

# PHILCO-TROPIC RADIO MODEL 3204

## SPECIFICATIONS

CABINET .....	Table model, brown, molded plastic
CIRCUIT .....	5-tube superheterodyne, dry-battery-operated
<b>FREQUENCY RANGES</b>	
Standard Broadcast .....	540—1650 kc.
Short Wave 1 .....	2.3—7.2 mc.
Short Wave 2 .....	7.2—22 mc.
AUDIO OUTPUT .....	320 milliwatts
POWER CONSUMPTION .....	"B" (plate supply): 20 ma. at 90 volts, d.c.; "A" (filament supply): 300 ma. at 1.5 volts, d.c.
INTERMEDIATE FREQUENCY .....	455 kc.
PHILCO TUBES .....	1L65 r-f amplifier, 1L65 i-f amplifier, 1L66 converter, 1U5 detector, α-v-c. and 1st audio, 3LF4 audio output
AERIAL .....	Conventional "L"-type, such as Philco Outdoor Aerial, Part No. 45-1494

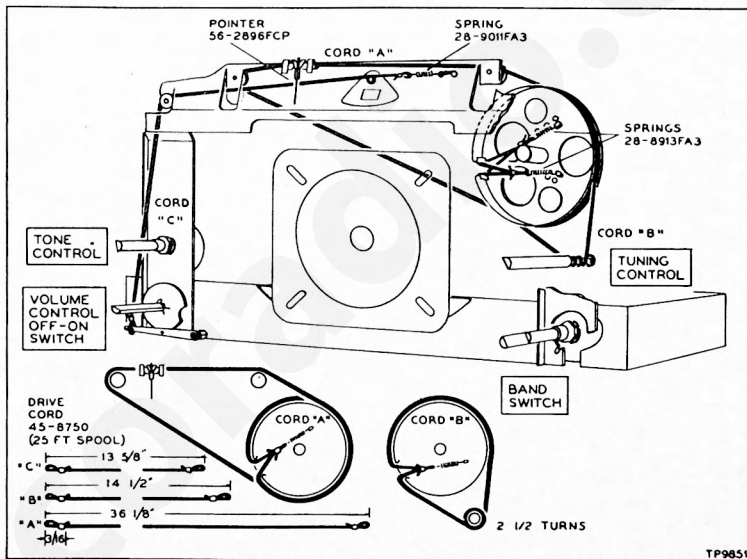


Figure 1. Drive-Cord-Installation Details

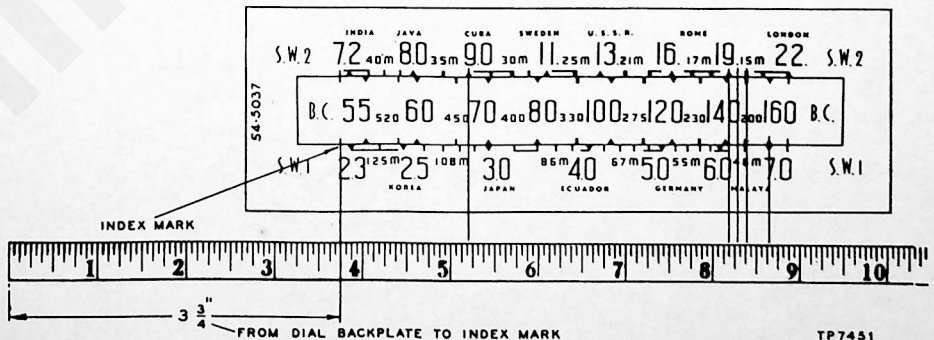


Figure 2. Dial-Calibration Measurements



## ALIGNMENT PROCEDURE

**DIAL POINTER**—With the tuning condenser fully meshed, set the pointer to coincide with the index mark at the low-frequency end of the dial, to the left of "55". See figure 2.

**OUTPUT METER**—Connect across the speaker voice-coil terminals.

**SIGNAL GENERATOR**—Connect the ground lead to the chassis, and the output lead as indicated in the chart. Use modulated

output.

**CONTROLS**—Set the volume control to maximum, and the tone control fully counterclockwise. Set the band switch, dial tuning, and signal-generator dial as indicated in the chart.

**OUTPUT LEVEL**—During alignment, adjust the signal-generator output to hold the output-meter indication below 1 volt.

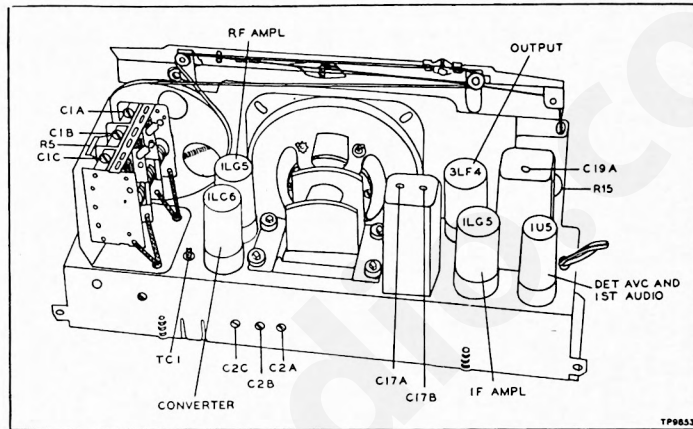


Figure 4. Top View, Showing Trimmer Locations

STEP	SIGNAL GENERATOR		RADIO			ADJUST
	CONNECTION TO RADIO	DIAL SETTING	BAND SWITCH	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Connect to r-f section of tuning gang (center lug) through .01- $\mu$ f. condenser.	455 kc.	BC	Gang fully meshed.	Adjust, in order given, for maximum output.	C19A—2nd i-f sec. C17B—1st i-f sec. C17A—1st i-f pri.
2	Connect to external aerial lead through 460-ohm resistor.	22 mc.	SW2	22 mc.	Adjust for maximum.	C1C—SW2 osc.
3	Same as step 2.	21 mc.	SW2	21 mc.	Adjust, in order given, for maximum, while rocking gang.	C1B—SW2 r-f C1A—SW2 aerial
4	Same as step 2.	8 mc.	SW2	8 mc.	Adjust for maximum while rocking gang.	TC1—SW2 osc. padder
5	Repeat steps 2 and 4 until no further change is noted.					
6	Same as step 2.	6 mc.	SW1	6 mc.	Same as step 4.	C2C—SW1 osc.
7	Connect to external aerial lead through 200- $\mu$ f. condenser.	1500 kc.	BC	1500 kc.	Same as step 4.	C2A—BC osc.
8	Same as step 7.	600 kc.	BC	600 kc.	Same as step 4.	C2B—BC osc. padder
9	Repeat steps 7 and 8 until no further change is noted.					

## ALINEAMIENTO

**INDICADOR DEL CUADRANTE**—Con el condensador de sintonización completamente cerrado (capacidad máxima), ajústese el indicador de modo que coincida con la marca índice en el extremo de baja frecuencia del cuadrante, a la izquierda del "55". Véase la figura 2.

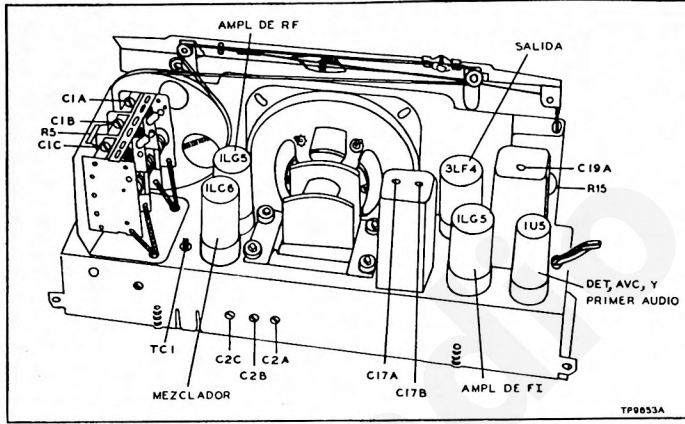
**MEDIDOR DE SALIDA**—Conéctese a los terminales de la bobina de voz.

**GENERADOR DE SEÑALES**—Conéctese el cable de tierra al chasis, y el cable de salida como se indica en la tabla. Usese

salida modulada.

**CONTROLES**—Fijese el control de volumen al máximo, y el control de tono completamente hacia la izquierda. Fijese el conmutador de bandas, y la frecuencia del radio y del generador de señales como se indica en la tabla.

**INTENSIDAD DE LA SALIDA**—Durante el alineamiento, atenúese la salida del generador de señales de modo que la indicación en el medidor de salida sea siempre menor de 1 voltio.



Vista Superior, Mostrando la Ubicación de los Compensadores

PASO	GENERADOR DE SEÑALES		RADIO			AJUSTENSE
	CONEXION AL RADIO	FRECUENCIA	CONMUT. DE BANDAS	FRECUENCIA	INSTRUCCIONES ESPECIALES	
1	Conéctese a la sección de r-f del cond. de sint. (terminal del medio) a través de un cond. de .01 $\mu$ f.	455 kc.	BC	Cond. de sint. completamente cerrado.	Ajústense, en el orden dado, para salida máxima.	C19A—sec. 2da f-i C17B—sec. 1ra f-i C17A—prim. 1ra f-i
2	Al cable exterior de antena, a través de una resist. de 400 ohms.	22 mc.	SW2	22 mc.	Ajústese para salida máxima.	C1C—osc. SW2
3	Igual que el paso 2.	21 mc.	SW2	21 mc.	Ajústense, en el orden dado, para salida máxima, mientras se mueve el cond. de sint. levemente de un lado a otro.	C1B—r-f SW2 C1A—ant. SW2
4	Igual que el paso 2.	8 mc.	SW2	8 mc.	Ajústese para salida máxima, mientras se mueve el cond. de sint. levemente de un lado a otro.	TC-1—padder osc. SW2
5	Repítanse los pasos 2 y 4 hasta que no se note cambio alguno.					
6	Igual que el paso 2.	6 mc.	SW1	6 mc.	Igual que el paso 4.	C2C—osc. SW1
7	Conéctese al cable exterior de antena, a través de un cond. de 200 $\mu$ f.	1500 kc.	BC	1500 kc.	Igual que el paso 4.	C2A—osc. BC
8	Igual que el paso 7.	600 kc.	BC	600 kc.	Igual que el paso 4.	C2B—padder osc. BC
9	Repítanse los pasos 7 y 8 hasta que no se note cambio alguno.					

## REPLACEMENT PARTS LIST

NOTE: Part numbers identified by an asterisk (\*) are general replacement items. These numbers may not be identical with those on factory assemblies; also, the electrical values of some replacement items may differ from the values indicated in the schematic diagram and parts list. The values substituted in any case are so chosen that the operation of the radio will be either unchanged or improved. When ordering replacements, use only the "Service Part No."

Reference Symbol	Description	Service Part No.	Reference Symbol	Description	Service Part No.
C1	Condenser, tuning gang, 3-section	31-2739	L10	Choke, r-f	32-4007
C1A	Condenser, trimmer, aerial	Part of C1	LS1	Loud-speaker	36-1507-4
C1B	Condenser, trimmer, r-f	Part of C1	PL1	Plug-and-cable assembly, battery	41-3710
C1C	Condenser, trimmer, SW-1 osc.	Part of C1	R1	Resistor, grid return, 470,000 ohms	66-4478340*
C2	Trimmer-condenser assembly, 3-section	31-6477-11	R2	Resistor, a-v-c filter, 2.2 megohms	66-5228340*
C2A	Condenser, trimmer, BC osc.	Part of C2	R3	Resistor, plate load, 4700 ohms	66-2478340*
C2B	Condenser, padder, BC osc.	Part of C2	R4	Resistor, grid return, 68,000 ohms	66-3688340*
C2C	Condenser, trimmer, SW-1 osc.	Part of C2	R5	Resistor, neutralization, 15,000 ohms	66-3158340*
C3	Condenser, fixed trimmer, BC aerial, 7.5 $\mu$ f.	30-1224-8*	R6	Resistor, screen dropping, 47,000 ohms	66-3478340*
C4	Condenser, fixed trimmer, SW-2 aerial, 15 $\mu$ f.	62-015200001	R7	Resistor, osc. plate load, 8200 ohms	66-2828340*
C5	Condenser, fixed trimmer, SW-1 aerial, 7.5 $\mu$ f.	30-1224-8*	R8	Resistor, a-v-c voltage divider, 100,000 ohms	66-4108340*
C6	Condenser, fixed trimmer, BC r-f, 56 $\mu$ f.	62-056409001	R9	Resistor, a-v-c filter, 2.2 megohms	66-5228340*
C7	Condenser, fixed trimmer, SW-1 r-f, 6.5 $\mu$ f.	30-1224-6*	R10	Volume control (with on-off switch), 500,000 ohms	33-5554-1
C8	Condenser, fixed SW-1 osc. tracker, .0027 $\mu$ f.	60-20275404*	R11	Resistor, a-v-c filter, 10 megohms	66-6108340*
C9	Condenser, fixed trimmer, SW-2 osc., 5 $\mu$ f.	30-1224-5*	R12	Resistor, grid return, 4.7 megohms	66-5478340*
C10	Condenser, d-c blocking, 470 $\mu$ f.	62-147001001*	R13	Resistor, screen dropping, 3.9 megohms	66-5398340*
C11	Condenser, d-c blocking, 470 $\mu$ f.	62-147001001*	R14	Resistor, plate load, 1 megohm	66-5108340*
C12	Condenser, d-c blocking, 470 $\mu$ f.	62-147001001*	R15	Tone control, 1 megohm	33-5565-1
C13	Condenser, a-v-c filter, .047 $\mu$ f.	30-4650-45	R16	Resistor, grid return, 2.2 megohms	66-5228340*
C14	Condenser, d-c blocking, 100 $\mu$ f.	62-110009001*	R17	Resistor, bias, 220 ohms	66-1228340*
C15	Condenser, osc. plate by-pass, .004 $\mu$ f.	60-20395404*	S1	Switch, on-off	Part of R10
C16	Condenser, screen by-pass, .047 $\mu$ f.	30-4650-45	T1	Transformer, output	32-8323
C17A	Condenser, trimmer, 1st i-f pri.	Part of Z1	TC1	Tuning core, SW-2 osc.	Part of L8
C17B	Condenser, trimmer, 1st i-f sec.	Part of Z1	WS1	Aerial switch-and-plate assembly	76-4252
C18	Condenser, a-v-c filter, .047 $\mu$ f.	30-4650-45	WS2	R-f switch-and-plate assembly	76-4252-1
C19A	Condenser, trimmer, 2nd i-f sec.	Part of Z2	WS3	Osc. switch-and-plate assembly	76-4252-2
C19B	Condenser, 100 $\mu$ f., coupling	Part of Z2	Z1	Transformer, 1st i-f	32-3895-2
C19C	Condenser, 100 $\mu$ f., diode filter	Part of Z2	Z2	Transformer, 2nd i-f	32-3897-2
C19D	Condenser, 100 $\mu$ f., diode filter	Part of Z2			
C20	Condenser, d-c blocking, .01 $\mu$ f.	30-4650-41			
C21	Condenser, screen by-pass, .01 $\mu$ f.	30-4650-41			
C22	Condenser, d-c blocking, .0033 $\mu$ f.	30-4650-55			
C23	Condenser, by-pass, 240 $\mu$ f.	60-10245307*			
C24	Condenser, tone, hi-cut, .047 $\mu$ f.	30-4650-45			
C25	Condenser, tone, plate by-pass, .0033 $\mu$ f.	30-4650-55			
C26	Condenser, electrolytic, filter, 40 $\mu$ f., 150v	30-2548			
L1	Coil, BC aerial	32-4338			
L2	Coil, SW-1 aerial	32-4337			
L3	Coil, SW-2 aerial	32-4336			
L4	Coil, BC r-f	32-4341			
L5	Coil, SW-2 r-f	32-4339			
L6	Coil, SW-1, r-f	32-4340			
L7	Coil, BC osc.	32-4344			
L8	Coil, SW-2 osc.	32-4342			
L9	Coil, SW-1 osc.	32-4343			

MISCELLANEOUS		Service Part No.
<b>Description</b>		
<b>Cabinet and Cabinet Parts</b>		
Back		54-7412
Baffle-and-cloth assembly		40-6929
Cabinet		10618G
<b>Dial Scale and Backplate Parts</b>		
Dial cord (25-ft. spool)		45-8750*
Pointer		56-2896FCP
Scale		54-5037
Strap, scale mounting, R.H.		56-2672FA3
Strap, scale mounting, L.H.		56-2671FA3
Scale plate, flag, and upright assembly		76-4306
Spring, gang-and-pointer drive, (2 required)		28-8913FA3
Spring, flag drive		28-9011FA3
Knob (4 required)		54-4376
Shaft, drive		56-6357FCP
Socket, Octal (4)		27-6207
Socket, miniature (1)		27-6226
Spring, transfer cam (flag drive)		57-0701FA1
Spring, retaining, transfer cam		57-1468FA1
Transfer-lever assembly (flag drive)		76-1655-2