

MUSIC MAN, INC.  
1338 State College Parkway  
P.O. Box 4589  
Anaheim, California 92803  
(714) 956-9220  
Telex 692-397

SERVICE BULLETIN #1

*RD-100 & RD-65 - HD150 & HD75*

Section I DRIVER TRANSISTOR BIAS CALIBRATION PROCEDURE

- A. This applies to all models containing the following circuit boards: DB-2, DB-3, DB-4, GP-1, GP-2, GP-3, GP-3A, GD-1, GD-2, and GD-2A.
- B. Adjustment is as follows:
1. Turn the amplifier to "on" with the Hi/Lo Standby switch in the Hi position. No signal.
  2. Using a voltmeter measure the voltage from emitter to ground on each of the two driver transistors. Across the 3.9 OHM emitter resistors is a convenient measuring point.
  3. Adjust the bias trimpot (TR-1) until you read 25mv DC across the 3.9 OHM emitter resistors. If there is a difference in voltage between the emitters of the two driver transistors, set the lower of the two to 25mv. The higher of the two should not exceed 55mv DC.

NOTE: Use only a 1458 op amp to drive the output section.

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Section II GRID BIAS CALIBRATION

*HD-130 & HD65*

- A. This applies to all models using a grid drive. (12AX7 driver tube).
- B. Adjustment is as follows:
1. Turn the amplifier to "on" with the Hi/Lo Switch in the Hi position. No signal.
  2. Using a volt meter, measure the voltage from cathode (pin 8) to ground on the output tubes. Across the 10 $\Omega$  cathode resistor is a convenient measuring point.
  3. Adjust the bias trimpot located farthest to the right (looking from the front) on the GB-1 and BB-1 circuit boards until you read .5 volts DC across the 10 OHM cathode resistor.

NOTE: Be sure tubes are warmed up before adjusting the bias voltage.

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## SERVICE BULLETIN #1 cont.

### Section III TREMELO CALIBRATION

A. This applies to the GB-1 circuit board only.

B. Adjustment is as follows:

1. Apply a 1KHZ sine wave at 50mv RMS to the #1 input of the effects channel. Turn the tone controls, master volume, tremelo intensity and speed to maximum. Reverb at 0. Bright and deep switches off. The amplifier may remain on "standby" as the power amp section does not need to be on to perform this calibration.
2. Using an oscilliscope monitor the output of the GB-1 preamp board. The purple wire at the right side of the GB-1 board is a convenient point for this.
3. Remove the low frequency oscillator transistor (2N3391) and turn the tremelo modulation trimpot to full counter clockwise. The tremelo modulation trimmer is the trimpot second to the left (looking from the front) on the GB-1 circuit board.
4. Turn up the channel volume until you achieve 4 volts peak to peak at the output of the preamp. (purple wire)
5. Slowly turn the tremelo modulation trimmer clockwise until both halves of the sine wave reach their lowest amplitude. (Just before phase reversal) The pattern on the scope should resemble fig. 1.
6. Replace the low frequency oscillator transistor and the pattern on the scope should resemble fig. 2.

Scope setting -.1v/cm .2ms/cm