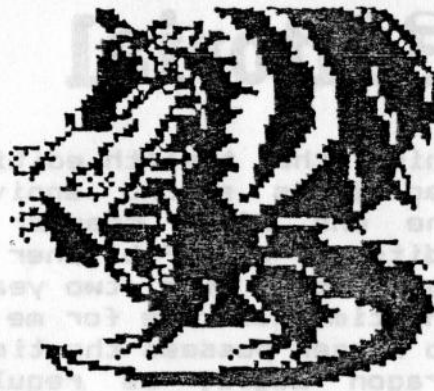


Dragon Logic



Issue 12

UK Only

INSIDE

£1

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(C) D. MORRISON

Editorial

DON MORRISON

This, the twelfth edition of Dragon Logic marks the magazine's second anniversary. Sadly, it also marks the end of a chapter in the Dragon's history. As Editor and Publisher of this widely respected publication for two years, I have decided that now, the time has come for me to move on. Unfortunately, I no longer possess the time to continue publication of Dragon Logic, as regular readers will have by now realised, owing to the late release of more recent titles. That, together with the fact that I will be entering University in the not too distant future means that, despite the fact that I would like to continue, I am longer able to do so. The past two years have provided me with a wealth of experience and I sincerely believe that they have not been wasted years-despite its low circulation Dragon Logic has done much to promote the Dragon and I hope and believe that our successors will continue that challenge. The last two years would not have been possible though, were it not for a band of loyal and dedicated writers, who worked often to tight deadlines with little or no reward and for their support I am sincerely grateful. I must also comment on the marvellous support we have had from software houses the length and breadth of the country with particular regard to Starship Software, Pulser Software and Preston Games. Without their support, none of this would have at all been possible. The Dragon has emerged from some very troubled years as a machine, which despite the support of several thousand loyal users, is slowly dying and that is indeed a great pity. Still one of the greatest 8-bit machines ever produced, the Dragon has outlived a great many machines from its day and that is a sterling tribute to the machine and to those who support it. It is only fitting that the final edition should be the best edition, and this I believe to be the case. We have always tried to provide the most interesting and informative Dragon publication and if public opinion is anything to go by, then I believe we have, for the most, succeeded but it would not have been the case had not it been for your support. Thank you.

LETTERS

If you would like to correspond with any section of the magazine write to Dragon Logic, 72 Diriebug Road, Inverness, IV2 3QT.

I do apologise for my last contribution not reaching you. Apparently it was one of several hundred letters and Christmas cards which got 'misaid' by our efficient postal system. You may yet receive it, if it's amongst the several bags of post which, according to our local paper, were found in a Post Office worker's cellar, where he was busy burning those packages without money. What an honest lot we are down this end of the country! Here's some good news though. Westgarth has finally managed to raise enough money to be able to purchase a good quality 12-seater mini-bus and adapt it to carry wheelchairs. So may I say a big thank you to those people who contributed by buying my Jingles program. This is still available, with all proceeds going towards toys etc for the kids.

Stuart Beardwood, 38 Salisbury Place, Boothtown, Halifax, West Yorkshire, HX3 6ND.

Editor Replies : I'm sure we speak for everyone when we congratulate Stuart for the marvellous contribution he has made to the Westgarth Childrens Home. However despite the target having been reached, as Stuart so often tells us, money is still lacking, so please do continue to offer your support.

I have tried, in vain, to contact Simon Jones and New Era Publications in an attempt to find out what happened to the infamous Invader's Summer Diaries. I have also contacted Roger Quaintance who has given me information concerning the handling/mishandling of New Era Publications but can't help with the Diaries.

Did these Diaries actually exist? If anyone can furnish me with any information about these Diaries I would be very grateful.

Alexander McIntosh, 26 Southhouse, Liberton, Edinburgh, EH17 8ED.

Editor Replies : However badly New Era handled the release of the Invader's Summer Diaries it is clear that the publications were eventually released. It appears, however, that McIntosh's complaints are by no means isolated and we too would be grateful if anyone, particularly those involved, could shed some light on the matter.

During a recent conversation with Mike Townsend, he mentioned the low circulation figures of Dragon Logic. You really do deserve a larger readership - Dragon Logic is easily the best all-round Dragon magazine available, and he certainly agrees with me on this. Just a suggestion, with new Dragon users being recruited steadily, an advertisement in Dragon Update might surprise you. I know there are a lot of new users because Pulser say they are being inundated with hardware sales and I myself have introduced two families to the Dragon during the last few months and they're both very happy. And should they enquire about the availability of magazines, I'll certainly recommend you.

Robin Hemmings, 8 Ingleby Road, Wigston, Leicester, LE8 1DQ.

Editor Replies : A nice gesture, but one which unfortunately comes too late.

NEWS

If you have any new products for the Dragon - Software or Hardware - write to Dragon Logic, 72 Diriebugt Road, Inverness, IV2 3QT.

Former New Era Proprietor, Simon Jones, has hit back at allegations that, as Editor of 6809 User, he was involved in anything untoward. Speaking in a recent edition of Dragon Update, Mr Jones claimed that all funds from New Era had been handed over to Roger Quaintance of Sunnydale Publications, together with £80 in the form of a donation. He added "I would have liked to have given Roger more but I simply couldn't afford to do so at the time".

Mr Jones also countered claims that his involvement with 6809 User was an attempt to further his Journalistic career. The magazine, he said, provided him with good experience and was probably a deciding factor in his securing a job with a local newspaper but, he added, "My primary objective in running 6809 was enjoyment."

Meanwhile, in a remarkable turnabout, Roger Quaintance has pledged his full support for Simon Jones claiming, "Simon put a lot of effort into the Dragon scene and developed from nothing, a fine magazine".

Still enthused by his recent takeover of Dragonfire Services, proprietor Robin Hemmings has launched a fully illustrated 28 page catalogue detailing the company's rapidly growing list of titles. And, in an attempt to further their standing in the Dragon market, the company have announced the release of further titles. Prominent amongst their new titles is Jonathan Cartwright's last commercial offering, Pop Up Print Master which is available on DragonDOS, priced £4. Other titles nearing completion include Intelligent Database by Craig Moss.

Copies of Dragonfire's new catalogue are available on receipt of a SAE from Dragonfire Services, 8 Ingleby Road, Wigston, Leicester, LE8 1DQ.

Preston Games have confirmed reports in certain quarters of the Dragon press concerning a General Computing show in Manchester as rumour only. Reports in Dragon Update claimed that the company intended to stage a show in Manchester's GMEX Centre during mid-March. Meanwhile Preston's are, at the time of writing, preparing for their Spring Ossett show on Saturday April 21st. Proprietor, Bob Preston, is hoping for a larger attendance than that which graced the recent Colour Computer Convention in Weston, in what may prove to be one of the last National Dragon events.

Preston Games can be contacted at Kings Hall Court, St Brides Major, Mid Glamorgan.

The NDUG are preparing for what they claim will be their last National Dragon show. Following the success of their previous event, the NDUG are confident that this years show will prove equally popular with several hundred Dragon users expected to pour into Hove to visit the show.

The show is to be held, once again, at the impressive Hove Town Hall on June 2nd with most of the leading Dragon retailers expected to attend. Group Chairman, Paul Grade, has confirmed that this will indeed be their last major Dragon show owing to the fact that shows on such a scale are no longer financially viable.

Write to Paul Grade, NDUG, 6 Navarino Road, Worthing, Sussex for further details.

PROGRAMMERS LOGIC

by Jonathan Cartwright

Computer virus threat

In recent months there has been much talk of the fabled virus and its supposed appearance on the old Dragon. I personally don't believe that any such virus exists. At present what people are describing as a virus is the method of software protection that is now often used on discs. This can appear to be a virus if the program is not run from the original disk. When you BOOT a copy protected disc, or alternatively RUN the program, what it will usually do is check that the disk in the drive is the original copy. If it isn't then it will proceed to do something nasty, either reformat the disc, or wipe out the directory tracks. Right, if all of you out there who claim to have been struck by a virus think about what you did prior to the 'virus' rearing its ugly head then you will probably arrive at the conclusion that you tried to copy a protected disk. Often it is merely the case that you wished to have a game on the same disk as your other titles but if it is copy protected then you will lose everything on the disc. I know that there have been cases of this and people have become very annoyed. However, if my disk software is protected then Pulser usually print a warning on the disk sleeve. If you ignore the warning then hard luck, you deserve everything you get. Copy protection may hamper your attempts to group programs onto as few discs as possible, but it does serve a purpose from a programmers point of view.

Now that the myth of the Dragon virus is out of the way I am free to tell you how a real virus works. As well as a Dragon I own a fairly advanced Atari ST. The ST is particularly well known for being struck by viruses, as is the Amiga. This is very much due to the way that the machine operates, and indeed most modern micros operate. When you first switch on the ST it goes into BOOTing procedure. It firstly checks to see if there is a disk in the drive. If there is not then after a pause of 30 seconds it will presents you with GEM DESKTOP, the reason for the delay is down to the drives, if you try to DIR on a Dragon without a disk present then you will a similar delay. If there is a disc in the drive the ST will check if there is anything in the BOOT SECTOR. If there is nothing there then it will present you with DESKTOP, and open whatever windows have been previously specified, switch to the appropriate resolution and load in any desktop accessories. If the BOOT SECTOR is executable (i.e. has a progam in it) then the ST will execute it. Most viruses live in the BOOT SECTOR and will thus be loaded into memory when an infected disk is BOOTed. There is normally no way of knowing if a disk is infected by simply BOOTing with it, it is usually much later when things go wrong that you will realise that you have been strck by a virus and will have to track down the infected disk(s). As you probably all know, by the time you realise that a virus is upon you it will more than likely have spread to a great number of your discs.

So, how does the virus work? (I don't condone viruses by the way). In an ST BOOT SECTOR there is only a limited amount of memory, 512 bytes, but this is enough to hold a virus. The virus will intercept calls to the disc drives by redirecting various interrupts and/or vectors. Thus the virus will be called each time access to the drives takes place. The

first thing the virus will do is check if it already exists on the disk currently in the drive. If it does then it will probably just do some random reformatting of sectors on the disc, or something similar that would corrupt the data on the disc. If the virus finds a disk which is not infected then it will write itself onto that disc. The process will continue indefinitely and more and more disks will become infected and corrupted. Eventually the user will notice that files are damaged and not being saved properly, and will conclude that they are the victim of a virus.

So why is it not possible to have a Dragon virus? Because of the way the ST works it is particularly suitable for viruses. It is an AUTO BOOT machine, it generally requires a disk in the drive when powering up. The means of course that the BOOT SECTOR is executed and thus the virus is instigated.

This cannot happen on a Dragon as the majority of Dragon DOS compatibles don't AUTO BOOT, you actually have to type BOOT. You're only going to BOOT a disk if you're told to do so and so you're unlikely to acquire a virus. It's true that user of AUTO BOOT DOS's like V4.0 could be struck by a virus. However, it would remain largely confined to the people who use AUTO BOOT DOS's as users of say 1.0 aren't going to BOOT a disk unless they need to and if all that is held in the BOOT SECTOR is a virus then there's no need to.

The way that 16-bit machines organise their memory is also a reason for viruses getting to grip. In the ST no program has a specific address in memory, everything is relocatable. This is because the ST operating system (TOS) loads a program wherever it can find room. Once a program has loaded then no other program can be loaded on top of it. All programs must contain the room they require to load graphics and music into. Basically the programs are totally self contained. This allows for a virus to exist as it will be allocated a small amount of memory, which will, of course, only be used by it.

There is very little chance of the virus being overwritten in memory as programs should not access any other part of RAM outside their own area unless they are accessing vectors low down in memory, onto which a program can't be loaded of course. In a 32K Dragon there is a great chance of a virus being destroyed in memory by other programs, although not so much of a chance with BASIC. BASIC programs do not have a specific address in memory, like TOS the BASIC INTERPRETER puts them wherever it can find room. Machine code programs, however, almost always have a specific address and it is more than likely that they would overwrite any virus. On the ST, games often access the Drive, whereas on the Dragon this seldom happens. Thus if a Dragon virus intercepted all calls to the drive it would have little effect. If a Dragon virus intercepted interrupts then it would also stand a good chance of being wiped out. To gain extra speed many programs disable the interrupts, this is especially true of programs that do not require access to the drives after initial loading.

Life for a Dragon virus would be extremely hard. It has the hardware against it. Whilst the various incarnations of Dragon DOS are fairly primitive, they do, in the main, serve as deterrents for viruses. The way that the Dragon handles its memory is also fairly primitive, but again serve to thwart any potential viruses. It is the newer and more advanced micros that are under threat by viruses, due to their much more flexible approach to disk and memory management. The Dragon user has little to worry about, although rumour will do more damage than the actual virus itself.

IT SHOULD BE NOTED THAT THIS ARTICLE WAS ORIGINALLY PRODUCED IN JULY 1989 AND THAT
CONSEQUENTLY, NEW DEVELOPMENTS MAY HAVE OCCURRED IN THIS FIELD.

POSTSCRIPT

I have spend quite a long time on the POSTSCRIPT side of things. I think it is only too appropriate to mention few things about how a Laser printer works.

This kind of printers do not burn an image to a sheet of paper, but they contain a real laser inside them. When a page of either text or images is sent to the printer is sent in the form of of a bit image. This means that the image is formed of 0s and 1s representing white and black dots. A light sensitive drum begins to rotate and a negative charge placed across it. The laser beam is then strobed very rapidly across the width of the drum firing a burst of light at each point where part of the image will fall.

Extreme accuracy is required which only a laser beam can provide. The drum loses its negative charge where the beam is. As the drum turns it comes into contact with the negatively charged areas. The net effect is that toner adheres to where the laser has been. The paper has this stage been given a positive charge as

it passes through the printer, so the negative toner particles send on the drum are attracted to it. The charge only lasts for a short while, so the toner is bonded on to the paper by passing it through heated rollers and delivered to a paper tray.

Coming back to the POSTSCRIPT language, the most important aspect of a Page Description Language such as Postscript, is that it is resolution independent. No matter, what the resolution of the Laser printer, being driven by a PDL it will be used to its full potential without loss of clarity. Although there are several PDLs in the market Postscript is the *de facto* industry standard. This means that even a Dragon Computer can be used to compile PDL text. You only need to know how to use a wordprocessor for the Dragon !! I am sure that you all know there are quite a few about.

I am sorry I was not able to keep you up to date on the previous DRAGON LOGIC edition. If you have any comments please let me (or the Editor) know.

Sotos Mandalos.

Preview Feature

The Summer Show this year will be the last to be organised by the NDUG owing to the rising cost of staging a large show and the declining number of Dragon and Tandy owners, but we intend that it should be a good one for all concerned, with the maximum number of stands and the maximum number of punters through the doors.

The venue will be the same as last year, the Great Hall at Hove Town Hall, Norton Road, Hove, Sussex. As all those who attended last year will know, facilities at Hove are exceptionally good, with ample cheap parking directly opposite, staff assistance with unloading and portering. We have also arranged for Caterers to provide refreshments and a fully licensed bar will be open from 1pm onwards.

Stand prices will be slightly less than last year and the categories are as follows:-

- 1) Full Trade Stand - Can be of any size. Price £60.
- 2) Limited Sales Stand - Can be of any size, but usage is restricted to the sale of ones own product. Price £25.
- 3) Small Stands - Two tables only. Price £15.
- 4) Group & Promotional Stands - Sales restricted to User Group products, magazines, newsletters etc not available from other sources. Price £10.

The Show will be on Saturday 2nd. June 1990 and doors will be open to the public from 10am until 3.30pm. Exhibitors will have access from 8.30 onwards.

If you have any queries, special requirements etc please phone Paul Grade on Worthing 207585 (evenings) as soon as possible.

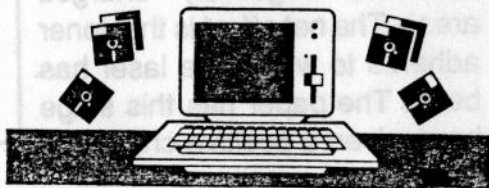
By Paul Grade

HARDWARE

By Alan Swift

Those amongst you who possess a Dragon 64, have at your disposal a Serial I/O port, the use of which has never been fully exploited. Dragon 32 owners have at some time had at their disposal a range of plug in Cartridges to take advantage of Serial Data transmission. Serial Data transmission? - we'll get technical later, but some of the uses of this data transfer format include Modems, used to access bulletin boards, Printers, Radio Communication as well as Short Wave Radio weather data transmission. I intend to go through those Interfaces I possess, reveal how they work, what they're used for, and with Dragon 64 users in mind, how to drive external equipment, set Baud rates, check control registers and gain control of the 6551 chip within the machine. Somewhere along the line there will be a self construct project, based on previous efforts, most of which will be Maplin based but which will work in a remote location away from the Dragon.

The actual Interfaces which will be featured include the Maplin RS232 kit, the Race Serial I/O Cartridge, Peaksoft's New Era Interface and of course the serial I/O port built into the Dragon 64. I understand that a couple of RS232 Interfaces are available from Siegfrieds of West Germany which can be soldered into a Dragon 32 and function as a Dragon 64 in D32 mode. This costs around £30. So the kit needed to get involved with Serial Data transfer is available even now, not to mention the myriad of second hand cartridges which are available through advertising in Dragon Logic, Update etc.





By Stuart Beardwood

The Dragon, not possessing a dedicated sound chip, can only produce single channel sound. Through software techniques, mixed waveforms can be created giving the impression of four channel music and programs such as Microdeal's Composer push the Dragon's music capabilities just about as far as they will go. Or do they? Here's how I discovered STEREO SOUND from the Dragon. The Dragon's ability to output sound to the cassette player is well known, and the recording of music to tape is a simple process,

although the quality of music reproduction on most data cassettes leaves a lot to be desired! We can, however, take this one stage further by replacing the data cassette with a dedicated music tape recorder or hi-fi unit. My own music centre has two sockets for microphones, allowing me to plug the Dragon's MIC lead directly into the machine. When recording my Composer pieces the problem was that, being a stereo hi-fi, I had only recorded on one track so the sound only came out of one speaker.

Being a multiple Dragon owner, my answer was to use two Dragons plugged into the two microphone sockets, playing the same tune on each machine. Some interesting effects were produced by not pressing ENTER at exactly the same time on both Dragons to EXEC the tunes. The resultant recording produced a pleasant 'echo' effect, the tune being played through one hi-fi speaker being slightly 'out of syn' with the other speaker. This sent my train of thought off in another direction STEREO.

In simple terms, we hear things in stereo by receiving a slightly different version of a particular sound in each ear. Our on board super-computer (the Brain) can calculate by triangulation which direction the sound is coming from. What was needed was two slightly different sounding tunes. So I had to find a way of altering the sound of a piece of music without altering the music itself. The method I used was the NOTESWAP routine which effectively re-allocates the waveforms in Composer by swapping around the four notes used in each note group. This produced some good results, but I was still unable to alter the volume of individual notes, and I was still stuck with the Composer 'organ' type sound.

The release of Composer X, with its multitude of waveforms and the ability to alter pitch and volume on individual voices was the timely answer to my problem! Now I can create a Composer tune, add different waveforms etc with Composer X and use Noteswap to alter the sound of different sections of the tune. Then produce two slightly different versions of the same tune for recording onto audio tape. I still haven't explored all the possibilities using the three programmes and there is still a problem with background noise from the Dragon when recording. But the music does sound much better than the squeaks and rattles that come from my portable T.V. speaker, and the tapes have proved popular with friends and relatives as music for motorway driving.

NOTESWAP LISTING OVERLEAF ... NOTESWAP LISTING OVERLEAF ... NOTESWAP LISTING OVERLEAF ..

NOTESWAP LISTING
By Stuart Beardwood

```

10 L1=0:L2=0:L3=0:L4=0:GOTO40
20 K$="":K$=INKEY$:IF K$=""THEN 20
30 RETURN
40 CLS:PRINT@42,"**noteswap**";
50 PRINT@164,"PRESS 'S' TO SWAP NOTES":PRINT
@202,"'P' TO PLAY TUNE":PRINT@234,"'L' TO LO
AD/SAVE TUNE":PRINT@266,"'Q' TO QUIT"
60 GOSUB20
70 POKE&H6002,0
80 IF K$="P"THENCLS:POKE&H6002,0:EXECST:PRINT@
32*8," PRESS A KEY TO CONTINUE":GOSUB20:G
OTO40
90 IF K$="L" THEN GOSUB 570:GOTO10
100 IF K$<>"S" THEN CLS:END
110 FG=1:CLS
120 PRINT@32*5," DO YOU WISH TO SPECIFY A BL
OCK OF NOTE GROUPS TO BE CHANGED ?"
130 PRINT:PRINT" PLEASE ANSWER Y OR N"
140 GOSUB20
150 IF K$="N" THEN FG=1:LG=999:GOTO200
160 CLS:PRINT@32*5," PLEASE ENTER THE BLOCK
OF NOTE GROUPS THAT YOU WISH TO CHANGE"
170 PRINT:INPUT" FROM NOTE GROUP NO ";FG
180 PRINT:INPUT" TO NOTE GROUP NO ";LG
190 IF FG>LG THEN 110
200 GOSUB 350
210 IF FG=1 THEN NG=1 ELSE NG=FG
220 NS=ST*1526:PRINT@197,"NOTE GROUP COUNT="
:PRINT@140,"working";
230 NS=NS+(NG*9)
240 A=PEEK(NS+N1):A1=PEEK(NS+N1+1):B=PEEK(NS
+N2+1):C=PEEK(NS+N3+1):D=PEEK(NS+N4+1)
250 POKE NS+1,A:POKE NS+2,A1
260 POKE NS+3,B:POKE NS+4,B1
270 POKE NS+5,C:POKE NS+6,C1
280 POKE NS+7,D:POKE NS+8,D1
290 NG=NG+1
300 NS=NS+9:IF PEEK(NS+1)=255 THEN 320:'CHEC
K FOR END OF MUSIC
310 IF NG=LG+1 THEN GOTO 320 ELSE PRINT@214,
NG;:GOTO240
320 PRINT@299,"finished":PRINT:PRINT"
press any key"
330 GOSUB20
340 GOTO40
350 '
360 CLS:PRINT@9,"**NOTE SWAP**"
370 P=140:PRINT@P,"1":PRINT@P+64,"2":PRINT@P
+128,"3":PRINT@P+192,"4":PRINT@40,"ENTER NEW
ORDER"
380 PRINT@64,"LAST SWAP";
390 PRINT@P-10,L1;:PRINT@P+54,L2;:PRINT@P+11
8,L3;:PRINT@P+182,L4;
400 P=143:PRINT@P," ";:INPUT N1:L1=N1:IF N1<
1 OR N1>4 THEN 400
410 IF N1=3 THEN N1=5
420 IF N1=4 THEN N1=7
430 IF N1=2 THEN N1=3
440 PRINT@P+64," ";:INPUT N2:L2=N2:IF N2<1 O
R N2>4 THEN 440
450 IF N2=3 THEN N2=5
460 IF N2=4 THEN N2=7
470 IF N2=2 THEN N2=3
480 PRINT@P+128," ";:INPUT N3:L3=N3:IF N3<1
OR N3>4 THEN 480
490 IF N3=3 THEN N3=5
500 IF N3=4 THEN N3=7
510 IF N3=2 THEN N3=3
520 PRINT@P+192," ";:INPUT N4:L4=N4:IF N4<1
OR N4>4 THEN 520
530 IF N4=3 THEN N4=5
540 IF N4=4 THEN N4=7
550 IF N4=2 THEN N4=3
560 FORP=32 TO 320 STEP 32:PRINT@P," ":NEXT:
RETURN
570 CLS:INPUT"LOAD OR SAVE (L/S) ";L$
580 IF L$="S" THEN 630
590 IF L$="L" THEN CLS:INPUT"NAME OF TUNE TO
LOAD";F$ ELSE 570
600 LOADF$+".BIN":POKE&HFF48,0:ST=&H6000:EX=
&H6000:FI=ST+(PEEK(1620)*256+PEEK(1621))
610 POKE 24725,167:POKE24730,167:POKE24773,1
67:POKE24777,167:POKE24781,167
620 RETURN
630 CLS:INPUT"NAME OF TUNE TO SAVE";F$
640 SAVEF$+".BIN",ST,FI,EX
650 RETURN

```

*COPIES OF THE ABOVE PROGRAM ARE AVAILABLE DIRECT FROM THE AUTHOR.

Software

Name: Pop Up Print Master
Author: Jonathan Cartwright
Supplier: Dragonfire Services
Price: £4.00 INC P&P
Format: DragonDOS and Compatibles
:Tape version available soon

Can Jonathan Cartwright ever do wrong ...? It appears not. Here is another success, very simple but it works and saves time and frustration. How often have you had to dig out your printer manual to search for the control code for Italics or Underline? It's not too bad when using a Word Processor, because they usually do it for you, but what if you want to emphasize part of a listing or just make up a Double Width heading for something? Perhaps you don't make full use of your printer simply because it's too time consuming and too fiddly to enter the codes each time, then to have to cancel them for the very next line. Well ... at the touch of a button (the CLEAR key actually) your prayers have been answered.

Pop Up Printer Master comes with full, and very humorous, instructions which tell you how to customise this program to suit your personal needs. There are two programs, "PRINT" - the machine code main program and "COMPILER" - the basic program that you add your printer commands to, which in turn modifies PRINT. All you have to do is enter all the printer commands you will ever need into Data Statements, for example:-

```
1000 DATA "DW+",27,87,1,-999
```

```
1010 DATA "DW-",27,97,0,-999
```

You could write "DOUBLE WIDTH ON" or OFF, but this takes up room. I'm used to the printer codes on my 'Electronic Author' word processor, so I used these. U+ and U- can select Underline on or off etc. If you know your ASCII codes, you will see that line

1000 sends ESCape (27) + "W" (87) + 1 to the printer, the -999 tells the program where the end of the command is. Once you've entered all the commands, you save the program, just to be on the safe side, then RUN it and it will load the original PRINT program, modify it and give you the chance to re-save it.

So how does it work? Load it, EXECute it, then hit the CLEAR key and a small area appears at the top of the screen, with your first command name in it (eg. DW+), using the up and down arrows you can run through all the commands. When the correct one is on screen, hit ENTER. Use as many as you require (eg. Double width+Italic+Underline then press the Space-bar and you are back in Basic, simple. Another handy little feature is that, while in command mode, pressing L toggles Line Feed on and off, just in case you run your printer with the LF DIP switch off, or, if you don't, it can supply double space Line Feeds.

I rarely use my printer from Basic, probably because it was too difficult in the past, but if you use the Basic word processor "EDITEXT", you have got to buy this program to go with it. Just make sure you modify the CLEAR command to guard it, and remove Editext's own printer commands. The machine code is totally relocatable, so put it where you like.

Problems - none really - I had to train myself to use CLS to clear the screen, but that was OK. As with a lot of commands, if you use it whilst the disc drive is spinning, the drive will remain spinning until you hit the space-bar. I haven't been able to crash it so I'm awarding it five out of five.

Due to reasons beyond our control we were not able to bring you reviews of Editext, Desktop Formatter or Publisher.

Name: Spy Against Spy
Author: Jonathan Cartwright
Supplier: Dragonfire Services
Price: £5.00

As one of Starship Software's earliest commercial releases, Spy Against Spy has never really found favour amongst the Dragon fraternity.

Based heavily upon the classic Spy Versus Spy, you play the part of a Spy whose task is to collect six objects strewn throughout an Embassy. Having found all six objects you must make your way towards a waiting Helicopter before a hidden bomb explodes.

What makes Spy Against Spy unusual is that it is a 2 player game, where two players actually compete against each other, the winner being he who escapes with all six objects. A practice mode is optional but as the author readily admits, the computer controlled spy "may not be particularly intelligent". Indeed, it is true to say that this character is in no position to thwart your efforts as he seems incapable of moving in any organised fashion.

To make your task just a touch easier, you are provided with a limited number of bombs and water traps, the purpose of which are to relieve your opponent of his possessions. To activate these traps simply push the Joystick up or down (depending on your intended actions) and press fire. Points are awarded each time you collect an object or bomb an opponent.

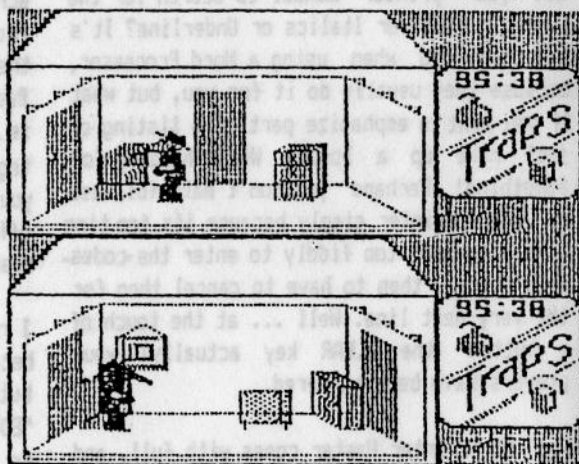
Spy Against Spy features over 100 locations, all displayed in colour graphics. Throughout these rooms lie various cupboards, televisions,

litter baskets etc, some of which store the six hidden objects. Mapping is not particularly easy owing to the size of the game and the sheer pace of movement - it's simply not possible to stay in one location for too long as each game features a limited time, and if your mission is not completed within that time limit, you are destroyed.

In the initial stages of the game, some doors can only be passed through if you possess the key. The key and other items are not visible (they're hidden throughout the various pieces of furniture) but can be found by moving certain pieces of furniture using the Joystick. Fortunately should you lose the key, you are not prevented from passing through those doors which you previously unlocked. Movement is by no means an easy affair as care has to be taken when moving forward or backwards as it is easy to not notice objects.

The screen display is quite interesting as it displays the current status of both players, the Computer taking up the top half of the screen. The graphics are not particularly attractive as there is often a clash of colours and the figures do tend to flicker slightly but the overall screen display is quite reasonable.

Despite the severe restrictions posed by the Practice mode, Spy Against Spy is a challenging game. Not the most addictive, mind you, but challenging nevertheless.



Name:Decathlon
Supplier:Dragonfire Services
Price:£3.00

Originally released in 1986 by Maridian, Decathlon is a compendium comprising of 10 games, for one to five players.

The games are essentially produced with Children in mind, but the program was launched as a party package and is also suitable for family use.

The games range from anagrams to chopper and shootout to Hangman, a traditional feature on this type of package. Most are designed for entertainment, but the likes of Hangman stimulate thought amongst youngsters and thus it provides an important educational use.

Each of the ten programs have been written in BASIC, allowing the user to alter and improve any features should you so desire. The programs are well written and equally well presented, making full use of the Dragon's low-resolution graphics and sound capabilities.

Essentially Decathlon succeeds where Cascade's offering failed so miserably. Not only are the programs well presented, they are to some extent stimulating, and dare I say challenging. Titles such as Anagram, where the player has to identify an eight letter word within a short time limit, and Chopper, where the player has to land his craft on a mountainous heli-pad make Decathlon slightly more difficult than your run of the mill compendiums, and for that, more interesting.

Let's not fool ourselves. Decathlon does not aspire to stretch the Dragon's Graphics and Sound capabilities to the limit, but it does aim to entertain small groups of children with ten challenging titles and when all is said and done, it achieves what it set out to.

SOFTWARE UPDATE

Barry Hitchings of the Drax PD Library has begun work on the Dragon version of the smash hit arcade racing simulation ... OUTRUN. In his most ambitious plan yet, 14 year old Barry intends to emulate many features of the original coin-op including 3D Graphics and up to 15 stages. Work is also to begin on a new adventure game based on the trial and tribulations of running an amateur Dragon magazine known as Dragon Logic!



Dragsoft has announced the launch of Version 2 of Data & Loader Printer, following development problems with the original. The revised edition will write files direct to tape as well as the printer, thereby cutting the risk of errors. And, following Jonathan Cartwright's decision to leave the Dragon market, Dragsoft has acquired the rights to Starships former WINDOS program.

An unknown Dragon author has announced the release of his first commercial title. Buzzing Bertie is an original arcade game featuring "23 screens of buzzing". Copies are available, priced £4 from Duncan Bryan, 74 Beeston Road, Dunkirk, Nottingham, NG7 2JP.

Dragonfire Services have confirmed that they are poised to release a tape version of their latest title...Pop Up Print Master. Dragon Logic writer, Mike Townsend, recently approached Robin Hemmings of Dragonfire with a view to converting the program to tape and subject to approval from the program's author, Jonathan Cartwright, Pop Up Print Master may shortly appear on Cassette.

By DON MORRISON

OS-9

Below is a list of the commands that you may seldom use and therefore may delete from your EXECUTION directory which is /D0/CMD5:..

None of these commands should be deleted from your original disk...Never delete Files/Directories/Commands from your original OS9 Master Disk. Always make alterations to a backup of the master disk. To make a backup of your OS9 Master disk follow this method:-

For a single drive system you must, at the OS9 prompt type - OS9:load format free. Take your OS9 Master disk out of your drive /d0, replace it with a blank disk and at the OS9 prompt type - OS9:format /d0. When OS9 asks if you really want to format the disk in drive /d0, respond with Y for yes or R for ready. When the format is complete OS9 will ask you for a name to put on the disk. You may give any name up to 32 chrs. The name at this point does not matter as when we backup the original Master disk to this disk it will retain the name of the original master disk. So you can just call the disk NEW.

When the format is done and the verify pass is complete the OS9 prompt will return. At this point you should type - OS9:free /d0. If the free does not reveal 720 sectors total on the disk, and 710 available for use, do not use this disk for backup purposes - it simply will not work.

Take the newly formatted disk out of drive /d0 and put your original Master disk back in drive /d0. At the OS9 prompt type - OS9:unlink format free. This will take the two commands out of memory and give you more memory to work with when you start to backup. At the OS9 prompt type - OS9:load backup. Take your original Master disk out of drive /d0 and replace it with your newly formatted disk. At the OS9 prompt type - OS9:backup /d0 £32k. OS9 will ask you if you

are ready to backup from /d0 to /d0 and will then ask you to prepare the destination disk - you already have it in the drive. Hit any key to continue and OS9 will list the name that was on the disk and ask if it is OK to write over this disk. OS9 will then ask to you prepare your source disk and you should put your OS9 master disk back in drive /d0 and press a key. When OS9 tells you to prepare the destination disk, take your master disk out of drive /d0 and put the newly formatted disk in drive /d0. OS9 will repeat this prompting until the whole original disk is copied over exactly to the new disk.

Warning...If the disk that you formatted did not reveal the whole 720 sectors when you typed free /d0 then it is no use trying to use it as a backup copy. A backup is an exact copy of the original disk to a new disk. If there is a bad sector on the new disk, the backup will not work nor would it were there a fault with the original disk. Both disks must be free of errors and must contain the number of sectors...A disk with 80 tracks can't be backed up to a disk with 40 tracks...A double sided disk can't be backed up to a single sided disk...A hard disk can't be backed up to a floppy disk. OS9 will check to see that both disks are the same size, and if not it will abort the operation.

When the backup is complete put the original master disk away. You can leave the new master disk in drive /d0 but you must let OS9 know that there is a new disk in the drive. So, at the OS9 prompt type:-

OS9:chd /d0

OS9:chx /d0/cmds

OS9 is now ready to continue and we can now delete some seldom used commands in order to gain some disk space for our own files.

To delete these commands you should type - OS9:del /d0/cmds/command.name - where command.name is the name of each command you intend to delete. By the way you can repeat command (or other) lines by typing CLEAR/A.

BINEX...EXBIN...These two commands are used to turn a binary file into a text file and vice/versa. I have never used these two commands to date. While they might be useful I am not sure who they are useful to.

COBBLER...This is only used to make a new OS9boot file on your master disk. You won't need to use this command until later lessons so you can delete it from the /d0/cmds directory for now.

DCHECK...This command does a total search of the disk it is called to check and will report if any files have been destroyed in some way. You will only need to use this command on a disk which is often used to capacity. DCHECK is very powerful but it will usually be the case that the time you need to use it is when some of the files on your disk have been damaged in some way. For this reason you may wish to keep this command in your /d0/cmds directory.

DISPLAY...If you don't have a printer hooked up to your OS9 system then you probably won't need the DISPLAY command. It is used to send a series of hex codes to a device. If you type - OS9:display 0c - the screen will clear. In this case the command sends a control 1 to the screen whereas if you typed - OS9:display 0c >p - it would send a control 1 to the print which in most cases will result in a form feed. If you have a decent printer you may use the DISPLAY command with the (>) redirect sign to send hex codes to your printer for setting it to double strike, emphasized print, underline etc and other features your printer might support.

Should your printer be one of those which are Epson compatible, you could use the following codes to set the ENLARGED mode - DISPLAY 1b 57 1 >p.

KILL...This command is used to kill off some

multi-process command that you may have started up to run in the background. If you type - OS9:dir e /d0/cmds >p& - OS9 will do a DIR E of your EXECUTION directory and send it to the printer. The OS9 prompt will return and the list will continue in the background. If you did a procs e command at this point you would see that there is a process 3, 4 or 5 running in the background which is called list. To stop the list from continuing type - OS9 Kill 3 (or 4 or 5). You won't be doing a lot of multi processing while you learn OS9 so you should not need this command at the moment.

LINK...This command is difficult to explain. Let's just say that when you enter a load command the computer does a link for you, so this command is not yet necessary.

LOGIN...This command is only used if you intend to hook up your OS9 system so that outsiders can link into your CoCo and use the computer at the same time.

MERGE...This command is used to put two data files into a single data file with a new name. This can also be done with the list command like this - OS9:list data 1 data 2 >data 3 - so the merge command is not yet needed.

OS9GEN...This command is used to create a new boot disk. The new boot disk might have more/less commands which it will load into memory when it starts up. For the time being you won't need this command until the next lesson.

PRINTERR...When you are first learning OS9 you will find this command most useful. When you start to learn the error number by heart you will be able to delete this command. You can also delete the /d0/sys/errmsg file also.

You may also delete the asm command from

your /d0/cmds directory if you never intend to do any m/l work. If you do delete the /d0/cmds/asm command then you can also get rid of the data files in the OS9DEFS directory that the asm command works with. Do this by typing - OS9:deldir /d0/os9defs. OS9 will then offer you a choice to list, delete or quit. If you choose to list it will display what is in the directory. If you choose to delete you will not be prompted again unless there is another directory found within the directory. This command will take some time to get rid of the directory /d0/os9defs but it will clear up a lot of space for your own use.

OK, I've saved you a bit of disk space, now let me save you a bit of a headache! TANDY now has two versions of the OS9 operation system. These are Level 1 and Level 2. Level 2 will only run on the CoCo 3 but a few clever souls in the US have upgraded their Dragons so that they too can use Level 2, though how efficiently I have no idea.

But to the average Dragon user, such as you and I, it's level 1 or bust! If you're with me thus far with these articles, you've obviously got Level 1 up and running. This will operate within the restrictions of the 64K RAM.

Lets now talk about the devices that are available to you under OS9.

/p...This is for your serial printer.

/t1...This is for the built in RS232 port.

/t2...This is for the RS232 cartridge.

/d0...This is drive 0.

/d1...This is drive 1.

/d2...This is drive 2.

/d3...This is drive 3.

term...This is for your Keyboard and VDU.

Not everyone will own a printer, an RS232 Cartridge or four drives so if you don't, why keep these modules in memory wasting space? Why not delete them from your system disk and save yourself some space which is badly needed in the 64K Dragon?

How do you do this? We'll cover this and other topics, such as making a new Boot disk the next article.

COMMENT

I would like to respond to accusations that we programmers are paranoid about the spread of piracy, and the suggestion that we have nothing to worry about as far as the Dragon is concerned. It's very obvious that certain individuals have no idea of the state of the Dragon games market these days - 20 copies is not a bestseller, it's a damned insult. I know of several games on the market that have sold in the region of 100 copies and that includes recent releases. Now, the vast majority of software available today is of a vastly superior quality to those in the past. There just isn't the junk that was churned out all those years ago. Okay, so software isn't always going to be particularly popular, but I know of a lot of material which, despite very good reviews, sold next to nothing.

If we programmers are paranoid about piracy then it is because some of us rely on our royalties as our only source of income. Right, I'm never going to comment on the piracy situation on condition that all this controversy surrounding the Atari ST stops. If programmers are paranoid about piracy, then the NDUG in particular is paranoid about Atari ST's. I'm sure we can all make up our own minds as to which computers we like and dislike. It's up to us as to which computers we buy and/or use. With its ridiculous bias, the NDUG is insulting vast numbers of Dragon users who also use ST's and is endangering its own survival.

People are always going to pirate software and people are always going to upgrade towards more advanced computers, and there's absolutely nothing that any of us on this earth can do to prevent it.

THE OPINIONS EXPRESSED IN THIS ARTICLE ARE ENTIRELY THOSE OF THE AUTHOR AND DO NOT REPRESENT THOSE OF DRAGON LOGIC.

Word Search

Welcome to the fifth and final Dragon Logic Word Search. All you have to do to enter the competition is to find the names of 10 major Computer manufacturers, all of which are still in existence, listed in the opposite word puzzle. When you've found all 10 names send the completed entry form to Dragon Logic at 72 Diriebugt Road, Inverness, IV2 3QT. The first entry drawn will receive a copy of the classic platform game, Manic Miner, whilst the two runners up will each receive a copy of Kouga Software's Ball Dozer.

Dragon Logic Word Search

R	F	D	K	A	S	A	G	C	J	R	E	G	F	S	C
W	E	N	E	B	Y	Y	T	A	N	D	Y	L	J	T	I
S	I	O	Z	R	O	N	B	X	U	J	K	E	P	R	N
Q	S	T	O	C	I	R	P	A	O	B	A	O	I	P	U
V	X	J	S	S	E	T	A	L	J	C	N	A	V	I	A
Y	R	K	X	Y	O	R	O	T	O	P	L	O	I	F	P
W	T	Z	L	S	B	L	O	R	A	C	G	F	H	Q	R
G	E	U	H	S	I	S	N	D	N	R	E	J	U	O	Q
F	R	I	Y	V	E	T	U	I	O	O	I	I	B	Z	M
O	B	N	E	K	H	D	S	M	K	M	J	T	M	M	T
A	P	T	D	S	I	H	Y	S	I	M	M	U	A	H	P
H	T	E	K	J	U	I	V	A	V	C	N	O	K	C	U
I	J	M	Y	R	W	O	R	V	Y	X	M	T	C	J	D
X	G	V	H	L	K	Z	Y	D	I	U	K	P	S	Y	H
Q	A	M	S	T	R	A	D	O	D	I	J	T	O	P	O

* Dragon Logic Word Puzzle - Entry Form *

* ----- *

* The hidden words are *

* *

* 1 6 *

* 2 7 *

* 3 8 *

* 4 9 *

* 5 10 *

* *

* ===== *

* Name *

* Address *

* Post Code *

* *

* ===== *

* ===== *

* The 10 names featured in last Issue's Word Search were 1) Harris / 2) Gerrard / 3) Cadge /

* 4) Jones / 5) Orbaum / 6) Armstrong / 7) Cartwright / 8) Grade / 9) Whitehouse / 10)

* Symes.

* ===== *

* ===== *

Adventurers Anonymous

In this, the final Adventurers Anonymous, we feature two titles which have now firmly established themselves, rightly or wrongly as Dragon classics.

If there appears to be a note of scepticism on my part, then that is because I do not consider one in particular, Madness and the Minotaur, to be described as such.

Originally produced in the US by Spectral Associates, in conjunction with Dragon Data, Madness and the Minotaur is set in the mythical Labyrinth of King Minos. You must enter the castle of King Minos, descend into the labyrinth, collect all the treasures and bring them out into the forest in order to score points.

Madness and the Minotaur is played in real time, so if you leave the game for any length of time you may well return to find yourself dead and this is particularly true in locations which pose special danger. You may disable this feature by typing QUIET and this will ensure that when you return the state of the game is that in which you left it.

Throughout the Labyrinth there are several hazard or benefit rooms; many of which are randomized. There are six creatures who stalk the walls of the Labyrinth and an Oracle, who possess magical powers. Of the six creatures, five possess treasures; though most are capable of attacking, sometimes killing you. The Scorpion, for instance, provides a slow painful death though cures are available throughout the game.

You begin the game at peak physical condition though each stumble or unsuccessful jump will cause you to lose valuable energy, as will attacks from creatures such as the Minotaur, Troglodyte and Satyr. Your

strength can however be partially resorted through eating or drinking. There are several objects which are protected by magic spells and may only be released from the spell when you possess certain objects or spells. Each spells provides you with differing abilities and it is up to you to decide which is more appropriate.

Madness and the Minotaur is a text-only adventure played in the normal verb-noun input form. Vocabularly is standard although there are some unusual verbs which reflect the violent nature of the game. The eight spells also form an unusual vocabulary.

While, on reflection, Madness and the Minotaur may appear an interesting and challenging adventure game, it is marred by one feature in particular - that is its tendency to randomize locations and situations. Many events are triggered by an action which may only be randomly effective. Normally you may have to try 2 or 3 times for an event to occur and the various treasures and inhabitants never appear in the same location.

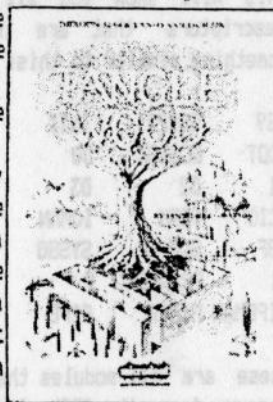
This, the only real fault in the game, may appear trivial but it makes mapping impossible and should one ever complete the game, it is likely that this was accomplished through luck. I for one have never enjoyed Madness and the Minotaur and I would recommend it only to those who are particularly experienced in this field.



Tanglewood, on the other hand, is and rightly so, considered one of the all time Dragon classics, second only to Juxtaposition. Tanglewood is an unusual game in that it is an arcade & adventure game combined and what is more unusual is that you control 5 characters, each with their individual characteristics and each with their own problems to solve. The aim of the game is to destroy the evil Schark, the property designer who aims to unleash his diggers on Tanglewood, that is what you must prevent him from doing. Tanglewood contains over 700 accessible locations in nine sections, all of which are displayed in full colour. These include the Woods, Dwarf Dive, Schark (a 3D maze on five floors) and six smaller text only locations. Surprisingly the entire game loads at once.

As mentioned, in the game you control five characters though only four are available to start with. Your first task is to release the fifth character, Paebody. The characters are controlled via the cursor keys and move around on the scrolling map at the bottom of the screen. The screen contains a map at the bottom, a picture of your current character, a picture of the current location, a cursor to input conventional adventure commands, an inventory, an indicator to show your energy status and whether your present character is 'safe' (ie. invulnerable to Schark's spells).

The 5 characters consist of Bruce, a wallaby who has great difficult climbing; Goliath, a mouse who lost his whiskers in a previous confrontation with Schark (and one of your tasks is to locate a new set); Beanbag, once a proud Lion now a Frog who, during the day can only move around in the marsh area though as Tanglewood is a real-time adventure night inevitably falls, in which case he is free to roam the paths; Foghorn, a cat of considerable abilities who just happens to have lost his specs (which just happen to lie at the bottom of a pond) and finally, Peabody. Other characters include Schark, who turns those he dislikes into stone and the Owl who, if you can find him, will reveal much valued information.



Tanglewood was one of Microdeal's last releases and undoubtedly one of its finest. Unique commands such as TIME (which changes day to night), SLEEP< SURRENDER, TRANSFER (which allows one character to give an object to another) make this adventure one of the all time greats. Both Tanglewood and Madness and the Minotaur are available from Computape, priced £2.99.

Before I sign off for the last time, I have one last plea for help from Alexander McIntosh who appears to have problems with Mountains of Ket in which he would like to know how to cross the crevice at the south edge of the Plateau and what significance the Skull holds. On Calixto Island, Andrew would like to know the order in which to trade with Jack. Anyone with suggestions should write to Alexander McIntosh, 26 Southhouse Avenue, Liberton, Edinburgh, EH17 8ED.

BY DON MORRISON

OS-9

In this final feature, we are going to make a new OS9 Boot disk. We can do this several ways. First, though, type this - OS9:mdir. This will show you all the programs and descriptors that are in memory, infact something similar to this:

OS9	OS9P2	INIT
BOOT	CCDISK	D0
D1	D2	D3
CCIO	TERM	IOMAN
RBF	SCF	SYSGO
T1	PRINTER	P
PIPEMAN	PIPER	PIPE

These are all modules that are loaded into memory from the OS9boot file which you can then change to load in more or less of these modules at boot time. For now we will just make a new boot disk which will load in all of the above modules exactly the same way. We can do this one of two ways. First let's format a new disk and put our new OS9boot on it. At the OS9 prompt type - OS9:load format free. Take your OS9 master disk out of drive/d0 and install a blank disk in /d0. Then at the OS9 prompt type - OS9:format /d0. When OS9 asks you for a name for the disk give it the name NEW BOOT DISK. When the format is done at the OS9 prompt type - OS9:free /d0. You should then get 720 sectors on the disk with 710 available for use. This lets you know that the format process went smoothly with no bad sectors present. Take the new disk out of drive /d0 and insert your OS9 master disk. Now type - OS9:load cobbler makdir save os9gen build echo. You should then have all these commands in memory.

Take your master disk out of drive /d0 and insert the new disk. Now at the OS9 prompt type - OS9:cobbler /d0. This will put the file OS9boot on the disk in drive /d0 and it

will contain all the modules which were loaded into memory from the last boot. To get all the other files/commands/directories over onto this new boot disk you will need a great deal of patience because you will have to go through a lot of typing, copying and swapping.

Essentially what you have to do is use the makdir command to re-create on the new disk, all the directories which were available on the Master disk. So you will have to type:-

```
OS9:mkdir /d0/sys
OS9:mkdir /d0/cmds
OS9:mkdir /d0/defs
```

Then you will need to use the copy command to move all the files/commands over from the old master disk onto the NEW Master disk. We are talking about a lot of disk swapping here and you just might not be up to going through all this work. Read on...there are 2 easier ways to do this and I will let you decide which of the two you prefer.

While cobbler will help us to make a newboot disk there is no flexibility to it and you are stuck with a mirror image of the modules from the last boot you did. To give us total control of what goes on in the OS9boot file we will need to use the OS9gen command.

Leave the new boot disk in drive /d0 and format it again. Then type FREE to be sure the total sectors and free sectors appear correctly at 720 and 710 respectively. You should then type:-

```
OS9:mkdir /d0/modules
OS9:save /d0/modules/ccdisk ccdisk
OS9:save /d0/modules/d0 d0
OS9:save /d0/modules/d1 d1
```

>>>If you only have a 2 drive system you can omit the next two lines<<<

```
OS9:save /d0/modules/d2 /d2
OS9:save /d0/modules/d3 /d3
```

```
OS9:save /d0/modules/ccio ccio
OS9:save /d0/modules/term term
OS9:save /d0/modules/ioman ioman
OS9:save /d0/modules/rbf rbf
OS9:save /d0/modules/scf scf
```



```
OS9:save /d0/modules/sysgo sysgo
OS9:save /d0/modules/clock clock
OS9:save /d0/modules/shell shell
```

>>>If you never intend to let an outsider link with your CoCo (or Dragon) by an outside phone line then again omit the next two lines<<<

```
OS9:save /d0/modules/rs232 rs232
OS9:save /d0/modules/t1 t1
```

>>>If you don't have a printer you may omit the next two lines<<<

```
OS9:save /d0/modules/printer printer
OS9:save /d0/modules/p p
```

```
OS9:save /d0/modules/pipeman pipeman
OS9:save /d0/modules/piper piper
OS9:save /d0/modules/pipe pipe
```

>>>If you don't possess a Radio Shack RS232 jack (which will include most Dragon users) you can omit the next two lines<<<

```
OS9:save /d0/modules/acia acia
OS9:save /d0/modules/t2 t2
```

We have moved an image of the modules which are in memory over to the disk in drive /d0. If you did not have a printer or did not have drives /d2 and /d3 then you did not save the listed modules over to the disk. If you did not intend to have an outside user then you did not save rs232, t1, acia and t2 over to the disk.

We are now going to build a data file which is going to tell OS9gen what modules it is to put into the OS9boot file. It is very important that the spellings you used in the save command are identical to the modules in memory. OK, now at the OS9 prompt you type - OS9:build /d0/bootlist. You will then see a (?) for the prompt. At each (?) prompt type the following lines (without the (?) marks):-

? ccdisk

? d0

? d1

>>>If you did not save d2 and d3 in the save

operation omit the next two lines<<<

? d2

? d3

? cc10

? term

? ioman

? rbf

? scf

? sysgo

? clock

? shell

>>>If you did not save the rs232 and t1 commands omit the next two lines<<<

? rs232

? t1

>>>If you don't possess a Printer and left printer and p out of the save operation omit the next two lines<<<

? printer

? p

? pipeman

? piper

? pipe

>>>If you did not save acia and t2 in the save operation omit the next two lines<<<

? acia

? t2

? (enter)

We now have everything we need on the disk in drive /d0 to make os9gen put an os9boot file on that disk. At the OS9 prompt type:-

```
OS9:chd /d0/modules -
```

```
OS9:os9gen /d0 </d0/bootlist
```

You will then have a working os9boot file on the disk in drive /d0. Now if you left out the d2, d3, printer, p, rs232, t1, acia and t2 modules when you did your save, those modules will not be in memory when you use this disk to do your next boot...BUT DON'T BOOT WITH THIS DISK YET...IT HAS NO COMMAND DIRECTORY. You will need to copy all the data files and commands off your master disk and onto this disk by the same method explained in the start of this tutorial where I talked about the ccbler command.

Now I also said earlier that there were 24

other ways to make this boot disk and you have to decide which suits your taste. The first method is to make the os9boot file with either cobbler or os9gen in the same way I have already explained. Now that the boot file is on the that disk, don't copy the whole Master disk over to this new disk. Instead type this - OS9:mkdir /d0/cmds - and then copy the commands setime, dir, free and echo over to the /d0/cmds directory on this new disk from /d0/cmds on the old disk. Use the build command to build a new startup file on this disk - OS9:build /d0/startup - and then enter these lines in the file:-

```
? setime </term
? echo take the disk out of drive 0
? echo and put your working disk in
? echo drive 0...This is ONLY A BOOT
? echo DISK!!!
? (enter)
```

So now when you wish to Boot OS9 you can use this disk. After OS9 boots you will take this disk out of /d0 and insert your Master disk. Then type:

```
OS9:chd /d0
OS9:chx /d0/cmds
```

And you'll be up and running...This will be your working disk and the other disk will be used each time you wish to Boot OS9.

Another way to make a new BOOT disk is to backup the old master disk to a newly formatted disk. Leave this new disk in /d0 and type:

```
OS9:chd /d0
OS9:chx /d0/cmds
```

This will let OS9 know that you have changed disks. Use the mkdir command to make a new directory called /d0/modules.

Follow all the save commands listed earlier in this article. Use the build command to build a file called /d0/bootlist. Type in all the lines as listed earlier in the tutorial. When this is done, you will use the del command - OS9:del /d0/os9boot. At this point type:-

```
OS9:chd /d0/modules
OS9:os9gen /d0 </d0/bootlist
```

Your new BOOT file will go on this disk with

more/less modules as you told it to put in the BOOT file.

Both of these methods will give you a new BOOT disk but they both have their drawbacks. The first method gives you a boot disk but with little else on it in the way of commands. The second method will give you a boot disk that has all your commands on it and all your working files. But the second method will not work 100% of the time. When you cobbler or os9gen a new os9boot file on the new disk it will write that file out to track 34 of that disk. It must have an unbroken number of sectors on track 34 to put this bootfile. If you use os9gen to make a new os9boot file and it has less modules in it than before, the second method will work fine. But if the new os9boot file will have more modules then the second method will not work quite so well.

It is for that reason that I suggest you os9gen a disk that only had the /d0/bootlist file on it and the /d0/modules directory on it. You can then copy over to this new disk the few commands you think you will need and after you boot with this disk take it out of /d0 and insert the disk you intend to work with...A disk that has all the commands you know you will need!

You might also want to add some commands to the os9boot file so that they will remain in memory at bootup time. Some very useful commands to have in memory include dir, build, del, mfree and free. The only disadvantage of having these modules in the os9boot file is that once these modules are in memory, there is no way you can remove them. So you have to decide if you want them in memory that much. It should not cause too much of a memory problem if you have left out the d2, d3, rs232, t1, acia, t2, printer and p modules.

One of the advantages to making a tailored os9boot file is that it gets rid of modules that you were never going to use and cleans up some RAM for you to use. Not a lot of RAM, mind you, but enough to make all this worthwhile. The most important thing to

remember though when using the os9gen command is that you must move the modules from memory out to a directory where you will put all the modules you wish in the new os9boot file. Then you must build a data file with the names of all the modules you saved, change your data directory to the directory that contains all the modules, then invoke the os9gen command telling it where to put the os9boot file.

You may have noticed way back in the beginning that there were some modules in memory known as OS9, OS9P2, INIT & BOOT and we did not save them out to the /d0/modules directory, nor did we put them in our bootlist? Why, the simple answer is that you don't need to - OS9 knows to put those 4 modules in each new os9boot file it creates. It is something you should not try to do.

Right about this time, you may be saying to yourself what a pain it is to go about making a new boot disk. Well on a single disk system it is and there's no getting around this. If you had two disks you could have formatted the disk in drive /d1 and then used the cobbler or os9gen commands to put os9boot on that disk. You could have then used the dsave command to move all the directories/files from /d0 over to /d1 and you would have saved a lot of time and typing. So I now repeat that OS9 will on a single drive system but it sure runs a lot better on a 2 drive system.

You'll probably read all these articles and say to yourself that you are never going to use cobbler or os9gen to make a new boot disk. Sound like too much work. Well after reading this all over I tend to agree with you. I had OS9 for about 1 year before I got around to using os9gen to make a tailored os9boot file. Why did I use it? I saw some articles in Rainbow magazine explaining how to make my disk drives run at 6ms under OS9 and I could resist speeding up the system. Sometime I'll tell you how!

Ray Smith & Bob Montowski

CHARTS

To mark the end of yet another eventful year, a year marred by the loss of Dragon User amongst others, Dragon Logic presented its Elite of '89 Chart Special. Though the response was not overwhelming, we believe the results nevertheless reflect widespread public opinion.

```
*****
* Award Categories * Recipient of Award *
*****
* Best Arcade * REVENGE OF THE *
* Game of '89 * ALIEN BONGO BEAST *
*****
* Best Adventure * LARKSPUR WALDORF *
* Game of '89 * THE JOURNEY HOME *
*****
* Programmer of '89 * JONATHAN CARTWRIGHT *
*****
* Supplier of '89 * PULSER SOFTWARE *
*****
* Magazine of '89 * DRAGON LOGIC *
*****
* Best Utility * PUBLISHER *
*****
* Most Underrated * CAD *
* Product of '89 * 6809 *
*****
* Best Peripheral * DOS ADAPTOR KIT *
*****
* Most Valuable * PAUL *
* Individual of '89 * GRADE *
*****
* Most Promising * ROBIN HEMMINGS *
* Newcomer * (DRAGONFIRE) *
*****
```

NEWS DESK

The NDUG has announced the release of two further titles - Ezee Adventure Writer and the second part of their Easy Machine Code Tutorial, both priced £3.50.

PROGRAMMING

EXCLUSIVE

For the past few months, Ray Smith and Jason Shouler have undertaken the unenviable task of converting a vast quantity of US CoCo software titles to Dragon format.

Imported from the United States, the software collection comprises of a vast array of games, utilities and tutorials, all of which are to be made freely available to the UK Dragon community.

And through the generosity of Ray Smith, Dragon Logic has acquired a large number of programs from the newly created Public Domain Library, the best of which are to be published.

This Issue we continue the series with Diggem, originally produced by Henry Schroy. In this arcade game you control Smiley and your task is to eat the Ground plants by digging further into the ground, using the right Joystick. However, you must avoid the square monsters, whose touch is fatal. Points are awarded for each Ground Plant collected, and it is possible to destroy the Square monsters by crushing them with Ground plants.

Many other such titles are available direct from Ray Smith, all of which are free. Details of these and other titles are available from the newly created Public Domain Library by writing to Ray Smith, 5 Glen Road, Parkstone, Poole, Dorset, BH14 0HF.

Please note that Software is not in the public domain unless it has been donated for this purpose by the author. Programs appearing in Dragon Logic and other publications are the Copyright of those publications, or of the author, and must not be reproduced without express written permission from all the copyright holders.

DON MORRISON REPORTING

```

0 GOTO7
1 REM COPYRIGHT (C) CLOAD 1982      "DIGGE
M"
2 REM PROGRAM BY:
3 REM HENRY SCHROY
4 REM 2790 NE 57 CT
5 REM FT. LAUDERDALE, FL 33308
6 GOTO10
7 PCLEAR5:GOTO6
10 PLAY"V31L255T25501":GOSUB540:D1=3:S=10000
20 PMODE0,5:PCLS:DRAW"BM30,100S16":A$="DIGGE
M":FORX=1TO6:DRAWL$(ASC(MID$(A$,X,1))-32)+L$
(0):NEXT:SCREEN1,1:DRAW"S4":PMODE4,1:PCLS
30 CIRCLE(5,5),5:PAINT(5,5):PRESET(3,3):PRES
ET(7,3):LINE(3,7)-(7,7),PRESET:DIMA(3):GET(0
,0)-(10,10),A,G:PCLS
40 LINE(0,0)-(10,10),PSET,BF:PRESET(2,8):PRE
SET(8,8):LINE(3,7)-(7,7),PRESET:PRESET(3,3):
PRESET(7,3):PRESET(2,2):PRESET(8,2):PRESET(5
,5):DIMB(3):GET(0,0)-(10,10),B,G
50 PCLS:PMODE3,1:CIRCLE(5,5),4,3:PAINT(5,5),
3,3:PMODE4,1:LINE(6,4)-(8,1),PSET:LINE-(10,0
),PSET:PSET(0,0):PSET(10,10):PSET(0,10):DIMF
(3):GET(0,0)-(10,10),F,G:PCLS
60 PCLS:LINE(0,0)-(252,32),PRESET,BF:LINE(0
,99)-(252,109),PRESET,BF:LINE(121,22)-(131,1
86),PRESET,BF:GOSUB2000
70 GOSUB510
80 RF=1:AG=1:CG=1:A=0:B=22:C=242:D=22:F=RND(
22)*11:R=RND(13)*11+33:IFPPPOINT(F,R+11)=0AND
PPOINT(F+10,R+11)=0THENB0
90 CS$="      ":GOSUB510
100 GOSUB420:PUT(231,14)-(241,24),A,PSET:FOR
P=1TO60:NEXT:LINE(231,14)-(241,24),PRESET,BF
110 SCREEN1,1:FORX=242TO121STEP-11:PUT(X,22)
-(X+10,32),A,PSET:PLAY"C":FORP=1TO50:NEXT:LI
NE(X,22)-(X+10,32),PRESET,BF:NEXT:X=121:FORY
=33TO99STEP11:PUT(X,Y)-(X+10,Y+10),A,PSET:PL
AY"C":FORP=1TO50:NEXT:LINE(X,Y)-(X+10,Y+10),
PRESET,BF:NEXT:Y=99
120 PUT(X,Y)-(X+10,Y+10),A,PSET
130 PUT(A,B)-(A+10,B+10),B,OR:PUT(C,D)-(C+10
,D+10),B,OR:PUT(F,R)-(F+10,R+10),F,PSET:PLAY

```



```

"L32T203AB-B0+L16.CO-L32AL16.B-L32GL16.AL32F
L16.GL32EL16F0+P16L16.F0-L32FL255T25501"
140 XX=X:YY=Y:PUT(F,R)-(F+10,R+10),F,PSET:SO
=SO+1:IFSO=256THENS0=1:GOSUB1170
150 IFPPOINT(F,R+11)=0ANDPPOINT(F+10,R+11)=0
THENLINE(F,R)-(F+10,R+10),PRESET,BF:R=R+11:P
UT(F,R)-(F+10,R+10),F,PSET:RF=0:GOTO150
160 IFF=A ANDR=B-11THENPUT(A,B)-(A+10,B+10),
B,PRESET:AG=0:PLAY"CDEF+G+A+G+C":SC=SC+500:G
OSUB420:GOTO150
170 IFF=C ANDR=D-11THENPUT(C,D)-(C+10,D+10),
B,PRESET:CG=0:PLAY"CDEF+G+A+G+C":SC=SC+500:G
OSUB420:GOTO150
180 IFJOYSTK(0)<10THENX=X-11ELSEIFJOYSTK(0)>
53THENX=X+11ELSEIFJOYSTK(1)<10THENY=Y-11ELSE
IFJOYSTK(1)>53THENY=Y+11
190 IFX<0THENX=0ELSEIFX>242THENX=242
200 IFY<22THENY=22ELSEIFY>176THENY=176
210 LINE(XX,YY)-(XX+10,YY+10),PRESET,BF:PUT(
X,Y)-(X+10,Y+10),A,PSET
220 IFAG=0ANDCG=0THEN360
230 AA=A:BB=B:IFAG=0THEN280
240 IFX>A ANDPPOINT(A+11,B)=0ANDPPOINT(A+11,
B+10)=0THENA=A+11ELSEIFX<A THENIFPPOINT(A-1,
B)=0ANDPPOINT(A-1,B+10)=0THENA=A-11
250 IFY>B ANDPPOINT(A,B+11)=0ANDPPOINT(A+10,
B+11)=0THENB=B+11ELSEIFY<B THENIFPPOINT(A,B-
1)=0ANDPPOINT(A+10,B-1)=0THENB=B-11
260 LINE(AA,BB)-(AA+10,BB+10),PRESET,BF:PUT(
A,B)-(A+10,B+10),B,OR
270 IFX=A ANDY=B THEN380
280 CC=C:DD=D:IFCG=0THEN330
290 IFX>C ANDPPOINT(C+11,D)=0ANDPPOINT(C+11,
D+10)=0THENC=C+11ELSEIFX<C THENIFPPOINT(C-1,
D)=0ANDPPOINT(C-1,D+10)=0THENC=C-11
300 IFY>D ANDPPOINT(C,D+11)=0ANDPPOINT(C+10,
D+11)=0THEND=D+11ELSEIFY<D THENIFPPOINT(C,D-
1)=0ANDPPOINT(C+10,D-1)=0THEND=D-11
310 LINE(CC,DD)-(CC+10,DD+10),PRESET,BF:PUT(
C,D)-(C+10,D+10),B,OR
320 IFX=C ANDY=D THEN380
330 IFPPOINT(F+10,R)=0ORRF=0THENF=RND(22)*11
:R=RND(13)*11+33:IFRF=1THENPLAY"03CGBB-AA-GG
-FEE-DD-C01":SC=SC+100:GOSUB420
340 SOUND50,1:IFRF=0THENRF=1
350 GOTO140
360 SC=SC+1000:GOSUB420:PLAY"03LBTCE;E;E;DF

```

```

;F;F;EG;G;G;FAFL255T25501"
370 PMODE0,5:SCREEN1,1:PMODE4,1:GOTO60
380 PUT(X,Y)-(X+10,Y+10),A,OR
390 FORP=1TO5:PUT(X,Y)-(X+10,Y+10),A,PRESET:
PLAY"C":PUT(X,Y)-(X+10,Y+10),A,PSET:PLAY"C":
NEXT
400 FORP=5TO1STEP-1:PLAY"D"+STR$(P)+"AFC":NE
XT
410 DI=DI-1:IFDI<1THEN490ELSEPMODE0,5:SCREEN
1,1:PMODE4,1:LINE(A,B)-(A+10,B+10),PRESET,BF
:LINE(C,D)-(C+10,D+10),PRESET,BF:LINE(X,Y)-(
X+10,Y+10),PRESET,BF:LINE(F,R)-(F+10,R+10),F
RESET,BF:GOTO80
420 SC$=STR$(SC)
430 FORP=2TOLEN(SC$)
440 IFMID$(SC$,P,1)=MID$(CS$,P,1)THEN460
450 LINE(P*8-3,10)-(P*8+2,3),PRESET,BF:DRAW"
BM"+STR$(P*8-3)+",10":DRAWL$(VAL(MID$(SC$,P,
1))+16)
460 NEXT
470 IFSC>S THENS=S+10000:DI=DI+1:IFDI>4THE
DI=4ELSEGOSUB510:PLAY"05T2L32CBCBCBT255L25
1"
480 CS=SC:CS$=STR$(CS):RETURN
490 A$="GAME OVER":LINE(89,99)-(163,109),PRE
SET,BF:DRAW"BM91,107":FORX=1TO9: DRAWL$(ASC(
MID$(A$,X,1))-32)+L$(0):NEXT
491 A$="HIT RED BUTTON TO PLAY":LINE(38,109)
-(214,119),PRESET,BF:DRAW"BM40,117":FORX=1TO
22:DRAWL$(ASC(MID$(A$,X,1))-32)+L$(0):NEXT
499 A$=INKEY$
500 IFPEEK(338)=255THEN500ELSERUN
510 LINE(214,2)-(250,12),PRESET,BF
520 IFDI=1THENRETURN
530 FORP=1TODI-1:PUT(P*12+202,2)-(P*12+212,1
2),A,PSET:NEXT:RETURN
540 DIML$(57)
550 L$(0)="BR4"
560 L$(12)="BR3BULURD2GER2BU"
570 L$(14)="BR2LURDBR2"
580 L$(16)="BUU4ER2FD4GL2HER4BD"
590 L$(17)="BRBUSED6LR2BR"
600 L$(18)="BUSER2FDG4R4"
610 L$(19)="BUSER2FDGLRFDGL2HER4BD"
620 L$(20)="BR3U6G3R4BD3"
630 L$(21)="BUFR2EUHL3U3R4BD6"
640 L$(22)="BU3R3FDGL2HU3E2RERBD6"

```

```

650 L$(23)="BU6R4G3D3BR3"
660 L$(24)="BR4BU2DGL2HUER2FDGFBBD2"
670 L$(25)="BUFR2EU4HL2GDFR2BRBD3"
680 L$(26)="BRBURULDBU3RULDBR3BD4"
690 L$(27)="BR2BULURD2GBRBU5LURDBR2BD4"
700 L$(28)="BR4BU6G3F3"
710 L$(29)="BRBU4R2BL2BD2R2BR3BD2"
720 L$(30)="E3H3BR4BD6"
730 L$(31)="BU5ER2FDG2BD2UBR2BD"
740 L$(32)="BU5ER2FD4GL2HUER3BD3"
750 L$(33)="U4E2F2D2L4R4D2"
760 L$(34)="RU6LR3FDGL2R2DGL3BR4"
770 L$(35)="BR4BUGL2HU4ER2FBD4"
780 L$(36)="RU6LR3FD4GL2BR3"
790 L$(37)="U3R4L4U3R4BD6L4R4"
800 L$(38)="U3R4L4U3R4BD6"
810 L$(39)="BR2BU3R2D2GL2HU4ER2FBD5"
820 L$(40)="U6D3R4U3D6"
830 L$(41)="BR2LU6L2R2BRBD6"
840 L$(42)="BU2DFR2EU5BD6"
850 L$(43)="U6BR4G3F3"
860 L$(44)="R4L4U6BR4BD6"
870 L$(45)="U6F2E2D6"
880 L$(46)="U6DF4U5D6"
890 L$(47)="R4L4U6R4D6"
900 L$(48)="U6R3FDGL3BR4BD3"
910 L$(49)="BUU4ER2FD4GL2HBR2BU1F2"
920 L$(50)="U6R3FDGL3RF3"
930 L$(51)="BUFR2EUHL2HUER2FBD5"
940 L$(52)="BU6R4L2D6BR2"
950 L$(53)="U6D6R4U6D6"
960 L$(54)="BU6D4F2E2U4BD6"
970 L$(55)="U6D6E2F2U6D6"
980 L$(57)="BU6DF2E2UDG2D3BR2"
990 GOTO1500
995 Y=10:PMODE4,1:PCLS:SCREEN1,1
1000 READA$:IFA$="END"THENFORX=1TO100:SOUNDR
ND(255),1:NEXT:RETURN
1010 DRAW"BMS,"+STR$(Y)
1020 FORP=1TOLEN(A$)
1030 DRAW"C1"+L$(ASC(MID$(A$,P,1))-32)+L$(0)
:NEXT:Y=Y+12:GOTO1000
1040 DATA "DIGGEM"
1050 DATA "
1060 DATA "YOU CONTROL THE SMILEY FACE"
1070 DATA "WITH THE RIGHT JOYSTICK AND DIG"
1080 DATA "THROUGH THE GROUND. "
1090 DATA "BY EATING THE GROUND PLANTS"

```

PROGRAMMING

```

5 ' BROTHER HR5 PRINTER SCREEN DUMP
10 P=0:D=191:CLS:INPUT"WHICH POSITION: 5=LEF
T 27=CENTRE 49=RIGHT";P
20 A=255-A:'DELETE THIS LINE FOR INVERSE
30 IF D>191 OR D<1 THEN PRINT "DON T BE STUP
ID!":GOTO20:PMODE4,1:SCREEN1,1
40 PRINT £-2,CHR$(27);CHR$(68);CHR$(P);CHR$(
0);:PRINT£-2,CHR$(27);"M"
50 IF P=0 THEN 60:PRINT £-2,CHR$(9);
60 PRINT£-2,CHR$(27);"K";CHR$(&H00);CHR$(&H0
1);:FORX=0TO255
70 A=PPPOINT (X,Y)*128+PPPOINT(X,Y+1)*64+PPPOIN
T(X,Y+2)*32+PPPOINT(X,Y+3)*16+PPPOINT(X,Y+4)*8
+PPPOINT(X,Y+5)*4+PPPOINT(X,Y+6)*2+PPPOINT(X,Y+
7)*1
80 PRINT£-2,CHR$(A);:NEXT X
90 PRINT£-2,CHR$(27);CHR$(48);CHR$(10);CHR$(
0);
100 Y=Y+8:IFY>D THEN 110 ELSE GOTO 40
110 CLS:END

```

```

1100 DATA"YOU SCORE POINTS. YOU MUST ALSO"
1110 DATA"DODGE THE SQUARE MONSTERS WHICH"
1120 DATA"ARE AFTER YOU. YOU CAN KILL THE"
1130 DATA"MONSTERS BY LETTING A GROUND "
1140 DATA"PLANT FALL ON THEM AND MUSH "
1150 DATA"THEM. THIS ALSO KILLS THE PLANT"
1160 DATA"AND A DEAD PLANT DOES NOT","SC
ORE POINTS. ","END"
1170 PLAY"03BDEGACDEGDFEA-D+CDEF601":LINE(A,
B)-(A+10,B+10),PRESET,BF:LINE(C,D)-(C+10,D+1
0),PRESET,BF:A=0:B=22:C=242:D=22:LINE(0,32)-
(255,32),PSET:LINE(0,33)-(255,191),PSET,BF:G
OSUB2000:LINE(0,32)-(255,32),PRESET:PUT(X,Y)
-(X+10,Y+10),A,PSET
1180 FORX=1TO10:LINE-(0,32),PSET:PLAY"C":LIN
E-(255,32),PRESET:PLAY"C":NEXT
1190 FORX=1TO6:LINE(X+125,33)-(127-X,186),PR
ESET,BF:PLAY"DGAFF":NEXT:X=XX:RETURN
1500 CLS:PRINT:PRINT:PRINT"DO YOU NEED INSTR
UCTIONS (Y/N)?";
1510 A$=INKEY$:IFA$=""THEN1510
1520 IFA$="Y"THEN995ELSERETURN
2000 FORP=1TO100:PRESET(RND(255),RND(191)):N
EXT:RETURN

```



NEWS FEATURE

EXCLUSIVE

COMPUTER JOBS • COMPUTER JOBS • COMPUTER JOBS

The world of computing has expanded tremendously in recent years, which means that there are now many job opportunities within the Industry. However, there is a shortfall of skilled labour to fill the vacancies. This means that the salaries offered in this Country are substantially higher than those in the USA, where there are a great many more skilled computer personnel.

Training comes in many varieties and is available from a great many sources. Some training leads to recognised qualifications, such as GCSE's, B/TEC's or Degrees. Other types merely provide experience and help to increase confidence with computers, which is often a problem when computers are introduced to an office.

I believe that at the moment the GCSE course offered is in Information Technology rather than computer studies or computer science. Because of the variation in examination boards, this course is likely to vary in content and quality across the Country. A qualification in Information Technology is likely to place less emphasis on practical programming and methodology than Computer Studies/Science courses. Thus the IT courses would be more suitable to those aspiring to become data entry personnel, computer operators, or indeed any form of secretarial post. To be brutally honest, I do not think that a qualification at such a base level is of much use on its own, especially if there are aspirations towards programming. I didn't have the opportunity to take an O Level in Computer Studies, but from what I can glean from friends who did, it was not particularly beneficial. Indeed when progressing to B/TEC a number of my class mates who has the O Level struggled with anything marginally above it.

From school I progressed straight to Stockport College of Technology where I gained a B/TEC National Diploma in Computer Studies. These courses take place over two or three years, full and part time respectively. Six units are taken in each year, and I am told that it is not dissimilar from the GCSE system. On average six assignments have to be completed for each unit, plus some form of examination, although the exam is not of major importance. On my first year I had to take some units that were not directly related to computers, but they did help, especially in my final year. For example, I had to take a unit called People & Communications, which was basically an English type class. However, I was taught a whole manner of communication skills which will help in the future - formal report writing, feasibility studies etc. The set of units taken on the B/TEC course are pretty standard and I understand that each college can choose one of the units itself. In my case that was Marketing. On the programming side, the first year consisted of no more than BASIC. This is to cater for those without any previous programming experience. On the second year COBOL & Pascal were taught, along with dBase. I was so appalled with dBase that I taught myself Open Access Database, which is far superior. Indeed, for my Small Business Systems project I wrote a college enrollment system in Open Access. I also had to write a suite of business programs for my COBOL project.

The final documentation for this ended up as 50 pages of typed A4, 25 pages of structure diagrams, 50 pages of test data and run copy and a further 100 pages or so of document

program listing. In addition to this I also produced a desktop published user manual for the package. For one month I was seconded into industry to program, which was good experience and resulted in my being offered a job. The industrial placement scheme is priceless and is one of the most attractive features of the course. Let's get it straight - B/TEC's are not easy! There's a lot of work involved, it just happened that I had already done a lot of what I was taught, and indeed on my first year learnt a very minimal amount. A lot of people struggled on the course and they tended to have had little or no experience with computers. However, they now have jobs in computing or have progressed further in education. The entry requirement for the courses are 4 GCSE's of Grade C or above, with mature students being considered on merit.

A Levels in Computer Studies do, I am reliably informed, exist in some parts of the country. From what I can gather the material covered is often less in-depth than that on the B/TEC although with different examination boards this may vary somewhat. An A Level in Maths is by no means essential, but it would certainly not go astray.

The next step up the qualification ladder is either an HND or a Degree. HND's are significantly easier to gain places on, but do not carry the weight of a degree. Once more, these are run by B/TEC and are of a similar structure to the National Diploma that I took. Entry requirements for these are quite low, a pass on an Ordinary National Diploma or one A Level is usually quite sufficient.

Degrees are a different kettle of fish altogether. To gain entry to one of these you will certainly need three A Levels. In the case of Lancaster University, where I am based, I understand that grades BBC are required. I needed to obtain two distinctions and four merits on my final year of my B/TEC for entry. These requirements differ from University to University and tend to be lower at Polytechnics. The content of the courses also tends to be lower at Polytechnics. The content of the courses also tends to differ quite a lot. A case in point is at UMIST where there is an accounting course on the first year for some reason. Additionally the UMIST degree is rather Mathematical, which wouldn't suit me with nothing more than O Level Maths. My degree here at Lancaster is not mathematically orientated, but does differ in a number of ways. On the first year all students take three subjects, in my case Computer Science, Economics and Marketing. From this, on the second year, students whittle the choice down to one or two and have the option of doing a single or joint major. My computer science course puts much less emphasis on practical programming than my B/TEC did, there is far more theoretical work which doesn't suit everyone. However, a good variety of subjects are covered, including Pascal, Software Engineering and Machine Code. I'm still on my first year, so I can't tell you much more, but the BSc does gain students exemption from some of the British Computing Society's examinations. The course suits me, but in no way could it be considered a continuation of A Levels or a B/TEC. Once again, experience is not required, merely useful.

Right, that just about sums up the main types of courses available. Now to jobs. There are a wide variety of these, and they all require different degrees of experience and qualifications, consequently they command different salaries too!

Programmers come in many varieties as Heinz have soups. There are essentially games programmers and serious programmers. When I say serious, I am referring to business and application programming, that's not to say that games programming isn't a serious business because it is.

To enter games programming you generally don't need any professional qualifications. You get in on your own merits and your ability to prove yourself. However, some software

companies and development houses are now demanding degrees. If you intend to work freelance, like myself, then you don't need any qualifications whatsoever. You just submit your work to a publisher or two and hound them to death. Becoming tied to a publisher never appealed to me, but then you may be guaranteed a regular income, and work on top licenses etc. Games programming requires a large amount of machine code experience, and a detailed knowledge of a popular machine (so don't go approaching Ocean telling them you can program a Dragon, they're not going to train you, you have to have the experience beforehand).

Serious programming tends not to be in machine code, but in high level languages. Thus, there are opportunities to program in virtually any language you can think of; COBOL (the most widely used programming language in the world), Pascal, Ada, Basic, C, dBase, and numerous 4GL's. The list is virtually endless. However, a large amount of programming work is 'simply' maintaining other people's programs, essentially de-bugging. This can be very tedious to say the least. There are many opportunities to work on defence, and indeed one of my friends from College is now working on defence programming for Ferranti. You will need a computing or mathematical qualification to enter the real world of programming. Experience is also a big plus. Training is usually provided as it is unlikely that everyone has done the same sort of programming before.

The financial rewards for both of the above programming jobs can be large. With games programming the reward is very much related to the talent you possess, and the royalty payments can be far apart. Serious programming guarantees a salary and there is job security, there's also a greater level of abstraction from the machine itself, which is an advantage when switching jobs.

The Systems Analyst is usually placed in the world of business. Often the job is described as Analyst/Programmer. Basically the position will probably involve programming COBOL solution to business problems that you are required to identify and detail. For this, experience in business studies is a good idea. The pay for this kind of job can be phenomenal, it all depends on who you work for. Generally to progress to this kind of job you will have had to have gained several years experience as a junior programmer. You will certainly need to be qualified past O-Level standard, and indeed an HND or BSc may be a necessity in some cases.

Unfortunately the job of a Computer Operator requires absolutely no programming skills whatsoever. Basically all that is required is keyboard skills. During vacations I have worked as an operator, and picked up between £75 and £100 per week, which for a non tax paying Student isn't too bad. Generally speaking computer operators have very little scope for promotion, the jobs tend to be with companies which are not specifically associated with computers, an example being one of my college friends who works for a haulage company. There are a great many types of jobs within the Computing industry and it would take a great deal more space and time to even try to document them all. However, I hope that this article has been of some assistance, and hopefully those interested will seek further information from alternative sources. If you are considering a career in computing then I wish you luck. There is still scope within the industry for many more to be employed because of the shortfall of qualified people and also to some extent of the brain drain factor.

FOR FURTHER INFORMATION CONTACT YOUR LOCAL COLLEGE/UNIVERSITY OR CAREERS ADVISORY SERVICE

clubs / FANZINES

LATE NEWS UPDATE

In only his first few months as proprietor of Dragonfire Services, Robin Hemmings has done much to rejuvenate the once troubled software house. With a host of hits under the belt, and the promise of more to come, the future, for the time being at least, looks bright. Such is their confidence, infact, that the company has re-launched the Dragon Domain - Public Domain Library originally created by Andrew Hill.

The service they provide is simple. In exchange for a blank 40 track 5.25" disk, a suitably sized SAE and £1 to cover production costs, the Library offer a large range of titles, all of which are freely available to the public. At present, the Library offer three packages - Dragon 1, 2 and Tandy 1.

Dragon 1 includes a vast range of graphics, utilities and games - 3D graphics packages, Disk convertors, many graphics screens and routines, simple games, disk management programs, hi-res screen drivers, databases ... the list is endless. Dragon 2 is not yet fully complete but already it boasts a large range of games and utilities. Tandy 1 contains 3 programs which accompany articles featured in Dragon Magazine.

If you provide, for example, two disks and request both Dragon 1 and 2, the Library will provide both at no extra cost - the same principle applies to double sided disks.

The Dragon Domain Public Domain Library is provided free to all Dragon users and we are assured that all programs will be considered for inclusion in the Library.

For further details concerning the Dragon Domain Public Domain Library contact Dragonfire Services, 8 Ingleby Road, Wigston, Leicester, LE8 1DG.

The newly created Drax Public Domain Library has announced major organisational changes. As of now membership to the Group is to be abolished, presumably with software titles being offered to the public at charge, though this has yet to be confirmed. The Group's monthly newsletter is also to be scrapped. Write to Barry Hitchings, Drax P/D, 123 Cowick Road, Tooting, London, SW17 8LJ for further details.

-Public Domain Software, exported directly from the USA has been readily available for some time. One of the more reliable sources, Randy Longshore, provides top quality software for the Dragon and CoCo's 1, 2 & 3. Write for further details to Randy Longshore, 15547 Chequer Drive, Chesterfield, NO 63017, USA.

Knight Computer Services has announced the release of its complete Desk Top package ... Priced £15 the program comes complete with 38 fonts in ten variable sizes and features an Epson Printer dump, full graphics package, font-editor and clip-art library. Further details are available from KCS at 76 Etwell Road, Hall Green Road, Birmingham, B28 0LE.

The European Leisure Software Publishers Association (ELSPA) have launched a new campaign aimed to combat the spread of Software Piracy. The campaign is supported by the majority of popular Computing Publications, most of which have donated advertising space to the cause. More information on the subject can be obtained from FAST (Federation Against Software Piracy) on 01 240 6756.

Compusense have recently moved address. All correspondence should now be directed to the Company at 54 Dawlish Avenue, Palmers Green, London, N13 4HT.

The Tandy Corporation has introduced major savings to its range of Printers. The DMP 132 Dot Matrix Printer has been reduced to £199 excluding VAT whilst the DMP 900 is available at the reduced price of £169, again excluding VAT. Contact your local Tandy dealer for details. 30

PROGRAMMING

By Robin Hemmings

"Top Down Programming" is one of those terms you really ought to know if, like me, you're doing A-Level Computer Studies. In layman's computer jargon, however, it simply means structured programming.

Structured programming and/or program design is something most people appreciate the usefulness of, but tend to think it doesn't really apply to them because it implies working a program out on paper before using the program. This is just too much for most of us (myself included) so we tend to ignore it. Therefore we are still seeing a lot of programs produced in "spaghetti BASIC", bits of program which are inefficient and not particularly elegant, both concerning run-time and memory usage. In fact this need not be the case. We can turn a mass-kludging session into a relatively elegant program just by thinking about the objectives for a minute or two before we stampede towards the keyboard and start frantically tapping away. It can be very useful to build up a mental picture of the program's structure, and this doesn't take up too much time.

So what are we looking for? First, discern the program's purpose. This may sound obvious, but I can remember starting a fair few BASIC programs with only the vaguest idea of what the end product was meant to achieve. Usually I gave up on these in disgust. So, having decided what you're going to write, it's time to start to structure the program. All structured programs should have a main program section. The idea behind top-down programming is that you break each task down into a number of smaller tasks and smaller ones still until what's left is a series of very simple subroutines. Well, cobblers to that, it sounds far too organised. This is where my own brand of structured programming comes into being, which I call bottoms-up programming, because it's best to have a stiff drink before you start!

Certainly, write a main program. It should consist mainly of subroutine calls. If your program is menu-driven, so much the better. The main program is the menu. If not then you'll have to break your program down into "X" tasks. For instance, suppose that you wanted a program to input a message, encode it and print out the coded message. There are four stages here. Teach the program the code (which I'll call "A"), input the message (B), encode the message (C), and print the coded message (D). My main program would look something like this:

```
10 GOSUB 1000 : ' LEARN CODE
20 GOSUB 2000 : ' INPUT
30 GOSUB 3000 : ' ENCODE
40 GOSUB 4000 : ' PRINT
50 INPUT "ANOTHER MESSAGE?";A$
60 IF A$="Y" THEN GOTO 20 ELSE END
```

Notice that I haven't used any variables, except A\$ for its obvious purpose. This is because I expect routine A to create its own DIMs and variables, routine B to provide a variable to input the user's message into, routine C to use the variables from A and B to create its own output and routine D to simply print this.

CONTINUED ON PAGE 35



HARDWARE

ALAN SHIFT REVIEWS THE BEST SERIAL I/O INTERFACES

By far the best option available is to have a Serial I/O port which doesn't fill the cartridge port, so a DOS system can still be accessed. The Dragon 64 is set out like, but there are no built in commands to use it. There are routines available from ROM which can be called on, but there are checks to be made on the system before they are used. Dragon User published routines to read and write to the I/O port but no explanation of the routine left me, for one, scouring Data sheets to figure out the use of the control register, more of which later. A good option for Dragon 32 users would be to fit an RS232 port inside the Dragon, the type advertised by Fullers which they claim behaves similarly to that of the Dragon 64. I have no experience of this unit but it would leave the DOS accessible.

A cartridge that provides RS232 and still allows DOS to be accessed is the New Era Interface, formerly marketed by Peaksoft. The New Era was intended as a plug in and go communications package and apart from one hiccup, it was exactly that for me. The cartridge plugged into the port, the Dos piggy backed onto the top and the DOS or New Era was selected by a toggle switch. The main advantage here was that when files were taken from a bulletin board and put into the memory buffer, this memory section could then be saved to disc, allowing a quicker method of obtaining files so reducing the time "on line". The unit came with an onboard operation system, was menu driven, contained in a ROM and it worked very well indeed. I have spent many an hour dialling boards, logging on all over the country and though it can prove quite expensive, it can be fun if you're sensible. I haven't explored the RS232 side of this unit, preferring to leave it dedicated to comms but I don't see any reason why it can't be used as a serial port, allowing DOS to be accessed.

If you are after a quick cheap way to get into RS232, the best option is the Maplin I/O Interface. It comes as a kit, costs £14 and is of low technical difficulty. To build it will take around four hours, little setting up is required and there are test routines included to help you prove the unit is functioning.

This was my first foray into RS232 and even now if I want a reliable set of pulses then this is the easiest way to get them. The main restriction is that the unit only runs at 300 baud, but word format can be altered. The unit is not cased but has proved robust, reliable and at £14 is good value. Seeing as this unit uses the Cartridge port, DOS is not available, unless you use a Sutcliffe DOS Adaptor.

Another option which takes up the cartridge port is the best RS232 add on available, though albeit secondhand. The Race RS232 I/O Interface features, as well as the RS232 port, a VIA by means of a 40 way IDC. The unit is cased and all that is visible when plugged in is an Led for power indication, a 40 way IDC socket and a 25 way D connector for the connections to the serial system. The connectors are only part of the system, onboard is a operating system which extends basic and all options - read, write, baud rate - are all controlled by BASIC commands, only word length and parity need to be poked. 32

On The Spot

EXCLUSIVE

In this, the last in our series, Dragon Logic talks exclusively to Robin Hemmings, proprietor of Dragonfire Services. As one of Dragon Logic's most prolific writers, and an enthusiastic programmer, Robin Hemmings has, in a few short months, restored Dragonfire's position as one of the market leaders in software production, with further releases now nearing completion, and looks to the early 1990's as a period of Challenge for both Dragonfire Services and the Dragon market, as a whole.

WHY DID YOU MAKE A PERSONAL CHOICE TO BUY A DRAGON?

Actually it was my parents' choice - I was 10 at the time! They had originally intended to buy a Spectrum but the waiting list put them off and someone suggested they take a look at the Dragon - they were suitably impressed.

WHAT EXPERIENCE HAD YOU HAD WITH THE DRAGON PRIOR TO TAKING CONTROL OF DRAGONFIRE?

I had access to a Dragon since November 1982, and was programming for most of the time. In 1986 I released an adventure called "The Bomb" under the name of Hobbitsoft, which I advertised in a Dragon Monthly classified ad. Nobody bought it, but in 1988 Andrew Hill offered to take it on under the Dragonfire label. This led me to also write "Hole" and "Don't Squeal".

HOW DO YOU RATE THE DRAGON AS A GAMES MACHINE?

There is no question that it's outdated, but I suppose it's OK if you're not after super-impressive graphics, sound, speech etc. For me it's the playability and addictiveness of a game that counts, and there's been plenty of good material over the years.

WHAT DO YOU LIKE BEST ABOUT THE DRAGON?

It does everything I want it to at the moment. Also 99% of the people involved with the Dragon are friendly, helpful etc.

DO YOU THINK DRAGON USERS ARE DOING ENOUGH TO KEEP THE DRAGON ALIVE?

What's needed is a major international advertising campaign run by Saatchi and Saatchi telling everyone to buy Dragons because they don't REALLY need an Amiga or ST! As this is not happening, Dragon users are not doing enough - someone should be organising it! I do think, though, that we're not doing badly for such a small number. After all, if people don't want to buy a game or write articles then you can't force them to.

HAS YOUR WORK WITH THE DRAGON BEEN AN ENJOYABLE EXPERIENCE AND WHAT HAS MADE IT ALL WORTHWHILE?

Certainly I've enjoyed my time with the Dragon. I don't think any specific reward has made it all worthwhile. When I make my first million, that'll probably be it. It's been a good experience all round, so far.

IN THE LIGHT OF YOUR RECENT TAKEOVER OF DRAGONFIRE, COULD YOU EXPLAIN THE REASONING BEHIND

YOUR DECISION TO BUY THE COMPANY?

I didn't want to see Dragonfire go down the drain or get bought up by another company. I thought enough companies had gone down those paths - soon there wouldn't be any left. It also might benefit me : certainly it will be (has been) an interesting experience and will look good on my CV. Making money was not really a primary thought as there's so little to be made. Other than that, all I can say is that it seemed like a good idea at the time

WHAT EXACTLY DOES THE DEAL WITH ANDREW HILL INVOLVE?

I own Dragonfire and he doesn't. I bought Dragonfire from Andrew because he no longer had the time to run it. I deal with all advertising, software sales, software duplication, payment of royalties and everything else I can think of. I also control the Dragon Domain - Public Domain software library, which means copying disks of free software.

HOW CONFIDENT ARE YOU THAT THE DECISION TO TAKE CONTROL OF DRAGONFIRE WAS THE RIGHT ONE?

It was the "right" decision for the Dragon fraternity if Dragonfire is still in existence in 1991. The more -companies the better. As to whether it was "right" for me, there are advantages and disadvantages, and only time will tell whether I should have kept my mouth and wallet closed.

HOW CONFIDENT ARE YOU THAT YOU CAN SUCCESSFULLY REVITALISE DRAGONFIRE?

I can only sell the software I've got to those who want to buy it. Beyond that, I try not to think about it. Again, only time will tell.

HOW DO YOU RATE THE DRAGON AS AN ALTERNATIVE TO THE MACHINES OF TODAY?

Not very highly, performance wise. It just doesn't have the graphics, sound capacity, speed, hardware or software range of the newest generation of computers - 16 bit and higher. It can and does, however, fulfill a useful function for many people, and could probably do so for many more were it not for the blinding capabilities of these other machines.

HOW SERIOUS A SET BACK DO YOU FEEL THE DEMISE OF DRAGON USER HAS PROVED TO BE?

Helen Armstrong once described Dragon User as a "safety net" for Dragon users. That safety net has now been removed and for those of us walking the tightrope this is a little disconcerting. Still, you're reading this, aren't you? Dragon User's loss was another nail in our coffin, but not the final one. I can't compare sales before and after its demise because I wasn't in the "business" before it happened. We've survived for over a year though, so it can't be that bad.

HAVE YOU ANY NEW TITLES NEARING COMPLETION?

Mike Townsend has very kindly converted Pop-Up-Print-Master for tape. "Intelligent Database" from Craig Moss is nearing completion. Beyond that, I don't know where the next game's coming from! Perhaps it's time for me to start writing ...

WHAT IN YOUR OPINION DOES THE FUTURE HOLD FOR SMALL, PART TIME COMMERCIAL CONCERNS SUCH AS DRAGONFIRE?

They will continue as long as they can until there is no longer a viable market and will then disappear. This applies to all Dragon publishers, including Dragon Logic.

TO WHAT EXTENT DO YOU ATTRIBUTE THE CONTINUED SURVIVAL OF THE DRAGON TO THE EFFORTS OF THE MEDIA?

The non-computer specific media has largely ignored computers, let alone Dragon. No help there. 'Trendy' computer magazines that appear on the shelves do their best to wash their hands of us, apart from a few exceptions who only rarely feature the NDUG's address. There is no doubt, though, that the Dragon media (Logic included) have kept the Dragon's head above the water

TO DATE, WHAT HAS BEEN YOUR MOST SUCCESSFUL PROGRAM?

Since I took over, Pop-Up-Print-Master, probably because it's a new release. Before that I can't say, but I'd guess at WIMP.

ON AVERAGE, HOW MANY UNITS OF ANY ONE PROGRAM CAN YOU HOPE TO SELL?

Since I took over I reckon the average sales equal about 1 copy of each item of software we stock.

WITH DRAGON SUPPORT FALLING HAVE YOU EVER BEEN TEMPTED TO MOVE ONTO MORE PROFITABLE MACHINES?

No, I wouldn't have the money to get started or the time to cope with possible success. It's Dragon or nothing for me.

DRAGONFIRE PULLED OFF A MAJOR COUP WHEN IT SIGNED UP JONATHAN CARTWRIGHT. HOW DID THIS DEAL COME ABOUT?

I'd been in touch with Jonathan before my takeover, and when I offered him a better deal than Pulser he obliged to help me get some more software on my list.

AS A PROGRAMMER DO YOU FIND IT DIFFICULT TO DEVISE NEW TITLES FOR THE DRAGON?

Adventures are easy, there's so many possible plots. It's also easy to come up with the ideas for arcade games - just copy them from other computers or look round the arcades. The hard part is finding the time needed to program.

PROGRAMMING

CONTINUED FROM PAGE 31

Why have a subroutine for B, you may ask, when a simple INPUT statement is obviously sufficient? This is to allow for expansion. Certainly, you could just use INPUT but what happens if you decide that you don't want to accept an input with an ampersand in it, for example. You could squeeze this coding in between lines 20 and 30, but this is the sort of thing that leads to spaghetti programs. Instead you have a whole subroutine to play with, lines 2000-2999. Working this way it is much easier to make changes without disrupting the flow of the program.

You may say it's only a simple program, I'll never want to expand it. But just writing programs this way makes it far easier to debug them and to understand them if you come back to them months or years later.

So that's the way I write programs in Dragon BASIC, or BBC Basic which I use occasionally. You may find the system totally unworkable but I find it fits my style of thought perfectly well - not too organised and not too messy. Feel free to adapt your own style.

One last note which I should add for completeness. You'll notice that if you were using BASIC09 or some similar language then this train of thought is tailor-made for it. Rather than use subroutines you can use BASIC09's wonderful "procedure" feature and forget about line-numbers completely. This does get slightly more complicated however when you realise that you have to define each variable you want to use as global (ie. in the main program). Otherwise they will be assumed to be local and will disappear on returning from the procedure. However, this system I use was really created through use of Dragon BASIC, which doesn't require the pre-definition of variables. Just right for us programming-slobs!

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