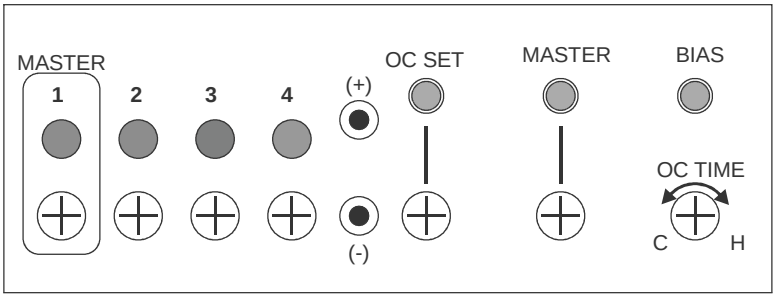
Tube Bias Setter and Overcurrent Protection

The picture at right is the front panel. From left to right, the functions are:

- Master/tube #1 bias indicator and bias set pot
- Tube #2
- Tube #3
- Tube #4
- Meter sockets for setting target current
- Overcurrent level set
- Master current level set
- Bias and overcurrent time



Here's how it works.

In normal operation, to rebias tubes, you turn the volume on the amp down to 0 (just to make the amp be quiet, as this will affect the indicated bias. The LEDs are all dark at this point.

When you press the "BIAS" tactile switch, the LEDs light to indicate the idle current in the tubes to which they're connected. In the picture, tubes 1 and 2 are at the target idle current, and their LED shows green. Tube 3 is conducting a current higher than the target current, and its LED shows red. Tube 4 is below the target current, and its LED shows blue.

The target for all four tube idle currents is set by the "MASTER" adjustment, which will be described later.

To set the bias, you insert a small Phillips screwdriver into the adjustment pot below the tube's LED and turn it clockwise to increase current, counterclockwise to decrease current. When the tube conducts the target amount of current, the LED turns green. You do this once per tube.

Setting up target current is done with your meter. The leads of the #1/MASTER tube cathode resistor are connected to the two meter probe sockets in the middle of the panel. You stick your meter probes into the socket points and set your meter to read under 1V DC. The cathode resistor is 10 ohms, so a current of 35ma would cause 350mV to show on your voltmeter.

Decide what you want the target current for your tubes to be. If you like your 6L6s biased at 42ma, you would read your meter and turn the MASTER tube bias adjustment pot until your meter reads 420mV. Tube #1 is now conducting the right amount of current. The LEDs remain dark while you do this.

But the bias indicator circuit does not yet know what the right amount of current is. To set that, you press the "MASTER" tactile switch. This tells the bias indicator to read the MASTER tube current and set its LED accordingly. Do NOT change the master bias setting pot under the MASTER tube LED. Instead, turn the MASTER setting pot under the MASTER tactile switch until the indicator for the MASTER tube turns green. The bias indicator circuit now knows that the current in the #1 tube is the correct master current for all tubes and will remember this level.

OC SET sets the level of current in any tube that is an overcurrent that is dangerous to the tube. OC TIME sets the amount of time that the internal circuit will let the current be over the OC SET current before turning off the B+ to the amp.