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International edition

The independent Dragon magazine

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How to submit articles

The quality of the material we can publish in
Dragon User each month will, in a very great
extent, depend on the quality of the
documents that you can make with your
Dragon. The Dragon 32 computer was launched
in 1982, but with very poor documentation.

Every one of us who uses a Dragon will be
able to discover new tricks and quips almost
every day. To help other Dragon users keep
up with the speed of the development, each
of us must assume that we made the
discovery first — that means writing it down
and passing it on to others.

Articles which are submitted to Dragon
User for publication should not be more than
3500 words long. All submissions should be
typed. Please leave wide margins and a
double space between each line. Paragraphs
should, wherever possible, be computer
printed (or plain white paper and be accom-
panied by a tape of the program).

We cannot guarantee to return every
submitted article or program, so please keep
a copy. If you want to have your program
returned you must include a stamped,
addressed envelope.

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Save £1.50 off a selection of games and
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Your chance to get into print — Escape,
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Watermark is offering 50 copies of its latest
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Adventure column

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Blair to know how to control the cursor,
use the remote jack as a switch for
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start to your micro — then Brian Cudge is
the person you're after, with his regular
amazing advice

Competition Corner

£250 of software from Microcal is this
month's prize to Gordon Lee's number
puzzle

Editorial

TWO YEARS AGO Dragon Data appeared to be one of the most successful young
British micro companies around. Backed by Mitelco, Dragon appeared from nowhere to
produce a machine with 38K RAM, colour graphics, 15K ROM and a 6809
microprocessor. More importantly, it was available at a time when there were lengthy
delays for Acorn, Sinclair and Commodore machines.

Dragon quickly established a sizeable user base and was stocked by giant retail
chains such as Boots and Deans. Independent software and book publishers soon
provided a plethora of additional products. So, what went wrong?

Dragon's main product — the 32 — though regarded as slightly old-fashioned now,
was extremely competitive at the time it was launched. But, follow-up machines such as
the 64 and the Professional, were a long time in coming. Nevertheless, Commodore's 64
is still selling extremely well and it was launched at around the same time as the Dragon.

Part of Dragon's difficulties undoubtedly stem from the cyclical nature of the micro
business. As much as three quarters of a company's annual sales may be generated in
the three month Christmas period. Dragon, faced with becoming dormant, joined up
production to meet anticipated sales. Consequently, when those sales failed to
materialise, Dragon found itself with a massive cash-flow problem.

Investors of cash from GEC and others kept the company afloat, but the impetus was
lost. Sadly, that impetus was never regained.

Dragon has not, however, disappeared completely. Though it now appears unlikely
that Randy will take over Dragon, a mysterious Spanish company has snapped up
Burnhard SA is now free to take over manufacture of the Dragon 32 and 64
machines. A new company, Touchmaster, is also being set up by ex-Dragon directors
Brian Moore and Richard Madras, to provide Burnhard with sales and software support
in the UK.

Blackburnian Warbler (Empidonax lutescens)

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Ole!

MANUFACTURE of the Dragon 32 and 64 looks certain to move to Spain as negotiations move into the final stages of Dragon Data.

At the time of going to press, Spanish firm Eurohard, set up with the help of the Spanish government specifically to manufacture computers in the Ebro Meduna region (a development area 180 miles south-west of Madrid, close to the Portuguese border) exchanged contracts with Dragon Data to manufacture the Dragon machines. The firm, prior to the receiver being called in, was negotiating with Dragon to obtain a licence to manufacture the machines in Spain.

GEC is planning to market the Dragon in the UK and other sales support will be provided by Touchmaster — a new company made up of ex-Dragon Data employees, headed by ex-managing director Brian Moore, and former marketing director Richard Waldman.

Touchmaster's first project will be the manufacture of a graphics — previewed at the COTD show in May and to be launched at the IFCI show this September.



Touchmaster's graphics

BROTHER has launched a new range of printers for the home computer market. Of interest to Dragon Users is the 14000 impact dot matrix printer which is expected to retail for under £200. The M14000 uses a 9 pin print head, has the full 80 ASCII character set, a graphics set and international characters. The standard interface on the printer is the Centronics parallel, though it is expected that Brother will also manufacture a dual interface (RS232C and Centronics) in the near future.

The printer, which is mains powered, has a print speed of 50 characters per second on normal characters (80 columns, 10 characters per inch). An expanded face (40 columns, 5 characters per inch) and condensed face (132 columns) is also possible. Paper up to a maximum width of 10 inches can be used, and an original plus two copies can be printed at one time. For further details contact Brother at Shopley Street, Guide Bridge, Aulsebrook, Manchester M24 5JD.



Pratch — the high technology investment arm of the Prudential Insurance group, is thought to be the main backer of Touchmaster. The company also had a 49 per cent stake in Dragon Data.

Tanly withdrew from negotiations after its final bid was rejected by the receiver. The company had hoped to acquire the Dragon name and finished goods stock in order to provide support to users.

The formation of Touchmaster and the continuing manufacture of the Dragon is good news for users worried about flagging support for their models. Dragon Data's existing stock of software, utilities and peripherals will be sold by Touchmaster. Brian Moore commented that there should be some good bargains available once plans have been finalised. It is not known how many Dragons are left in stocks nor what will happen to them.

The future of the Dragon Professional and project beta is uncertain. It is also not known whether Touchmaster or Eurohard will take over Dragon Data's existing facilities.

THE FATE of the Dragon Users club hangs in the balance as negotiations get under way between John Richardson formerly of Games and Computers, and David Tomlinson of Cotswold Computers who has expressed an interest in taking over the club.

Several readers have written and phoned Dragon User complaining that the club has cashed cheques and failed to deliver the goods. Computerhouse, which supposedly took over the running of the club (see Dragon User, April) admits that there are a number of outstanding orders and liabilities, but says it didn't take over the club and is therefore not responsible for existing liabilities.

The story is a complicated one. Alan Monaghan of Computerhouse said that a company was set up with the intention of running the Dragon Users club, however, this was never actually done. "We found it impractical to take over the Users club and suggested to John Richardson that he make other deals." Computerhouse then became Computerhouse UK Limited and at present distributes the Pined Piper micro. John Richardson is a director of Computerhouse UK Ltd. He was unavailable for comment, though John Bobill of Computerhouse suggested that all inquiries about outstanding orders should be directed to John at his home address: 48 Gorse Lane, Upton, Poole, Dorset.

Computerhouse has received a number of letters, but maintains that it cannot help anybody as the club is the responsibility of John Richardson and not Computerhouse. John merely happens to work for Computerhouse. "I'd like to see it all settled" said Alan Monaghan, so presumably would Users who have to date been waiting for their money.

No joy for Users club



Club founder John Richardson

Alan assured us that "something is being done" and that part of the deal that John Richardson organises will be that people will get what they ordered. However, David Tomlinson of Cotswold said that any agreement he makes with John Richardson will not involve Cotswold taking over the outstanding liabilities, and he stressed that people should not contact Cotswold about these. "The liabilities are nothing to do with us" he said.

Cotswold is interested in taking over the list of club members, thought to number about 1,800 and to continue to offer discounts to members — possibly in the region of 10 per cent.

Facilities to produce a magazine exist at Cotswold Computers, though David hopes that someone else will be interested in compiling the editorial contents of the magazine should Cotswold begin running the club. Anyone who is interested is asked to contact David at 8 Middle Row, Chipping Norton, Oxfordshire. David added that it would be impossible to undertake the administration of the cassette based magazine Dragonics.

At present negotiations are still under way to find a solution to the problem, and it is suggested that readers do not send any money to the Club until existing orders are honoured.



THE NEWS that Dragon Data in conjunction with GEC, was to launch a Dragon MSX machine prompts the question "What exactly is MSX about?" The short answer is that MSX is about compatibility. MSX is an operating system that allows software and peripherals for one micro to work on others using the MSX standard.

Comparisons can be made with the video trade — any VHS video recorder can be used to play VHS video tapes. Similarly with betamax, a betamax tape will play on any of the many different brands of betamax recorders. Philips tried launching its own video recorder standard — the Philips 2000 around the same time as the VHS and betamax systems were launched. The project failed. Hence the importance of compatibility.

As Dragon owners know (often to their disappointment) Commodore, Spectrum and other software will not run on the Dragon; even the Tandy, with all its similarities to the Dragon, is not software compatible. The result is that hardware specific software has had to be programmed for each individual micro. With the arrival of MSX, all this will change.

September launch

The Japanese are the force behind MSX. Eight Japanese manufacturers — Canon, Hitachi, JVC, Mitsubishi, Sanyo, Sony, Teletex and Toshiba have combined to form a British MSX working group to coordinate the launch of MSX in Britain, and to liaise with software companies in the UK to produce products for MSX. The expected official launch of MSX in Britain is this September, and several British software companies are believed to be releasing software in September/October including a number of companies that produce software for the Dragon, such as Premier Micro Systems, Hewson Consultants, Computer Rentals, Mastertronics and Solo Systems.

The MSX standard has been devised by the American firm Microsoft and a total of 19 manufacturers are said to have acquired a license to produce the machine. The license is not cheap. "It is a rich man's club not a poor man's" said Philip Scollie, Overseas Export Manager of Microsoft (UK & Scandinavia), who refused to specify the exact cost, though it is thought to be in the region of 250,000 US dollars.

GEC was approached by the British MSX working party in May at the GEC/Ex show in Earl's Court, London with a view to joining the group. The license that GEC has acquired from Microsoft to manufacture the micro is understood to be the sole rights to produce MSX in Britain. (The Japanese firms will be importing their versions into Britain.) The company has not yet joined the working party, which is open to all manufacturers of MSX should they wish to join.

Microsoft has set the specifications for MSX hardware and software, though within its guidelines individual manufacturers are at liberty to produce a design of their choosing — provided compatibility is maintained. Thus a floppy disk drive for example will work on a Hitachi micro, as will a

MSX - what now?

GEC Dragon was to launch a MSX machine — what's all the fuss about, by Gordon Ross



Sanyo Light pen and a Yamaha synthesizer.

The broad specifications laid down by Microsoft provide that each of the machines will use a Z80 processor with a 32K ROM including Microsoft Basic and at least 6K RAM. The same TI video chip giving a 40 x 34 text display (256 x 192 graphics resolution) with 16 colours available is used, together with the same TI three-channel sound chip in all versions. Where a disk unit is available as an option, 3 1/2 inch disk drives will run Microsoft's MSX disk operating system, MSX-DOS, which is data compatible with MS-DOS meaning that IBM files can be exported to an MSX machine.

GEC's MSX machine is thought to have 64K RAM, a Z80 processor and a built in 3 1/2 inch disk drive unit. It is not known where the manufacture of the new machine will take place nor if Teletext's, the UK firm set up by ex-GEC Dragon chiefs Brian Moore and Richard Watkinson, will have any part in the operation.

The Microsoft standard is a controversial one. Several software companies are disappointed that the manufacturers have chosen the somewhat elderly Z80 processor. The relatively old technology, however, must be compared with the central concept of MSX. Distributors, small computer dealers and the High Street retail stores are extremely enthusiastic. The demand from them is to stock MSX, solving their merchandising problems. With interchangeability, stores need not worry about compatibility. Further, software companies can cut development costs by producing only one version of a

game and mass marketing it on the various MSX machines. This could lead to a reduction in software prices.

Brian Moore, former managing director of GEC Dragon, spoke at a major conference as far back as April about the dangers to UK manufacturers of MSX. "MSX could well eliminate major sections of the home computer market and comparisons with VHS and video recorders can be readily drawn" said Brian, who estimated that 100,000 to 150,000 units will be available this year. Continuing with his speech, he said that predictions indicated that the Japanese will take 30 to 35 per cent of the home computer market "and that's for a product that hasn't even arrived in this country yet!"

Established business computer companies are thought to have little to fear from MSX. The machines are games oriented and unsuitable for serious use of present. However, though MSX-DOS there is a way to compatibility with the IBM PC and MSX may offer compatibility with business machines in the future.

The probable cost of MSX will be in the region of £250-£300. Derek Madden at Sanyo revealed that Sanyo's MSX machine with 64K user RAM, 32K ROM and 19K video ROM will be retailing for £299.00. The machine, with built-in RS modulator is connected to a light pen, will be launched this September. A 12-month warranty comes with the machine, which can be returned to Sanyo on a prepaid basis through the Post Office within a year. A network of service centres around the country should be in existence after the expiry of the first 12 month warranty.

Derek envisages the launch of several generations of MSX over the next seven or eight years. "This year MSX products will be at entry level" and by late tentatively 1986 he foresees the introduction of a new range of machines with a "superchip" for microcode and video products. "The whole idea of MSX is upgradability" said Derek, saying that the Z80A chip will be totally compatible with any new developments.



Former GEC Dragon director Brian Moore — warnings about MSX

The immediate vision for GEC may not be as bright. Brian Moore commented that GEC was having trouble with component supplies and might wait until the beginning of next year before making its entry into the MSX market.

Whether or not MSX will gain a foothold in this country remains to be seen. The Japanese have chosen Britain as their overseas test market and with a reported advertising campaign of £1 million (by the way, the stage is set for an interesting battle in the home computer arena.)

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giant station run, negotiating a series of station gates and avoiding the trees. The program is a 3D perspective simulation with five runs.



Keys of Roth

An adventure in search of the keys, you must use your powers of deduction and determination to overcome the mysteries of the caverns. Orcs, trolls and the giant Jub-jub are out to stop you in your quest.

winds to be taken into account.

Laser Racer

Designed by Martin software for Computer Rentals, Laser Racer puts you inside a huge computer. As the driver of a space-age laser racer, it is up to you to reach the computer's central processor and destroy it. Joystick or keyboard control.



St George and the Dragons

Slippery bridges and fire-breathing Dragons impede your progress as you attempt to steal the fabled magic stone and lift the curse from the castle and its readers. Musical interludes accompany your failures. Joystick or keyboard control.



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FACTS, FOLKS

During the last few years we have produced or licenced lots of software for the 6800 microprocessor. Most of the software has been advertised or reviewed at one time or another, but never all together — there was too much to say about each product. This month we are giving the "blurb" a rest and just printing a list of most of the software available from Compusense. If you want further details, write to us direct.

DRAGON/TANDY Software

	Cassette	Disk	Type
EDIT + (includes HI-RES)	34.95	34.00	misc
HI-RES	26.50	n/a	misc
DASIMACROM	30.45	15.95	misc
DASIM	15.95	n/a	misc
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DeSim Source Programs — Program + Source code for DeSim.

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Vol 1. Disassembler	5.99
Vol 2. Name of life	5.99
Vol 3. Binary Search Dump	5.99
Vol 4. Database Screen Dump	5.99
All four Volumes	14.95

Postage on above software — 50p per order.

TANDY COLOR versions are available — but enquire first please!

Books and entries

6800 Assembly Language — Lavettine	15.95 + 1.95 p&h
Programming the 6800 — Zeln	12.50 + 1.95 p&h
Introducing Dragonmac — Senior	1.95 + 0.50 p&h
Advanced WordGraphics — Shain	5.95 + 0.50 p&h
Dragon mac — Jones/Cowell	8.95 + 0.50 p&h

*These books contain DASIMACROM examples.

Monitor/Screen test	4.95 incl p&h
Dragon/Dual Cover	2.00 incl p&h
Dynapast test	14.95 incl p&h
DRAGON Disk drives	Enquire for prices

DASIMACROM, EDIT + are available from larger branches.



FLEX/6800 Disk Software

FLEX is available on a number of hardware systems including the DRAGON and TANDY COLOR COMPUTER. All the software shown here is fully compatible with these systems. More to follow soon!

Flex Operating Systems, EditAim for DRAGON	88.25
Flex Advanced Manager	11.50
TSC DBASIC package	74.75
TSC BASIC/comp compiler	61.75
TSC LIBRARY	74.75
TSC PASCAL	258.00
Super Search Disassembler (flex/6800) + source	97.75
Super Search Macro Sets	61.75
6800 Simulator + source	97.95
6800 Translator + source	97.95
6800 structured programming macros	49.25
OTYMACAL FLEX	112.50
COROL Compiler	115.00
OTYMACAL flex disassembler COMP.	112.50
Intel 'C' compiler (later	439.25
also available for IBM PC and LINUX based microcomputers)	
Lambert Pascal	500.00
Lambert C++	11.50
Lambert Crystal CPM replacements	38.75
System/Soft (DRAGON only)	175.50
OTYMACAL	47.45
OTYMACAL spelling checker	58.95
OTYMACAL PASCAL + system source	500.44
OTYMACAL 'C' compiler	58.94
Winchuck MACAL	35.20
Winchuck 'C' Compiler + link loader	188.75

Flex Operating System	40.25
TSC Editor + assembler	61.75
TSC BASIC/comp compiler	105.80
TSC BASIC/comp package	74.75
TSC TextProcessor	74.75
TSC Relocating Assembler/link loader	175.50
Super Search Disassembler (flex/6800) + source	97.75
6800 Simulator + source	97.95
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TSC 6800 Cross assembler	387.50
OTYMACAL 6800 disassembler	125.50
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Locusts Printer	11.50
Stylog 486 v20	265.00
DYNACAL 164 word processor	57.45
DYNACAL 164 DTP/FORM	114.85
DYNACAL PASCAL	68.94
6800C Compiler	218.50
Winchuck MACAL	40.70
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*** Some of the software above is also available for OS9 — enquire! ***
Sales and demonstrations by appointment.



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No smoking on tubeway

John Scriven surveys the software scene

AT THIS time of the year many people go through a very strange personality change. Instead of getting up at the usual time and going to work in a normal fashion, they suddenly jet off to foreign parts, leap around in a most undignified manner, get slung by jelly fish, stand on sea urchins, eat food that gives them Delia Dally or Montezuma's Revenge, and come back suffering from mild sunstroke — all in the name of "enjoying the holidays". It's hardly a good time for slaving away over a hot computer — in fact, the weather last summer was one reason given for Dragon Data's early problems. Software writers have obviously been working at top speed to put their products on the market before they too, slide into their cars and zoom off for a week at Baffins or wherever it is they go.

Strident sounds

There is therefore a great number of programs out at this time of the year, although I would think it unlikely that many will be sold before September is through. There are some new names in this month's collection, which is encouraging, and some new ideas in the programs themselves, which makes my task more interesting. Something tells me, however, that I should invest in a set of ear plugs if the accompanying sound tracks become more strident.

The last thing **Mission ER1** from J. Montrose Mirros suffers from is a quiet opening. As the title pages tell, the familiar strains of "Thus Spake Zarathustra" (inexplicable to fans of 20th AD and certain razor advert) ring out in multi-part harmony. A mother ship appears at the top of the screen, and you steer your tiny craft from this down to a landing pad on the surface of the planet Zephyr. Progress is hampered by clouds of what was once the moon of Zephyr circling the planet, although it is possible to blast them out of the way with a laser cannon.

If you survive the landing, much-needed fuel is drawn up from the planet and you have now to transfer it safely to the mother ship, once again avoiding the pieces of rock.

The game is well-written, and appears quite spectacular the first few times it is played. I found that the music became irritating after this, and it wasn't possible to turn it off. (Lowering the volume on the TV naturally kills the more useful sound effects as well.) The game itself does not seem to progress anywhere, and although the asteroid belt becomes thicker as you

play on, there are no continuing parts to play. I would agree that there are many other programs that are no more complicated and are very popular, but for me I'm afraid there was no magic. If, however, you want a thrilling rendition of space music, I'm sure Richard Strauss himself would approve of the sound track.

Beam Rider from Microdeal is yet another US import that originates from Special Associates. The screen is covered by more than a hundred little blocks arranged in rows. Steering a "beam", you destroy the blocks by running over them. The speed at which you move is determined by whether there are any blocks in the direction in which you are moving. If there are, a beam shoots out and pulls you towards the block. Nothing could be that simple, however, and there are odd little problems like *Spinners* and *Chasers* that follow you around, just waiting till your attention slips.

If you manage to clear a screen before losing three men, another screen appears with the blocks arranged differently. The scoring system and rules for play are a little complicated, but soon acquired, and although the graphics are rather abstract, the game is fairly addictive. If you like *Goldrunner*, then this will certainly appeal to you, and is worth looking at.

A couple of months back I looked at the first of the Horace series of software to appear on the Dragon, *Hungry Horace*. This month I received the latest iteration from a Spectrum original, **Horace Goes Biking** from Multimedia House.

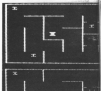
Kamikazi attack

In this program, the object is to steer Horace (with £40 in his pockets) across a busy road to a ski shop where he can hire his equipment, then back through the traffic to the other side before he can start out on the slope. The road is fairly quiet at the start, but soon reaches rush hour conditions, and it's easy to end up on the wrong side of a juggernaut or one of the kamikazi motorcyclists that appears from out of nowhere. If this happens, you will have to pay out £10 for the ambulance, leaving you with less for ski hire.

Assuming that you manage to acquire your skis and return to the top of the screen, you can now help Horace to speed down the Harrogate station course. There are an obvious hazard to avoid if you value your skis, and there are the station poles to steer between if you want to gain points. The display scrolls up, as Horace remains in the centre of the screen, and control is



Synthesised sounds accompany you on your flight.



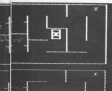
Avoid the nasties by switching mazes in *Quabber*.



Unfazed, Horace Peeps across the juggernaut traffic.



by Larry Jolly



by Larry Jolly

achieved by either joystick or keyboard.

If you complete the course, there is another plot to follow—but of course, it has to be on the opposite side of yet another busy road. As you reach higher levels, it's harder keeping a true course, and there are even mounds—those mounds of snow caused by everyone following the same track on their parallel turns. Hit one of these awkwardly and the track leap out to greet you!

Happy Horace

Horace games seem to translate well for the Dragon, and this is no exception. Presumably, we shall soon see Horace versus the Spiders on our screens as well. Hungry Horace is a sort of up-market Pacman, and in some ways, Horace Goes Fishing is reminiscent of Frogger, although the graphics are much better. Not quite as much fun as Hungry Horace, but better than average.

Beau Jolly, now marketing Imagine's existing stock, has an offering entitled *Cosmic Cruiser* which promises great things as it loads. A highly detailed graphic design of an astronaut appears as the main program enters the machine. The cassette insert is also dripping with information about the wonderful facilities that Imagine offer, sorry, used to offer their programmers, and goes into more detail about the writer than I've seen before, complete with life history and trendy photograph.

After this rapturous introduction, what of the product itself? The theme is fairly original—you are in charge of rescuing crewmen from a space station at the top of the screen and have to transport them to the safety of your cosmic cruiser. The graphics are quite detailed and the characters are reasonably life-like. All the while, the space station rotates at the top, occasionally revealing doors that can be shot open with a laser cannon from the base of the screen. As the spacecraft appears, they can be collected and guided to safety.

You can choose to use either the keyboard or joystick to control the main spaceship, or "Taco" as he is called in the notes, and his movement is slow and ponderous, as if there really is low gravity. If you choose joystick you will find that you have to use them upside down. If you use normal sticks there is no problem, but if you have the Spaceinvaders type, you will have a little difficulty.

My first impressions were of imitation, as the instructions are rather long-winded, but once you grasp the general idea, the game improves considerably and is quite lively when the aliens start to appear. I still don't feel it lives up to the impressions on the cassette insert, although the screen shots are a good idea. With clearer instructions, the program would be worth a closer look.

As usual, Microdeal has produced even more since this month. *Mr Dig* shows influences from several other games, combined in a new format. The screen shows a tunnel underground, viewed from the side. Buried in the earth are various utility objects, including cherries and apples. The cherries are what Mr Dig is after, and the

apples can be pushed along to squash anything in their path. Just to annoy you, there are several Measles who are out to spoil your fun. You can run from them, fire a Power Orb in their general direction, or use the ultimate deterrent—drop an apple on their heads.

There are a few other dimensions, such as Letter Monsters who enable you to increase the number of your space men, and the odd diamond that grows in the middle of the apples. This is clearly designed for quiet, non-aggressive children of less than 11, who will doubtless turn their noses up at it, while their parents love it. At some times it resembles Pacman with you digging your own maze, and at others, a sort of truly version of Pengo. Not a game to get too excited about, but well worth the standard £5.

A game that has given me a lot of pleasure this month is *Toughstene*, again from Microdeal. This is a graphic adventure for one or two players, and involves finding your way along a sideways scrolling maze collecting various treasures along the way. The adventure is presumably set in a pyramid as the documentation mentions Ankhs and the god Ra.

There are several unpleasant creatures that inhabit the maze, such as snakes, spiders and butterflies, but the fire button sends a shining glance from your eyes (thanks to Ra) to destroy them. Some locations are harder than others, such as Doom Chambers that take you across parts of the maze. Some have rather weird names, like the infamous Poof Chamber, however modesty prevents me from making any comments about this!

I enjoyed this game a lot, and would recommend it to anyone who likes adventures but finds text versions rather heavy going. You need arcade fingers as well as clear thinking to be successful. As you dash through the tunnels pursued by evil monsters, this program may make you feel like Indiana Jones, which makes me wonder when someone will produce a Dragon game based on *Raiders of the Lost Ark* or *The Temple of Doom* .

Doomlaid

Another adventure that uses graphics, although not in the same way, is *Castle of Doom* from Paramount Software. This is basically a text adventure that uses graphics to show a 3-D view of the location, usually a corridor with doors on either side and occasional objects such as chairs, tables and windows. In this adventure, you are the "chosen one" who has the mission of finding the dreaded Count Doom and destroying him. There is less tongue-in-cheek amusement than in Richard Shaper's *Transylvanian Tower*, and until you have the knack, the first stage is difficult to leave. The vampire's house consists of 27 locations, and the aim is to leave this and reach Doom Town. This has 38 locations, and is completed by *Castle Doom* itself, with a further 27 rooms.

Instructions follow the usual Verb-Noun format of most adventure programs, such as "Take gargoyle" or "Open door", and ■

■ There is the useful addition of command "look", which gives you a list of sound clues, so it is important to use the command "listen" when you think something may be heard. As usual, "inventory" gives you a list of the things you are carrying at any particular time, "score" tells you how you are doing, and "look" rediscovers the location so you can see where you are.

In some adventure games, once you have solved the mystery, there is little point in replaying the adventure. In this game, the objects that can assist you are scattered throughout the system of locations. This gives it a certain edge over predictable adventure games, although it is lacking in surprises and much funnier. If you are a serious adventure fiend, then you may like this program, although I found it rather dry after other adventures.

Damsel in distress

What's wrapped in cloggies and twigs from the coils of Paris? It pains me to tell you that the answer is "The Lureback of Notre Dame". If you have the kindness to forgive me that apology for a joke, and have had your eyes open in arcades recently, you will have noticed that for some reason, the exploits of a crippled Frenchman two centuries ago have proved fascinating to many people. Charles Laughton starred in a cult movie many years ago, and the story found its way to the arcades about a year back. *Lureback* is a popular game in which you take on the role of the unfortunate tale-bearer as he swings his way far above the roof-tops of Paris attempting to rescue his doomed love, Esmeralda.

This game is brought to you by two fine firms, Ocean Software with *Handicapped* and Cable Software with *Quasimodo*. After spending several business hours with each, the conclusion I've come to is that both are worthy of consideration as a reasonable version of a difficult arcade game. They both have their good points, as well as their more irritating features, and I can't honestly say that one is better than the other.

I found *Handicapped* closer to the arcade game and with rather more detail in the graphics, but *Quasimodo* is easier to play in the early stages. I would have thought a voice moaning "The bells! The bells!" would have provided a good soundtrack, but *Handicapped* has musical touches — something like the Teddy Bears' Picnic hat to be batted briefly each time you play, and a sort of soft, squealing sound emanates from the TV speaker as the handicapped lurches across the screen.

For what it's worth, this title caused me more frustration as I failed to climb over the towers of Notre Dame for the umpteenth time, but the frantic movements as I struggled to avoid the arrows in *Quasimodo* totally destroyed my favourite Spectravision joystick, which went up to the pounding involved in the game.

The object in both programs is to overcome apparently insurmountable objects such as battlements and moats to reach Esmeralda and take her to safety. On the way, you may encounter such problems as

floating islands, flaming arrows, and so on, each involving its own special means of escape. If you have extreme patience after these games it is likely to give you a bit of fun as well as a pile of broken joysticks.

Horse Goes Biting £5.95	Melbourne House Castle Yard House Castle Yard Richmond TW9 1EP
Mission XX1 £3.95	J. Marston Morris 2-Glenade Street Leeds LS2 5JJ
Beam Rider Mr Dig Touchdown Grabber £3	Microdeal 41 Trow Rd St Austell Cornwall
Cosmic Cruiser £3.50	Beau Jolly 116 New Broadway Basing, London W5
Castle of Doom £5.95	Paragon 49 Westwood Lane Bloxham-on-Tees Cleveland TS16 9PU
Handicapped £3.95	Ocean Software Ocean House 8 Central Street Manchester M2 5NS
Supertown Quasimodo £3.95 (casualty) £3.95 (hire)	Cable Software PSL Marketing 50 Linsbury Road Luton Bedd LU2 3PL



Go get 'em, Floyd!

Bug Diver £1.99	Masterton 48 George Street London W1
Mission Moonbase £5.99	Phoenix Software 112 Marsh Road Pinner Middlesex
Taberna Army £1.95	Crysal Computing 120 Smethley Road Chesham Buckinghamshire MK8 7JG
Hilltop £3.95	Cool Software 64 Prince Street Puchside Lancs

A game from Microdeal that has some quite original touches is *Grabber*. This is a maze pursuit with a difference — there are two mazes on screen at one time, and you appear as a figure on one maze. Pressing the fire button on the joystick sends you

to swap between them. The object is to grab treasures, shown on each maze, and transport them to the centre while avoiding monsters who pursue you. If they are uncomfortably close, you can beam across to the other maze and continue the game there.

Unlike Captain Kirk and Mr Spock, who always avoided beaming down in the middle of a piece of furniture, you can find yourself on top of a monster in the parallel maze which tends to prove rather lethal. Although this is hardly more than a double version of Pacman complete with a type of power pill, it has the makings of an addictive game — it is quite easy to begin, but rapidly becomes a considerable challenge to remain alive on both screens.

Masterton has made the headlines recently, selling inexpensive software, (price £1.99 each) and *Bug Diver* is the first Dragon program from its 199 series. In this game you dive from a little boat that speeds across the top of the screen. As the bottom you have the task of collecting bugs and swimming with them to the boat, which will gain you points. Fish swimming from both sides with their mouths open try to gulp at you if you get within their range.

Although the game is rather ordinary, with a few mistakes on the packaging — for example, "enter LOAD" rather than CLOAD — *Masterton* is to be commended in bringing prices down to pocket money rather than birthday present level.

Cable Software, who are responsible for some of the pile of shattered joysticks outside Notre Dame cathedral, have coaxed the Atlantic (its month to bring us the first version of American football for the Dragon). In *Supertown*, which is apparently entered by the newly-formed Luton team, the Flyers, you control someone called Floyd, seen from above as he hurls up the screen. The teams involved are the Washington Redskins and the Dallas Cowboys, and the object is to steer Floyd round the opposing team as the screen scrolls downwards.

Fancy footwork

It seems quite difficult to achieve just the peddled figures as they hurt you to the ground once more, and the play never seems to be reversed, but maybe things change if you can ever get near the posts at the other end of the field. This is not a game that had much appeal to me, but with Channel Four coverage, and sixty teams being formed into a league, this is bound to find some ardent fans before long.

Mission Moonbase is another twin-screen game from Phoenix Software, and follows on from *Death Mines of Sirius* and *The Emperor Must Die*. One cassette contains the action game, where you have to control a marauding huggie across a rough surface while avoiding Sagan riders that buzz along above you. These can be removed by a double firing laser, but potholes must be kept to stay in the game.

Occasionally you receive progress reports on the screen, and if you reach the base, you will be given the code necessary for the second, adventure part of the



Seizing over the burning pits is the venue in Hunchback

game. There is no way you can die into this section without the code, but sufferers from arthritis and joystick wiggles' cramp may find benefit in the fact that Phoenix supply an emergency phone number where you can obtain the code in times of desperation.

Gary Huxman's original group of robotic musicians went by the name of **Tubeway Army**, but in Dragon circles, this is the name given to a game from Crystal Computing. On loading, it appears to be yet

another version of Scurmble. It is, however, one of the best versions, and seems to have all the features of the arcade game.

Initially, you fly your craft across a sideways scrolling landscape avoiding rockets while bombing fuel dumps. As you reach the cave system, steering becomes more critical, and you soon have to face swarms of the enemy coming towards you. If you steer past these and negotiate the Wall and the final narrow tunnel, you are faced with destroying the base before

starting again. There is some synthesized speech to accompany you on your journey and if you don't yet have a version of Scurmble, Tubeway Army is to be recommended.

Design utility

The first program I've looked at is a graphics design utility from Orion Software called Hfiles. Although the Dragon has a good set of Basic commands, it is easier to use a program like this to produce good drawings and these can then be used in your own programs. More useful are probably those machine-code utilities that enable you to use new graphics keywords in Basic, but this sort of program is a good start. Dragon Data produced a similar program back in 1982, but joystick control was very difficult. Hfiles is a lot easier to use and can produce boxes, circles, borders and repeated shapes over the screen. The price is reasonable at £3.95.

If I can drag myself away from the keyboard this month, I might even join the crowds on their way to the sun. As I lie on some distant shore I shall contemplate a world without aliens, buzzards, gorillas, Cuthbert, Horace and all their electronic friends. After a few months of varied software in large quantities, it is noticeable that the supply is starting to dry up. One hopes that this is not a pattern for the future, and that users will not be starved of Dragon fodder when they return to their monitors.

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Daisywheel or dot-matrix?

Iolo ap Gwynn compares the Shinya CP60 printer with the Smith-Corona TP-1

ONE OF THE ways in which the Dragon can be very useful is as a word processor — probably the only services use to which many owners will ever put their machine. Many suitable packages have appeared on the market for this purpose; the Dragon Super Writer 2 probably being one of the most versatile, and the only one which can be considered for serious use on the 32 because it overcomes the machine's inherently slow keyboard response as well as giving an auto-repeat facility.

To complement word processing packages a good printer is needed in order to produce hard copies of your works of literary genius. A choice exists between dot-matrix machines, which have a large choice of characters and print sizes as well as the possibility of printing graphics screen dumps, but whose print quality is

for lead is an optional extra), has a limited character set, and only prints at a speed of 120CPS. The same full A4 page of text takes about 7 minutes to be printed on this machine. I will now examine these machines in more detail.

First the Shinya CP60. This is slightly more expensive than the Sekosha, but it does have features which are essential for use with any word processing package, such as the ability to use ordinary paper in tractor feed mode as well as the usual perforated printer paper in the tractor mode. This printer is different from many other dot-matrix machines in that its pins are of square rather than round section. This means that the letters are printed thicker than with other printers giving an effect which is most acceptable and is definitely of "almost letter quality".

inch, but is software switchable to any setting in increments of either 1/8 of an inch or 1/16. It is also capable of producing three carbon copies when printing.

The standard interface is the Centronics parallel which can be linked directly to the Dragon — using it with the Dragon presented no problems whatsoever. (For owners of other models an RS232C serial interface is available as an optional extra.) A cartridge containing a carbon ribbon is supplied with the machine and this lasts a surprisingly long time. Replacements cost about £5, but I am sure an enterprising owner could easily reload the cartridge as it is not sealed. Print head life is quoted as 35 million characters. I find trying to estimate what this means in practical terms rather difficult, but get the feeling it will take me a long time to reach it — at least I hope that is the case!

The operation manual supplied with the printer is reasonably well written, although some parts have suffered somewhat in translation from the original Japanese. Some information for machine code use would however have been useful at times.

It took me a while to sort out how to get the bit image mode to work properly. Reference to an Epson manual helped as the commands and control codes seem to be similar to those used in that machine. Needless to say it copes well with the listing of programs, the option of having the zero with or without a line through it being available according to the user's choice. Even without this, there is a noticeable difference between the zero and the "O". It also has available the "C" as ASCII 120 without the loss of the back, as happens on a substantial number of other printers.

The other use to which the printer can be put is to produce a hard copy of the graphics screen, be they graphs or other drawings. The CP60 allows for the printing of graphics by means of its "Bit Image Mode" of operation. This allows the print-



From left to right, the Smith-Corona TP-1 and the Shinya CP60 printers

ing "almost letter quality" print and the Smith-Corona TP-1, a daisywheel printer.

Where the Shinya, as any dot-matrix printer, scores over the Smith-Corona is in its versatility and speed. Its standard specification the Shinya can handle both tractor choices in the edges paper and fiction feed (like an ordinary typewriter), a full range of dot-matrix characters including the possibility of defining your own, (invited you are good at machine code programming), as well as having graphics dumps, and a printing speed of 80CPS. This speed means it will print a full A4 page of text in about 10 seconds. The daisywheel on the otherhand, while giving an excellent print quality, can only handle fiction feed (mas-

Examples of its character print set are given in Figure 1, printed in some of the various print sizes and fonts available. It is obvious from examining this list that this printer can cope with all the possible needs of a word processor and more. The character set available includes normal and italic characters as well as a set of semi-graphic characters and a set of playing card symbols. Its printing speed of 80 CPS or 640 dots/line/second is more than adequate. The normal line width maximum is 640 dots but in the compressed mode it will give 1,280 dots over the 100mm width of the line. The maximum width of paper which can be used is 26.6mm or 10 inches. Line spacing is normally set at 1/6 of an

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100 FORI=5H7E41 TO 5H7E43
110 POKI I,5H12
120 NEXT
130 POKI5H7F1A,5H00
140 POKI5H7F1F,5H00

```

Listing 2: modification of the original routine



Figure 2: graphics screen

Full character set for Smith-Corona TP-1

```

!"#$%&'()*+,-./0123456789:; = ?@ABCDEFGHIJKLMNPQRSTUWXYZ[ _`abcdefghijklmnopqrstuvwxyz

```

Figure 3: full character set for the Corona TP-1 daisywheel printer

be controlled manually to five different settings. This enables sufficient pressure to be exerted for producing several carbon copies or for clear typing on to duplicator slabs. The specification of this printer would seem to be up to the requirements of a business user and is very well made, if a little noisy.

Deciding which of these two printers to

use depends very much on the use to which they are to be put. Straightforward word processing and nothing else would suggest the daisywheel if high quality printing is required. However, if any program development work is done, rapid printing of reasonable quality is needed, or if graphics dumping is expected, then the Shirova would cope adequately.

If the physical size of the printer is a consideration then the Smith-Corona TP-1 (made in the United States) is about four times the size of the Shirova (made in Japan). Both machines have been designed to do different jobs, both do them well and bring quality printers down to a price many home users would be prepared to consider. ■

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Shards' diary

Gordon Ross tracks the movements of adventurers Shards software



CLQADM ... and enter the world of Shards software, the family entertainment specialists. With 18 games under its belt, including the best-selling *Petrigrews Diary*, Shards is the third largest producer of Dragon software — following on the heels of Salamander and Microdeal.

The man behind the mysterious adventures and founder of the Shards empire is managing director, Stephen Miller. His interest in programming stems from a competition he won in 1980 to rank 10 different business computers in order of preference. Stephen won a Superbrain micro, a date of champagne and the opportunity to take time off from his job as a Systems Analyst with Banger Paint to write programs.

Early days

The Superbrain gave Stephen an appreciation of micros in general and, in the summer of 1982 he purchased a Dragon 32. His first programs appeared four months later competing for his attention with a blaring TV set and a noisy child.

In September of 1982 Stephen approached Dragon Data at the Personal Computer World exhibition and asked them to look at two of his programs. The response was less than enthusiastic — they lost his tapes twice. Nevertheless, Stephen persevered with his programming and the two games that Dragon Data ignored later turned up on Shards Fun and Games tape — a compendium of 18 games for children's parties.

A two-centimetre high classified advertisement in a well known popular computer weekly magazine was the first indication that Shards was on the go. For almost a year Stephen ran Shards as a mail order venture. In June of 1983 he gave up his job to run Shards full-time, and took on two staff to help with the packaging and processing of the mail-order business.

One of the first successfully marketed adventures that directly hit on the Dragon was one that Stephen actually wrote on the Superbrain and converted to the Dragon — *Empire*. At the start of the game the world is shown as consisting of 32 neutral blocks to be divided up between the player, the Dragon (Empire) and neutral countries. Having allocated your forces the idea is to strengthen your hold on the world, forcing the opposing forces into submission.

This was followed shortly afterwards by the release of Shards most popular adventure, *Petrigrews Diary*, which has sold upwards of 10,000 copies. The adventure is in three chapters, each being an adven-

ture in its own right and loading separately. Close gained in each section, however, are essential to the following part. The first part takes place in a burning farmhouse — you have to extract vital clues to escape the flames and continue to the second part of the quest in London, collecting more clues and outwitting a clock taking away at the top of the screen. Finally, the last stage of the adventure takes you around Europe, placing various puzzles together in order to successfully end the search.

The triumph of *Petrigrews* has led to a series of new releases over the last year and a half, including *Puzzle* (a computer simulated jigsaw puzzle); *Mystery of the Java Star* (a four part "educational" adventure which has you searching for the fabled ruby); *North Sea Oil* (a simulation program that puts you in the role of Offshore Installation Manager in charge of a drilling rig); *Shrap* (a sound utility program with accompanying 30 page booklet) and most recently *Operation Saturn*, the "prequel" to *Petrigrews Diary*.



The man at the top — Stephen Miller

Most of these titles have had only limited sales success, averaging approximately 2,000 sales per title. Thus, the recent collapse of Dragon Data couldn't have happened at a worse time for Shards, coming as it did when sales are traditionally low over the whole spectrum of the micro industry.

As a result, many shops are reducing prices, notably Boots and Cussons, in a bid to get off unwanted stock. And, according to Stephen, since Dragon's collapse Shards has had trouble in getting its new stock into the hands of distributors and retail outlets leading to a fall in revenue and rise in the importance of mail order — a situation that sees Shards going back to its original position.

Operation Saturn for example, has had very disappointing sales, although Stephen believes it to be a better adver-

ture than *Petrigrews Diary*. "The public believes that it is all plain sailing," said Stephen, "yet if they saw that companies were in trouble they would support them." Stephen said that recent titles that Shards has been working on have had to be shelved. This includes *Time Travelling*, an adventure written entirely in graphics, incorporating a split utility in the program, and Shards major project for 1984 which was to have been an educational adventure, using music, graphics and coming complete with books and instructions.

Shards has put its faith in the family market. Stephen believes that it is preferable to have several members of a family or group playing and discussing an interesting adventure, rather than seeing a single person blasting away, zapping aliens, and hogging the TV set in isolation, says Stephen, families are less likely to pirate tapes.

Hard in hand with this goes the belief that more adults will join in the playing of adventure-type games. "My philosophy is that the market will change — we are aiming at families and mature audiences now, so that when the market does change we will be in a strong position."

The ideal micro

All present Shards employs five full-time staff and several part-time programmers, "most of whom are 20 year old men with two children" says Stephen, belying the wizened old image of the industry. It takes about three months to write an adventure, according to Stephen, who says that an original idea and sound technique are the two most important facets of an adventure. Stephen, who does most of the programming for the Dragon — his other staff members are mostly concerned with writing adventures for the Commodore 64 and Spectrum — claims that the Dragon "with its amazingly powerful Basic is the ideal micro for the programmer." Indeed it's only lately that Shards has diversified away from the Dragon, Stephen believing that the road to the future depends on small companies specialising in one area — such as adventures, rather than producing software for one particular micro.

Although the immediate outlook is gloomy, this is not necessarily the end of Shards' associations with the Dragon. Recently several people have approached Shards with the possibility of developing adventures on the Dragon. Come October the time for decision making and the launch of new products will begin. Only then will a decision be taken on whether or not to continue with the Dragon. ■

In search of excellence

Microdeal consultant, Chas Robertson of NSC, brings his programming skills into your home with his strategy game, Nimbo



If only I looked like Colfetti! — Chas Robertson's logo for Tom Mox Software

NIMBO IS A GAME of skill and strategy which has you pitting your wits against the Dragon in order to see who is forced to take the last square from the board. Full instructions are contained in the program, which was written by Chas Robertson of Northern Software Consultants, best known for the work he does for Microdeal.

Chas, a chartered engineer, began working for Microdeal two years ago, at about the same time that he set up his own consultancy company, his largest customer is Microdeal for whom he does all the

Tandy to Dragon conversions from tapes received from Tandy in America. He also has the job of converting Dragon tapes to the Color Computer.

Converting a Tandy tape to the Dragon is not an easy process says Chas, "We only get the finished program not the source files, so we have to disassemble it, examine the contents, locate the areas that need changing, make the changes and check to see if they work." It is a long process which requires continual checking and source checking.



Chas — on the hotline

Chas's other major project for the Dragon involved the design of the software key or "dongle" that Microdeal launched with Buzzard Mail in order to combat piracy.

Besides his work for Microdeal and the Dragon, Chas has also worked on graphic designs for the Commodore 64, 280 and Color Computer. He has a pool of four specialists who he can contract work out to, and will undertake a wide spectrum of projects, from electronics design to adding finishing touches to software. ■

```

80 CLEAR2000
90 DIM A(15), B(15):T=15
100 FOR X= 1 TO 15
110 READ A(X)
120 NEXT X
130 FOR X= 1 TO 3:READ B(X):NEXT X
140 FOR X= 1 TO 3:READ C(X):NEXT X
150 GOSUB 1070
160 CLS:GOSUB 670
170 REM HUMANS MOVE
180 PRINT# 448,"REMOVE HOW MANY DO
200 IF H<1 OR H>3 THEN PRINT#448,"S
210 IF H>T THEN 180
220 FOR S=1 TO H
230 PRINT#448,STRING$(32,143);
240 PRINT# 448," BOX #":X;
250 INPUT H(X)
260 IF H(X)>15 OR H(X)<1 THEN 240
270 IF B(H(X))=0 THEN GOSUB 400:G0
280 B(H(X))=0
290 NEXT X
300 FOR X= 1 TO H
310 SOUND 200,1
320 PRINT# A(H(X)),B;
330 PRINT# A(H(X))+32,E4;
340 FOR Y=1 TO 500:NEXT Y
350 NEXT X
360 T=T-H
370 PE="HUMAN"
380 GOTO 870
390 REM INVALID CHOICE
400 PRINT#448,"THAT BOX WAS REMOVE
410 FOR Y= 1 TO 1500:NEXT Y
420 PRINT#448, STRING$(26,143);
430 RETURN
440 REM COMPUTERS MOVE
450 PRINT#448,"My turn"
```

```

440 FOR X=1 TO 1000:NEXT X
470 IF T=15 THEN H=2
480 IF T=13 OR T=9 OR T=5 THEN H=1
490 IF T=14 OR T=10 OR T=6 THEN H=
1
500 IF T=12 OR T=8 OR T=4 THEN H=3
510 IF T=11 OR T=7 OR T=3 THEN H=2
520 IF T=2 THEN H=1
530 IF T= 1 THEN H=1
540 FOR X= 1 TO H
550 Y=AND(15)
560 IF B(Y)=0 THEN 550
570 H(X)=Y
580 B(H(X))=0
590 NEXT X
600 FOR X= 1 TO H:PRINT# A:H(X);,E
#;PRINT # A:H(X);+32,E#;SOUND 10
0,1
610 FOR Y= 1 TO 500:NEXT Y
620 NEXT X
630 PRINT#448,"I choose";:FOR X= 1
TO H:PRINT#(X);,NEXT X
640 FOR Y=1 TO 1000:NEXT Y
650 T=T-H:P#="CCCC":GOTO 670
660 REM set-up screen
670 PRINT#0, STRING$(32,19);
680 PRINT#416,STRING$(32,19);
690 FOR Y= 1 TO 37
700 SET(0,Y,4):SET(43,Y,4)
710 NEXT Y
720 A$=CHR$(178)+CHR$(175)+CHR$(17
5)+CHR$(170)
730 FOR X= 1 TO 15
740 PRINT# A(X),A#;PRINT# A(X)+32
,X#
750 PRINT#137,LEFT$(B#,15);
760 PRINT# A(X)+32,A#;
770 PRINT#236,LEFT$(B#,30);
780 NEXT X
790 PRINT#324,B#;
800 PRINT#13,"NIMBO?";
810 FOR X= 1 TO 15
820 B(X)=1
830 NEXT X
840 C$=CHR$(143)+CHR$(143)+CHR$(14
3)+CHR$(143)
850 RETURN
860 REM check for win/lose
870 IF T=0 AND P#="HUMAN" THEN PRI
NT # 448,C#(AND(3));:CCCC=CCCC+1:B
OTO 900
880 IF T=0 AND P#="CCCC" THEN PRI
NT# 448,B#(AND(3));:HUMAN=HUMAN+1:
GOTO900
890 IF P#="HUMAN" THEN 450 ELSE 10
0
900 FOR X= 1 TO 2000:NEXT X
910 PRINT # 448,N#;:HUMAN
920 PRINT#448,"NIMBO";:CCCC
930 PRINT # 480,"care to play agai
n?";
940 A$=INKEY$:IF A$="" THEN 940
950 IF A$="N" THEN CLS:END
960 FOR X= 1 TO 15:B(X)=1:NEXT X
970 T=15:GOTO140
980 DATA 48,73,78,83,88
990 DATA 176,201,206,211,216
1000 DATA 324,329,334,339,344
1010 DATA you win-luck is with you
human
1020 DATA beware-nimbo is a poor 1
user
1030 DATA ha! nimbo just let you w
in!
1040 DATA stupid human-why don't y
ou try?
1050 DATA i won without even conce
nstrating
1060 DATA the superior mind has wo
n again!
1070 CLS0
1080 PRINT # 105,"CAN YOU OUTWIT?";
1090 PRINT # 137," THE MIGHTY ";
1100 PRINT # 167," NIMBO? ";
1110 FOR X= 1 TO 1500:NEXT X
1120 PRINT # 321," WHAT IS YOUR NA
ME, O UNWISE ";
1130 PRINT # 353," CHALLENGER
";
1140 PRINT#349,"";:INPUT N#
1150 CLS0
1160 PRINT#32," NEED INSTRUCTI
ONS(Y/N)";:INPUT A$:IF A$="N" THEN
RETURN
1170 FOR X= 1 TO 500:NEXT X
1180 PRINT # 96," YOU HAVE TAKEN 1
7 UPON YOUR- ";
1190 PRINT # 128," SELF TO TRY TO
OUTWIT THE ";
1200 PRINT # 160," MOST-WISE NIMBO
. THE TASK ";
1210 PRINT # 192," BEFORE YOU IS T
O REMOVE ";
1220 PRINT # 224," EITHER 1,2 OR 3
BLUE BOXES ";
1230 PRINT # 256," ON YOUR TURN, O
MO- BONEHOW ";
1240 PRINT # 288," FORCE ME TO TAK
E THE LAST ";
1250 PRINT # 320," BOX. BUT, IF I
FORCE YOU TO ";
1260 PRINT # 352," TAKE THE LAST B
OX, YOU HAVE ";
1270 PRINT # 384," AGAIN DEMONSTR
ATED YOUR LACK ";
1280 PRINT # 416," OF WISDOM AND T
HE POWER OF ";
1290 PRINT # 448," NIMBO! ";
1300 PRINT# 484," PRESS ENTER TO
PLAY";:INPUT A$
1310 RETURN
1320 Y=AND(15):PRINT Y;:GOTO 1320

```

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Kick start for Ultra Drive

Brian Cudge takes a look at the Ultra Drive — a high-speed storage system for the Dragon

FROM THE letters we receive at Dragon User, it is obvious that quite a number of readers spend a lot of their time grappling with cassette recorders, trying in vain to load that program that took hours to type in. At last there is a reasonably priced solution — for just £89 you can own an Acorn Ultra Drive.

The Ultra Drive is based on a Philips mini digital cassette recorder, which uses cassettes similar to those used in dictation machines. For your cash you'll receive the Drive itself, in a sturdy metal case finished in the same livery as the Dragon 32, the interface cartridge and a manual, plus one blank mini cassette to get you started.

The interface is the same size as a standard Dragon cartridge and plugs in as normal, the only difference being the 12 inches of ribbon cable which protrudes out to connect to the drive.

Looking in

Taking a look inside revealed a very simple circuit board, just a 46 apcm to hold the extensions to Basic, a 6801 Pdc (the same chips are used inside the Dragon to control I/O operations), and a few resistors and transistors. Unfortunately, the cartridge is an extremely tight fit; whilst this will certainly prevent any crashes due to bad connections, I wouldn't speculate how long the Dragon's edge connector would stand up to the strain of repeatedly plugging and unplugging the cartridge. As the power for the interface and the drive are taken directly from the computer.

There are no external controls except for the eject button as all operations are controlled by the computer. For example, to insert a tape in the drive you simply enter the command REWIND. Similarly, to advance (or fast-forward) the tape there is the ADVANCE command. Both of these immediately return the OK prompt — once the drive has been sent a command it gets on with it on its own.

In operation, the Ultra Drive is essentially a fast and very reliable cassette recorder — that is you must position the tape in the correct place to record the next program. (Unlike a disk drive, the Ultra Drive does not do this for you.) There is a STOP command which acts like the BREAK command to help position the tape for reading or writing. When loading a file, it is important to make sure that the tape is some-



The Drive: a sturdy metal case that fits

where before the file or the drive will reach the "End of File" and give up the search — it will not automatically rewind to carry on loading. There are, thankfully, no I/O errors for starting a tape mid-way through a recording.

The first thing to be done on a new tape is to type INIT, which initializes the tape directory and prepares the cassette for recording. Saving and loading Basic programs is identical to using the normal cassette, except that "Save" and "Load" are used rather than "Save" and "Load". In addition, if the first character of a filename is "F", the program is saved as a protected file. This means any attempt to read or append the program will result in a autosaving with the break key disabled. Similar commands "Save", "Load" and "Run" exist for machine code programs.

Once you have several files on a tape you may start forgetting where programs are. The DIR command will list revised the tape and then list each filename on the tape together with the type of file, its length, start and execute addresses. (Only the name and type is displayed for a protected file.)

The area which I thought the Ultra Drive would probably be most useful turned out to be the most disappointing feature — file handling. Although the Dragon's cassette filing system is slow and not very reliable, it is quite sophisticated. Similar commands have not been implemented on the Ultra Drive. There are just two filing commands

— SAVE and LOAD. These will save and load whole or chunks of arrays on to the drive. The arrays can be numbers or character, although the manual only mentions numeric arrays.

The inclusion of these commands means that it is not possible to do file handling programs (such as databases) on the Ultra Drive, but it is certainly not as feasible as the Dragon's own DOS.

In addition to the Ultra Drive commands, there are a few (very easily implemented) additions to Microsoft. These are Break ON and OFF, to disable the break key; Fast and Slow, which do the same as the high speed jobs and so cause some Dragons to crash; and finally, OLD, which will recover a Basic program after it has accidentally been overwritten, provided no new files have since been entered. I would have preferred to see more useful commands like automatic file numbering and error trapping implemented, rather than these cosmetic commands such as FAST & SLOW.

Error messages

A first feature which I disliked in the GD was its error handling. Whilst error messages are in nice plain English, such as "No tape" and "End of File", if these occur during a program they are printed on the screen, but the program does not stop and there is no error trapping or detection included. This could create chaos in a program which loads arrays from the drive, if the user forgets to put the tape in, or puts the wrong tape in.

Although there are features I would like to see improved, the Ultra Drive's good points far outweigh the bad. The system proved to be very reliable in use, has a capacity of 200k per cassette, and is some 10 times faster than a normal cassette. A good quality tape recorder will cost around £40 anyway, so for just £89 the Ultra Drive is very good value for the User who is tired of cassettes, but cannot afford to move up to a disk drive. ■

The Ultra Drive costs £79.95 + £1.40 p.p.h. A box of 5 cassettes costs £26.15.

Both are available from Acorn Computer Products, Dept. B, 1000 Lakes, Loughborough, Leicestershire LE11 3AS. Tel: 0505 421515 for further information.



Plug in, switch on and go . . .

Keith and Steven Brain look at a handy RS232 I/O port interface

THE ABSENCE of a serial port on the Dragon 32 prevents communications with RS232 devices, such as printers, other micros, modems and so on. As a result, a number of suitable RS232 interfaces have appeared. In addition, interest in using the Dragon to monitor and control external events is increasing, and dedicated I/O ports are therefore also becoming available. The most recent interface on offer is the rather unusual RS232 I/O Port Interface from Steve's Electronics Supply (an established Dragon Service Agent who has recently entered the Dragon add-on market).

User-friendly

It differs from previous units which we have seen in that it features not only a standard RS232 port but also a comprehensive two-port parallel input/output facility, and provides straightforward user-friendly access through the extension of the standard Basic command set. In addition to a 9851 Universal Asynchronous Receiver Transmitter the unit uses the very powerful 6522 Versatile Interface Adapter which provides not only two eight-bit parallel ports, but also handshaking lines for bi-directional data transfer, two 16-bit programmable timers, and a synchronous/asynchronous shift register.

This is a very professionally produced unit and it is housed in a custom ABS cartridge (about the size of a disk controller). A good example of the fine attention paid to detail in the design is the fact that not only are two integral legs incorporated into the case, but two lugs moulded on to the front edges to provide a snug fit so that the unit does not have to rely on the ability of the edge connector to defy gravity. Power is taken directly from the Dragon (with a red LED power-on indicator) and both a 25-way D-type RS232 socket and a 40-way IDC I/O port socket are provided.

Removing the lid reveals a neatly laid-out PCB bearing the respected name of Race Electronics. Notable features are a 2716 Eprom containing the operating system software, a 6522 VICA, a 6551 UART, the crystal, and a multiple DIP switch allowing reconfiguration of the RS232 port as Data Communication Equipment or Data Terminal Equipment. Only RT5 (Re-

quest to send) and CTS (Clear to send) signals are used.

On power up the standard Dragon start message is supplemented by the words Extended Control Basic, and the full features of the unit are now easily available through 13 new Basic commands, rather than the more usual PEEKing and POKEing. BAUD sets the baud rate between 50 and 19,200, whilst TDRM provides a very simple terminal emulator where ASCII control codes 0 to 26 are available by pressing Shift and the appropriate letter.



The RS232 plugs in

Selection of RS232C04 echoes all keyboard input to the RS232 port, and RS232 port input to the screen, while RS232C0FF is selected. INBNTB (I/O) and OPD are more selective commands which respectively read and write single bytes between the RS232 port and Basic. Transfer of Basic and machine code files from

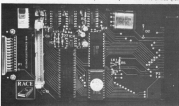
Dragon to Dragon is well supported. SBAVE and SLDAD transfer ASCII format ("spooled") Basic programs with file searching, whilst SBAVIN and SLDADM transfer binary data in Intel hex format.

Detailed manual

The data format and transmission protocol for these commands are described in detail in the manual, so that transfer to and from other machines can be catered for. But whilst testing out the unit we were interested to discover that if RS232C04 was selected and a Basic program file uploaded from a Tandy 100 via its built-in Telecom package then the Dragon would happily accept this as keyboard input and crunch it as usual (at least at the fixed rates).

The 6551 UART is set up by default for the most usual RS232C data format (1 start, 8 data, 2 stop bits, no parity) but if necessary this can be modified. This is the only command not included in the extension to Basic but is accomplished by POKEing to the command and control registers at \$BFF000 and \$BFF003.

The 6522 I/O lines and many of the 6805 bus lines are brought out to the 40-way IDC connector and are thus available for connection to whatever peripheral equipment you want. Inputting and Outputting provide easy read and write of four (four-



Inside the RS232 reveals a neatly laid-out PCB bearing the respected name of Race Electronics

DRAGON OPEN FILE

Send us your Dragon programs, beginning with a general description and then explaining how the program is constructed. Take care that the listings are all bug free, enclosing a cassette and, if possible, a printout. We pay £5 for each original bug-free program published, double for the program of the month, if you have any problems with the listings, please send your queries to the appropriate author, Dragon User, 12-15 Little Newport Street, London WC2N 3LS.

Escape

From Lam Huyen Le in North London
THIS PROGRAM was written in low-resolution graphics by using CHR\$ command to print the maze and objects.

In this program you control a small flashing square at the bottom of the screen. Your job is to eat all the objects in orange and purple which appear ran-

domly around the screen. You must do this in time or without falling into the maze. You can also use a bomb to break the maze if you get stuck, but you will lose a life each time you do this. You have five lives and three levels to play but you need a certain number of points to transport into the next one.

Program notes:

10-180	Instructions.
208-690	Set screen and prints maze.
708-820	Prints door and objects.

830-940

Prints your block, score and lives and checks keys.

950-970

Score check.

980-1130

Movement routine.

1170-1270

Sets maze and new time for level 2.

1280-1320

Bombs routine.

1330-1410

Set maze and time for level 3.

1420-1510

Winning routine.

1520-1800

Loss routine and end of game.

```

10 REM*****THIEF *****
20 REM*****BY LAM HUYEN LE .84****
30 CLS:PRINT#167,"H A Z E   T H I
   E F":SCREEN0,1
40 PRINT#230,"BY LAM HUYEN LE 198
   4":SCREEN0,1
50 FOR I=1 TO 2000:NEXT
60 PRINT#320,"INSTRUCTIONS(Y/N)":
   SCREEN0,1
70 AS=INKEY$:IF AS="" THEN 70
80 IF AS="Y" THEN 100
90 IF AS="N" THEN 150 ELSE 70
100 CLS:PRINT#0,STRING$(32,233):
   PRINT#480,STRING$(31,233):
101 FOR I=32 TO 448 STEP 32:PRINT#T,CHR
   $(233):PRINT#T+31,CHR$(233):NEXT
   I:PRINT#33,"<<<<<<<<<INSTRUCTIONS>
   >>>>>>>>":SCREEN0,1
102 PRINT#99,"THE OBJECT IS TO PIC
   K UP RUBY":
103 PRINT#130,"OBJECT (ORANGE AND
   PURPLE) AS":
104 PRINT#161,"YOU CAN WITHOUT HIT
   ING YOURSELF":
105 PRINT#194,"INTO THE WALL (BLUE
   MAZE)....":
106 PRINT#225,"YOU CONTROL THE SHA
   LL FLASHING":
107 PRINT#258,"BY USING THE FOUR A
   ROW KEYS":
108 PRINT#290,"YOU CAN ALSO USE TH
   E SPACEBAR":
109 PRINT#322,"TO BLOW THE WALL BU
   T YOU WILL":
110 PRINT#354,"LOSE A LIFE EACH TI
   ME":
111 PRINT#410,"PRESS SPACEBAR TO B

```

```

EE MORE..":
112 SCREEN0,1
113 IF INKEY$(">") THEN 113
114 CLS:PRINT#0,STRING$(32,233):
   PRINT#480,STRING$(31,233):
115 FOR I=32 TO 448 STEP 32:PRINT#T,CHR
   $(233):PRINT#T+31,CHR$(233):
116 NEXT
117 PRINT#34,"THERE ARE THREE LEVE
   L TO PLAY":
118 PRINT#66,"THE FIRST ONE HAS OR
   DER MADE":
119 PRINT#98,"YOU NEED TO GET MORE
   THAN 700":
120 PRINT#130,"POINTS AND MUST GET
   THROUGH":
121 PRINT#162,"THE DOOR (WHITE) TO
   GO ON TO":
122 PRINT#194,"THE NEXT LEVEL...":
123 PRINT#226,"HOWEVER IF YOU DON'
   T FINISH":
124 PRINT#258,"IN TIME YOU WILL BE
   SEND TO":
125 PRINT#290,"JAIL. ALSO IF YOU B
   O ON TO ":
126 PRINT#322,"THE DOOR AND DON'T
   HAVE A":
127 PRINT#354,"RIGHT NUMBER OF POI
   NTS YOU ":
128 PRINT#386,"INSTANTLY WIPE THE B
   OARD OFF ":
129 PRINT#450,"PRESS SPACE BAR TO
   SEE MORE.":
131 SCREEN0,1
132 IF INKEY$(">") THEN 132
133 CLS:PRINT#0,STRING$(32,233):
   PRINT#480,STRING$(31,233):

```

```

134 FOR T=32 TO 40 STEP 3:PRINT#T,CHR
41233:;PRINT#T+3:;CHR(1233):NEXT
T
135 PRINT#34,"ON LEVEL TWO AND THR
EE THE ":
136 PRINT#36,"WALLS ARE SET RANDOM
LY SO YOU":
137 PRINT#99,"HAVE TO SORT YOURSEL
F OUT ":
138 PRINT#130,"QUICK AS POSSIBLE,
YOU NEED":
139 PRINT#162,"MORE THAN 1500 POIN
TS TO GO":
140 PRINT#194,"ON TO LEVEL THREE A
ND 2500 ":
141 PRINT#226,"POINTS TO WIN THE G
AME":
142 PRINT#258,"YOU HAVE 5 LIVES AN
D EACH ":
143 PRINT#290,"TIME YOU HIT YOURSE
LF OR USE":
144 PRINT#322,"A BOMB A LIVE WILL
BE LOSE ":
145 PRINT#354,"AND REMEMBER THAT Y
OU ONLY ":
146 PRINT#386,"HAVE A LIMIT OF TIM
E ":
147 PRINT#418,"PRESS SPACEBAR TO S
TART...":SCREEN0:;
148 IF INKEY<>" " THEN 148
150 CLSND(8)
160 PRINT#215,"GOOD LUCK":;SCREEN0
:;
170 TIME#="03L2,BL4804L40CP403,480
4L403L48A6L,UF#P404L2DC03L68604LBC
03L8A04L40C03L2B4L10:"
180 PLAY"TX&TIME&:T10&TIME&:"
200 CLS0
210 X=32:Y=29:SC=0:L=5
220 FOR I=0 TO 14
230 PRINT#0+I,CHR#(175):
240 PRINT#17+I,CHR#(175):
250 PRINT#440+I,CHR#(175):
260 PRINT#465+I,CHR#(175):NEXT
I
270 FOR I=0 TO 384 STEP 32
280 PRINT#32+I,CHR#(175):
290 PRINT#63+I,CHR#(175):NEXT I
300 FOR I=1 TO 4
310 PRINT#65+I,CHR#(175):
320 PRINT#94+I,CHR#(175):
330 PRINT#80+I,CHR#(175):
340 PRINT#87+I,CHR#(175):
350 PRINT#129+I,CHR#(175):
360 PRINT#139+I,CHR#(175):
370 PRINT#144+I,CHR#(175):
380 PRINT#153+I,CHR#(175):
390 PRINT#193+I,CHR#(175):
400 PRINT#202+I,CHR#(175):
410 PRINT#208+I,CHR#(175):
420 PRINT#217+I,CHR#(175):
430 PRINT#227+I,CHR#(175):
440 PRINT#266+I,CHR#(175):
450 PRINT#272+I,CHR#(175):
460 PRINT#281+I,CHR#(175):
470 PRINT#321+I,CHR#(175):
480 PRINT#330+I,CHR#(175):
490 PRINT#336+I,CHR#(175):
500 PRINT#345+I,CHR#(175):
510 PRINT#355+I,CHR#(175):
520 PRINT#394+I,CHR#(175):
530 PRINT#400+I,CHR#(175):
540 PRINT#409+I,CHR#(175):
550 NEXT
560 FOR I=1 TO 3
570 PRINT#70+I,CHR#(175):
580 PRINT#85+I,CHR#(175):
590 PRINT#134+I,CHR#(175):
600 PRINT#149+I,CHR#(175):
610 PRINT#198+I,CHR#(175):
620 PRINT#213+I,CHR#(175):
630 PRINT#263+I,CHR#(175):
640 PRINT#277+I,CHR#(175):
650 PRINT#326+I,CHR#(175):
660 PRINT#341+I,CHR#(175):
670 PRINT#390+I,CHR#(175):
680 PRINT#405+I,CHR#(175):
690 NEXT
700 TIMER=0
710 T=0
720 FOR I=1 TO 2
730 PRINT#14+I,CHR(1207):
740 NEXT
750 R=RND(129):PRINT#33+R,CHR(1255):
760 R=RND(29):PRINT#99+R,CHR(1255):
770 R=RND(29):PRINT#161+R,CHR(1255):
780 R=RND(29):PRINT#225+R,CHR(1255):
790 R=RND(129):PRINT#289+R,CHR(1255):
800 R=RND(129):PRINT#353+R,CHR(1255):
810 R=RND(29):PRINT#417+R,CHR(1255):
820 R=RND(480):PRINT#0+R,CHR(1223):
830 PRINT#480,"==SCORE==":SC:
840 PRINT#495,"LIVES":;L:
850 IF TIMER>1500+T THEN 1530
870 SET(X,Y,2)
880 PLAY"O4L200AA"
890 RESET(X,Y)
900 IF PEEK(341)=225 THEN GOSUB 900
910 IF PEEK(342)=225 THEN GOSUB 10
20
920 IF PEEK(343)=225 THEN GOSUB 10
40
930 IF PEEK(344)=225 THEN GOSUB 11
00
940 IF PEEK(345)=225 THEN GOSUB 12
80
950 IF POINT(X,Y)=R THEN SC=SC+100
+RND(100) ELSE IF POINT(X,Y)=6 THE
N SC=SC+RND(500)+100
960 IF SC=750 AND POINT(X,Y)=5 TH

```

Continued on page 32

```

EN 1170 ELSE IF SC<=1500 AND POINT
(X,Y)=4 THEN 1330
%62 IF SC<=2500 AND POINT(X,Y)=7 T
HEN 1430
%64 IF L=0 THEN CLS:RND(10):PRINT#22
8,"YOU LOST ALL LIVES.YOUR SCORE I
S":SC:PRINT#PRINT"PRESS SPACEBAR
TO PLAY AGAIN":;80:SUB 1700
%70 GOTO #30
%80 Y=Y-1
%90 IF POINT(X,Y)=3 THEN Y=Y-2:500
UND200,2:L=L-1:IF POINT(X,Y)=5 AND
SC<=700 THEN Y=Y-2:IF POINT(X,Y)=4
AND SC<=1500 THEN Y=Y-2
1000 IF Y=0 THEN Y=1
1010 RETURN
1020 Y=Y+2
1030 IF POINT(X,Y)=3 THEN Y=Y-2:50
UND200,2:L=L-1:IF POINT(X,Y)=5 AND
SC<=700 THEN Y=Y-2:ELSE IF POINT(
X,Y)=4 AND SC<=1500 THEN Y=Y-2:1040
IF Y=31 THEN Y=30
1050 RETURN
1060 X=X-2
1070 IF X=0 THEN X=1
1080 IF POINT(X,Y)=3 THEN X=X+2:50
UND200,2:L=L-1:IF POINT(X,Y)=5 AND
SC<=700 THEN X=X+2:ELSE IF POINT(
X,Y)=4 AND SC<=1500 THEN X=X+2:1090
RETURN
1100 X=X+2
1110 IF X=63 THEN X=62
1120 IF POINT(X,Y)=3 THEN X=X-2:50
UND 200,2:L=L-1:IF POINT(X,Y)=5 AN
D SC<=700 THEN X=X-2:IF POINT(X,Y)
=4 AND SC<=1500 THEN X=X-2
1130 RETURN
1140 FORI=1TO2
1150 PRINT#14+I,CHR$(120);
1160 NEXTI:RETURN
1170 CLS:FORM=1TOS10
1180 S=RND(14)
1190 IF S=2 THEN PRINTCHR$(175); E
LSE PRINTCHR$(120);
1200 NEXT R
1210 TIMER=0
1220 T=300+RND(100)
1230 Z=RND(400)
1240 FORI=1TO2
1250 PRINT#2+I,CHR$(171);:NEXTI
1260 GOTO750
1270 RETURN
1280 RESET(X-1,Y-1):RESET(X,Y-1):R
ESET(X+1,Y-1)
1290 RESET(X-1,Y):RESET(X+1,Y):RES
ET(X-1,Y+1)
1300 PLAY"D3V31T16L10CCCCCCCCC"
1310 L=L-1
1320 RETURN
1330 CLS:FORM=1TOS10
1340 R=RND(3)
1350 IF R=3 THEN PRINT CHR$(175);E
LSE PRINT CHR$(120);
1355 NEXTA
1360 TIMER=0
1370 T=300+RND(100)
1380 W=RND(510)
1390 PRINT#W,CHR$(239);
1400 GOTO750
1405 IF POINT(X,Y)=7 THEN L=L-1
1410 RETURN
1420 REM***WIN ROUTINE***
1430 CLS:RND(0)
1440 RR=120+RND(127)
1450 FORI=1 TO 16
1460 PRINT#232+I,CHR$(RR);:NEXTI
1470 PRINT#234,"CONGRATULATIONS!!
":
1480 PLAY"D4L5T10CCCCCCCCCDDFF06000
00000FF0000;03L4T10CCCCCCCC0FF06
00FF060000000000FF0000"
1490 PRINT#236,"YOU HAVE STEAL ALL
THE OBJECT THAT YOU NEEDED. YOU
R SCORE IS":SC:"AND YOU HAVE":L:"L
EFT":
1500 FORI=1TOD4000:NEXT
1510 GOSUB1670
1520 REM***LOSE ROUTINE***
1530 CLS:RND(5)
1540 FORI=1TO22
1550 PRINT#40+I,CHR$(120);
1560 PRINT#196+I,CHR$(120);:NEXTI
1570 PRINT#2,"J A I L!!":
1580 FORI=32 TO 160 STEP 32
1590 PRINT#236+I,CHR$(120);
1600 PRINT#239+I,CHR$(120);
1610 PRINT#440+I,CHR$(120);
1620 PRINT#442+I,CHR$(120);
1630 PRINT#64+I,CHR$(120);:NEXTI
1640 PRINT#263,"B A D - L U C K !!
":
1650 PLAY"D3V31T3L40GL000L40-0000F
40"
1660 FORI=1 TO 200:NEXT
1670 PRINT#322,"TOO LATE!YOU BEEN
CAUGHT AND YOU HAVE TO GO TO JAIL!
:YOUR SCORE IS":SC:"POINTS AND YO
U HAVE":L:"LIVES LEFT":
1680 FORI=1 TO 5000:NEXT
1690 PRINT#483,"PRESS SPACEBAR TO
PLAY AGAIN":
1700 KEY=INKEY$:IF KEY<>" THEN 17
00
1800 GOTO200

```

Easy Edit

From Russell Staller in Huntsville

THIS PROGRAM enables the selective listing of programs without the need to specify the start and end lines of the listing.

This is done by providing the functions of listings present, next, previous and first lines with the press of a key.

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Death Valley



Actual screen photograph

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```

80 CIRCLE(100,25),2
90 CIRCLE(120,25),2
100 DRAW"BM15,30;D5BL2US"
110 CIRCLE(114,41),7,1,1,30,100,1
120 DRAW"BM98,50;R32BLBU10L1U1L4G4
E2H2LS01L1010"
130 CIRCLE(114,44),4,1,1,0,5
140 DRAW"BM120,43;D5L104L102L301L2
U1L3U2L104L102"
150 PRINT(119,44),3,3
160 PRINT(119,41),3,3
170 PRINT(121,121),3,3
180 CIRCLE(100,50),7,1,1,0,5,1
190 CIRCLE(129,50),7,1,1,0,5,1
200 FOR A=50 TO 90 STEP 10
210 CIRCLE(115,A),2
220 NEXT
230 LINE(135,50)-(145,70),PSET
240 LINE(85,70)-(95,50),PSET
250 DRAW"BM85,70;L102L18102R18R40U
R1U2R1L102"
260 LINE(85,74)-(100,95),PSET
270 LINE(145,72)-(130,95),PSET
280 DRAW"BM75,70;U2R1U2R1U2R1D12L1
U2L1U2L1U2R3U2L1U2L1U2L1D12R1U2R
1U2R1U2"
290 DRAW"BM102,102;U3R3L1D5L1U7R1U
1R1U1L1U1L1U1L8D1R4D11U5L3U4"
300 DRAW"BM105,94;U1R4U1R4U1R4U1R4
U1R4U1R4U1R4D4L4D1L4D1L4D1L4D1
L4D1L5"
310 PRINT(104,95)
320 LINE(100,143)-(102,102),PSET
330 LINE(133,143)-(130,95),PSET
340 DRAW"BM118,100;D15L25L15L15
2BR5B5D1R2D1R1D1R1D2D10R1D3D1L1D1
5L9U10L1U30R1U12"
350 DRAW"BM121,150;H4F2E204E2U2D4U
2L2R4"
360 DRAW"BM115,150;H4F2E204E2U2D4U
2L2R4"
370 DRAW"BM112,147;D10L5U2L4D1L3D1
L3U1L2U5L1U2L1R1U1R2U1R4U1R3U2U2
R1U1L7L0B3R12"
380 DRAW"BM117,147;D10R5U2R4D1R3D1
R3U1R2U2R1U2R1L1U1L2U5L4U5L3U1L2U
2L1U1R7U3D3L12"
390 PRINT(110,140)
400 PRINT(121,149)
410 A=RD(1000)+100
420 FOR N=1 TO A*AI=INKEY$:IF AI<>
""THEN 490 ELSE NEXT N
430 GOSUB 550
440 TIMER=0
450 FOR N=1 TO T1:IF INKEY$<>""THE
N 580
460 IF T1<0 THEN GOTO 800
470 NEXT N
480 FOR N=1 TO 10:CLS:PLAY MU12
1:CLS2:NEXT N
490 CLS:PRINT"
500 PLAY MU1(1)
510 AI=INKEY$
520 PRINT#457,"PRESS ANY KEY"
530 AI=INKEY$:IF AI=""THEN 530
540 RUN
550 DRAW"BM100,00;R2D3L2U3R1U1D1R1
D3R104L404"
560 LINE(98,90)-(105,100),PSET,B
F
570 RETURN
580 TR=TIMER:CLS:PRINT"
BLAM
DONE"
590 N=N+1:PRINT"IT TOOK YOU";TR;"H
1000 SECONDS"
600 PLAY MU1(2)
610 FOR N=1 TO 300:NEXT
620 PRINT"YOU'VE SHOT";N;"OF THEM"
630 T1=T1-50
640 PLAY MU1(3)
650 PRINT#457,"PRESS ANY KEY"
660 AI=INKEY$
670 AI=INKEY$:IF AI=""THEN 670
680 GOTO 60
690 CLS:PRINT"
CHEAT"
700 PLAY MU1(1)
710 GOTO 510
720 MU1(1)="TSL1003CCD1C"
730 MU1(2)="GDT256L256BAGFDC"
740 MU1(3)="D3T4L10EC+CC+ED1AW"
750 RETURN
760 CLS:PRINT"-----
-----SHOOT OUT BY DU
NE-----'31/3/84"
770 PRINT"INSTRUCTIONS
-----THE AIM OF THE
GAME IS TO SHOOT ";INT(T1/50)+1;"
MEN BEFORE THEY SHOOT YOU AFTER
EACH MAN YOU WILL BE TOLD HOW M
ANY MEN YOU HAVE SHOT & EACH M
AN WILL PULL HIS TRIGGER A BIT
QUICKER ";
780 PRINT"THAN THE MAN BEFORE HIM
YOU PRESS ANY KEY TO SHOOT
BUT DO NOT SHOOT BEFORE HE RAISES
HIS GUN.
PRESS ANY KEY."
790 IF INKEY$=""THEN 790 ELSE RETU
RN
800 FOR N=1 TO 50:IF INKEY$=""THEN
NEXT ELSE CLS:PRINT"WELL DONE YO
U KILLED THEM ALL":GOTO 820
810 GOTO 490
820 PLAY"TS2020HLS6H120+03CDH15H
L20H0CD0H"
830 SCREEN1,1
840 IF INKEY$=""THEN 840
850 RUN

```

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Inside the front cover

Mike Harrison rounds up his reviews with a look at three books dealing with machine code

IN PREVIOUS REVIEWS (Dragon User, June, July) I looked at a range of books dealing with Basic programming through to controlling the whole machine by means of its own language — 6809 machine code. In doing so, I have discussed the advantages of machine code programming: you can have complete control not only of your machine but also over all characters and hardware features.

Faster execution of instructions (in some cases by a factor of 10^4) and the use of less memory are attractive features of machine code, but the drawbacks are also formidable. It is estimated that a programmer can write a program about 10 times as fast in a high-level language compared to assembly code. That's just writing the program; it doesn't include problem definition and design, debugging and testing. For machine code programming in assembly language you need to know the instruction set, registers or other features. The interpreter (or in some cases compiler) takes care of this in high-level languages.

Popular choices

However, almost all microcomputer programmers ultimately find that they need some knowledge of assembly language, most often to debug programs, write I/O routines or speed up/shorten critical sections of programs. So where are they to turn for help? Our list (Dragon User, June 1984) gives some choices and here I will look at three of the most popular.

Introducing Dragon Machine Code by Ian Sinclair is an excellent beginner's guide to this field. The author should have some skills at explaining elements of computers and electronics having written over 40 books on the subject aimed mainly at beginners. The book does not fall into the trap of assuming that its readers are already familiar with machine code programming and just want to transfer this knowledge to the Dragon. Nor does it treat machine coding as a study in itself without telling the reader how to apply it to the machine. The author declares two aims:

- To introduce the Dragon owner to some of the details of how the computer works;
- To introduce the methods of machine code programming in a simple way.

"ROM, RAM, bytes and bits", chapter one, explains very carefully and deliberately from first principles how eight bits (on and off lines) combine to make up a byte, and how Read Only Memory, which can be read and copied but not changed, is



different from Read/Write memory (known as RAM — also referred to as Random Access Memory).

Have you noticed how often we are told that certain features of the Dragon can take values from 0 to 255? Well, a group of eight bits or switches can represent $2^8 = 256$ different states. So one byte could have any one value according to the combination of its switches ranging from 00000000₁₀ = 0 to 11111111₁₀ = 255₁₀, or $2^7 + 2^6 + 2^5 + 2^4 + 2^3 + 2^2 + 2^1 + 2^0$. Each of the 32768 bytes of RAM in the Dragon 32 can store a number in this range.

Now numbers themselves are not of much use, but, if treated as codes, a variety of possibilities open up. Many readers will be familiar with ASCII codes to represent alphanumeric and controls to peripherals, but the Dragon also represents Basic words as tokens. PRINT, for example, is memorised in token form as 135 and in this way is stored in one byte of memory — much more efficient than having to use bytes for the ASCII code for each letter. Incidentally, this is why we can use "P" in programs because this also has a token of 135 and when the token is recalled it is recognised as PRINT and appears so in lists or edited lines.)

When you use Basic the only commands that you can use are those for which tokens are provided. Some knowledge of machine codes would allow you to

make your own. Hence if you want to do other than select from the menu of machine code subroutines provided in Basic you have to go to direct action on the microprocessor unit. The author aims to have you do this.

The book makes sure you understand what happens in "direct action" when you switch on your Dragon so you know what you are working on. An initialisation routine (a long machine code program from ROM) checks the RAM and writes to parts of it with bytes which will be used later. It also "cleans up" the areas which will be used to store instructions and data. Initially, when power is supplied to the machine it is full of "garbage" as bits are switched on or off at random. The initialisation process fills each byte with a much more ordered pattern as you will see if you investigate this:

```
POKE 13604 TO 13647 : POKE 13616, 1  
' : NEXT
```

Memory storage

The author also sets out to teach you how a Basic program is stored in memory. Just above any program resides the variable table list (VTL). This is the part of RAM used to store the current value of any variable used in programs. As your program runs these variable values are constantly read and re-written from this list according to the program instructions. Its position in memory is not fixed but is adjusted to fit in the free space above the program — hence if you add to or shorten your program the VTL is destroyed and has to be re-written by running the program again. You can find the VTL address by:

```
PEEK(327) * 256 + PEEK(328)
```

and information is given such that its contents can be examined by use of VARPTR. Stored programs and variables can then be examined and it is (but a short step to) interfacing with them. How about a program where every line number is 10 yet still runs sequentially (running depends on the "next line" addresses stored with the program not on how the lines are numbered)? In this test we learn about the memory organisation of the Dragon.

Ian also points to why interpreted Basic is so slow. For example:

```
10 FOR N = 1 TO 50
```

```
20 PRINT N : 30 NEXT
```

This requires the action of recalling the PRINT token of 135, and finding where the correct subroutine is stored. The whole

process will be carried out 80 times. There is no simple way of finding it once, then using it 80 times — we have to have 80 searches.

The action of the microprocessor is completely automatic and is built into the chip itself. The snag is that the machine code programs must work to the same rules and get the program right (100% correct is just good enough). If you feed a microprocessor with an instruction byte when it expects a data byte or vice versa, you could well get an endless loop "hanging" the computer with a blank screen and ineffective keys and reset button. The only way is off and that means losing your work. To get you used to these situations has got you writing and running machine code as you learn from your own mistakes.

Addresses

The 6800 has the capacity to work with various addressing modes: immediate, extended, direct, page, constant indexed, accumulator indexed, relative and indirect. Each method has considerable space devoted to it to ensure understanding and to supply the reader with a choice before his own efforts get under way.

Interacting directly with your Dragon is done by means of a simple machine code program which is issued out of your grey matter and placed in a "reset off" area of memory by use of CLEAR. You also have to put into the program counter the starting byte of your program. You can in fact do this by using the Basic EXEC which incidentally has another subroutine which copies the current contents of the data registers into the stack so that an return they can be recalled for use in any current Basic program.

In the absence of an assembler the author shows us how to "hand assemble" some simple routines and POKE them into memory. He uses examples, each slightly more complex than the last, as a method of stretching your understanding to each new concept. Taking a bigger "bite" at coding we are shown how to link existing subroutines in ROM to our own machine code. Thus the ROM routines can be made to fulfil ends of our own choosing.

Debugging starts almost — if at all else fails add 129 after each memory store command and then POKE into memory to see if it's what you expect. This monitor assembler is vividly described and longer programs are prepared for the DREAM/6800/6801 compiler (DREAM wasn't out at the time of writing).

One of the main problems of an introductory book is knowing where to stop. Ian pitches his book nicely, leaving readers at a stage where they can start to link together programs of their own but with a thrust for more knowledge. On the launch pad you are in a position to progress by examining programs printed in magazines, and books and to recognise addresses you might find useful in the future. Some useful starts to machine code programs are provided for you to cannibalise. These include one to key graphics characters directly to the screen, to achieve a keyboard, flicking between text and

graphics and one to move a block around the screen. They are presented in a form suitable for 6800 assembly but can be hand-converted and POKE'd if desired. The appendices include the 6800 instruction set and a useful dis-assembler which can be typed in.

Inside the Dragon is certainly a treasure to would-be machine code programmers, but where do they go from there? Up to recently, every request of this nature I have read has been answered with the mention of two very expensive books. Both *Programming the 6800 and 6801 Assembly Language Programming* are American in origin and were published before the Dragon came out.

The first of these, by Rodney Zaks and William Latvah (distributed by Computer Booksheet), sets out to school you in the principles of chip manipulation and to do it right. Ten per cent of programmers, say the authors, can write successfully without recourse to a flow chart of their desired program. Unfortunately, 90 per cent of the population believe they belong to this minority. Thus the authors push readers to do this elementary task before they start and thereby avoid "unclean" and "muddled" programs which take longer to put right than to write in the first place.



They cover similar ground to the microprocessor sections in the introductory book but in a "serious" way — don't expect to enjoy a good read if you buy this book. In the text book style, there are exercises at the end of each chapter to make sure you've been paying attention. I couldn't find any answers to these questions so I'll don't know if my answers are correct.

The internal organisation of the 6800 is rigorously examined with its instruction formats, their execution and eventually the signals of the microprocessor chip. The registers need to be fully understood and this knowledge is relied on in subsequent chapters. Rapidly Rodney and William progress to how information is manipulated by instructions, introducing increasingly complex algorithms and translating them into programs. They examine the main types of instructions and important structures such as loops, stacks and

subroutines, and go on to describe in detail the six categories of instructions available on the 6800.

It is not necessary to understand the role of each and every instruction to start programming, just a few essential instructions of each type will do. However, say the authors, you will soon want details of the full set in order to make your programs as efficient as possible. Hence the authors do a magnificent job devoting 70 pages to individual descriptions of each member of the set.

The programmer's dream chip is so named because of the variety of addressing techniques to facilitate data retrieval within the memory area. To program the 6800 efficiently it is necessary to understand the many addressing mechanisms and the authors go far enough to ensure that you stand a good chance of doing so.

As in *Inside the Dragon* (see July's Dragon) a considerable weight is given to input/output techniques. Input is the transfer of data from a peripheral external to the MPU (keyboard, disk and so on) to internal computer storage. Output is the transfer of data from within the microprocessor or memory to an external device like a screen, disk or printer. Rodney and William show how several input/output devices can be managed simultaneously, and space is devoted to polling vs interrupt techniques. Interrupts programs in the case of a parallel transfer and a parallel-to-serial conversion are examined and they teach you how to schedule the operation of multiple peripherals.

General survey

The task of programming a system includes not only programming the microprocessor itself but also the input/output chips. The 6800 was designed to provide 16-bit microprocessor capability whilst interfacing easily with any of the extensive 8000 family of I/O chips developed for 8-bit processors and also most 6801 I/O devices. Here the book, by necessity, is very general and is not intrinsically pertinent to Dragon owners' needs. It surveys the field of use of the 6800 chip rather than providing help for the programmer.

Chapters on data structure and program development conclude this professional book which I am sure, as a study, does great credit to its writers. If you intend to immerse yourself in machine code and already have substantial knowledge of the rest of the Dragon then *Programming the 6800* will be of benefit to you. If you need to know the precise nature of the MPU to squeeze out every bit of its potential then the book is £12.50 well spent, if, however, you just want a little amusement or want to sharpen up a few routines in your Basic program, if you are a novice to machine code, or if you want a book to give you a library of practical routines which will make things happen — then don't bother.

The other "all or nothing" book and the last in this series of reviews is *6800 Assembly Language Programming* by Lance A Lovatnick, published by Osborne McGraw-Hill. I found this book a better

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propeller. It is more readable and addresses itself to problems and an explanation of their solutions, rather than playing in the mysteries of the chip itself. The format of the book is interesting. Large uses two different type faces. On each page and within each paragraph the important concepts and main ideas are in bold print. Explanations and elaborations take up the rest of the space. I found myself scanning the black type until I was soon an idea I wanted to follow up and then read this closely. In this way the "text book" atmosphere of the book could be overcome.

Program details

The book's stated aim is to pass on knowledge of the chip enabling you to program it in assembly language. Such assembly directives is explained and a run-down given of the different types of assemblers. Some introductory programs that perform microprocessor tasks are listed. Each program contains:

- A description of the problem
- A statement of purpose that describes the specific tasks the program performs and the memory locations it uses
- A flow chart
- A sample problem with data and results
- The assembly language listing
- The hexadecimal object code
- Explanatory notes that discuss the instructions and methods used.

In this way we learn 8-bit data transfer; 8-bit addition to shift left 1-bit; to mask off the most significant 4-bits; clear a memory

location; byte disassembly; and to find the larger of two numbers. Compare this to the machine code routines found in some books and you can see why this is only for the very outset.

The author gives us next a tutorial on machine code program loops and how to



use them in modules to turn data, learn to use negative number elements and find the maximum value in a block of unsigned binary numbers. Microprocessors often handle data which represents printed characters rather than numeric quantities. So handling 7-bit ASCII coded data has a chapter devoted to it. This chapter, like all

the rest, is very well written and is probably ideal for those heavily into assembly language and certainly those who might use their 6809 knowledge on other machines in future years. Its disadvantage is that you cannot use this knowledge and apply it to make things happen without further information.

Recommendations

Neither of the advanced books mentions the Dragon or the Tandy Colour Computer. So there are no games or fit-in routines. Readers also know that it makes sense to make use of some ROM routines and basic statements to save yards of hexaglyphs — the books are of no use here either. Be for those who want to go further into machine code on the Dragon, I would recommend *Inside the Dragon* as a better buy at half the price. If you still, however, feel attracted to the two further texts described above don't buy them by mail order — go to a specialist computer book shop and have a good look before immersing yourself in machine code from this angle.

If any of my descriptions have interested you in any particular book reviewed in this series of articles, I hope you'll put it on your birthday list. Some of the books cost less than a games tape and, who knows, may set you on the path to fame and fortune. My thanks go to the various publishers for providing me with copies of the books, and to Computer Bookshop Ltd, distributors of Programming the 6809, published by Sybex. ■



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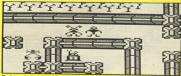


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MIKE GERRARD'S ADVENTURE TRAIL

HAVING BEEN promised an early look at the Dragon version of the **Mysterious Adventure** series, so popular on most other home micros, a phone call from Channel 8 revealed that in producing the master tapes some data had been corrupted and final copies had been held up. However, we have been promised them within the next few weeks. Meanwhile a look at two of this month's adventure releases, one from a new software name, **Six Software**, and the other the much-awaited sequel to **Pettigrew's Diary: Operation Salvo**, from Shanda Software.

Lame Duck

Any company calling themselves **Six** are asking for trouble if they don't produce a professional product, and regrettably, with **Burden City**, they haven't. It is rather disappointing to read on the cassette cover that "a thick white vertical line appears on the hi-res screen when you first run it, press **BREAK**, and type **RUN**." Sure enough, each time I've loaded the game so far those lines have appeared on the hi-res world map which greets you as you start the game, though they disappear second time around. The main problem with this adventure is quite simply that it is not very original, but is similar, and inferior at that, to **The Ring of Darkness** from Wimscoff, whose follow-up **Return of the Ring** is being offered as a prize in our adventure competition (see facing page). Why similar? Well, you start out as a flashing character (he is spoken) on a large scale map, around which you move using the cursor keys. Where **Ring** has barbed and thieves leaping out at you unexpectedly, **Burden City** has mules and wolves.

When you reach certain points on the map you can **ENTER** the location by pressing the "E" key (one of only five commands available to you) and the display switches to that of the location, for instance Ottawaville, where you can move around, again using cursor keys, to buy supplies, be given tasks by the chief, buy transport, or visit the army. This last is rather unusual as the adventure is set in 1850 and opens in North America, where, I feel, armour was not the height of fashion at that time.

The purpose of the adventure is to find the Wheel of Time, buried in the **Burden City**, and you're doing this on behalf of one

Professor Ets, who needs the wheel to complete his Time Machine. There are plenty of adventure elements in the game, such as the fact that you cannot travel to South America until you devise some way of getting past a persistently awkward Red Indian; and you need to do that to complete the task set for you in Ottawaville, which may earn you enough money to buy a boat to set sail and reach another continent. But there are also so many boring elements that it is very hard to recommend the game. Every time the wolves, bears or whatever leap out at you, they deprive you of some of your mortality points, and you always kill them "with a lucky punch", which somehow earns you a few sovereigns — I must admit that the logic of this escapes me, though the legend didn't.

By comparison, **Operation Salvo** wasn't too bad, though I'd better admit at once that I didn't really care for this, just as I didn't care for **Pettigrew's Diary**, which seems to put me in a minority as far as reviewers are concerned. However, **Salvo** at **Pettigrew** is in three parts, and casts you as cost accountant, part-time computer programmer and part-time secret agent Roger James Pettigrew. The first chapter, "The Awakening," is not for the impatient as you must wait a full four minutes once the game has finished loading before you do a single thing. The graphics and sound effects are admittedly good, but to have to sit through them every time you load the game until you solve this first chapter is a little too much.

At the end of the preamble you will be asked half a dozen questions to test your observation of what's gone before, and dogged determination will get you through these, though I didn't like the way you have to go back to the first question should you get a later one wrong. If you're a little uncertain on question six, why should you type in the answers to the first five questions again . . . and again . . . and again, when you've already proved that you know the answers? The same applies to the last code number which you have to work out in order to load Chapter two. There's some guesswork involved here for most people, I imagine, but get it wrong and you are sent back to answer those same six wretched questions yet again.

Chapter two is "The Searching" and is similar to the second section of **Pettigrew**,

but here the adventure extends to the whole of the British Isles rather than just the streets of London, though that's where you start off your hunt for your five fellow agents, held by the enemy in secret locations throughout the country. You are given OS60, a map of the UK, a list of towns you can visit, and an agent locator device. This means that the five agents are listed across the bottom of the screen, with a cursor indicating which is nearest you, and a figure denoting the hours taking away for each agent.

In some ways this is a conventional text adventure, with commands entered in the usual **Goat/Verb** manner, though I don't think it's conventional to be told "You can't do that, I'm afraid" when you haven't even touched the keyboard, which happens constantly. You can travel from town to town (GO BRIGHTON) by car, rail, plane or foot-hitch, and you must decide which is best in terms of time taken (this is a real-time adventure) and cash consumed.

I wasn't too successful with the second part, and although I'd been given the code word to load Chapter three, "The Returning," I wasn't asked for it and the eight separate challenges contained in this section simply began. The first has you armed with a sword and facing an axe-wielding ogre, with room to enter your instructions beneath the simple picture.

Cryptic clues

Commands such as **RIGHT**, **NORTH**, **RUN**, **GO NORTH**, **WALK**, **SPRING**, **SWORD**, **ATTACK**, all resulted in the barely repetitive "Try Another Action," until eventually the right combination of two words led me on to the second challenge, after a rhyning preamble containing cryptic clues, some referring back to earlier chapters of **Operation Salvo**. This time the graphics consisted of a jato, with the same prompt awaiting your instructions beneath. Comparing with the several tests at the end of **Pettigrew** are inevitable, and I felt that like that earlier program, this too was a collection of fairly mundane Basic programs lacking a cohesive theme, and which run out of steam very quickly. But I did say I was in a minority before, so if you loved **Pettigrew** you'll probably love this. Whoever listens to the opinions of reviewers anyway? **Pettigrew III** is probably already underway. ■

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Dragon Answers

Cursor control

I WOULD be grateful if you could tell me how to move the cursor across the screen, treating a sentence as it goes along. I think this would be very helpful in programming.

Shawn Clyde
East Ayrshire
Scotland

A SIMPLE, but effective way to achieve this is by the following routine:

```
100 LET AS = "The text to be printed"
110 FOR I = 1 TO LEN(AS)
120 PRINT MID$(AS,I,1);
130 FOR D = 1 TO 250: NEXT D
140 NEXT I
150 PRINT
```

Here, AS is set up as the text you wish to print, and the value in the delay loop of line 130 controls the speed of printing.

INKEY\$ repeat

AFTER purchasing the sound extension module for the Dragon 32 by J.C.B. Microsystems I felt that a sound generator would come in very handy. I have written such a program which converted the entire keyboard into an organ.

The Dragons' INKEY\$ function does not give auto repeat, so the key had to be pressed to get a note each time, instead of holding a key in for a continuous note until the key was released. I tried using the peaks 327 to 345 but this turned out very tedious and the program very slow.

The peak addresses seem to be the only way I can get an auto repeat. Can you be of any help?

Andrew Purser
Dunfermline
Dumfriesshire

TO OBTAIN an autorepeat on the Dragon 32, these scan locations are used, but instead of reading them, they are read to 255. The following line will give a repeating INKEY\$ function:

```
100 FOR I=327 to 345:POKE 178,NEXT I: = INKEY$
```

Here, it will continue the character currently being held down on the keyboard. The Dragon 32 has a built in autorepeat in both modes and so the second loop is not required on this machine.



Dragon Basiccode

I HAVE recently become interested in using the BBC Basiccode-2 translation program with my Dragon microcomputer. I am sure that it is an idea that will appeal to many other Dragon owners.

The BBC does not include the Dragon on the list of computers for which a translation program has been written, but the Tandy TRS-80 computer is included. I would like to know whether or not the translation kit for the Tandy can be used with the Dragon?

Philip Haddock
Murrenloch
Dumfriesshire

BY THE time you read this, the official BBC version of Basiccode for the Dragon should be available. There is also a version available at the same price of £3.50 from Graemac Software (see Dragon User May '84).

A number of readers have asked if the BBC Basiccode for the Tandy TRS-80 computer can be used with their Dragons. The answer to this is no. Don't buy the version for the Tandy as it cannot be used and cannot be converted for the Dragon. This version is in fact for the TRS-80 models I and II, not for the Dragon lookalike the TRS-80 Core.

Logs out of line

I AM puzzled about one of the read-outs from my Dragon 64 when using the log function. PRINT LOG(1) returns 1.47388804E-10.

This seems to be completely out of line with the other logs, and I wonder if you can tell me if this would appear to be a fault in the computer itself?

David Smith
Maddenhead
Berks

YOU HAVE pointed out another bug in the Microsoft floating point arithmetic, the same bug that causes so much trouble when using the π operator.

The way to get round this problem is instead of using: $X = LOG(A) * 100 * X = INT(LOG(A) * 100 * 100)$. This will give the correct answer to eight decimal places as on a calculator.

Safe switch

IS IT safe to use the remote jack (from the cassette lead) as a switch for external devices?

Secondly, when using CROMM and other swifts a "clicking" sound is heard from inside the Dragon. Can this noise be stopped?

J. Hailley
Balfry
W. Yorks

THE RELAY used in the Dragon is only really designed to be used with cassette recorders. The relay can only handle up to about nine volts at 100 milliamps safely. This means it could only be used with a light bulb or something of similar rating off a battery.

Of course, you could use it to control a much bigger relay which could take a full 240v mains supply. Such relays can cost £1.50.

The "clicking" from the Dragon is the relay operating and cannot be stopped.

Interfacing a printer

I HAVE the opportunity of buying a Silver Reed EX-44 electronic typewriter and a Silver Reed IF-44 computer interface at a very reasonable price.

I have been informed that it will work on my Dragon 32. Could you please tell me if this is correct?

Also, two other printers I have been looking at are the Selsolux EP-100A and the Tandy Colour Plotter 115.

Are there any problems when using these two printers with the Dragon?

D.C. Smith
Killinghall
Northants

THE Silver Reed EX-44 is a daisy wheel typewriter which can be connected to a computer via the interface box sold separately (for an extra £180).

The interface supports the parallel Centronics type — the same as used for the Dragon. Providing you can obtain the necessary cable, there should be no problems with this set-up.

The other two printers that you mention are amongst the most popular that are used with the Dragon and are easily hooked up.

Warm or cold start

I HAVE come across several references to the "warm" and "cold" start, particularly in connection with FORTH. Could you please explain what this is about?

P. Atkinson-Smith
London

A COLD start is what the computer does when it is first switched on; that is resetting all its internal "mode codes" and displaying the copyright message. A warm start is what happens when you press the reset key — the computer is reprogrammed and then restarts, but does not read most of its pointers, so your Basic program is not lost. You can force a cold start by typing POKE 178,0 and then pressing reset.

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Competition Corner

Answers to Competition Corner,
Dragon User, 1213 Little Newport
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REGULAR readers of this page may remember that in the January issue of *Dragon User* I made some general remarks about puzzle-solving. One of the points that I mentioned was to ensure that the computer is doing just what you want it to, and it is this that I would like to take a closer look at this month.

Take the following simple problem: which numbers under 400 have a square root that is a whole number? You might write something like this:

```
10 FOR N = 1 TO 400
20 S = SQR(N)
30 IF S = INT(S) THEN
PRINT N
40 NEXT N
```

I know that this is a rather roundabout way of tackling such a problem, but it will illustrate the point in question. If the above program is run, the print-out will indicate answers of only 1, 2, 3, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144, 169, 196, 225, 256, 289, 324, 361, 400. So what about the rest? Take the first missing integer, 5. At some point while the program was running, it must have checked the value 25 to determine if its square root (5) was integral, and, it seems, come up with the wrong answer.

If we type in `PRINT SQR(25)` we get the expected answer, 5 — so this gives us no indication as to what has gone wrong — even though this value was apparently rejected by the `IF THEN` statement in the program. Now try `PRINT SQR(25)*5` and, surprisingly, up pops the answer 1.60246150708. This minute decimal, caused as a result of minor errors in the calculation is not big enough to show on

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the display and yet it is still there to influence any `IF THEN` decisions made on it. (For a more detailed discussion of this particular difficulty see *Dragon User* October, 1983 pages 31-34.)

A useful tip to eliminate the problem is to put the value to be tested into a string and then take it out again, if that sounds a touch odd, just add this line to the original program and run it again.

```
20 S = VAL(STR$(S))
```

This cures the problem — the offending digits having been well and truly chopped off! And now for something completely different.

Here is a little problem, in the following listing can you say which you would expect to be printed at line 40 — that is, what is the third character of strings `AS` and `BS`. Try to answer this one before running the program.

```
10 A = "12345"
20 AS = STR$(A)
30 BS = "123456"
```

```
40 PRINT MID$(AS,3,1),
MID$(BS,3,1)
```

If you now type in and run the program you may be surprised to find that although `MID$(BS,3,1)` gives a value of "5" — as might be expected — `MID$(AS,3,1)` returns a value of "2". So why the difference? Add the line: `50 PRINT LEN$(A), LEN$(B)` and you will find that `AS` has grown to a length of six characters while `BS` remains at five: so what has happened?

Clearly, if we are dealing with a problem in which it is important to locate the exact position of a character within a string, we could have difficulty. To take the case of `BS` first. Line 30 of the program simply puts into `BS` the characters contained in the string. The fact that they are numbers is irrelevant to the computer — they could be numbers, letters or symbols — or even a mixture of all three. The computer just regards them as five characters, so `MID$(BS,3,1)` will

return the third character — that is "3". Now, the case of `AS` is slightly different. This is a string created by the computer to hold value `A`, which was here defined in line 10 as being "12345". However, as this is a numerical value, the computer needs to know if this number is positive or negative and so the first character in the string is reserved for this purpose. Of course, if it is positive, the plus sign isn't displayed — indeed, it would be rather tedious if it was, but, nevertheless, the space that it would occupy is still held available. These would be nothing strange about a string, the value "12345" is a string, and, in this case, the third character of the string would be the "3".

It's all a matter of "you pays your money and you takes your choice" — in other words, so long as you are aware of exactly what is happening when you write a program involving the location of digits within strings, there shouldn't be any problem. But, remember, this only applies to strings that the computer has created to hold what was formerly a numeric variable. Much of the foregoing will probably be relevant to tackling this month's competition question.

I have in front of me a card on which I have written a certain number. If I were to multiply this number by itself I would get a ten-digit number in which each digit — zero to nine — occurs once and once only. If I were now to tell you how many digits in my original number are odd you would be able to tell me what this number is. What number have I written on the card?

Prize

MICRODEAL, the biggest Dragon software house in the country and regular member of the Software Too 10 club is offering readers a chance to win £250 worth of its games and adventures.

Rules

TO WIN this month's prize you must show both the answer to the competition and how to solve it with the use of a Basic program developed on your Dragon. Please do not send in a cassette containing the answer. As a beginner's com-

plete the following sentence in 16 words or less: "I want Microdeal's range of software for my Dragon because..."

Your entry must arrive at Dragon User by the last working day of September. The winner and the solution to the puzzle will be published in our December issue. Entries will not be acknowledged and we cannot enter into correspondence on the result. You may only enter the competition once.

June winner

THE WINNER of June's com-

petition and recipient of a Dance disk drive from Alpha Disc is Deirdre McCrea of Belfast, Northern Ireland, who correctly stated that the data landed in table 16, double 7 and double 16.

Horace hunt winners

Five responses to our Horace Hunt competition were overwhelming and from amongst a plethora of replies we have chosen the following winners, who will all receive a copy of the Dragon version of Hungry Horace:

NE Bell, Derbyshire; Darren Lewis, Aberystwyth; Darren White, Stranmillis; Joanne Crosswell, Bromley; Barry Saxon, Wigton; E Hopkins, Canterbury; Darren Ross, Southwick; D Dillon, Virginia Water; Mark Spence, Wolverhampton; Michael Houghton, Bolton; Jonathan Peters, Warrington; James Ward, Pudsey; Christopher Spinks, Colinton; Adrian Throup, Netherthorpe; Stephen Lindon, Winterton; Lee Fish, Cramlington; Elaine Ferguson, Kilmacnock; D B Egan, Southampton; A P Humphreys, Reading; and A Whitehead, Kingsbury.

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