

# OPERATING MANUAL



**TE-22**

**SINE SQUARE WAVE**

**AUDIO GENERATOR**

# TECHNICAL SPECIFICATIONS

Sine Wave Range . . . . .	20 Hz - 200K Hz in 4 bands. Band A      20 - 200 Hz Band B      200 - 2,000 Hz Band C      2,000 - 20,000 Hz Band D      20,000 - 200,000 Hz
Square Wave Range . . . . .	60 Hz - 30K Hz. (5% tilt at 60 Hz, 5% rounding at 30K Hz.) Read on same scales as Sine Waves
Calibration Accuracy . . . . .	±3% +2 Hz
Frequency Response . . . . .	±1.5db, 60 Hz to 150K Hz.
Output Voltage:	
Load Impedance - 1M ohm . . . . .	7 V. (max.)
Load Impedance - 10M ohm . . . . .	5 V. (max.)
Tube Complement . . . . .	7"high, 10-1/2"wide, 5-3/8"deep.
Weight . . . . .	8.6 lbs.

## OPERATING INSTRUCTIONS

1. Rotate the Tuning Control dial until the basic setting for the desired frequency is lined up beneath the hair-line. Frequency settings are indicated by the inner scale. The outer scale is a vernier, for "fixing" settings accurately.
2. Set the Band Selector switch at the position which will provide the multiplication factor needed for a given frequency output. If Fx1 is selected, frequencies may be read directly from the Tuning Control dial. If Fx10 is selected, multiply the Tuning Control setting by 10 in order to determine the frequency of the audio output signal. If Fx100 is selected, multiply the Tuning Control setting by 100. If Fx1000 is selected, the Tuning Control setting must be multiplied by 1000.
3. Set the Wave Form switch at the sine or square wave position, as desired.
4. Shift the Off-On switch to the ON position. Allow at least five minutes for warm-up.
5. A shielded test cable, terminated with banana jacks at one end and alligator clips at the other, has been supplied. Make sure that the shielded portion of the cable is always connected to the instrument's black output terminal.

NOTE: Never connect the shield lead directly to the chassis of AC/DC equipment. To prevent danger of shock, place a capacitor (approximately  $5\mu\text{fd}$ , 400v) in series with the shield lead before connecting it with such equipment.

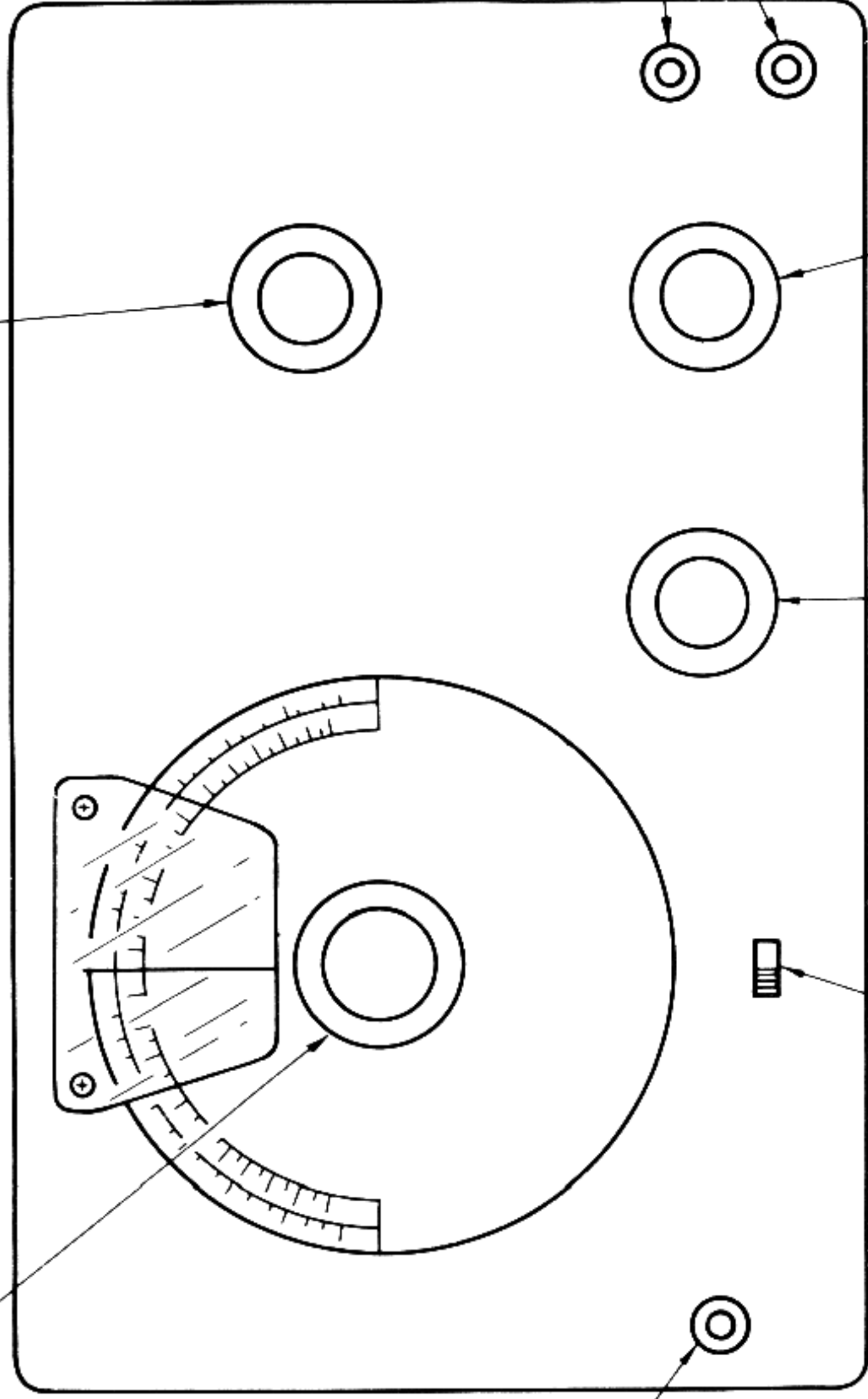
6. Adjust the Amplitude control to suit your requirements.

**TUNING DIAL CONTROL:**

Selects the basic frequency setting.

**WAVE FORM SWITCH:**

Selects sine or square wave output.



**OUTPUT TERMINALS:**  
Multi-connection type binding posts for transfer of signal via output cables.

**PILOT LIGHT**

**OFF-ON SWITCH:**

Energizes the unit. Note the red pilot light.

**BAND SELECTOR SWITCH:**

Selects the factor by which the basic frequency setting must be multiplied.

**AMPLITUDE CONTROL:**

Adjusts amplitude of output signal.

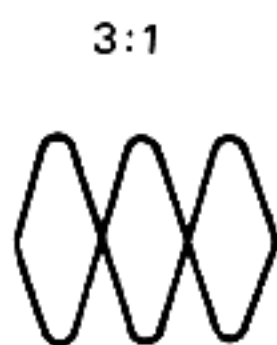
**FIGURE 1 LOCATION AND FUNCTION OF CONTROLS**

## CALIBRATION

The TE-22 is factory calibrated. After long use or parts replacement, however, it will probably be necessary to readjust the unit. Only one control is involved in calibration; a trimmer capacitor installed atop the main tuning capacitor. For calibration you will need an oscilloscope – preferably, one having a 60 Hz test output.

### Procedure

1. Two retaining screws will be found at the back of the case, and two phillips-head screws are located at each corner of the escutcheon plate. Remove these screws, lay the instrument on its back and lift the chassis out of the case.
2. Set the Band Selector switch at the Fx1 position.
3. Set the Tuning Control dial at 180 on the inner scale.
4. Connect the oscillator's output terminals to the vertical input terminals of the oscilloscope.
5. If the oscilloscope has 60 Hz output terminals, connect them to its horizontal input terminals. If the oscilloscope has no 60 Hz output terminals, the secondary of a 6.3 volt filament transformer can be used to provide the necessary signal.
6. Adjust the oscilloscope controls for approximately equal "x" and "y" axis deflection.
7. Using a non-conductive alignment tool, adjust the oscillator's trimmer capacitor until the oscilloscope reproduces the pattern illustrated in Figure 2. Adjust the capacitor until the pattern remains as nearly stationary as possible.

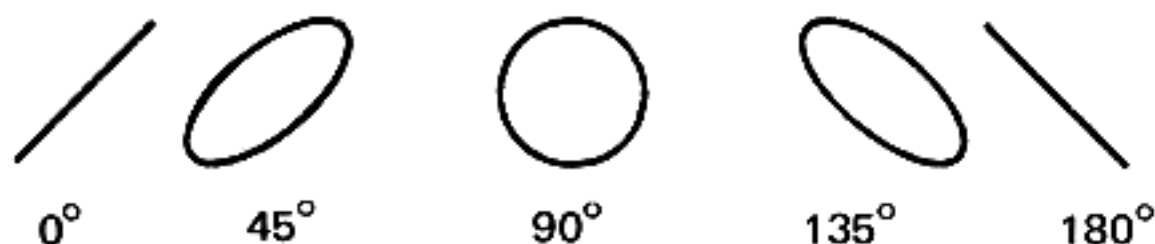


**FIGURE 2**

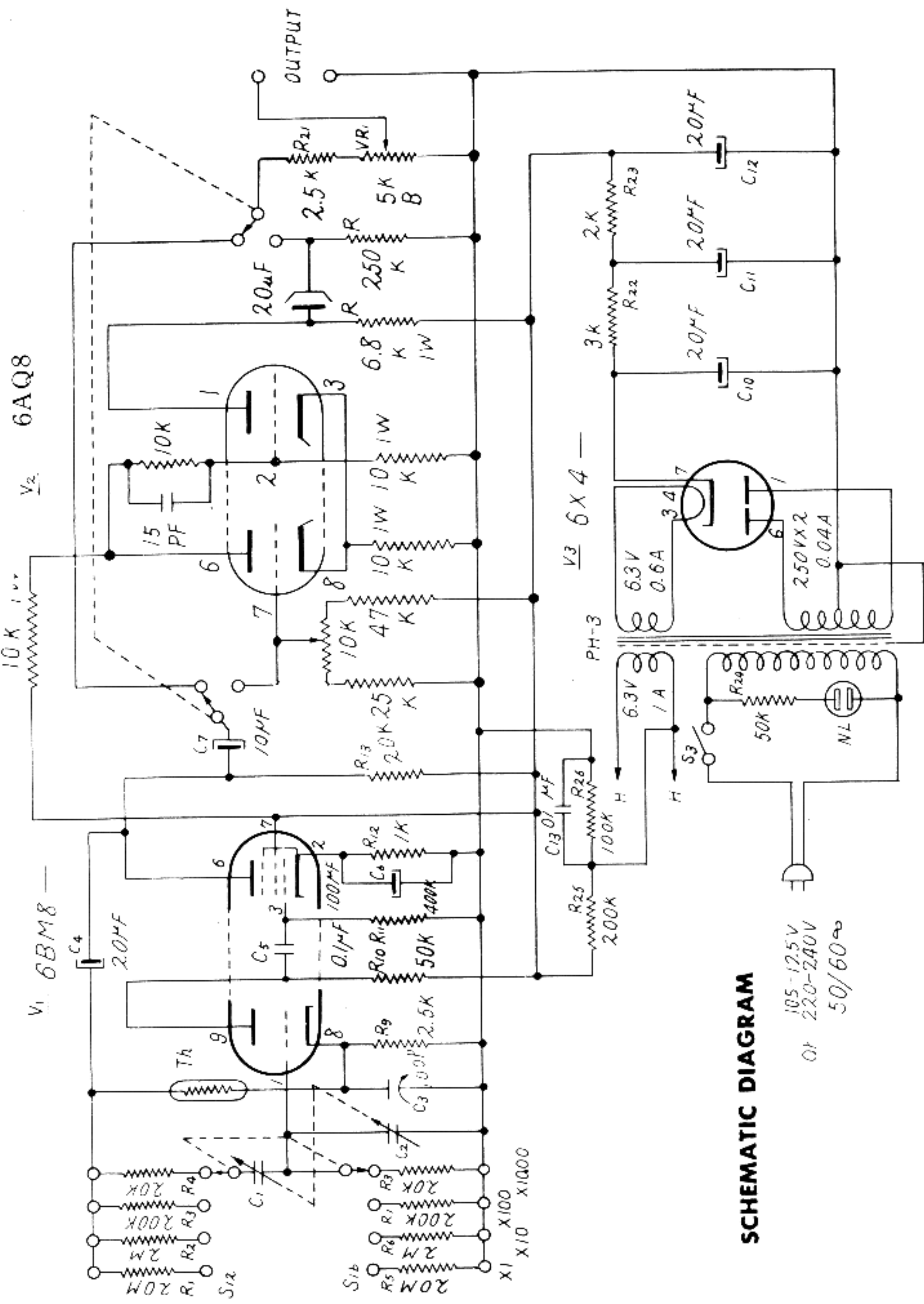


**FIGURE 3**

The calibration is completed. As a check, set the Tuning Control dial at 20 on the inner scale (with the Band Selector switch still at the Fx1 position). A trace similar to Figure 3 should appear on the oscilloscope screen. Finally, set the Tuning Control dial to sixty on the inner scale. A trace similar to any one of the patterns shown in Figure 4 should appear on the oscilloscope screen.



**FIGURE 4**



**SCHEMATIC DIAGRAM**

105-12.5V  
 Or 220-240V  
 50/60<sup>∞</sup>

# **K4XL's** **BAMA**

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