

# DRAGON'S TEETH



THE MONTHLY NEWSLETTER OF  
THE DRAGON CLUB AT THE DUNGEON

ISSUE 3. MAY 1983.

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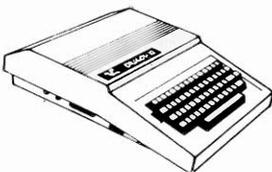
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## VIEW FROM THE DUNGEON

The Midland Computer Fair was, frankly, something of a disappointment. It wasn't that there weren't many Dragons evident (there were) or that the software scene for the D32 didn't appear to be hotting up (it was, see the Salamander announcements below), it was the absence of hardware!

The Dragon has now been with us for 8 months (discount August, supplies were too limited) and, by this time in the life of the ZX's or the Spectrum, the hardware was appearing thick and fast. The 64K upgrade remains a Maytime promise, disc drives a confused scene (Compusense and FLEX? Dragon Data and OS9? Windrush?) and nary a parallel port in sight. Maybe we are expecting too much (it is only a matter of 36 weeks or so after all), but with the speed of the whole microscene accelerating all the time, we might have expected at least a dedicated cassette recorder by now.

Our correspondence indicates that there is a substantial market out there dying to get their hands on a reasonably-priced printer for their Dragons. At present it seems odd to most of you to have to pay a good deal more for an effective printer than for the Dragon itself. Yes, we know that Dragon Data have promised two in due course but we don't fancy the CoCo copy (4½ inch paper doesn't seem adequate for program listing) and the A4 paper dot-matrix printer sounds a Seikosha look-alike and price-alike. Epsn, please come down market!

Turning back to software, the dearth of serious educational programs is puzzling. Dragon Data are a presumed "cert" to get schools approval (the Welsh Development Agency are, after all, the government in

another guise), so why aren't we seeing the quality programs that came out for the BEEB? Dragon Data have announced a series of educational tapes but these all seem to be pitched at the younger end of the user market and quality educational software seems limited to a couple of Garland G.C.E. tapes (O.K. if you're taking A-level Physics or Biology). Can't somebody out there write something other than the 27th version of educational 'Hangman'?

Enough moaning! What was encouraging at Birmingham was the wealth and quality of Dragon software emerging and promised in the near future. The Pi-man (dancing around the Automata stand in his pink combinations, to the beat of a "trad" jazz band) confirmed that "Groucho Marx" à la Dragon is in the offing. Gravesend Computers announced the "Baby Dragon" series (tapes for the under-10's) and passed on the first containing a "classic" - 'Teddy Bears' Picnic' (try to take the honeypots past the sleeping Teddies!)

Salamander, as usual, appeared to be leading the Dragon scene by the nose. They advised us that they have just signed up the rights to Jeff Winter's U.S. arcade game series, probably leading off for the Dragon with "Grid-runner" (the number one seller in the U.S. at the moment, in VIC-20 form) and the classic "Laser Zone." The latter makes the arcade "Armored Patrol" look positively primitive!

Salamander are also launching off into an adventure series; probably three scenarios, starting off with "Franklin's Tomb". These adventures use every byte of the Dragon's memory and, rather than weaken the program with all that graphics memory requirement, Salamander are issuing a booklet with each tape. In the booklet, each scene is depicted in detail and, as the adventure progresses, you are referred to the booklet for "what you see." Could catch on as an aid to the big text adventures.

The real treat at the Salamander stand however, was the superb Graphics System tape, released at a snip price of £7.50. This resembles their BBC graphics package and is way ahead of many of the other artist/designer packages launched to date. Perhaps the ultimate tribute to the system is the fact that a number of software house competitors have been quietly buying the tape, to assist in the production of their own programs.

The other news of note came from a member of our own Dragon Club at The Dungeon. You will shortly be seeing the launch of a unique games tape, with definite "Tron" overtones. What makes this particular game (probably to be sold as "Drone") special is the use of pre-recorded robotic speech embedded in the program. Not synthetic speech, but your actual studio-recording-session speech. Can't think why nobody's done it before.

Finally, the usual monthly contrition for the late arrival of D.T. The Club has grown to the point that it badly needs full-time attention and it is clear that, to expand its services on advice, etc., "Dragon's Teeth" needs volunteer specialists to answer the flood of questions and requests for more details of this and that. Anybody feel up to advice on a particular topic?



# REVIEW

## 'SEARCH AND DESTROY'

A Review of P.S.S.'s 'ATTACK' and 'STAR TREK' by Clive Gifford.

Personal Software Services offer 2 games cassettes, both at a price of £7.95. These cassettes arrived promptly in excellent custom cases with black and white inserts. I was told by P.S.S. that mine were pre-production ones and that the proper ones will be in colour - great! The packaging of these cassettes is really very good indeed and adds so much to the whole software. It's a shame that more software houses cannot produce packages like this, but I suppose for the smaller houses the cost of bulk-buying these types of cases must be prohibitive.

Back to the games. The first one I looked at was 'ATTACK', a totally machine code program which P.S.S. describe as a cross between 'Defender' and 'Scramble.' I had problems with loading and eventually, after much fiddling with the volume and tone controls on my usually reliable cassette recorder, I managed to achieve a 50% success rate. I did not receive any instructions with this particular cassette at first and could only find the up and down keys. The instructions arrived promptly and I found that the game was not based on dodging the aliens but shooting them!

The idea behind the game is that you are in charge of security on the planet 'Koventri' (what an awful pun, P.S.S.) where all the space invaders are kept in captivity. There has been a large breakout and you must stun them and shepherd them back to the compound which is represented by the flat area among the mountainous skyline of the planet.

A large pat on the back for P.S.S. on the subject of controls. These are the usual up and down, thrust and fire and a reverse direction key but the positioning of these controls is particularly good. A and Z control your up and down movement, K and L provide your thrust and fire your laser respectively and the space bar changes your direction. Much thought has been put into the positioning of the controls and the result allows fast and easy control.

The game is started by typing EXEC and as soon as the screen display appears, the Break key should be pressed. The game is played in the highest resolution mode of the Dragon with a green and black display. Your craft is in the middle of the screen with a landscape below. Below the landscape are 3 numbers. The left number is your total score, the middle one is the number of lives you have left (you start with 3) and the right figure tells you the number of invaders you have stunned.

A small query with the instructions that P.S.S. provide on the subject of loading. They say that you have to type in CLEAR 20, 16000 before loading the game. I found that the program never loaded when typing this in - would any owners of this game like to comment?

Your ship always stays in the middle of the screen and when moving the landscape scrolls smoothly below. You must search for the escaping invaders and once they are within range of your laser pistol you must open fire and stun them. Your task is not over though, for you must catch them before they land and drag them unwillingly

back to the prison compound. You receive points for stunning aliens and many more for imprisoning them.

After some time, the invaders start to mutate into creatures seemingly dedicated to your destruction. These mutants home in on you and are very difficult to get away from, let alone trying to capture. The sounds in this program are pretty simple but effective and the program had some nice touches to it, such as the way the ship slows down after you stop pressing the thrust key.

The aliens move about at a terrific rate, weaving and bobbing all over the place and sometimes in pairs. They have no weapons but they only have to collide with you to destroy you. I think the provision of different levels could and should have been added. This game is very fast and quite difficult to attain a reasonable score on. Even just 1 slower level would enable many people, new to the game, a better chance of learning to play.

In conclusion, this program is quite distinct from 'Defender' and 'Scramble.' For the arcade games enthusiast who wants a challenge, it is worth the above-average cost. For the 'not so hot' arcade player, have a look elsewhere before choosing this game.

Presentation.....	9 $\frac{1}{2}$
Entry Complexity.....	7 $\frac{1}{2}$
Play Complexity.....	8 $\frac{1}{2}$
Play Balance.....	6 $\frac{1}{2}$
Interest Level.....	8
Overall Rating.....	8

'STAR TREK' is another version of the classic space exploration game. P.S.S.'s version came in the same high quality packaging as 'ATTACK', but unlike that game, 'STAR TREK' loaded every time.

As with the usual version, you must scour the galaxy destroying Klingons, refuelling at star bases and avoiding certain hazards. This version has 10 commands at your disposal once you have chosen the level of action at which you wish to play. The commands include the usual warp drive, long range and short range scanners, phasers and torpedoes. It also has several other features. The impulse engines are used for moving within a quadrant and involve entering the direction and the warp. Engineering is a clever repair command and Alert allows you to select the standing of your ship at red, yellow or green.

The game is very comprehensive and has all the features that you would expect. It is played on a large 8 by 8 by 3 sector of space where there are many Klingons, black holes, star bases and other hazards to encounter. The game is very user-friendly, except for the long range scanner which is a bit confusing at first.

I have to feel a little sorry for any software house that produces a Star Trek game for the Dragon, as they have to compete with the acknowledged leader in the field, Salamander Software's version (reviewed in the first issue of "Dragon's Teeth.") Though £2.00 cheaper and not requiring joysticks, the P.S.S. version lacks many of the touches that transform a good game into an outstanding one. The graphics on the P.S.S. version are crude compared to the high resolution display of Salamander's effort.

Action in the P.S.S. version is very limited and the sounds which are very effective at first, tend to annoy after some time. The game is well-structured and there are many possible happenings within

the program that will keep you amused for some time. One particular criticism is of the movement within the quadrant and the firing of torpedoes, which could have been made single-key operations. This version, then, is not a real-time game but more of a strategy game. It does have good points (the three-dimensional universe adds a distinct challenge) but will not succeed Salamander's version as the definitive program.

Presentation.....	9½
Entry Complexity.....	7
Play Complexity.....	8
Play Balance.....	7
Interest Level.....	6½
Overall Rating.....	7

## OFFERS

This month's special offer will continue until 30th June, to allow for the late publication of "Dragon's Teeth."

During this period Club Members will be entitled to purchase two programs at 10% discount and as many "hardware" items as they wish, also at 10% discount. The latter will include Seikosha printers, but for these no cheques should be forwarded until we determine the number required for a bulk order on the Seikosha distributors.

We will shortly have to introduce postal charges for mail order customers, but Club Members will continue to be supplied at Catalogue prices, post-free. If you do see postage and packing quoted in the Dungeon advertisements, remember that these do not apply to Club Members.

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### COMPATIBILITY

Readers may have missed the letter in "Dragon User", from a user who considered that the Binatone Radiocorder (£19.95 ex Rumbelows) is the best available for trouble-free use with the D32. He stated that it had proved "much more consistant than the Sony, Aiwa or Hitachi."

Dragon Data report that the Prinz TR12 and TR15 and Tandy's "Realistic" recorders all seem to work well with the Dragon.

As far as printers are concerned, Dragon Data have announced that the following printers appear fully compatible: Seikosha GP100A and GP250A; Epson MX80; NEC PC8023; Amber 2400.

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# Hardware

WHY DO I NEED A PRINTER?  
by Keith and Steven Brain

There you are; you've spent £200 on a Dragon, £20 on a cassette recorder, far too much on software and here is someone telling you that you should spend as much again on a Printer. So can they be really serious? Well, that's a bit like asking how long is a piece of string? If all you want to do is play arcade games, then clearly the answer is no, but if that's all you are interested in doing then why did you buy a Dragon in the first place, instead of one of the 'toy' computers? So, what can a Printer do for you and can it be worth the money?

Let's start at the beginning with LISTing programs. No matter how much theory you read about the advantages of planning and flowcharting your programs in advance, real life just isn't like that. In actual fact, you suddenly get an idea for a program so you sit down at the keyboard and just start composing your masterpiece on the fly. That works fine as long as the program is short and you can finish it in one sitting, but as your programs get longer your problems increase exponentially. The amount you can LIST on the screen at any one time is very limited and, unless you can get a 'hard copy' that you can pore over, debugging starts to get almost impossible. Every month sees new additions to the range of weekly and monthly, general and specialist, micro-magazines and all of these are crying out for good 'copy' in the form of programs or articles on all aspects of the micro scene. At the same time we all know that there is nothing worse than typing in a long LISTing from a magazine, only to find that it doesn't work! Nobody likes being accused of publishing duff programs and, since they really don't have time to test out everything submitted to them, you will find that most reputable mags won't even think twice about publishing a program you send them unless you can provide an 'actual' LISTing taken straight from the working program. Now, micro-mag publishers are not renowned for their generosity to contributors but, if you read the small print on the title pages, you don't need a computer to work out that it doesn't take long for your Printer to pay for itself if you can get some of your work 'into print.'

Of course, the Dragon can PRINT#-2 as well as LLIST, so things you can print on the screen you can also easily get down onto paper. Just think what that means if you are dealing with financial programs, data bases or mailing lists. Anyone using their Dragon 'seriously' will find a Printer invaluable. Whether we like it or not, we are living in the micro age where word processing is becoming a way of life we must all adapt to and this is an obvious place where a Printer is essential. For example, this piece has been written on our trsuty Dragon with the aid of the excellent Microdeal Telewriter Package and a Seikosha GP100A Printer. Those who think that learning to use a word-processor is difficult should come and see eight-year old Nicholas using it to do his English homework! OK, so he has to write it out again the hard way in the end to satisfy tradition, but the advantages of writing 'on screen' have to be experienced to be appreciated.

The GP100A is the cheapest 'real' Printer on the market and we think it offers first-class value for money. Although the cheaper Tandy Color Printer lets you plot in four different colours, it only uses very narrow width paper and is so slow that it makes you feel a bit like Moses waiting for the stone tablets. The Seikosha is a dot-matrix Printer with the unique 'unihammer' system where a single needle flies round at great speed doing all the work. Although we must admit that this doesn't exactly make it quiet, the integral plastic cover means it is a lot less noisy than

its GP80 predecessor. You might suspect that the head is going to wear very fast with all that work to do, but having flogged our machine to death for six months we can't see any difference in the print quality. It prints upper and lower case characters on a 7 by 5 matrix, which means that you don't have true descenders on lower case (letters like 'p' and 'q' stand up above the line), but what do you expect for the price? The ribbon cartridge is easy to replace and with a new ribbon the printing is so dense that it is difficult to see the individual dots making up the characters. In our experience, you can get about 1000 printed sheets before the ribbon starts to fade, but the print still remains legible for a long time after that. There is an internal DIP switch which allows you to select one of four alternative character sets. In these different sets most characters are the same but, for example, the UK set gives the Pound Sterling sign and the others give German and Swedish accented characters. Whichever character set is switch-selected it is also possible to call up certain 'special' symbols (such as Greek letters) by sending out an appropriate character code. Text printing can be up to eighty columns wide and can be either single or double width, which is very useful for printing headings, or for emphasising particular words on a line. Single and double width characters can easily be mixed on the same line.

In addition to the character printing capability, the GP100A allows you to address each dot individually to print graphics, which you can also mix with text on a line. This means that you can design and print your own 'special' characters and, with a suitable program, dump copies of the high-resolution graphics pages of your Dragon. Apart from allowing you to print 'pretty pictures' this means that you can plot graphs, histograms, pie-charts, etc. The worst feature of the GP100A is without doubt the manual which, as you might have guessed, is written in best Japanese technical 'English', which almost needs a computer to decode!

Having struggled to convert this example of slow Oriental torture into 'real' English, we have provided the Dungeon Master with copies of our translation for your benefit.

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#### DRAGON DATA NEWS

Dragon Data have announced that they are licensing from Microware the OS9 Disc Operating System, together with BASIC 09, PASCAL and VERSION 7C compilers (all to sell around the £40 mark.) They also hope to launch twin RS232 interfaces around the £30 level.

D.D. also say that they are finalising an 80-column card (cheers from potential word-processing purchasers) and are planning to launch software to run Cis-COBOL on the Dragon.



# TIP

This month's Winning Tip comes from John Ford of 77, Arundel Drive, Harrow, HA2 8PN:-

Many users of the Dragon probably have access to a slow speed serial printer (e.g. a teletype or similar.) To use this type of printer on the centronics interface a parallel/serial converter is required. (I can supply a circuit if anyone is interested.)

This has one drawback as the Dragon has no 'LINE FEED' after 'CARRIAGE RETURN' (cheap printers having no auto line feed.) By POKEing 330,1 this is rectified and LF follows CR.

If your printer requires a non-printing character to follow LF (to allow the print head to return to the start of line) up to 4 NULL characters may be added as follows:-

POKE 330,A where A is the total number of characters to be output at the end of each line (e.g. CR, LF + 2 NULLS = 4) Now POKE locations listed below with the decimal equivalent of the character you require (using standard ASCII codes)

END OF LINE OF PRINT	<u>Default values</u>		CHAR	CHAR	CHAR	CHAR
	CR	LF	1	2	3	4
LOCATION	331	332	333	334	335	336
i.e.	0 FOR NULL		(Max. no. of NULLS shown			
	15 FOR SI		to indicate POKE locations.)			
	14 FOR LF					

Any non-print character may be used in locations 1 - 4 (POKES 333 - 336) or even another line-feed for two line spacing. A simple program to do it for you is as below:-

```
10 CLS : PRINT @ 10,"PRINTER SETUP"  
20 POKE 330,1  
30 INPUT "NO. OF NULLS NEEDED"; A  
40 POKE 330,(A+2)  
50 FOR T = 333 TO (333+A) : POKE (T),0 : NEXT T  
60 CLS : PRINT @ 10, "READY"
```

(John's choice of the PSS "TEXTSTAR" cassette as his 'reward' is on its way to him - D.M.)

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The light down here in the Dungeon is pretty dim and we may have misread your name or address. If this issue arrives with your name misspelt or the address incorrect, please let us know so that we can amend the mailing list. Thanks!

# Programs

by CLIVE GIFFORD

This article is rather a 'mish-mash' of ideas collected under the extremely broad banner of BASIC programming. It is well nigh impossible to write an article that will interest and inform everyone from the newest beginner to the most experienced machine code buff. This article is pitched more at the newer computer user and I hope that some of the tips are of use to you.

Firstly, on the subject of the famous POKE 65495,0. For those of you that have not heard of this (and I'm sure that most have), by typing the above value in, the speed of the 6809 processor, the heart of your Dragon, is increased by approximately 1.35 times. This may not sound much but can increase the speed of programs with many arrays and complex calculations to a very noticeable extent. There has been much correspondence on the subject but the major question was "What are the side-effects?" Apart from the output sources (the cassette recorder and the printer), being inoperable and the sound channel starting an octave higher, I have found no other side-effects from using this POKE, which is reset using POKE 65494,0. It has been recommended for use by Colin Carter in his book 'Enter the Dragon' and for those people whose Dragons also allow them to do the same, it is a very useful method of speeding up certain programs.

Following on from this piece is a program called Rally Driver. It is quite short as regards the LISTing, but plays an enjoyable game and shows how just a few graphics can be used to good effect. The game requires joysticks, but, with a little programming knowledge, could be changed to use just the keyboard (using the INKEY\$ function.)

The game puts you in charge of a car racing along a twisting, turning track and you must keep to the middle of the road and avoid crashing off the sides. The car can be stopped by pressing the joystick button while you calm your shattered nerves, but you lose valuable points for every second that you're not moving. The game will continue until you crash, when the screen will flash and your score will be given.

The screen display is quite effective with the road going off into the horizon, giving a 3-dimensional view. As you play the game, you may notice that the car does not in fact move, but the edges of the road do. This gives the appearance of movement and is much simpler than using the PUT and GET commands to move the car about. All that has to be done is the drawing of two lines from the horizon down to the bottom of the screen. These two lines are drawn in relation with a variable P. This variable is changed firstly by the values from the joystick and then by a random amount in line 190. The lines are then re-drawn in their new position, with the previous lines erased. Line 100 calculates if the car goes off the edge of the road by checking to see if P is less than 100 or greater than 160.

Lines 160 and 170 give the joystick values. I have deliberately left a gap between the left and right movement of the joystick. This is to counter sensitive joysticks and allow an area where no movement is performed. This stops the car swaying from left to right and visa versa when you try to position your stick in the centre. The score is given as the variable N. Every time the computer runs through the program loop, it adds a number between 20 and 22 on to the score. What a peculiar number, I can sense you thinking, but the reason is that it gives you a much more interesting and varied score than if you added 1 every time.

After all, if someone played the game for 10 minutes and did very well, I'm sure they would feel cheated with a score of 47 as opposed to a score of 943. This is the sort of finishing touch which will make your program more fun to play.

Lines 230 and 250 produce the crash sounds. Try and experiment with these, bearing in mind that a sequence of several notes played very fast over and over again gives a suitable effect.

Other lines of interest include 280 which prints a rude comment if your score fails to reach 300; 340 which puts the brakes on the car until you press the joystick button again and line 90, which draws the car onto the screen. Perhaps after playing the game for a while you can add to it or just use part of the workings for your own programs. The program has been kept short with the help of multi-statement lines, thus saving much time in typing it in.

Below is a summary of the program's workings:-

- 10-30 REM statements and setting up score variable (N) and road position variable (P).
- 40-80 Set up screen display with horizon, sky, sun, etc.
- 90-200 The main loop. This draws the car, the road, checks joysticks to see if there needs to be a change in position, re-positions the road if a change is necessary, checks for crash, checks to see if joystick button has been pushed, and adds points onto the score.
- 210-260 The crash. A simple FOR/NEXT loop changing the screen modes and adding a suitable sound.
- 270-320 Goes back into text mode, gives you your score and waits for the '1' key to be pressed whereupon it will RUN the program again.
- 330-350 The braking pause with a little sound. Pressing the joystick button for the second time will restart the car.

\*\*\*\*\*

```
10 REM****RALLY DRIVER****
20 REM****(C)C.GIFFORD****
30 P=125:N=0:CLS
40 PMODE 1,1:PCLS:SCREEN 1,0
50 CIRCLE(20,20),8,4
60 PAINT(20,20),2,4
70 LINE(0,40)-(255,40),PSET
80 PAINT(0,0),3,4
90 DRAW"BM125,160;R10U4D8BL10U8BD4BR5U10R4U2D4BL9U4BD2R5D10L2U11R2"
100 IF P<100 OR P>160 THEN GOTO 210
110 LINE (P,42)-(P-40,170),PSET
120 LINE (P+5,42)-(P+45,170),PSET
130 B=PEEK(65280):IF B=254 OR B=126 THEN GOSUB 330
140 LINE(P,42)(P-40,170),PRESET
150 LINE(P+5,42)-(P+45,170),PRESET
160 IF JOYSTK(0)<21 THEN P=P+10
170 IF JOYSTK(0)>41 THEN P=P-10
180 B=PEEK(65280):IF B=253 OR B=125 THEN GOSUB 330
190 P=P+RND(20)-10:N=N+RND(3)+19
200 GOTO 90
210 FOR C=1 TO 10
220 SCREEN 1,1
230 PLAY"T200L40BAG"
240 SCREEN 1,0
250 PLAY"T200L4003DEL80FGA"
260 NEXT C
```

```

270 CLS 0:PRINT @ 134,"CCRRRAAASSSHHH!!!";
280 IF N<300 THEN PRINT @ 195,"YOU'RE A TERRIBLE DRIVER";: GOTO 300
290 PRINT @ 199,"YOU SCORED ";N;
300 PRINT @ 262,"AGAIN? PRESS 1 KEY";
310 B$=INKEY$:IF B$="1" THEN RUN
320 GOTO 310
330 FOR T=1 TO 150:NEXT T
340 IF PEEK(65280)=254 OR PEEK(65280)=126 THEN RETURN ELSE PLAY
    "T255L255CD":N=N-4
350 GOTO 340

```



THE WAR MACHINE

Interested in the best games software for the popular home micros?

Since July 1981, The War Machine has been covering the exciting field of computer simulation games with detailed software reviews by independent writers. We also carry articles on how to design your own games programs and give advice on rewriting programs for other micros.

Each issue of TWM carries a special offer, available only to subscribers. Sometimes it's a discount on software, from independent suppliers, for the Dragon, Spectrum, ZX81, TRS-80 and other computers. Sometimes it's an Emjay computer simulation game, which may be a wargame, an Adventure or an SF game. These are at present available for the ZX81 and TRS-80; versions for the BBC micro are now becoming available and other computers will be covered in due course.

From issue 17 onwards, TWM is carrying a PBM feature dealing with postal play of computer-moderated games and looking ahead to the developing area of multi-player gaming by 'phone modem. This PBM feature will in due course be split from the magazine and become a separate publication in its own right.

The War Machine

Current issue: £1.15 (overseas £1.65)

6-issue subscription £6.50 (overseas £9.50)

12-issue subscription £12 (overseas £18)

Overseas rates are for airmail delivery; payment must be made in U.K. funds. Please make cheque/P.O.'s payable to Emjay.

EMJAY, 17 LANGBANK AVENUE, RISE PARK, NOTTINGHAM NG5 5BU, ENGLAND.

# Review

'STRATEGIC COMMAND' : ROMIK SOFTWARE : PRICE £9.99., by W.J. Hurfurt

## A strategy/combat game for two players

Knowing the Dungeon Master's interest in War Games, it was with some trepidation that I entered this world with Strategic Command. This global war simulation is a long way from my previous experience of schoolboy 'Battleships' or the occasional board game such as 'Risk.' You will require a good memory, quick wits, two joysticks and a magnifying glass to play this game. The last-mentioned since the instructions are in minute print on the cassette insert. Given good eyesight, they are quite readable and give a clear, explicit summary of the mechanics of play. So do not try to absorb it all in one go, but play the game a few times and try out the various procedures and you will soon get the hang of things. There are no tactical hints but a lot of the fun of games such as these is learning as you go along and trying out various different plans.

Now to the details of the program. It starts with a short joystick test. A good idea in principle but this one doesn't tell you what to do if your joysticks are faulty or not sufficiently sensitive for the program. Surely, it wouldn't have been difficult to allow the user to set comparison values to suit his own joysticks and then pass those values to the main program. The other alternative is to take your joysticks back and complain. If yours aren't sufficiently sensitive, you will be unable to use parts of your armoury later.

And so to the main program 'Strategic Command' by A.J. Ovens. After the title page, you are shown a map of the five continents with each side having three bases - Army, Navy and Capital (Political forecasters might be interested to note that West is Red and East is Yellow.) You can dispatch Task Forces from your bases, Army and Navy from their appropriate bases and either from your Capital, which is situated on the coast. You have a wide variety of military units at your disposal, including Battleships, Submarines, Carriers, Light Artillery, Light and Heavy Tanks, Minelayers, Minesweepers and several more. Each unit has three properties - an attacking factor, a defensive factor and a speed. A Task Force consists of up to three units and will move at the speed of the slowest unit in the Task Force. Units are selected by a combination of joystick movements and use of the fire button and successful formation is indicated by a 'beep.' A Task Force is set in motion in a similar manner but be warned; once it starts moving it will continue in the same direction until you stop it or it meets a land/sea boundary. Forging points are provided to enable armies to move from one continent to another.

Control is passed from one base to another and to the Task Forces by again using the joystick fire button. In this way you can dispatch several Task Forces from different bases and guide them towards enemy forces or bases. The aim of the game incidentally is to reach the enemy Capital. Task Forces can change direction or temporarily halt but what sets this game apart from a board game is the ability to have several Task Forces all moving at once in different directions. This calls for a keen eye and quick wits on the part of the players.

Combat takes place when two opposing Forces are close to one another. All other movement is suspended and your Dragon acts as umpire as you battle it out. You are shown the disposition of your own and your opponents Task Force and you have the ability to direct your fire against any of the enemy targets. Using the attacking and defensive factors of the units involved

the Dragon decides the outcome of the battle and destroys the Forces accordingly.

When you eventually succeed in reaching the enemy Capital, your Dragon plays a short victory tune and the continent, initially green, changes to the winner's colour. Some interesting features of the simulation include the ability to send 'reccy' planes to monitor Task Forces or bases (your own if you have forgotten your dispositions as well as your opponent's.) You may also use Mine Layers both on sea and on land. These are very slow but potentially very destructive operations. Each unit can lay two minefields which will totally destroy any encroaching enemy but through which your own forces can pass with impunity. Minefields can be cleared by a Minesweeper so take great care of yours and seek to destroy your opponents. It is possible to simulate minelaying by stopping a slow-moving Task Force since the sounds of mine laying and stopping are the same, so there is scope for misleading your opponent. The standard of the graphics is good with excellent reproduction of the combat units. The sound, mainly short 'beeps' is a little confusing to the beginner with different sounds being used to signal different activities but it is an essential part of the game and is fairly quickly assimilated.

Overall, this is an excellent game. The instructions are clear and it has consistently loaded without error. There is no 'save game' facility which could be a nuisance to experienced players, as games tend to lengthen as your understanding of tactics deepens. Initial hesitancy over how to pass control around your bases and Task Forces soon disappears and you will soon find yourself handling six or seven Task Forces with increasing confidence. Thoughtful use of 'reccy' planes enables you to plan which battles to seek and which to avoid. (Task Forces move backwards just as happily as forwards; strategic regrouping it is called.)

My only criticism is the inability to deal with faulty joysticks. This means that you could find some of your forces unusable and that Task Forces contain different units than you thought. While a colour T.V. is preferable, especially for your first few games, the game can be played with a black and white set - which is good news for those of you relegated to the bedroom with the b/w portable! The game is fairly simple to learn but has hidden depths and can provide hours of fun long after the latest Space Invader has palled.

Presentation.....	9
Entry Complexity.....	8
Play Complexity.....	8
Play Balance.....	9
Interest Level.....	9
Overall Rating.....	9

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#### DRAGON TIPS

Every month The Dragon Dungeon will give software to the value of £15.00 for the best tip sent in to "Dragon's Teeth." Tips don't have to relate to programming alone and can cover any subject of potential assistance to a Dragon owner.



Winners can select the software of their choice.

# LETTERS

## EASY ENTRY

I sent you my little 'Easy Entry' routine for hex assembly listings the other day, incase anyone might find it useful. If there is any chance you might like to include it in 'Dragon's Teeth', then perhaps you should use this corrected version. (I'd got the INKEY\$ commands all on the same lines in the version I sent you, and so they didn't work perfectly when it came to CSAVEing the routines: otherwise all O.K.)

Just in case you might also be interested, I've included on the other side of the cassette another little program (to work out the length of a loan at given interest and monthly repayment) which isn't so fascinating in itself - but it does show how well the Dragon can be speeded up by 100% (another Mike Jarvis suggestion!!) when you don't actually need a screen display. (Of course, the SAM chip can be POKEd back to default speed when the display is required by the program itself.)

The garbage on the screen while the Dragon is calculating is actually quite pretty - not a bad representation of lightning-fast thinking! There seems to be absolutely no problem POKEing the faster speeds (the 50% increase by POKEing 65495,1 still retains video synchronisation and I must say I use it for all my games now on the Dragon - much more satisfying, especially for games like PIMANIA, which have such maddeningly long delays between moves) and the POKEing back to default.

N.B. Only one thing to look out for when running a program with the fastest speed - if it crashes because of an error while running, you have to POKE it back to default blind (no screen display) - so mind you get it right!

Dominic Gill,  
82, Carlton Hill,  
London NW8 0ER.

## DOMINIC AGAIN!

Well, you asked for letters!

1) Tape recorder problems. When I got my D32 nine months ago, I asked around knowledgeable friends - and they all recommended the HITACHI TRQ 299 - not, and they said not, the 295R. My TRQ 299 has performed perfectly without a moment's hitch from the start: and I know of several other D32 users with the same model who likewise have had no problems. Maybe you might mention the model as one tried and tested and recommended? (It's widely available - and incidentally proffered as first choice in many computer shops in Edgware Road.)

2) Your correspondent A.E. Standing's problem with his text changing and breaking up. I had exactly the same problem with my first Dragon. First fortnight of ownership absolutely maddening: I'd have a program beautifully entered and then, just like Mr. Standing, it would start changing before my eyes. I rang up Dragon Data and they said obviously the ROM was corrupted - and they had 'one or two' (I had the impression rather more) similar cases. They told me to take the machine back to my supplier and tell him to change it for a new one. I did and the supplier did. Henceforth, no problems at all. The man in the technical department at Dragon Data said that the problem couldn't be anything to do with fluctuating current: fluctuation symptoms quite different.

3) I hope you have by now my revised Hexm/c program, which I'm immensely

flattered you think interesting enough to list. Perhaps you'd like to mention it at the same time that if any Club Members are interested, or too lazy to enter the program themselves, I'd be quite happy to CSAVE them 2 or 3 copies on receipt of a stamped and self-addressed Jiffy Bag with a blank cassette in it, (but in no other circumstances!)

4) I really must take mild issue with your reviewer of the Morrison Chess program in the first issue of 'Dragon's Teeth'. I'm sure that for the price it's probably good fun-value; and that kids and beginners especially will find it gives them at least a thought-provoking partner. I'm no kind of serious chess-player at all - just enjoy the occasion game and get regularly beaten by anyone who knows his stuff. I have, however, beaten Morrison's program at its highest level (8) every one of the eleven times I have played it; and on each occasion it failed to see even pretty elementary traps and allowed me to take its Queen twice in a series of really dumb moves. My 12-year old daughter gives me a tougher game than this! David Williams can't be allowed to get away with his assessment of 'pretty mean game'!

Dominic Gill,  
82, Carlton Hill,  
London NW8 0ER.

(We print both of Dominic's letters, since most of the points raised will be of interest to many readers. The listing will be found in M/C CORNER - D.M.)

#### LOADING

I read with interest your article "I/O Error" in issue 2 of 'Dragon's Teeth'. I agree with all your comments but I feel you may still get recording problems and consistent I/O errors, so please may I offer the following advice?

- a) Firstly, ensure that the cassette is wound on with a pencil until ALL the LEADER TAPE is wound past the recording head. Failure to do this will result in the program name being down loaded on to the leader tape which, of course, does not record, then on reloading the computer looks for the program name and does not find it!
- b) When recording a second program do not leave too large a gap between the first and second program as the computer will hear the hiss of the blank tape, also the rumble of the recorder motor and will respond with and I/O error. The way to overcome this is to type in SKIPF "Program one's name." The computer will then read through program one and stop the recorder just past the end of program one, down load program two at this point.

Since adopting the above procedure, my nine-year old son succeeds EVERY TIME with a Sony cassette recorder.

I hope the above information will be of use to all your readers.

B. Jones,  
19 Cefn Parc,  
Skewen Neath,  
West Glamorgan, Wales.

#### PRINTER OUTPUT

I read the first issue of 'Dragon's Teeth' with interest; it is unfortunate that your review of the 'Dragon Companion' was compiled before the typeset version was produced (though the program listings are still matrix printer output.)

Also, while I agree that the 'verification' program published in P.C.W. provides some useful information - filetype and number of blocks - it does so for only one file per entry and gives no extra information over that obtained by using 'SKIPF', which will verify the whole tape in one entry. As the filetype and size are kept in manual records for each tape (you do keep records don't you?) even the extra information supplied may not be as useful as seems at first sight.

Can anyone explain why the Dragon 32 was not fitted with keyboard repeat and two key roll-over on all keys? Changing \$BBF9 to \$C8 and \$BBFA to \$FF allows 'sloppy' typists like me to get PRINT every time instead of a regular PINT (not that I'm against a regular PINT.) There is plenty of space in the ROM from \$BB7F to \$BFEF inclusive. For those who like a puzzle, try pressing (and not releasing) in order the following keys - A C S - and then release in reverse order.

I hope that in future I will be able to provide some useful information for fellow owners (as soon as my dis-assembler works) as well as glean some tips from 'Dragon's Teeth.' To that end, I think everyone should be made aware that the 'Centronics Type' parallel interface does NOT use full hand-shaking, 'ACKNOWLEDGE' is ignored and only 'BUSY' checked. This works perfectly with some printers (e.g. Epson) where every character is greeted with a BUSY response, but buffered printers may lose characters if BUSY is only used when the buffer is full.

DT mailing list - I noticed that the postcode of the address used to send the latest 'DT' was incorrect; would you please amend to that shown above. Is it not time you 'MAILER'ed your list?

DT (April) - Baffled of Bucks - This fault would seem to be a result of corrupting the BASIC workspace at about 268 (\$120). This area is set up at power-on only and if corrupted can cause reserved words (such as RUN) to be treated as illegal (?SN ERROR).

Printer Output - For information, at power-on, the Dragon sets up printer controls in locations:-

155 (\$9B)	maximum number of characters per line - up to 255 (set to 132)
328 (\$148)	line control (set to 255) zero = output "end-of-line" sequence if line length exceeded non-zero = no line length control
330 (\$14A)	Number of characters in "end-of-line" sequence in range 0 to 3 (set to 1)
331 (\$14B)	"end-of-line" character sequence of 3 characters (set to <CR>, <LF>, <space>)

\*Also, location 156 (\$9C) is used to count the number of printing characters output on the current line. This is set to zero whenever the "end-of-line" sequence is output or the maximum line length is reached.

The "end-of-line" sequence is output whenever  
(i) a<CR> is encountered  
(ii) the number of characters reaches the line maximum AND the line control (location 328) is zero.

Note that none of the characters output in the "end-of-line" sequence are counted in the current line length.

If no characters have been output on the current line and <CR> is encountered, a space is output before the "end-of-line" sequence. Note that this space cannot be suppressed.

I look forward to my next issue of 'DT.'

Philip G. Scott,  
4 Badgerwood Drive,  
Frimley, Camberley,  
Surrey GU16 5UF.

(We are currently "MAILER"-ing, using POWERMAIL. This should avoid the duplications and errors of the manual system. - D.M.)

#### BEGINNER'S COLUMN?

At last! A Newsletter for my very own Dragon.

May I through your Newsletter congratulate you on taking the initiative in starting up this venture.

Having had my Dragon 32 for only 6½ months, actually only 3 months due to repairs, it was nice to read of people like Dominic Gill, who echoed my very thoughts.

If you're planning on building a 'compatibilities' list of hardware for the Dragon, then you might like to include my Amstrad CTV 1400 (14"), Superscope C190 and Sanyo M2511G cassette. All work perfectly on my Dragon.

Obviously, its early days yet, but I hope future plans include increasing contents and the size of the Newsletter (for lesser mortals without perfect eyesights, yer sees!) Have you thought of a Tabloid type?

On contents, what about a regular article, whereby instead of an expert writing the column, why not a complete beginner (like me!) or someone who has just read through the manual (also like me!) The idea being that the article will present not a 'correct version' of how to do things but to show the fumbblings, fiddlings and 'wrong versions' and hopefully leading to a 'correct version.'

Such a regular feature could be fully interactive among the 'just starting' people, each sending in their own thoughts on what's wrong, right. Of course, as the writer becomes more proficient, so will those reading the article. Who, also, won't feel quite so alone when encountering problems.

I had to take exception on Clive Gifford's review of Dragon Trek, having become a Fleet Commodore and Commodore by level 6. I decided that was enough, really the game is far too mechanical and thus boring. Often consisting of jumping back and forth from home base (if found), everytime the energy gets low. Incidentally, which one is higher - Fleet Commodore or Commodore? Can you go higher?

Indeed, a lot of games (in particular graphic games) leave a lot to be desired and quality has to improve considerably before I spend any more money.

Finally, in response to your request for reviewers, I'd be delighted to help out if you need me!

Raymond J. Callaby,  
16 Beatrice Close,  
Ipswich,  
Suffolk, IP3 9LL.

(Anyone out there willing to be the "beginner" suggested? - D.M.)

PROMISES, PROMISES!

What manner of beast is this that has been unleashed on the unsuspecting public!?

In the first issue of 'Dragon's Teeth' we are promised in the 'M/C Corner' quote "we propose to use the March corner to list the most frequently requested 6809 instructions - branching."

Here, at last, I thought!, an introduction to machine code for an amateur novice beginner of four months standing! Alas, the March issue (Issue 2, April 83??) finds the beast has had its first extraction - NO M/C Corner!:

Being one of Dominic Gill's "many thousands of beginners" I would appreciate, as would many others no doubt, the second teething of M/C Corner, that we may learn from first principals the weird and wonderful world beyond.

Many thanks for an interesting mag. and I shall increase my trial sub. to an annual sub. on renewal date.

J. Gardner,  
18 Linfit Lane,  
Kirkburton,  
Huddersfield,  
W. Yorks, HD8 0TZ.

(Sorry about the loss of M/C Corner in the April issue, where we ran out of space. It's back and will stay back! - D.M.)

TABBING?

Thank you for the flood of information you sent me this week in the shape of two 'Dragon's Teeth' issues and a catalogue.

Relating to a letter in the April 'D.T.' by B.G. Chedd of Chippenham, I have finally received a copy of the Dragon Users Club paper 'The Voice of the Dragon' after waiting since last October. As with the Dragon manual, it is riddled with mistakes both in the text and in listings! Still, it shows something is happening slowly.

Please could somebody tell me if there is any way of quickly returning the Dragon 32 cursor to the beginning of the next line when typing-in text such as names and addresses in filing inserts? Having to use the spacebar a considerable number of times to "tab" each line is not very professional.

N. Bennett,  
56 Plaxtol Road,  
Erith,  
Kent DA8 1NL.

MORRISON'S CHESS

I must disagree with David Williams' review of Morrison's "Chess". I am a very average player, but the computer cannot beat me at any level. I cannot win either, but the reason I do not lose is because it has no end play at all. It just moves one piece to put me into check everytime I move out of it. This goes on indefinitely until I get bored and call it a draw. To me, this makes the game and the program useless.

Has anyone made any progress in the game 'Madness and the Minatour'? Any tip will be gratefully received as I have got nowhere, always being killed by the random element "You have fallen down a pit" when moving between rooms.

Thanks in advance for any help.

L. Compton,  
40, Copyhold Rd.,  
East Grinstead,  
W Sussex RH19 1DH.

#### MANUAL CORRECTIONS

1) The manual has left and right joystick commands reversed i.e. for JOYSTK(X)

- X = 0, horizontal right
- X = 1, vertical right
- X = 2, horizontal left
- X = 3, vertical left.

2) JOYSTK(0) appears to initiate a routine and must be used each time any joystick is to be read. The other joysticks must be read in numerical order, or no change will be sensed, i.e., to read the left joysticks only the following sequence must be used:

- A = JOYSTK (0)
- B = JOYSTK (2)
- C = JOYSTK (3)

If the A = JOYSTK (0) command is not used, then the values of B and C will not change.

3) Some games tapes (particularly J. Morrisons' Games Tape Two) which use the arrow keys for control, may not operate if the joysticks are plugged in, depending on the position of the right horizontal joystick.

I. G. Norris,  
17 St. Marks Close,  
Gosport PO12 2DB.

(This information has been printed elsewhere, but relates to the most frequent query received at the Dungeon. - D.M.)

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#### CLUBWARE

Dragon User Club Badges are now available by return of post at 30p. The fabric 3½in. diameter badges are red and black on a white ground and suitable for sewing onto sweaters, caps or jerkins, etc. Please add letter postage if ordered separately.

Top quality (and we mean top quality) showerproof Club Bomber Jackets are now available for extrovert members who wish to let the world know that they own a Dragon. These zip-up jackets, in a wide choice of two-tone colours in ripstop, non-rustle nylon (the choice of the mountaineering fraternity) are made to order for us by Dane Valley Weatherwear and intending purchasers should contact the Dungeon for details and measurements. Prices will vary slightly on the choice of colours and sizes, but will be in the region of £15.00.

T-shirts and sweatshirts will be available in June.

# Inside View

## DRAGON INTERNALS

by M.R. Brook

The letter from Adrian Jones on internal storage locations leads me to think that readers may be interested in further data. With reference to his comments on POKEing &600 being messed up by pressing Reset, I have successfully used this method to store additional programs, Reset having no effect.

As with other versions of microsoft basic, including APPLESOFT, the interpreter stores a variety of pointers which are all interrelated. The most important are the pointers to top and bottom of available RAM space. When these pointers are altered, by PCLEAR (bottom of RAM) and CLEAR (top of RAM) other pointers are automatically updated by the interpreter. Perhaps the Reset on Adrian Jones's machine is upsetting a pointer. Now to the addresses which I have identified:-

&19,1A	Start of Basic Program
&1B,1C	End of Basic Program/Start of Simple Variables
&1D,1E	End of Simple Variables/Start of Arrays
&1F,20	End of Arrays/Start of Free RAM
&21,22	Start of String Storage (Set by "CLEAR" Statement)
&23,24 )	Pointers in String Space which vary as Program runs.
&25,26 )	
&27,28	End of RAM. Usually &7FFF.
&33,34	Start of User RAM. (Gives first address of RAM after Video RAM - varies with "PCLEAR")
&87	Contains ASCII code of last key pressed.
&112,113	Contains current value of "TIMER"
&151 to 159	Contains Map of Keyboard - part of software for keyboard decoding.
&FF00 to FF03	PIA 0 Controlling Keyboard and Printer (6821)
&FF20 to FF23	PIA 1 Controlling Sound Generator, Cassette and Video.

(Note: Address space decoding is incomplete and PIA is mapped several times in address space FF00 to FF1F/FF20 to FF2F. This decoding is controlled inside SAM chip (6883) and cannot be varied.)

&FFC0 to FFDF SAM. These addresses control the registers in the SAM chip which does not have any data bus. Even addresses set register, odd address clears register. These registers contain information on RAM size, VIDEO display mode, VIDEO RAM address, CPU rate.

### KEYBOARD

<u>Address</u>	<u>Value in Address for Key Pressed</u>						
	&BF	&DF	&EF	&F7	&FB	&FD	&FE
152	ENTER	X	P	H	@	8	0
153	CLEAR	Y	Q	I	A	9	1
154		Z	R	J	B	:	2
155		↑	S	K	C	;	3
156		↓	T	L	D	,	4
157		←	U	M	E	-	5
158		→	V	N	F	.	6
159	SPACE		W	O	G	/	7

Location 151 contains same code as one of 152 to 159 except when Shift Key is pressed then code as follows:

IF	BF	THEN	BF
IF	DF	THEN	9F
IF	EF	THEN	AF
IF	F7	THEN	B7
IF	FB	THEN	BB
IF	FD	THEN	BD
IF	FE	THEN	BE

i.e. Location 151 maps rows.  
Locations 152 - 159 monitor columns.

#### CARTRIDGE CONNECTOR SIGNALS - MEMORY EXPANSION

Pin		Pin	
1	+ 12 volts	2	+ 12 volts
3	HALT (Input to CPU)	4	NMI (Interup to CPU)
5	RESET (Main reset line)	6	E (Main Clock)
7	Q (Additional Clock)	8	CART(Cartridge enable)
9	+ 5 volts	10	D0
11	D1	12	D2
13	D3	14	D4
15	D5	16	D6
17	D7	18	READ/WRITE
19	A0	20	A1
21	A2	22	A3
23	A4	24	A5
25	A6	26	A7
27	A8	28	A9
29	A10	30	A11
31	A12	32	R2 (Address select C000-FFEF)
33	GROUND	34	GROUND
35	ESND (External sound source)	36	P2 (Address select FF40-FF51)
37	A13	38	A14
39	A15	40	EXTMEM (Disables internal device selection)

Linking pin 7 to pin 8 causes CPU to run program held on cratridge.

R2 pin 32 is main memory select signal for cartridge

P2 pin 36 is a subsidiary select signal.

EXTMEM pin 40 disables 74LS138 demultiplexor which decodes 3 bit address block selection from SAM chip. Disabling this chip will disable all internal RAM, ROM and both 6821 PIA's.

I recently contacted Dragon Data to get info on the Disc Drives and in return received the info which I have sent to the D.M. I was particularly enlightening on ehe various pointers to the Basic Interpreter and details will be printed in the next issue of 'Dragon's Teeth.'

During a disassembly of the interpreter I discovered some additional fault messages which are not documented; these are "DN", "NE", "UF". Any ideas out there? I also found that the Basic has a further device code that is set up during the ROM routines but never used, i.e. (-3); is this for a disc or some unusual tape recorder?

During the initial set up routines in ROM a check is made on locations &HCO00 and &HCO01 to see if these contain &H444B and, if so, the processor then starts to execute code at &HCO02, see &HB432 to &HB438 (this takes place at the end of the initialising routines.)

Finally, I would note two books which I have found useful for Dragon explorers:-

- a) 'TRS-80 COLOR COMPUTER TECHNICAL MANUAL' - which gives masses of technical data, much of which is relevant to the Dragon.
- b) 'COLOR COMPUTER GRAPHICS' - which gives detailed operation of all the possible graphics and semigraphics modes.
- (These are, of course, TANDY products.)

# Bookshelf

## BOOKS FOR THE DRAGON 32

With what threatens to become an avalanche of books published for the Dragon, we are rapidly falling behind in our intentions to review one book per month in detail (any member out there care to assist by reviewing a book?) We are therefore limiting this month's 'Bookshelf' to a brief outline of two major new additions and a "classic" which should be better known on the Dragon scene.

### A) THE POWER OF THE DRAGON, by John Sharp & David Bolton

This excellent publication combines a collection of 30 "fun" programs with a serious educational intent and, to our mind, achieves its intentions of providing a broad, but carefully planned tutorial in Dragon programming in BASIC. The Introduction sums up the book very accurately, i.e.

- The presentation carefully caters for the needs of the user.
- First the function of each program and the techniques that it will illustrate are summarised.
- The program is listed in exactly the same format in which it will appear on the TV screen so that typing errors can be easily spotted.
- The means to perform a 'Checksum' calculation on each program (to confirm that a program has been properly typed in) is given.
- Rather than confusing and expanding the program with remark statements a separate detailed program structure explanation is presented, saying what each line or section of the program does and explaining with practical examples each new topic or command as it arises.
- In addition, suggestions and hints are given for expanding the programs further and other applications for the techniques presented are suggested.

A comprehensive guide to debugging is provided and a 'Checksum' routine is given to confirm that each program has been typed in correctly. We particularly liked the way that each program is listed in a 32-column format, just as it will appear on the VDU screen and the elimination of the mass of REM's that clutter most publications. In this case, a separate, detailed explanation of the structure and operation of the program is given, together with commentary on each new topic or command as it arises. Suggestions and hints are given for expanding the programs further and other applications are suggested for each technique.

The book is divided into four sections:

- (i) Games & Puzzles (including Reversi, Space Invader, Racing Driver and City Bomber.)
- (ii) Graphics (including ball-bouncing, Lissajous figures, geometric plotting, etc.)
- (iii) Business & Financial (including a simple database.)
- (iv) Utilities (bar charts, bio-rhythms, calendars and an amusing "code-machine" routine.)

We note that here (at last) the authors have taken the trouble to show beginners how to append one BASIC program to another. Yes, we know that 'The Dragon Companion' does so, but that doesn't pretend to be a book for the uninitiated.

In short, this book will help you to write well-structured, intelligent BASIC programs and teaches it's lessons painlessly. Priced at £5.95 it is excellent value.

B) DRAGON EXTRAVAGANZA by Roger Valentine

Roger Valentine made quite a name for himself with his ZX81 and Spectrum books and it was to be expected that his Dragon 32 book would maintain the high standard. Equally, with his educationalist approach (he started his computer career at Lancaster University), it was to be expected that his book would form a painless course in BASIC programming.

With 50 programs packed into the 127 pages of 'Dragon Extravaganza', they are necessarily short and this proves a positive advantage. Neat, economical and with definite style (his 'Sketchpad', etch-a-sketch program consists of 9 short lines) the programs are documented in two sections. The first explains what the program does and how to use it and the second ('Program Notes') explains how it is constructed and what each line means.

The sequence is progressive, with new programming concepts introduced sequentially. Again, economical presentation, with no flannel, is the order of the day and the dreaded concepts of PEEK and POKE are clearly and adequately explained in two pages of text and two listings. Another example is his numeric or alphabetic "sorting" program, which is wonderfully compressed into just three lines!

Some detailed tests are included for the technically minded (e.g. ASCII and CHR\$ tests) and business applications (sales ledger, Bar and Pie charts, invoicing routines, etc.) are covered, but the book is heavily slanted to learning via games. Even the educational applications are games-orientated, but none-the-less serious in intent. We are still trying to work out how the Dragon always wins in the 'Magic Dice' routine on page 60, having so far failed to wrinkle out the mathematical principle involved.

Those with homicidal tendencies towards alien spacecraft are not forgotten and the programs include a selection of classical computer games. These are again well explained and suggestions are given on how to improve or extend them.

In short, this is a very worthwhile addition to the growing Dragon library and good value at £4.95.

C) TRS-80 COLOR BASIC by Bob Albrecht

This thick book (380 pages) was produced in the U.S.A. for the Tandy Color Computer and Tandy must now be furious that the publishers chose to show a cheeky-looking dragon sitting on the computer keyboard. The intention was either to give the Dungeons & Dragons flavour to the reader (to show that the reader would be taught painlessly) or a reference to the author's nickname, but it now gives the appearance of another Dragon 32 manual (which it is, come to think of it!)

Written by Bob Albrecht of Dymax Corporation as a total replacement for the dry and incomplete Tandy manual, the book is a superb self-teaching tutorial to Microsoft Color BASIC. Very little is irrelevant to a Dragon user (you should naturally ignore the few hardware sections, e.g., joysticks) and all the calls to the 6809 CPU are covered in great detail. In the classical

manner, each new concept is followed by a quiz to be filled in in pencil in the book (with the answers elsewhere) and to quote the author "the book is full of challenges, ranging from hard to awful!"

Essentially though, Bob Albrecht works hard to make the learning FUN! He was once quoted as saying "If you don't get a kick out of computing, chuck it!" His other famous quote is "BASIC is a simple language, much more easily learned than Spanish, Swahili or even English."

For information, the chapters run: Easy Stuff, BASIC Programs, Number Boxes, String Boxes, Skipping around the Screen, Graphics Galore, Meandering, Playtime, String Functions (a long, very detailed study), Subscripted Variables (in far more detail than most books), Computing Problems & Challenges (enough to keep you chewing them over for weeks), The Color BASIC toolbox and no less than 11 appendices over 30 pages, everything from screen maps to sound analysis (e.g. SOUND X,16 lasts 1 second or SOUND 80,X is Middle C).

Following the fall in the Pound, this book is now priced at £7.50 (the Dungeon's Catalogue price is out-of-date), which puts it out of the pocket-money range. It is still good value, however, since it dives into detail not covered by many others and it probably the most comprehensive guide to Dragon BASIC produced to date.

# Cousins

## A MONTHLY REVIEW OF THE U.S. 6809 SCENE

- We were somewhat taken aback when Dragon Data announced that they had licensed OS9 as the Disc Operating System (DOS) to support the eagerly awaited drives ex Port Talbot. We had assumed that FLEX would be chosen, simply because there is a wealth of FLEX software and OS9 software is still thin on the ground. However, the more we look at the U.S. scene, the more logic there appears to be in D.D.'s choice.

OS9 is one of several UNIX-like operating systems, but, unlike UNIX (written in C-language), OS9 is written in machine code and therefore runs faster. It offers a distinct advantage to small business users, in that in a multi-user environment it assigns each user a discrete block of memory. UNIX swaps programs in and out of memory, which means that it runs more slowly. Now the hint here is that Dragon Data must be due to launch a business machine, with a fairly impressive memory capacity (to assign all those blocks in multi-user mode.)

- In the U.S.A. there are a variety of languages available for OS9; two BASICS, three C-compilers, at least three assemblers, two PASCALS, two FORTHS, Cis-COBOL, etc.

- Interesting point raised in 'Color Computer News.' Will 6809 software be compatible with future 68000 offerings?

- An answer to the moaner who wrote in to one of the U.K. weeklies with an 'I hate Dragons' letter (he was, of course, a Spectrum fanatic) and who asked "just what can the Dragon do?" Bill Sias of REMarkable Software notes:

'The 6809 is superior because it was designed to be used by programmers. It has more addressing modes than any other processor and two stacks. And if Apple want to run FLEX or OS9, what do they do? They add a 6809 board!'

- Verne Winter of Des Moines is quoted as saying "I've had the 'Telewriter' word processor for over a year now. I can only say I feel sorry for those who have anything less. I looked at Radio Shack's 'Scripsit' and it took about 20 seconds to determine that it is overpriced." As owners of a non-running, bug-riddled £120 Tandy package called 'Superscripsit', we at the Dungeon concur!
- Once we get Dragon discs, then watch out for "Color Writer II" arriving in the U.K. This is described as a Rolls Royce word processor, with right justification, video windows, programmable function string commands (perform up to 28 commands automatically), programmable text file chaining, etc., etc., etc. Sounds nice!
- Micronix Systems of St. Charles are offering "drop-in" keyboards to replace the Tandy Color Computer ones. Wonder if they scan faster than the Dragon 32 keyboard?
- Star Kits of Mount Kisco, New York State, are offering a M/C tape called "Shrink" for the Tandy CoCo. This is, of course, a rip-off of the old 'Eliza' psychiatrist program. Sounds as if we'll be analysed by our Dragons yet!
- StarKits are also offering a (presumably) unique package which reads out your machine code listings in a digitized sound code. Think of all those sweated hours trying to compare machine code listings with the written page, when you could have your computer tell you through the audio channel what has been typed in! Much easier to check with your eyes permanently on the page. At only \$20 NEWTALK would seem to have a big future for the M/C programmer.
- Creative Distribution of Centreville, Ohio, have brought out a 6809 AMLOG (Amateur Radio Log.) We have been asked for this for the Dragon several times. Anyone out there written anything for the "Lams"?
- Ron Clark of ARCsoft has written a Color Computer Songbook. With a Welsh pedigree, surely we ought to have the same for the Dragon!
- Botek Instruments have launched an interface which enables users to run parallel printers from the CoCo serial I/O port. This we need for the D32 (if only to run our Tandy Line Printer VI from the Dragon.)
- We note that UPLOAD software is appearing for the Color Computer, enabling programs to be passed by telephone (via modems) and the DLOAD/DLOADM commands. Why doesn't DLOAD work with the Dragon, when the 6809 supports the command?
- Brunswick have just clobbered Tom Mix for infringement of their world rights to the "Donkey Kong" title copyright (mmm, yes, "Donkey King" is a bit close.) We hear that Microdeal will have to reissue it as "The King.")
- The more we read of Softwride's "Battle of Gettysburg", the more we want to see a Dragon version here. Any program that enables you to move entire divisions by use of the joystick has to be user-friendly. And a manual divided into 4 pages of wargame rules and 8 pages of strategy hints just has to be playworthy.
- Groan, groan! The writers of 'Silly Syntax' have now launched 'Galactic Hangman.' 'Nuff said!
- Or what about 'Shoot to Spell' and 'Flash Math'?
- TJN Systems have announced a Y-PAK adaptor which plugs into the "games" cartridge slot of the CoCo and provides two selectable ports to plug into.

You can thus leave your disc unit plugged in and still be able to slot in a games cartridge at the same time. Will Compusense follow this lead?

- We just have to quote this as an example of how dim some U.S. software houses assume their customers to be. The company (who shall remain nameless to save face) describe their "arcade game", which turns out to be a perfectly standard game of dominoes. The instructions commence: "There are 28 dominoes. Each domino is divided into two ends. Each end has a number. This number varies from zero to six. Dominoes that have the same number at both ends are called doubles. There are seven doubles... .."etc., (interminably.)

- Finally, for the arcadians, we note that Computerware have launched what they term the ultimate in Centipede-type games. Watch out for 'Megapede' turning up for the Dragon. Described as "exponentially more challenging than Centipede or Caterpillar," and said to be "much faster" than current versions, the mind boggles!

# Competitions

## 1 - PEAKSOFT 'CHAMPIONS' CUP

Most of you will be au fait with Peaksoft's excellent football management simulation 'Champions', where the aim is to manage your team from the 4th Division, up through the League to the European Cup.

As those of you who have played it will know, every Saturday the computer posts news bulletins which give the flavour of the passing week. A classic example is the news item: "Brian Clough says you're rubbish. Morale soars!"

Peaksoft are sponsoring this month's competition and offering the following prizes:

- 1st Prize - £20 software voucher (anything stocked at the Dungeon)
- 2nd Prize - A copy of John McNeil's computer novel 'Little Brother)

Ten "honourable mentions" will also receive £2 software vouchers to be spent at the Dungeon.

And the competition? Simply invent a fresh news item for the 'Champions' program, keeping it pithy, brief and (preferably) amusing.

We'll print the best ones and Harry Whitehouse of Peaksoft will no doubt consider them for any future edition of 'Champions.'

## 2 - A YEAR'S FREE SOFTWARE - PART I

The Dragon Dungeon will supply one free tape (up to the retail value £15) every month for a year to the winner of this 3-part competition. Do not send your answers in until the July edition of "Dragon's Teeth" appears, when the three answers will be linked to provide a final solution.

The first part of the competition has two possible answers. Both are required:

Sinc. Clivehair sent out his Christmas cards coded in digital form, having noticed that "Merry Xmas to All" included ten different letters, which could be represented 0 - 9. However, being the perfectionist he is, he selected the two codings which kept the no. represented by each word a perfect square. One coding he sent to Spectrum users and the other

# m/c Corner

Before we were unceremoniously squeezed out of the April issue, we started by listing the 6809 Branch Instructions. Perhaps we ought to go back a step and explain why we need these.

The power of a machine-code program, as with a BASIC program, lies in the Dragon's ability to take decisions and perform different functions according to those decisions. In BASIC we would use an IF...THEN conditional statement (or IF...THEN...ELSE), which would generally relate to arithmetic, logical or comparison operators. In machine code, however, we are limited to sign, zero, carry and overflow flags.

In March we listed the Branch or Relative conditional jump. Those new to code will note that while BASIC is line-orientated, assembly language uses "labels" instead of line numbers. Labels are similar to BASIC File names, in that they may be up to six characters long, the first character must be alphabetic and subsequent characters may be either alphabetic or numeric. Register names, opcode mnemonics and other "reserved" words are not normally allowed as labels and, even if a particular assembler allows their use, it is bad practice to use them.

To see how a label is used with a branching instruction, take the following example:

<u>Hex Object Code</u>	<u>Label</u>	<u>Instruction</u>
86 10	START	LDA# 10
4A	LOOP	DECA
26 FD		BNE LOOP

Here we have started by setting a register to the initial value of a counting loop. We then decrease the counter register. If the register is not zero the program jumps back to the decrement instruction labelled LOOP. When the counter register becomes zero, then the program moves on to the next instruction. This is, of course, similar to the BASIC delay loop (FOR X = 1 to 100 : NEXT).

Branching jump instructions introduce the new addressing mode, relative addressing. The second byte of the object code is a displacement, specifying how many bytes to jump. Irrespective of the absolute address of the instruction, the jump will be to the address a specified number of bytes away. The "displacement" is a signed binary number, with a value from 0 to 7F hex (0 to 127 decimal) for a forward jump and with a value from 80 to FF hex (128 to 255 decimal) for a backwards jump.

The absolute address is calculated by taking the absolute address of the byte immediately following the relative jump instruction and then adding the displacement, with due allowance for the sign. The absolute address is, of course, the destination of the relative jump.

As well as relative jumps, you also have absolute jumps in machine code, where the destination address is included in the instruction. For the 6809, however, relative addressing is used for all conditional jumps and the only other jump used is the unconditional, with the opcode mnemonic JMP, e.g.

```
JMP $1000
JMP START
```

Object code format for unconditional jumps is a single byte for the opcode, followed by an operand of two bytes. For the latter, the high byte is given first, followed by the low byte, e.g.

Turning to "comparison" instructions, these operate by subtracting an operand from a register specified in the instruction. Only flags are affected, the sign, zero, carry and overflow flags being modified according to the result of the subtraction. The comparison mnemonics for the 6809 are CMPA, CMPB, CMPD, CMPS, CMPU, CMPX and CMPY and it will come as no surprise to learn that these compare with the A,B,D,S,U,X and Y registers. For example, CMPA data requests the computer to compare A with the 8-bit data provided in the instruction. (Apart from CMPB, which is also 8-bit, all the others will take a 16-bit operand.)

Next month we will take a look at tests for relations and the operation of flags.

Finally, to answer a number of readers just starting assembly language, who have asked how to do it, we would note that to access machine code from BASIC you use a USR call, i.e.

```
A = USRnn(X)
```

Here, nn is a two-digit integer. The entry point must be set up first by the use of:

```
DEFUSRn = XXXX XXXX
```

This is the position of the machine code subroutine. To quote from Dragon Data's own, very useful, machine code listing, to call a subroutine at \$B7BA you would use:

```
DEFUSR3 = &HB78A
A = USR03(X)
```

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#### COMPETITIONS (Contd.)

(in which "All" was a higher number) he sent to Dragon owners.

Subtract the Spectrum "Xmas" from the Dragon "Xmas" and save the number for Part II.

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#### HELD OVER

Due to space limitations, we have been unable to give Dominic's M/C listing (see above) and will have to hold over the results of the Competition to name our dragon. This gives those of you who have not entered a further chance to christen him/her!

Members' advertisements have also been held over until June.