

DRAGON



USER

The independent Dragon magazine

November 1987

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APPEAL + APPEAL + APPEAL + APPEAL
In the struggle to get SEPTEMBER to its rightful owners, some people were sent duplicate copies. We now have a shortage in the office — so if anyone has a spare SEPTEMBER they can bear to part with, please invest 10p and send it back to us at your leisure.

Editorial

WELL, they didn't lynch me at Rochdale. But if they had I would not have been surprised. To all the readers who phoned or wrote to us, particularly to those who were told first one date and then another, thank you for bearing with us. Considering that she has been answering the phone to Dragon users almost back to back for the last three weeks, and faces another week of it while the issues crawl through the post, Carol is still speaking to me, so you must have been nice to her.

Thanks. It's been a very, very long time since we last missed our print date (if ever, indeed) and I hope it never ever happens again.

A small factor like someone leaving suddenly can end up affecting thousands of individuals who don't know what's happening, and wish it wasn't, not to mention those who think they know what's happening, and wish it wasn't.

At 1.14pm on Thursday 17th September the first reader PHONED US BACK TO SAY THAT HIS COPY HAD ARRIVED! Thank you a thousand times, Mr. Marley. But I know some of you still hadn't received it by the 23rd. And the 17th was the publication day for the OCTOBER edition. No, I hope this never happens again.

How to submit articles

The quality of the material we can publish in Dragon has each month will, is a very great asset depend on the quality of the discoveries that you can make with your Dragon. The Dragon computer was launched on to the market with a powerful version of Basic, but with very poor documentation.

Articles which are submitted to Dragon 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, whenever 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 would like your program after our publication include a stamped addressed envelope.

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Hands off our OS-9

I HAV'E read Three Little Words in the June 1987 issue of Dragon User, and I feel quite strongly about the negative comments made about Stylegraph. It seems obvious that Mr Merrick has not been able to master rudimentary OS-9.

I would argue that Style can be enhanced by an 80 column screen display, and of course two drives and better than one. But Style is in the league of any PC word processor I have seen. For the comment on the double line feed, he should read David Rooney's article in the March 1987 issue, and check the OS switches on his printer. One of these will control the line feed/carriage return mode. Reverse the switch and it will level off. You will have to test the switch for settings in Dragon mode, but it is not necessary to ditch your current printer.

The volume of memory is governed by the user. To obtain 528 on a level one system, use a parameter value on the Style calling statement, eg Style 528 (528), which should give you 5 or 6 pages to work with. If your motherboard is larger, you can unbind what you have written to disc, and carry on writing, and the whole document will remain under the same filename. The limit to the size of your document is effectively the size of your formatted disc.

The Spell and Mail merge programs are most professional. The standard dictionary contains 40000 words, and you can add as many as you like. Mail merge gives the ability to print multiple copies and make text substitutions while printing.

If you run a small business, OS-9 is most certainly suited. A bit of upgrade to your Dragon 64, like a second disc drive, programmer etc, is worth the investment. There are packages like Cash and Mail and Stock Control.

My wife who is a creative writer and a computer user was horrified when I told her the time had come to change word processors. With utilities provided by the OS-9 User Group I began with the original word processor OS-9 formatted diskettes.

The first week was almost unbearable for us both, with fre-

Every month we will be shelling out a game or two, courtesy of Microsoft, to the readers who send the most interesting or entertaining letters. So send us your hints and your opinions, send us your hi-scores and suggestions. Send us your best Dragon stories. What if you think we are, mind readers?!



Words of wisdom for the wise

I greatly enjoy struggling with Gordon Lee's powers. Not only that, I have found them a great help as an aid to programming.

When teaching my Dragon 64 to knowledge of basic programming, so I had to start from scratch. I did not find copying out programs from the manual very helpful. I found that the 'back it and see' — sometimes known as the experimental — method helped me most. Things often find out for oneself lead to stick in the mind.

Many of you Dragon 64/800 readers have the advantage over me since I only manage to press one correct key in ten, and I can't spell. Because of this I have been officially certified the World's Worst Programmer in spite of this. I have even the odd prize. So you see and all are in with a chance.

For those who would like to have a go, although it is worth having a good read of the Dragon manual, I recommend the 'try it and get it wrong' method (I know as known as the 'back it and find it a Chinese method power method' — lol) in the manual there is a list of all the Dragon commands.

Start with the PRINT command, because it helps if Dragon gives an output, then play with INPUT, and carry on from there. By experimenting one can find out what to do, even things not in the manual.

A final point. With Gordon's powers, I always try to solve them by several quite different means. If I get two answers that are the same then they could be right. But, above all, trying different methods gives considerable insight into programming.

Good hunting!

Bob Newman
103 New Year Road
Aldershot
Surrey
KT15 2DA

Looks like Ted wins again

quent phone calls from home demanding how, and why, and where, and that I return Telewriter to her. The second week was a dramatic change. My always creating networks with vigor, and checking the clock on with the Spell program. The moral is 'a little persistence will reap great rewards'.

R.G. Drayton
50 Hawthorn Crescent
Casham
Poyserville
North PO8 2TP

Stylegraph will not send codes over OS as it was designed for a 7 bit bus which was the American standard at the time. Microsoft is very slow because it is in Basic, but its adaptability to different computers and printers. Telewriter is possibly the most powerful compact word processor I have seen, and though it does not have justification or spelling correction as standard, it has features not found on most home packages.

The embedded format codes allow you to send any character in the range 0 to 255 directly to the printer, allowing use of any character the printer produces, or nearly any printer format or typeface can be changed during printing, allowing mixed faces or styles. The embedded codes should sometimes be followed with spaces to make them look properly.

Incidentally, as files generated by Telewriter are text files, they should not be named as backup files, but as updated files, ie: FRED1.TXT, FRED1.TEX under Dragon-OS, Or: DATEDOS there are no bugs, so no problems arise.

If we can be of help to any readers we will provide they send an SAE.

A.C. Densham
(High security systems)
23 Dalfield Crescent
Lidbridge
Middlesex UB8 3ET

PS Can anyone help us? We have a timely mission, but it has become corrupted and will no longer load.

Not so Mfree

Roger Merrick's hard disk word processor made some valid points, but I feel that he was less than fair to OS-9 and Stylegraph.

OS-9 is complex and can be frustrating, but Style is automatic in its use of the OS-9 filing system, and you need know only a little to use it. A small business would surely find OS-9 without utilities a god-send. Also, the idea of putting OS-9 in ROM would be a move

Style style

I HAV'E read Three Little Words in the June issue and I think Mr Merrick has not read the manual carefully. All the programs can be used successfully if understood. They have used differences of operation, and since they have to work with a selection of printers, need time to be used to their best advantage.

attribution of OS-8 — the fact that the number of commands available is only limited by the size of your disc, and that extra utilities are readily available from the public domain through user groups.

Impressed by Mr. Merrick's use of MFREE to check the memory available, Fyco calls his from Splo, you are checking what is left to OS-8, not what is available to your text. You can call different amounts of memory for text, using STRILO stack, for example, and the more you ask for, the less will show on MFREE! Also, OS-8 version 2.0 has a better screen driver, and/or half_palette, which Mr. Merrick prefers. However, using the Computer DragonPlus board gives a marvelous 80 column display and an almost instantaneous redisc on which your commands may be put. I could argue that even allowing for the hundred pounds or so for the add-on, you have a system which would compete favourably with much more expensive machines. Style can make whatever were like a toy by comparison, useful as it is.

Selester an old does right justly. Just press J in the format menu, and K to remove it. The problem with Selester is that it is all too easy to lose text — try printing out before saving, and with some printer settings you lose the text. Also, if your disc is full, Fyco and Fyco Selester will tell you. On the other hand, a might be all over your existing files, as mine did. (Yes, I DO have a backup, Helen!) And I would patiently use updates of figures and select 80 columns width for the printer, and I told that Selester had rearranged the text beyond recognition. Style allows the line length to be set first, another "embedded format" commands are much more straightforward.

Incidentally if you don't want OS-8's facilities, File is somewhat simpler to learn, and File's SPAN is really Style under another name.

David Anthony,
1, Heath Road
Glossop
Derbyshire
SK13 6AP

Once again, the OS-8 Users Group can be contacted through Martin Vermaas, at Roseberry Court, Llanbadina, Gwynedd, LL20 1TF

Author gets it right

Thank you for publishing *Three Little Wands*. A number of points have occurred to me since submitting this to you last year.

(1) The problems of Stylograph are overcome by simply entering the patches published in a recent issue of *Dragon User*.

(2) Before a three and a half inch disc uses a different standard and cannot be successfully connected to the *Dragon* disc cartridge.

(3) Tandy CoCo OS-8 will not boot the *Dragon* because the device drivers and the disc format are different.

(4) I joined the OS-8 Users Group and have made more progress in OS-8 since then than in all the time before.

(5) A 20 megabyte hard disc and interface would now cost around £200. When I bought the *Dragon* DOS disc drive from Boots, it cost me ... £295.

Roger Merrick
30 Dean Road
Widlington
Hampshire
RG21 6DP

Atoms are found again

In an old copy of *Dragon User* (June 1984) I found a program with the name 'In search of Atoms'. At first the description didn't attract me, but I decided to try it. I have put it in and tested most utility programs in OS-8 but this is in my opinion the best. It is very good with the use of colour, and is easy to play. When playing it you must think quite a bit. If you have June 1984 and want a good game, try it.

This is not necessary, but I recommend you to change the 620 to:

```
620 IN-INTJSL-FIND  
(TIMEP)+1  
F2=INTJSL-FIND;TIMEP)+1
```

Otherwise the same configuration carries up with every new start.

Martin Norman
Cheritonsgovan 12
19101 Solomons
Sweden

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The new text MAG-PA (CODE: T3109) we produced — *Dragon Machine Language for the Amateur Programmer*. Language of the *Dragon* and *Dragon Machine Code* (DMS) each, or £10 for the complete set. Inside the *Dragon* (TTC book) £20.

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LEADS: Aerial 12.95, cassette £1.95, printer £1.95.

SOFTWARE: *Whitehouse File* £14.95. *Colour Code* £500 (For other software, see comment John Fern, at 0420 365).

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News desk

If you have any new products for the Dragon — software or hardware — ring the News Desk on 01-437 4343

Discs from Preston

R & A J PRESTON have collated some popular older titles (on disc) and tapes, to be released shortly.

Rudy Rabbie, Pentious Pitand Despatches Dave are together on one disc, and Kung Fu, The Master is on another. Space Truck and the game Powers will also be available together.

Cassette versions will cost £2.99 and disc versions £4.99. For more information contact R & A J Preston, Kings Hall Court, St. Bridges Major, Mill, Gillingham CF32 0BE. Tel: (0866) 880965. Even so for the, Preston's are representing Dragon users at the PCW Show in London.

NDUG see double . . .

Here's the August issue of Dragon Update. Paul Gade is beginning to make Editor-of-the-month-of-tracking noises (it's the best, the best . . .). I've noticed that professional editors only go slightly off their trolleys. Amateur ones go right off their trolleys. You can't get away from it, you're exempt from leaving the country. Which you can't do, because there's too much work.

The August Update has articles on Pascal for beginners, easy machine-code, running C under DragonDOS, a review of Basic Maker, some DeltaDOS news (with Dave Martin waving hello) because more Delta users aren't registering. What, not speaking to each other? (Unitedweareandremember), a couple of small Randy hardware reviews, some good advice for people thinking of starting their own magazines (after the demise of Dragon's fall), and a review of Gaid's Master's Galactic Get — which brings me to . . .

The Lorians (the editor) spending off about people sending the same article to Update and to other publications. Which usually means Dragon also. I only found out about Galactic Get when I was too late to paste something out of it. Now, whereas I entirely believe in the author's innocence — it's also difficult to get things printed that it always seems like good sense to run off four copies and send them to different publications — I have to request that anyone else who feels innocent, gets wise. Broad-mindedness is all very well, but actually people don't like buying too different mags and reading the same things in both of them (the occasional reprint is acceptable, but that's all), and if you think about it, writers are pretty lazy, and if we all did that you'd have a choice

of eight identical newspapers every morning. So please don't do it. At best you won't get paid, and at worst you'll be very unpopular, and have even more difficulty getting things printed.

Mike tells me that he even asked Paul the minute I being printed elsewhere. This is what I mean by innocence, and it taken of that I shall only be adding half his fee to Dragon Update.

So now that Tim and I have both said, no-one can say they weren't warned. National Dragon User Group, c/o Paul Gade, 8, Navarino Road, Welling, Sussex.

OS-9 offer from Denmark

HWAS Christian Andersen Computer Inc. have been in touch with us with a special offer for the months of November and December.

As regular readers will be aware, HCA are the official licensor for OS-9 for the Dragon, which enjoys a high reputation, but a correspondingly high price.

For November and December HCA will be offering OS-9 at the considerably lower price of £87.50 as advertised, as well as 25% off the price of other software in their regular advertisements.

You should find further details somewhere in this issue of Dragon User (but if you want to contact HCA for details, or order without further ado, their address is H.C. Andersen Computer Inc., Englandsvej 380, DK-2799 Rastrop, Denmark. Phone 01 52 44 04. Postage for software is 5% of the order price, up to £5.

London Show

John and Helen Penn of John Penn Discount Software are organising the 8th 8000 Dragon Show in London on Saturday 18th December.

The show is to be held in the Great Hall of the Connaught Rooms from 10am to 4pm, according to our present information, and we'll be bringing you more information when we receive it. The Connaught Rooms are altogether warmer and more hospitable venue than the Hercules Hall, and the Penns are organising guest demonstrators as well as trade stands.

This is a good opportunity for everyone who lives within

striking distance of The Snake to come and support one of the Dragon's most loyal suppliers over the years, as well as many other Dragon names, and do a bit of shopping in time for Christmas. The future of the 8000 Show, and indeed all Dragon shows, depends on users turning up to see what's doing, even if they don't plan to spend a fortune on any new product or software. And it's a great way to meet other Dragoners as well.

You might even get a laughly watching the staff of Dragon User locate the ball of the September issue another few hundred times, with themes and variations.

New Starship games

STARSHIP Software were at Rochdale, demonstrating at their new software, and the old stuff as well. We have *Roll-out* in the news pipeline. *Roll-out* is described as 49 systems of 2D strategic Guide the ball over a hazardous 3D landscape, collecting (space) pieces on route. Beware the cube and the cheer-leader!

Also on the horizon are *CACODON*, with trees, boxes, circles, discs . . . *3DCCM* command for great perspectives, many types of brushes, freehand mode. As used to create all *Starship* title pages!

More room in the Arc

ARC Software are reducing the price of their adventure game *The Thirteenth Year* from £3.80 to £1.99 (including p&p) as a special Christmas discount from 1 December 1987 to 31 January 1988.

The Thirteenth Year would be better known if ARC were in a position to advertise more freely, and is well spoken of by those who have played it. An adventure for the price of a discount game is definitely a bargain.

Contact Arc Software at 272 Meana Road, Newton Meana, Glasgow G77 5JX.

and Windows, with 10 user definable windows, icons, pull-down menus, and a pointer, a 32 x 24 display, a real time clock, plus much more! Complete with a suite of dedicated utilities. Easily incorporated into your Basic programs. Does NOT require 64K! No price has been announced for the new programs as yet, but *Starship* programs typically retail at around £3 to £5.

Starship's other titles are the *Devine* series and *Composer Companion* and *HPear*, a collection of routines and 32K Turbo-writer on *Composer Companion*, all published by Microvision, and *HP-Net*, available from John Penn.

Show in Cardiff

SPONSORED by Dragon dealers and general wholesalers R & A J Preston, the Wales and West Computer Show in November will feature the Dragon as well as other computers. The show is to be held on 21 November at the Central Hotel in Cardiff from 10am to 4pm, and the entrance fee is only £1.

For further information contact R & A J Preston on Southendphone (0865) 808965.

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Dragonsoft

Save and lose

Program: Starliner Delta disc upgrade
Supplier: Microdeal
Price: £104

THE instruction manual which comes with Microdeal's Starliner is quite simply the best I have ever seen. So far so good, but it's time for another price, because I'm about to start to talk about the Delta disc upgrade of Starliner. My copy had the most incredible bug in it. I thought it was just me, until I checked around, and lo and behold, someone else had the same problem, which is simply this: if you visited the printer, it is 100% certain that when you next access the disc ROM the program is going to go into an irretrievable crash, if you don't print your notes before leaving it.

Then there's no certainty of a crash, just a very big chance. So far since buying this upgrade, I have had two acts of a price certainty for this magazine, a short story, the first eight chapters of a book, and about fifty seconds' songs and points. At this rate I'm going to follow Blakey Griffiths's example and switch to an Amstrad Microdeal should stop selling this garbage until the bug has been sorted out.

Jason DeGroot

(See also this month's Letter page. Editors usually gentlemen about three days' grace to get over a system crash, so if your WP still won't open what Jason's WP seems to have done several times, do the sensible thing — start trust it with anything important that's on a disk. — Ed.)

Four in one

Name: Airball
Supplier: Microdeal
Price: £5.95

Name: Stone Raider II
Supplier: Microdeal
Price: £5.95

Name: Run
Supplier: R & A J, Preston
Price: £3.99

Name: Adventure Writer
Supplier: Cowan Software
Price: £14.95

MICRODEAL have recently come out with Stone Raider II and Airball. Of the two, Airball is definitely the better designed although it is very, very lagged. The game puts you in a classic dungeon beautifully drawn in black and white 3-D. The object is to find and return a book of spells that the wizard has lost. It's basically a mapping game but incorporates the keyboard games; the key to success lies in negotiating your way around the screens without hitting the spikes, and getting to the purple before you run out of life. The game is really beautiful to play and involves a lot of skill and fine perception. It is a great game on joystick or keyboard, unlike Stone Raider II which is a waste for one simple reason — there's no keyboard option and

the game is too fast for joystick work.

In a game like Boulder Dash (which is what this is), where positioning and timing are far more important than speed, slow play control like this is tactical. The game contains a cheat for those who can't find it which is becoming a general trend lately, much to my distress. I have to be able to buy a game that I don't have to work out how to hack to get the full enjoyment from it. If a program has a screen designer in it I would like to use it without having to solve several convoluted problems — if I want to do this I'll buy an adventure game.

However, that notwithstanding in accord there are some very interesting aspects in Stone Raider II and it seems to have been well thought out. The sound isn't anywhere near Chris Jolly standard but it gets by and the graphics are quite attractive. If you've got a blaster, Crash, and have finished it with ease, then this one is for you as it really starts where the others finished, surely oh why this late into the Dragon's life, are we getting games without keyboard control??

Moving on we come to Run, one of Blakey's last releases, which has all the elements of the arcade game in it, but all of them

badly ripped off. In the arcade this was one of my favourite games and, due to the excellent graphics in chess terms of fun, one of my favourite times to play this game just doesn't do it justice. The cycles are an embarrassingly slow, the tanks are impressively hard, the spiders are messy and the coin is the sort of graphics my two year old cousin would design! Basically, this version of Run is no better than the other really useless one that's been on the market for quite some time now.

Adventure Writer from Cowan software is, I'm sure a superb piece of programming and I'm equally sure that its creator has written many very good adventures on it. My copy however, has photocopied A4 sheet after photocopied A4 sheet of comprehensive instructions some of which have helped me even to start to use the program if it's supposed to be an adaptive writing language, well if that's true then it's the most user friendly language I've ever used! It makes FORTRAN seem like baby talk and assembler seem like BASIC. I would really like to be able to give this program a good review because I think a study of this nature is quite exceptionally useful. However, if it can't be used because someone doesn't take time to test out the instructions then what's the point?

Before I sign off and give my ratings on these programs, please do not think I am being pessimistic. I love the Dragon, it is the only computer I own, and it is still the best programmers' machine on the market. This is an appeal to the software companies. If you can get games like Airball and Superkid then give them to us. We're not up with it yet to sort through the stuff to find the best. Of course, and one other thing, whoever is selling Microdeal's tapes (Jason), please stop... you're embarrassing me!

Jason DeGroot

Airball	
Stone Raider	
Adventure Writer	
Run	

High life

Program: The Immortal Green Jaguar
Supplier: Broomfield
30 Grosvenor, Westway Garden
City, Herts HLT 1RF
Price: £4.00

IT'S time to bring out those old adventure favourites of adolescent metal rings, Nazi in coffins and devil statues in Michael Edwards' latest Broomfield adventure.

As for your purpose in collecting such objects, well accordingly Design User needs desk a few months back in a vain attempt to become immortal (that explains the title). I went to the old Newmarket there are several instructions somewhere. This may well be a secret mission, but they could at least introduce a poor person who has to do it.

Actually lack of instructions doesn't prove a problem because with any adventure you set off to wander around and pick up any useful looking objects. Also there's a very handy discarded note in a church telling you what various items to help you succeed in your quest.

Your task begins in a pentacle where there's a 'feeling of magic' according to the re-designed white text on black background. I would not disagree with this description as when you stop specific objects within its boundary your score mysteriously rises. There is a score feature, by the way, so you can check on your progress throughout the game.

One of your initial problems is a real very nice fellow called Zargon, whose mysterious name aptly fits the atmosphere generated in the program. This nasty chap keeps following you about, and then for no other reason than he's a lot of a stick-man (or machine, whatever is applicable) gives you immortality rather earlier than you would expect. Except that acting on a fully white cloud playing there is obviously why you were after.

A location called 'The old green' also provides a method of dispatching Zargon. Having done to him all he would creditably have done to you, the old dad then resurrects himself for a few seconds to try and get his hands on a nearby animal. Not exactly cricket — but then again you're not quite

at the MCC, as shown by the fact that he leaves a map written in Swahili.

Wandering in peace around beaches, cliffs, forests and a church for good treasure should reward you if only different treasures, one found by the old graveyard and coffin scenario, than the last actually satisfies them.

The chance to go up and down as well as traditional compass-directions is also used. By exploring downwards you could find yourself amid a sea of fire with a hand stretching up of the inferno.

Also by diverting down you can get on a beach where you can't along the shore is a motorboat willing to transport you to three other areas (and to the main shore, although as you're inside there it seems a bit of a waste of petrol), in theory the boat should take you to these locations, but it only seems to want to go to the small island and back to the main shore. Southern and northern waters you are told have nothing of interest. If there's nothing worth acquiring there why have a motor boat going to them? Sounds about as fruitful as a sentence from a second hand car salesman would be.

Conclusion time is approaching and therefore I'll have to say adieu to the game. It doesn't seem over difficult as the problems are logically solved, but what do you think the grade is and why does the computer reply 'sorry' when I try to get in to the level? (No doubt I shall solve these problems about two minutes after I've posted this review.) The game through the dungeons and graveyards has an ominously eerie atmosphere about it and is as well written as any text adventure by a big software house for the Dragon.

Big software houses bring us new reality on any platform, but just because this game wasn't advertised in pages of glossy blurb it doesn't mean it's not worth buying. Small firms like Biosoft don't deserve all the support they can get — they're not after vast profits but just providing the public with adventures, and good ones at that.

Philip Oake



Cream cake quaffer

Program: *Catcom's Crete*
Supplier: Microvision
Software:
Price: £195

MICROVISION'S adverts for this title have been describing it as a 'graphic adventure'. On playing it becomes apparent that it is only just bordering on being an 'arcade adventure'.

The slight misrepresentation doesn't, of course, alter its quality, but traditional adventure fans might like to know that the only full word you type in is your name and that movement is totally by joystick.

Starting out with a grumpy may appear as if I don't like the game, but the opposite is true. You start out with a grumpy cat in a very nice inn, in the hope of escaping the numerous mad labyrinthine of Tyros mountain. How and why you're here in the first place is irrelevant; you just have the problem of getting out intact.

In the caverns you are shown an overhead 2D view, and as its pretty black (or red in this case) underground caves you have a lamp which lights up the walls with a green glow. The catacomb itself is made up of a series of simply drawn passages interspersed with larger caves where various nasty creatures and above-normal sized objects are found.

Only a small section of the whole network is shown on the screen and therefore you are able to call up a map which shows all that has so far been discovered. By using this map it becomes apparent that it's not merely a question of learning where everything is on a level and then completing it almost without thinking the next time as a new network is created for every game. Adding much more reality.

As well as showing where you are the main screen has a box for displaying messages and commands, and a score panel revealing your status and standing.

To pick something up you just move over the object, and can then use with various single-letter commands. For instance, if you find a dagger to hold the weapon you type 'H' and then a corresponding letter on the

inventory, is the third object on the list is letter 'C' and you therefore enter that.

As well as holding weapons threateningly you can put on or take off clothes or armor (and potions, read scrolls, those objects sound dead). Edible objects are normally apples, cheese (in sweet pasta pits, though here they're cream cakes — whether you're trapped in a cavern or not you're obviously not on a diet).

You don't only have to eat to survive but to keep your hit points up. How many hit points you have determines how long you can stand the attacks of 'globs' 'sparks' and other monsters.

The more monsters that are killed the higher the experience level and the greater the limit on the number of hit points. The hit point level can be replenished by staying out of attack mode. But this mode obviously allows you to attack your foes and also stops them giving you a fair old thrashing.

There are also bags of gold scattered about for good reasons, although they don't look much like money filled sacks, just like the cakes don't look like cakes. None of the graphics are razor sharp like, say *Arbit*, although this is partly due to the fact that the author hasn't sacrificed his four scores just for the sake of electricity.

There is of course the traditional high score table, determined by gold or experience or custom level as perhaps would be expected. As for music, well there isn't any. The author obviously isn't a composer as the only sound you hear Dragon users is the thud of heavy feet padding up and down the passages ways.

As with all good games you eventually get that bit further and eventually hopefully manage to complete it. With progression you gradually find more potions to use, tougher armor and weapons with greater power, and as always more monsters — how easy life would be without them!

I must be starting to get reasonable at this game as I'm now playing games which are beginning to take over the hour rather than over the minute. If you haven't got a couple of hours for one game then there's the old adventure option of saving onto a handy blank tape

and resuming later on — well perhaps its not as unlike an adventure after all.

Philip Oake



Bargain screens

Program: *Frankie*
Supplier: Quickscore
Price: £95

WHEN Wayne Smithson started writing this it was as an alternative to Roy Coates's 100 screen game *Galaxia* which never made it to the market as the 100/100 screen game around. As well as being a one-of-a-kind game it has the only loading system of its type which scrolls the instructions across the middle of the screen while it loads, and the game takes about the same length of time to load as the average Dragon game.

The game can be in one of two colour sets: model, screen 0 or model, screen 1. You can use joystick or key board and there is of course a 'reserved' section which is called Hacker's Delight, which has been mentioned in The Expert's column.

There is an option to re-design the screens in which you can save and load the screens.

On to the game. You are Frankie Gainspick, a know who has to collect all the keys on the screen in order to go on to the next screen. Trying hard to stop you are eyes, tent, noses, mouths, hands, vampire bats and even Eggs, sent to fire lightning bolts at you. Thankfully you have a defence against this lot, a laser, but when you use it your energy goes down and when your energy gets to 0 you lose a life. To top it all you have collapsing platforms, killer pads and conveyor belts. Thank heavens for Hacker's Delight!

I can't give Frankie five out of five, as it's not quite addictive enough, but it's definitely worth four at the price.

Stephen Cooper



4EC3	0000	T4	ADDA	010	0F04	0504	F10	LDB	-8
4EC5	0040		0FA	05	0FAC	0F		CLRA	
4EC7	0080	T5	ADDA	05	0FA0	10		COMB	
4EC9	00C0		0FA	10	0FAC	C000		ANDB	0100
4ECB	0100	T6	ADDA	04	0F70	2017		0FA	P1
4ECD	00E0		0FA	07	0F72	0004	02	LDB	-8
4EEF	0002	T7	ADDA	02	0F74	00		COMB	
4ED4	0004		0FA	00	0F70	C000		ANDB	004
4ED5	0006	T8	ADDA	01	0F77	2014		0FA	P2
4ED6	0008		0FA	PRINT	0F79	0504	02	LDB	-8
4ED7	004000	0F0	LDA	000	0F70	05		COMB	
4ED8	0100		0FA	08	0F7C	C000		ANDB	020
4EDC	270E		000	RET	0F70	2011		0FA	P3
4EDE	14		00CA		0F00	0504	04	LDB	-8
4EDF	074000		0FA	000	0F02	00		COMB	
4EE2	0040		LDA	0100	0F03	C010		ANDB	010
4EE4	074004		0FA	000	0F05	2040		0FA	P4
4EE7	0000		LDA	1,0	0F07	0000		0FA	L20
4EE9	100000		LDA	010001	0F09	0000	F1	ADDA	0192
4EEC	0C1000	RET	0FA	07002	0F00	0070		0FA	02
4EEF	10000000		LDA	0001C	0F00	0000	F2	ADDA	000
4EF3	000002		LDA	01,0	0F0F	0000		0FA	00
4EF4	100000		LDA	010001	0F11	0000	F3	ADDA	012
4EF9	00		0001C	010	0F10	0000		0FA	04
4EFA			*****		0F15	0000	F4	ADDA	00
4EFA			= 010010000 0000 +		0F17	0000		0FA	L20
4EFA			*****		0F19	0504	02C	LDB	-8
4EFA	0010		0LDA00	LDA	027	0F10	4F	CLRA	
4EFC	000070		000	00070	0F1C	05		COMB	
4EFD	0040		LDA	004	0F10	C000		ANDB	00
4EFF	000070		000	00070	0F1F	2010		0FA	D1
4F00	0000		LDA	010	0F01	0004	02	LDB	-8
4F04	000070		000	00070	0F03	00		COMB	
4F09	170000		LDA	010	0F04	C004		ANDB	04
4F0C	0002		LDA	02	0F06	2015		0FA	02
4F0E	074010		0FA	000	0F00	0504	03	LDB	-8
4F11	001000		LDA	07000	0F04	00		COMB	
4F14	10000000	L20	LDA	0192	0F00	0000		ANDB	02
4F15	000004	L20	000	000004	0F00	2012		0FA	00
4F16	0101		0000	001	0F0F	0004	04	LDB	-8
4F1D	10070000		LDA00	0001C	0F10	0001		COMB	
4F21	0C1000		0000	07000	0F10	C001		ANDB	01
4F25	10040000		LDA0	0001C	0F10	200F		0FA	L20
4F28	004000		LDA	000	0F10	100700		LDA	L20
4F2B	0102		0000	02	0F07	0000	05	ADDA	0192
4F2D	2700		000	010	0F00	2004		0FA	02
4F2F	2000		0FA	00C	0F00	0000	02	ADDA	040
4F35	000070	L20	0FA	00070	0F0F	0007	03	ADDA	012
4F3A	000070		0FA	00070	0F01	0000		0FA	04
4F37	000000		LDA	-02,0	0F03	0000	04	ADDA	03
4F3A	0100		LDA	-1,0	0F05	0000		LDA	L20
4F3C	2004		0FA	L20	0F07	100700	F0A	LDB	000002
4F3E	004000		LDA	000	0F05	0004000		LDB	00
4F42	074000		0FA	000	0F00	C000	0E000	LDA	-P1
4F45	2004		0FA	044	0F01	000070	0E000	000	00070
4F47	0002		LDA	02	0F05	04		ANDB	
4F49	074000		0FA	000	0F00	2070		0FA	0E000
4F4C	00011000		LDA	0100,0	0F00	00		F10	0
4F50	0000		LDA	000	0F00	00	000	F0C	0
4F52	000070		000	00070	0F00	00	000	F0C	0
4F55	170002		LDA	004	0F00	00	000	F0C	0
4F58	100700		LDA	0444,0	0F0C	10070000	000002	F00	27,05,0,10,27,42
4F5D	00010000	L20	LDA	0444,0	0F02	000002		F00	5,0,12
4F5F	0004		LDA	000	0F05	10070000	000002	F00	27,05,0,27,42,0
4F61	000070		000	00070	0F00	0001		F00	L20,1
4F64	170002		LDA	004	0F00				
4F67	100700		LDA	L20					

Pamcodes

Part one of a new series on machine code for beginners by Pam D'Arcy.

HAVING volunteered to try and help R.J.F. Harding (Letters, September issue) and others like him, I have a couple of days before deadline and you are going to do, so you can imagine what you are going to get this month — a lot of waffle and no real detail. However, because the 'getting started' syndrome described in R.J.F. Harding's letter is often a big problem, I have included a few lines of assembler source code to see if we can all get going without waiting another month simply waiting for the first real article.

If you're trying to learn Dragon machine code for whatever reason, I will assume that you will already have:

- 1) at least one book on the subject
- 2) some form of assembler software.

Rather than dive in with a blow by blow account of machine code, which may or may not leave you dangling mid-code from one long month to another, my intention will be to present a series of self-contained articles. Some of them will refer to programs from popular Dragon machine code books that people have had problems with, so that those of you who have those books in your possession, or want to get them, can go back later and tackle them with more confidence. This also opens the floodgates for you to swamp me with examples you find difficult, which I may be able to write an article about.

Lack of standards

Using the Dragon's own Basic, variables may be numeric or string, and are given alphanumeric names of any length — except that for various planned and very good reasons, these names are truncated within the Dragon to the first two characters when the Basic program is RUN. Thus variable names, for example, QUORUM and QUANTITY would both be treated as variable named QU, and this same memory location would be used every time either variable QUORUM or QUANTITY (or any other variable commencing with the letters QU) was encountered when RUNNING a Basic program — which could account for some unexpected results...

```
10 QUORUM=10
20 INPUT MEMBERS
  PRINT QUANTITY
30 IF QUANTITY<QUORUM THEN
  PRINT QUORUM ELSE
  PRINT QUANTITY
```

(That's as I would enter it — I never type in the word PRINT but always use the available shorthand/question mark form.)

In a similar manner, Basic commands, or keywords, are replaced internally by a value, or token, that occupies a single byte of memory as the line of code is entered into the program (a procedure known as 'tokenizing' — and denotching when it is converted back for LISTing purposes). If any of the names of our variables commences with the same letters as a keyword,

Listing 1 To rescue a lost Basic program, 100 lines

Assembler generated object code	Source code			
	Line number	Label	Mnemonic	Operand
00 00	00	GO	LDI	R7C
00 01	01		LDI	R7C,0
00 02	02		LEAD	2,4
00 03	03		LDI	R7C
00 04	04		LDI	R7C
00 05	05		LDI	R7C
00 06	06		LDI	R7C
00 07	07		LDI	R7C
00 08	08		LDI	R7C
00 09	09		LDI	R7C
00 10	10		LDI	R7C
00 11	11		LDI	R7C

the CRUNCH routine positively ruins our programming intention...

100 TOTAL=BALANCE+VALUE

It fails correctly because of the DEC RUMCH routine, but when attempting to RUN the program, TO of total and VAL of value will be tokenized keywords that the Basic rightly says do not make sense, so it gives a syntax error.

Why have I taken this time can't to go over what you probably know already about Dragon Basic when it is machine code that you are keen to get to grips with? In the same way that Dragon's Basic (and all other Basic) has its own quirks and rules, so do assemblers — and unfortunately there is no one inbuilt assembler on the Dragon. Assembling using singly means to an end, a program that converts source code written according to ITS OWN rules, to object or machine code that it places (again, depending on its own rules) at its own or user specified addresses in memory. Apart from the fact that in general the 89 different types of source code instructions are represented by standard groups of letters, or mnemonics (memory jiggers, as in DUB for SUBtract and DIV for Branch for Equal) and that preceding the mnemonic field is a line of source code will be a label field, and following the mnemonic will be an operand field, there are similarities between assemblers will end, making it impossible for anyone to present source code in a form suitable for input direct into a (or probably even most) assemblers produced for the Dragon. I shall therefore keep the code as straightforward as possible so that minimum adjustment is needed for it to be immediately acceptable to your assembler.

To rescue your Basic

I'll now include a few lines of source code for you to play with. There is no room to explain anything about this routine or its machine code this month, other than to say that once it has assembled correctly (perhaps save it to tape or disc at this point), too, if you type in an object Basic program to ROM will do; LIST it, type in NEW then LIST again — i.e., the Basic program has gone. EXEC the assembled routine from its start address and a OK, LIST again and the Basic program will have been restored to its former glory. It is also useful should you have an MO error on your only saved copy of a Basic program. Load in the machine code routine and EXEC it, and

the program lines as far as successfully read will be available to you. This routine can be found in Dragon User July 1983, page 44 and June 1984, page 29, and in the Dragon Programmers Reference Guide by John Standen (Raylen Melbourne House), pages 107 — 108. Note the printing errors in the assembler listing on page 108 if you had trouble with it — a common enough problem that I shall deal with another time. The book is still available from Pretext.

Assembly

There are two stages to assembly: source code input, or editing, and the assemble process itself, or generation of object or machine code. Your assembler may include its own editing facilities, or it may assemble source code statements entered using the Basic editor. Enter the source code according to your assembler's instructions and rules. Line numbers may or may not be needed. Using them when not required or vice versa is likely to cause every line to be an error. The label on line 10 is not needed by the program itself, but is included in case it is mandatory in your assembler that the first instruction will be labelled. Your assembler may need an *jr* or other symbol to precede the label name. It may need the source code to be entered in particular columns at a time or lines only need to be separated by a specific character. The last line of source code may need a special value in the label or mnemonic field, hence my leaving a line number 80 there, to remind you.

The assembler instructions should tell you where the object code will be placed in memory, which may depend on any CLEAR statement you type in before loading or running the assembler. The above program will run successfully from any address within the Dragon provided, obviously, that it is not loaded into areas occupied by the Basic program that is being recovered, nor into Basic's workspace. Reserved graphics pages and higher addressed memory reserved for machine code by using an appropriate CLEAR statement are also areas. With routines like this (that uses a routine within the DRK Basic ROM, line 20) Dragon 04 owners who would want to use the routine in DRK mode will need to add \$4000 to the operand.

ADR \$C0FF

with correspondingly different object code being produced.


```

230  DBF01C(80)F00) AND1 TH#M00
240  FOR#M01T25, 8027000) 27000) 0) FOR#M01T22, 8027100) 27000) 0) 1) 20
250  M02=INT(0.7) * IF#M1 TH#M00-1
260  FOR#01T02) FOR#M01T25-1, AND1 NEXT
270  IF#020 AND SP=0 TH#M00
280  IF#020 TH#M00-1) SP#020) 0) 0) 0) 0) 0)
290  IF#020 TH#M00-1) SP#020
300  PUT(0P, VP)-(0P-0, VP-0), BL, P0ET
310  SP#0P-P
320  GET(0P, VP)-(0P-0, VP-0), BL, 0
330  IF#020 TH#M0000) 0) 0) 0) 0) 0) 0)
340  PUT(0P, VP)-(0P-7, VP-0), BL, 0P
350  IF#020 TH#M000) 0) 0) 0) 0) 0) 0)
360  00T0200
370  *****
380  ** M00 TO THE RIGHT **
390  *****
400  YP#127) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0)
410  FOR#M01T25, 8027100) 27000) 0) 0) FOR#M01T22, 8027100) 27000) 0) 1) 20
420  M02=INT(0.7) * IF#M1 TH#M00-1
430  FOR#01T02) FOR#M01T25-1, AND1 NEXT
440  IF#020 AND SP=0 TH#M00
450  IF#020 TH#M00-1) SP#020) 0) 0) 0) 0) 0) 0)
460  IF#020 TH#M00-1) SP#020
470  PUT(0P, VP)-(0P-7, VP-0), BL, P0ET
480  SP#0P-P
490  GET(0P, VP)-(0P-7, VP-7), BL, 0
500  IF#020 TH#M0000) 0) 0) 0) 0) 0) 0)
510  PUT(0P, VP)-(0P-7, VP-0), BL, 0P
520  IF#020 TH#M000) 0) 0) 0) 0) 0) 0)
530  00T0200
540  *****
550  **++ THE LEFT BIT... **
560  *****
570  SP#190) GET(0P, VP)-(0P-7, VP-7), BL, 0) 0) 0) 0) 0) 0) 0)
580  FOR#M01T22, 8027100) 27000) 0) 0) FOR#M01T22, 8027100) 27000) 0) 1) 20
590  M02=INT(0.7) * IF#M1 TH#M00-1
600  FOR#01T02) FOR#M01T25-1, AND1 NEXT
610  IF#020 AND SP=0 TH#M00
620  IF#020 TH#M00-1) SP#020) 0) 0) 0) 0) 0) 0)
630  IF#020 TH#M00-1) SP#020
640  PUT(0P, VP)-(0P-7, VP-7), BL, P0ET
650  SP#0P-P
660  IF#P-7) 200) TH#M120
670  GET(0P, VP)-(0P-7, VP-7), BL, 0
680  IF#020 TH#M0000) 0) 0) 0) 0) 0) 0)
690  PUT(0P, VP)-(0P-7, VP-0), BL, 0P
7000  00T0200
7010  *****
7020  **++ M00) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0)
7030  *****
7040  IF#020 TH#M120
7050  IF#020 TH#M120
7060  PUT(0P, VP)-(0P-0, VP-0), BL, 0) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0)
7070  PUT(0P, VP)-(0P-0, VP-7), BL, 0P
7080  FOR#01T02) NEXT
7090  PUT(0P, VP)-(0P-7, VP-7), BL, P0ET
7100  PUT(0P, VP)-(0P-0, VP-0), VP, 0P
7110  FOR#01T02) NEXT
7120  PUT(0P, VP)-(0P-7, VP-7), BL, P0ET
7130  PUT(0P, VP)-(0P-7, VP-7), BL, 0P
7140  00T0200
7150  *****
7160  **++ M00) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0)
7170  *****
7180  IF#020 TH#M120
7190  IF#020 TH#M120
7200  PUT(0P, VP)-(0P-0, VP-0), BL, 0) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0) 0)
7210  PUT(0P, VP)-(0P-0, VP-7), VP, 0P
7220  FOR#01T02) NEXT
7230  PUT(0P, VP)-(0P-7, VP-7), BL, P0ET
7240  PUT(0P, VP)-(0P-0, VP-0), VP, 0P
7250  FOR#01T02) NEXT
7260  PUT(0P, VP)-(0P-7, VP-7), BL, P0ET
7270  PUT(0P, VP)-(0P-7, VP-7), BL, 0P
7280  00T0200
7290  *****
7300  **++ OF THE M00 **

```

```

0310 '#####
0320 SP=251*VP+170*SD*CF*VP+CF*7,VP*7,SD,0
0330 FOR I=1000 TO 1000 STEP 10
0340 PUT I,SP,VP+CF*7,VP*7,SD,PRINT I,SP+CF*7
0350 GET I,SP,VP+CF*7,VP*7,SD,0
0360 PUT I,SP,VP+CF*7,VP*7,SD,0
0370 FOR I=1000 TO 1000 STEP 10
0380 GET
0390 CI=CF+1:GOTO
0400 '#####
0410 '## LEFT DIV:##
0420 '#####
0430 L=2000:2000*VP+20*SP+1
0440 SP=0,0:VP=0:FOR I=1000 TO 1000 STEP 10
0450 VP=SP+L+2000*2+1000*2000
0460 VP=1000*VP
0470 IF SP=0 THEN GOTO 1000:PRINT I,SP
0480 SP=1:PRINT I,SP+1000:PRINT I,SP+1000
0490 IF SP=1000:PRINT I,SP+1000
0500 IF SP=1000:PRINT I,SP+1000
0510 IF SP=1000:PRINT I,SP+1000
0520 GET I,SP,VP+CF*7,VP*7,SD,0
0530 PUT I,SP,VP+CF*7,VP*7,SD,0
0540 CI=CF+1:GOTO
0550 '#####
0560 '## SUB TOP L,ADD:##
0570 '#####
0580 PUT I,0,VP+100+0,70+0,SD,0
0590 PUT I,0,VP+100+0,70+0,SD,0
0600 GOTO 1000
0610 '#####
0620 '## SUBSTIT L,ADD:##
0630 '#####
0640 VP=170
0650 SP=0
0660 GET I,SP,VP+100+0,VP*0,SD,0
0670 FOR I=0 TO 1000 STEP 10
0680 PUT I,SP,VP+CF*7,VP*7,SD,PRINT
0690 VP=VP+100
0700 GET I,SP,VP+CF*7,VP*7,SD,0
0710 PUT I,SP,VP+CF*7,VP*7,SD,0
0720 FOR I=0 TO 1000 STEP 10
0730 GET
0740 PUT I,SP,VP+CF*7,VP*7,SD,PRINT
0750 SP=0
0760 FOR I=1000 TO 1000 STEP 10
0770 GET I,SP,VP+CF*7,VP*7,SD,0
0780 FOR I=0 TO 1000 STEP 10
0790 IF SP=10:PRINT I,SP
0800 GET I,SP,VP+CF*7,VP*7,SD,PRINT
0810 SP=0
0820 GET I,SP,VP+CF*7,VP*7,SD,0
0830 PUT I,SP,VP+CF*7,VP*7,SD,0
0840 FOR I=0 TO 1000 STEP 10
0850 GET
0860 FOR I=1000 TO 1000 STEP 10
0870 '#####
0880 '## OVER-SUBST ##
0890 '#####
0900 SP=SP+2:IF SP=0 THEN SP=0
0910 VP=0
0920 GET I,SP,VP+CF*7,VP*7,SD,0
0930 PUT I,SP,VP+CF*7,VP*7,SD,0
0940 FOR I=0 TO 1000 STEP 10
0950 GET I,SP,VP+CF*7,VP*7,SD,PRINT
0960 SP=SP+2:IF SP=0 THEN SP=0
0970 VP=0
0980 GET I,SP,VP+CF*7,VP*7,SD,0
0990 PUT I,SP,VP+CF*7,VP*7,SD,0
1000 FOR I=0 TO 1000 STEP 10
1010 GET I,SP,VP+CF*7,VP*7,SD,PRINT
1020 PUT I,SP,VP+CF*7,VP*7,SD,0
1030 '#####
1040 '## CRASH: ##
1050 '#####
1060 FOR I=0 TO 1000 STEP 10
1070 FOR I=0 TO 1000 STEP 10

```



```

2850 NEXT X,Y
2860 GET I1,I2=I1+1,61,61,6
2870 PCL=I1+20+4000+5400
2880 FOR Y=1 TO 6
2890 FOR I2=I1+1 TO I1+6
2900 READ A+P(I2),Y,A1
2910 NEXT X,Y
2920 GET I1,I2=I1+1,61,61,6
2930 PCL=I1+20
2940 READ A+P(I2),Y,A1
2950 NEXT X,Y
2960 GET I1,I2=I1+1,61,61,6
2970 READ A+P(I2),Y,A1
2980 FOR Y=1 TO 6
2990 FOR I2=I1+1 TO I1+6
3000 READ A+P(I2),Y,A1
3010 NEXT X,Y
3020 GET I1,I2=I1+1,61,61,6
3030 PCL=I1+20
3040 FOR Y=1 TO 6
3050 FOR I2=I1+1 TO I1+6
3060 READ A+P(I2),Y,A1
3070 NEXT X,Y
3080 GET I1,I2=I1+1,61,61,6
3090 READ A+P(I2),Y,A1
3100 NEXT X,Y
3110 GET I1,I2=I1+1,61,61,6
3120 PCL=I1+20
3130 FOR Y=1 TO 6
3140 FOR I2=I1+1 TO I1+6
3150 READ A+P(I2),Y,A1
3160 NEXT X,Y
3170 GET I1,I2=I1+1,61,61,6
3180 PCL=I1+20
3190 FOR Y=1 TO 6
3200 FOR I2=I1+1 TO I1+6
3210 READ A+P(I2),Y,A1
3220 NEXT X,Y
3230 GET I1,I2=I1+1,61,61,6
3240 PCL=I1+20
3250 FOR Y=1 TO 6
3260 FOR I2=I1+1 TO I1+6
3270 READ A+P(I2),Y,A1
3280 NEXT X,Y
3290 GET I1,I2=I1+1,61,61,6
3300 PCL=I1+20
3310 FOR Y=1 TO 6
3320 FOR I2=I1+1 TO I1+6
3330 READ A+P(I2),Y,A1
3340 NEXT X,Y
3350 GET I1,I2=I1+1,61,61,6
3360 PCL=I1+20
3370 FOR Y=1 TO 6
3380 FOR I2=I1+1 TO I1+6
3390 READ A+P(I2),Y,A1
3400 NEXT X,Y
3410 GET I1,I2=I1+1,61,61,6
3420 PCL=I1+20
3430 FOR Y=1 TO 6
3440 FOR I2=I1+1 TO I1+6
3450 READ A+P(I2),Y,A1
3460 NEXT X,Y
3470 GET I1,I2=I1+1,61,61,6
3480 PCL=I1+20
3490 FOR Y=1 TO 6
3500 FOR I2=I1+1 TO I1+6
3510 READ A+P(I2),Y,A1
3520 NEXT X,Y
3530 GET I1,I2=I1+1,61,61,6
3540 PCL=I1+20
3550 FOR Y=1 TO 6
3560 FOR I2=I1+1 TO I1+6
3570 READ A+P(I2),Y,A1
3580 NEXT X,Y
3590 GET I1,I2=I1+1,61,61,6
3600 PCL=I1+20
3610 FOR Y=1 TO 6
3620 FOR I2=I1+1 TO I1+6
3630 READ A+P(I2),Y,A1
3640 NEXT X,Y
3650 GET I1,I2=I1+1,61,61,6
3660 PCL=I1+20
3670 FOR Y=1 TO 6
3680 FOR I2=I1+1 TO I1+6
3690 READ A+P(I2),Y,A1
3700 NEXT X,Y
3710 GET I1,I2=I1+1,61,61,6
3720 PCL=I1+20
3730 FOR Y=1 TO 6
3740 FOR I2=I1+1 TO I1+6
3750 READ A+P(I2),Y,A1
3760 NEXT X,Y
3770 GET I1,I2=I1+1,61,61,6
3780 PCL=I1+20
3790 FOR Y=1 TO 6
3800 FOR I2=I1+1 TO I1+6
3810 READ A+P(I2),Y,A1
3820 NEXT X,Y
3830 GET I1,I2=I1+1,61,61,6
3840 PCL=I1+20
3850 FOR Y=1 TO 6
3860 FOR I2=I1+1 TO I1+6
3870 READ A+P(I2),Y,A1
3880 NEXT X,Y
3890 GET I1,I2=I1+1,61,61,6
3900 PCL=I1+20
3910 FOR Y=1 TO 6
3920 FOR I2=I1+1 TO I1+6
3930 READ A+P(I2),Y,A1
3940 NEXT X,Y
3950 GET I1,I2=I1+1,61,61,6
3960 PCL=I1+20
3970 FOR Y=1 TO 6
3980 FOR I2=I1+1 TO I1+6
3990 READ A+P(I2),Y,A1
4000 NEXT X,Y

```


Interrupt driven sound

When does an interrupt produce a continuous sound? Gareth Fenton explains.

In 'Dragon Answers' in a recent issue of Dragon User it was asked if it is possible to produce sound that would play continuously while a program runs (as in Crazy Painter and the like). The following program is my solution to this problem and works by using the Dragon's IRQ (Interrupt ReQuest) interrupt.

To enter the program, type in the loading program (Listing one) and RUN it. If there is an error in the data you will be advised accordingly, and in which line the error lies. Once it is successfully entered, save the data, as a crash caused by any incorrectly typed numbers could result in complete loss of control of your computer, the only course open to you being to switch off and start again.

To use the (save) program, use the command EXEC 847500.0. The value of n will determine what of the three functions it to be used.

The options are summarised in the following table:

```
EXEC 847500.0 SWITCH TUNE OFF
EXEC 847500.1 SWITCH TUNE ON
EXEC 847500.2 DEFINE NEW TUNE
```

The option 'Define new tune' needs some further explanation. To create the tune to be played use the format:

```
EXEC 847500.2:note (separated by a comma)
```

The number used for each note is the same as that used by the Dragon's SOUND command. For example, as mentioned in the manual, SOUND 89.1 will play Middle-C for a short duration. EXEC 847500.2:89.0 will play Middle-C repeatedly until the sound tones is changed or until EXEC 847500.0 is entered.

In order to avoid slowing the 'fast' program the note produced is very short. Therefore it may be necessary to repeat the note to make it appear longer.

If you make an error in the definition of a new sound series, a new error message 'FS: ERROR (Fenton Sound)' will be displayed and any tune currently being played will be switched off. Also, any error in

a Basic program which uses this program will automatically switch the tone off as well. The defined series of notes must be less than 255 — the FS error will result if you attempt to define any further notes.

To make a short pause in the tune, the number 255 should be used instead of a note value. The program will accept a variable instead of a number, so, by using P = 255, the variable P can be used to represent a pause in the same way. Other variables can be used instead of notes, for example C = 89 defines variable C as middle-C.

A point to remember is that the interrupt driven sound must be switched off (using EXEC 847500.0) before using the SOUND or PLAY commands.

That is all the information you require to use the program, from Basic. If you wish to use it from a machine code program or are interested in finding out how it works, the complete assembler listing is included and the rest of this article is devoted to its explanation.

As I have already mentioned, the program works by using the Dragon's IRQ interrupt, which occurs every 1/60th of a second. As well as being used to update the basic TIMER, it is also involved in synchronising the video output to the 'frame buffer' of the TV set and so must be used with care.

In order for the program to work, the IRQ vector (the address the IRQ jumps to fifty times a second) must be changed to point to a dispatch routine which calls the new program and then jumps to the ROM routine to handle the interrupt. The vector at \$100 is changed to point to @JUMPER, the new dispatch routine, by the routine @SWITCHON. It is reset to its normal value of \$8000 by the routine @SWITCHOFF.

While it is possible to change the IRQ vector to point to your own routines directly from Basic, it is not advisable as you could well end up losing any program currently stored in memory. It is better to use a machine language routine as I have done — it is much safer, although the IRQ should normally be left alone unless you are sure what you are doing.

Another important part of the program is

the routine which actually makes the sound (@SOUND). This makes use of the ROM routine (at address 4779) which sounds a beep for the length in the B register of the pitch stored in location 180 (see SRC).

In Basic, the IRQ interrupts the playing of notes, resulting in the 'travelling' that is particularly audible during high notes. To produce a cleaner note, it is necessary to turn off or mask the interrupt. This is done by logically OR'ing the condition code register with 15; they are re-enabled by AND'ing the CCR with 235. Unfortunately, this cannot be done from BASIC because the SOUND and PLAY commands use the interrupts to determine how long to play each note. With interrupts disabled, the first note will play indefinitely. To get round this problem, the program has also looked set up to make the notes independently of the IRQ, which is then disabled. This is done by the subroutine @SLEEP in the assembler listing.

The routine @COMMAND determines which option has been selected. It makes use of two ROM routines. The first, CRODM checks that the next character in the command buffer is a comma (signifying an if) and causing a system error if not. The second routine is @CTERM which will return the number or variable in the command buffer as an eight bit value in the B register, causing a function error if the character is not a number or variable name (a register name - 255).

In order to use this program from your own machine language programs, the routines @SWITCHON and @SWITCHOFF can be called directly. The note values can be stored directly in the sound buffer pointed to by @SOUNDADR, remembering to compare the string with a zero byte. As is the case when using the program from Basic, a byte value of 255 (FF) will cause a short pause.

The length of each note played can be altered by storing an alternative value at @PLDOP. This is originally set to 10 and I suggest that if you do change it, you keep the value fairly small as otherwise it will slow down the program too much.

My thanks to Brian Cudge for his very useful Firmasources which details some of the ROM routines used in this program.

Listing 1

```
10 'INTERRUPT DRIVEN SOUND
20 'LOADING PROGRAM
30 FOR A=847500 TO 847599 STEP 16
40 BLK=BLK+1
50 LD=0
60 FOR L=0 TO 15
70 EXEC=8888
80 READ A#
90 B=VAL ("84"+A#)
100 POKE A#L,B
110 C=C+B
120 LD=LD+B
130 NEXT L
140 READ D
```

```

150 IF LC<>D THEN SOUND,1:PRINT"DATA ERROR IN BLOCK";BLK:STOP
160 NEXT A
170 IF C<>17000 THEN SOUND,1:PRINT"THERE ARE AT LEAST TWO ERRORS.
CHECK CHECKS
LMS":STOP
180 PRINT"DATA CORRECT. I SUGGEST YOU SAVE THIS PROGRAM"
190 END
200 DATA DE,75,23,BF,01,92,84,7E,87,01,91,1A,10,8D,89,AA,1739
210 DATA 80,8E,51,5D,27,0D,C1,01,27,10,C1,02,27,15,C4,01,1260
220 DATA 7E,83,44,8E,9D,3D,BF,01,0D,89,8D,82,8E,51,35,10,1878
230 DATA 01,60,39,8E,75,9B,34,10,8D,89,AA,8D,8E,51,35,10,1878
240 DATA E7,80,8C,75,9D,2E,B7,2D,3A,8C,E7,84,39,8D,03,70,2139
250 DATA 9D,3D,73,75,9B,27,0D,8D,01,39,1A,10,8E,75,99,AA,1810
260 DATA 8D,27,28,81,FF,26,07,8D,1C,8F,7D,99,2D,14,8F,75,1639
270 DATA 99,87,00,8C,3F,8D,8A,AA,7A,73,97,26,FD,0A,0A,87,2109
280 DATA 75,97,1C,8F,39,10,8E,75,9B,31,3F,26,FC,39,8E,75,1830
290 DATA 9B,8F,75,99,39,03,00,0A,FF,00,00,75,9F,7A,9E,00,1493

```

Listing 2

```

7500 248C 490 END BEEPLOOP
7501 248E 500 BTR 1
7502 2490 510 BTR
7503 2494 520 *
7504 2498 530 BEEP BTR BEEP
7505 249C 540 JRF BEEPLOOP
7506 2500 550 *
7507 2504 560 BEEP BTR BTR
7508 2508 570 BTR BEEP
7509 2512 580 BTR BEEP
750A 2516 590 BTR BTR
750B 2520 600 BTR BTR
750C 2524 610 BTR BTR
750D 2528 620 BTR BTR
750E 2532 630 BTR BTR
750F 2536 640 BTR BTR
7510 2540 650 BTR BTR
7511 2544 660 BTR BTR
7512 2548 670 BTR BTR
7513 2552 680 BTR BTR
7514 2556 690 BTR BTR
7515 2560 700 BTR BTR
7516 2564 710 BTR BTR
7517 2568 720 BTR BTR
7518 2572 730 BTR BTR
7519 2576 740 BTR BTR
751A 2580 750 BTR BTR
751B 2584 760 BTR BTR
751C 2588 770 BTR BTR
751D 2592 780 BTR BTR
751E 2596 790 BTR BTR
751F 2600 800 BTR BTR
7520 2604 810 BTR BTR
7521 2608 820 BTR BTR
7522 2612 830 BTR BTR
7523 2616 840 BTR BTR
7524 2620 850 BTR BTR
7525 2624 860 BTR BTR
7526 2628 870 BTR BTR
7527 2632 880 BTR BTR
7528 2636 890 BTR BTR
7529 2640 900 BTR BTR
752A 2644 910 BTR BTR
752B 2648 920 BTR BTR
752C 2652 930 BTR BTR
752D 2656 940 BTR BTR
752E 2660 950 BTR BTR
752F 2664 960 BTR BTR
7530 2668 970 BTR BTR
7531 2672 980 BTR BTR
7532 2676 990 BTR BTR
7533 2680 1000 BTR BTR
7534 2684 1010 BTR BTR
7535 2688 1020 BTR BTR
7536 2692 1030 BTR BTR
7537 2696 1040 BTR BTR
7538 2700 1050 BTR BTR
7539 2704 1060 BTR BTR
753A 2708 1070 BTR BTR
753B 2712 1080 BTR BTR
753C 2716 1090 BTR BTR
753D 2720 1100 BTR BTR
753E 2724 1110 BTR BTR
753F 2728 1120 BTR BTR
7540 2732 1130 BTR BTR
7541 2736 1140 BTR BTR
7542 2740 1150 BTR BTR
7543 2744 1160 BTR BTR
7544 2748 1170 BTR BTR
7545 2752 1180 BTR BTR
7546 2756 1190 BTR BTR
7547 2760 1200 BTR BTR

```

Winners and Losers

Every month
Gordon Lee will
look at some prize programming

MULTIPLES of 17 were the name of the game in the June competition — the problem being to find the longest possible sequence (or sequences) of multiples such that each number in the sequence must begin with the same three digits in the order that end the preceding number.

The solutions, as given in Dragon User, lists two sequences of eight numbers in each. These are shown below, the number in brackets indicating the multiple of 17 at each step.

0090	(300)	9090	(540)
0092	(54)	0942	(540)
0020	(500)	0022	(500)
0082	(306)	0202	(360)
2020	(718)	2027	(131)
0200	(14)	0270	(134)
2000	(140)	2700	(184)
3000	(204)	7000	(404)

Each of these series ends when the final three digits of the last number cannot represent the first three digits of a multiple of seventeen, in the cases above 009 and 008. For example, to take the first of these numbers, the next lowest multiple of 17 that would be in the required range is 9075, with the one above being 8082. Thus, all values in the eight thousand and eighties have been "jumped".

These were the results given, but a number of readers came up with a third sequence of eight values commencing with the digits 0001:

0001	(53)
0010	(330)
0102	(6)
1020	(60)
0204	(12)
2040	(120)
0408	(34)
0800	(240)



The acceptance of this as a valid answer depends on the "leading zero" issue. Philip Beed of Gosport was one of the entrants who pushed up this particular point. He writes:

"A simple test for my progress was to use the value you gave to check my results against your own, however, with my first program I got different results even though my program seemed correct. Closer examination revealed that you had included a three digit multiple with a leading zero! So I also included all multiples which could be made four digit by adding leading zeros. This gave me three winning results,

only one of which contained no leading zero multiples. I feel there should be only one answer, except this one, possibly as you say in January that leading zeros are not usually allowed unless specified, and you did not specify it but implied it by including one in your example? I look forward to an answer to the leading zero question."

So the question is, do we allow no leading zero in which case there is but one solution (0090 at seq. 1), or we allow leading zeros but not in the initial number (giving two solutions, 0090 and 0090), or do we allow unrestricted use of leading zeros to give us three solutions (0001, 0090 and 0090)?

In retrospect, the first option (producing a single unique solution) would, as mentioned by Mr. Beed, be the most suitable history — although it was the second option which I had in mind when devising the question. However, fear not. As the question as set contained this ambiguity, all three approaches were considered in selecting the prizewinner. (As in case anyone gets the wrong idea, all the prizewinners had produced either the first two solutions, or all three, but no extra points were added for getting the third option, and nobody at all came up with questions two and three, or one and three, because all of you were aware of the leading zero question and had either deliberately included or deliberately excluded it, either way, the programming required was of the same caliber — 80.)

However, all of this was in danger of being made irrelevant by one solution claiming a sequence of sixteen (yes, sixteen!) numbers. The relevant part of the listing which accompanied this entry is given here, and it provides an interesting exercise in "reverse" programming.

Can you spot just what the program does and where the programmer went wrong? I'll give you my solution next month.

```
10 REM SEVENTEENS
20 FOR I=1 TO 999
30 L=1:X=I*10
40 R=X-17*INT(X/17)
50 IF R<10 THEN L=L+1:X=10*
  (VAL(RIGHT$(STR$(X),3)))+R:
  GOTO 40 ELSE IF L>M THEN M=L:N=I
60 NEXT I
70 PRINT"The longest sequence starts
  at";STR$(M);", and is";
  STR$(M);" numbers long.":END
```


Dragon Answers

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

A basic problem

AS well as my Dragon I also use an Amstrad PC, in which I use Lotusware Software's Basic 2. While using it I came across two control characters which I would like to add to the Dragon's Basic, as they cover advantages over Basic 2. These are the **WHILE** ... **THEN** and **REPEAT** ... **UNTIL** loops.

Could you please give a simple explanation of how this can be achieved in Dragon Basic?

Adrian Cunn
27 Wickwood Close
Penzance
Stafford

It is possible to simulate the control structures you mention using just the **IF-THEN** and **GOTO** commands, as follows:

Structured Basic:

WHILE *n* **DO**

Program statements

END

Dragon Basic:

DO *n* **NOT** **DO** *n* **THEN** *m*

Program statements
m
DO *n* **DO** *m*
DO *n* **END** end of loop

Structured Basic:

REPEAT

Program statements

UNTIL *n*

Dragon Basic:

DO *n* **REPEAT** *m* **UNTIL** *n*
DO *n* **DO** *m*
Program statements
m
DO *n* **NOT** **DO** *n* **THEN** *m*
DO *n* **END** end of loop

Also take a look at **BASED** from Hare's Micro Software with the optional **STRUCTURE** utility. This will add these control structures directly to the Dragon's vocabulary. Hare can be contacted on 01 230 8322.



Disc drive error

I am writing to ask your help concerning a problem I have with a disc drive. The interface I am using is the SuperDOS from PDP. The problem is that the interface connector comes up irrespective of the tabbing span or closed, so that I cannot format the disc. I have no information on the disc (is it Minsid) so I would appreciate your comments please.

David Cogg
21 Wickwood Close
Ayr 10
Cumbria

ASSUMING that the drive you are using is wired correctly to the interface, is the motor starts and stops, and the lamp light works as expected then the problem would seem to be with the write protect line which is pin 28 on the interface.

You can check this by connecting a voltmeter between pins 28 and 1 (or any odd numbered pin which is grounded). By inserting a write-protected disc and a non-write-protected disc. The reading should switch between +5V and 0V. If you cannot get such a reading, then the drive is probably at fault.

If all seems well with the drive, then the interface may be at fault, so try contacting PDP directly on 01773 24761 for advice.

Tokenised

PUNIC, could you tell me where in the Dragon 32 memory the tokenised Basic program is stored and how to access it. The information I have specifies 02000 to 27777, but when I peek these locations I get a continuation of zeros.

Crig Henderson
29 Woodbury Avenue
Dale
Sussex

WHERE the tokenised Basic program is actually stored in RAM depends on several things, such as the number of graphics pages reserved and whether DOS is attached or not. You can find the start address of the current Basic program by peaking locations 25 and 26, thus:

25:00 = **POK** *25* / **26:00**

The end of the program can be found by peaking locations 27 and 28 (which point to the start of the volatile table):

16:00 = **PEEK** *27* / **28:00** = **PEEK** *28*

The actual format of the tokenised Basic is quite complicated, and I won't go into it here. Sufficiently that command and function words are replaced by a single byte in the range / 255.

Which modem, where?

I own a Dragon 32 (without disc drive) and would like to buy a 2300/75 modem for use with my machine. Could you let me of a stocked for the above and the cost?

Alan Swift
26 Marshall Grove
Alderton
Cambridge

If you intend to use a Dragon 32 with a modem, you will find of all need an RS232 interface. These are available from several suppliers, but do not come cheap, and software may be a problem for the modem you eventually buy too. Your best solution would probably be to pick up a second hand (or discarded) Dragon 64 machine and buy the Hayes Electronics Print Modem 2000 package (£45). This can be contacted at 26 Laurel Drive, Wilton, South West.

Trying for black and white

I AM trying to get my Dragon to run on a black and white monitor, but unfortunately the Dragon appears only to be set up to run on a colour monitor. Can you tell me how to obtain a signal to make a black and white monitor work?

Chris Fisher
4 Wynton Road
Spilly
Suffolk

The Dragon's monitor socket supplies composite video (PAL) and sound on pins 3 and 1 respectively (pin 2 is ground). The signal is compatible with monochrome monitors with an impedance of 75 ohms. As you do not say what monitor you are using I can only suggest that you check you have connected the correct pins, and that the monitor is compatible with the above information.



Write: ADVENTURE

Peter Gerard adds verbs to your adventure

As promised at the end of last month's article, this month we'll be tackling the relatively important point of adding verbs to your adventures, and also introducing characters.

Adding verbs is a fairly straightforward task, and since our parser always (if it recognizes a verb) returns a value associated with that particular verb, we can then add something like:

```
1000 IF VB = 32 THEN 2350
```

or whatever, always knowing that we can of course use the

```
1000 ON VB GOTO ...
```

command to take up less space.

Assuming that we do that, we then need to introduce characters. The listing that we're using this month comes from an adventure that I have recently completed writing. One of the characters in it is a wizard of great legend, a chap called Strombringer the Grey, and he is there to help you in your quest. We'll assume that you've introduced in your program a line 1000 mentioned earlier, so that the wizard has appeared.

Now then, the syntax which the player is instructed to use in the game, when he's talking to characters that is, takes the form: SAY TO (CHARACTER) "DO SOMETHING". That is, assuming one were talking to our wizard friend and wanted him to GO EAST, we would enter SAY TO STROMBRINGER "GO EAST", and this is what we have to work on.

There are other things that can be said, magic words, and for these the player is told that to do so he uses the syntax SAY "MAGIC WORD". Bearing these things in mind, take a look at the listing.

There are, however, other things that the player can say to the program, and this involves invoking the two magic words that the program will recognize. These are sorted out in lines 2350 and 2351, and if

either of the two words are said (as in SAY "FOZZE" or SAY "TETLEY") then program control goes off to two different routines. These just determine whether or not the player is in the correct location for the words to have any effect.

From now on we know that the player is trying to talk to someone, or something, and the rest of the routine is essentially sort of this sort. Lines 2352 and 2354 determine where the quotation marks appear in the player's input, which then gives us a variable 'told'. Thus if the player typed in SAY TO STROMBRINGER "CAST A SPELL", then 'told' would contain "CAST A SPELL", leaving the rest of the string untouched. If, however, the program fails to find any quotation marks (CHECKED) by repeatedly then program execution goes off to line 2354 to print up a suitable response for what the procedure considers to be a conventional input.

Having found out what we're saying, we then have to find out whose we're saying it to, and this is the purpose of the first part of the line 2354 which gives us 'name' to contain the name of the person being addressed. If, by any chance, the player were to type in SAY TO ME "HELLO" the program would then respond with "HELLO". This, satisfied? Before going back off to line 10 to get another input, if the player isn't talking to Strombringer, then line 2357 sends execution careening off to line 2356, which we'll come to later.

Now we know what the player is trying to say and that he's trying to say it to Strombringer. So, line 2356 checks to see if the wizard is here to attempt to carry out the task set before him, and if he isn't then the program kindly informs the player of this fact before going off to line 10 again.

Line 2357 is the start of the main chunk of code for this particular verb, and you'll note that the initial thing which does is to set the 'td' variable to 0, indicating that Strombringer has been spoken to and that he can also going for the pub for a while if you don't give him anything to do then he, reasonably enough, gets bored. Then, if the player has typed in SAY TO STROMBRINGER "FOLLOW ME" the old wizard eventually complains that he's here, and we go to line 10 again, which is the particular game is our main control line for the program. All being well, this does keep the wizard by you longer.

Line 2358 is used to tell the player that the syntax is okay to use (that he's the wizard) is thinking about it, and then it sets up a little delay using line 2428 (it's just PCOR=1 TO 5000 NEXT RECTURN). Lines 2360 and 2362 are a miniature parser, and they attempt to unravel the player's request by splitting it up into a verb and a noun. If the player has only entered one word, line 2360 prints up message number 150, which is something to the effect that the



wizard doesn't understand one word requests and you'll have to type in something else. These messages are all printed out via the subroutine at line 5990, which simply accesses a file (which is) and prints up on the screen the right message. And, having said that, immediate apologies for using upper and lower case in the listing, but alas my Dragon is not equipped to fit out things. Just, as ever, use upper case all the time.

Anyway, there's really only two things the wizard can do, those being to GO somewhere and to CAST a spell, so whether of these and the case we go to line 2367 and 2369 respectively. Otherwise, another little parser comes into play and lines 2365 to 2368 sort out what verb has been entered. If it's a recognized one then we carry on, otherwise print out a message that the wizard is not going to comply and then off to line 10, if it is a known verb, and it happens to be verb number 19, 20 or 21 (these being GET, TAKE and CARRY), then a message about the wizard not being able to do it is printed up as a sadface and you're printed up. Verb 14, OPEN, gives you "I'm a yourself" message, but if some of these conditions are met then the stock message about not complying is used and we retreat, as always, to line 10.

Lines 2380 to 2386 are all about casting a spell, and if the player hasn't typed in CAST A SPELL or CAST SPELL then line 2380 sends him packing with a suitable message. You've got to be in room 07 for the wizard to be able to cast a spell anyway, which is what line 2381 sorts out, and you can't be greedy and have more than one cast for you, which is what line 2382 does.

Lines 2383 to 2384 concern themselves with the number of times that the wizard has visited the pub, and if he hasn't ever been there after your initial meeting then his hands are shaking and he can't do it, if he's been there more than four times then he's too drunk to cope, but all being well he'll cast a spell and open up a new route for you. Thus we increment the score, set the cast spell variable 'ca' and change our



map of the game by altering (P4)(2)(2) to equal (8): this, as you may recall, will allow the player to go south from location 27 to location 30. As location 28 cannot be visited until this is done, we have already set (P4)(2)(1) to equal 27, allowing the player to go east again. Line 2389 is just a theatrical effect!

Now onto the other main reason for Stronbolger's presence, and that is dealt with by lines 2387 to 2388. Without giving away the problem, you basically have to get the old boy to go east at one point,



because if you go east you encounter difficulties. Being a wizard, however, Stronbolger can sort things out much better than you can. Bearing that in mind, line 2387 checks to see that the player is specifying east, and if he isn't then print up a response before returning to line 10.

Line 2388 ensures that we're in the correct location and also that the problem hasn't been solved already. If the player isn't in the desired place, or the problem has been dealt with, then we print a message and shuffle back to line 10.

Line 2389, the player's crowning glory, means that we set the particular problem solved variable ('s'), increment the player's score, print up the relevant message, open up the new route now available to the player, set the solution variable ('o'), so this problem can be approached in two different ways, only one of which works, and we then return to line 10 to wait for fresh input.

And that is all that the player can do when talking to characters. This only leaves us with lines 2390 to 2398, used for coping with attempts to communicate with people other than Stronbolger. Line 2390 settles what is contained in 'mard', and then another small sub-chunk of the parser routine we first of all eliminate the unknown (lines 2392 and 2394) before telling the player off for talking inanimate objects to talk foxy characters in the adventure other than Stronbolger the Dray. This is, as line 2396 tells you, a straightforward "You are ignorant" message.

```

Line 2387:
IF (P4)(2)(1) = 27 THEN
  GOTO 2389
ELSE
  PRINT "You can't go east from here."
  GOTO 10
ENDIF

Line 2388:
IF (P4)(2)(2) = (P4)(2)(2) THEN
  GOTO 2389
ELSE
  PRINT "You are not in the correct location."
  GOTO 10
ENDIF

Line 2389:
SET (s) = (P4)(2)(2)
SET (o) = (P4)(2)(2) + 1
SET (P4)(2)(2) = (P4)(2)(2)
PRINT "You have solved the problem."
PRINT "Your score is now (P4)(2)(2)."
SET (P4)(2)(2) = (P4)(2)(2) + 1
GOTO 10
ENDIF

Line 2390:
IF (P4)(2)(1) = 27 THEN
  GOTO 2389
ELSE
  PRINT "You can't talk to (P4)(2)(1)."
  GOTO 10
ENDIF

Line 2391:
IF (P4)(2)(1) = 27 THEN
  GOTO 2389
ELSE
  PRINT "You can't talk to (P4)(2)(1)."
  GOTO 10
ENDIF

Line 2392:
IF (P4)(2)(1) = 27 THEN
  GOTO 2389
ELSE
  PRINT "You can't talk to (P4)(2)(1)."
  GOTO 10
ENDIF

Line 2393:
IF (P4)(2)(1) = 27 THEN
  GOTO 2389
ELSE
  PRINT "You can't talk to (P4)(2)(1)."
  GOTO 10
ENDIF

Line 2394:
IF (P4)(2)(1) = 27 THEN
  GOTO 2389
ELSE
  PRINT "You can't talk to (P4)(2)(1)."
  GOTO 10
ENDIF

Line 2395:
IF (P4)(2)(1) = 27 THEN
  GOTO 2389
ELSE
  PRINT "You can't talk to (P4)(2)(1)."
  GOTO 10
ENDIF

Line 2396:
PRINT "You are ignorant."
GOTO 10
ENDIF

```

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Don't worry — you'll still have Adventure Teams write to us well!

Adventure
 Problem
 Name
 Address



AMSO malicious lies and rumours put about by scandal-mongers and thieves, one's beloved editor forgot to remind yours truly about when the deadline for this month's issue expired. It expires about five minutes after I've finished this article, so to all those people who've sent in tapes this last month (hello Simon and A.H. Bessley and Robert Margrave and someone whose name is indecipherable but could well be Dini! Going for all I can make out) many apologies, and over the next week or so I'll be extracting the Dragons from Ishtar. Then I can dress it all up, dust it all down, and start all over again. All together now . . .

Actually I'm quite looking forward to Robert's game, as he gives a brief description of it in his accompanying letter. Apparently the game is called *The Jewel of Time*, and so if you have to stop time stopping. This, I believe, sounds quite easy but I've included some complications. Sounds easy? If you do, if Eshera had trouble with the staff (sorry, Johnnie, but then I'm sure that even *Taleslayer* Pete's going to have the odd problem or two.

Mr. Bessley (he doesn't tell me his first name, must be shy) has a game called *The Temple of Ra*, and to quote "it has taken me a long time to complete it because it started off merely as something to fill in my spare time . . ." How often have we heard that, fellow adventure writers? I've just completed an adventure of my own (based on that legendary dwarf Dini! Going) and I thought I'd set some kind of a record by doing it in a week, writing it initially as a combination of letters for friends and interest in producing a truly bizarre adventure. Four weeks later, and I was still putting in commissioner changes prior to writing this. That's the way it goes.

As for Simon Hargrove, the man who writes more adventures than Scott Adams, I'll be particularly interested in *The Missing of Life*, where Simon assures me that the answer is NOT 42, and that you have to control four characters. It would seem that you can make them eat, sleep, walk, drink, and, as he so delicately puts it, "do things to each other". The mind boggles, boggle boggle boggle it goes, and one hesitates to play this game with little ones in the room. We shall see, we shall see.

Why, you may wonder, am I mentioning all these games? Well, ever patient reader, you have noticed that there are precious

few adventures being released by commercial companies for your friend the Dragon these days. Indeed, as Simon points out, he hasn't heard of anything since *Belegweest*, and that is quite some time ago. Consequently any individuals who are releasing games need all the publicity that they can get, and over the next couple of months I'll be doing the best that I can.

Why it should be that companies have deserted the Dragon in such droves is a bit of a mystery to me, since people haven't suddenly all got rid of their computers (apart from a temporary loss for Simon, whose machine lies up there is still a large number of Dragons in regular weekly adventure format). We'll share and

But enough of this fearless crusade to restore the Dragon as an adventure player's friend, and on to your queries, writings, whines and moans (a firm of solicitors, perhaps). First off this pile the most is a letter from Stephen "It's really stuck!" Wood, which begins "Dear Pete 'The Great', that's the way to do it, grovel your way to the top of the heap. Anyway, back to our old friend Spogge. I must have had more letters about this game than any other, but this time a serious complaint. Stephen cannot find the string, and says that it is not in the place that the *DRAGON* User (or possibly I) suggests, or at least in his version. Well, friend Stephen, we who have the complete solution can reliably inform you that if you follow the following ten steps you'll be well on your way to success, and this should also help a number of other readers who seem to get stuck at step 10. So backwards writing, because it takes so long, and the editor is, not literally one-taped, breathing down my neck.

- 1) Go to the 2nd computer (NOT a main-one) and PRESS F4/P4.
- 2) Get the Puzzy Creature.
- 3) Go to the 1st room space with the alien creature.
- 4) Go forward 2 places and THROW PUZZY.
- 5) Get the light sabre.
- 6) Go to Ishtar and defeat him (easy-peasy, I know).
- 7) Look at the screen of the main computer.
- 8) Get the blanket and the STRANGE!
- 9) Go outside the airless corridor.

10) HOLD BREATH and enter corridor.

There, that should sort out a few problems for a collection of you Spoggy-ists. Stephen's next query takes us on to another old favourite, *The Winter Factor*, which is probably the second most popular (or unpopular depending on your point of view) adventure for the Dragon. Poor Stephen can't rig up the time machine to work, and so for the benefit of him and anyone else who's stuck at the same point, another collection of steps to take in order to get going, assuming that you've got the yellow and red cartridge and you've got into the cylinder by using the lift. Then . . .

- 1) Drop the cartridge and the sandwich. Cut the line and stop the hatchet. Squeeze the line, pour the juice then drop the lime peels and the vital.
- 2) Get the bird and the space suit. Wear the suit and get the coal. Put the coal and the suit into the device. Write in the device near the YELLOW cartridge and press the button.
- 3) Exit the time machine and examine the bookcase and the counter. Take the pink cartridge and the hanger. Open the desk and examine it. Read the document to find the combination of the safe. It is 11,29,42 (November 29th 1942).
- 4) Return to the time machine and load the hanger and the document and the pink cartridge. Go to the device. Drop the coal (get it from the time machine) and EXIT. Press the button and return to the time machine.
- 5) Remove the yellow cartridge and insert the red one.
- 6) Press the button then EXIT. Open the safe to get a blue cartridge.

Right, that's the story as it, and then into the time machine up and running and you whizzing about all over the place. Stephen should now no longer be "really stuck", but let us not neglect the Pete 'The Great' bit, all right?

Where's the next letter? "Dear Dragon User" it reads. On well, down to earth with a bump again, as usual. An interesting letter this, from someone who will obviously be a better one day because their signature is not that good, but I assume it to be P.H. Stahl. Hello what? Who knows? I'll annoy lots of people and say

that, because the writing isn't neat, P.R. Diablos must be a male) has been diving around in Mithras and the Mithras, and has extracted from it all the messages that are used by the game. I can't print the whole lot, here just isn't room, although anything that includes "by playing the flute according to a song on the parchment a secret passage has been exposed". Obvious, really, something you do every day isn't it, walking about playing flutes and finding secret passages. Anyways, P.R. Diablos also includes a list of the commands that the program will accept (and points out that the word ones are spells), so for anyone still trying to plough their way through the game, here they are:

**H GET MY DROP BACK JUMP LAMP
DRINK EAT PILL ASK LOCK SCORE KILL
PUSH OPEN HELP CLIMB TH STAND
WYTH MITRA DEARM AKHFROM
SERIAL BELONG CDMX OYHAR PLAY
THROW TAKE GRAB QUIT UNCLE**

Uncle? Intriguing command. Anyways, thanks for all that lot.

I know this name would crop up again and long. Paul Walker, who will be Paul from now on, asks me to tell all that his address is 48 Solara Avenue, P.O. 38 Haters, Menemeyee WA8 990. And why? Because he has solutions to the following adventures available at 30 pence each, or you can get a little book containing the whole lot for £1.99. **Diablos: Dragon Shemangans, Latin Spain, Apesman 47, Winter Factor, Black Scavium, Preamble's**

Dem's, Colinto Island, Jerusalem Adventure 2, William Adventure 3. I shall now quote from his letter: "they [you, in other words P.R.] must choose as S.A.E. the size or a size 20 bigger than Dragon User's Answer Page to the dragon user because they are all big heads who ain't it." This is a, certainly says its head drive again, all letters of complaint to Paul, not me.

What not slapping people off. Paul has a few hints on Shemangans for you. Once again, I quote: "... If you can't get the pole into the cave, go into the cave and look for a trap door in the roof. Open the door and go through it. When in the cabin go to the cave and get the pole. Go back to the cabin and then go through the trap door holding the pole". So there you go. And there's more, there's more. In *Spryze* (again) he says that "to survive the jump off the cliff just carry the blanket and the string". Finally, in *Apesman 47* he says: "to get through the force field tell Mary to Go North. When it is the cave go E, S, E, E, N, W. Then get the mummy and go up. Mummy! I love it. Mummy, to you and me, incidentally, at the bottom of Paul's letter is the figure 9. If this is his age, it is astonishing, or perhaps it's just a comment about the God "the big heads who ain't it". Perhaps we shall find out for real time.

Diablos is another popular one that was, in its later life, sold without cassette-tape notes, thus causing problems for one or two of you who don't have the faintest idea of what you were supposed to be doing. Since I haven't got space to print

them all now, we'll correct this month by printing Part One, and provided that I remember (oh dear!) I'll try, honestly, we'll start next month with Part Two. The original cassette tape notes:

"You are lost and confused, in the middle of a desert in the southwest. You had been learning the techniques of sorcery from an old man who lives in these parts. He told you that an evil sorcerer, a wizard, had become his enemy. Now your teacher is missing and you are alone. Where are you, you can't seem to remember these techniques that you already had learned. The only thing that you can recall is this curious verse:

Remember well the power word,
Remember that which dwells within,
Awake to that which dwells within,
Thine of the yoke of ignorance.

"You have entered the world of El Diablos, where you must learn to acquire and use magical 'power' in order to prepare for the final confrontation with your adversary. El Diablos accepts commands in the form of one or two word sentences. For example, LOOK AROUND or GET BOOK are valid commands. Only the first four letters of each word are used. Note this is by no means an 'easy' adventure. If you are not an experienced adventurer you may want to try a simpler one first ..."

Me again, that'll have to do for now, part two later, so, from the Mithras Paul, goodbye!

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All hands to the wall

Gordon Lee gets to grips with a series of amazing coincidences

MAZES are probably one of the oldest forms of puzzle. From ancient Greece comes the legend of the labyrinth of King Minos at Crete. This maze-like array of passages housed the Minotaur, a bull-like monster, until it was slain by Theseus, who was then able to escape by following a length of thread which he fastened to one of his toes.

In the early Christian era maze-like designs were used to decorate the early churches — either in miniature on ecclesiastical vestments, or in the form of a pavement on which a route to the centre could be traced. These mazes were not usually of a puzzle nature, as the route to be taken was generally "forced" — that is, there was no branching, so the route was simply a convoluted path leading to the centre. Often these were used as a parable to be traversed on trials and tribulations. A guide-book of 1967 describes one such maze at the abbey of St. Stephen at Caen in Normandy:

"...the middle whorl represents a maze or labyrinth about five feet in diameter, and so intricately contrived that, were we to sup-



A pose a man following all the intricate meanders of this whorl, he could not travel less than a mile before he got from one end to the other."

Mazes in Britain have appeared only within the last 500 years. The earliest of these were known as "turl mazes" — that is, the paths were simply cut into the turf. This would allow the solver to be able to trace



B his route fairly easily, as he could see the overall plan of the maze. The hedge maze became fashionable in the late Renaissance, such as the one at Hampton Court, designed in 1690 for William III. There are not now so many still existing — possibly due to the enormous amount of upkeep which they require — although modern versions, usually with wood or concrete walls, are occasionally encountered. These can have an additional feature of gates at certain positions, which can be locked in either the open or closed position, and so allow the plan of the maze to be altered from time to time. The advent of the computer has now added a new dimension to the maze, and there are a number of games of this type available.

Finding the centre of a maze is fairly easy if a plan is available, but otherwise a different strategy must be used. A simple way to avoid being lost in a maze is to keep one hand in contact with the wall as you move about. This must be done from the moment of entering the maze, but it will ensure that you will eventually reach an exit. However, it doesn't guarantee that you will pass through the centre of the maze. This is dependent on the type of layout — either "simply" connected, or "multiply" connected. Maze A is of the simply connected type — that is, all of the dividing walls are directly connected to each other. The "hand on wall" technique if used on this type of maze will take you fairly consistently peripateticly (once in each direction), eventually bringing you back to the entrance. For this reason, most mazes are multiply connected, as in maze B. Here, the technique as outlined will bring you back to the entrance, but it is not likely unless the maze is very badly planned to take you to the centre.

Next month, we will be looking at the way to solve multiply connected mazes, and in keeping with the tradition of featuring a puzzle game in the Christmas issue, there will be a maze program listing to allow you to put theory into practice!

The competition this month is based on the word "DRACON" again. In the inverted

Prize

UP at Preston I read Mr. Rochdale ... I mean, up at Rochdale, I read Mr. Preston they all sound the same to me, these fogging-in, and I said to him, what have you got behind your mouth? And he said, whatever you like. We negotiated Billie, Carles and lotteries, but settled in the end on 30 copies of Space 2000/2001, the new one from R & A. Preston, for those of you who can add six up to make 200.

Rules

All in all, it's just another brick in the dragon. Grab your copy of the C&D in 26 volumes, run up your dragon and find the words. Then pack up your answer, a copy of your program (preferably on cassette), and the postman's having trouble with his discs, any program notes you wish to add, stuff them in an envelope marked NOVEMBER COMPETITION, and send it off to us here along with your name and address.

I've invented more six-letter words than you've had hot dinners, until my mother-in-law checked the dictionary at the (that's how I know it's got 26 volumes), so don't try anything with anky, Anagrams, Sueton, or I'll redefine your definitions for you. What we want for this here decoder are some of the six letter words that nobody except you and your dragon have ever seen before — and we want to know what they mean, too. They don't all add up to 200 this time. So if your word looks too

fantastic, it had better mean something really yobbie.

August winners

Someone winning a prize in the August competition seems just that little bit more — well — expect that winning is any other month.

The twenty august winners follow, led proudly at the front by some other than Richard Long, who sent not only a program and an answer, but an entire work of explaining why he wanted a t-shirt. We can't reproduce, 'cos his contact address is a bit strange, but here he is anyway:

Richard Long of Cambridge, Prof Sapiro of Wootton, Christopher James of Marfa, Alan Thomas of Southampton, Martin Smith of Lewes, J. Smith of Leyford, Chris Jolly of Orpington (he says it's for his mother in law), Dennis Gates of Durham, J. Parker of Westham, P.J. Taylor of Acton, S.A. Newman of Adlestrop, S.A. Siddiqui of Clewley, A.R. Henderson of Kingsgrove, T. Pascoe of Horden, Dave Lambson of Petherton, M. White of Stratford, P.D. Madsen of Maidenhead, C. Wilkinson of Cleveland, G.R. Barber of Sutton Coldfield and S. Watson of Wintour.

Some of the plans for the t-shirts were of a very private nature, but one of the less private ones was that of Prof Sapiro, who is going to take his for the next transatlantic party, so that he can go with his dragon.

Solution

See opposite.

pyramid opposite, each letter has been entered in the top row of 'bricks'. The row beneath contains the alphabetical position of each of the letters in the row above (A=1, D=4, etc.). The brick in each subsequent row is the sum of the two bricks immediately above it, reaching the final total of 263 in the bottom position.

How many other words can you find of six letters in each that also total 263? Preference should be given to common, rather than obscure, words, as the following, although totaling 263, would not be allowed:

- BLAZK — the hijacking of a bicycle
- CLUSEC — to walk in an unusual manner
- COFFLE — a combination of a cough and a snuffle
- DAWDM — a playwright who can't spell

Can you do any better? (No, that's about as good as you can do in this position for this month. See in the box below — Ed.)



This is Gordon Lee's own solution to the August competition — see page 56 for results

The Answer

ANSWER: The full value of the factor is 18004655347808084784

SOLUTION: This competition provides a good example of utilizing a routine to perform calculations with numbers larger than those which are normally within the arithmetic capability of the computer. The operation is done by storing the actual number being operated on as a string variable, and not as a numeric variable. This will allow numbers with over two hundred digits to be stored (even more if some method of splitting the number into sections is devised).

In the program, the actual mathematical operations are carried out by the subroutine at line 1808. This routine multi-

plies a multi-digit number held as a string variable, by a single digit value held as a numeric variable. Before going to the subroutine, the single digit is defined as variable M, and the multi-digit number is entered into string N\$. The resulting calculation is also found in string variable P\$ on returning from the routine.

After the initial value of N\$ is set, the 7th power of this value is calculated. This is done by multiplying by 7, seventy-five times in the FOR/NEXT loop at line 58; the multiplier M already having been set to two at line 40. Note that at each stage in the loop the value P\$, which is returned by the subroutine, is transferred to N\$ before the next step in the operation.

The next step is to multiply the resulting total by 3 — once again using the same subroutine. The multiplier M is now set to 3 in line 76, and the subroutine then performs the multiplication.

Finally it is necessary to add 1 to the product, and this is done at lines 108 to 100. This is done by taking the units digit from the string, adding 1 to it, and then replacing this value in its correct place in the string. Normally it would be necessary to check if the first digit was a nine as this would involve a 'carry', which would affect the next figure to the left. However, as the previous operation was a multiplication by 3, the units digit would be either a zero or a five, and so this problem would not occur.

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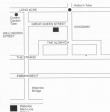
18 REM Set up initial value of N$
20 N$="1"
30 REM Compute the 7th power of 2
40 M=7:REM Set multiplier
50 FOR I=1 TO 35:GOTO 60:REM 7*7*7
60 REM Multiply by 7
70 M=5:REM Reset multiplier
80 GOSUB 1808
90 REM Add 1
100 N=VAL(STR$(P$,1))
110 N=N+1:W=STR$(N):M=LEN(W),2
120 L=LEN(P$)
130 P$=LEFT$(P$,L-1)+W
140 PRINT "The value of 2^75 * 3 + 1 is";P$;STR$(M)
150 END
1800 REM Multiplication using strings
1810 P$="" :CARRY=0
1820 FOR I=LEN(M) TO 1 STEP -1
1830 N=VAL(LEFT$(M,I))
1840 N=N*M+CARRY
1850 IF N>9 THEN CARRY=INT(N/10):N=N-CARRY*10 ELSE CARRY=0
1860 W=STR$(N):W=RIGHT$(W,2)
1870 P$=W+P$
1880 NEXT I
1890 IF CARRY>0 THEN W=STR$(CARRY):W=RIGHT$(W,2):P$=W+P$
1900 RETURN

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