



# Microbee Technology Pty Ltd

## Engineering Change Order #20121031-1 (Rev 2)

ECO to be applied to product : Premium Plus Kit Computer  
Part or sub-assembly: Baseboard PCB  
PCB part #: 8501-4

### Background:

The Premium Plus kit computer baseboard is essentially a standard Premium Series baseboard with a few updates to suit the Premium Plus overall design. The Premium series baseboard although designed to allow for other processors or direct memory access controllers to take control of the Z80 bus has never (until now) used this functionality. With the Premium Plus coreboard, there is a need to have the Z80 relinquish control of its bus & allow access to the memory & I/O peripherals by another bus master (in this case the Floppy disk emulation hardware within the FPGA and the Coldfire processor). A problem occurs when the Z80 releases control of the bus (by asserting its /BUSACK signal in response to a /BUSREQ Signal assertion). At this point the control signal outputs (/MREQ, /IORQ, /RD, /WR etc..) are tri-stated by the CPU and left to 'float high' with the weak internal pull ups in the CPU. Unfortunately, during this transition, the control signals don't pull up high quickly enough and this causes erroneous bus cycles to take place (ie, reads / writes to random memory or IO addresses).

### Symptoms:

There are numerous symptoms of failure caused by this problem but the most common is that emulated 'disk' activity fails on access to the SDcard.

### Workaround:

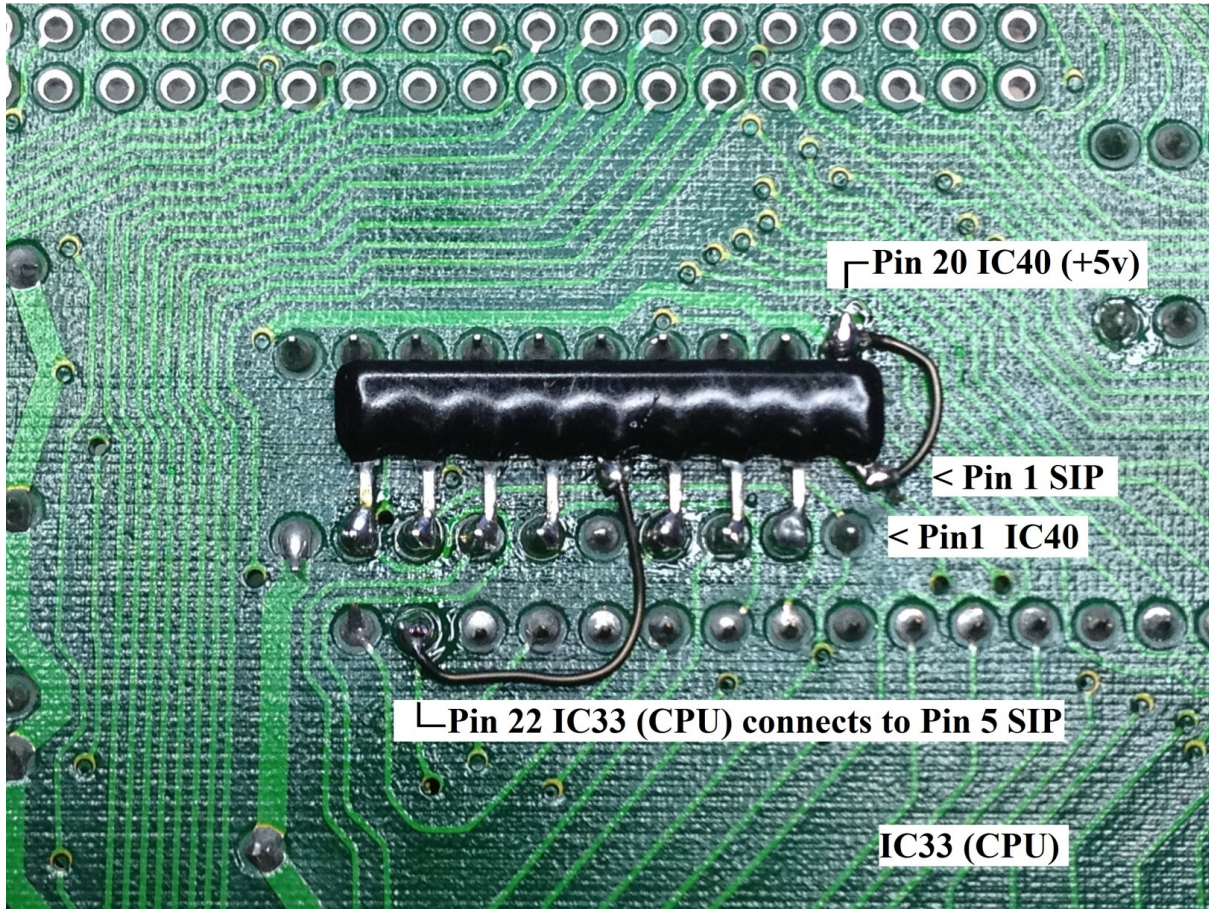
To ensure that these erroneous bus cycles do not happen, 1K pull ups must be added to the control signal outputs of the CPU. This is achieved fairly easily by adding a resistor SIP to IC40 (the control signal buffer).

### Fitting of ECO:

A 1K x 8 resistor SIP (9 pins total) is fitted on the underneath (solder) side of the board at IC40. The SIP is placed face down (ie printed side down) in between the 2 rows of pins of IC40. Pins 1 & 5 of the SIP should be trimmed close to the body of the SIP so that wires can be attached and soldered to other points in the circuit. The rest of the pins of the SIP get soldered to IC40's pins, pin for pin (ie SIP pin 2 to IC40 pin 2, SIP pin 3 to IC40 Pin 3 etc..) See photo next page.

Pin 1 of the SIP must be connected to +5v which is available at Pin 20 of IC40

Pin 5 of the SIP gets connected to Pin 22 of the CPU (IC33) to pull up the /WR signal.



There are no track cuts to be done, so once fitting is completed as per the above photo, re-assemble & test the Microbee.

Also, a 33pF capacitor needs to be fitted between pin 19 IC33 and GROUND. There is a convenient Ground Point right near Pin 20 of the CPU (IC33).

