

PHILCO

REG. U.S. PAT. OFF.

Service Bulletin—No. 165-B

(This Bulletin Supersedes Service Bulletin No. 165)

Model 16

THE PHILCO RADIO MODEL 16 is an eleven-tube superheterodyne broadcast and short-wave receiver, operating upon alternating current and employing the high-efficiency 6.3 volt tubes, automatic interstation noise suppression, and a frequency (wave-band) coverage that permits reception of the short-wave (high-frequency) broadcast programs. The same superheterodyne circuit is used for all reception. The Receiver is equipped with a five-point wave-band switch. The ranges are—

- (1) 520 K. C. to 1500 K. C.
- (2) 1.5 M. C. to 4.0 M. C.
- (3) 3.2 M. C. to 6.0 M. C.
- (4) 5.8 M. C. to 12.0 M. C.
- (5) 11.0 M. C. to 23.0 M. C.

The Receiver employs a Philco Type 77 tube for first detector, a Type 76 for oscillator, a Type 78 for first I. F., a Type 78 for second I. F., and a Type 37 for second detector. The automatic interstation noise suppression circuit uses a Type 78, the first A. F., a Type 77. The driver (second A. F.) is a Type 42; the class "A" amplification is accomplished with two Type 42 tubes as triodes; the rectifier is a Type 5-Z-3. The intermediate frequency is 460 kilocycles. The power consumption of Model 16-122 is 130 watts; of Model 16-121, 120 watts.

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

Circuit	1st Det.	Osc.	1st. I. F.	2nd I. F.	2nd Det.	Inter-Station Noise Suppr. Circuit	1st A. F.	2nd A. F. (Driver)	Output		Rectifier
Type Tube	77	76	78	78	37	78	77	42	42	42	5-Z-3
Filament Volts—F to F.....	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	4.7
Plate Volts—P to K.....	220	53	225	230	0	1.8	130	220	340	340	400
Screen Grid Volts—SG to K....	80	—	80	80	—	1.8	1.8	220	340	340	—
Control Grid Volts—CG to K...	1.6	6.4	0	0	.2	1.6	.4	.6	34	34	—
Cathode Volts—K to F.....	4.2	1.9	2.2	2.5	0	0	0	0	0	0	—

NOTE—These values are for Model 16-122. Model 16-121 uses a Type 80 Rectifier Tube. See Note, page 4, at end of Replacement Parts List.

* All of the above readings were taken from the underside of the chassis, using test prods and leads, with a suitable A. C. voltmeter for filament voltages, and a high-resistance multi-range D. C. voltmeter for other readings. The Philco Model 048 All-Purpose Set Tester is highly recommended for this use. Volume control set at maximum and station selector turned to low frequency end; interstation noise suppression circuit potentiometer turned all the way to the right; and toggle switch (interstation noise suppression circuit) in "ON" ("S") position. Readings taken with a plug-in adapter will NOT be satisfactory.

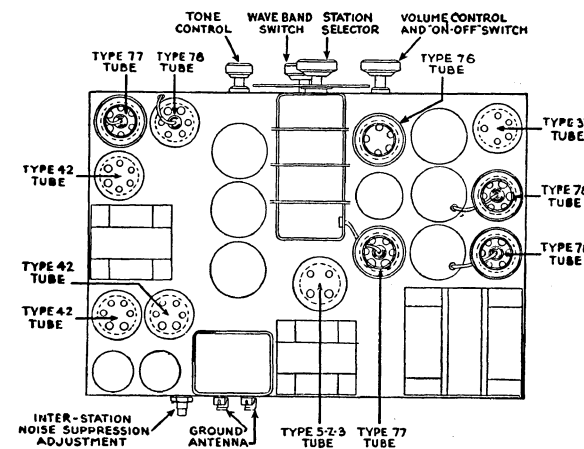
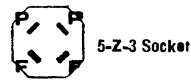
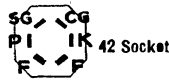
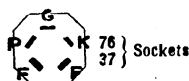


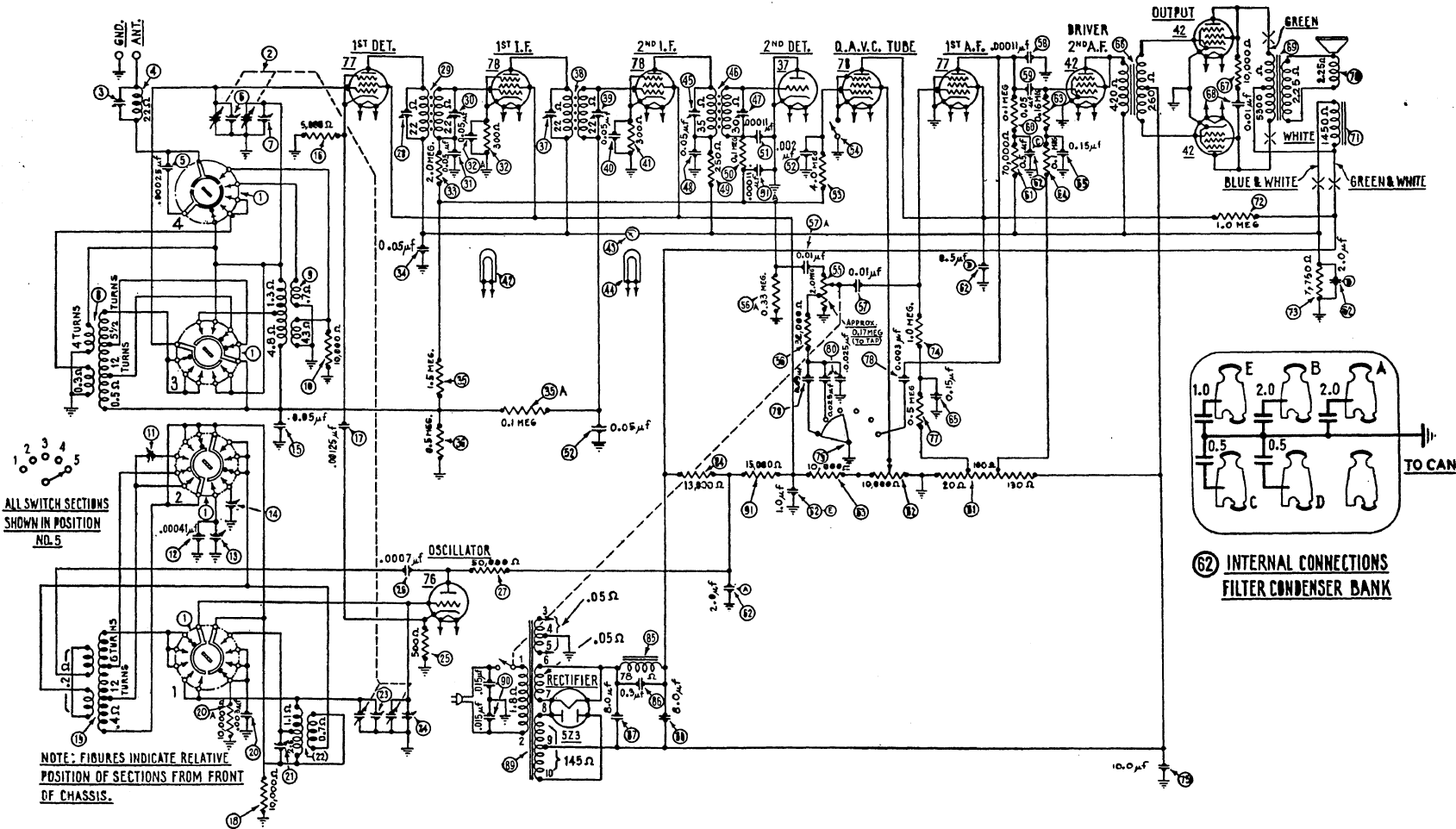
Fig. 1—Top View of Chassis, Showing Tube Locations and Major Parts

Table 2—Power Transformer Data

Terminal	A. C. Volts	Circuit	Color
1—2	105—125	Primary	White
3—5	6.3	Filament	Black
6—7	5.0	Filament of 5-Z-3	Blue
8—10	800	Plates of 5-Z-3	Yellow
4	—	Center Tap of 3—5	Black—Yellow Tracer
9	—	Center Tap of 8—10	Yellow—Green Tracer



Terminal Arrangement of Tube Sockets Viewed from Underside of Chassis



I.F. = 460 K.C.

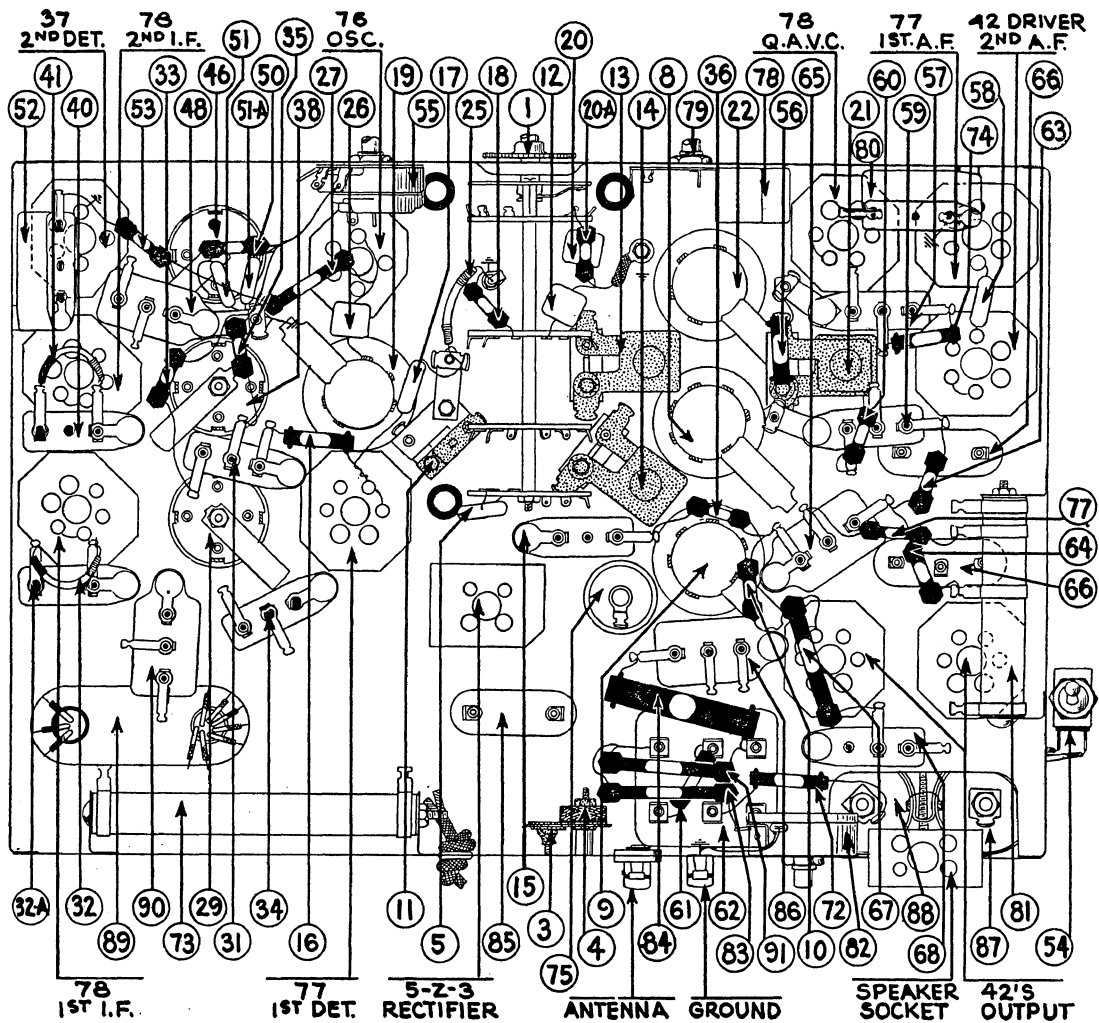


Fig. 3—Bottom View of Chassis, Showing Parts, and Position of Compensating Condensers Located Under Chassis

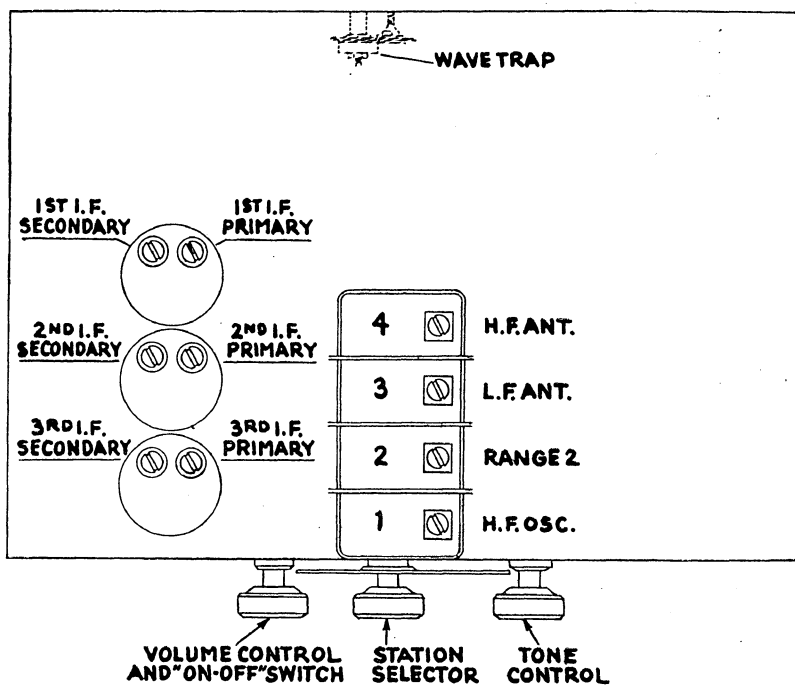


Fig. 4—Position of Compensating Condensers Located Above Chassis

NOTE: DO NOT ATTEMPT TO ADJUST the compensating condensers mounted upon sections 3 and 4 of the tuning condenser. These compensating condensers are carefully adjusted, and sealed at the factory.

Inability of a suitable radio receiver to pick up signals upon the shorter waves (higher frequencies) frequently can be traced to the aerial itself. A relatively short, but efficiently designed, aerial will give better results on the short waves than one which has a long and involved lead-in. Extreme care should be exercised in the installation of the Model 16, that it may have every opportunity to bring in all the frequencies. Instruction should be given the customer in tuning in the shorter waves, which are characteristically difficult for a novice. Attention should be called to the time-difference existing, that the listener may not listen at such hours as a desired station is *not* transmitting. Much good will be accomplished by a thorough instruction of the customer. Philco distributors are prepared to supply special aerial equipment, especially designed for reception of the short waves.

ADJUSTING MODEL 16

(Refer to Service Bulletin No. 165-A)

These receivers are adjusted accurately at the factory prior to shipment. Under normal conditions it is not necessary to readjust the compensating condensers. If such adjustment becomes necessary, it should not be attempted without first making sure that proper instructions and suitable equipment are at hand. Philco distributors are in a position to supply both. The Philco Model 048 All-Purpose Set Tester contains a variable-frequency signal generator covering all frequencies between 105 K. C., and 2000 K. C., and is highly recommended for the adjustment of the intermediate frequency compensating condensers, and for the adjustment of those compensating condensers in the lower frequency circuits. The Philco Model 091 Signal Generator is recommended for the higher frequencies. Refer to Service Bulletin No. 165-A for full instructions upon the adjustment of Model 16 series.

CAUTION: The I. F. and low frequency compensating condensers only should be adjusted in emergencies. Extreme care should be exercised in adjusting the H. F. circuits.

REPLACEMENT PARTS FOR MODEL 16

No. on Figs.	Description	Part No.	List Price	No. on Figs.	Description	Part No.	List Price
①	Wave Band Switch.....	42-1037	2.75	④⑦	Compensating Cond'r (3d, I. F. Secondary)	Common with ④⑧	.....
②	Tuning Condenser Assembly.....	31-1039	4.50	④⑨	Condenser.....	3615-AS	.25
③	Compensating Condenser (Wave-trap).....	33-5199	.....	④⑩	Resistor (Part of ④⑨).....	.....	.....
④	Inductance (Wave-trap).....			{ Wave-trap } { Assembly }	④⑪	Resistor (White-White-Orange).....	4411	.20
⑤	Condenser.....	5858	.16	④⑫	Condenser.....	4519	.18
⑥	Compensating Condenser (Ant.; H. F.; Part of ②).....	.....	.....	④⑬a	Condenser.....	4519	.18
⑦	Compensating Condenser (Ant.; Broadcast and Police; Part of ②).....	.....	.....	④⑭	Condenser (Double).....	7296-G	.....
⑧	Antenna Transformer (H. F. Bands).....	32-1183	.....	④⑮	Resistor (Yellow-Black-Green).....	6010	.20
⑨	Antenna Transformer (B'dc't & Police B'ds).....	32-1182	.....	④⑯	Switch (Toggle); Interstation Noise Sup- pression Circuit.....	3253	.40
⑩	Resistor (Brown-Black-Orange).....	4412	.20	④⑰	Volume Control and "On-Off" Switch.....	33-5022	.....
⑪	Compensating Condenser (Range 3).....	04000-V	.16	④⑱	Resistor (Orange-Red-Orange).....	5279	.20
⑫	Condenser.....	30-1000	.20	④⑲a	Resistor (Orange-Orange-Yellow).....	6046	.20
⑬	Compensating Condenser (Range 2; series).....	04000-R	.35	④⑳	Condenser.....	3903-J	.20
⑭	Compensating Condenser (Range 1; series).....	04000-R	.35	④㉑a	Condenser.....	3903-J	.20
⑮	Condenser.....	3615-L	.16	④㉒	Condenser.....	4519	.18
⑯	Resistor (Green-Black-Red).....	5310	.20	④㉓	Condenser.....	3615-AD	.20
⑰	Resistor.....	5886	.25	④㉔	Resistor (White-White-Orange).....	4411	.20
⑱	Resistor (Brown-Black-Orange).....	4412	.20	④㉕	Resistor (Violet-Black-Orange).....	5385	.20
⑲a	Oscillator Coil (H. F.).....	32-1185	.....	④㉖	Filter Condenser Bank.....	30-4026	3.00
⑳	Condenser.....	7301	.35	④㉗	Resistor (Brown-Blue-Yellow).....	5331	.20
㉑	Resistor (Brown-Black-Orange).....	4412	.20	④㉘	Resistor (White-White-Orange).....	4411	.20
㉑a	Compensating Condenser (Range 1; Shunt).....	0-4000-A	.12	④㉙	Condenser (Double).....	6287-J	.....
㉒	Oscillator Coil (Broadcast and Police).....	32-1184	.....	④㉚	Input Transformer.....	32-7057	2.25
㉒a	Compensating Condenser (Osc.; H. F.; Part of ②).....	.....	.....	④㉛	Resistor (Brown-Black-Orange).....	3524	.20
㉓	Compensating Condenser (Osc.; Police; Part of ②).....	.....	.....	④㉜	Condenser.....	3903-F	.15
㉔	Resistor (Flexible Wire-wound; Green-Black-Brown).....	6977	.20	④㉝	Output Transformer.....	32-7052	1.50
㉕	Condenser.....	5863	.18	④㉞	Voice Coil and Cone Assembly.....	36-3061	.75
㉖	Resistor (Green-Brown-Orange).....	4237	.25	④㉟	Speaker Field, Assembled with Pot (U-2).....	36-3088	.....
㉗	Compensating Cond'ner (1st, I. F. Primary).....	31-6002	.....	④㊱	Resistor (Brown-Black-Green).....	4409	.20
㉘	1st, I. F. Transformer.....	32-1186	.....	④㊲	Resistor (Wire-wound).....	33-3020	.30
㉙	Compensating Cond'r (1st, I. F. Secondary).....	Common with ㉙	.....	④㊳	Resistor (Brown-Black-Green).....	4409	.20
㉚	Condenser.....	3615-AB	.20	④㊴	Resistor (Brown-Black-Green).....	4409	.20
㉚a	Resistor (Flexible Wire-wound; Orange-Black-Brown).....	33-3010	.15	④㊵	Condenser (Electrolytic).....	30-2003	.70
㉚b	Condenser.....	3615-BK	.16	④㊶	Resistor (Yellow-White-Yellow).....	4517	.20
㉚c	Resistor (Red-Black-Green).....	5872	.20	④㊷	Condenser (Internal to ㉚).....	.....	.....
㉚d	Condenser.....	3615-BL	.16	④㊸	Tone Control.....	30-4069	.....
㉚e	Resistor (Brown-Green-Green).....	7009	.20	④㊹	Condensers (External to ㉚).....	7653-C	.....
㉚f	Resistor (White-White-Orange).....	4411	.20	④㊺	Voltage Divider Resistor (Wire-wound).....	33-3021	.16
㉚g	Resistor (Yellow-White-Yellow).....	4517	.20	④㊻	Potentiometer (Interstation Noise Suppres- sion Circuit).....	33-5015	.80
㉚h	Compensating Cond'ner (2d, I. F. Primary).....	31-6002	.35	④㊼	Resistor (Brown-Black-Orange).....	3524	.20
㉚i	2d, I. F. Transformer.....	32-1186	.....	④㊽	Resistor (Brown-Orange-Orange).....	6450	.35
㉚j	Compensating Cond'r (2d, I. F. Secondary).....	Common with ㉚j	.....	④㊾	Filter Choke.....	32-7056	1.85
㉚k	Condenser.....	3615-BK	.16	④㊿	Condenser.....	6287-F	.12
㉚l	Resistor (Flexible Wire-wound; Orange-Black-Brown).....	33-3010	.15	⑤①	Condenser (Electrolytic).....	30-2011	1.25
㉚m	Pilot Lamp (Station Selector).....	6608	.12	⑤②	Condenser (Electrolytic).....	30-2011	1.25
㉚n	Shadow Tuning Meter.....	6497	2.25	⑤③	Power Transformer (50-60 ~).....	32-7058	5.00
㉚o	Pilot Lamp (Shadow Tuning Meter; Part of ㉚l).....	.....	.....	⑤④	Condenser (Double).....	3793-E	.20
㉚p	Compensating Cond'ner (3d, I. F. Primary).....	31-6003	.35	⑤⑤	Resistor (Brown-Green-Orange).....	5718	.40
㉚q	3d, I. F. Transformer.....	32-1188	.....		Speaker Socket.....	4957	.08
					Tube Shield.....	28-1107	.10
					Four-prong Socket.....	7545	.08
					Five-prong Socket.....	7546	.10
					Six-prong Socket.....	7547	.10
					Knob (Large).....	27-4025	.....
					Knob (Medium).....	03063	.08
					Knob (Small).....	03064	.06

NOTE.—Model 16-121 uses a Type 80 tube in lieu of 5-Z-3. Parts used in the 16-121 chassis that differ from the 16-122 parts above listed are:

④⑥	Power Transformer (50-60 ~).....	32-7080	4.50	Speaker.....	K-17	.....
④⑦	Condenser (Electrolytic) (8.0 Mfd.).....	6706	1.50	Speaker Socket Hole Cover.....	7084	.75 per C
④⑧	Condenser (Electrolytic) (8.0 Mfd.).....	7464	1.25	Speaker Cable.....	L1632	.20

USE PHILCO REPLACEMENT PARTS AND TUBES FOR EVERY MAKE RADIO.
GET COMPLETE CATALOG FROM YOUR DISTRIBUTOR.

PHILCO RADIO & TELEVISION CORPORATION

Service Department