

**Building Instructions**

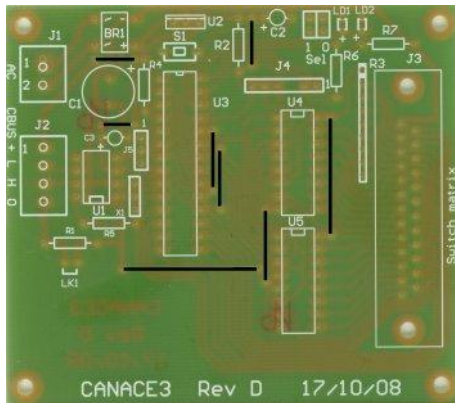
These are the Building Instructions for Kit 83 CBUS Control Panel Switch Module (CANACE3) which is used to connect up to 128 toggle switches or 64 pairs of pushbuttons. Do take a few minutes to read right through these Instructions before commencing assembly and begin by checking through the kit contents shown on the back of the kit label or page 4 of the downloaded document. If any items are missing please contact the Kitmaster. These instructions refer to Rev D of the printed circuit board (PCB).

Static Precautions are vital when handling the major Integrated Circuits, such as the CANACE3 PIC, which should be left in its protective tube until instructed to install. It is also recommended that the builder has read through Technical Bulletin G32/4 which provides an introduction to the CANACE3 driver board, how it works and how it is configured for push button or toggle switches.

CAN_ ACE3 Circuit Diagram is on page 3.

Please note that before commencing construction that the hole denoted by the red arrow is slightly undersized. This should be opened up to be the same size as the rest of the J4 Pin holes.

Assembly starts with the smallest items first to allow the PCB to lie flat on the bench while soldering the underside. (The 25 diodes are for use with switches on the Control Panel)



Fit the 8 wire links as shown in black in the image alongside.

Fit resistors R1, R2, R4 - R7.

Fit the bridge rectifier BR1, ensuring the correct orientation.

Fit the switch S1. Although this is not used in SLIM mode, fitting it now allows for future upgrades to FLIM mode if required. This switch can be fitted either way round.



Fit the 8-way, the two 16-way and 28-way Dual-in-line (DIL) IC sockets, with the 'bite' corresponding to the bite shown on the printed overlay, ensuring the base of the holder is lying flat to the board. Note, the 'bite' on U1 is at the opposite end of the PCB compared to the others.

Do NOT fit the ICs yet

Fit the resonator X1. This may be fitted either way round.



Fit the 9 pin Resistor Pack (R3) to the board. Note that the dot on the resistor pack is pin 1. It must be inserted with this pin inside the small square to the top of the silk screen outline.



Fit the LEDs LD1 (yellow) & LD2 (green) observing polarity. The + of the LED is marked on the drawing, this is the longer of the 2 leads.



Fit the capacitors C2, & C3 observing polarity ('+' marking on cap. to '+' on overlay.) Do not fit C1 yet.

Fit the two pin terminal block (J1) to the board ensuring that the cable entry is to the outside of the board and that the block is flush to the top surface.

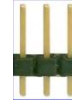


Slide together the 2 pin green terminal blocks to create a 4 pin terminal block (J2) fit this to the board as per the drawing ensuring again that the cable entry is to the outside of the board and that the block is flush to the top surface.

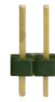
Fit the header J4. Note that only 5 of the 6 pins are used. Pin 3 should be removed (see picture right). There is no hole for Pin 3 on the board.



Fit the 3-way header J5 (this is for setting either “toggle” mode or “push button” mode).



Fit the two 2-way headers for Sel0 & Sel1.



Fit the 25-way D socket J3. The holes on the PCB may need to be drilled or reamed out for this to fit.



Fit Voltage Regulator U2, with the *metal tabs facing towards the edge of the board*.



Fit the heatsink to U2. Attach the heatsink using the M3 hardware supplied. If available put a smear of silicon heatsink compound between the face of the regulator and the heatsink.

Fit capacitor C1, observing the correct polarity. N.B. The positive end of C1 is shown as “+” on PCB layout, this is the pin opposite the end marked with the white stripe and “-” on the actual capacitor.

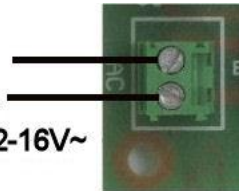


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Testing

Check that the completed board look similar to the picture to the right but without the IC's inserted. Check the PCB trackside for any unsoldered or bridged joints.

Connect an AC power supply between terminals as shown here

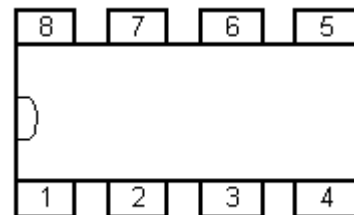


Check that the U2 regulator is not getting hot. If it is, disconnect power and re-check for PCB track short circuits.

12-16V~



Using a standard multi-meter set to its Vdc range check that there is 15 – 2 DC across the terminals of C1. The precise voltage found will be approximately 1.4 times your input AC voltage. Check that 5V DC is found across the terminals of C2 and pins 20(+) and 8(-) of the U3 DIL socket. The pins are numbered anti-clockwise starting with the “bite” as for the 8 pin socket shown



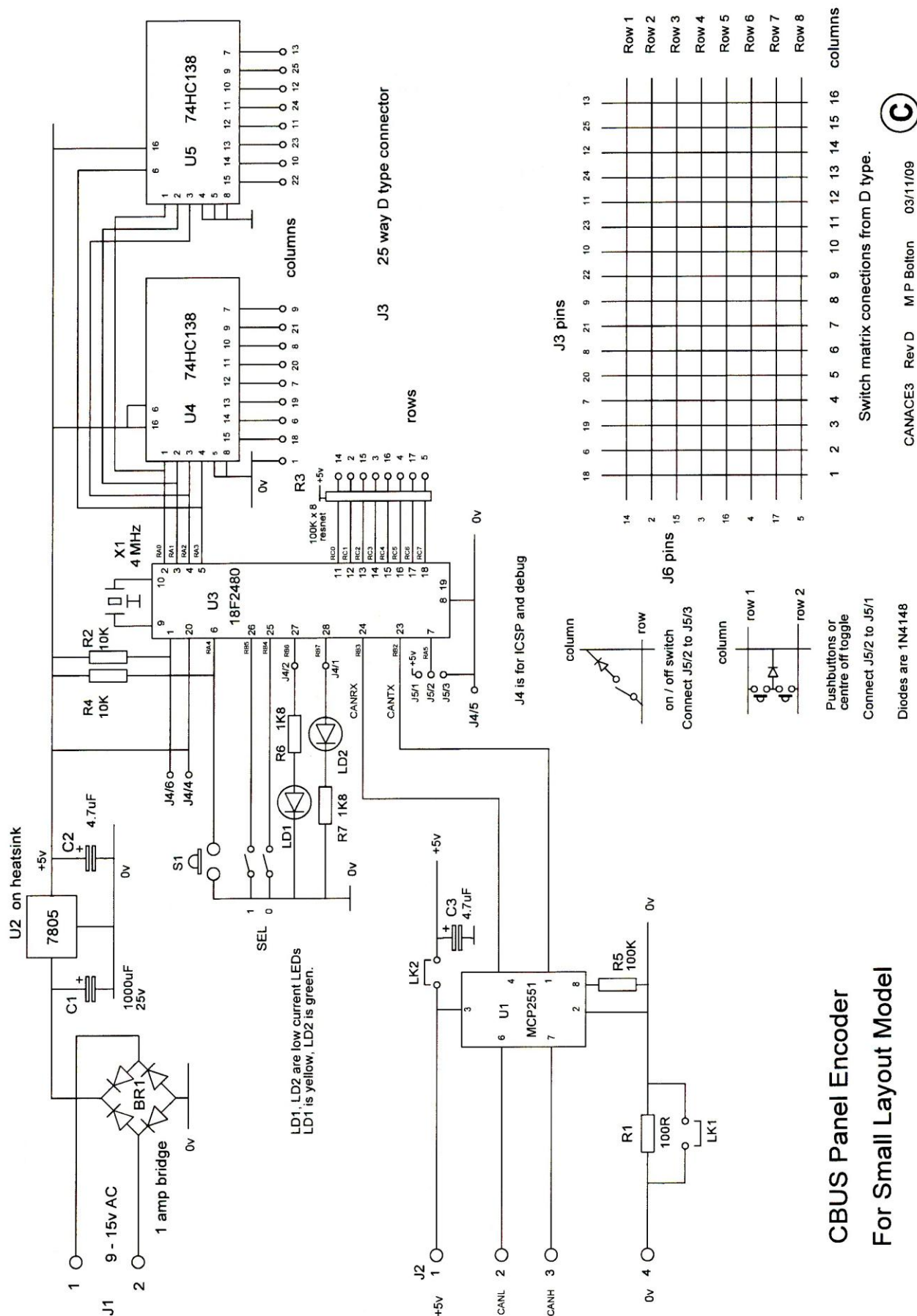
If all is well, disconnect the power and allow up to 10 seconds for the various

Fit the various ICs U1, U3, U4 & U5 **observing static precautions**. The IC 'bite' corresponds to the bite on the DIL sockets. Reconnect power and recheck the voltages being careful not to short pins with the meter probes.

Check that the GREEN LED is illuminated. If so you now have a correctly working CBUS module.

Note, two of the Jumpers are used for selecting the node number via Sel0 & Sel1. The third jumper is used to select “toggle mode” or “push button mode” via J5.

Refer to the latest issue of **TB G32-4** for Teaching and Putting to Use.



Kit Contents

Type	No.	part	Type	No.	part
PCB	1		2-way terminal block 5mm	1	J1
100 Ohm resistor ¼ W (Brown-black-brown)	1	R1	4-way terminal block 3.5mm	1	J2
10K resistor ¼ W (brown - black -orange)	2	R2, R4	25 way D socket	1	J3
8 x 100K resistor network	1	R3	25 way D solder lug plug	1	Connects to J3
100K resistor ¼ W (brown - black -yellow)	1	R5	8-way DIL socket	1	For U1
1.8 K resistor ¼ W (Brown-grey-red)	2	R6, R7	Heatsink	1	For U2
3mm Yellow LED	1	LD1	M3 Nut, bolt & washer	1	For Heatsink
3mm Green LED	1	LD2	16-way DIL socket	2	For U4, U5
1000uf 25V capacitor	1	C1	28-way DIL socket	1	For U3
4.7uF 10V Tantalum	2	C2, C3	6-way header 0.1" pitch	1	J4
CANBUS IC	1	U1	2-way header 0.1" pitch	2	Sel0, Sel1
LM7805 Regulator	1	U2	3-way header 0.1" pitch	1	J5
18F2480 PIC	1	U3	Jumpers	3	For J5, Sel0 & Sel1
74HC138 3-8 multiplexer	2	U4, U5	1A bridge rectifier	1	BR1
4 MHz resonator	1	X1	pushbutton	1	S1
1N4148 diodes	25				