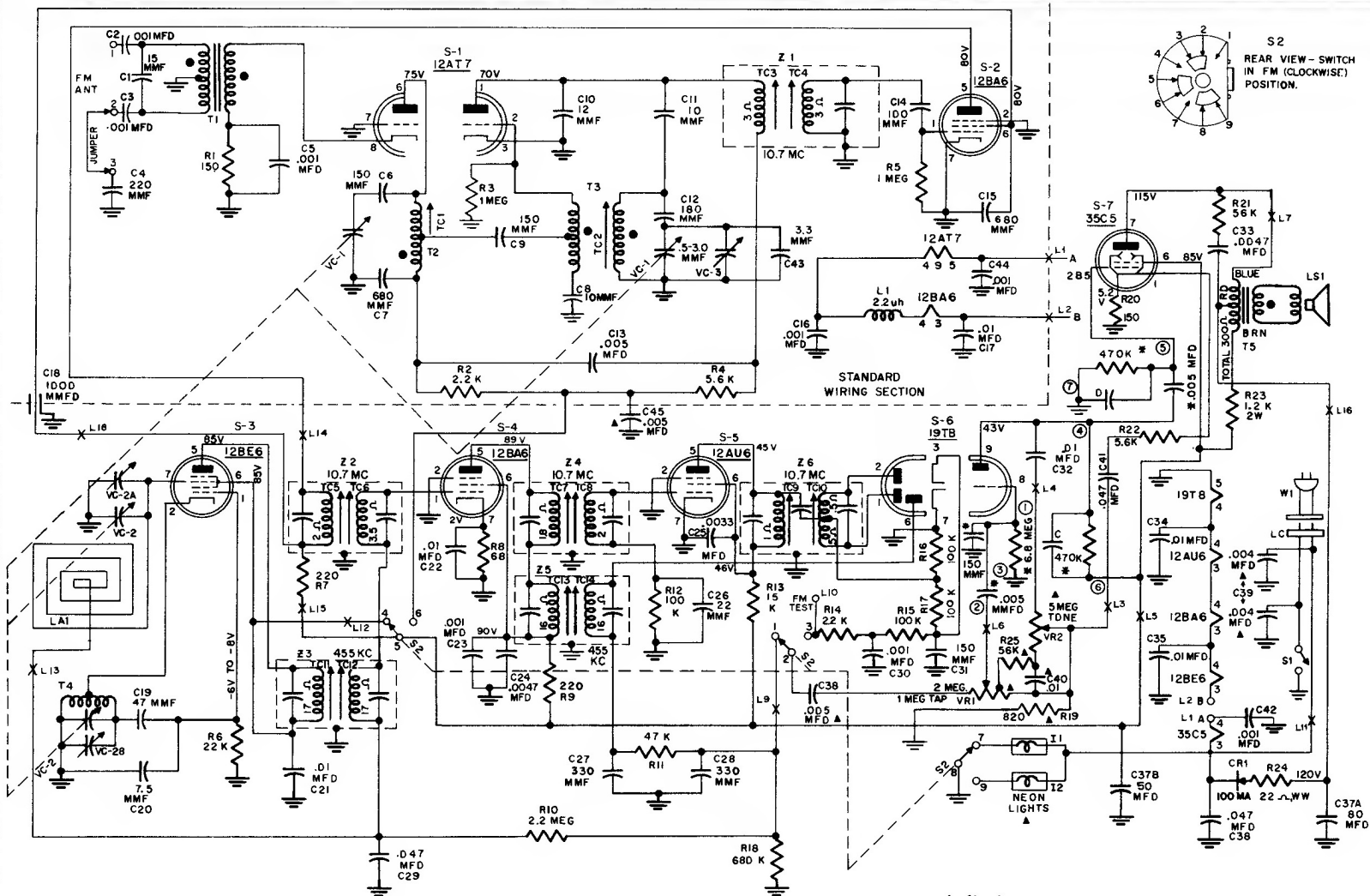


# **PHILCO** MODEL E-976



Components marked with an \* are part of NI, the Audio Circuit Couplate. Condensers "C" plus "D" equal 250 mmf in couplate.  
Components marked ▲ are part of chassis wiring.

(Continued on the next page)

## **SPECIFICATIONS**

**Cabinet** — Wood table model — Mahogany, Blonde or Fruitwood. Dual slide-rule dial with neon band indicators.  
**Circuit** — Seven-tube superheterodyne plus selenium rectifier.  
**Frequency Ranges** — Tuning drive ratio 12:1  
Broadcast — 540-1620 KC  
FM — 88-108 MC

**Audio Output** — 1 watt

Variable bass boost or treble cut tone control

**Operating Voltage** — 105 - 125 volts, a.c./d.c.

**Power Consumption** — 40 watts

**Antennas** — AM — Built in high impedance, pancake loop  
FM — Line cord with provision for connecting external antenna.

**Intermediate Frequency** — AM 455 KC  
FM 10.7 MC

# PHILCO Model E-976

## AM ALIGNMENT PROCEDURE

**OUTPUT INDICATOR** — Connect either an a-c voltmeter or an oscilloscope across the voice coil terminals.

**SIGNAL GENERATOR** — Use an AM r-f signal generator with modulated output.

1. Connect generator, through a .05 mfd condenser, to grid, pin 7, of the AM converter, S-3. Connect ground lead to chassis.
2. Set generator to 455 kc, tuning gang fully closed and adjust, in order given, TC14, TC13, TC12 and TC11 for maximum output. Repeat until no further gain is indicated.
3. Connect generator to radiating loop. Set generator to 1600 kc. Set receiver to 1600 kc as indicated by pointer. Adjust VC-2B for maximum.
4. Set generator to 1400 kc. Tune receiver to signal and adjust VC-2A for maximum.

## FM ALIGNMENT PROCEDURE

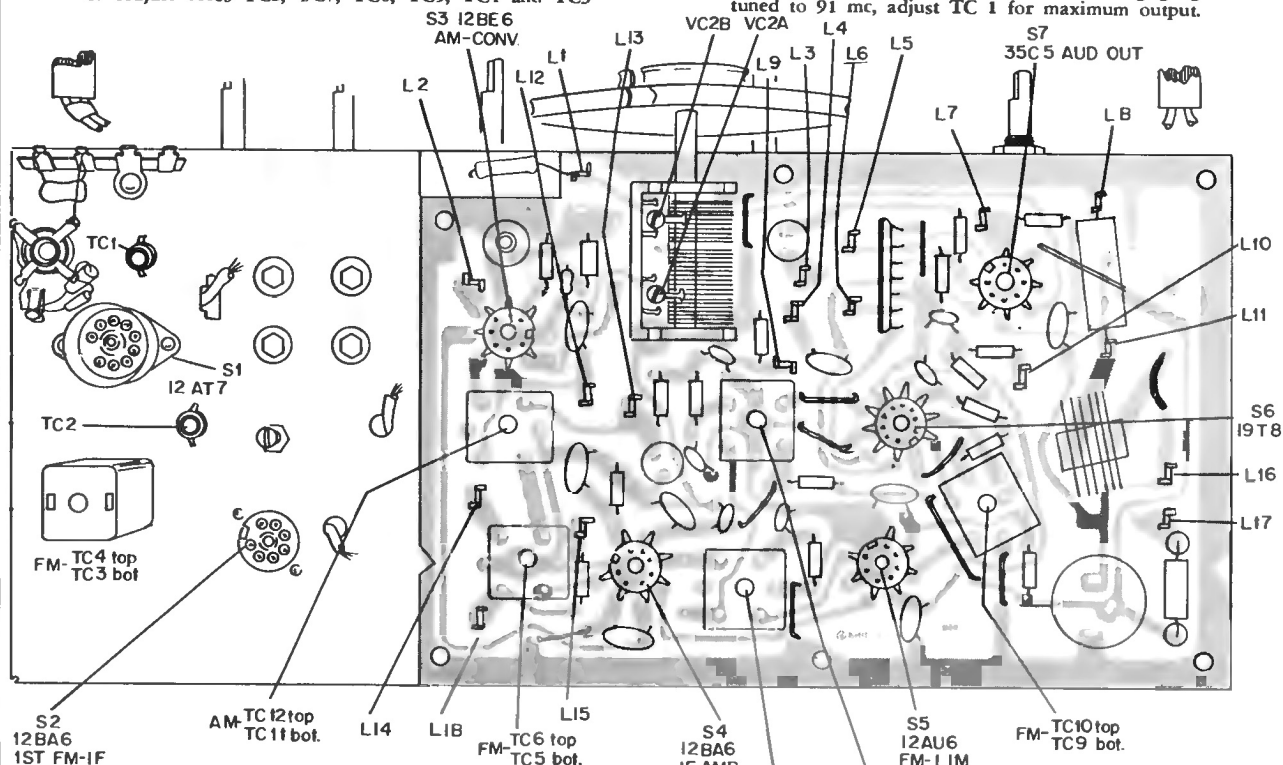
1. Calibrate the scope for 2 volts P/P.
2. Connect the scope, through a 100,000 ohm isolating resistor, to junction of R12 and C26. Scope ground lead to chassis.
3. Connect the signal generator to bottom of T1 secondary (junction of T1 with R1 and C5). Generator ground lead to chassis.
4. Inject marker signal, 10.7 mc (unmodulated).
5. Inject sweep signal, 10.7 mc, approximately 150 kc total deviation (do not over sweep).
6. Adjust cores TC8, TC7, TC6, TC5, TC4 and TC3

for maximum amplitude, symmetrical curve with the 10.7 mc marker at top of curve.

Adjust input signal to maintain output, as shown on scope, below 2 volts peak during alignment.

Repeat step 6 until no further gain is obtained.

7. Calibrate the scope for 5 volts P/P.
8. Change the scope connections to L10 (FM audio output to function switch).
9. Remove sweep signal. Inject 10.7 mc, 30% AM modulated signal. Adjust TC10 for minimum indication between peaks. See note below.
10. Inject 10.7 mc sweep signal and adjust TC9 for maximum symmetrical output.
11. Touch up cores as in Step 6 plus TC9 for a symmetrical, maximum amplitude, discriminator curve. To check alignment, discriminator curve should not shift in frequency with an increase in signal input (below overload). If a shift does occur, the I-F is not properly aligned, particularly the first stage, TC3 and TC4.
12. Inject 108.5 mc 30% AM modulated signal, through an antenna matching network to the receiver antenna terminals.
13. Open tuning condenser. Insert a 6 mil, non-metallic, shim between stator and rotor of the FM gang and close gang against shim. Adjust VC3 for minimum indication between peaks.
14. With tuning condenser fully closed, inject 87.75 mc, 30% AM modulated, signal and adjust TC2 for minimum indication between peaks. See note below.
15. Inject 91 mc, sweep signal and with tuning gang tuned to 91 mc, adjust TC 1 for maximum output.



Top View — Showing Alignment Points, Tube Locations and Tie Lugs

## IDENTIFICATION OF PRINTED PANEL TIE LUGS

- |  |  |  |
|--|--|--|
| L1 Filament lead from pin 4 of S-7 (35C5) to pin 5 of S-1 (12AT7)          | L7 Blue lead from audio output, T-5, to plate, pin 7 of S-7                    | L13 Loop antenna return to A.V.C.                                    |
| L2 Filament lead from pin 3 of S-2 (12BA6) to pin 3 of S-3 (12BE6)         | L8 Bare wire from panel ground to chassis ground                               | L14 Blue lead from plate, pin 5 of S2, to 2nd FM I-F transformer, Z2 |
| L3 Green lead to junction of R19, C40, bottom of VR1 and arm of VR2 to C41 | L9 Yellow lead, AM audio to lug 1 of S2 from junction of R11, C28, R10 and R18 | L15 Red lead (B+) from lug 5 of S2 to R7                             |
| L4 Yellow lead from high side of VR2 to C32                                | L10 Orange lead, FM audio to lug 3 of S2                                       | L16 Red lead from junction of R24 and C37A to audio output, T5       |
| L5 Red lead (B+) from lug 5 of S-2 to screen of S-7 and terminal 6 of N1   | L11 Brown lead to AC interlock and two white leads to pilot lamps              | L17 Brown lead from audio output, T5, to R23                         |
| L6 Yellow lead from arm of VR1 to terminal 2 of N1                         | L12 Red lead (B+) from lug 4 of S2 to AM converter screen, pin 6, and Z3.      | L18 Orange lead (B+) to C18 feed-through                             |