

Philco Radio & Television Corp.

Model: 54

Chassis:

Year: Pre October 1937

Power:

Circuit:

IF:

Tubes:

Bands:

Resources

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PHILCO RADIO & TELEVISION CORP.

MODEL 54
Voltage
Data

THE PHILCO RADIO MODEL 54 is a five-tube superheterodyne, designed for operation on 110 volts, alternating current, 25, 60 cycles, and 110 volts direct current, employing the new Philco high efficiency tubes with pentode output and an Electro Dynamic Speaker. The set uses a Philco Type 6A7 tube as a first detector and oscillator; a Type 78 tube as intermediate frequency; a Type 75 tube as a second detector and oscillator; a Type 43 tube as pentode output and a Type 25-Z-5 tube as a rectifier and voltage doubler. The intermediate frequency for tuning the I. F. transformers is 460 kilocycles. The power consumption on both A. C. and D. C. is approximately 50 watts.

Table 1—Tube Socket Data*—A.C. Line Voltage 115 Volts

Circuit	Det. Osc.	I. F.	2nd Det.	Output	Rectifier
Type Tube	6A7	78	75	43	25-Z-5
Filament—Total 68—Refer to Note.					
Plate Volts—P to K.....	84	84	38	84	146
Screen Grid Volts—SG to K... K to G 3/5	65	52	..	90	....
Control Grid Volts—CG to K..	.15	.15	.25	.5	....
Cathode Volts—K to F.....	12	12	10	10	....

Table 2—Tube Socket Data*—D.C. Line Voltage 120 Volts

Circuit	Det. Osc.	I. F.	2nd Det.	Output	Rectifier
Type Tube	6A7	78	75	43	25-Z-5
Filament—Total 70—Refer to Note.					
Plate Volts—P to K.....	90	90	40	90	....
Screen Grid Volts—SG to K... 70	70	70		92	....
Control Grid Volts—CG to K..	.15	.15	.25	.5	....
Cathode Volts—K to F.....	7.5	7.5	10	10	....

NOTE—Due to filaments in series, test with suitable A. C. voltmeter across the two points on Resistor (X) marked with an X in Fig. 3.

* All of the readings above in Table 1 were taken from the under side of chassis, using test prods and leads with a suitable A. C. voltmeter for filament voltage and a high resistance, multi-range D. C. voltmeter for all other readings. Volume control at maximum and station selector set for 550 KC. Readings taken with a radio set tester and plug-in adapter will not be satisfactory.

NOTE—Due to filaments in series, test with suitable D. C. voltmeter across the two points on Resistor (X) marked with an X in Fig. 3.

* All of the readings above in Table 2 were taken from the under side of chassis, using test prods and leads with a suitable high resistance, multi-range D. C. voltmeter for all readings. Volume control at maximum and station selector set for 550 KC. Readings taken with a radio set tester and plug-in adapter will not be satisfactory.

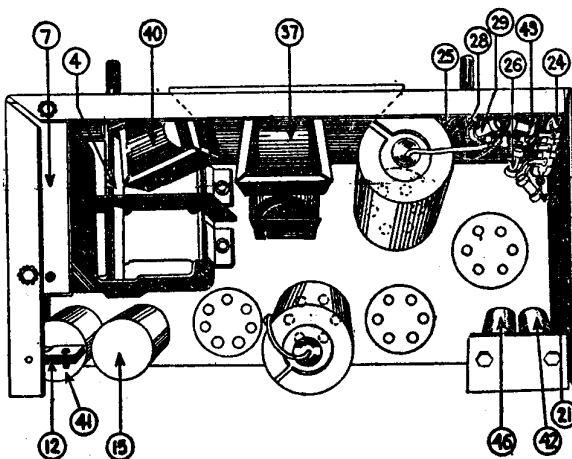


Fig. 1—Top View of Chassis Showing Parts

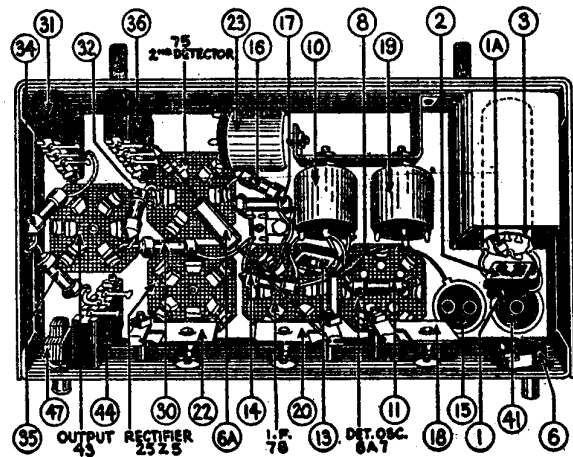
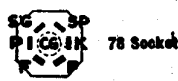


Fig. 2—Bottom View of Chassis Showing Parts



6A7 Socket



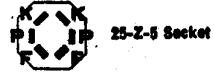
78 Socket



75 Socket



43 Socket



25-Z-5 Socket

Terminal Arrangement of Tube Sockets Viewed From Under Side of Chassis.

MODEL 54
Schematic
Parts List

PHILCO RADIO & TELEVISION CORP.

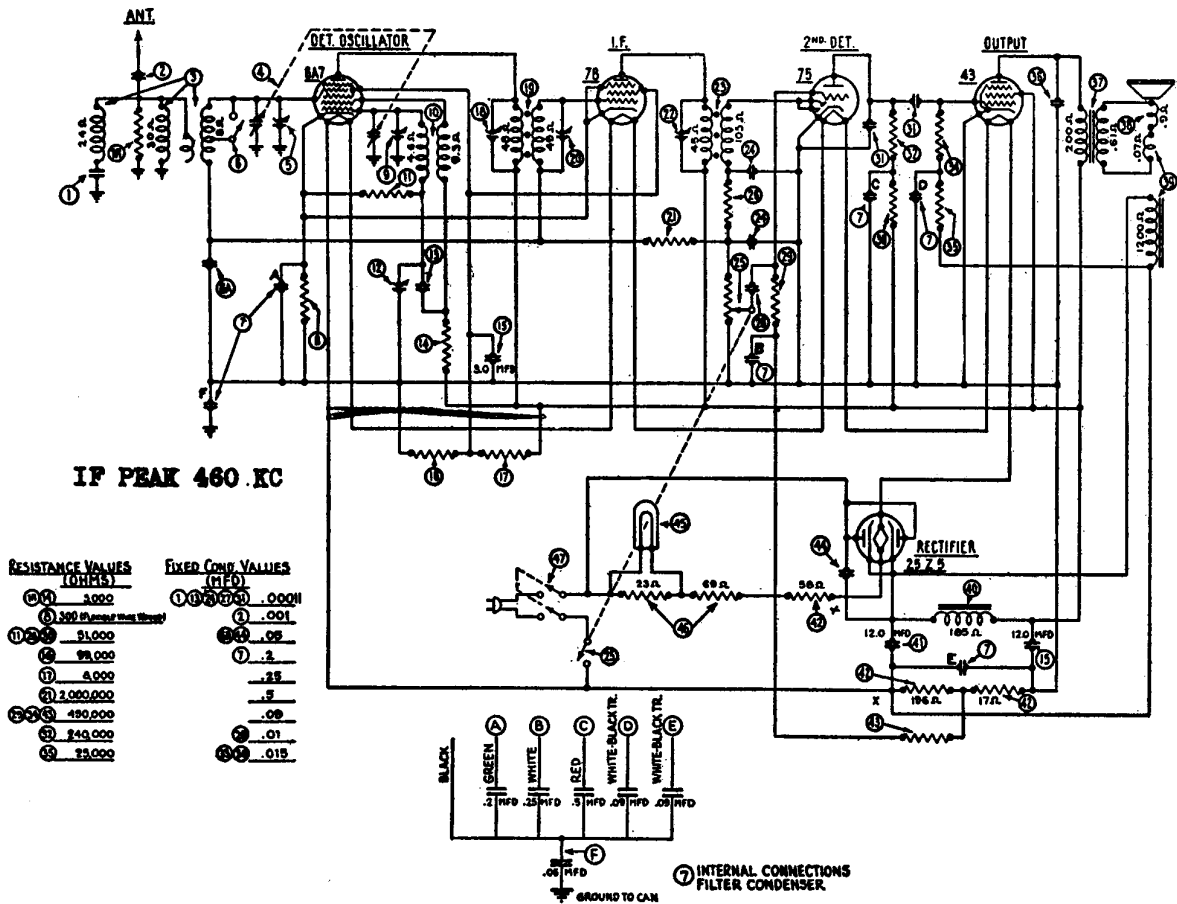


Fig. 3—Schematic Wiring Diagram

REPLACEMENT PARTS FOR MODEL 54

No. on Figs.	Description	Part No.	List Price	No. on Figs.	Description	Part No.	List Price
①	Condenser	30-1005	.16	②①	Condenser (Double)	8035-G	.20
①a	Resistor (Green-Black-Red)	6096	.20	②②	Volume Control and "On-Off" Switch	33-5010	1.00
②	Condenser	5215	.20	②③	Resistor (Green-Brown-Orange)	4518	.20
③	Antenna Transformer Assembly	32-1117	1.25	②④	Condenser	3903AM	.20
④	Tuning Condenser Assembly	31-1027	1.75	②⑤	Resistor (Yellow-White-Yellow)	6097	.20
⑤	Compensating Condenser (Part of ④)			②⑥	Resistor (Green-Brown-Orange)	4518	.20
⑥	Wave Band Switch	42-1027	.50	②⑦	Condenser (Double)	8035-F	.18
⑥a	Condenser	30-4020	.12	②⑧	Resistor (Red-Yellow-Yellow)	4410	.20
⑦	Filter Condenser (Block)	30-4023	1.00	②⑨	Resistor (Yellow-White-Yellow)	4517	.20
⑧	Resistor (Flexible)	33-3010	.15	②⑩	Resistor (Red-Green-Orange)	4516	.20
⑨	Compensating Condenser (High Frequency 1400) Part of ④			②⑪	Condenser	3793-Y	.16
⑩	Oscillator Coil	32-1118	1.00	②⑫	Output Transformer	32-7020	.80
⑪	Resistor (Green-Brown-Orange)	4518	.20	②⑬	Voice Coil and Cone Assembly	36-3029	
⑫	Compensating Condenser (Low Freq.)	04000-B	.19	②⑭	Field Coil and Pot Assembly	36-3040	1.60
⑬	Condenser	4519	.18	②⑮	Filter Choke	32-7036	.75
⑭	Resistor (Green-Black-Red)	5310	.20	②⑯	Electrolytic Condenser	30-2001	1.25
⑮	Electrolytic Condenser (Double)	30-2002	1.00	②⑰	Resistor (Wire Wound)	33-3012	.25
⑯	Resistor (White-White-Orange)	4411	.20	②⑱	Resistor (Yellow-White-Yellow)	6097	.20
⑰	Resistor (Gray-Black-Red)	5838	.20	②⑲	Condenser	3615-B	.30
⑱	Compensating Cond. (1st I. F. Primary)	04000-A	.14	②⑳	Pilot Lamp	4567	.11
⑲	1st I. F. Transformer	32-1115	.65	②㉑	Resistor (Wire Wound)	33-3011	.25
⑳	Compensating Condenser (1st I. F. Secondary)	04000-A	.14	②㉒	Safety Switch	42-1026	1.00
㉑	Resistor (Red-Black-Green)	5872	.20	②㉓	Tube Shield	28-1130	.10
㉒	Compensating Cond. (2nd I. F. Primary)	04000-A	.14	②㉔	Six Prong Socket	7547	.10
㉓	2nd I. F. Transformer	32-1116	.75	②㉕	Seven Prong Socket	27-6005	.10
				②㉖	Tuning Scale	27-5008	.12
				②㉗	Volume Control Scale	27-5010	.12

MODEL 37
 MODEL 43-121
 MODEL 54
 Changes

PHILCO RADIO & TELEVISION CORP.

Model 37

In Run No. 4, the cathode resistor \textcircled{a} is changed from Part No. 7352 (6,000 ohm) to Part No. 5838 (8,000 ohm).

Model 43-121

The following substitutions of electrolytic condensers are effective with current production:

Position	Code 121
\textcircled{a}	7556 (6 Mfd.) (remains)
\textcircled{b}	7556 (6 Mfd.)
\textcircled{c}	6453 (6 Mfd.)

Model 54

Effective with Run No. 9, fixed condenser \textcircled{d} , 3793-Y is replaced by 3793-S, same capacity, .015 mfd. 3793-S is mounted in a new hole and is parallel to chassis.

Present production of this Model carries condenser \textcircled{e} Part number 3903AR instead of 3903AM. There is no difference in the electrical characteristics of these condensers.

In run number 4, two of Part number 31-6004 double compensating condensers supersede Parts number 04000A in locations \textcircled{f} , \textcircled{g} , and \textcircled{h} one of Part number 31-6004 covers \textcircled{f} and \textcircled{g} , the other \textcircled{h} , and the additional compensating condenser is used to tune the secondary of the 2nd I. F. transformer \textcircled{i}

The correct resistance value of the Speaker Field Coil \textcircled{j} is 2600 ohms.

The extruded washers at top and bottom of voltage divider resistors \textcircled{k} and \textcircled{l} are Part No. 27-7168. These washers are used in some of the later production of this Model.

Second I. F. Transformer. \textcircled{m} Part No. 32-1116 is superseded by Part No. 32-1195.

Refer to Figures 1 and 2

The adjustment of the I. F. compensating condensers is first completed. This is followed by the adjustment of the High Frequency and Antenna compensating condensers, and then the Low Frequency compensating condenser. The intermediate frequency is 460 kilocycles, and it is necessary to have an accurately calibrated signal generator for the adjustment. The Philco All Purpose Set Tester Model 048 is ideal.

The adjustment of the High Frequency and Antenna compensating condensers can be accomplished by means of a screw driver through the top grille of the cabinet. The Low Frequency condenser is accessible from rear of cabinet.

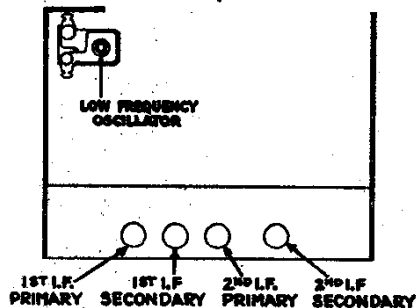


Fig. 1—Back of Model 54 Chassis, showing location of Compensating Condensers.

Model 54

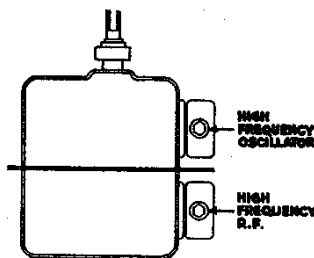


Fig. 2—Tuning Condenser, Model 54 Chassis, showing location of additional Compensating Condensers.

FOR FURTHER INFORMATION ON THESE RECEIVERS, SEE INDEX

CHANGES IN MODELS

Since Publication of Each Service Bulletin

Grouped under each model and arranged according to date . . . All models included . . . August 1st to December 31st, 1935.

The second column on each page gives the "Run Number" of the set at the time of the change (where this information was available from our records). The Run Number is stamped on the top of the chassis with a rubber stamp and is the lefthand number in the rectangle.

The Code Number of the set is given on the chassis name plate or name label (at rear of chassis).

MODEL 29

Approximate Date of Change	Run No.	CHANGES
11-1-35		No. ④ on base view of Fig. 4 should be ⑤. No. ⑤ next to ④ on base view of Fig. 4 should be ⑥.

MODEL 54

Approximate Date of Change	Run No.	Old Part No.	New Part
9-1-35	14		
		Condenser ②	3793-AG
		Condenser ④	3615-BF
		Condenser ⑤	8085-F
			8085-T

MODEL 60

Approximate Date of Change	Run No.	CHANGES		
10-1-35	11	Tube Shield and Tube Shield Base Nos. 28-2726 and 28-2725 for the 6A7 Tube will no longer be necessary.		
		Old Part No.	New Part No.	
		Resistor ①	5872 (1/2 watt) 2 meg.	33-1025 (1/2 watt)
		Resistor ②	4409 (1/2 watt) 1 meg.	33-1096 (1/2 watt)
		Resistor ③	4411 (1/2 watt) 99,000 ohms	6099 (1/2 watt)
		Resistor ④, ⑤	5385 (1/2 watt) 70,000 ohms	33-1115 (1/2 watt)

MODEL 116 (Code 121 and 122)

Approximate Date of Change	Run No.	CHANGES		
8-1-35	..	Adjustment of high frequency end of broadcast band should be made at 1500 K. C. (1.5 M. C. on the Philco 083 scale) instead of 1600 K. C.		
	5	There will be an addition of resistor and condenser assembly. Replace Condenser No. 6287DU ② with 6287-ODU. The latter is impregnated with the new high melting point wax.		
		No. on Schematic Code 121	No. on Schematic Code 122	Install
		Remove 80-4886 (.00125 mfd.)	②	38-6978
		5337 (1000 ohms)	②	
		32-1114 (8000 ohms)	②	
		80-1028 (.003 mfd.)	②	7801

Approximate Date of Change	Run No.	CHANGES		
9-1-35	9	This change made to eliminate frequency drift.		
		Old Part No.	New Part No.	
		2nd I. F. Transformer ②	32-1734	32-1865
	3	Code 122 only		
		Old Part No.	New Part No.	
		Condenser ②	30-2011	30-2069
		Insulator	27-7195	27-7194

MODEL 116 (Code 121 and 122)

Approximate Date of Change	Run No.	CHANGES
11-1-35	..	Code 122 The grid lead from the 6A3 power tube near the front of the chassis is changed to run over to and parallel with the end of the chassis down as far as condenser ② then over to the input transformer. Change made to prevent audio oscillation.

Code 121, Run No. 9 Code 122, Run No. 11

Part	Schematic No.	Removed	Old Part	New Part
Resistor	(Code 121) ② (Code 122) ②	6984 (2000 ohms) 1/2 watt		
	10			
	8			
	Code 121			
	Code 122			
	Schematic No.		Old Part	New Part
Tuning Condenser Assembly ②			31-1606	31-1607
Dial Mask and Hub Assembly			31-1575	29-5186

12-1-35

Code 121, Run No. 12

Code 122, Run No. 10

Part	Schematic No.	Old Part	New Part
Input Transformer ②		32-7447	32-7057

Change ② Resistor (10,000 ohm) to ②a
September Change Notices indicated a change in the 2nd I. F. Transformer ②. The Part No. of the new Transformer is 32-1865 and the corresponding Compensating Condenser Part No. is 31-6067.

MODEL 116X and 116B

Approximate Date of Change	Run No.	CHANGES
8-1-35	..	Add bezel frame gasket No. 27-7973. Remove Rubber Bumper No. 27-4150 to prevent microphonics. Remove Bezel Light Guard No. 27-8001 on Codes 121 and 122.

MODEL 610

Approximate Date of Change	Run No.	CHANGES
8-1-35	7	Tube Shield and Tube Shield Base on the 6A7 tube will not be necessary. Remove Part No. 28-2726 and 28-2725.
10-1-35	8	Part No. 6096 (6000 ohms) ② Resistor and Part No. 33-1206 (20 ohms) ② Resistor will not be used. In eliminating Resistor ②, shunt a wire across the terminals from which it is disconnected.
11-1-35	..	Reverse numbers ② and ② shown in Figure 3.

MODELS T2-CT2, T5-CT5

MODELS T3-MT3, RT3, ST3

MODEL 54

Alignment, Trimmers

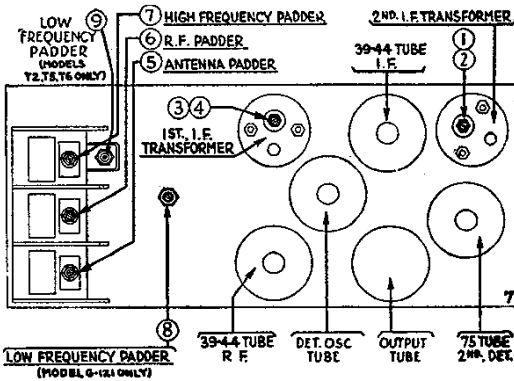
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MODEL NOS. T2, T5

Signal Generator Connection	Signal Generator Frequency	Dial Position	Wave Band Switch Position	Trimmer Number	Output Signal
Remove grid clip from det.-osc. tube					
Control grid of det.-osc. tube	260 k.c.	...	...	1 ¹	Max.
"	"	...	...	2 ²	Max.
"	"	...	...	3 ¹	Max.
"	"	...	...	4 ²	Max.
Connect grid clip to det.-osc. tube					
Ant. ^{3, 5}	1600 k.c.	Note 4	...	7	Max.
"	1400 k.c.	140	...	6	Max.
"	"	"	...	5	Max.
"	600 k.c.	60	...	9	Max.*
"	1400 k.c.	140	...	6	Max.
"	"	"	...	5	Max.

Note 1.—This is a screw adjustment.
 Note 2.—This is a nut adjustment.
 Note 3.—Through a 150 mmfd. condenser.
 Note 4.—Turn the tuning condenser plates wide open. This gives the correct adjustment for 1800 k.c.—180 on the dial scale.
 Note 5.—When the antenna-stage adjustment is made with the receiver installed in the car, the receiver must be connected to the car antenna in the usual manner. Connect the signal-generator output to a wire placed near the car antenna but not connected to it.

* While rocking.

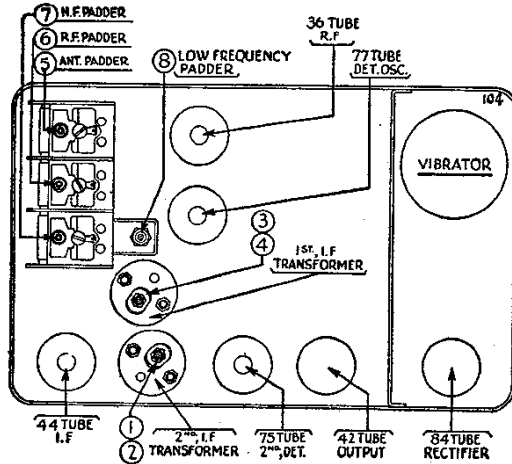


MODEL NO. T3

Signal Generator Connection	Signal Generator Frequency	Dial Position	Wave Band Switch Position	Trimmer Number	Output Signal
Remove grid clip from det.-osc. tube					
Control grid of det.-osc. tube	260 k.c.	...	...	1 ¹	Max.
"	"	...	...	2 ²	Max.
"	"	...	...	3 ¹	Max.
"	"	...	...	4 ²	Max.
Connect grid clip to det.-osc. tube					
Ant. ^{3, 5}	1600 k.c.	Note 4	...	7	Max.
"	1400 k.c.	140	...	6	Max.
"	"	"	...	5	Max.
"	600 k.c.	60	...	8	Max.*
"	1400 k.c.	140	...	6	Max.
"	"	"	...	5	Max.

Note 1.—This is a screw adjustment.
 Note 2.—This is a nut adjustment.
 Note 3.—Through a 150 mmfd. condenser.
 Note 4.—Turn the tuning condenser plates wide open. This gives the correct adjustment for 1800 k.c.—180 on the dial scale.
 Note 5.—When the antenna-stage adjustment is made with the receiver installed in the car, the receiver must be connected to the car antenna in the usual manner. Connect the signal-generator output to a wire placed near the car antenna but not connected to it.

* While rocking.



MODEL NO. 54

Signal Generator Connection	Signal Generator Frequency	Dial Position	Wave Band Switch Position	Trimmer Number	Output Signal
Remove grid clip from 6A7	480 k.c.	55	Broadcast	1	Max.
Control grid of 6A7	"	"	"	2	Max.
"	"	"	"	3	Max.
"	"	"	"	4	Max.
Connect grid clip to 6A7					
Ant.*	1400 k.c.	140	"	5 1	Max.
"	600 k.c.	60	"	6 1	Max.**
"	1400 k.c.	140	"	7 2	Max.**
"	"	"	"	5 1	Max.

Note 1.—Paddlers (5) and (6) are accessible through the top grille of cabinet.
 Note 2.—Padder (7) is accessible through the top grille of cabinet.
 * Use a 100-mmfd. condenser as dummy antenna.
 ** While rocking.

