

# TECHNICAL QUERIES

Alan Wrigley answers your questions on how to find out if a specific task is running, and how to replace the directory folder sprite

**Q** Dear Sir I have been plagued recently by problems when switching on my A540. Instead of the normal display telling me that RISC OS is initialising, all I get is a black screen with an error such as Abort on instruction fetch at... . This often happens several times before the machine will boot up as normal.

Karl-Heinz Fleischmann

**A** It sounds from your description as though you are suffering from faulty connections. In a perfect world, all the various circuit boards and expansion cards that sit inside the computer would be connected together firmly by well-designed connectors, and signals would pass between them happily ever after. Unfortunately, connectors do work loose over a period of time, and become dirty and prone to intermittent contact. In a few cases poor design encourages this to happen, for example with expansion boards that don't fit tightly into the backplane socket, or whose earthing circuitry is inadequate. If there is a poor or intermittent contact somewhere at power-on, this can lead to problems such as those you describe.

The A540 is prone to similar problems with its processor board, and extra memory boards if fitted. I recently had a problem with my hard drive not being accessed properly. I thought the drive was at fault, but in fact all that was needed was a quick wiggle of the processor board in its socket. It looked firm enough beforehand, but after wiggling it around and pressing it firmly down, the problem disappeared. This illustrates how critical the connections are between various parts of the computer.

I suggest that you remove the cover from your machine (having first removed the mains lead!) and make sure that all the connectors are fully pushed together. Likely culprits are any expansion boards that may be fitted, but while you're inside

**Q** computer it's worth checking all the other connections as well - for example, my floppy drive failed to work recently because the connector had worked loose.

You may find it helpful to spray switch cleaner on the contacts before reassembly.

Dear Sir The new PRM describes the instruction set for the Floating Point

**A** Emulator, but gives no details on how floating point numbers can be displayed from within a machine code program. Can you explain how to do this?

Martin Dale

The FPE instructions can handle floating point numbers in five different formats. These are single, double and extended double precision, and packed and expanded packed decimal. The latter two formats are provided to aid the process of inputting and outputting floating point numbers via screen and keyboard. The extended packed decimal format was not available on older FPEs, so we will concentrate on packed decimal. If you store a number in memory using this format, it is

Sign	e3	e2	e1	e0	d16	d17	d16
d15	d14	d13	d12	d11	d10	d9	d8
d7	d13	d5	d4	d3	d2	d1	d0

stored in three words (12 bytes), each nibble (half byte) representing a decimal digit in the number or some other information. The first word holds the sign nibble, four nibbles which make up the exponent, and the first three digits of the number. The other two words hold the remaining 16 digits. The format is shown below:

Bit 3 of the sign nibble holds the sign of the result, while bit 2 holds the sign of the exponent. So if the result sign is set, you first need to print a minus sign. The decimal point is assumed to start between the first two digits of the number, i.e. after d18, and the exponent indicates how many places to shift it. Assuming that you want to print the number as a signed value, then if the exponent is positive, the decimal point must be shifted right by the number of places indicated, while if it is negative, it must be shifted left and padded with leading zeros. Get the value of the exponent by reading each nibble in turn, e3 being the most significant. If the exponent is negative, print 0. followed by the required number of zeros, then output

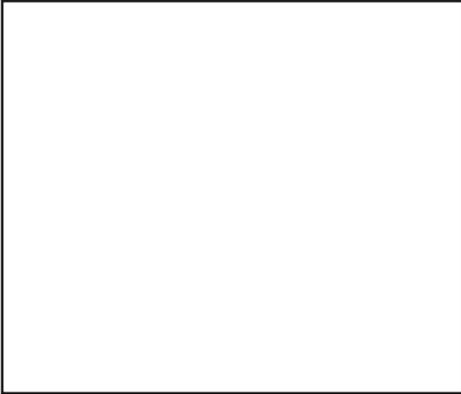


each digit of the number starting with `d18` to the required number of places. If it is positive, start printing from `d18`, placing the decimal point where indicated by the exponent.

If you want to print the number in exponential notation, all you need do is print it using the following format:

<sign

bit



caption

`%>d18", "d17..d0"E"<sign bit 2>e3..e0`