

DRAGON USER

International edition

The independent Dragon magazine

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August 1984

*Exploring
adventures*

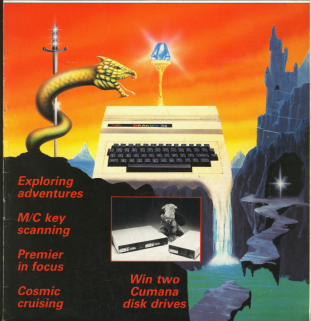
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How to submit articles

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

One line of us who uses a Dragon will be able to discover how tricks and quirks almost every day. To help other Dragon users keep up with the speed at the development staff 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 2000 words long. All submissions should be typed. Please leave wide margins and a double space between each line. Programs should, wherever possible, be computer printed on plain white paper and be accompanied by a tape of the program.

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

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Including this month further information on preventing/unauthorised access to program data, help for Tandy to Dragon conversions and a short program of a formatter for printer output.		David Berry comes up with a key-scan routine that aids data inputting and does not suffer from the drawbacks of other methods that do not use the classical input or binary functions.	
News	8	Ending 10 Errors	30
An update on the late of Dragon Data, news of a possible Dragon 3200 machine from GED, price reductions at Ocean's, the High Street retail chain and the latest on software, peripherals and utilities for the Dragon.		D. L. Jones takes you out of the dreaded 10 errors with handy hints to evade the problem.	
Games galore	14	Open File	32
John Scriven battles his way through the software scene taking on all comers — be they dromes, cricket balls, bats or buzzards.		Trev, Caterpillar and Converter are among the program listings sent in by our readers and published in this month's edition of the magazine.	
Cosmic cruiser	21	Adventure column	41
Our space-age program of the month by the architect of the <i>Stations</i> download, Brian Money.		Our new monthly feature by Mike Gerrard which takes a look at the latest and the greatest adventures for the Dragon (Cover illustration by Stuart Hughes).	
Premier profile	24	Dragon Answers	45
Gordon Ross interviews the people at Premier Microsystems — home of the Data disk drive system for the Dragon.		Brian Cridge puts an end to your problems with news, views, information and routines on your subject areas.	
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		Cumaria is offering two disk drives as this month's prize for the successful entrants to Gordon Lee's key-code puzzle.	

Editorial

REACTION TO THE news that Dragon Data had called in the receivers was that the 32 had been killed off. But judging from our readers' responses, their interest in the machine is still alive — and it is that interest we intend to continue serving on *Dragon User*.

Readers have let us know that they think "the Dragon is an excellent computer and a reasonable games machine", and that they intend to stick by it. Poor marketing is held to blame for the company's problems: "We all feel greatly let down by Dragon Data's pathetic approach to marketing and advertising and their highly overpriced peripherals." (At least these were some good news here: the price of Dragon Data's peripherals fell when the receivers walked in — although make sure that if you buy the drives you get the controller cartridge as well.)

The company's software came under particular attack. To quote one disgruntled reader on the subject of what Dragon users did — and didn't — need from Dragon Data: "It was most certainly not to pay the highest prices for software, a lot of which was double the price of the far superior Commodore software, and it was not to have the feeling of being an owner of an inferior machine whilst browsing the shop shelves trying to find anything at all relating to the Dragon. . . . One can find a needle in a haystack easier than finding new, imaginative and original software for the Dragon." Microdeal has been far more successful than Dragon Data at picking the right games — and at marketing them. Dragon Data's first software appeared in polythene bags hung on racks, eventually being transferred into giant video cassettes. Neither looked very good, nor made much sense — the video cassettes contained footnotes with areas of white space. As the same reader commented: "Dragon Data seemed stoned on cocaine."

Self-willed or misled by outside market pressures, Dragon Data's "gamble" makes it even more important for this magazine to serve the needs of Dragon users. So don't forget to keep in touch — write and let us know what you think we're doing well and (please be forth) what we're doing badly.

EDIT+ - A true Utility

Some 'Utilities' are really not very useful when you come down to it. To be genuinely useful the software has to do something quite special - it has to be a real improvement over the way that you do things. (see *Jan*) be convenient to use. We looked at the DRAGON. The facilities for program development are primitive and the display is a pain. It could even put you off programming for life.

EDIT+ is a real improvement for the DRAGON. It allows you to develop programs quickly and easily, whatever they are for. In addition EDIT+ includes HIRES, an enhanced screen display with 24 lines by 51 characters, selectable character sets (English, French, German, Danish, Swedish, Italian, Spanish), Sprin graphics, redefinable characters, and an improved keyboard action with auto-repeat. Graphics and text can be mixed on the same screen. To use EDIT+ you either plug in the cartridge or load the program from disk. Tapes are fine for games - not for something you will use over and over again. Programming can be pleasant - try EDIT+ and see how. It may even help you to make proper use of some of the other 'Utilities' on the market.

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We were delighted to see DASM/DEMON become the most regularly featured assembler in *Microcomputer DRAGON* machine code articles.

We were rather proud when Ian Sinclair chose our assembler and monitor for his book 'Introducing Dragon Machine Code' and 'filled' by his description of DASM as 'The Rolls Royce of Assemblers'.

Our latest accolade is in 'DRAGON Machine Code' by Robin Jones and Eric Cowell who use DASM for the worked examples throughout their book.

These gentlemen know their stuff and they picked our product. Perhaps you should too.

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We will be issuing a FLEX utility disk which will allow you to run DRAGON BASIC with FLEX. So you don't have to start again with a new BASIC. If you want PROCAL, COBOL, FORTRAN, FORN or 'C' they are available from several sources. An editor and assembler are part of the standard FLEX package.

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Letters

This is the chance to air your views — send your tips, compliments and complaints to Letters Page, Dragon User, 12-13 Little Newport Street, London WC2R 2LJ.

Top secret

POWERS: Mr Mags Letters Dragon User May 1984, would be interested in my own method of preventing unauthorised access to program data.

The first time you create the data, include a temporary line at the beginning of the program: `ORG = "ABCDEF"` (where ABCDEF is your own secret word of at least six characters in length).

You then save OMS along with all of your other program data (that is, point # — 1). Remove the temporary line and the code-word is retrieved from tape along with all of the other program data.

Before the program allows you to proceed any further, the code-word must be entered. The method I use to enter the code-word prevents someone reading it from the screen as you type it in. The listing is as follows:

```
1 CLSA: PRINT @ $0, "Data
loaded and ready for use!"
2 Play "PA": SOUND 100,4
3 PRINT @ $03, "Enter pass
code":
4 For A=1 to 6
5 $0=ASC $0: $A$ = "" : Then
6 If INSTR (A, DWSAQ) = A then
A=$A
7 Next A
8 If A=$0 then CLS: PRINT @
296, "Invalid code!": play "P1":
goto 1
```

You will never prevent one of the whizz kids from getting into your program but you can make things hard for them. The above method combined with the disable list method should prevent most unauthorised eyes from gaining access.

S J Jones
Great Barr
Birmingham

A stitch in time

With reference to Peter Hooton's "Survival" program in May's issue of Dragon User, much typing can be saved if lines 1208-1248 are deleted and the following amendments are made:

```
1208 FOR J=1 TO 10
1240 IF JO<>INT(J/2) THEN
LINE (LJ,LJ+1), VJ, PSET
ELSE LINE (LJ,LJ+1), PSET
1245 IF JO = J THEN GO TO
1220 NEXT J
```

```
1240 IF JO=J THEN GO TO
1248 NEXT J
1271 VJ=VJ+6
1288 IF VJ=192 THEN VJ=192
1290 FOR J=1 TO 20
1298 IF JO<>INT(J/2) THEN
LINE (LJ,LJ+1), VJ, PSET
ELSE LINE (LJ,LJ+1), PSET
1310 IF JO = J THEN GO TO
1320 NEXT J
```

Colin Wilson
Breakfasts Point
Manchester

Tandy and Dragon

I WAS a little surprised to see a listing for a Tandy-Dragon converter in June's Dragon User, since many have been either advertised or reproduced in various forms. Some time ago I decided it was necessary to have one, mainly in order to facilitate exchanging programs between Tandy and Dragon owners, and promptly set about writing one. It reused some ideas and information from a number of people to produce it and so is not exactly all my own work, but has advantages over many I have seen published or advertised.

There are several problems involved including the problems of USR and EXEC functions (and in some instances PEEK's and POKE's) and the fact that some people poke graphics into strings directly; these cannot be saved in ASCII format and the coding information must remain unaltered.

The point in writing this letter is that I will happily provide a copy of this program to any user in a situation where he finds it necessary to convert programs, for the minimal effort of a stamped addressed envelope and coin(s). For those interested it is a 438

byte machine language program fully compatible with either a Dragon or Tandy, using a simple menu-driven mechanism to determine which conversion it is to take place. It ignores anything in quotes and CLEAR's its own memory to protect itself, and does not bother about PEEK's and POKE's but lists all line numbers, containing USR or EXEC.

One final point, a few users (like people really) take the effort to write programs that will not without any trouble on either machine (this in some circumstances of course requires inside knowledge, whether to be helpful to other users or whether to make more money selling it to more people I'm not sure, but it is only that users cannot exchange information to make this more universal.

Robin Tolman
W-Ankney Terrace
Leeds

A RECENTLY published book that contains a utility to convert Tandy tapes to Dragon format and vice versa is *Hot Programs to Feed Your Dragon & Tandy Color Computer*, published by Sigma Technical Press, page 25-26.



Printer power

I ENCLOSE a short program of a formatter for printer output which might be of use to any other Dragon Users as it helps to tidy up listings, a description of its effect together with the means of using it is enclosed in the program as comments.

```
10 ***FORMATTER FOR
PRINTER***
20
30
40
50
60
70
80
90
100
110
120
130
140
150
```

R A Shepherdson
Hemel Hempstead

Sunderland calling

WE WOULD like to set up a Users Club for Dragon owners in the Sunderland area. Meetings would be held at regular intervals to allow people to exchange ideas and to help each other solve any problems found with programming and so on. Other ideas could possibly include a "Coffee Exchange" and a listing facility for club members.

If you are interested in such an idea please contact me on Sunderland 294188 or lat on Houghton-le-spring 044286.

Peter Thackstone
Sunderland

Software Top 10

- 1 Buzzard Bar..... Microdeal
- 2 Curbside in Space..... Microdeal
- 3 Dragon Chess..... Ceas
- 4 Hungry Harass..... Melbourne House
- 5 Bug Diver..... Mastertronics
- 6 Eightball..... Microdeal
- 7 Sprite Magic..... Knight
- 8 Dungeon Raid..... Microdeal
- 9 Skramble..... Microdeal
- 10 Mr Dig..... Microdeal

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Dominoes
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The future of Dragon



Dragons on the shelf?

COCOMO responded to the news that Dragon Data had called in the receiver by cutting the price of the Dragon 32, 64 and peripherals.

For £79.99 you can pick up a 32 and five pieces of software, while £199.99 will get you a 64. Dragon disk drives are going for under £100.

As regards the fate of Dragon Data, at the time of going to press, the receiver, Robert Ellis, of accountants Touche Ross, had received several offers. He revealed few details, but it is known that both Tandy and GEC have expressed a strong interest in the company.

Indeed, GEC paid for the GEC Dragon stand at the Elettro Court Computer fair held recently. If GEC do take over Dragon Data it is thought that they will concentrate on the Dragon Professional (see Dragon later, July) and an MSX type machine.

As for Tandy, its interest lies with the 32 and 64, and more importantly for readers, the service and support side of the Dragon.

Unexpired warranties on products are legally unenforceable against a company that has gone into receivership, though any company that bought up Dragon would,

it is expected, fulfil outstanding obligations in order to maintain good will.

As we went to press, Dragon Data were still receiving a lot of calls and are trying to help people as much as possible" according to Derek Williams, technical director.

Readers who have a problem with their micro are advised to contact Dragon Data for a list of accredited service shops that have the spare parts to allow maintenance to be carried out.

To date, 52 employees have been retained at the company with a further 100 being made redundant. It is not known where the manufacture of future micros will take place should the company be taken over.

Tandy have been people over from the USA and Europe to have a look at the plant and are keen to take over the servicing and support if nothing else.

Another company rumored to be interested are Philips, though no further details were available. Unlike Dixons, Boots have not altered the price of its Dragon products. The company is still stocking Dragon software and will continue to do so for as long as there is a demand for it.

sole producer of MSX in Britain.

The MSX concept is that micros with broadly the same hardware will all run the same software (Dragon User, June).

If GEC markets a MSX micro, it will have the option of adding a second chip to make the micro compatible with Dragon software.

Software on the go

A PREHISTORIC caveman, the Hulk and an assorted array of football teams make their debut in some of the many new games and adventures being released for the Dragon.

From Imagine comes two new games (price £5.50 each) — BC 88, a "fun game" which has you in the role of a caveman collecting wives, bashing monsters and feeding your wives in order for them to have babies and Arcadia, Imagine's arcade game for the Spectrum, Commodore 64 and Vic20 and now available for the Dragon.

Catchy naming is the name of the game in Skyquest from J. Morrison Motors, an arcade game with three different screens, each becoming progressively more difficult as you ride your stretch killing off other riders and avoiding giant birds that lay eggs which hatch into snakes. Also from J. Morrison is Mission X01, a machine code arcade game with joystick or keyboard options. The task is to command the 55 Explorer on a dangerous mission to collect liquid Zythoneum whilst avoiding asteroids and other such objects. Both tapes cost £8.95.

Adventure International is launching a version of the Hulk as its first release on the Dragon, price £7.95. Taking the role as either Blue Banner or the Hulk, the idea is to fend games in order to regain your lost power. Ants, killer bees and others are there to prevent you in your task. Unfortunately, the Dragon version is text only.

Inexpensive software is now available for the Dragon in the



form of Bug Diver from Masteronic, a company formed by four local wholesalers who produce software at the price of £1.99. The idea of the game is to dive under the water to collect eggs without being eaten by larger fish.

Scorpio Software, a new name to Dragon users, is releasing three titles for the Dragon. The first, Pratical Pearly, is a graphics adventure with over 60 locations as you search for pearls avoiding manta rays such as being sent to prison for smuggling. Star Cargo is a defender-style arcade game and Ruby Runabout is a graphics adventure converted from the Spectrum. In this, you are Reggie the Ruby Robber and your quest objective is to steal the Rockswoman Ruby and stash it away in your garage hideout. There are 40 locations to explore and the cassette should retail at £5.50, the same price as Star Cargo and Pratical Pearly.

Football fanatic should be pleased by the news that Additive Software plans to launch its 3D-graphics Football Manager for the Dragon, and from Castle Software comes news of the release of the first home computer game based on American football, entitled Superball. The game is being test-marketed on the Dragon 32 and if successful will be converted to other micros.

Adventure hiccup

TECHNICAL hiccups have occurred at Channel 5 with its attempts to convert the Mystical Adventure series to the Dragon.

The company is at present waiting for the master copies of the Dragon versions to arrive from the author. Many advance orders have been received from Dragon owners and if customers have still not obtained their copies the company would like to stress that it has not cashed any of the

cheques that it has received and will not do so until the orders can be fulfilled.

Marion Penning of Channel 5 extends its apologies to users and mentioned that direct mail orders will be supplied first before the wholesalers are issued with their stocks. The reason for the delay is due to technical problems in transferring data to the Dragon.

All 11 titles of the Mystical Adventure range will be available for the Dragon, with full graphics versions on the 64 and occasional graphics on the 32.

Dragon MSX?

HUMCROFT that Dragon Data were thinking of manufacturing an MSX micro were confirmed by staff at the Elettro Court stand.

John Savers, managing director of Tandy, revealed that GEC had acquired the rights from Microsoft to be the

Systems software

COMMUNICATIONS software is on the way from Telepost Systems, a newcomer to the Dragon scene. The company, which has specialised in developing such software for the Dragon scene, the company, which has specialised in developing such software for the 6809 processor (the chip at the heart of the Dragon), has recently released the first two products of a new range of communications programs for the Dragon.

The Telepost Terminal Simulator enables the Dragon 64 to operate as a terminal with a 51-character upper and lower case) by 24-line display. It features keyboard-type ahead facilities, KOD/SCPP, line overline, character echo, automatic line feed generation, full code generation recognition and audible alarm.

Standard operation is at 300 bauds full duplex, though speeds of 110, 600, 1,200, 2,400 and 4,800 are available under software selection. The cartridge costs £89 and comes with connecting instructions.

Another communications package from Telepost is a

disk-based data transfer utility for DDB users. The data transfer software enables both text and binary data to be received continuously from the RS232C or other external interface and to be transferred to disk without loss of data.

The utility is available on a Dragon format disk together with optional device descriptions for alternative speeds of operation and is priced at £30. Further details from Telepost at Leadwater House, London Road, Leamington, High Wycombe, Bucks, phone 0494 448744.

Oxfam calling

COFAM has launched a major appeal for computer software through its chain of shops in the London area.

Oxfam, one of Britain's leading voluntary organisations in the field of overseas aid and development, receives all sorts of donated goods, clothes, toys and so on, and is operating particularly freely in reaching for computer software, especially games car-

tridges for personal and home computers.

Manufacturers and retailers are also asked to spare some software. The appeal is mainly being launched in the London area though any of Oxfam's shops around the country can take them. In the London area contact Oxfam at 348 4225.

Flexing it

COMPUSENSE, distributors of Flex for the Dragon 64 (see Dragon User, April, page 12), is now offering a complete system which includes the Dragon 64, ten disks, Flex operating system, editor and assembler.

The cost of the system is £265 excluding VAT and Compusense will continue to offer the system as long as stocks of the 64 are readily available from OBC Dragon.

The Flex operating system itself retails for about £75 and is a direct rival to Dragon Data's D99. Flex has been developed over a period of six years according to Ted Ojczyk of Compusense, and is available for a number of other microes including the Tandy, BBC computer and Motorola Exorcist.



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Good news at the fair

THE EARLS Court Computer Fair held recently in London brought good news for Dragon users.

The show saw several major firms displaying new releases for the Dragon and vowing to continue doing so. The largest was, not unexpectedly, Microdeal with a space ship stand and a twenty TV screen to enable enthusiasts to have a chat with Outburn — the bespectacled "wizzo-kid" featured in many of Microdeal's games.

Microdeal is releasing seven new titles for the Dragon, four of which — Time Search, Castles, Downland and Demon Base — were on display at the show. Worlds of Flight, Demolition Derby and Fury are still being worked on and should be released soon. John Symes of Microdeal said that details what happens at Dragon Data, Microdeal will be sticking with the Dragon and has a contract with Tandy to sell the top Dragon titles in Tandy, and also has a deal with a Tandy company to obtain the titles of Tandy tapes.

Hercule Goes Skiing, the successor to Hungry Hotties from Melbourne House, is now out and about for the Dragon. In this version, Hercule must cross a busy road to collect his skis, make his way to the ski slope and then ski down.

Roman gladiators at the Argus Software stand

heralded the release of the Fall of Rome. As commander of Rome it is up to you to prevent the crumbling of the Empire as Rome struggles for survival. Also coming from Argus is Demon Knight, a text-only adventure.

Phoenix Software had two new titles on display, Mission Moonbase and The Emperor Must Die. The company, which releases action/adventure games in twin cassette packs has also announced a price cut — its software titles now cost £8.95 down from £9.95. In Mission Moonbase you are chosen to deliver Strontium 90 fuel to Rocket Base Moon, only to find that the transporter driver has been murdered, and in The Emperor Must Die, your job, should you take it, is to assassinate the evil Emperor.

Judging by the many letters we have had inquiring into Funchock-type games, readers will be pleased to note that Ocean Software has released a version for the Dragon. Funchock, like the arcade original, has Quasimodo rushing to save Esmeralda from a castle stronghold by leaping about dodging arrows and towers and staying one step ahead of the pursuing knight.

Finally Lighthouse, producers of war games, announced the forthcoming release of a new game tentatively entitled Time Jumper. No further details were available.

Cases and covers

A HANDY carrying case is now available for the Dragon.

The case, constructed from heavy-duty, brown vinyl, waterproof material, was one of Dragon Data's top-selling mail order items according to Bob Artiss of Jenart Design, makers of the cases. Designed to protect and carry the Dragon, transformer, plug and leads, the case will continue to be sold by Dragon Data should the company continue with the retail side of its business. At present the cases are available direct from Jenart at 19 Spine Lane, Slough, Wokingham, South Milton, Devon DG8 4NY (price £12.95).



Jenart's cover

The company also produces a black nylon cover for the Dragon (price £3.20 plus 30p p&h) complete with ted logs. The covers were produced to the direct specifications of Dragon Data who put in an order for 500 of them prior to going into receivership. For further details on the cases and covers contact Jenart on 07697 693.

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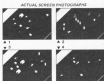
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Tom Mix's buzzards bowl out Ian Botham

Intergalactic Cheese-snuffers, Amorphous pterodactyls and the evil Seikido empire are no match for our man at the controls, John Scriven

THIS MONTH I've concentrated on games, some more familiar names and some from fresh companies. I've also had a chat with Callbert, won a good medal in the decoration at The Olympics, scooped out Ian Botham and Kapil Dev in the same match, pushed ice blocks round the Antarctic and avoided playing invaders — in fact, a very pleasant month.

A frequent name on the credits screen at the start of many excellent games is that of

Tom Mix. Now the American company has decided it should have an English outlet, rather than license other companies to market its programs. The first opus from this new company, **Buzzard Ball**, is up to the standard of previous titles and contains several interesting features. The most noticeable of these is probably the plastic object on the end of a cable that you find in the box next to the cassette. This strange item is a "dongle", designed to prevent piracy of the game.

Although not uncommon in the field of business software, it's the first time that I've encountered one on a piece of home software. Dongles for the Apple computer usually consist of small attachments that fit on a board inside the computer and have a selection of micro-switches that can be set to an entry code. If the dongle is absent, or the switches incorrectly set, not only will the software fail to load, it will sometimes also corrupt the disk.

I have been calculating that millions of pounds are lost each year by software firms due to people copying each other's software. While backup copying for one's own use is perfectly legitimate, issuing your friends with old copies is not. If the situation had worked there, then probably program writers would have put up with it. Unfortunately, there is now a thriving black market of software rip-offs, that can be seen in many market stalls round the country. What also disturbed manufacturers was the fact that so-called computer clubs had been set up solely with the aim of supplying members with cheap copies of popular games.

There is little physically that can be done to a cassette to prevent it being copied tape-to-tape, even if the program is difficult to break into. The one idea that worked well this year was snatched away by the Ministry of Defence. Some companies record the program at a very low level, but



Seikido Attack puts you in charge of three ships

often this merely frustrates the efforts of the owners to load the original tape. If you make a copy of software that has been "dongled", then you won't be able to use it unless a dongle is attached to your machine.

Buzzard Ball's dongle consists of a small black box containing a lump of black resin. Somewhere inside this resin lies a little board developed by a Newcastle firm. The details of the board are secret, but even if you found out what it contained, it would probably be easier to go out and buy your own copy of the game than to try and duplicate it.

Either way . . .

Has all this trouble been worth while? When the game has loaded and you swing the dongle for a joystick, you are offered the chance to select the background colour, and then the screen starts to reveal the playing area. This consists of several islands suspended in the air. Your player stands on the back of a bird about the size of an ostrich.

Using a joystick to control left and right movement and the fire button to flap the wings, your aim is to attack other nodes on the screen. If your force is higher than your opponent's, then they are destroyed. If you manage to get yourself killed, then you are reincarnated on one of the islands

Under review

Buzzard Ball

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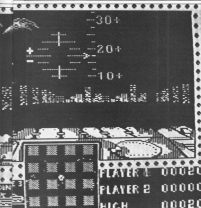
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anks — watch the radar for the enemy above.

provided you still have one of your five lives remaining). When an enemy is destroyed, the rider is transformed into an egg that must also be destroyed before it falls into a new rider. Managing to clear the screen results in a fresh wave appearing and more bits of the islands crumbling away. If you spend too long on any particular wave, parodycity's zoom in from left and right, and they are particularly difficult to destroy. From the fourth wave onwards, the land at the bottom of the screen gives way to a lake of lava inhabited by a lava monster who will grab any bird that flies too close.

... it's fun to play

Although this game is great fun to play singly, it is even better with two players. Whereas most two-player games merely allow you to take it in turns, this game lets both of you appear on the screen at the same time. In this mode, each player controls a rider of a different colour, and you can pit yourselves against the enemy as a team. Indeed, you will get cooperation points if you choose to play this way.

For those readers possessing a mean nature, there's nothing to stop you jumping on your friend when he/she least expects it, although I found it often did this by mistake rather than by design (that's my excuse, anyway). If you like the arcade

game *Joust*, or want something different from standard space games, then you will find this good value and great fun, simple and all.

Another game from Tom Mix is *Electron*. This could be confusing, especially if someone brings out a game called *Dragon for the Electron*. To show the derivation of the game, it should really be called *electron*, as this is a competent version of the arcade game based on Disney's *TRON*. As such, it starts with a selection board with a dot at the centre. You can choose to move the dot in one of four directions, and this will result in one of the four games being displayed on the screen. If you fail at any game, you can re-enter if you have lives remaining, or you can go on to the other games.

In the game *Beam Buggy*, you control a light cycle running around the screen leaving a trail and making 90 degree turns like *Automan*. The object is to make the computer bike out one of the tracks while avoiding them yourself and this isn't too difficult. *Protonid* is similar to *Decid* and other robot games where you have to avoid little creatures that fire at you. If you can avoid them you climb on board the transporter and see back on the selector board again.

Force Field puts you in a cylinder at the bottom of the screen with the roof grad-

ly descending on your head. If you can shoot a hole through it, you can escape to freedom. The *Maze* consists of an area of walls containing your tank and the computer's vehicle. You have to shoot it three times to destroy it, while it only needs to hit you once, which seems rather unfair.

All the first round of games are reasonably easy to cope with, but on successive screens you have to defeat larger numbers of the enemy in each game, for instance three light cycles rather than one, and three tanks in the maze. This makes the whole program well balanced in terms of difficulty, as it is possible to improve your score each time. The graphics aren't amazing, and it's hardly based on an original idea, but it's well-written and can become quite addictive.

Galaxman has produced a wide range of rather strange games in the past. From Dan Diamond's Trilogy to the *Gridwood* incident, so I was surprised when a version of *Pac-man* arrived this month. However, very little is ever what it appears from Brighton software houses, and the case of *Red Meanies* is no exception.

Meanies to Loonies

According to the accompanying blurb, you are a member of the great star-taring race of Intergalactic Cheese-shufflers who happen to be trapped in a maze of cheese. No bad fate, you might think — until you discover that the maze is inhabited by Red Meanies who rather enjoy the taste of Cheese-shufflers (that is, you). The red dot lying on the floor of the maze are ordinary cheeses, but occasionally you will find green ones that are so strong they turn the Red Meanies into Blue Loonies, who are easy to catch and eat. Unfortunately this increases the number of Red Meanies, but life never was supposed to be that simple.

The screen shows how many cheeses you have consumed and how many loons you have left, as well as a view of the maze. In this version, however, you never see the maze from the air, always from ground level. For those of you who have ever wondered how it felt to be a white rat racing through the maze always in some laboratory, then play this game. The graphics are very fast, and you use the keyboard to turn or go forward. The keyboard routine is also very efficient, and you can hold the forward key down at the same time as you turn left and right. I think that *Phantom Steer* is still my favourite *Dragon* maze game, but *Red Meanies* is well worth considering.

Mordool has produced several new titles this month, including some that continue themes from previous games. *Caesh* is one of these, and stars *Mico*, from *The King*, who doesn't get on with goblins quite as well as *David Abernethy* does. Flying across the Amazonian basin, he has been forced to parachute into the jungle and must now try to reach safety. The initial display lets you choose the background colour, and there has a rather long piece of introductory music as the tiles are displayed. At this point, you are shown the four different screens until ▶

DUCKWORTH HOME COMPUTING

All books written by Peter Gerrard, former editor of Commodore Computing International, author of five bestselling adventure games for the Commodore64, or by Simon Boyce, both an regular contributor to *Home Computer News*, *Which Micro?* and *Software Review* and *Popular Computing Weekly*.

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you press a key to start the game.

The first screen consists of two ladders on each side of the screen. The object is to swing across in a rope, climb a ladder, swing back, climb another ladder and so on, until you arrive at the top of the screen. On the way Mario needs to collect various objects lying on ledges before he is allowed to proceed to the next screen. Impeding his progress are spiders that drop from the roof and bounce up and down on the threads, and some snail shells that wriggle around as they too descend about the area.

Screen two has evil frogs to jump over, and screen three forces him to use his parachute again as he attempts to leap from a tall tree into a boat. Screen four introduces monkeys who must be avoided at all costs before Mario is back at the start.

I found the spiders reasonably easy to escape, but the snails are particularly aggressive. All in all, a good game to play, and one with quite a bit of originality, though probably not as addictive as the King, Cuthbert in the Jungle, or my favorite, Dragon Data's Junior's Revenge.

Remembering Cuthbert reminds me of an enjoyable day I had at Earth Court recently, where I actually had a conversation with Cuthbert and joined his club. Unfortunately the conversation had to be conducted via a TV screen, but was interesting none the less, and it was good to see that the lad had escaped from the clutches of the Mercurians once again.

His latest exploits are recorded on **Cuthbert in Space**, which sends him right to the Moroccan Solar System to plunder their planets for fuel pods. The display shows you landing on each planet in turn, and leaving the matter ship in a highly maneuverable scout craft. You can control the vessel round the screen to the different locations of the gods. The Mercurians send out their police force to prevent you from achieving your aim but you can shoot at them, provided you are facing in the right direction.

By collecting all the fuel pods from one planet you are allowed to try to capture scored gods that descend from the top of the screen. I don't find this as much fun to play as some of Cuthbert's earlier adver-

tures, and I found it a difficult game to master. This is probably a point in its favour, however, as anyone buying the game would not like to spend \$8 only to find there was no challenge.

A couple of months ago, I reviewed a game from Hewson Consultants called **3D Space Wars**, which showed you the view from the flight deck of a space craft under attack. I was very impressed with the graphics in this game and was interested to see two other titles come my way this month, **3D Seidlab Attack** and **3D Lunaticack**.



Making it out in Cuthbert in Space

In **3D Seidlab Attack**, you control three drone tanks as they trundle slowly along long canyons of buildings. All the time you are being attacked by enemy craft which swoop-out of the sky at you. You are given warning of their approach on a radar screen at the bottom of the display, and you can also see the front of the tank. This is very useful, as each time you see hit, a piece of the front breaks off in an alarming fashion, and eventually the engine shuts down and the next drone takes over. If you lead **3D Wars** then you'll enjoy this game, although the lumbering speed of the tank tends to be frustrating as you try to swing the nose around to fire at the enemy craft. The displays are very clear and the animation excellent. Definitely worth a look.

3D Lunaticack uses the same technique to display enemy ships moving towards you, but this time you are piloting a ZS Luna Hover Fighter attempting to penetrate three rings of defence before it can attack and destroy the Seidlab Base. This is a fairly complicated game and one that needs quite a lot of practice before the inner defence rings can be reached. The visual effect of flying over the lunar surface

is very realistic, complete with a partially deflated earth hanging in the sky. There are enemy tanks and fighters to contend with, as well as an insidious landscape to negotiate.

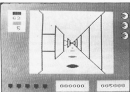
There is an instrument panel at the bottom of the screen that gives you warning of fighters approaching and the direction of the base. There are also messages that tell you if tanks are near and one curious one that must be a weather report for 'Yokohama, as it keeps reading "Hull overhauling" (17).

The sound effects are quite exciting and the whole game is another success from Hewson Consultants. Although the formula has worked well so far, I'm not sure if Hewson could get away with any more 3D programs, as there is a certain amount of similarity between all three. As a final program, it could use the excellent 3D display to good effect in a re-visit of its flight simulator.

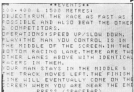
Sporting Destination is the title of a game from a new name in Dragon programs, Penamount Software. This game has appeared at the right time to cash in on Olympic fever this summer, but any budding Daley Thompsons would probably have more fun outdoors than playing this game. The idea is five — 10 events in which you control a miniature athlete who fights his/her way to gold, but after a few plays, it begins to get past.

The graphics are quite good, with a little figure running from left to right across the screen, and the amount of energy available during fat races is shown as a line across the bottom of the display, as is the distance remaining. The winning technique seems to be discovering how to use up almost all your energy without actually collapsing before the finishing line. The throwing events seem to be won by luck more than by judgement — you have to try to release the joystick button while a flashing strength line is at its greatest. The jumping events are similar, though more difficult. I still haven't managed the correct technique of doing the pole-vault.

All the end you get the accolade of the crowd at the medal ceremony accompanied by the strains of the *Chant des Fleurs* theme. Although I don't think this is the sort of program to have lasting appeal, it might have some attraction to those of you who



Green ones turn the red ones into blue ones in Red Menace



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• prefer their exercise in front of a TV screen.

Another new company name is that of **Bliss**, and the name of the game is **The Chocolate Factory**. From the title, you might expect a thrilling adventure game with Charlie, the Cornish-Lancashire, and all the other characters from *Road Darts* look back. However, this is simply a simulation game in which from two to six players can chocolate factories and try to make their fortune. It doesn't sound very inspiring, and I'm afraid it didn't strike me as being the sort of program I'd rush out and buy. It appears to be very well written, and you can choose to have rampant inflation, strikes, heatwaves and other problems taking place just to liven up the game, but it just didn't seem to have any real excitement. I suppose if you have fantasies about being a factory owner or a millionaire, then it might appeal to you, but it's not one for me.

Cricket anyone?

Another simulation that uses far more of the Dragon's abilities is **Tim Lave's Cricket** from Peasack. For some reason, computers and cricket both produce the same unkind remarks from some females of my acquaintance — something about their both being traditional male activities. Whereas more girls are enjoying computers nowadays, the same cannot really be said for cricket, and I imagine that you'd have to be quite keen on the game to enjoy this cassette. However, it might appeal to those who want to know more about the

magical sound of leather on willow, and it does give you a very full version of the real game (the only serious omission seems to be the over limit).

At the start there is a screen display of what looks like the Oval, complete with John Arlott's favourite view, "the gasometer sinking slowly in the distance". After this you can enter your standard test match, county or village game. Even if you select the last category the match is between England and a World XI, although you can name your own team, and the choice of category merely changes the speed of bowling. You can play against someone else or try your best against the computer. There are many fine details in this game and you need careful control of



the joystick to avoid no-ball calls.

There is a view from the side of the wicket as well as one from above, and the figures are very life-like. The angle of the ball, its height and the position of the batsman are all variable, so is the control of the ball when it's your turn to bowl. Immediately the batsman has hit the ball,

the display changes to a bird's-eye view of the whole pitch. If you are batting, you press the fire button until the batsman closest to the ball begins to flash, then you can control his movements as he chases the ball. This game takes a long time to perfect, but if you are interested in this noble sport, you will undoubtedly get hours of enjoyment from Peasack's Cricket.

Cooling down

The last cassette I have looked at is an ideal game to cool you down in the middle of summer. **Pengon** from Microdeal, is a Dragon version of the arcade game where you control a little penguin who pushes large blocks of ice around the screen. You can select the skill level from one to five and a maze of blocks appears on the display. Some creatures who go by the unlikely name of Seacreats appear and try to maul you. Your only defense is to crush creatures between the blocks by pushing them. Eventually you kill all the creatures on the screen, and it fills up with fresh blocks. There are three special blocks also on the screen that cannot be crushed, but will add 1,000 points to your score if you manage to push them together. A rather simple game, but with addictive potential.

After a month in which Dragon Data has gone under yet again, it is reassuring to see that the selection of software grows in both quality and quantity all the time, and that Dragon owners are not being neglected by the games writers. One hopes it will continue to carry on in this way. ■

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WIZARD'S SPEED DRAGON



Cosmic cruiser

Destroy the Starons in Brian Morley's space-age game

HAVING several friends who own computers other than the Dragon 32, I often see game programs that appear to be beyond the graphics capabilities of my Dragon. I decided to see how far the Dragon's Basic language could be used to create an Atari-style Star Raiders game. The result was this slightly lengthy and surprisingly difficult game.

The program uses the PUT and GET commands in graphics MODE4, and it also reports and messages to be displayed. I have defined each character in a "view string", which is put onto the front screen using the routines in lines 1250 to 1260. The target sights are moved using the right joystick, as I found inputs from the keyboard to be unreliable.

The fire button on the joystick fires the

fighters' laser weapons, which comeing at a point in the centre of the sights. If a hit is detected the "Starons" ship is blown up, the screen is cleared and a new view is displayed. Altogether there are nine Starons, if all are destroyed you win, but be careful, you only have limited laser energy. I have not used the double speed POKE 65485, but this may be inserted as line 40 if desired.

Variables

A B S1 S2	Location of spaceship
S5	Spaceship array
FL FR FU FD	Ship movement limits
CD	Ship movement distances
T1 T2 T3 T4	Location of target sights
TS	Sight array
TL TR TU TD	Sight movement limits

JO J1	Joystick values
T3 T5	Joystick direction determinants
BP P B1 B2	Fire button variables
AS	Print string
LH	Length of AS
EG	Energy for each laser shot
NR	Number of shots remaining
NT	Number of targets remaining
L78	Laser array
N78	Number array
K5 K	Input B
X	Counter
UV U5 U5	Random variables

Program notes

10-40	Copyright message
50	Dim arrays
60-90	Instructions
100-200	Set up screen
270-340	Set constants
350-530	Set difficulty
540-560	Set up display
560-750	Main loop
760-930	Fire laser routine
910-1060	Hit Staron routine
1070-1160	Out of energy routine
1180-1260	No Starons left routine
1280-1360	Draw letter + numbers
1380-1470	Update screen
1480-1510	Set up arrays
1520-1900	Data for letters and numbers

```

10 *****
20 *****DRAWSTAR 4*****
30 *****BRIAN MORLEY FEB84*****
40 *****
50 DIM L78(26),N78(7),S5(25,18),T5
(40,20)
60 CLS:PRINT:PRINTTAB(11) "DRAWSTAR
4":PRINT
70 PRINT"MISSION:":PRINT TAB(7) "YO
U ARE REQUIRED TO RID THE GALAXY
OF THE 9 REMAINING STARONS. YOU
ARE THE PILOT OF A CRIPPLED DRA
STAR FIGHTER."
80 PRINT " YOUR FIGHTERS ENGINE
S ARE DAMAGED,SO YOU MUST ANTICI
PATE THE STARONS FLIGHT PATH TO P
UT THEM IN YOUR SIGHTS."
90 "SET UP SCREEN
100 PMODE4,1:COLOR 1,0:PCLS:GOSUB
1480
110 DRAW"BM0,054BD7BR4KE3KUDR2FZR
L6L24H2":PRINT(10,10)
120 GET(0,0)-(25,18):S5,6
130 PCLS:DRAW"BM0,055"
140 DRAW"BD2BR3K2L2D3LR3C"
150 DRAW"BM25,0BD2BR2D3R3L3D2"
160 GET(0,0)-(40,20):T5,6
170 PCLS:LINE(0,170)-(254,192),PSE
T,BP:DRAW"CO"
180 LINE(1,173)-(254,186),PSET,B1D
RAW"BM,174"
190 AS="ENERGY":GOSUB 1260
200 LINE(41,174)-(253,178),PRESET,
BF
210 LINE(11,182)-(126,190),PRESET,B
DRAW"BM4,184"
220 AS="STARONDATE":GOSUB 1260
230 DRAW"BM0,184":AS="0000":GOSU
B 1310
240 LINE(1128,182)-(254,190),PRESET
,B:DRAW"BM130,184"
250 AS="STARONSREMAINING":GOSUB 1
260
260 DRAW"BM240,184":AS="00":GOSUB
1310
270 "SET CONSTANTS
280 C=5:D=4:F=225:FL=5:FU=5:FD=14
5
290 E=4:F=4:TR=210:TL=4:TU=4:TD=14
5
300 T3=40:T4=20:TS=9:TA=34
310 S1=25:S2=18
320 B1=254:B2=126:NT=7:BP=55200
330 PRINT:PRINT:PRINTTAB(2) "HIT 'B
FACE' BAR TO CONTINUE"
340 KB=INKEY$:IF KB="" THEN 350 E
LSE GOTO 340
350 "SET DIFFICULTY
360 CLS:PRINT TAB(6) "HOW MANY LASER
S SHOTS?":PRINT
370 PRINTTAB(11) "A. 10 SHOTS":PRINT
380 PRINTTAB(11) "B. 14 SHOTS"
390 PRINT:PRINTTAB(11) "C. 15 SHOTS"
:PRINT
400 PRINTTAB(11) "D. 21 SHOTS":PRINT
410 PRINTTAB(11) "E. 30 SHOTS":PRINT
420 PRINTTAB(10) "SELECT BY LETTER"
430 KB=INKEY$:IF KB="" THEN 430

```

Continued on page 28

```

440 K=ASC(001)-44:IF K<1 OR K>5 THE
N BOUND 100,2:GOTO 430
450 ON K GOTO 460,470,480,490,500
460 NS=10:ES=21:BDTOS10
470 NS=14:ES=15:BDTOS10
480 NS=15:ES=14:BDTOS10
490 NS=21:ES=10:BDTOS10
500 NS=30:ES=7
510 PRINT:PRINTAB(3) "PRESS 'SPACE
  BWR TO BEGIN"
520 K0=INKEY$:IF K0="" THEN TIMOR
=0:PRINT#446,"          STAND BY
          ":GOTO 540
530 GOTO 520
540 'SET UP DISPLAY
550 LINE(0,0)-(256,169),PSET,BF
T1=100:T2=86
560 PUT(T1,T2)-(T1+T3,T2+T4),TS,PS
ET
570 FOR X=1 TO 10:GOSUB 1360:NEXT
580 A=RD(225):B=RD(145):SCREEN 1
,I
590 A=A+C:B=B+D
600 IF A<P OR A>PR THEN C=-C
610 IF B<P OR B>PR THEN D=-D
620 PUT(A,B)-(A+S1,B+S2),SS,PSET
630 P=PEEK(BP):IF P=81 OR P=82 THE
N BOSUB 760
640 JO=JOYSTK(0):J1=JOYSTK(1)
650 IF JO<T5 THEN T1=T1-TL
660 IF JO>T5 THEN T1=T1+TL
670 IF J1<T5 THEN T2=T2-TL
680 IF J1>T5 THEN T2=T2+TL
690 IF T1<TL THEN T1=TL
700 IF T1>TR THEN T1=TR
710 IF T2<TL THEN T2=TL
720 IF T2>TR THEN T2=TR
730 PUT(T1,T2)-(T1+T3,T2+T4),TS,PS
ET
740 U=RD(IT4):IF U>S2 THEN GOSUB 1
360
750 GOTO 590
760 'FIRE LASER
770 PLAY"TZSL40ZSACBACBACBACBACB
A":T1=T1+30:T2=T2+10
780 FOR X=5 TO 7
790 LINE(X,169)-(T1,T2),PSET
800 LINE(256-X,169)-(T1,T2),PSET:N
EXT
810 FOR X=5 TO 7
820 LINE(X,169)-(T1,T2),PSET
830 LINE(256-X,169)-(T1,T2),PSET
:NEXT
840 NS=NS-1:LINE(NS+ES+41,173)-(25
3,179),PSET,BF
850 GOSUB 1400
860 PUT(A,B)-(A+S1,B+S2),SS,PSET
870 IF PPOINT(T1,T2)>0 THEN GOTO 9
10
880 IF NS=0 THEN GOTO1070
890 T1=T1-20:T2=T2-10
900 RETURN
910 'HIT STARDN
920 PUT(A,B)-(A+S1,B+S2),SS,PSET
930 PLAY"LI0000SGFEB"
940 PUT(A,B)-(A+S1,B+S2),SS,PSET
950 PLAY"CBND46FED"
960 PUT(A-1,B-1)-(A+S1+1,B+S2+1),S
S,PSET
970 PLAY"CBAC36FED"
980 PUT(A-3,B-3)-(A+S1+3,B+S2+3),S
S,PSET
990 PLAY"CBAC26FED"
1000 PUT(A-6,B-6)-(A+S1+6,B+S2+6),
SS,PSET
1010 PLAY"CBND16FEDCBA"
1020 NT=NT-1:LINE(237,183)-(253,18
9),PSET,BF
1030 A=STR$(NT):DRAW"BM240,184":D
OSUB 1310
1040 IF NT=0 THEN GOTO 1160
1050 IF NS=0 THEN GOTO 1070
1060 GOTO 540
1070 'OUT OF ENERGY
1080 LINE(0,0)-(256,169),PSET,BF
1090 LINE(0,170)-(256,192),PSET,BF
1100 DRAW"BC2,171":A0="STARDATE":
GOSUB1260
1110 DRAW"BM70,171":GOSUB 1450
1120 DRAW"BM120,171":A0="YOURMIND
UTROFENERGY":GOSUB 1260
1130 DRAW"BC2,178":A0="THEGALAXY
815DESTROYED":GOSUB 1260
1140 PLAY"PB302:T2:L3:C:L4:C01:LB
:0:02:L4:L4:C:L4:2:LB:D:L4:D:L4:C:
L4:C:LB:01:B:02:L3:C:"
1150 DRAW"BM26,185":GOTO1230
1160 'NO STARS LEFT
1170 LINE(0,170)-(256,192),PSET,BF
1180 DRAW"BC2,172":A0="STARDATE":
GOSUB 1260
1190 DRAW"BM70,171":GOSUB 1450
1200 DRAW"BM13,179":A0="CONGRATULA
TIONSYOURGAVEDETHEGALAXY":GOSUB
1260
1210 FOR X=1 TO 3:PLAY"T15:L4:V15:
03:A0:ADCFRCD0FNNMDE":NEXT
1220 DRAW"BC26,172":GOTO1230
1230 A0="PRESS8THECFIRERJUTTONTOE
RESTART":GOSUB 1260
1240 P=PEEK(BP):IF P=81 OR P=82 TH
EN RUN
1250 GOTO 1240
1260 'DRAW LETTERS
1270 DRAW"8400"
1280 FOR X=1 TO LEN(A0)
1290 DRAW LTR(ASC(ORD(A0,X,1))-64
14"8R3"
1300 NEXT:DRAW"C1":RETURN
1310 'DRAW NUMBERS
1320 DRAW"8400"
1330 FOR X=1 TO LEN(A0)
1340 DRAW RTR(VAL(MID$(A0,X,1))+
"8R2"
1350 NEXT X:DRAW"C1":RETURN
1360 'DRAW STARS

```

```

1370 AR=STR# (RND (255) / 1) + STR# CRND
(166)
1380 DRAW "BH"+UP+" , "+VR+" SEC INDLN
UR"
1390 RETURN
1400 "DRAW TIME
1410 L=LINE (88, 183) - (124, 185) / PSET, B
P: DRAW "BNO", 184"
1420 AR=STR# (INT (TIMER / 10) / 1) + LA=LEN
(88)
1430 AR=LEFT# ("000", 3-LA) + AR+GOSUB
1310
1440 RETURN
1450 AR=STR# (INT (TIMER / 10) / 1) + LA=LEN
(88)
1460 AR=LEFT# ("000", 3-LA) + AR+GOSUB
1310
1470 RETURN
1480 "SET UP ARRAYS
1490 FOR X=0 TO 26: READ L,TRX:INDEX
T
1500 FOR X=0 TO 9: READ MUR#1: NEXT
1510 RETURN
1520 DATA 8 TO Z
1530 DATA 8N4
1540 DATA D4RNUZRDZUHLZ
1550 DATA D4RNUZRDZUZR1UZNLZBR
1560 DATA D4RNUZRUZUZR3Z
1570 DATA D4RNUZRUZUZR2BR
1580 DATA D4RNUZRUZUZR1LZURZ
1590 DATA D4RNUZRUZUZR3
1600 DATA D4RNUZRUZUZR3

```

```

1610 DATA D4RNUZRUZUZR3
1620 DATA D4RNUZRUZUZR3
1630 DATA 8003RU4
1640 DATA 8030RNURU4
1650 DATA D4RNUZRUZUZR2Z2Z
1660 DATA ND4RZBRZURZU4
1670 DATA D4RNUZRUZUZRNDZURZUZR4BU4
1680 DATA D4RNUZRUZUZR3UR4
1690 DATA NR3D4RNUZRUZUZR4RZU4
1700 DATA D4RNUZRUZUZR3Z
1710 DATA NR3D4RNUZRUZUZR3LZUZR3BR
1720 DATA NR3DNRZUZR3UR3BR3UR4
1730 DATA D4RNUZRUZUZR3UR4
1740 DATA D4RNUZRUZUZR4
1750 DATA ND4RZURZUZR4
1760 DATA D4RNUZRUZUZR4UR4
1770 DATA ND4RZUZR4
1780 DATA D4RNUZRUZUZRNDZ
1790 DATA ND4RZURNUZRU4
1800 "DATA 0 TO 9"
1810 DATA D4RNUZLZURZ3
1820 DATA BRZD4RUZURZUR
1830 DATA RZDZURZUZR4URZUR4U4
1840 DATA R4RZUZRZUZR4U4
1850 DATA D3RNUZRUZUZRNDZURZUZR4
1860 DATA NR4DZRUZUZR3ZUZR4UR4BU4
1870 DATA ND4RZURZUZR4UR4
1880 DATA DRURZUZR4URZURZ
1890 DATA D4RNUZLZURZUZR4URZURZUR4U4
1900 DATA R4D4RZUZR4UR4

```

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Going strong with the Dragon

A Dragon newsletter and telephone hotline service are two of the hallmarks of Premier Microsystems, one of the leading Dragon firms — by Gordon Ross

SLEEPY, SOUTH NORWOOD in suburban London is perhaps an unusual location to head for in search of one of the leading developers of Dragon associated products.

Nevertheless, this is the home of Premier Microsystems, producers of the best disk system for the Dragon 32 and "independent inventors" of a whole host of Dragon compatible software, utilities and peripherals.

The company developed from its embryonic form as Premier Publications, a firm set up by John Peel (a leading luminary in *Waltari*, one of the most popular adventure fantasies for the Spectrum and Commodore) to produce cassettes to run on the C6400 programable calculator. He was joined by Janet and John Hooker (two of the current vice chairmen) who helped with the diversification of material for the UR150 Superboard and the Tandy.

Starting up

Mike Bedford, now managing director of Premier, first became involved with the company after buying one of its tapes. He was joined by wife Sandra and together the Hookers and the Bedfords bought out John Peel Operating from their homes, they continued with the mail order business of Premier Publications, Peter Hines, the fifth director of the company and now chairman, actually started by producing books for Premier, but, as Mike Bedford put it, "it became too expensive paying him royalties" and he was asked to join the company.

In March last year the five partners became directors (Peter, Mike, Sandra and Janet are full-time directors and John works part-time) and Premier Microsystems came into being.

The company, from its humble beginnings, has mushroomed and the "development is far greater than we ever thought would happen" says Janet Hooker. This is predominantly due to Premier's association with the Dragon and the success of its Dragon compatible disk drive system.

Janet, who has not exactly followed a traditional career structure in her present position (her first jobs were as a nurse and then a health visitor) was the first of the "famous five" to become involved in Premier. She helped John Peel with the mail order side of his business and after he left, decided to stay on with the intention of diversifying and selling as many packages for a computer as had been sold for calculators.

Finding the right computer was of paramount importance. The Dragon was chosen because it was regarded at the time as the best value-for-money computer available. Here Mike Bedford takes over the story. Mike, an engineer and one time employee of computer giant ICL, says "we were looking around for a micro to put the same amount of effort into as we had for the 191 Superboard type of machine.

Initially, Premier was after a machine for people who like "dabbling", the Dragon with its proper keyboard was a potential small business machine and it was felt that there would be a market to supply kits. Also, the Dragon's management was ideally suited to their background — having already developed the RomDex and Vortex disk systems for the UR101, switching to the Dragon would not be such a problem.

Premier's Delta disk drive system was first publicly displayed at a horticulture demonstration in January 1985. In March the single density disk drive was first sold to the public and eventually sales were taken over by Cumana (thought to be Europe's largest independent disk manufacturer and distributor). The disk system was also converted to double density and now retails for £294.95 (for this you receive the 40-inch 1080 of storage disk drive, a controller, manual, disk and cabling).

The Delta disk drive system has had good reviews and now costs £3 more than its rival, the DragonDisk system from Dragon Data (for a comparison of the two systems see *Dragon User*, November).

An obviously very proud Mike Bedford



Home for Premier Microsystems

did lament the fact that Dragon Data "didn't talk about a compatible Ddx" and decided to produce a competitive product rather than simply adopt the Delta system.

Asked if Premier had any regrets in associating with the Dragon, the answer was a categorical "no". Although, as they said, there were now better machines available (and with higher sales figures) the Dragon 32 is a good machine and has great potential. They were disappointed though when Dragon Data upgraded the 32 to the 64. Mike criticised the "quality of the display" saying "the colour was disappointing and the big drawback was the omission of lower case characters." He would have preferred an 80 column display and said the 32 character display was "a retrograde step."

On relations with Dragon Data itself, Mike commented that they had an "odd relationship" but that it was as good as anyone's. "We sell our products on Dragon Data's recommendation, but, at first, we were regarded with suspicion because we knew more about the Dragon than Dragon Data did in terms of hardware and technical knowledge." Peter Hines added that this situation had changed, and prior to Dragon Data's present problems, its servicing side had greatly improved.

Future features

Questioned about Premier's future plans, Peter said that the "company is considering on what we've got but are considering new products such as the Dory micro-drive" (see *Dragon User*, May). He also added that for the foreseeable future Premier would continue to offer a service to Dragon owners despite the uncertain nature of Dragon Data's future. There were also rumours about supporting the new products from BBC Dragon, though Premier remained non-committal.

Premier's present productions for the Dragon include the aforementioned Delta disk drive system; Encoder 06 — a full 8008 Assembler/Disassembler; a split graphics board; DoubleMaster; a Toolkit; 80 software packages; and the Flex single-task operating system which Premier regards as superior to Dragon Data's OS-9 system. Although OS-9 is a multi-task system, Premier argues that there is not a great deal you can do on the Dragon with multi-tasking due to the Dragon's memory restrictions. (For a review of the OS-9 system see *Dragon User*, April. For a review of Flex readers will have to wait for the time being.)

The company's expertise lies in machine-code programming and hardware. "The core of expertise is reflected in the main products we have," says Mike Bedford. The company is moving away from game software towards utilities. They are also moving away from cassette based software, and most of Premier's serious products are contained on disk or EPROM cartridges (reusable, programmable, read only memory).

Peter Hines led this in to the problems of piracy, and all four directors launched into a vehement denunciation of pirates.

"Privacy is one of our biggest headaches," said Sands, and husband Mike added, "If privacy continues people will quite simply stop producing quality software." He read in one journal that, on average, a tape is copied seven times. This he reckons to be a conservative estimate given the extreme simplicity of copying a tape.

Not so easy, is printing material on disk or cartridge, and added Mike, "all our products in which we have a security interest are serial numbered to prevent piracy." By this means, printed material can be traced back to the culprit and an occasion Premier has resorted to legal action. Usually the threat of a writ or legal injunction is enough to prevent further piracy, but Premier has no quibbles about going all the way to the courts if necessary.

A large part of Premier's success is owed to their loyal staff, most of whom, like Mike Bedford, joined the company after having purchased products from them. As Sands put it: "First they were our customers, then they helped in their free time and finally they worked full time."

This total interest and involvement with computers means that the staff are only too glad to work unusual hours if necessary. "Everyone works in together and the only demarcation problems we have are over emptying the bins and bringing in the milk," said a joking Mike Bedford. Indeed, the directors are very proud of their employees and of the company's obvious success formula. One sign of that success is the increasing number of manufacturers who are approaching Premier direct in

order to develop their products. The Sony micro-drives are an indication of this. Premier is being seen increasingly as a development company, and rather than seeking out manufacturers to develop products, the reverse is happening.



A beaming Peter Khan.

Being in the forefront of an expanding industry is not an easy task. "As the company grows there is a great deal of excitement about new products," says Mike, "but as we get bigger more time is spent on developing and marketing our products, and innovation has become harder as the industry and users develop expertise."

There are obviously a number of pitfalls to be wary of, but the company was

releasing no details to potential rivals. "It's playing nice," said Mike, merely stating that "avoiding action is part of our management expertise."

One reason for Premier's success is its after sales service and comprehensive customer records. The mail order side of its business stretches from Greenland in the north to New Zealand in the south and from Canada in the west to Hong Kong in the east. In Britain its products are available by direct order or through retail shops.

Part of its after sales service includes a regular news letter for Dragon customers (provided a purchase has been made within the past three months). Though Premier did mention that by sending a SASE other interested parties could gain a copy and a telephone hotline service.

Between 7 and 9 o'clock on a Monday evening, a programmer and engineer are available to answer questions. Although this service is primarily aimed at existing or potential customers, anyone who has a Dragon associated problem can ring Premier on 01-4556 7131.

The service began through Premier's links with the Dragon. "As we were in at the beginning people didn't know how to program" so we began this service to help them, mentioned Peter — and judging by the number of prostrated Dragon users who ring this office with a whole range of problems, this service will still worth continuing. Indeed Mike Bedford added, tongue in cheek, "if there is anything Dragon Data wants to know about the Dragon, they can come and ask us." ■

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Selective scanning

David Berry comes up with a key-scan routine that is called from machine code and detects continuously pressed keys

MOST DRAGON owners will, by now, know at least two ways of reporting data without using the classical input or input functions. Location 135 (for anyone who does not know) contains the code of the last key pressed. The other widely published scanning method examines the contents of locations 100 to 145 (see). A little experimentation will allow you to build up a table of keynames against locations (even plotted down the left of the table) and location contents (across the top). If you get stuck, this method is described in many of the Dragon books on the market at the moment (for example: *Enter the Dragon* by Colin Carter).

The first method above is not much more useful than `INKEY`. The latter method, however, does provide continual scanning so that you do not have to keep re-pressing a key to read it again, as you do with `INKEY`. However, there are still two problems: first, if two keys are pressed at once the values returned for each key are changed; secondly, this method cannot be used by machine code routines.

Routines

Languishing in the Dragons' ROM is a routine whose address is stored at `A000H`. An indirect `JSR` (`LDI` `SPH` `ADH` `00H`) will return the ASCII code of the key pressed. However, this routine is like `INKEY` with its one read per keypress. To counter these drawbacks I needed a routine which could be called from machine code, would detect continuously pressed keys and could identify correctly more than one key pressed at a time. Thus `Key-Scan` was born.

As written, `Key-Scan` occupies addresses `7000H` to `706AH`. `7000H` and `7001H` are used as counters, then from `7002H` to `7041H` is the keyboard image. This image reproduces an eight row by eight column keyboard matrix. `Key-Scan` first clears the image to zero then sets each byte corresponding to a depressed key equal to one. Subsequent routines, whether machine code or Basic, can then examine the image as if the keyboard were memory mapped.

It is worth asking the hardware designers, in passing, why we cannot have memory mapped keyboards? After all memory is cheap these days, and if the mapping were bit-wise rather than byte-wise, as here, eight bytes would map only four keys. ■

DIS-ASSEMBLY OF MACHINE CODE ROUTINE.

```

0 7042 NOP                #12
0 7043 NOP                #12
0 7044 NOP                #12
0 7045 NOP                #12
0 7046 LDA                x FF00    #EE FF 00
0 7047 PSHE                E 10    #04 10
0 7048 LDA                x FF00    #EE FF 02
0 7049 PSHE                E 10    #04 10
0 7050 LDA                E 7000    #00 70 02
0 7051 LDA                E 3F     #06 3F
0 7052 NOP                #12
0 7053 CLR                I A,X     #07 00
0 7054 DEC                #04      #04
0 7055 BPL                # -6     #04 FF
0 7056 NOP                #12
0 7057 CLR                x FF00    #7F FF 00
0 7058 CLR                x FF01    #7F FF 01
0 7059 CLR                x FF02    #7F FF 02
0 7060 LDA                E FF     #00 FF
0 7061 STA                x FF01    #07 FF 01
0 7062 STA                x FF02    #07 FF 02
0 7063 LDA                E 00     #00 00
0 7064 STA                x 7000    #07 70 00
0 7065 STA                x 7001    #07 70 01
0 7066 LDA                E FE     #00 FE
0 7067 STA                x FF02    #07 FF 02
0 7068 LDA                E FF     #00 FF
0 7069 NOP                #12
0 7070 LDA                x FF00    #00 FF 00
0 7071 NOP                #12
0 7072 INCB                #0C     #0C
0 7073 NOP                #12
0 7074 NOP                #12
0 7075 NOP                #12
0 7076 NOP                #12
0 7077 LDA                #04      #04
0 7078 BLO/BCS           # +6     #00 00
0 7079 INC                I B,X     #00 00
0 7080 NOP                #12
0 7081 NOP                #12
0 7082 NOP                #12
0 7083 NOP                #12

```

Continued
on page 29



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```

# 7004 NOP          #17
# 7005 DEC          x 7001 #79 70 01
# 7006 INC          # -15 #25 25
# 700A DEC          x 7000 #79 70 00
# 700B INC          # +19 #27 19
# 700F DRCC        # 01  #1A 01
# 7011 ROL          x 7702 #79 FF 02
# 7014 LIR         # 00  #00 00
# 7016 STR          x 7001 #07 70 01
# 7019 DRB         # -20 #20 04
# 701B NOP          #12
# 701C NOP          #12
# 701D NOP          #12
# 701E NOP          #12
# 701F NOP          #12
# 7020 PULS        # 10  #35 10
# 7025 STR          x 7702 #0F FF 02
# 7028 PULS        # 10  #35 10
# 702F STR          x 7700 #0F FF 00
# 7030 RTS         #39

```

END OF RUN

```

10 CLSB
20 CLEAR: 1000,ARGOFF
30 DDN ARG(0)
40 FOR I=ARG(0) TO 507041
50 PAGE I,ARGP
60 NEXT
70 PRINT "02.":
90 EXEC 507042
92 I=0
100 FOR S=0 TO 7
110 FOR R=0 TO 7
120 REM(0,S)=R(S)
    (PDS: 507002+1)34
130 I=I+1
140 NEXT R,S
150 FOR C=0 TO 7
160 FOR R=0 TO 7
170 PRINT REM(C,R)
180 NEXT
190 PRINT
200 NEXT
210 GOTO 70

```

Listing of test program

a particular key has been pressed at address location 7000h+CODE. If the key is pressed the location will contain one, else zero. For example, location 7000h contains one thus the "R" key is being pressed. (7000h + 08 = 7000h).

Phantom keypresses

Seemingly, because of the way the keyboard is wired, it is possible to have phantom keypresses. If two rows are grounded and that another key is pressed on one of the grounded rows this will also appear as a keypress on the other grounded row. Listing two is a program which draws the keyboard matrix and displays the state of the matrix. If you play with this routine you will soon discover which sequences give rise to phantoms, and why.

You can relocate Key-Scan by changing all the 7000h word addresses, and you can leave all the NOPs out provided you reassemble all the relative jumps. Without too much trouble you could also use PCP addressing to give yourself a useful routine for inclusion in any number of your machine code programs. ■

00	00	10	10	20	20	30	30
01	1	2	3	4	5	6	7
02	09	11	19	21	29	31	39
03	9	.	.	.	.	.	.
04	0A	12	1A	22	2A	32	3A
05	A	B	C	D	E	F	G
06	0B	13	1B	23	2B	33	3B
07	H	I	J	K	L	M	N
08	0C	14	1C	24	2C	34	3C
09	P	Q	R	S	T	U	V
0A	0D	15	1D	25	2D	35	3D
0B	Y	Z	SP	LF	RT	SP	SP
0C	0E	16	1E	26	2E	36	3E
0D	CF	.	.	.	.	.	SP
0E	0F	17	1F	27	2F	37	3F
..

Table 1 Key codes (address offsets) codes shown above keyboard

■The Dragon keyboard is hard wired to the two ports of the 6821 PIA located at 7730h. Key-Scan initializes the PIA such that one port is an output and the other an input in a cross matrix configuration. The keyboard is then read by grounding indi-

vidual matrix rows then scanning the columns to look for grounded lines. Each line — row or column — is equivalent to one bit passing over the port.

Table 1 gives the code number associated with each key. To determine whether

HEX DUMP INCLUDING KEYBOARD TRACE.

# 7000	0070	00000000	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
# 7010	0070	00000000	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
# 7020	0070	00000000	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
# 7030	0070	00000000	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
# 7040	0070	00000000	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
# 7050	0070	00000000	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
# 7060	0070	00000000	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
# 7070	0070	00000000	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
# 7080	0070	00000000	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
# 7090	0070	00000000	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
# 70A0	0070	00000000	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
# 70B0	0070	00000000	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
# 70C0	0070	00000000	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
# 70D0	0070	00000000	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
# 70E0	0070	00000000	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
# 70F0	0070	00000000	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00

END OF DATA TRACE

Eradicating I/O errors

I/O Errors are the bane of all Dragon users — D L Jones looks at a variety of situations where they are most likely to occur and shows how to prevent them

HOW MANY times do you pull at your hair after waiting for a long load to complete, only to be faced with the dreaded I/O ERROR? The reason for this frustrating episode is simple and there is no need to suffer from it.

It occurs because the Dragon does a check on the information as it is being loaded and if it finds one error it stops the load and displays that annoying message. Simple causes of this failure are: starting to load in the middle of a program and wrong playback volume.

Save the former by always fully rewinding tapes before loading or, if you have more than one program recorded on a tape, use the AUDIO OFF feature to locate the gap between programs.

The problem of playback volume can be solved by experiment. Use a professional recorded cassette (for example one of the Dragon games) and try to load it at high playback volume. You may well get an I/O ERROR, so reduce the volume, reinsert the tape and start again.

Select a point

Eventually you will find a point at which the program loads, thank the volume control of the cassette recorder. Now continue to reduce the volume and repeat the loading procedure until you either get I/O ERRORS again or the program doesn't load at all. Mark this point on the cassette volume control. Now, select a point midway between the two points you have marked and gain a nice white line on the volume control. This will set the correct playback level and ensure that it doesn't get lost again.

Now what about saving programs? The trouble here is that most cassette recorders sold as "suitable for use with the Dragon", aren't. Dragon Data recommends that recorders with an "Aux" connection are preferred, but, many of the so-called suitable machines have a "line" input only. At first we might think that if the recorder has automatic record level control that all our problems are over — they aren't.

What happens is that if you do not use an "Aux" input to the recorder then the Dragon output is too high and the automatic level control has to work hard to reduce the gain of the record channel in order to correct the excess. This takes time and it is thus possible for the first few bytes of data

being saved to be so distorted as to be unrecognisable on playback.

There are two ways out of this dilemma. Either or perhaps both should be used to solve the problem. First, reduce the gain of the record channel with an attenuator. I fitted mine inside the recorder, but with the benefit of hindsight it would be better to fit it inside the record plug.

About 4:1 was found to be suitable and, since the input of my recorder had an impedance of 10k, some value of 30k will achieve this (see figure one). I also played a 10k resistor across the input to ensure that the impedance "seen" by the Dragon remained unchanged.



The recorder can be altered. . .



... to solve your I/O dilemma, figure 1

The second solution involved some programming. Since it is always a good plan to make regular saves of a program as it is being entered (just in case the power fails as you are typing in line 800 and you have to start again) I like to include the following as the first two lines of my program:

```
10 GOTO 15
15 MOTOR OFF/SOUND 1,10/SAVE
   "name"/SOUND 1,1/STOP
15 First line of your program
```

Note that "name" = name of your program. When the program is run normally, line 2 will cause a jump over line 15. However, when you wish to CSAVE the

program, as the part so far entered, simply set the cassette recorder to record and type GOTO 15 in direct mode.

The line will then be executed and will first switch on the recorder and record a low note (which will be also heard in the speaker). It will then record the program followed by "sleep" and will then halt due to the STOP at the end of the line. The low tone is ignored on playback but serves to get the automatic level control settled before the wanted data starts arriving at the cassette pot.

I have found that the combination of all of the foregoing completely eliminated any errors except those caused by starting in the middle of a program and the fix for that is obvious.

Loading data

However, there still remained one problem. Although I could now reliably load programs, I still had trouble with loading data from the cassette recorder into a program. When data is saved it is often done as an array outputted to the cassette recorder in a FOR NEXT loop.

I found that if all of the data was contained in one array, then the data save was one continuous process. However, when more than one variable was saved, the recorder control would switch off the tape transport motor momentarily each time the variable changed. This resulted in a series of bursts of data with about 0.5 second breaks between them. Why then did this upset the cassette recorder? I thought 0.5 second breaks were too short to upset the automatic level control, or are they?

The solution turned out to be one more area in which "suitable" recorders fail to meet the grade. To save battery power when the recorder is used for non-computer recording with remote control, the remote switch not only cuts power to the tape transport motor, but to the electronics as well. Whilst this action causes no problem at all for ordinary audio work, it spells disaster when the recorder is used for data.

The 0.5 second breaks during the save sequence give rise to momentary "drop-outs" in the data stream to which the Dragon responds with that all too familiar message. The remedy is to alter the circuit of the recorder so that the electronics remains "live" at the time irrespective of

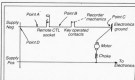


Figure 2: The internal board before undergoing surgery

the remote control and the latter controls the transport motor only.

Unfortunately, this involved some surgery inside the recorder and if you have any doubts at all I suggest that you enlist the services of your local friendly local repair man. I list below the modification to my Oxon TR10 recorder. If yours is different, perhaps it will serve as a guide, although the layout may be different.

Figure 2 shows the circuit before surgery whilst figure three shows the circuit afterwards.

Refer to the photograph of the recorder's insides. Disconnect the lead from point B and reconnect it to point D. Remove the original lead from point D. This permanently connects power supply negative to the control switch, missing out the remote control socket.

The white lead (negative end of the



Inside the Oxon TR10 recorder

motor) is moved from point C to point B, thus removing it from the negative end of the electronics and connecting it to one end of the remote control socket.

The red lead which became spare in

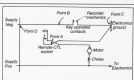


Figure 3: The aftermath of the surgical operation

operation and allows to now used to connect point C to point A, thereby connecting the electronics negative to the other side of the remote control socket.

You should now find that whilst the remote control will control the tape transport motor, the record/play electronics is only controlled by the control buttons on the recorder.

We have thus seen that problems in CGAVING programs and data stem mainly from shortcomings of so called "suitable" cassette recorders. In some cases, where a continuous CGAVE or CLOAD is involved, the problem can be overcome by software and/or simple external circuit changes. However, for the utmost reliability it is necessary to resort to simple modifications to the cassette recorder to separate the motor and electronics switching at the remote control socket. ■

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Caterpillar

From *J Lomas in Wincor*

THE OBJECT of this game is simple. Using the "AT" and "D" keys you must guide your caterpillar through the fields avoiding the killer pellets. In the second stage, having successfully negotiated your way through the fields, you have to steer under the road.

The main reason for writing the program was to demonstrate the Dragon's scrolling ability. The speed-up (FOR) can be used on the routine but may crash the program.

Program notes

10-120 Sets up screen and enters machine code.
130-140 Scans keyboard.
150 Increases score.
160-190 Checks to make sure that you do not go off the screen or hit anything.

200-220 Draws new position and associates machine code.
230 Checks to see if you are on stage one or two.
240-260 Stage one.
260-280 Stage two.
280-320 Ends game and checks for new one.

Variables

X Your position
Y Your level
SC Your score

```

10 REP*****J.LOMAS*****
20 CLSO:PRINT#70,"CATERPILLER";
30 BDATA6,57,40,10,88,57,42,FE,57,
44,4C,4E,A1,AF,C1,5A,26,FY,4A,26,F
A,39
40 FOR V=546700 TO 546715:READY#P
ONE V,VAL("SH"+Y)+NEXTV
50 BDATA3,FO,06,10,06,00,
60 FORM=546740 TO 546745:READY#PO
KEN,VAL("SH"+64)+NEXTM
70 FORT=100TO1STEP-3: SOUND#2,LINE
XT
80 PHODE0,1:SCREEN#1,0:PCLS1
90 X=120:Y=150:A=240:SC=5:IF=1:G=10
0:Z=10:M=10
100 LINE(2,190)-(10,185),PSET,BF
110 LINE(253,190)-(245,185),PSET
,BF
120 CIRCLE(X,80),11,0,.5
130 IFFEEK(338)=251THENPAINT(X,80)
,0,0:Y=X+10
140 IFFEEK(339)=239THEN PAINT(X,80)
,0,0:Y=X-10
150 SC=SC+1
160 IFX<10 THENX=10
170 IFX>240THENX=240
180 IFFPOINT(X,95)=0THEN#390
190 IFFPOINT(X+1,95)=0 THEN#390
200 PAINT(X,80),0,0
210 CIRCLE(X,90),10,0,.5:
220 FORT=1TOS:EXEC#46700:NEXT
230 IF P<>1THEN300
240 PLAY"T20001EDCCD"
250 M=RND(251)+G+G
260 CIRCLE(M,175),10,0
270 PAINT(M,178),0,0
280 IFFC=0 THENP=2:G=0+2:LINE(10,1
90)-(245,185),PSET,BF
290 GOT0130
300 LINE(0,190)-(205,185),PSET,B
F
310 M=RND(2):IFM=1THEN#--H ELSE B=
M
320 IFA<50 THENM=50 ELSE IFA>220TH
ENM=220
330 A=M+G
340 CIRCLE(A,185),2+G
350 PAINT(A,185),1,1
360 SC=SC+1:IFSC=0 THENP=1:G=0+2:L
INE(10,190)-(245,185),PSET,BF:M=M+
2:Z=Z-2:A=RND(230)+10:IFZ=12THENZ=
20:
370 PLAY"T2004804CCD0D66"
380 GOT0130
390 PLAY"T200L4V3168L880L4B-AA80F+
B"
400 FORT=1TOS:X#="T20001L2V31CCDCC
CCDCC":PLAY#H:SCREEN#,0:PLAY#H:SC
REDS,1:NEXT
410 CLSO:PRINT#128,"you traveled"
+STR$(INT(SC/100))+ " miles however
d":PRINT#203,"NEW GAME";
420 SCREEN0,1:IF INKEY#="N" THENCL
S:END ELSE IF INKEY#<>"Y"THEN#420
ELSE#0

```

Converter

From *James Oswald in Harfordshire*
CONVERTER is a program for the conversion of numbers between decimal, hexadecimal and binary and is directed mainly

at machine code programmers. It may, however, also be adapted for educational use in respect of binary and hex numbers.
On running, the headings (see line 20)

are displayed at the top of the screen and the input prompt (?) appears on the left side of the screen. Any number can then be entered, either decimal, hex or binary, followed by a digit to indicate its base (D, H or B). After a short pause the corresponding numbers will be displayed in their various columns.

Variables

Eight variables are utilized in the program and their uses are as follows:

- B A numeric array, each element representing one bit of the current binary number.
- D The value of the current decimal number.
- M A counter to control the display of lines on the screen.
- X A general purpose counter used in FOR ... NEXT loops.

Y
AS
DS
HS

Temporary store during the decimal/binary conversion.
Store for the initial entry.
The binary value of the current number.
The hex value of the current number.

1100-1200
2000-2050
3000-3050
9000 & 9010
9100 & 9110

Convert a decimal number (D) to its binary equivalent (B). The seemingly spurious values at the end of lines 1100 and 1140 are required owing to inaccuracies in the calculations as a result of minor bugs in the Dragon's ROM.
Check the validity of a Hex entry and convert it to decimal using the BH facility of the Dragon and hence convert to binary.
Check the validity of a binary entry, convert same to decimal and hence to Hex using the HXD function.
Display the error message in the event of an entry not passing the validity checks.
Display the results of the conversion.

Program notes

Lines
10-40

Initialize the variables, display the heading and accept and check the input transferring control to the appropriate section of the program.
Check the validity of a decimal entry, convert to Hex using the HXD function and call the subroutines to convert to binary and display the results.

```

1 REM CONVERTER, A PROGRAM TO CONVE
RT BETWEEN DECIMAL, HEX AND BINARY
2 REM (C) 1984 JAMES GREENALL
10 DIM B(16):N=1
20 CLS:PRINT"ENTER NUMBER FOLLOWED
BY EITHER D(DECIMAL), H(HEX) OR B
(BINARY)":PRINT STRING$(32,CHR$(13
));" DECIMAL    HEX    BINARY"
Y=
30 N=N+2:INPUT A#
40 D=0:FOR X=1 TO 16:B(X)=0:NEXT X
:HH="" :BB=""
50 IF RIGHT$(A#,1)="D" THEN 1000
60 IF RIGHT$(A#,1)="H" THEN 2000
70 IF RIGHT$(A#,1)="B" THEN 3000
80 GOTO 9000
1000 REM DECIMAL NO. INPUT
1010 D=VAL(CLEFT$(A#,LEN(A#)-1))
1020 IF D>65535 THEN 9000
1030 HH=HEX$(D)
1040 GOSUB 1100
1050 GOSUB 9100
1060 GOTO 30
1100 REM CONVERT DECIMAL TO BINARY
1110 Y=D
1120 FOR X=15 TO 0 STEP-1
1130 B(16-X)=INT(1(Y/2^X)+.000005)
1140 Y=INT(Y-(2^X)*B(16-X)+.5)
1150 NEXT X      1160 BB=""
1170 FOR X=1 TO 16
1180 BB=BB+CHR$(B(X)+48)
1190 NEXT X

```

```

1200 RETURN
2000 REM HEX NO. INPUT
2010 IF LEN(A#)>5 THEN 9000
2020 FOR X=1 TO LEN(A#)-1
2030 IF ASC(MID$(A#,X,1))>70 OR AS
C(MID$(A#,X,1))<48 THEN 9000
2040 NEXT X
2050 HH=LEFT$(A#,LEN(A#)-1)
2060 D=VAL("H"+HH)
2070 GOSUB 1100
2080 GOSUB 9100
2090 GOTO 30
3000 REM BINARY NUMBER INPUT
3010 BB=LEFT$(A#,LEN(A#)-1)
3015 IF LEN(BB)<16 THEN LET BB="0"
+BB:GOTO 3015
3020 FOR X=1 TO LEN(BB)-1:IF MID$(
A#,X,1)<>"1" AND MID$(A#,X,1)<>"0"
THEN 9000 ELSE NEXT X:IF LEN(A#)>
17 THEN 9000
3030 FOR X=15 TO 0 STEP-1:D=INT(D+
2^X*VAL(CMID$(BB,(16-X),1))):NEXT X
3040 LET HH=HEX$(D)
3050 GOSUB 1100
3060 GOTO 30
9000 PRINT B32$(M+13),"INVALID INPU
T - TRY AGAIN":M=M-2
9010 GOTO 30
9100 PRINT B32$(M+13)," ";D:PRINT
TAB(15) ;BB:PRINT TAB(23);LEFT$(B
B,D):PRINT TAB(23);RIGHT$(BB,D)
9110 RETURN

```

Budget

From O.L. George in Sussex

I WOULD imagine there are a lot of people who have regular financial commitments throughout the year. The difficulty is that payments tend to be irregular, some are

quarterly, some paid over part of the year, some are seasonal and others are "one-offs".

This program provides a monthly review of the current situation, suggests an amount to be "carried forward" and tells you how much you can actually spend?

As listed the program only deals for two inputs, the amount "brought forward" from the previous month and people "income" (salary). It would not be difficult to

introduce multiple "incomes", for example the daily takings from a small shop, weekly sales from a club, and so on. Furthermore, if you wanted the gruesome details, a routine could be introduced listing the actual outgoings.

Line 13150 checks the average for the current month and the next one under review. If the outgoings for this month are less than the average for the two months, it recommends a minimum amount to be

• **QIP:** If you are the cautious type, or if the monthly commitments vary widely than I suggest, modify line 13450 as follows:
 $A^* X3 = X3$ THEN $X7 = X3 - X3 / 2$
 $A^* X6 = X3$ THEN $X7 = X3 - X3 / 2$
 $A^* X4 = X3$ THEN $X7 = (X4 - X3) / 2$
 *USING and so on.

Once on tape, you only have to RUN the program once a month, enter the amount you can spend in your check book, then enjoy a little peace of mind.

Program notes

Lines 10-250 List individual amounts to be budgeted and

260-370

400-640

700-960

assigns variable names (PREM A to C available). Assigns variable names to the lists of items per month.

Averages monthly totals over:

1. Two month period.
 2. Three month period (both include "current" month).

3. For the year.
 Assigns variable names. Lays out initial display and totaling per month. Includes "msg key".

1000-12000

13000-13740

14000-14740

Re-allocates selected variables per month proportional to the final routine. Prints loadings per month and routes program to final display. Requests two inputs. Specifies relationship of variables. Asks month, variable names. Prints final display and result of calculations. Includes safety check (when sum of BP and income are less than net outgng).

Check routine.

```

1 *          D=40+80+0+0+0
2 *          BUDGET ANALYSIS
3 *          PER MONTH
4 *LIST ITEMS TO BE BUDGETED
  FOR IN LINES 10-250 AND ALLOCATE VARIABLES.
5 *LIST COMBINATION OF VARIABLES BY MONTH IN LINES 260-370.
6 *PRESS /RUN/
7 *DAVE GEORGE,33 VICTORIA ROAD, SHOREHAM-BY-SEA,WEST SUSSEX.
8 *MAY 1985
10 A0=178.47*HOUT/HP/LOAN/INS
20 A1=46.00*TV LIC
30 A2=14.13*COUNCIL RATE
40 A3=14.04*COUNCIL RATE
50 A4=6.36*WATER RATE
60 A5=6.35*WATER RATE
70 A6=60.00*GND RENT & MAINT
80 A7=50.00*GAS PROVISION
90 A8=50.00*ELECT. PROVISION
260 D1=A0          * APRIL
270 D2=A0+A2+A4          * MAY
280 D3=A0+A3+A5+A7+A8          * JUNE
290 D4=A0+A1+A3+A5          * JULY
300 D5=A0+A3+A5          * AUGUST
310 D6=A0+A3+A5+A6+A7+A8          * SEPT
320 D7=A0+A3+A5          * OCTOBER
330 D8=A0+A3+A5          * NOVEMBER
340 D9=A0+A3+A5+A7+A8          * DECEMBER
350 D0=A0+A1          * JANUARY
360 E1=A0+A2          * FEBRUARY
370 E2=A0+A6+A7+A8          * MARCH
400 H0=(D1+D2)/2
410 H1=(D1+D2+D3)/3
420 H2=(D2+D3)/2
430 H3=(D3+D3+D4)/4
440 H4=(D3+D4)/2
450 H5=(D3+D4+D5)/3
460 H6=(D4+D5)/2
470 H7=(D4+D5+D6)/3
480 H8=(D5+D6)/2
490 H9=(D5+D6+D7)/3
500 I0=(D6+D7)/2
510 I1=(D6+D7+D8)/3
520 I2=(D7+D8)/2
530 I3=(D7+D8+D9)/3
540 I4=(D8+D9)/2
550 I5=(D8+D9+D0)/3
560 I6=(D9+D0)/2
570 I7=(D9+D0+E1)/3
580 I8=(D0+E1)/2

```

Continued
 on page 87

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```

590 I9=(E0+E1+E2)/3
600 J0=(E1+E2)/2
610 J1=(E1+E2+D1)/3
620 J2=(E2+D1)/2
630 J3=(E2+D1+D2)/3
640 J4=(D1+D2+D3+D4+D5+D6+D7+D8+D9+E0+E1+E2)/12
700 ARE="#####"
701 CLS
710 PRINTB64+10,"DATA#G#G#G#":
720 PRINTB75+6,"BUDGET ANALYSIS":
730 PRINTB160,ARE
740 PRINTB224+6,"TYPE FIRST THREE":
750 PRINTB224+6,"LETTERS OF MONTH":
760 PRINTB320+14,"AND":
770 PRINTB320+12,"/ENTER/":
780 PRINTB416,ARE
790 INPUT ARE
800 IF ARE="APR"THEN GOTO 1000
810 IF ARE="MAY"THEN GOTO 2000
820 IF ARE="JUN"THEN GOTO 3000
830 IF ARE="JUL"THEN GOTO 4000
840 IF ARE="AUG"THEN GOTO 5000
850 IF ARE="SEP"THEN GOTO 6000
860 IF ARE="OCT"THEN GOTO 7000
870 IF ARE="NOV"THEN GOTO 8000
880 IF ARE="DEC"THEN GOTO 9000
890 IF ARE="JAN"THEN GOTO 10000
900 IF ARE="FEB"THEN GOTO 11000
910 IF ARE="MAR"THEN GOTO 12000
920 CLS
930 FOR I=1 TO 50
940 PRINTB76+14,"I#I#I":
950 PRINTB160+12,"A#I#A#I#I#":
960 PRINTB224+10,"FUMBLE FINGERS":
970 NEXT I
980 GOTO 710
1000 CLS
1010 PRINT"      ANALYSIS MONTH OF APRIL"
1020 K3=D1
1030 K5=H0
1040 K6=H1
1050 GOTO 13000
2000 CLS
2010 PRINT"      ANALYSIS MONTH OF MAY"
2020 K3=D2
2030 K5=H2
2040 K6=H3
2050 GOTO 13000
3000 CLS
3010 PRINT"      ANALYSIS MONTH OF JUNE"
3020 K3=D3
3030 K5=H4
3040 K6=H5
3050 GOTO 13000
4000 CLS
4010 PRINT"      ANALYSIS MONTH OF JULY"
4020 K3=D4
4030 K5=H6
4040 K6=H7
4050 GOTO 13000
5000 CLS
5010 PRINT"      ANALYSIS MONTH OF AUGUST"

```

Continued
on page 38

```

5020 X3=05
5030 X5=40
5040 X4=49
5050 GOTO 13000
6000 CLS
6010 PRINT*  ANALYSIS MONTH OF SEPTEMBER*
6020 X3=06
6030 X5=10
6040 X6=11
6050 GOTO 13000
7000 CLS
7010 PRINT*  ANALYSIS MONTH OF OCTOBER*
7020 X3=07
7030 X5=12
7040 X6=13
7050 GOTO 13000
8000 CLS
8010 PRINT*  ANALYSIS MONTH OF NOVEMBER*
8020 X3=08
8030 X5=14
8040 X6=15
8050 GOTO 13000
9000 CLS
9010 PRINT*  ANALYSIS MONTH OF DECEMBER*
9020 X3=09
9030 X5=16
9040 X6=17
9050 GOTO 13000
10000 CLS
10010 PRINT*  ANALYSIS MONTH OF JANUARY*
10020 X3=00
10030 X5=18
10040 X6=19
10050 GOTO 13000
11000 CLS
11010 PRINT*  ANALYSIS MONTH OF FEBRUARY*
11020 X3=01
11030 X5=10
11040 X6=11
11050 GOTO 13000
12000 CLS
12010 PRINT*  ANALYSIS MONTH OF MARCH*
12020 X3=02
12030 X5=12
12040 X6=13
12050 GOTO 13000
13000 PRINT A##:
13010 INPUT "TOTAL B/F:"I10
13020 INPUT"INCOME:"I11
13030 X2=I0+I1
13035 X4=I2+I3
13040 IF I2<I3 GOTO 14000
13050 PRINTUSING"TOTAL AVAILABLE:  ****0000.00":I2
13060 PRINT A##:
13070 PRINTUSING"LESS NET OUTGOING:  ****0000.00":I3
13080 PRINTUSING"GROSS DISPOSABLE:  ****0000.00":I4
13100 PRINT A##:
13110 PRINTUSING"AV THIS/MONTH:      ****0000.00":I5
13120 PRINTUSING"AV FOR QUARTER:    ****0000.00":I6
13130 PRINTUSING"AV FOR YEAR:       ****0000.00":I7
13140 PRINT A##:
13150 IF X5<X3 THEN X7=I5-I3/2:PRINTUSING"RECOMMEND
MIN C/P:  ****0000.00":I7

```

```

13160 X0=X2-(X3+X7)
13170 PRINTUSING"MET DISPOSABLE;" *****.CC"X0
13180 GOTO 13180
14000 CLS0
14005 FOR J=1 TO 100 STEP 3
14020 PRINTB52+12,"DIDN'T";
14030 PRINTB54+15,"PAIN!"C";
14050 PRINTB16+3,"CREDIT LESS THAN OUTGOINGS";
14060 PRINTB192+9,"X2" MINUS "X3" = "X4
14080 PRINTB320+5,"IF YOU MADE A MISTAKE";
14090 PRINTB384+9,"/BREAK/" & /RUN/";
14100 PRINTB448+5,"OTHERWISE DO NOTHING";
14110 NEXT J
14120 CLS
14125 PRINTB9:BXB10XB
14130 GOTO 13050

```

Tron

From C-Crecher's Best Machines This PROGRAM simulates the Death Race in the film Tron. It is a game for two players, using inverted joysticks (I find they are easier to use this way) and each player has to force the other to crash into the court boundaries, the random vertical lines or the ball set behind the disk. Sometimes it is possible to cross the trail on diagonal and traps can be set.

I have used PCOPY to store the court:

into memory (and also to bring them back). Full instructions are included in the game. Do not centre your joystick at the beginning of the game as this will cause your bike to automatically crash.

Program notes

10-30 Ask for instructions.
 40-120 Sets and "ready" screen.
 120 Sets variables for score.
 130-170 Returns screen.
 180-220 Reads joysticks, checks for crash, plots pixel for yellow.
 230-260 Reads joysticks, checks for

crash, plots pixel for blue.
 Adds score.
 Draws lawns, screen and displays scores.
 Checks for a winner.
 Starts game.
 Displays winner and returns to title game.
 Displays instructions.

Variables

50 Blue score
 60 Yellow score
 81Y Yellow's position
 81Y Blue's position

```

10 CLS:PRINT"DO YOU WANT INSTRUCTIONS?"
20 I=INKEY$:IF I="Y" THEN 30
30 IF I="N" THEN SCREEN=40 ELSE GOTO 140
40 POLINE%
50 PMOVE%:J
60 PCL%
70 LINE%:C1=10,192:PRINT LINE=125
8,192:PSET P,LINE-C200,C:PSET LINE
-10,50:PSET
90 PMOVE%:S
95 PCL%
100 PCOPY% TO S:PCOPY% TO S
110 S=AND(155)I,L:LINE%:500-150,50+
51:PSET LINE C200,S:I=C200,50+51,P
120
130 S=C+P%
135 GETX%:S
140 S=AND(S)
150 PCOPY%:S:GOTO 1
160 PCOPY%:S:GOTO 2 TO 4
170 PMOVE%:L:SCREEN%:J
180 S=C201+P%:S1=100:P1%
190 S=C+P%:J:SCREEN%:C:SCREEN%:C:J:SCREEN%:
10:C2
200 Y%:C+J:SCREEN%:10:51-C+J:SCREEN%:
10:C2
210 IF PRINT%:Y:C1 THEN 300
220 PSET X1,Y:J
230 X1=X1+C+J:SCREEN%:10:51-C+J:SCREEN%:
10:C2:J
240 Y%:Y1+C+J:SCREEN%:10:51-C+J:SCREEN%:
10:C2:J
250 IF PRINT%:Y:C1 THEN 300
260 PSET X1,Y1:J
270 GOTO 1%
280 Y%:Y%
290 GETX%:L
300 S=C+P%+1
310 CLS AND 150:PLAY"TS60C0LFC0B"
PCOPY%:S:SCREEN%:PRINT%:C:"*****"

```

```

1:PRINT%:C:"*****"
11:SCREEN%:FROM *****
PRINT%:C:"*****"
220 PRINT%:C:"PRESS A KEY TO START PLAY"
300 IF SCREEN%:C:AND(120) < 120 THEN 140
310 PRINT%:C:"PRESS A KEY TO START PLAY"
320 IF SCREEN%:C:AND(120) < 120 THEN 140
330 PRINT%:C:"PRESS A KEY TO START PLAY"
340 IF SCREEN%:C:AND(120) < 120 THEN 140
350 PRINT%:C:"PRESS A KEY TO START PLAY"
360 IF SCREEN%:C:AND(120) < 120 THEN 140
370 GOTO 140
380 IF SCREEN%:C:AND(120) < 120 THEN 140
390 IF SCREEN%:C:AND(120) < 120 THEN 140
400 IF SCREEN%:C:AND(120) < 120 THEN 140
410 IF SCREEN%:C:AND(120) < 120 THEN 140
420 IF SCREEN%:C:AND(120) < 120 THEN 140
430 IF SCREEN%:C:AND(120) < 120 THEN 140
440 CLS:PRINT%:C:"TRON"
450 PRINT%:C:"PRESS A KEY TO START PLAY"
460 PRINT%:C:"FOR A NEW GAME."
470 IF SCREEN%:C:AND(120) < 120 THEN 140
480 IF SCREEN%:C:AND(120) < 120 THEN 140
490 IF SCREEN%:C:AND(120) < 120 THEN 140
500 IF SCREEN%:C:AND(120) < 120 THEN 140
510 IF SCREEN%:C:AND(120) < 120 THEN 140
520 IF SCREEN%:C:AND(120) < 120 THEN 140
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690 IF SCREEN%:C:AND(120) < 120 THEN 140
700 IF SCREEN%:C:AND(120) < 120 THEN 140
710 IF SCREEN%:C:AND(120) < 120 THEN 140
720 IF SCREEN%:C:AND(120) < 120 THEN 140
730 IF SCREEN%:C:AND(120) < 120 THEN 140
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750 IF SCREEN%:C:AND(120) < 120 THEN 140
760 IF SCREEN%:C:AND(120) < 120 THEN 140
770 IF SCREEN%:C:AND(120) < 120 THEN 140
780 IF SCREEN%:C:AND(120) < 120 THEN 140
790 IF SCREEN%:C:AND(120) < 120 THEN 140
800 IF SCREEN%:C:AND(120) < 120 THEN 140
810 IF SCREEN%:C:AND(120) < 120 THEN 140
820 IF SCREEN%:C:AND(120) < 120 THEN 140
830 IF SCREEN%:C:AND(120) < 120 THEN 140
840 IF SCREEN%:C:AND(120) < 120 THEN 140
850 IF SCREEN%:C:AND(120) < 120 THEN 140
860 IF SCREEN%:C:AND(120) < 120 THEN 140
870 IF SCREEN%:C:AND(120) < 120 THEN 140
880 IF SCREEN%:C:AND(120) < 120 THEN 140
890 IF SCREEN%:C:AND(120) < 120 THEN 140
900 IF SCREEN%:C:AND(120) < 120 THEN 140
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970 IF SCREEN%:C:AND(120) < 120 THEN 140
980 IF SCREEN%:C:AND(120) < 120 THEN 140
990 IF SCREEN%:C:AND(120) < 120 THEN 140

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THE DRAGON has never been the best machine for the avid adventurer, though there are certainly some good titles available, and six months ago *Dragon User* could not have considered a regular adventure page because of the lack of material. However, with a resurgence of interest in this kind of game, and with a flood of popular adventures now being converted to the Dragon, we can launch this monthly feature with a look at the best of the old and a few of the new.

Rare treat

Just about the only adventure that is still unadapted to *Pitfalls* from Automata, one of the first to appear for the Dragon and a rare treat in being an adventure with a sense of humor, as you discovered if you swore at the Pi-Man, who accompanies you in your quest for the Golden Sarcoid of Pi, worth \$5,000. In this game you wander around various locations, answering questions, collecting objects, solving riddles and picking up clues to the Sarcoid's whereabouts. It's an amusing and entertaining game, with several cartoon sequences and good use of the Dragon's sound facilities, giving you everything from The Funniest March to The Holey-Cokeys — and it is important not to get these two confused unless you want to be buried to the sound of "You put your left leg in..." It's a lot of fun for an old-timer now, but still worth checking out if you haven't sampled the Automata style of humor.

Also standing the test of time is Watersell's *The Ring of Darkness*, in which you search for that ring, Steed, that's hidden somewhere in the uncharted land that you see displayed before you when you begin. It's a land of lakes, forests and rivers, but with less delightful features such as bandits and giant rats, too. You move around using the cursor keys, with text being printed beneath the map, and separate graphics displays appearing as you reach different features, including a 3D maze which you must LOAD from another program if you stumble across it. Even at 2-10

it's good value for money, and an exceedingly difficult adventure to solve.

Microdeal has undoubtedly made itself king of the arcade game, but it's a shame that it hasn't done the same for adventures. Its first four (*Menslin*, *Jurastien*, *Williamsburg* and *Ultimate*) were all in Basic and extremely disappointing, but the later release of *Keys of the Wizard* more than made up for that. Machine language this time, and featuring over 200 locations, it has three skill levels and sets you the task of finding treasures and returning them to the Sanctuary, assuming you can find the Sanctuary, while simultaneously beating off the beasts that populate the game.

I'd put *Keys of the Wizard* high up on my Dragon adventure list, with *Madness* and the *Minotaur* from *Dragon Data* up there too. The setting this time is the labyrinth beneath the castle of King Minos in ancient Crete, with the tasks being very tricky indeed. *Dragon Data* has also just published four graphics adventures — yes, new titles. See *Quest* and *Steinergate*, and two old ones with graphics added, *Black Sanctuaries* and *Calisto Island*. To be honest, I didn't find them too difficult as adventures, managing to solve a couple of them in three or four hours each, but the moving graphics are very impressive indeed, and you should try to have a look at one of them, at least.

Salamander's Dan Diamond character has proved to be popular with many, though I find him highly irritating, preferring instead Salamander's other adventures, *Wings of War* and *The Cripplewood Incident*, although the latter with its mad Pythonesque humor may well not appeal to traditional adventure fans.

The two new titles that have come my way this month are *Touchstone* from Microdeal, a hybrid arcade-adventure, and *Dragon Data's Monsters and Magic*, which is text-only. *Touchstone* is in Tuckermans-style, and you use your joystick to manoeuvre your character through a network of mazes, searching for

the Touchstone itself, located at the end of the 11 levels. Each level has from one to five doors for you to pass through, the keys being scattered in such a way that you frequently have to go back to earlier levels to collect one, as you can only carry one at a time. Needless to say, the mazes are heavily populated with riddles such as snakes and spiders, and *Touchstone* is highly recommended if you like your arcade games to have a touch of the quest about them.

Though more in traditional adventure style, *Monsters and Magic* was less impressive but should still appeal to those "D&D" fans who are used to the roll of a die deciding the outcome, rather than adventure fans who believe that logical deduction is the only answer. In this game you choose your character's abilities, and decide how many characters from one to 50 you should have to defeat before coming face to face with the evil Dungeon Lord. Higher numbers are in fact better as they allow you to build up the strength and experience you'll need for the ultimate encounter.

Frustrating

There are something like 1,000 different place descriptions, though you can integrate how brief these must be, and with gold to find, weapons to buy, spells to avoid and monsters to confront it's a game with a lot of variety, but I found it frustrating to have your progress halted by the unfortunate throw of a die. More one for younger players, perhaps, rather than those who like to puzzle out a problem.

After this necessarily brief introduction to several adventures, in future columns I'll look in more detail at the newer releases as they appear. The *Lord Adams* and *Level 2* series of adventures are said to be on their way for Dragon owners, and next month I hope to look at the popular *Mysterious Adventures* series, which are on the verge of release. Things are definitely looking brighter for Dragon adventures these days. ■

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If you've got a technical question write to Brian Coaga. Please do not send a SASE as Brian cannot guarantee to answer individual inquiries.

Dragon Answers

Games graphics

IS THERE a cassette available for the Dragon 32 which allows you to make up your own arcade games with graphics, sound effects, explosions, scores, lives and so on?

I already know of a program that does these things but it is for the Vii 20 called "Games Designer" by Galactic Software.

Samuel Akala
Dunston
County Tyrone

THE SORT of program you are after is "Sprite Magic" from Merlin Microsystems. This 80 program adds many new commands to Basic to allow you to control up to 128 sprites (two sprites, not just 600 characters). There is also a very powerful Sleep command with 16 pre-programmed sound effects and the facility to create your own, and a score command to handle this in arcade games. Sprite Magic is certainly the best ability program I have used and is reasonably priced at £17.95.

It is available direct from Merlin at 90 High Street, Edon, Cleveland, or from the mail order department at Dragon Data.

Random routine

AT PRESENT I am writing a machine code arcade type game on my Dragon, but I have come up against a rather annoying problem.

How do I generate a random number in machine code? I wish to set the X register to a random address which will position a character somewhere on the first four pages of graphics memory. To there a ROM routine that I can call up sometimes?

Steven Lippard
Kewst Gate
Leobard

ALTHOUGH it is quite a short algorithm to produce "random" numbers from machine code, there is a ROM routine that we can use instead. This routine starts at 38790 and returns a "random" number between 0 and 255 in location Z16. This is part of the basic 800 function.

To get a random number in



the X register, simply call the routine twice, transferring the number to A and B and then exchanging the B register for the X register. For example:

```
J04 38790  
L04 Z16  
J04 38790  
L04 Z16  
T04 0,0
```

Finding the light

I READ the article in April's Dragon User about building a light-pen and was very interested, though I am unsure as to what purpose it may be put. Can you give me some ideas as to the capabilities and uses of the light-pen?

Brian Collier
Wicklow
Ire

THE BARCODE lightpens that can be bought for the Dragon all use the joystick port to read the light intensity from the pen. This means that, is theory anyway, you should be able to read all the different colours from the screen using the pen, making it useful for menu selection and the like.

No pens that I know of for the Dragon can return the X-Y position of the pen on the screen in the same way as those for some other machines do, so their use for "drawing" is somewhat limited.

Dial a Dragon

I AM becoming increasingly interested in the idea of telephone networking via my Dragon 32. I

read, with interest, the article concerning the new Phetal adapter in the April issue of Dragon User, but I am reluctant to commit myself to this system as I understand it is incompatible with other networks, such as Bulletin Board Systems, for example.

I have searched the pages of Dragon User for information on terminal software, but without success. Also, I am confused by the variety of RS232C interfaces available for the Dragon as I understand some are obsolete for telephones (relaying purposes). Which RS232C interface should I buy, and where can I obtain suitable software, or will I have to write my own?

J A Fox
Perthshire
Scotland

CONTINUED Computers have recently released a package for the Dragon 32 which includes RS232C interface, telecon approval modem, cables and software. This will allow you to access mail services and bulletin boards. The package may seem a little expensive to most users of DUSA, but it does include all you need to get "on line". For more details contact Continental Computers on 0688 40232.

Saving arrays

PLEASE could you tell me how to save arrays on tape.

I have looked in the Dragon manual and have not been able to find out how to do so.

Andrew Garner
Suffolk
West Midlands

TO DO this you need to use cassette files. Suppose the array to be saved is called DS and has

N elements. To save this to a file called BATAF you would use:
100 OPEN "0", -1, "DATA"
110 FOR I = 1 TO N
120 PRINT# -1, DS(I)
130 NEXT I
140 CLOSE# -1
and to reload the data from tape you would use:
100 OPEN "1", -1, "BATAF": N
- 0
110 IF NOT EOF# -1 THEN N =
N - 1: INPUT# -1, DS(N):
DS(N) DS(N)
120 CLOSE
130 ' Next of program ...

Builly buzzing

I HAVE noticed that when I run the program listed below, I hear a buzzing sound and as I move the joystick the noise changes. Is this some sort of feedback? Is my Dragon faulty?
80 Audio on
20 A = joystick (0): B = joystick (1)
30 Goto 20.

Duncan Rowland
Astonham
Lincs

THERE is no problem with your Dragon here, the buzzing is caused by the fact that the same piece of hardware is used to read the joystick values as it to produce sound through the TV. Typing AUDIO ON allows you to "hear" the joystick being read. The remedy is, if you must use audio with joysticks, use AUDIO OFF before reading them.

Card edge connectors

I AM experiencing a problem in finding a retail outlet or mail order company that sells the "2 x 28-Way" edge connector as used on the cartridge port of the "Dragon 32" computer. Can you be of any help?

J Sand
London

MARK 28LL suitable hard edge connectors which can be cut to the conventional size for the Dragon for only a few pounds. They can also supply ready-made expansion boards for building your own cartridges on. Alternatively, I suggest you consult the Merlin catalogue available from most newspapers (including W & Smith's).

RETURN OF THE RING

THE RING OF DARKNESS PART II

At last the saga continues...

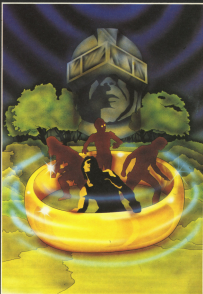
The Guardian of Shedd is defeated, the Hell spawned hordes of the Evil Sage lie at bay. Now Ringbearers, wielder of the Four Bright Rings, must face the greatest challenge: to return the Ring Of Darkness to its creator on the hidden planet Ringworld...

And somewhere at the ends of time the forces of evil are preparing their revenge.

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Please note: RETURN OF THE RING is a complete adventure. You need not buy THE RING OF DARKNESS to play it.



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The best books for the Dragon 32



The Working Dragon 32

A library of practical sub-routines and programs. **£10.95 each**

- There clearly is a need for books of this kind which provide more than just games! — *Practical Computing*, Sept 1983
- It's a go-ahead! — *Personal Computer News*, May 20 1983



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- If you can't write a half-way-decent game after three days it will be shown to your own lack of imagination. I would recommend the Brain's book as the best of this selection. — *Which (More)* — Sept 83



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Competition Corner

Answers to Competition Corner,
Dragon User, 12/13 Little Newport
Street, London WC2R 2LD

EVER SINCE the spoken language first came to be written down, there have been instances where person "A" wishes to send a message to person "B" such that if it is intercepted by person "C", that message would be indecipherable. In other words "A" and "B" would employ a sort of secret code. Certainly, in comparatively recent times, codes were in use in 10th century Arabia; and in Egypt in 1410 a fourteen volume encyclopedia on crypt-analysis was written by a certain Gassendi.

The use of codes by their very nature suggests the existence of personal or political intrigues, but probably their greatest use is for military purposes. They were certainly used during the American Civil War, and the First World War. As an example of the importance of these codes, the Russians lost the battle of Tannenberg in 1914 as a result of poor cryptography which allowed the enemy to decipher the Russian messages. More recently, the use of codes during the Second World War led to the development of cipher machines, from which the modern electronic computer is a descendant.

Decipherment

The alpha-numeric handling of computers, coupled with their speed of operation, makes them ideal for use in encoding secret messages, and also in breaking such codes. Perhaps the simplest form of code is that known as "monoalphabetic substitution" in which each letter is transposed for another, say A = P, C = L, and so on. Unfortunately, it is also one of the easiest codes to break, and the longer the message the easier this becomes. For example, in English, the most frequently occurring letter in ordinary text is "E", followed by T, N, R, O, A, I, S, D, and L (the actual order may vary depending on the source quoted), so the most frequently appearing letter in the coded message stands a good chance of being an "E". Also, the code makes no attempt to disguise word lengths which makes decipherment easier.

Nevertheless, using a computer we can produce reasonably secure messages quite simply by use of a key-code, and also by including any space as an extra letter of

Cracking the code

Win Cumana's disk drives in Gordon Lee's key-code quiz



the alphabet. This device will effectively disguise both the frequency at which letters occur in the message and also the word lengths.

In practice, if we regard the alphabet in cyclical form with the "spaces" occurring between "Z" and "A", we can encode a message by advancing letters a predetermined number of times. So "Z" advanced once will become a space (by convenience this will be shown as ' '), advanced twice will become "A", three times "B" and so on. Clearly, if each letter were advanced by the same amount the code could be broken quite easily, so a key-code or sequence of digits is used. For example, if we used the 5-digit key-code "54197", we would first write the message with the "key-code" written beneath it — repeated as necessary to the end of the text. Each letter is then advanced by the number of letters denoted by the digit appearing below it.

H A P P Y B I R T H D A Y

6 4 1 5 7 6 4 1 5 7 6 4 1 5
N E Q U E F F J W / N H B C

Note how, for example, the two "P"s in the original message now appear as different letters in the code. Also note how the word lengths alter. To decode the message simply reverse the process. All that is necessary is knowledge of the code. As an alternative to a key-code a key-word could also be employed — each letter indicating the shift required A = 1, B = 2 and so on. So the code word "SECRET" would be given the numerical sequence 10, 5, 3, 18, 5, 20.

Here is a coded message that has been encoded using the method just described with a three-digit code. As a clue, it is the sort of sentence that you might find in this magazine!

QV1THSQQWVWFFRSQZ1WYRBNQZD
JWRSHLHDEORALNDRVWRBPAW
YUQWVWYMYNSXRECKPWR

Can you decipher it, and state also, the key-code used?

Prize

THIS MONTH Cumana is offering two prizes worth more than £800: first prize is its dual disk drive system, the CS200, and second is the single drive equivalent, the CS250.

The CS200 is a single-sided 40-track drive giving 192K bytes of formatted storage capacity in double-density recording mode. The dual unit doubles this capacity.

Each drive is supplied with demonstration disks, connecting cables, manual and the Data disk operating system. An independent power supply,

main lead and moulded plug are included in each pack.

Rules

TO WIN the disk drives you must show both the answer to the competition and how to solve it with the use of a Basic program developed in your Dragon.

Your entry must arrive at Dragon User by the last working day in August. The winners — and solution — to the puzzle will be published in our November issue. Entries will not be acknowledged and we are not able to enter into correspondence on the result.

As a tebreaker, choose a name for

the toy dragon shown in the photograph.

May winner

THE WINNER of our May competition and recipient of an Ultra Drive from Icon Computer Products is R H Wilson of Basildon with a grid containing 523 primes.

A number of higher-scoring entries had to be disqualified as some entrants failed to realise that the digits "1094" had to remain in place on the grid (what others gave an incorrect listing of the primes on their grid).

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