designing the Preescape system. Sean Hill programmed the 16-bit version of *Darkside* and also wrote STAC, the SF adventure engine.

Magpie (we're not sure if that's Magpie the Wizard) composed the music. As for his name in countless other games and Robin Chapman is responsible for the graphics.

Next month will see the arrival of *Total Eclipse* and other that you'll get more to read and see because the next game is not due for release until about the late next year.



PROGRAMMERS

game you need to double as much of the network as possible in the first five minutes of play. Double an LCD can't even know it, because you can only double one of its at a time. CCDs connected to more than one other CCD operate almost instantly.

The *Order* team left the door unopened though, they

want both to be in bits little pieces and so tanks, satellites and forcefields after the start. Forcefields deploy your energy if you hit them and shoot from tanks and satellites do the same. Running out of fuel can be equally fatal when you're flying, because once you've got hold of you if you can't let go until you hit the

ground and go spin.

Apart from disabling the CCDs and avoiding or destroying the radar bases there are other problems that you'll face: collecting tritium crystals, finding hidden doors and activating switches to get in other sections of the moon.

In some sections of the moon there are sensors which detect

you in orbit and the only way to get out again is by paying a fine. Inside the jet there are two letter-bomb objects, one takes fuel and the other shields when you shoot the oil. After enough shots have been fired the door will open and you can leave.

Make sure you choose wisely because the only way out of the jet is to going or through a trap door.

Graphically, Preescape games have always suffered from a very boring black structure and there's no change here. However, challenging strategy elements certainly keep your mind off problems in the effects department.

Darkside has the one thing that was lacking in *Order*, some pressure to drive you forwards and make sure that you don't waste time. The problems are more logical in their nature and the fact that your opponents move around makes for a more challenging and demanding game.

Gary Barrett



▶ A splashy title in *Order* makes, perhaps a little the best of the Operation *Order* or *Contrast*'s real game, *Planet Eclipse*.

CONCLUSION



▶ Planet tanks guard some base that you have to be careful not to destroyed.



▶ A network of satellites to deal before the surface. A safe way to move around the planet.

Magpie - Mean GOD Entry

RT - Rating: CMM

GRAPHICS



ANIMATION



GAMEPLAY



LEARNING CURVE



OVERALL 87%



GAME BUSTERS

In space no one can hear you scream. You send out your distress signal in the rain hope that someone will hear you. Someone always does, and his name is Captain Gamebusters

AFTERBURNER

ST
Here are some tips for Afterburner on the ST. Pause the game and type in "TRUCK BORGNADE".

Now you should find that typing the following keys will give you 50,000 extra missiles.
T-reduces your missile supply
-jumps to the next stage
V-returns to the previous stage
R-gives extra lives.

Chris Brown
Waltham, Cambs

ULTIMA V.

ST & Amiga
To destroy the Shadowlands, you must first know their names. These can be learned by going to one of the three castles that represent the principle that each Shadowland represents. Once there, ask the owner of the castle (usually the king) about the Shadowland. The person will usually tell you where to go and who to ask for more information.

Once you have the name of a Shadowland, you must then get

the shard of the Gem of Morden from which that Shadowland draws its power: it is located in the Underworld. Once you have the Shadowland's name and shard you can return to the castle that the Shadowland occupies. Go to the name of love for the Shadowland of Famed, for example and yell the Shadowland's name. The Shadowland appears two spaces from you. Throw the shard into the flame (by using 'L') and attack the Shadowland. You should cast several fire flame spells, at the

Shadowland, or repeatedly attack it. You might have to use some Heal spells on your characters, since the Shadowland will select one character and focus all of its attacks on that individual. When you destroy a Shadowland it is gone forever, and you can then go after the next one.

When all of the Shadowlands are destroyed, you can resume your search for the lost Lord Britain. Do this by first locating and obtaining the Crown, Scepter and Amulet of Lord Britain. Next enter the dungeon called "Shame". Go to the bottom level of the dungeon and enter the Underworld. Search the area (using many Blink spells and standing mountains) until you find a large area of lava. Walk through the lava until you find a large area of darkness. Tell the word "Strawman", and then you can enter the dungeon of Boom. The bottom level of the dungeon of Boom is where you will find Lord Britain!

Mark Collinson
Osley, West Yorkshire

DEFENDER OF THE CROWN

Amiga
If you're having trouble winning in Chris Brown's medieval game then

WAR IN MIDDLE EARTH

These few tips should help people getting started on War in Middle Earth when game starts move Frodo, Pippin etc in a north-west or south-east direction on very hasty setting. If they avoid the Nazgul go and wait down to the west making sure you stay and listen to Aragorn etc. As the time you have done this all Nazgul should have started retreating back towards Rivendell. This allows you to stop and collect all items from Isildur etc on the way back. When all Nazgul reach the area just below Rivendell they vanish but are still there, find the nearest party of Rangers you can control and move them to this area, a battle will start where upon all Nazgul will be drawn from the field.

When the battle is over the way is clear for your party to go to Rivendell where the Fellowship of

the Ring will be formed, where to find objects, North of Mount Erebor, South of Mount Doom, Ancient Belegost, Buckland, Road to Rivendell, Bombadil's House, Grey Havens, North of White Tower, West of Annunimas, Turinborough, Old Forest, Mordor Dairing, South of Forlind, Mount Gundabad from where the Lingsvald Treasures

I hope these tips will be useful in knowing where these objects are when you stop going to talk with people. Also if you get the Palantir first it can be used to find out where objects can be found and also gives you other information. Good luck on your journey to destroy the ring.

O A Shaw
Wood, Essex

If you want to play War in Middle Earth as 'The game or the book' rather than as a

game then follow these simple instructions and Sauron will meet his maker.

The first thing to do is to get Frodo out of Hobbiton, because the Nazgul quickly converge on the area. It is essential that you go to Eryn and meet Aragorn, because without him, Frodo doesn't stand a chance. As long as the Ring Bearer is in the party led by Aragorn, then he will be able to avoid almost everything encountered on the road, and to defeat those that can't be avoided, including Nazgul.

Once you have joined Aragorn, then head for Rivendell with all speed. You should not have too much trouble getting there, and joining up with the rest of the party. From there you can follow the book, and take the party down to Lorien, and to Eglith. Join Aragorn and Frodo (and Minas Tirith), and go to Cerin Uigat. Here Aragorn will hit Sauron, and the way is clear down to Mordor. Once you reach Mount Doom leave Aragorn to fight the few thousand orcs, while Frodo heads a hasty retreat.

And that's it! Don't expect any spectacular scenes of Frodo throwing the ring down the Cores of Doom, because there aren't any! No triumphant music, no banners waving, nothing except a view of the party of nine standing on the bridge in Hobbiton. Quite an anti-climax to an otherwise good game.

Bonnie Stafford
Wirral, Merseyside





GIMME, GIMME!

Winners players all over the world need help and the only people that can help them are other gamers players. If you're one of the folks in need, please don't have Madcat show you and every other weekend event problem that never in your life and who knows, you could even win yourself a couple of games as a thank. Send in your tips and advice to: GameSaviors, 87-Ampa Forum, # Oneal Street, Bath ME 04515.

This month's winners are Daniel Vetter for his Special of Madcat tips and Sarah Carter for her adventure tips. Both will be receiving prizes through the post shortly.

you might like to have 1000 knights in both your home army and your campaign army. All you have to do is hold down the 'X' key when asked to count the '0' and you have an endless supply army.

Craig Swaine
Stoke-on-Trent, Staffs

RAMBO III

Use your REFUGES on the high count table, allowing you to press keys 1, 2, 3 on the title screen to adjust to the level of your choice.

Chris Brown
Walsbrook, Cambs

LEATHER GODDESS-ES OF PHOBOS

BT & Amiga
Can't enter the orphanage? Put the baby in the basket and put the basket on the sheep. They will wait until the baby is taken in. Can't crack code? Replace each letter by its third previous one in the alphabet. For example A by X and H by E. Read the message backwards.

Sarah Carter
Redditch, Worcs

KNIGHT OWG

BT & Amiga
Spells and where to find them:

Charisma - Lake
Empathy - rotten apple
Gold - man
Jump - smooth pebble
Eye - fire
Location - rained
Grow - manse
Kings - camp
Sarah Carter
Redditch, Worcs

wound with sponsored and put saddle on his back. Then take the white.

Sarah Carter
Redditch, Worcs

BETOND

ZORK

BT & Amiga
Transporter scroll a problem? Say the word on the scroll at the stable house and whenever you are in trouble say the word and you will be transported back there. Study wall a problem? Forget it. It's immovable. Can't see mine? Rub out footprints. Don't bunnies need feeding with? Rub bearskin rug and touch bunnies. Can't kill combat? Throw oil of holy water. Don't know how to deal with sterabody? Post Arthura's rod at it and take arrow. Rub



SWORD OF SODAN

In general, Don't use any actions on levels 1 to 5, save them for later on, especially the last level.

On levels with barrels, back off when you see one approaching. This avoids touching the enemy when you jump over the barrel.

There is no time limit so never rush a level unless you have a power shield activated and you want to use it on the next level.

Level 1

As soon as the level begins jump forwards until you hear the guard telling you to halt, then begin attacking. Jump forwards to keep as near to the guards as possible so that they can't stab you.

Level 2

Attack the guard when you are between the single spikes and the double spikes. Avoid following him, instead back off a little then when he approaches you jump forwards then hit him.

Level 3

If the first two men are just a little too far away to be hit with the throwing spikes then change to the overhead blow. They will come a little closer allowing you to get them with the throwing spike.

Attack the guard with the overhead blow. Never jump into him because his stab will drain your energy considerably.

Level 4

To kill the fat gop, steal and stab. They will continue to jump into the sword until they die.

Attack the two creatures in a similar way but keep backing off and quickly waiting for words again to get a few hits on.

Level 5

Use sword to attack the zombies. Do not waste your faith being injured by their arms and the staff they spit out at you.

Level 6

Use a power shield, this will stop you falling into the traps. Jump towards the man and continue to hit him. Follow him if he walks away from you.

Level 7

Walk forward until you are in line with the body on the wall. Kill the flying creatures with the overhead blow. Once they fall to the floor use a magic dagger to kill the man at the end.

Level 8

At first you be prepared to jump the fire that ruffles along the floor. It begins to get tricky when the walls come down. It is best to listen for the fire and to keep looking at the top of the screen to get an early warning if a wall is about to crush you. When the steel spikes appear, the fire will stop. The spikes are more deadly than the walls, being a whole lot away when you are impaled on one, you should therefore concentrate more on avoiding the spikes than the walls.

When you reach the liquids section, walk to the edge of the pool of lava and wait until the first block is aimed at the edge, then jump forwards onto it. Jump onto the next

block when they are as close as possible to the one you are on. When you are on the third block wait until it is at the very edge of the floor before jumping because the end of the floor will crumble if you jump too early.

Stand in many drops as possible and be ready to jump the fire. When you reach the stone shield, stand a little way from it and hit it with to make it slide back, revealing the exit.

Level 9

Kill the two pairs of creatures with the overhead blow (as in level 7).

Jump over the caterpillar-like creature when its head is as far down as possible. Walk past the poison to get the last wall and backwards and the last wall and the creature. Once the last has finished eating walk forwards until the water starts to rise. When the water is just below the tent's mouth you should begin to jump. Continue jumping until the water is below its mouth. The wall will disappear allowing you to walk forwards again.

Hit the bits of fire with your sword to prevent them from injuring you. You can increase your hit strength by hitting the grey creature on top of the wall. When they fly over your head use the overhead blow to get them and your hit strength will increase by one. When the wall disappears walk forwards to beat the exit.

Daniel Vernon
Dunstable, South Yorkshire

The remaining levels will be covered next month.



What is the single most popular option for a computer? A printer maybe? How about a colour monitor or even a modem? Perhaps surprisingly, it is in fact the humble joystick.

There are three different types of joystick, the traditional analog style sticks, the newer, more expensive type and the current fad—the 'tremor' hand-held variety.

Joystick construction is a very important factor to consider. Most modern joysticks use microswitches to register movement but many older (and cheaper) models use rather unreliable leaf switches which tend to break rather quickly. How do you spot a microswitched joystick in a crowd? Easy, just move the joystick about and if it makes enough clicking noises then you know that it is microswitched.

So what should you be looking for when choosing your ideal joystick? And what type of joystick is best suited to the many different types of games available? Well, no one knows more about what joysticks are best for particular games than the programmers themselves. So, we've let them do the choosing.

MOVE OVER MOUSE...

Does anyone remember the controller used in the classic arcade games *Starline Madness* and *Mania Command*? It was of course the rather under-rated handle-ball.

If you fancy getting one for your ST you're in luck — an enterprising company has taken an old classic to make new. The unit is marketed by Third Edge Communications, priced at £24.95, and is in fact a modified



version of the classic Alan Thackwell, which was used for use with the old Alan 888 computer.

This new ST version is purely a mouse replacement and cannot be used on any games which require a joystick. But for mouse-controlled games (particularly *Frederic's Wheel*, the TRACKBALL is a 'joy' to use. Third Edge Communications can be contacted on 0742 9887 15.

JOY DIVISION

Choosing that just-so joystick can be a bewildering experience. JASON HOLBORN tries not to get confused



PROGRAMMERS' CHOICE

Who better to judge a joystick than the people responsible for its popularity – the games programmers themselves. Format popped the question to some of the big names in games design.

Dave Jones of DMA Design – Dave, programmer of *Blood Money* and *Menace*, is a self-confessed shoot-em-up junkie and for his purposes, the Dynamics Competition Pro 3000 (£14.95) does the job very nicely thank you. Surprisingly, Dave prefers the last switch version to the more reliable rewire-switched model.

Steve Bell says he's got to find a stick to match the original Atari model. "If a company produced one like that for under £20 I'd buy 10," said Steve.

Tony Smith of DMA Design – Tony is infected with the same obsession for shoot-em-ups as his partner in crime, Dave Jones. "Dave can keep his Dynamics Pro, I wouldn't swap my Konix Speedking (£11.99) for anything!", says Tony.

Jon San of Argonaut – Jon, head programmer on *StarDriver 2*, has always been a great fan of the original Amiga joystick that was released in the States by Amiga, Inc. (before they were bought up by Commodore).

The unit is a very small device that fits snugly in the palm of your hand and is controlled by your thumb. Recent favourites include the Konix Speedking and Navigator.

Anthony Smith – Anthony's pick of the sticks is the old faithful SparcoVideo QuickShot (£19.95), a joystick that many a gamer/player has been weaned on.

Giles Goddard of Argonaut – "It's a little very large knobby one". Well, what more can you add to that!

SUPPLIERS:
Dynamics 061-428 7222
Eurocom 0262 802581
Konix 0480 390101
Power Play (Mr Joystick) 04277 6601

FORMAT FAVOURITES

Richard Monteiro – Our editor has been through three joystick fests that you've not yet dreamed. His pick of the bunch, until recently, was the Konix Navigator (£14.99) but he has since fallen in love with the Mr Joystick's Crystal Clear Turbo (£19.99).

Jason Mathers – I give my Supermax SuperPro with autofire (£19.95) a well-earned nod.

night. Mark's sticks lack the kind of pixel precision that games such as *Blood Money* and *It's a Wonderful Rapid Fire* also demand.

Stuart Anderson – Stuart's choice in joysticks is the Terminator, a now unavailable joystick that's shaped like a hand grenade. "I like the Terminator because it brings out the violent side of my nature."

John Stewart – **Mark Stigman** – Mark's a snipe who likes to have Complete control at all times, so he like Richard chooses the Konix Navigator.

Gary Barrett – Gary too, is a fan of the more traditional arcade style stick made famous by companies such as Rompage. Gary's long time favourite is the EuroMax Pro (£13.99) because of its reliability.



PREVIEWS

Soccer

Microprose ■ Amiga & ST ■ £24.95 ■ May

Let's hope that Microprose's programming ability is much better than their footballing skills after the recent slaughter they suffered at the hands of a Future Publishing team. If not then you're going over the top with the footballing game, maybe you'll even equal us with a 12:0 final score.



■ **Sticks 'n' Stones** comes looking for the 1991, but will the computerized Microprose team keep him at bay this time?

Have no fear, no one can possibly program that badly.

As soon as we get a review copy we'll let you know what it's like, it does look good.

Total Eclipse
Incentive ■ ST & Amiga
£24.95 ■ Out soon

The *Sid* is the king of Post-nap games, should be with you next month. Deep space has been left behind with the setting now being the middle of the desert. Don't worry, puzzle elements have been included in this one and time is again your greatest enemy. The occasional mummy proves to be a problem too.



■ Once again the king of the world is in your hands. This time it's the course of a long dead Egyptian pharaoh which is responsible. Save the world and get some odd fortunes, or come to a croaky end in the midst of the desert.



■ **Crimes From England** is probably one of the most important games to the Mirrorsoft company. Although it's unlikely to appear much before last year, it might double before as well as a legal one, intended for the growing gaming population. It's unlikely to appear much until early next year, but it's worth a look. The ST and Amiga have not yet been taken over, but they will. Crises from England promises to be a hard one to beat.

MIRRORSOFT INTO THE '90s

Mirrorsoft are hoping to continue their path as one of the leaders in the home video entertainment scene with their range of new products scheduled to appear in the months leading up towards 1991. On show at their recent European promotions event in Amsterdam were a host of games from the pool of programming copyrights falling under the Mirrorsoft umbrella. Just some of the Mirrorsoft games to watch out for are shown here.



■ The *Missing Mothers* had a phenomenal hit on their hands when they produced the ultimate shoot-em-up - *Demons* and their follow up, *Exiles*. It looks to be far more impressive. Last and not least makes up the backdrops and there have been impacted with complex action from *Search for Boris*. It's likely to appear on the game scene around September.



■ *Pollux* is one of the Missing Mothers and it's coming. It's a puzzle game and it's likely to appear on the game scene around September.



■ *Sorcerer* is an arcade adventure game featuring action sequences set in a fantasy world. It's coming under the Mirrorsoft label and offers impressive graphics from *Search for Boris*. The release date for ST and Amiga versions looks likely to be around Christmas.



■ *Intergalax* is one of those games to really watch out for. It might incorporate the best elements ever but it does have some very impressive 3D features. It's likely to appear in some form or another in the game scene around September.



THAT OLD MAC MAGIC

You take one ST with no strings attached, plug in an innocuous looking cartridge, and abracadabra - one fully-fledged Macintosh. STUART ANDERTON tried pulling an Apple out of the hat

INGREDIENTS

- To make one fake Mac you will need:
- 1 real Mac
- 1 ST without hard disk
- 1 floppy disk drive or 1 floppy and one hard drive
- 1 serial cable with the right plug
- 1 Spectra 128 cartridge
- 6 different formats of floppy disk
- Some Mac software
- 6 different formats of program
- 1 good book to read while waiting up



Spectra 128
4199 ■ 180soft:
The Old School,
Greenfield,
Bedford MK45
5426 Tel: 0925
718182

MAC MACHISMO

To what's it all about about the Mac? The ST has a 68000 processor, better mouse and pointer environment too, GEM.

Anyone who has ever used a Mac and IBM will agree what is the better system, it's difficult to put your finger on why the Mac outperforms IBM - the Mac just feels like a smoother, more professional machine.

Little points add up - to move a file from one directory to another, for example, just involves dragging the file icon between two windows, no moving files, deleting. And you can double click on a disk file icon to a sophisticated document and the relevant application will be launched and the file loaded automatically. Together with the use of a command key repeats the Mac to a much more relaxing system to work on.

Much more important, however, is the quality of Macintosh software. Especially in desktop publishing and technical drawing, there is a vast range of top-quality programs to choose from. An ST program even comes close to a Mac GPP package like Heavy for GPP or PageMaker.

Then there is the little matter of price. The Macintosh range starts with a single floppy disk, usually provided, that Plus at £1,280. A more practical 28 will set you back £2,600 or so. Running Mac software on an ST is rather attractive to the bank.

To Spectra 128 makes a very simple claim; you plug it in to the ST's cartridge port and the ST miraculously becomes an Apple Macintosh.

It sounds incredible - particularly if you're experienced PC imitator like PC Data which, in all honesty, are slow, clumsy and don't work as well as claimed. The Mac is a much more sophisticated beast than the PC, so it's only right that you should be dubious of Spectra's claim.

Enclosed in the box is a note from Helmut, the distributor, explaining that they aren't at all happy with the set up procedure and the way it is documented. A quick glance through the instruction sheet confirmed this. Oh dear.

FIRST, FIND YOUR MAC

It's not worth describing the entire set up procedure - that would take two pages on its own. Suffice it say you need an Apple Mac, a serial cable, five different formats of disk, and a patient nature.

The basic problem is that the ST cannot read Mac disks directly. The format Apple chose is utterly different to Atari's - for example an ST disk spins at a constant speed, whereas the Mac disk's speed varies depending on where on the disk the drive's head is. A device

to overcome this is in the picture - watch the specs.

Because of the problem with disks, all the Mac software you wish to use has to be sent down a serial cable from a real Mac. Easy enough, you just run a communications program on your ST (see Mac and...), ah, how do you get the communications software onto your ST in the first place? That's where the five different disk formats come in.

You send the Mac communications program, along with some vital system files, to the ST as data. Then translate this onto a disk which the Mac emulator can read - no, it can't read ordinary ST format disks. The translator program we recognise as an old disk format used with a previous version of Spectra called Magic Disk. Spectra itself uses a different format again, Confused? You should be.

It'll take a couple hours to get a Spectra-format disk containing a communications program, a Mac system file, and Focus (the Mac's version of GEM). So at last, with the Spectra box firmly in the cartridge slot, you're ready to switch on and insert the boot disk. Running a program by the user-friendly name of I SPICED UP gives you the configuration options - the default is usually fine. A dialog box asks for the disk with the



IN - OUT

Why this drive isn't quite entirely under software control, you can't do it by hand. To get around this the emulator flashes "0" at you when it wants you to restore a disk. Inside Mac knows the disk is in the drive and it spins it out, it needs to write data to disk around there. So although it takes some getting used to you need never take a disk out of a drive unless the drive tells you to. Similarly you must eject all the disks before restoring otherwise some data may be lost which has not even been written to the floppy.

Mac programs, click on OK and... nothing happens. Then, just as you are about to throw the machine against the wall, the screen fades to black and the usual Mac image appears.

Welcome to Macintosh' snaps onto the screen, the ST is transformed into a Mac. The appearance of the desktop is indistinguishable from a real Mac's - Spectre sees the actual Macintosh operating system ROMs. The only difference is the screen size - the ST's screen is 33 per cent bigger than the original's.

WELL IMPRESSED

With the initial set up out of the way, you can get Mac software down the local cable with the normal program. After a few applications have been test driven the wire and tested your original disks about Spectre will vanish.

The emulator works. It starts well and it works fast. Nearly six out of the time you wouldn't know you weren't using the real thing, and the difficulties of the differing keyboards are coded with reliability.

For example, the Mac makes extensive use of the unique keys on it's keyboard, Command and Option. These are mapped onto Control and Alternate respectively, which works well.

WHAT WORSEST

The vast majority of Mac software test of worked fine with the emulator. There is a long list of programs which are deemed to run, and the only difference of opinion with it is the spreadsheet Excel, which stubbornly refused to work - although admittedly a different version of the Finder was used.

All the major desktop publishing programs ran without a hitch. Quark Xpress, PageMaker and Heavy Set Got work a treat except for printing out - more on that later. Similarly graphics packages like Illustrator, Freehand and



Crocket Draw ran well. These graphical applications use the Mac's drawing port and the most likely reason for wanting to use Spectre.

Spectre has the main problem is the floppy disks - a problem with real Mac too. Spectre will run on a single floppy machine, but it is utterly impractical. The problem lies in the way the Mac uses its files - it only loads in the bits of the program and operating system it needs at any one time, so it is continuously accessing the disk drive.

Rails from the disk access problem, Spectre runs daisy-lead but for an emulator. Some rough time tests show it to be marginally faster than a Macintosh Plus. Spectre runs at a perfectly usable speed.

VERY GOOD BUT...

Oh, that's the good part, but what about the damn cable?

The first disadvantage is the hardware you need to actually run Spectre. Forget using a SCSI. Forget a single disk drive. In fact forget floppies - a hard disk is virtually essential for serious Macing. You can use your Atari's hard drive if you have one.

Considerably more serious is the problem of printing out your work. Macs are designed to only work with their own printers, the dot-matrix ImageWriter and the LaserWriter laser printer. If you have an ImageWriter lying around - unlikely as they are expensive and only work with Apple's - you can't plug it in and go, otherwise you are stuck. To use a standard Epson-compatible printer you need a special printer driver which you have to buy separately for around £30. A driver for the Atari SIMBON laser printer is included.

Getting the high-quality printout of a LaserWriter is most of a problem. Printout to a laser printer uses a custom chip on the Mac that simply can't there on the ST. The only possible way to get laser quality output from the Spectre is to send your finished files back to the

Mac. With the serial cable - clearly impractical for more than very occasional use. Alternatively, if you have a modem you can send the files down the phone line to one of the many local typing services which offer online services. The real solution is this will only come when the planned addition to read and write Mac disks is ready. Then you can get back your friendly neighborhood Mac owner into printing out the files for you.

THE BOTTOM LINE

Spectre 1.26 provides an excellent Macintosh environment running on an ST. It is highly compatible with the real thing and will happily run most of the software which makes the Macintosh such a desirable machine to own. It is fast, and when married up to a hard disk, considerably more pleasant to use than the ST's native OS.

Its principal drawback are the difficulties of getting high quality printout and the time and effort it takes to set up. Together with the promised device to read and write Mac disks, a floppy ST with a hard disk running Spectre offers a viable alternative to a real Mac at a fraction of the price.

for

- Runs most Macintosh programs
- Fast and reliable
- Cheap at the price
- Well written, providing manual

against

- Lousy writing on procedures
- Can't read Mac disks
- Needs extra software to print out
- Requires at least 1MB and a hard disk

features

performance

ease of use

price

format

THE EMULATION GAME

There are few more attractive to "professionals" personal computers - the IBM PC and Apple's Macintosh. Because of the vast amount of quality "productivity software" available to these machines several attempts have been made to make the ST run programs designed for them.

Emulating the IBM PC is dependably easy because the PC's microprocessor is entirely different to the ST's; the machine code instructions have to be translated from 8086 code to 68000. The Apple Macintosh was the real same story as the ST, so it should be really easy to emulate... right? Wrong! The Mac's unique operating system is stored on two ROM chips and all these programs use the routines built into these chips. The only way to get the ST to run Mac programs is to add the Mac ROMs to the Atari. That's what Spectre 1.26 does.



DESKTOP

The knives are drawn again this month with ST owners battling it out against their machines. On these illustrious pages are so many tips you'll think you've fallen into a box of Liquorice Allsorts. PHILIP BEXON from Leicester wins this month's £30 prize for his musical STOS tip.

AND THEN THERE WAS SOUND

The composite video signal output produced by STs and provided via the monitor socket offers an excellent video signal which can be taken to a TV using the correct connections as indicated below. Additionally, the output from the

monitor socket offers an audio line which may be taken to the auxiliary input on a hi-fi system.

Factual Point Selling, West Yorkshire.

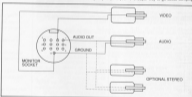
HARD DISKING

According to the Finetworks DTP manual the only way to get your

pages onto disk is to give up long for a year and take the proceeds from the venture - hopefully around £500 - and purchase yourself a hard disk. Now Finetworks have the idea that this is the way everyone should be but in actual fact there's a far cheaper way to go about dumping

the file onto disk providing you have a machine with a megabyte of memory or more. Simply create a RAM disk and give it the identity C. Now when you point to disk it will be based onto this RAM disk which can then be transferred onto floppy at a later date.

Andrew Triggs
Croydon, Surrey.



BEWARE THE DEATH RAY

All monitors are cathode ray generators which, by the very nature of their design, generate a large electromagnetic field around them. Three hours a day exposure to your monitor is reckoned to be about the maximum limit. Exceeding this can cause all types of ill short term problems such as headaches, sleeplessness, and even heart disturbances. At present no one has been able to predict long-term exposure problems, but it seems that cancer and genetic defects are a possibility.

A test in West Germany led

STOS is a brilliant package offering all sorts of great features for sleeping games but it has its problems. Sleepless nights can turn a mediocre game into a masterpiece but how do you go about including them into your well-designed Personal Designer to grab your samples and then load the SAMPLES.DSK file. It is this file which plays samples in your own programs. To use it in STOS you'll need to copy this file onto a blank disk along with your sample. Next, load STOS

in the usual way and enter the following program.

Running this program should see your samples loaded into memory and then played at the selected speed. It must be remembered that samples take up substantial amounts of memory which obviously cuts down on the room left for your game. This idea will work adequately for samples taken using either Extended's Processor or Play4 from Microbot.

Philip Bexon
Sheffield, Leicestershire

MAKING MUSIC WITH STOS

```

00 RESERVE 60 DATA 1,10000000 RESERVE BANK FOR "SAMPLES.DSK" FILE
01 RESERVE 60 DATA 1,00000000 RESERVE BANK FOR SAMPLE FILE, 1000-BITS IN BYTES OF SAMPLE
02 LOAD "SAMPLES.DSK",40000 LOAD "STOSPLAY.E22" DO BANK 0
03 LOAD "SAMPLES.DSK",10000000 SAMPLE 1000 BANK 1
04 GOTO START (0-40,STOS) (1)
05 GOTO START (0-40,STOS) (1+1000000) (1)
06 GOTO START (0-40,STOS) (1+40,STOS) (1+1000000) (1)
07 CALL 0

```

If the program to use your sound samples from within STOS.





year compared to seven people members. The inquiry concluded that the 2800 24 model by Ruz was found to generate the smallest electromagnetic field and was hence the safest on the market. The 2870 series is lucky devil!

Gerard Nolan
Reading, Berkshire

FINDING THE RIGHT FUNCTION

Function key guides are a major asset to anyone who uses their ST for more than just playing games.

This one is complicated to explain but it basically consists of taking several sheets of A4 size paper and binding them all together using a standard paper folder of the fat line - ring binders aren't any good. When you have made sure that the paper doesn't fall out of the binder, the next step is to introduce it to a paper cutter. Trim your A4 sheets so that they are just under 1.5 cm wide and then trim away all the remaining paper. This rudimentary paper binder will rise to sit the paper just above the ST keyboard and the excess of paper can be made to fall close to the function keys.

Using Lefkowitz you can then create a real set of tabs applicable to whatever package you're using at the time. You can flip through these during use. So, for example, a separate function key guide can be designed for

QW, BASIC, Networks, DTP and Fleet Street Editor.

You can even use extra pages to hold notes - such as the kind that is used after a bout of QWing.

Marie Lamb
Newcastle upon Tyne,
Northumberland

If at next month we will be opening up this page as a forum for advice about your ST problems, we'd like and welcome any queries you have about your machine out of the usual time away with them to reach us by our first or second. As ever, there's a reward of £20 for the tip of the month. Send your problems to **Cracking ST Advice Forum**, 2 Green Street, Bath, BA1 2AA. We'll guarantee 17 problems only - no personal ones unless you want to give us all a good laugh in the normal office.

SHOWING WHAT YOU'VE GOT

Sometimes on your ST language disk is a tiny little assembly program called the VT52 emulator. It's not a program which interests very many people. After all, what does it do and is it really any good? The VT52 emulator is designed as a kind of micro-program which takes input from the RS232C port and displays it on screen, either at the same time, offering you the opportunity to send your own keyboard commands and data. The VT52 emulator is thus a very simple terminal program.

As an emulator it responds to a set of codes which will change the on-screen display so that the cursor can be fixed around the screen, text and background colours may be adjusted and the cursor can even be disabled altogether. There are obviously a lot of specific benefits to anyone who deals with the VT52 emulator but where their wider impact can be found is in the use of these codes in standard BASIC files. When you double-click from the desktop on a file without .PRG or .DOS extensions (ie, it cannot be loaded), you can see the file call up an application; then you will be presented with the option to **EDIT** or **PRINT** the file. Switching normally only presents a standard and unimpressive text display of the information but by making clever use of the same codes employed in the VT52 emulator you are able to create all sorts of interesting effects.

The codes you do follow and it would be a list. No they should be in the form **ESC**, but where **ESC** is the ASCII code of the character listed, **ESC** is the code

for **ESC**. Probably one of the simplest ways to do this is to write your test file leaving less space wherever you want the control code to go. Save your file and then load **Playbook** or another file editing program and overwrite all the spaces with your control codes.

The commands listed below cause direct alterations to all screen output so that when **ESC**ESC is hit, the display can be made to look exactly what you like. However, programs will error if you try to **PRINT** the file or if you load it into a wordprocessor. The control codes included will prompt some very unusual reactions. Therefore, the codes are not any use as long as the file is in **EDIT** mode. It is possible however to implement codes which will affect your printer so that if you **PRINT** the file then some will affect printer output. In this circumstance, the screen output is likely to be affected.

INSERTING PRINTER CODES

Printer control codes may be included in a similar way to the **ESC**ESC codes. A space must be left for each command code and then these can be over-typed later using a text editor.

So, for example, you could leave three spaces in your text and then replace these with the printer codes: **ESC** **ESC** **ESC** **ESC** **ESC** which sets the printer into expanded text mode. These codes could then be used at least to provide a decent heading for your programme.

VT52 ESCAPE CODES

| | |
|---------------|---------------------------|
| ESC A | Cursor Up |
| ESC B | Cursor Down |
| ESC C | Cursor Right |
| ESC D | Cursor Left |
| ESC E | Clear Home |
| ESC H | Cursor Home |
| ESC I | Cursor Up |
| ESC J | Clear below cursor |
| ESC K | Clear remainder of line |
| ESC L | Insert line |
| ESC M | Delete line |
| ESC Y | Position cursor |
| ESC @ | Character colour |
| ESC a | Background colour |
| ESC d | Clear screen to cursor |
| ESC eF | Enable/Disable the cursor |
| ESC i | Clear line |
| ESC pF | Reverse shift |

This function moves the cursor up one line providing it is not already on the top line. Any text will then continue from this new location.

The entire screen is cleared and text continues from the top left-hand corner of the screen. Returns the cursor to the top left corner of the screen without clearing first.

This moves the cursor up one line. If it is already on the top then a blank line is inserted. The column position is maintained.

The rest of the screen below the cursor is cleared.

The cursor position and the remainder of the line is cleared although the cursor does not move position.

A line is inserted and the remainder of the screen is scrolled down.

The line with the cursor is cleared and deleted.

This allows you to position the cursor anywhere on screen. It is structured with the row and column values provided as parameters and is added to each. The result falls in this way: **ESC Y** **CHRS(8)** **CHR(2)** places **CHR(2)** at column 8.

This is the command used to change the colour of all subsequent text output. Only the least four bits are recognised as values in the register **R**, if any appropriate.

This code changes the background colour in an identical fashion.

This clears the screen from the top down to the position of the cursor.

Clears the entire line and resets the cursor to the start of that line.

All text output is reversed, ie, black on white text becomes white on black after execution of this **ESC** escape sequence.

SIREN SOFTWARE

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WORKBENCH

PROBLEMATIC PRINTER

I have an old Alphacom 32 printer (top triggering) and would like to know if it is possible to connect it to my Amiga 500 before I connect it to the darker depths of my cupboard?

Is it possible to obtain a hard-wired device such as the Multiface 37 for the Amiga?

Is there a difference between a sound digitiser and a sound sampler?

M.J. Pryor
Berkhamstead

Alphacom 32? If my memory serves me well, that particular printer was designed for use on the Spectra. There really is no reason why any printer cannot be made to work with the 32 or Amiga if you get the correct leads made up. Try your local computer store who may offer a lead-making service.

Romantic (Petal), producers of the Multiface 37 cartridge, are considering producing an Amiga version, but nothing is definite. Romantic can be contacted on 01 295 0070.

There is no difference between a sound sampler and a sound digitiser, both are exactly the same piece of equipment.

I THINK THEREFORE AMIGA

I am about to buy a computer for home use and the Amiga seems to be ideal for reasons. There is also plenty of business software available for it. However, at work I use an IBM PC to write special purpose programs using dBASE 3+ and dBASE, and I would like to use my home machine to do the same.

There would seem to be two

This month, along with the usual helping of handy hints, we introduce a new reader technical help section. JASON HOLBORN sorts out your problems.

options available — use a PC emulator program such as Transformer (cheap) or its an XT Bridgeboard (expensive). How well do these options perform? Accounting 1 fit an external 5.25-inch drive, is the disk format OK for transferring software between my PC and the Amiga?

M.P. Green
Miff Green

The Transformer has now been discontinued. For your particular needs, the XT Bridgeboard is most certainly your best bet. The board is in fact a complete PC compatible on a card and comes as standard with a 5.25-inch PC drive. The bridgeboard is completely PC compatible and will quite happily run software such as dBASE 3+. You won't even need to transfer files to and from the Amiga because the included drive reads and writes PC format disks. For further info on the XT bridgeboard, check out our review in issue 9. The main problem is price — you can buy a real PC for the price of the bridgeboard.

FLOPPY COPY

Since issue 1 I have been backing up my Format disks and have managed to store two Format disks on one blank disk, having first renamed all files to avoid confusion.

TOOL that will contain something like CoverDisk4096000. At you now have to do it to change this and then click on save.

Unfortunately, there is no way of getting your program back to its original, unrenamed state. Always remember to keep backup of your own programs as well as Format cover disks!

SOUND ADVICE

However, when I try to load a Read Me file from my backup disk, a system request appears for the original disk to be inserted.

My friend and I have recently purchased a 1 Mb 68000 expansion for our Amiga 500s. We use Amiga



■ The Workbench INFO window tells you all that you would possibly want to know about a file.

Please tell me how I can get the 'ReadMe' file to access my backup disk.

Secondly, a friend showed my how to protect a BASIC program from being listed. He renamed the program using the SAVE 'TELNAME' option. However, I can't find a way to reverse this, and (honestly might) have no backup of this program.

K. Thornton
Convey Island, Essex

To make the Read Me files work from your backup, you will first have to copy the 'MORE' program from our cover disk to your backup. Secondly, you will have to change the last name of the user to MFC008, where MFC008 is the name of your backup disk.

This is done on the Workbench. First of all, click one on the Read Me file's icon and then select 'INFO' from the Workbench menu. After a while, a window will pop up containing loads of really interesting info about that particular file. Somewhere within that window, there is a field called 'DETAIL'

INTRODUCING THE WORKBENCH HELP LINE

Have you got a problem with your Amiga? If the answer is yes, then why not try the Format helpline, and we actually go, get your mind at rest in our all new Amiga technical help line.

Every month we'll be asking through your problems and queries, hoping to sort out as many technical queries as possible. Whatever the subject, be it programming in Amiga BASIC, fitting the hardware to better computers, or even just more general problems with software packages on the Amiga, our technical jiffies will solve it for you.

Send your worried words to: **WORKBENCH HELPLINE**, 27 Amiga Format, a Cover Sheet, Box 641 11A.

Unfortunately we can only answer your queries in print. We can't enter into any correspondence even if you include an SAE — or have you sent a stamp.



■ The XT Bridgeboard which provides the Amiga with PC compatibility and comes with a 5.25-inch internal drive as standard.



Some a lot and the main reason for upgrading was so that we could produce larger screens and use more instruments, flowmeters, and more instruments. However, we were writing a score when our duty we were unable to load any more samples into memory. We checked how much free memory we had left and over 40Kb was free. Hence could you help us.

Robert Parkes
Leicester

As the graphics and sound that you see and hear in your Amiga are generated by the Amiga custom chips Agnus, Denise and Paula. On the current release of these chips, they can only access the first 512K of RAM, any extra RAM is only used by the 68000. Therefore, if the custom chips are to access data such as sound samples, the data must reside in the first 512K block.

Older new programs are written so that the actual program code itself is loaded into expansion RAM (if it is present), leaving at least one chip RAM free for data such as sound samples as it is possible.

The chip RAM problem will hopefully be solved when Commodore finally get around to releasing the improved Enhanced Chip Set (ECS) upgrade. This new chip set promises to raise the chip RAM barrier from the present 512K level to a full 1 Mb. When this does arrive, you will then be able to load up to 1 Mb of samples.

GET YOUR MITTS ON THIRTY BIG ONES!

Surely, the *Commodore* buffers are only human and therefore don't know absolutely everything that you would like to know about the possible new about Amiga you're interested about. Therefore, this is where you get come in, the want you to send us your handy tips and notes on any aspect of the Amiga we write for an absolute nothing and everything that you don't know about. We're simply looking for the best ideas and we'll send you a copy of the issue you're interested in.

"What do I get out of it?" I hear you ask. Well, how does it sound? Well, we'll send you a copy of the issue you're interested in. If you're interested in *Commodore*, *ST Action*, *Forum*, *ST Games*, *Smart*, *Soft*, *SA*, *SL*.

BEGINNERS' CORNER

In last month's tutorial on using AmigaDOS we briefly look at storage and started looking at a couple of the most common commands that you will encounter during your Amiga sessions. This month we'll continue where we left off with a look at a couple more AmigaDOS commands.

The first thing we must do before we start is to create a new readable environment for those of you with single drives. Enter the CUI and then type in the following commands:

```
COPY C:\DOS\*\*.* >C:\RAMDISK\*\*.*
<Press RETURN>
C:\RAMDISK\*.* >C:\RAMDISK\*.*
<Press RETURN>
```

MY TYPE OF COMMAND

Anyone who has any form of experience with any of the very early public domain disks on the Amiga will know how irritating this can often be. Probably the most annoying aspect arises when you try to view the contents of a fixed file. Just how do you open a text file and read its contents? Let me introduce you to the TYPE command.

The TYPE command is used to display the contents of an ASCII text file. The format of the command is as follows:

```
TYPE <filename>
```

Now let's put this theory into practice. The first thing we need before we can display a text file is to find a text file to display (unless, luckily, you own a standard Workbench disk that has a file called *readme* in the *Mounted*, which is located in the *DEVS* directory of your boot disk. To display this file you would enter the following:

```
TYPE C:\DEVS\MOUNTED\*.*
<Press RETURN>
```

After a few seconds of disk access, the TYPE command will start to display the contents of the *Mounted* directory. Unless you've a very quick reader, the text will fly off the screen before you get a chance to even read the first sentence. To pause the display, just press the space bar, and to start again, press the DEL key.

DO YOU COPY?

All this moving around disks, displaying the contents of directories and files is all very nice, but sooner or later you may want to start saving files around. This then is where the COPY command comes in.

The COPY command, as you've probably already guessed, is a command that allows you to make a copy of a file (or a group of files) and have the results stored in the location of your choice. The format of the copy command is as follows:

```
COPY <source> <filename> <target> <unit>
```

The copy command is a fairly complex command that can be used in many different ways. For example, if you wanted to make a COPY of the *Mounted*

disk you can argue that the Amiga's *Mounted* disk is really interesting. It is really interesting because it is simple because it offers you such control over the machine. The term of control that you have available from Workbench, from Workbench you can copy, delete and view files from the disk you can do all that plus view all the files available to Workbench, add custom messages to disks and even receive messages. Now, remembering that and keep reading Workbench... and one day off will be clear.

file and have it written to the *Fixed* disk, you would enter the following:

```
COPY C:\DEVS\MOUNTED\*.*
```

You may have noticed that we haven't actually told the COPY command what filename we would like the file to be stored under. Luckily, the command is fairly intelligent and if you don't specify a filename, it will use the same filename as the source file. In this example, *Mounted*, the code has entered *RAMDISK\MOUNTED* as the destination filename and had the same effect.

If you wanted to, you could have the destination file stored under a different filename to that of the source. For example, if you wanted the destination file to be called *TEXT*, you would enter:

```
COPY C:\DEVS\MOUNTED\*.* TEXT
```

FIN AND GONE

It's actually possible to get rid of files stored on disk. If you plan to do this from Workbench - the one containing disk-drive menus and icons - it's simply a matter of displaying the disk's contents and moving the file or files of your choice into the *Junkie*.

The first problem, of course, is producing a directory of what's on the disk - simple, just insert a disk into the drive and double-click on the disk icon when it appears. A window will pop up displaying the disk's contents. You can now highlight the items you want to be and drag them onto the *trash* icon (this icon should be inside the disk contents window). Easy, right? This operation doesn't erase files completely, it simply removes them from the user directory in storage. To erase files completely - and free space on the disk - it is necessary to click on the *Format* icon in the *Disk* menu (accessed by clicking and holding down the right mouse button). Make sure the trash icon is highlighted before you do this.

Because not all files are displayed when you start to view files from Workbench, it is best to carry out formatting operations from the CUI. By entering the command *DELFRE* followed by a filename it is possible to erase files. For instance,

```
DELTEXT <filename>
```

would remove *filename* from the current directory of the disk. It is possible to erase from other parts of the disk by adding a drive identifier and device information to that of the filename. Thus,

```
DELETE C:\DEVS\MOUNTED\*.*
```

would erase anything from within the *SYSTEM* table on drive C:\.

HOMEWORK TIME AGAIN

Thought you had got off easy this month, didn't you? Well, now that you are able to copy files, display their contents, and then delete them, why not by experimenting with these three commands? Next month we will introduce a couple of our CUI commands and the concept of wildcards.





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Blood Money from Psygnosis

RRP Price £24.99 Format Price £11.95

Amiga only

The ultimate shoot-em-up game where greed is the driving force!

With four planets to conquer and lead and weapons to buy, you must strategically kill monsters along the way to obtain more cash. Money munchers try to steal your money and stationary items cause instant death! Shoot blocks out of your way and open gates with your laser to reach your final enemy and to kill.

"This is arguably the best shoot-em-up on the Amiga to date" ST Amiga Format Issue 11 order code 97021

A Special Compilation for Amiga Owners.

Lombard/RAC Rally and Pioneer Plague from Mordant Software. The RRP for each product is £24.95. But we are offering the two for only £29.99 (a saving of £20!)



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Rallying is rather different from normal racing, and Lombard/RAC Rally features a variety of inclement weather, from fog to night-driving together with three stage types, including an impressive mountain track. The object of the rally's 15 stages



is to win enough to pay for repairs, and keep your car in prime condition. Beating lap-times reaps rewards but wealth can be further increased by entering a quiz game. If you want to race, you must first complete all 15 stages against the clock. You can then complete them all again, but in competition.

Pioneer Plague

The Pioneer Probe Mk IV was created to solve Earth's over-population problems. It runs around finding uninhabited planets and terra-forming

them so that they're ready to be colonised. Sounds like a great idea? It might have been. A genetic defect in the Mk IV means that it no longer creates environmental variety — which is a way of explaining the fact that all of the game's planet surfaces look identical — turning everything into a large slab. With the Mk IV now out of control, it just rules all planet life without testing to see if it's installed.

It's up to you to prevent the spread of the Probe. The Lifesaver will take you around the Universe but the airstrip is your attack vehicle. By selecting a planet with Pioneer Probe in the vicinity, the Lifesaver will whisk you away to a sub-Duclidian space zone. The guide you cruise through here the fewer probes you'll need to total when you get to your colonised planet.

Once a planet has been cleared it's back to the map to select somewhere else. When all planets have been cleared it's over — and better luck next time!

Amiga ONLY
Order Code AM015



HISOFT DEVPAK 1

Unleash the power in your machine - teach yourself the fastest programming language there is with **ST Amiga Format** and **HISOFT!**

If you're at all interested in programming your ST or Amiga, you may have read a lot about the different languages you can get: BASIC, C, Pascal... they're all got their fans, but for sheer speed there's only one choice: programming directly in 68000 Assembly language.

Starting last month, **ST Amiga Format** started a superb tutorial series to show you how to program in Assembly. And the system we've picked to teach you with is HISOFT's **Devpac 1** - widely recognised as one of the best assemblers you can learn on.

There was a real demo version on the cover disk for you to get the feel of, but once you decide to get serious we know you'll want to get hold of the full version.

HERE'S WHAT YOU GET

■ HISOFT 'GENAM'

Full screen mouse-driven integrated editor and assembler for preparing your programs. Once you've typed the code in, a simple click of a mouse assembles your program to a machine code disk file.

For the experienced, your assembler program can include macros, conditional assembly and any ST or Amiga operating system call.

■ HISOFT 'MOHAM'

Monitoring program to help you debug your programs when they go wrong. Inspect and change any memory location, watch your pro-

gram running and spot errors as they happen. Once you're happy with a program, it can be run as a simple standalone (executable) file, just like any commercial program you buy.

■ EXTRA DISK

With a full version of **Devpac 1**, all the library files you need to write any ST or Amiga program, and example files to get you going.

■ COMPREHENSIVE MANUAL

150 page ring-bound documentation with full details of using **Devpac 1**.

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FORMAT LETTERS

SLAPPED WHISTS

I feel severely let down by the first instalment of the 68000 programming series. You clearly place the quality of service to your readers a poor third to the initial interests of your readers and the software companies. We were promised a full development environment on the cover story, which in fact we only got half that. You should NEVER separate a program from its documentation.

Now we have half an example, what are we supposed to do with it? Perhaps the article can help. Article? All we get here is a few pretty pictures and bits and pieces of OMS. Assembly language instruction, and 2177 comments worth of things programmers will already know and beginners will be confused by.

Why not start programming now? suggests an attractive rectangular box. Does anyone in the Format office honestly believe we could start programming with this? Of course not. What we can do is pay £25 for the essential documentation of a non-superseded program, and buy lots more issues of Format.

It seems there are 22 basic instructions for the 68000; in this case cheap trick to keep us. Bring your pockets for the rest we want!

Garth Palmer,
Mansfield, London

Searching through the bulging postbag the bulging postman brings in each day brings its little rewards, the gems of wit and insight others call Format Letters. Write to STUART ANDERTON, 4 Queen Street, Bath BA1 1EJ.

We included language on the disk so that readers could try out the example programs given in the magazine tutorial, and we included enough instructions for you to be able to do that. There didn't seem a lot of point in telling people about assembly programming if they couldn't try out their new found knowledge.

Am I sorry if you weren't impressed with the tutorial disk - we've tried to pitch it at a level the intelligent beginner can understand without having to re-visit the wheel each month.

STUCKY PROBLEM

I have a small but annoying problem - labels. Lots a lot of work on my ST and regularly save documents to disks and so need to change disk labels when saving or copying items. Like now I have

saved this letter to disk. The problem is to remove labels on a 5" 1/4 disk. The labels always come off in tiny blue pieces and I end up covering the disk with a big mass of glue.

Please could you recommend a way to remove disk labels without removing a layer of plastic or ruining the disk.

Yours hopefully with a very chafic look.

Nick Caliphoun,
Silverdale, Leam

I asked Jason our disk expert about this one, but unfortunately they don't let them hear letters were for him so he couldn't help.

NAME, BARR & SERIAL NUMBER

I read David Stevens' letter March 1991 with interest after having used

the Format II high capacity disk formatter (lower disk 44) extensively. I had had no problems of loss of data, so I put the matter to the back of my mind and kept using the laboriously useful formatter. It was when I was reading the excellent Four Second Manual to the Atari ST by Andrew Rance that alarm bells went off. Chapter 4 is about disks, disks down, IDE etc. Page 23 details problems of 'diskcopy number' which were apparently common place in 1987. I got an ST in 1988.

When the ST suggests you have swapped a disk by monitoring the drive with an infrared light it reads the disk's serial number. This should be a random number varying over a large range and is put on the disk at formatting time. If the number is different to that of the disk the ST falls into a bit of a loop, the RAM sections of the new disk are read into memory. Observe the information already held about open directories should still be valid, and the FAT is not read.

All this hinges on the fact that each of your floppy disks has a unique serial number. If not, you run the risk of your starting ST swapping indiscriminately over your precious 100 Word Plus files.

So I experimented. After formatting a few disks with Format II, I checked their serial numbers

Right of Reply

In last month's Format Letters we printed a far old slapping-off of Menace on the ST, in the interests of fair, unbiased presentation, and later we owe a good score, here's what Menace's programmer has to say about it...

Dear Mr Stevens,

I agree with you wholeheartedly that the ST version of Menace is crap. What I advise you to do is sell your ST and buy an Amiga.

As for your comments about the graphics, apart from the 32000 panel they are identical in every way to those on the Amiga.

If you start this and give the Menace disk is any office you like (as long as it's not too painful) all I would do is withdraw them. It's a nasty thing to say about my own game, but true.

The reason for it being so bad is simply the ST's hardware. It has none of the features



of the Amiga version - no better, only 16 colours on screen from a palette of 512, and above all, no hardware scrolling. The last is the most important since this is what takes the majority of the time on the ST. The game runs in just over two frames on a 50 ST. Of this time more than one frame is devoted to scrolling the screen - if this was done in hardware it would take only about one or two scan lines to do this. The rest of the time is devoted to placing the sprites on the screen. This could be done a lot quicker with a better, but

the main deficiency is the hardware scrolling.

Also, on the Amiga version of Menace, the disk played a major role in display is read, it then uses two physical screens in memory, one defined on the other. It's hard to explain but it's a very useful technique if you want to scroll backgrounds, every frame and everything else in less than one frame. This could not possibly be done on an ST with the horrible 5MHz 68000 simply because it takes too much time to move that amount of memory.

If the hardware just can't cope, the game is bound to suffer - that's why my recommendation that you sell your ST and buy an Amiga is a good one. Please don't see me as an ST hater, I do enjoy using and programming the ST in the distant future, but it won't be a game like Grand Money as I think it's almost impossible to do a game like that in any reasonable amount of processor time.

Brian Wilson
Programmer for OMS Design

I may be taking my ill in my hands here, but does anyone out there disagree with Brian?



with a boot sector examine program. Sure enough, all the formatted disks had the same number (1154460).

Also, during my experiments a noticed how slowly these disks were read, probably due to the layout of the 12 sectors on the track. It seems to me that Format 12 is not worth the worry and danger it causes.

My suspicions about all formatting abilities were soon aroused, and read on my label was DOSACC by L. Moring, lower disk, 85. My fears were confirmed; all formatted disks had the serial number 65536.

Of two lower disk, March 88 enhanced your choice of PS soft were however, as the disks it formatted all have different numbers. Also you can format 5, 8 or 10 tracks per track, 40, 80 or 82 tracks per disk, and in fact, 100 or 8M format.

**Barry Frenson,
Wulf, North Humberdale**

LETTER FROM AMERICA

It is interesting to find a magazine that is not interested in the ST-Ampex war. I am tired of the constant arguments of my computer in letters than your computer. I mean, it's like saying my 88 Magazine is bigger than your 88 Magazine, if you get bit by either you get bit will leave a very large hole.

The basic question is, "What do you want to do with the computer?" Who cares which computer is more powerful? Can you that measure that you've got to have bragging rights? Only those people who are worried about their purchase or people who did not take the time to look at the strengths and weaknesses of the machines, before they put down

Rude kids

Why is it that most computer shops employ rude, arrogant, ignorant morons who know nothing about computers?

I saw a typical example in a well known Tottenham Court Road store I was standing in the shop waiting in a queue to be served. There were two sports-bronze (so-called) salespeople waiting serving customers. One had a cigarette hanging out of his mouth, making what might well have been 'The Doctor' if that is not of me was waiting

for my money and my way.

Price is not the only consideration when buying a computer or any piece of equipment. The major consideration is what software can the computer run and does it meet my needs. The idea is to be an educated consumer. Put a person who is helped by advertising hype or someone else's opinion.

I therefore submit your magazine (for a job well done). Buy your magazine through a local IBM computer SHOP COMPUTER GAMES+ and while it is expensive the magazine is well worth the price when compared to USA computer magazines.

**Wille G. Bismark Jr.,
Chicago, USA**

ACE CARD

Only few merely pages of text look at ACE! All those tips make your health water. And only eight

EXPERT ADVICE
ANSWERS TO YOUR QUESTIONS



CALL ME EXTENSIVE, INC.
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ON THE SUBURBS!

to buy a Cambridge 288 (why I don't know). The conversation I heard was this:

MAN: Oh, that's such a small thing.

ACCIDENT: But it's got a lot of bits and bytes for memory.

MRS. PEARCE: What's the difference between a bit and a byte, or what are they meant for? I mean it's so many things and so one seems to know.

ACCIDENT: Oh, yeah, well it's like this, a bit is like a light you know it's like saying what's the difference between the lead and the rhythm in music?

MRS. CH: Yes.

And all the time I was thinking what a waste!

**Angela Bismarck,
London**

reviewed, for every everybody's sake of all the intelligence.
**Martin Groves,
Widham, East Sussex**

It's not a games-only magazine, so of course we have less tips and reviews than ACE, why not get the best of both worlds and buy both?

GOING UP?

I am very interested in programming, but, of course, hacking and have just scored up around 11.20, and wish to upgrade.

But that's where the problems start. I just can't make my mind up what to buy. I have been thinking of another external disk drive, or an extra 50.26 expansion (although I will probably never get to use it), or perhaps even some good software.

You're the experts, what do you think should be the next

upgrading step for me?
**Marvin Rubbers,
Went, Essex**

Which upgrade to go for depends on what you want to use the machine for. Some games require a megabyte, but most do happily from a single drive 4000, so if you want to play, buy some software. For programming how ever a hardware add on comes into its own. Two drives are a real boon, but a RAM drive can be just as effective if you upgrade the memory. Personally though, I just couldn't live with a single floppy drive.

ISLE WAFFLE

I am writing to you as all I can't be bothered to do my number 5000 course, which is nothing on TC. I just finished 18.88 finally a having a nap, if I had time it would be going to sleep me!

Hard fax

In my office we have a fax machine. It would seem to me that here we have a combination of a flatbed scanner, a laser printer and a modem. Would it not be theoretically possible to do the following:

- Produce BIP work at home on my ST and then send the bit down the BT line to the fax machine for a hard copy.
- Scan an image in the fax machine, and send it to my ST?

I say theoretically, because I imagine that in addition to communications software, there would need to be a resident program that is capable of producing recognition signals, and of converting data into the appropriate format. Do the folks know of anything commercially available, or in PD that can handle this?



■ A fax machine or a scanner?

If there is nothing readily available, it would seem to me that here is an area awaiting exploration, as there are an awful lot of fax machines about.

**Kevin A. Moss,
Cardiff**

I own an Atari 520ST computer and a Canon

MX 520 facsimile machine. Is there any way to interface them so I could use the fax's scanner and place records with my computer? If not, can I just interface the scanner?
**Thomas A Murray,
Barnby, Oxon**

Would it be possible via the RS232 port and a modem to communicate with a fax machine? If so how? And what software would do this?
**Simon David Greenway,
Stoke on Trent, Staffs**

interesting idea. Of course the protocol from a fax is of fairly soft quality so I doubt it would be much use as an output device, but as a scanner it has much more potential. As I understand it there are a standard message systems, so it should be possible if any one out there knows how it can be done, please do tell.



How about a series on assembly programming? Also, what processor do PCs and Apple Macs have?

I would like to say thanks for such a readable mag, without which, 16-bit computing would be pointless.

Why are there no female ST users? And if there are I want their phone numbers!

Love and kisses,
**Glen Chester,
Shepperton, Middlesex**

What are you on? Whether it is I want some. Anyway, you'll find the third episode of the assembly language book starts on page 47. As to processors, the original PC used an Intel 8088, but nowadays you'll find 8086, 80286, 80386, and any day now 80486s tucked away in your desk. The Mac uses the good old familiar 68000, and the new ST.

You're too young to have Oswald's phone number, you'll just have to play Teenage Queen instead.

PROTECTION RACKET

Speaking from experience, copy protection schemes implemented by most software companies are just not adequate to stop pirates. Often I say speaking from experience I don't mean I'm a pirate. I mainly analyse the disks, venturing out of game curiosity.

The one company who has done the hard bit says protection is meaningless. Backup copies of their games are very easily made but the manual is needed to

access the game using pictures associated with it for example. David Service has detectors to identify and identify Stealth Fighter but incidentally the best game I have ever played runs afloat: the secret detour from the game, in my opinion, but adds to the fun of it. Prices making copies wouldn't find it feasible to copy the entire manual now would they?

**Fred Broadbent,
Glasgow, Scotland**

Fry, totally agree.

PCX PROBLEMS

Currently using a \$178 expanded Amstrad PC8000 for wordprocessing, I intend to switch over to Protext 4 on the Amiga 500 (ordered to arrive very shortly). However, all the files and information I now have stored on 24 three-inch compact discs... I would like to convert to the Amiga's 3 1/2-inch disk and in a format that Protext can understand.

Microscript does have the facility to make an ASCII file of a particular document, though certain special characters (such as open and closed question marks) do not appear as they should on screen. Is there some way of connecting the two machines together in order that this ASCII file be transferred to the Amiga?

**Mary Fossman,
Leeds, Yorks**

It shouldn't be too difficult to do. You'll need a cable to link the

serial ports of the two machines and some control software to run at both ends. Make sure things like baud rate, parity, etc. are set the same on both machines and let James Kirk at the Amstrad lead.

Another possibility is using one of the many data transfer agencies, who'll do the job for you. One such is Transport Communications on 0225 248215.

LOAD UP ZAK

I am writing to complain (yes, complaint about issue 104) Dick Evans section. It was an utter disgrace. You say that the demo of Zak Mcracken and the Amstrad Mission is playable. Absolute rubbish! All I was able to do was sit back and watch Zak take me on a tour of the game. Please explain your blunder! Was it meant to be some sort of April Fool joke?

**Robert Macdonald,
Seawee, West Glamorgan**

As we explained last month, the playable Zak demo we were expecting to put on the disk turned up after we'd gone to print and was, as you all now know, not playable at all. Factors beyond our control, etc. etc.

SPREAD STAKES

After discussing why the same game on the Amiga often runs more slowly than on the ST, people make much of the slightly lower clock frequency of the Amiga (7.2MHz vs. 8MHz). Is no one considered that a more

significant reason is that the Amiga has 32 colours and hence far less data to manipulate, whereas the ST has only 16 colours and four bitplanes?

It is possible that if both machines only used four bitplanes, the custom graphics chip of the Amiga would more than make up for its slower clock rate. Has anyone ever performed any benchmarks?

**James Subitiff,
Sandbach, Cheshire**

No.

TECHNOLOGY TELLY

I was totally disappointed by the Software Store on the BBC.

At the start I thought it would be about games and all the things you cover but no. They decided to be totally staff and even education software and ODP with a sort of test matching. I think if this is the way the BBC want to show a computer show it's like reading through the papers.

**Robert Brand,
London**

The BBC have consistently failed to produce a show which appeals to the many thousands of computer users across the country. But they do have their own computers: the BBC micro, Model 128 and Acorn/Amstrad 386 aimed to look after, and indeed their own computer mag BBC Active (short, all of which are heavily biased towards education - hence the bias in their programme).

Superheroes, Inc.

by Barker



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4. The order including the voucher must be received by the advertiser before the closing date printed on the voucher.
5. You must fill in the details requested on the voucher.

PERSONAL NIGHTMARE

There's something very strange going on. It's as if you are being intruded on by some nightmare and unable to wake up. Won't anyone tell you it's all the terrible secret that haunts your waking moments.

Personal Nightmare is the new brain child of *Horror House*. A new kind of user-driven, animated game that has been written using the new specialty developed, Agos language.

Personal Nightmare is highly originalizing all the features of the total movie. The superb, fully animated graphics, backed by incredible sound-effects come together with a highly sophisticated user interface to give total involvement of a new dimension.

Personal Nightmare will introduce you to numerous characters including:

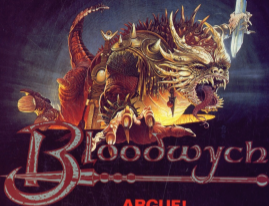
The Lombard of the Pig and Dick
Johnny the Fool and his attractive wife Susan
Alice O'Connellwood

The local village policeman
and a host of other inhabitants who will share in your

delicious adventures.
Available on TRS, PC, and



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As the people of the Bloodwych awake to a new dawn, they find it stranger in their midst - from one of many races he has come. His task: to hunt the demon that lies dormant within the Castle of the Bloodwych.

Utilisation of the Crystals of Bargaia will secure the Behemoths in his lair for all eternity. Should they remain separate, then he shall rise to bring darkness into the world.

This unique role-playing fantasy game allows greater interaction with the environment than has ever been seen before. Argue, barter, negotiate - even lie through your teeth! The fully implemented personalities of all the characters in Bloodwych allows a rich style of role playing that has only been dreamt of.

With one or two player simultaneous mode, this is the game that you've been waiting for. Bloodwych for those that dare!

**ARGUE!
BARTER!
LIE THROUGH
YOUR TEETH!!!**



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