Practical Programs for
The Electron

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Practical Programs for The Electron

Owen Bishop and Audrey Bishop

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Key Points

All the programs in this book were written on the Electron. To obtain error-free printouts ofthe programs, we saved the programs on to tape, then loaded the tape into a BBC Microcomputer. The program was printed out, using a printer attached to the BBC machine, without any alteration. This method was adopted because it was not possible to operate a printer directly from the Electron at the time this book was written. However, this ensures that the listings show the Electron programs exactly. This has been done to avoid the errors which always seem to occur when listings are set independently in type. All the programs should work perfectly, provided that they are correctly keyed in. The description of each program has a section dealing with keying it in. Below are given some general points that apply to all programs.

A mistake which is easy to make is to type 'G' (letter 'oh') instead of '0' (figure 'zero'). The letter 'oh' is used in BASIC words such as 'FOR' and 'OPENOUT', but is never used alone in this book as a variable. In a few instances it is used as part of a variable name, e.g. MO$, used to represent a month number. In the listings, the figure zero is narrow and rounded, while the letter 'oh' is broader and squarer in shape. On the TV screen, the Electron makes both zero and 'oh' the same shape, but the zero has a 'slash' through it.

Another possible confusion is between '1' (letter 'eye') and '1' (figure 'one'). They are easily distinguishable from each other in the listings.

The semicolon ';' is an essential item in many PRINT statements. Watch out for this, especially at the ends of lines. It may be even more difficult to spot in a multistatement line such as:

```
FOR J=1 TO 10:PRINT M$(J);:NEXT
```

If you leave out the semicolon, the display on the screen will be spoiled. Another punctuation mark to look for is the 'tick' symbol ('),

found on key number 7. Here is an example:

    PRINT' ' ' "How many ?"

In this example, PRINT is followed by three ' ticks. The effect of these is to PRINT three blank lines on the screen. Then comes the opening quote (") for the message. Take care not to confuse the ' ticks with the quotes. Make sure you have the right number of ' ticks, otherwise the display will not be set out as it should be. While on the subject of quotes, it is essential to note the difference between:

                    ""   and   " "

The example on the left has nothing between the quotes. In other words, it is an empty string, usually referred to as a null string. The example on the right has a space between the quotes and is therefore not an empty string. A space is a character, just as much as any other character, such as "A" or "9". To leave out the space when it should be there, or to type in a space when there should be no space, can cause a program to crash.

There is one typing error that is easy to make but which is extremely difficult to spot. It is most likely to occur when a program line ends exactly on the right-hand edge of the screen. The error is to forget to key RETURN before beginning to type the next line. The effect of this omission is that the next line becomes tagged on to the previous line. The computer will not accept a iine which is tagged on to the end of another one, so it naturally reports an error when the program is run. The type of error reported varies, but there is no special error message to say ' You forgot to type RETURN' When you list that part of the program, the listing on the screen looks perfectly correct! The first line ends at the right-hand edge of the screen and the second, tagged-on, line is displayed as expected at the left-hand edge of the screen. There is nothing to indicate that the two are joined together. If the computer reports an error at a particular line and you can see nothing wrong with your typing, list that line by itself. For example, if the message is ' No such variable at line 410' , list line 410 on its own.

You might then see this displayed on the screen:

```
>LIST410
  410 FOR J=1 TO 25:D$(J,2)=E$(J+X):NEXT
  420 VDU 23,224,1,3,7,15,63,127,255
```

Line 420 has appeared too! If this happens, retype both lines, remembering to press RETURN at the end of each line.

Storing data on tape or disk

Several of the programs are concerned with the storage and handling of data, such as account details, stock quantities, or questions and answers. These programs have all been designed to make the best use of cassette tapes as the data storage medium. When disk drives become available for the Electron, the programs should work with disks too. These data-storage programs have all been tested (on a BBC Microcomputer) using Acorn DFS and are compatible with that system. The data tapes can also be used in conjunction with the equivalent programs in our book *Practical Programs for the BBC Micro* even though the programs in that book may differ materially from those in this book.

One point to note is that although these programs can be used with disk systems, they are designed to make the most effective use of tape. Programs which were primarily intended for disk-based storage would normally be designed in a slightly different way to take advantage of that fact.

With any kind of magnetic medium, whether tape or disk, there is the risk of faulty mechanisms or media causing a partial or total loss of data. This can also occur should the power supply to the computer fail while data is being transferred to disk or cassette. The risk of a crash always exists but there are several ways in which the risk of loss of data can be minimised:

(1) Always use the best quality tapes (or disks) obtainable. Often the so-called 'computer' tapes, which are sold cheaply, are not reliable enough for storing important data. Price is a fairly good guide to quality; you need to pay £1, possibly more, to obtain a good quality C-15 tape.

(2) Tapes longer than C-30 are not to be recommended. Such tapes are usually coated on a thinner base. This is more subject to distortion, especially when the larger mass of tape on each reel causes greater tension in the tape as it passes the tape head.

(3) Clean the tape heads regularly.

(4) Use a tape head demagnetiser every month or two.

(5) Store tapes in their cases, and keep them well away from any device which emits a strong magnetic field. In particular, tapes should not be placed close to the TV set or monitor used with the computer. (6) Take a backup copy, or possibly two copies, of any data that you cannot afford to lose. The programs provide the opportunity to do this.

   If you adopt the suggestions above, the risk of data loss is reduced to such a low level that you need worry no more about it.

The TV screen

With certain makes of TV set, part of the top line of the Electron' s display may not be visible. In some cases the whole of the top line and even the second line as well does not appear. We have designed the screen layout of each program so that, as far as possible, the two top lines are not used for essential messages. This is why so many PRINT statements begin with at least two ' ticks'If you run a program and obtain a blank screen, it may be that there is a message somewhere above the top of your TV viewing area. Probably the Electron is waiting for you to key in a responpe to this message which you cannot see! If this happens, examine the listing you have typed, to make certain that essential ' ticks' have not been omitted.
   In a few programs it has been necessary to use the top line, simply because all available screen space was wanted for the display. However, in these cases, the top line is used for column-headings or other material of secondary importance.
   If you are using a monitor as a display unit instead of a TV set, the whole of the display will always be visible.