

DRAGON WORLD

Data Ltd.™

No.3 April 84 60p

```

01. 111 MONTHLY B
02. 111 MONTHLY B
03. 111 MONTHLY B
04. 111 MONTHLY B
05. 111 MONTHLY B
06. 111 MONTHLY B
07. 111 MONTHLY B
08. 111 MONTHLY B
09. 111 MONTHLY B
10. 111 MONTHLY B
11. 111 MONTHLY B
12. 111 MONTHLY B
13. 111 MONTHLY B
14. 111 MONTHLY B
15. 111 MONTHLY B
16. 111 MONTHLY B
17. 111 MONTHLY B
18. 111 MONTHLY B
19. 111 MONTHLY B
20. 111 MONTHLY B
21. 111 MONTHLY B
22. 111 MONTHLY B
23. 111 MONTHLY B
24. 111 MONTHLY B
25. 111 MONTHLY B
26. 111 MONTHLY B
27. 111 MONTHLY B
28. 111 MONTHLY B
29. 111 MONTHLY B
30. 111 MONTHLY B
31. 111 MONTHLY B
32. 111 MONTHLY B
33. 111 MONTHLY B
34. 111 MONTHLY B
35. 111 MONTHLY B
36. 111 MONTHLY B
37. 111 MONTHLY B
38. 111 MONTHLY B
39. 111 MONTHLY B
40. 111 MONTHLY B
41. 111 MONTHLY B
42. 111 MONTHLY B
43. 111 MONTHLY B
44. 111 MONTHLY B
45. 111 MONTHLY B
46. 111 MONTHLY B
47. 111 MONTHLY B
48. 111 MONTHLY B
49. 111 MONTHLY B
50. 111 MONTHLY B
51. 111 MONTHLY B
52. 111 MONTHLY B
53. 111 MONTHLY B
54. 111 MONTHLY B
55. 111 MONTHLY B
56. 111 MONTHLY B
57. 111 MONTHLY B
58. 111 MONTHLY B
59. 111 MONTHLY B
60. 111 MONTHLY B
61. 111 MONTHLY B
62. 111 MONTHLY B
63. 111 MONTHLY B
64. 111 MONTHLY B
65. 111 MONTHLY B
66. 111 MONTHLY B
67. 111 MONTHLY B
68. 111 MONTHLY B
69. 111 MONTHLY B
70. 111 MONTHLY B
71. 111 MONTHLY B
72. 111 MONTHLY B
73. 111 MONTHLY B
74. 111 MONTHLY B
75. 111 MONTHLY B
76. 111 MONTHLY B
77. 111 MONTHLY B
78. 111 MONTHLY B
79. 111 MONTHLY B
80. 111 MONTHLY B
81. 111 MONTHLY B
82. 111 MONTHLY B
83. 111 MONTHLY B
84. 111 MONTHLY B
85. 111 MONTHLY B
86. 111 MONTHLY B
87. 111 MONTHLY B
88. 111 MONTHLY B
89. 111 MONTHLY B
90. 111 MONTHLY B
91. 111 MONTHLY B
92. 111 MONTHLY B
93. 111 MONTHLY B
94. 111 MONTHLY B
95. 111 MONTHLY B
96. 111 MONTHLY B
97. 111 MONTHLY B
98. 111 MONTHLY B
99. 111 MONTHLY B
100. 111 MONTHLY B

```



SPECIAL FEATURES
Word Processing

**NEW RELEASES FOR THE DRAGON 32/64
FROM SALAMANDER SOFTWARE**

TURTLE GRAPHICS

This program has been designed to provide a method of drawing pictures with your computer which is both fun and educational, and yet simple enough to be enjoyed by the young or inexperienced computer user and the enthusiast alike.

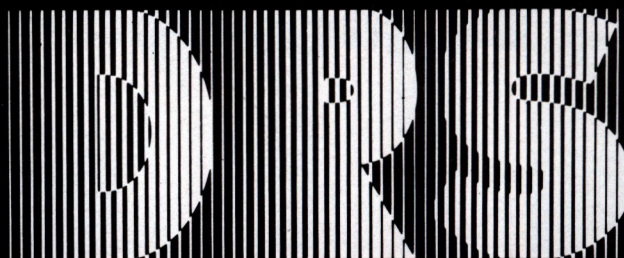
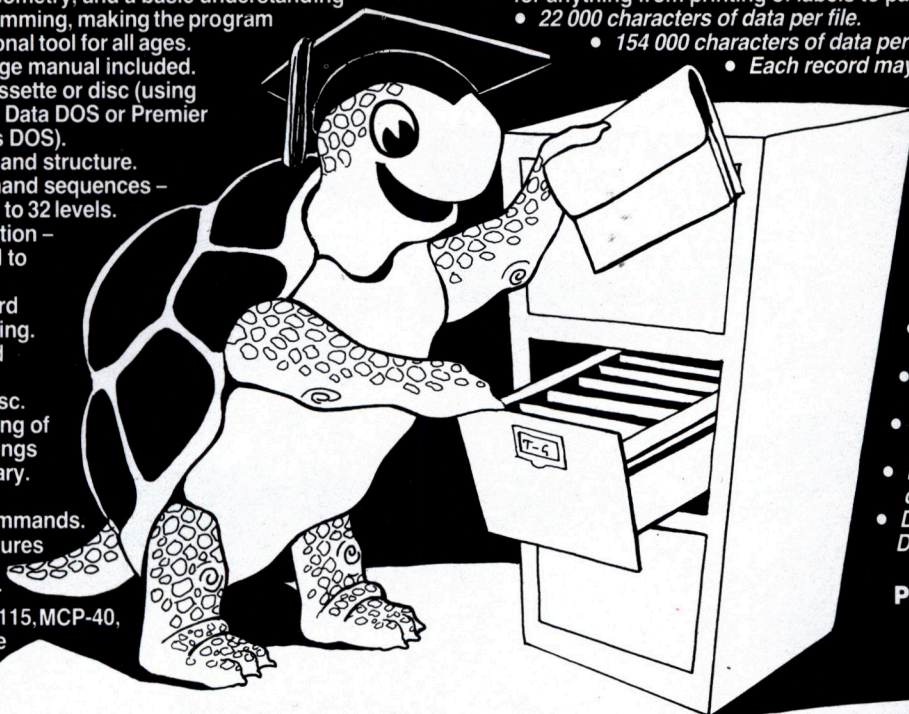
Pictures are drawn by telling the "turtle" to move forward and turn so that it traces a picture on your TV screen or 4 colour printer/plotter.

Powerful "repeat" and "word library" facilities allow you to build up new commands as you progress, and you can save your "word library" on cassette tape or floppy disc.

The end result of using a system such as this is an increased knowledge of geometry, and a basic understanding of simple programming, making the program an ideal educational tool for all ages.

- Snappy 32 page manual included.
- Runs from cassette or disc (using either Dragon Data DOS or Premier Microsystems DOS).
- Simple command structure.
- Repeat command sequences – can be nested to 32 levels.
- "Word" definition – can be nested to 30 levels.
- Powerful "word library" handling.
- Save and load library using cassette or disc.
- Dynamic editing of command strings and word library.
- Scaling and stretching commands.
- Will draw pictures on 4 colour printer/plotter (TRS-80 GCR115, MCP-40, or compatible plotter).

**Price
£9.95**



DATA RETRIEVAL SYSTEM

DRS is a powerful database package for the Dragon computer, supporting files stored either on cassette or disc (using the Dragon Data DOS).

DRS has been designed for ease of use and flexibility. You can design your own database, specifying number and type of fields. Powerful full screen editor allows easy design of your own screens.

DRS contains full facilities for adding, maintaining and deleting records. Fields may be added to or deleted from existing files even after records have been added. Search facilities allow for selection of records by any portion or combination of fields.

DRS also has an extremely flexible report generator, allowing for anything from printing of labels to paged reports.

- 22 000 characters of data per file.
- 154 000 characters of data per disc file.
- Each record may contain a maximum of 480 characters, 26 alphanumeric fields and 10 numeric fields.
- Inclusive, exclusive and ranged searches on alphanumeric fields.
- Comparative searches on numeric fields.
- Add, delete and change records.
- User definable screen displays.
- User definable report generator.
- Record formats may be changed at any time.
- Disc files require Dragon Data DOS.

Price £14.95



Tape duplication by
DATA CLONE

Please add 50p P.&P. to all orders. Send A5 SAE for full catalogue.
Cheques or postal orders payable to:

Salamander SOFTWARE

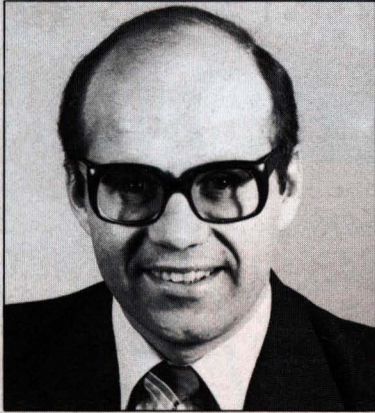
17 Norfolk Road, Brighton, BN1 3AA. Telephone: Brighton (0273) 771942.

Look out for these other new releases from Salamander Software.

DRAGON: Wings of War £7.95 (WW II Adventure). The Cricklewood Incident £7.95 (Weird & Wonderful Adventure).

BBC: Eagle £7.95 (Original-Arcade Action). Turbo £9.95 (BASIC Compiler)

INTRODUCTION TO 'DRAGON WORLD'



We are all excited this month with our distribution deal with GEC which will offer Dragon considerable opportunities to prosper and grow. This arrangement also provides more exciting products as a result of combining our resources, which we are confident you will find interesting and useful.

Dragon still continues to flourish overseas and this month we greet new readers in Canada and welcome their involvement in the DRAGON WORLD.

Finally, may we thank you for your continuing support for DRAGON WORLD. We are very pleased with the response to date and look forward to your correspondence which is proving to be most helpful.

SUBSCRIPTION OFFER

SUBSCRIPTIONS FOR DRAGON WORLD CAN BE OBTAINED DIRECT FROM DRAGON DATA FOR £4. THIS WILL ENTITLE YOU TO 6 BI-MONTHLY ISSUES MAILED DIRECTLY TO YOU AND THE FORM FOR THIS CAN BE FOUND IN A SEPARATE INSERT TO THIS MAGAZINE. IF YOU KNOW OF ANYBODY WHO MIGHT BE INTERESTED WHO CURRENTLY DOESN'T RECEIVE THE MAGAZINE, PLEASE LET THEM KNOW OF THIS FACILITY.

CONTENTS

User Club News	6
Readers Contributions	7
Dragon Data and GEC	9
Dragon Answers Back	11
Machine Code Corner	14
Young Users' Pages	16
Software Reviews	19
Dragon User of 1983	23
Dragons in Dragon	24
This Month . . .	26

EDITORIAL

We have been aware for some time that there is a need for more peripherals for Dragon computers, so we are delighted to be able to give you the advance information that a whole new range of products, including printers, plotters and a data recorder, will be available shortly. Full details will be given in the next issue of 'Dragon World'. This, coupled with the new product range to be launched soon, means a very exciting future for Dragon Data.

You may well have heard that GEC have signed a sales and marketing agreement with Dragon Data. It will be of great benefit to all to have the strength of the mighty GEC behind Dragon Data, and GEC have been able to add home computers to their vast range of products. We hope this arrangement will enable Dragons to be available in far more outlets than before, but let us assure you that Dragon Data will still be here to help you with any problems or difficulties you may have.

The winner of the Dragon User of 1983 competition has been decided. This was a very difficult task, as the standard of entries was so high: thank you for all your entries — we hope to have a similar competition this year.

The response to our software offers has been immense, and we are pleased to say that we have more special offers for you this issue. New software titles are appearing on a regular basis and reviews on several items are included in this issue.

We do appreciate receiving contributions from Dragon Users; as usual, please send all communications to the editorial address.

Editorial Team,
Dragon World,
Dragon Data Ltd.,
Kenfig Industrial Estate,
Margam,
Port Talbot SA13 2PE,
West Glam.
Tel: 0656 744700

Editor: Kathy Ashton
Advertising: Kevin Stephens
User Clubs: Cathy Hyde

OASIS SOFTWARE

present . . . TWO NEW RELEASES



SPRINT BASIC COMPILER

A rapid step forward in Home Programming.

The newly released 1.1 upgraded compiler written by Dr. David Gray for Dragon 32 and 64 owners. By converting your own BASIC programs into intermediate code, Sprint accelerates them by up to 5 or even 10 times their normal running speed. Supporting virtually all the integer BASIC and cassette and printer commands, Sprint programs are not only compiled from tape but also run independently of the compiler.

PETITE PASCAL

Not just a language — an education in structured programming.

This extended integer subset of the structured programming language is the ideal introduction, not only to a language widely used in schools and universities but also to programming itself. As an appreciation of PASCAL is generally accepted as the best way to increase your understanding of structured languages, this is a must for anyone who takes computing seriously.

OASIS SOFTWARE

Oasis Software, 9a Alexandra Parade,
Weston-super-Mare, Tel: 0934 41 9921

Please send me
SPRINT BASIC COMPILER
PETITE PASCAL

£14.95
£14.95

I enclose cheque/PO for £ _____

Name _____

Address _____

OASIS SOFTWARE

DRAGON 32 & 64

DRAGON CHESS

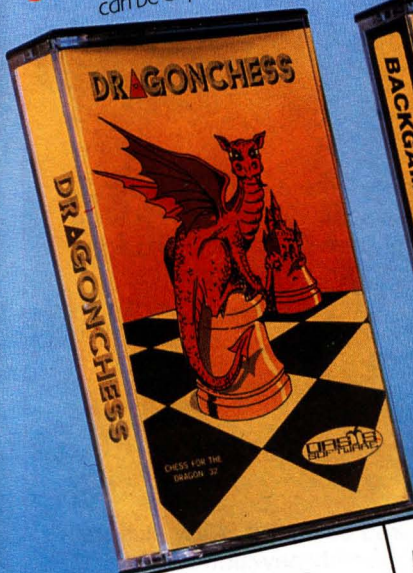
- Six levels of play.
- All legal chess moves including en-passant, castling and pawn to queen promotion.
- List of previous moves stored which can be displayed or printed.

- Loading and saving of games positions from tape.
- High resolution graphics which can be flipped round to make black or white play from either end.
- Simultaneous text and graphics.

- Sides can be exchanged at any stage.
- Best move hint.
- Set up from any position.
- Opening move library.
- Moves may be taken back and play resumed from any point.


- Change level of play at any point in the game.
 - Will adjudicate games between humans.
 - Very high standard of play.
 - Professional packaging and lifetime guarantee.
- "Dragonchess is without doubt the best value chess on the market today."
(Microdeal)

"... I thought this was an excellent version of the game. Well worth buying."
(Home Computer Weekly)



MIND GAMES COMPENDIUM.

All five games for just **£19.95**

Oasis Products are available from  and all good software suppliers. Including: Websters, Games & Computers, Microdeal, The Dragon Dungeon, PCS Distribution, Pilonmist, Goal Computers (France), Falck Computers (Scandinavia) and Joylab (Germany).

If your local dealer does not stock these products then let us know his address and we will contact him.



Access orders taken by phone 24 hours a day.



0934 419921

Every product carries a lifetime guarantee. All prices include VAT and p & p.

BACKGAMMON

The well known game of backgammon complete with full instructions and computer demonstration for beginners.

REVERSI

At last! Reversi running on your Dragon 32 or 64. 2 levels of play, full instructions and computer demonstration for beginners.

INVADER CUBE

As well as being one of the best games of skill written for the Dragon 32 and 64 it also has some of the best pure machine code graphics we have ever seen.

DOMINOES

Two games in one with full instructions. Hours of frustrating fun this program has 6 levels of play and on the higher levels adapts its assessment of your ability.



Oasis Software, 9a Alexandra Parade, Weston-super-Mare, Tel: 0934 419921

Please send me

DRAGON CHESS

BACKGAMMON

REVERSI

DOMINOES

INVADER CUBE

MIND GAMES COMPENDIUM

NAME _____

ADDRESS _____

Dragon 32 Dragon 64

£9.95

£5.95

£5.95

£5.95

£5.95

£19.95

_____ I enclose cheque/PO for £ _____



USER CLUB NEWS

I realise all has been quiet on the Dragon Data Ltd. front for a while now but this month we are looking to change that. One proposal has been organised tours of the factory. Many of you wish to see how we operate and this would be an ideal opportunity. We also plan to open our shop facility at the end of the tour so you can buy all those goodies you are having difficulty obtaining from the dealers. Anyone interested, please contact me, or Kevin Stephens, on 0656 744700 for further details.

Good news on the software front too, we are now offering 10% discount on most of our software products to those clubs who have contacted me. Special 'Club' order forms will be issued shortly. If you have not as yet sent me your details and want to take part in this scheme, put pen to paper with details of your club.

I hope that you now feel that things are moving in the right direction. Keep the letters flowing in with news on your clubs.

PEN PALS

Mr. Fred Belfield would like to start up a Pen Pal Club and anyone interested should contact him at St. Stour Hill, Quarry Bank, Brierley Hill, West Midlands DY5 2AT.

CLUB LIST ADDITIONS

ENGLAND

Hants.

Contact Mr. Adrian May,
Portsea Island Co-op,
69/99 Fratton Road,
Portsmouth.

Hants.

Romsey Area Dragon User Group has regular meetings and a newsletter. For details, please send SAE to:
Ashley Adamson,
St. Elmo,
Slab Lane,
West Wellow,
Romsey SO5 0BY
or 'phone Romsey 23041

Herts.

Contact: Paul Kennedy,
The Herts & Essex Dragon Owners Club,
46 Cheyne Close,
Ware,
Herts.

Paul is looking for new members in his area, club membership is modest at present, with 14 members on a good day.

Lancs.

Contact: Steve Melrose,
4 Kempton Avenue,
Blackpool FY3 9HS
Steve wants to start up a club in the Blackpool/Fylde area.

London

Philip Firth,
Time & Talents Youth Clubs,
Community Centre,
The Old Mortuary,
St. Mary Church Street,
Rotherhythe
London SE16

This is basically a youth club but they have got two Dragons. A registered charity, aimed to help 11-18 year olds, I am sure that offers of help will be welcomed.

Manchester

Master John Edwards,
50 Biddall Drive,
Baguley M23 8PF

John is an enthusiastic 14-year old who would like to start a club for the Greater Manchester area. You may contact him by telephone, but please ensure that you phone ONLY between 5pm and 7pm. (Tel. No: 061 998 4439)

Middlesex

68 Micro Group,
41 Pebworth Road,
Harrow,
Middx. HA1 3UD

This club will be of more interest to the serious programmers. They cover aspects of various 68 series micros and have a bi-monthly newsletter including a page for Dragon users. Membership is £6 per annum.

Surrey

P. R. Young,
(Dragon Computer Club),
Flat 1,
3 St. Johns Road,
Earlswood,
Redhill RH1 6HF

Only local members required as a start. New club with limited free membership, monthly newsletter etc.

WALES

Bridgend

Mr. Bonfield,
3 The Glen,
Daleside,
Bryncethin CF32 9LX

Mr. Bonfield is the chairman of the Bridgend & District Micro-Computer Club which meets every Wednesday at 7pm at the Aberkenfig Miners Welfare Hall. You may write to Mr. Bonfield but he cannot guarantee a reply to every letter.

Cardiff

Hywel Francis,
8 Azalea Close,
Cyncoed,
Cardiff.

Hywel Francis would like to extend an open invitation to anyone interested in a club in the Cardiff area. You may contact Hywel direct or leave your name and address at Steve's Computer Company, Castle Arcade, Cardiff.

OVERSEAS

I have had a letter from a user in Thailand who would like to know if there are any other users out there. If you are in Thailand, please contact me and I can put you in touch.

READERS' CONTRIBUTIONS

The first contribution this month is from Mrs. Pam D'Arcy for Pamcomms Ltd., 21 Wycombe Lane, Wooburn Green, High Wycombe, Bucks, who has been kind enough to prepare an additional information sheet on Pixel Editor. This applies to the Multi-Coloured Print Routine and the sheet is printed below:

Technical Appendix B (Multi-colour print routine)

Having experienced problems in trying to use MCPR (particularly when varying the character set size) the following information has been discerned and may be of use to anyone else experiencing similar difficulties.

MCPR parameter area layout (15 byte area commencing at address "A+2" (p.26) or "A1+2" (p.19).

Locn.	Other refs	pages	Description of content	Value set to at load
A+2	A1+2,DX	19,20, 24,28	X co-ordinate (theoretical range 0-255)	120
A+3	A1+3,DY	19,20, 24,28	Y co-ordinate (theoretical range 0-191)	0
A+4,+5	A1+4,+5, & VPT	19,28, 29	Address of VARPTR descriptor	\$36CF
A+6,+7	SBP	29	Grid character set base address	(g.page 5)\$1E00
A+8	GL	29	Grid character set height (=rows)	8
A+9	GN	29	Grid character set width in PMODE3 addr.elements	6
A+10	—	—	Number of characters across the grid (i.e. integer of 128/GN, as when Pixel editing)	21
A+11	—(RSP?)	—	Required graphics display line spacing (rows)	12
A+12	—	—	Reqd. graph display char. spacing graph. (PMODE3 el.*2)	12
A+13	A1+13	19,20, 25,29	End of line character (not the freq.mentioned "<" but shift& ↑)	\$5F
A+14	—	—	"Normal" foreground colour for the character set (=internal code=Pixel Ed.code-1) if the colour for the current PMODE3 element being displayed is this, it uses current Basic foreground (\$B2) unless colour switch has been requested (A+16)	2 (blue /magenta)
A+15	—	—	"Normal" background colour of the char.set when created(internal as above). If the colour of the current PMODE3 element being displayed is this, it uses the current Basic background colour(\$B3)	1 (yellow /buff)
A+16	—	19,25, 29,31	Colour switch code	@ (\$40)

A parameter DBP (p26) is mentioned. I think that the relevant reference should be to locations \$BA,\$BB (base address of current graphics page).

Also, when using Pixel Editor, should the background colour selected be colour code 4, as the grid lines are in that colour regardless, the system may appear to be "hanging" particularly if a large grid size has been selected) but it is in fact initialising the screen without you being able to see it doing so and patience is eventually rewarded by the "cursor" appearing.

The competition to draw 'the star in the east' produced some very good entries and we wish we had space to print more than one. Our winning entry from Graham Bell exploits the LINE command to produce a star with a graceful and symmetric shape.

```

5 REM STAR --- GRAHAM BELL
10 PMODE 4,1:SCREEN 1,1:PCLS 0:COLOR 1,0
20 B=84:C=128:D=76
30 FOR A=44 TO 128 STEP 4
40 LINE (A,B)-(C,D),PSET:D=D-4:
   IF D<0 THEN D=0
50 NEXT A
60 D=76
70 FOR A=212 TO 128 STEP -4
80 LINE(A,B)-(C,D),PSET:D=D-4:
   IF D<0 THEN D=0
90 NEXT A
100 B=84:C=128:D=92
110 FOR A=44 TO 128 STEP 4

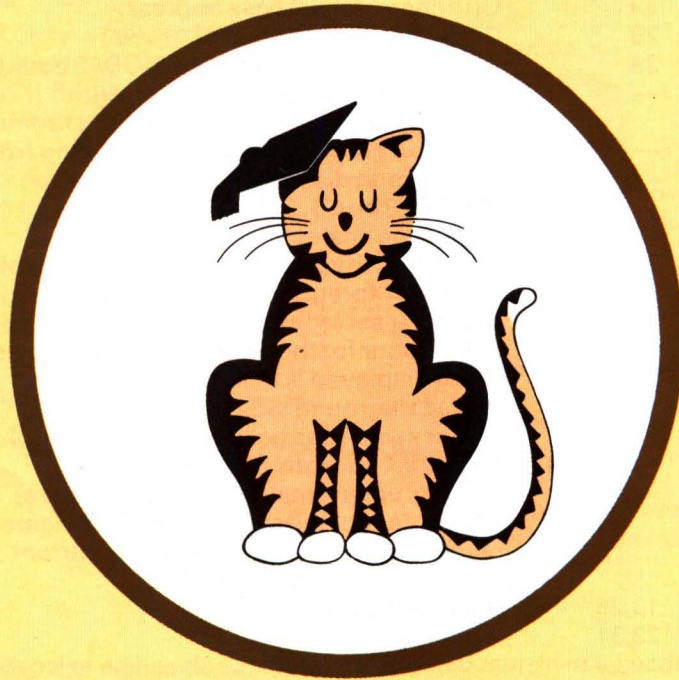
```

```

120 LINE(A,B)-(C,D),PSET:D=D+4:
   IF D>188 THEN D=188
130 NEXT A
140 D=92
150 FOR A=212 TO 128 STEP -4
160 LINE(A,B)-(C,D),PSET:D=D+4:
   IF D>188 THEN D=188
170 NEXT A
180 CIRCLE (128,82),50
190 PLAY "O3L2T10EDL1.CL2DEFL1GGL2
   ABL1O4CO3BAGGL2ABL1O4CO3BAGAB
   O4CO3GFEEL2EDL1.CL2DEFL1GGL
   2ABL1O4CO3BAGGL2ABL1O4CO3BAGABO4
   CO3GFEEL2EDL1.CL2DEFL1GGL2O4CO3B
   L1AAAL1GL1.GL1O4CO3BAGABO4CO3GFEE"
200 FOR V=1 TO 1000:NEXT V:GOTO 190

```

CHESHIRE CAT **EDUCATIONAL SERIES** from **AMPALSOFT**



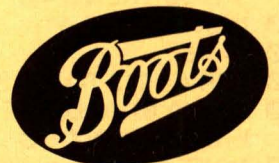
CHESHIRE CAT

The First name in Educational Software.

An exciting range of top quality programs
covering all needs from pre-school to 'A' level.

Now available from Boots and other good stores.

Ampal Computer Services Ltd.
31 Woodbridge Road, Darby Green, Blackwater,
Camberley, Surrey.
Tel: (0252) 876677



GEC DRAGON

DRAGON DATA AND GEC



GEC at Stoke Poges

The announcement that GEC had taken over the sales and marketing of Dragon computers and software from 1st February 1984 has opened up a completely new field for both operations.

For Dragon it means that the resources and reputation of Britain's biggest name in the field of electronics and electrical equipment of all kinds has been put behind our company's business.

For GEC, a company concerned with the marketing of consumer electrical and electronic leisure and entertainment products, it adds the range of Dragon computers and software and extends the outlets from which they will become available. With new and exciting products planned for the year, access to more and more customers can only mean good news.

Let's take a look at the company with whom Dragon has been allied.

Quite literally GEC's products and expertise range from the depths of space to the depths of the Earth; from giant power generating equipment to handy sized telephones, from an integral role in national and international defence, to fireside entertainment of TV and video.

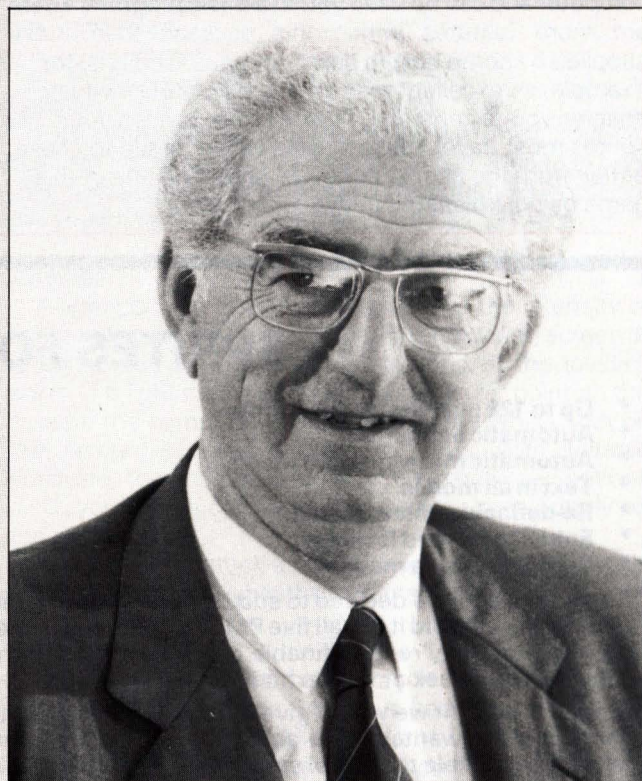
The General Electric Company plc (GEC) is Britain's biggest electronics and electrical company and ranks amongst the best in the world. UK-owned and managed, GEC employs 137,000 people in the UK and 41,000 overseas. It has 159,000 shareholders. Turnover at £5,456 million has nearly doubled in the last five years. The company's financial position is extremely strong and in 1982/83 pre-tax profits reached £670 million. During

the same year the Company spent £206 million on capital expenditure and £530 million on research and development and engineering new products.

GEC operates in a decentralised way, allowing the management of its many operating units the maximum freedom to run their businesses. Amongst the businesses are many famous names such as Marconi, Ruston, Paxman, Hotpoint, Osram, Express Lift and W & T Avery.

GEC is Britain's largest exporter of capital goods and last year shipped to customers overseas equipment worth £1,142 million.

Dragon Chief Executive and Managing Director, Mr. Brian Moore, speaking about the GEC involvement said, "We are very excited about the prospect of integrating our range with the well established consumer electronic products marketed by GEC. The whole field of consumer electronics is growing at a tremendous pace. Our Dragon products have been very successful; we achieved record sales for our current home computers — and we have new products coming on stream which we expect to do equally well. These new products will strengthen our position in the home computer market as well as moving us into the accelerated growth area of professional and small business usage".



Mr. Ron Bosanko

Mr. Ron Bosanko, Chairman, GEC McMichael said, "This marketing arrangement with Dragon Data following so quickly on the acquisition of the Ayr Viewdata business, significantly strengthens our position in the fast growing home electronics marketplace". This relationship between GEC and Dragon will enable us to further strengthen our product range and utilise the skills and resources of both companies to the full.

Dragon Data believe that this arrangement with GEC will lead to a bigger and better service for customers, but don't forget that Dragon's Customer Support Department will continue to help and advise you in any way possible.



NEW SOFTWARE FOR THE DRAGON

SPRITE MAGIC

Sprite Magic is quite simply the best Dragon utility available on the market today. Merlin Micro Systems have accomplished the seemingly impossible by giving the Dragon Sprite the ability to use graphics. Sprites (for those who have been on another planet for the last year) are independent graphic objects that can be put into motion by a single command and return a special value when hit.

There are 41 new commands which form an extension to the Microsoft Basic supplied with your Dragon computer and can be used within a Basic program. There are more features within this package than those supplied by some built-in sprite routines. There is, for example, an excellent feature called MAZEON which enables you to construct a maze around which your sprites must travel, these sprites can be made to chase or flee from the user's sprite. Do I hear the title of this game being whispered in the background.

The documentation is quite bulky so don't expect to be using Sprites as soon as you purchase the package, but after carefully reading the commands section you should be ready to experiment on your own. If you cannot wait that long then there are seven Demonstration programs on this tape several of which could have made games in their own right. A listing of this will give great insight into the techniques of using Sprites.

There is now no need for those amongst you, who are unfamiliar with machine code, to produce lifeless games. Now with this package and a few lines of Basic, Pac Man and Frogger will soon be flashing across your screen.

Sprite Magic is available now on mail order from Dragon Data . . . see separate insert.



SPRITES FOR THE DRAGON

- * Up to 128 non-destructive sprites.
- * Automatic animation.
- * Automatic maze-running mode.
- * Text in all modes.
- * Re-definable character set.
- * Enhanced sound facilities.
- * Comprehensive manual.
- * Size single pixel to 1600 pixels.
- * Automatic joystick/keyboard control.
- * Collision detection.
- * True lower case ASCII.
- * Auto-repeat keyboard.
- * Dozens of powerful new commands.
- * Six free demonstrated programs.

Some time ago, we decided to add text printing facilities to the Dragon's graphics screens. Although it took three weeks of hard work we did it, for all five PMODES. We made the characters re-definable but we did not call them sprites because they are not, they're re-definable characters. Then we decided to add some sound effects and user-definable sounds. After another week or so, we had done that as well.

Next, we thought we would give the Dragon some sprites. We required multi-coloured sprites of any reasonable size or shape and we wanted to be able to move them without obliterating whatever else might be on the screen. We quite fancied being able to control sprites from the keyboard or joysticks with just a single command and we thought it would be nice to be able to fire sprites with the joystick buttons. No sprites system worth its salt would ignore collisions, we thought, so we would have to have collision as well. Also, we wanted the sprites to be fast, versatile and easy to use, with lots of functions so that the control program would know where all the sprites were and what they were doing. Another brainwave was to include an automatic maze-running feature where all the sprites chase (or run away from) a particular sprite, so that it would be easy to write THAT kind of program. Then we thought we would like to have easy animation, preferably looked after automatically by the sprite handling system. Finally, just to make the whole idea totally impractical, it would have to be driven entirely from Basic, without any tedious Peeking and Poking.

We did it. It took months, but we did it. The author of the two top-selling Dragon games in a recent best-sellers list has described Sprite Magic as the best piece of software he has ever seen. P.C. Weekly said "excellent" and "superb". Modesty forbids, but we think it's pretty good too.

Phone your Access/Visa number or send cheque or Postal Order for £17.25 to:-



MERLIN (MICRO SYSTEMS) LTD,
93 HIGH STREET, ESTON, CLEVELAND
Tel: (0642) 454883



DRAGON ANSWERS BACK

Question

Can you tell me if it is possible to load a number of short programmes from tape and then to 'merge' them without losing them?

Answer

It is possible using a BASIC routine we have available. Unfortunately, this routine is too long to be listed here; should you require further details, please send a SAE to our Customer Support Department stating what you require.

Question

I have a Dragon 64 computer and I wish to download via RS232 a program to my Dragon from a large machine which also has an RS232. Is this possible without using specialist software?

Answer

This is possible using the following routine:

```
1Ø ' TO DOWNLOAD A PROGRAM FROM  
ANOTHER COMPUTER SELECT SERIAL  
OUTPUT ON THE MASTER COMPUTER AND  
LIST PROGRAM TO SERIAL PRINTER THEN:-  
2Ø POKE&HF4BF,&H2A:POKE&HF4CO,&H12  
25 POKE&HF4C1,&12:REM ONTO DRAGON 64  
3Ø ' THE PROGRAM WILL APPEAR ON THE  
DRAGON SCREEN AND WILL BE CRUNCHED  
4Ø ' ONCE LOADED PRESS RESET AND LIST  
PROGRAM
```

This routine configures the Dragon to accept input from the RS232 and use it as it would any keyboard input.

Question

I would find it very useful to have a hard copy of everything that my Dragon prints on the TV screen. Is there a routine to direct the output to printer and screen simultaneously?

Answer

The following routine should achieve the desired results:

```
POKE &H168,&H8Ø  
POKE &H169,&HØF  
POKE &H167,&H7E  
To CANCEL, POKE &H167,&H39  
To RE-START, POKE &H167,&H7E
```

Question

Sometimes when typing in a listing from a book or magazine, I have come across a pound sign. However, this symbol is not on my Dragon's keyboard and I can find no way of getting it on the screen. Can you help?

Answer

The confusion arises because printers are not entirely standardised in the way they interpret character codes. The Dragon assigns code 35 to the "#" symbol. On many printers, this code is allotted to the "£" sign.

If you encounter a "£" sign, substituting a "#" will allow the program to run correctly.

Question

I have read that the Dragon 64 incorporates an auto-repeat facility for the keyboard. Is there any way that I can implement an auto-repeat on my Dragon 32?

Answer

All that is needed is a subroutine to set the keyboard rollover table every time an auto-repeat is required. The rollover table is stored in locations &H15Ø to &H159 and can be set by POKEing each location with &HFF. Try running this short BASIC program as a demonstration:

```
1Ø CLS  
2Ø PRINT "HOLD DOWN ANY KEY"  
3Ø FOR I =Ø to 9  
4Ø POKE &H15Ø + I , &HFF  
5Ø NEXT I  
6Ø A$=INKEY$:PRINT A$;  
7Ø GOTO 3Ø
```

Question

I am interested in using a light pen with my computer, but I am not exactly sure of what they do. Please explain their function and tell me where I can get hold of one for the Dragon.

Answer

A light pen is a device used to assess the intensity of light emitted by any point on the TV (or monitor) screen. It is connected to the computer via one of the joystick ports. If a light pen is pointed at a particular point on the screen, the computer is able to calculate which spot on the screen is being referred to. Thus, with suitable software, they can be used to choose between options displayed by the computer, or even to draw directly on the screen.

We ourselves stock a versatile light pen which retails at £9.95 and is available through mail order.

Question

Although I find that most Dragon 32 software runs perfectly on my Dragon 64, I have had some difficulties with 'Breakout' and 'Middle Kingdom'. Is there anything I can do to make them run as they should?

Answer

Both programs will run perfectly if you make these simple modifications:

'Breakout': Load Game. Once loaded, type:

```
POKE &H1E28,&HFA  
EXEC
```

'Middle Kingdom': Load Game. Once loaded, type:

```
POKE &H1E0D,&HF8  
POKE &H5E0B,&HF8
```

42 Radcliffe Drive,
Ipswich, Suffolk, IP2 9QZ.

Telephone: (0473) 684425

DRAGON SOFTWARE AT UNBEATABLE PRICES

Chuckie Egg	A & F	6.87	Maurice Minor	Morrison	6.04
Sub Commander	B & H	6.04	Jungle Search	Omega	6.04
And All Because	B & H	6.04	Go for Broke	Omega	6.09
Pub Crawl	B & H	6.04	Death Mines Sirius	Phoenix	8.69
Up Periscope	Beyonbd	6.04	Pimania	Automata	8.70
Kriegspiel	Beyond	6.04	Taskship	Prog Fact	7.78
Planet Conquest	Blaby	5.17	Ninja Warrior	Prog Guild	7.78
Drone Datatank	Cable	7.60	Pacroids	Prog Guild	7.78
Dragrunner	Cable	7.60	Protector	Prog Guild	7.78
Baccarat	Cable	7.60	Golf	PSS	6.91
Cave Fighter	Cable	7.68	Startrek	PSS	6.91
Trace Race	Cable	7.68	Attack	PSS	6.91
Drag Racer/Wasp	Cable	8.65	Flight Simulation	PSS	6.91
St George Dragon	CRL	6.04	Drag Bug (Utility)	PSS	11.26
Keys of Roth	CRL	6.04	TextStar (Word Proc)	PSS	11.26
Handicap Golf	CRL	6.04	Dataplant (Database)	PSS	11.26
Maths Trek	Dungeon	5.17	Champions	Peaksoft	6.04
Temple of Zoren	Dungeon	6.91	Lionheart	Peaksoft	4.74
Treasure Tomb	Dungeon	6.91	Death's Head Hole	Peaksoft	4.74
Giants Castle	Dungeon	5.17	Don't Panic	Peaksoft	4.74
Midas Maze	Dungeon	5.17	SAS	Peaksoft	6.04
Dragonfly	Hewson	6.04	Photo Finish	Peaksoft	6.91
Pedro	Imagine	4.78	Ossie	Peaksoft	6.04
Leggit	Imagine	4.78	Hang It	Peaksoft	4.74
Samuria Warrior	Lothlor	6.04	Mined Out	Quicksil	5.17
Tyrant of Athens	Lothlor	6.04	Strategic Command	Romik	6.08
Warlord	Lothlor	6.04	Cyclops	Romik	6.08
Roman Empire	Lothlor	6.04	Convoy Attack	Romik	6.08
Johnny Reb	Lothlor	6.04	White Crystal	Romik	6.08
Hungry Horace	Melbourn	5.17	Dragon Trek	Salamand	8.65
Bonka	Morrison	6.91	Wizard War	Salamand	6.91
The Quest	Impact	4.35	Golf	Salamand	6.91
The Orb	Impact	4.35	Grand Prix	Salamand	6.91
Startrek	Impact	4.35	Night Flight	Salamand	6.91
JD Maze	Impact	4.35	Franklin's Tomb	Salamand	8.65
Droids	Morrison	6.04	Empire	Shards	6.91
Vultures	Morrison	6.04	Pettigrew's Diary	Shards	6.91
Chess	Morrison	6.91	Transylvanian Tower	Shepherd	5.63
Crusader	Morrison	6.04	Ugh!	Softek	6.04
Editor/Assembler	Morrison	17.35	Monsters	Softek	6.04

**** SPECIAL OFFER ** 'EDITEXT' Word Processor by NECTARINE —**
Rated at 5* by 'Home Computing Weekly'. Used by us and rated SUPERB. Our Price £11.25
Cheques/Postal Orders to AMBERSOFT — Postage/Vat included in above prices

DON'T JUST PLAY GAMES! EDUCATIONAL SOFTWARE

Physics (O level/CSE Revision)	Maths (CSE Revision)
Biology (O level/CSE Revision)	Sports (Quiz 9/99 years)
Computer Studies (O level/CSE)	Tables (Practice 7/11 years)
Spelling (Improver 9/99 years)	Knowledge (Quiz 9/99 years)
Mathematics (Practice 8/11 years)	English (Practice 8/11 years)
Reasoning (11+ Revision)	Arithmetic (Practice 7/10 years)
Science (Revision 12/14 years)	Maths (Revision 12/14 years)
English (Revision 12/14 years)	

Unbeatable value at £4.95 each post free

'O' level/CSE Computer Studies

A set of four cassettes jam packed with up to date knowledge covering the 'O' level CSE syllabus. Full tutorial with revision questions. Subject areas include Data Coding, Data Storage, Computer Arithmetic, Computer Logic, Processing Information, Society and Computers, Computer Structure, Backing Storage and much, much more.

Also suitable as a general introduction to the computing world

(Mums and Dads please note)

**UNBEATABLE VALUE AT JUST £14.50 PER SET
PRO-FILE £9.95**

The cassette based filing system

Hundreds of uses in the home. Easy-to-understand 56-page manual.

Design your own file layout.

"Your Computer is actually useful" (PCW. July 83)

"Pro-File does everything claimed, and does it well"

(Which Micro, Nov 83)

Cheques/PO to:

MICRO-DE-BUG CONSULTANCY
60 Sir John's Road
Selly Park, Birmingham B29 7ER
Tel: 021-472 7610

AMAZING DRAGON UTILITY

"KK3" on cassette (new version)

READ TYPE-HEADERS: list filenames, start and entry addresses, catalogue your multi-program tapes.

GUARD AGAINST LOSS of information through chewed-up tapes, I/O errors, accidental NEWing or erasure, etc.

LOAD AND EXAMINE virtually any m/c program (including auto-run and headerless formats), and make security back-up copies for personal use.

Price only £5.95 incl. 1st class packing & postage
(£6.95 airmail Europe, \$12 airmail U.S.)
from D. Gill, 82 Carlton Hill, London NW8 0ER

ABACUS SOFTWARE-UK-LIMITED.

21 UNION STREET RAMSBOTTOM, Nr. BURY LANCs.

SPREADSHEET ANALYSIS.

A dynamic Spreadsheet system enabling data to be entered, altered and manipulated, giving the user the ability to observe future theoretical or factual changes that could occur within his business. **£9.95**

PURCHASE/SALES LEDGER	£29.95	NON-VAT ACCOUNTS	£15.00
A COMPLETE SALES AND PURCHASE LEDGER SYSTEM ON TWO PROGRAMS. INCLUDING CREDIT NOTE ANALYSIS, STATEMENTS, CASHBOOK, AGED DEBT ANALYSIS, FULL CUSTOMER LISTINGS, SUPPLIER REPORTS, INVOICE LISTINGS AND REMITTANCE ADVICE NOTES. 60 ACCOUNTS TOGETHER WITH 200 TRANSACTIONS CAN BE HELD ON FILE.		FOR NON-VATABLE BUSINESSES. PROGRAM SIMULATES DOUBLE ENTRY BOOK-KEEPING PROVIDING FULL ACCOUNTING FACILITIES.	
STOCK CONTROL	£15.00	HOME FINANCE	£8.00
MENU BASED SYSTEM GIVING MINIMUM AND MAXIMUM STOCK, SUPPLIER DETAILS, STOCK SUMMARY AND VALUATION ETC.		CONTROL YOUR FAMILY ACCOUNTS WITH THIS HOME ACCOUNTANCY PACKAGE.	
PAYROLL	£25.00	TAX CALCULATOR	£4.00
CONFORMS TO DHSS RULES. PRINTS PAY SLIPS AND WILL HOLD DETAILS ON 50 EMPLOYEES.		FILL IN YOUR TAX FORMS WITH EASE AND CONFIDENCE USING THIS PROGRAM.	
		PERSONAL BANK ACCOUNT	£7.95
		KEEP COMPLETE CONTROL OF YOUR BANK ACCOUNT WITH THIS PROGRAM	

GENEROUS DEALER DISCOUNTS

NEW EDUCATIONAL SOFTWARE

TELL THE TIME — DRAGON — £6.50

Three programs using high-res. graphics and sound designed to teach children how to tell the time. The first being for the very young and the other two for students of French and German.

FIRST LETTERS AND WORDS — DRAGON, BBC — £6.50

A unique program that uses graphics to teach young children how to correctly form letters of the alphabet and use them in simple words and sentences.

ABC — DRAGON — £6.50

A spelling and letter recognition program using animated high-res. graphics and sound. This superb program will amuse and educate children for hours.

MATHS TUTOR — DRAGON, SHARP M2 700 — £6.50

A set of three programs designed to teach simple mathematics to your children (3-10). The package also includes a test sequence for parents or teachers allowing them to set their own questions.

Trade-Distributor Enquiries Ring BOLTON 383839

MANY MORE PROGRAMS AVAILABLE

SEND S.A.E. FOR DETAILS

Datapen

A QUALITY LIGHTPEN

for the DRAGON 32 microcomputer

Datapen**£25**

inclusive of VAT, P&P. Two different drawing programs provided free with each lightpen. "SKETCH" and "SHAPE-CREATE". SKETCH is a superb high resolution colour drawing program allowing both precise drawing and freehand sketching, painting etc. SHAPE-CREATE is a high resolution library shape drawing program.

SUPERIOR PROGRAMS

- * Tape storage of your work
- * Good documentation
- * User routines provided on tape and on printout

Also available for:- VIC-20, CBM-64 or BBC B. Please state your micro when ordering.

Send cheque or P.O. for £25 to:-

**Dept D.W.1. Datapen Microtechnology Limited,
Kingsclere Road, Overton, Hants. RG25 3JB**

Or send S.A.E. for details. Now available from good computer shops.

SUPERIOR PERFORMANCE

- * Insensitive to ambient lighting
- * Responds to different colours
- * Program accessible LED lamp readout
- * Switch for program control

"It differs from all other lightpens available for the Dragon in that it is a far more sophisticated beast... This program (Sketch)... clearly demonstrates the superiority of the Datapen"

Popular
computing
Weekly,
Dec. 15th



SHARDS proudly introduce for the Dragon 32

"The Mystery of the Java Star"

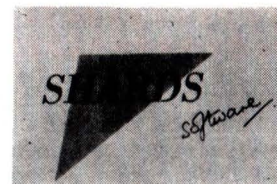
THIS IS AN EDUCATIONAL ADVENTURE OF EPIC PROPORTIONS

Taking up over 100K of memory, including 80K of high resolution graphics, and loading in four parts, this adventure is designed to provide hours of family fun, filled with puzzles, challenges and interesting facts. Also, with three levels of difficulty and a score sheet at the end, this is a game you can play again and again, to try and beat your last score.

You have discovered an old map and a ship's log book, indicating the existence of magnificent treasures, including a mysterious ruby, the Java Star, aboard an 18th-century sailing ship, that sank in the Caribbean. You must mount an expedition, gathering all the necessary information, then search for the shipwreck and the hidden treasure. Many skills are needed to solve this mystery, making it the ideal adventure for friends or family to play together.

**ALL THIS
FOR ONLY
£7.95**

AVAILABLE NOW AT ALL GOOD STOCKISTS OR BY PHONING THROUGH YOUR ACCESS/BARCLAYCARD ORDER TO 01-514 4871 OR BY SENDING A CHEQUE/PO FOR £7.95 TO SHARDS SOFTWARE, 189 ETON ROAD, ILFORD, ESSEX IG1 2UQ





MACHINE CODE CORNER

MATHEMATICAL SKETCH PAD

This is for the many Dragon users who need to sketch graphs. 'O' and 'A' level mathematics students can explore the behaviour of functions with this program irrespective of whether they can program or not.

BASIC allows you to define 'one-line functions'. The statement

```
DEF FN(X)=2*X*X+3*X+1
```

allows future lines of program to refer to (for example) FN(2) which would equal $2*2^2+3*2+1=15$. To write an all purpose program allowing users to specify such a function, either the full line must be written by the user, or we need an effective way of creating such a line from an INPUT statement.

To do this, we need to know how such lines are stored in the RAM of your Dragon. A short program is sufficient to unravel the secret.

```
10 ST=256*PEEK(166)+PEEK(167)
20 REMXXXXXX
30 FOR I=ST TO ST+20:PRINT PEEK(I);:NEXT
```

Line 10 finds the position in RAM of the next executable statement, in this case line 20, and line 30 produces the numbers 0 36 42 0 20 130 88 88 88 88 88 88 0 36 76 0 30 128. These numbers can be interpreted as follows:

The two bytes 36 42 determine the position in RAM of the next line, 0 20 specify the line number (20 in this case), 130 is the "token" for "REM", followed by 6 88's (88 is the ASCII code for "X"), and the end of the line is marked by a zero.

The most important aspect of this is the notion of "tokens" representing the key words of the BASIC language. If we replace line 20 with

```
20 DEF FN(X)=X+X-X*X/X↑X
```

and run the program again, we find the following tokens: DEF(152), FN(190), =(203), +(195), -(196), *(197), / (198), and ↑(199).

With this background information we can begin to see how to use the characters of a string F\$ to create the appropriate line of program — scan each character to see whether it should be a token, and if so POKE the appropriate token into the program line, otherwise POKE the ASCII value instead.

In the following program, subroutine 130 does precisely this, together with the necessary tokens for

```
DEF FN(X)=
```

and to finish the definition, the characters 58 (.) and 130 (REM) are POKEd. (REM is a useful statement to end the function, because the remainder of the line is then ignored.)

```
10 CLEAR500,13000
20 ST=256*PEEK(166)+PEEK(167)+13:GOTO70
30 REMXXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXX
40 DEF FNU(X)=10+230*(X-AX)/(BX-AX)
50 DEF FNV(Y)=180-170*(Y-AY)/(BY-AY)
60 RETURN
70 DIM F(255):INPUT"ENTER YOUR FUNCTION";
F$:G$=F$
80 GOSUB 310:GOSUB30
90 INPUT"ENTER RANGE OF X VALUES XMIN TO
XMAX";AX,BX
100 INPUT"ENTER THE NUMBER OF X
VALUES";NX
110 IX=(BX-AX)/NX:FOR I=0 TO NX
120 X=AX+IX*I:F(I)=FNU(X):IF I=0 THEN
AY=F(I):BY=F(I):NEXTI
130 IF F(I)<AY THEN AY=F(I)
140 IF F(I)>BY THEN BY=F(I)
150 S$=STRING$(LEN(G$),32):
FT$="WHEN X=####.## %"
+S$+"% =####.###"
160 PRINT USING FT$;X,G$,F(I)
170 NEXTI
180 PRINT"RANGE OF Y-VALUES IS
FROM"AY;"TO";BY
190 PRINT"PRESS ANY KEY FOR THE GRAPH"
200 IF INKEY$="" THEN 200
210 PMODE4,1:SCREEN1,1:COLOR0,1:PCLS
220 LINE(10,10)-(240,180),PSET,B
230 IF AX<0 AND BX>0 THEN
U=FNU(0):LINE(U,180)-(U,10),PSET
240 IF AY<0 AND BY>0 THEN
V=FNV(0):LINE(10,V)-(240,V),PSET
250 FOR I=0 TO 10:X=10+23*I:Y=10+17*I
260 LINE(X,180)-(X,185),PSET:LINE(10,Y)-(
5,Y),PSET:NEXT
270 FOR I=0 TO NX:X=AX+IX *
I:Y=F(I):U=FNU(X):V=FNV(Y)
280 IF I=0 THEN LINE(U,V)-(U,V),PSET
290 LINE-(U,V),PSET:NEXTI
300 GOTO300
310 C$="+-*/↑=<>":FOR I=1 TO 8:READ
N(I):NEXT
320 DATA 195,196,197,198,199,202,203,204
330 DATA 152,32,190,88,40,88,41,203
340 FOR I=0 TO 7:READ X:POKEST+I,X:NEXT
350 FOR I=1 TO LEN(F$):X$=MID$(F$,I,1)
360 X=INSTR(1,C$,X$)
370 IF X>0 THEN POKE ST+7+I,N(X):NEXT:ELSE
POKEST+7+I,ASC(X$):NEXT
380 POKEST+7+I,58:POKEST+8+I,130:RETURN
```

As it stands, standard functions like SIN, COS etc. cannot be used, since no provision has been made to translate these into tokens. Nevertheless a wide range of graphs can be sketched using this program. All you need do is to input the required function, together with the range of x values you want the graph to cover, and the number of points (up to 255) you want calculated in this range. The program lists the values of the function at the appropriate points (you can halt the scroll using SHIFT[@]) and gives the corresponding range of function values. When a key is pressed, the graph is drawn. Where the range of x or y values includes 0, an axis is drawn.

The standard functions are represented by two bytes — FF (255) followed by 127+n, where n is the number of the function in the table of standard functions, which

starts at address \$81CA in ROM. For example, SIN is 255 followed by 136, because SIN is the seventh function in the table. To see a list of the functions and their corresponding numbers, run the following program:

```

10 J=128:I=&H81CA
20 PRINTJ;;J=J+1
30 X=PEEK(I):I=I+1:IFX>128THEN50
40 PRINTCHR$(X);:GOTO30
50 PRINTCHR$(X-128)
60 IFI<&H8250 THEN20

```

To include these functions, we need a routine which analyses the string F\$ and searches the table to match sequences of characters with the standard function words. This can be done in BASIC, but the response time is rather poor. The following machine-code program does the job a lot faster.

```

NLETS EQU RETURN+1
NWORDSEQU RETURN+2
LENPTR EQU RETURN+3
1 START LDX $1B 9E1B
2 LDD #$4680 ;F$ CC4680
3 SEARCH CMPD ,X++ 10A381
4 BEQ FOUND 2704
5 LEAX 5,X 3005
6 BRA SEARCH 20F7
7 FOUND STX LENPTR,PCR AF8D0099
8 LDB ,X++ E681
9 LBEQ RETURN;LENGTH0 10270090
10 STB NLETS,PCR E78D008D
11 LDY ,X 10AE84
12 LIST LDX #$81CA 8E81CA
13 LDA #34 8622
14 STA NWORDS,PCR A78D0082
15 FIRST TFR Y,U 1F23
16 LDA ,Y+ A6A0
17 DEC NLETS,PCR 6A8C7A
18 BEQ RETURN 2777
19 CMPA #$41 8141
20 BLO FIRST 25F3
21 CMPA #$5A 815A
22 BHI FIRST 22EF
23 CHECK CMPA ,X+ A180
24 BEQ MATCH 270D
25 CHECK2 DEC NWORDS,PCR 6A8C6A
26 BEQ NOFUNC 2750
27 SKIP LDB ,X+ E680
28 CMPB #$80 C180
29 BLS SKIP 23FA
30 BRA CHECK 20EF
31 MATCH LDA ,Y+ A6A0
32 CMPA ,X+ A180
33 BEQ MATCH 27FA
34 ORA #$80 8A80
35 CMPA ,-X A182
36 BEQ FOUND2 2706
37 TFR U,Y 1F32
38 LDA ,Y+ A6A0
39 BRA CHECK2 20E1
40 FOUND2 STA ,-Y A7A2
41 TFR U,Y 1F32
42 LDA #$FF 86FF
43 STA ,Y+ A7A0
44 LDA #162 86A2
45 SUBA NWORDS,PCR A08C41
46 STA ,Y+ A7A0
47 DEC NLETS,PCR 6A8C3B
48 LDB (LENPTR),PCR E69C3A

```

```

49 TFR Y,U 1F23
50 LOOP1 LDA ,Y+ A6A0
51 DECB 5A
52 DEC NLETS,PCR 6A8C30
53 CMPA ,X A184
54 BNE LOOP1 26F6
55 STB (LENPTR),PCR E79C2B
56 LDB NLETS,PCR E68C26
57 BEQ RETURN 2723
58 PSHS U 3440
59 LOOP2 LDA ,Y+ A6A0
60 STA ,U+ A7C0
61 DECB 5A
62 BNE LOOP2 26F9
63 PULS Y 3520
64 BRA FIRST 2096
65 NOFUNC LDA ,Y+ A6A0
66 CMPA #$41 8141
67 BLO NEXT 250B
68 CMPA #$5A 815A
69 BHI NEXT 2207
70 DEC NLETS,PCR 6A8C0A
71 BEQ RETURN 2707
72 BRA NOFUNC 20EF
73 NEXT LEAY -1,Y 313F
74 LBRA LIST 16FF77
75 RETURN RTS 39

```

The program is written in Position Independent Code (PIC), which means that the same code will work anywhere in RAM. PIC is very easy to write for the 6809 and will be discussed in detail in a future article. For those who are using the DREAM, Editor/Assembler, it is convenient to assemble the code starting at address 13001 — this is available when DREAM is located at the top of RAM, and is not needed by the BASIC program. Before loading DREAM, type CLEAR 100, 13000. The program will then automatically assemble from byte 13001.

The code can, of course be POKEd into RAM using a BASIC program — simply put the sequence of bytes 9E, 1B, CC, 46, 80, 10, A3, 81 . . . into data statements and run a program to POKE them in, starting at any convenient position above 13000.

Lines 1-6 search the simple variable space (indicated by the contents of \$1B/C) for F\$. Line 8 loads the B register with the "length" of F\$ and line 11 loads Y with the address of the first byte of F\$. Line 12 loads X with the address of the Function Table. There are 34 function words (line 13).

Lines 15-30 check for a first-letter "match" between the characters of F\$ and the table. If one is found, lines 31-39 check the rest of the word. Lines 31-64 replace the character string with the corresponding token and close up the resulting gap. The final part of the program deals with strings of letters which are not functions (i.e. variables).

Two techniques are used which may be new to some readers. The brackets in lines 48 and 55 indicate "indirect addressing". For some assemblers these should be typed as square brackets (not in DREAM). Lines 58 and 63 are Stack operations — the contents of register U are PUSHED on to the System Stack, and later PULLED back into register Y. Both User and System Stacks may be used for this sort of temporary storage of values, and a sound understanding of how the Stacks work is invaluable for the serious machine-code programmer. These techniques will also be discussed in a future article.

(Continued on page 17)



YOUNG USER'S PAGES

PLEASE REMEMBER THIS DRAGON

As the programs you write become more interesting you see how much you need to be able to put special information into your program — the sort of information which enables the same program to do different things. This sort of information is often described as DATA (singular-datum). This time we are going to look at some of the different ways we can get data into the Dragon.

Most people enjoy the sort of program which requires you to respond even if only to enter your name. Both computer games and arithmetic tests require a response. This type of program is called INTERACTIVE.

Can you teach Dragon your name? One way of getting your name into Dragon's memory is to use the INPUT command. After the command you must give a variable name so that whatever is put in can be stored and recalled. Here is an example:

```
1Ø CLS:INPUT NAMES$
2Ø CLS:PRINT "HELLO ";NAME$
```

When you RUN this tiny program you see a question mark on the screen. When you type your name and press <ENTER> your name is put into the variable NAME\$. The next line clears the screen again and prints HELLO followed by your name. Of course your name is made up of letters and must be stored in a string variable which has a \$-sign after it. What if your Dragon wants to know more about you?

```
1Ø CLS:INPUT NAMES$,AGE
2Ø CLS:PRINT NAMES$;" YOU ARE ";AGE;" YEARS OLD."
```

This time Dragon expects two pieces of information, one string and one number. Try entering just your name. Dragon waits for more. You are supposed to enter your age as a number. See what happens if you enter it as a string.

```
?CHRIS
??TWELVE
?REDO
CHRIS,12
CHRIS YOU ARE 12 YEARS OLD
OK
```

When you see REDO, you must re-enter the whole input.

When you want to enter something during a program your program should indicate what to enter. A question mark on its own looks rather demanding and rude. The INPUT command lets us do this easily. The 'prompt' is written in quotes and is followed by a semi-colon. Put in a new line 1Ø.

```
1Ø CLS:INPUT "NAME,AGE ";NAME$,AGE
```

Only one prompt is allowed in any one line so NAME and AGE must come in the same prompt.

Suppose you wanted to enter an address:

```
3Ø INPUT"ADDRESS";ADDRESS$
4Ø PRINT ADDRESS$
RUN 3Ø
```

```
ADDRESS? 32,RAM STREET.
EXTRA IGNORED
32
```

All that is stored in ADDRESS\$ is 32. The computer took the comma in the address as separating two variables. We can overcome this by using LINEINPUT. Change line 3Ø.

```
3Ø LINEINPUT ADDRESS$
RUN 3Ø
32,RAM STREET.
32,RAM STREET.
```

Now the whole address is in ADDRESS\$. But there is a snag — there is not even a question mark to remind us to enter something. You can add a prompt (with question mark) as with INPUT or supply your own prompt using PRINT.

```
25 PRINT "ADDRESS ? "
```

Now type RUN25. You see we have our prompt on one line and the input on the next. To get them on the same line you need a semi-colon at the end of line 25. In fact we can place the prompt and the response wherever we want on the screen by using PRINT@. Here is a new line 25.

```
25 CLS:PRINT@1ØØ,"ADDRESS ? ";;LINEINPUT ADDRESS$
```

Of course you can use this with the ordinary INPUT too. Sometimes it is useful not to have the question mark for input. Use LINEINPUT instead but remember you can input only one variable and it must be a string. If you want a number, put it into a string first and convert it using VAL, e.g.

```
5Ø PRINT"WHAT IS THE NEXT NUMBER 1 2 4 8 ";
6Ø LINEINPUT N$:N=VAL(N$)
7Ø IF N=16 THEN PRINT"RIGHT"
RUN 5Ø
```

Now this is all very well but, when we use either of the INPUT commands, that input is printed on the print screen. If we have a display on the high resolution screen or on the print screen which we want to alter without printing we can use INKEY\$. This notes which is the next key pressed but doesn't print anything. We can make a very useful subroutine with this. Type NEW first to clear away the old program.

```
NEW
1ØØØ K$=INKEY$:IF K$="" THEN 1ØØØ ELSE
RETURN
```

When your program meets this subroutine it puts into K\$ the next value of INKEY\$. If there is nothing there it goes back and tries again. If a key has been hit it returns to the program and that key is shown in K\$. Here is a demonstration:


```

10 PMODE3,1:SCREEN1,1:PCLS
20 GOSUB1000:N=VAL(K$)
30 IF N<9 AND N>0 THEN COLOR N :
   DRAW"E20F20G20H20"
40 GOTO20
1000 K$=INKEY$:IF K$="" THEN 1000 ELSE RETURN

```

When you run this program you will see a blank screen. When you press a number between 1 and 8 a square appears. You can change its colour by pressing a different number. Press <BREAK> to stop.

You can still print letters on the screen. The next little program uses the same subroutine and prints whatever you type both forwards and backwards! Press <ENTER> to stop.

```

10 CLS
20 GOSUB1000:IF K$=CHR$(13)THEN END
30 PRINT@32+N,K$;:PRINT@479-N,K$;
40 N =N+1 :GOTO20
1000 K$=INKEY$:IF K$="" THEN 1000 ELSE
   RETURN

```

Subroutines are very useful when you want to do the same sort of thing many times. Perhaps you want to draw lots of circles. You might have a program like this:

```

10 PMODE3,1:SCREEN1,0:PCLS
20 X=100:Y=50:R=30:C=2:H=1:S=1:F=0
30 GOSUB1020:GOSUB1000
90 END
1000 K$=INKEY$:IF K$="" THEN 1000 ELSE
   RETURN
1020 CIRCLE(X,Y),R,C,H,S,F:RETURN

```

When you RUN this, you will see a circle. When you change R you will see a circle with a different radius. Let's do this with a new line:

```
40 R=50:GOSUB1020:GOSUB1000
```

Pressing any key sends the program to the next stage. First one circle, then the next.

If we want to do a lot of circles we can READ our data (the values of X, Y, R etc) from DATA statements. Simply change lines 20 and 40 and add the data line.

```

20 READ X,Y,R,C,H,S,F
40 READ R:GOSUB1020:GOSUB1000
1000 DATA 100,50,30,2,1,1,0,50

```

We can easily add more lines like line 40.

In the following program we have used this technique for the whole program. The subroutines themselves read the data they require.

```

0 REM EASTER CARD 1
10 PMODE3,1:SCREEN1,0:PCLS
20 GOSUB1010:GOSUB1000
30 PAINT(125,100),2,4
40 GOSUB1030:GOSUB1000
50 GOSUB1010:GOSUB1010
60 PAINT(100,50),1,4:GOSUB1000
70 GOSUB1010:GOSUB1010:GOSUB1000
80 GOSUB1030:GOSUB1000
90 READ A$:GOSUB1040
100 DATA 125,100,50,4,1,2,0,1
110 DATA "BL52D5E20F30E18F20E8"
120 DATA 125,100,50,1,1,2,5,0

```

```

130 DATA 125,100,40,4,1,4,54,0.05
140 DATA 115,75,4,4,1,0,1
150 DATA 135,75,4,4,1,0,1
160 DATA "BM124,95;NE8H8UF8E8"
170 DATA "BM124,79;NG8NF8"
180 DATA T10005CDCD
1000 K$=INKEY$:IF K$="" THEN 1000 ELSE
   RETURN
1010 READ X,Y,R,C,H,S,F
1020 CIRCLE(X,Y),R,C,H,S,F:RETURN
1030 READ A$:DRAWA$:RETURN
1040 READ T$
1050 DRAW "C4"+A$:PLAY T$:GOSUB1000:
   DRAW"C2"+A$:GOSUB1000:GOTO1050

```

Just keep pressing the space bar. To continue an Easter theme we have another program which looks almost the same but has different data. The special thing here is that the data tell which subroutine to go to next.

These programs are easy to build up but rather difficult to follow once you've forgotten what you wrote.

```

0 REM EASTER CARD 2
10 PMODE3,1:SCREEN1,0:PCLS3
20 FOR I=1 TO 20:READ N
30 ON N GOSUB 1000,1010,1030,1040,1060
40 NEXT:END
1000 DATA 2,125,130,40,4,1,1,0,1
1100 DATA 3,"BG72R25BD10R60BU5R30"
1200 DATA 2,125,80,30,4,1,1,0
1300 DATA 2,115,50,10,4,4,1,0
1400 DATA 2,135,50,10,4,4,1,0
1500 DATA 5,0,0,1,4
1600 DATA 5,125,100,2,1
1700 DATA 2,115,75,4,4,1,0,1
1800 DATA 2,135,75,4,4,1,0,1
1900 DATA 3,"BM123,90;U4R2D4R2U4"
2000 DATA 3,"BM123,90;U2BR4D2"
2100 DATA 4,T901BC
1000 K$=INKEY$:IF K$="" THEN 1000 ELSE
   RETURN
1010 READ X,Y,R,C,H,S,F
1020 CIRCLE(X,Y),R,C,H,S,F:RETURN
1030 READ A$:DRAWA$:RETURN
1040 READ T$
1050 DRAW "C4"+A$:PLAY T$:DRAW"C2"+A$:
   GOSUB1000:GOTO1050
1060 READ U,V,P,Q:PAINT(U,V),P,Q:RETURN

```

Just for fun we have here a program which demonstrates INKEY\$. The arrow keys control the cursor and you can make it draw in different colours with the numbers one to eight. When you press the space bar it stops drawing and you can move about the screen without altering your picture. You can choose a screen colour at the start or, by just pressing <ENTER> you can select a grass and sky background.

(Continued from page 15)

To integrate this code into the BASIC program, just insert the following line:

```
75 EXEC13001
(assuming assembly at 13001).
```

When the machine code is loaded, the program will now allow the use of any of the Standard Functions.

NEW

SPEECH and ADVANCED SOUND

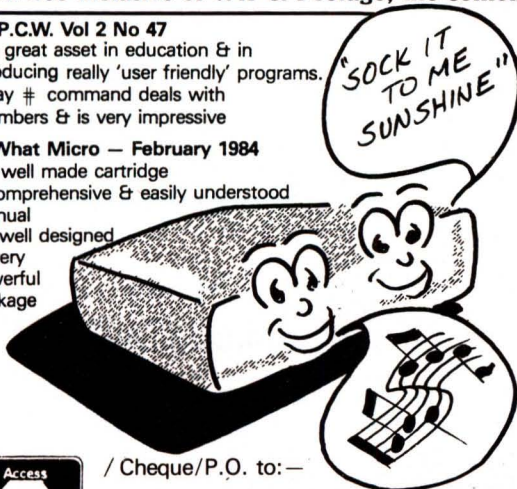
for your Dragon 32 Computer
OUR HIGHLY SUCCESSFUL SPEECH & SOUND MODULES
NOW AVAILABLE IN ONE MODULE

- Combined module costs £65 inclusive of VAT & postage
- Modules also available separately. Speech module costs £39.95 inclusive. Sound Module costs £36.96 inclusive.
- Payment by cheque, postal order or ACCESS.
- At £65 inclusive of VAT & Postage, the combined module represents a considerable saving on the separate Modules.

- modules are fully cased and plug into cartridge port
- sophisticated operating system included — complete control using new BASIC commands — no need to 'PEEK' or 'POKE' — no additional cassettes necessary
- Speech and sound can occur simultaneously with graphics — speech & sound TOGETHER from new combined module
- Unlimited speech vocabulary using allophones — over 200 words pre-defined for text to speech output. All numbers spoken from direct entry
- advanced sound features three channels, 'noise' generator and envelope generator — six octave range — incredible sound effects. Control over envelope generator direct from BASIC.
- Comprehensive user manual includes many examples
- Modules available separately if required. Speech module **£39.95**
Sound module **£36.95**
- Sound Module incorporates two input/output ports

P.C.W. Vol 2 No 47
... a great asset in education & in producing really 'user friendly' programs. the Say # command deals with numbers & is very impressive

What Micro — February 1984
... a well made cartridge
... comprehensive & easily understood manual
... a well designed & very powerful package



/ Cheque/P.O. to: —

J.C.B. (MICROSYSTEMS)

29, Southbourne Road. — Bournemouth — BH6 5AE Tel: (0202) 423973

Dealer & Export orders welcomed. Write/phone for details

TELEX NO. 418405 PDC G

... MST ... MST ... MST ...

DRAGON DISKETTE AND CASSETTE BUSINESS SOFTWARE FOR DRAGON 32/64 DISKETTE PROGRAMS FROM £24.95 INC. VAT — CASSETTE PROGRAMS £19.95 INC. VAT

MST DATABASE

Computerised card index filing system. Choose your own card headings — nine in all. Add cards and delete cards. Sort them, search them, amend them, print them, view them. Total fields. Flexibility at the touch of a button.

MST INVOICES & STATEMENTS

Seeing is believing. The power of this program is too great to be described in detail here. It stores up to 50 customer addresses. It prints superb Invoice and Statement pages. A separate CREATOR program allows user details to be added — and AMENDED. Variable VAT rate calculations. Discount calculations. Carriage costs are automatically incorporated to produce an accurate AMOUNT DUE. All this PLUS user-defined footer messages. Even poor quality printer paper produces superb invoices and statements.

MST MAILER/ADDRESS BOOK

This highly-acclaimed dedicated database prints selected ranges of address and other labels by SEARCHKEY or RECORD RANGE. Select addresses by street, by town, by region. Screen and printer options. Browse. Records etc. A superb little program. 1,000 records in all on five files.

MST CALC

The MST-Calc Spreadsheet is designed to replace pen, paper and basic calculator with a standard Dragon tape recorder. TV set and printer. Each program comes with a 20-page booklet describing MST-Calc and its operation.

The Spreadsheet enables work to be carried out on 21 rows and 20 columns. Numbers relating to headings can be orientated horizontally or vertically. They can be

added, multiplied, subtracted, divided, formatted etc. across rows and down columns. Ten levels of bracket pairs can be used to establish operator precedence in equations. Rows, part-rows, columns, part-columns can be summed or averaged. Equations placed in one location can be repeated (replicated) across rows and down columns to save typing-in time. Recalculation procedures allow powerful WHAT-IF? projections to be carried out at the touch of a button. Business data so obtained can be stored on tape or disk.

MST STOCK CONTROL

Computerised stock control. Alpha numeric references. Stock description, user-defined stock units, cost/sell prices, re-order levels, supplier details. 1,000 stock items on five files on a single-sided disk. Produces stock evaluation over user-selected range of stock, stock lists, re-order reports, screen/printer options.

MST BUSINESS ACCOUNTS

Another gem of a program. What won't it do? is a more suitable question than what will it do. A unique search facility enables all data entry problems with a 32-character screen to be overcome. Transaction List, Debtor/creditor Lists. Search/Amend selected customer records, Bank Summary, Year-to-date, Manual Bring Forward options make this a superb program. Credit/Cash sales and purchases are all neatly linked with Bank Account option to allow an up-to-date statement of your financial status.

MST HOME ACCOUNTS

A lovely program. Keep track of your household budget. Menu options include Estimated and Actual budgets, up-to-the-minute bank statements, current balance etc. Graphical representations of past and present months, printouts of surplus and deficit, and much more.

... DOWN TO EARTH DISK SOFTWARE FOR SMALL BUSINESSES ... READY NOW ...



SOFTWARE REVIEWS

For this edition of Dragon World we have concentrated on the educational programmes available for the Dragon 32 and 64. We have used two different independent sources to review the software — Mr. John Fullick, Youth leader of the John Pound Youth Club in Portsmouth very kindly for us reviewed Words Words Words, Number Gulper and Cranky. The other reviewers were two young girls, Katie and Rebecca, with a little help from Katie's oldest sister.

The John Pound Youth Club

This was opened in March 1983 to help meet the needs of youngsters with educational learning difficulties. It has a membership of over 90 with a very wide range of activities offered to the youngsters, including the access to a Dragon 32 Home Computer. For this reason we asked John, with the help from the members of the Club, to review some of our educational range of software.

REVIEW

I have reviewed the three items of software in relation to their use with students designated as ESN(M) i.e. mildly educational sub normal, aged 16-19. Their reading ages range from 6-10 years and number ages from 5-11 years. years.

Words, Words, Words £10.95

Is a mixture of instructional and revelatory software designed for young children to read. It can be best used by the teacher and pupils working together and is at its best with smaller groups i.e. up to 3 pupils.

The instruction manual is well written and supplies the teacher/user with an introduction containing the objectives, intended skill areas covered, loading procedures, use of the programme including correction procedures and a very useful dictionary of the words used.

Basically the programme enables the user to build up a scene, e.g. street, house or castle, by correctly spelling the names of objects presented on the screen.

Once the user has chosen which scene he wants to begin his story, objects begin to appear on the screen. The user then has to correctly spell these. The programme allows two mistakes before showing the correct spelling. If all the objects are spelt correctly a reward is given — the 'scene' comes to life, with some of the objects doing various things.

The programme was popular with the students across the ability range and only one criticism was noted. Although the graphics are good, they are not as good as the 'Hide and Seek' programme from ASK which the students have used extensively. The students found it difficult to recognise some of the objects e.g. the boy, the girl, the balloon and it would seem that a slight enlargement of detail would help a great deal adding to the quality of the programme.

While helping the students to practice the main achievement was in getting them to use their imagination and stimulating ideas and interest for story writing.

Number Gulper £10.95

Very popular with all the students because of the 'arcade' style of presentation and a very useful programme for students with learning difficulties because of the range of difficulty levels and the ability of the programme to drop to an easier level should the user fail to successfully complete one level.

The idea of the game is quite simple, but the actual operation requires more skill than it appears at first.

The user has to move a 'gulper' around a maze-type board containing numbers that have a +, -, *, or / sign next to them. The user chooses a number between 10 and 9,999 (the lower, the easier) and then the computer selects another number. The user then has to use his gulper to eat the numbers required to make up the difference between the chosen number and the computer selected number. As if this isn't hard enough, you are racing against time as your energy store is decreasing with time and each number you 'gulp'. At the higher levels, 'scramblers' appear which, if hit by your gulper, randomly change the selected number thereby forcing the user to rethink the strategy for making the new number.

The students soon found that a pencil and paper were essential for planning their 'routes' before starting the game.

The programme also includes a Self-Test option with which the user can test how much progress is being made in using numbers. It consists of ten questions, varying in difficulty according to the level of the last 'gulper' game played, which are answered in the shortest possible time.

A highly entertaining interactive game which while making it fun to practice number skills also involved the students in using strategy and forward thinking skills.

Cranky £10.95

Another popular programme with the more able students.

This one is really playing with numbers! Cranky is a pocket calculator whose circuits get damaged by rain. It is the job of the player to repair the circuits by making the number patterns that have been damaged. In the basic game the player can only use the numbers 3 and 5 and the +, -, and =, signs to construct numbers but in 'Challenge' you can choose your own two numbers to manipulate.

This programme really tested the students addition and subtraction skills to the full and new techniques, number patterns and relations were found. Like 'Gulper', this programme also encouraged the students to develop and explore their own strategies usually by trial and error at first.

This revelatory programme was best used by students on their own with periodic supervision and was a help in giving many of the students initial confidence in discovering their own ability to successfully manipulate numbers.

Summary

Most of our students are naturally 'turned off' from literacy and number work because of their learning difficulties and the biggest advantage of the computer and educational software has been the confidence they gain in being able to 'play around' with words and numbers and to explore patterns, all at their own pace: without the pressure of time or a teachers patience! (The Dragon hasn't blown a fuse yet!!)



Katie and Rebecca are six years and seven years old respectively and attend Presteigne Primary School in Mid Wales. They reviewed three of Dragon Data's new educational software titles for Dragon World; Facemaker, Children From Space and Shape Up. Each of these titles are designed specifically to enhance one particular aspect of a child's education.

REVIEW

Facemaker £10.95

This was Katie's and Rebecca's favourite program. The aim of 'Facemaker' is to draw a face by typing certain commands into the computer. The girls took it in turn to draw each other and, whilst finding the pictures very amusing, took it quite seriously. As a result they did not find it too long or boring.

Some of the vocabulary had to be explained — words such as 'cleft' and 'bulbous'. The program did prompt certain questions, such as why certain relatives wore glasses, and these were discussed.

The only criticism that came from the girls was that they did not understand all the words used, but this problem was soon solved.

Children From Space £10.95

The two girls found this considerably harder than 'Facemaker' and as a result found it tedious. The main reason was that they were too young to enjoy it. The program demands grammatical accuracy and is really suited for children slightly older than Katie and Rebecca.

The game has four episodes in which different aspects of English are explored — correction of common spelling mistakes, changing of tense, order of jumbled sentences, choosing the more appropriate of two words to fit into a sentence.

This particular piece of software was slightly too advanced for Katie and Rebecca.

Shape Up £10.95

In contrast to 'Children From Space', 'Shape Up' was a little too easy for the girls. It was very enjoyable but the girls mastered it a bit too quickly.

The four games on this title are designed to introduce and familiarize children to different shapes and sizes. Each game is slightly harder than the last. The clever use of colour and moving graphics meant that the children's interest was kept. However, it was too easy for the two girls and is more ideally suited for the younger child.

BRIDGE

Bridge Master with its excellent graphics and presentation makes the player feel that he is participating in a bridge game.

The outstanding features are:-

- (1) The player can elect to bid either the North or the South hand and, as declarer, play each of 100 bridge hands.
- (2) Before making his first bid he may elect to have the computer display the point count and honour trick valuation of his hand.
- (3) At the end of the auction the computer will, if requested, give a review of the bidding.
- (4) At any stage during the play of the hand the computer may be asked to remind the declarer of the contract and display the number of tricks made to date.
- (5) At the end of the play on each hand the computer will, on request automatically re-run through the hand showing the correct bidding and play.
- (6) Although the operator may make any bid, or play any card he chooses, the computer will accept only those bids and plays that are correct. The beginner therefore receives necessary instruction whenever a mistake is made, and errors are not compounded. At any time during the bidding or play the computer may be asked for advice and will respond with the correct solution.

The solution consists of a cartridge and cassette containing 100 different hands. It is a course of instruction in both bidding and play for the beginner and an entertainment and challenge for the intermediate player. There are two manuals. The manual of instruction contains a short Introduction to Bridge, a Summary of Opening Bids, a Hand Valuation Chart, a Scoring Table and a Glossary of Bridge Terms. The second manual contains instruction in the form of comments on the bidding and play for each of the 100 deals.

For use with the Dragon 32 and the Dragon 64. Joysticks optional. Recommended retail price is £29.95.



*EDIT +

Full screen editor and enhanced screen
Available on Dragon Disc **£34.50**
£24.00

HI-RES

51 x 24 screen display with upper and lower case
£25.30

*DASM/DEMON

Versatile Assembler/Monitor
Available on Dragon Disc **£30.45**
£19.95

GRAPH DRAWER

Business and Educational plots to your screen and printer
£19.95

SOURCE TAPES

These programs contain both source and object code.
Only **£5.99 each!**

1. DISASSEMBLER
2. GAME OF LIFE
3. HI-RES SCREEN DUMP FOR EPSON
4. HI-RES SCREEN DUMP FOR SEIKOSHA

BOOKS/EXTRAS

Introducing Dragon Machine code by Ian Sinclair **£7.95**
 Programming the 6809 ZAKS **£12.50**
 Leventhal **£12.85**
 Postage on books: 50p per book except ZAKS/
 Leventhal **£1.30**
 Maximum **£1.50**

EXTRAS

DUST COVER Inc. p & p **£2.99**
 PRINTER LEAD Inc. p & p **£14.99**
 MONITOR/SOUNDLEAD Inc. p & p **£3.99**
 DRAGON DISC DRIVE COMPLETE Inc. p & p **£269.00**



COMPUSENSE LIMITED

THE FLEX OPERATING SYSTEM

If you've reached the stage where the restraints of your 6809 based computer are becoming a bore, cast your eye over this advertisement.

After 4 years of research, in conjunction with T.S.C. Incorporated, Compusense are launching "The Flex" in Britain.

Sales have already reached the 100,000 mark worldwide, which will give you an idea of how successful the product is.

FLEX is an elegant, friendly and efficient disk based operating system. It is supplied with a 200 page manual and includes an editor and an assembler.

All very well you may be thinking, but what will it do for me? And why should I replace my existing package? Or indeed, why buy one at all?

Our reply is simple. We let the facts speak for themselves.

FLEX's features are dynamic file space allocation, random and sequential file accessing, user start up facility, automatic drive searching, file dating, space compression, complete user environment control, English error messages, over 20 commands for normal disk operations and there are high quality software packages available on disk.

It requires any 64K Dragon with at least one disk drive or any 6809 based micro-processor or system that supports disk drives. FLEX is also available on the BBC Model B, and on Premier Delta Controller.

In short, this product enables you to use your computer to it's full potential. A whole range of new facilities and controls will be at your disposal. You may even think you're using a new machine what with all the extra functions you'll obtain.

Oh yes, one last thing we'd like to tell you. It knocks the spots off the competition **and** it's cheaper! **£75 +VAT**

Box 169, 286D Green Lanes, Palmers Green,
London N13 5XA.
Tel: 01-882 0681/6936 24hr
Telex: 8813271 GECOMS G

DYNAFAST

SPEED-UP!

Compiles any working BASIC program into superfast machine code. Write and test programs as usual then compile with DYNAFAST to achieve maximum time saving during operation.

DYNAFAST - BASIC COMPILER

DISK **£19.95**
CART **£29.95**

SPECIAL INTRO. OFFER INCLUDES DYNAMISER AND DYNAXREF.

DYNAMISER

MAKE ROOM!

DYNAMISER OPTIMISES YOUR BASIC PROGRAM BY...

- 1) removing redundant space and characters
- 2) deleting unnecessary REMS
- 3) combining several lines into one line. Save space, protect your program and speed it up!

DYNAMISER - BASIC COMPILER

£5.99 Inc. TAPE OR DISK

DYNAXREF

ANALYSE!

DYNAXREF analyses a basic program and displays all references to variables and labels within the program.

Now that you can tell where your program is updating variables it's easier to correct errors! DYNAXREF - BASIC CROSS REFERENCE **£5.99 TAPE OR DISK**

Order 2 software products and get a free dust cover! This offer is exclusive to Dragon World Readers. Return this ad with order.

*Available at larger branches of Boots.



POSTAGE & PACKING — 50p
PER ORDER

**** IS YOUR DRAGON COMPUTER STARVED OF ADD-ON'S ****

DEVELOPMENT BOARD

PLUGS INTO CARTRIDGE PORT. ALL INPUT/OUTPUT AND SUPPLY LINES AVAILABLE. AVAILABLE IN BOTH TIN AND GOLD CONTACT VERSIONS.

CAN BE USED TO CONSTRUCT MOTHER BOARDS, EPROM PROGRAMMER, ADD ON RAM/ROM, INPUT/OUTPUT CONTROL, ETC.....

PRICES : TIN CONTACT **£5.75 INC VAT** GOLD CONTACT **£6.75 INC VAT**

RS 232 / PARALLEL INTERFACE

PLUGS INTO CARTRIDGE PORT. NO EXTERNAL POWER SUPPLY REQUIRED.

CONTROL PROGRAMME IN EPROM, THIS ADDS TO THE BASIC COMMANDS SO NO MESSY PEEKS AND POKES ARE NEEDED.

FULL RS 232 COMMUNICATIONS. TWO PARALLEL PORTS FOR PROCESS CONTROL, ETC.

PRICE : **£54.50 INC VAT**

EPROM PROGRAMMER

AVAILABLE IN KIT AND READY BUILT VERSIONS. WILL PROGRAMME

2716, 2516, 2732, 2732A, 2532, 2764 EPROMS.

*READY BUILT VERSION ALSO 27128 AND INTELLIGENT PROGRAMMING.

PLUGS INTO CARTRIDGE PORT. NO EXTERNAL POWER SUPPLY REQUIRED.

CONTROL PROGRAMME IN EPROM.

PRICES AND FULL CONSTRUCTIONAL DETAILS AVAILABLE LATE APRIL 1984.

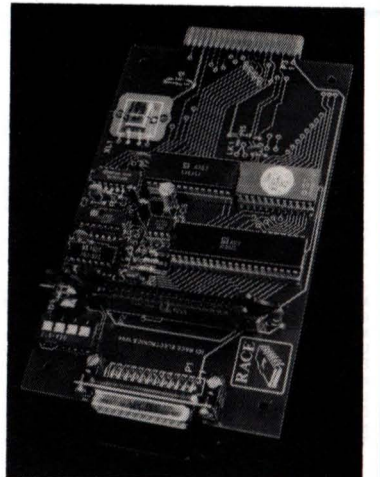
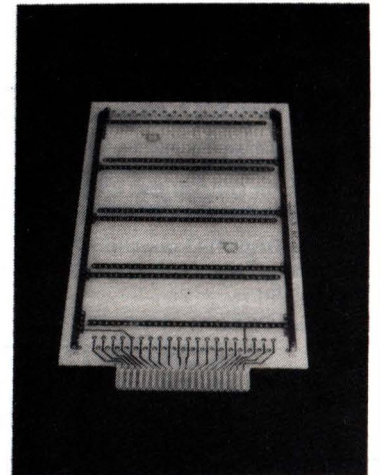
DEALER ENQUIRES INVITED.

PLEASE ADD 30p P/P ON BOARDS AND **£1.00** ON ALL OTHER ITEMS.

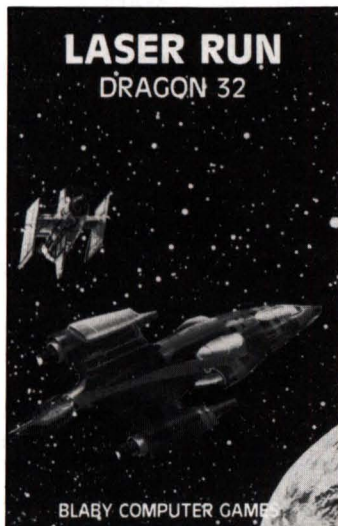
**** COMING SOON - MOTHER BOARD, 80 COLUMN ADAPTOR, ETC, ETC.....**

STEVES ELECTRONICS SUPPLY CO LTD,

35/45 CASTLE ARCADE, CARDIFF. CF1 2BW. Tel: (0222) 41905/371578.



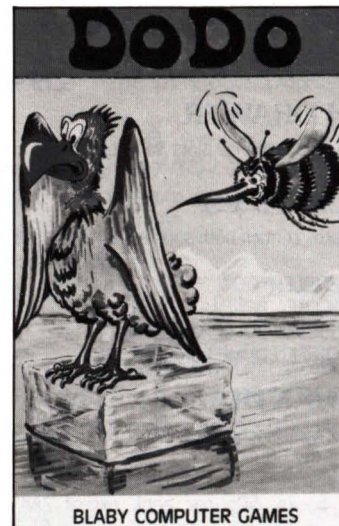
**STEVE'S
ELECTRONICS
SUPPLY
CO. LTD.**



LASER RUN — Fly your Starfighter against Darth Vader's crack pilots. 3-D Graphics and Arcade Action. **£5.95**



BARMY BURGERS — Baps, Burgers, Cheese and Lettice — they are all there, all you have to do is put them together. It sounds easy doesn't it? But not when you are being chased by a fried egg and sausages! **M/C £5.95**



DODO — Starring Dodo and the Snow Bees — you are the last surviving breed of Dodo's alone in the Antarctic, surrounded by ice blocks and Snow Bees. Slide the ice blocks on to the Snow Bees or electrify the walls to kill them **£5.95**

**AVAILABLE FROM ALL GOOD COMPUTER STOCKISTS
DISTRIBUTORS/DEALERS ENQUIRIES WELCOME
DEPT. 1 CROSSWAYS HOUSE, LUTTERWORTH ROAD, BLABY, LEICESTER
Telephone 0533 773641 Telex 342629 JRHHG**

PLANET CONQUEST — Land your Freighter Ship safely and then you may return to your next Solar System. (Skill levels etc. **£5.95**)

O-LEVEL or CSE DRAGON 32 SOFTWARE

- * Prepare for the exams and practice multiple choice questions (each question timed)
- * Ideal for O-Level and CSE revision
- * Written by qualified educationalist

Physics Tutor (141 questions) £5.50 (inc p&p)
Chemistry Tutor (105 questions) £5.50 (inc p&p)
Or both for £10.00 (inc p&p)

Cheques/PO to:

**COMPUTER SYSTEMS
IMPLEMENTATION Ltd.**

17 Morden Road, London SE3 0AA. Tel. 01-852 4888

ELTEK

ELTEK
DEPT. DW1
29 PARKSIDE AVENUE
LITTLEHAMPTON, WEST SUSSEX, BN17 6BG

'AN INTRODUCTION TO PROGRAMMING THE DRAGON 32' by R & J Penfold helps you master Basic and has many demonstration programs. £2.10
'ANATOMY OF THE DRAGON: ADVANCED BASIC FOR THE DRAGON' by M. James. Learns how the Dragon works inside and how to use it's power in your Basic programs. An excellent book at only £6.95.
'BEGINNERS GUIDE TO MICROPROCESSORS & COMPUTING' by E. Scott £2.10
'LANGUAGE OF THE DRAGON: 6809 ASSEMBLY LANGUAGE' by M. James is a good starter for the budding Machine code programmer. £6.95
'BASIC MICROPROCESSORS & THE 6800' by R. Bishop is a useful book for those wanting to learn about the 6800 family of ICs £5.50.
'THE 6809 COMPANION' by M. James is the cheapest source of information on the 6809 MPU and contains the full instruction set and addressing modes for this powerful device plus much more for only £2.10.
MACHINE CODE PROGRAMMERS PACK contains the data booklets for the four main ICs in the Dragon. (6809, 6821, 6847 & 6883) Over 80 pages of technical data plus a 6809 Reference card. £3.95.
MACE EDITOR/ASSEMBLER/MONITOR Cartridge with 80 page manual for anyone who wants to learn 6809 Assembly Language or write serious Assembly Language programmes. £29.95
EPROM PROGRAMMER for most single power supply EPROMs up to 32Kbytes. Powerful fill, move, examine/change, copy, verify, program, cassette save/load and dump Menu driven facilities. Intelligent programming reduces programming time. Full documentation with this professional product. £79.95 (£89.95 With MACE fitted)
D-BUG TRACER/MONITOR/DISASSEMBLER Cartridge emulates the 6809 running your program and gets you m/c programs working quickly and easily. £29.95.
TELEWRITER WORD PROCESSOR: The best is now even better with Auto-repeat and a faster Keyboard response. £49.95.
Send a stamp for details of over 70 items for the Dragon (Mail order only)

DUPLICAS THE DRAGON 32 CASSETTE COPIER

DUPLICAS WILL COPY ALL OF YOUR PRESENT DRAGON 32 SOFTWARE AT NO RISK TO THE ORIGINAL TAPE. DUPLICAS COPIES WILL OFTEN LOAD AND RUN BETTER THAN ORIGINALS.

PURCHASERS ARE ADVISED NOT TO INFRINGE COPYRIGHT ACTS.

PRICE IN U.K. £7.95 inc.

PLEASE MAKE CHEQUES AND P.O. PAYABLE TO:-

QUICKBEAM SOFTWARE
(MAIL ORDER ONLY)

**67 OLD NAZEINL ROAD,
BROXBOURNE, HERTS EN10 6RN**

TRADE ENQUIRIES WELCOME



DRAGON USER OF 1983 COMPETITION

We had no idea that Dragon owners were so inventive. The entries in our 'User of the Year' competition were of such a high standard that we had to award five Dragon 64s!

Of course there had to be an overall winner, and that honour goes to Tariq Mohammed, a doctor at Booth Hall Childrens' Hospital in Manchester. He receives a Dragon 64, plus a large parcel of software.

Tariq works in the Department of Paediatric Gastroenterology and he devised a program to work out the feeds for children who are fed intravenously. The program also provides a print out of instructions for the pharmacy and nurses.

Congratulations to Tariq and we hope he will keep up the good work with his prize.

The other four winners of 64's were equally interesting and inventive. John Wilkinson of Warwickshire uses a Dragon 32 to help in his work on fuel and ignition specifications at Jaguar Cars.

At an Electricity Control Centre in the West Country, a Dragon 32 is helping B. J. Parish and colleagues to display the status of the sub-station breakers. Using high resolution colour graphics and the powerful inbuilt basic,

the Dragon outpaced very much more expensive solutions.

In Cumbria, a schoolteacher named Stephanie Fear uses her Dragon to write simple graphics for a partially sighted four-year old pupil. Stephanie reports that the pupil's concentration improves remarkably when working with the graphics, which he enjoys enormously.

Our final winner is Rachel Hart of Amersham, Bucks, who has used her Dragon 32 to help a friend to translate English books into Russian.

Altogether a marvellous selection of uses and users who thoroughly deserve their prizes.

The runners-up, who each win a 'Super Dragon Writer 11' cartridge, are:

R. Callow, Daventry, Northants.

A. E. Charlish, Wyken, Coventry.

Herwig Cuypers, Herenthout, Belgium.

A. Deeley, Warwick.

A. Farrar, Stutton, Ipswich, Suffolk.

P. Gladwell, Gorton, Manchester.

Major T. T. Hallchurch, Church Crookham, Hants.

Warren Hart, Leyland, Lancs.

A. F. Iles, Wesbury-on-Trym, Bristol.

T. Martin, East Grinstead, Sussex.

H. L. Nyman, Harrow, Middlesex.

G. Powell, New Inn, Pontypool, Gwent.

G. Scullion, Skelmersdale, Merseyside.

A. Spencer, Weymyss Bay, Renfrewshire.

G. Thomson, Dunblane, Perthshire.

We intend to feature articles on each of the competition winners in future issues of 'Dragon World'.

CAMEO COMPUTER SERVICES LTD

4 Roma Road, Tyseley

BIRMINGHAM

B11 2JN

PRINTERS

£199.50 inc VAT

Quen-Data DMP — 81

Friction & adjustable tractor

80 Char/sec bi-direction

Normal, Enlarged, Condensed text

Low cost ribbons, Long life head

Carriage £7.50 Interface cable £15.00

DRAGON 64 plus OS9

Sales & Training

Stylograph £79.95

Dynacalc £59.95

Record Management £54.95

Cash & VAT £49.95

Business Systems

REPAIRS

Micro-Computers

Printers

Video Display Units

EDUCATIONAL SOFTWARE

The best on the Market

Plus specialist software from

our own software team.

Call the SPECIALISTS

Whatever the **PRINTER** for the **RIGHT PRICE**

Phone **021 708 0774**



DRAGON 64

DRAGONS IN DRAGON

Our Production Department had a problem — and an answer to that problem. The problem was accessing information for management statistics — the answer was a Dragon 64K, a double disk drive, a printer, a television screen and a little flair and imagination.

The production manager, Mike Lewis, was constantly frustrated by the time and effort his clerical staff had to put in to provide him with the information he needed to complete various management reports. So when the Dragon 64K was launched, and later the OS-9 operating system was developed, he saw the combination as a solution to a problem.

When compiling management information and statistics, the major drawback is the time it takes to access, collate and update the data. If the history data is, however, on a disk the time and resources saved can be considerable. Mike Lewis had three specific areas where a suitable computerised system appeared to be the answer to the manual system his staff currently used.

The first of these areas was information on the soak test racks. These are used in Dragon Data to test and "burn in" the computer componentry for a specified

period of time. The information on the number of good and reject boards is obviously essential to the production area. Using BASIC, a database was established to hold daily recordings of such things as loading/unloading times. Now information is immediately available and passed to Quality Control; it is then incorporated in the weekly production efficiency reports.

The second area which was integrated to a computerised system was the production efficiency reports. Using BASIC and the manual information already established on standard hours, a database was established. This enables access to a file of information which, when used in conjunction with daily production reports, forms the basis of a daily and weekly area by area efficiency report. Any area not to standard is immediately highlighted and action taken.

The third area looked at was the one of software control. Although the company uses a main frame computer which has a finished stock file as well as the facility for invoicing accounts, a major expenditure would have been necessary to set up the type of stock control system needed for software. The Dragon 64K in conjunction with OS-9 would, however, accomplish the same ends at a fraction of the cost.

Once this was established, a weekly update of production/sales for each item enabled a report to be generated indicating on-going sales and total cash value held in stock; stock held on each item; and those items requiring re-ordering. Mike Lewis can now give other areas within the organisation the accurate information they need to perform their jobs efficiently.

From ideas initiated in the Production Department, other departments are now evaluating possible uses within their own areas. We will keep you up-dated on any further uses of Dragons within Dragon.



Complete Dragon Business System being used in the Stock Control Area . . .



. . . and also the Monitor the Soak Test Operation.

St. George now has two choices!

Red or green will slay the Dragon

- ▲ Nylon encased-Steel shafted joystick with ball and socket joint.
- ▲ Fast sprung return to centre.
- ▲ Graphite wiper linear potentiometers.
- ▲ 12 Months Guarantee.
- ▲ 7 day Money back Guarantee.

Complete control at your fingertips

The smooth control of the Voltmace delta sprung return joystick is now available to Dragon owners. Each joystick has been individually tested before it leaves our factory, following extensive robot testing to prove the design (we tested it more than a million times). This means that not only will your joystick be strong, tough and reliable, but it ensures long life, accurate control and with the choice of red or green fire buttons, gives instant recognition between the left and right joysticks.

If you are not completely satisfied with the delta 3d, return it to us within seven days for a full refund.



Dragon dealers come out of your caverns!

More stockists required in some areas.



Made in England

DELTA 3d JOYSTICK £10.00
TWO DELTA 3d JOYSTICKS £19.50
PLEASE STATE COLOURS REQUIRED

Prices include VAT and P&P.

Voltmace delta 3d



VOLTMACE LTD
PARK DRIVE
BALDOCK
HERTS
SG7 6ED
Tel: (0462) 894410

Callers welcome at the factory — Monday to Friday.



THIS MONTH . . .

In response to the many requests for a word-processing feature, "This Month" we have reviews of the two word-processing packages available from us and, as a printer is required for these packages, we are reviewing a selection of printers.

The review of printers is restricted due to space available this issue, but we hope to review other makes in future issues. If there are any particular models you would like to see reviewed, please contact us at the editorial address.

"SUPER DRAGON WRITER II"

The first word-processing package to be reviewed is 'Super Dragon Writer II'. This is priced at £39.95 and is available now. The review has been prepared by Doug Bourne of the Dragon Independent Owners Association:

The 'Super Dragon Writer II' word-processing program arrives in the now standard video box which, when opened, reveals a ROMpak and a thick manual. It is at this point that we choose our course of action. Do we plug in the ROMpak and run the program, or do we read the manual? Well, if you do like me and do the former then you very quickly find yourself reaching for the manual and, in fact, the manual tells you that the best way to learn is by reading and using the information given.

So let us start again. Plug in the ROMpak and switch on. First comes up the colourful title page. By pressing any key we enter the command mode and the display mode of 51 characters per line, 21 lines per screen. This is a big improvement over the small box that we normally see.

The command mode is as its name implies, how we tell the program what we want from it. We now decide whether we would like to alter the display mode for one of the other options. There is the low-res, 32 x 16 display which is the standard display with the standard inverse letters for lower case. The colour can be changed from green to orange. Next, the hi-res displays which are 51 x 21; 51 x 24; 64 x 21; 64 x 24; 85 x 21 and 85 x 24. Also in the 64 displays you can choose narrow or wide characters and, as in the low-res display, the colour can be changed between green or white and inverse. In all the hi-res modes you get true lower case with descenders.

Pressing "BREAK" puts you into the text entry mode in which you can write your letters or whatever. If you make a mistake, you just position the cursor using the arrow keys and type over to correct the error. You can delete characters using the command (CLEAR) key and D.

When you have your block of text, you will want to see if it looks correct before printing so command P gives you the option of printing or window. Asking for window (W) shows how the text will look. Here I found that if at this time I entered the 85 column mode, the text showed better. You can now see if you need to move anything around, e.g. change the position of one paragraph for another. This is accomplished using BLOCK MOVE and

BLOCK DELETE. If you are satisfied with everything, then all that there remains to do is to print the text. Pressing the command (CLEAR) key then P, you will be asked whether you want print or window. Press P again and away it goes.

There is much more it can do, too much to mention here. In fact, the price of the program belies its capabilities. It has features not found in more expensive programs. It can be used with any printer with minor adjustment to take into account differences in their control code and any special function they might have.

There are cheaper cassette-based programs on the market and, indeed, more expensive ones but for ease of use with the ROMpak and its ample facilities, not to mention its price tag, this must make 'Super Dragon Writer II' the most useful program to come from Dragon Data.

"STYLOGRAPH"

For those of you with Dragon 64s and disk drives, this word-processing package, which runs under OS-9, may be of interest. Priced at £79.95, we feel that it is an excellent buy when compared to other similar packages. Please note that you would require the OS-9 system disk to run "Stylograph". "This Month's" review is by Duncan Smeed, whose name may be familiar to you as co-author of "Inside the Dragon":

Stylograph, Mailmerge and Spellcheck is one of the new titles now available in Dragon Data's Professional Software series for OS-9 operating system on the Dragon 64. The book-style pack contains the floppy disk, a comprehensive manual, a command summary reference card and a keyboard function reference chart.

Stylograph is a "professional" word-processor providing facilities normally only found in word-processors costing many times its price. It makes use of the 51 by 24 text screen mode (by using the OS-9's "go51" command) for upper and lower case characters and normal terminal emulation. Stylograph's SUPERVISOR mode presents the user with a menu of possible options available such as "EDIT", "PRINT", "SAVE AND RETURN", etc. The "EDIT" option transfers Stylograph into its ESCAPE mode, where most of the editing of existing text takes place. The user can scroll through the text on a character, line, or page basis or a "search" string can be used to specify the position within the text.

Commands exist to replace, move, duplicate and delete text and to perform single character overwrite, insert and delete.

The INSERT mode is the one where you can type in the text just as you would on a typewriter and formatting is carried out during input on a "what you see is what you get" basis. In other words, the text is laid out on the screen as it will appear in the final print-out. The formatting commands are too numerous to describe in detail here but they do control things like the page length, header/footer definitions, line spacing, justification, line lengths, indentation, character spacing, paragraph settings, printer control parameters, and whether characters will be underlined, overlined, subscripted superscripted, or emboldened.

About six full pages of A4 text can be held in the RAM text area. However, text files larger than this can be manipulated by storing part of the text on disk, and/or by using the Mail Merge package.

Mail Merge has been designed to complement Stylograph in three ways. Firstly it provides the facility to merge together a number of small text files when printing. Secondly it allows a file of, say, names and

addresses to be merged with a "standard" text file so that letters, etc., can be "personalised" when printed. Thirdly this package can be used to print multiple copies of the same file. In all these cases Mail Merge can take advantage of OS-9's multi-tasking capabilities and be run as a background task. For example, a text file can be typed while a long document is being printed.

The final package of the trio, Spellcheck, is used to check each word against a dictionary of over 42,000 words! A mis-spelt word can be: (a) ignored, (b) added, (c) marked so that it can be easily found by Stylograph, (d) displayed in context, and (e) corrected, in which case all occurrences of that word will be corrected automatically in the text file.

It has not been possible to do justice to the full range of facilities and options provided by the above packages in the limited space available for this review. Suffice to say that it is an indication of their power to know that the complete range of OS-9 manuals was prepared and printed using them.

PRINTERS

DYNEER DW16

Price	£329
Type	Daisy Wheel
Interface	RS232 or Centronics
Maximum Speed	16 cps
Graphics Capability	Limited
Maximum Width of Paper	12 inches
Direction of Printing	Bi-directional
Legibility	High

This printer brings better quality printing within the reach of the home user. Although the machine is rather slow, it prints to a standard that would impress any businessman. It is clean and easy to use, with the controls and DIP switches being easily accessible. The manual is more comprehensible than most.

Provided printing time is not at a premium, the DW16 offers unbeatable value for money.

MICROLINE 82A

Price	£299
Type	Dot Matrix
Interface	Centronics (optional RS232)
Maximum Speed	120 cps
Graphics Capability	Block graphics and Hi-res
Maximum Width of Paper	9.5 inches
Direction of Printing	Bi-directional
Legibility	Average

A fast, efficient printer which offers reliability and a sturdy construction. Since it is at the bottom of the Microline range, it does lose a little of its legibility when printing at maximum speed, although this would not trouble most users. All basic functions can be found fairly easily in order to get started.

It has an overall feeling of quality and will be of interest to the home/small business user.

MICROLINE 92

Price	£499
Type	Dot Matrix
Interface	Centronics (optional RS232)
Maximum Speed	160 cps
Graphics Capability	Hi-res facility
Maximum Width of Paper	9.5 inches
Direction of Printing	Bi-directional
Legibility	Good

The Microline 92 has facilities for a wide range of print styles and formats. It is very fast, sturdy and its high resolution features are easy to access. A double strike facility allows the print to approach correspondence quality, although it still falls short of daisy wheel standard.

If you are looking for a machine to handle the donkey work of your printing requirements, then this one is worth of consideration.

ADVERTISING RATES

If you would like to advertise in 'Dragon World', then please contact Mr. Kevin Stephens or Miss Cathy Hyde at Dragon Data Limited on 0656-744700. Our rates are highly competitive:

Full page colour	£490
Full page black and white	£320
Half page black and white	£170
Quarter page black and white	£85
(Spot colour 10% extra)	
10% Extra for specified positions	
10% Discount for 6 insertions	

COPY DATE FOR JUNE EDITION
For Typesetting 11th May
Camera Ready Artwork
..... 23rd May

The publishers would like to notify readers that the appearance of an advertisement in 'Dragon World' does not necessarily mean that the product or service shown is approved by Dragon Data Limited.

OKI Microline 92

So fast - and NLQ



NLQ = Near Letter Quality.

It's just one of the many outstanding features which put the OKI Microline 92 matrix printer at the top of the 80 column league. Add to this standard print at 160 cps, high resolution graphics, downline-loadable character sets, subscript, superscript and underline capability, and you will see why the Microline 92 is an unbeatable price/performer.

The Microline 93 offers the same unrivalled specification to users requiring a full 136-column format.

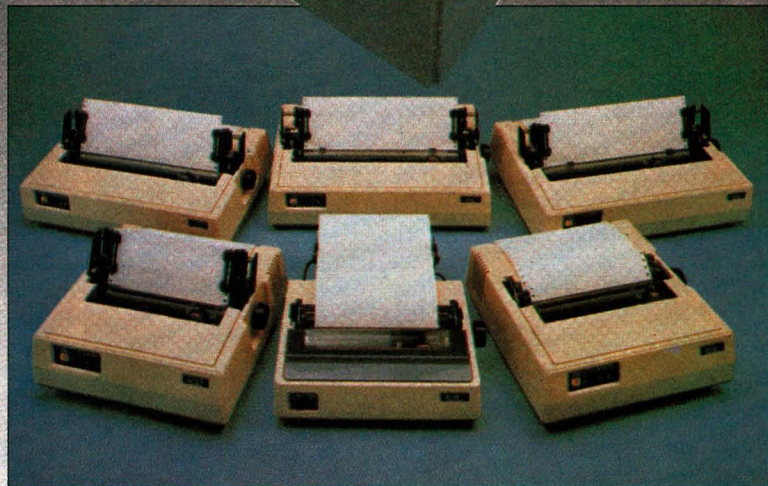
And if all this is not enough, both machines are available with our unique IBM Plug 'n' Play Kit, ensuring full compatibility with the IBM PC.

An even more impressive feature list, including a print speed of 200 cps, defines the 136-column Microline 84. In addition to its increased throughput capability, the optional Automatic Cut Sheet Feeder permits maximum use of the near-letter-quality print mode.

Quality, reliability and unbeatable price/performance are of course hallmarks of the entire OKI Microline range, including the ever popular Microline 80, still a best-selling entry-level printer.

The range is completed by the Microline 82A (80 col) and the Microline 83A (136 col) which offer a print speed of 120 cps amongst a host of other features.

OKI Microlines - the unbeatable printer family!



X-DATA

THE NAME BEHIND
THE PRODUCTS IN FRONT

X-DATA LIMITED, 750 DEAL AVENUE, SLOUGH TRADING ESTATE, SLOUGH, BERKS SL1 4SH. TEL: SLOUGH (0753) 72331

a **Dyneer** company

'hands off the Ultradrive!'



At last a computer controlled storage device that will load a 16k program in under 15 seconds* and doesn't use any of your computer's precious memory!

Each ULTRA DRIVE Micro cassette has an enormous 200k byte capacity*.

The ULTRA DRIVE comes complete with all necessary interfaces, its own sophisticated filing system, and a utility cassette.

All this for only
£79.95 inc. VAT
 NO HIDDEN EXTRAS

This incredible machine
 is available for
 DRAGON ELECTRON BBC
 NASCOM ORIC TANDY
 COMMODORE



*For the Dragon computer. Specifications may vary slightly for other computers.

10 day money back guarantee
 Purchase price will be
 refunded if not delighted

IKON

COMPUTER PRODUCTS

IKON COMPUTER PRODUCTS, DEPT. E, KILN LAKE, LAUGHARNE,
 DYFED SA33 4QE (Tel. 099 421 515)

To: IKON COMPUTER PRODUCTS, DEPT. E, KILN LAKE, LAUGHARNE, DYFED SA33 4QE (Tel. 099 421 515)
 Please send me _____ ULTRA DRIVE(s) for the
 Data certified cassettes @ £4.03 each.
 Cleaning cassettes @ £4.60 each.
 Please charge my Access/Misa card no _____
 Name: _____
 Address: _____
 Signature: _____
 Boxes of cassettes @ £79.95 + £3.45 p&pp each
 I enclose cheque/P.O. value £ _____ (Delete whichever not applicable)
 will not be cashed until goods are ready to be despatched)
 *For the Dragon computer. Specifications may vary slightly for other computers.

CALLING ALL USER CLUBS

Do you realise what you are missing by not contacting Cathy Hyde to tell her of your existence?

Special offers, factory tours and lots, lots more! Too good an offer to be missed!

All you have to do is to contact Cathy at the editorial address with details of your club. You will then have your details published in Dragon World (if you wish) and receive information on how Dragon Data can help you and your club.



THE TYPIST

TURN'S YOUR DRAGON INTO A SIMPLE WORD PROCESSOR!!!

You can now write professional quality letters on your printer. Your keyboard becomes a typewriter with full upper and lower case characters. Features include full on screen editing, change, insert or delete any character will file or retrieve data from mass storage medium suppresses word wrapround automatically, plus much more. Tape version £6.95 ***** Delta Disc Version £9.95.

Plus 'Pontoon'. Can you beat the Dragon?? Full colour Graphics, both hands on screen. Recognises Pontoons, Five Card Tricks, with automatic ace evaluation.

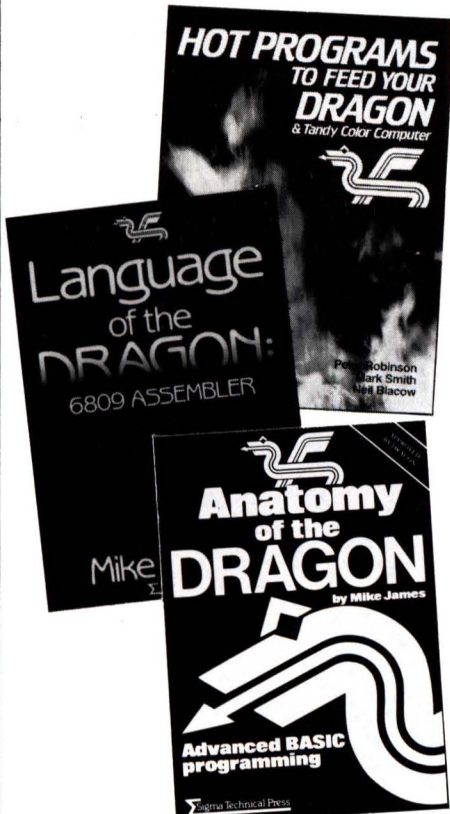
And 'Hi-Low'. Based on the popular TV Game, can you predict the next card. Very Hard, Very Addictive.

Pontoon and Hi-Low are on tape and cost £4.95 each

Our Prices include Post & Packing and VAT

SOUTH MOLTON COMPUTERS
Dootson House, South Molton,
North Devon, EX36 4EJ

FIRE YOUR IMAGINATION...



HOT PROGRAMS TO FEED YOUR DRAGON AND TANDY COLOR COMPUTER

by Peter Robinson, Mark Smith and Niel Blacow
This book contains, not only the best programs for your Dragon (or Tandy Color Computer) but also a full description of how the programs work, how you can change them and how you can produce your own programs. The book divides into four sections: Advanced Games, Sound and Graphics, Business, and Utilities.

0905104 51 X 162pp £6.95

LANGUAGE OF THE DRAGON: 6809 ASSEMBLER

by Mike James
To many people, assembler language is a black art, not intended for the average programmer. Mike James shows you that this is just not true and takes you step-by-step through every detail of assembler concepts for the 6809 microprocessor (as used in the Dragon) leading to those techniques that you need to write fully professional programs.

0905104 36 6 242pp £6.95

ANATOMY OF THE DRAGON: ADVANCED BASIC PROGRAMMING

by Mike James
Here is a complete guide to programming the Dragon taking you through: Dragon hardware: its anatomy — chips and circuitry — as it affects the programmer; Low - Res Graphics and Text; High - Res Graphics; Sound Generation — from music to talking programs; Advanced graphics — including animation; Interfacing — joysticks and the various input/output parts; Inside BASIC — includes entry points and system variables.

0905104 35 8 148pp £6.95

Orders to: Annabella Duckit, John Wiley & Sons Ltd., FREEPOST, Baffins Lane, CHICHESTER, West Sussex PO19 1YP. Tel: Chichester (0243) 784531 Telex: 86290 (Reg. No. 641132 England)

Please send me: Hot Programs Language of the Dragon Anatomy of the Dragon

I enclose cheque for made payable to John Wiley & Sons Ltd.

Please charge my AMERICAN EXPRESS/CLUB/BARCLAYCARD/VISA/ACCESS Card

Date of Expiry Acc. No. []

Telephone your credit card order — FREEFONE 3477 (UK only)

Name/Address _____

Signature _____ DW

Wizard Software

STRATEGY NEW

£8.45

A high resolution colour graphics war game for 2 players. Each player has control of a Navy, an Army and an Airforce and the object of the game is to destroy all of the opposing forces or obtain a surrender from the other player. Control the movement and firing of all your aircraft, ships and tanks in battle as well as finances and provisioning. This game is a challenge with a difference, its active, yet chess-like qualities provide a stimulating experience and a lot of fun for the games' connoisseur. Comes with instruction manual. Joysticks required.



DECATHLON NEW

£5.95

A 10 game competition for 1-5 players. These lighthearted games are designed to give players of differing aptitudes hours of fun. Ideal for parties or family play.

DRAGON STARTREK

£8.45

A real time version featuring a 10 x 10 galaxy, shield control, photon torpedoes, status reports, signals received, galactic search, scanner control, warp drive, star bases with docking, black holes, planet and planet landfall, pulsars, novas, stars, asteroids, meteors, shuttles and shuttle docking, automatically converging and attacking Klingons. Four levels of difficulty. Comes with instruction manual.

TIME PORT 1

£8.45

The first in a series of five adult strategy adventure games. Direct your robot and acquire the object that the Keeper will ask for and bring it safely back to the Time Port.

RED ALERT

£7.95

An original machine coded Arcade game, presented in high resolution colour graphics using all 9 colours simultaneously, featuring alien spaceships, energy bolts, homing torpedoes and meteor showers. Includes digitised speech. One joystick optional. 5 skill levels.

Also Available:-

Evictor	£7.95	Crazi Plumber	£6.95	Sirus IV	£5.95
Aliens +	£7.95	Starword	£5.95	Wizard	£5.95
Clowns	£7.95	Fruita	£5.95	Galleons	£4.95
Smash	£6.95	Triplet	£5.95		

All prices inclusive, mail order, cheques or postal orders to:-

WIZARD SOFTWARE, DEPT DW, P.O. BOX 23, DUNFERMLINE, FIFE, KY11 5RW.

Also available from software retailers world wide. Send large S.A.E. (7in x 5in) for full programme catalogue. Royalties paid for machine code DRAGON software.

RED ROM DATA

Proudly presents two new racing forecasters for the flat season

SUPAPUNTA

- * A special program which utilises much of the data supplied in Sporting Life's Weekender paper.
- * This most sophisticated program leads you step by step through each runner's form, then produces the probable race placings.
- * Includes facility to alter significance of any/all factors if required.

£7.95 inclusive

COMPUNTA

- * A more general version of the forecaster program, for use with any daily paper's racing section.

£5.50 inclusive.

Easy to Use — No Records to Update

Both Programs available for:-

**SPECTRUM 48K — DRAGON 32/64
TANDY COCO 32K**

Available ONLY from:-

RED ROM DATA

72 Lambert Road, Grimsby, Lincs.

DN32 0NR

STATE MACHINE FOR PROMPT DELIVERY

WINDRUSH MICRO SYSTEMS



BUG ZAPPER



MACE



D-BUG

**MACE-32/64
(29.95)**

A co-resident editor/assembler/system monitor for the DRAGON 32/64. MACE works independantly of BASIC so you can work in BASIC and assembly Language at the same time. The assembler supports the standard Motorola syntax for all MC68009 mnemonics. MACE provides a completely interactive assembly Language programming environment. You have instant access the EDITOR, the ASSEMBLER and the SYSTEM MONITOR. ROM cartridge with 80 page manual.

**D-BUG-32
(29.95)**

A co-resident tracer/disassembler/monitor for the DRAGON-32 only. Includes its own RAM so that it may be used to work with programs resident anywhere in memory. D-BUG enables you to single-step trace a program or to disassemble a program. You can even single-step through the BASIC ROM'S in the DRAGON. ROM/ RAM cartridge with 47 page manual plus 63 page MC6809 Assembly Language Programmers Reference Guide.

**D-BUG-32/64
(29.95)
MACE/D-BUG
(49.95)**

As above but does not include the internal RAM. Only works with the DRAGON-64 in 32K mode.

MACE and D-BUG-32/64 in one cartridge. This represents the ultimate in assembly Language program development tools for the DRAGON-32 of DRAGON-64. Only works with DRAGON-64 in 32K mode. ROM cartridge plus MACE manual, D-BUG manual and Programmers Reference Guide.

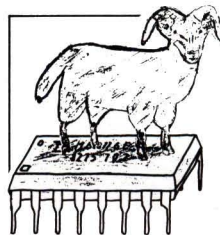
**BUG-ZAP
(79.95)**

A professional quality EPROM programmer cartridge for the DRAGON-32 or the DRAGON-64. Covers all single voltage EPROMS: 2758, 2508, 2716, 2516, 2732, 2732A, 2532, 2764, 2564, 68764, 27128 and the 27256. Intel's intelligent programming algorithm supported for 27128 and 27256. Ease of use is guaranteed by menu driven operation: FILL, MOVE, EXAMINE/CHANGE, HEX/ASCII, DUMP, CRC CHECKSUM, COPY EPROM, VERIFY EPROM, PROGRAM EPROM, SELECT NEW EPROM TYPE, START/STOP CASSETTE MOTOR, LOAD OR SAVE TO CASSETTE. 36 page manual.

**BUG-ZAP/MACE
(89.95)**

As above but including MACE.

PRICES INCLUDE POSTAGE & VAT. VISA/ACCESS PHONE ORDERS ACCEPTED
WORSTEAD LABORATORIES, NORTH WALSHAM, NORFOLK, ENGLAND. NR28 9SA
TEL: (0692) 405600/405189 DEALER ENQUIRIES INVITED



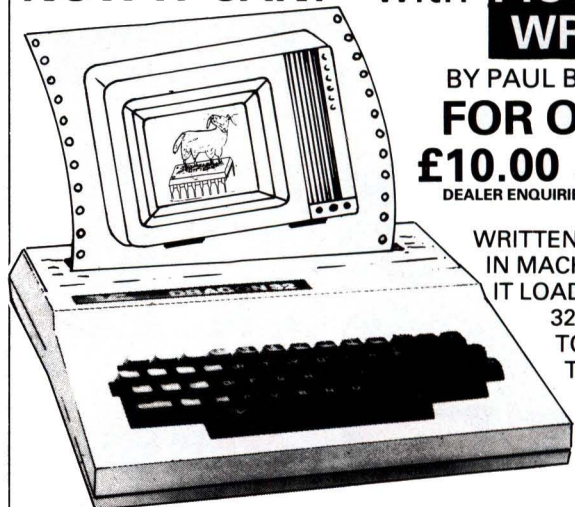
SOFTWARE

32 BIRCHWOOD DRIVE WILMINGTON DARTFORD KENT DA2 7NE

Ever wish your WILMINGTON could have

- * Text and Graphics easily mixed*
- * 221 Redefineable Characters*
- * Lower Case* * Cursor Control*

NOW IT CAN! with **PICTURE WRITER**



BY PAUL BARNED
FOR ONLY

£10.00 (+75p Overseas)
DEALER ENQUIRIES WELCOME

WRITTEN ENTIRELY
IN MACHINE CODE
IT LOADS IN JUST
32 SECONDS
TO GIVE ALL
THE ABOVE

PLUS:

- * Defineable scrolling window * Choice of four colour formats * Text scrolls independently of graphics * Auto-repeat keyboard * Text or graphics can be independently cleared * 225 characters including 32 control codes and graphics all available direct from the keyboard and in quotes in print statements * Programmed cursor control — eg: "PRINT ^ → → ↓ ↓ ↓ ↓" * Characters can be easily redefined using arrow keys or in Basic and Saved * Preprogrammed maths symbols and graphics including Invaders etc * Abbreviated keyword entry * "Old" command * Crash recovery * Co-resident programmed

INTERFACES COMPLETELY WITH BASIC AND AVAILABLE IN YOUR OWN PROGRAMS

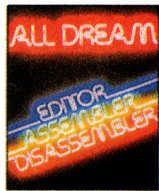
"Excellent value for money" ... Popular Computing Weekly.
"We recommend it unreservedly" ... Dragon Dungeon

FEED YOUR DRAGON

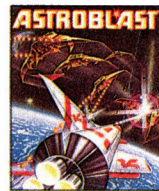
EXCLUSIVE SOFTWARE FOR DRAGON MICROCOMPUTERS



ADVENTURE TRILOGY
M30881



ALL DREAM
EDITOR/ASSEMBLER
I20001



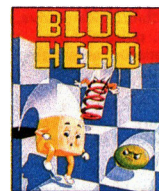
ASTROBLAST
J20107



JUNIORS REVENGE
L30844



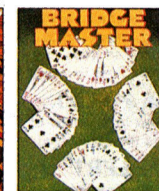
BLACK SANCTUM
M30509



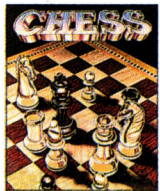
BLOC HEAD
M30885



BREAKOUT
MIDDLE KINGDOM
M30891



BRIDGE MASTER
H41000



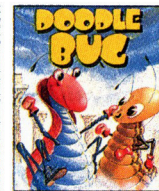
CHESS
I20108



CIMEON MOON
M30882



COSMIC CLONES
M30887



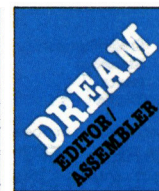
DOODLE BUG
J20110



DRAGON MOUNTAIN
N30513



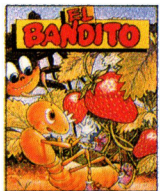
DRAGON FORTH
J30798



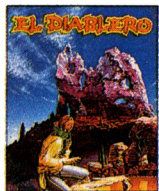
DREAM
EDITOR/ASSEMBLER
L30516



DREAMBUG
DISASSEMBLER
M30535



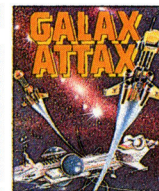
EL BANDITO
M30888



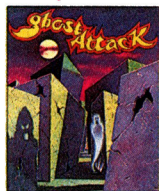
EL DIABLERO
M30518



FLIGHT
M30893



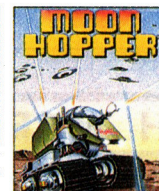
GALAX ATTAX
K30112



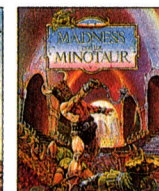
GHOST ATTACK
J20103



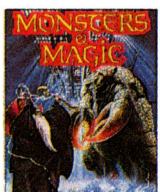
JUMPJET
M30890



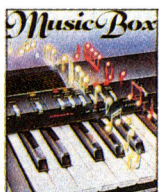
MOON HOPPER
M30884



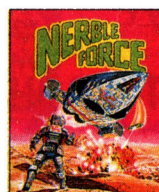
MADNESS & THE
MINOTAUR
M30503



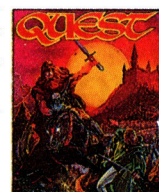
MONSTERS &
MAGIC
M30880



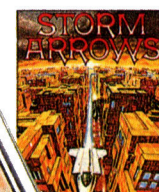
MUSIC BOX
M30895



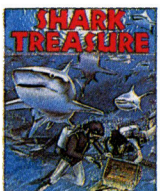
NERBLE FORCE
M30886



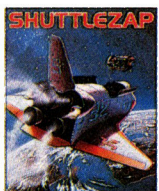
QUEST
M30502



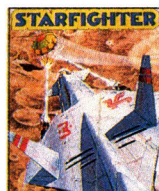
STORM
ARROWS
M30527



SHARK
TREASURE
K30532



SHUTTLEZAP
K30535



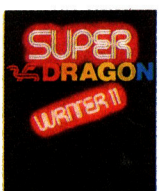
STARFIGHTER
M30883



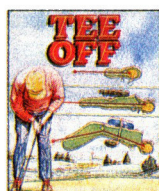
SHAFT
M30894



SYNTHET 7
L30838



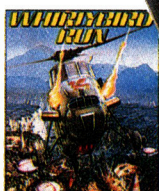
SUPER DRAGON
WRITER II
F20310



TEE OFF
M30896



VIKING
M30879



WHIRLYBIRD
RUN
K30114



LUNAR ROVER
PATROL
L30941

vs. DRAGON Data Ltd.

Dragon Data Ltd., Kenfig Industrial Estate, Margam, Port Talbot, West Glamorgan, SA13 2PE.

FEED YOUR DRAGON

EXCLUSIVE SOFTWARE FOR DRAGON MICROCOMPUTERS



ADVENTURE TRILOGY
M30881



ALL DREAM
EDITOR/ASSEMBLER
L20001



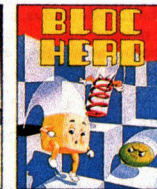
ASTROBLAST
J20107



JUNIORS REVENGE
L30844



BLACK SANCTUM
M30509



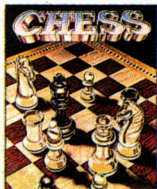
BLOC HEAD
M30885



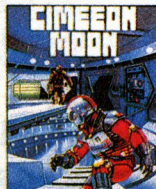
BREAKOUT
MIDDLE KINGDOM
M30891



BRIDGE MASTER
H41000



CHESS
L20108



CIMEON MOON
M30882



COSMIC CLONES
M30887



DOODLE BUG
J20110



DRAGON MOUNTAIN
N30513



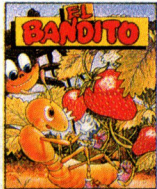
DRAGON FORTH
J30798



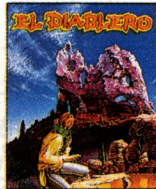
DREAM
EDITOR/ASSEMBLER
L30516



DREAMBUG
DISASSEMBLER
M30536



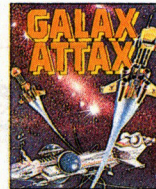
EL BANDITO
M30888



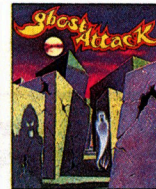
EL DIABLERO
M30518



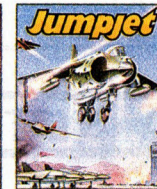
FLIGHT
M30893



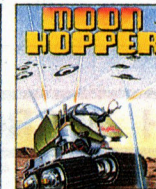
GALAX ATTAX
K30112



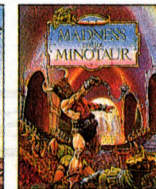
GHOST ATTACK
J20103



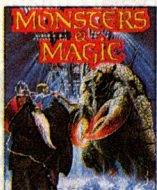
JUMP JET
M30890



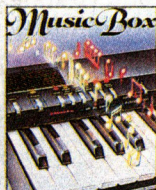
MOON HOPPER
M30894



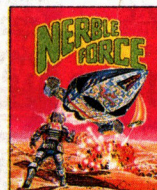
MADNESS & THE
MINOTAUR
M30503



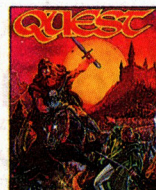
MONSTERS &
MAGIC
M30880



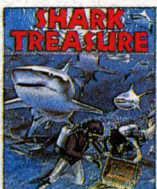
MUSIC BOX
M30895



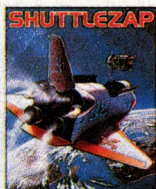
NERBLE FORCE
M30886



QUEST
M30502



SHARK
TREASURE
K30532



SHUTTLEZAP
K30535



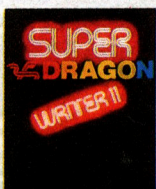
STARFIGHTER
M30883



SHAFT
M30894



SYNTER 7
L30838



SUPER DRAGON
WRITER II
F20310



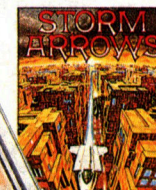
TEE OFF
M30896



VIKING
M30879



WHIRLYBIRD
RUN
K30114



STORM
ARROWS
M30527



LUNAR ROVER
PATROL
L30841

DRAGON LTD

Dragon Data Ltd., Kenfig Industrial Estate, Margam, Port Talbot, West Glamorgan, SA11 2PE.