VOL. 1
NO. 8

STATUS 1500

SEPTEMBER
1983

* 12 issues £10.50 (UK) * overseas £14.50 * published monthly *

* Edited by RONALD COHEN, 62 BLENHEIM CRESCENT, LONDON W.11 *

STATUS

So many letters recently have referred to this newsletter as a 'club' or'group', and to other subscribers as 'fellow-members' , that I feel I must take this opportunity to gently remind readers that STATUS 1500 is not quite a 'user-group', even though in many ways it functions very like one. The idea of being a club is fostered by the very friendly help so many subscribers have extended toward me, and to each other; but I am old-fashioned enough to believe that a club or group belongs to its members, who appoint an executive directly responsible to them. STATUS 1500 is not quite like this, nor do I think that democratic or committee control is practical when subscribers are not able to meet personally. Nor indeed would I wish my freedom of action fettered by the sort of controls a club *ought* to have. I know that most user-groups function as autocratically as I do; but I prefer to retain nominal as well as practical independence. And the thought of a committee makes me shudder; committees are institutions where commonsense is perpetually sacrificed on the altar of diplomacy. If anyone starts a user-group they would have my enthusiastic support: I do not propose to start one myself. STATUS 1500 remains a private newsletter.

* * * * * * *

TANDY at CENTREPOINT feel that I was not quite fair to them in the JUNE issue. In particular, they have mildly reproved me for not mentioning that they palliated the effects of their mistake by lending me a cassette-recorder while they eventually mended my own. I had understood that they did not wish this favour publicised: I am now happy to express my gratitude. I may also point out that it was only their truthfulness ard straightforwardness - not to be expected from every organisation - that gave me the chance to be a little less than fair to them.

* * * * * * *

Advertising material usually arrives long after the deadline, and then is the wrong size or shape. Every care is taken by the editor to prevent advertisements being in any way misleading: and we will not knowingly allow any misleading material to appear. Nevertheless in the 2 or 3 days usually available it is not always possible to check it out as exhaustively as might be desirable: and so it necessary to warn readers that this newsletter is not to be held responsible for the accuracy or otherwise of the contents of any advertisement.

DISTRESS SIGNALS

R.WILLIAMES asked - some weeks ago - for more 'utilities' such as DELETE and RENUMBER.

I delayed printing your request until I had something to offer. I hope the utilities on page 77 and page 78 will satisfy your hunger for thc moment. Ideas for utilities are always welcome. The utilities themselves are even more so.

A.GENZEL suggests very reasonably that the newsletter should be more orientated towards the portable uses of the PC 1500, rather than printing the sort of program which is generally available for any desk machine.

This is not as easy as it sounds. The trouble is that most peoples' 'desk' needs coincide: Utilities, Texthandling, Sorting, Databases, etc., whereas their portable or outdoor uses are all so wildly different. Navigation? I only know of two subscribers involved in this: one in the air, and the other at sea - two entirely different disciplines. Sport? We expect to print an interesting cricket-scoring program in a few months - but I would hesitate to risk my precious PC 1500 at the average football match! And as for other uses, I do not think it right to devote much space to programs which are of interest only to specialists.

C.J.NORTH has a distressed index finger as a result of writing the whole of his article on INTERFACING (page 80) with the aid of SUPERTEXT!

Many thanks - a noble effort!

SIMON COX has successfully extended his PC 1500 to 96K.He has built the extension himself, at a cost of about £50. It is fitted externally. Any enquiries will be forwarded to him.

C.A.F.LEDSAM has further information about R.J.COURT's query on page 43. The fault is indeed in SHARP's program: a data entry that is too large to be read by the data-reading statement.

ANDREW HALSEY who successfully connected his TANDY COLOR PRINTER to his PC 1500 via parallel interface, has now also succeeded with the RS232 side.***TANDY supply a lead for the purpose, price £11.95.

Further to K.SOUTHGATE's problem last month, here is an example of an EVAL routine:

```
10: REM ABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZ
15: B=B+A:USING "#####.##":LPRINT A$(0): LPRINT A;B:LF 1
30: "A" ON ERROR GOTO 35
32: DIM A$(0)*52
35: INPUT A$(0): CLS: L=LEN A$(0): POKE 14536, 65,61
60: FOR F=1 TO L: POKE 14537+F, ASC MID$ (A$(0),F,1): NEXT F
70: POKE 14538+F, 58, 241, 171: GOTO 10
```

[execute by DEF A]

[respond to the ? with an expression, such as 3.7(17/99)]*

....

**** Protocols are:*

```
Turn all bits on.
SETCOM 600,7,N,2
SETDEV PO
CONSOLE 80,0,1
```

PEEK, POKE & MEMORY - VIII

Since the DELETE program on page 69 (August issue) consists mainly of PEEKs and POKEs, and affects the memory, it is a suitable subject for detailed examination in this column.

112: sets S as the address where the subject program ends.
117: F is set at 1 byte before beginning of program: GOSUB 500 is a special case for first line.
120: FOR (1st byte after "length of first line") to (end of subject program)
130: picks up 13 , (end-of-line-marker), and then GOSUB 500
500: Sets Y as 256*(first address after address of EOL) plus (second address), which is the way the line number being examined is held in memory.
510: If Y is identical to (1st line no. to delete) sets J as 1st address for deletion, and point where "1st address after last deleted address" is to be placed. In fact, this replacement acts as deletion.
520: Sets K as " address of start of last line to delete", then picks up address holding length-of-line, and sets K as "1st address of next line" (1st line undeleted, after deleted lines). If found, loop completed.
525: Advances F counter by length-of-line to next EOL marker (13), and RETURN.
160: Sets L as distance between 1st and last addresses for deletion.
170: From " start of block to remain" to "end of subject program"....
180: ..successively transfer addresses to remain into addresses to be deleted.
210: Sets T as new length of shortened subject program, and U and V as T divided into 256ary.
215: The search-and-edit pointers had been altered by the MERGE operation: these are now restored to be identical with start-of-program pointers.
220: Put End-of-Program marker into address after end of shortened program. Puts U and V (see line 210) into end-of-program pointers.
230: End.

....

It is fatally easy to destroy DIMensioned and 2-chr. variables by RUN or CLEAR. However if you have not re-DIMensioned, they are not lost: it is only the access to them that is lost. STATUS 3, which indicates the beginning of the area where you have stored them, at the end of the program area, is held (in the usual 256ary) in addresses 30873 and 30874. If you can restore the right figures into these addresses, you will have recovered your variables. If you had indeed noted the contents of these addresses (but who has ever done so!) there is no problem. If not, it can be worked out. Allow 8 bytes for the contents of each numeric variable, plus 7 bytes for its title, making 15 in all. For alphabetic variables, it is 16 bytes for contents, and 7 for the title. For DIMensioned variables, the system is the same. Allow 7 for the title, and 8 for each numeric variable. Thus DIM A(2), which has dimensioned 3 variables - don't forget A(0)- will reserve 31 addresses. (3*8+7). For alphabetics, DIM A$(2) would require 55 addresses, (3*16+7). If you had specified a particular length for your variables, such as DIM A$(5)*20 , this would come to 127 spaces.(6*20+7).

So in this case you would deduct 127 from your normal STATUS 3, divide this into 256ary, POKE the two figures back into addresses 30873 and 30874, and your access to the variables is restored.

If you PEEK at the contents of a numeric unfixed variable, you will have difficulty in recognising it as 'the number you first though of'. The machine saves space by storing the figures in pairs. Take a number such as AA=102134. These are stored in the form 10 21 34, in 3 bytes. But owing to the habit the machine has of storing everything in hex, and displaying it in decimal, successive PEEKs into the location of AA will display 16 33 52 . The computer has assumed, for display purposes, that these were hex figures: and has misleadingly translated 10 - because &10 is dec 16- into a displayed 16. Remember that this storage is for the purposes of the computer's operations: the display is secondary.

LABELS

BY

MIKE O REGAN

```
10:" "CLEAR :
   CSIZE 2:S=1:
   DIM L$(5)*30
20:FOR J=1TO 5:
   INPUT L$(J)
30:IF LEN L$(J)>S
   LET S=LEN L$(J
   )
40:NEXT J
50:GRAPH :RLINE -
   (200,S*-15),0,
   0,B:ROTATE 1
60:FOR H=1TO 5:
   FOR I=0TO 2:
   GLCURSOR (180-
   H*30-I,-30):
   LPRINT L$(H):
   NEXT I:NEXT H
70:TEXT :LF S*.75
   :END
```

SCREEN DUMP by *CHARLIE SIMPSON*

[There is a similar routine in the PC 1500 "APPLICATIONS MANUAL". However the SHARP version is 10 times as slow, and 10 times as long.]

EXECUTE by DEF A

```
10: "A" GRAPH: GLCURSOR (150,0):SORGN
20: FOR K=0 TO 155
30: P=POINT K: IF P=0 THEN 70
40: FOR J=0 TO 7: DOT=2^J:GLCURSOR (-J*6,-K*6)
50: IF (P AND DOT)=DOT RLINE -(4,4),,,B
60: NEXT J
70: NEXT K
```

ADDRESS FINDER - FROM THE KEYBOARD

This routine instantly gives the start address of any line.
Key in, and ENTER, statements successively.
The illogical mixture of hex and decimal is for the sake of compression.

```
1] K=STATUS 2-STATUS 1-1
2] G=K-132  [cr wherever]
3] N= [line number required]
4] M=INT(N/256)
5] W=N-256*M
6] POKE G,&B5,13,68,7,&99,4,&B5,M,68,7,&99,12,&B5,W,68,7,&99,18,70,&FB,&9A
7] CALL G,K
8] PRINT K
```

Certain extraordinary coincidences* can cause this to give a wrong address, so it it is wise to check before making use of the result.

**such as line 13 bytes long, and the first 2 bytes of the line having the same ASCII codes as the line number required. Improbable, but not impossible.*

DELETE (2)

Here is the superfast version promised last month. Merge it with subject program. Before doing so, make sure you have at least 555 bytes free. The machine code routine occupies part of the Template area.

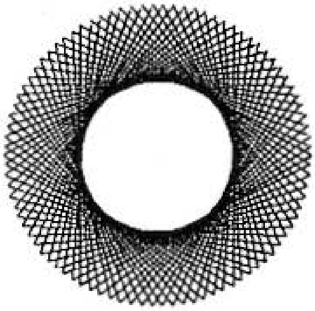
Running time to delete 4K from 9K : 3 seconds.

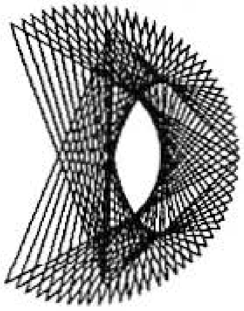
```
100:"D"INPUT "1st
    line";A
105:INPUT "last li
    ne";B
110:S=STATUS 2-553
    :G=STATUS 2-
    STATUS 1-163
120:E=PEEK 30821:N
    =A:GOSUB 500
140:F=256*E+197
150:P=PEEK (F-2):Q
    =PEEK (F-1)
160:N=B:GOSUB 500
170:R=PEEK (F-2):Z
    =PEEK (F-1):C=
    INT (S/256):D=
    S-256*C
175:K=256*R+Z:K=K+
    3+PEEK (K+2):R
    =INT (K/256):Z
    =K-256*R
180:J=256*P+Q:L=K-
    J
190:POKE G,&48,R,&
    4A,Z,&58,P,&5A
    ,Q,&F5,&4C,C,&
    99,5,&4E,D,&99
    ,9,&9A,0
200:CALL G
210:T=S-L-1:U=INT
    (T/256):V=T-25
    6*U
215:POKE 30825,E,1
    97
220:POKE T,255:
    POKE 30823,U,V
230:BEEP 3:END
500:M=INT (N/256):
    W=N-256*M
720:POKE G,&68,E,&
    6A,196,&B5,M,&
    64,&27,&99,4
730:POKE G+10,&B5,
    W,&64,&27,&99,
    &C,&66,&A4,&AE
    ,E,195,&24,&AE
    ,E,196,&9A
740:CALL G:RETURN
```

BINARY TO DECIMAL

```
10: INPUT K$
15: IF LEN K$<8LET K$="0"+K$: GOTO 15
20: FOR X=1TO 8
30: X$=MID$(K$,X,1)
40: IF X$="1" LET P=P+2^(8-X)
50: NEXT X
60: PRINT P: CLEAR: GOTO 10
```

MINDBOGGLE CORNER





The pattern on the left, from a program by SIMON COX, is produced by the program below. When first I keyed it in, I inadvertently added 1 extra character, and produced the pattern on the right. What was the character, and where was it placed? Usual splendid prize: deadline 21st September.

```
10:GRAPH
20:R=100:P=120
30:GLCURSOR (100,
   0):SORGN
40:FOR X=0TO P
   STEP 4
45:D=R*COS X:E=R*
   SIN X:F=R*COS
   (X+P):G=R*SIN
   (X+P):H=R*COS
   (X+2*P):I=R*
   SIN (X+2*P)
50:LINE (D,E)-(F,
   G)-(H,I)-(D,E)
60:NEXT X
```

PC 1500 TECHNICAL REFERENCE MANUAL *reviewed by J.BLAND****

This essential work is at long last available in U.K., and confirms what I believe PC 1500 fans have always suspected - that the PC 1500 is a beautifully though-out design, with considerable expansion possibilities. But why, oh why did it take so long? Why, oh why did SHARP bring out a "state of the art" pocket computer aimed at the serious user, and then withold all this information from the serious user for so long? Why indeed so much secrecy about the LH 5801 microprocessor?

In a nutshell, the book contains:

1) Introduction, with a nice LCD illustration of m/c's speed improvement.4pp.
2) LH 5801. Very thorough hardware.and machine code details. 62pp.
3) LH 5810/5811 I/O chip. Exhaustive detail. 18pp.
4) PC 1500 system details. A number of Memory Maps: connector pins.26 pp.
5) Subroutine calls with supplementary information. 32pp.
6) Machine Code programs. Only 6 . unexplained . examples.6pp.
APPENDIX) Circuit diagrams for computer and all accessories up to CE 159. 12 pp.

It is important to realise that this is a Reference Manual, and not a tutorial. SHARP assume - unfortunately - that you understand about flipflops, how to loop in m/c, and so on. For all readers of STATUS 1500 who want to progress beyond BASIC, it must be thoroughly recommended for the wealth of new information , especially the new information on machine code, subroutine calls, and parameters.Rather like a car manual, its usefulness is determined by individual requirements for specific areas covered.

My criticism would be the lack of elaboration on some points. I 'find it terse almost to the point of ambiguity. Just the bare facts, with their sense left to the reader, appears to be the SHARP way. The memory maps, for instance, are beautifully neat and concise, but necessary detail is often just not given. "DO NOT USE" and "CANNOT BE USED" are sufficient explanation for SHARP; but not for the interested reader, who wants to know WHY? Every pin on the LH 5801 is described, with a circuit diagram: but you must work out for yourself how certain functions are not supported.

I see the Manual as being the definitive and absolutely essential source bible. The machine code , for instance is far more detailed than .in the TANDY listings. The mnemonics are entirely compatible, also with the listings in STATUS 1500 (except for some very minor differences of punctuation). But I can see that there is scope for interpretive discussion and analysis of many areas for some time to come.

PC 1500 TECHNICAL REFERENCE MANUAL is available from SHARP (UK) Ltd at £20, and from ATLANTIC NORTHEAST MARKETING at $20. + postage. see AUGUST edition of STATUS 1500, pages 64 and 71 , for the relevant addresses.

****JOHN BLAND is researching Computer Graphics with the aid of a Fellowship from the LEVERHULME TRUST. This newsletter is indebted to him for many items of informaticn which it has not always been possible to acknowledge individually.*

CALL

A most useful function for machinecode addicts, which is mentioned nowhere else, is the statement CALL nnnnn, J where nnnnn is an address, and J is any variable. When a m/c routine is CALLedin this way, the value of the variable is automatically placed in the X-register, and on return to BASIC with RTN, *provided the Carry bit is set,* the contents of the X-register are put into the variable. (If in doubt, the Carry bit can be set with SEC). For nonnumeric variables there is a similar but somewhat more complex facility which will be mentioned in a later issue.

INTERFACE - 1

by Chris North

INTRODUCTION: The CE-158 provides for two types of connection - serial and parallel. The serial port is designed to meet the RS-232C standard (also known as EIA and V.24), although not all of the possible connections are provided (luckily for PC-1500 owners!), while the parallel port is stated to be compatible with the Centronics interface. This article discusses the use of the serial interface with various external equipment and the use of the parallel interface with printers. It is intended to be a simple guide to how to make your PC talk to other devices, not a precise discussion of data communications.

Serial (RS-232C) Interface

BASICS: First lets establish the major connections provided by the dreaded 25-pin connector.

PIN	DESCRIPTION	ABBR.	DTE		DCE	REMARKS
1	Protective Earth		*	----	*	Not connected in the CE-158
2	Transmit Data	TD	*	--->	.	Essential (with RD)
3	Receive Data	RD	.	<---	*	Essential (except for printers)
4	Request to Send	RTS	*	--->	.	Always used with CTS
5	Clear to Send	CTS	.	<---	*	Always used with RTS
6	Data Set Ready	DSR	.	<---	*	Used with DTR
7	Signal Ground	Ov	*	----	*	Essential
8	Data Carrier Detect	DCD	.	<---	*	Indicates modem is on-line
20	Data Terminal Ready	DTR	*	--->	.	Used with DSR

Notes: DTE = Data Terminal Equipment - the PC-1500 plus CE-158
DCE = Data Communications Equipment - modem plus host computer, external printer, micro or other device
* = signal generated by DTE/DCE
. = signal received by DCE/DTE

The meaning of each of these is reasonably clear and all you need to know about the status pins (4,5,6,8,20) is that they go high (positive voltage) when they are ON.

SERIAL PRINTERS: Are usually the least complicated devices, often requiring only TD and Ov. However it is important to note that most serial printers (including all keyboard terminals - teletypes) are wired as DTE and that connecting your CE-158 pin 2 (TD) to the printer pin 2 (also TD) is likely to be unrewarding! You need to swap TD and RD by reversing pins 2 and 3.

PC-1500 + CE-158: The state of pins 4,5,6,8 & 20 is indicated by individual bits of the status byte which is evaluated by the INSTAT function. When zero, each bit indicates a high signal as follows:

Bit 0 - DTR, low at switch-on set high by OUTSTAT 0 or on entering the terminal mode (via DTE or TERMINAL commands)
Bit 1 - RTS, as for DTR
Bit 2 - CTS, must be high for input/output to proceed
Bit 3 - CD, as for CTS
Bit 4 - DSR, as for CTS

MAKING THE CONNECTIONS: The difficult way to connect two serial devices is to try to obtain a precise match between all available pins on each device, while the easy way is to use only the minimum number of pins required for the basic functions and then to add any extra connections after data has been transferred successfully. All you need to know is which signals must be set for each of the two devices to work individually and then you can attempt to match them via your connecting cable.

A fairly painless way of meeting the PCs demands is to use its own output signals to drive the input, while at the same time providing any possible signals needed by the modem or printer. So, general-purpose modem and printer (null-modem) cables should look like this:

```
              PIN       PIN                              PIN       PIN

     DCE      2---------2           DTE                  2---------3      DTE

  (Modem)     3---------3    (PC-1500 + CE-158)          3---------2   (Printer)

              7---------7                                7---------7

              4        -4                                4-       -4
                     I       Note: I indicates             I     I
              5        -5    pins to be linked           5-       -5
                             within the plug.
              6        -6                                6---------6
                     I                                     I     I
              8        -8                                8-       -8
                     I                                     I
              20       -20                               20-       20
```

In an attempt to clarify the tortured English of the CE-158 user manual, I have added some comments on a few of the special BASIC commands.

SETCOM: Allows you to set the speed, etc. of the serial interface. A likely setting is SETCOM 300,7,E,1, which will work with many printers and host computers (via modem).
COM$: Displays the current SETCOM setting.
SETDEV: Determines where output from a BASIC command is to be directed. For a start, with a printer, use SETDEV PO.
DEV$: Like COM$, shows the assigned device(s).
OUTSTAT: Discussed earlier. Use OUTSTAT 0 before printing. The two terminal modes do this for you.
INSTAT: Provides a check on the status pins. If communications are not working then check that INSTAT = 0.
LPRINT: If DEV$ = PO then printer output will go to the external printer rather than to the CE-150. Obviously, COLOR n, CSIZE n, LCURSOR n, and LF n will not now work. See CONSOLE and FEED.
LLIST: See LPRINT. A very useful way of getting faster, more readable and more easily edited program listings than with the CE-150.
CONSOLE: The command CONSOLE a,b,c handles the end-of-line condition caused by an LPRINT. Use a = 0 to allow unlimited length for printed lines (control this within your program), and b = 0, c = 1 to give Carriage Return + Line Feed after each line. This will give correct results with most printers in their usual configuration.
FEED: The command FEED n will send n <new-line> sequences as defined by the CONSOLE command.
DTE & TERMINAL: Are used to run the terminal emulator program. Recommended for a first attempt at communicating with a host computer, as writing your own terminal program in BASIC is very difficult. The two commands give you slightly different conditions but for an initial try at 300 bps, I suggest you use DTE.

NEXT MONTH: Parallel (Centronics) & Modems

#CAP-SET#

THE PROGRAM THAT PRODUCED THIS AD.

WRITES

BIG

SMALL, OR

SLOPING

PROGRAMMABLE PRINTING OR TYPEWRITER MODE

REQUIRES 8K RAM EXPANSION.

PRICE £9.50

#SIXPACK#

1 GRID... MATHEMATICAL SHAPES

2 3-D... DRAWS IN THREE DIMENSIONS

3 LURGO... USER-FRIENDLY SCREEN GRAPHICS

4 SCRAMBLOID... MINI ARCADE GAME

5 NOUGHTS & CROSSES

6 COLOUR DEMO... INTERESTING GRAPHICS

ALL ON ONE TAPE

PRICE £6.75

D.D.D. SOFTWARE

ALL TAPES ARE SUPPLIED WITH A MANUAL AND PRICE INCLUDES POST & PACKING.

D.D.D.SOFTWARE
150 HIGH STREET
TWERTON
BATH BA2 1BY

ELKAN ELECTRONICS

! !

OUR LATEST PRODUCTS

SUPERTEXT by Ronald Cohen **ELKAN PRICE 19.95**

text-handling/word processing program—reviewed in Status 1500.

EASI-CALC 1500	Spreadsheet program	**ELKAN PRICE**
EASI-FILE 1500	Data management system	**19.95**
EASI-TREND 1500	Statistical forecasting	**each**

EA158C PARALLEL PRINTER LEAD for the CE158 New product from Sharp **ELKAN PRICE £38.05**

Coming soon! Coming soon!

EASI-CASH 1500 Book-keeping for small businesses

CASH-PLAN Complete personal finance program

SEND FOR THE LATEST EDITION OF OUR "ELKAN FILE"

ELKAN ELECTRONICS, FREEPOST, 11 Bury New road, Preswich, Manchester M25 6LZ or telephone 061-798 7613 (24 hour service)