

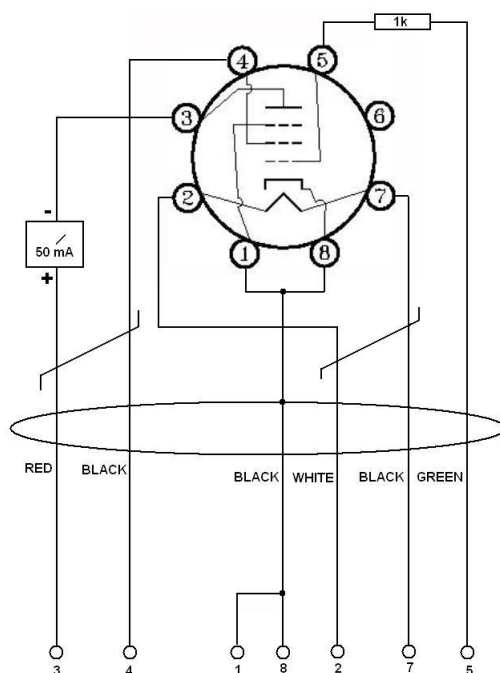
## ***Bias setting box***

I made a handy bias setting box which enables you to set up all output tubes on both channels at the same time. It is particularly handy when servicing an amplifier as it allows you to keep an eye on all 4 tubes as they warm up and get under way!

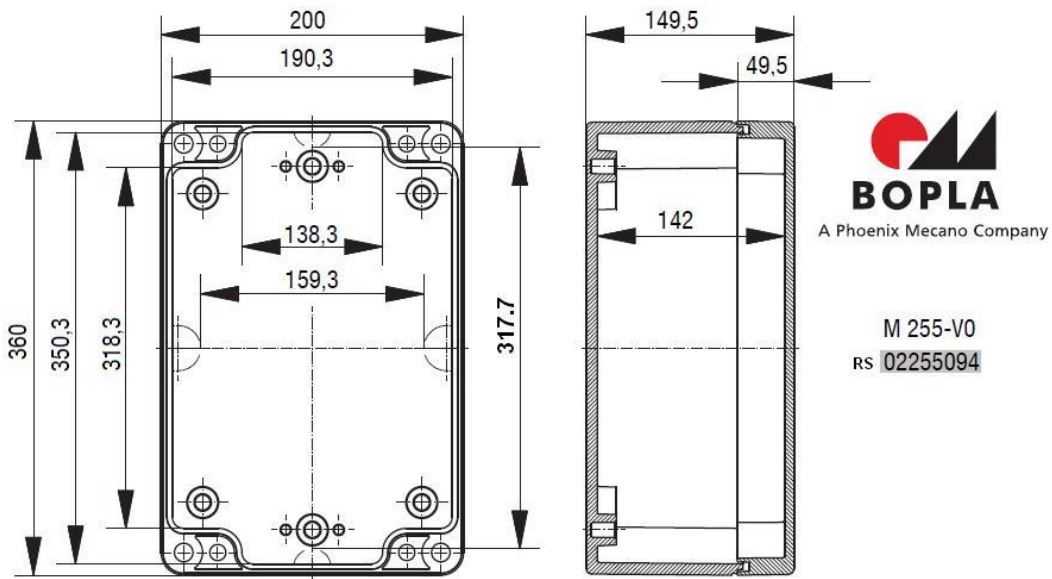
I made some suitable plugs using the bases obtained from some defective octal tubes. However, it would be more prudent, safety wise, to use the correct fully insulated moulded plugs if you can obtain them. The box uses separate 50mA meters wired into the Plate Circuits with the mandatory grid stopper resistor on each tube. The meters I used were made by Monacor Model PM-2/50mA.



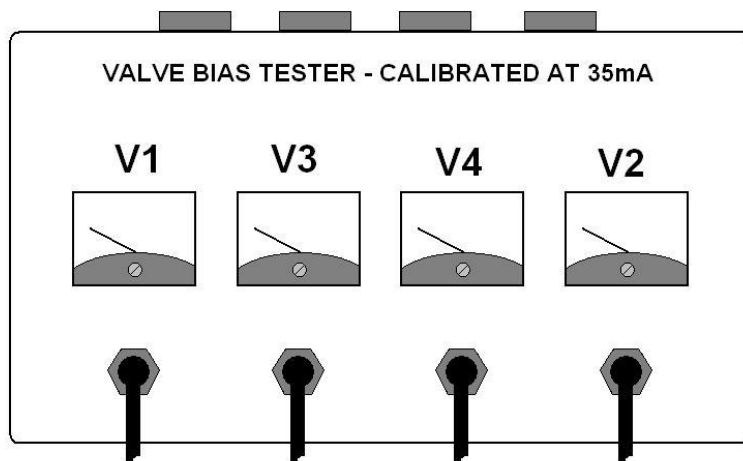
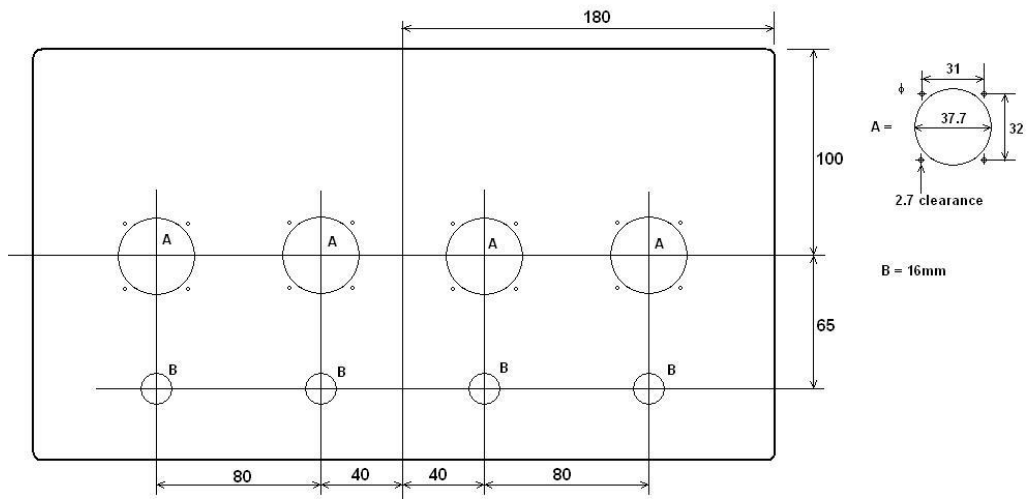
***Each Plug and socket is wired thus:-***



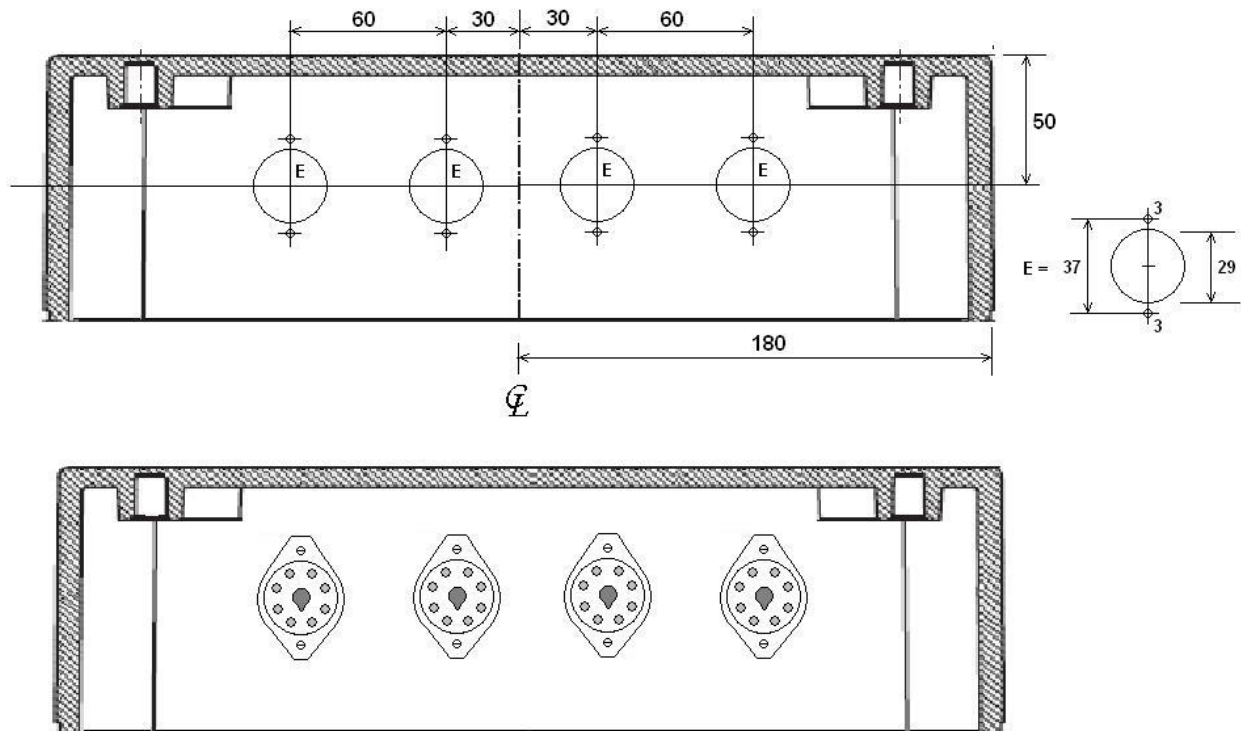
*This is the Box used but you may find a cheaper one!*



*Meter side drill.*



## Tube side drill



To check the meters you can simply daisy chain the plugs by fitting V3 Plug into V1 socket, V4 Plug into V3 socket and V2 plug into V4 socket. You then connect a variable 0 – 6V power supply with a fixed resistor of 120 Ohms in series with the positive supply line to Pin 3 of the Plug for V1.

The negative lead should be connected to pin 3 of the V2 socket but via a multi-meter set to measure 200mA.

All of the meters should respond together and by setting the power supply as required, it should be possible to set the current to 35mA as shown by the multi-meter. If any of the meters are slightly out on their scales, (this should be no greater than a needle width), then adjust the small screw on the front of the meter to show the correct 35mA. This screw is provided for the normal purpose of setting the zero point on the meter scale but we can use it to set for the optimum 35mA. We are not interested in any other part of the scale and adjusting this screw saves a lot of bother in making adjustable shunts.

The box was made for a particular amplifier using EL34's biased at 35mA. It can be tailored for other tubes like the 6V6, 6L6, KT66 and KT88 as the base wiring is essentially the same, only the current meters may need replacement or adjustment.

The Monacor meters I used seem to be around 1.2 Ohms in resistance so I guess a similar resistor placed across the meter would give a full scale reading of 100mA. I have not tried this myself as most amplifiers I have serviced have only needed 50mA maximum. Remember that you are seeing actual Plate current and what you measure on, for example a cathode monitor resistor, will be higher as it is including the screen grid current.

**It is very important to include the 1k resistor in the Grid circuit of each Tube as otherwise you may experience oscillation taking place.**

## *Unit connected to an early Yaqin Model 10L*



One amazing design error the box showed up was the fact that turning the input signal off and on, produced quick responses in two of the meters but very sluggish in the other two. This was on both channels and seemed to be due to poor response on one side of the phase splitter.

This was cured by reducing the B+ feeding the front end amplifier which is directly coupled to the splitters in the 10L.

Zener diodes of around 220V value wire placed onto the B+ source resistors.

This circuit arrangement is used on many Yaqin amplifiers and the Author often wonders if there are many amplifiers with this fault, which without a monitor box like this, would never be suspected or even found.