

DIFFICULTY	POSSIBLE CAUSE
Measured voltage less than 43 VDC but more than zero.	<ol style="list-style-type: none"> 1. Diode D5 or D6 installed backwards. 2. Poor solder connections. 3. Capacitors C1, C2, C3, or C4 installed backwards.
No voltage.	<ol style="list-style-type: none"> 1. Transistor improperly installed. 2. Open circuit or short circuit on power supply circuit board.
Measured voltage about 50 volts.	<ol style="list-style-type: none"> 1. Zener diode D7.

(✓) Turn the POWER switch off.

This concludes the tests. Proceed to the Adjustments.

ADJUSTMENTS

Two methods for adjusting the Audio Generator are provided below. The first method uses only an AC voltmeter, and the second method (on Page 42) uses an AC voltmeter and an oscilloscope. Use the second method if you intend to use the Audio Generator with an oscilloscope. This will enable you to adjust the square wave Symmetry control, which cannot be done effectively with only a voltmeter.

ADJUSTMENTS WITH AC VOLTMETER ONLY

Set the switches and controls as follows:

- (✓) POWER SWITCH: OFF.
- (✓) MULTIPLIER: X10.
- (✓) TENS FREQUENCY: 10.
- (✓) UNITS FREQUENCY: 0.
- (✓) FREQUENCY control: 0.

NOTE: The word FINE on the front panel refers to the small knob on each of the AMPLITUDE controls. COARSE refers to the large knob on each of the AMPLITUDE switches.

- (✓) SINE WAVE AMPLITUDE switch (coarse): 10 volts.
- (✓) SINE WAVE AMPLITUDE control (fine): Fully clockwise.
- (✓) SQUARE WAVE AMPLITUDE switch (coarse): 10 volts.
- (✓) SQUARE WAVE AMPLITUDE control (fine): Fully clockwise.
- (✓) 600 Ω LOAD SWITCH: EXT.

NOTE: The following controls are located on the wave generator circuit board. Refer to Figure 1 for their location. Position each control at its center of rotation.

- (✓) BIAS.
- (✓) FEEDBACK.
- (✓) SYMMETRY.
- (✓) METER CAL.

- (✓) Plug the line cord into an AC outlet.
- (✓) Turn the POWER switch ON.
- (✓) Adjust the FEEDBACK control until the panel meter reads between 6 and 8 on the 0-10 scale.
- (✓) Set the external voltmeter to read 10 volts AC.
- (✓) Connect the external voltmeter common lead to the black sine wave output binding post. Connect the other voltmeter lead to the red sine wave output binding post.
- (✓) Rotate the METER CAL control clockwise until the panel meter reads the same, on the 0-10 scale, as the voltmeter.
- (✓) Disconnect the external voltmeter.

NOTE: During the following adjustments the panel meter pointer may seem to vary erratically. This is normal. If you encounter difficulties, make the control adjustments in small increments and allow the instrument time to stabilize after each adjustment.

- (✓) Turn the SINE WAVE AMPLITUDE control (fine) to approximately the 3 o'clock position.
- (✓) Adjust the BIAS control until you obtain a maximum panel meter reading.
- (✓) Turn the SINE WAVE AMPLITUDE (fine) control fully clockwise.
- (✓) Adjust the FEEDBACK control until the panel meter reads 10 volts.

NOTE: In the following two steps, if no change can be detected in the panel meter reading, it will not be necessary to readjust the feedback control.

- (✓) Turn the TENS FREQUENCY switch to each position, 10 through 100. Leave the switch in the position where the panel meter indicates the lowest voltage.
- (✓) Turn the MULTIPLIER switch to each position, X1 through X1000. Leave the switch in the position where the panel meter indicates the lowest voltage.

- (✓) Readjust the FEEDBACK control until the panel meter indicates 10 volts.

This completes the adjustments of the Audio Generator. Turn off the power and remove the AC plug from the socket. Proceed with the Final Assembly on Page 45.

ADJUSTMENTS WITH AC VOLTMETER AND OSCILLOSCOPE

Set the controls and switches as follows:

- () POWER SWITCH: OFF.
- () MULTIPLIER: X100.
- () TENS FREQUENCY: 10.
- () UNITS FREQUENCY: 0.
- () FREQUENCY control: 0.

NOTE: The word FINE on the front panel refers to the small knob on each of the AMPLITUDE controls. COARSE refers to the large knob on each of the AMPLITUDE switches.

- () SINE WAVE AMPLITUDE switch (coarse): 10 volts.
- () SINE WAVE AMPLITUDE control (fine): Fully clockwise.
- () SQUARE WAVE AMPLITUDE switch (coarse): 10 volts.
- () SQUARE WAVE AMPLITUDE control (fine): Fully clockwise.
- () 600 Ω LOAD: EXT.

NOTE: The following controls are located on the wave generator circuit board. Refer to Figure 1 (fold-out from Page 36) for their location. Position each control at its center of rotation.

- () BIAS.
- () FEEDBACK.
- () SYMMETRY.
- () METER CAL.

- () Plug the line cord into an AC outlet.
- () Turn the POWER switch ON.
- () Adjust the FEEDBACK control until the panel meter reads between 6 and 8 on the 0-10 scale.
- () Set the external voltmeter to read 10 volts AC.
- () Connect the external voltmeter common lead to the black sine wave output binding post. Connect the other voltmeter lead to the red sine wave output binding post.
- () Adjust the METER CAL control until the panel meter reads the same, on the 0-10 scale, as the voltmeter.
- () Disconnect the external voltmeter.
- () Set the oscilloscope to display a 1000 Hz waveform at an amplitude of 10 volts.
- () Connect the oscilloscope to the sine wave output binding posts.



Figure 2

- () Rotate the FEEDBACK control fully clockwise. Note that the positive or negative half of the waveform is clipped as shown in part A or B of Figure 2.
- () Adjust the BIAS control so both halves of the waveform are clipped equally, as shown in Part C of Figure 2.
- () Adjust the FEEDBACK control until the panel meter indicates 10 volts.
- () Disconnect the oscilloscope.

NOTE: In the following two steps, if no change can be detected in the panel meter reading, it will not be necessary to readjust the feedback control.

- () Turn the TENS FREQUENCY switch to each position, 10 through 100. Leave the switch in the position where the panel meter indicates the lowest voltage.
- () Turn the MULTIPLIER switch to each position, X1 through X1000. Leave the switch in the position where the panel meter indicates the lowest voltage.
- () Readjust the FEEDBACK control so that the panel meter indicates 10 volts.
- () Reset the FREQUENCY and MULTIPLIER switches for a 1000 Hz output at 10 volts (MULTIPLIER at X100, TENS FREQUENCY at 10).
- () Connect the oscilloscope to the square wave output binding posts. Set the oscilloscope input switch to AC.

NOTE: The very fast rise time (leading edge) of the square wave signal is very rich in harmonics, extending into the megahertz range. Low frequency oscilloscopes may respond in various ways to this signal. The leading edge may be "rounded off" through the roll-off characteristics of the oscilloscope, or frequency compensation (with peaking coil, for instance) may lead to "ringing" or "overshoot". Even the leads between the generator and oscilloscope may affect the pattern displayed.

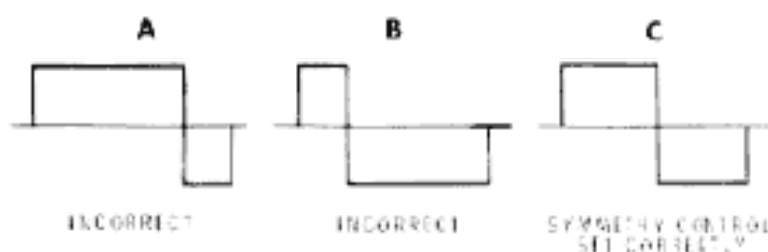


Figure 3

- () Rotate the SYMMETRY control until the positive and negative halves of the square waveform are equal, as shown in part C of Figure 3.

This completes the adjustments. Turn off the power and remove the AC plug from the socket. Proceed to Final Assembly.

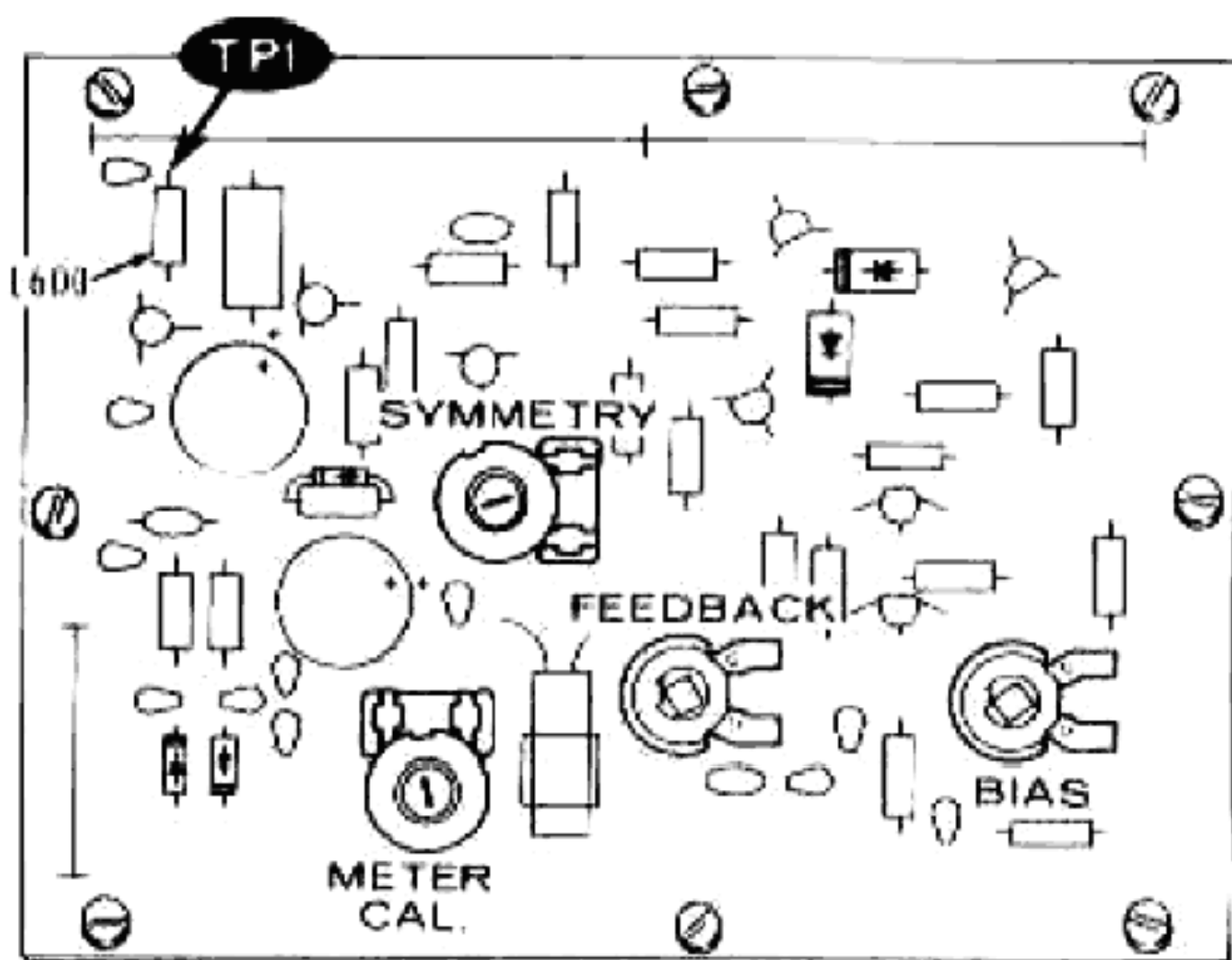


FIGURE 1