

ASSEMBLY INSTRUCTIONS FOR RMS-PB-00083 MODULE

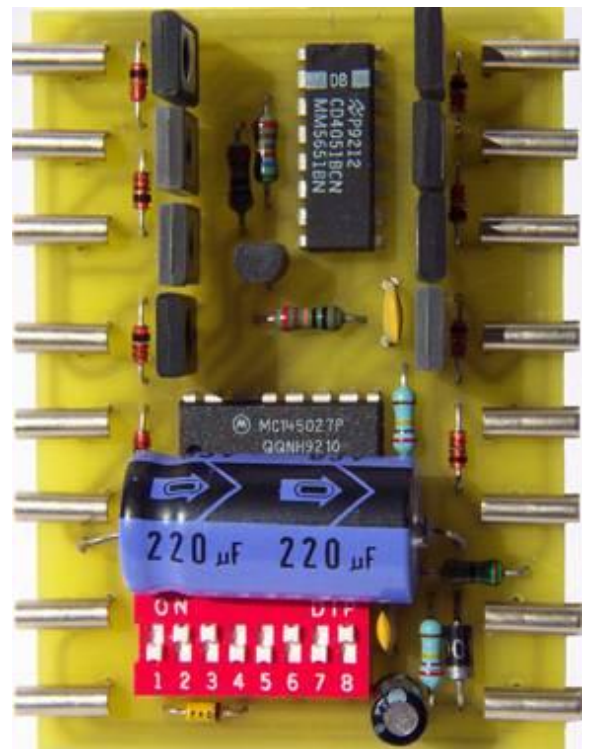
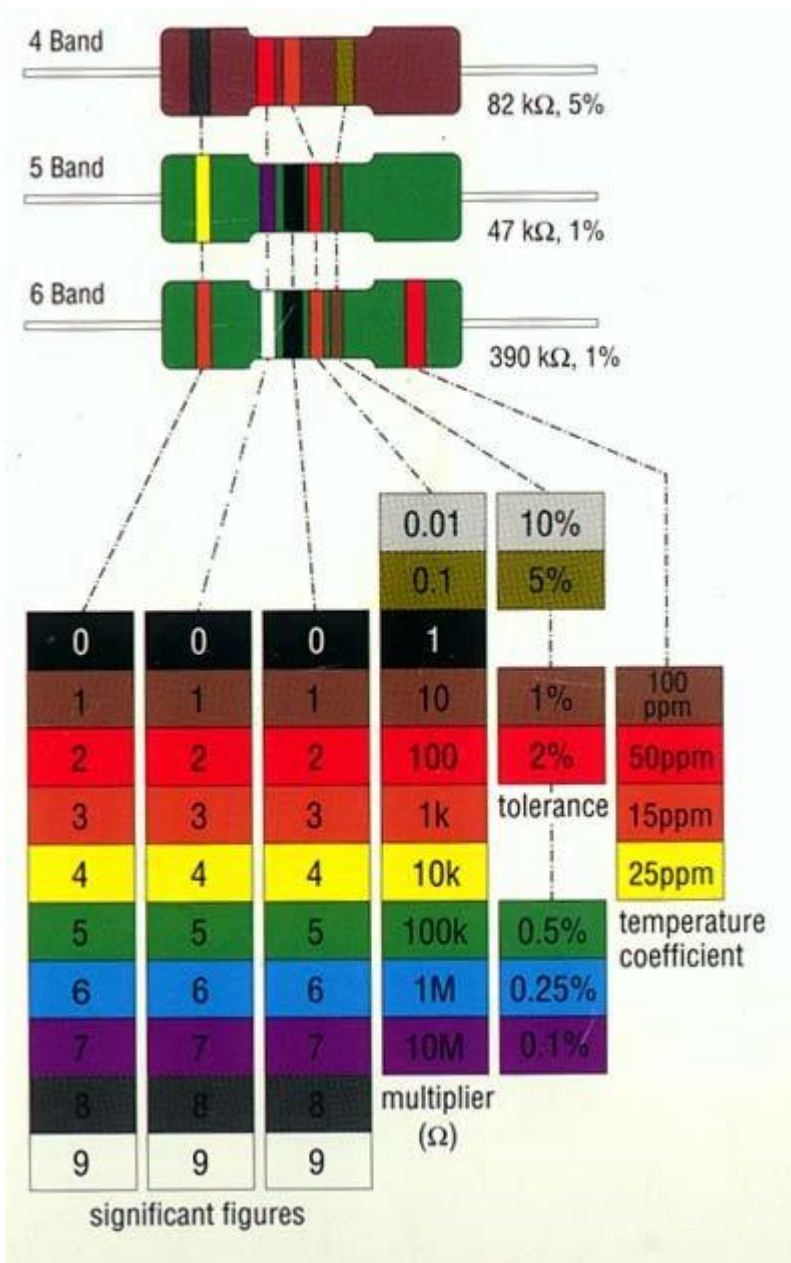
Modified: - 13-02-2012 coding table link added


Revised 05-02-2008 Photo of assembled PCB and parts list added.

HINT 1. on using PDF files. If you wish to find a component while using Adobe Acrobat just go to Edit → Find on the menu or type (Ctrl+F). Type the component reference designator ie. "D1" Acrobat will highlight the first instance it finds, you can then find the next instance by typing (Ctrl+G). Acrobat will take you to each instance across all pages.

HINT 2. Any text which has a coloured rectangle around it is a quick link to the item or place it refers to ie. D1.

- 1.) Start with the low profile components first.
- 2.) Take D2 the 8V2 zener diode and place the end with the black band towards the pointed end (cathode) of the component overlay.
- 3.) Next place diodes D3-D10 in positions shown by the component overlay. The black band is the (cathode) end and is shown as the pointed end on the overlay.
- 4.) Solder these components and trim the excess leads off. Make sure you have made neat solder joints and haven't made any short circuits to any other tracks or pads.
- 5.) Next place the resistors at the correct locations as shown on the overlay. If you are unable to read the colour codes you can get a chart at your local electronics store or you should measure each value with a multimeter. Solder resistors and trim leads.



- 6.) Next place D1, C3 and C4. Solder components and trim leads.
 - 7.) Place C2 make sure you get the +/- as shown on the overlay with the component also place T1. Solder components and trim leads.
 - 8.) Place T2-T9, the heavy black line on the component overlay indicates the side of the transistor which has the exposed metal surface. Solder components and trim leads.
 - 9.) Place the 8 way dip switch. Pin 1 should be positioned at the end where the square mark is shown on the overlay. The off position of the switch is closest to the edge of the pcb.
 - 10.) Make 16 connectors from 1/8" copper tube by 10mm long (see sample provided). The cuts were made using a very fine toothed razor stiff backed saw which can be found in most hobby shops. Before cutting to length cut across the tube 5mm from the end to a depth approx half the diameter of the tube then on the same side only make a cut along the 5mm length to intersect the first cut then cut the tube to the 10mm length. Clean burrs and the connector is ready for the next step.
- 
- 11.) Next solder the home made connectors J1-J16. The trick here is to make a loop in the solid copper wire (.019" or 0.5mm) by bending around a spare piece of 1/8" copper tube, solder one end then insert the connector under the loop and pull the free end tight through the printed circuit board. Solder the free end of the copper wire, at this point the connector is at an angle and hasn't been soldered. Now twist the connector straight and solder it to the wire loop. The connector with the **split end** should overhang the pcb by 3-3.5 mm (see picture on web page)
 - 12.) Option: The 733628 connector from Conrad can be soldered direct to the pcb instead of the home made connector. (see photo on page 1 or the parts list in this document)
 - 13.) If you don't want to use the home made connectors and are going to solder wires direct to the pcb make sure you put a wire link between J5 connector pins as there is a track between these 2 pins.
 - 14.) **CAUTION:- use an anti static mat and wrist strap to handle the IC's as they can be damaged by static. These can be obtained from most electronic supply stores.**
 - 15.) Now place the IC's, a dot or indent indicates pin 1 which is to the left of this mark and the rest of the pin numbers follow in a CCW rotation. ie pin 16 is opposite pin 1 on a 16 pin dip. Pin 1 is indicated on the overlay by a small square.
 - 16.) Hold the IC by the end between your fore finger and thumb and bend the legs of the IC in towards each row of pins so they IC will fit into the holes on the pcb.
 - 17.) Solder pin 8 then pin 16 of each IC, then solder the rest of the pins in any order.
 - 18.) Now bend the leads of the C1 capacitor to fit the holes in the pcb. Make sure you place the positive lead as indicated by the + sign on the overlay, also make sure the component lead isn't shorting to the J12 connector. Solder and trim leads.
 - 19.) Take time now to inspect your solder joints and make sure you haven't made any solder bridges to tracks or pads which shouldn't be connected. When you are satisfied there are no short circuits and you have placed all the components in their correct position move to the next step.
 - 20.) Using the [coding table](#) provided switch the required switches "ON". Under no circumstances change these switch settings while you have power on as you will destroy IC1.
 - 21.) Now for power up. Connect the red wire to J13 or J14 and the brown wire to J15 or J16. Connect a magnetic device such as a point motor or a signal to each of the channels, now turn the power on and test each channel. The physical layout of the connectors for each channel is clearly shown on the circuit diagram and is the same as a true Marklin K83. ie Green, Yellow, Red.
 - 22.) **If your module doesn't work and you have no electronic knowledge, seek help from an electronics expert.** Most problems arise from poor solder joints, components in the wrong location, or too much solder which causes short circuits. To date no one has failed to get this module working.
 - 23.) Installation of the module can be fixed by a left and right hand plastic bracket (see drawing supplied) the plastic angle I used can be obtained at a hardware or plumbing supplies.

Happy building

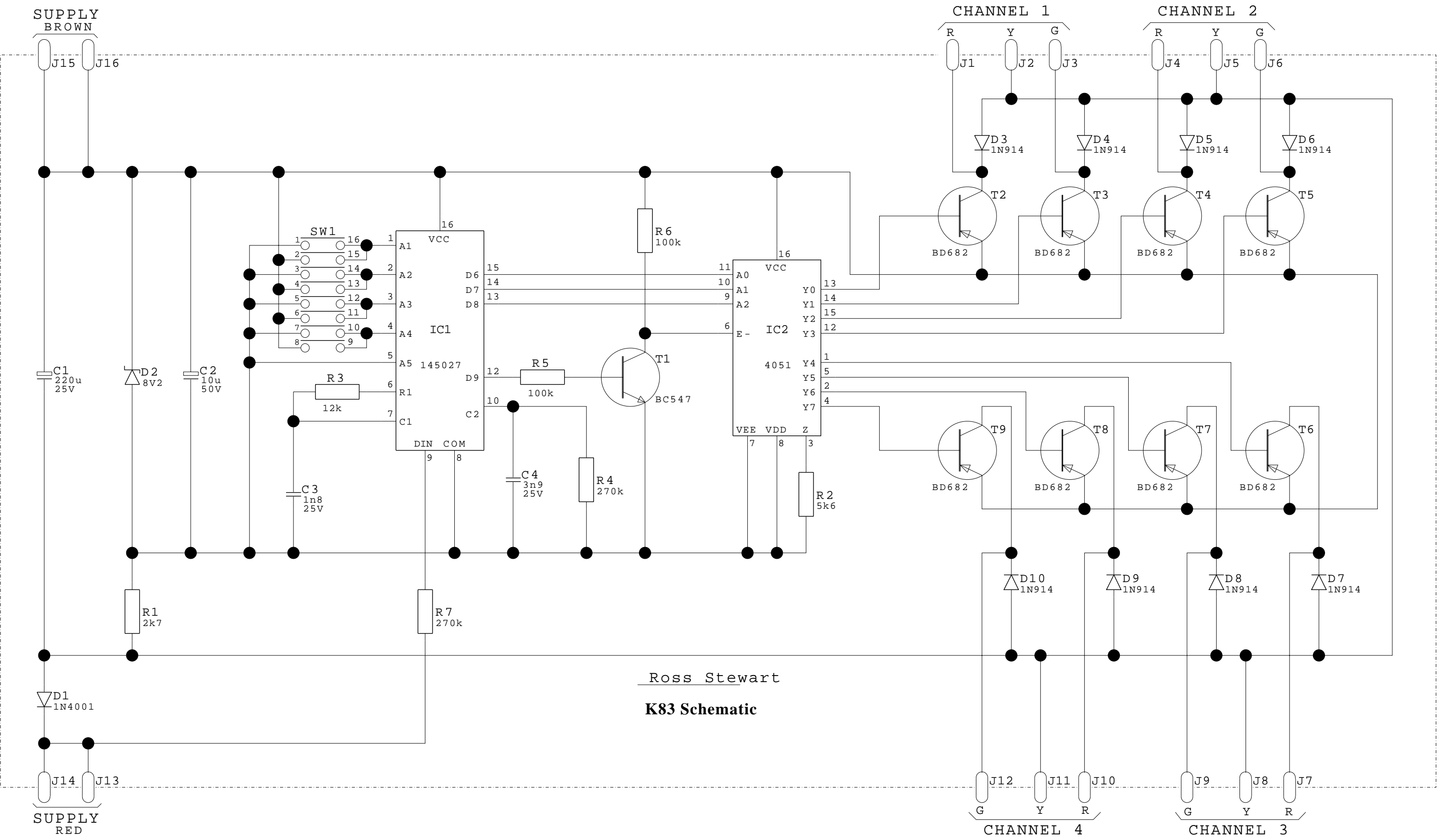
Regards

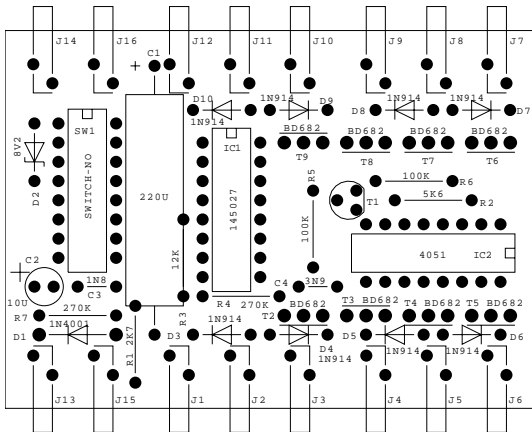
Ross Stewart

As always you can contact me by email at

rossstew@ozemail.com.au

<http://members.ozemail.com.au/~rossstew/rms/marklin.html>



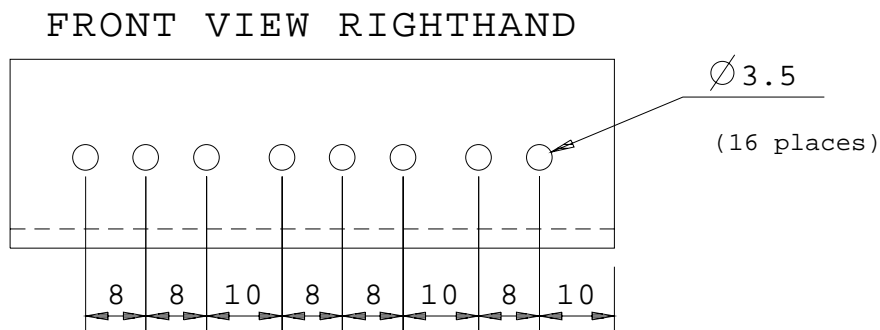
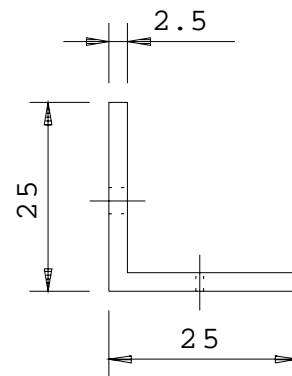
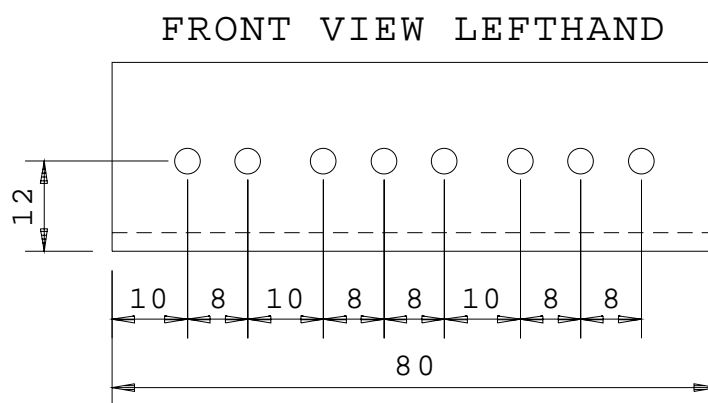
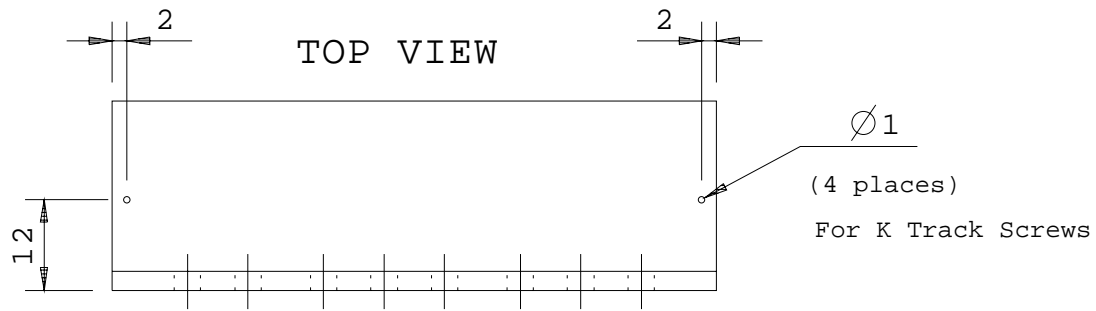


Parts List k83

04-02-2008 Revised

rms-pl-00083

Farnell Part #	Symbol	Description	Value	Volt.	Ref Designator	Qty.
345-0892	ECAP1200	Electrolytic Axial lead	220u	63V	C1	1
920-502	ECAP100PC	Electrolytic Radial lead	10u	25V	C2	1
303-689	CAP200	Ceramic Cap	1n8		C3	1
303-720	CAP200	Ceramic Cap	3n9		C4	1
365-117	DIODE400	Power Diode	1N4001		D1	1
369-457	ZDIODE300	Zener Diode 250mW	8V2		D2	1
885-060 368-118	DIODE300	Signal Diode	1N914 or 1N4148		D3-D10	8
	DIP16	IC Decoder	MC145027 P		IC1	1
385-323 700-393	DIP16	IC Single 8 Channel Multiplexer	CD4051 BCN or MC14051 BCP		IC2	1
285-973	DIP16	Dipswitch 8 Way Top Actuated	SW-NO		SW1	1
543-482	RES400	RESISTOR MF25 1%	2k7		R1	1
543-561	RES400	RESISTOR MF25 1%	5k6		R2	1
543-640	RES400	RESISTOR MF25 1%	12k		R3	1
543-860	RES400	RESISTOR MF25 1%	100k		R5-R6	2
543-962	RES400	RESISTOR MF25 1%	270k		R4,R7	2
357-054	TO92	Transistor NPN	BC547		T1	1
931-240	TO126	Transistor PNP	BD682		T2-T9	8
	CON1	Home made	CON1		J1-J16	16
733628-62 Conrad		Connector "Steckmuffen 2.5mm"	CON1		J1-J16	16



Material 25x25x2.5 Plastic Angle
or Similar Insulated Material

Suggested Mounting Bracket
k83 and k84 Printed Circuit Boards

Ross Stewart 23-08-01