

MICROMART



1-4 LANGLEY COURT, LONDON WC2E 9JY

**DATABASE
PROGRAMMING**

**d Base II / d Base III
Informix & C**

Regd Trademarks Ashton Tate RDS Inc.

**FULL ACCOUNTS, STOCK OR
TIME - MAILING - BROKING -
MATCH & RETRIEVE - ETC**

01-240 3118

SUPPORT · ANALYSIS · PROGRAMMING

ANALYSIS · PROGRAMMING · TRAINING

APPLICATIONS · TRAINING · SUPPORT

MEMORY UPGRADES

Expand the on-board memory of your PC with one of our kits - easy to fit at home or office.

IBM PC/XT AND COMPATIBLES

Kit 1	upgrades 64K to 128K	£13.95
Kit 2	upgrades 64K to 256K	£37.95
Kit 3	upgrades 128K to 256K	£25.95

M24, COMPAQ DESKPRO, and COMPATIBLES

Kit 4	upgrades 128K - 384K	£51.95
Kit 5	upgrades 384K - 640K	£51.95
Kit 6	upgrades 128K - 640K	£94.95

(4128 for AT £6.50 each)

Full fitting instructions included

Lowest Prices

Dealer enquiries welcome

Add £1 p&p for each kit and VAT at 15% (except EXPORT)

Make cheques payable to RAM UPGRADES & send to:

17 Orchard Way, Flitwick, Bedford MK45 1LF
Tel: (0525) 715977

MIDLAND MICROCARE

(0902) 751307

SPECTRUM (PLUS): £20.00 (ALL INCL.)

ZX81..... £13.00 (ALL INCL.)

7 DAY TURN-AROUND

FOR

★ **GOLD STAR** ★

GUARANTEED 48 HR SERVICE

ADD £10.00

ALL PARTS AND LABOUR GUARANTEED

FOR 120 DAYS

TRADE WELCOME

By post: send cheque or p/o

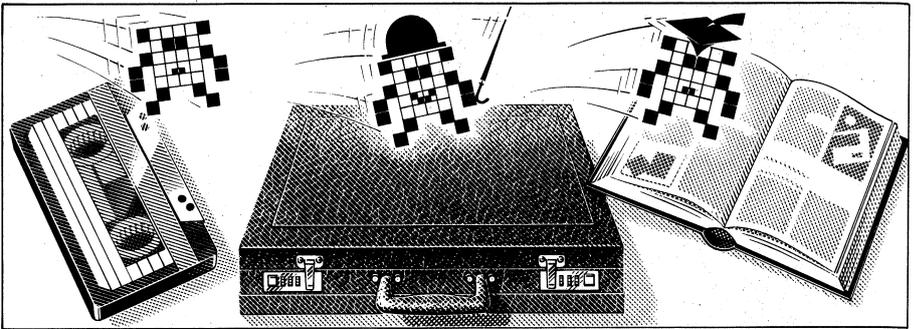
(Sound Design Studios) and Computer Minus PSU to:

**COLROY HOUSE, 174 NEWHAMPTON RD WEST
NEWBRIDGE WOLVERHAMPTON WV6 0RP**

OR

WHY NOT POP IN? MON-SAT 10AM-8PM
SPECIALIST SINCLAIR REPAIRS

PROGRAM FILE



*Owen Linderholm selects the best of readers' programs.
For details on submitting your own, see the end of
this section.*

Program of the Month is a superb program for the Spectrum by Phillip Wade. It allows a Spectrum with an Interface 1 to be hooked up to almost any modem in order to communicate with all types of bulletin board and information retrieval systems. The program overcomes the lack of a UART (Universal Asynchronous Receiver/Transmitter) chip, and is more flexible and powerful than most commercial communications software for the Spectrum — and it's free!

While Sir Clive Sinclair may be struggling, the users of his machines most certainly aren't. Apart from the aforementioned Spectrum program, there is a well written and comprehensive (though a little fragile and slow) turtle graphics program for the QL. This program is carefully written and easy to follow, so additions are easy to implement and translation to other machines is possible. Commodore 64 users can type in an editing program that allows bi-directional scrolling of listings and auto-inserting. It can be combined with the trace/step/walk utility published in PCW, November 1985.

Amstrad owners can try out the latest program from Justin Moffitt, the author of the popular Amsquill program that was also featured in the November 1985 issue. For the BBC there is a useful development utility called Auto Program Saver. This runs in the background while you are typing in and debugging your Basic program, and automatically saves it to disk at time intervals specified by you. This is an invaluable aid to guarding against crashes and

power failures.

One machine that has not appeared in this column recently is the Lynx, but this month there is a fill routine that runs on both the 48k and 96k versions. Another machine that has been absent recently is the Enterprise, and for this there is Cuboid, a version of the popular arcade game, Q*Bert.

Please note: in the October 1985 edition of PCW we published a program under the title Spectrum Football Manager.

We are reminded that for sometime a very popular and successful program entitled Football Manager has been marketed by Mr Kevin Toms and his company Addictive Games Limited of Richmond Hill, Bournemouth.

Mr Toms' program has been recognised in the business as a classic and has regularly topped the best-selling charts. We would not wish our readers to be confused into thinking that the game we reproduced in any way represents the product of Mr Kevin Toms or Addictive Games Limited.



Games



Scientific/mathematic



Business



Toolkit/utilities



Educational/Computer Aided Learning



Program of the Month Spectrum Communicator

by Phillip Wade

This program enables a 48k Spectrum with an Interface 1 to act as an ASCII terminal to other computers via the RS232 socket. It will work at up to 1200 baud full duplex, including split baud rates, and can be used with a modem for

contacting bulletin boards, and so on. The program will not work with Prestel and Micronet as the Spectrum can't reproduce the Viewdata character set.

If a modem is used, you will need one which can be connected to the Spec-

PROGRAM FILE

trum's RS232 socket. If you can't obtain one with a suitable plug, it's probably best to get one to plug into the BBC's RS423 port and then change the plug yourself. The necessary plugs and cables can be obtained from electronics shops. Another alternative is to connect to a standard RS232 socket (25-pin D plugs). The correspondence between the two sockets for the Spectrum RS232 and BBC R423 is shown in Fig 1. When connecting to other plugs, use the same pins on the Spectrum nine-pin D plug and refer to the modem manual to connect these to the pins corresponding to the equivalents for the BBC.

If you have a modem that can be controlled by software, you will need to write this software yourself, and remember to connect the Spectrum's CTS line to the modem's RTS. Generally, it is safer and easier to use a modem controlled by switches and handle it manually.

The program stores a copy of the online interaction in a log file so that it can be viewed again later. It is also possible to print, save and load a log file. This file can hold up to 22,500 characters, and the amount of characters used up at any time is shown below the main menu.

Another option from the menu allows you to reset the protocol used to one of the common protocols used by bulletin boards, or to define all the settings individually. One of the settings allows control characters to be displayed explicitly on the screen. They will appear as an up-arrow followed by one of @,A,B,...,Z,[,],, (^),_ (E) for the control codes 0,1,...,31,127 respectively. These can also be generated for transmission by typing EMODE followed by the correct letter. Type EMODE again to revert to normal.

The following keys have special functions:

- CAPS SHIFT 1 — returns to main menu
- " " 2 — toggles caps lock
- " " 3 — sends Xoff (CHR\$ 19)

- " " 4 — sends Xon (CHR\$ 17) to remote computer
- " " 5 — sends backspace (CHR\$ 8) to remote computer
- " " 6 — sends linefeed (CHR\$ 10) to remote computer
- " " 7 — sends cursor up (CHR\$ 11) to remote computer
- " " 8 — sends cursor down (CHR\$ 9) to remote computer
- " " 9 — prints a copy of the screen to a ZX printer
- " " 0 — sends delete (CHR\$ 127) to remote computer

You should remember that the program only simulates full duplex operation using half duplex, which effectively means that the computer can't really send and receive at the same time, and only pretends to do so by switching between sending and receiving very quickly.

It is possible that arriving characters could be missed or garbled if you are typing when they arrive, but this shouldn't be of too much inconvenience as it is difficult to type quickly on the Spectrum. Just remember not to type ahead by anticipating questions and typing the answers too early.

To use the program, type in the first of the listings and save it using SAVE "sc" LINE 30, then type in the second program and save it to a different tape. This program should then be run, and when it finishes it will generate code. Save it to tape (it should be saved after the first program on the first tape); this tape then holds the working version of the program. To put the program on microdrive, alter the aforementioned SAVE instruction, plus line 50 of the first program and line 110 of the second program.

In the listing, the close-bracket character in lines such as 390, 470, 500 and 510 should be typed in as the # (hash) character.

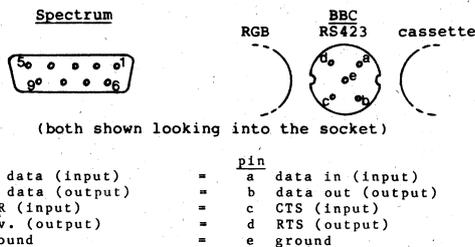


Fig 1 Correspondence between the two sockets

```

10 GO TO 80
20 REM *****
30 REM enter program here after loading
40 REM subsequently RUN from start
50 CLEAR 32938: LOAD "sc"CODE
60 POKE 63817,170: POKE 63818,128: POKE 63833,228: POKE 63834,87: POKE 63847,2
55
70 REM *****
80 REM main program loop
90 DIM a$(64): CLS
100 PRINT AT 0,0;"Main menu";AT 0,0: OVER 1;"
110 PRINT AT 3,0;"1. Go on-line (new log file)"
120 PRINT AT 5,0;"2. Go on-line (append log file)"
130 PRINT AT 7,0;"3. Display log file"
140 PRINT AT 9,0;"4. Print log file"
    
```

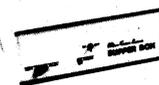
MICROMART

Set your micro free!
WITH A HARDWARE
Data Buffer

Don't wait for printing to finish - no matter how fast your printer, your computer works faster.

Release that micro for more processing, seconds after giving the command to print out.

Save time by using a data buffer. And remember, computer time saved means operator time saved.



Word-processing and all print-orientated tasks can be speeded-up dramatically.

Graphics and CAD output - a data buffer is a must for these applications.



Cost-effective time saving. From £87.50 for 16K of buffer memory (for use with Epson printers). 64K buffer memory with optional serial or parallel input or output £199. Full-featured (copy, output hold, etc) 256K buffer memory, £423. Prices exclude VAT. Trade, quantity, and corporate terms - please call.

A) Line Dataspeed Devices Ltd

3 Auburn Road,
Blaby,
Leicester LE8 3DR.
☎ (0533) 778724

IS YOUR DAY TOO SHORT?

Save yourself time and trouble by using our independent service.

Feasibility studies undertaken. Hardware/software package selection. Training, support and hot-line.

For information ring:
KEYSTROKES,
CHANDLERS FORD
(04215) 62242

COMPUTER REPAIRS

We are the experts, having serviced Sinclair computers since the introduction of the Z80. Don't waste money on estimates — we repair Sinclair computers at price quoted (inclusive parts, labour, postage, VAT), irrespective of fault. No hidden charges.

Repairs guaranteed for 3 months.

Spectrum £18.75 inc parts
 Keyboard fault only £7.85 inc parts
 ZX81 £11.50 inc parts
 16K Ram £9.95 inc parts
 Microdrive £15.95 inc parts
 Interface 1-11 £18.75 inc parts

also

BBC £22.00 + parts
 Electron £19.95 + parts
 Commodore 64 £19.95 + parts
 XK Memory Expansion Kit £15.95

Computer Retailers please phone for Special Trade Price

Call or send with cheque or P.O.

T.V. Services of Cambridge Ltd.
 French's Road, Cambridge CB4 3NP
 Tel: 0223 311371

COMPUTER REPAIRS

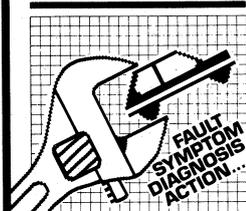
- * COMPUTERS (Business & Personal)
- * DISK DRIVES (5¼", 8", 3", 3½")
- * WINCHESTERS
- * MONITORS, VDUs, PRINTERS
- * IBM PC and APPLEBOARDS
- * IBM POWER SUPPLIES
- * XEBEC CONTROLLERS
- * Fixed repair charges
- * 3 months warranty on repaired part

A.N. ELECTRONIC & COMPUTER SERVICES LTD

130B North Lane, Aldershot, Hants
 Tel: Aldershot (0252) 25608

Repair Centre appointments welcomed

CAR CURE



*** REVIEWS**
 "... works extremely well... a great deal of effort has gone into making it user friendly as well as functional... a very worthwhile package"
 -CRASH
 "... an expert system... incredibly easy to use"
 -Popular Computing Weekly
 "... well produced... a worthwhile addition to your toolkit"
 -ZX Computing
 "... one of the most useful programs I have ever used. Makes 'xyz' look very childish and useless. A software company to keep an eye on!"

CAR CURE will transform your micro into an expert mechanic to help you find faults on your car and then determine the cure. Technical Colleges buy CAR CURE to help students learn about the faults cars suffer, as well as their symptoms and cures. Now you too can benefit!
 Complete with comprehensive 5000-word User Guide and packaged in a long-life plastic wallet. Export orders get American-English cross reference. All for less than many garages charge for an hour's work!
 Tape for Amstrad CPC464 only £9.95
 Discs for CPC464, 664, 6128 at £13.95 or will copy onto your disc for only £9.95
 Tape for 48K Spectrum (microdrive transfer instructions free, on request) at £9.95
 Disc for BBC (state 40 or 50 track) at £11.95

SIMTRON
 PROGRAMS TO HELP YOU
 DEPT YC, 4 CLARENCE DRIVE, EAST GRINSTEAD,
 WEST SUSSEX RH19 4RZ Telephone (0342) 28188

PROGRAM FILE

```

150 PRINT AT 11,0;"5. Save log file"
160 PRINT AT 13,0;"6. Reload log file"
170 PRINT AT 15,0;"7. Reset protocol"
180 PRINT AT 17,0;"8. Into Basic"
190 LET startlf=32939: LET endlf=PEEK 63817+256*PEEK 63818
200 PRINT AT 21,0;"Log file: ";endif-startlf+1;" /22500 bytes used"
210 PAUSE 0: LET k$=INKEY$: IF k$<"1" OR k$>"8" THEN GO TO 210
220 IF k$="3" AND k$<"5" AND endlf=startlf-1 THEN LET m$="No log file exists"
230 SUB 880: GO TO 210
230 CLS
240 IF k$="1" OR k$="2" THEN GO TO 320
250 IF k$="3" THEN GO TO 370
260 IF k$="4" THEN GO TO 420
270 IF k$="5" THEN GO TO 560
280 IF k$="6" THEN GO TO 680
290 IF k$="7" THEN GO TO 920
300 STOP
310 REM *****
320 REM go on-line
330 POKE 63816,VAL k$
340 RANDOMIZE USR 63631
350 GO TO 80
360 REM *****
370 REM display log file
380 POKE 63635,2: RANDOMIZE USR 63634: REM outputs the log file to stream 2
390 PRINT );"Press any key to return to main menu.": PAUSE 0
400 GO TO 80
410 REM *****
420 REM print log file
430 PRINT AT 0,0;"Print log file";AT 0,0; OVER 1;"-----"
440 PRINT AT 3,0;"1. ZX printer"
450 PRINT AT 5,0;"2. RS232 printer"
460 PAUSE 0: LET k$=INKEY$: IF k$<"1" OR k$>"2" THEN GO TO 460
470 CLS: CLEAR )
480 IF k$="1" THEN GO TO 520
490 INPUT "Supply baud rate for printer: ";baud
500 FORMAT "t";baud: OPEN )3;"t"
510 PRINT );"Connect printer to RS232 socket, and press any key.": PAUSE 0: CLS

520 POKE 63635,3: RANDOMIZE USR 63634: REM outputs the log file to stream 3
530 IF k$="2" THEN CLOSE )3: PRINT );"Reconnect modem to RS232 socket, and press any key.": PAUSE 0
540 GO TO 80
550 REM *****
560 REM save log file
570 PRINT AT 0,0;"Save log file";AT 0,0; OVER 1;"-----"
580 LET f$="t": GO SUB 770
590 IF k$="2" THEN PRINT );"Insert cartridge in drive 1, address any key.": PAUSE 0: CLS: SAVE *m";1;f$CODE startlf,endlf-startlf+1: VERIFY *m";1;f$CODE: GO TO 80
600 SAVE f$CODE startlf,endlf-startlf+1
610 PRINT );"Press V to verify, any other key to continue."
620 PAUSE 0: LET k$=INKEY$: CLS
630 IF k$<"v" AND k$>"v" THEN GO TO 80
640 PRINT );"Reconnect EAR lead and play tape"
650 VERIFY f$CODE
660 GO TO 80
670 REM *****
680 REM reload log file
690 PRINT AT 0,0;"Reload log file";AT 0,0; OVER 1;"-----"
700 LET f$="f": GO SUB 770
710 RANDOMIZE USR 63777: REM clears log file area
720 IF k$="2" THEN PRINT );"Insert cartridge in drive 1, address any key.": PAUSE 0: CLS: LOAD *m";1;f$CODE startlf,22500: GO TO 740
730 PRINT );"Start tape.": LOAD f$CODE startlf,22500
740 RANDOMIZE USR 63795: REM sets address of end of log file
750 GO TO 80
760 REM *****
770 REM routine to enquire tape or m/d and get file name
780 PRINT AT 3,0;"1. ";f$;" tape"
790 PRINT AT 5,0;"2. ";f$;" microdrive"
800 PAUSE 0: LET k$=INKEY$: IF k$<"1" OR k$>"2" THEN GO TO 800
810 CLS
820 INPUT "Supply filename: ";LINE f$
830 IF LEN f$=0 THEN LET m$="Filename must be given": GO SUB 880: GO TO 820
840 IF LEN f$>10 THEN LET m$="Filename too long": GO SUB 880: GO TO 820
850 CLS
860 RETURN
870 REM *****
880 REM routine to output an error message
890 PRINT AT 20,0; INVERSE 1;m$: BEEP 1,0
900 RETURN
910 REM *****
920 REM reset protocol
930 PRINT AT 0,0;"Reset protocol";AT 0,0; OVER 1;"-----"
940 PRINT AT 3,0;"1. 300/300 baud, no parity, 1 stop bit, remote echo"
950 PRINT AT 4,0;"2. 300/300 baud, even parity, 1 stop bit, remote echo"
960 PRINT AT 9,0;"3. 1200/75 baud, even parity, 1 stop bit, remote echo"
970 PRINT AT 12,0;"4. Other"
980 PAUSE 0: LET k$=INKEY$: IF k$<"1" OR k$>"4" THEN GO TO 980
990 CLS
1000 IF k$="4" THEN GO TO 1100
1010 IF k$="1" THEN LET inbaud=300: LET outbaud=300: LET parity=2
1020 IF k$="2" THEN LET inbaud=300: LET outbaud=300: LET parity=0
1030 IF k$="3" THEN LET inbaud=1200: LET outbaud=75: LET parity=0
1040 POKE 63820,inbaud-256*INT (inbaud/256): POKE 63821,INT (inbaud/256)
1050 POKE 63822,outbaud-256*INT (outbaud/256): POKE 63823,INT (outbaud/256)
1060 POKE 63824,parity
1070 POKE 63827,2
1080 POKE 63828,0
1090 GO TO 80
1100 PRINT "Baud rate for input""Baud rate for output""Parity""Stop bits""Echo""Insert LF when CR recd""Insert LF when CR sent""Show control characters"
1110 LET restore=1510: LET address=63818
1120 FOR n=0 TO 14 STEP 2
1130 GO SUB 1270
1140 PRINT AT n,26;v$
1150 IF n>0 AND n<10 THEN LET restore=restore+10
1160 NEXT n
1170 PRINT AT 19,0;"Press "; INVERSE 1;"SPACE"; INVERSE 0;" to toggle setting"
1180 PRINT AT 21,0;"Press "; INVERSE 1;"ENTER"; INVERSE 0;" when set"
1190 LET restore=1510: LET address=63818
1200 FOR n=0 TO 14 STEP 2
1210 GO SUB 1270
1220 GO SUB 1370
1230 IF n>0 AND n<10 THEN LET restore=restore+10
1240 NEXT n
1250 GO TO 80
1260 REM *****
1270 REM routine to find previous value of one protocol setting
1280 RESTORE restore
    
```

PROGRAM FILE

```

1290 READ inc,bytes
1300 LET address=address+inc
1310 READ v$,v
1320 IF v$="end" THEN RESTORE restore: READ inc,bytes,v$,v: RETURN
1330 IF bytes=1 AND PEEK address=v THEN RETURN
1340 IF bytes=2 AND PEEK address=v-256*INT (v/256) AND PEEK (address+1)=INT (v/2
56) THEN RETURN
1350 GO TO 1310
1360 REM *****
1370 REM routine to set new value for one protocol setting
1380 PRINT AT n,26;" ";AT n,26; FLASH 1;v$
1390 PAUSE 0
1400 IF INKEY$=CHR$ 13 THEN GO TO 1450
1410 IF INKEY$<>CHR$ 32 THEN GO TO 1390
1420 READ v$,v
1430 IF v$="end" THEN RESTORE restore: READ inc,bytes,v$,v
1440 GO TO 1380
1450 PRINT AT n,26;v$
1460 IF bytes=1 THEN POKE address,v: RETURN
1470 POKE address,v-256*INT (v/256): POKE address+1,INT (v/256)
1480 RETURN
1490 REM *****
1500 REM data for protocol settings
1510 DATA 2,2,"50",50,"75",75,"110",110,"134",134,"150",150,"200",200,"300",300,
"600",600,"1200",1200,"end",0
1520 DATA 4,1,"even",0,"odd",1,"none",2,"end",0
1530 DATA 1,1,"1",2,"1.5",3,"2",4,"end",0
1540 DATA 1,1,"remote",0,"local",1,"end",0
1550 DATA 1,1,"no",0,"yes",1,"end",0

10 CLEAR 63630
20 LET byte=63631
30 FOR n=1000 TO 2180 STEP 10
40 LET total=0
50 FOR p=1 TO 16
60 READ data: POKE byte,data
70 LET total=total+data: LET byte=byte+1
80 NEXT p
90 READ data: IF total<>data THEN PRINT "Mistake in line ";n;":";","Correct pro
gram and run again.": STOP
100 NEXT n
110 SAVE "sc"CODE 63631,1890
1000 DATA 195,113,249,62,255,205,1,22,42,73,249,237,91,89,249,122,2254
1010 DATA 179,40,1,35,58,12,254,119,17,171,128,213,1,255,255,197,1935
1020 DATA 3,26,19,230,127,254,32,56,7,254,127,40,3,3,24,241,1446
1030 DATA 33,12,254,190,40,11,35,35,190,40,40,35,190,40,36,24,1205
1040 DATA 224,225,124,165,60,40,10,68,77,225,205,10,249,84,93,24,1883
1050 DATA 202,225,213,205,10,249,62,13,215,209,42,73,249,183,237,82,2469
1060 DATA 216,24,184,225,120,177,40,16,11,120,177,40,11,237,66,48,1712
1070 DATA 4,9,229,24,172,197,24,169,225,24,160,120,177,200,126,35,1895
1080 DATA 230,127,254,32,56,245,254,127,40,241,11,197,229,215,225,193,2676
1090 DATA 24,233,33,170,128,34,73,249,35,17,172,128,1,227,87,54,1665
1100 DATA 0,237,176,201,33,142,216,1,228,87,62,0,237,169,32,4,1825
1110 DATA 234,59,249,43,35,34,73,249,201,1,170,128,1,44,1,44,1566
1120 DATA 1,0,1,2,2,0,0,0,0,1,228,87,0,0,0,0,255
1130 DATA 0,0,0,0,0,0,0,0,255,0,0,0,0,0,0,0,255
1140 DATA 0,0,205,172,249,205,138,249,205,237,250,220,44,252,205,242,2873
1150 DATA 252,42,100,249,124,181,196,185,253,24,234,58,80,249,183,200,2610
1160 DATA 42,100,249,17,170,2,237,82,56,11,237,82,216,62,238,50,1851
1170 DATA 91,249,211,239,201,62,254,50,91,249,211,239,201,62,9,237,2656
1180 DATA 71,237,94,221,33,0,0,33,59,92,203,174,193,217,229,217,2073
1190 DATA 58,9,92,245,62,30,50,9,92,58,10,92,245,62,4,50,1168
1200 DATA 10,92,58,72,92,245,42,61,92,229,197,58,72,249,254,2,1825
1210 DATA 40,12,33,170,128,34,73,249,33,228,87,54,89,249,33,255,1747
1220 DATA 90,17,254,90,1,255,2,58,141,92,230,63,19,237,184,50,1883
1230 DATA 72,92,166,128,50,106,249,31,31,31,230,7,211,254,1,0,1739
1240 DATA 24,58,103,249,60,40,13,58,75,249,183,40,7,33,142,240,1574
1250 DATA 237,184,24,34,43,27,119,237,184,50,104,249,60,50,112,249,1963
1260 DATA 205,1,22,62,3,50,103,249,62,24,50,107,92,17,191,250,1488
1270 DATA 1,46,0,205,60,32,175,50,107,249,50,105,249,205,120,255,1909
1280 DATA 33,0,0,34,98,249,34,100,249,175,50,102,249,42,76,249,1740
1290 DATA 205,140,250,96,105,34,92,249,203,60,203,29,1,28,0,237,1932
1300 DATA 66,34,96,249,42,78,249,205,140,250,237,67,94,249,58,80,2194
1310 DATA 249,183,192,58,81,249,183,202,156,249,195,164,249,229,62,2,2703
1320 DATA 205,40,45,42,93,92,229,33,183,250,34,93,92,126,205,155,1917
1330 DATA 44,225,34,93,92,62,26,205,40,45,193,205,43,45,239,4,1595
1340 DATA 5,1,3,56,205,162,45,201,51,53,48,48,48,13,1035
1350 DATA 22,0,5,83,112,101,99,116,114,117,109,32,32,67,111,109,1229
1360 DATA 109,117,110,105,99,97,116,111,114,22,1,7,127,49,57,56,1297
1370 DATA 53,32,80,104,105,108,108,105,112,32,87,97,100,101,205,7,1436
1380 DATA 251,175,33,59,92,203,110,200,203,174,58,8,92,254,32,56,2000
1390 DATA 21,254,127,48,43,195,243,251,221,229,193,175,177,200,205,191,2773
1400 DATA 2,221,33,0,0,201,254,7,40,66,254,6,202,164,251,254,1955
1410 DATA 15,202,180,251,254,14,202,205,251,214,4,33,70,251,24,13,2183
1420 DATA 254,172,200,254,226,202,241,251,214,195,33,80,251,22,0,95,2690
1430 DATA 25,126,183,248,195,243,251,19,17,0,0,8,9,10,11,127,1472
1440 DATA 13,124,0,93,91,255,255,255,0,125,125,92,225,225,34,61,1971
1450 DATA 92,241,50,72,92,31,31,31,230,7,211,254,241,50,10,92,1735
1460 DATA 241,50,9,92,217,225,217,58,75,249,183,40,13,1,0,24,1694
1470 DATA 17,143,216,33,0,64,237,176,24,5,62,255,50,103,249,62,1696
1480 DATA 2,205,1,22,205,107,13,62,63,237,71,237,86,58,80,249,1698
1490 DATA 183,196,156,249,201,58,107,249,183,192,58,106,92,238,8,50,2326
1500 DATA 106,92,195,36,252,58,107,249,183,192,205,36,252,33,203,251,2450
1510 DATA 229,237,115,61,92,243,6,192,205,175,14,225,175,201,58,88,2316
1520 DATA 249,183,200,58,107,249,238,1,50,107,249,58,72,92,203,255,2371
1530 DATA 40,7,230,7,71,7,7,176,50,106,249,205,120,255,175,1712
1540 DATA 24,51,62,126,55,33,107,249,203,70,40,41,254,64,63,208,1650
1550 DATA 254,96,40,6,48,8,214,64,24,9,62,127,24,5,254,123,1358
1560 DATA 208,214,96,245,175,50,107,249,58,72,92,246,128,50,106,249,2345
1570 DATA 205,120,255,241,55,245,6,15,205,115,254,241,201,245,205,242,2850
1580 DATA 252,58,80,249,183,40,33,205,156,249,42,92,249,41,205,204,2338
1590 DATA 252,219,239,203,95,32,17,205,84,31,56,245,205,36,252,62,2233
1600 DATA 127,219,254,31,48,249,241,201,241,33,86,249,203,70,40,13,2305
1610 DATA 33,12,254,190,32,7,245,35,126,205,108,252,241,33,84,249,2106
1620 DATA 203,70,40,5,245,205,10,253,241,79,58,82,249,254,2,40,2036
1630 DATA 18,48,14,71,121,183,234,140,252,62,1,24,1,175,168,40,1552
1640 DATA 2,203,249,121,47,79,237,91,94,249,58,91,249,246,1,211,2228
1650 DATA 239,62,1,211,247,27,6,9,98,107,0,0,205,236,252,175,1875
1660 DATA 203,57,23,211,247,16,241,58,91,249,211,239,203,58,203,27,2337
1670 DATA 58,83,249,71,25,16,253,237,87,254,9,32,32,1,2,0,1409
1680 DATA 219,247,23,56,6,237,66,216,195,207,252,229,205,242,252,225,2877
1690 DATA 237,91,92,249,6,8,237,82,216,16,251,24,224,43,124,181,2081
1700 DATA 32,251,201,205,111,253,208,245,205,10,253,241,33,85,249,203,2785
1710 DATA 70,200,203,191,33,12,254,190,192,35,126,87,58,87,249,183,2170
1720 DATA 40,24,122,203,191,254,127,32,4,62,96,24,6,254,34,48,1519
1730 DATA 9,198,64,245,22,94,205,41,253,209,58,72,249,183,40,19,1961
1740 DATA 42,89,249,124,181,40,12,43,34,89,249,42,74,249,35,34,1585
1750 DATA 73,249,114,42,100,249,1,0,8,183,237,66,200,213,237,74,2046

```

MICROMART

DISK-OUNT DISKS FROM
MONAS OVERSEAS UK LTD
UNIT 34, CANNON WORKSHOPS
CANNON DRIVE, WEST INDIA DOCK
LONDON E14 9SU. Tel: (01) 987 3213

Prices per box of 10 disks

	5 1/4"			
	1	2-5	6-9	10
DYSAN	15.00	14.80	14.50	13.60
SS/DD	21.90	21.20	20.50	19.20
DS/DD	21.90	21.20	20.50	19.20
SS/QD	28.10	27.40	26.40	24.90
DS/QD				
MAXELL	1	2-5	6-9	10
SS/DD	12.80	12.00	11.60	10.90
DS/DD	17.80	17.20	16.60	16.10
SS/QD	18.50	17.80	17.20	16.10
DS/QD	23.00	22.40	21.70	20.30
1.6Mb	33.70	32.40	30.00	28.00
FUJI	1	2-5	6-9	10
SS/DD	13.00	12.50	12.00	11.60
DS/DD	18.50	17.80	17.20	16.50
DS/QD	22.30	21.50	20.70	19.90
1.6Mb	28.50	27.50	26.40	24.60

P & P: 1-5 Boxes: 50p per box
6+ Boxes: FREE in UK

BARGAIN 3 1/2" DISKS

	1	2-5	6-9	10
SONY	25.30	24.30	23.40	22.50
SS/DD	35.80	34.40	33.10	31.90
DS/DD				
FUJI	1	2-5	6-9	10
SS/DD	25.80	24.80	23.90	23.00
DS/DD	36.20	34.80	33.50	32.30

FREE P & P ON ALL 3 1/2" DISKS IN UK

ALL PRICES EX. VAT
 (Subject to Availability)

TYPESET DIRECT FROM DISK

✦ Anvil direct typesetting from micro disks puts you firmly in control of your photo-typesetting. Mark up your text using your usual wordprocessor commands (as long as you are using WordStar, Wordwise or another similar CP/M, MS-DOS or PC-DOS wordprocessing program).

✦ TypeFit software copyfits (casts off) your text files on your micro in exactly the same way as a photo-typesetter. Create copyfitted wordprocessor files which can be typeset line-for-line and character-for-character.

Write or telephone now for details of low-cost TypeFit demo software and FREE Anvil typesetting offer.

Wordsmiths
 33 Clerkenwell Close • London EC1
 ☎ (01) 608 1868
 19 West End • Street • Somerset
 ☎ (0458) 45359

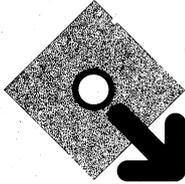
DISK COPYING/FORMATTING/ FILE TRANSFER

WE CAN TRANSFER YOUR DATA
BETWEEN OVER 500 DIFFERENT
MICROS, MINIS AND MAINFRAMES.

FORMATS INCLUDE:

CPM, CPM86, MSDOS, PC DOS, UNIX,
XENIX, IDRIS, TAR, RT11, MDOS, IBM
BEF, ISIS, FLEX, OS9, VICTOR-SIRIUS,
TORCH, ACORN, AMSTRAD, APPLE,
MISC. TYPESETTING/WORD
PROCESSING

***OVERNIGHT SERVICE** - most formats returned by
next day's Post
***£10.00 + VAT per copy**
(Blank disks not included)
***DISCOUNT for BULK**



A.L. DOWNLOADING SERVICES

166 PORTOBELLO ROAD
LONDON W11 2EB
TELEPHONE 01-727 8722

FREE FLOPPIES

SS/DD	85p + VAT + £1.00 per 10 p&p
DS/DD	99p + VAT + £1.00 per 10 p&p
SS/QD	99p + VAT + £1.00 per 10 p&p
DS/QD	110p + VAT + £1.00 per 10 p&p

PURCHASE IN 10s — FOR EACH 10
BOUGHT WE SEND 11. CHEQUE WITH
ORDER PLEASE.

HOLLBARN LTD
8 Alexander Road, Stotfold
Hitchin, Herts

LOWEST PRICES IN UK?

MICROS	MONITORS
Sinclair Spectrum 48K Free Software 6 pack.....£66	Microvitec QL (tilt & swivel).....£235
Sinclair Spectrum Plus Free Software 6 pack.....£35	Prism QL 14.....£169
Sinclair QL.....£169	Commodore Colour.....£174
Commodore 128.....£225	DISK DRIVES
Commodore 64.....£130	Commodore 1541 with Easy Script.....£130
Commodore 64 Xmas Comp. Pack C2N Recorder, Music Maker Keyboard and Software.....£166	Amstrad 3" DD1.....£139
Commodore 64 Disk Pack Computer, 1541 Disk Drive & Easy Script.....£260	Amstrad 3" FDI.....£87
Commodore 64 Printer Pack Computer, MPS 803 Printer & Easy Script.....£220	TYPEWRITERS
Commodore Disk Drive & Printer, pack 1541 Drive, MPS 803 Printer & E-Script.....£174	Canon Typewriter 5R.....£156
Amstrad CPC 464 Colour Monitor & over £100 Software.....£200	Canon Typewriter 6.....£165
Amstrad CPC 464 Green Monitor & over £100 Software.....£173	Canon Typewriter 10.....£122
Amstrad CPC 6128 Green Monitor.....£260	Brother EP 44.....£208
Amstrad CPC 6128 Colour Monitor.....£347	Casio CW10.....£130
Amstrad PCW 8256.....£399	ACCESSORIES
PRINTERS	ZX Expansion System Microdrive, Interface & Software.....£79
Commodore MPS 803.....£89	Quick Shoot II Joystick.....£8
Commodore Spectrum.....£43	C64 Easy Script (Disk).....£26
AlphaCom 32 for ZX Spectrum.....£173	C64 Easy File (Disk).....£25
Commodore DPS 1101 with E-Script.....£173	C64 Easy Stock (Disk).....£25
Epson LX80.....£222	C64 Int. to Basic (Disk).....£10
Canon PW 1080 A.....£299	C64 Simons Basic.....£25
Brother M 1009.....£170	CASIO
Juki 2200.....£295	PB 770.....£160
	PB 100.....£108
	FX 820P.....£83
	FX 750P.....£75
	FX 720P.....£42
	FX 4000P.....£34
	PB 410.....£42
	PB 110.....£33

Complete range of Casio and Spectrum/Commodore add ons at discount prices.
Prices/Goods subject to availability and change without notice. All prices exclude VAT.
P&P £5 (within UK). Trade and Export enquiries welcome

K. K. STATIONERS

187 Edgware Road
Marble Arch
London W2 1ET
Tel: 01-723 1436

126 Edgware Road
Marble Arch
London W2 2DZ
Tel: 01-402 4582

172 Queensway
Queensway
London W2
Tel: 01-229 3247

PROGRAM FILE

1760 DATA	34, 100, 249, 58, 102, 249, 180, 50, 102, 249, 43, 237, 91, 98, 249, 25, 2116
1770 DATA	11, 124, 160, 103, 125, 161, 111, 17, 143, 240, 25, 241, 119, 201, 0, 0, 1781
1780 DATA	219, 247, 23, 48, 63, 219, 247, 23, 48, 58, 42, 96, 249, 205, 254, 252, 2275
1790 DATA	219, 247, 23, 48, 47, 6, 8, 237, 91, 92, 249, 35, 98, 107, 43, 205, 1755
1800 DATA	236, 252, 219, 247, 23, 203, 25, 16, 242, 197, 237, 87, 254, 9, 204, 7, 2458
1810 DATA	251, 193, 42, 92, 249, 203, 60, 203, 29, 219, 247, 23, 48, 6, 43, 124, 2034
1820 DATA	181, 0, 32, 245, 175, 201, 121, 47, 55, 201, 205, 137, 255, 33, 143, 240, 2271
1830 DATA	237, 91, 98, 249, 25, 78, 19, 33, 255, 7, 122, 164, 103, 123, 165, 11, 1880
1840 DATA	34, 98, 249, 42, 100, 249, 43, 34, 100, 249, 121, 205, 228, 253, 205, 20, 2330
1850 DATA	255, 205, 242, 252, 201, 203, 191, 254, 32, 56, 11, 254, 127, 40, 7, 205, 2535
1860 DATA	187, 255, 205, 159, 254, 201, 1, 10, 0, 33, 12, 254, 237, 177, 192, 62, 2239
1870 DATA	9, 145, 7, 79, 33, 22, 254, 9, 94, 35, 86, 235, 233, 13, 10, 127, 1391
1880 DATA	8, 9, 11, 12, 7, 255, 255, 42, 254, 50, 254, 54, 254, 63, 254, 67, 1849
1890 DATA	254, 84, 254, 88, 254, 110, 254, 148, 254, 154, 254, 175, 50, 104, 249, 205, 2891
1900 DATA	235, 255, 201, 205, 172, 254, 201, 205, 187, 254, 62, 32, 205, 187, 255, 201, 3111
1910 DATA	205, 187, 254, 201, 33, 104, 249, 126, 214, 31, 56, 5, 119, 205, 172, 254, 2415
1920 DATA	201, 205, 159, 254, 201, 205, 202, 254, 201, 205, 154, 254, 205, 91, 255, 175, 3221
1930 DATA	50, 103, 249, 50, 104, 249, 205, 235, 255, 201, 221, 35, 251, 237, 77, 205, 2727
1940 DATA	120, 255, 6, 200, 58, 72, 92, 31, 31, 31, 230, 7, 246, 24, 14, 247, 1664
1950 DATA	238, 16, 211, 254, 197, 6, 70, 237, 80, 203, 18, 56, 6, 16, 248, 193, 2049
1960 DATA	16, 238, 201, 193, 201, 62, 255, 50, 105, 249, 201, 175, 50, 105, 249, 201, 2551
1970 DATA	33, 110, 249, 52, 33, 108, 249, 52, 33, 104, 249, 52, 201, 205, 235, 255, 2220
1980 DATA	58, 103, 249, 254, 23, 40, 34, 60, 50, 103, 249, 201, 33, 110, 249, 53, 1869
1990 DATA	33, 108, 249, 53, 33, 104, 249, 53, 240, 54, 31, 205, 235, 255, 33, 103, 2038
2000 DATA	249, 53, 240, 175, 119, 50, 104, 249, 201, 17, 0, 64, 58, 80, 249, 183, 2091
2010 DATA	32, 30, 42, 100, 249, 1, 170, 2, 237, 66, 56, 20, 237, 66, 56, 8, 1372
2020 DATA	1, 8, 16, 33, 0, 72, 24, 14, 1, 2, 22, 33, 64, 64, 24, 6, 384
2030 DATA	1, 1, 23, 33, 32, 64, 197, 6, 8, 197, 213, 229, 205, 114, 255, 1, 1579
2040 DATA	32, 0, 237, 176, 225, 209, 193, 36, 20, 16, 238, 123, 198, 32, 95, 63, 1893
2050 DATA	159, 230, 248, 130, 87, 125, 198, 32, 111, 63, 159, 230, 248, 132, 103, 193, 2448
2060 DATA	16, 212, 65, 197, 6, 8, 197, 213, 98, 107, 54, 0, 19, 205, 114, 255, 1766
2070 DATA	1, 31, 0, 237, 176, 209, 193, 20, 16, 236, 33, 32, 248, 25, 84, 93, 1634
2080 DATA	193, 16, 224, 13, 58, 103, 249, 145, 50, 103, 249, 201, 33, 255, 87, 17, 1996
2090 DATA	254, 87, 6, 192, 175, 119, 197, 205, 114, 255, 1, 32, 0, 237, 184, 193, 2251
2100 DATA	16, 244, 201, 217, 205, 242, 252, 217, 201, 58, 104, 249, 254, 32, 200, 205, 2897
2110 DATA	151, 255, 58, 106, 249, 42, 108, 249, 119, 201, 58, 104, 249, 254, 32, 200, 2435
2120 DATA	58, 72, 92, 42, 108, 249, 119, 201, 58, 112, 249, 167, 200, 58, 103, 249, 2137
2130 DATA	205, 158, 14, 58, 104, 249, 133, 111, 34, 110, 249, 124, 15, 15, 15, 230, 1824
2140 DATA	3, 246, 88, 103, 34, 108, 249, 175, 50, 112, 249, 201, 245, 58, 104, 249, 2274
2150 DATA	254, 32, 32, 7, 175, 50, 104, 249, 205, 172, 254, 205, 151, 255, 237, 91, 2473
2160 DATA	110, 249, 241, 237, 75, 54, 92, 38, 0, 111, 41, 41, 41, 9, 58, 105, 1502
2170 DATA	249, 79, 6, 8, 126, 169, 18, 20, 35, 16, 249, 201, 62, 1, 50, 112, 1401
2180 DATA	249, 201, 254, 16, 16, 16, 16, 16, 0, 0, 66, 66, 66, 66, 66, 60, 1174



QL Turtle Graphics

by Nicholas Cooley

This program is an adaptation of turtle graphics functions for the QL. The screen is divided into three windows: one for graphics output, one for commands and editing, and one for error reporting. When an error occurs, a message is displayed and a bleep is sounded. The message stays until a legal command is entered. The graphics window is the default output window, and displays not only the turtle and graphics, but also text such as file directories.

At the lowest level, the user can directly control the turtle by issuing single commands. User-defined procedures may also be written, and these can be added together to build up more complex procedures. Procedures may also be recursive, although it should be pointed out that using procedures, especially recursive ones, makes the program response extremely slow.

The program can cope with nested repeat loops, mixing of loops and procedures, assignment of variables, and arithmetic functions carried out on these (+, -, * and /). Variables may also be used as parameters for those commands that take them.

When using the program, remember that all typing should be done in lower case, and spaces should appear between reserved words and parameters or special symbols. The turtle graphics commands supported are:
forward (or fd) — this takes a single parameter and moves the turtle that distance forward.
back (or bk) — as forward, but moves

backward.
right (or rt) — this takes a single parameter and moves the turtle right through that number of degrees.
left (or lt) — as right but turns left.
penup (or pu) — this lifts up the drawing pen.
pendown (or pd) — this puts down the drawing pen.
setx — this sets the x coordinates of the turtle, takes one parameter.
sety — this sets the y coordinates similarly.
repeat (or rep) — this is used for looping. It should be followed by a control variable, and a set of instructions to be carried out, held within square brackets. These instructions can include calls to user-defined procedures. The control variables can be a value or a variable identifier. The full structure of the statement is — repeat control.variable [statements].
to — this is used to define procedures. It should be followed by the name of the procedure, and then the instructions that make up the procedure. The procedure definition is terminated by the instruction 'end'. Parameters are not passed to or from these procedures, but by defining variables before a procedure is called you can circumvent this limitation. Procedures may be fully nested.
end — see 'to'.
rubberon (or ron) — this has the effect of making the turtle draw in the background colour.
rubberoff (or roff) — this makes the turtle revert to drawing as normal.