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???????

So what to call this column, consisting,as it does, of a somewhat disjointed collection of RANDOM REMarks ? There must surely be some suitable expression from the language of computing. Unfortunately the only term I know which is used to describe characters and expressions displaced from their context is - GARBAGE !

* * *

I would like to express my gratitude to the very many readers who have sent good wishes for the success of this venture, and to the not-quite-so-many who have supported it with information and help. There has not been as much feedback from the February issue as I had hoped. Editors are notoriously greedy in wanting more material than they can actually use: thus they can select - not necessarily the best, but what best helps to make a balanced and useful magazine. If you are an experienced programmer there must be some little subroutine or crumb of wisdom you can spare: if you are less sophisticated in programming, surely you must have some queries , the answers to which would be useful to others. Without more contributions, this newsletter will not last very long. It is up to you.

* * *

It is testing to settle this object in Japanese clothing. Readers who have managed to make sense of SHARP's Instruction Manuals will have no difficulty in understanding the foregoing sentence to mean " It is tempting to compose this article in Japanese fashion"! SHARP are by no means the worst offenders in this respect. If they cannot afford to employ someone who understands Japanese, writes clear ordinary English, and understands computers, but instead are obliged to use first-year students with a dictionary beside them, why at least cannot they furnish them with a good dictionary? And an English grammar as well? Cannot they understand the difference between "This program is now executed" and "This program must now be executed" ? I have been reading the instructions for the CE 159 battery 8K module: so much effort has gone into saying the same thing three times over, and each one meaningless, or wrong!

* * * CONTENTS * * *

WHAT TO BUY AND WHERE TO BUY IT

In Hong Kong - so I hear - the prices of PC 1500 and accessories are about half UK prices. Unfortunately , no professional smugglers have yet subscribed to this newsletter (as far as I know), so it is necessary to shop around in this country for the best deals. The following information is by no means exhaustive, being based mainly on personal experience, and some hearsay. Nevertheless some of it may be useful. If you can add to it, please write in.

Cassette Recorders - SHARP's own CE 152 is obviously recommended, and has the advantage that in the event of difficulty in CLOADing one would not be shunted between two different manufacturers, each blaming the other's equipment. SANYO make a microcassette recorder which is compatible, but it is expensive, and so are microcassettes. This question of compatibility is a tricky one. Recorders advertised as "Computer Compatible" are not to be relied upon. The description merely means that they have a 'square wave' which computers prefer, and which more sophisticated recorders avoid. The PC 1500 is extremely sensitive about 'matched impedance', and few of the recorders on the market have this. One which does do so, is the TANDY "Realistic Minisette 9" which they recommend with their PC 2, whose innnards are identical to those of the PC 1500. I have used one for nearly a year, and only once had the dreaded ERROR 44. This was when I had CSAVED a program with the recorder's batteries very low. The 'Minisette 9' costs about £49.

Tapes - It is a mistaken economy to use cheap tapes, which will give trouble, and deposit oxide on the head and capstan of your recorder, thus causing future trouble. I use TDK AD46 tapes, which have always run perfectly. You can get these at a substantial discount from TOP TAPE, who have a number of branches in London.For utilities and short programs I use the C15 tapes sold by WH SMITH - from their computer counter. I have used one of these at least a dozen times, updating the mailing list for STATUS 1500, without trouble.

Software - It is hoped to write a more comprehensive study of what is available at a later date. The only sources known to me are ELKAN ELECTRONICS, TEMPUS, and MICROS FOR MANAGERS. I should be most interested to hear of any others.

Hardware - LASKY's offer a 2-year guarantee, unlike the usual 1-year. However I have found their normal after-sales service to be negligible, unless one takes the trouble to contact their Head Office . I have been trying for 6 months to get a set of pens from one of their branches; promises by its manager to phone me as soon as they are available have never been fulfilled. TEMPUS of Cambridge offer Bonus Software Vouchers with many purchases. However it is rumoured that not all the software they advertise is in fact currently available. So if you are making an expensive purchase from them because you want a particular piece of software, check first that it is available. Allow several weeks for a reply. The firm I have found most helpful is ELKAN ELECTRONICS, who specialise in pocket computers. They do not carry large stocks, but have easy access to SHARP in Manchester.

Carrying Case - The ' System Briefcase' has yet to make its appearance. However TANDY make a neat little carrying case costing about £22. It holds computer and printer, power adaptor, and some rolls of paper and cassettes - but probably not the recorder. It is well padded for

protection, but lacks a shoulder-strap, which would have been useful, as anyone who has staggered any distance under the weight of a full set of equipment will agree.

Pens and Paper - If you make good use of your PC 1500 these can add up to a considerable expense. I roll my own paper rolls from till-roll. I use 'Super Quality' rolls, 2 7/16" x 2¼" ; each costs me 25p plus VAT, and from each I can get 4½ rolls for the computer. This works out at about 6p per roll, as opposed to about 30p for those purchased from a PC 1500 dealer.Furthermore they are better quality paper, and only the last roll is polluted by pink stripes. I get them from MORPLAN in Great Titchfield Street, not far from Oxford Circus.
Pens I get from TANDY; their PC 2 uses exactly the same ones. They are packed in threes, not fours. They cost £1.69 for 3 coloured, or 3 black pens: considerably cheaper than the SHARP prices. Not all TANDY branches stock them, but they have 22 Computer Centres in UK who should normally have them in stock.

Firmware - To make the fullest use of the PC 1500 the 8K memory add-on is essential. The module with 5-year battery back-up costs £10 more than the ordinary model, but is well worth the extra; it has a built-in switch to prevent the program being destroyed, and it is preserved even when the module is taken out of the computer. It comes with a 30-page instruction manual. It would be useful to have a number of these, one for each long program, but at £79.95 each .....

Magazines - The only magazine that sometimes features PC 1500 is "PERSONAL COMPUTER WORLD". It has one page called "PORTABLE COMPUTER WORLD" but the PC 1500 has to take its turn with all the other portable machines, old and new. OUTPUT is the newsletter of the Pocket Computer Club, and is printed alternate months. It usually has programs for, or interesting information about our machine. Here is a list of material concerning PC 1500, other than in OUTPUT. (List compiled by R.MILLEN)

PERSONAL COMPUTER WORLD June 82 // YOUR COMPUTER June 82 // PRINTOUT June 82 // YOUR COMPUTER July 82 // COMPUTING TODAY July 82 // POPULAR ELECTRONICS July 82 // PRACTICAL COMPUTING August 82 // MICRODECISION November 82 // MICROCOMPUTING November 82 // PERSONAL COMPUTER WORLD December 82 // PRACTICAL COMPUTING January 83

STOP PRESS - I have just acquired the TANDY carrying-case mentioned above,and am very pleased with it. It holds at present PC 1500, CE 150, Minisette 9, mains adaptor, 3 cassettes, 4 paper rolls, 6 pens, and small odds and ends. This is slightly overfull.

FROM THE KEYBOARD

Did you know that LINE and RLINE can be executed direct from the keyboard? And did you know that you do not need two sets of co-ordinates? The instruction

```
LINE -(50,50)
```

will draw a line to the above co-ordinates from wherever the cursor is now. The instruction manual is not explicit about this form: I am indebted to H.LOVEGROVE for a program which makes use of this facility.

PEEK, POKE & MEMORY - II

3 useful points:

a) 10: X = 14536
20: POKE X + 1 , 65
will put 65 into address X + 1
BUT
10: X = 14536
20: PRINT PEEK X + 1
will not return the value stored in 14537.
It will return the value stored in 14536, with 1 added to it.
If you require PEEK (X + 1) you must not omit the brackets.

b) The sums required to translate addresses for 8K add-on to set-up with no extra memory, or with 8K battery add-on, are tedious multiples of 1024. But 1K is represented in 'hex' by &400. So alter - say - 14533 to the basic set-up, or 8K battery module, by adding &800 or subtracting &1800 ,in calculator mode, and let the PC 1500 take care of the sums for you.

c) Continuous instructions - POKE 14536, 72: POKE 14537, 69: POKE....etc are tedious to write, and space-consuming. The following form is available:

POKE 14536, 72, 69, 76, 80

and this will POKE the value 72 into address 14536, and the succeeding values into immediately succeeding locations. (For the purposes of this series the earlier form will normally be used).

Last month we altered the first line of a program by poking altered values into its first line. Before can make much use of this facilty we need to know how a program is configured, before we change it: not only what to POKE,but where to POKE it. Rewrite the program which ended last month's article, leaving out Line 20. Add:

```
50 CSIZE 1
60 FOR F = 14533 TO STATUS 2
70 LPRINT CHR$ PEEK F; PEEK F; F
80 NEXT F
```

RUN 50 will list all the addresses occupied by your program, and what you have in each one. You will see that REM , in 14536 and 14537, is represented by 2 characters only: 241 and 171. REM is a 'Reserved Word': these are listed on page 18 , together with their two-byte tokens. If you were to POKE 14537, 141 you would find that 'REM' had changed into 'DATA'.

It would be no use to POKE the characters D,A,T,A into a line: the computer will only obey this sort of instruction if either it has been entered in the normal way, or has been POKEd in the form of its two-byte token.

If you POKE 14534, 99 you will find your first line number has changed to 99 : but it is important to note that it will remain as the first line, in spite of being a greater number than the succeeding line.
But supposing you wanted to change it to 257? We have noted that no address will hold a value greater than 255: this is why line numbers are held in what might be called "twofivesixary" : (I know what I said about Jargon last month!) .By this I mean that the first address contains multiples of 256, and the second address holds the remainder. We shall meet this form again outside the program area.
So if you POKE 14533, 1: POKE 14534, 1 you will find your first line number has changed to 257

(to be continued)

DR. A.NICHOLSON asks about the practical significance of storing in A to Z , as opposed to A1 to ZZ.

Fixed memory variables A - Z and A$ - Z$ have a permanent home outside the program area, whereas the flexible variables A1 - ZZ and A1$ - ZZ$ are created within the program area, at the end of it, as are DIMensioned variables. If you write the following program:

```
10: PRINT STATUS 3
20: AA = 1
30: PRINT STATUS 3
```

you will find that the value given by STATUS 3 has altered. The practical effects are a) if you are using the flexible memory variables, you must be careful not to overwrite the space they need, or you will get ERROR 10; and b) The fixed memory variables are not destroyed by a RUN command, whereas the flexible ones are. This allows one to clear some of ones variables, while preserving others. The table on page 135 of the Instruction Manual, on INITIATION METHODS is worth detailed study.

Good news - perhaps - for SIMON COX and others interested in Machine Code. An authoritative source at SHARP informs me that Japan are seriously contemplating releasing these details: if so, SHARP (UK) will certainly make an English translation available.

L.P.GOODHEW asks "How can one make the PC 1500 draw a circle?"

Here are two methods. The second one, though seemingly less sophisticated, runs faster. Both are based on the behaviour of a right-angled triangle whose hypotenuse is the diameter of a circle: the right-angle will inevitably lie on the circumference. If in the second listing the value of Z is changed to slightly more or less than 1, you will draw an ellipse.

```
 5:CLEAR :INPUT "
   radius=";R
10:TEXT :GRAPH
20:GLCURSOR (100,
   0):SORGN
25:GLCURSOR (0,R)
30:FOR C=0TO 360
40:X=INT (R*SIN C
   )
50:Y=INT (R*COS C
   )
80:LINE -(X,Y)
90:NEXT C
```

```
 1:CLEAR
 5:TEXT :GRAPH
10:INPUT "Z (circ
   le:Z=1) ";Z
15:GLCURSOR (100,
   0):SORGN
20:INPUT "radius
   ";R
25:GLCURSOR (-R,0
   )
30:FOR X=-RTO R
40:Y=√(R*R-X*X)*Z
50:LINE -(X,Y)
60:NEXT X
70:IF SGN Z=-1END
80:Z=-Z:GOTO 25
```

R.MILLEN has had difficulty connecting up to an OKI printer via the CE 158 interface. The trouble seems to be the lack of a "busy" or an "acknowledge" line on the Centronics side of the interface, which has one or other, but not both.

If any reader has encountered a similar problem, Mr.Millen would like to hear: particularly if they have overcome the problem.

EASICALC

This fascinating program is an example of a "spreadsheet" like VISICALC, but much ingenuity has been used to adapt the principle to the limited capacity of the PC 1500, and to use that capacity to the full. 8K memory is essential. By cursor movements you move a window round an invisible screen to any pair of cells to a maximum of 305 cells; you choose the number of columns, and the number of rows is automatic, or vice versa.

In each cell you place a name, a number, or a formula. Another command will 'calculate the sheet' according to your instructions. Formulae are limited to the basic operators +-*/, so for anything complex you will have to build up your instructions via several cells.The most powerful commands are 'replication' of a cell throughout a column or row, and 'relative replication'; if for instance you replicate a command to add the cell above to the one on the left, and use'relative replication' then the formula you enter will actually alter itself to take care of your intentions.

You do not need to know how to program a computer, since the program is highly "Menu-driven". A half-day's intensive study will enable you to get the best out of the facilities offered. I usually dislike menu-driven programs, and their petty interrogations : but the author has made this one as painless as possible: clear choices are displayed on the screen, and you merely press the function key beneath your choice.

Another facility is 'FIX', which keeps the lefthand column visible, while turning to any other. I would have liked to have seen this facility applied to the printout as well. This is in the form of a rectangle, maximum width 4 columns, from any cell to any other within range.

The extensive use of INKEY$ gives a slightly sluggish feel to the keys. I had trouble with 'ENTER', which needed split-second timing - either nothing was entered, or the entry appeared and was wiped out again. I understand however an improvement has been made to deal with this problem.

At £19.95 this piece of software is a little expensive for domestic use, but for any business user who needs to produce immediate projections from continuously varying data, it would be an invaluable and very reasonably priced program. The author is Ian Traynor; distribution is by ELKAN ELECTRONICS.

MINDBOGGLE CORNER

```
10:xxA$(nn)
20:xxF=nnxxnnxx-n
30:xxA$(F)
40:xxF
50:ZZ$=A$(91)+A$(
   97)+A$(43)+A$(
   99)+A$(43)+A$(
   85)+A$(40)+A$(
   37)+A$(85)
60:xx"I CLAIM A "
   ;ZZ$
70:xx
80:xx"A","B","C",
   "D","E","F","G
   ","H","I","J",
   "K","L","M","N
   ","O","P","Q"
90:xx"R","S","T",
   "T","U","V","W
   ","X","Y","Z"
```

In the program on the left each xx stands for one of the "Reserved Words" Each n stands for a figure - (nn for 2 figures). Can you fill these in? Do not be guided entirely by the quantity of A$(nn). One or more of these may be dummies. And do not alter anything else in the program except xx or n or nn.

The first correct solution opened will win a small prize. The solution must include a corrected listing.

Closing date: 21st March

LAST MONTH'S MINDBOGGLER: The program as listed, peculiar as it looks, runs perfectly well without error.

CE 158 INTERFACE

Hitherto we have been spoilt by SHARP. The PC 1500 and CE 150 are almost idiot-proof. Not for for us the endless protocols and hard-to-remember control codes which larger and more expensive computers often require. With the PC 1500 we just turn it on, select the right mode, and carry on.

With the CE 158 the situation is very different. The connection to the PC 1500 is supplied (and this can be either through the printer, or direct) but for the connection to whatever peripheral you want to use you are on your own. In fact SHARP specifically warn the user that they do not commit themselves to technical support with regard to connection to other machines; and they warn that not every 'so-called RS232 Compatible device ' is in fact compatible. So unless you are really clued-up electronically, or have reliable expert advice available, the CE 158 is not for you.

And when you get it connected up your troubles are only just starting. You will need to learn a whole new set of commands - SETCOM, RINKEY$, CLOADa , etc, and will need to learn to use the correct combination of these for whatever device you are connected to.

But if you can overcome these problems, you have a whole new world available to you. The CE 158 contains both an RS232 interface, and a CENTRONICS interface. The RS232 is a serial interface, and the CENTRONICS is a parallel one. The latter is for connection to printers, while the RS232 is for terminals, modems, plotters, and printers as well. But make sure first that the device you wish to connect to has its own interface: the CE 158 is not a bridge, but one half of a bridge, and your device must contain the other half. You can connect to other computers: the MZ 80B is is OK, but not the MZ 80A, without the addition of a card to it. The handbook does in fact give details of connection to MZ80B and PC3200.

Some readers have had a measure of success . Antony Hodge has connected the PC 1500 to a Newbrain Computer, and R.Millen has successfully joined the PC 1500 to the REWTEL network, (run by Radio and Electronics World). On the other hand he has had difficulty in connecting up to an OKI printer - see 'DISTRESS SIGNALS'.

A query which many readers will ask is : " Can you connect the PC 1500 to a VDU ? " . The answer is "Yes, if the VDU also contains an RS232 interface." Effectively, this means that one would need a dedicated terminal, costing about £1100: it would be cheaper to connect to a VDU via another computer. But then if you have another computer, why not work direct from it, and forget about the PC 1500? One possible use is in Word-Processing: it would be possible - theoretically - to write up to 10K on one's PC 1500 whilst travelling, and see it on the screen, correct it, and print it out via CE 158 and another computer, on return to base.

To sum up, the CE 158, at £139.95, is not easy to use; it requires expert advice, and a lot of hard study; but the possibilities, including the ability to connect to several devices simultaneously via the 2 interfaces, are almost unlimited.

NOTE: this review is compiled from information received from various sources, and not from personal experience of the CE 158

RENUMBER

This program is designed to renumber a whole program. MERGE it with the program you wish to renumber. When it has done the job it will delete itself. If you wish to use it again on the same program, 'break' with the ON key during the final long low beeps.

Whilst renumbering, the screen shows the address being dealt with. At the same time, the new Line Numbers are listed, with their old equivalents. Since lines containing a GOTO or GOSUB may need editing, each pair is marked with a * where a GOTO or GOSUB is present (except for the first line).

IT IS FATAL TO INTERUPT THE RUNNING OF THIS PROGRAM (except during the final long low beeps). Take the following precautions:

a) Make sure you have a long enough paper roll.
b) Make sure your power supply is adequate.
c) Have a copy of your program on cassette. Then if anything should go wrong all is not lost.
d) Double check for errors when first you key in this program

```
60000:"="CLEAR :
      INPUT "new s
      tart ";SP:
      INPUT " step
       ";S1
60010:T2=STATUS 2:
      T1=STATUS 1:
      T3=T2-T1:T4=
      T3+1:P5=PEEK
      30821:P6=
      PEEK 30822
60020:X7=INT (SP/2
      56):X8=SP-25
      6*X7
60030:X9=256*PEEK
      T3+PEEK T4
60040:POKE T3,X7:
      POKE T4,X8
60050:LPRINT " ";S
      P;X9:WAIT 0
60060:FOR X=1TO T1
      -2
60070:A$=" "
60080:X1=X+T3:
      PRINT X1
60090:X2=X1+1:X3=X
      2+1:X4=X3+1:
      XM=X1-3
60100:IF PEEK X1<>
      13GOTO "M"
60110:IF PEEK XM=1
      3BEEP 2:GOTO
      "M"
60120:IF PEEK X2=2
      55BEEP 7:
      GOTO "N"
60130:SP=SP+S1
60140:L1=256*PEEK
      X2+PEEK X3
60150:L2=INT (SP/2
      56)
60160:L3=SP-256*L2
60170:POKE X2,L2:
      POKE X3,L3
60180:FOR Y=1TO
      PEEK X4
60190:IF PEEK (X4+
      Y)=146OR
      PEEK (X4+Y)=
      148LET A$="*
      "
60200:NEXT Y
60210:LPRINT A$;SP
      ;L1:X=X+PEEK
      X4
60220:"M"NEXT X
60230:"N"K=STATUS
      2-608:K1=INT
      (K/256):K2=K
      -256*K1
60240:BEEP 5,200,2
      00
60250:POKE 30823,K
      1:POKE 30824
      ,K2:POKE 308
      25,P5:POKE 3
      0826,P6
```

RESERVED WORDS
and their 2-Byte Tokens

ABS	241	112
ACS	241	116
AND	241	80
AREAD	241	128
ARUN	241	129
ASC	241	96
ASN	241	115
ATN	241	117
BEEP	241	130
CALL	241	138
CHAIN	240	178
CHR$	241	99
CLEAR	241	135
CLOAD	240	137
CLS	240	136
COLOR	240	181
CONT	241	131
COS	241	126
CSAVE	240	149
CSIZE	230	128
CURSOR	240	132
DATA	241	141
DEG	241	101
DEGREE	241	140
DIM	241	139
DMS	241	102
END	241	142
ERROR	241	180
EXP	241	120
FOR	241	165
GCURSOR	240	147
GLCURSOR	230	130
GOSUB	241	148
GOTO	241	146
GPRINT	240	159
GRAD	241	134
GRAPH	230	129
~		
IF	241	150
INKEY$	241	92
INPUT	240	145
INT	241	113
LCURSOR	230	131
LEFT$	241	122
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LET	241	152
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LINE	240	183
LIST	240	144
LLIST	240	184
LN	241	118
LOCK	241	181
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MEM	241	88
MERGE	240	143
MID$	241	123
NEW	241	155
NEXT	241	154
NOT	241	109
OFF	241	158
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~		
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RMT	231	169

Note: P and 4 spaces - 241 163 - does not appear to have any function except to cause ERROR. Any suggestions?

NEXT MONTH - (probably) - ASCENDANTS - SALVAGE -
- HOW PC 1500 HELPS PRODUCE STATUS 1500 -
- 2-BYTE TOKENS NUMERICALLY - MORE PEEK & POKE -

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