PHILCO . . . . . Model 655

SERVICE BULLETIN
No. 235

For Members of
RADIO MANUFACTURERS SERVICE
A PHILCO SERVICE PLAN

Model 655

General Specifications

TYPE CIRCUIT: Superheterodyne, with preselector R.F. amplifier, and push-pull triode output (10 watts); built in connections for Philco All-wave aerial; aerial selector built into and operated by wave-band switch.

POWER SUPPLY: 115v., 60 cycle A.C.

TUBES USED: 1 type 78, R.F.; 1 type 6A7, Detector-Oscillator; 1 type 78, I.F.; 1 type 75, 2d Detector and 1st A.F.; 1 type 42, Driver; 2 type 42's, Push-Pull Output; 1 type 80, Rectifier.

WAVE BANDS: Three: (1) Short-wave; (2) Police, aircraft and amateur; (3) Standard.

COVERAGE OF EACH BAND: Band 1, 5.75–18 M.C.; Band 2, 1.75–5.8 M.C.; Band 3, 540–1750 K.C.

TUNING DRIVE: Dual planetary, ball bearing. 80 to 1 ratio for slow-speed tuning; glowing arrow wave band indicator.

PROGRAM CONTROL: 4-position, with bass compensation effective in first position (counter-clockwise).

INTERMEDIATE FREQUENCY: 460 K.C.

POWER CONSUMPTION: 100 watts.

SPEAKER: 655 Baby Grand Model—K17; Furniture Model—H13.

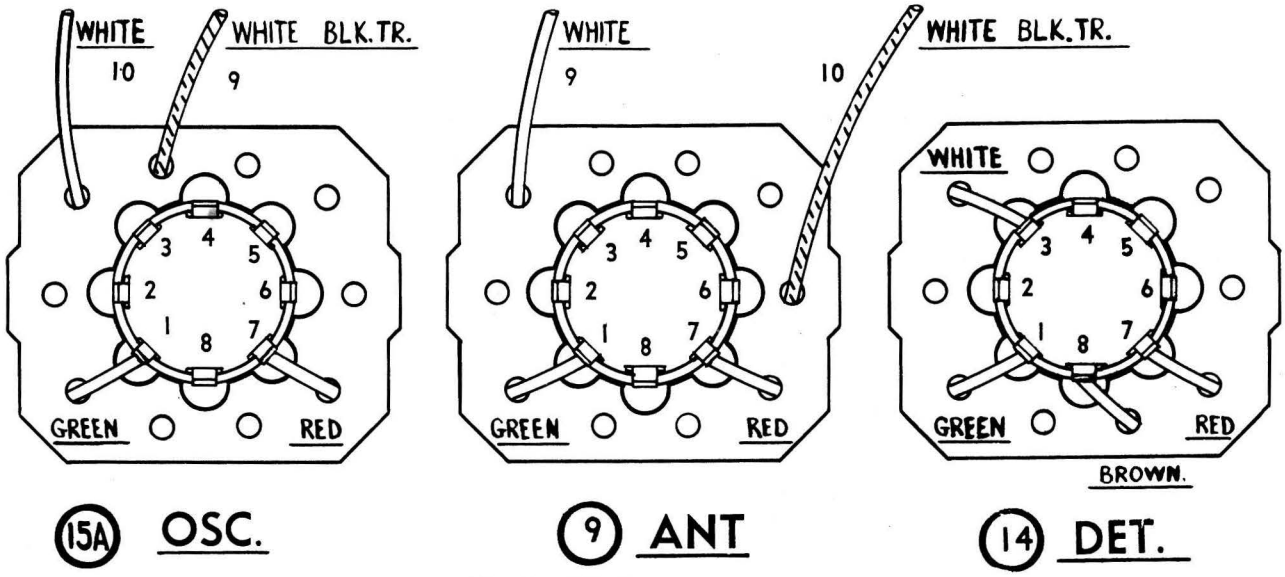

Fig. 1. R.F. Transformers

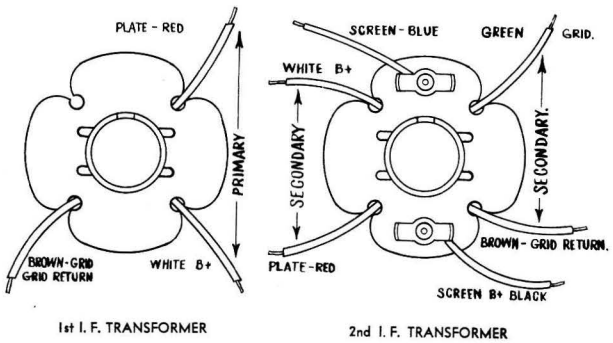

Fig. 2. I.F. Transformers

TUBE SOCKET VOLTAGES
(Measured from Tube Contact to Gnd.)

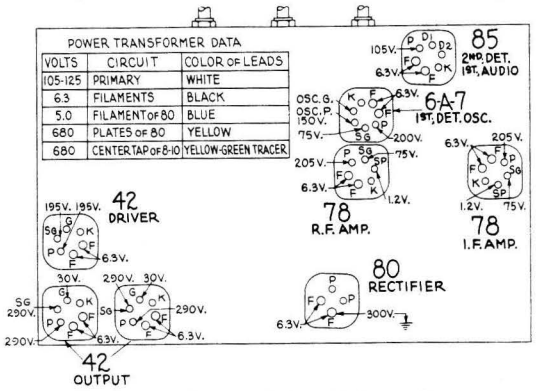

Fig. 3. Tubes as Viewed from Bottom

The voltages at the points indicated by the arrows above were obtained with a Philco type 025 Circuit Tester which contains a high resistance (1000 ohms per volt) voltmeter. Volume control at minimum, waveband switch at standard broadcast. K17 speaker.

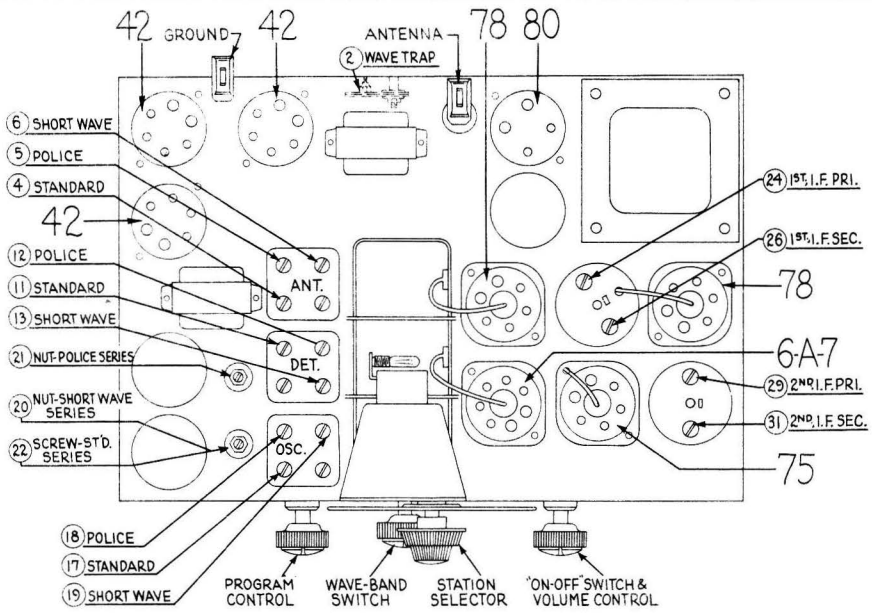

Fig. 4. Location of Compensating Condensers

Adjusting Compensating Condensers

Adjustment of compensating condensers in Model 655 requires an accurate signal generator covering I.F., standard-wave, police and short-wave frequencies. The **PHILCO Model 088 All-Wave Signal Generator,** having a continuous range of from 100 to 20,000 K.C., is ideal for this purpose.

An output meter is also needed. **PHILCO Model 025 Circuit Tester** includes a high grade output meter.

Philco No. 3164 fibre wrench and No. 27-7059 fibre-handled screwdriver complete the equipment needed for making these adjustments. The locations of the various compensating condensers are shown in Fig. 4. Connect the output meter to the plate contacts of the type 42 output tubes (using the adapters provided with the "025") and set it at the 0-30 volt range.

INTERMEDIATE FREQUENCY: Set the signal generator at 460 K.C. with attenuator set at minimum, connect a .001 mf. condenser in series with its antenna lead and attach it to the grid cap of the 78 I.F. amplifier tube. Connect ground lead to ground terminal on set. Set the dial at 55 and turn the waveband switch to position 3 (extreme left). Adjust the volume control of set to almost maximum, and the 088 attenuator so that about one-fourth (¼) scale reading is had on the output meter. With a fibre screwdriver adjust condensers ㉙ and ㉛ (2nd I.F.) for maximum reading on output meter. Turn attenuator of signal generator to minimum and remove its antenna lead from the grid of the 78 I.F. tube; place it on the grid of the 6A7. Adjust 088 attenuator as before, then proceed to adjust condensers ㉔ and ㉖ (1st I.F.) for maximum output meter reading. Then remove the 088 oscillator lead. Care should be taken to keep the output meter reading during adjustments at about one-fourth scale reading. This should be done by using the 088 attenuator control.

WAVE TRAP: Connect the Signal Generator antenna and ground leads to the antenna and ground posts of the set. With the signal generator operating at 460 K.C. and the set controls adjusted as before for I.F. alignment, adjust wave trap ② until a minimum reading is obtained in the output meter.

SHORT WAVE: In adjusting the short wave or high frequency band, the det. compensator will have a tendency to "pull" or **change** the frequency of the oscillator. By shunting a padding or variable condenser (about .00025 Mf.) across the oscillator section of the gang (front section) and tuning it so that the second harmonic, instead of the fundamental, beats with the incoming signal, this "pull" can be minimized. The procedure for tuning this band is as follows:

Set the dial of the receiver at 18 megacycles (top scale) and the 088 dial at the same frequency. Turn wave band switch to position 1 (extreme right). Connect the shunt condenser to the oscillator section of the gang and tune it so that the second harmonic of the oscillator beats with the 18 M.C. signal from the 088. Next tune condensers ⑥ and ⑬ (antenna and det.) for maximum reading of the output meter. Disconnect shunt condenser and tune condenser ⑲ (osc.) for correct dial calibration. The set, oscillator frequency, when correctly adjusted, will be higher than that of the incoming signal. In order to check this it should be possible to pick up the 18 M.C. 088 oscillator signal as an image signal by increasing the 088 output and tuning the set to approximately 17.1 M.C.

For the low frequency adjustment of this band, turn the dial to 6.0 M.C., set the signal generator at 6.0 M.C. and adjust condenser ⑳ (nut) for maximum output meter reading. Readjust condenser ⑲ at 18.0 M.C.

POLICE: Turn wave band switch to position 2 (center), set signal generator at 5500 and dial of set at 5.5. Adjust condensers ⑱, ⑤ and ⑪ (osc., ant., and det.) for maximum output. Turn the set dial to 1.8 and the signal generator to 1800. Adjust condenser ㉑ (nut) (osc. series) for maximum output meter reading.

STANDARD WAVE: Turn waveband switch to position 3 (extreme left), set signal generator at 1500 and dial of set at 150. Now adjust the oscillator, antenna and det. "Standard" condensers. These are ⑰, ④ and ⑪ respectively.

Turn the dial to 60, set signal generator at 600 and adjust condenser ㉒ (oscillator standard series), (screw) for maximum output meter reading.

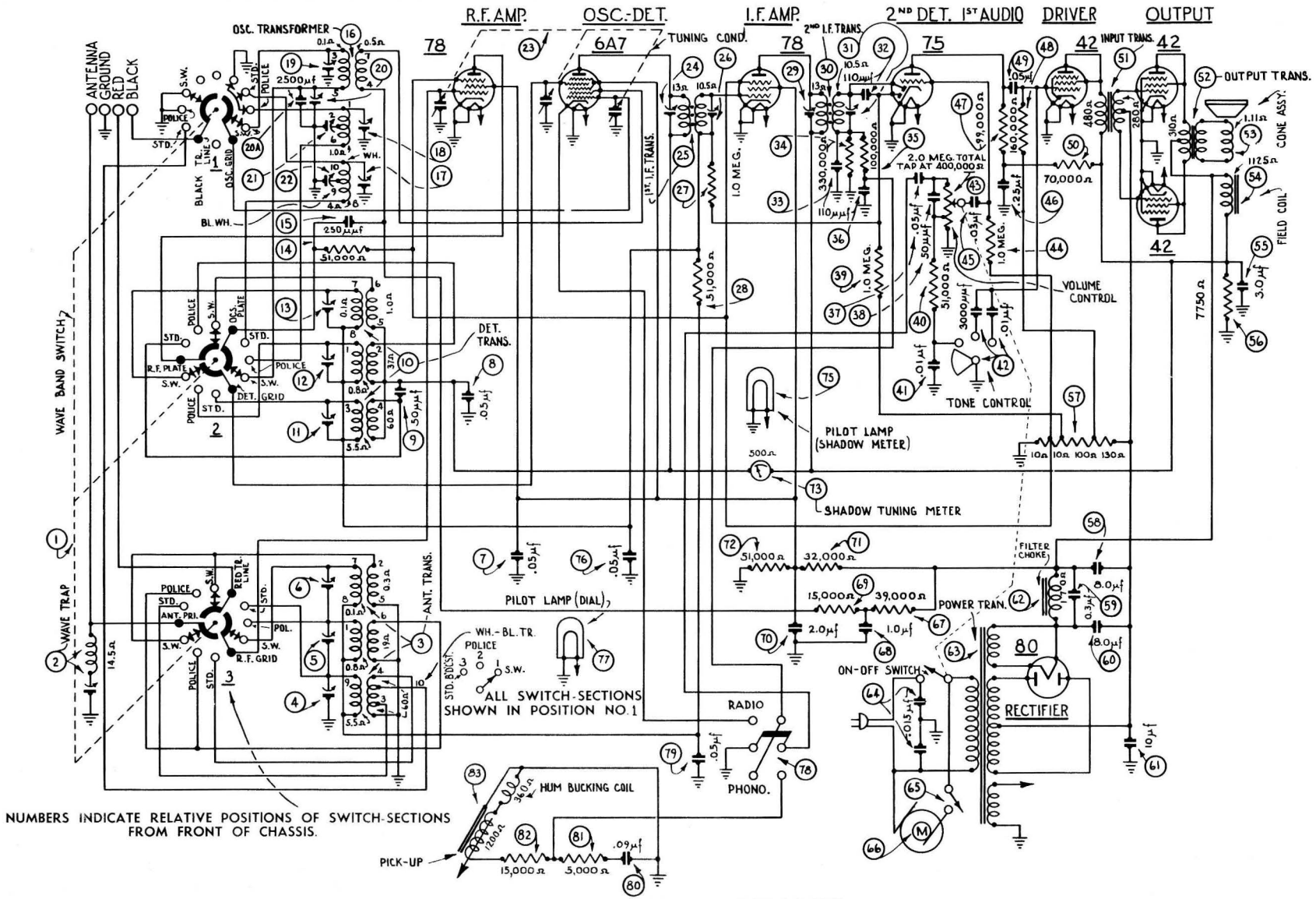

Fig. 5. Schematic Diagram of Model 655

Model 655

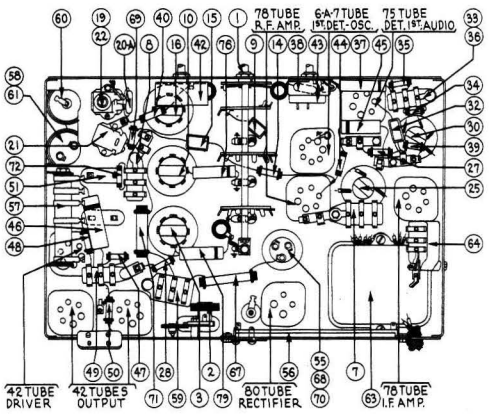

Fig. 6. Base View

Schematic Number	Part and Description	Part No.	List Price
①	Wave Band Switch	42-1153	$2.00
②	Wave Trap	38-6850	1.10
③	Ant. Transformer	32-1867	3.00
④⑤⑥	Compensater (Standard) (Ant.) / Compensater (Police) (Ant.) / Compensater (Short-Wave) (Ant.)	31-6058	.60
⑦	Condenser (.05 mf. Bakelite)	3615-SG†	.35
⑧	Condenser (.05 mf. Bakelite)	3615-SG†	.35
⑨	Condenser (50 mmf. Mica)	30-1029	.20
⑩	Det. Transformer	32-1868	3.00
⑪⑫⑬	Compensater (Standard) (Det.) / Compensater (Police) (Det.) / Compensater (Short-Wave) (Det.)	31-6063	.50
⑭	Resistor (51,000 ohm, ¼ watt)	33-351143	.20
⑮	Condenser (.00025 mf. Mica)	30-1032	.25
⑯	Osc. Transformer	32-1976	1.75
⑰⑱⑲	Compensater (Standard) (Osc.) / Compensater (Police) (Osc.) / Compensater (Short-Wave) (Osc.)	31-6058	.60
⑳	Compensater (Std. Series) (Osc.)	31-6027	.70
⑳a	Condenser (.0025 Mica)	7006	.40
㉑	Compensater (Police Series) (Osc.)	31-6073	.50
㉒	Compensater (Short-Wave Series) (Osc.)	Part of ⑳	
㉓	Tuning Condenser	31-1555	4.50
㉔	Compensater (1st I.F. Pri.)	31-6053	.50
㉕	1st I.F. Transformer	32-1917	1.75
㉖	Compensater (1st I.F. Sec.)	Part of ㉔	
㉗	Resistor (1.0 meg., ¼ watt)	33-510143	.20
㉘	Resistor (51,000 ohm, ¼ watt)	33-351143	.20
㉙	Compensater (2nd I.F. Pri.)	31-6053	.50
㉚	2nd I.F. Transformer	32-1836	1.60
㉛	Compensater (2nd I.F. Sec.)	Part of ㉙	
㉜	Condenser (.00011 mf. Mica)	30-1030	.20
㉝	Condenser (.00011 mf. Twin Bakelite)	8035-DG†	.25
㉞	Resistor (330,000 ohm, ¼ watt)	33-433133	.20
㉟	Resistor (99,000 ohm, ¼ watt)	33-399143	.20
㊱	Condenser (.00011 mf.)	Part of ㉝	
㊲	Condenser (.05 mf. Tubular)	30-4020	.20
㊳	Condenser (50 mmf. mica)	30-1029	.20
㊴	Resistor (1.0 megohm, ¼ watt)	33-510143	.20
㊵	Resistor (51,000 ohm, ¼ watt)	33-351143	.20
㊶	Condenser (.01 mf.)	Part of ㊷	
㊷	Program Control	30-4378‡	.75
㊸	Volume Control	33-5108	1.45
㊹	Resistor (1.0 megohm, ¼ watt)	33-510143	.20
㊺	Condenser (.03 mf. Tubular)	30-4025	.20
㊻	Condenser (.25 mf. Tubular)	30-4134	.35
㊼	Resistor (99,000 ohm, ¼ watt)	33-399143	.20
㊽	Resistor (160,000 ohm, ¼ watt)	33-416133	.20
㊾	Condenser (.05 mf. Bakelite)	3615-SU†	.35
㊿	Resistor (70,000 ohm, ¼ watt)	33-370133	.20
(51)	Input Transformer	32-7114	3.00
(52)	Output Transformer	32-7078	1.25
(53)	Voice Coil & Cone Assy. (B.G. K-17)	*36-3159	.80
(54)	Field Coil Assy. (B G. K-17)	†36-3104	2.70
(55)	Electrolytic Condenser (3.0-1.0-2.0 mf.)	30-2122	1.85
(56)	B. C. Resistor (7750 ohm)	33-3211	.65
(57)	B. C. Resistor (10-10-100-130 ohm)	33-3226	.25
(58)	Electrolytic Condenser (8.0-10.0 mf.)	30-2045	1.80
(59)	Condenser (.3 mf. Bakelite)	6287-DU†	.40
(60)	Electrolytic Condenser (8.0 mf.)	30-2025*	1.35
(61)	Electrolytic Condenser (10 mf.)	Part of (58)	
(62)	Filter Choke	32-7115	1.80
(63)	Power Transformer (115 V., 60 cycle)	32-7402	4.50
(64)	Condenser (.015 Twin Bakelite)	3793-DG†	.40
(65)	Phono-motor switch assy.	6345	3.15
(66)	Phono-motor (115 V., 60 cycle)	35-1002	23.00
(67)	Resistor (39,000 ohm, 1 watt)	33-339443	.20
(68)	Electrolytic Condenser (1.0 mf.)	Part of (53)	
(69)	Resistor (15,000 ohm, ¼ watt)	33-315133	.20
(70)	Electrolytic Condenser (2.0 mf.)	Part of (53)	
(71)	Resistor (32,000 ohm, 2 watt)	33-332533	.30
(72)	Resistor (51,000 ohm, ½ watt)	33-351343	.20
(73)	Shadow Tuning Meter	45-2083	2.50
(74)	Pilot lamp (shadow meter)	34-2064	.09
(76)	Condenser (.05 mf. Tubular)	30-4020	.20
(77)	Pilot lamp (dial)	34-2039	.15
(78)	Phono-radio switch assy.	35-3014	1.30
(79)	Condenser (.05 mf. Tubular)	30-4020	.20
(80)	Condenser (.09 mf. Bakelite)	4989-SU†	.35
(81)	Resistor (5,000 ohm)	33-250123	.20
(82)	Resistor (15,000 ohm)	33-315133	.20
(83)	Pickup head	35-2014	7.25
	Pickup arm	35-2010	8.30
	Phono-motor (115 V., 50 cycle)	35-1007	23.00
	Phono-motor (115 V., 40 cycle)	35-1003	35.00
	Phono-motor (115 V., 25 cycle)	35-1008	35.00
	Phono-motor (230 V., 60 cycle)	35-1004	28.50
	Phono-motor (230 V., 50 cycle)	35-1009	....
	Phono-motor (230 V., 40 cycle)	35-1005	....
	Phono-motor (230 V., 25 cycle)	35-1006	....
	Hum Bucking coil	32-1940	1.10
	Radio-phono switch plate	28-2250	.10
	Switch Pointer	4277	.02
	Needle Cup	28-2222	.05
	Needle Cup Cover	28-2223	.05
	Speed Change lever	28-1648	.25
	Speed Change lever spring	28-1649	.05
	Speed Change lever spacer	28-6103	.03
	Speed Change lever washer	5577	.25C
	Turntable	35-3001	9.00
	Motor Board	25869	3.00
	Motor Board mtg. washer	27-4199	1.60C
	Motor Board mtg. washer	28-2089	.30C
	Motor Board mtg. washer	W-464-A	.55C
	Motor Board mtg. screw	W-461-B	.01
	Motor Board mtg. nut	W-149-A	.45C
	Motor Connector plug	4091	.30
	Shadow Meter light shield	28-2917	.02
	Glowing arrow screen	27-5159	.10
	Glowing arrow mask	27-5160	.20
	Scale guard	27-8140	.01
	Screen bracket	29-3061	.07
	Mask arm	29-3274	.03
	Coupling	29-3339	.06
	Link	29-3338	.03
	Shadow Screen	27-5120	1.50C
	Speaker Cable	02722	.30
	Knob (Phono-Radio)	03334	.10
	Knob (Tuning)	27-4206	.12
	Knob (Slow Speed Tuning)	27-4207	.10
	Knob (Volume Program Control)	27-4208	.10
	Knob (Wave Band)	27-4225	.10
	Socket (4-prong)	27-6044	.10
	Socket (6-prong)	27-6036	.11
	Socket (7-prong)	27-6037	.11
	Speaker Socket	27-6043	.08
	Tube Shield Body	28-2726	.10
	Tube Shield Base	28-2725	.03
	R. F. Shield	38-6921	.35
	I. F. Shield	38-6808	.25
	Wave Switch Nut	W-684-A	1.25C
	Power Transformer (115 V., 25 cycle)	32-7403	9.00
	Power Transformer (230 V., 50-60 cycle)	32-7404	7.50
	Electrolytic Condenser clamp	6440	.05
	Electrolytic Condenser insulator	27-7194	.01
	Chassis Mtg. screw	W-1496-A	1.60C
	Chassis Mtg. washer (rubber)	27-4201	1.40C
	Chassis Mtg. cushion (rubber)	27-4202	.03
	Chassis Mtg. sleeve	28-3101	.04
	Mask	28-3433	.25
	Bezel	28-3164	.50
	Bezel mtg. screw	W-1494	.30C
	Bezel glass	27-8113	.07
	Bezel glass gasket	27-8036	.01
	Dial scale	27-5165	.30
	Hub & set screw assy.	31-1724	.15
	Pilot lamp bracket assy.	38-6789	.50
	B.C. Resistor mtg. screw	W-888	1.00C
	B.C. Resistor mtg. nut	W-317-A	.40C
	B.C. Resistor spacer	3791	.45C
	Front Bumper	27-4200	3.75C
	Dial scale (inverted type code 123)	27-5183	.30
	Speaker Trans. Terminal cover	02824	.10
	Bottom shield	38-7189	.40
	Speaker mtg. bolt	29-3128	.02
	Speaker mtg. nut	W-124-A	.35C
	*Voice coil cone assy. (Furn. H-13)	02625	1.20
	†Field coil assy. (Furn. H-13)	02803	2.70

*Code 122—30-2014 ‡Code 122—30-4379 †Code 122—Use Type "O" (ODG, etc.) Prefix Condensers

PRICES SUBJECT TO CHANGE WITHOUT NOTICE