

# PHILCO-TROPIC RADIO-PHONOGRAPH

## MODELS 3402, 3403 and 3451

Models 3402 and 3403 are identical table models, with the exception of the record-changer section. Model 3402 uses the M-9 Record Changer, while

Model 3403 uses the M-9C Record Changer and Record Player Combination. Model 3451 is identical to Model 3403, except for the cabinet, which is a wood console.

### SPECIFICATIONS

#### CABINET

Models 3402 and 3403 ..... Brown bakelite, table-model radio-phonograph  
 Model 3451 ..... Wood console, mahogany finish

CIRCUIT ..... 5-tube, 5-band superheterodyne

AUDIO OUTPUT ..... 3 watts

#### FREQUENCY RANGES

Standard Broadcast ..... 540—1600 kc.  
 Short Wave 1 ..... 2.3—5.8 mc.  
 Short Wave 2 ..... 5.7—9.3 mc.  
 Short Wave 3 ..... 9.2—12 mc.  
 Short Wave 4 ..... 11.6—22 mc.

INTERMEDIATE FREQUENCY ..... 455 kc.

OPERATING VOLTAGES ..... 105—125 volts or 220—250 volts, 50 or 60 cycles, a.c.

POWER CONSUMPTION ..... Radio—47 watts at 117 volts; 60 watts at 234 volts  
 Phonograph—60 watts at 117 volts, 70 watts at 234 volts

AERIAL ..... 100-foot, conventional L-type, such as Philco Part No. 45-1494

PHILCO TUBES (5) ..... 7S7 converter, 7A7 i-f amplifier, 7B6 detector and 1st audio,  
 7C5 power output, 7Y4 rectifier

#### PHONOGRAPH

Model 3402 ..... M-9 Record Changer (for service information, refer to Page 493)

Models 3403 and 3451 ..... M-9C Record Changer and Record Player Combination (for service information, refer to Page 511)

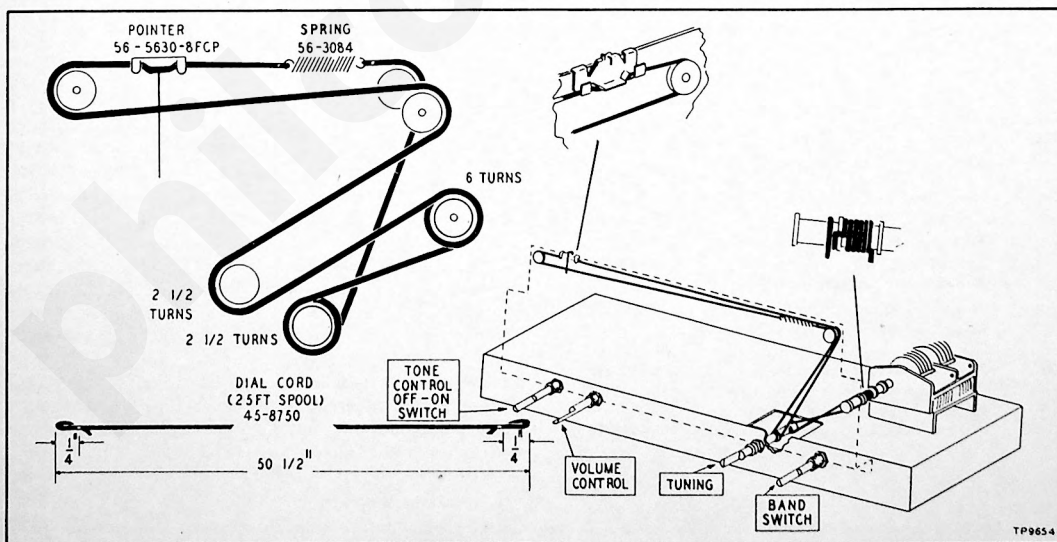
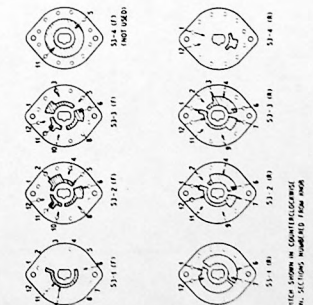
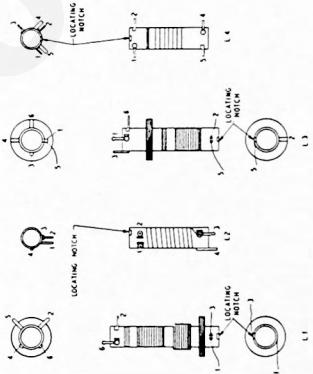
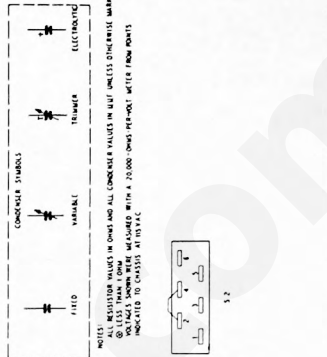
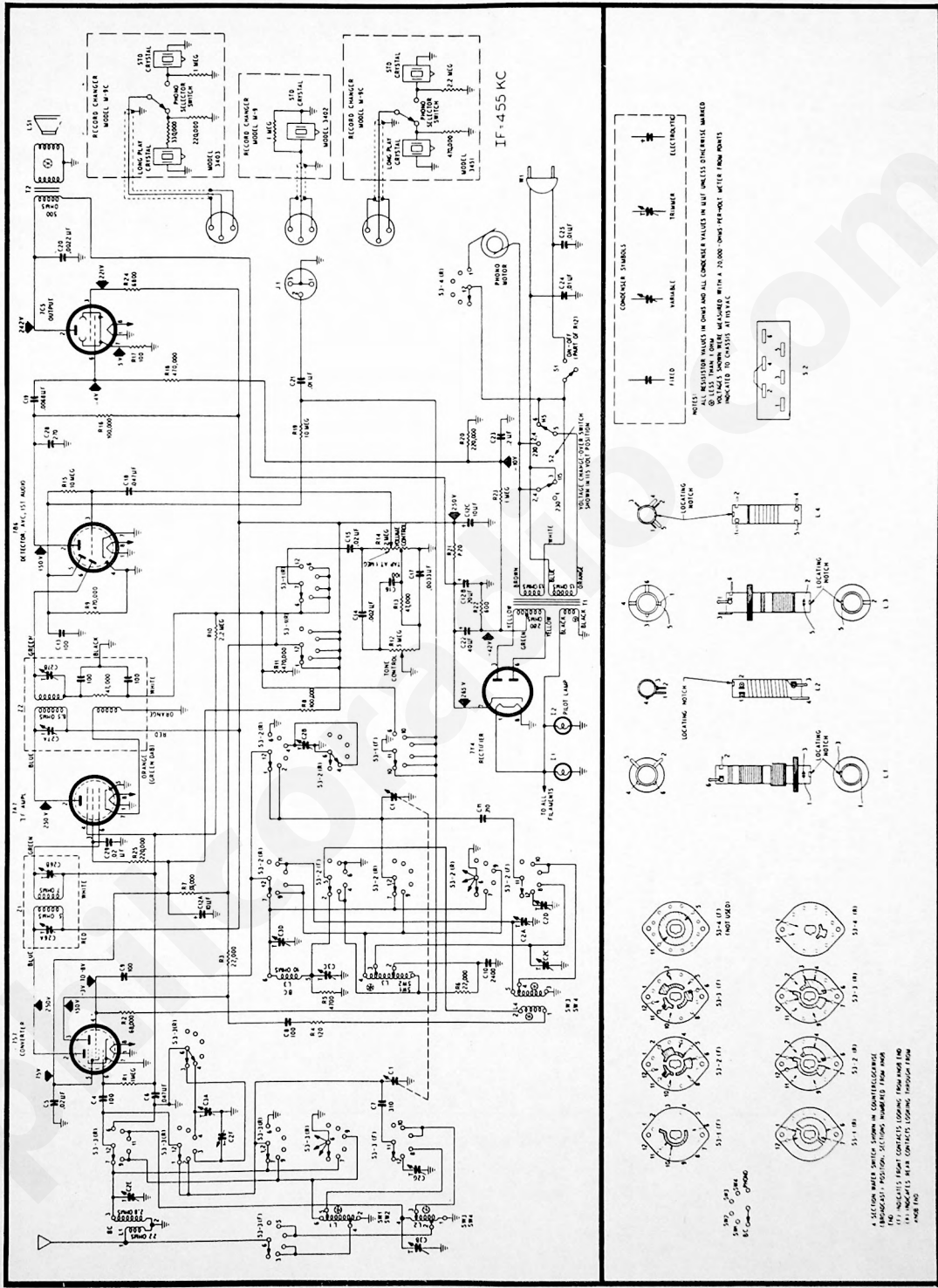


Figure 1. Drive-Cord-Installation Details



1. SECTION WIRE SWITCH SHOWN IN CONTRASTING POSITION  
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 50. SECTION WIRE SWITCH SHOWN IN CONTRASTING POSITION

Figure 2. Philco-Tropic Radio-Phonograph Models 3402, 3403, and 3451, Schematic Diagram

# PROCEDURE

**CONTROLS**—Set the radio volume control to maximum, and the tone control for maximum treble response (fully counterclockwise without turning set off). Set the band switch, tuning control, and signal-generator frequency as indicated in the chart.

**OUTPUT METER**—Connect across the voice coil.

**OUTPUT LEVEL**—During alignment, the signal-generator output must be attenuated to hold the output reading below 1.5 volts.

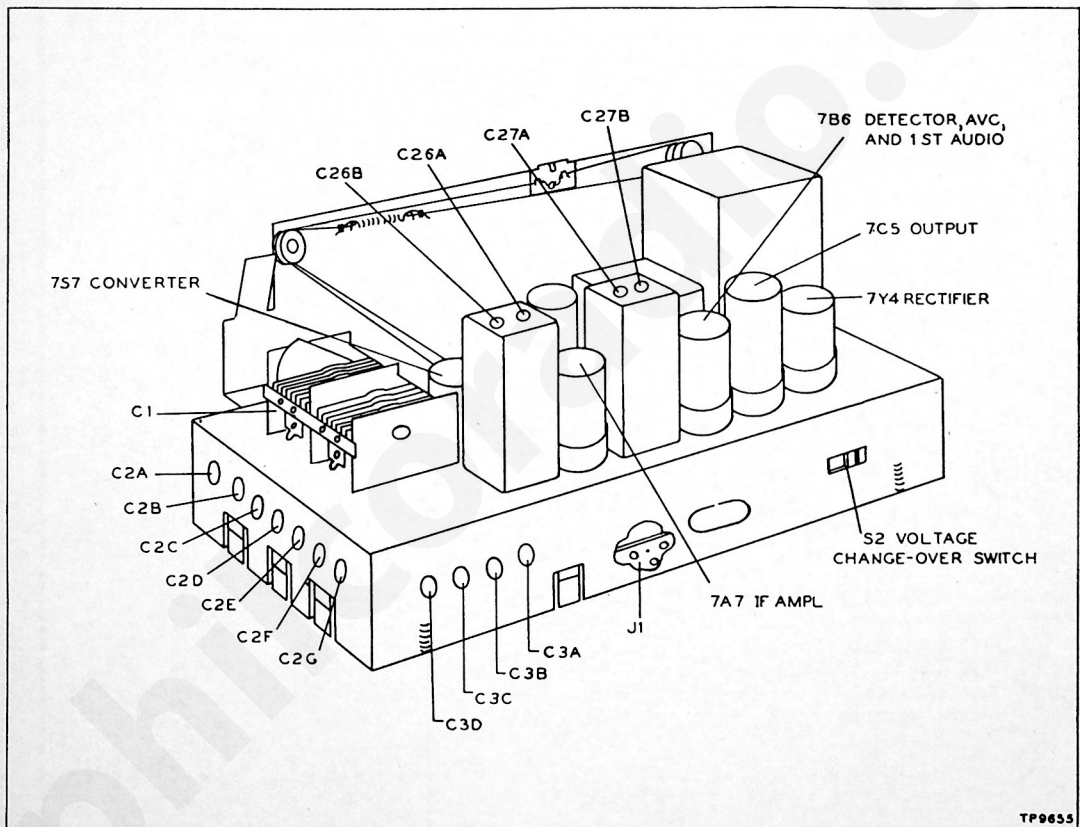


Figure 3. Top View, Showing Trimmer Location

# ALIGNMENT

**CAUTION:** Before connecting the radio to the power source, make certain that the voltage change-over switch (S2) is correctly set for the line voltage.

**DIAL POINTER**—With the tuning condenser plates fully meshed, adjust the dial pointer to coincide with the index mark to the left of "55" on the BC scale.

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

STEP	SIGNAL GENERATOR		RADIO			ADJUST
	CONNECTION TO RADIO	DIAL SETTING	BAND SWITCH	DIAL SETTING	SPECIAL INSTRUCTIONS	
1	Through .05- $\mu$ f. condenser to rear section of tuning gang.	455 kc.	BC	550 kc.	Adjust, in the order given, for maximum output; then repeat.	C27B—2nd i-f sec. C27A—2nd i-f pri. C26B—1st i-f sec. C26A—1st i-f pri.
2	Through 400-ohm, non-inductive resistor to aerial lead.	22 mc.	SW4	22 mc.	Adjust for maximum.	C2A—SW4 osc.
3	Same as step 2.	21 mc.	SW4	21 mc.	Adjust for maximum.	C3B—SW4 aerial
4	Same as step 2.	12 mc.	SW3	12 mc.	Adjust, in the order given, for maximum output.	C2B—SW3 osc. C3A—SW3 aerial
5	Same as step 2.	9.3 mc.	SW2	9.3 mc.	Adjust for maximum.	C2C—SW2 osc.
6	Same as step 2.	9.0 mc.	SW2	9.0 mc.	Adjust for maximum.	C2F—SW2 aerial
7	Same as step 2.	5.8 mc.	SW1	5.8 mc.	Adjust, in the order given, for maximum output.	C2D—SW1 osc. C2G—SW1 aerial
8	Through 200- $\mu$ f. condenser to aerial lead.	1600 kc.	BC	1600 kc.	Adjust for maximum.	C3D—BC osc.
9	Same as step 8.	1500 kc.	BC	1500 kc.	Adjust for maximum.	C2E—BC aerial
10	Same as step 8.	580 kc.	BC	580 kc.	Adjust for maximum while rocking tuning control.	C3C—BC osc. (series)
11	Repeat steps 8, 10, and 8 until no further improvement is noted.					

# 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.
C1	Condenser, tuning gang, 2-section	31-2723-2
C2	Condenser, trimmer assembly, 7-section	31-6414-5
C3	Condenser, trimmer assembly, 4-section	31-6414-2
C4	Condenser, d-c blocking, 100 $\mu$ f.	60-10105407
C5	Condenser, screen by-pass, .02 $\mu$ f.	61-0108*
C6	Condenser, $\alpha$ -v-c filter, .047 $\mu$ f.	30-4650-45
C7	Condenser, fixed tracker, 310 $\mu$ f.	30-1220-11
C8	Condenser, d-c blocking, 100 $\mu$ f.	60-10105407
C9	Condenser, d-c blocking, 100 $\mu$ f.	60-10105407
C10	Condenser, fixed tracker, 2400 $\mu$ f.	60-20245304
C11	Condenser, fixed tracker, 310 $\mu$ f.	30-1220-11
C12	Condenser, electrolytic, 3-section	30-2570-15
C12A	Condenser, electrolytic, filter, 10 $\mu$ f., 450v	Part of C12
C12B	Condenser, electrolytic, filter, 20 $\mu$ f., 450v	Part of C12
C12C	Condenser, electrolytic, filter, 10 $\mu$ f., 450v	Part of C12
C13	Condenser, bias filter, 100 $\mu$ f.	60-10105407
C14	Condenser, tone compensation, .002 $\mu$ f.	61-0062*
C15	Condenser, d-c blocking, .02 $\mu$ f.	61-0108*
C16	Condenser, tone compensation, 100 $\mu$ f.	60-10105407
C17	Condenser, tone compensation, .0033 $\mu$ f.	30-4650-55
C18	Condenser, d-c blocking, .047 $\mu$ f.	30-4650-45
C19	Condenser, d-c blocking, .0068 $\mu$ f.	30-4650-57
C20	Condenser, plate by-pass, .0022 $\mu$ f.	30-4650-54
C21	Condenser, d-c blocking, .01 $\mu$ f.	61-0120*
C22	Condenser, electrolytic, filter, 40 $\mu$ f., 450v	45-6252
C23	Condenser, bias filter, 2 $\mu$ f.	45-3500-3*
C24	Condenser, line filter, .01 $\mu$ f.	30-4650-58
C25	Condenser, line filter, .01 $\mu$ f.	30-4650-58
C26A	Condenser, trimmer, 1st i-f pri.	Part of Z1
C26B	Condenser, trimmer, 1st i-f sec.	Part of Z1
C27A	Condenser, trimmer, 2nd i-f pri.	Part of Z2
C27B	Condenser, trimmer, 2nd i-f sec.	Part of Z2
C28	Condenser, r-f by-pass, 270 $\mu$ f.	60-10275407*
C29	Condenser, screen by-pass, .02 $\mu$ f.	30-4650-60
I1	Pilot lamp	34-2064
I2	Pilot lamp	34-2064
J1	Socket, phono input	27-6126
L1	Coil, aerial (BC, SW-1, SW-2)	32-4330
L2	Coil, aerial, (SW-3, SW-4)	32-4195
L3	Coil, oscillator (BC, SW-1, SW-2)	32-4329
L4	Coil, oscillator (SW-3, SW-4)	32-4194
LS1	Speaker, p-m, 8-inch	
	Models 3402 and 3403	36-1629-2
	Model 3451	36-1626-2
R1	Resistor, grid return, 1 megohm	66-5108340*
R2	Resistor, grid return, 68,000 ohms	66-3688340*
R3	Resistor, plate load, 22,000 ohms	66-3228340*
R4	Resistor, oscillator stabilizer, 120 ohms	66-1128340*
R5	Resistor, oscillator suppressor, 4700 ohms	66-2478340*
R6	Resistor, oscillator suppressor, 22,000 ohms	66-3228340*
R7	Resistor, screen voltage divider, 56,000 ohms	66-3568340*
R8	Resistor, voltage dropping, 100,000 ohms	66-4108340*
R9	Resistor, diode load, 470,000 ohms	66-4478340*
R10	Resistor, $\alpha$ -v-c filter, 2.2 megohms	66-5228340*
R11	Resistor, diode load, 470,000 ohms	66-4478340*
R12	Tone control (with on-off switch), 5 megohms	33-5535-22
R13	Resistor, bass-boost, 47,000 ohms	66-3478340*
R14	Volume control, 2 megohms (tapped at 1 megohm)	33-5566-2

Reference Symbol	Description	Service Part No.
R15	Resistor, grid return, 10 megohms	66-6108340*
R16	Resistor, plate load, 100,000 ohms	66-4108340*
R17	Resistor, cathode bias, 100 ohms, 1 watt	66-1104340*
R18	Resistor, grid return, 470,000 ohms	66-4478340*
R19	Resistor, phono voltage divider, 10 megohms	66-6108340*
R20	Resistor, bias voltage divider, 220,000 ohms	66-4228340*
R21	Resistor, filter, 820 ohms, 1 watt	66-1824340*
R22	Resistor, filter, 600 ohms, 3 watts	33-1334-10*
R23	Resistor, bias filter, 1 megohm	66-5108340*
R24	Resistor, screen dropping, 6800 ohms	66-2688340*
R25	Resistor, screen-dropping, 220,000 ohms	66-4228340*
S1	Switch, on-off	Part of R12
S2	Switch, voltage change-over	42-1569
S3	Switch, band	42-1882
T1	Transformer, power	32-8327
T2	Transformer, output	32-8330
W1	Line cord	L-2183*
Z1	Transformer, 1st i-f	32-4345
Z2	Transformer, 2nd i-f	32-4346

## MISCELLANEOUS

Description	Service Part No.
Cabinet, mahogany (Model 3451)	10725E
Back	54-7716
Bin mechanism (l.h.)	76-3223-5
Bin mechanism (r.h.)	76-3223-6
Cardboard-baffle-and-cloth assembly	40-6991-2
Dial scale	54-5045
Dome (4 required)	45-6190
Door pull	56-4420
Frame assembly, changer mounting	76-4104
Knob, band-change	54-4527-16
Knob, off-on	54-4527-17
Spring, changer-mounting (6 required)	56-3043FA15
Spring, bin mechanism (2 required)	56-4978
Cabinet, Models 3402 and 3403	10740
Back	54-7716
Baffle-and-cloth assembly	40-7644
Dial scale	54-5048
Knob, band-change	54-4527-19
Knob, tone-off-on	54-4527-18
Spring, changer-mounting (6 required)	56-3043FA3
Cable, speaker	41-3751-4
Dial-backplate assembly	76-4412
Drive cord (25-foot spool)	45-8750*
Pointer	56-5630-8FCP
Spring, gang and pointer	56-3084
Knob, tuning	54-4527-14
Knob, volume	54-4527-20
Pilot-lamp assembly	27-6233-8
Pilot-lamp assembly	27-6233-4
Plug, a-c (Continental)	L-3275
Shaft, drive	31-2738
Socket, Loktal (5 required)	27-6207