

Setting Tube Bias

Allow the unit to warm up at proper AC line voltage for at least 20 minutes. With no input signal present, adjust each control so that only the associated green LED is lit. The controls may be slightly interactive. If neither LED is lit, the amp is over biased. This will result in some distortion in the power amp and a generally thin sound. If the green and red LED are lit, the amp is under biased and too much current is flowing to the power tubes. This will give a big, full sound but will also reduce the life of the power tubes. Once set, the controls should not have to be changed except as needed for tube replacement, or to compensate for tube aging. Note that the AC line voltage may vary from place to place and the LEDs will read slightly different. There is no need to fiddle with this every other day. Note that it is normal for the red LEDs to light when there is a signal present. Bias 1 Control adjusts the three left (as seen from the rear) power tubes. Bias 2 Control adjusts the three right power tubes. By observing the LEDs as the Bias Controls are slowly rotated clockwise, a number of tube problems can be diagnosed by the user:

| <u>Condition</u> | <u>Problem</u> | <u>Solution</u> |
|--------------------------|---|--|
| Green comes on, then red | No problem | The longer the green LED is on before the red LED comes on – the better matched the tubes are. |
| Red comes on, then green | Tubes not properly matched | Set slightly before green comes on, obtain matched tubes when possible. |
| Red comes on, no green | One or more tubes are non-functioning | Check to make sure tubes are all seated properly; if so, find and replace bad tube(s). |
| None on | Possibly no high voltage or bad Bias Control or bad tube(s) | Have unit checked by a service technician. |
| Both on all the time | Possible bad Bias Control or bad tubes | Have unit checked by a service technician. |