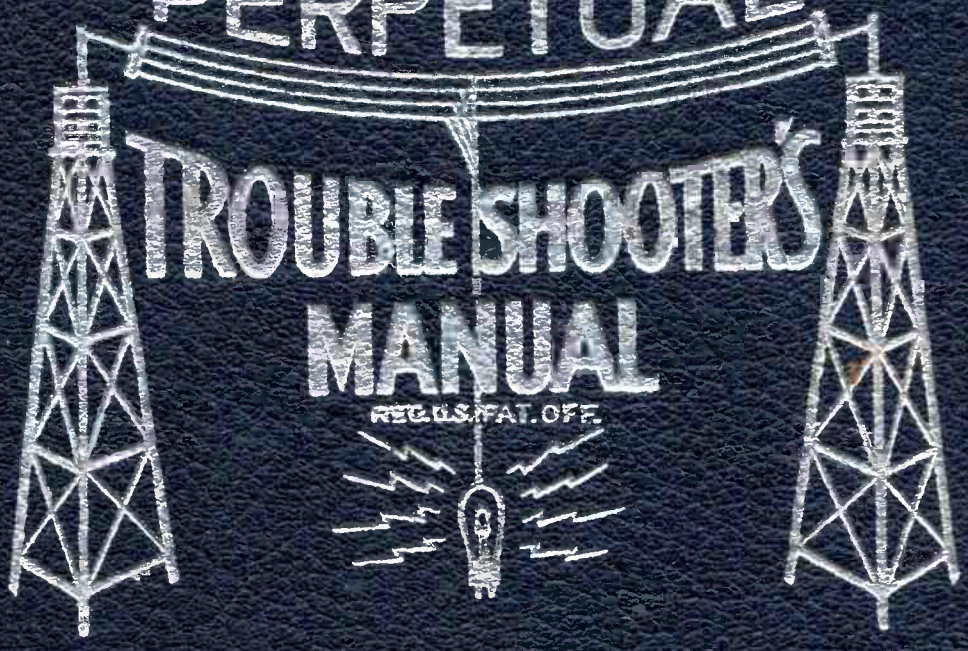
VOLUME XI

PERPETUAL TROUBLESHOOTER'S MANUAL

REG. U.S. PAT. OFF.

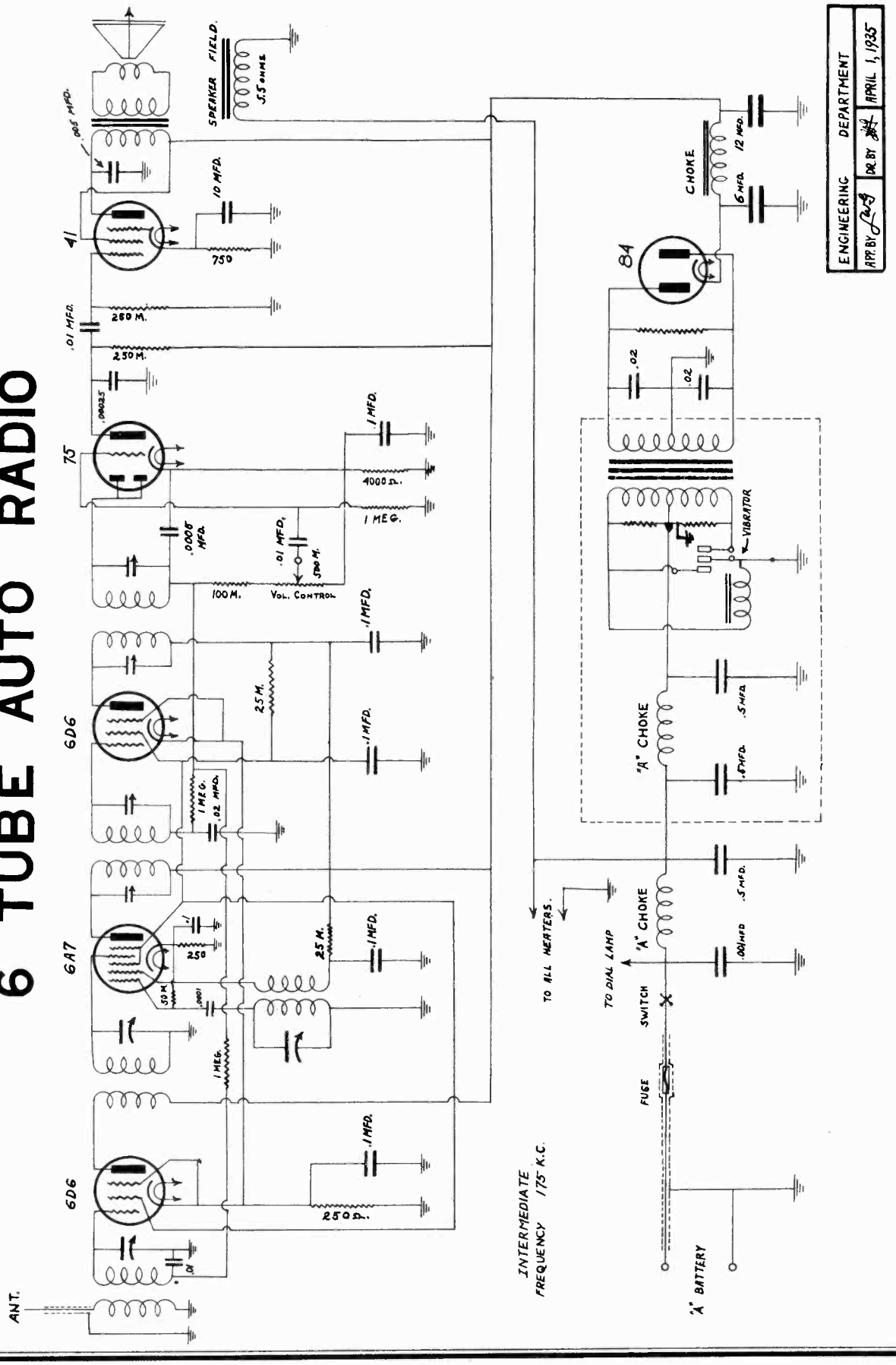


JOHN F. RIDER

PACIFIC RADIO CORP.

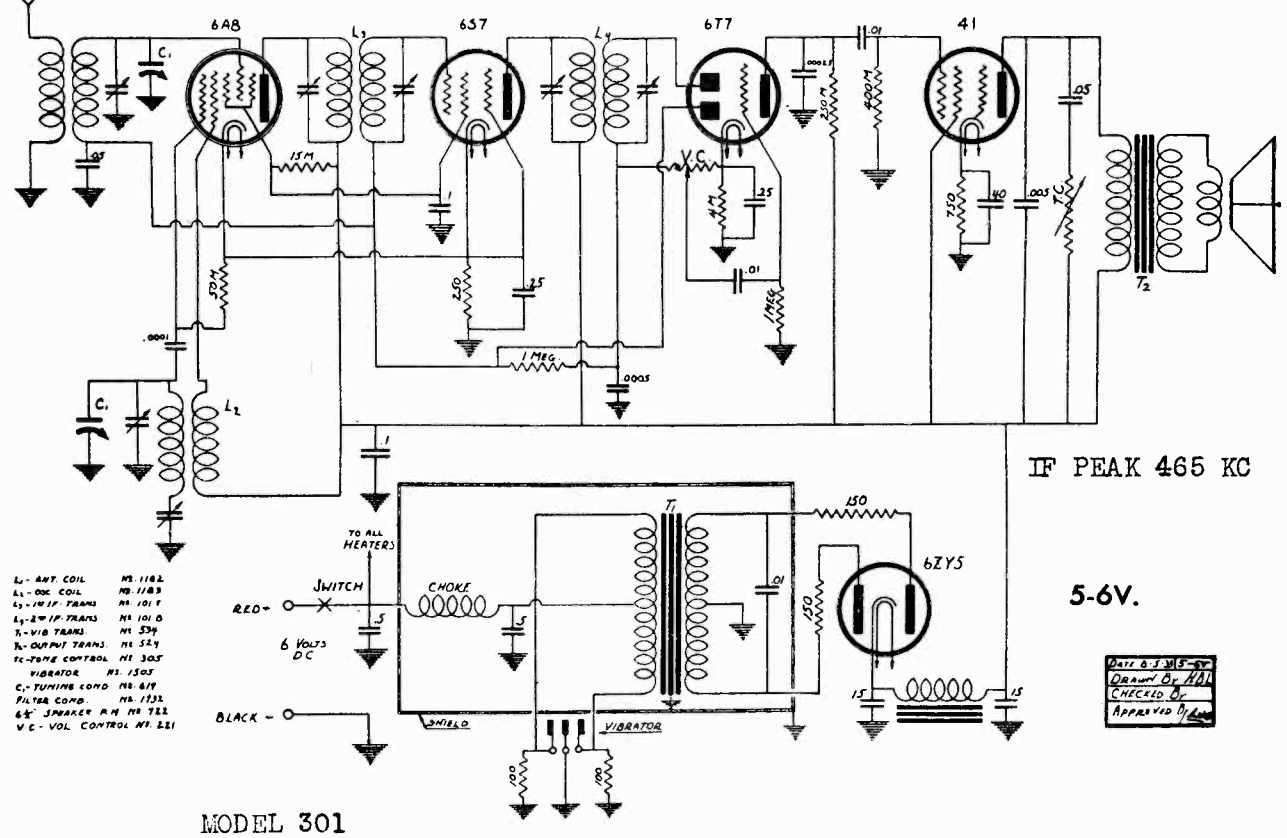
MODEL 102, Early
Schematic

6 TUBE AUTO RADIO

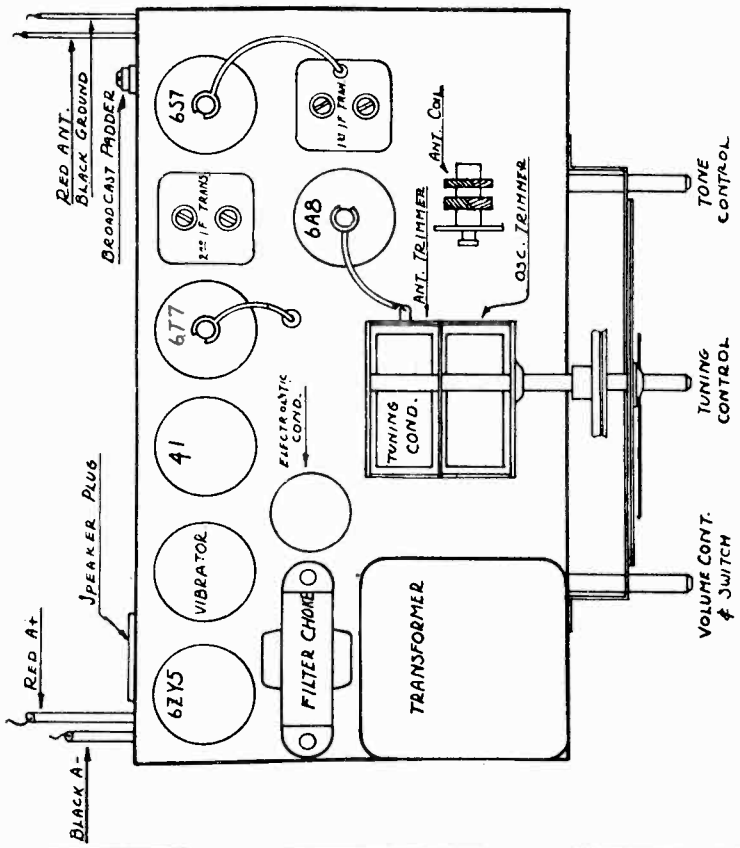


MODEL 301
Schematic, Alignment
Socket, Trimmers

PACIFIC RADIO CORP.



MODEL 301



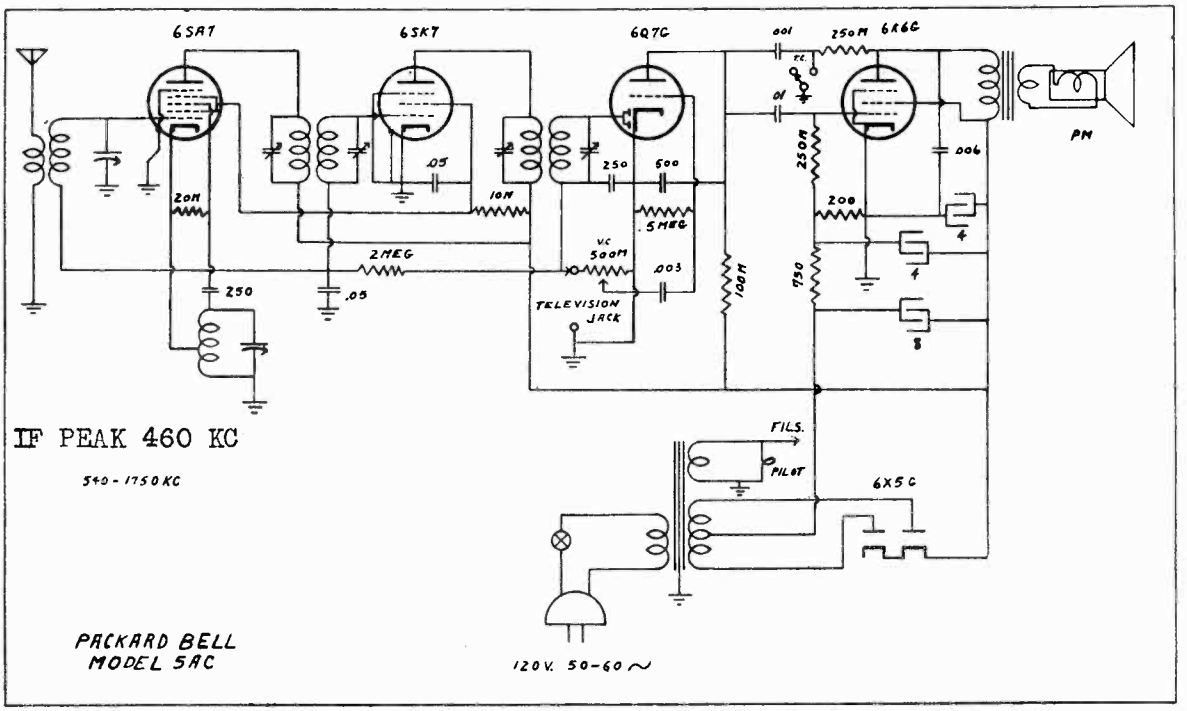
ALIGNMENT DATA

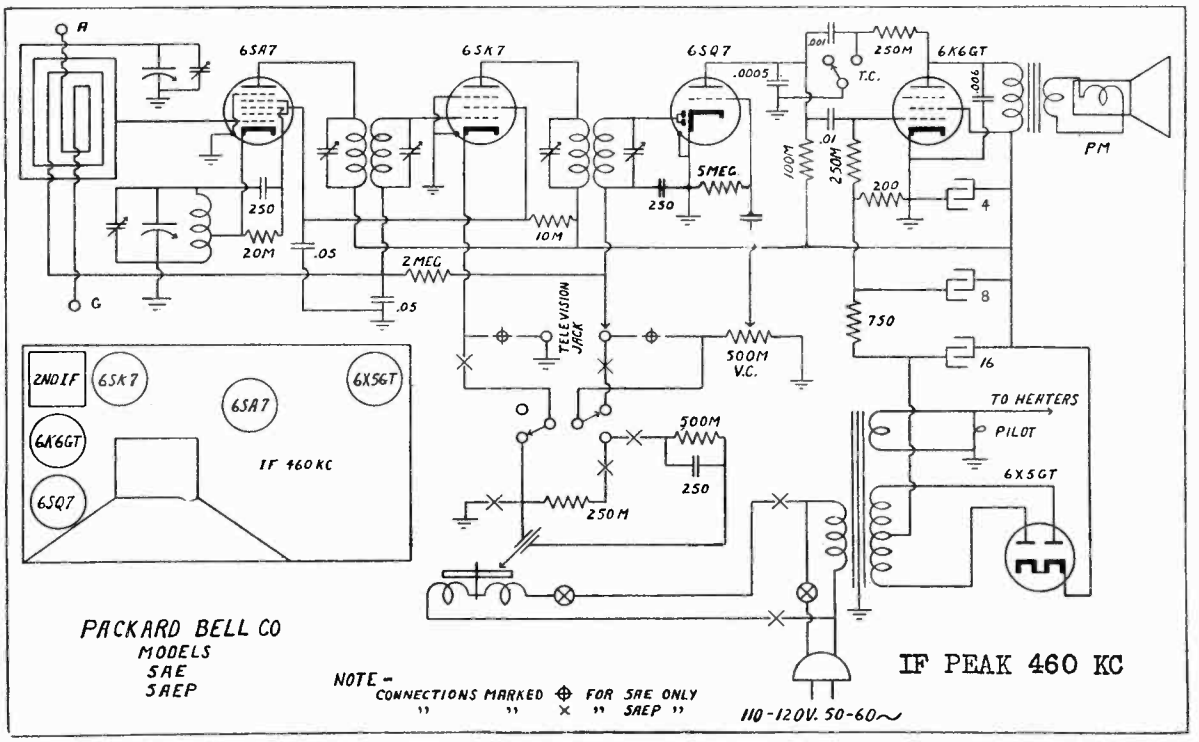
INTERMEDIATE FREQUENCY: Set oscillator to 465 KC. Feed this to the grid of the pentagrid (6A7) converter tube. Adjust trimmers on the intermediate frequency transformers for peak readings as indicated on the output meter which is to be placed across the output transformer.

BROADCAST BAND: Adjust oscillator to 1400 KC and connect the output of the generator to the antenna connection at the rear of the chassis through a .0002 mfd. mica condenser. Set the pointer on the dial to 1400 KC making sure that the volume control is set at its maximum position. Adjust the broadcast antenna and broadcast oscillator trimmers for maximum signal (as indicated on the output meter). Reset the dial pointer on the receiver and on the test oscillator to 600 KC. Slowly increase or decrease the *broadcast padding* condenser while tuning back and forth across the signal with the station selector knob until the maximum reading is obtained on the output meter. Re-check the 1400 KC alignment as the adjustment at 600 KC may have slightly disturbed the original 1400 KC setting.

PACKARD BELL CO.

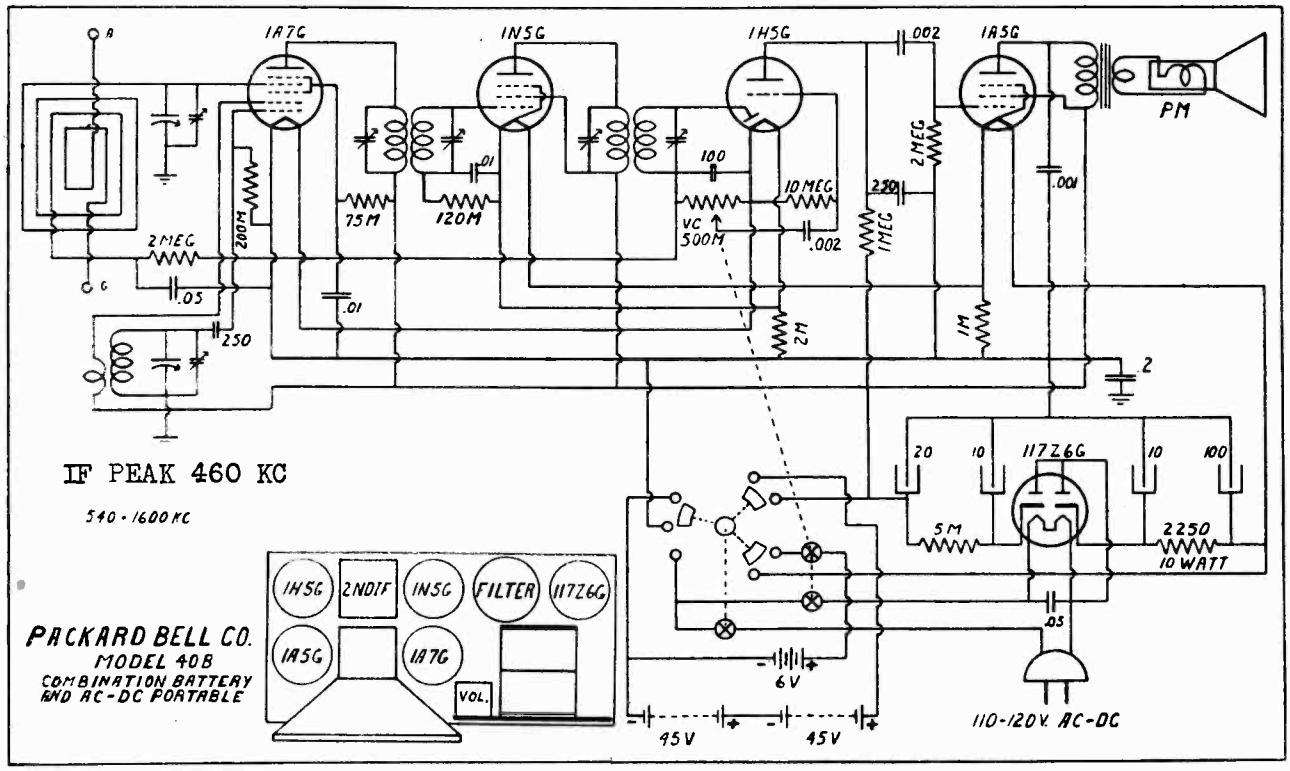
MODEL 5AC
Schematic
MODELS 5AE, 5AEP
Schematic, Socket

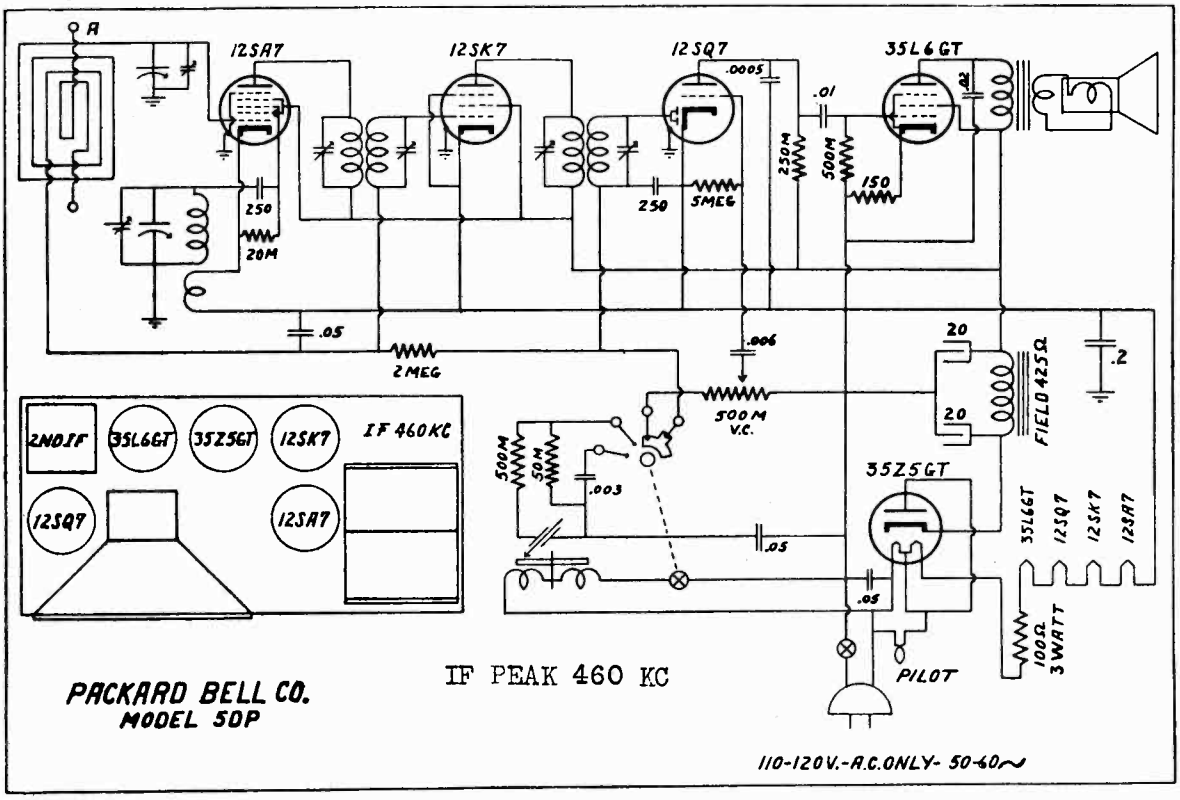




MODEL 40B
MODEL 50P
Schematics, Socket

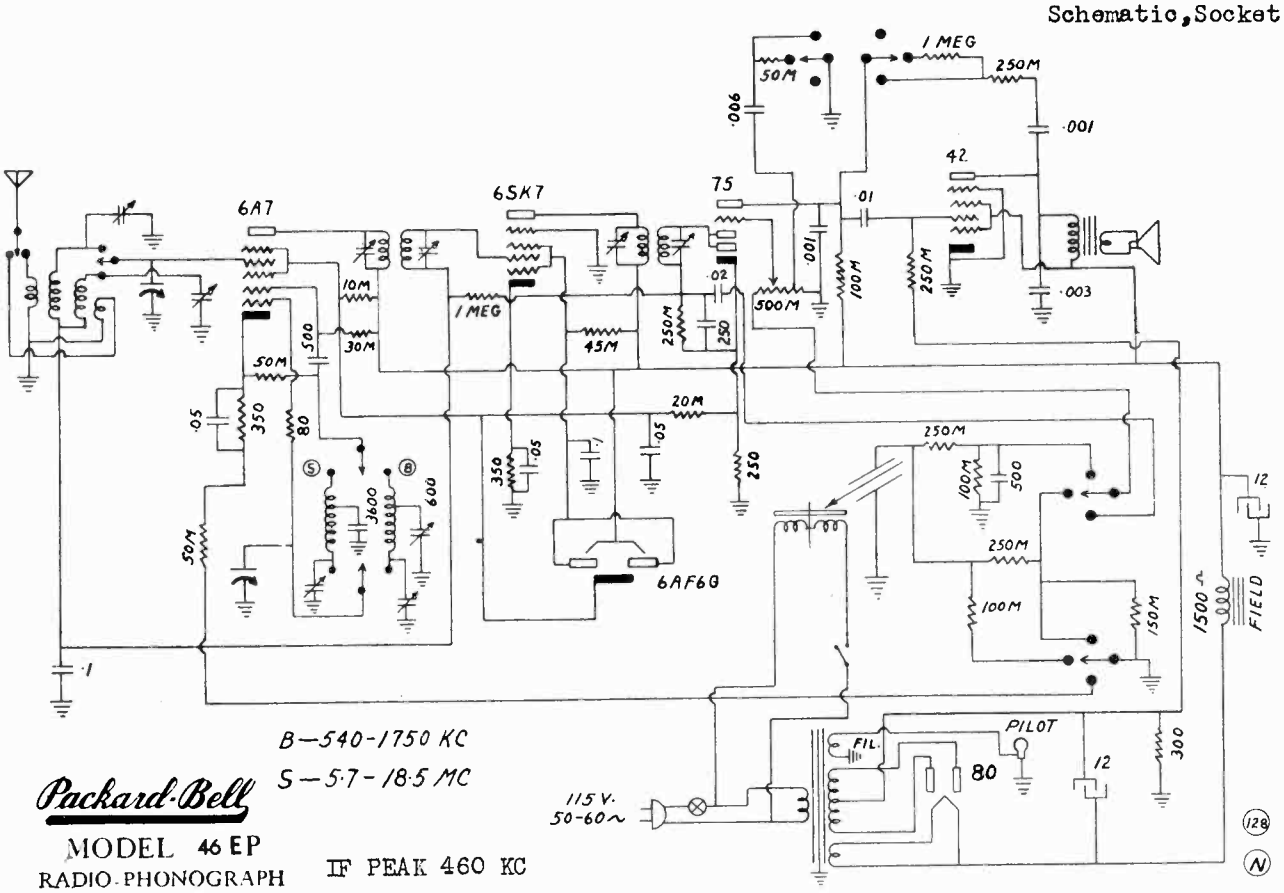
PACKARD BELL CO.

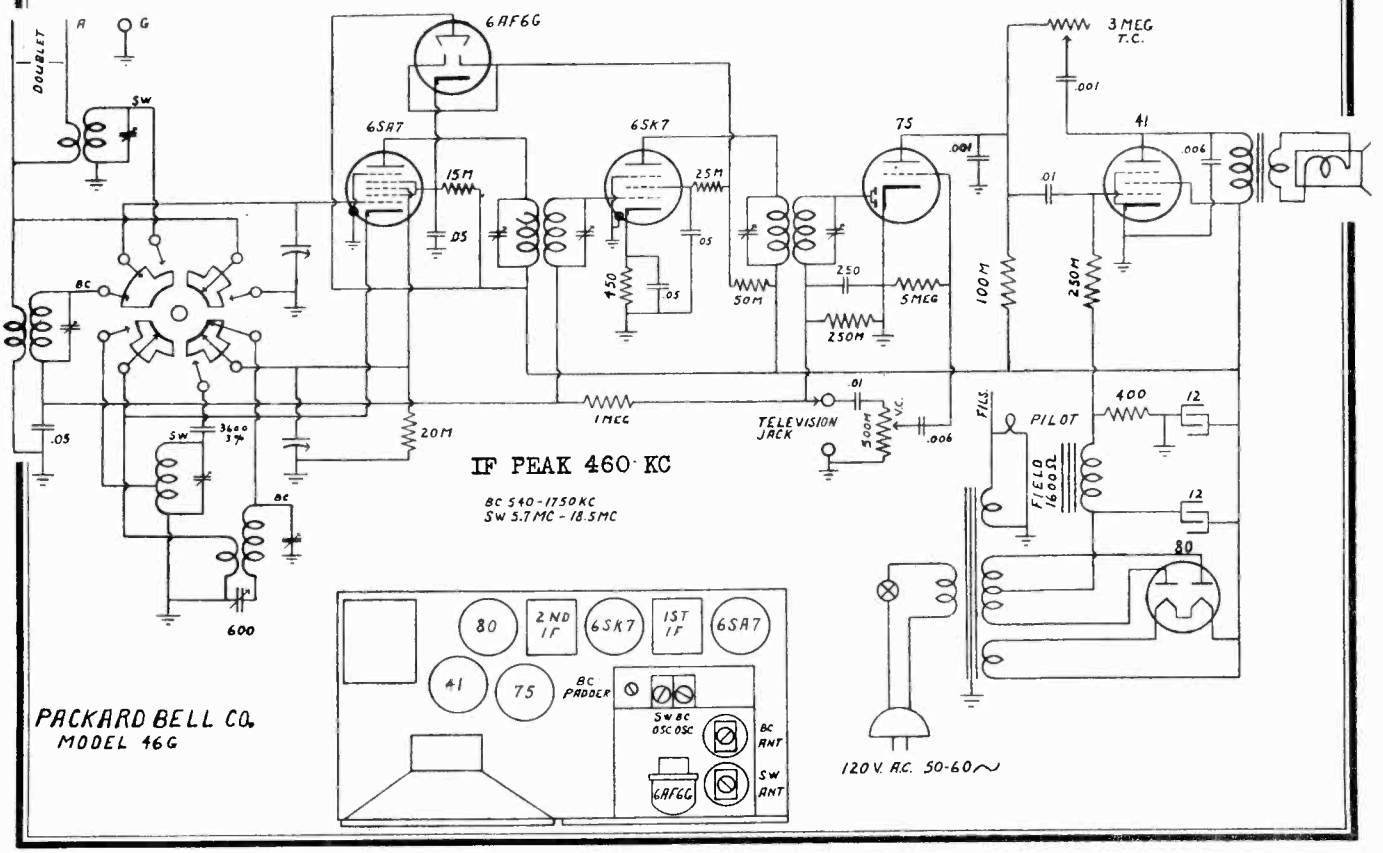




PACKARD BELL CO.

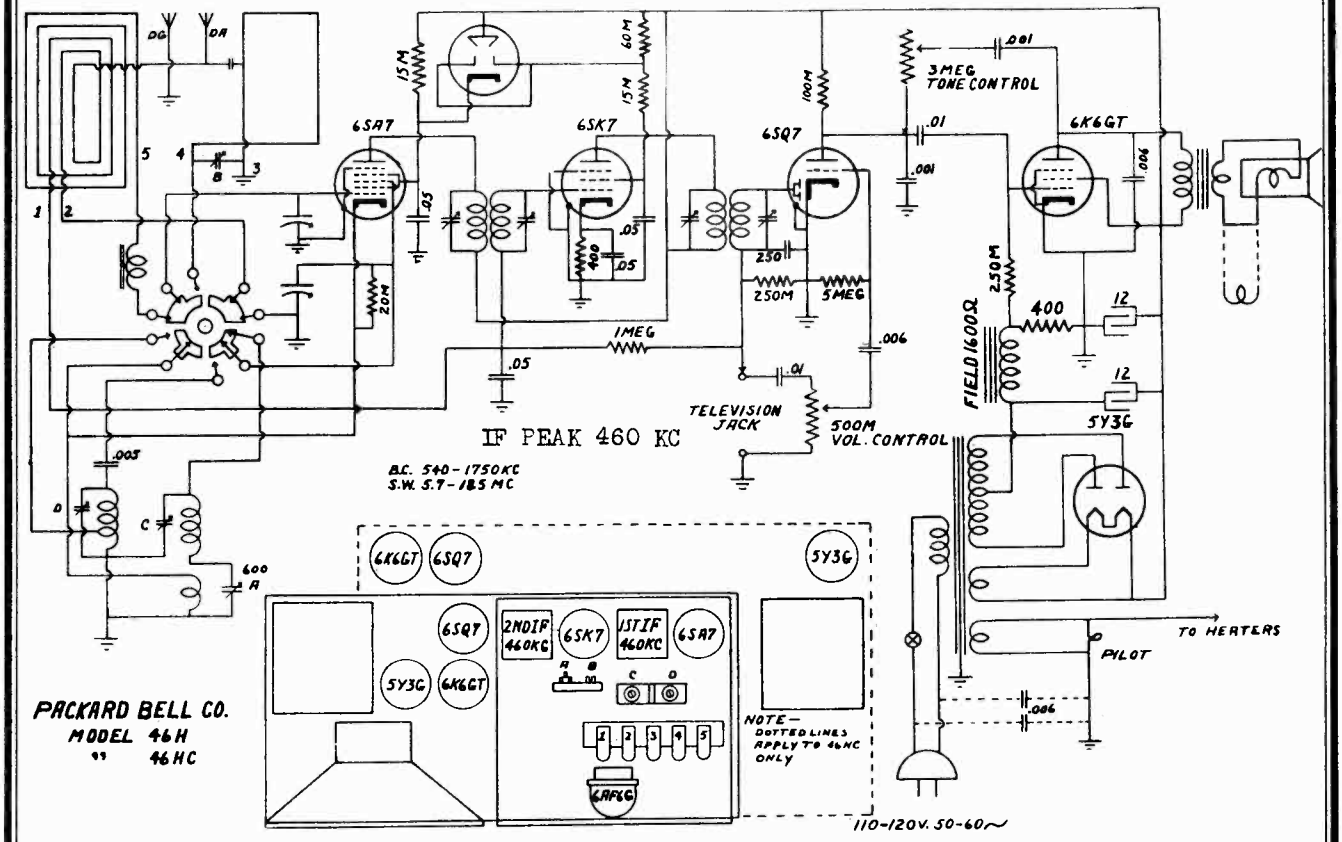
MODEL 46EP
Schematic
MODEL 46G
Schematic, Socket

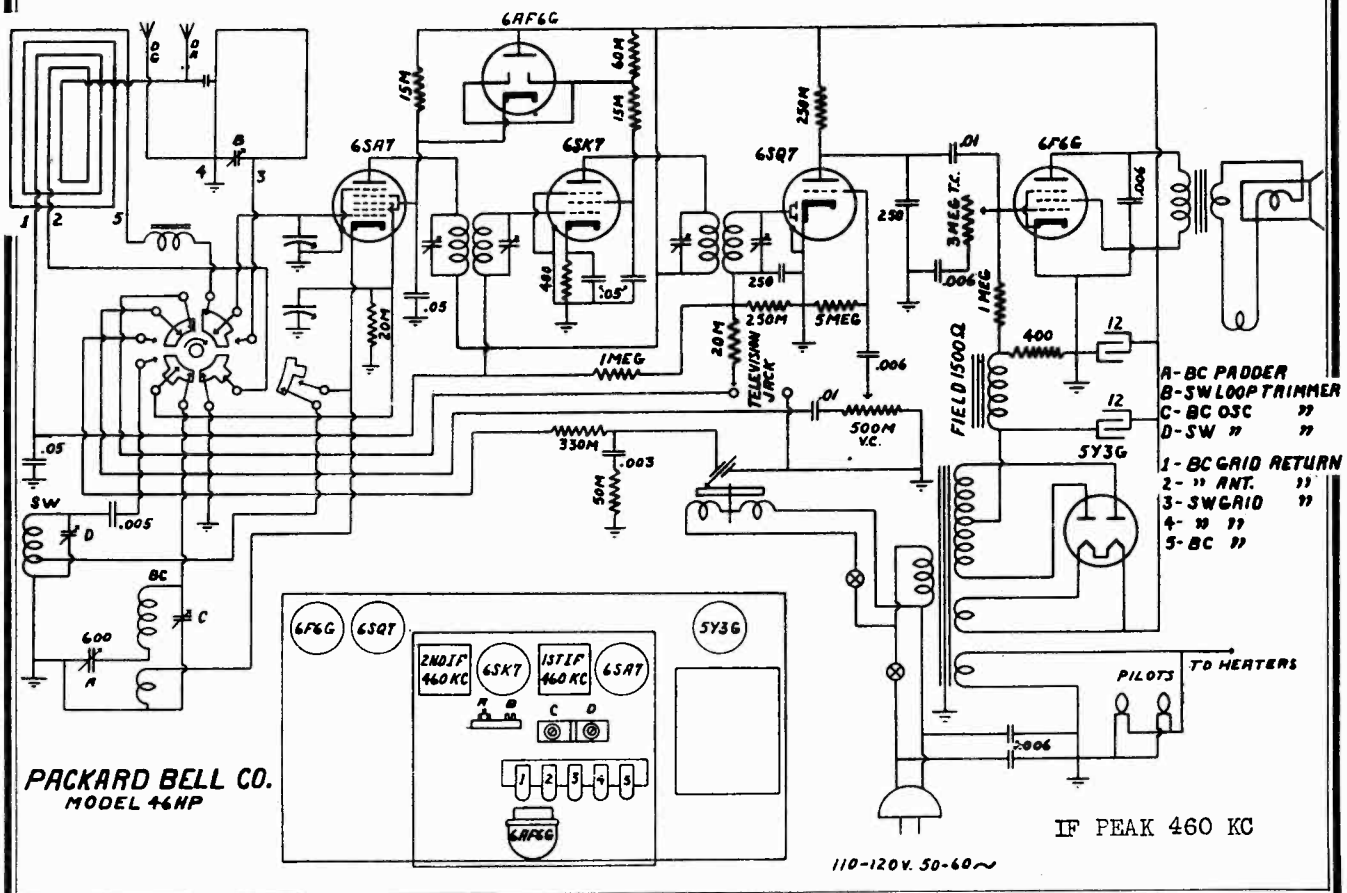




MODELS 46H, 46HC
MODEL 46HP
Schematics, Socket

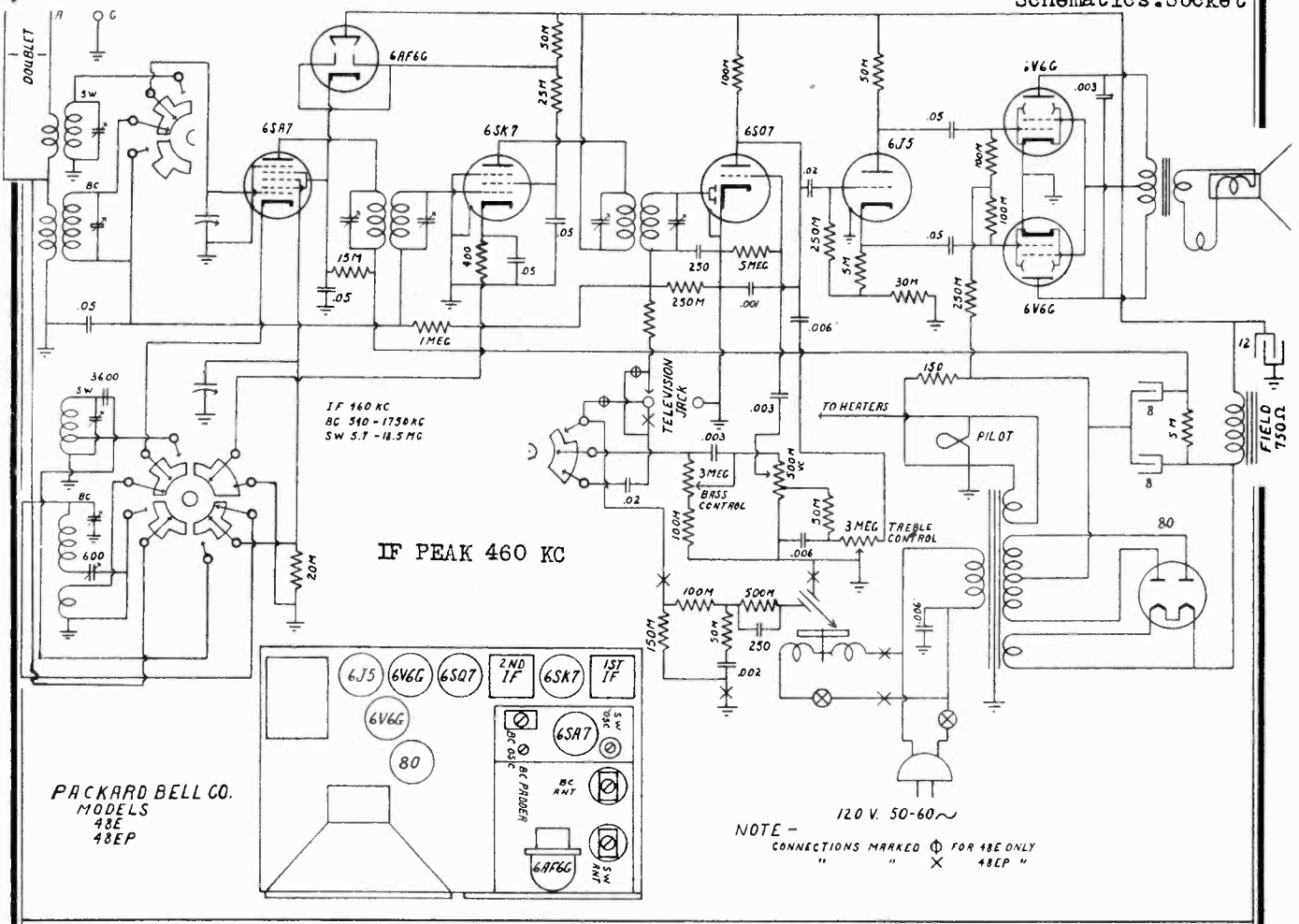
PACKARD BELL CO.

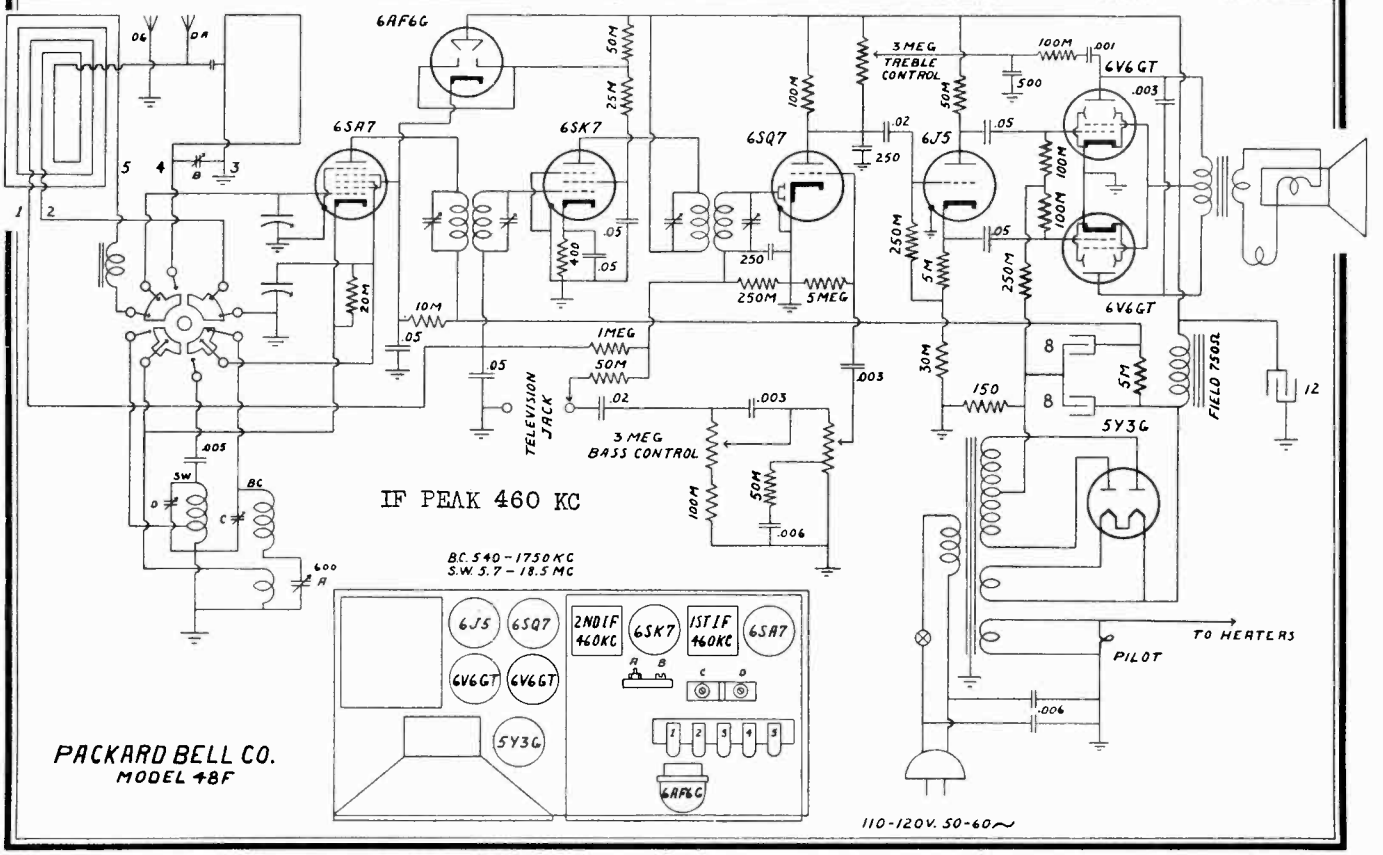




MODELS 48E, 48EP
MODEL 48F
Schematics. Socket

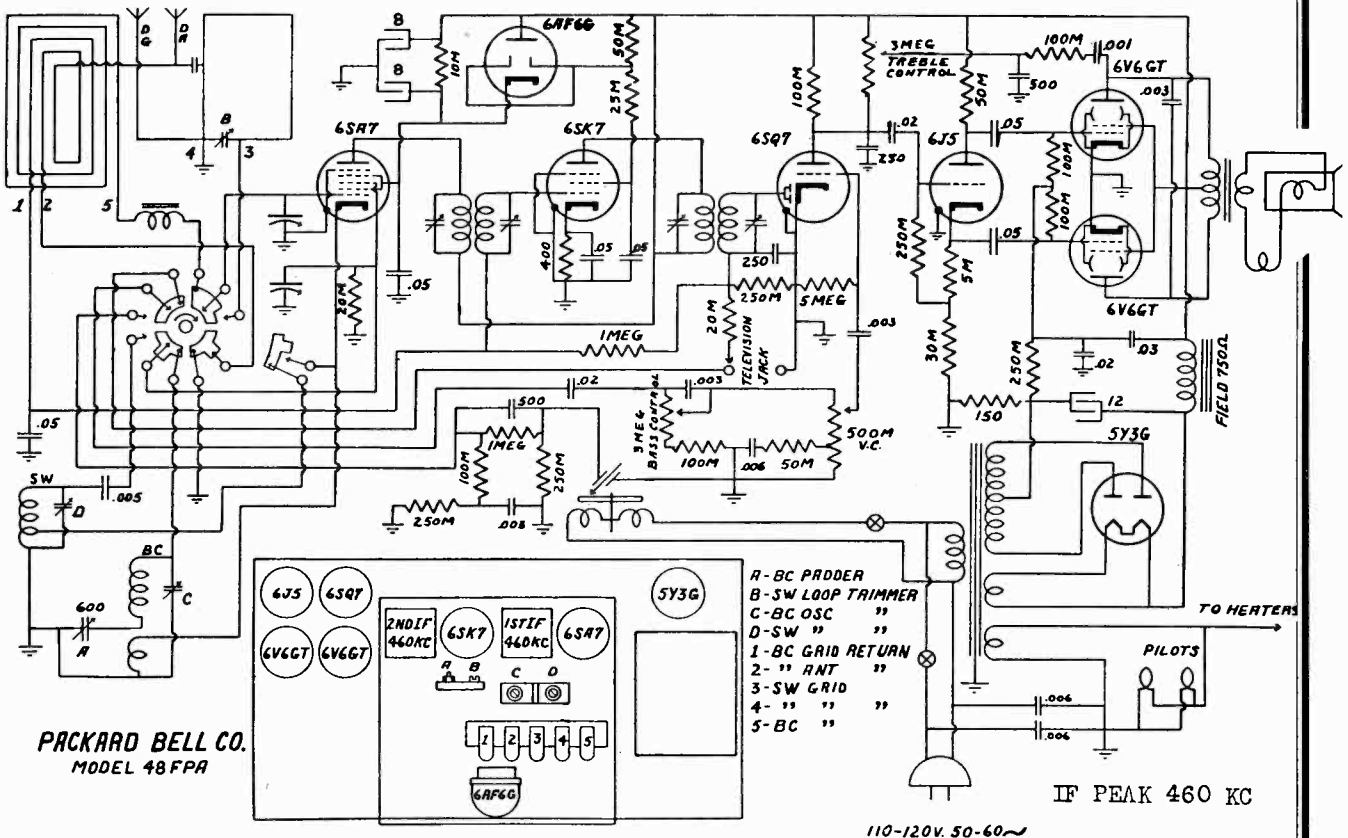
PACKARD BELL CO.

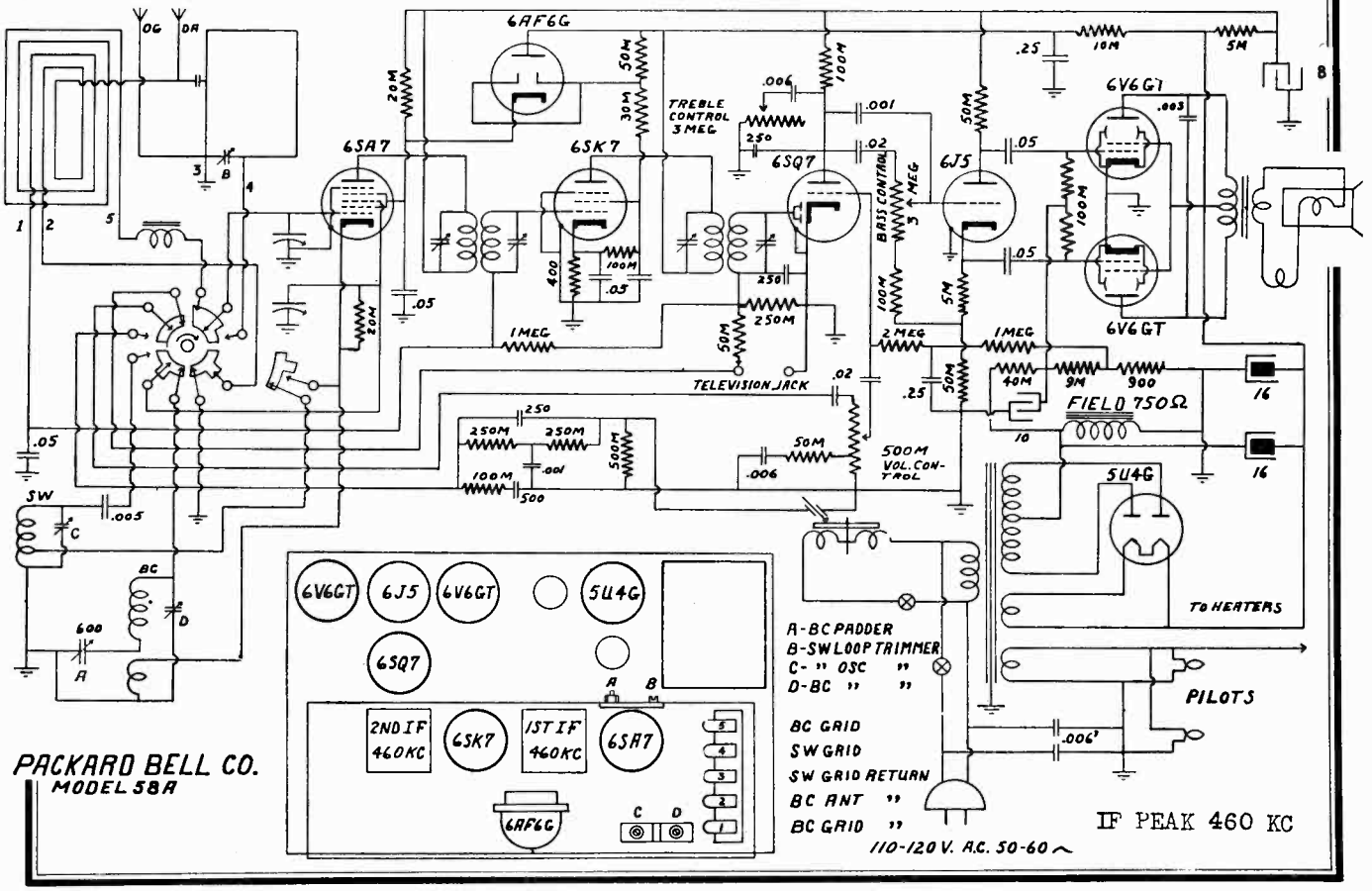




MODEL 48FPA
MODEL 58A
Schematics, Socket

PACKARD BELL CO.

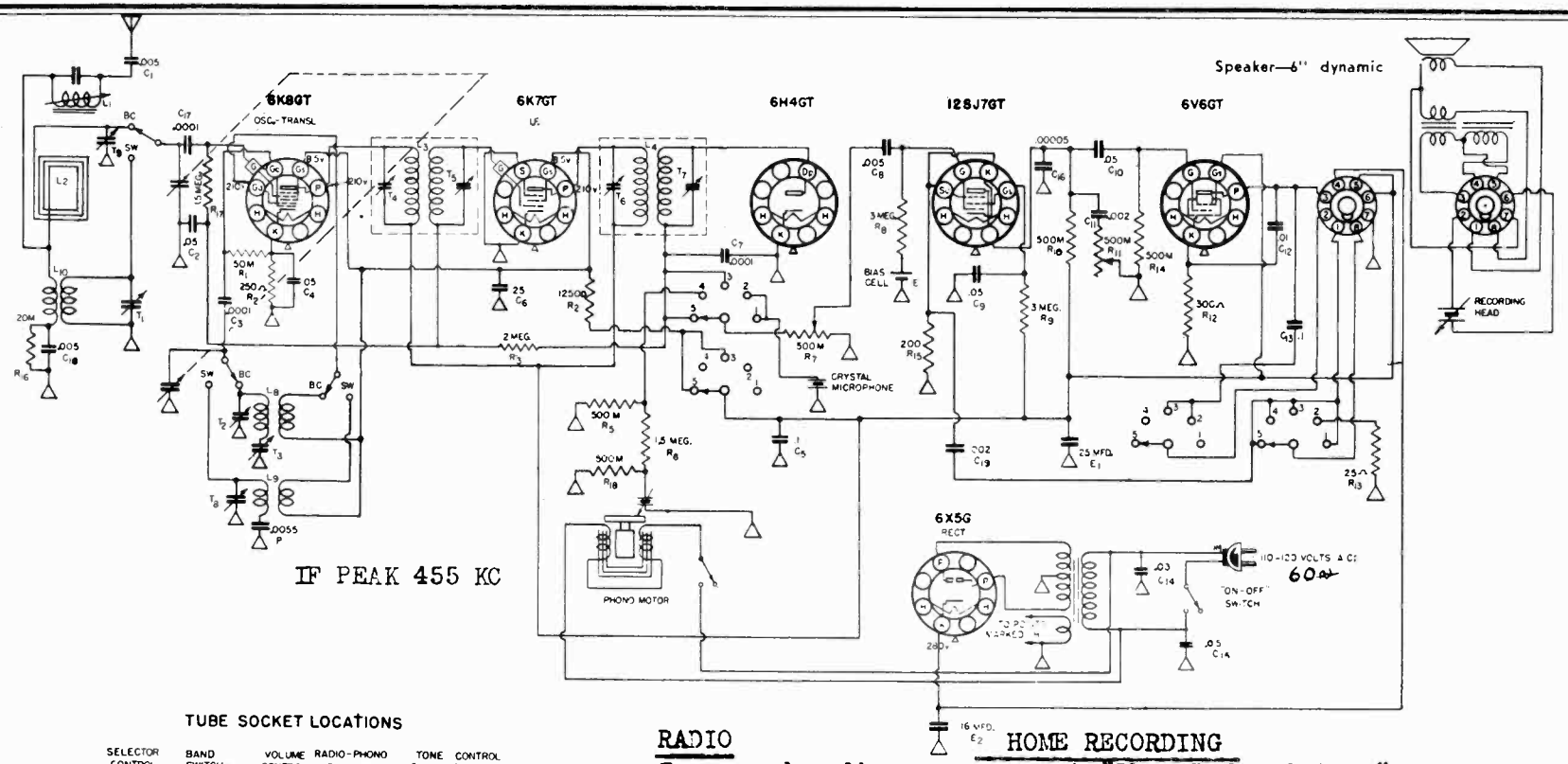




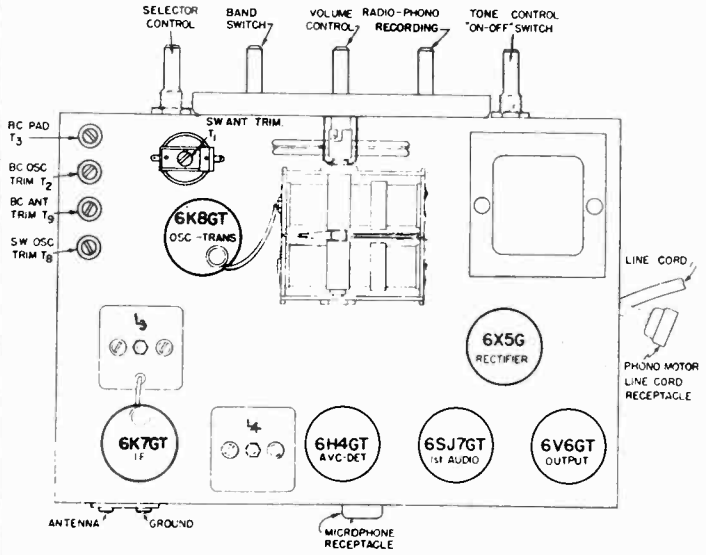
PATHE

MODELS P5, 500P

Schematic, Socket Trimmers, Notes



TUBE SOCKET LOCATIONS



RADIO

HOME RECORDING

To record radio programs set "PhonoRadio Switch" so that number "5" is opposite brass marker above the knob. Set volume control for loud and clear reception. Then set switch so that number "3" is opposite the marker and record the program. Do not allow needle to cut disc when it reaches the inner label. Do not allow the fine threads which form to collect under the needle, brush lightly with a soft cloth or brush towards the center of the disc.

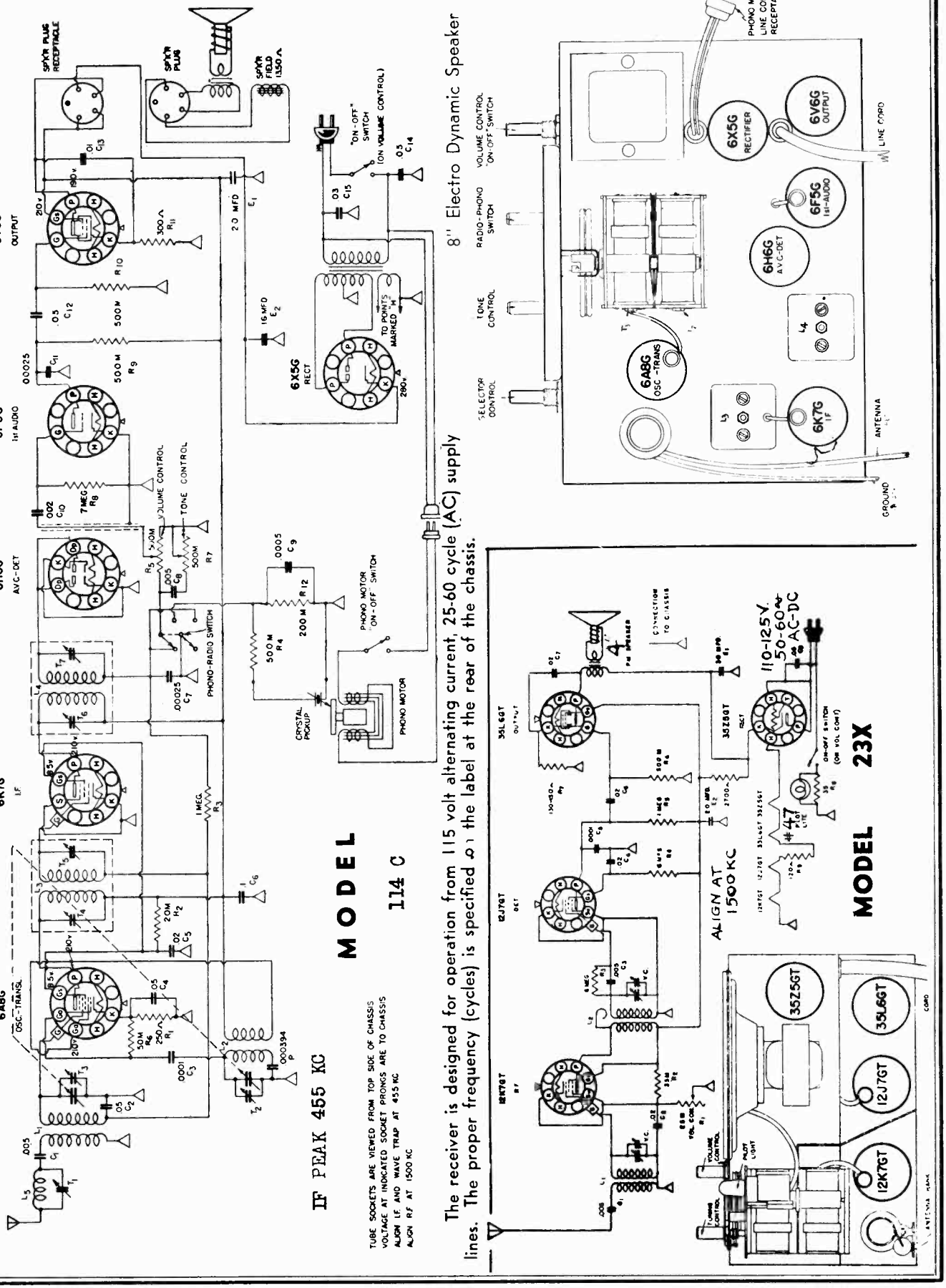
MICROPHONE

For microphone recording set switch so that number 1 is opposite marker and test for operation. Then turn switch so that number "2" is opposite the marker. Turn volume control fully to the right. In speaking use normal voice with microphone at least six inches from the mouth.

NOTE:-Be sure needle is firmly in place and that the flat side points towards the rear of the cabinet. Check that the small pin projects through one of the three holes on the blank to prevent the disc from slipping.

MODEL 23X
MODEL 114C
Schematics, Socket

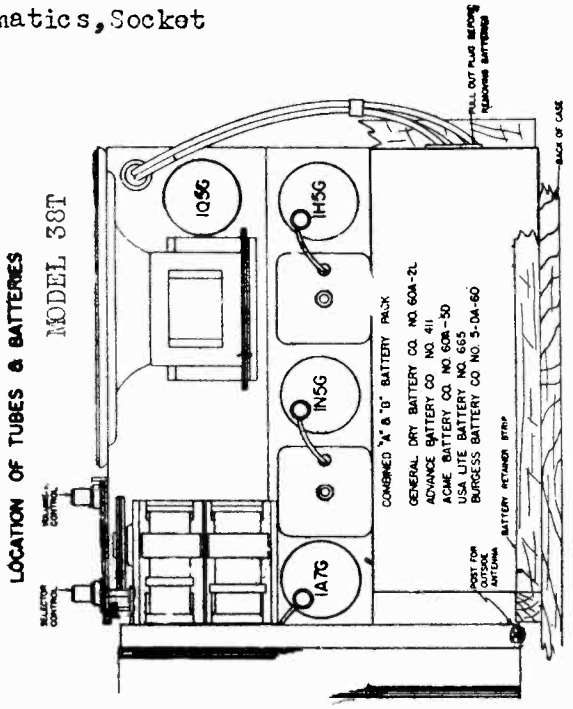
PATHE



MODEL 38T
MODEL 52
Schematics, Socket

PATHE

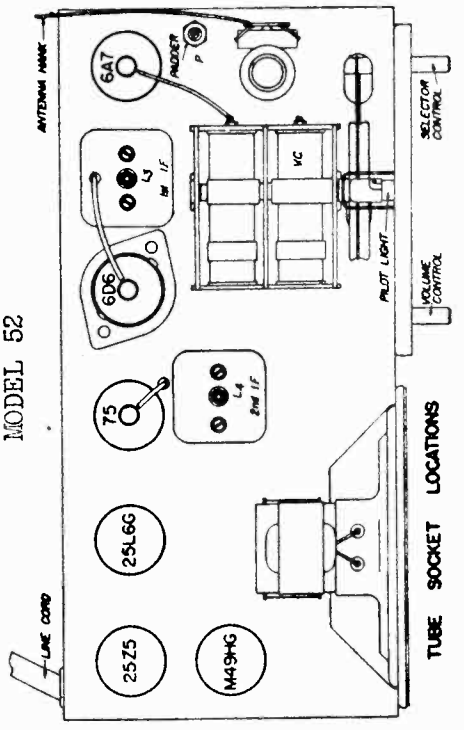
MODEL 40T
Schematic

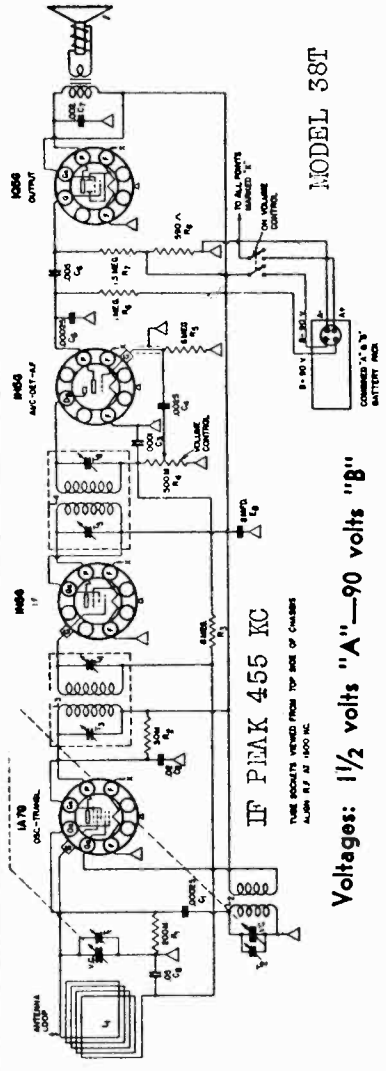


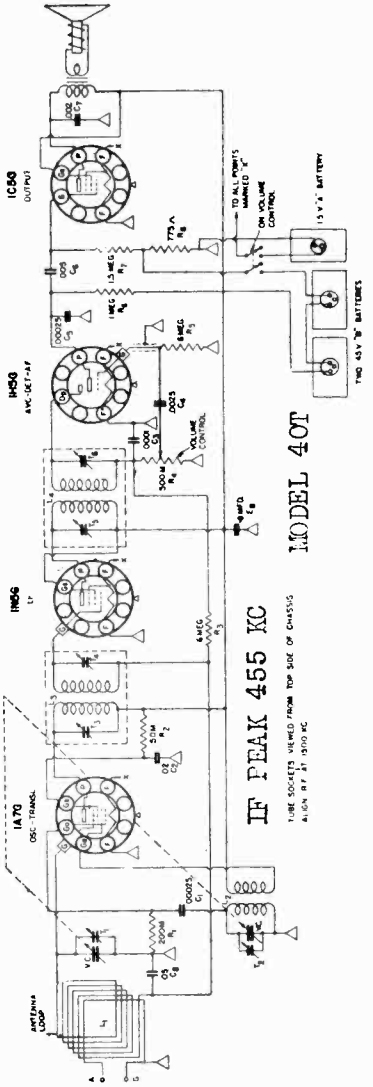
CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOLUME VIII

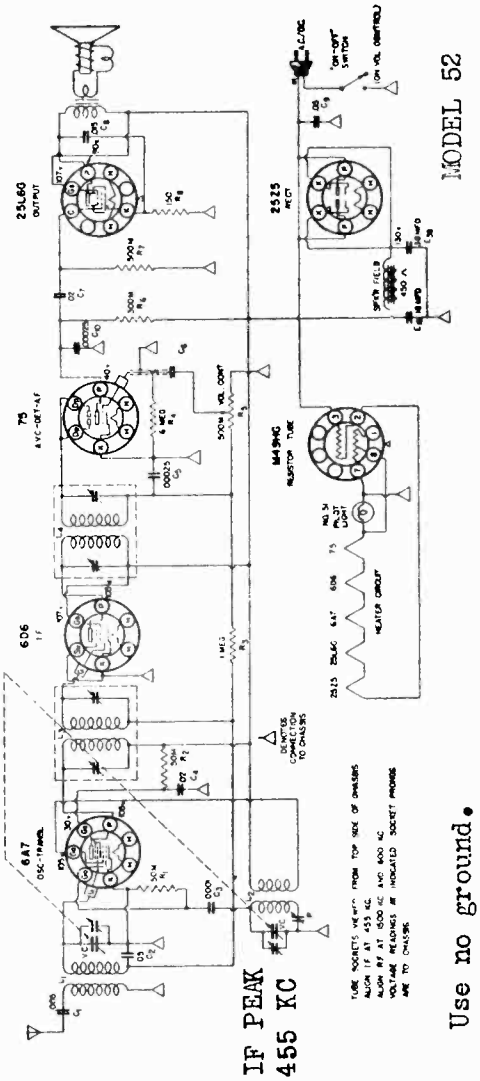
110 to 125 volts 50-60 cycles AC or DC

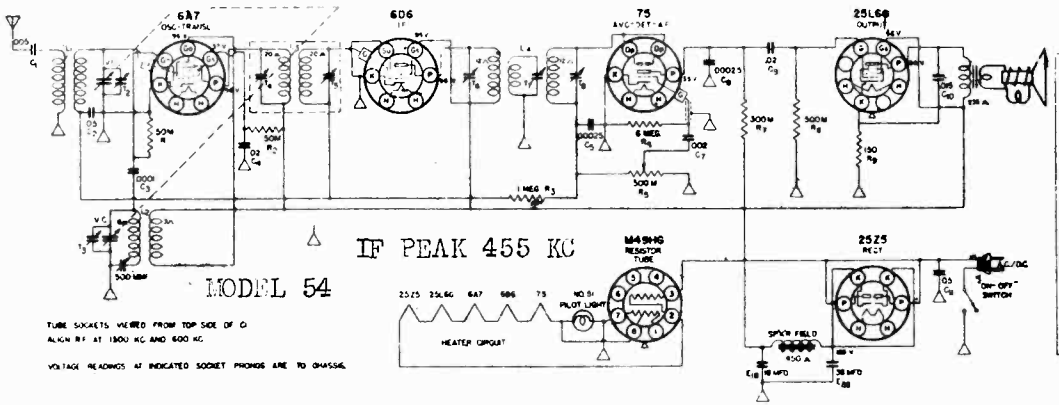
MODEL 52

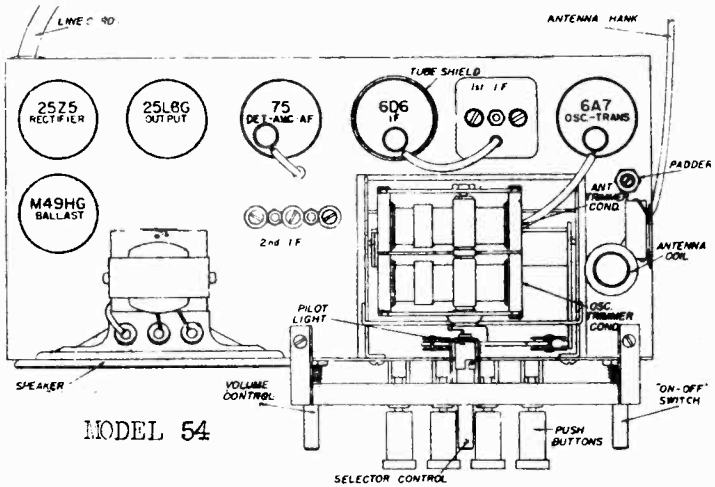












MODEL 54

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOLUME VIII

AUTOMATIC TUNING: There are four push buttons on the front panel which can be set so that by simply pushing the button marked with a station's call letters, any of four different stations may be received.

Allow the receiver to warm up tor 20 minutes betore making the station adjustments.

Decide on the station you wish to receive.

Tune to this station as accurately as possible with the selector knob.

Next, push in this button as far as possible, being careful not to disturb the station setting on the dial.

Turn this push button knob about one turn to the left, or until it starts to unscrew easily.

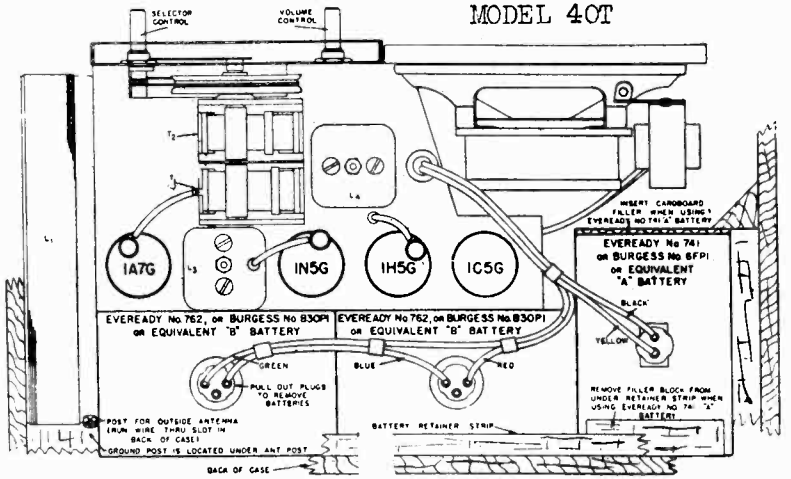
Holding the button at the "IN" position, screw the push button knob to the right until it is tight.

Cut out name of station from list supplied and insert in face of button.

Insert celluloid disk.

This completes the adjustments for one station. The three other buttons may be set in a similar manner.

LOCATION OF TUBES & BATTERIES
MODEL 40T



PHILCO Model "L" RECORD CHANGER

OPERATING INSTRUCTIONS

The Model "L" Record Changer plays seven 12" or eight 10" Records automatically. The last record remains on the turntable and repeats as long as the Record Changer is in operation.

Records may be repeated as often as desired by raising the record removing arm at A Fig. 1 to the upright position.

To reject a record and play the next record below it, pull the latch lever at L Fig. 1 forward.

To adjust the record removing arm to handle 10" records set the record removing arm change lever at D Fig. 1 opposite the number 10 stamped on the base plate. For 12" records set the lever opposite the number 12.

To adjust the pickup to play 10" records, push the pickup stop at K Fig. 1 back. (Away from the pickup needle). For 12" records pull the stop forward (toward the needle) as far as it will go.

Some units are equipped with two speed motors, and others with 78 RPM motors. When the two speed motor is used change from one speed to the other by simply moving lever at F Fig. 1 to position desired.

To start motor, throw switch at N Fig. 1 on the "on" position.

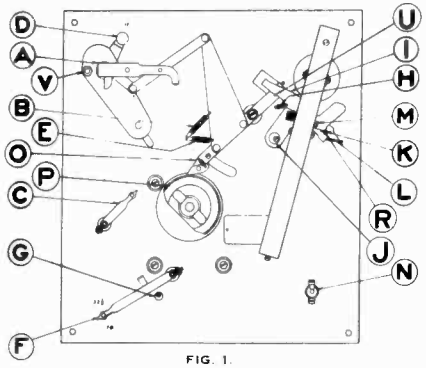


FIG. 1.

MOTOR SPEED

The motor speed is adjusted by means of a lever at C Fig. 1 which is mounted under the turntable. The direction of swing to fast or slow is indicated by the legends F and S on the base plate.

33-1/3 RPM — 78 RPM SHIFT
(Two-speed motors only)

Move the speed change lever at F Fig. 1 as far as it will go in the direction of swing indicated by the legends 33-1/3 and 78 on the base plate.

If adjustment of the speed change lever is required for any reason, proceed as follows: First loosen the screw which clamps the lever to the motor shaft. This shaft is provided with a screw-driver slot in the end. Next, using a screw driver, turn this shaft in a clockwise direction until you feel it strike the stop. The motor is now in the 33-1/3 RPM position. Now set the lever against the lug provided in the base plate and opposite the legend 33-1/3 and tighten the clamp screw. This places the lever in the correct position on the motor shaft. The final step is the adjustment of the eccentric bushing at G Fig. 1 which limits the throw of the lever. First loosen the screw which holds the eccentric bushing. Next, throw the speed changer lever to its farthest 78 RPM position, (using care that the lever does not slip on the motor shaft). Then turn the eccentric bushing around until it touches the side of the lever, and tighten it in place with the screw provided.

TRIP MECHANISM

The trip mechanism is the trigger that sets the Record Changer in motion. This is done by allowing the latch bar at O Fig. 1 to drop in front of, and be actuated by the cam at P Fig. 1. This cam is driven by the motor and is in motion as long as the motor is running. If this mechanism does not operate smoothly, the precautions outlined in succeeding paragraphs should be observed.

First of all, make sure that the square pin in the latch lever at U Fig. 1 latches properly in the notch in the lift lever at I Fig. 1. When latched, the notch should be engaged approximately one-half of its depth. The depth of engagement is adjusted by means of the eccentric washer and locking screw at J Fig. 1. Now run the Record Changer through its cycle. If the square pin fails to engage the notch in the lift lever, first check the tension of the latch spring at H Fig. 1 to insure that the notch can engage the pin. Next check the tension of the reset spring at E Fig. 1. This reset spring should not be under tension when the latch bar is latched but should have enough tension when the latch bar drops back off of the cam to cause the square pin to over travel the notch in the lift lever.

IMPORTANT — Before attempting to change the tension of any spring, be sure that the parts involved work freely without any tendency to bind, as of course any binding condition would preclude proper operation.

The Record Changer is adjusted at the factory to trip on a spiral trip groove record when the phonograph needle is 1¾" from the edge of the hole in the center of the record.

MOTOR LUBRICATION

The motor installed in the Record Changer is governor controlled, with all gearing enclosed, and leaves the factory lubricated for proper operation. For maximum satisfaction, lubricate the motor at regular intervals with SAE No. 10 oil. Please do not use any other grade of oil.

The governor disc engages with a ring of hard felt. This felt is impregnated with a lubricating solution sufficient for proper operation for approximately a year under normal conditions. It may be necessary, however, if the motor shows a tendency to chatter or waiver, to apply a drop or two of oil to this felt ring.

When eccentric or oscillating trip groove records are used, tripping is effected by means of the hardened steel pin in the end of tone arm lift crank at S Fig. 2 engaging the serrated block on the trip lever at T Fig. 2. There must be a minimum of 1/32" play between the end of the pin and the block, when, with a short needle, (⅝" Minimum Length) the pickup is resting on one record on the turntable. If the pressure of the pin on the block is not sufficient to insure operation, then check the pressure spring which is located up under the pickup.

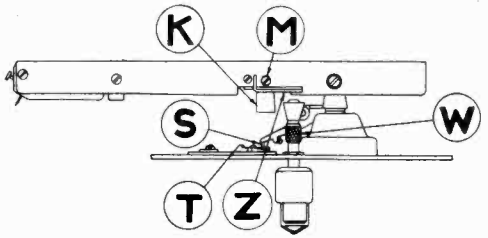


FIG. NO. 2

The oval head pivot screw at R Fig. 1 serves as a pivot for the lift lever at I Fig. 1. This screw should allow the lift lever to be raised by the latch bar to its maximum height without binding but also without any additional play.

If the Record Changer fails to trip, see if the phonograph needle is jumping out of a worn record trip groove. Next make certain that all parts of the mechanism work freely and smoothly. If it is found that the latch bar at O Fig. 1 is not dropping in far enough to engage the cam at P Fig. 1, then check the tension of the trip spring at B Fig. 1.

RECORD REMOVING MECHANISM

The Record Changer is adjusted so that it will always leave one record on the turntable. This is done to prevent the phonograph needle from damaging the covering on the turntable.

In case the Record Removing Mechanism fails to operate smoothly, proceed as follows: First make certain that all parts work freely with no binding in pivots or bearings, and that the record removing arm assembly rests on the stop screw at Q Fig. 3 Next stop the motor in such a position that the latch bar at O Fig. 1 can swing by and clear the cam at P Fig. 1. Place just one record on the turntable and measure from the top of this record down to the base plate. This distance should be one inch. Now by pulling the reject lever at L Fig. 1 first, it will be found possible to swing the record removing finger at Y Fig. 3 over to where it just touches the edge of the record. If the adjustment is correct, the record removing finger should just barely rise over the edge of the first record. If adjustment is required it can be made by means of the stop screw at Q Fig. 3. In the event the record removing arm raises the record from the turntable and drops it back in place without removing it, check the lift adjustment at V Fig. 1. This adjustment consists of an eccentric stud which is provided with a lock nut, and is made by loosening the lock nut and turning the eccentric stud. The lift adjustment should be set so that the hole in the center of the record just clears turntable spindle when the Record Changer is in operation.

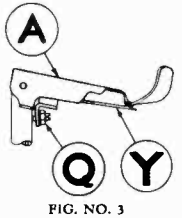


FIG. NO. 3

PICKUP LOWERING MECHANISM

The pickup lowering mechanism has two functions. First, it lowers the phonograph needle gently to the surface of the record. Second, it feeds the needle toward the center of the record so that it will enter the playing groove.

If the pickup descends too fast or too slow, adjust the speed of descent by turning the knurled thumb nut on the dashpot sleeve at W Fig. 2.

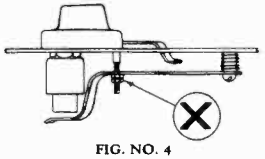
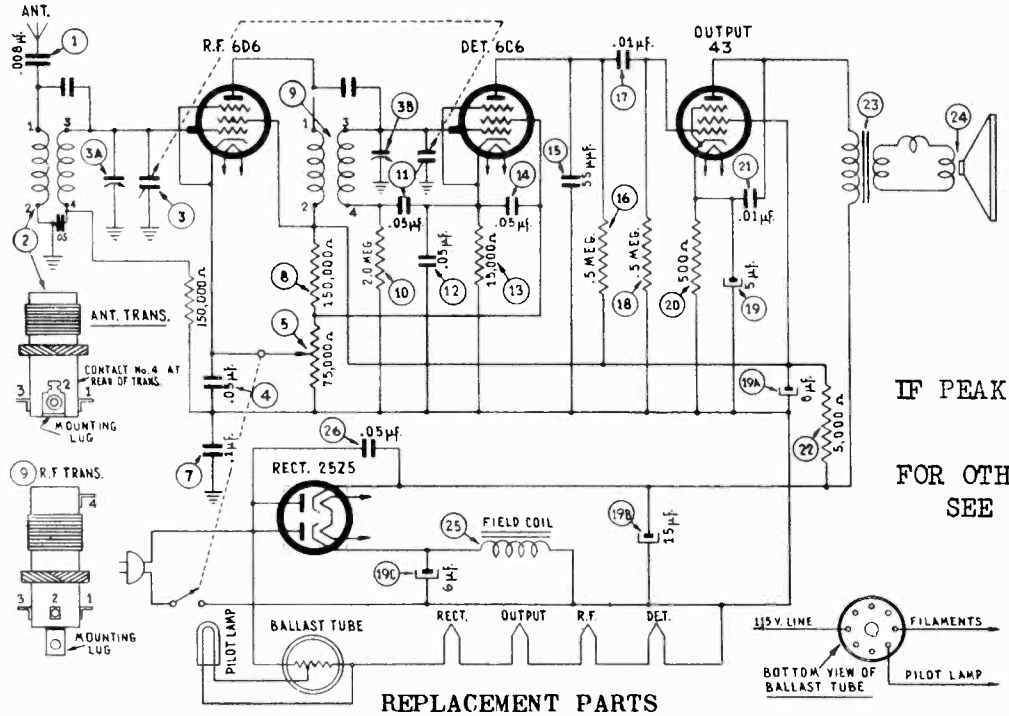


FIG. NO. 4

The unit is adjusted at the factory so that the needle will be set down approximately 3/32" in from the edge of the record. An adjusting screw is provided on the side of the pickup at M Fig. 2. If the needle is being lowered onto the playing surface of the record, and the adjusting screw at M Fig. 2 fails to correct the condition proceed as follows: First stop the record changer, with the pickup in the maximum raised position and check the clearance between the underside of the pickup shelf at Z Fig. 2 and the tip of the dashpot. This clearance should be very small as otherwise the pickup will tend to bounce as it is lowered. There must be sufficient clearance however to prevent the pickup shelf from rubbing on the tip of the dash pot, or the pickup will not swing out far enough to allow the adjustable stop at K Fig. 2 to come to rest against the dashpot. Check this clearance in both 10" and 12" record positions. If adjustment is required, the height of the dashpot may be regulated by loosening the nuts on the bottom of the lift lever stud at X Fig. 4 and changing their position on the stud. To raise the dashpot turn the nuts clockwise, to lower the dashpot turn the nuts counter-clockwise. Be sure to lock the nuts tightly together after the adjustment is made.

MODEL TH-1
Schematic
Alignment

PHILCO RADIO & TELEV. CORP.



IF PEAK 470 KC

FOR OTHER DATA SEE INDEX

REPLACEMENT PARTS

TRANSITONE HOME RADIO MODEL TH-1

Schem. No.	Description	Philco Part No.
1	Condenser (.006 mfd. 200 V).....	32104
2	Ant. Transformer.....	40168
3	Tuning Condenser.....	33110
4	Condenser .05 mfd. 200 V).....	32100
5	Volume Control.....	49115
6	Resistor 150,000 ohms.....	47100
7	Condenser .1 mdf. 200V.....	32117
8	Resistor 150,000 ohms.....	47100
9	R.F. Transformer.....	40169
10	Resistor 150,000 ohms.....	47100
11	Condenser .05 mfd. 200 V.....	32100
12	Condenser .05 mfd. 200 V.....	32100
13	Resistor 15,000 ohms.....	47154
14	Condenser .05 mfd. 200 V.....	32100
15	Condenser 55 mmfd.....	30115
16	Resistor .5 megohm.....	47101
17	Condenser .01 mfd. 200 V.....	32102
18	Resistor .5 megohm.....	47101
19	Electrolytic Condenser.....	31116
20	Resistor 500 ohms.....	47155
21	Condenser .01 mfd. 400 V.....	32103
22	Resistor 5000 ohms.....	47105
23	Output Transformer.....	43118
24	Speaker.....	60110
25	Field Coil.....Part of Spkr. Unit	
26	Condenser .05 mfd. 400 V.....	32101
	Clip (Drive Cord).....	20156
	Dial (Scale).....	16200T
	Dial Window.....	14100
	Drive Cord Assembly.....	90232
	Drive Pulley & Screw.....	21102
	Knob Assembly.....	13100
	Pointer.....	20237
	Socket 25Z5.....	15103
	Socket 6D6.....	15100
	Socket 6C6.....	15101
	Socket 43.....	15102
	Socket K55B.....	15104
	Socket Assembly (Pilot Lamp)....	90100
	Shaft (Tuning Drive).....	21101
	Spring (Drive Cord).....	23103
	Speaker Cone.....	
	Washer "C" Type Drive Shaft.....	23102

ALIGNMENT OF THE COMPENSATORS

In order to align the R.F. circuit of the receiver, an output meter, and signal generator will be required. With these instruments, the compensators should be adjusted as given below.

1. Connect an output meter to the plate and cathode terminals of the 43 tube.

2. The signal generator output lead is now connected to the aerial wire of the receiver through a 100 mmfd. condenser and the generator ground to a good ground connection. Then, turn the volume control to a full volume position.

3. Adjust the dial pointer as follows: Turn the tuning condenser to maximum capacity position. With the condenser in this position, the dial pointer should be ½ inch below the 550 K.C. mark of the dial and horizontal with the chassis.

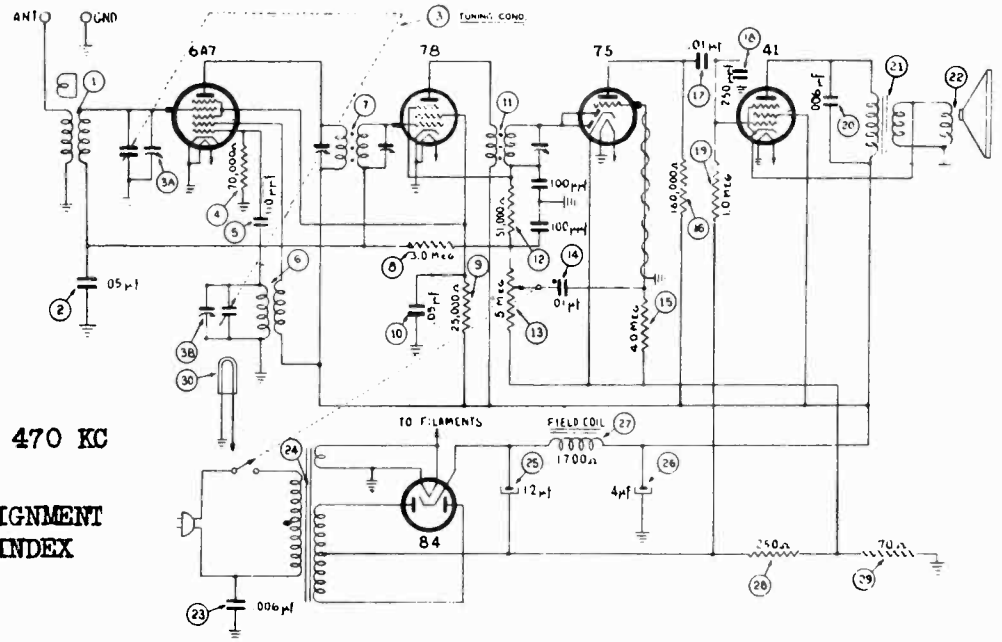
4. Set the signal generator and receiver dial for 1500 K.C. and adjust padders 3A and 3B for maximum reading on the output meter.

MODEL TH-1 is a 5 tube receiver designed for operation on alternating current (A.C.) or direct current (D.C.) 115 volts and covers a frequency range of 540 to 1720 kilocycles.

An indoor aerial 20 feet in length is attached to the receiver for average receiving conditions. In remote localities where signal strength is weak, a regular outdoor aerial is recommended, such as Philco aerial Part No. 40-6383. For hotels and apartment house installations, Philco Utility Aerial Part No. 40-6384 should be used.

PHILCO RADIO & TELEV. CORP.

MODEL TH-3
Schematic



MODEL TH-3 is a 5 tube superheterodyne receiver covering a frequency range from 540 to 1720 kilocycles and designed for operation on 115 volts alternating current (A.C.). The tubes used in this model are indicated on the schematic diagram shown below.

REPLACEMENT PARTS

TRANSITONE HOME RADIO MODEL TH-3

Schem. No.	Description	Philco Part No.
1	Antenna Transformer	32-2583
2	Condenser (.05 mf. tubular)	30-4519
3	Tuning Condenser	31-2335
4	Resistor (70,000 ohms, ½ watt)	33-370339
5	Condenser (110 mmf. mica)	30-1031
6	Oscillator Transformer	32-3021
7	1st I.F. Transformer	32-3120
8	Resistor (3.0 meg., ½ watt)	33-530339
9	Resistor (25,000 ohms, ½ watt)	33-325339
10	Condenser (.05 mf. tubular)	30-4444
11	2nd I.F. Transformer	32-2674
12	Resistor (51,000 ohms, ½ watt)	33-351339
13	Volume Control	33-5254
14	Condenser (.01 mf. tubular)	30-4479
15	Resistor (4.0 meg., ½ watt)	33-540339
16	Resistor (160,000 ohms, ½ watt)	33-416339
17	Condenser (.01 mf. tubular)	30-4169
18	Condenser (250 mmf. mica)	30-1032
19	Resistor (1.0 meg., ½ watt)	33-510339
20	Condenser (.006 mf. tubular)	30-4467
21	Output Transformer	
	For Speaker 36-1461-1	32-8046
	For Speaker 36-1461-2	32-8040
22	Speaker Cone and Voice Coil Assembly	See next column Part of Speaker 36-1461
23	Condenser (.006 mf. molded)	30-4423
24	Power Transformer	32-7979
25	Electrolytic Condenser (12 mf.)	30-2327
26	Electrolytic Condenser (4 mf.)	30-2328
27	Field Coil	Part of Speaker 36-1461
28	Resistor (250 ohms, ½ watt)	33-125339
29	Resistor (70 ohms, ½ watt)	33-070339
30	Pilot Lamp	34-2064
	Baffle & Silk Assembly	40-6430
	Bezel Throat	28-5474
	Bezel Window	27-5409
	Cone Assembly (For Speaker 36-1461-1	36-4114
	Cone Assembly (For Speaker 36-1461-2	36-4095
	Dial & Scale Assembly	31-2351
	Drive Cord 10 9/16"	27-8411
	Drive Drum	28-6662
	Drive Shaft	56-5018
	Knob Assembly	27-4632
	Pointer	28-5408
	Power Cord	L-2778
	Socket (5 prong)	27-6035
	Socket (6 prong)	27-6036
	Socket (7 prong)	27-6037
	Speaker	36-1461

MODELS TH-3,TH-4,TP-4,
TH-5,TP-5,TP-10,TP-11
TP-12
Alignment Instructions

PHILCO RADIO & TELEV. CORP.

GENERAL ALIGNING INSTRUCTIONS

Models TH-3, TH-4, TP-4, TH-5, TP-5, TP-10, TP-11, TP-12

The same general procedure is followed in aligning the compensating condensers in any of the above listed models.

EQUIPMENT REQUIRED

Signal Generator Philco Model 077 or 177 should be used.

Aligning Indicator Philco Model 027 and Model 028 circuit testers which contain an audio output meter and vacuum tube voltmeter. Either of the vacuum tube voltmeter or the audio ouput meters may be used as an aligning indicator and are connected as given under "Connecting Aligning Instruments".

Tools: Fibre handle aligning screw driver, Philco Part No. 45-2610.

CONNECTING ALIGNING INSTRUMENTS

Audio Output Meter: If an aligning indicator of this type is used, connect it to the plate and screen terminals of the output tube.

Vacuum Tube Voltmeter: To use the vacuum tube voltmeter as an aligning indicator, make the following connections:

Attach the negative terminal of the voltmeter to any point in the circuit where the A.V.C. voltage can be obtained. Connect the positive terminal to the ground connection of the receiver. In AC-DC sets the positive (+) terminal of the vacuum tube voltmeter should be connected to (B—) of the receiver. (Cathode 7C6.)

For aligning receivers with loktal type tubes, an aligning adaptor, Philco Part No. 45-2767 may be used with the vacuum tube voltmeter. To use the adaptor, remove the second detector tube from its socket and insert the aligning adaptor in the socket, then replace the tube in the adaptor. Connect the negative terminal of the vacuum tube voltmeter to the light colored wire which protrudes from the side of the adaptor. Attach the positive terminal of the vacuum tube voltmeter to the black wire of the adaptor.

Signal Generator: When adjusting the I.F. padders, the high side of the signal generator is connected through a .004 mfd. condenser to the antenna section of the tuning condenser. Connect the ground or low side of the generator to the chassis. It may be necessary when adjusting AC-DC models to reverse the power plug to eliminate hum.

The R.F. and oscillator padders are aligned with the high side of the signal generator connected to the antenna of the receiver through a 100 mmfd. condenser.

After connecting the aligning instruments, adjust the compensators on all models in the order as shown in the tabulation below. The first and second I.F. transformers in all models are located on the top and bottom sections of the chassis respectively. The antenna and oscillator padders are located on the tuning condenser.

Operations in Order	SIGNAL GENERATOR		RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dial Setting	Dial Setting	Control Setting	Adjust Compensators in Order	
1	Ant. Section of Tuning Cond.	470 K. C.	540 K. C. Tuning Cond. closed	Vol. Max.	1st & 2nd I.F.	Push in manual button on push button models
2	Ant. Ter.	1700 K. C.	1700 K. C.	Vol. Max.	"Osc"	Note A and B
3	Ant. Ter.	1500 K. C.	1500 K. C.	Vol. Max.	"Ant"	Note B

NOTE A — DIAL CALIBRATION: With the exception of Models TP-10 and TP-11 the dial pointers are adjusted by closing the tuning condenser (plates fully meshed) and setting the pointers on the dot below 55 on the dial.

NOTE B—The alignment procedure for the I.F. padders in Models TP-10 and TP-11 is the same as that given above. The antenna and oscillator padders of these models, however, are adjusted as follows:

1. Turn the tuning condenser to the extreme high frequency position (all plates out of mesh).
2. Insert a .004" gauge between the stationary and rotor plates of the oscillator condenser. If the gauge is not handy, a piece of bond writing paper can be used. After inserting gauge, turn rotor toward the low frequency end so that the gauge will be held in position.
3. Set signal generator at 1720 K.C. and tune oscillator padder for maximum reading on the output meter.
4. Remove gauge and set signal generator to 1500 K.C. and tune tuning condenser for maximum reading on this signal, then adjust the antenna padder for maximum output.
5. Place set in cabinet so that the tuning arm on the tuning condenser engages the dial on the cabinet. After placing receiver in the cabinet and it is found that the dial does not track properly with station signals, the dial can be calibrated as follows: Set the signal generator to a low frequency signal (600 K.C.) and tune receiver until signal shows maximum reading on the output meter. The dial is then set to this signal by inserting a 6-32 Phillips screw driver to the adjustment screw on the tuning condenser pulley. Loosen screw and slightly turn dial so that it reads 600 K.C. then retighten screw. When doing this, however, precaution should be taken so that the tuning condenser is not disturbed while dial is being adjusted and screw is being tightened or loosened.

WIRELESS RECORD PLAYER.....MODEL RP-3

Model RP-3 is a Wireless Record Player, designed to operate through the entire R.F. and audio system of a Radio Receiver. No connections are required between the Wireless Record Player and the Radio. The sound from the record is converted into a radio signal (540 K.C.) and broadcasted to the aerial of the radio set.

This model is equipped with a semi-automatic cystal pickup mechanism which will play either ten inch or twelve inch records. The pickup mechanism automatically places the pickup on the record when the lid of the cabinet is closed. Records can also be repeated by simply opening and closing the lid.

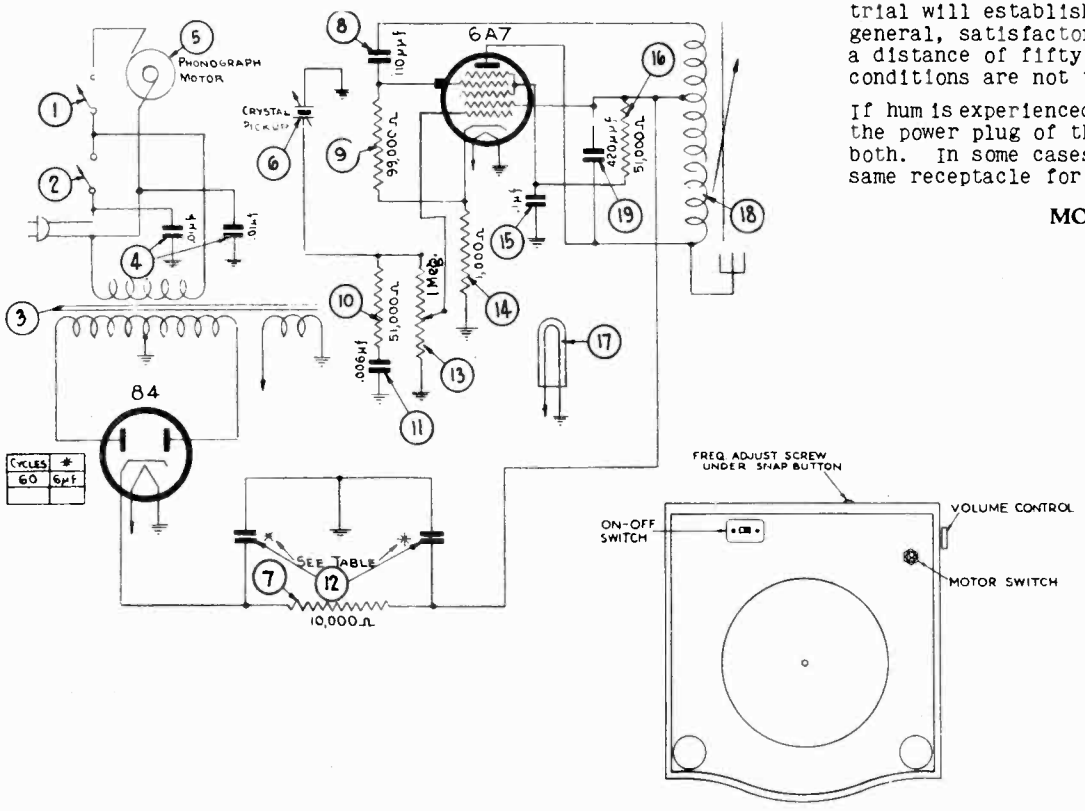
The player is operated from a 115 Volt, 60 cycle A.C. power supply. A volume control is also provided for adjusting the output of the player.

CHANGING OPERATING FREQUENCY

When the Record Player leaves the factory it is adjusted to operate at approximately 540 K.C. If interference from broadcasting stations is encountered, the frequency of the unit can be changed to any other frequency between 530 K.C. and 580 K.C. by removing snap button and adjusting small screw indicated in Diagram. Turning screw clockwise lowers the frequency, counter-clockwise raises the frequency. *This adjustment is best made while the unit is in operation.*

No definite rule can be established for the relative location of the record player to a radio; individual trial will establish the best location. However, in general, satisfactory operation may be obtained up to a distance of fifty (50) feet, provided local noise conditions are not too severe.

If hum is experienced it may be necessary to reverse the power plug of the record player, the radio, or both. In some cases it may be advisable to use the same receptacle for record player and radio.

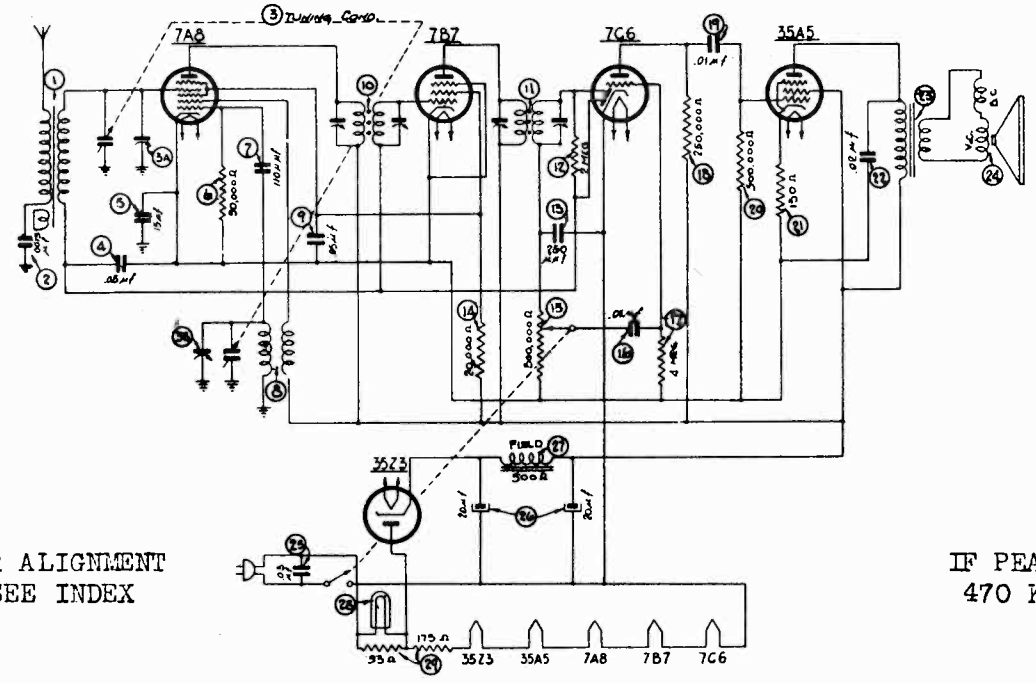


MODEL RP-3 WIRELESS RECORD PLAYER

Schem. No.	Description	Philco Part No.
1	Motor Switch	42-1503
2	Master Switch	42-1406-2
3	Power Transformer	32-8043
4	Line Condenser (.01 mf.-.01 mf., 600 v.)	3903-DG
5	Motor	35-2021
6	Crystal Pickup	35-2028
	Crystal Cartridge	415-1027
7	Filter Resistor (10,000 ohms., ½ watt)	33-310344
8	Oscillator Grid Cond. (110 mmf.)	30-1031
9	Oscillator Grid Resistor (99,000 ohms., ½ watt)	33-399344
10	Comp. Resistor (51,000 ohms., ½ watt)	33-351344
11	Comp. Condenser (.006 mf., 200 v.)	30-4467
12	Electrolytic Condenser (6 mf.-6 mf., 150 v.)	30-2388
13	Volume Control	33-5322
14	Cathode Bias Resistor (1,000 ohms., ½ watt)	33-210341
15	Screen By-Pass (.1 mf., 200 v.)	30-4499-S
16	Screen Resistor (51,000 ohms., ½ watt)	33-351344
17	Pilot Light (6-8 v., .250 amp.)	34-2210
18	Oscillator Coil	32-3232
19	Oscillator Condenser (420 mmf.)	30-1116

MODELS TH-4,TH-4T
Schematic,Notes

PHILCO RADIO & TELEV. CORP.



FOR ALIGNMENT
SEE INDEX

IF PEAK
470 KC

REPLACEMENT PARTS

TRANSITONE HOME RADIO MODEL TH-4

Schem. No.	Description	Philco Part No.
1	Antenna Transformer	32-3151
2	Tubular Condenser (.0015 mf., 200v.)	30-4555S
3	Tuning Condenser	31-2354
4	Tubular Condenser (.05 mf., 400v.)	30-4519S
5	Tubular Condenser (.15 mf., 400v.)	30-4505S
6	Resistor (50,000 ohms, 1/3 watt)	33-350244
7	Mica Condenser (110 mmf.)	30-1031
8	Oscillator Transformer	32-3152
9	Tubular Condenser (.05 mf., 400v.)	30-4519S
10	1st I.F. Transformer	32-3149
11	2nd I.F. Transformer	32-3150
12	Resistor (2 meg., 1/3 watt)	33-520244
13	Mica Condenser (250 mmf.)	30-1032
14	Resistor (20,000 ohms, 1/3 watt)	33-320244
15	Volume Control 500,000 ohms)	33-5306
16	Tubular Condenser (.01 mf., 200v.)	30-4479S
17	Resistor (4 meg., 1/3 watt)	33-540244
18	Resistor (250,000 ohms, 1/3 watt)	33-425244
19	Tubular Condenser (.01 mf., 400v.)	30-4572S
20	Resistor (500,000 ohms, 1/3 watt)	33-450244
21	Resistor (130 ohms, ½ watt)	33-113336
22	Tubular Condenser (.02 mf., 400v.)	30-4516S
23	Output Transformer	
	For Speaker 36-1469-1	32-8047
	For Speaker 36-1469-9	32-8044
24	Speaker	36-1469
25	Tubular Condenser (.03 mf., 400v.)	30-4449S
26	Electrolytic Condenser (20-20mf, 150v)	30-2382
27	Field Coil -- Part of Speaker No..	36-1469
28	Pilot Lamp	34-2068
29	Line Resistor	33-3367
	Cone Assembly (for Speaker 36-1469-1	36-4115
	Cone Assembly (for Speaker 36-1469-9	36-4113
	Drive Cord Assy	31-2358
	Drive Shaft Assy	31-2355
	Pilot Lamp Socket	38-9825
	Pointer	27-4891
	Power Cord	L-3199
	Scale	27-5553
	Socket	27-8130
	Spring (Drive Cord)	28-8954
	Speaker Assy	36-1469

MODEL TH-4T

Cardboard Back	27-9511
Dial Window	27-5472
Grille Cloth	44-1287
Knob Assy	27-4809

MODEL TH-4T IVORY

Cardboard Back	27-9545
Knob Assembly	27-4810

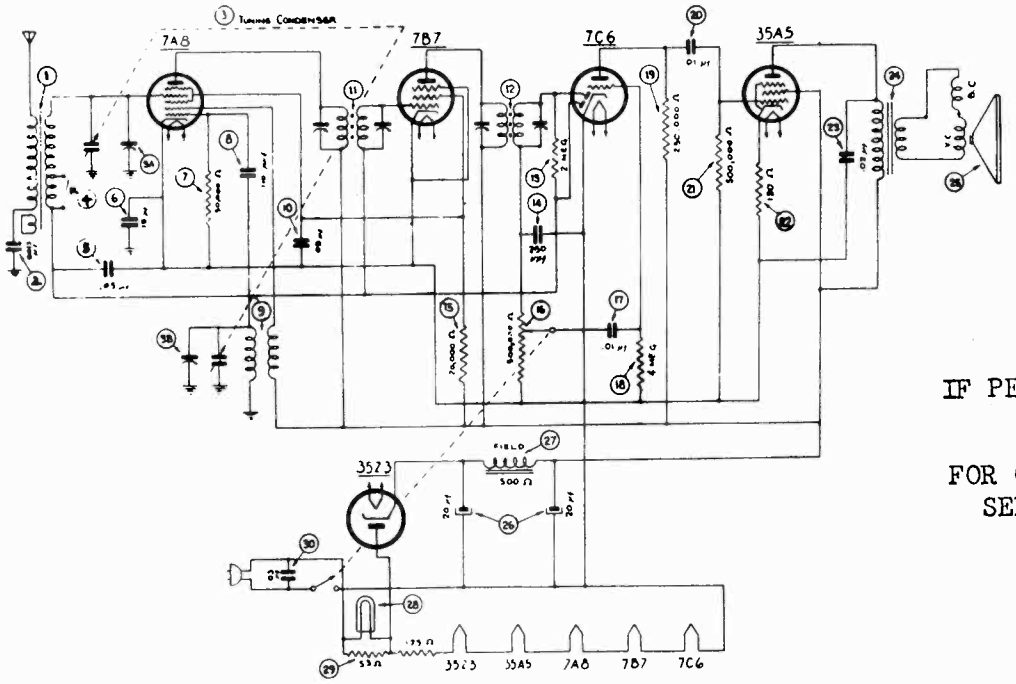
MODEL Th-4 is a 5 tube superheterodyne receiver covering a frequency range of 540 to 1720 kilocycles and designed for operation on either alternating current (A.C.) or direct current (D.C.) 115 volts.

An indoor aerial 20 feet in length is attached to the receiver for average receiving conditions; however in apartment houses, hotels, or steel re-inforced buildings, the Philco Utility Aerial Part No. 40-8384 is recommended.

NOTE: If no sound is heard after connecting the receiver to the power supply and sufficient time has been allowed for the tubes to heat, reverse the electric plug in the outlet. The same procedure should be observed on A.C. power supplies when a slight hum is heard with the volume turned low.

MODELS TP-4, TP4-I
Schematic, Notes

PHILCO RADIO & TELEV. CORP.



IF PEAK 470 KC

FOR OTHER DATA SEE INDEX

REPLACEMENT PARTS

TRANSITONE HOME RADIO MODEL TP-4

Schem. No.	Description	Philco Part No.
1	Antenna Transformer	32-3164
2	Tubular Condenser (.0015 mf., 200V)	30-4555S
3	Tuning Condenser	31-2354
4	Switch	42-1406
5	Tubular Condenser (.05 mf., 200V.)	30-4519S
6	Tubular Condenser (.15 mf., 400V.)	30-4505S
7	Resistor (50,000 ohms, 1/3 watt)	33-350244
8	Mica Condenser (110 mmf.)	30-1031
9	Oscillator Transformer	32-3152
10	Tubular Condenser (.05 mf., 200V.)	30-4519S
11	1st I.F. Transformer	32-3149
12	2nd I.F. Transformer	32-3150
13	Resistor (2 meg., 1/3 watt)	33-520244
14	Mica Condenser (250 mmf.)	30-1032
15	Resistor (20,000 ohms, 1/3 watt)	33-320244
16	Volume Control (500,000 ohms)	33-5306
17	Tubular Condenser (.01 mf., 200V.)	30-4479S
18	Resistor (4 meg., 1/3 watt)	33-540244
19	Resistor (250,000 ohms, 1/3 watt)	33-425244
20	Tubular Condenser (.01 mf., 400V.)	30-4572S
21	Resistor (500,000 ohms, 1/3 watt)	33-450244
22	Resistor (130 ohms, 1/2 watt)	33-113336
23	Tubular Condenser (.02 mf., 400V.)	30-4516S
24	Output Transformer	
	For Speaker 36-1469-1	32-8047
	For Speaker 36-1469-9	32-8044
25	Cone Assembly	
	For Speaker 36-1469-1	36-4115
	For Speaker 36-1469-9	36-4113
26	Tubular Condenser (.03 mf., 400V.)	30-4449S
27	Electrolytic Condenser (20-20 mf., 150V.)	30-2382
28	Field Coil ..... Part of Speaker, Part No	36-1469
29	Pilot Lamp	34-2068
30	Line Resistor	33-3367
	Cardboard Back	27-9511
	Dial Window	27-5472
	Drive Cord Assembly	31-2358
	Drive Shaft Assembly	31-2355
	Drive Drum	28-6662
	Grille Cloth	44-1287
	Knob Assembly	27-4809
	Pointer	27-4891
	Scale	27-5556
	Sockets	27-6130
	Speaker	36-1469
	Spring (Drive Cord)	28-8954

TP-4 IVORY

Cardboard Back	27-9545	Knob Assembly	27-4810

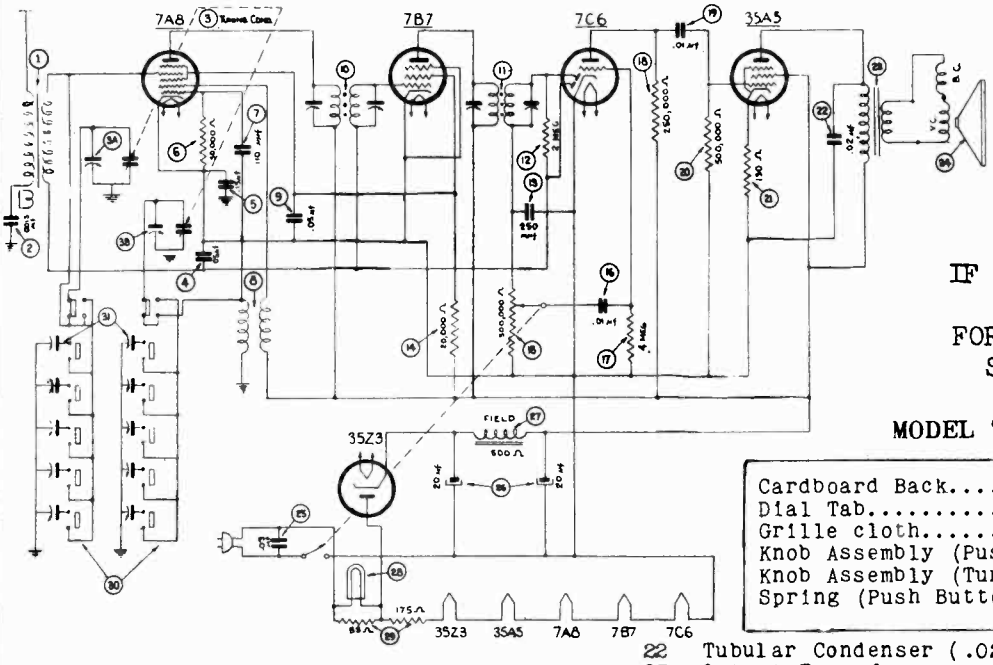
MODELS TP-4 and TP-4-I are 5 tube superheterodyne receivers having 2 tuning ranges covering from 540 to 1720 kilocycles on the broadcast band and a frequency range from 2.3 to 2.6 megacycles (M.C.) on the police band. This model is designed to operate on either alternating (A.C.) or direct current (D.C.) 115 volts. These models are identical with the exception of cabinets.

An indoor aerial 20 feet in length is attached to the receiver for average receiving conditions; however in apartment houses, hotels or steel re-inforced buildings, the Philco Utility Aerial Part No. 40-6384 is recommended.

NOTE: If no sound is heard after connecting the receiver to the power supply and sufficient time has been allowed for the tubes to heat, reverse the electric plug in the outlet. The same procedure should be observed on A.C. power supplies when a slight hum is heard with the volume turned low.

MODELS TH-5, TH-5T
Schematic, Tuner

PHILCO RADIO & TELEV. CORP.



IF PEAK 470 KC

FOR OTHER DATA
SEE INDEX

MODEL TH-5T IVORY

Cardboard Back	27-9328
Dial Tab	27-5528
Grille cloth	44-1288
Knob Assembly (Push Button)	27-4830
Knob Assembly (Tuning & Volume)	27-4810
Spring (Push Button Knobs)	28-5686

REPLACEMENT PARTS

Schem. No.	Description	Philco Part No.
1	Antenna Transformer	32-3166
2	Tubular Condenser (.0015 mf., 200v)	30-4555S
3	Tuning Condenser	31-2365
4	Tubular Condenser (.05 mf., 200v.)	30-4519S
5	Tubular Condenser (.15 mf., 400v.)	30-4505S
6	Resistor (50,000 ohms, 1/3 watt)	33-350244
7	Mica Condenser (110 mmf.)	30-1031
8	Oscillator Transformer	32-3167
9	Tubular Condenser (.05 mf., 200v)	30-4519S
10	1st I.F. Transformer	32-3149
11	2nd I.F. Transformer	32-3150
12	Resistor (2 meg., 1/3 watt)	33-520244
13	Mica Condenser (250 mmf.)	30-1032
14	Resistor (20,000 ohms, 1/3 watt)	33-320244
15	Volume Control (500,000 ohms)	33-5306
16	Tubular Condenser (.01 mf., 200v)	30-4479S
17	Resistor (4 meg. 1/3 watt)	33-540244
18	Resistor (250,000 ohms. 1/3 watt)	33-425244
19	Tubular Condenser (.01 mf., 400v)	30-4572S
20	Resistor (500,000 ohms, 1/3 watt)	33-450244
21	Resistor (130 ohms, 1/2 watt)	33-113336
22	Tubular Condenser (.02 mf., 400v)	30-4516S
23	Output Transformer	
	For Speaker 36-1469-1	32-8047
	For Speaker 36-1469-9	32-8044
24	Speaker	36-1469
25	Tubular Condenser (.03 mf., 400v.)	30-4449S
26	Electrolytic Condenser (20-20 mf., 150 v)	30-2382
27	Field Coil-Part of Speaker, PartNo.	36-1469
28	Pilot Lamp	34-2068
29	Line Resistor	33-3367
30	Push-Button Switch	42-1485
31	Padding Condenser Strip	31-6293
	Cone Assembly (for Speaker 36-1469-1	36-4115
	Cone Assembly (for Speaker 36-1469-9	36-4113
	Cardboard Back	27-9314
	Dial Window	27-5472
	Drive Cord Assy	31-2358
	Drive Shaft Assy	31-2355
	Grille cloth	44-1288
	Knob Assembly (Push Button)	27-4823
	Knob Assembly (Tuning, Volume)	27-4809
	Padder Strip (Tuning Unit)	31-6293
	Pilot Lamp socket assembly	38-9825
	Pointer	27-4891
	Power Cord	L-3199
	Push Button Switch	42-1485
	Scale	27-5553
	Sockets	27-6130
	Spring (Drive Cord)	28-8954

MODEL TH-5 is a 5 tube superheterodyne receiver covering a frequency range of 540 to 1720 kilocycles and designed for operation on either alternating current (A.C.) or direct current (D.C.) 115 volts.

This model is equipped with 6 electric push-buttons for automatically selecting stations in addition to dial tuning. Five push-buttons are used for the stations and one push button for selecting dial tuning. The push-buttons cover a frequency range as follows:

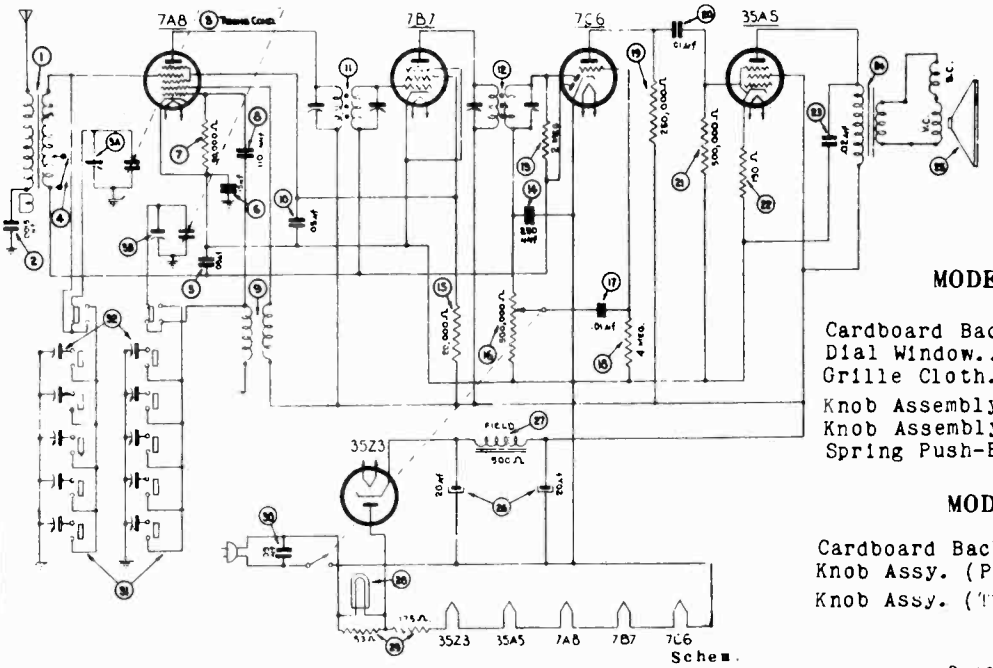
Padders (right to left from rear)	Circuit	Buttons (left to right from front)	Frequency Range
1, 2	Ant., Osc.	1	540 to 1030 kilocycles
3, 4	Ant., Osc.	2	650 to 1100 kilocycles
5, 6	Ant., Osc.	3	740 to 1240 kilocycles
7, 8	Ant., Osc.	4	900 to 1470 kilocycles
9, 10	Ant., Osc.	5	1160 to 1600 kilocycles
		6	Manual

An indoor aerial 20 feet in length is attached to the receiver for average receiving conditions; however in apartment houses, hotels or steel re-inforced buildings, the Philco Utility Aerial Part No. 40-6384 is recommended.

NOTE: If no sound is heard after connecting the receiver to the power supply and sufficient time has been allowed for the tubes to heat, reverse the electric plug in the outlet. The same procedure should be observed on A.C. power supplies when a slight hum is heard with the volume turned low.

PHILCO RADIO & TELEV. CORP.

MODELS TP-5, TP-5-I
TP-5T
Schematic, Tuner



IF PEAK 470 KC

FOR OTHER DATA SEE INDEX

MODEL TP-5T WALNUT

Cardboard Back	27-9314
Dial Window	27-5472
Grille Cloth	44-1288
Knob Assembly	27-4809
Knob Assembly (Push Button)	27-4823
Spring Push-Button Knob	28-5686

MODEL TP-5T IVORY

Cardboard Back	27-9328
Knob Assy. (Push Button)	27-4830
Knob Assy. (Tuning, Volume)	27-4810

REPLACEMENT PARTS

MODEL TP-5

Schem. No.	Description	Philco Part No.
1	Antenna Transformer	32-3168
2	Tubular Condenser (.0015 mf., 200V)	30-4555S
3	Tuning Condenser	31-2365
4	Switch	42-1406
5	Tubular Condenser (.05 mf., 200V)	30-4519S
6	Tubular Condenser (.15 mf., 400V)	30-4505S
7	Resistor (50,000 ohms, 1/3 watt)	33-350244
8	Mica Condenser (110 mmf.)	30-1031
9	Oscillator Transformer	32-3167
10	Tubular Condenser (.05 mf., 200V)	30-4519S
11	1st I.F.Transformer	32-3149
12	2nd I.F.Transformer	32-3150
13	Resistor (2 meg. 1/3 watt)	33-520244
14	Mica Condenser (250 mmf.)	30-1032
15	Resistor (20,000 ohms, 1/3 watt)	33-320244
16	Volume Control (500,000 ohms)	33-5306
17	Tubular Condenser (.01 mf., 200V)	30-4479S
18	Resistor (4 meg., 1/3 watt)	33-540244
19	Resistor (250,000 ohms, 1/3 watt)	33-425244
20	Tubular Condenser (.01 mf.,400V)	30-4572S
21	Resistor (500,000 ohms, 1/3 watt)	33-450244
22	Resistor (130 ohms, 1/2 watt)	33-113336
23	Tubular Condenser (.02 mf., 400V)	30-4516S
24	Output Transformer	
	For Speaker 36-1469-1	32-8047
	For Speaker 36-1469-9	32-8044
25	Cone Assembly	
	For Speaker 36-1469-1	36-4115
	For Speaker 36-1469-9	36-4113
26	Electrolytic Condenser (20-20 mf., 150V.)	30-2382
27	Field Coil -- Part of Speaker No.	36-1469
28	Pilot Lamp	34-2068
29	Line Resistor	33-3367
30	Tubular Condenser (.03 mfd. 400V.)	30-4449S
31	Push-Button Switch	42-1485
32	Padding Condenser Strip	31-6293
	Drive Cord Assembly	31-2358
	Drive Shaft Assembly	31-2355
	Drive Drum	28-6662
	Padder Strip	31-6293
	Pointer	27-4891
	Power Cord	L-3199
	Push-Button Switch	42-1485
	Scale	27-5553
	Sockets	27-6130
	Spring (Drive Cord)	28-8954
	Speaker	36-1469

MODELS TP-5 and TP-5-I are 5 tube superheterodyne receivers having 2 tuning ranges covering from 540 to 1720 kilocycles on the broadcast band and from 2.3 to 2.5 megacycles (M.C.) on the police band. This model is designed for operation on alternating current (A.C.) or direct current (D.C.) 115 volts. These models are identical with the exception of cabinets.

The set is equipped with 6 electric push-buttons for automatically selecting stations in addition to dial tuning. Five push-buttons are used for the stations and one push-button for selecting dial tuning. The push-buttons cover a frequency range as follows:

Padders (right to left from rear)	Circuit	Buttons (left to right from front)	Frequency Range	Padders (right to left from rear)	Circuit	Buttons (left to right from front)	Frequency Range
1	Ant.	1	540 to 1030 kilocycles	7	Ant.	4	900 to 1470 kilocycles
2	Osc.			8	Osc.		
3	Ant.	2	650 to 1100 kilocycles	9	Ant.	5	1160 to 1600 kilocycles
4	Osc.			10	Osc.		
5	Ant.	3	740 to 1240 kilocycles			6	Manual
6	Osc.						

An indoor aerial 20 feet in length is attached to the receiver for average receiving conditions; however in apartment houses, hotels or steel re-inforced buildings, the Philco Utility Aerial Part No. 40-6384 is recommended.

NOTE: If no sound is heard after connecting the receiver to the power supply and sufficient time has been allowed for the tubes to heat, reverse the electric plug in the outlet. The same procedure should be observed on A.C. power supplies when a slight hum is heard with the volume turned low.

MODELS TP-5,TP-11,TH-5
Tuner Data
MODEL 39-8
Alignment

PHILCO RADIO & TELEV. CORP.

SETTING AND OPERATING ELECTRIC PUSH BUTTON TUNING

Models TP-5, TP-11, TH-5

Select five of your favorite nearby broadcast stations and remove their call letters from the station call letter tab sheets supplied. Place the call letters in the windows above the buttons, making sure that each respective button covers the frequency of the station for which it is to be used. The frequency of the popular stations in your vicinity may be found by consulting any station list. The frequency range of the buttons is as follows:—

Padders (right to left from rear)	Circuit	Buttons (left to right from front)	Frequency Range
1 2	Ant} Osc}	1	540 to 1030 kilocycles
3 4	Ant} Osc}	2	650 to 1100 kilocycles
5 6	Ant} Osc}	3	740 to 1240 kilocycles
7 8	Ant} Osc}	4	900 to 1470 kilocycles
9 10	Ant} Osc}	5	1160 to 1600 kilocycles
		6	Dial

The left-hand button looking at the front of the cabinet corresponds to the two right-hand screws looking at the rear and covers the lowest frequency range.

With the "Manual" button depressed, tune in the station whose call letters appear above the left-hand button. Then depressing the left-hand button, tune in this station by rotating the "OSC" screw of No. 1 pair (at the right end of the unit looking at the rear of the chassis). Turn the screw slowly and listen carefully or the station may be passed without noticing it. After the "OSC" screw has been adjusted for maximum volume, the corresponding "ANT" screw should be adjusted for maximum. For some stations, it may be necessary to re-adjust the "OSC" screw after the "ANT" screw has been set. Switching from the "Manual" to the automatic push button will enable you to make sure you have the correct station tuned in. When the first station has been set, the same procedure should be followed for the remaining buttons, first tuning in the desired station by means of the "Manual" control.

To tune the receiver with the "Push-Buttons," simply press in the button which is under the call letters of the desired station. Your station will be received instantly. The volume of the program may be controlled with the manual volume control.

While the above procedure is satisfactory in setting up push buttons for stations, a very accurate adjustment can be obtained with a vacuum tube voltmeter.

Model 39- 8

ALIGNMENT OF COMPENSATORS

EQUIPMENT REQUIRED:

(1) Signal Generator; Philco Model 077 Signal Generator which has a fundamental frequency range from 115 to 36,000 K.C. is the correct instrument for this purpose.
(2) Output Meter, Philco Model 027 Circuit Tester, incorporates a sensitive output meter and is recommended.
(3) Philco Fiber Handle Screw Driver, Part No. 45-2610 and Fiber Wrench, Part No. 3164.

OUTPUT METER:

The Philco 027 Output Meter is connected to the plate and screen terminals of the type 43 tube and adjusted for the 0 to 30 A.V.C. scale. After connecting the output meter, adjust the compensators in the order as shown in the tabulation below. Locations of the compensators are shown on Fig. 2. If the output meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.

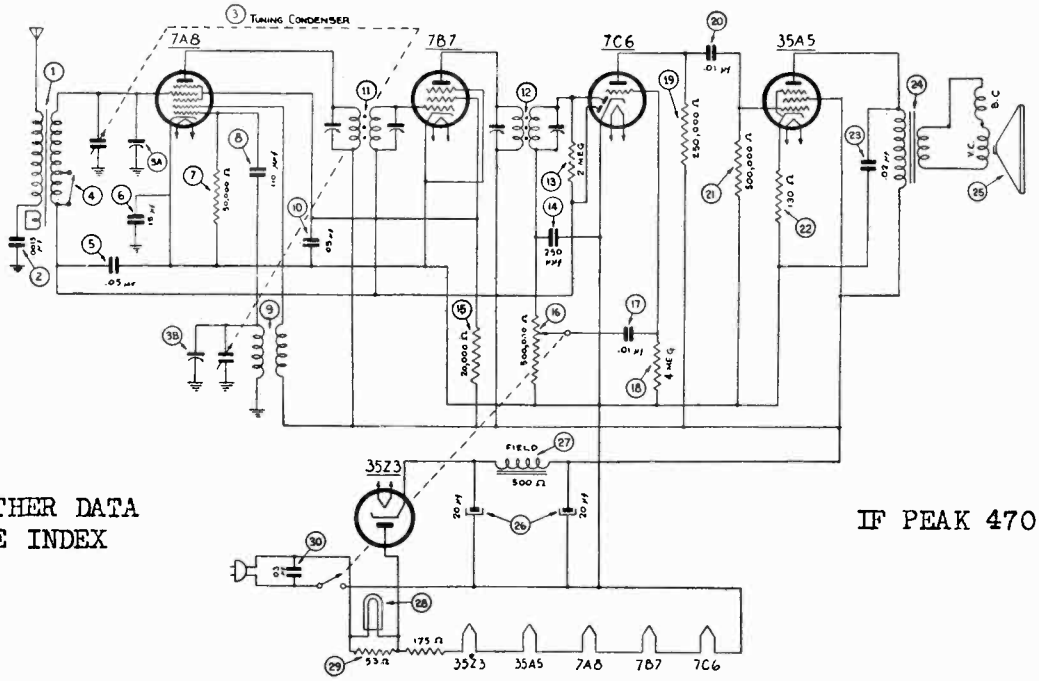
	Signal Generator			Receiver			
Operation In Order	Output Connections to Receiver	Dummy Antenna (Note A)	Dial Setting	Dial Setting	Control Setting	Adjust Compensators in order	Special Instructions
1	6A7 Grid Cap	.1 mf.	470 K.C.	580 K.C.	Vol.Cont. Max.	12A, 10B, 10A	Adjust for max. output
2	Ant. Lead	100 mf.	1550 K.C.	1550 K.C.	Vol.Cont. Max.	2B, 2A	Adjust for max. output Note A,B.

NOTE A--The "Dummy Antenna" consists of a condenser connected in series with the signal generator output lead (high side). Use the capacity as specified in each step of the above procedure.

NOTE B--DIAL CALIBRATION: With the tuning condenser in "maximum capacity" position (plates fully meshed), set the dial pointer between the two horizontal lines at the low frequency end of the scale (550 K.C.).

PHILCO RADIO & TELEV. CORP.

MODEL TP-10
Schematic
Notes



FOR OTHER DATA
SEE INDEX

IF PEAK 470 KC

REPLACEMENT PARTS

TRANSITONE HOME RADIO MODEL TP-10

Schem. No.	Description	Philco Part No.
1	Antenna Transformer	32-3164
2	Tubular Condenser (.0015 mf., 200V)	30-4555S
3	Tuning Condenser	31-2354
4	Switch	42-1406
5	Tubular Condenser (.05 mf., 200V)	30-4519S
6	Tubular Condenser (.15 mf., 400V)	30-4505S
7	Resistor (50,000 ohms, 1/3 watt).	33-350244
8	Mica Condenser (110 mmf.)	30-1031
9	Oscillator Transformer	32-3152
10	Tubular Condenser (.05 mf., 200V)	30-4519S
11	1st I.F. Transformer	32-3149
12	2nd I.F. Transformer	32-3150
13	Resistor (2 meg., 1/3 watt)	33-520244
14	Mica Condenser (250 mmf.)	30-1032
15	Resistor (20,000 ohms, 1/3 watt).	33-320244
16	Volume Control (500,000 ohms)	33-5306
17	Tubular Condenser (.01 mf.,200V).	30-4479S
18	Resistor (4 meg., 1/3 watt)	33-540244
19	Resistor (250,000 ohms, 1/3 watt)	33-425244
20	Tubular Condenser (.01 mf., 400V)	30-4572S
21	Resistor (500,000 ohms, 1/3 watt)	33-450244
22	Resistor (130 ohms, 1/2 watt)	33-113336
23	Tubular Condenser (.02 mf., 400V)	30-4516S
24	Output Transformer	
	For Speaker 36-1469-1	32-8047
	For Speaker 36-1469-9	32-8044
25	Cone Assembly	
	For Speaker 36-1469-1	36-4115
	For Speaker 36-1469-9	36-4113
26	Electrolytic Condenser (20-20 mf., 150 V.)	30-2382
27	Field Coil....Part of Speaker No.	36-1469
28	Pilot Lamp	34-2068
29	Line Resistor	33-3367
30	Tubular Condenser (.03 mf., 400V)	30-4449S
	Cabinet	10367-A
	Cardboard Back	27-9320
	Disc Feet	27-9337
	Drive Cord Assembly	31-2358
	Drive Drum	56-6033
	Driving Arm (Pointer Drive)	56-1376
	Drive Shaft Assy	31-2355
	Grille Silk & Gasket	40-6452
	Knob Assembly	27-4815
	Pilot Lamp Socket Assembly	38-9828
	Power Cord	L-3199
	Rubber Tubing (Driving Arm)	27-9334
	Sockets	27-6130
	Speaker Assembly	36-1469
	Spring	28-8751

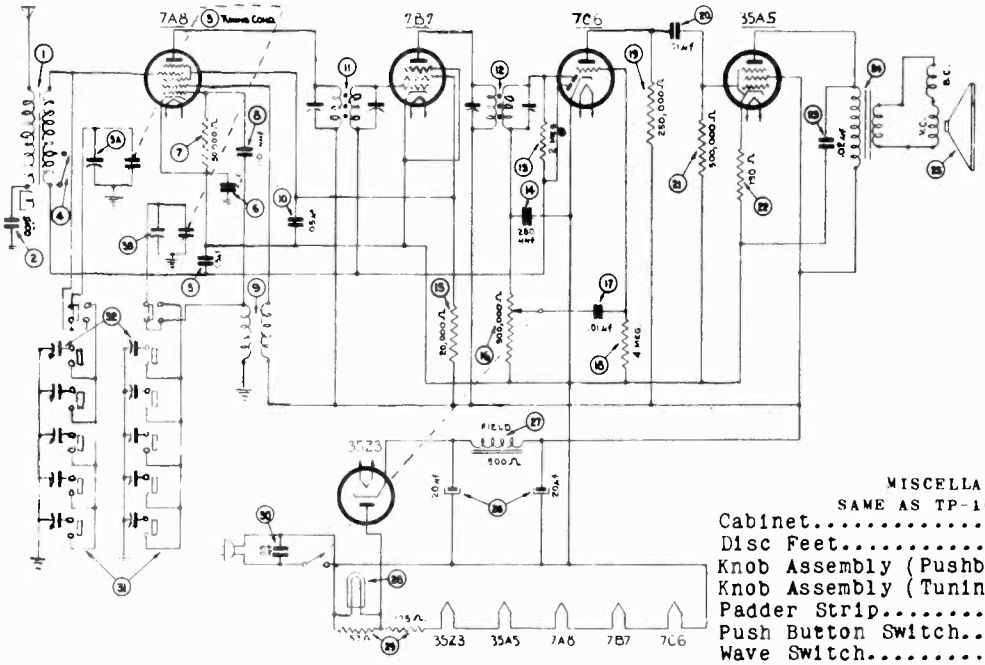
MODEL TP-10 is a 5 tube superheterodyne receiver having 2 tuning ranges covering from 540 to 1720 kilocycles (K.C.) on the broadcast band and 2.3 to 2.5 megacycles (M.C.) on the police band. This model is designed for operation on either alternating current (A.C.) or direct current (D.C.) 115 volts. The receiver is assembled in a streamlined, 2 toned plastic cabinet.

An indoor aerail 20 feet in length is attached to the receiver for average receiving conditions; however in apartment houses, hotels or steel re-inforced buildings, the Philco Utility Aerial Part No. 40-6384 is recommended.

NOTE: If no sound is heard after connecting the receiver to the power supply and sufficient time has been allowed for the tubes to heat, reverse the electric plug in the outlet. The same procedure should be observed on A.C. power supplies when a slight hum is heard with the volume turned low.

MODEL TP-11
Schematic, Tuner

PHILCO RADIO & TELEV. CORP.



IF PEAK 470 KC

FOR OTHER DATA
SEE INDEX

MISCELLANEOUS PARTS
SAME AS TP-10 WITH EXCEPTION

Cabinet	10368-A
Disc Feet	27-9337
Knob Assembly (Pushbutton)	27-4824
Knob Assembly (Tuning)	27-4815
Padder Strip	31-6293
Push Button Switch	42-1485
Wave Switch	42-1406

REPLACEMENT PARTS

Schem. No.	Description	Philco Part No.
1	Antenna Transformer	32-3168
2	Tubular Condenser (.0015 mf., 200V	30-4555S
3	Tuning Condenser	31-2365
4	Switch	42-1406
5	Tubular Condenser (.05 mf., 200V)	30-4519S
6	Tubular Condenser (.15 mf., 400V)	30-4505S
7	Resistor (50,000 ohms, 1/3 watt)	33-350244
8	Mica Condenser (110 mmf.)	30-1031
9	Oscillator Trnsformer	32-3167
10	Tubular Condenser (.05 mf., 200V)	30-4519S
11	1st I.F. Transformer	32-3149
12	2nd I.F. Transformer	32-3150
13	Resistor (2 meg., 1/3 watt)	33-520244
14	Mica Condenser (250 mmf.)	30-1032
15	Resistor (20,000 ohms, 1/3 watt)	33-320244
16	Volume Control (500,000 ohms)	33-5306
17	Tubular Condenser (.01 mf., 200V)	30-4479S
18	Resistor (4 meg., 1/3 watt)	33-540244
19	Resistor (250,000 ohms, 1/3 watt)	33-425244
20	Tubular Condenser (.01 mf., 400V)	30-4572S
21	Resistor (500,000 ohms, 1/3 watt)	33-450244
22	Resistor (130 ohms, 1/2 watt)	33-113336
23	Tubular Condenser (.02 mf., 400V)	30-4516S
24	Output Transformer	
	For Speaker 36-1469-1	32-8047
	For Speaker 36-1469-9	32-8044
25	Cone Assembly	
	For Speaker 36-1469-1	36-4115
	For Speaker 36-1469-9	36-4113
26	Electrolytic Condenser (20-20 mf., 150 V.)	30-2382
27	Field Coil ..... Part of Speaker No	36-1469
28	Pilot Lamp	34-2068
29	Line Resistor	33-3367
30	Tubular Condenser (.03 mf., 400 V.	30-4449S
31	Push-Button Switch	42-1485
32	Padding Condenser Strip	31-6293

MODEL TP-11 is a 5 tube superheterodyne receiver having 2 tuning ranges covering from 540 to 1720 kilocycles (K.C.) on the broadcast band and from 2.3 to 2.5 megacycles (M.C.) on the police band. This model is assembled in a 2 toned, streamlined plastic cabinet.

This model is equipped with 6 electric push-buttons for automatically selecting stations in addition to dial tuning. Five push-buttons are used for the stations and one push-button for selecting dial tuning. The push-buttons cover a frequency range as follows:

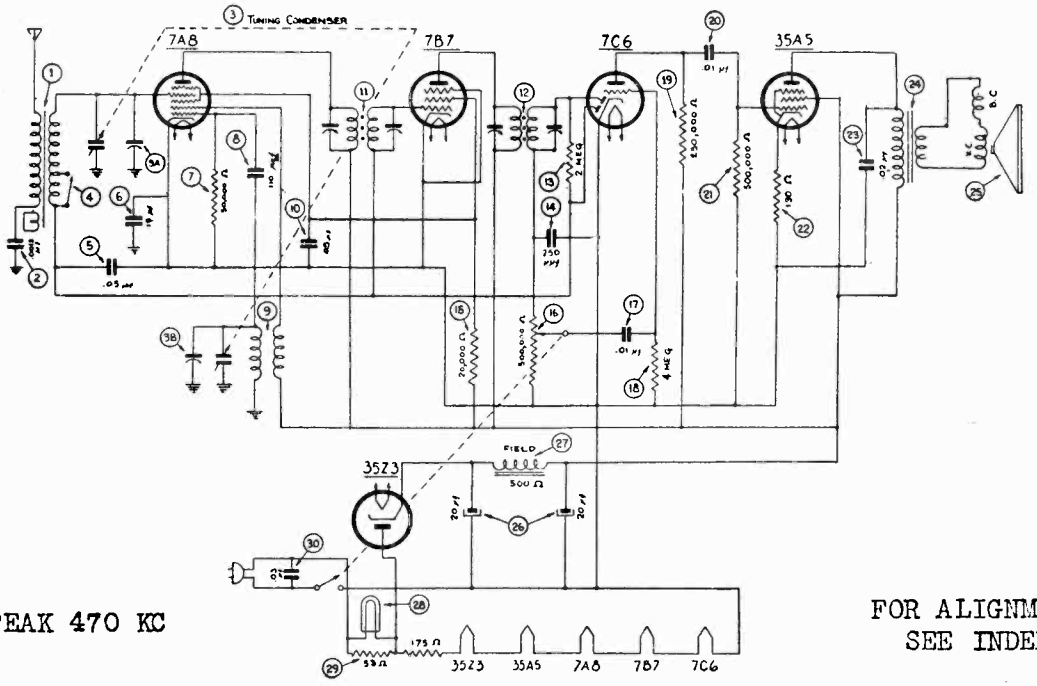
Padders (right to left from rear)	Circuit	Buttons (left to right from front)	Frequency Range	Padders (right to left from rear)	Circuit	Buttons (left to right from front)	Frequency Range
1	Ant.	1	540 to 1030 kilocycles	7	Ant.	4	900 to 1470 kilocycles
2	Osc.			8	Osc.		
3	Ant.	2	650 to 1100 kilocycles	9	Ant.	5	1160 to 1600 kilocycles
4	Osc.			10	Osc.		
5	Ant.	3	740 to 1240 kilocycles			6	Manual
6	Osc.						

An indoor aerial 20 feet in length is attached to the receiver for average receiving conditions; however in apartment houses, hotels or steel re-inforced buildings, the Philco Utility Aerial Part No. 40-6384 is recommended.

NOTE: If no sound is heard after connecting the receiver to the power supply and sufficient time has been allowed for the tubes to heat, reverse the electric plug in the outlet. The same procedure should be observed on A.C. power supplies when a slight hum is heard with the volume turned low.

MODEL TP-12
Schematic, Notes

PHILCO RADIO & TELEV. CORP.



IF PEAK 470 KC

FOR ALIGNMENT SEE INDEX

REPLACEMENT PARTS

TRANSITONE HOME RADIO MODEL TP-12

Schem. No.	Description	Philco Part No.
1	Antenna Transformer	32-3164
2	Tubular Condenser (.0015 mf., 200V)	30-4555S
3	Tuning Condenser	31-2354
4	Switch	42-1406
5	Tubular Condenser (.05 mf., 200V)	30-4519S
6	Tubular Condenser (.15 mf., 400V)	30-4505S
7	Resistor (50,000 ohms, (1/3 watt)	33-350244
8	Mica Condenser (110 mmf.)	30-1031
9	Oscillator Transformer	32-3152
10	Tubular Condenser (.05 mf., 200V)	30-4519S
11	1st I.F. Transformer	32-3149
12	2nd I.F. Transformer	32-3150
13	Resistor (2 meg., 1/3 watt)	33-520244
14	Mica Condenser (250 mmf.)	30-1032
15	Resistor (20,000 ohms, 1/3 watt)	33-320244
16	Volume Control (500,000 ohms)	33-5306
17	Tubular Condenser (.01 mf., 200V)	30-4479S
18	Resistor (4 meg., 1/3 watt)	33-540244
19	Resistor (250,000 ohms, 1/3 watt)	33-425244
20	Tubular Condenser (.01 mf., 400V)	30-4572S
21	Resistor (500,000 ohms, 1/3 watt)	33-450244
22	Resistor (130 ohms, 1/2 watt)	33-113336
23	Tubular Condenser (.02 mf., 400V)	30-4516S
24	Output Transformer	
	For Speaker 36-1469-1	32-8047
	For Speaker 36-1469-9	32-8044
25	Cone Assembly	
	For Speaker 36-1469-1	36-4115
	For Speaker 36-1469-9	36-4113
26	Electrolytic Condenser (20-20 mf., 150V)	30-2382
27	Field Coil.....Part of Speaker No	36-1469
28	Pilot Lamp	34-2068
29	Line Resistor	33-3367
30	Tubular Condenser (.03 mf., 400V)	30-4449S
	Cardboard	27-9299
	Cabinet	10374
	Cable (Power)	L-3183
	Dial Scale	27-5498
	Drive Drum	28-6662
	Drive Shaft Assembly	31-2355
	Drive Cord Assembly	31-2358
	Knob Assembly	27-4820
	Pointer Dial	56-1326
	Spring (Drive Cord)	28-8751
	Speaker	36-1469
	Socket Assembly (Pilot Lamp)	38-9825
	Sockets	27-6128

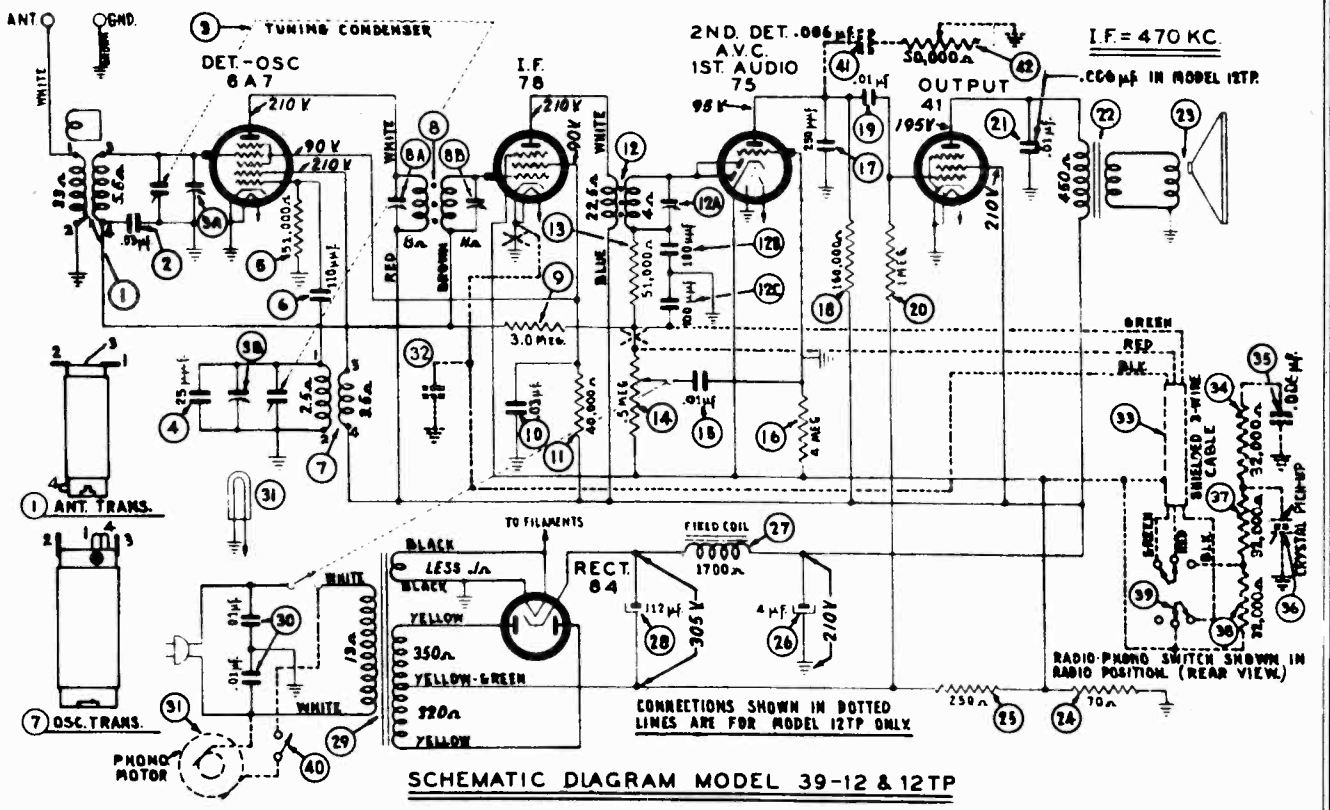
MODEL TP-12 is a 5 tube superheterodyne receiver having 2 tuning ranges covering from 540 to 1720 kilocycles (K.C.) on the broadcast band and from 2.3 to 2.5 megacycles (M.C.) on the police band. This model is designed to operate on either alternating (A.C.) or direct current (D.C.) 115 volts. This model is assembled in a walnut cabinet with contrasting maple inlays.

An indoor aerial 20 feet in length is attached to the receiver for average receiving conditions; however in apartment houses, hotels or steel re-inforced buildings, the Philco Utility Aerial Part No. 40-6384 is recommended.

NOTE: If no sound is heard after connecting the receiver to the power supply and sufficient time has been allowed for the tubes to heat, reverse the electric plug in the outlet. The same procedure should be observed on A.C. power supplies when a slight hum is heard with the volume turned low.

MODELS 12TP,39-12
39-12TP,Early,Late
Schematic,Changes

PHILCO RADIO & TELEV. CORP.



SCHEMATIC DIAGRAM MODEL 39-12 & 12TP

The wiring of the earlier and later production models 12-TP were different. The complete circuit diagram of the early production receiver is shown above. The later production receivers used a Model 39-6 chassis.

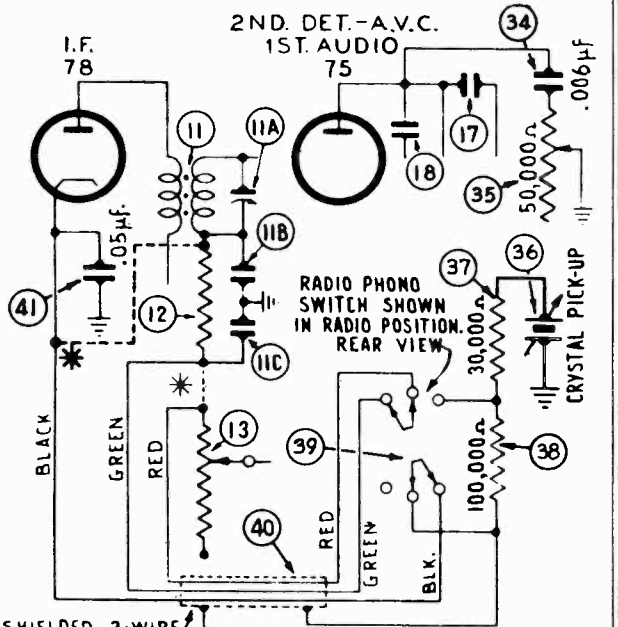
The Phonograph connections as used with Model 39-6 is shown below. Refer to index for Model 39-6.

MODEL 39-12TP
"EARLY TYPE"

Schem. No.	Description	Part No.
31	Motor (115 Volts)	35-1174
32	Condenser (.05 mfd., 200 V.)	30-4519
33	Cable	
34	Resistor (32,000 ohms)	33-332339
35	Condenser (.006 mfd., 400 V.)	30-4591
36	Crystal Cartridge	415-1027
37	Resistor (32,000 ohms)	33-332339
38	Resistor (32,000 ohms)	33-332339
39	Switch (Radio-Phono)	42-1522
40	Motor (Power Switch)	42-1498
41	Condenser (.006 mfd., 400 V.)	30-4591
42	Tone Control	33-5330
	Pickup Complete	35-2027

MODEL 39-12TP
"LATER PRODUCTION MODELS"

Schem. No.	Description	Part No.
34	Condenser (.006 mfd., 400 V.)	30-4591
35	Tone Control	33-5330
36	Crystal Cartridge (Pickup)	415-1027
37	Resistor (30,000 ohms)	33-330339
38	Resistor (100,000 ohms)	33-410339
39	Switch (Radio-Phono)	42-1522
40	Cable	
41	Condenser (.05 mfd., 200 V.)	30-4519
	Pickup Complete	35-2027
	Motor (115 Volt A.C. 60 cycle)	35-1174
	Power Switch (Motor)	42-1498



*DOTTED LINES INDICATE CONNECTIONS BEFORE ADDITION OF PHONOGRAPH. REFER TO MODEL 39-6. (see index)

PHONOGRAPH CONNECTIONS FOR LATE MODEL 12TP

PHILCO RADIO & TELEV. CORP.

MODELS 12TP, 39-12
39-12TP, Early, Late
Alignment, Trimmers
Socket, Parts

PHILCO RADIO PHONOGRAPH.....MODEL 12-TP

SPECIFICATIONS

TYPE OF CIRCUIT: Model 39-12 TP is a table model combination semi-automatic phonograph and superheterodyne radio receiver. The phonograph mechanism automatically places the pickup on the record when the lid is closed and will play 10 or 12 inch records.

A.C. operated, superheterodyne with automatic volume control, pentode audio output, and covers the standard broadcast and state police frequencies.

POWER SUPPLY:

Voltage	Frequency Cycles
115	50 To 60

INTERMEDIATE FREQUENCY: 470 K.C.

R.F. TUNING RANGE: 540 to 1720 K.C.

AUDIO OUTPUT: 2 watts.

PHILCO TUBES USED: Five: One 6A7, Det. Osc.; One 78, I.F.; One 75, 2nd Det., 1st Audio; One 41, Output, and One 84, Rectifier.

TUNING MECHANISM: 8 to 1 Ratio using Pulley and Cord.

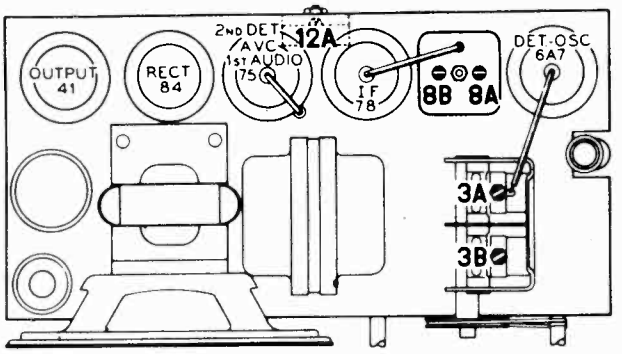


FIG. 2.—Locations of Compensators.

ALIGNMENT OF COMPENSATORS

EQUIPMENT REQUIRED:

(1) Signal Generator
(2) Output Meter
(3) Philco Fibre Handle Screw Driver, Part No. 45-2610 and Fibre Wrench, Part No. 3164.

OUTPUT METER:

The 027 Output Meter is connected to the plate and cathode terminals of the 41 tube. Adjust the meter to use the (0-30) volt scale and advance the attenuator control of the generator until a readable indication is noted on the output meter after signal is applied.

DIAL CALIBRATION:

1 Turn the tuning condenser to maximum capacity position (plates fully meshed).
2 Holding the tuning condenser in this position, turn the pointer until it is 1/16 of an inch below the three lines of the scale at the 550 K.C. end. This is the correct position of pointer at maximum capacity of tuning condenser.

OPERATIONS IN ORDER	SIGNAL GENERATOR			RECEIVER			NOTES
	Output Connections to Receiver	Dummy Antenna	Dial Setting	Dial Setting	Control Settings	Adjust Compensators	
1	6A7 Grid	.1 mfd	470 KC	580 KC	Vol (Max)	(12A), (8B) (8A)	Adjust for Max.
2	Aerial (White Wire)	100 mmfd	1500 KC	1500 KC	Vol (Max)	(3B), (3A)	Adjust for Max.

REPLACEMENT PARTS
MODEL 39-12 TP

Schem. No.	Description	Part No.
1	Antenna Transformer	32-2583
2	Condenser (0.05 mfd. tubular)	30-4444
3	Tuning Condenser Assembly	31-2258
4	Compensator (Part of tuning condenser 3)	
5	Resistor (51,000 ohms, ½ watt)	33-351339
6	110 mmfd. mica	30-1031
7	Oscillator Transformer	32-3019
8	First I.F. Transformer	32-3018
9	Resistor (2 megohms)	33-520339
10	Condenser (0.03 mfd. tubular)	30-4449
11	Resistor (40,000 ohms, ½ watt)	33-340339
12	Second I.F. Transformer	32-2944
13	Resistor (51,000 ohms, ½ watt)	33-351339
14	Volume Control	33-5230
15	Condenser (0.01 mfd. tubular)	30-4479
16	Resistor (4 megohms, ½ watt)	33-540339
17	Condenser (250 mmfd. mica)	30-1032
18	Resistor (160,000 ohms, ½ watt)	33-416339
19	Condenser (0.01 mfd. tubular)	30-4169
20	Resistor (2 megohm, ½ watt)	33-510339
21	Condenser (0.01 mfd. tubular)	30-4169
22	Output Transformer	32-7861
23	Cone and Voice Coil Assembly	36-4084
24	Resistor (70 ohms, ½ watt)	33-070339
25	Resistor (250 ohms, ½ watt)	33-125431
26	Condenser (Electrolytic 4 mfd.)	30-2236
*27	Field coil assembly (not supplied; see Note)	
28	Condenser (Electrolytic 12 mfd.)	30-2235
29	Power Transformer (115V, 50 to 60 cycle)	32-7993
30	Condenser (0.01 mfd., .01 mfd.)	3903-DG
	Pilot Lamp	34-2068
	Bezel and Glass Assembly	40-6158
	Bezel Clamp	28-5153
	Cable (Power)	L-2778
	Clip (R.F. Trans. small)	28-5002
	Clip (R.F. Trans. large)	28-5003
	Clip (Tuning Shaft)	28-8610
	Dial Assembly	31-2097
	Dial Pointer	28-5185
	Dial Drive Cord Assembly	31-2082
	Dial Drive Drum	28-6662
	Dial Drive Spring	28-8751
	Knob (Tuning and Volume)	27-4604
	Shaft Assembly (Tuning)	31-2179
	Shield (Tube)	28-5059
	Socket (6 prong)	27-6036
	Socket (7 prong)	27-6037
	Socket (5 prong)	27-6035
	Stop--Rubber	27-4540
	Speaker Model BO-1	36-1418
	Pilot Lamp Assembly	31-2179

* Entire Speaker must be replaced when field coil is open or damaged.

MODEL 35-1169, Automatic Record Changer

PHILCO RADIO & TELEV. CORP.

Notes

Automatic record changer Part No. 35-1169 plays eight 10" records automatically or eight 12" records manually. The last record remains on the turntable and repeats as long as the record changer is in operation either in the manual or automatic position.

OPERATION

AUTOMATIC POSITION:

To load the mechanism lift the record removing arm at (A) Fig. 1 to the upright position. To adjust the pickup to play 10" records, automatically, push the pickup stop at (K) Fig. 1 back away from the pickup. To play 12" records manually, pull the stop forward toward the needle as far as it will go. Place records on turntable. Throw switch at (N) Fig. 1 to the "On" position. Mechanism will now operate and reject each record after it has been played through. To reject a record and play the next record below it, pull the latch lever at (L) Fig. 1 forward.

MANUAL POSITION:

To operate the mechanism in the manual position, lift the record removing arm at (A) Fig. 1 to the upright position. 10 or 12" records can then be played by the position of the pickup stop at (K) Fig. 1. To play 10" records manually, push the pickup stop at (K) Fig. 1 back away from the pickup needle. For 12" records, pull the stop forward toward the needle as far as it will go.

MOTOR LUBRICATION

The motor installed in this Record Changer is governor controlled, with all gearing enclosed and leaves the factory lubricated for proper operation. For best results, lubricate the motor at regular intervals with a pure mineral oil as light as obtainable. Under no circumstances use any oil heavier than an SAE #10 nor any oil containing mixtures of animal or vegetable oils.

The governor disc engages with a felt brake. This felt is impregnated with a lubricating solution sufficient for proper operation for approximately six months under normal conditions. An oil hole is provided in the top of the governor housing for relubricating the brake felt.

MOTOR SPEED

The motor speed is adjusted by means of a slotted post (C) 3 Fig. 1 which is located under the turntable. To change motor speed rotate this post slightly by means of a screw driver.

TRIP MECHANISM

The trip mechanism is the trigger that sets the Record Changer in motion. This is done by allowing the latch bar at (O) Fig. 1 to drop in front of, and be actuated by the cam at (P) Fig. 1. This cam is driven by the motor and is in motion as long as the motor is running. If this mechanism does not operate smoothly, the precautions outlined in succeeding paragraphs should be observed.

First of all, make sure that the square pin in the latch lever at (U) Fig. 1 latches properly in the notch in the lift lever at (1) Fig. 1. When latched, the notch should be engaged approximately one-half of its depth. The depth of engagement is adjusted by means of the eccentric washer and locking screw at (J) Fig. 1. Now run the record changer through its cycle. If the square pin fails to engage the notch in the lift lever, first check the tension of the latch spring at (H) Fig. 1 to insure that the notch can engage the pin. Next check the tension of the reset spring at (E) Fig. 1. This reset spring should not be under tension when the latch bar is latched but should have enough tension when the latch bar drops back off of the cam to cause the square pin to over travel the notch in the lift lever.

IMPORTANT --- Before attempting to change the tension of any spring, be sure that the parts involved work freely without any tendency to bind, as of course any binding condition would preclude proper operation.

The Record Changer is adjusted at the factory to trip on a spiral trip groove record when the phonograph needle is 1-3/4" from the edge of the hole in the center of the record.
When eccentric or oscillating trip groove records are used, tripping is effected by means of the hardened steel pin in the end of tone arm lift crank at (S) Fig. 2 engaging the serrated block on the trip lever at (T) Fig. 2. There must be a minimum of 1/32" play between the end of the pin and the block, when, with a short needle, (5/8" Minimum Length) the pickup is resting on one record on the turntable. If the pressure of the pin on the block is not sufficient to insure operation, then check the pressure spring which is located up under the pickup.

The oval head pivot screw at (R) Fig. 1 serves as a pivot for the lift lever at (1) Fig. 1. This screw should allow the lift lever to be raised by the latch bar to its maximum height without binding but also without any additional play.

If the Record Changer fails to trip, see if the phonograph needle is jumping out of a worn record trip groove. Next make certain that all parts of the mechanism work freely and smoothly. If it is found that the latch bar at (O) Fig. 1 is not dropping in far enough to engage the cam at (P) Fig. 1 then check the tension of the trip spring at (B) Fig. 1.

RECORD REMOVING MECHANISM

The record Changer is adjusted so that it will always leave one record on the turntable. This is done to prevent the phonograph needle from damaging the covering on the turntable.

In case the Record Removing Mechanism fails to operate smoothly, proceed as follows: First make certain that all parts work freely with no binding in pivots or bearings, and that the record removing arm assembly rests on the stop screw at (Q) Fig. 3. Next stop the motor in such a position that the latch bar at (O) Fig. 1 can swing by and clear the cam at (P) Fig. 1. Place just one record on the turntable and measure from the top of this record down to the base plate. This distance should be one inch. Now by pulling the reject lever at (L) Fig. 1 first, it will be found possible to swing the record removing finger at (Y) Fig. 3 over to where it just touches the edge of the record. If the adjustment is correct, the record removing finger should just barely rise over the edge of the first record. If adjustment is required it can be made by means of the stop screw at (Q) Fig. 3. In the event the record removing arm raises the record from the turntable and drops it back in place without removing it, check the lift adjustment at (V) Fig. 1. This adjustment consists of an eccentric stud which is provided with a lock nut, and is made by loosening the lock nut and turning the eccentric stud. The lift adjustment should be set so that the hole in the center of the record just clears turntable spindle when the Record Changer is in operation.

PICKUP LOWERING MECHANISM

The pickup lowering mechanism has two functions. First, it lowers the phonograph needle gently to the surface of the record. Second, it feeds the needle toward the center of the record so that it will enter the playing groove.

IF the pickup descends too fast or too slow, adjust the speed of descent by turning the knurled thumb nut on the dashpot sleeve at (W) Fig. 2.

The unit is adjusted at the factory so that the needle will be set down approximately 3/32" in from the edge of the record. An adjusting screw is provided on the side of the pickup at (M) Fig. 2. If the needle is being lowered onto the playing surface of the record, and the adjusting screw at (M) Fig. 2 fails to correct the condition proceed as follows: First stop the record changer, with the pickup in the maximum raised position and check the clearance between the underside of the pickup shelf at (Z) Fig. 2 and the tip of the dashpot. This clearance should be very small as otherwise the pickup will tend to bounce as it is lowered. There must be sufficient clearance however to prevent the pickup shelf from rubbing on the tip of the dash pot, or the pickup will not swing out far enough to allow the adjustable stop at (K) Fig. 2 to come to rest against the dashpot. Check this clearance in both 10" and 12" record positions. If adjustment is required, the height of the dashpot may be regulated by loosening the nuts on the bottom of the lift lever stud at (X) Fig. 4 and changing their position on the stud. To raise the dashpot turn the nuts clockwise, to lower the dashpot turn the nuts counter-clockwise. Be sure to lock the nuts tightly together after the adjustment is made.

PHILCO RADIO & TELEV. CORP.

MODEL 35-1169
Assembly, Parts

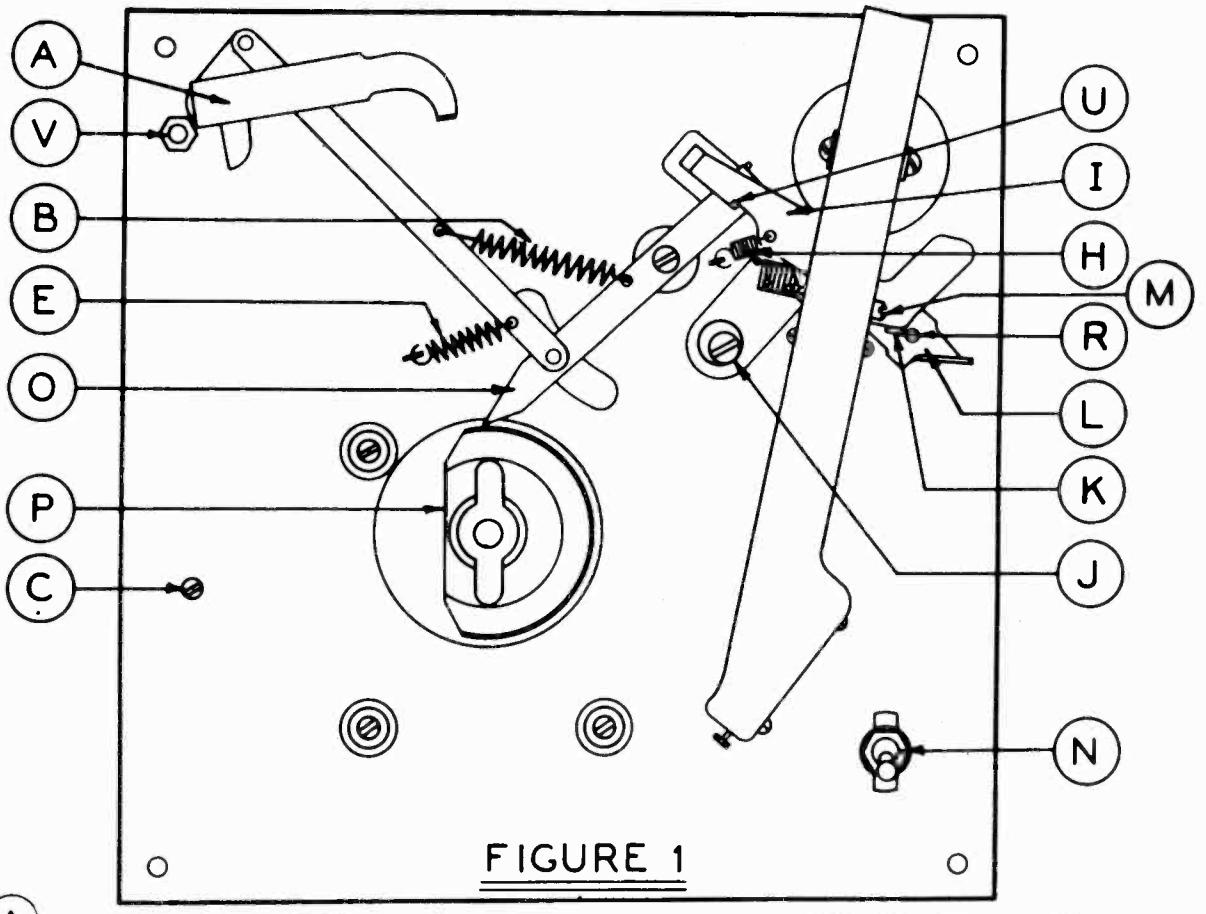


FIGURE 1

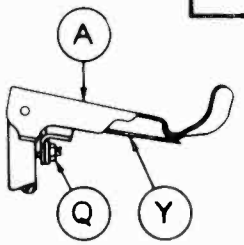


FIGURE 3

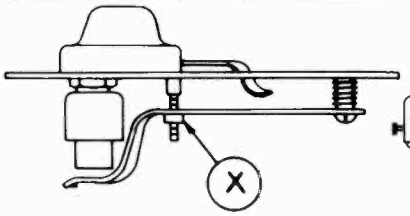


FIGURE 4

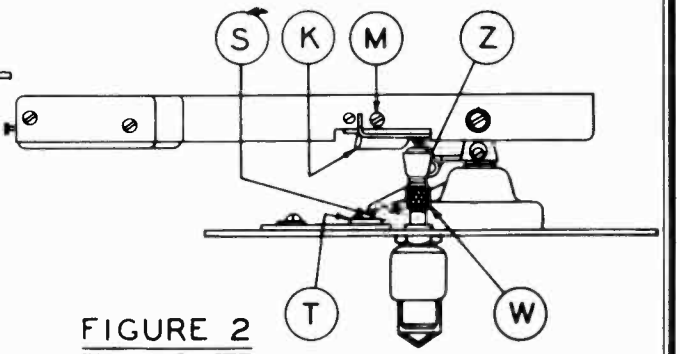


FIGURE 2

A. Record Removing Mechanism Assy. Complete

Parts of Above Assembly

- Record Removing Arm Assembly
- Record Removing Sleeve & Link Assy.
- Record Removing Sleeve Link Mtg. Stud
- Record Removing Sleeve Screw
- Record Removing Link Screw
- Record Removing Link Spring
- Record Removing Finger Pin
- Record Removing Finger
- Record Removing Finger Spring
- Record Removing Arm Adjusting Nut
- Record Removing Arm Adjusting Screw
- Record Removing Arm Pin (Arm to Sleeve & Link Assy.)

B. Trip Spring

C. Motor Speed Adjusting Post

E. Record Removing Link Spring

H. Latch Spring

I. Lift Lever Assembly

- Lift Spring
- Lift Crank Washer
- Lift Lever Screw

J. Eccentric Washer & Locking Screw

K. Adjustable Stop

L. Reject Lever

M. Pickup Positioning Adjusting Screw

N. Power Switch

O. Latch Bar Assembly Complete

- Screw (Latch Bar Mtg.)
- Stud Nut (Latch Bar & Bumper)
- Stop (Latch Bar)
- Washer (Latch Bar Mtg. Screw)
- Mounting Screw (Latch Bar Stop)
- Screw (Latch Bar & Pickup Lift Stop)

P. Cam (Latch Bar Stop)

Q. Record Removing Arm Adjusting Screw Nut (Record Removing Arm)

R. Lift Lever Pivot Screw

S. Tone Arm Lift Crank

T. Trip Lever Serrated Block (Part of L)

U. Pin (Part of Latch Bar (O)

V. Record Removing Arm Adjusting Stud

W. Dash Pot Complete

- Dash Pot
- Nut (Dash Pot)
- Adjusting Cap (Dash Pot)
- Gland (Dash Pot)
- Plunger Assembly (Dash Pot)
- Lever Spring (Dash Pot)
- Weight (Dash Pot)
- Lever Spacer (Dash Pot)
- Felt Washer (Dash Pot)
- Leather (Dash Pot)
- Washer Large (Dash Pot)
- Washer Small (Dash Pot)

X. Dash Pot Lift Lever

Y. Record Removing Finger

Z. Pickup Lift Shelf

MODEL 35-1176, Intermix
Auto Record Changer
Assembly, Motor Notes

PHILCO RADIO & TELEV. CORP.

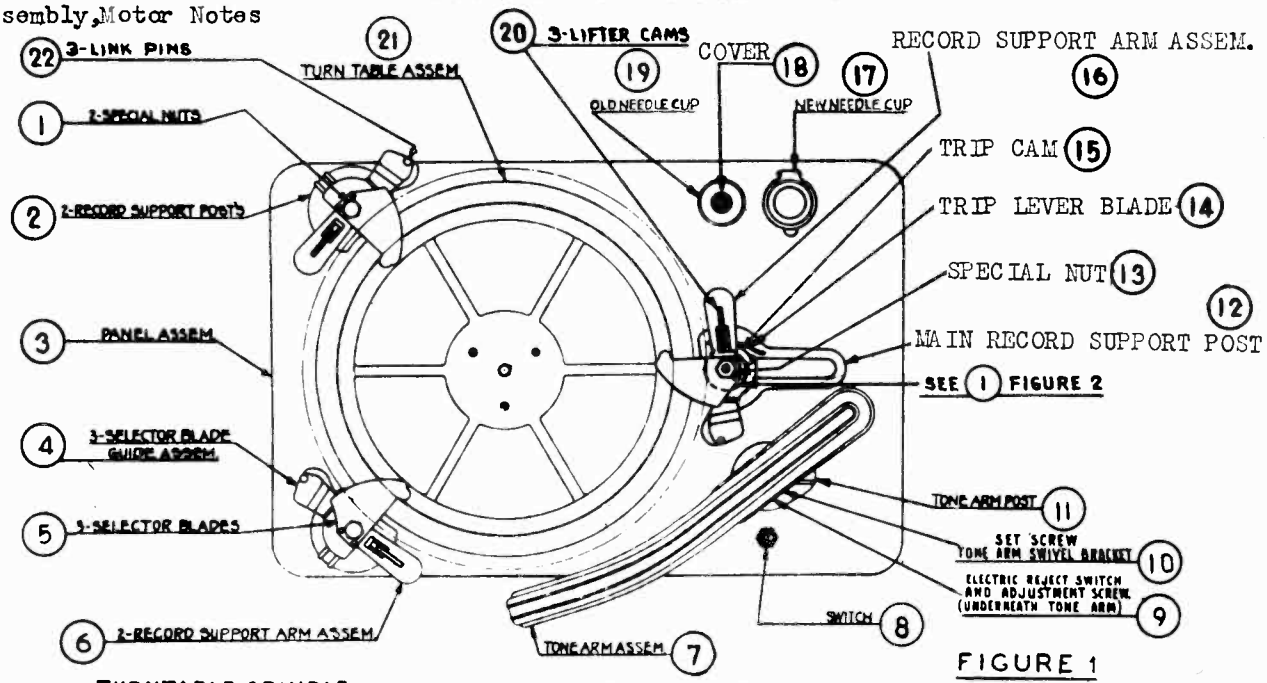


FIGURE 1

TOP VIEW OF RECORD CHANGER PART No. 35-1176

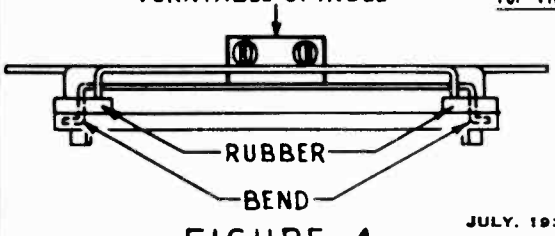


FIGURE 4

JULY. 1939.

REMOVING MOTOR TRANSMISSION

In removing the motor transmission, the following parts should be disassembled first:

1. Remove turntable shaft. (See paragraph — Removing Turntable Shaft Assembly.)
2. Unsolder pick-up wires.
3. Loosen the two set screws which hold the tone arm lever and the tone arm shaft and remove tone arm and shaft.
4. Remove the mounting screws which hold the tone arm post to the panel. Unsolder electric tone arm reject switch wire from the terminal strip and remove tone arm post.
5. Remove "C" washer from the drive link pin — this will allow the drive link to be removed from the transmission and then remove the six mounting screws holding the transmission to the panel and take out the transmission.

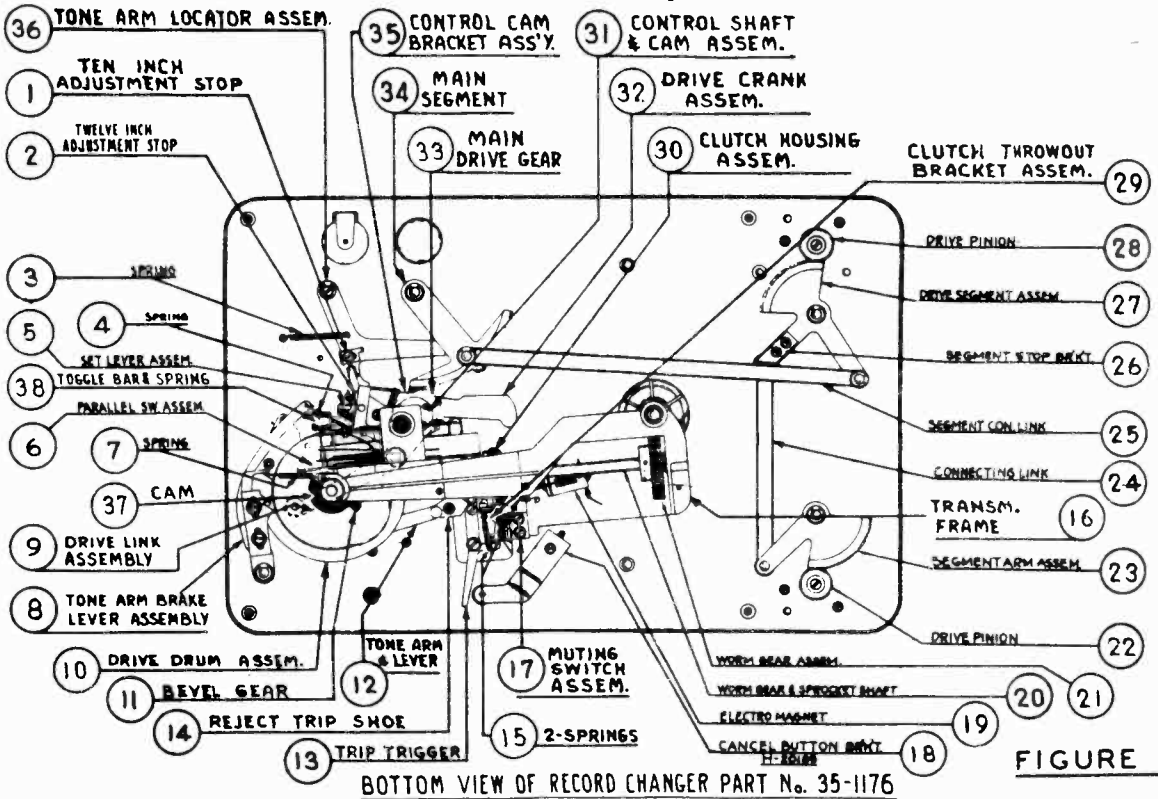


FIGURE 3

BOTTOM VIEW OF RECORD CHANGER PART No. 35-1176

PHILCO RADIO & TELEV. CORP.

PHILCO INTER-MIX RECORD CHANGER, Part No. 35-1176 plays and automatically changes with one loading — 14 ten-inch and twelve-inch records mixed together in any order. This record changer will also separately play 15 ten-inch records or 13-twelve inch records. In addition, the mechanism is designed to operate with slightly warped records.

Service information contained in this bulletin covers operation, care, and adjustments that may be necessary if the mechanism ceases to function properly.

When ordering parts, refer to the part number of the entire mechanism in addition to the number and name of parts shown in the figures of this bulletin.

PHILCO RECORD PLAYER NEEDLES

To obtain brilliant life-like tone quality, PHILCO Record Player Needles are recommended. These needles are especially designed to give high fidelity tone reproduction — less record wear and less surface noise. One needle plays 15 to 20 records. The use of inferior needles in the pick-up of this mechanism will greatly affect the tone reproduction performance.

AUTOMATIC AND MANUAL POSITIONS

A control knob (1) Fig. 2 is provided for placing the mechanism in the automatic or manual operating position.

When changing from manual to automatic or automatic to manual positions, the mechanism should be turned off and allowed to complete its cycle. The knob can then be set for the position desired as follows:

To operate the mechanism manually, press knob (1) Fig. 2 marked "Press-Turn" down and turn to the right (clockwise) until record support arm assembly (16) Fig. 1 is in the extreme clockwise position.

For the automatic operating position, control knob (1) Fig. 2 is turned to the left (counter-clockwise) until knob snaps up.

PICK-UP DOES NOT INDEX PROPERLY ON OUTER EDGE OF 10" AND 12" RECORDS

The pick-up is set for 12" records by the trip cam (15) Fig. 1 that is pivotally mounted under the selector blade on main record support post (12) Fig. 1. This trip cam is operated by the edge of a 12" record compressing the cam when the record support arm moves in a clockwise direction. This cam moves trip lever blade (14) Fig. 1 and toggle bar and spring (38) Fig. 3 which pushes set lever blade (5) Fig. 3 into position to hold the tone arm locator (36) Fig. 3 in the 12" position.

After playing a record or the mechanism has been rejected, the set lever (5) Fig. 3 is reset for the 10" position by the control cam bracket lever (35) Fig. 3 mounted on the set lever shaft. The control cam bracket (35) Fig. 3 engages the control shaft cam pin (31) Fig. 3 at the start of rotation.

Adjustment of the tone arm when placing the needle in the first groove of 10" and 12" records is controlled by tone arm locator (36) Fig. 3. When 10" or 12" adjustments are made, the 12" adjustment should be made first. If 10" adjustment alone is necessary, the 12" adjustment should be re-checked. Adjustment of the locator lever is as follows:

12-inch Record Adjustment

1. Turn control knob (1) Fig. 2 to "manual" position.
2. Place a 12" record on the turntable.
3. Start mechanism and allow pick-up to position itself on the outer edge of the record. If the needle has not been placed in the center of the smooth outer rim of the record, adjust stop (2) Fig. 3 by loosening set screw. Move the stop in the direction necessary to center the needle on the smooth outer rim of the record.

10-inch Record Adjustment

1. Set control knob (1) Fig. 2 to "automatic" position.
2. Load the mechanism with several 10" records.
3. Allow mechanism to set a record on turntable and place the pick-up on the smooth outer rim of the record.
4. If the pick-up does not come down in the center of the smooth outer edge of the record, adjust the following:
5. Loosen 10" record stop (1) Fig. 3.
6. Move the stop slightly toward or away from the stop pin as the case may be to center the pick-up needle on the outer edge of the record.

If, after making the above adjustments, it is found that the pick-up will not move into the first groove after the needle is centered on the outer edge of the record, examine the following parts:

1. Spring (2) Fig. 3 on 12" adjustment stop may be weak.
2. Tone arm lever or swivel shaft may be binding; examine and lubricate.

TONE ARM ELECTRIC REJECT SWITCH WILL NOT OPERATE

(When no record is on turntable)

The tone arm electric reject switch operates when the mechanism is first loaded and no records are on the turntable or no records are on the record support arms. This switch closes when the pick-up needle drops into a groove provided in the turntable; allowing the tone arm to go to a lower level and causing switch contact to close. Adjustment of this switch is as follows:

1. Adjust screw (9) Fig. 1 located in the tone arm directly above the end of the tone arm shaft. Turn this screw in the direction necessary to obtain a clearance of 1/16" between the bottom of the groove in the turntable and the bottom end of the needle.
2. With a record on the turntable and the needle resting on the record, a clearance of 1/16" between the top and bottom contacts of the tone arm electric reject switch should be obtained. Bend the moving contacts spring upward or downward to obtain the necessary clearance.
3. Also check the electric magnet (19) Fig. 3 and associated wiring for open circuits.
4. Check the small metal rod connecting the trip trigger (13) Fig. 3 and lever of electric magnet.

MECHANISM WILL NOT REJECT AT THE END OF RECORDS

The tone arm is designed to reject records with an oscillating or spiral reject groove. To make the adjustments for either type of records, proceed as follows:

1. See that the screw (10) Fig. 1 which clamps the tone arm swivel bracket is tight. Make sure that the set screws holding the tone arm lever (12) Fig. 3 to the tone arm shaft are tight.

2. Oscillating Groove Records

Records with an oscillating reject groove are rejected by the trip dog located on the end of the tone arm lever (12) Fig. 3 engaging the saw teeth of the trip trigger (13) Fig. 3. When the mechanism will not reject an oscillating groove record, either the screws mentioned in paragraph 1 are loose or the trip dog trip trigger (13) Fig. 3 or springs (15) Fig. 3 are at fault. When it is found that these parts have become worn or weak, they should be replaced.

3. Spiral Groove Records

Records with spiral reject grooves are rejected by the trip shoe (14) Fig. 3 located on the end of the tone arm lever (12) Fig. 3. This trip shoe (14) Fig. 3 hits the pin on the trip trigger (13) Fig. 3 releasing the clutch throwout bracket (29) Fig. 3. This should occur when the pick-up needle has traveled to within a distance of 1 7/8" from the center of the turntable spindle. Adjust the mechanism to properly reject this type of record as follows: If the pick-up does not reject the mechanism after traveling to within 1 7/8" from the center of the turntable spindle (or 1 3/4" from the edge of spindle), loosen the knurled nut holding trip shoe (14) Fig. 3 to the tone arm lever (12) Fig. 3. Move trip shoe toward or away from the pin on the trip trigger (13) Fig. 3 until the trip shoe operates the mechanism properly. When this point is found, the knurled nut should be well tightened.

TEN AND TWELVE INCH RECORDS DO NOT SEPARATE PROPERLY IN A MIXED LOADING

Ten and twelve inch records in a mixed loading are separated by lifter cams (20) Fig. 1 located on the record support arms (6) (16) Fig. 1. These cams operate when the next record to be selected by the mechanism is 10" and are designed to lift a 12" record when one is located directly above the 10" record. This allows the selector blades (5) Fig. 1 and guide arms (4) Fig. 1 to slide under the 12" record so that a 10" record can be placed on the turntable. The lifter cams (20) Fig. 1 are caused to operate by the 10" record hitting the end of the cam. Check the following parts when mechanism does not separate records properly:

1. The lifter cam link (20) Fig. 1 should be approximately 3/32" above the surface of the record support arms (6) (16) Fig. 1 when no records are on support arms (6) (16) Fig. 1. This link is held in this position by the small return spring found under (20) Fig. 1 underneath the support arms (6) (16) Fig. 1. If link is not above the surface of support arms (6) (16) Fig. 1, check for loose spring; replace spring if necessary.
2. The selector blades (5) Fig. 1 should have a slight downward pressure on the top surface of the guide arms (4) Fig. 1 when in their return position ready for next selection.
3. In their full return position after a record has been placed on the turntable the selector blades should also pass the guide arm link pin (22) Fig. 1 so that the selector blades will carry the guide arm toward the edge of a record when making the next selection. If any one of the blades do not return enough to clear the guide arm link pin (22) Fig. 1, the blade should be adjusted as given in paragraph "RECORD SELECTORS DO NOT OPERATE IN SYNCHRONISM".

MODEL 35-1176

Notes

4. There should also be sufficient tension between the guide arm link pin (22) Fig. 1 and the end of the selector blade (5) Fig. 1 so that the guide arms (4) Fig. 1 will be pulled forward against the record when the selector blade (5) Fig. 1 moves to select the next record. Tension between guide arms and selector blades should be sufficient so that sloop on guide should lift a full load of records to proper height for selector blades to select bottom record. If guide arm pin (22) Fig. 1 does not have enough tension against end of selector blades (5) Fig. 1, check the springs holding the pin in position, also, for worn surface on side of pin.

5. Action of the selector guide arm (4) Fig. 1. The guide arm is designed to guide the selector blade (5) Fig. 1 and lift the record to the proper height necessary to separate the records. The top of the guide arm (4) Fig. 1 has two inclined surfaces. The outer surface for 10" records and the inner surface for 12" records. After the selector blades (5) Fig. 1 have entered between the records, the guide arm (4) Fig. 1 is released and returned to its normal position. If it does not return to its normal position, check for a weak spring on the guide arms (4) Fig. 1 or binding between guide arm and record support post (2) Fig. 1. These springs are attached to record support posts (2) (12) Fig. 1 and a pin at the swivel of the guide arm.

6. In case of a warped 10" record with its concave face down, resting on a warped 12" record with the concave face upward, there is a tendency for the selector blades to jam against the edge of the 10" record instead of going in under it. In order to prevent this condition the blades must be bent down sufficiently to slide along the top surface of the 12" record.

SELECTOR BLADE (5) FIG. 1 FAILS TO SEPARATE BOTTOM RECORD FROM STACK

This is due either to a badly warped condition of the record, or to its being of a thickness considerably different from those now in standard use. The design of both selector blade and record support arms is such as to accommodate a maximum variation in thickness and flatness of records, but certain records may be found which are so far out as to be unfit for use in the automatic changer.

RECORD SELECTORS DO NOT OPERATE IN SYNCHRONISM

If the record selector blades (5) Fig. 1 do not operate in synchronism proceed as follows:

1. Set the control knob (1) Fig. 2 to "automatic" position. See page 1 "Automatic and Manual Positions". (Turn knob to the left until it snaps up). Place one 10" record on selector blades. After record has been dropped to record supports, pull lower plug and rotate turntable by hand until the selector blades are close to the edge of record. At this point all selector blades should be as nearly as possible the same distance from spindle. If the selector blades are not the same distance from the spindle due to replacement of gears, etc., the blades are resynchronized as follows:

2. With the mechanism in the same condition as outlined in paragraph 1, remove the "C" washer from segment arms (23) or (27) Fig. 3 depending on which of these selector blades are out of time. Pull segment arm down so that gears are disengaged, then move selector blade (5) Fig. 1 in direction necessary to align it with other blades. When this position is found, mesh gears and replace "C" washer.

MECHANISM DOES NOT RETURN SELECTOR BLADES TO LOADING POSITION

If the selector blades will not return to the loading position (pointed toward spindle) after a record has been placed on the turntable:

1. Look for trouble in the parallel cam switch (6) Fig. 3. The contact of this switch should be in a closed position, at the time a record is being played.

2. When the selector blades are in the proper loading position cam (37) Fig. 3 should open parallel switch (6) Fig. 3. To place the mechanism in the loading position, turn changer switch (8) Fig. 1 off. After the switch is off the changer should continue to operate until the next record is selected and dropped on the turntable. When the record is dropped on the turntable, cam (37) Fig. 3 should open parallel switch (6) Fig. 3. When the turntable stops rotating the selector blades should be pointed toward spindle.

3. To adjust cam (37) Fig. 3 loosen the two set screws and rotate cam on the shaft until proper position is obtained. Retighten set screws.

TOP RECORD SLIPS WHEN PICK-UP IS IN THE PLAYING POSITION

If the top record slips in the playing position, check the following parts:

1. Check for excessively warped records. Records warped too badly should be replaced and not used in the changes.

2. Check for worn grooves in record, particularly old records. After the grooves of the records lose their gloss, the pick-up does not glide through the groove. This condition has a tendency to cause pick-up needle to drag resulting in the top record slipping.

3. Check record friction spring (16) Fig. 2 for tension. This spring should protrude far enough from the shaft to hold the top record from slipping when in the playing position. This spring when adjusted properly to hold a record, should also allow a 10" record to fall freely onto the turntable.

If the spring is in need of adjustment, see heading "Removing Turntable Shaft Assembly", Paragraph 4.

OILING AND GREASING MOTOR AND MECHANISM

The motor and mechanism should be oiled and greased every six months with a good grade of S. A. E. 10 oil.

Parts to Lubricate:

1. All bearings of the mechanism.
2. All sliding surfaces such as, cams, etc., should be lubricated with a very light grease.
3. Motor bearings and governor felt.

TURNTABLE SPEED ADJUSTMENT

If motor runs too fast or slow, the governor adjustment screw (27) Fig. 2 on the top side of the governor should be screwed in or out slightly as required. To do this, loosen the lock nut and turn screw, then retighten lock nut.

REMOVING TURNTABLE SHAFT ASSEMBLY

To remove the turntable shaft assembly, proceed as follows:

1. Loosen the two set screws holding the motor coupling (21) Fig. 2 to the turntable shaft.

2. Loosen the two screws holding the turntable drive worm (23) Fig. 2 to the turntable shaft, then lift out turntable and shaft.

3. To remove the turntable from the shaft, remove the three screws and nuts which hold it to the hub.

4. The record friction spring (16) Fig. 2 on the turntable shaft can be removed by pushing the hub downward toward the heavy end of the shaft — the spring can then be removed. If it is desired to increase the record friction on spring, bend upward the lower section of the spring which contacts with the bottom surface of the hub. To decrease the record friction against the spring, bend the spring downward.

The motor is removed as follows:

1. Remove the three $^{10}/_{32}$" machine screws which hold the motor to the motor mounting bracket. Three ½" spours will also be found which space the motor from the mounting plate.

2. There are two motor bracket locating pins on the underside of the changer base panel which pass through rubber grommets located in the motor mounting bracket. These are provided to keep the mounting panel and motor bracket in proper alignment.

MECHANISM AND CHASSIS MOUNTING

The mechanism is mounted in the cabinet as follows: 4 mounting studs are located in the bottom surface of the panel each threaded to take ¼" No. 20 machine screws. The mounting panel rests on four tapered coil springs. The small end of each spring is pressed over a mounting stud and the large end of each spring fits into a screw in the top surface of the mounting shaft in the cabinet. Four spacing blocks ½" thick and with a ⅝" hole are fastened to the lower side of the cabinet motor board. The ⅝" hole in each block is centered with the $^{7}/_{16}$" screw clearance hole. These are provided and located on the lower side of the cabinet motor board into which each of the lower mounting springs are to fit. The ¼" No. 20 machine screws are turned through the four wing nuts until the head of each screw is against the head of the bottom side of each wing nut. The four lower springs are of smaller diameter than the upper springs. These lower springs are slipped over the nuts to each of the ¼" No. 20 machine screws with the smaller end toward the head and resting on the wing nuts.

The ¼" No. 20 machine screws are pushed through the $^{7}/_{16}$" clearance hole and tightly screwed into the mounting studs. Wing nuts should be backed down on head of ¼" No. 20 bolt to place changer in operation.

MODEL 35-1180
Auto. Record Changer
Operating Notes

PHILCO RADIO & TELEV. CORP.

MODEL 35-1176
Assembly, Notes

NO REPRODUCTION WHEN NEEDLE IS OPERATING ON RECORD

A muting switch (177 Fig. 3, the purpose of which is to short the pick-up during the change cycle. This switch is mounted on the transmission frame, and is operated from the clutch throw-out (29) Fig. 3. When a record is on the turntable and the needle is in playing position, the contact of this switch should be in the open position.

AUTOMATIC CLUTCH DOES NOT COMPLETELY DISENGAGE AT THE END OF THE CYCLE

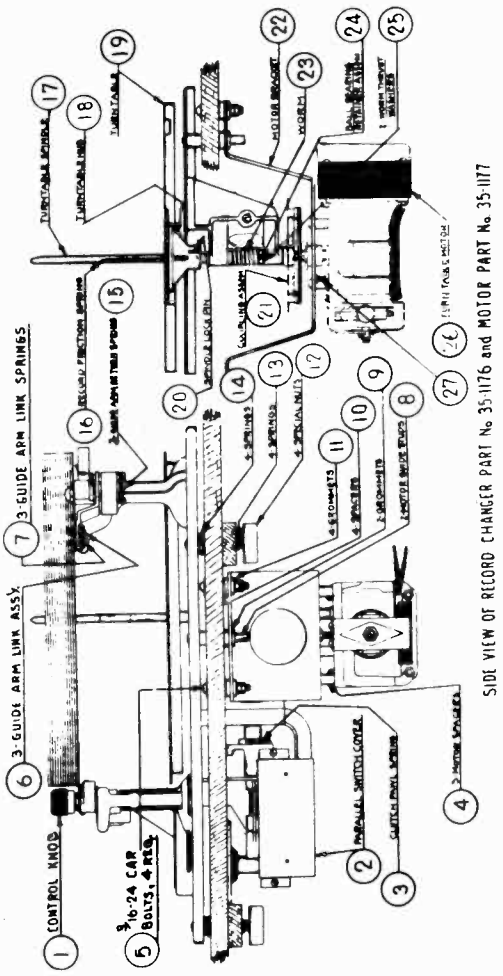
This trouble is identified by a steady thumping or clicking sound when the pick-up is in the playing position and is caused by the clutch not properly disengaging at the end of the automatic cycle. In most cases, this trouble is due to the clutch clearance adjusting plate not being in the proper position on the tone arm brake (8) Fig. 3. To eliminate this trouble, make the following adjustments:

1. Loosen the two screws that hold the clutch clearance adjusting plate to the tone arm brake lever (8) Fig. 3. Advance the adjusting plate until the clutch pawl [found in clutch housing (30) Fig. 3] clears the clutch sprocket.
2. If the clutch disengages before the pin on the drive drum (10) Fig. 3 reaches the inclined surface of the adjusting plate, the plate should then be retarded until the drive drum pin passes over the humps and slides down inclined surface.

FAILURE OF UNIVERSAL DRIVE COUPLING

The Universal drive coupling consists of four strips of rubber held together by a frame having ears projecting into slots in the rubber.

If excessive strain is placed on the coupling, the projecting ears may slip out of the slots in the rubber, thus disconnecting the drive. In order to hold the coupling together more firmly, the outer end of these ears projecting through the rubber may be bent outward at right angles to form a hook which will hold the rubber firmly in place. Do not make bend any more than ⅛" from end of ear. See Fig. 4.



SIDE VIEW OF RECORD CHANGER PART No. 35-1176 and MOTOR PART No. 35-1177

FIGURE 2

Automatic Record Changer Part No. 35-1180

PHILCO AUTOMATIC RECORD CHANGER Part No. 35 - 1180 automatically changes either twelve 10" or ten 12" records. The service information contained in this bulletin covers the operation, care, and adjustments that may be necessary if the mechanism ceases to function properly.

When ordering parts for this mechanism, refer to the part number of the entire mechanism in addition to the number and names of the parts shown in the figures of this bulletin.

CHANGER OPERATION

Setting for Record Size

This changer plays up to twelve 10-inch records or ten 12-inch records at one loading.

On each post you will see two plates. The lower one, on which the records rest, is the shelf plate. The upper one is the selector blade which selects the next record to be played from the bottom of the stack.

To set for record size. (1) Clasp one of the posts just underneath the shelf plate, with thumb and finger of left hand. With right hand, lift knob and turn selector plate until the figure 10 or 12 (whichever size you want to play) is opposite the pointer. Do the same with the other post. Both selector plates must be in 10 or 12 position. (2) Push button marked 10 or 12, as required (see Figure 1).

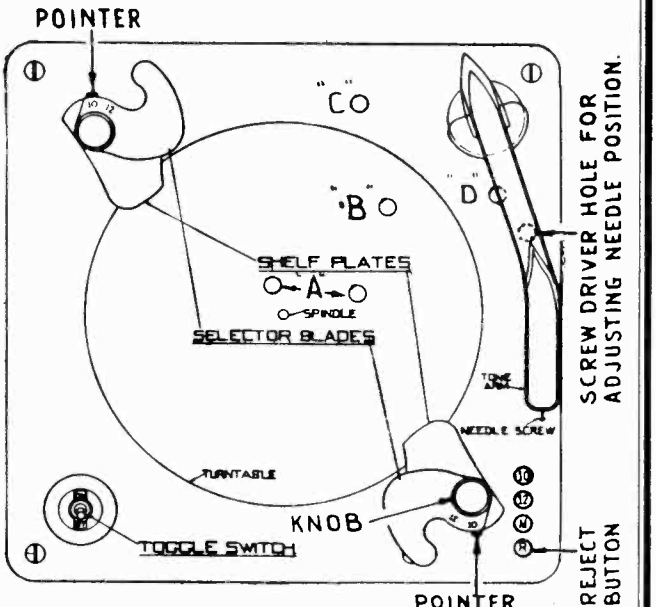


FIG. 1 SHOWS SELECTOR BLADES IN POSITION FOR 10-INCH RECORDS.

MODEL 35-1180

Adjustments, Notes

PHILCO RADIO & TELEV. CORP.

Loading

See that both shelf plates are turned toward center of turntable. As shelf plates near correct position you will feel the shelf plates drop into their indexing slots. Make sure both posts have dropped into their slots, if one is not in the slot, records may be damaged. Place the stack of records over center pin so they will rest on the two shelf plates.

Starting the Mechanism

To start motor and turntable (1) turn the switch to "ON" position. (2) Then push button "R". This will release the first record and start the record-changing mechanism.

Rejecting a Record

To reject a record press the "R" button. This can be done any time after the needle has come into contact with that record.

Turning Off

Turn changer switch to "OFF" position. Lift pickup arm, place it on the pickup rest. (If you happen to turn off the changer switch while the mechanism is going through a "change cycle", you will notice that it does not stop until the cycle has been completed, and pickup is again in playing position, ready to be lifted over onto the pickup rest.)

To avoid warping of records, **never leave records resting on the shelf plates.**

Removing Played Records

To remove records make sure motor switch is off, then take hold of both posts, just below the shelf plates, and turn them out of the way. Lift the played records from the turntable. Taking hold of posts as before (**below** shelf plate) move plates until post again falls into indexed position as outlined under loading. The changer may then be loaded with a new stack of records.

Manual Operation

To play records one at a time as in an ordinary phonograph: (1) Remove any records remaining on the turntable, leave plates turned outward as for removing played records Do not turn them back toward center of turntable. (2) Press button marked "M". Then place a record on the turntable, switch on motor and lift pickup into position.

LUBRICATION

The record changer will not need lubrication more than once a year and should be lubricated with a good light machine oil such as S.A.E. 10. There are 6 locations that will need oiling. These are shown in Figure 1. These lubricating holes can be reached from the top of the mechanism and are as follows:

1. The motor gear housing contains 3 lubricating wicks. These wicks are shown at "A" in Figure 1. Two of these wicks are reached through the hole directly in back of the turntable spindle and the other wick to the right of the turnable spindle.

2. A small quantity of oil should be dropped through hole marked "B" in Figure 1. Lubricating this point distributes oil to the various moving surfaces of the mechanism.

3. A felt wick directly below the hole marked "C" in Figure 1 should also be oiled.

4. Another felt wick marked "D" in Figure 1 should also be well oiled.

After long periods of use the oil becomes gummed in the above mentioned wicks. The wicks should be removed and cleaned with kerosene or carbon tetrachloride.

NEEDLE FAILS TO MOVE INTO RECORD GROOVE AFTER LANDING ON RECORD

Generally when the needle will not pull into the groove after landing on the record, trouble may be found due to lead spring (97) being weak. Increasing the tension of this spring or replacing spring will generally eliminate the trouble.

If after adjusting the lead spring (97) it is found that the needle jumps across the record, it may be necessary to adjust the angle of the pickup in relation to the turntable spindle. This procedure is covered under paragraph "Mechanism Will Not Reject at the End of Records".

TONE ARM SLIDES INWARD ACROSS RECORD

This is caused by the guide arms stud (12) not releasing from the grooves in the upper side of the large cam gear (11). This may be due to friction at the shoulder screw (26) or the coil spring lifting the arm may be weak.

If the coil spring appears to be weak, it may be strengthened by shortening. If there is binding at the bearing, a little oil will help; also, a few movements by hand under considerable pressure will relieve the binding. If the binding is caused by the are being twisted out of line, the trouble can be sured by straightening up the parts.

ADJUSTING THE RISING HEIGHT OF PICK-UP ARM

The pick-up arm should rise high enough during the change cycle so that the top of the tone arm clears the record resting on the support arms by ⅛". When the maximum load of records are on the turntable, the needle should clear the top record, if not adjust as follows:

Loosen the lock nut in pick-up sleeve (22). Turn the sleeve in the direction necessary to lengthen or shorten the pick-up plunger (21). After correct adjustment is found, tighten lock nut.

ADJUSTING DISTANCE FROM TURNTABLE SPINDLE AT WHICH REJECT WILL OPERATE AND CYCLE WILL BEGIN

The mechanism is designed to reject records of all types whether they are provided with special grooves or not. The mechanism is adjusted to operate 1⅞" from the center of the record spindle; this distance has been found to be the most satisfactory point for all modern records so that they will be rejected after they have been played through. To adjust the reject mechanism for this distance or any distance that may be desired, a trip adjusting screw (18) is provided. By turning this screw toward the trip trigger (16), the mechanism is caused to operate at a closer distance from the spindle. Turning the adjusting screw (18) away from the trip trigger, operates the reject closer to the turntable spindle.

It may be found on some records of very early manufacture that it will not be possible to obtain a satisfactory adjustment that will always operate the changer mechanism.

REJECT BUTTON "R" WILL NOT OPERATE MECHANISM

If the "R" button does not cause the mechanism to go through a change cycle check the following parts:

a. Examine key control unit (75) for parts that have become out of shape or any obstruction that will prevent the "R" button from moving to its maximum length of travel.

b. Inspect reject rod (78). If this rod does not trip the mechanism even when properly revolved by complete depressing of "R" button, the rod has probably been bent out of shape. Replace the rod or reshape it to its former position.

c. If trigger (16) is properly actuated but without starting a change cycle see instructions as given under "Mechanism Will Not Reject at End of Records" paragraph 3.

PRESSING "M" BUTTON DOES NOT CHANGE MECHANISM FROM AUTOMATIC TO MANUAL POSITIONS

Observe action of "M" button. Button should travel far enough down when depressed to cause the manual rod (77) to actuate the key control unit. The key control unit (75) should also be checked for parts which have become out of shape or any foreign obstruction.

MOTOR STOPS IMMEDIATELY WHEN CHANGER SWITCH IS TURNED OFF DURING A CHANGE CYCLE

The normal action of the mechanism when the changer switch is turned off during a change cycle is to continue to operate until the needle is again on the record. The mechanism should then stop. This action is caused by the cycling switch (85) short circuiting the manual changer switch during a change cycle. The switch should be changed when the above mentioned trouble develops.

MECHANISM DOES NOT REPEAT THE LAST RECORD

If the mechanism does not repeat the last record, any one of the parts listed under "Mechanism Will Not Reject at End of Records" may be causing the trouble.

RECORDS FALL UNEVENLY ON THE TURNTABLE

Records falling unevenly on the turntable is generally due to the turntable spindle not being correctly centered between the record loading posts. To correct this trouble, see "Replacing Motor."

LAST RECORD DROPS ON ONE SIDE

This trouble is due in most cases to the loading posts being bent out of perpendicular to the main plate. To check for this trouble, test the posts with a steel square as directed under "Replacing Motor". Replace or adjust post so that it will be perpendicular to the main plate.

CHANGER CONTINUES CYCLING

If the mechanism continues to change records constantly, it indicates trouble in the lift (37). Failure of this lift to disengage with the cam gear (11), Fig. 2, will cause the trouble. Check the various rivets at which motion occurs to find a point where friction or binding is interfering with freedom of motion. The cam lever (39), Fig. 2, should also be checked for too much friction. Oil this part if necessary.

SELECTOR BLADE FAILS TO SEPARATE BOTTOM RECORD FROM STACK

This is due either to a badly warped record or to its being of a thickness considerably different from records now in standard use. The selector blade and shelf blades are designed to accommodate a maximum variation in thickness and flatness of records now in standard use. There are certain records, however, that may be found which vary in thickness so much as to be impracticable for use in the automatic changers.

SELECTOR BLADES JAM INTO EDGE OF RECORD

This is generally caused by too small a spacing between the selector plate and the spacing between the selector plate and the shelf plate. This space should never be less than .050 inch when selector plate is in 10" position. Another cause of jamming is too sharp an edge on the selector plate.

To eliminate this trouble, check spacing of plates. Bend the selector plate slightly, if necessary. Smooth up the edge of the selector plate by means of a piece of fine emery cloth.

MECHANISM SLOW IN STARTING OR STALLS DURING A CHANGE OF CYCLE

Trouble is probably due to:

a. Motor mechanism is not thoroughly lubricated. See heading "Lubrication".

b. Check for loose set screws.

c. Line voltage may be abnormally low or motor windings damaged. If the windings of the motor are damaged, replace motor. To remove motor, see heading "Replacing Motor".

REPLACING MOTOR

Replacing the motor necessitates extreme care in aligning and correctly mounting the new motor. The procedure listed below should be followed closely. When replacing a new motor or ordering a new one from your distributor, specify the power supply from which the motor is to be operated. The motor electrical wiring is shown in Fig. 4.

When mounting replacement motor, it is most important to see that record pin is centered between the two posts of the changer, that it stands perpendicular to main plate (53), and that it has not become bent so as to wobble. Even though the posts are stout and not easy to bend, it is well to check them also, with a 12" combination square laid clear across the concave upper surface of main plate. When the new motor has been attached, with three screws through grommet sleeves (51) (spacers) into its frame, and record pin is seen to revolve without appreciable wobble, the correct position of the record pin between the record-mounting posts can be accurately checked as follows: Place a single 12" record on the shelf plates, press "R" button, and turn turntable forward by hand. Immediately after the shelf plates open and allows the record to fall, turn turntable slightly backward, and with other hand support the record between the shelf plates; it can then be readily seen whether record pin is off center. If the record pin is found to be off center, remove the record and turntable, and loosen slightly the motor mounting screw or screws nearest the shelf plate to which record appeared closest. This should improve evenness of operation. However, unless the unevenness was very slight, it will be necessary for a permanent repair to insert a shim or two on one or more of the three screws (or change shims from one screw to another). The shims used are shaped like an ordinary washer, cut out at one side (see cut-away view at 52 on photo, showing a shim in place upon one of the grommet sleeves). Shims can readily be cut out with shears and punch from thin metal or cardboard—or an assortment of shims of different thicknesses can be had from your distributor. (Order "Assortment of Part No. 45-2785"). They should be inserted, around proper screws (when screws have been sufficiently loosened) between motor frame and the metal grommet sleeve. Do not insert shims next to rubber grommet.

TURNING CHANGER SWITCH OFF FAILS TO STOP MECHANISM

If after turning the changer switch off the mechanism continues to operate it indicates trouble in the cycling switch (85). Replace the switch when this trouble develops.

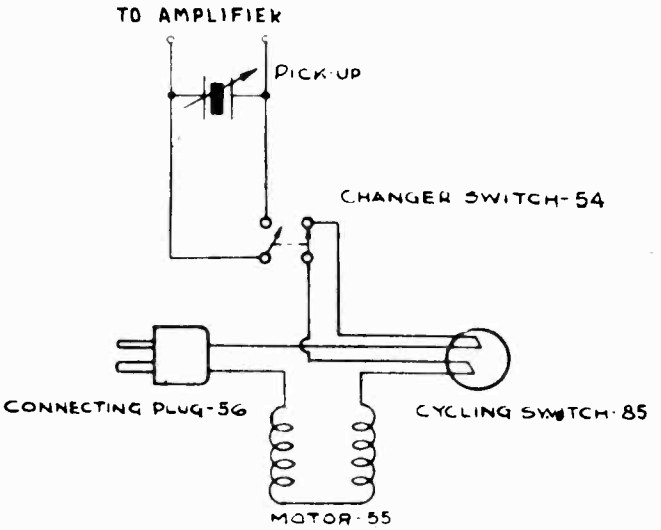


FIG. 4. MOTOR ELECTRICAL CONNECTIONS

DISASSEMBLING THE CHANGER

Before attempting to remove sub-plate assembly (83) detach key control unit (75) from main plate. To do this, start with control unit truss bar (80). Then take out the screw which holds left end of adjusting rod lever (94). Next remove adjusting rod (92) and adjusting rod extension (79). Take out the screw holding spring (73); then the screws holding key control unit (75) to main plate. Rods (77) and (78) can then, with due care, be extracted without bending. Free the cam connecting rod (58) by loosening setscrew holding spreader and hub assembly (59). Sub-plate assembly can then be detached without bending parts. In reassembling, reverse the procedure.

MODEL 35-1180
Assembly, Notes

PHILCO RADIO & TELEV. CORP.

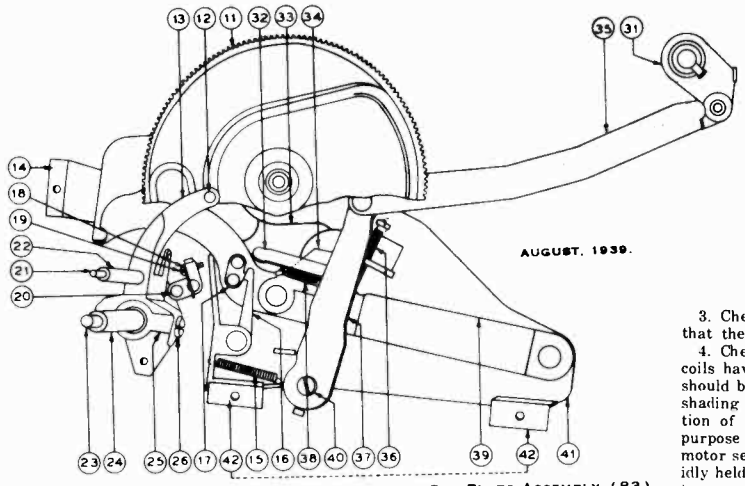


FIG. 2. CUTAWAY VIEW SHOWING PARTS UNDER SUB-PLATE ASSEMBLY (83)

FIG. 3

Numbers on Figs. 2 and 3	PART DESCRIPTION
11	Cam Gear
12	Stud
13	Guide Arm
14	Bracket
15	Trigger Spring
16	Trigger
17	Trigger Catch
18	Trip Adj. Screw
19	Lock Spring
20	Release Lever
21	Pickup Plunger
22	Pickup Sleeve
23	Swivel Shaft
24	Swivel Tube
25	Swivel Trunnion
26	Shoulder Screw
31	Spreader-Hub Assem.
32	Bridge
33	Lifter Cam
34	Pawl
35	Cam Connecting Rod
36	Spring
37	Lift
38	Spring
39	Cam Lever
40	Shoulder Screw
41	Sub-Plate
42	Bracket
51	Grommet Sleeve
52	Shim
53	Main Plate
54	Changer Switch
55	Motor
56	Connecting Plug
57	Changer Connect. Rod
58	Cam Connecting Rod
59	Spreader-Hub Assem.
60	Shaft
61	Spring Roller
62	Spreader Spring
71	Post Nut
72	Lever-Hub Assem.
73	Flat Spring
74	Shaft
75	Key Unit
76	Key Bracket
77	Manual Rod
78	Reject Rod
79	Extension Rod
80	Truss Bar
81	Adjusting Cam
82	Cam Gear
83	Sub-Plate Assem.
84	Spring
85	Cycling Switch
86	Bracket
87	Spring
88	Link
89	Release Lever
90	Upper Spreader
91	Lower Spreader
92	Rod
93	Lever-Hub Assem.
94	Lever
95	Swivel Spring
96	Lever Spring
97	Lead Spring

SQUEAKS OR OTHER NOISES DURING PLAYING OF RECORDS

If squeaks or various noises are heard from the mechanism during the playing of records or changing of records, the following items should be checked:

1. In the majority of the cases, these squeaks will be usually found to come from the friction between the stacked records and the turntable spindle. To check for this trouble, operate the mechanism with and without a load of records. To eliminate this condition, apply a very thin coat of light motor grease or vaseline to the turntable spindle.

2. Check the 5 wicks given under the paragraph on "Lubrication." Each wick should be thoroughly saturated with oil. All 3 motor wicks should be removed from the retaining holes with tweezers and examined to see if the oil has become gummy. In this case, the wicks should be thoroughly cleaned and relubricated with oil and replaced in their sockets.

3. Check all set screws to see that they are in place and tight.

4. Check motor windings. If coils have been jarred loose they should be tightened in place. The shading coils which encircle a portion of each laminated pole, the purpose of which is to make the motor self-starting, should be rigidly held in place by the retaining tape.

TURNTABLE SPEED VARIES

The turntable speed should be 78 R.P.M. + or — 2 R.P.M. when a record is being played, and the mechanism will operateate satisfactorily. If the speed is below or above these limits, it indicates either trouble in the motor windings or bearings of the motor. Sometimes a few drops of oil on the bearings will increase the speed to normal. If upon investigation the normal speed cannot be obtained, replace the motor.

ADJUSTING LANDING POSITION OF NEEDLE ON RECORD

Adjustment of the landing position of the needle on records is controlled by the adjusting screw located in the hole shown in Figure 1. This adjustment is made with a screw driver from the top of the mechanism and does not require the removal of the changer from the cabinet. If the needle comes down too far from the edge of the record, playing of records will not start at their beginning. In this case, turn the needle positioning adjustment screw very slightly counter-clockwise. If the needle comes down too close to the edge of the record, the pickup may slip off the record. To adjust this condition turn the adjusting screw clock-wise. If adjustment screw is too far to rear and cannot be adjusted through hole in base plate, depress "Manual" push button, and push bracket—Forward.

MECHANISM WILL NOT REJECT AT THE END OF RECORDS

There are several parts that will cause the mechanism to fail in the operation of rejecting of records. These items are listed as follows:

1. Examine swivel spring (95) for stretching. This spring is attached to the lugs at the end of the swivel spreaders (90) (91). The purpose of this spring is to keep the swivel spreaders (90) (91) closed, so that the trip trigger can be actuated. Increasing the tension of the spring (95) will prevent the swivel spreads from opening allow the trip trigger to actuate properly.

If after increasing the tension of the spring (95) it is found that the needle jumps across the record, it may be necessary to adjust the horizontal level of the pickup. Sometimes the pickup leans towards the center of the record. To remedy this condition, the pickup mounting post should be examined for proper mounting position or the pickup arm may be twisted out of shape. In either of these cases the pickup arm should be replaced or adjusted to its original position. When the pickup arm is properly adjusted, it should lean slightly in an outward direction (toward the edge of the record).

2. After it is found that the trip trigger (16) is operating properly, trouble may be found due to the cam lever (39) binding against sub-Plate (41). In this case, look for some obstruction or foreign material on these two parts. Also see that the rivets are operating freely. If lever (39) engages cam lever pawl (34) so that lift (37) forces its rollers up into the groove on cam gear (82) and if the set screws are tight, the change cycle should go into motion as the cam gear (82) turns.

3. Sometimes friction between the trigger (16) and trigger catch (17) due to burrs or rough surfaces may also prevent the reject from operating. If the trigger unlatches but the cam lever (39) does not move, it indicates binding between sliding surfaces. This may be caused by above mentioned burrs or by the cam lever being slightly warped.

To eliminate this condition, locate the position where there is excessive friction. If it is found that the parts are out of shape due to being bent, new parts should be added or the old ones straightened. When it is found that trouble is due to a burr on the edge of the metal parts, burrs should be removed with a very fine file or scraper. After eliminating this trouble, a small amount of oil should be applied to the sliding surfaces.

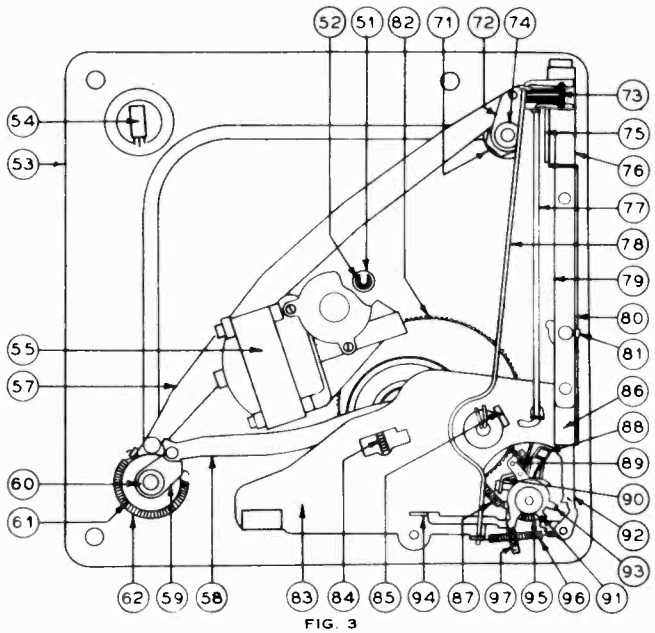


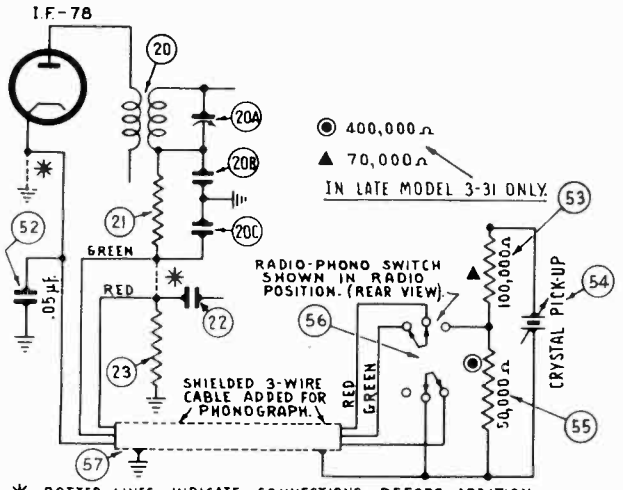
FIG. 3

PHILCO RADIO & TELEV. CORP.

MODELS 39-31,39-31XF
39-31XK, Code 121
MODELS 39-3-31PA,
39-40PCX,39-2-40PC
Schematics,Notes

PHILCO Model 39-3-31 PA

Model 3-31 PA is a combination automatic record changer, phonograph and electric push-button tuning superheterodyne radio. This model is identical to the Model 39-31 Code 121 with the exception of the automatic record changer.



PHONOGRAPH CONNECTIONS FOR MODEL 3-31.

The automatic record changer plays seven 12″ or eight 10″ records automatically. The last record remains on the turntable and repeats as long as the record changer is in operation. The electric pick-up is a crystal type.

The specifications for the radio receiver, alignment of compensators and adjustments of push-buttons for reception of stations is covered under the Model 39-31 Code 121. Connections for the phonograph pick-up as connected to the Model 39-31 Code 121 receiver are shown below. The circle numbers of this diagram correspond to the circle numbers of the Model 39-31 Schematic.

For automatic record changer Model "L" used with this set, see index.

Replacement Parts — Model 39-3-31 PA

SCHE. No.	DESCRIPTION	PART No.
52	Condenser (.05 mfd., 200 V.)	30-4519
53	Resistor (100,000 ohms)	33-410339
54	Crystal Cartridge	35-2030
55	Resistor (50,000 ohms)	33-350339
56	Switch (Radio-Phono)	42-1053
57	Cable	

MISCELLANEOUS PARTS

Motor (115 V., 60 cycle A. C.)	
Motor Switch	
Tone Arm Complete	35-2055
Turntable	35-3041

Models 39-31XF and 39-31XK are identical to Model 39-35, Code 121 with the exception of cabinets.

The Model 39-35, code 121 specifications, diagram and replacement parts apply to Models 39-31XF and XK.

See Philco pages 10-13 through 10-16.

NOTE:-
Models 39-30 and 39-35 code 121 are similar with the exception of the type of Cabinets, Speakers and Power Transformers. These differences are shown on the Replacement Parts list and circuit diagram.

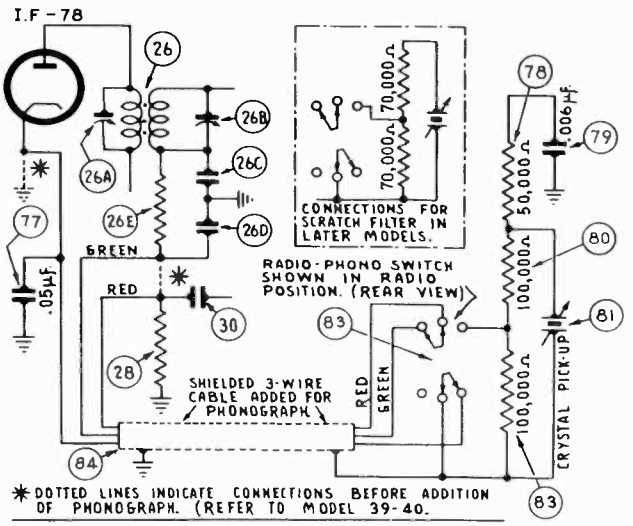
PHILCO Models 39-40 PCX and 2-40 PC

Models 39-40 PCX and 2-40 PC are combination automatic record changer phonograph and electric push-button tuning superheterodyne radio receivers. These models are identical to the Model 39-40 Code 121 with the exception of the phonograph mechanism. The phonograph contains an automatic record changer which plays ten records either 10 or 12 inches repeating the last selection until the records are restacked or the set is turned off.

The radio receiver specifications, aligning instructions and adjustments for electric push-button tuning are covered under Model 39-40 Code 121. The cabinet size and power consumption, however, differ on the Models 39-40 PCX and 2-40 PC and are listed below.

The phonograph connections diagram shown below indicates the connections to the radio receiver of the Model 39-40 Code 121. The circle numbers of the diagram correspond to the circle numbers of the Model 39-40 Code 121 diagram.

CABINET DIMENSIONS:
Height, 37⅛″. Width, 39 1/16″. Depth, 17⅛″.



PHONOGRAPH CONNECTIONS FOR MODELS 39-40PCX, 2-40PC

Replacement Parts — Models 39-40 PCX and 2-40 PC

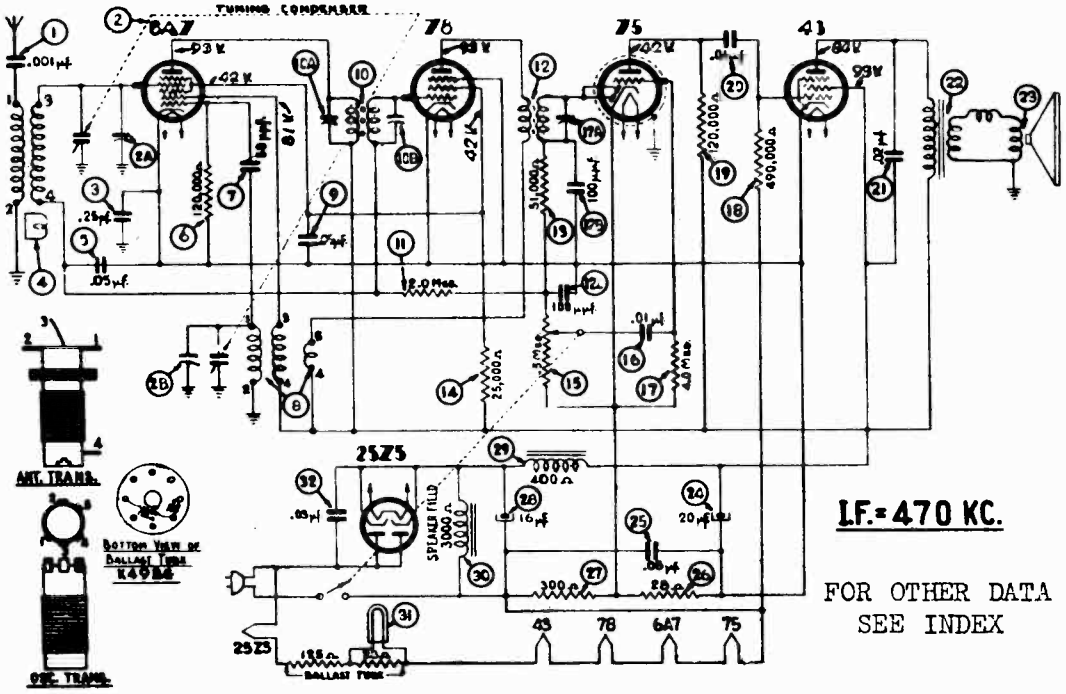
SCHE. No.	DESCRIPTION	PART No.
77	Condenser (.05 mfd., 200 V.)	30-4519
78	Resistor (50,000 ohms)	33-350339
79	Condenser (.006 mfd., 200 V.)	30-4583
80	Resistor (100,000 ohms)	33-410339
81	Crystal Cartridge	35-2030
82	Resistor (100,000 ohms)	33-410339
83	Switch (Radio-Phono)	42-1053
84	Cable	

MISCELLANEOUS PARTS

Motor 110 volt, 60 cycle	35-1187
Motor 110 volt, 50 cycle	35-1186
Automatic Record Chgr. (Com.)	35-1178
Governor (motor)	35-1165

MODELS 39-8,39-8T
Schematic
Voltage

PHILCO RADIO & TELEV. CORP.



SPECIFICATIONS

TYPE OF CIRCUIT: Model 39-8T is a 5 tube superheterodyne receiver designed for operation on AC or DC current in a frequency range from 25 to 100 cycles. In addition, other features of design are: Automatic Volume Control and Pentode Audio Output.

PHILCO TUBES USED: 6A7, First Detector, Oscillator; 78, I.F. Amplifier; 75, Second Detector, A.V.C., First Audio; 43, Audio Output and 25Z5, Rectifier.

POWER SUPPLY: 100 to 125 volts AC 25 to 60 cycles or D.C.

POWER CONSUMPTION: 30 watts.

AUDIO OUTPUT: One (1) watt.

FREQUENCY RANGE: 530 to 1720 K.C.

INTERMEDIATE FREQUENCY: 470 K.C.

REPLACEMENT PARTS
MODEL 39-8

Schem. No.	Description	Part No.
1	Tubular Cond. (.001 mfd.)	30-4453
2	Tuning Cond. Assy.	
2A (2B (	Part of No. 2	
3	Tubular Cond. (.25 mfd.)	30-4146
4	Antenna Trans.	32-2583
5	Tubular Cond. (.05 mfd.)	30-4444
6	Resistor (120,000 ohms, 1/2 watt)	33-412339
7	Mica Cond. (50 mmfd.)	30-1029
8	Oscillator Trans.	32-2860
9	Tubular Cond. (.05 mfd.)	30-4444
10	1st I.F. Trans. Assy.	32-3018
10A (10B (	Part of No. 10	
11	Resistor (2.0 meg., 1/2 watt)	33-520339
12	2nd I.F. Trans. Assy.	32-2674
12A (12B (12C (	Part of No. 12	
13	Resistor (51,000 ohms, 1/2 watt)	33-351339
14	Resistor (25,000 ohms, 1/2 watt)	33-325339
15	Volume Control (.5 meg.)	33-5254
16	Tubular Cond. (.01 mfd.)	30-4479
17	Resistor (4.0 meg., 1/2 watt)	33-540339
18	Resistor (490,000 ohms, 1/2 watt)	33-449339
19	Resistor (120,000 ohms, 1/2 watt)	33-412339
20	Tubular Cond. (.01 mfd.)	30-4479
21	Tubular Cond. (.02 mfd.)	30-4215
22	Output Transformer	32-7874
23	Cone & Voice Coil Assembly. Speaker Part No. 36-1362-1)	36-3981
24	Electrolytic Cond. (20 mfd., 150V)	30-2245
25	Tubular Cond. (.05 mfd.)	30-4444
26	Resistor (27 ohms, 1/2 watt)	33-027339
27	Resistor (300 ohms)	33-1214
28	Electrolytic Cond. (16 mfd., 150V)	30-2246
29	Filter Choke	32-7868
30	Field Coil (Replace Speaker)	
31	Pilot Lamp	34-2068
32	Tubular Cond. (.03 mfd.)	30-4449

MISCELLANEOUS PARTS

Bezel & Glass Assembly	13105
Bezel Clamp	20162
Dial Scale	16104P
Drive Drum & Set Screw	31-1283
Drive Shaft Assembly	31-2140
Drive Cord Assembly	90325
Output Transformer	32-7874
Pointer (Dial)	28-5468
Spring Drive Cord	28-8751
Speaker	36-1362-1
Socket (7 prong)	27-6037
Socket (6 prong)	27-6036
Socket (8 prong)	27-6058

PHILCO RADIO & TELEV. CORP.

MODELS 39-17,39-18,39-19
39-19PA,39-19PF,39-19PCS
39-19PT,39-75
Tuner Data
MODEL 39-85
Alignment,Trimmers

Alignment of Compensators

EQUIPMENT REQUIRED:

(1) Philco Model 077 Signal Generator which has a fundamental frequency range from 115 to 36,000 KC is the correct instrument for this purpose.

(2) Output Meter, Philco Model 027 Circuit Tester, incorporates a sensitive output meter and is recommended.

(3) Philco Fiber Handle Screw Driver, part No. 45-2610 and Fiber Wrench, part No. 3164.

OUTPUT METER: The Philco 027 Output Meter is connected to the plate and screen terminals of the 1A5G tube. Set the meter to use the 0-30 volt scale.

Operations in Order	Signal Generator			Receiver			Special Instructions
	Output Connections to Receiver	Dummy Antenna (Note A)	Dial Setting	Dial Setting	Control Settings	Adjust Compensators in Order	
1	1A7G Grid	.1 mf	470 KC	580 KC	Vol. Cont. max.	(20A) (19B) (19A)	
2	Ant. Lead (white)	400 ohms	18.0 MC	18.0 MC	Vol. Cont. max.	(6B)	See Note B
3	Ant. Lead (white)	225 mmf	1550 KC	1550 KC	Vol. Cont. max.	(9) (6A)	
4	Ant. Lead (white)	225 mmf	580 KC	580 KC	Vol. Cont. max.	(9A)	Roll gang
5	Ant. Lead (white)	225 mmf	1550 KC	1550 KC	Vol. Cont. max.	(9)	

MODEL 39-85.

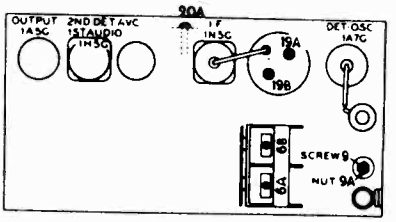


Fig. 1. Locations of Compensators

NOTE A—The "Dummy Antenna" consists of a condenser or resistor connected in series with the signal generator output lead (high side). Use the capacity or resistance as specified in each step of the above procedure.

NOTE B—DIAL CALIBRATION: In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser. To adjust the dial proceed as follows: Turn the tuning condenser to maximum capacity (plates fully meshed). With tuning condenser in this position set the pointer horizontally across the dial.

Specifications

TYPE OF CIRCUIT: Four tube, battery operated superhetrodyne circuit, two tuning ranges, Automatic Volume Control, and Pentode Output.

TUNING RANGES: Range 1, 540 to 1720 KC.; Range 2, 5.6 to 18.0 MC.

INTERMEDIATE FREQUENCY: 470 KC.

PHILCO TUBES USED: 1-1A7G, 1st Detector and Oscillator; 1-1N5G, I. F. Amplifier; 1-1H5G, 2nd Detector, 1st Audio, and Automatic Volume Control; and 1-1A5G, Output.

AERIAL AND GROUND: Philco "Farm Radio Aerial," part No. 40-6383, is required for maximum performance. A good ground is very essential.

CABINETS: Types "B" and "XF."

BATTERIES REQUIRED: One Philco "A" Pack, part No. 41-8014, and one Philco "B" Pack, part No. 41-8015.

BATTERY DRAIN: 6.5 Ma. "B" and 200 Ma. "A." Total with no signal.

TUNING MECHANISM: Pulley and cable drive for Manual tuning. Electric Push-Button for Automatic Tuning.

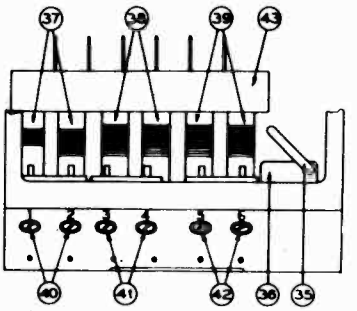


Fig. 4. Automatic Tuning Unit

Instructions for setting up and operating the electric push-button tuning will be found on Philco Page 10-16.

SETTING AND OPERATING AUTOMATIC TUNING

Models 39-17, 30-18, 39-19, 39-19PA, 39-19PF, 39-19PCS, 39-19PT, and 39-75.

For best results follow these instructions carefully.

Select six of your favorite nearby broadcast stations and remove their call letters from the station call letter tab sheets supplied. Insert these call letters in the escutcheon directly in front of the buttons at the top of the cabinet.

Hold the "Station Selector" knob to prevent it from rotating while you insert a large coin in the screw head at the center of the knob, (see figure) and loosen by turning counter-clockwise about one turn. Press down any one of the six buttons. Holding it down, tune in with the "Station Selector" the station corresponding to the call letters in front of the button. With the volume low, turn the "Station Selector" knob slowly back and forth until the signal is clearest. The station is then tuned in correctly.

Release the button and press another button all the way down. Follow the above instructions, tuning in the station accurately with the button held down. In the same way continue to set all the buttons.

After all buttons are set, and the last one is released, hold the "Station Selector" knob to prevent it from turning while you tighten the screw at the center of the knob. When the screw is tightened the unit is ready to operate.

If it is ever desired to substitute a station received well in your locality for a station already set, follow the same procedure, setting up only the desired station.

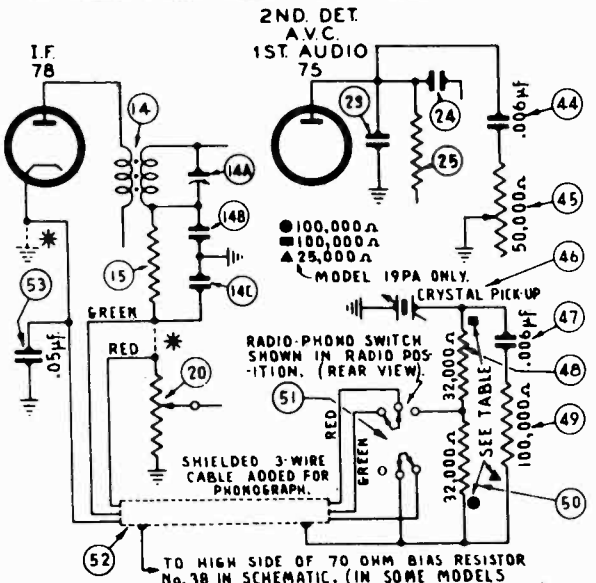
To tune your receiver automatically simply press down the button in the rear of the desired station call letters. Be sure that you press the button all the way down until a distinct stop is noted.

MODELS 39-19PA, 39-19PF, 39-19PCS 39-19PT

PHILCO RADIO & TELEV. CORP.

MODEL 39-30PCX Phono. Connections Notes, Parts

Models 39-19 PA, 39-19 PF, 39-19 PCS, 39-19 PT



*DOTTED LINES INDICATE CONNECTIONS BEFORE ADDITION OF PHONOGRAPH. (REFER TO MODEL 39-19. see index.

PHONOGRAPH CONNECTIONS MODELS 19PA, 19PF, 19PCS, 19PT

Model 39-19 PA is a combination automatic record changer phonograph and automatic push-button tuning superheterodyne radio receiver. The radio receiver of this model is identical to the Model 39-19 Code 122 with the exception of the automatic phonograph connections. The automatic record changer plays eight 10-inch records automatically or 12-inch records manually.

The specifications of this model with the exception of the cabinet dimensions and power consumption and automatic record changer are the same as Model 39-19 Code 122. The connections for the phonograph pick-up as connected in the Model 39-19 Code 122 are shown below. The circle numbers of this diagram correspond to the circle numbers of the Model 39-19 Code 122.

The alignment of compensators will also be found under Model 39-19 Code 122 (see index)

For record changer 35-1169 see index.

Models 39-19 PF, 39-19 PCS and 39-19 PT, are combination phonograph and automatic tuning superheterodyne radio receivers. The radio receivers of Models 39-19 PF and PCS are identical to Model 39-19 Code 122 with the exception of the phonograph connections. The radio receiver of Model 39-19 PT is identical to Model 39-19 Code 121 with the addition of phonograph connections. The phonograph section of these models consists of a semi-automatic pick-up that places itself automatically on the turntable when the lid is closed and plays either 10- or 12-inch records.

The specifications of this model with the exception of cabinet dimensions, power consumption and semi-automatic pick-up are the same as Model 39-19 Codes 121, 122. The connections for the phonograph pick-up as connected to Model 39-19, Codes 121 and 122 are shown below. The circle numbers of this diagram correspond to the circle numbers of the Model 39-19 Codes 121, 122.

The alignment of the compensators will also be found under Model 39-19 Codes 121, 122 (see index)

Replacement Parts — Model 39-19 PA

SCHE. No.	DESCRIPTION	PART No.
44	Condenser (.006 mfd., 400 V.)	30-4591
45	Tone Control	33-5327
46	Crystal Cartridge	35-2044
47	Condenser (.006 mfd., 400 V.)	30-4591
48	Resistor (32,000 ohms)	33-332339
49	Resistor (100,000 ohms)	33-410339
50	Resistor (32,000 ohms)	33-332339
51	Switch (Radio-Phono)	42-1053
52	Cable (Radio-Phono Switch)	
53	Condenser	30-4519

MISCELLANEOUS PARTS

DESCRIPTION	PART No.
Automatic Record Changer Complete	35-1169
Governor (Motor)	35-1199
Grille and Baffle	40-6491
Tone Arm Complete with Crystal	35-2047
Tone Arm Complete with Crystal and Base	35-2048
Turntable (10")	35-3032
Tuning Shaft	56-6015
Motor (110 V., 60 cycle)	35-1163
Shaft (Wave Switch and Volume Control)	38-9640
Tuning Shaft Tube	56-6004
Dashpot Assy. (Automatic Record Chgr.)	315-1001
Handles (For Lid of 19PA Cabinet)	27-4597
Springs (Governor Ball of Record Chgr.)	35-1179

Replacement Parts — Models 39-19 PF, 39-19 PCS, 39-19 PT

SCHE. No.	DESCRIPTION	PART No.
44	Condenser (.006 mfd., 400 V.)	30-4591
45	Tone Control	33-5327
46	Crystal Cartridge	415-1027
47	Condenser (.006 mfd., 400 V.)	30-4591
48	Resistor (32,000 ohms)	33-332339
49	Resistor (100,000 ohms)	33-410339
50	Resistor (32,000 ohms)	33-332339
51	Switch (Radio-Phono)	42-1053
52	Cable (Radio-Phono Switch)	
53	Condenser (.05 mfd., 200 V.)	30-4519
	Crystal Cartridge Holder	35-2057
	Extension Shaft (Tuning) PCS, PF	28-6926
	Sleeve for Tuning Shaft	28-6935
	Shaft (Wave Change and Volume Control)	38-9748
	Tuning Shaft Tube	28-6935
	Tone Arm and Pick-up Complete	35-2027
	Turntable (9")	35-3035

PHILCO Model 39-30 PCX

Model 39-30 PCX is a combination automatic record changer phonograph and electric push-button tuning superheterodyne radio receiver. This model is identical to the Model 39-30 Code 121 with the exception of the automatic record changer The automatic record changer plays ten records either 10 or 12 inches repeating the last selection until the records are restacked or the set is turned off. The electric pick-up is a crystal type.

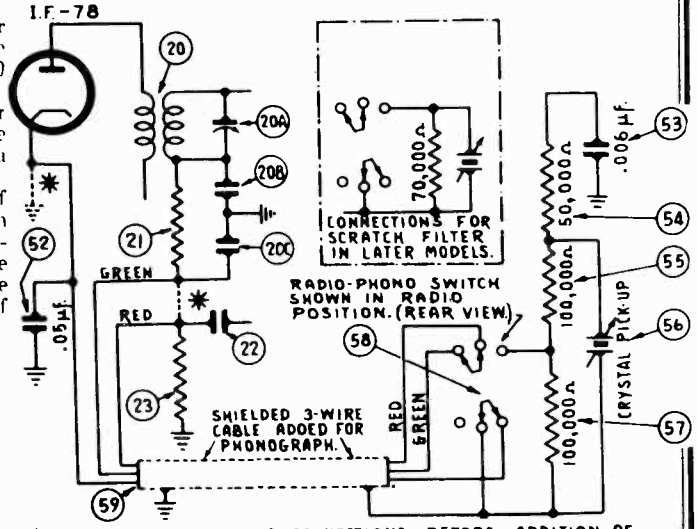
The specifications for the radio receiver, alignment of compensators and adjustment of push-buttons for reception of stations is covered under Model 39-30 Code 121. The connections for the phonograph pick-up as connected in the Model 39-30 Code 121 receiver are shown below. The circle numbers of this diagram correspond to the circle numbers of the Model 39-30 Code 121 schematic.

Replacement Parts — Model 39-30 PCX

SCHE. No.	DESCRIPTION	PART No.
52	Condenser (.05 mfd., 200 V.)	30-4519
53	Condenser (.006 mfd., 200 V.)	30-4583
54	Resistor (50,000 ohms)	33-350339
55	Resistor (100,000 ohms)	33-410339
56	Crystal Cartridge	35-2030
57	Resistor (100,000 ohms)	33-410339
58	Switch (Radio-Phono)	42-1522
59	Cable	

MISCELLANEOUS PART

Tone Arm and Pick-up (Less Base)	35-2059



*DOTTED LINES INDICATE CONNECTIONS BEFORE ADDITION OF PHONOGRAPH. (REFER TO MODEL 39-30. (see index).

PHONOGRAPH CONNECTIONS FOR MODEL 39-30PCX

MODEL 39-85, Code 121

PHILCO RADIO & TELEV. CORP Schematic, Chassis Voltage

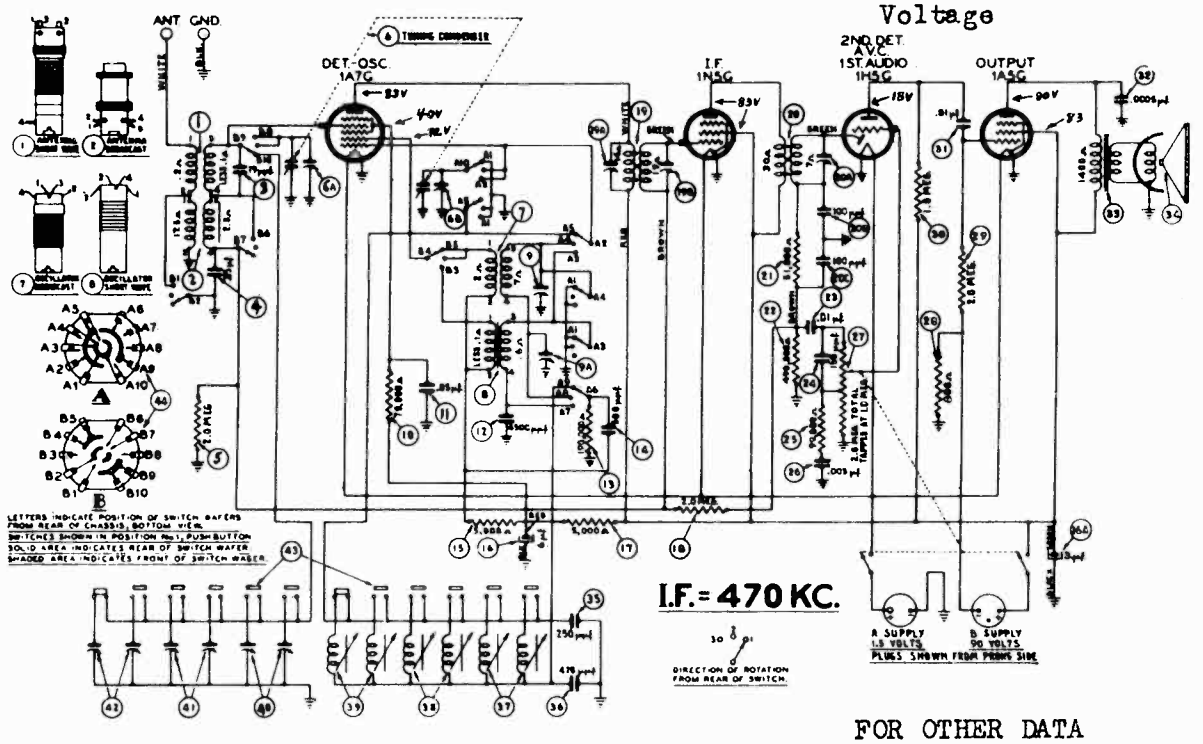


Fig. 2. Schematic Diagram

FOR OTHER DATA SEE INDEX

Replacement Parts Model 39-85, Code 121

Schem. No.	Description	Part No.
1	Antenna Transformer, Range 2 (Incls. No. 3)	32-3092
2	Antenna Transformer, Range 1	32-3084
3	Condenser (19 mmf) (part of No. 1)	30-1090
4	Condenser (.05 mf tubular)	30-4519
5	Resistor (2.0 megohms, ½ watt)	33-520339
6	Tuning Condenser Assembly	31-2300
7	Oscillator Transformer, Range 1	32-3082
8	Oscillator Transformer, Range 2	32-3085
9	Compensator (two sections)	31-6100
10	Resistor (70,000 ohms, ½ watt)	33-370339
11	Condenser (.05 mf tubular)	30-4444
12	Condenser (4500 mmf mica)	30-1109
13	Resistor (190,000 ohms, ½ watt)	33-419339
14	Condenser (500 mmf mica)	30-1114
15	Resistor (5000 ohms, ¼ watt)	33-250339
16	Electrolytic Condenser (6 mf—3 mf)	30-2348
17	Resistor (5000 ohms, ½ watt)	33-250339
18	Resistor (2.0 megohms)	33-520339
19	1st I. F. Transformer Assembly	32-2841
20	2nd I. F. Transformer Assembly	32-3081
21	Resistor (51,000 ohms, ½ watt)	33-351339
22	Resistor (490,000 ohms, ½ watt)	33-449339
23	Condenser (.01 mf tubular)	30-4572
24	Condenser (150 mmf mica)	30-1033
25	Resistor (99,000 ohms, ½ watt)	33-399339
26	Condenser (.003 mf tubular)	30-4580
27	Volume Control and On-Off Switch	33-5288
28	Resistor (800 ohms, ½ watt)	33-180339
29	Resistor (2.0 megohms, ½ watt)	33-520339
30	Resistor (1.0 megohm, ½ watt)	33-510339
31	Condenser (.01 mf tubular)	30-4572
32	Condenser (.0005 mf mica)	30-1114
33	Output Transformer	32-7984
34	Cone & Voice Coil Assembly for Speaker (Part No. 36-1410)	36-4093
	Cone & Voice Coil Assembly for Speaker (Part No. 36-1436)	36-4094
35	Condenser (250 mmf, silver plated mica)	30-1104
36	Condenser (420 mmf, silver plated mica)	30-1116

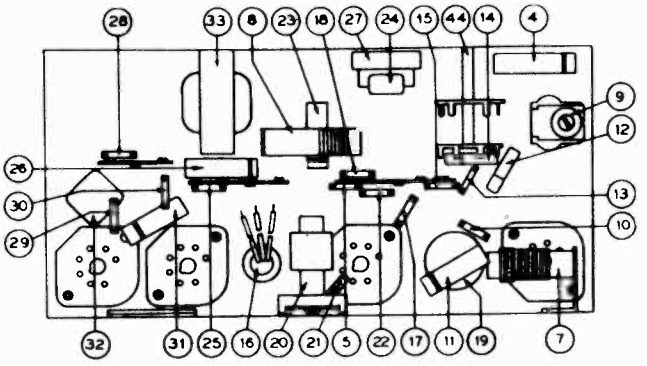


Fig. 3. Part locations, underside of chassis

Replacement Parts

CONTINUED

Schem. No.	Description	Part No.
37	Oscillator Coil Assem. (High freq. No. 1 and 2)	32-2941
38	Oscillator Coil Assem. (Medium frequency No. 3 and 4)	32-2942
39	Oscillator Coil Assem. (Low frequency No. 5 and 6)	32-2943
40	Compensator (two sections) (Nos. 1 and 2)	31-6244
41	Compensator (two sections) (Nos. 3 and 4)	31-6245
42	Compensator (two sections) (Nos. 5 and 6)	31-6246
43	Push-Button Switch	42-1471
44	Wave Switch	42-1466

Description	Part No.
Bezel Assy. (Dial)	40-6374
Cable (Battery)	41-3437
Dial Assy.	31-2307
Dial Pointer	56-1091
Dial Drive Cord	31-2318
Dial Drive Spring	28-8751
Dial Tuning Shaft	31-2290
Escutcheon (Push-Button)	28-5561
Knob (Push-Button)	27-4702
Knob (Range Switch)	27-4321
Knob (Volume & Tuning)	27-4332
Pulley (Tuning Condenser)	28-6662
Speaker (B Cabinet)	36-1410
Speaker (XF Cabinet)	36-1436
Socket (6 prong)	27-6086
Socket (7 prong)	27-6099
Socket (Speaker)	27-6115
Tab Kit	40-6408

MODEL 39-116PCX
Phono.Connections
Notes

PHILCO RADIO & TELEV. CORP.

PHILCO Model 39-116 PCX

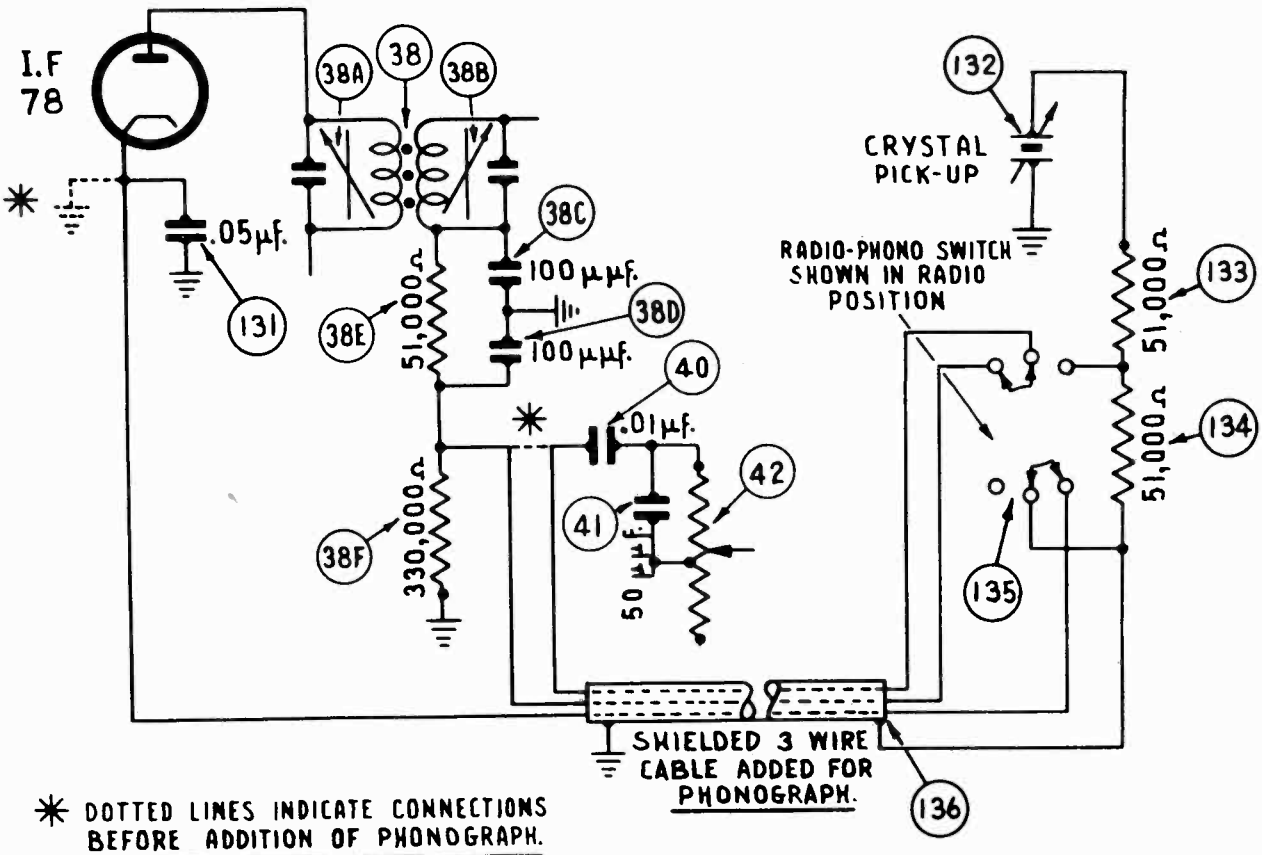
Model 39-116 PCX is a combination phonograph and 14 tube radio receiver employing a superheterodyne circuit with three tuning ranges for reception of standard and short-wave broadcast stations. Incorporated in this receiver is Philco mystery control for electric automatic tuning of eight standard broadcast stations from a remote point. The phonograph section contains an automatic record changer which plays ten records either 10- or 12-inch size automatically repeating the last record until the records are restacked or the switch turned off.

This model with the exception of the phonograph mechanism is identical to the Model 39-116 RX. The same specifications for the Model 39-116 RX apply to this model except the cabinet size and power consumption which are listed below.

CABINET DIMENSIONS:

Height, 37⅛". Width, 44⅝". Depth, 17⅛".

The adjustment of the mystery control circuit for reception of stations and alignment of compensators is also covered under Model 39-116 RX. The phonograph connections are shown below as connected in the Model 39-116 RX circuit diagram. The circle numbers of this phonograph diagram correspond to the circle numbers of the Model 39-116 RX diagram.



✳ DOTTED LINES INDICATE CONNECTIONS BEFORE ADDITION OF PHONOGRAPH.
REFER TO SERVICE BULLETIN No. 310.

PHONOGRAPH CONNECTIONS FOR MODEL 39-116 PCX

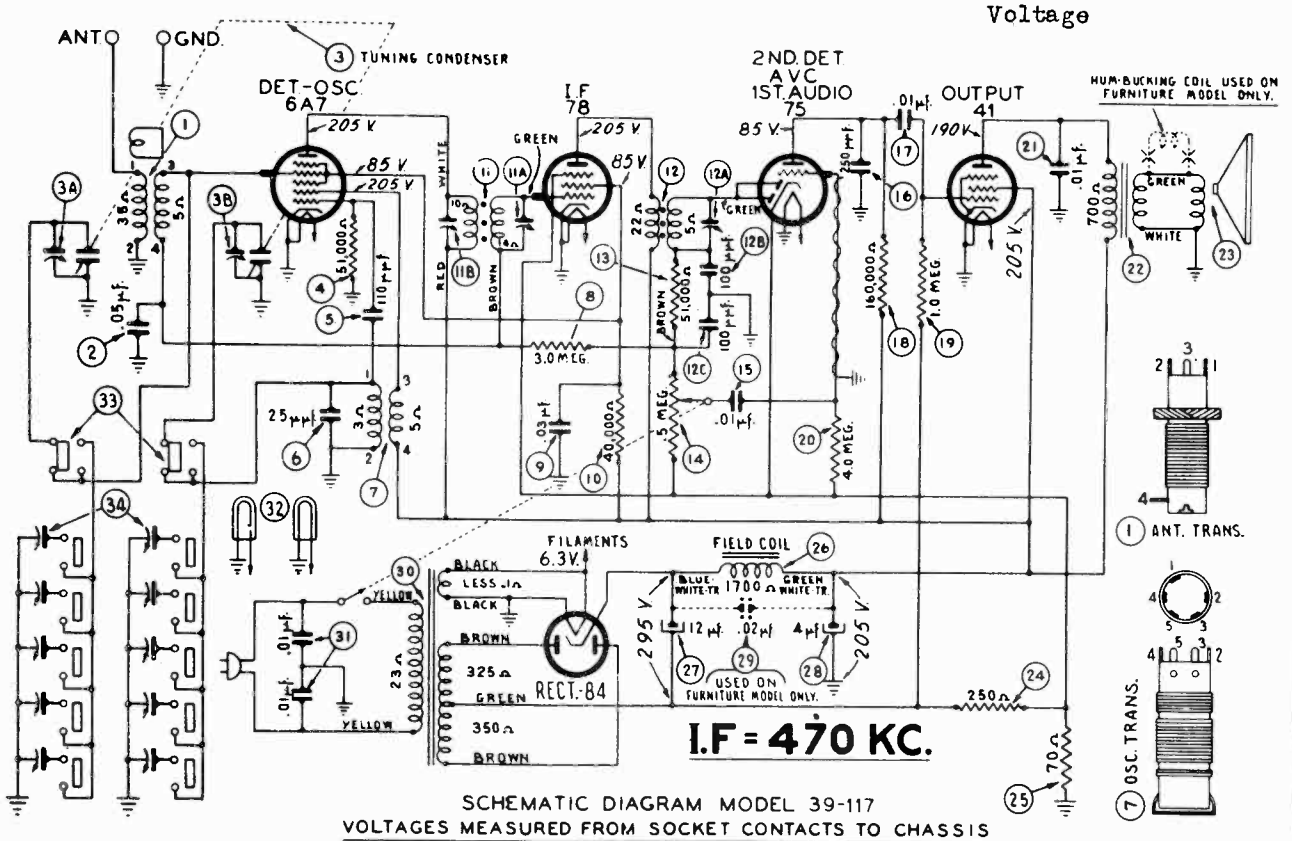
Replacement Parts — Model 39-116 PCX

SCHE. No.	DESCRIPTION	PART No.
131	Condenser (.05 mfd., 200 V.)	30-4519
132	Crystal Cartridge (Pick-up)	35-2030
133	Resistor (51,000 ohms)	33-351339
134	Resistor (51,000 ohms)	33-351339
135	Switch (Radio-Phono)	42-1053
136	Cable	

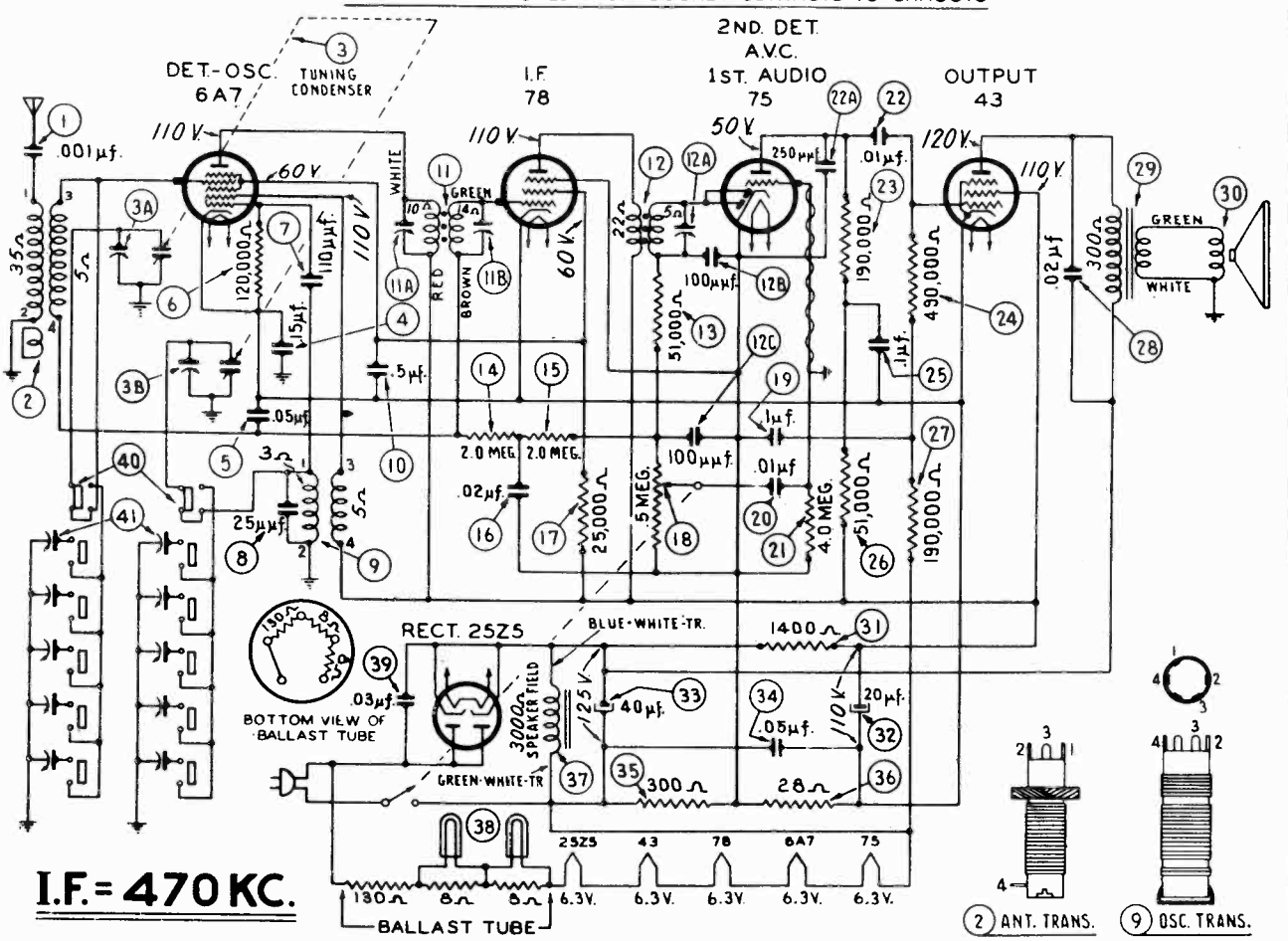
SCHE. No.	DESCRIPTION	PART No.
	MISCELLANEOUS PARTS	
	Automatic Record Changer (Complete)	35-1178
	Motor 110 volts, 60 cycles	35-1187
	Motor 110 volts, 50 cycles	35-1186
	Governor (motor)	35-1185

PHILCO RADIO & TELEV. CORP.

MODEL 39-117(121,122)
MODEL 39-118(121,122)
Schematics
Voltage



SCHEMATIC DIAGRAM MODEL 39-117
VOLTAGES MEASURED FROM SOCKET CONTACTS TO CHASSIS



SCHEMATIC DIAGRAM MODEL 39-118
VOLTAGES MEASURED FROM SOCKET CONTACTS TO B MINUS

MODEL 39-117(121,122)
MODEL 39-118(121,122)
Alignment

PHILCO RADIO & TELEV. CORP

MODEL 39-119(121,122
Alignment,Trimmers
Chassis,Parts

Alignment of Compensators

EQUIPMENT REQUIRED:

(1) Signal Generator: Philco Model 077 Signal Generator, which has a fundamental frequency range from 115 to 36,000 K.C., is the correct instrument for this purpose.

(2) Output Meter: Philco Model 027 Vacuum Tube voltmeter and Circuit Tester incorporates a sensitive output meter and is recommended.

(3) Philco Fiber Handle Screw Driver, Part No. 27-7059, and Fiber Wrench, Part No. 3164.

(4) Philco Set Transformer, Part No. 32-2763

OUTPUT METER:

Two indicating devices for aligning of the receiver can be used; either an audio output meter or a vacuum tube voltmeter. The method of connecting the audio output meter is given in the next paragraph. The procedure for connecting the vacuum tube voltmeter as an aligning indicator will be found on Page 5. Where greater accuracy of the various tuned circuits is desired, the vacuum tube voltmeter is recommended as an aligning device.

The Philco 027 Output Meter is connected to the plate and cathode terminals of the type 41 tube in Model 39-117 and 119 and type 43 tube in Model 39-118. Set the meter to use the 0-30 volt scale.

Procedure—Model 39-117

Operations in Order	SIGNAL GENERATOR: Output Connections to Receiver	SIGNAL GENERATOR: Dummy Antenna (Note A)	SIGNAL GENERATOR: Dial Setting	RECEIVER: Dial Setting	RECEIVER: Control Settings	RECEIVER: Adjust Compensators in Order	Special Instructions
1	6A7 Grid	.1 mf.	470 K.C.	580 K.C.	Vol. Cont. (Max.)	12A, 11A, 11B	Push "In" Manual Button
2	Ant. Ter.	200 mmf.	1550 K.C.	1550 K.C.	Vol. Cont. (Max.)	3B, 3A	See Note B

Procedure—Model 39-118

1	6A7 Grid	.1 mfd.	470 K.C.	580 K.C.	Vol. Cont. (Max.)	12A, 11A, 11B	See Note C
2	Ant. and Gnd.	200 mmf.	1550 K.C.	1550 K.C.	Vol. Cont. (Max.)	3B, 3A	See Note B See Note D

Procedure—Model 39-119

1	6A7 Grid	.1 mfd.	470 K.C.	580 K.C.	Vol. Max.	14A, 13B, 13A	
2	Ant. and Gnd.	200 mmf.	18 M.C.	18 M.C.	Vol. Max.	4B	Note B
3	Ant. and Gnd.	200 mmf.	1550 K.C.	1550 K.C.	Vol. Max.	8, 4A	
4	Ant. and Gnd.	200 mmf.	580 K.C.	580 K.C.	Vol. Max.	8A	Roll Tuning Condenser
5	Ant. and Gnd.	200 mmf.	1550 K.C.	1550 K.C.	Vol. Max.	8, 4A	

A—The "Dummy Antenna" consists of a condenser or resistance connected in series with the signal generator output lead (high side). Use the capacity or resistance as specified in each step of the above procedure.

B—Dial Calibration: In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser. To do this, proceed as follows: Turn the tuning condenser to the maximum capacity position (plates fully meshed). With the condenser in this position, the tuning pointer is set on the first index line at the low frequency end of the scale (540 K.C.).

* Several speakers on these models have the same part number with the exception of a -1, -2, etc., following the part number. These speakers are interchangeable. The cone assembly, however, cannot be interchanged. When ordering cones, be sure to order correct cone part number as indicated in each parts list.

C—Insert the signal generator output lead into the "Med" jack and the ground lead into the "Gnd" jack of the signal generator. Connect the other end of the output lead to terminal No. 1 on the Set Transformer Part No. 32-2763, and the cable ground to terminal No. 2. Nos. 3 and 4 terminals of Set Transformer are then connected to the chassis and 6A7 grid respectively of the receiver with short pieces of wire. Insert the 0.1 mf. in series with the No. 4 lead which connects to the grid.

D—Insert the signal generator output lead into the "Med" jack and the ground lead into the "Gnd" jack of the signal generator. Connect the other end of the output lead to terminal No. 1 of the Set Transformer, Part No. 32-2763, and the cable ground to terminal No. 2. Nos. 3 and 4 terminals of Set Transformer are then connected to the chassis and antenna lead respectively of the receiver with short pieces of wire. Insert the 100 mmf. in series with the No. 4 lead which connects to the antenna lead.

MODEL 39-119, CODE 121-122

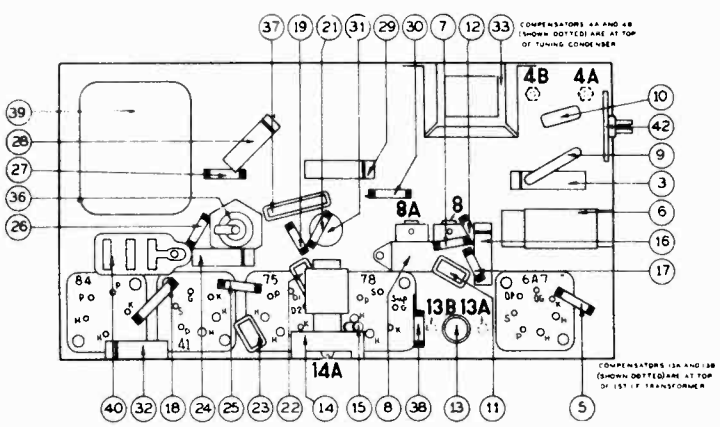


Fig. 3—Part Locations, Model 39-119

Description	Part No.
Bezel Assembly (Dial)	40-6364
Bezel Gasket (Dial)	27-9174
Bezel (Push Button)	56-1364
Bezel Gasket (Push Button)	27-9218
Bezel Clamp (Push Button)	28-5153
Cable & Plug (Power Supply)	L-2778
Dial	27-5480
Dial Tuning Drum Assy.	31-2281
Drive Cord Assy. (Pointer operation)	31-2275
Drive Cord Assy. (Tuning Cond.)	31-2343
Clip (Mtg. Ant. Coils)	28-5002
Clip (Mtg. Osc. Coil)	28-5003
Escutcheon Plate (extension shafts F cabinet)	56-1051
Escutcheon Pin	W-950
Knobs (Volume & Tuning)	27-4753
Knob (Wave Switch)	27-4754
Pilot Lamp Socket Assembly	38-9612
Pointer (Dial)	28-5934
Push Button	27-4814
Screws (Bezel Mtg.)	W-1834 PGA
Shaft Extensions (Volume, Tuning and Wave Switch)	38-9610
Spring (Tuning Cond. Cord)	28-8751
Spring (Pointer Cord)	28-8946
Speaker (T cabinet, code 121—optional)	†36-1426-3 *36-1426-1
Speaker (F cabinet—code 122)	*36-1449-3
Spring, Retaining (Volume Shaft)	28-8915
Socket (5 prong, Rect. tube)	27-6035
Socket (6 prong, type 78, 75 and 41 tubes)	27-6036
Socket (7 prong, type 6A7 tube)	27-6107
Tab (Manual)	27-5486
Tab Kit	40-6391

† Replace speaker

MODEL 39-117(121,122)

PHILCO RADIO & TELEV. CORP. MODEL 39-118(121,122)

Chassis, Trimmers

Parts

Model 39-117, Codes 121-122

TYPE OF CIRCUIT: A.C. operated; superheterodyne circuit, covering standard broadcast and police stations (540 K.C. to 1720 K.C.). In addition other features of design are: Electric Push-Button Tuning; Automatic Volume Control; and pentode audio output.

Codes 121 and 122 chassis of this model are similar with the exception of Speaker and Cabinet.

This receiver is designed to operate from a "Philco Utility Aerial," Part No. 45-2450. This aerial system should be used to obtain maximum performance from the receiver.

POWER SUPPLY: Voltage—115 volts. Frequency—50-60 cycles. Power Consumption—40 watts.

INTERMEDIATE FREQUENCY: 470 K.C.

TUNING RANGE: 540 to 1720 K.C.

AUDIO OUTPUT: 2 watts.

PHILCO TUBES USED: Five tubes: 1-6A7, 1st detector and oscillator; 1-78, I.F.; 1-75, 2nd detector, Automatic Volume Control, and 1st audio; 1-41, Output; and 1-84, Rectifier.

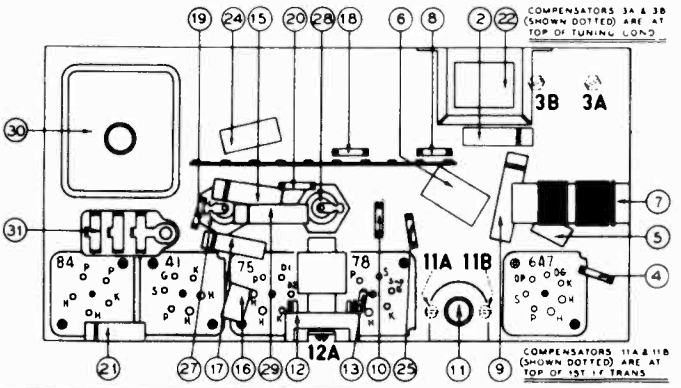
TUNING MECHANISM: Pulley and cable drive for Manual tuning. Six Electric Push-Buttons for Automatic Tuning. Five push-buttons are used for stations and one for manual tuning. The procedure for adjusting and operating the Electric Push-Buttons will be found in the instructions supplied with each set.

CABINETS: Code 121 chassis in type "T" cabinet
Code 122 chassis in type "F" cabinet.

Schem. No.	Description	Part No.
1	Ant. Trans.	32-3039
2	Tubular Cond. (.05 mfd.)	30-4519
3	Tuning Cond. Assy.	31-2362
4	Resistor (51,000 ohms, 1 watt)	33-351439
5	Mica Cond. (110 mmfd.)	30-1031
6	Silver Mica Cond. (25 mmfd.)	30-1112
7	Osc. Trans.	32-3040
8	Resistor (3.0 meg., 1 watt)	33-530439
9	Tubular Cond. (.03 mfd.)	30-4449
10	Resistor (40,000 ohms, 1 watt)	33-340439
11	1st I. F. Trans. Assy.	32-3075
12	2nd I. F. Trans. Assy.	32-2944
13	Resistor (51,000 ohms, 1 watt)	33-351439
14	Volume Control & On-Off switch.	33-5276
15	Tubular Cond. (.01 mfd.)	30-4479
16	Mica Cond. (250 mmfd.)	30-1032
17	Tubular Cond. (.01 mfd.)	30-4572
18	Resistor (160,000 ohms, 1 watt)	33-416439
19	Resistor (1.0 meg., 1 watt)	33-510439
20	Resistor (4.0 meg., 1 watt)	33-540439
21	Tubular Cond. (.01 mfd.)	30-4572
22	Output Trans.	32-7980
23	Cone & Voice Coil Assy. For Speaker (Pt No. 36-1426-1)	36-4083
	(Pt. No. 36-1426-3)	36-4085
	Cone & Voice Coil Assy. for Speaker (Pt. No. 36-1440-3)	36-4086
24	Resistor (250 ohms wirewound)	33-125431
25	Resistor (70 ohms, 1 watt)	33-070439
26	†Field Coil for Speaker (Pt. No. 36-1426)	
	†Field Coil for Speaker (Pt. No. 36-1440)	
27	Electro. Cond. (12 mfd.)	30-2319
28	Electro. Cond. (4 mfd.)	30-2236
29	Tubular Cond. (.02 mfd.)	30-4215
30	Power Trans. (115 volts, 50-60 cycles)	32-7974
31	Bakelite Cond. (.01 mfd.—.01 mfd.)	3903 DG
32	Pilot Lamps	34-2064
33	Push button switch	42-1484
34	Padder strip	31-6292

Bezel Assy. (Dial)		40-6364
Bezel Gasket (Dial)		27-9174
Bezel (Push buttons)		56-1364
Bezel Gasket (push buttons)		27-9218
Bezel Clamp (Dial)		28-5153
Cable & Plug (Power Supply)		L-2778
Dial		27-5406
Dial Tuning Drum Assy.		31-2281
Drive Cord Assy. (Pointer)		31-2275
Drive Cord Assy. (Tuning cond.)		31-2243
Clip (Mtg. Ant. Coil)		28-5002
Clip (Mtg. Osc. Coil)		28-5003
Escutcheon Plate (extension shafts F Cabinet)		56-1051
Escutcheon Pin		W-950
Knobs (Volume & Tuning)		27-4753
Pilot Lamp Socket Assy.		38-9612
Pointer (Dial)		28-5934
Push buttons (6 used)		27-4814
Screws (bezel mtg.)		W-1834 FGA
Shaft Extensions (2 used) F cabinet only		38-9640
Spring (retaining, volume and tuning) F cabinet only		28-8915
Spring (Tuning cond. cord)		28-8751
Spring (Pointer Cord)		28-8946
Socket (5 prong, Rect. tube)		27-6035
Socket (6 prong, type 78, 75 & 41 tubes)		27-6036
Socket (7 prong, type 6A7 tube)		27-6107
*Speaker (F cabinet)		*36-1440
*Speaker (T cabinet)	*Optional	36-1426-1 / 36-1426-3
Tab Kit		40-6391

* Replace speaker.



Model 39-118, Codes 121-122

TYPE OF CIRCUIT: A.C. D.C. operated; superheterodyne circuit, covering standard broadcast and police stations (540 K.C. to 1720 K.C.). In addition other features of design are: Electric Push-Button Tuning; Automatic Volume Control; and pentode audio output.

Codes 121 and 122 chassis of this model are similar with the exception of Speaker and Cabinet.

The receiver is designed to operate from a "Philco Utility Aerial," Part No. 45-2450. This aerial system should be used to obtain maximum performance from the receiver.

POWER SUPPLY: Voltage—115 volts. A.C. or D.C. Power Consumption—55 watts.

INTERMEDIATE FREQUENCY: 470 K.C.

TUNING RANGE: 540 to 1720 K.C.

PHILCO TUBES USED: 1-6A7, 1st detector and oscillator; 1-78, I.F.; 1-75, 2nd detector, Automatic Volume Control and 1st audio; 1-43, Output; 1-25Z5, Rectifier; and 1-BKV51DJ, ballast tube.

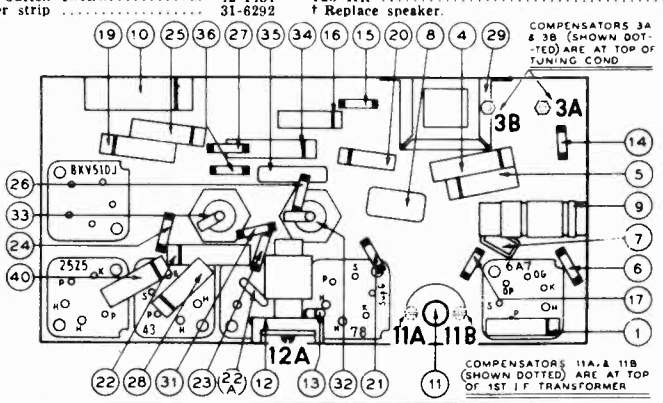
TUNING MECHANISM: Pulley and cable drive for Manual tuning. Six Electric Push-Buttons for Automatic Tuning. Five push-buttons are used for stations and one for manual tuning. The procedure for adjusting and operating the Electric Push-Buttons will be found in the instructions supplied with each set.

CABINETS: Code 121 chassis in type "T" cabinet.
Code 122 chassis in type "F" cabinet.

Schem. No.	Description	Part No.
1	Tubular Cond. (.001 mfd.)	30-4453
2	Ant. Trans.	32-3039
3	Tuning cond. Assy.	31-2362
4	Tubular Cond. (.15 mfd.)	30-4505
5	Tubular Cond. (.05 mfd.)	30-4519
6	Resistor (120,000 ohms, 1 watt)	33-412439
7	Mica Cond. (110 mmfd.)	30-1031
8	Silver Mica Cond. (25 mmfd.)	30-1112
9	Osc. Trans.	32-3040
10	Tubular Cond. (.5 mfd.)	30-4551
11	1st I. F. Trans. Assy.	32-3075
12	2nd I. F. Trans. Assy.	32-2944
13	Resistor (51,000 ohms, 1 watt)	33-351439
14	Resistor (2.0 megohms, 1 watt)	33-520439
15	Resistor (2.0 megohms, 1 watt)	33-520439
16	Tubular Cond. (.02 mfd.)	30-4215
17	Resistor (25,000 ohms, 1 watt)	33-325439
18	Volume Control & On-Off Switch	33-5276
19	Tubular Cond. (.1 mfd.)	30-4499
20	Tubular Cond. (.01 mfd.)	30-4572
21	Resistor (4.0 megohms, 1 watt)	33-540439
22	Tubular Cond. (.01 mfd.)	30-4572
23	Resistor (190,000 ohms, 1 watt)	33-419439
24	Resistor (490,000 ohms, 1 watt)	33-449439
25	Tubular Cond. (.1 mfd.)	30-4499
26	Resistor (51,000 ohms, 1 watt)	33-351439
27	Resistor (190,000 ohms, 1 watt)	33-419439
28	Tubular Cond. (.02 mfd.)	30-4516
29	Output Trans.	32-7986
30	Cone & Voice Coil Assy. Speaker Part No. 36-1444-1.	*36-4083
	Speaker Part No. 36-1444-3.	*36-4085
	Cone & Voice Coil Assy. Speaker Part No. 36-1445	*36-4086
31	Resistor (1400 ohms, 1 watt)	33-214439
32	Electro. Cond. (20 mfd.)	30-2245
33	Electro. Cond. (40 mfd.)	30-2332
34	Tubular Cond. (.05 mfd.)	30-4444
35	Resistor (300 ohms) (wirewound)	33-130431
36	Resistor (28 ohms, 1 watt)	33-028439
37	†Field Coil for Speaker, Part No. 36-1444	
	†Field Coil for Speaker, Part No. 36-1445	
38	Pilot Lamps	34-2068
39	Tubular Cond. (.03 mfd.)	30-4449
40	Push button switch	42-1484
41	Padder strip	31-6292

Bezel Assy. (Dial)		40-6364
Bezel Gasket (Dial)		27-9174
Bezel (Push Buttons)		56-1364
Bezel Gasket (Push Buttons)		27-9218
Bezel Clamp (Dial)		28-5153
Cable & Plug (Power Supply)		L-2778
Dial		27-5406
Dial Tuning Drum Assy.		31-2281
Drive Cord Assy. (Pointer)		31-2275
Drive Cord Assy. (Tuning Cond.)		31-2343
Clip (Mtg. Ant. Coil)		28-5002
Clip (Mtg. Osc. Coil)		28-5003
Escutcheon Plate (extension shafts F cabinet)		56-1051
Escutcheon Pin		W-950
Knobs (Volume & Tuning)		27-4753
Pilot Lamp Socket Assy.		38-9649
Pointer		28-5934
Push Buttons (6 used)		27-4814
Screws (Bezel Mtg.)		W-1834 FGA
Shaft Extensions (2 used F cabinet only)		38-9640
Spring (retaining) Volume & Tuning F Cabinet only		28-8915
Spring (Tuning Cond. Cord)		28-8751
Spring (Pointer Cord)		28-8946
Socket (5 prong, Ballast tube)		27-6035
Socket (6 prong, type 25Z5, 43, 75 & 78 tubes)		27-6036
Socket (7 prong, type 6A7 Tube)		27-6107
*Speaker (F cabinet)		36-1445
*Speaker (T cabinet, optional)		36-1444-1 / 36-1444-3
Tab Kit		40-6391

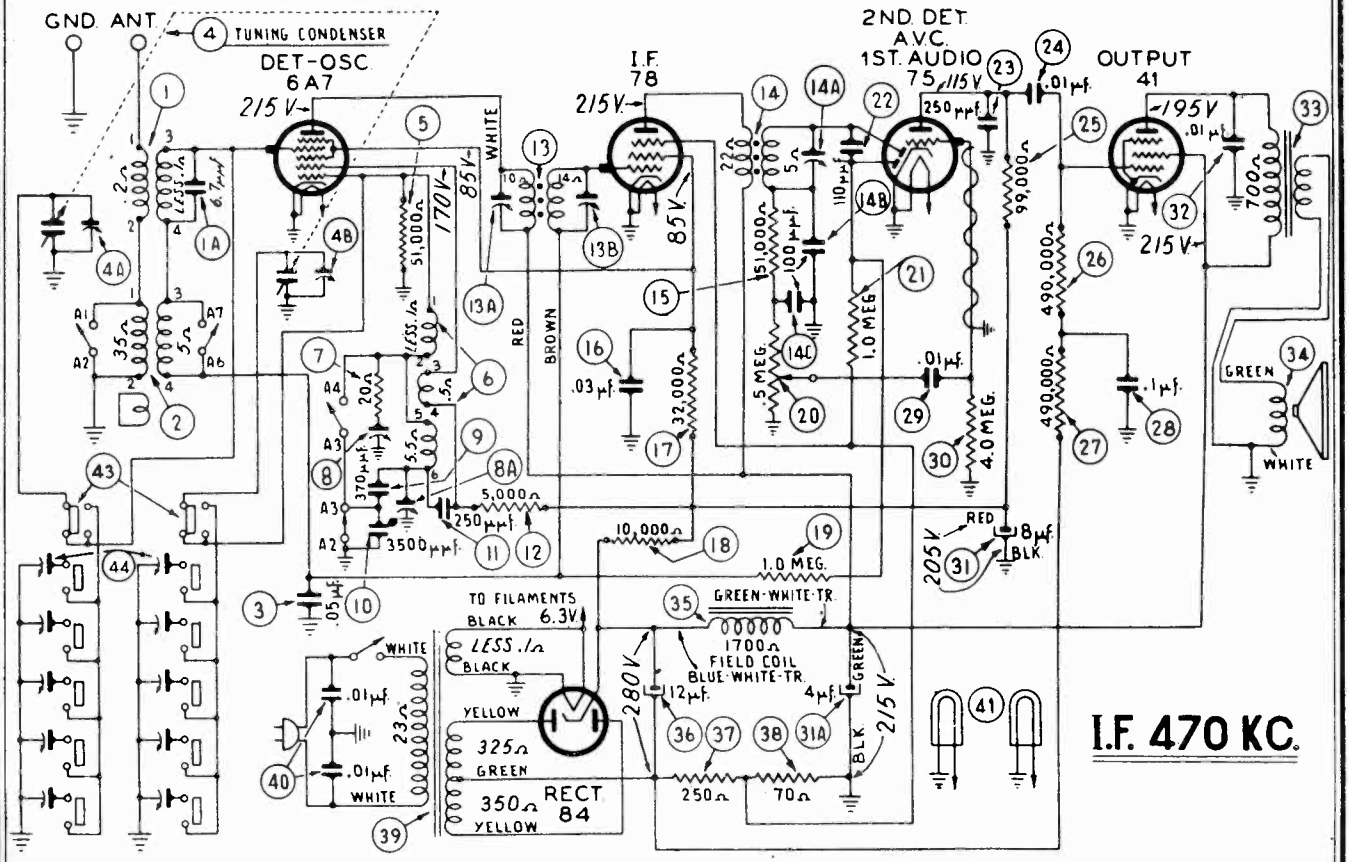
† Replace speaker.



MODEL 39-119(121,122)
Schematic, Voltage
Notes

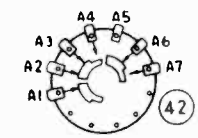
PHILCO RADIO & TELEV. CORP.

MODEL 39-119EZ
Changes(121,122)



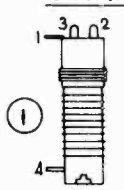
SCHEMATIC DIAGRAM MODEL 39-119
VOLTAGES MEASURED FROM SOCKET CONTACTS TO CHASSIS

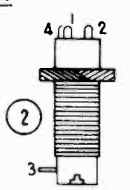
I.F. 470 KC.

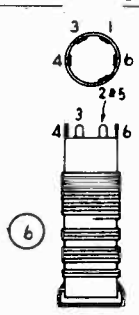


SWITCH SHOWN FROM REAR OF CHASSIS, BOTTOM VIEW IN BROADCAST POSITION.

DIRECTION OF ROTATION FROM REAR OF CHASSIS







PRODUCTION CHANGES
MODEL 39-119EZ, CODE 121-122

(39) Power Trans. 110/220 V., 60 cycle 32-8005

TYPE OF CIRCUIT: A.C. operated; superheterodyne circuit with two tuning ranges, covering standard broadcast (540 K.C. to 1720 K.C.) and short wave (5.5 M.C. to 18.0 M.C.) frequencies. In addition other features of design are: Electric Push-Button Tuning; Automatic Volume Control; and pentode output.

Codes 121 and 122 chassis of this model are similar with the exception of Speaker and Cabinet.

The receiver is designed to operate from a "Philco Utility Aerial," Part No. 45-2460. This aerial system should be used to obtain maximum performance from the receiver.

POWER SUPPLY: Voltage—115 volts. Frequency—50-60 cycles. Power Consumption—40 watts.

INTERMEDIATE FREQUENCY: 470 K.C.

TUNING RANGES: 540 K.C. to 1720 K.C.; 5.5 M.C. to 18.0 M.C.

AUDIO OUTPUT: 2 watts.

PHILCO TUBES USED: Five tubes: 1-6A7, 1st detector and oscillator; 1-78, I.F.; 1-75, 2nd detector, Automatic Volume Control, and 1st audio; 1-41, Output; and 1-84, Rectifier.

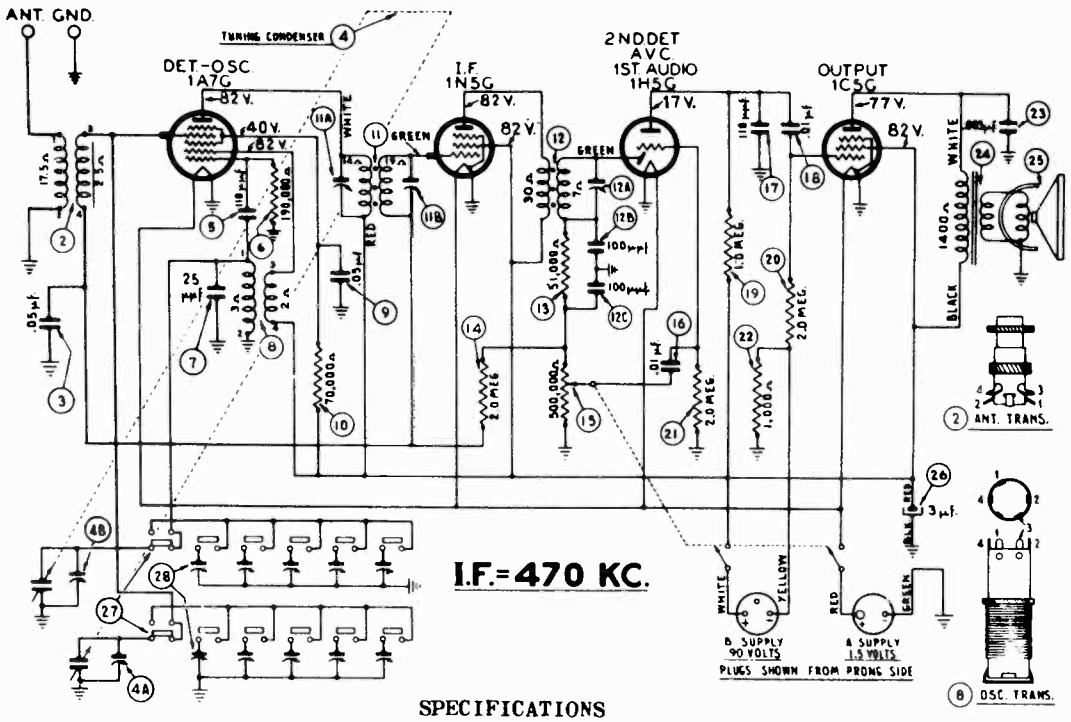
TUNING MECHANISM: Pulley and cable drive for Manual Tuning. Six push-buttons for Automatic Tuning. Five push-buttons are used for stations and one for manual tuning. The procedure for adjusting and operating the Electric Tuning Push-Buttons will be found in the instructions supplied with each set.

CABINETS: Code 121 chassis in type "T" cabinet. Code 122 chassis in type "F" cabinet.

Schem. No.	Description	Part No.
1	Ant. Trans. (Short Wave)	32-3162
1A	Mica Cond. (5 mmfd.)	30-1097
2	Ant. Trans. (Broadcast)	32-3161
3	Tubular Cond. (.05 mfd.)	30-4519
4	Tuning Cond. Assy.	31-2363
5	Resistor (51,000 ohms, 1 watt)	33-351439
6	Oscillator Trans.	32-3163
7	Resistor (20 ohms, 1 watt)	33-020439
8	Compensator (2 section)	31-6257
9	Silver Mica Cond. (370 mmfd.)	30-1110
10	Mica Cond. (3500 mmfd.)	30-1094
11	Mica Cond. (250 mmfd.)	30-1032
12	Resistor (5000 ohms, 1 watt)	33-250439
13	1st I. F. Trans. Assy.	32-3075
14	2nd I. F. Trans Assy.	32-2944
15	Resistor (51,000 ohms, 1 watt)	33-351439
16	Tubular Cond. (.03 mfd.)	30-4449
17	Resistor (32,000 ohms, 1 watt)	33-332439
18	Resistor (10,000 ohms, 1 watt)	33-310439
19	Resistor (1.0 meg., 1 watt)	33-510439
20	Volume Control and On-Off Switch	33-5276
21	Resistor (1.0 meg., 1 watt)	33-510439
22	Mica Cond. (110 mmfd.)	30-1031
23	Mica Cond. (250 mmfd.)	30-1032
24	Tubular Cond. (.01 mfd.)	30-4572
25	Resistor (99,000 ohms, 1 watt)	33-399439
26	Resistor (490,000 ohms, 1 watt)	33-449439
27	Resistor (490,000 ohms, 1 watt)	33-449439
28	Tubular Cond. (.1 mfd.)	30-4499
29	Tubular Cond. (.01 mfd.)	30-4479
30	Resistor (4.0 meg., 1 watt)	33-540439
31	Electrolytic Cond. (4-8 mfd.)	30-2323
32	Tubular Cond. (.01 mfd.)	30-4572
33	Output Trans.	32-7980
*34	Cone & Voice Coil Assy. Speaker Part No. 36-1426-1	*36-4083
	Speaker Part No. 36-1426-3	*36-4085
	Cone & Voice Coil Assy. Speaker Part No. 36-1449	*36-4086
35	†Field Coil (Speaker Part No. 36-1426) †Field Coil (Speaker Part No. 36-1449)	
36	Electrolytic Cond. (8 mfd.)	30-2319
37	Resistor (250 ohms, wirewound)	33-125431
38	Resistor (70 ohms, 1 watt)	33-070439
39	Power Trans. (115 volts, 50-60 cycles)	32-7974
40	Bakelite Cond. (.01—.01 mfd.)	3903 DG
41	Pilot Lamps	34-2064
42	Wave Switch	42-1449
43	Push Button Switch	42-1484
44	Padder Strip	31-6292

MODEL 39-175(121,122)

PHILCO RADIO & TELEV CORP Schematic, Voltage



SPECIFICATIONS

RANGE: 530 to 1720 K.C.

Model 39-175 is a 4 tube battery operated superheterodyne receiver covering standard broadcast and state police stations. The receiver is equipped with electric push-button tuning in addition to manual tuning, low current battery tubes and extremely sensitive speaker.

The electric push-button tuning contains 6 push buttons for selecting any of 5 stations in the standard broadcast band and one button for dial tuning. The procedure for adjusting and operating the push-buttons will be found in the instructions on page 3.

Code 121 is assembled in a type T cabinet and has the speaker mounted on the chassis. Code 122 is assembled in a console cabinet with the speaker detached from the chassis.

Alignment of the R.F. and I.F. compensating condensers of this model is the same as that given for the model 39-75 code 121 and 122.

2	Antenna Transformer	32-3169
3	Tubular Condenser (.05 mfd.)	30-4519
4	Tuning Condenser Assembly	31-2362
5	Condenser (110 mmfd., mica)	30-1031
6	Resistor (190,000 ohms, 1 watt)	33-419439
7	Condenser (25 mmfd., silver plated mica)	30-1112
8	Oscillator Transformer	32-3083
9	Tubular Cond. (.05 mfd.)	30-4444
10	Resistor (70,000 ohms, 1 watt)	33-370439
11	1st I.F. Transformer Assembly	32-3078
12	2nd I.F. Transformer Assembly)	32-3081
13	Resistor (51,000 ohms, 1 watt)	33-351439
14	Resistor (2.0 megohms, 1 watt)	33-520439
15	Volume Control	33-5291
16	Tubular Condenser (.01 mfd.)	30-4572
17	Condenser (110 mmfd., mica)	30-1031
18	Tubular Condenser (.01 mfd.)	30-4572
19	Resistor (1.0 megohm, 1 watt)	33-510439
20	Resistor (2.0 megohms, 1 watt)	33-520439
21	Resistor (2.0 megohms, 1 watt)	33-520439
22	Resistor (1000 ohms, 1 watt)	33-210439
23	Tubular Condenser (.003 mfd.)	30-4469
24	Output Transformer	32-7995
25	Cone & Voice Coil Assemblies	
	Speaker Part No. 36-1442-3	36-4090
	Speaker Part No. 36-1447-3	36-4092
26	Electrolytic Condenser (3 mfd.)	30-2346
27	Push-Button Switch	42-1484
28	Padder Strip	31-6292

INTERMEDIATE FREQUENCY: 470 K.C.

PHILCO TUBES: One 1A7G, First Detector and Oscillator; one 1N5G, I.F. Amplifier: one 1H5G, Second Detector; First Audio and Automatic Volume Control, and one 1C5G Pentode Output.

BATTERIES REQUIRED: One (1) Philco "A" Pack, Part No. 41-8014; one (1) Philco "B" Pack, Part No. 41-8015.

BATTERY DRAIN:
"A"- (250 M.A.) "B"- (8½ M.A.)

AERIAL AND GROUND: In order to obtain the highest amount of sensitivity from these receivers the Philco Farm Radio Aerial, Part No. 40-6383, should be used. This aerial is accurately designed to match the tuned antenna circuit in the receiver so that maximum performance will be obtained.

A good ground connection to the nearest water pipe or any other good ground source is also required.

Spring (On-Off Indicator)	28-8927
Snap Fastener (On-Off Indicator)	28-4342
Speaker (T Cabinet)	36-1442
(F Cabinet)	36-1447
Socket (6 prong)	27-6086
Socket (7 prong)	27-6099
Socket (Speaker)	27-6115
Wire Link (On-Off Indicator)	28-8922
Tab (Manual)	27-5487
Tab Kit	40-6408
Shaft Extension (Tuning, Volume)	38-9640
Spring (Shaft Retaining)	28-8915
Bezel (Push button)	56-1364
Bezel Assembly (Dial)	40-6364
Bezel Gasket (Dial)	27-9174
Bezel Gasket (Push Button)	27-9218
Cable Battery	41-3429
Dial	27-5420
Drive Drum Assembly	31-2281
Drive Pulley	28-6662
Drive Cord (Pointer)	31-2275
Drive Cord (Cord Drive)	31-2343
Knob (Push Button)	27-4814
Knob (Tuning, Volume)	27-4753
Pointer	28-5934
Shaft (Tuning)	56-6032
Spring (Drive Cord Tuning Condenser)	28-8751
Spring (Drive Cord Pointer)	28-8946

MODEL 39-711(121)
MODEL 39-751(121)

PHILCO RADIO & TELEV. CORP.

Chassis, Trimmers Parts

Replacement Parts Model 39-711

Schem. No.	Description	Part No.
1	Tubular Cond. (.001 mfd., 1000 V.)	30-4601
2	Tubular Cond. (.01 mfd., 400 V.)	30-4572
3	Tubular Cond. (.25 mfd., 400 V.)	30-4589
4	Ant. Trans. (B.C. & Police)	32-3141
5	Ant. Trans. (S.W.)	32-3143
6	Compensator (2 section)	31-6287
7	Tubular Cond. (.1 mfd., 200 V.)	30-4586
8	Tubular Cond. (.25 mfd., 400 V.)	30-4589
9	Resistor (51,000 ohms, 1 watt)	33-351439
10	Resistor (120,000 ohms, 1 watt)	33-412439
11	Tuning Cond.	31-2357
12	Osc. Trans. (B.C. & Police)	32-3142
13	Osc. Trans. (S.W.)	32-3144
14	Compensator (2 section)	31-6287
15	Compensator	31-6289
16	Mica Cond. (1850 mmfd.)	5877
17	Mica Cond. (3500 mmfd.)	30-1094
18	Resistor (3300 ohms, 1 watt)	33-233439
19	Mica Cond. (250 mmfd.)	30-1119
20	Resistor (5000 ohms, 1 watt)	33-250439
21	1st I.F. Trans. Assy.	32-3139
22	2nd I.F. Trans. Assy.	32-3140
23	Tubular Cond. (.1 mfd., 200 V.)	30-4586
24	Tubular Cond. (.01 mfd., 600 V.)	30-4581
25	Resistor (20,000 ohms, 1 watt)	33-320439
26	Resistor (2.0 meg., 1 watt)	33-520439
27	Tubular Cond. (.05 mfd., 200 V.)	30-4519
28	Volume Control (.5 meg.)	33-5305
29	Tubular Cond. (.001 mfd., 200 V.)	30-4592
30	Resistor (10.0 meg., 1 watt)	33-610439
31	Resistor (99,000 ohms, 1 watt)	33-399439
32	Resistor (330,000 ohms, 1 watt)	33-433439
33	Mica Cond. (250 mmfd.)	30-1119
34	Tubular Cond. (.02 mfd., 200 V.)	30-4584
35	Resistor (330,000 ohms, 1 watt)	33-433439
36	Resistor (150 ohms, 1 watt)	33-115439

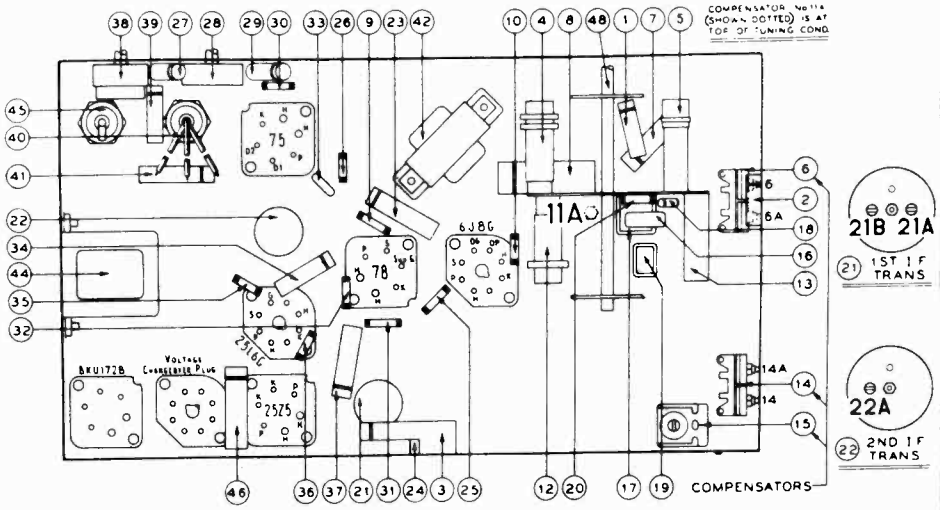


Fig. 3—Part Locations, Model 39-711, Underside of Chassis

Schem. No.	Description	Part No.
37	Tubular Cond. (.1 mfd., 200 V.)	30-4586
38	Tone Control Switch	42-1481
39	Tubular Cond. (.05 mfd., 400 V.)	40-4518
40	Electrolytic Cond. (6 mfd., 25 V.) (20 mfd., 150 V.)	30-2380 30-2380
41	Tubular Cond. (.015 mfd., 400 V.)	30-4515
42	Output Trans.	32-8033
43	Cone & Voice Coil Assy.	36-4110
44	Filter Choke	32-8029
45	Electrolytic Cond. (20 mfd., 150 V.)	30-2245
46	Tubular Cond. (.05 mfd., 600 V.)	30-4602
47	Pilot Lamp	34-2068
48	Wave Switch	42-1480

Miscellaneous Parts

Description	Part No.
Cord (Wave Band Indicator)	27-9294
Cord (Pointer Operation)	31-2359
Dial	27-5469
Indicator (Wave Band)	56-1269
Knobs (4 used)	27-4332
Pointer (Dial)	56-1276
Socket (Pilot Lamp)	38-9127
Socket (6 prong, type 25Z5 & Ballast tube)	27-6036
Socket (6 prong, type 78 & 75 tubes)	27-6123
Socket (8 prong, type 6J8G & 25L6G tubes)	27-6120
Socket (8 prong, voltage changeover plug)	27-6127
Spring (Tuning Indicator Cord)	28-8913
Spring (Wave Band Indicator Mounting)	28-8943
Spring (Wave Band Indicator Cord)	28-8945

Replacement Parts Model 39-751

Schem. No.	Description	Part No.
1	Tubular Cond. (.25 mfd.)	30-4589
2	Tubular Cond. (.01 mfd.)	30-4572
3	Ant. Trans. (B.C.)	32-2588
4	Ant. Trans. (S.W. 1)	32-3093
5	Ant. Trans. (S.W. 2)	32-2885
6	Compensator	31-6288
7	Tubular Cond. (.01 mfd.)	30-4572
8	Tubular Cond. (.15 mfd.)	30-4600
9	Tubular Cond. (.05 mfd.)	30-4519
10	Tubular Cond. (.05 mfd.)	30-4519
11	Resistor (100 ohms, 1 watt)	33-110439
12	Tubular Cond. (.1 mfd.)	30-4586
13	Tubular Cond. (.1 mfd.)	30-4586
14	Resistor (1.5 megohm)	33-515439
15	R.F. Trans. (Brdcst.)	32-2379
16	R.F. Trans. (S.W. 1)	32-3099
17	R.F. Trans. (S.W. 2)	32-3165
18	Mica Cond. (5 mmfd.)	30-1120
19	Compensator	31-6288
20	Tubular Cond. (.05 mfd.)	30-4519
21	Tubular Cond. (.05 mfd.)	30-4519
22	Resistor (51,000 ohms, 1 watt)	33-351439
23	Resistor (100 ohms, 1 watt)	33-110439
24	Resistor (32,000 ohms, 1 watt)	33-332439
25	Mica Cond. (250 mmfd.)	30-1119
26	Tuning Cond.	31-2325
27	Osc. Trans. (Brdcst.)	32-2180
28	Osc. Trans. (S. W. 1)	32-3094
29	Osc. Trans. (S. W. 2)	32-3102
30	2 Section Compensator	31-6287
31	Compensator	31-6289
32	Semi-Fixed Condenser (1605 mmfd.)	31-6282
33	Compensator	31-6288
34	Semi-Fixed Condenser (3300 mmfd.)	31-6283
35	Mica Cond. (250 mmfd.)	30-1119
36	Resistor (5,000 ohms, 1 watt)	33-250439
37	Resistor (2,000 ohms, 1 watt)	33-220439
38	Tubular Cond. (.05 mfd.)	30-4519
39	Resistor (600 ohms, 1 watt)	33-160439
40	Tubular Cond. (.05 mfd.)	30-4519
41	Tubular Cond. (.001 mfd.)	30-4592
42	Resistor (20,000 ohms, 1 watt)	33-320439
43	1st I.F. Trans. Assy.	32-3116
44	2nd I.F. Trans. Assy.	32-3133
45	Resistor (10,000 ohms, 1 watt)	33-310439
46	Mica Cond. (250 mmfd.)	30-1119
47	Tubular Cond. (.1 mfd.)	30-4586
48	Resistor (120,000 ohms, 1 watt)	33-412439
49	Resistor (99,000 ohms, 1 watt)	33-399439
50	Resistor (240,000 ohms, 1 watt)	33-424439
51	Resistor (120,000 ohms, 1 watt)	33-412439
52	Resistor (1.0 meg., 1 watt)	33-510439
53	Resistor (10.0 meg., 1 watt)	33-610439
54	Tubular Cond. (.006 mfd.)	30-4583
55	Tubular Cond. (.01 mfd.)	30-4581
56	Tone Control (4.0 meg.)	33-5299
57	Tubular Cond. (.02 mfd.)	30-4584
58	Mica Cond. (110 mmfd.)	30-1118
59	Volume Control	33-5304
60	Resistor (70,000 ohms, 1 watt)	33-370439
61	Tubular Cond. (.006 mfd.)	30-4583
62	Tubular Cond. (.25 mfd.)	30-4588
63	Resistor (32,000 ohms, 1 watt)	33-332439
64	Resistor (32,000 ohms, 1 watt)	33-332439
65	Resistor (25,000 ohms, 1 watt)	33-325439
66	Resistor (5,000 ohms, 1 watt)	33-250439
67	Tubular Cond. (.02 mfd.)	30-4584
68	Resistor (490,000 ohms, 1 watt)	33-449439
69	Tubular Cond. (.01 mfd.)	30-4581

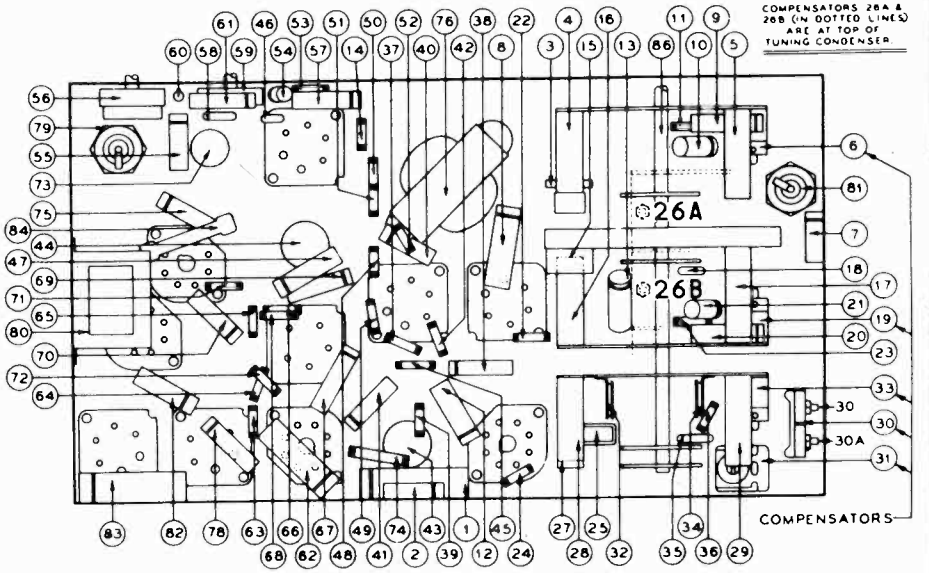


Fig. 4—Part Locations, Model 139-751, Underside of Chassis

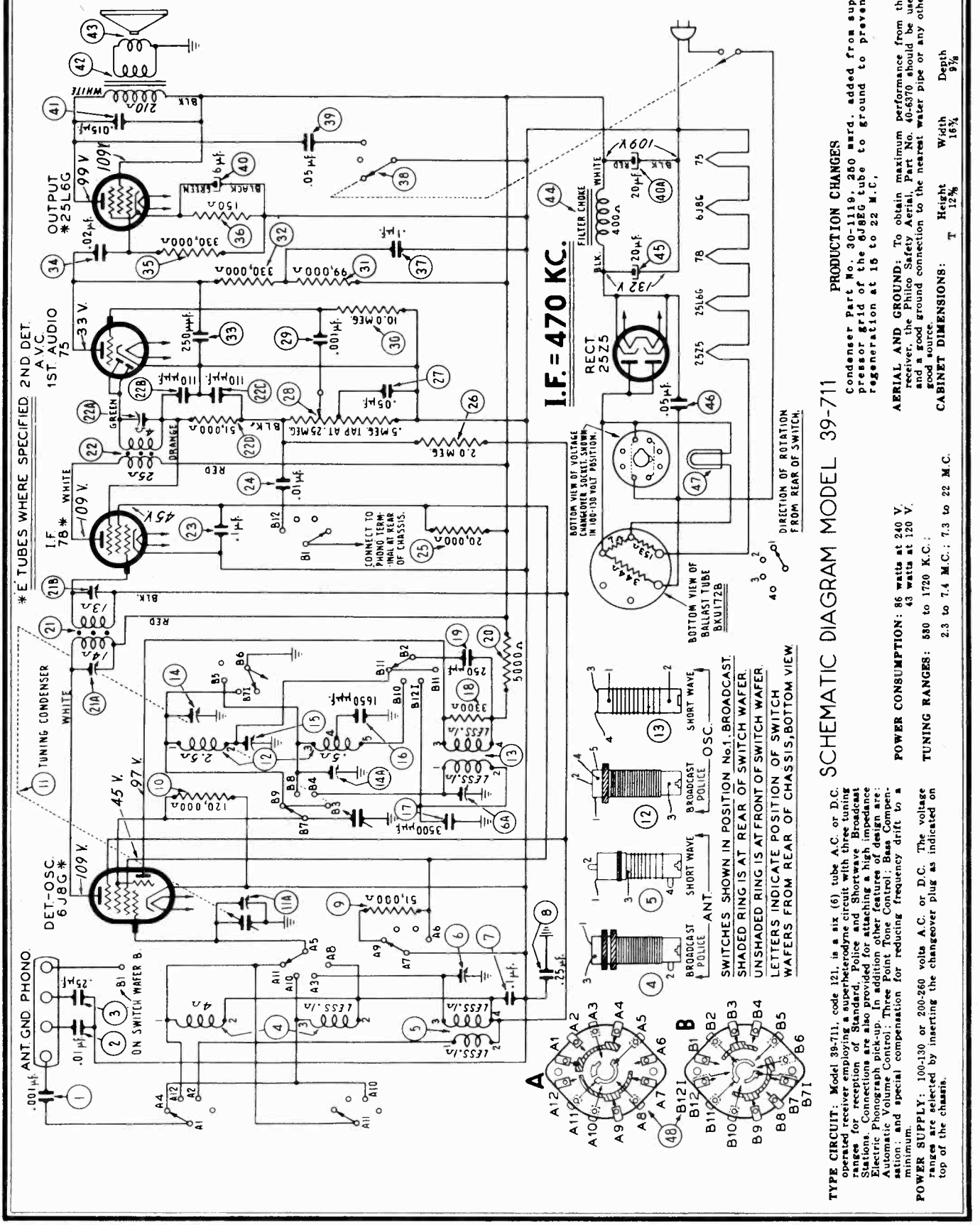
Schem. No.	Description	Part No.
70	Tubular Cond. (.02 mfd.)	30-4584
71	Resistor (240,000 ohms, 1 watt)	33-424439
72	Resistor (240,000 ohms, 1 watt)	33-424439
73	Electrolytic Cond. (16 mfd.) 300 V, 10 mfd., 25 V.	30-2372
74	Resistor (150 ohms, 1 watt)	33-115439
75	Tubular Cond. (.01 mfd.)	30-4581
76	Output Trans.	32-8028
77	Cone & Voice Coil Assy. (For Speaker 36-1456-3)	36-4108
	Cone & Voice Coil Assy. (For Speaker 36-1455-3)	36-4107
78	Tubular Cond. (.01 mfd.)	30-4581
79	Electrolytic Cond. (40 mfd. 300 V.)	30-2373
80	Filter Choke	32-8029
81	Electrolytic Cond. (20 mfd. 150 V.)	30-2245
82	Tubular Cond. (.02 mfd.)	30-4599
83	Tubular Cond. (.5 mfd.)	30-4590
84	Resistor (10,000 ohms, 3 watt)	33-3368
85	Pilot Lamps	34-2068
86	Wave Switch	42-1454

Miscellaneous Parts

Description	Part No.
Bezel (39-751T)	56-1246
Bezel (39-751NX)	56-1222
Cord (Wave Band Indicator)	27-9294
Cord (Pointer Operation)	31-2330
Cord (Tone Control Indicator)	31-2331
Dial	27-5438
Indicator (Wave Band & Tone Control)	56-1269
Knob (Tuning)	27-4330
Knob (Vernier)	27-4331
Knob (Tone Control & Vol. Cont.)	27-4332
Pointer (Dial)	56-1276
Screws (Bezels)	W-1834(FA9)
Socket (Pilot Lamps)	38-9418
Socket (5 prong, type 76 tube)	27-6124
Socket (6 prong, type 78 & 75 tubes)	27-6123
Socket (6 prong, type 25Z5 & Ballast Tubes)	27-6036
Socket (8 prong, type 6J8G & 25L6G tubes)	27-6120
Socket (8 prong, voltage changeover plug)	27-6127
Spring (Tuning Indicator Cord)	28-8913
Spring (Indicator Operation)	28-8931
Spring (Indicator Mounting)	28-8943
Vernier Drive	31-2329
Speaker	36-1456-3
Speaker	36-1455-3

PHILCO RADIO & TELEV. CORP.

MODEL 39-711(121)
Schematic, Voltage Changes



SCHEMATIC DIAGRAM MODEL 39-711

TYPE CIRCUIT: Model 39-711, code 121, is a six (6) tube A.C. or D.C. operated receiver employing a superheterodyne circuit with three tuning ranges for reception of Standard, Police and Shortwave Broadcast Stations. Connections are also provided for attaching a high impedance Electric Phonograph pick-up. In addition other features of design are: Automatic Volume Control; Three Point Tone Control; Bass Compensation; and special compensation for reducing frequency drift to a minimum.

POWER SUPPLY: 100-130 or 200-260 volts A.C. or D.C. The voltage ranges are selected by inserting the changeover plug as indicated on top of the chassis.

POWER CONSUMPTION: 86 watts at 240 V.
43 watts at 120 V.

TUNING RANGES: 530 to 1720 K.C.;
2.3 to 7.4 M.C.; 7.3 to 22 M.C.

PRODUCTION CHANGES

Condenser Part No. 30-1119, 250 mmfd. added from suppressor grid of the 6J8EG tube to ground to prevent regeneration at 15 to 22 M.C.

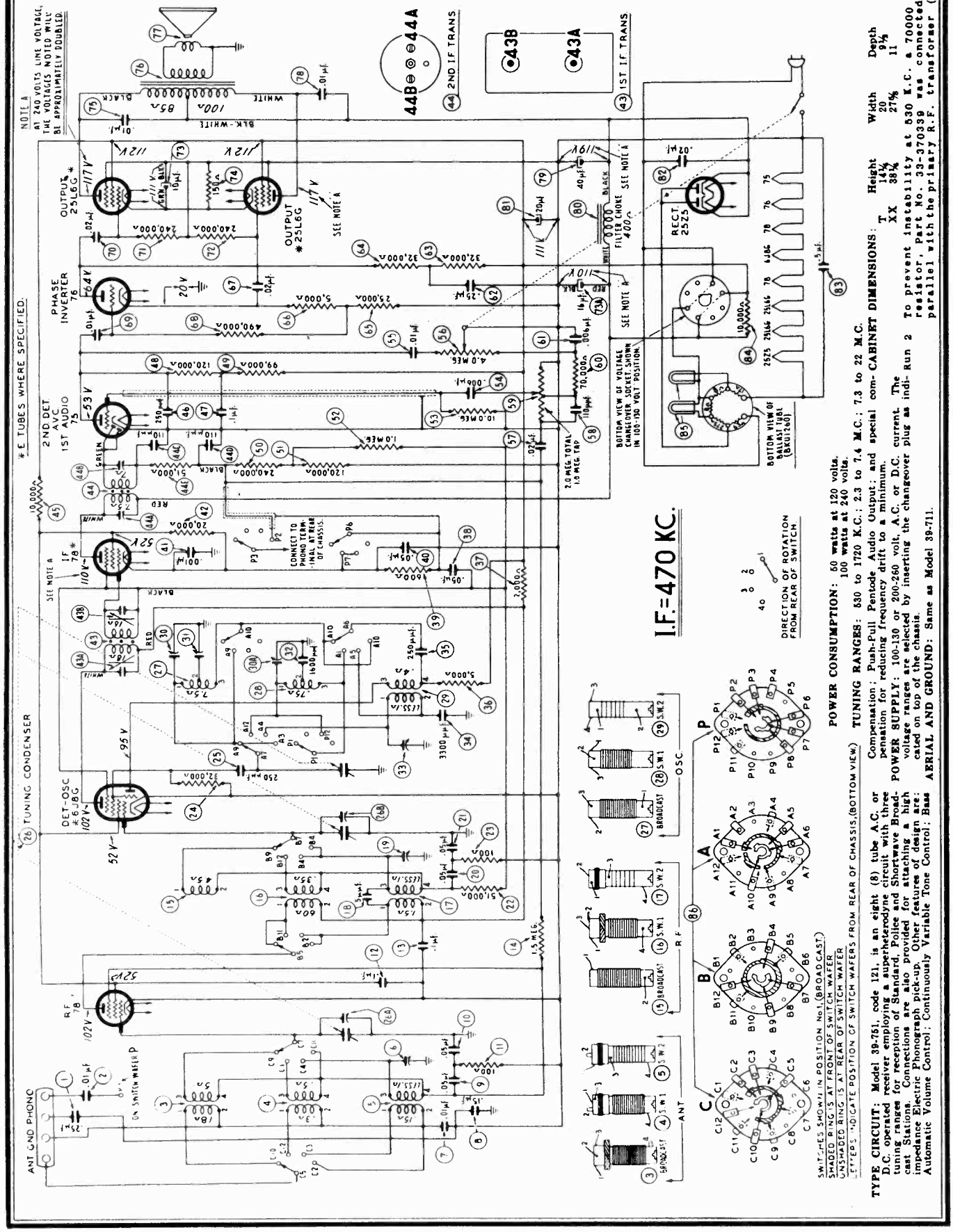
AERIAL AND GROUND: To obtain maximum performance from this receiver, the Philco Safety Aerial, Part No. 40-6370 should be used and a good ground connection to the nearest water pipe or any other good source.

CABINET DIMENSIONS:

	Height	Width	Depth
T	12¾	16¾	9⅞

MODEL 39-751(121)
Runs 1,2
Schematic, Voltage
Changes

PHILCO RADIO & TELEV. CORP.



TYPE CIRCUIT: Model 39-751, code 121, is an eight (8) tube A.C. or D.C. operated receiver employing a superheterodyne circuit with three tuning ranges for reception of Standard, Police and Shortwave Broadcast Stations. Connections are also provided for attaching a high impedance Electric Phonograph pick-up. Other features of design are: Automatic Volume Control; Continuously Variable Tone Control; Bass Compensation; Push-Pull Pentode Audio Output; and special compensation for reducing frequency drift to a minimum.

POWER SUPPLY: 100-130 or 200-260 volt, A.C. or D.C. current. The voltage ranges are selected by inserting the changeover plug as indicated on top of the chassis.

POWER CONSUMPTION: 60 watts at 120 volts.
100 watts at 240 volts.

TUNING RANGES: 530 to 1720 K.C.; 2.3 to 7.4 M.C.; 7.3 to 22 M.C.

AERIAL AND GROUND: Same as Model 39-711.

CABINET DIMENSIONS:

	Height	Width	Depth
T	14¾	20	9¼
XX	38¾	27¾	11

To prevent instability at 830 K.C. a 70000 ohm resistor, Part No. 33-370339 was connected in parallel with the primary R.F. transformer (16).

PHILCO RADIO & TELEV. CORP.

MODEL 39-711(121)
MODEL 39-751(121)
Alignment

Alignment of Compensators

EQUIPMENT REQUIRED:

(1) Signal Generator; Philco Model 077.
(2) Output Meter, Philco Model 027 Circuit Tester.
(3) Philco Fiber Handle Screw Driver, Part No. 27-7059 and Fiber Wrench, Part No. 3164.

OUTPUT METER:

Two indicating devices for aligning of the receiver can be used; either an audio output meter or a vacuum tube voltmeter. The method of connecting the audio output meter is given in the next paragraph. The procedure for connecting the vacuum tube voltmeter as an aligning indicator will be found on page 5. Where greater accuracy of the various tuned circuits is desired, the vacuum tube voltmeter is recommended as an aligning device.

The Philco 027 Output Meter is connected to the plate and cathode terminals of the type 25L6G tube (use one tube in Model 39-751) and adjusted for the 0 to 30 V.A.C. scale. After connecting the output meter, adjust the compensators in the order as shown in the tabulation below. Locations of the compensators are shown in Fig. 3, Model 39-711, and Fig. 4, Model 39-751. If the output meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.

MODEL 39-711

Operations in Order	SIGNAL GENERATOR			RECEIVER			Special Instructions
	Output Connections to Receiver	Dummy Antenna Note A	Dial Setting	Dial Setting	Control Settings	Adjust Compensators	
1	6J8EG	.1 mfd.	470 K.C.	580 K.C.	Vol. Max. Tone treble Range Sw. Brdcst.	22A, 21B, 21A	
2	Ant. & Grnd.	200 mmfd.	1500 K.C.	1500 K.C.	Vol. Max. Tone treble Range Sw. Brdcst.	14, 11A	Note B
3	Ant. & Grnd.	200 mmfd.	580 K.C.	580 K.C.	Vol. Max. Tone treble Range Sw. Brdcst.	15	Roll gang Repeat Oper. 2
4	Ant. & Grnd.	400 ohms	7.0 M.C.	7.0 M.C.	Range Sw. Police	14A	Roll Gang
5	Ant. & Grnd.	400 ohms	20 M.C.	20 M.C.	Range Sw. S. W.	6A, 6	Note C

MODEL 39-751

Operations in Order	SIGNAL GENERATOR			RECEIVER			Special Instructions
	Output Connections to Receiver	Dummy Antenna Note A	Dial Setting	Dial Setting	Control Settings	Adjust Compensators	
1	6J8G Grid and Ground	.1 mfd.	470 K.C.	580 K.C.	Vol. Max. Tone-Treble	44B, 44A, 43B, 43A	
2	Ant. and Grd.	200 mmfd.	1500 K.C.	1500 K.C.	Vol. Max. Range Sw. Brdcst.	30, 26B, 26A	Note B
3	Ant. and Grd.	200 mmfd.	580 K.C.	580 K.C.	Vol. Max.	31	Roll gang Repeat Operation 2
4	Ant. and Grd.	400 ohms	6.0 M.C.	6.0 M.C.	Vol. Max. Tone-Treble Range Sw. Police	30A	Roll gang
5	Ant. and Grd.	400 ohms	20 M.C.	20 M.C.	Vol. Max. Tone-Treble Range Sw. S. W.	33, 19, 6	Note C

NOTE A — The "Dummy Antenna" consists of a condenser or resistance connected in series with the signal generator output lead (high side). Use the capacity or resistance as specified in each step of the above procedure.

NOTE B — Dial Calibration: In order to adjust the receiver correctly the dial must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows: With the tuning condenser closed (maximum capacity), set the dial pointer on the first mark on the left edge (low frequency end) of the broadcast scale.

NOTE C — When adjusting compensator (33) model 39-751 and (6A)—model 39-711 be sure to tune in the fundamental signal (20 M.C.) instead of the image signal. If the compensator is correctly adjusted, the image signal will be found by turning dial 940 K.C. below the fundamental signal, which will be 19.060 M.C.

The Philco-Tropic radio is particularly recommended for locations where super reception of short wave is necessary and where the radio and the cabinet are exposed to extreme conditions. The receiver is especially constructed to withstand decay, spoilage and deterioration caused by extreme conditions of humidity, heat, salt air and cold; and to stand up under the most severe tropic weather conditions.

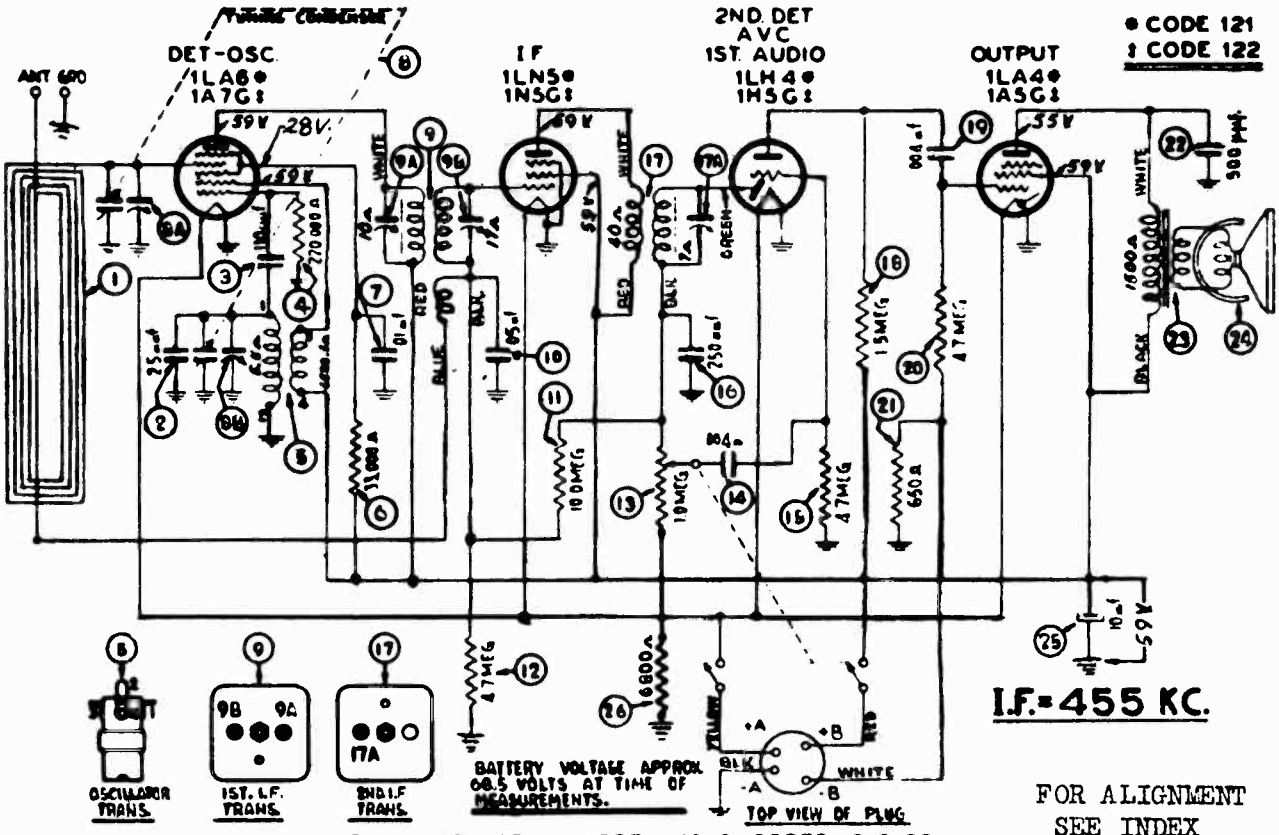
The chassis is heavily plated, making it impervious to salt air, rust and corrosion.

The various parts, such as coils, condensers, chokes and transformers, are treated with special wax that will withstand very high temperatures. In addition the wax is treated with chemicals which repel rodents and insects.

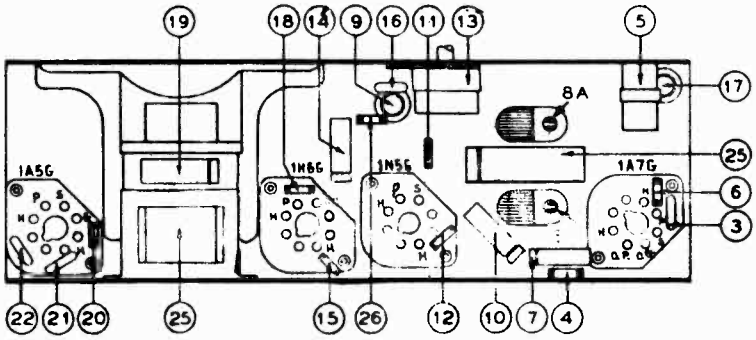
The cabinet is treated with a special sealing compound which protects it against moisture and heat.

MODEL 40-81(121,122)
Schematic, Voltage
Chassis

PHILCO RADIO & TELEV. CORP.



SCHEMATIC DIAGRAM MODEL 40-81 CODES 121 & 122.



PART LOCATIONS, UNDERSIDE OF CHASSIS, MODEL 40-81

AUGUST, 1939.

Replacement Parts — Models 40-81, Codes 121, 122

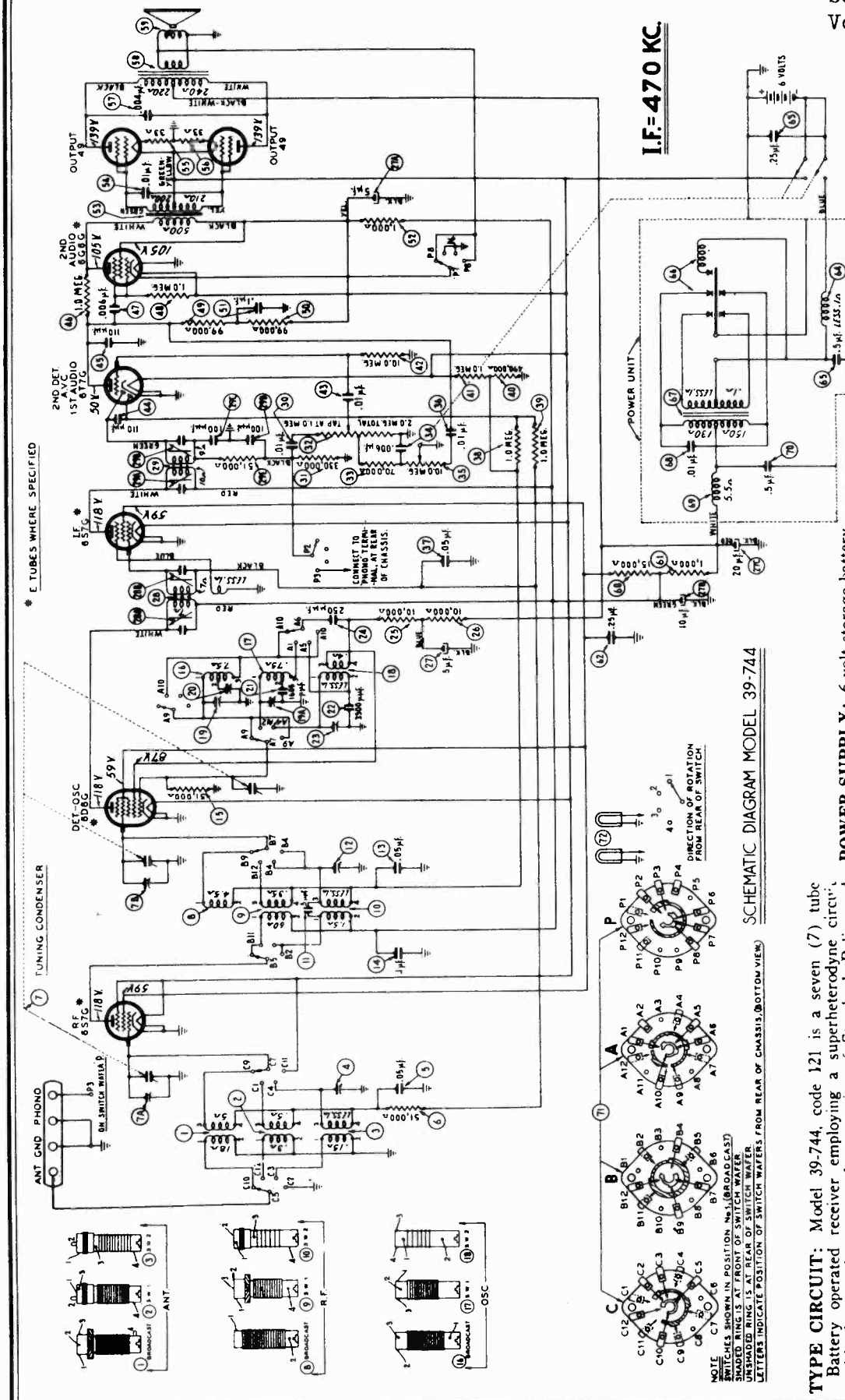
SCHE. No.	DESCRIPTION	PART No.
1	Loop Assembly (Part of Cabinet)	10413A
2	Mica Condenser (15 mmfd.)	61-0038
3	Mica Condenser (110 mmfd.)	30-1031
4	Resistor (220,000 ohms, ½ watt)	33-422339
5	Oscillator Transformer	32-3277
6	Resistor (33,000 ohms, ½ watt)	33-333339
7	Tubular Condenser (.01 mfd.)	30-4572
8	Tuning Condenser Assembly	31-2432
9	1st I. F. Transformer Assembly	32-3265
10	Tubular Condenser (.05 mfd.)	30-4519
11	Resistor (10.0 meg., ½ watt)	33-610339
12	Resistor (4.7 meg., ½ watt)	33-547339
13	Volume Control and On-Off Switch	33-5331
14	Tubular Condenser (.004 mfd.)	30-4575
15	Resistor (4.7 meg., ½ watt)	33-547339
16	Mica Condenser (250 mmfd.)	61-0033
17	2nd I. F. Transformer Assembly	32-3266
18	Resistor (1.5 meg., ½ watt)	33-515339
19	Tubular Condenser (.004 mfd.)	30-4575
20	Resistor (4.7 meg., ½ watt)	33-547339
21	Resistor (650 ohms, ½ watt)	33-165326
22	Mica Condenser (500 mmfd.)	30-1114
23	Output Transformer	32-8062
24	Cone and Voice Coil Assembly (Speaker Part No. 36-1481-3)	36-4121
25	Electrolytic Condenser (10 mfd., 150 V.)	30-2396
26	Resistor (6800 ohms, ½ watt)	33-268339

MISCELLANEOUS PARTS

Acetate Window	27-5541
Cabinet	10431A
Clip (Coil Mounting)	28-5002
Drive Cord Assembly	31-2411
Dial	27-5561
Grille Screen	56-1539
Knobs (Volume and Tuning)	27-4876
Pointer	27-4891
Speaker	36-1481
Shield (Tube, Code 122)	56-1566
Sockets (Loktal, Code 121)	55-0575
Sockets (Octal, Code 122)	27-6133
Spring (Drive Cord)	28-8751
Tuning Shaft Assembly	38-9878

PHILCO RADIO & TELEV. CORP.

MODEL 39-744(121)
Runs 1,2,3
Schematic
Voltage, Changes



TYPE CIRCUIT: Model 39-744, code 121 is a seven (7) tube Battery operated receiver employing a superheterodyne circuit, with three tuning ranges for reception of Standard, Police and shortwave Broadcast Stations. Connections are also provided for attaching a high impedance Electric Phonograph pick-up. In addition, other features of design are: Automatic Volume Control; Continuously Variable Tone Control; Bass Compensation, and special compensators for reducing frequency drift to a minimum.

AERIAL AND GROUND: To obtain maximum performance from this receiver, the Philco Safety Aerial, Part No. 40-6370 should be used, a good ground connection to the nearest water pipe or any other good ground source.

POWER SUPPLY: 6 volt storage battery.

TUNING RANGES:
530 to 1720 K.C.;
2.3 to 7.4 M.C.;
7.3 to 22 M.C.

AUDIO OUTPUT: 2.5 watts.

PRODUCTION CHANGES

Run 2 To prevent Oscillation resistor (60) 15000 ohms, 1 watt, part no. 33-315339 was changed to 20000 ohms, part no. 33-320339.

Run 3 Beginning with Run 3, a resistor 33-370539 7000 ohms, was added across No. 9 R.F. Transformer primary.

To stabilize tuning of broadcast band and prevent regeneration, condensers (62) were removed from the wiring panel and connected directly to the screen terminal of the 6S7G tube.

MODEL 39-744(121)
Runs 1,2,3
Alignment, Chassis
Trimmers, Parts

PHILCO RADIO & TELEV. CORP.

Replacement Parts Model 39-744

Schem. No.	Description	Part No.
1	Ant. Trans. (Brdcst.)	32-2588
2	Ant. Trans. (S.W. 1)	32-3093
3	Ant. Trans. (S.W. 2)	32-2885
4	Compensator	31-6288
5	Tubular Cond. (.05 mfd.)	30-4519
6	Resistor (51,000 ohms, 1 watt)	33-351439
7	Tuning Cond.	31-2325
8	R.F. Trans. (Brdcst.)	32-2379
9	R.F. Trans. (S.W. 1)	32-3099
10	R.F. Trans. (S.W. 2)	32-3165
11	Mica Cond. (5 mmfd.)	30-1120
12	Compensator	31-6288
13	Tubular Cond. (.05 mfd.)	30-4519
14	Tubular Cond. (.1 mfd.)	30-4586
15	Resistor (51,000 ohms, 1 watt)	33-351439
16	Osc. Trans. (Brdcst.)	32-2120
17	Osc. Trans. (S.W. 1)	32-3094
18	Osc. Trans. (S.W. 2)	32-3102
19	2 Section Compensator	31-6287
20	Compensator	31-6289
21	Semi-fixed Cond. (1605 mmfd.)	31-6282
22	Semi-fixed Cond. (3300 mmfd.)	31-6283
23	Compensator	31-6288
24	Mica Cond. (250 mmfd.)	30-1119
25	Resistor (10,000 ohms, 1 watt)	33-310439
26	Resistor (10,000 ohms, 1 watt)	33-310439
27	Electrolytic Cond. (5 mfd., 150 V.)	30-2374
27A	Electrolytic Cond. (5 mfd., 150 V.)	
27B	Elect. Cond. (10 mfd., 150 V.)	
27C	Elect. Cond. (20 mfd., 150 V.)	
28	1st I.F. Trans. Assy.	32-3127
29	2nd I.F. Trans. Assy.	32-3117
30	Tubular Cond. (.01 mfd.)	30-4581
31	Resistor (330,000 ohms, 1 watt.)	33-433439
32	Volume Control (2.0 meg.)	33-5298
33	Resistor (70,000 ohms, 1 watt)	33-370439
34	Tubular Cond. (.006 mfd.)	30-4583
35	Tone Control (10.0 meg.)	33-5303
36	Tubular Cond. (.01 mfd.)	30-4581
37	Tubular Cond. (.05 mfd.)	30-4519
38	Resistor (1.0 megohm, 1 watt)	33-510439
39	Resistor (1.0 megohm, 1 watt)	33-510439
40	Resistor (490,000 ohms, 1 watt)	33-449439
41	Resistor (1.0 megohm, 1 watt)	33-510439
42	Resistor (10.0 megohm, 1 watt)	33-610439
43	Tubular Cond. (.01 mfd.)	30-4581
44	Mica Cond. (110 mmfd.)	30-1118
45	Mica Cond. (110 mmfd.)	30-1118
46	Resistor (1.0 megohm, 1 watt)	33-510439
47	Tubular Cond. (.006 mfd.)	30-4583
48	Resistor (1.0 megohm, 1 watt)	33-510439
49	Resistor (99,000 ohms, 1 watt)	33-399439
50	Resistor (99,000 ohms, 1 watt)	33-399439
51	Tubular Cond. (.1 mfd.)	30-4586
52	Resistor (1,000 ohms, 1 watt)	33-210439
53	Driver Trans.	32-8027
54	Tubular Cond. (.01 mfd.)	30-4581
55	Resistor (33 ohms, 1 watt, wire-wound)	33-033421
56	Resistor (33 ohms, 1 watt, wire-bound)	33-033421
57	Tubular Cond. (.004 mfd.)	30-4578
58	Output Trans.	32-8026
59	Cone & Voice Coil Assy. (8pkr. 36-1455-3)	36-4107
	Cone & Voice Coil Assy. (8pkr. 36-1456-3)	36-4108
60	Resistor (15,000 ohms, 1 watt)	33-315439
61	Resistor (1,000 ohms, 1 watt)	33-210439
62	Tubular Cond. (.25 mfd.)	30-4588
63	Tubular Cond. (.25 mfd.)	30-4588
64	"A" Choke	32-1954
65	Tubular Cond. (.5 mfd., metal case)	30-4296
66	Vibrator	41-3222
67	Power Trans.	32-7682
68	Tubular Cond. (.01 mfd.)	30-4598
69	"B" Choke	32-2925
70	Tubular Cond. (.5 mfd., metal case)	30-4296
71	Wave Switch	42-1474
72	Pilot Lamp Bulbs	34-2068
	Bezel (T Cabinet)	56-1246
	Bezel (XX Cabinet)	56-1222
	Cable (Battery)	41-3472
	Cord (Wave Switch)	27-9294
	Cord (Tuning Drive)	31-2330
	Cord (Tone Control)	31-2331
	Dial	27-5438
	Drum (Tone Control)	28-6996
	Drum (Wave Switch)	28-7315
	Drum and Coupling (Tuning Drive)	31-2327
	Gasket (Dial Mtg.)	27-9258
	Indicator (Tone & Range)	56-1269
	Knob (Tuning)	27-4330
	Knob (Vernier)	27-4331
	Knob (Tone, Volume)	27-4332
	Pointer	56-1276
	Speaker (T Cabinet)	36-1455-3
	Speaker (XX Cabinet)	36-1456-3
	Spring (Tuning Cord)	28-8913
	Spring (Tone and Range Indicators)	28-8945
	Spring (Indicator Mtg.)	28-8943
	Socket (5 prong.)	27-6035
	Socket (6 prong) Vibrator Unit)	27-6036
	Socket (6 prong)	27-6086
	Socket (8 prong)	27-6120
	Socket Assy. (Pilot Lamp)	38-9796
	Shield (Square)	28-2726
	Shield Cap (Square Shield)	28-2727
	Shield—Round (two required)	56-1072
	Shield Cap (Round Shield)	56-1073
	Shield Base	56-1074
	Station Card	27-5436
	Station Card Shield	27-5437
	Station Card Holder	56-1273
	Vernier Drive	31-2329

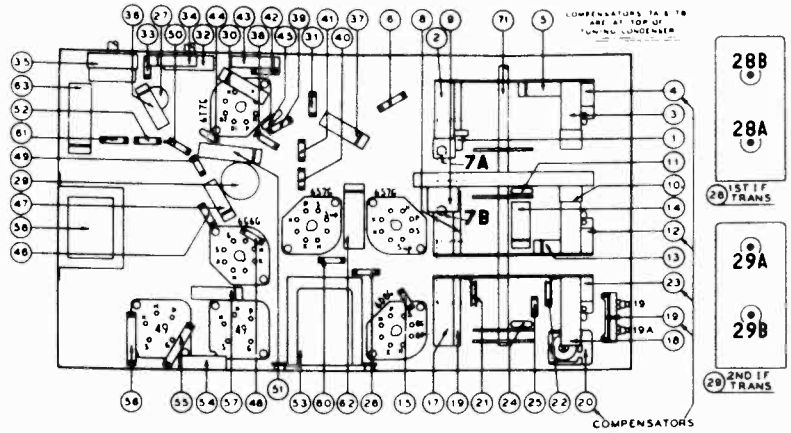


Fig. 1—Part Locations—Underside of Chassis

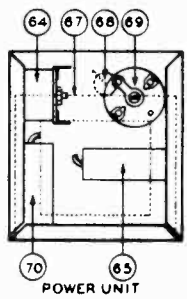


Fig. 2 —Part Locations— Power Unit

Alignment of Compensators

EQUIPMENT REQUIRED:

(1) Signal Generator; Philco Model 077 A.C. operated or Model 177 Battery operated.

(2) Output Meter, Philco Model 027 Circuit Tester.

(3) Philco Fiber Handle Screw Driver, Part No. 27-7059, and Fiber Wrench, Part No. 3164.

OUTPUT METER: The Philco 027 Output Meter is connected to the plate and cathode terminals of one of the type 49 tubes and adjusted for the 0 to 30 V.A.C. scale. After connecting the output meter, adjust the compensators in the order as shown in the tabulation below. Locations of the compensators are shown in Fig. 1. If the output meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.

Order	Signal Generator: Output Connections to Receiver	Signal Generator: Dummy Antenna Note A	Signal Generator: Dial Setting	Receiver: Dial Setting	Receiver: Control Settings	Receiver: Adjust Compensators	Special Instructions
1	6D8EG Grid and Ground	.1 mfd.	470 K.C.	580 K.C.	Vol. Max. Tone-Treble	29B, 29A, 28B, 28A	
2	Ant. and Grd.	200 mmfd.	1500 K.C.	1500 K.C.	Vol. Max. Range Switch Brdcst.	19, 7B, 7A	Note B
3	Ant. and Grd.	200 mmfd.	580 K.C.	580 K.C.	Vol. Max.	20	Roll Gang Repeat Oper-2
4	Ant. and Grd.	400 ohms	6.0 M.C.	6.0 M.C.	Vol. Max. Tone-Treble Range Switch Police	19A	Roll Gang
5	Ant. and Grd.	400 ohms	20 M.C.	20 M.C.	Vol. Max. Tone-Treble Range Switch S. W.	23, 12, 4	Note C

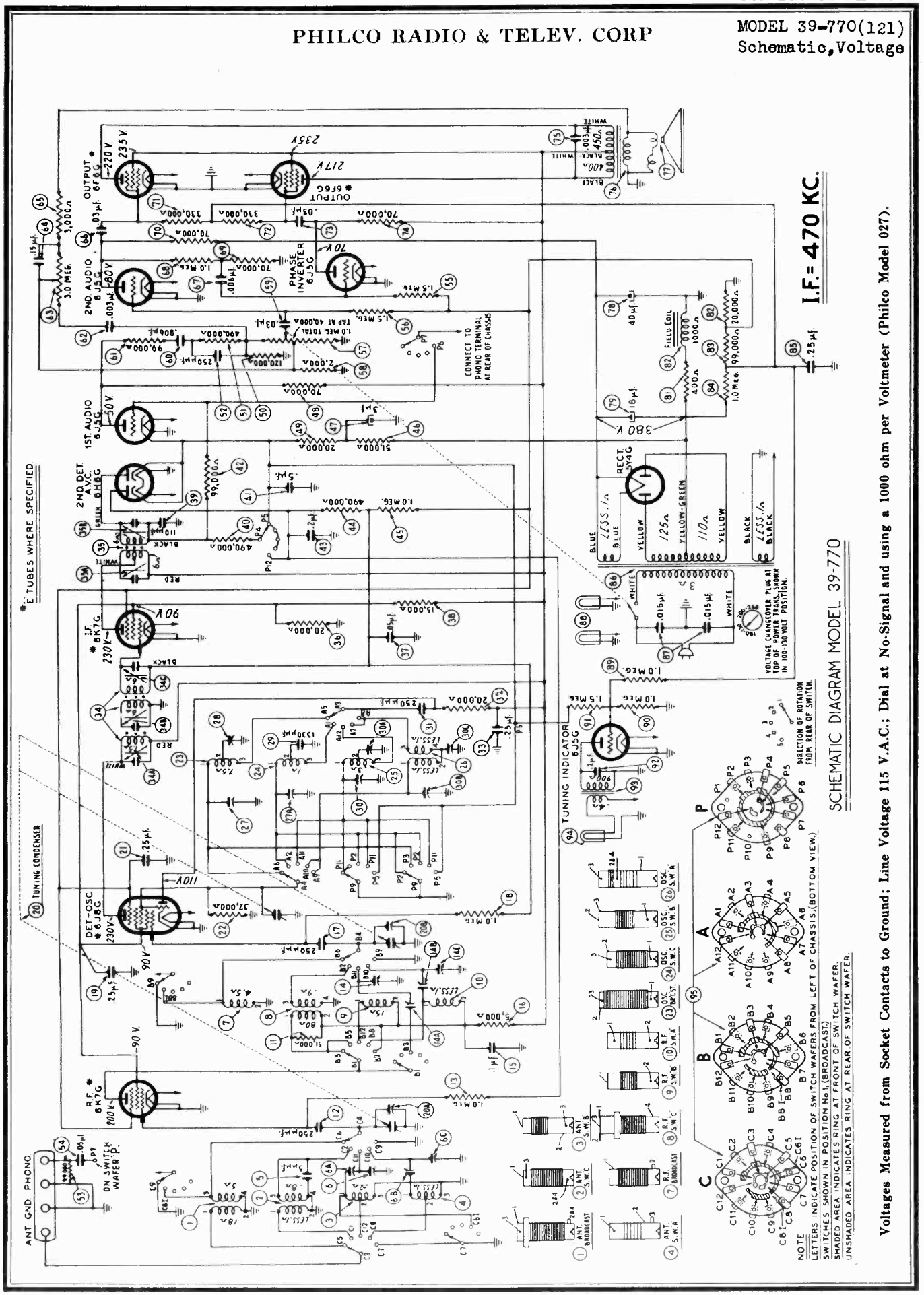
A—The "Dummy Antenna" consists of a condenser or resistance connected in series with the signal generator output lead (high side). Use the capacity or resistance as specified in each step of the above procedure.

B—Dial Calibration: In order to adjust the receiver correctly the dial must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows: With the tuning condenser closed (maximum capacity), set the dial pointer on the first mark on the left edge (low frequency end) of the broadcast scale.

C—When adjusting compensator (23) be sure to tune in the fundamental signal (20 M.C.—second signal from tight position of padder) instead of the image signal. If the compensator is correctly adjusted, the image signal will be found by turning the receiver dial 940 K.C. below the fundamental signal.

PHILCO RADIO & TELEV. CORP

MODEL 39-770(121)
Schematic, Voltage



Voltages Measured from Socket Contacts to Ground; Line Voltage 115 V.A.C.; Dial at No-Signal and using a 1000 ohm per Voltmeter (Philco Model 027).

MODEL 39-770(121)
Chassis, Trimmers
Drive Cord Data

PHILCO RADIO & TELEV. CORP.

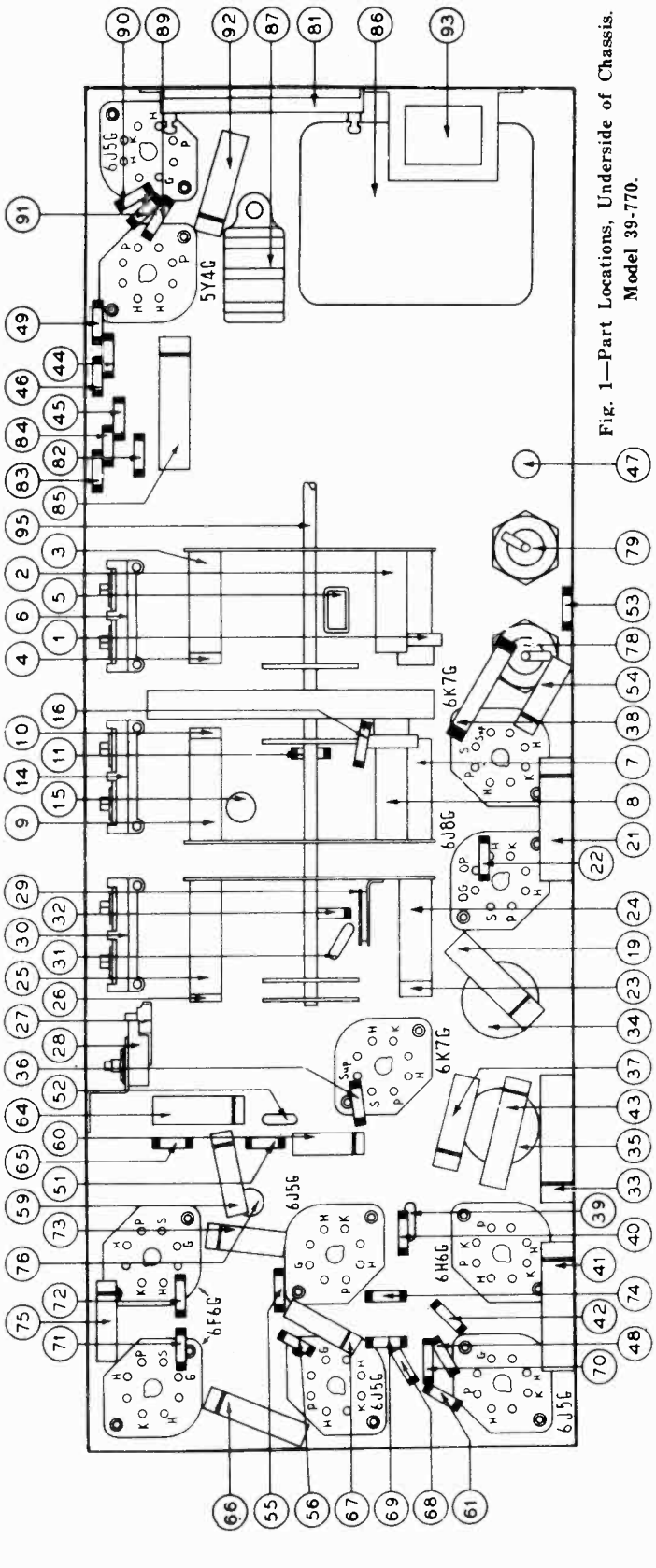


Fig. 1—Part Locations, Underside of Chassis. Model 39-770.

TYPE CIRCUIT: Model 39-770 is an eleven (11) tube A.C. operated superheterodyne circuit with four (4) tuning ranges covering the frequencies listed below. Provisions are also provided for connecting a high impedance phonograph pick-up. In addition other features of design are: Tuning Light Indicator; Continuously Variable Tone Control with Variable Bass Compensation; Amplified Automatic Volume Control; Push-Pull Pentode Audio Output; and Special Compensation in all circuits to prevent frequency drift.

POWER SUPPLY: 115 or 220 V. 50 to 60 Cycle A.C. 115 Watts. To operate the receiver on either of the above voltages, insert the plug on top of power transformer as indicated on the transformer. Special Power Transformers for operation on 25 cycle current are available.

TUNING RANGES: 530 to 1720 K.C.; 1.7 M.C. to 5.6 M.C. 5.5 M.C. to 11.6 M.C.; 11.6 M.C. to 22.0 M.C.

AUDIO OUTPUT: 7.5 Watts.

AERIAL AND GROUND: To obtain maximum performance from this receiver, the Philco Safety Aerial, Part No. 40-6370, should be used together with a good ground connection to the nearest water pipe or any other good ground source.

CABINET DIMENSIONS:

	Height	*Width*	*Depth*
Type T	18⅛	23⅛	12⅛
Type XX	36⅛	34⅝	14⅛

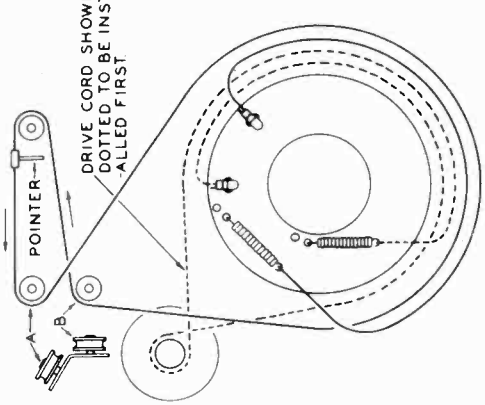


Fig. 3—Installing Drive Cords.

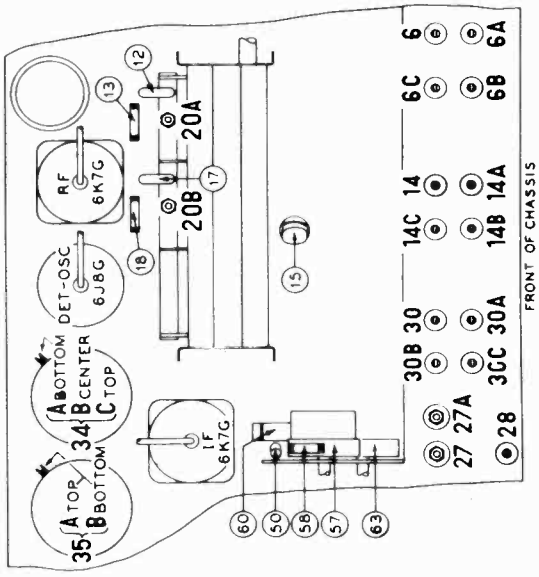


Fig. 2—Compensator Locations: Top, Front View of Chassis.

PHILCO RADIO & TELEV. CORP.

MODEL 39-770(121)
Alignment, Parts

Alignment of Compensators

Operations	SIGNAL GENERATOR			RECEIVER			Special Instructions
	Output Connections to Receiver	Dummy Antenna Note A	Dial Setting	Dial Setting	Control Setting	Adjust Compensators	
1	6J8G Grid	.1 mfd.	470 K.C.	580 K.C.	Tone-Treble Vol.—Max. Range Switch "Brdcst."	35B, 35A, 34C, 34A	Turn 34B "IN" full
2	6J8G Grid	.1 mfd.	470 K.C.	580 K.C.	Tone-Treble Vol.—Max. Range Switch "Brdcst."	34B	TO MAX. OUTPUT
3	Ant. & Gnd. Panel	200 mmfd.	1500 K.C.	1500 K.C.	Tone-Treble Vol.—Max. Range Switch "Brdcst."	27, 20B, 20A	Note B
4	Ant. & Gnd. Panel	200 mmfd.	580 K.C.	580 K.C.	Tone-Treble Vol.—Max. Range Switch "Brdcst."	28	Roll Gang
5	Ant. & Gnd. Panel	200 mmfd.	5.0 M.C.	5.0 M.C.	Tone-Treble Vol.—Max. Range Switch "SWC"	27A	Roll Gang Note C
6	Ant. & Gnd. Panel	400 ohms	11 M.C.	11 M.C.	Tone-Treble Vol.—Max. Range Switch "SWB"	30, 14, 6	Note D Roll Gang on 14 and 6 Image above 11.0 M.C.
7	Ant. & Gnd. Panel	400 ohms	6.0 M.C.	6.0 M.C.	Tone-Treble Vol.—Max. Range Switch "SWB"	30A, 14A, 6A	Note D Roll Gang on 14A and 6A Image above 6.0 M.C. Repeat Operation 6
8	Ant. & Gnd. Panel	400 ohms	20.0 M.C.	20.0 M.C.	Tone-Treble Vol.—Max. Range Switch "SWA"	30B, 14C, 6C	Note D Roll Gang on 14C and 6C Image above 20.0 M.C.
9	Ant. & Gnd. Panel	400 ohms	12.0 M.C.	12.0 M.C.	Tone-Treble Vol.—Max. Range Switch "SWA"	30C, 14B, 6B	Note D Roll Gang on 14B and 6B Image above 12.0 M.C. Repeat Operation 7

NOTE A—The "Dummy Antenna" consists of a condenser or resistance connected in series with the signal generator output lead (high side). Use the capacity or resistance as specified in each step of the above procedure.

NOTE B—Dial Calibration: In order to adjust the receiver correctly the dial must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows: With the tuning condenser closed (maximum capacity), set the dial pointer on the extreme left index line at the low frequency end of the broadcast scale. The arrangement of the drive cable with condenser and pointer in this position is shown.

NOTE C—Compensator (27A) should be peaked to the Fundamental signal which is the second (2) signal from the tight (maximum capacity) position. If the compensator is correctly padded, the "Image" signal will be found by turning the receiver dial 940 K.C. *below* 5.0 M.C.

NOTE D—Compensators of Shortwave Ranges "A" and "B" should be peaked to the first signal from the tight (maximum capacity) position. If the compensators are correctly padded, the "Image" signal will be found by turning the receiver dial 940 K.C. *above* the frequencies being used. Example: 11.0 M.C. (Image 11.940); 20.0 M.C. (Image 20.940).

Schem. No.	Description	Part No.
1	Ant. Trans. (Brdcst.)	32-2588
2	Ant. Trans. (S.W. C)	32-3105
3	Ant. Trans. (S.W. B)	32-3108
4	Ant. Trans. (S.W. A)	32-3111
5	Mica Cond. (5 mmfd.)	30-1120
6	Compensators (4 section)	31-6284
7	R.F. Trans. (Brdcst.)	32-2379
8	R.F. Trans. (S.W. C)	32-3106
9	R.F. Trans. (S.W. B)	32-3109
10	R.F. Trans. (S.W. A)	32-3112
11	Resistor (32,000 ohms, 1 watt)	33-351439
12	Mica Cond. (250 mmfd.)	30-1119
13	Resistor (1.0 meg., 1 watt)	33-510439
14	Compensators (4 section)	31-6284
15	Tubular Cond. (.1 mfd.)	30-4527
16	Resistor (5000 ohms, 1 watt)	33-250439
17	Mica Cond. (250 mmfd.)	30-1119
18	Resistor (1.0 megohm)	33-510439
19	Tubular Cond. (.25 mfd.)	30-4588
20	Tuning Cond.	31-2326
21	Tubular Cond. (.25 mfd.)	30-4588
22	Resistor (32,000 ohms, 1 watt)	33-332439
23	Osc. Trans. (Brdcst.)	32-2120
24	Osc. Trans. (S.W. C)	32-3107
25	Osc. Trans. (S.W. B)	32-3110
26	Osc. Trans. (S.W. A)	32-3113
27	Compensator	31-6288
28	Compensator	31-6289
29	Semi-Fixed Cond. (1330 mmfd.)	31-6286
30	Compensators (4 section)	31-6285
31	Mica Cond. (250 mmfd.)	30-1119
32	Resistor (20,000 ohms, 1 watt)	33-320439
33	Tubular Cond. (.25 mfd.)	30-4589
34	1st I.F. Trans. Assy.	32-3114
35	2nd I.F. Trans. Assy.	32-3115
36	Resistor (20,000 ohms, 1 watt)	33-320439
37	Tubular Cond. (.05 mfd.)	30-4519
38	Resistor (15,000 ohms, 2 watt)	33-315539
39	Mica Cond. (110 mmfd.)	30-1118
40	Resistor (490,000 ohms, 1 watt)	33-449439
41	Tubular Cond. (.5 mfd.)	30-4590
42	Resistor (99,000 ohms, 1 watt)	33-399439
43	Tubular Cond. (.2 mfd.)	30-4587
44	Resistor (490,000 ohms, 1 watt)	33-449439
45	Resistor (1.0 megohm, 1 watt)	33-510439
46	Resistor (51,000 ohms, 1 watt)	33-351439
47	Electrolytic Cond. (.3 mfd., 150 V.)	30-2367
48	Resistor (70,000 ohms, 1 watt)	33-370439
49	Resistor (20,000 ohms, 1 watt)	33-320439
50	Resistor (120,000 ohms, 1 watt)	33-412439
51	Resistor (490,000 ohms, 1 watt)	33-449439
52	Mica Cond. (250 mmfd.)	30-1119
53	Resistor (99,000 ohms, 1 watt)	33-399439
54	Tubular Cond. (.05 mfd.)	30-4519
55	Resistor (1.5 megohms, 1 watt)	33-515439
56	Resistor (1.5 megohms, 1 watt)	33-515439
57	Volume Control (1.0 megohm)	33-5302
58	Resistor (2000 ohms, 1 watt)	33-220439
59	Tubular Cond. (.03 mfd.)	30-4585
60	Tubular Cond. (.006 mfd.)	30-4591
61	Resistor (99,000 ohms, 1 watt)	33-399439
62	Tubular Cond. (.003 mfd.)	30-4580
63	Tone Control (3.0 megohms)	33-5287
64	Tubular Cond. (.15 mfd.)	30-4593
65	Resistor (3000 ohms, 1 watt)	33-230439
66	Tubular Cond. (.03 mfd.)	30-4517
67	Tubular Cond. (.006 mfd.)	30-4591
68	Resistor (1.0 megohm, 1 watt)	33-510439
69	Resistor (70,000 ohms, 1 watt)	33-370439
70	Resistor (70,000 ohms, 1 watt)	33-370439
71	Resistor (330,000 ohms, 1 watt)	33-433439
72	Resistor (330,000 ohms, 1 watt)	33-433439
73	Tubular Cond. (.03 mfd.)	30-4517
74	Resistor (70,000 ohms, 1 watt)	33-370439
75	Tubular Cond. (.003 mfd.)	30-4582
76	Output Trans.	32-8020
77	Cone and Voice Coil Assy. (Spkr. Pt. No. 36-1460-3)	36-4105
77A	Cone and Voice Coil Assy. (Spkr. Pt. No. 36-1459-2)	36-4106
78	Electrolytic Cond. (40 mfd., 300 V.)	30-2366
79	Electrolytic Cond. (18 mfd.)	30-2368
80	Field Coil (Replace Spkr. 36-1459-2 in "T" Cabinet and Replace Spkr. 36-1460-3 in "XX" Cabinet).	
81	Resistor (400 ohms, wire wound)	33-3365
82	Resistor (20,000 ohms, 1 watt)	33-320439
83	Resistor (99,000 ohms, 1 watt)	33-399439
84	Resistor (1.0 megohm, 1 watt)	33-510439
85	Tubular Cond. (.05 mfd.)	30-4588
86	Power Trans. 100/130 or 200/260 V., 50 to 60 cycles	32-8008
87	Bakelite Cond. (.015 and .015 mfd.)	3793-ODG
88	Pilot Lamps (Dial)	34-2064
89	Resistor (1.0 megohm, 1 watt)	33-510439
90	Resistor (1.0 megohm, 1 watt)	33-510439
91	Resistor (1.5 megohms, 1 watt)	33-515439
92	Tubular Cond. (.2 mfd.)	30-4587
93	Tuning Indicator Trans.	32-8009
94	Pilot Lamp (Tuning Indicator)	34-2221
95	Wave Switch	42-1476
	Bezel	56-1163
	Bezel Gasket	38-9734
	Cable (Power)	L-3180
	Coupling (Tuning Cond. to Drive)	31-2291
	Disc (Volume Control)	27-4765
	Disc (Range Switch)	27-4767
	Disc (Tuning)	27-4798
	Disc (Tone Control)	27-4802
	Dial	27-5448
	Dial Pointer	56-1033
	Dial Cord Spring	28-8913
	Drive Cord (Pointer)	31-2352
	Drive Cord (Tuning Drum)	31-2350
	Drum Assembly (Tuning Cond.)	38-9716
	Range Switch Operating Arm and Link Assembly	38-9756
	Socket (7 prong—6K7G R.F. Tube)	27-6099
	Socket (6 prong)	27-6121
	Socket (8 prong—6J8G)	27-6120
	Socket Assembly (Dial Lamp)	38-9694
	Socket Assembly (Dial Lamp)	38-9695
	Socket Assembly (Bullseye XX Cabinet)	38-9696
	Station Card	27-5446
	Station Card Shield	27-5447
	Spring (Retaining Station Card)	56-1294
	Speaker (XX Cabinet)	36-1460-3
	Speaker (T Cabinet)	36-1459-2

MODEL 39-2770(121)
Alignment, Notes

PHILCO RADIO & TELEV. CORP.

SPECIFICATIONS

Model 39-2770 is an eleven (11) tube A. C. operated superheterodyne circuit with four tuning ranges covering—long wave, 140 to 390 K. C.; standard broadcasts, 540 to 1720 K. C.; short wave (A) 5.7 to 11.5 M. C.; short wave (B) 11.5 to 22 M. C. Other than the tuning range coverage Model 39-2770 is similiar in design to the Model 39-770.

Service information for Model 39-2770 is the same as that given for Model 39-770 with the exception of "Alignment of Compensator" procedure and some parts in the R. F. section.

These differences are listed below:—

SCHEMATIC NO.	DESCRIPTION	PART NO.
(2)	Ant. Trans.	32-3135
(8)	R. F. Trans.	32-3136
(24)	Osc. Trans.	32-3137

1—Add a 2200 mmfd. condenser, Part No. 30-1125, from contact C1 on Range Switch to ground.

2—Add a 5 mmfd. condenser, Part No. 30-1120, from contact C2 on Range Switch to ground.

3—Add a 110 mmfd. condenser, Part No. 30-1118 in place of the 51,000 ohm resistor, Part No. 33-351439, now used in the Model 39-770.

4—Add a 5 mmfd. condenser, Part No. 30-1120 from contact B2 on Range Switch to ground.

5—Add a compensator, Part No. 31-6297, from contact A1 on Wave Switch to ground. (The 1330 mmfd. semi-fixed condenser, Part No. 31-6286, used in Model 39-770 is removed from Model 39-2770.)

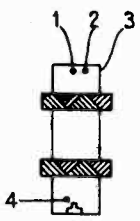
ALIGNMENT OF COMPENSATORS

	SIGNAL GENERATOR				RECEIVER		
Operations	Output Connections to Receiver	Dummy Antenna Note A	Dial Setting	Dial Setting	Control Setting	Adjust Compensators	Special Instructions
1	6J8G Grid	.1 mfd.	470 K. C.	580 K. C.	Tone-Treble Vol.-Max. Range Switch Brdcst.	35B, 35A, 34C, 34A	Turn 34B "in" full
2	6J8G Grid	.1 mfd.	470 K. C.	580 K. C.	Tone-Treble Vol.-Max. Range Switch Brdcst.	34B	To Max. Output
3	Ant. & Gnd. Panel	200 mmfd.	1500 K. C.	1500 K. C.	Tone-Treble Vol.-Max. Range Switch Brdcst.	27, 20B, 20A	Note B
4	Ant. & Gnd. Panel	200 mmfd.	580 K. C.	580 K. C.	Tone-Treble Vol.-Max. Range Switch Brdcst.	28	Roll gang
5	Ant. & Gnd. Panel	200 mmfd.	350 K. C.	350 K. C.	Tone-Treble Vol.-Max. Range Switch "LW"	27A	Note B
6	Ant. & Gnd. Panel	200 mmfd.	160 K. C.	160 K. C.	Tone-Treble Vol.-Max. Range Switch "LW"	New Compensator contact A1 Range Switch	Roll gang
7	Ant. & Gnd. Panel	400 ohms	11 M. C.	11 M. C.	Tone-Treble Vol.-Max. Range Switch "SWB"	30, 14, 6	Note D Roll gang on 14 and 6 image above 11.0 M. C.
8	Ant. & Gnd. Panel	400 ohms	6.0 M. C.	6.0 M. C.	Tone-Treble Vol.-Max. Range Switch "SWB"	30A, 14A, 6A	Note D Roll gang on 14A and 6A image above 6.0 M. C. Repeat operation 6
9	Ant. & Gnd. Panel	400 ohms	20.0 M. C.	20.0 M. C.	Tone-Treble Vol.-Max. Range Switch "SWA"	30B, 14C, 6C	Note D Roll gang on 14C and 6C image above 20.0 M. C.
10	Ant. & Gnd. Panel	400 ohms	12.0 M. C.	12.0 M. C.	Tone-Treble Vol.-Max Range Switch "SWA"	30C, 14B, 6B	Note D Roll gang on 14C and 6B image above 12.0 M. C. Repeat operation 7

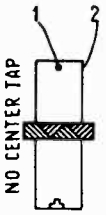
COILS SHOWN BELOW

The numbers on coil connections shown, correspond to same numbers on coil connections for Model 39-770.

32-3135



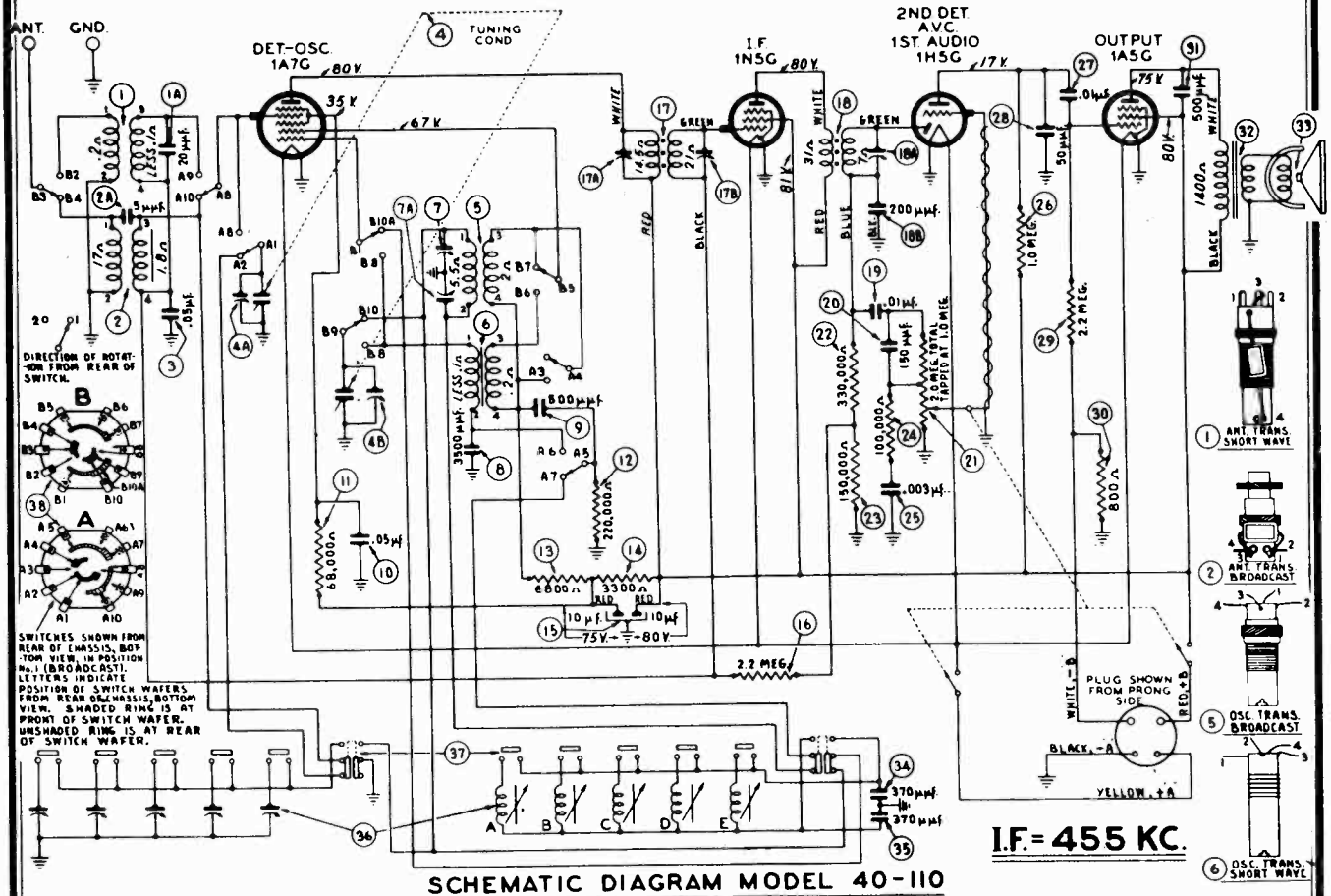
32-3136



32-3137

PHILCO RADIO & TELEV. CORP.

MODEL 40-110
Schematic, Voltage
Chassis, Trimmers

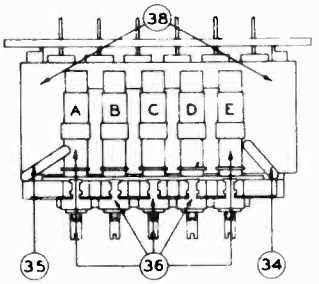


SCHEMATIC DIAGRAM MODEL 40-110

Replacement Parts — Model 40-110

SCHE. No.	DESCRIPTION	PART No.
1	Ant. Trans. Ass'y. (Short Wave)	32-3289
1A	Mica Condenser (20 mmfd.)	61-0039
2	Ant. Trans. Ass'y. (Broadcast)	32-3279
2A	Mica Condenser (5 mmfd.)	30-1097
3	Tubular Condenser (.05 mfd.)	30-4519
4	Tuning Condenser Assembly	31-2404
5	Osc. Transformer (Broadcast)	32-3287
6	Osc. Transformer (Short Wave)	32-3288
7	Compensator	31-6321
8	Mica Condenser (3500 mmfd.)	30-1094
9	Mica Condenser (500 mmfd.)	30-1114
10	Tubular Condenser (.05 mfd.)	30-4444
11	Resistor (68,000 ohms, ½ watt)	33-368339
12	Resistor (220,000 ohms, ½ watt)	33-422339
13	Resistor (6800 ohms, ½ watt)	33-268339
14	Resistor (3300 ohms, ½ watt)	33-233339
15	Elec. Condenser (10-10 mfd., 150 V.)	30-2408
16	Resistor (2.2 meg., ½ watt)	33-522339
17	1st I. F. Transformer Assembly	32-3198
18	2nd I. F. Transformer Assembly	32-3259
19	Tubular Condenser (.01 mfd.)	30-4572
20	Mica Condenser (150 mmfd.)	30-1033
21	Volume Control (2 meg.)	33-5326

SCHE. No.	DESCRIPTION	PART No.
22	Resistor (330,000 ohms, ½ watt)	33-433339
23	Resistor (150,000 ohms, ½ watt)	33-415339
24	Resistor (100,000 ohms, ½ watt)	33-410339
25	Tubular Condenser (.003 mfd.)	30-4469
26	Resistor (1.0 meg., ½ watt)	33-510339
27	Tubular Condenser (.01 mfd.)	30-4572
28	Mica Condenser (50 mmfd.)	30-1029
29	Resistor (2.2 meg., ½ watt)	33-522339
30	Resistor (800 ohms, ½ watt)	33-180326
31	Mica Condenser (500 mmfd.)	30-1114
32	Output Transformer	32-8066
33	Cone and Voice Coil Assembly (Speaker Part No. 36-1410-1)	36-4093
34	Silver Mica Condenser (370 mmfd.)	30-1110
35	Silver Mica Condenser (370 mmfd.)	30-1110
36	Coils—Padder Strip and Brk. Assembly	
36A	Coil No. 1 (540-1030 K. C.)	32-3042
36B	Coil No. 2 (650-1100 K. C.)	32-3042
36C	Coil No. 3 (650-1100 K. C.)	32-3042
36D	Coil No. 4 (740-1240 K. C.)	32-3041
36E	Coil No. 5 (1160-1600 K. C.)	32-3041
37	Push-Button Switch	42-1527
38	Wave Switch	42-1516



ELECTRIC AUTOMATIC PUSHBUTTON UNIT

FIG. 2.

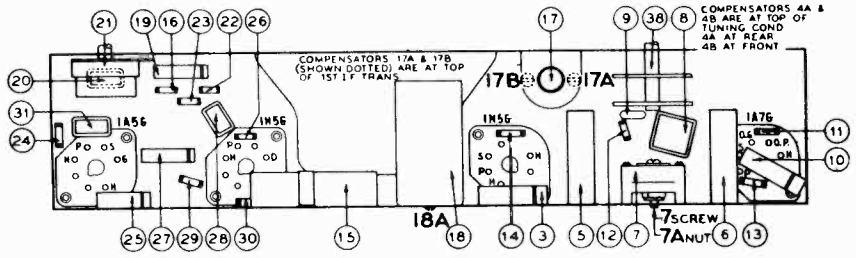


FIG. 3.

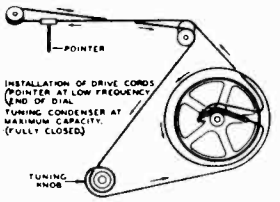


FIG. 1.
INSTALLATION OF DRIVE CORD.

MISCELLANEOUS PARTS

DESCRIPTION	PART No.
Bezel (Dial)	56-1453
Bezel (Push-Buttons)	56-1455
Cabinet	103938
Clip (Coil Mounting)	28-5002
Dial	27-5539
Dial Tab	27-5524
Drive Cord Assembly	31-2405
Knob Ass'y. (Vol., Tuning, Wave switch)	27-4329
Knob Assembly (Push-Buttons)	27-4824
Pointer	56-1464
Speaker	36-1410
Spring (Drive Cord Assembly)	28-8913
Spring (Flag Assembly Mounting)	28-8949
Spring (Locking, Flag Drive and Flag Assembly Mounting)	28-8498
Socket (6 prong)	27-6086
Socket (7 prong)	27-6087
Socket (7 prong, type 1A7G tube)	27-6099
Socket (Speaker)	27-6115
Screw (Push-Button Bezel Mounting)	W-1834FG2
Screw (Bezel Mounting)	W-1836FG2
Tab Kit	40-6472
Tuning Shaft Assembly	31-2395

AUGUST, 1939.

MODEL 40-110
Alignment, Notes

PHILCO RADIO & TELEV. CORP.

SPECIFICATIONS

TYPE OF CIRCUIT: Model 40-110 is a four tube battery operated superheterodyne receiver with electric push-button tuning. In addition other features of design are: Low current drain tubes, new high sound output speaker, specially designed tone chamber, two tuning ranges, automatic volume control, and pentode audio output.

The receiver is equipped with six electric tuning push-buttons for automatically selecting stations. Five of the push-buttons are used for broadcast stations and one for selecting dial tuning. The procedure for adjusting the push-buttons will be found in the instructions supplied with each set.

TUNING RANGES: 540 to 1630 K. C. 5.4 to 18.0 M. C.

INTERMEDIATE FREQUENCY: 455 K. C.

PHILCO TUBES USED: One 1A7G, Converter; one 1N5G, I. F. Amplifier; one 1H5G, 2nd Detector, A. V. C. 1st Audio; one 1A5G, Audio Output.

PHILCO BATTERIES: One Type P-60D-11L.

BATTERY DRAIN: "A" 200 M. A. "B" 7.2 M. A.

CABINET DIMENSIONS:

	Height	Width	Depth
40-110K	37½	26¾	11½
40-110B	17½	17½	9½

AERIAL AND GROUND: To obtain maximum operating performance with this model, Philco Farm Radio Aerial Part No. 40-6383 is recommended and a good ground source such as a water pipe.

ALIGNMENT OF COMPENSATORS

EQUIPMENT REQUIRED

Signal Generator covering a frequency range of 115 K. C. to 36 M. C. such as Philco Model 077.

Aligning Indicator: A vacuum tube voltmeter or audio output meter such as contained in Philco Models 027 and 028 circuit testers. Either of these meters can be used to align the receiver and are connected as given below.

Tools: Aligning screw driver Part No. 45-2610.

CONNECTING ALIGNING METERS

Audio Output Meter: The audio output meter is connected to the plate and screen terminals of the 1A5G tube. Adjust the meter for the 0 to 30 volt A. C. scale.

Vacuum Tube Voltmeter: To use the vacuum tube voltmeter as an aligning indicator it should be connected to the A. V. C. circuit as follows: Connect the negative (—) terminal of the voltmeter through a 2 meg. resistor to any point in the A. V. C. circuit where voltage can be obtained. The positive (+) terminal is connected to the receiver chassis.

After connecting the aligning meter, adjust the compensators in the order as shown in the tabulation below.

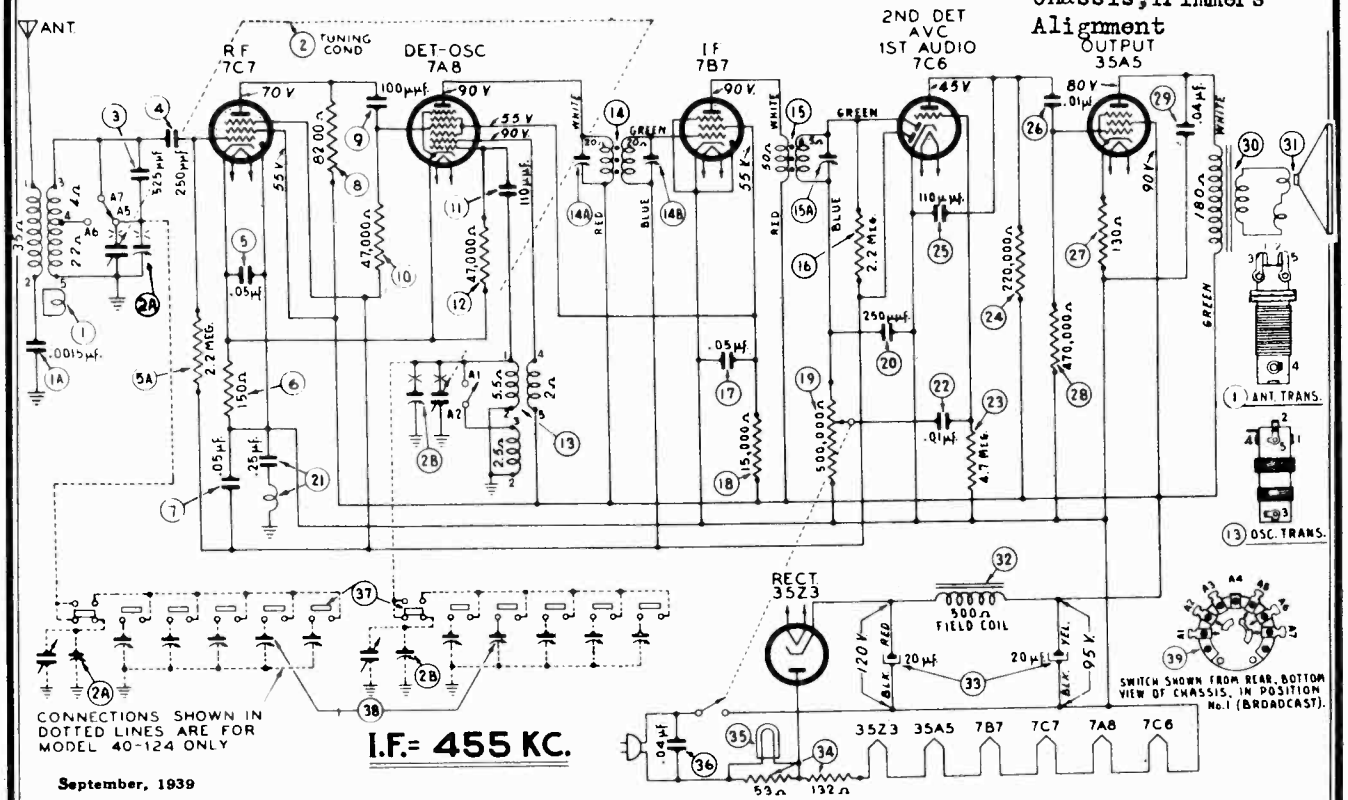
Operations in Order	SIGNAL GENERATOR			RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dummy Antenna	Dial Setting	Dial Setting	Control Setting	Adjust Padders	
1	Aerial	Note A	455 K. C.	580 K. C.	Vol. Max. Range Switch "Brdcst"	18A, 17A, 17B	Manual Push-button "IN"
2	Aerial	400 ohms	18 M. C.	18 M. C.	Vol. Max. Range Switch "S. W."	4A	Note B
3	Aerial	225 mmfd.	1500 K. C.	1500 K. C.	Range Switch "Brdcst"	7 screw, 4B	Note E
4	Aerial	225 mmfd.	580 K. C.	580 K. C.	Range Switch "Brdcst"	7A (nut)	Roll Tuning Condenser
5	Aerial	400 ohms	1500 K. C.	1500 K. C.	Range Switch "Brdcst"	7 screw	

NOTE A — The "Dummy Antenna" consists of a condenser connected in series with the signal generator output lead (High side). Use the capacity or resistance as specified in each step of the above procedure.

NOTE B — DIAL CALIBRATION: In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser. To do this, proceed as follows: Turn the tuning condenser to the maximum capacity position (plates fully meshed). With the condenser in this position, the tuning pointer is set horizontal at the low frequency end of the scale (530 K. C.).

PHILCO RADIO & TELEV. CORP.

MODELS 40-115, 40-124
Code 121
Schematic, Voltage
Chassis, Trimmers
Alignment



September, 1939

SCHE. No.	DESCRIPTION	PART No.
1	Antenna Transformer (Model 40-115)	32-3303
	Antenna Transformer (Model 40-124)	32-3321
1A	Tubular Condenser (.0015 mfd.)	30-4555
2	Tuning Condenser (Model 40-115)	31-2425
	Tuning Condenser (Model 40-124)	31-2426
3	Mica Condenser (525 mmfd.)	30-1142
4	Mica Condenser (250 mmfd.)	61-0033
5	Tubular Condenser (.05 mfd.)	30-4519
5A	Resistor (2.2 meg., ½ watt)	33-522339
6	Resistor (150 ohms, ½ watt)	33-115336
7	Tubular Condenser (.05 mfd.)	30-4519
8	Resistor (8200 ohms, ½ watt)	33-282339
9	Mica Condenser (100 mmfd.)	30-1128
10	Resistor (47,000 ohms, ½ watt)	33-347339
11	Mica Condenser (110 mmfd.)	30-1130
12	Resistor (47,000 ohms, ½ watt)	33-347339
13	Oscillator Trans. (Model 40-115)	32-3255
	Oscillator Trans. (Model 40-124)	32-3256
14	1st I. F. Transformer Assembly	32-3237
15	2nd I. F. Transformer Assembly	32-3238
16	Resistor (2.2 meg., ½ watt)	33-522339
17	Tubular Condenser (.05 mfd.)	30-4519
18	Resistor (15,000 ohms, ½ watt)	33-315339
19	Volume Control and On-Off Switch	33-5306
20	Mica Condenser (250 mmfd.)	30-1074
21	Choke and Condenser Assembly (.25 mfd.)	38-9956
22	Tubular Condenser (.01 mfd.)	30-4479
23	Resistor (4.7 meg., ½ watt)	33-547339
24	Resistor (220,000 ohms, ½ watt)	33-422339
25	Mica Condenser (110 mmfd.)	30-1130
26	Tubular Condenser (.01 mfd.)	30-4572
27	Resistor (130 ohms, ½ watt)	33-113336
28	Resistor (470,000 ohms, ½ watt)	33-447339
29	Tubular Condenser (.04 mfd.)	30-4119
30	Output Transformer	
	(Speaker Part No. 36-1469-1)	32-8047
	(Speaker Part No. 36-1469-9)	32-8044
31	Cone and Voice Coil Assembly	
	(Speaker Part No. 36-1469-1)	36-4115
	(Speaker Part No. 36-1469-9)	36-4113
32	Field Coil (Replace Speaker Part No. 36-1469)	30-2403
33	Electrolytic Condenser (20-20 mfd.)	33-3375
34	Filament Resistor	34-2068
35	Pilot Lamp	30-4119
36	Tubular Condenser (.04 mfd.)	

SCHE. No.	DESCRIPTION	PART No.
37	Pushbutton Switch (Model 40-124)	42-1512
38	Padder Strip (Model 40-124)	31-6312
39	Wave Switch	42-1505

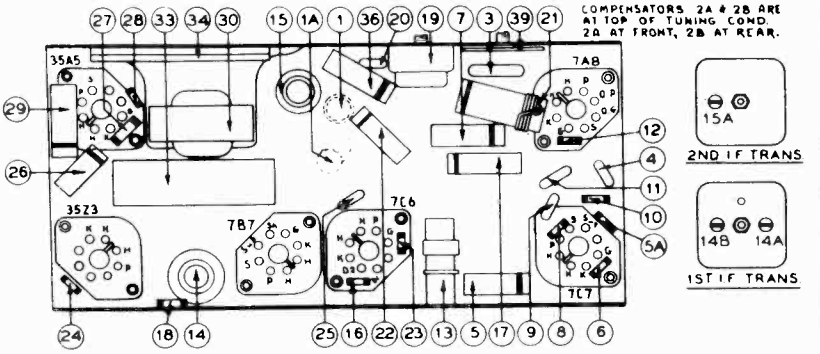
MISCELLANEOUS PARTS

Cable and Plug (Power Supply)	L-3199
Cabinet (Model 40-115)	10432A
Clip (Coil Mounting)	28-5002
Dial	27-5517
Drive Cord Assembly	31-2387
Drive Shaft Assembly	31-2370
Knobs (Volume, Tuning, Wave Switch)	27-4809
Pilot Lamp Socket Assembly	38-9825
Pointer (Dial)	27-4868

SCHE. No.	DESCRIPTION	PART No.
	Pointer (Knob)	27-9521
	Spring (Drive Cord Assembly)	28-8954
	Speaker Assembly	36-1469
	Sockets (Loktal)	55-0575

MISCELLANEOUS PARTS
MODEL 40-124

Cabinet	10433A
Knobs (Pushbutton)	27-4824
Tab (Dial)	27-5528
Tab (Television)	27-9450
Tab Kit	40-6473



MODELS 40-115, 40-124 PART LOCATIONS, UNDERSIDE OF CHASSIS.

SIGNAL GENERATOR — RECEIVER

Operations in Order	Output Connections to Receiver	Dummy Antenna	Dial Setting	Dial Setting	Control Settings	Adjust Padders	SPECIAL INSTRUCTIONS
1	7A8 Grid	.004	455 K. C.	580 K. C.	Vol. Max. Range Switch "Brdcst"	15A, 14A, 14B	Manual Pushbutton "IN" Model 40-124
2	Aerial	100 mmfd.	1580 K. C.	1580 K. C.	Range Switch "Brdcst"	(2B)	Note B, Note C
3	Aerial	100 mmfd.	1500 K. C.	1500 K. C.	Range Switch "Brdcst"	(2A)	

NOTE B — DIAL CALIBRATION: In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser. To do this, proceed as follows: Turn the tuning condenser to the maximum capacity position (plates fully meshed). With the condenser in this position, the tuning pointer is set horizontal at the low frequency end of the scale (530 K. C.).

NOTE C — Compensators 2A and 2B are on top of the Tuning Condenser. 2A at the front, 2B at the rear.

MODEL 40-81(121,122)
MODEL 40-88(121)
MODELS 40-140,40-145,
40-507

PHILCO RADIO & TELEV. CORP.

Alignment

Models 40-140, 40-145, 40-507.

ALIGNMENT OF COMPENSATORS

EQUIPMENT REQUIRED

1. **Signal Generator** with a frequency range from 115 to 36,000 K. C., such as Philco Model 077.

2. **Aligning Indicator,** Philco Model 027 or 028, vacuum tube voltmeter and circuit tester incorporates sensitive audio output meters and vacuum tube voltmeters. Either of these instruments can be used as an aligning indicator.

3. **Fibre Handle Screw Driver,** Philco Part No. 45-2610. When using the vacuum tube voltmeter for aligning the receiver, an aligning adaptor Part No. 45-2767 is required.

CONNECTING ALIGNING METERS

1. **Audio Output Meter:** If the Philco Models 027 and 028 audio output meters are used, they are connected to the speaker voice coil terminals or the plate and screen terminals of the 7B5 tube. Adjust the meter to use the 0 to 10 volt A. C. scale.

2. **Vacuum Tube Voltmeter:** To use the vacuum tube voltmeter as an aligning indicator make the following connections:

Adjusting I. F. Circuit: Remove the 1232 R. F. tube from its socket and insert the aligning adaptor, then replace the tube in the adaptor. Connect the negative terminal of the vacuum tube voltmeter to the light colored wire which protrudes from the side of the adaptor. Attach the positive terminal of the vacuum tube voltmeter to the black wire of the adaptor.

Adjusting R. F. Circuit: To adjust the R. F. circuit, the aligning adaptor is inserted in the 7C6 second detector tube socket. The vacuum tube voltmeter remains connected to the adaptor as given in the paragraph above. With the voltmeter connected in this manner, a very sensitive indication of the A. V. C. voltage is obtained when the padders are adjusted.

After connecting the aligning adaptors, adjust the compensators as shown in the tabulation below. Locations of the compensators are shown in Schematic Diagram. If the aligning meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.

Operations in Order	SIGNAL GENERATOR		RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections	Dial Setting	Dial Setting	Control Settings	Adjust Compensators	
1	No. 1 Ter. on Loop Panel Note B	455 K. C.	580 K. C.	Vol. Cont. Max. Range Switch "Brdcst"	33A, 33B, 28A, 28B	Dial Push-Button "In" Model 40-145
2	Use Loop, Note C	18.0 M. C.	18.0 M. C.	Vol. Cont. Max. Range Switch "S.W."	27A, 2A, Note D	Check Image at 17.090 K. C.
3	Use Loop, Note C	1500 K. C.	1500 K. C.	Range Switch "Brdcst"	25A, 1A	Note A
4	Use Loop, Note C	580 K. C.	580 K. C.	Range Switch "Brdcst"	25	Roll Tuning Condenser
5	Use Loop, Note C	1500 K. C.	1500 K. C.	Range Switch "Brdcst"	25A, 2A	
6	Use Loop, Note C	18.0 M. C.	18.0 M. C.	Range Switch "S.W."	2A, Note D	Roll Tuning Condenser & Adjust Padder to First Peak from Tight Position

NOTE A — DIAL CALIBRATION: In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser. To do this, proceed as follows: Turn the tuning condenser to the maximum capacity position (plates fully meshed). With the condenser in this position, set the tuning pointer on the extreme left index line at the low frequency end of the broadcast scale.

NOTE B — When adjusting the I. F. padders the high side of the signal generator output is connected through a .1 mfd. condenser to terminal No. 1 of the loop terminal panel at the rear of the chassis. The ground or low side of the generator is connected to the chassis of the receiver.

NOTE C — When aligning the R. F. Circuits a loop is made from a few turns of wire and connected to the generator output terminals; the signal generator is then placed two or three feet from the loop in the cabinet.

NOTE D — S. W. Oscillator compensator (27A) is located on top of the tuning condenser. Antenna compensators (1A) and (2A) are located on the loop. When adjusting the "Ant" compensators, the receiver loop should be held in place against the back of the cabinet.

Models 40-81, Codes 121, 122

Operations in Order	SIGNAL GENERATOR		RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dial Setting	Dial Setting	Control Setting	Adjust Compensators	
1	See Paragraph on Signal Generator above	455 K. C.	580 K. C.	Vol. Max.	17A, 9B, 9A	See Paragraph on Signal Generator above
2	Use Loop on Generator	1500 K. C.	1500 K. C.	Vol. Max.	8B, 8A	Padder location Fig. 1 Note A

Model 40-88, Code 121

1	See Signal Generator Paragraph above	455 K. C.	580 K. C.	Vol. Max.	21A, 20B, 20A	
2	Use Loop on Generator	18 M. C.	18 M. C.	Vol. Max. Range Switch "S. W."	8B	Note A
3	Use Loop	1400 K. C.	1400 K. C.	Range Switch "Brdcst"	12, Screw, 8A	
4	Use Loop	580 K. C.	580 K. C.	Range Switch "Brdcst"	12A, Nut	Roll Tuning Condenser
5	Use Loop	1400 K. C.	1400 K. C.	Range Switch "Brdcst"	12, Screw, 8A	
6	Use Loop	18 M. C.	18 M. C.	Range Switch "S. W."	3	See Paragraph on Signal Generator above

NOTE A — DIAL CALIBRATION: Before adjusting the R. F. padders the dial must be aligned to track properly with the tuning condenser. To adjust the dial proceed as follows: With the tuning condenser in the closed position (maximum capacity) set the dial pointer on the small dot below 550 K. C.

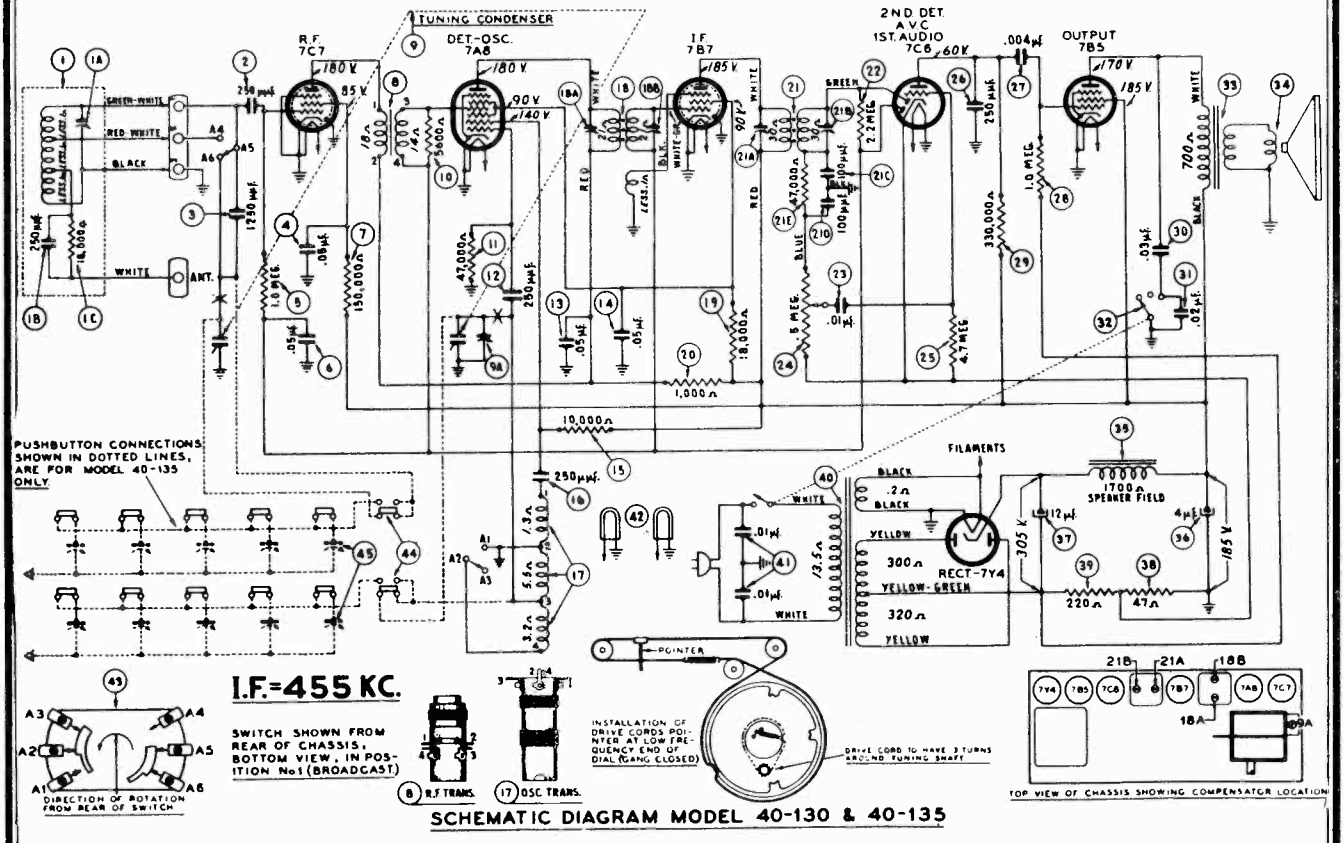
BATTERY CURRENT: "A" Battery, 200 M. A. Model 40-81 "B" Battery, 5.6 M. A.

BATTERY CURRENT: "A" Battery, 250 M. A. Model 40-88 "B" Battery, 8 M. A.

MODELS 40-503, 40-506,
MODEL 40-525
Chassis, Tuner

PHILCO RADIO & TELEV. CORP.

MODELS 40-130, 40-135
Schematic, Voltage, Tuner
Chassis, Trimmers



SCHEMATIC DIAGRAM MODEL 40-130 & 40-135

JUNE, 1939.

Replacement Parts — Models 40-130 and 40-135

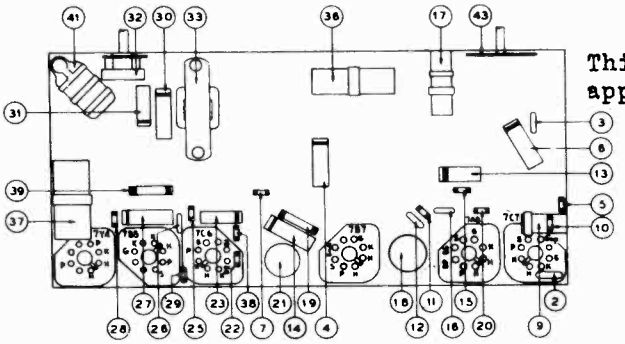
SCHE. No.	DESCRIPTION	PART No.
1	Loop Assembly	38-9891
1A	Compensator	31-6318
1B	Mica Cond. (250 mmfd.)	61-0033
1C	Resistor (10,000 ohms, ½ watt)	33-310339
2	Mica Cond. (250 mmfd.)	61-0033
3	Mica Cond. (1250 mmfd.)	5886
4	Tubular Cond. (.05 mfd.)	30-4518
5	Resistor (1.0 meg., ½ watt)	33-510339
6	Tubular Cond. (.05 mfd.)	30-4518
7	Resistor (150,000 ohms, ½ watt)	33-415339
8	R. F. Transformer	32-3283
9	Tuning Condenser	31-2374
10	Resistor (5600 ohms, ½ watt)	33-256339
11	Resistor (47,000 ohms, ½ watt)	33-347339
12	Mica Cond. (250 mmfd.)	61-0033
13	Tubular Cond. (.05 mfd.)	30-4518
14	Tubular Cond. (.05 mfd.)	30-4518
15	Resistor (10,000 ohms, ½ watt)	33-310339
16	Mica Cond. (250 mmfd.)	61-0033
17	Oscillator Transformer	32-3212
18	1st I. F. Trans. Assy.	32-3210
19	Resistor (18,000 ohms, 1 watt)	33-318439
20	Resistor (1,000 ohms, ½ watt)	33-210339
21	2nd I. F. Trans. Assy.	32-3281
22	Resistor (2.2 meg., ½ watt)	33-522339
23	Tubular Cond. (.01 mfd.)	30-4572
24	Volume Control (.5 meg.)	33-5332
25	Resistor (4.7 meg., ½ watt)	33-547339
26	Mica Cond. (250 mmfd.)	61-0033
27	Tubular Cond. (.004 mfd.)	30-4578
28	Resistor (1.0 meg., ½ watt)	33-510339
29	Resistor (330,000 ohms, ½ watt)	33-433339
30	Tubular Cond. (.03 mfd.)	30-4449
31	Tubular Cond. (.02 mfd.)	30-4481
32	Tone Control and On-Off Switch	42-1820
33	Output Transformer	32-8063
34	Cone and Voice Coil Assy. (Spkr. Part No. 36-1478-3)	36-4085
35	Field Coil (Replace Spkr. Part No. 36-1478)	
36	Electrolytic Cond. (4 mfd., 400 V.)	30-2401
37	Electrolytic Cond. (12 mfd., 400 V.)	30-2409
38	Resistor (47 ohms, ½ watt)	33-047331
39	Resistor (220 ohms, 1 watt)	33-122431
40	Power Trans. (115 V., 50-60 cycles)	32-8064
41	Bakelite Cond. (.01-.01 mfd.)	3903-DG
42	Pilot Lamps	34-2064
43	Wave Switch	42-1494
44	Pushbutton Switch (Model 40-135 only)	42-1828
45	Padder Strip (Model 40-135 only)	31-6315

MISCELLANEOUS PARTS

Cabinet (Model 40-130)	103944
Cabinet (Model 40-135)	103942
Cable and Plug (Power Supply)	L-3199

SCHE. No.	DESCRIPTION	PART No.
	Clip (R. F. and Osc. Trans. Mtg.)	28-8002
	Dial	27-5506
	Drive Cord Assy. (Pointer)	31-2399
	Drive Cord Assy. (Tuning Cond.)	31-2400
	Escutcheon (Pushbutton) (Model 40-135)	28-5742
	Escutcheon Pin (Model 40-135)	W-1074
	Insulating Bushing (Insulate Drive Shaft)	27-9437
	Knobs (Tuning, Tone, Volume and Wave Switch)	27-4332
	Knobs (Pushbutton, Model 40-135)	27-4824
	Pilot Lamp Socket Assy.	38-9904
	Pointer	56-1532

SCHE. No.	DESCRIPTION	PART No.
	Rubber Bushing (Tuning Cond. Drive)	27-9432
	Spring (Drive Cord, Tuning Cond.)	28-8791
	Spring (Drive Cord, Pointer)	28-8993
	Spring (Tuning Shaft Assy.)	28-8885
	Speaker	36-1478
	Socket (Loktal, all tubes)	55-0575
	Tuning Shaft	56-6052
	Tuning Drive Drum Assy.	38-9883
	Tab (Dial, Model 40-135)	27-8526
	Tab (Television, Model 40-135)	27-9450
	Tab Kit (Model 40-135)	40-6473
	Washer "C" Type, Tuning Shaft)	28-2043



This parts layout applies to Models 40-130, 40-135, 40-503, 40-506, and 40-525.

FIG. 1. PART LOCATIONS, UNDERSIDE OF CHASSIS.

Model 40-130 is dial tuned and assembled in cabinet type "T"

*Model 40-135 is equipped with six electric push buttons for automatically selecting stations in addition to dial tuning. Five push buttons are used for stations one of which can be used in combination with Special type PHILCO TELEVISION receivers for reception of television sound programs. The sixth push button selects dial tuning. The push buttons in this model cover frequency ranges as follows:

540 to 1030 K. C.	740 to 1300 K. C.
650 to 1100 K. C.	900 to 1470 K. C.
1160 to 1600 K. C.	

The procedure for adjusting the push buttons for reception of stations is similar to the method described in volume ten the only difference being that the frequency range of each button is different.

Philco television sets and record players contain instructions for setting up and adjusting the push-button in model 40-135.

TUNING RANGES: 540 to 1550 K. C.; 1.5 to 3.3 M. C.

INTERMEDIATE FREQUENCY: 455 K. C.

POWER SUPPLY: 115 volts A. C., 60 cycles.

POWER CONSUMPTION: 35 watts.

See Philco page 10-16.

*NOTE: Push button data and tuning ranges apply for Models 40-503, 40-506 and 40-525 also.

MODELS 40-130,40-135
MODEL 40-165
MODELS 40-503,40-506
MODEL 40-525

PHILCO RADIO & TELEV. CORP.

Alignment

40-503, 40-506,40-130, 40-135, 40-525

ALIGNMENT OF COMPENSATORS

EQUIPMENT REQUIRED

(1) **Signal Generator:** Philco Model 077 Signal Generator which has a fundamental frequency range from 115 to 36,000 K. C. is the correct instrument for this purpose.

(2) **Aligning Indicator:** Philco Models 027 or 028 Vacuum Tube Voltmeters and Circuit Testers incorporate sensitive vacuum tube voltmeters and audio output meters and are recommended.

(3) Philco Fiber Handle Screw Driver, Part No. 45-2610. Aligning adaptor Part No. 45-2767, when using the vacuum tube voltmeter for alignment.

CONNECTING ALIGNING METERS

Audio Output Meter: Philco Model 027 or 028 Audio Output Meters is connected to the voice coil terminals of the speaker or the plate and screen of the 7B5 tube and adjusted for the 0 to 10 volt A. C. scale.

Vacuum Tube Voltmeter: To use the Vacuum Tube Voltmeter as an alignment indicator make the following connections:

(1) **Adjusting I. F. Circuit:** Remove the 7C7 R. F. tube from its socket and insert the aligning adaptor, then replace the tube in the adaptor. Connect the negative terminal of the vacuum tube voltmeter to the light colored wire which protrudes from the side of the adaptor. Attach the positive terminal of the vacuum tube voltmeter to the black wire of the adaptor.

(2) **Adjusting R. F. Circuit:** To adjust the R. F. circuit, the aligning adaptor is inserted in the 7C6 second detector tube socket. The vacuum tube voltmeter remains connected to the adaptor as given in the paragraph above. With the voltmeter connected in this manner a very sensitive indication of the A. V. C. voltage is obtained when the padders are adjusted.

After connecting the aligning adaptors, adjust the compensators as shown in the tabulation below. Locations of the compensators are shown in Fig. 1. If the output meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.

Operations in Order	SIGNAL GENERATOR		RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dial Setting	Dial Setting	Control Settings	Adjust Compensators in Order	
1	No. 1 Ter. on Panel Note B	455 K. C.	580 K. C.	Vol. Cont. Max. Range Switch "Brdcst"	21B, 21A, 18B, 18A	Dial Push-Button "In" Model 40-125
2	Loop Note C	1500 K. C.	1500 K. C.	Vol. Cont. Max. Range Switch "Brdcst"	9A, 1A Note D	Note A

NOTE A — DIAL CALIBRATION: In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser. To do this, proceed as follows: Turn the tuning condenser to the maximum capacity position (plates fully meshed). With the condenser in this position, set the tuning pointer on the extreme left index line at the low frequency end of the broadcast scale.

NOTE B — When adjusting the I. F. padders the high side of the signal generator output is connected through a .1 mfd. condenser to terminal No. 1 of the loop terminal panel at the rear of the chassis. The ground or low side of the generator is connected to the chassis of the receiver.

NOTE C — When aligning the R. F. a loop is made from a few turns of wire and connected to the signal generator output terminals; the signal generator is then placed two or three feet from the loop in the cabinet.

NOTE D — Oscillator compensator (9A) is located on top of the tuning condenser. Antenna compensator (1A) is located on the loop. When adjusting the "ANT" compensators the receiver loop should be held in place against the back of the cabinet.

Model 40-165

Signal Generator: When adjusting the I. F. padders, the high side of the signal generator is connected through a .1 mfd. condenser to terminal No. 1 of the loop terminal panel at the rear of the chassis. The ground or low side of the signal generator is connected to the chassis of the receiver.

When aligning the R. F. padders a loop antenna is made from a few turns of wire and connected to the signal generator output terminals; the generator is then placed two or three feet from the loop in the cabinet. Do not remove the receiver loop from the cabinet. It is necessary when adjusting the padders, that the receiver be left in the cabinet.

Operations in Order	SIGNAL GENERATOR		RECEIVER			Special Instructions
	Output Connections to Receiver	Frequency Setting	Dial Setting	Control Settings	Adjust Compensators	
1	High Side to No. 1 Ter. Loop Panel	455 K. C.	580 K. C. No Signal	Range Switch "Brdcst." Vol. Max. Dial Push-Button "In"	37A, 37B, 34A, 34B	See paragraph on signal generator above
2	Use Loop on Generator	18.0 M. C.	18.0 M. C.	Range Switch "SW"	61A	Note A. Image should be 910 K.C. below 18 M.C.
3	Use Loop on Generator	1500 K. C.	1500 K. C.	Range Switch Brdcst.	26, 25	
4	Use Loop on Generator	580 K. C.	580 K. C.	Range Switch Brdcst.	26A	Roll tuning condensor
5	Use Loop on Generator	1500 K. C.	1500 K. C.	Range Switch Brdcst.	26, 25	
6	Use Loop on Generator	18.0 M. C.	18.0 M. C.	Range Switch "SW"	2A	Note B, Note C

NOTE A — DIAL CALIBRATION: In order to adjust the receiver correctly the dial must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows: With the tuning condenser closed (maximum capacity), set the dial pointer on the extreme left index line at the low frequency end of the broadcast scale. The arrangement of the drive cable in this position is shown in Schematic Diagram.

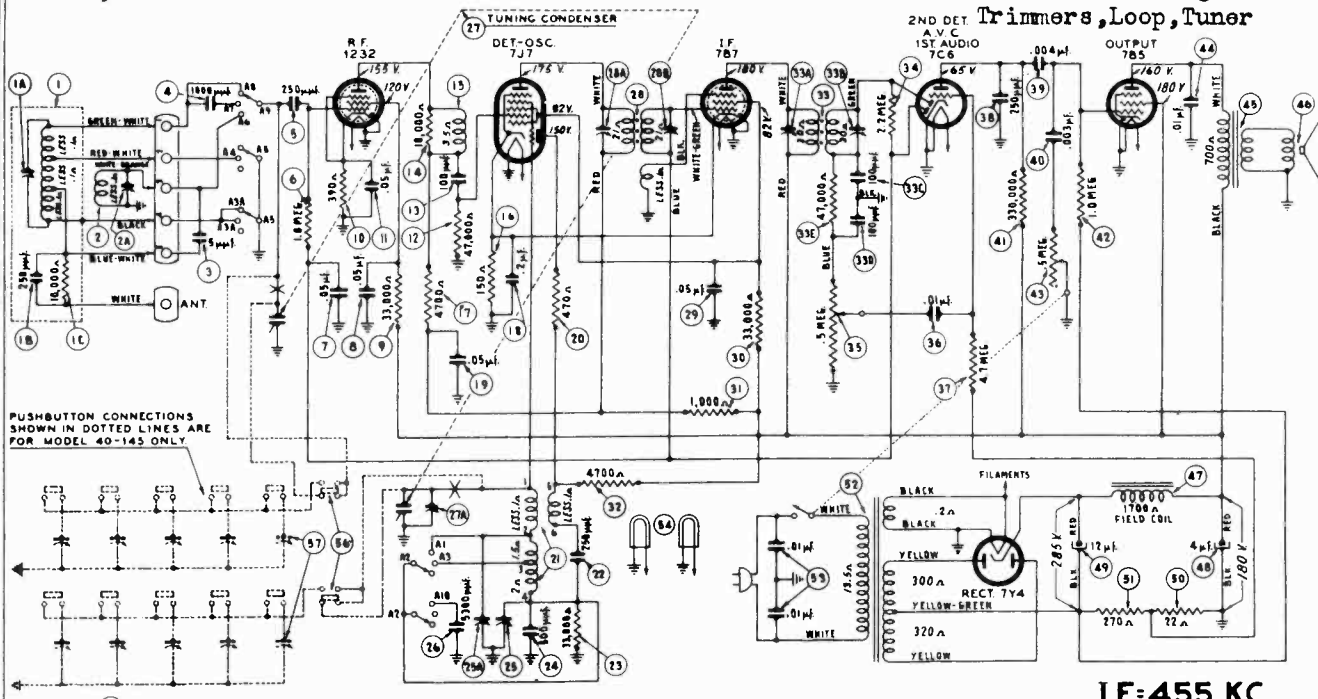
NOTE B — Turn loop padder to closed position (maximum capacity), then adjust to the first signal peak from this position; at the same time roll the tuning condenser. See Note C.

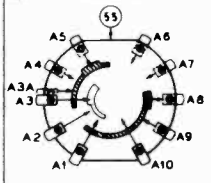
NOTE C — When adjusting the low frequency compensator of Range One (Broadcast) or the antenna compensators of the high frequency tuning ranges: the receiver Tuning Condenser must be adjusted (rolled) as follows: First tune the compensator for maximum output, then vary the tuning condenser of the receiver for maximum output. Now turn the compensator slightly to the right or left. Continue turning compensator in the direction that gives greatest signal and again vary the receiver tuning condenser for maximum output. This procedure of first setting the compensator and then varying the tuning condenser is continued until there is no further gain in output reading.

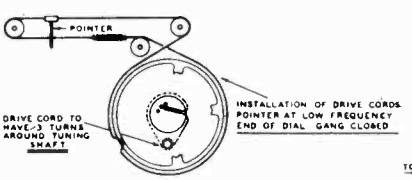
MODEL 40-507
Tuner, Chassis

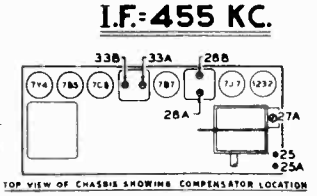
PHILCO RADIO & TELEV. CORP.

MODELS 40-140, 40-145
Schematic, Voltage, Chassis
Trimmers, Loop, Tuner









Replacement Parts

SCHE. No.	DESCRIPTION	PART No.
1	Loop Assembly (Broadcast)	38-9892
1A	Compensator	31-6318
1B	Mica Cond. (250 mmfd.)	61-0033
1C	Resistor (10,000 ohms, ½ watt)	33-310339
2	Loop Assembly (Short Wave)	38-9893
2A	Compensator	31-6320
3	Mica Cond. (5 mmfd.)	30-1097
4	Mica Cond. (1000 mmfd.)	30-1103
5	Mica Cond. (250 mmfd.)	61-0033
6	Resistor (1.0 meg., ½ watt)	33-510339
7	Tubular Cond. (.05 mfd.)	30-4518
8	Tubular Cond. (.05 mfd.)	30-4518
9	Resistor (33,000 ohms, ½ watt)	33-333339
10	Resistor (390 ohms, ½ watt)	33-139331
11	Tubular Cond. (.05 mfd.)	30-4518
12	Resistor (47,000 ohms, ½ watt)	33-347339
13	Mica Cond. (100 mmfd.)	30-1128
14	Resistor (10,000 ohms, ½ watt)	33-310339
15	R. F. Transformer	32-3194
16	Resistor (150 ohms, ½ watt)	33-115331
17	Resistor (4700 ohms, ½ watt)	33-247339
18	Tubular Cond. (.2 mfd.)	30-4536
19	Tubular Cond. (.05 mfd.)	30-4518
20	Resister (470 ohms, ½ watt)	33-147339
21	Oscillator Transformer	32-3195
22	Mica Cond. (250 mmfd.)	61-0033
23	Resistor (33,000 ohms, ½ watt)	33-333339
24	Silver Mica Cond. (500 mmfd.)	30-1138
25	Compensator (2 section)	31-6317
26	Mica Cond. (5300 mmfd.)	30-1134
27	Tuning Condenser	31-2378
28	1st I. F. Trans. Assy.	32-3210
29	Tubular Cond. (.05 mfd.)	30-4518
30	Resistor (33,000 ohms, ½ watt)	33-333339
31	Resistor (1,000 ohms, ½ watt)	33-210339
32	Resistor (4700 ohms, ½ watt)	33-247339
33	2nd I. F. Trans. Assy.	32-3281
34	Resistor (2.2 meg., ½ watt)	33-522339
35	Volume Control (.5 meg.)	33-5319
36	Tubular Cond. (.01 mfd.)	30-4572
37	Resistor (4.7 meg., ½ watt)	33-547339
38	Mica Cond. (250 mmfd.)	61-0033
39	Tubular Cond. (.004 mfd.)	30-4578
40	Tubular Cond. (.003 mfd.)	30-4580
41	Resistor (330,000 ohms, ½ watt)	33-433339
42	Resistor (1.0 meg., ½ watt)	33-510339
43	Tone Control (.5 meg.) & On-Off Switch	33-5333
44	Tubular Cond. (.01 mfd.)	30-4572
45	Output Transformer	32-8063
46	Cone and Voice Coil Assy. (Spkr. Part No. 36-1478-3)	36-4085
47	Field Coil (Replace Spkr. Part No. 36-1478)	27-9526
48	Electrolytic Cond. (4 mfd., 400 V.)	30-2401
49	Electrolytic Cond. (12 mfd., 400 V.)	30-2409
50	Resistor (22 ohms, ½ watt)	33-022331
51	Resistor (270 ohms, 1 watt)	33-127431
52	Power Trans. (115 V., 50-60 cycles)	32-8064

JUNE, 1939.

FOR OTHER DATA SEE INDEX

SCHEMATIC DIAGRAM MODEL 40-140 & 40-145

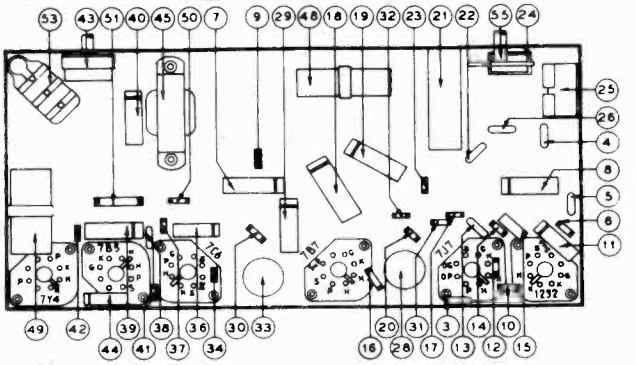


*FIG. 1. PART LOCATIONS, UNDERSIDE OF CHASSIS.

53	Line Condenser (.01-.01 mfd.)	3903-ODG
54	Pilot Lamps	34-2044
55	Wave Switch	42-1495
56	Push Button Switch (Model 40-145 only)	42-1528
57	Padder Strip (Model 40-145 only)	31-6316

MISCELLANEOUS PARTS

DESCRIPTION	PART No.
Cable and Plug Assy. (Power Supply)	L-3189
Cabinet (Model 40-140)	10388A
Cabinet (Model 40-145)	10388B
Clip (Mtg. Osc. Coil)	28-8003
Drive Cord Assy. (Pointer)	31-2399
Drive Cord Assy. (Tuning Cond.)	31-2400
Dial	27-8507
Escutcheon (Pushbuttons, Model 40-145)	28-8742
Escutcheon Pin (Model 40-145)	W-1074
Insulating Bushing (Drive Shaft)	27-9437
Knobs (Tuning, Tone, Vol., Wave Switch)	27-4332
Knobs (Pushbuttons, Model 40-145)	27-4624
Pilot Lamp Socket Assy.	38-8904
Pointer	56-1532
Rubber Bushing (Tuning Cond. Drive)	27-9432
Spring (Tuning, Drive Cord)	28-8751
Spring (Pointer, Drive Cord)	28-8953
Spring (Tuning Shaft Assy.)	28-8955
Speaker	36-1478
Sockets (Loktal Tubes)	55-0575
Tuning Shaft	56-6052
Tuning Drive Drum Assy.	38-9883
Tab (Dial, Model 40-145)	27-5526
Tab (Television, Model 40-145)	27-9450
Tab Kit (Model 40-145)	40-6473
Washer ("C" Type, Tuning Shaft)	28-2043

PHILCO BUILT-IN SUPER AERIAL SYSTEM:

Included in the built-in super aerial system is a statically shielded loop for broadcast band reception and a short wave receiving loop. A feature of the built-in broadcast band statically shielded loop is that the receiver may be turned to the position in which it picks up a minimum amount of interference, or if interference is not present the receiver may be set in the position where best reception is obtained.

In addition, other features of design are: Three tuning ranges; special high gain R. F. stage; Philco high-efficiency Loktal tubes; automatic volume control, tone control and a Beam power audio output stage. In general, these models are similar but differ in their tuning mechanisms and cabinets.

Model 40-140 is dial tuned and assembled in cabinet type "T" (Table model).

* Model 40-145 is equipped with six electric push buttons for automatically selecting stations in addition to dial tuning. Five push buttons are used for stations one of which can be used in combination with special type PHILCO TELEVISION receivers for reception of television sound programs. The sixth push button selects dial tuning.

The procedure for adjusting the push buttons to broadcast stations is the same as that contained in "volume ten."

The frequency coverage of each push button is as follows:

540 to 1030 K. C. 740 to 1300 K. C.
650 to 1100 K. C. 900 to 1470 K. C.
1160 to 1600 K. C.

Philco television sets and record players contain information for adjusting the push button on the 40-145.

*APPLIES TO MODEL 40-507 ALSO

TUNING RANGES: 540 to 1550 K. C. 1.5 to 3.3 M. C. 5.7 to 18.0 M. C.

INTERMEDIATE FREQUENCY: 455 K. C.

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

POWER CONSUMPTION: 38 watts.

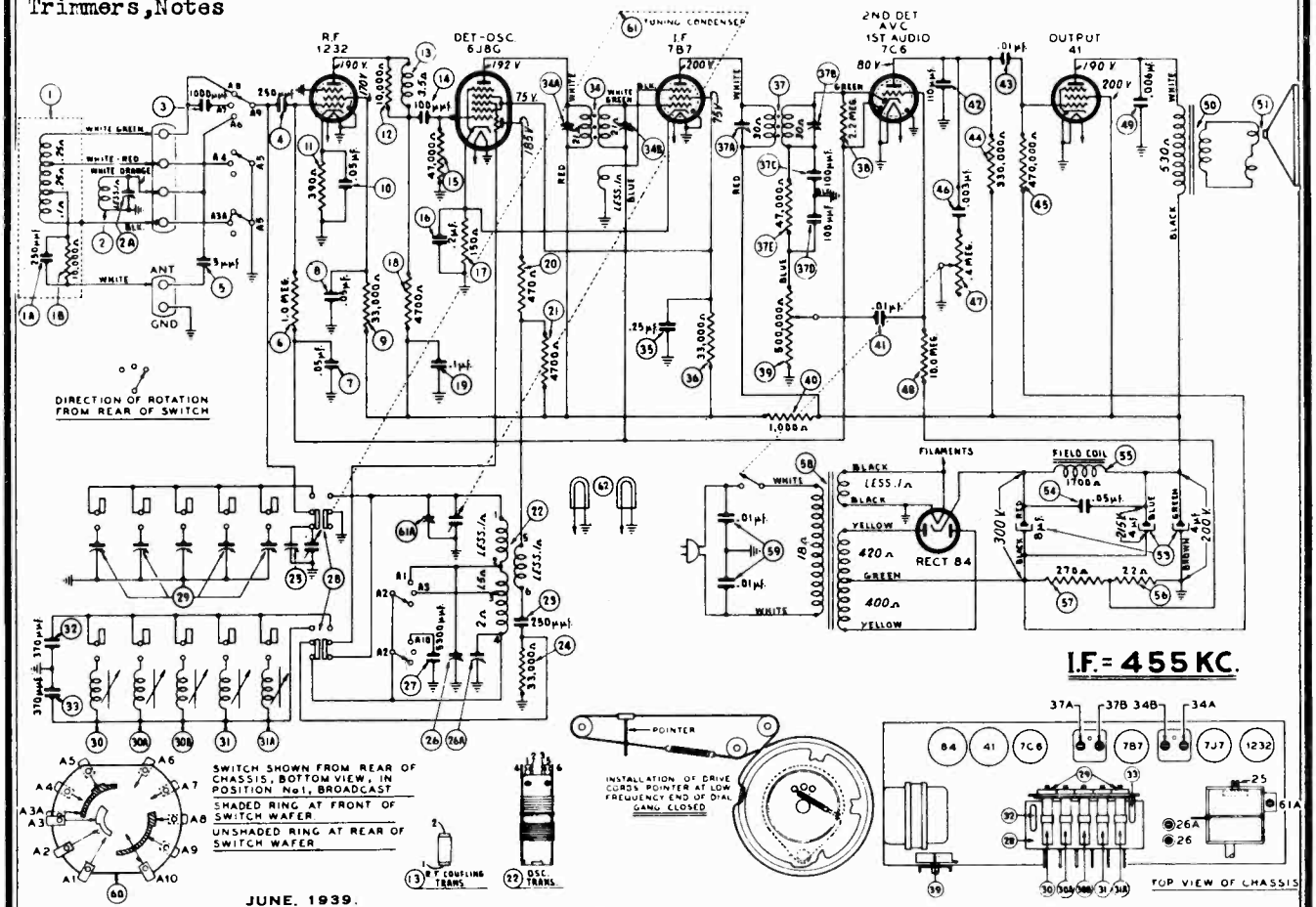
AUDIO OUTPUT: 2 watts.

PHILCO TUBES USED: 1232, R. F.; 7J7, converter; 7B7, I. F.; 7C6, second detector, AVC and first audio; 7B5, audio output and 7Y4, rectifier.

*See Philco page 10-16.

MODEL 40-165
Schematic, Voltage, Chassis
Trimmers, Notes

PHILCO RADIO & TELEV. CORP.



JUNE, 1939.

Replacement Parts — Model 40-165

SCHE. No.	DESCRIPTION	PART No.
1	Loop Assy. (Broadcast)	38-9895
1A	Mica Cond. (250 mmfd.)	61-0033
1B	Resistor (10,000 ohms, ½ watt)	33-310339
2	Loop Assy. (Short Wave)	38-9896
2A	Compensator (Part of S. W. Loop)	
3	Mica Cond. (1000 mmfd.)	30-1063
4	Mica Cond. (250 mmfd.)	61-0033
5	Mica Cond. (5 mmfd.)	30-1143
6	Resistor (1.0 meg., ½ watt)	33-510339
7	Tubular Cond. (.05 mfd.)	30-4519
8	Tubular Cond. (.05 mfd.)	30-4123
9	Resistor (33,000 ohms, ½ watt)	33-333339
10	Tubular Cond. (.05 mfd.)	30-4519
11	Resistor (390 ohms, ½ watt)	33-139339
12	Resistor (10,000 ohms, ½ watt)	33-310339
13	R. F. Coupling Trans.	32-3194
14	Mica Cond. (100 mmfd.)	30-1128
15	Resistor (47,000 ohms, ½ watt)	33-347339
16	Tubular Cond. (.2 mfd.)	30-4587
17	Resistor (150 ohms, ½ watt)	33-115339
18	Resistor (4700 ohms, ½ watt)	33-247339
19	Tubular Cond. (.1 mfd.)	30-4527
20	Resistor (470 ohms, ½ watt)	33-147339
21	Resistor (4700 ohms, ½ watt)	33-247339
22	Osc. Trans.	32-3195
23	Mica Cond. (250 mmfd.)	61-0033
24	Resistor (33,000 ohms, ½ watt)	33-333339
25	Compensator (Single)	31-6308
26	Compensator (2 section)	31-6302
27	Mica Cond. (9300 mmfd.)	30-1134
28	Push Button Switch	42-1493
29	Padder Strip and Bracket Assy.	31-8325
30	Coil No. 1 (540-1000 K.C.)	
30A	Coil No. 2 (650-1100 K.C.)	32-3042
30B	Coil No. 3 (740-1300 K.C.)	
31	Coil No. 4 (900-1500 K.C.)	
31A	Coil No. 5 (1100-1600 K.C.)	32-3041
32	Silver Mica Cond. (370 mmfd.)	30-1110
33	Silver Mica Cond. (370 mmfd.)	30-1110
34	1st I. F. Trans.	32-3210
35	Tubular Cond. (.25 mfd.)	30-4589
36	Resistor (33,000 ohms, ½ watt)	33-333339
37	2nd I. F. Trans.	32-3211
38	Resistor (2.2 meg., ½ watt)	33-522339
39	Volume Control (500,000 ohms)	33-5319
40	Resistor (1000 ohms, ½ watt)	33-210339
41	Tubular Cond. (.01 mfd.)	30-4572
42	Mica Cond. (110 mmfd.)	30-1130
43	Tubular Cond. (.01 mfd.)	30-4572
44	Resistor (330,000 ohms, ½ watt)	33-433339
45	Resistor (470,000 ohms, ½ watt)	33-447339
46	Tubular Cond. (.003 mfd.)	30-4469
47	Tone Control and On-Off Switch (.4 meg.)	33-5333
48	Resistor (10.0 meg., ½ watt)	33-810339
49	Tubular Cond. (.006 mfd.)	30-4504
50	Output Trans.	32-8056
51	Cone and Voice Coil Assy. (Spkr. Part No. 36-1460-3)	36-4086
53	Electrolytic Cond. (4-4-8 mfd.)	30-2400
54	Tubular Cond. (.05 mfd.)	30-4123
55	Field Coil (Replace Spkr. Part No. 36-1480)	
56	Resistor (22 ohms, ½ watt)	33-022331
57	Resistor (270 ohms, 1 watt)	33-127439
58	Power Trans. (110 volt, 60 cycle)	32-8055
59	Line Cond. (.01-.01 mfd.)	3903-DQ
60	Wave Switch	42-1495
61	Tuning Cond.	31-2375
62	Pilot Lamps	34-2064

MISCELLANEOUS PARTS

DESCRIPTION	PART No.
Bezel	27-4842
Cabinet	103988
Cable and Plug (Power Supply)	L-3199
Clip (Coil Mtg.)	28-5003
Dial	27-5507
Drive Cord Assy. (Pointer)	31-2382
Drive Cord Assy. (Tuning Cond.)	31-2400
Escutcheon (Push Button)	27-4843
Insulating Bushing (Insulate Drive Shaft)	27-9437
Knobs (Push Buttons)	27-4824
Knobs (Tuning, Tone, Volume, Wave Switch)	27-4332
Pilot Lamp Socket Assy.	38-9908
Pointer	58-1479
Rubber Hose (Tuning Cond. Drive)	27-9432
Spring (Tuning, Drive Cord)	28-8751
Spring (Pointer, Drive Cord)	28-8953
Spring Drive Shaft, Grounding))	28-8955
Screw (Bezel Mtg.)	W-1834
Speaker	36-1480
Socket (Type 84 Tube)	27-6035
Socket (Type 41 Tube)	27-6036
Socket (Loktal, Type 1232, 7B7, 7C6 Tubes)	27-6131
Socket (Type 6J8G Tube)	27-6120
Tab (Dial)	27-5528
Tab (Television)	27-9491
Tab Kit	40-6474
Tuning Shaft	56-6052
Tuning Drive Drum Assy.	38-9883
Washer ("C" Type, Tuning Shaft)	28-2043

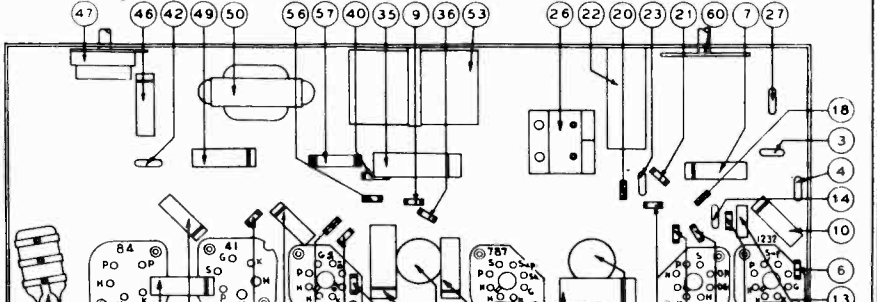


FIG. 1. PART LOCATIONS, UNDERSIDE OF CHASSIS.

PHILCO BUILT-IN SUPER AERIAL SYSTEM:
Included in the built-in super aerial system is a statically shielded loop for broadcast band reception and a short wave receiving loop. The feature of the built-in broadcast band statically shielded loop is that it may be turned to the position in which it picks up a minimum amount of interference, or if interference is not present the loop may be set in the position where best reception is obtained.

POWER SUPPLY: 115 Volts, 25 and 60 Cycle A. C.

POWER CONSUMPTION: 45 watts.

FREQUENCY TUNING RANGES: (Three)
540 to 1550 K. C. 1.5 to 3.5 M. C. 6.0 to 18.0 M. C.

INTERMEDIATE FREQUENCY: 455 K. C.

AUDIO OUTPUT: 2 watts.

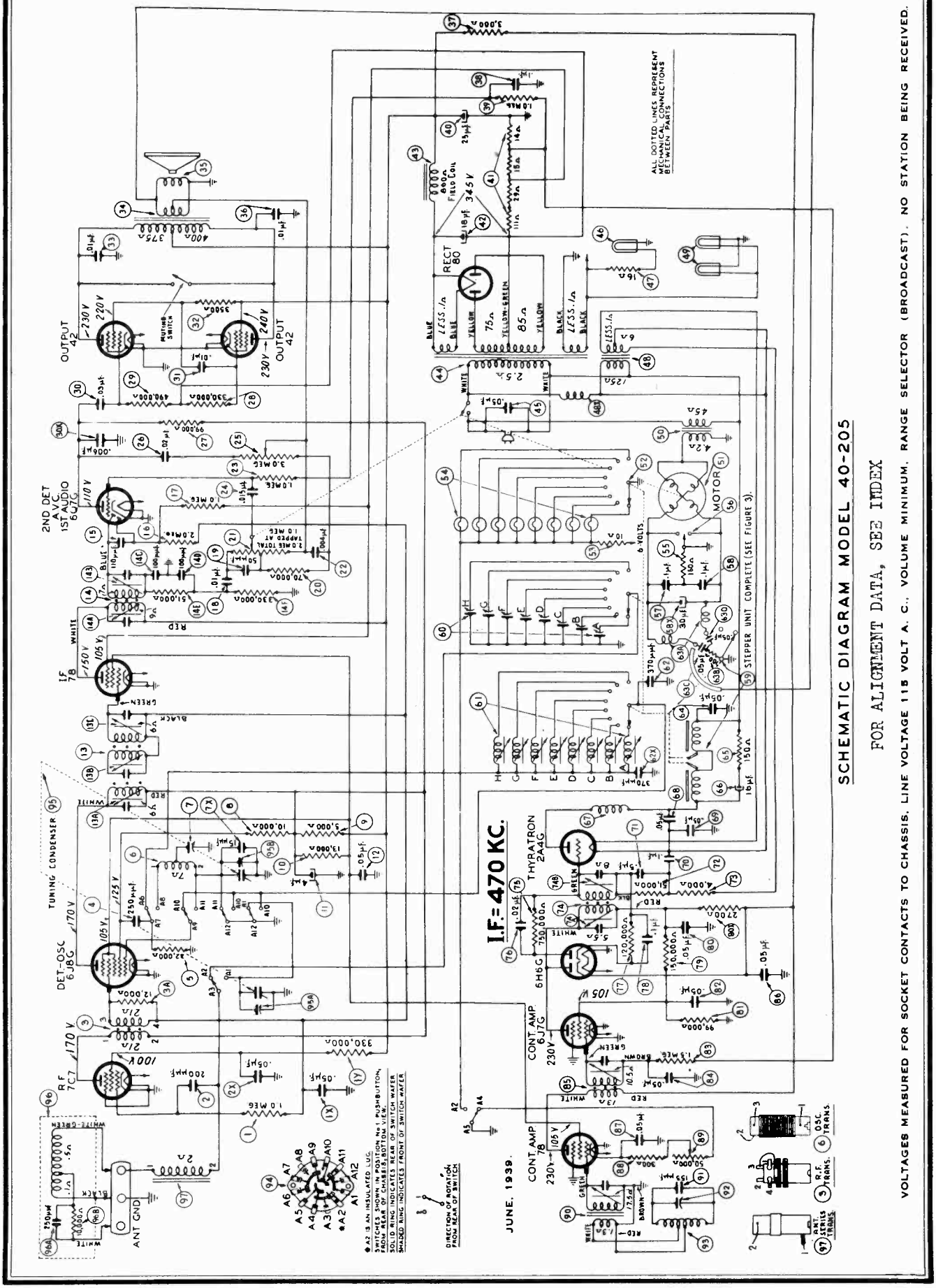
PHILCO TUBES USED: 1232, R. F.; 6J8G, Converter; 7B7, I. F.; 7C6, Second Detector A. V. C. and First Audio; 41, Audio Power Output; 84, Rectifier.

CABINET DIMENSIONS: Type F; Height, 37"; Width, 23¾"; Depth, 9¾".

ADJUSTING ELECTRIC PUSH-BUTTON TUNING:
The procedure for adjusting the electric tuning push-buttons in this model is covered in Vol. X, Philco page 10-16.

PHILCO RADIO & TELEV. CORP.

MODEL 40-205
Schematic, Voltage



MODEL 40-205
MODEL 40-216
MODEL 40-510
MODEL 40-516

PHILCO RADIO & TELEV. CORP.

Models 40-205, 40-216

and MODELS 40-510, 40-516.

Wireless Remote Control Adjustments, Notes

Model 40-205, 510.

TYPE CIRCUIT: Model 40-205, code 121, is a 12-tube wireless remote control and dial tuned receiver employing a superheterodyne circuit for reception of standard broadcast stations. Eight broadcast stations can be automatically tuned in from the remote control unit. The wireless remote control unit also increases and decreases volume and turns off the set without any connections between the receiver and the control unit. This model is also designed to receive the sound of a television program tuned in by Philco Television sets.

PHILCO BUILT-IN SUPER AERIAL SYSTEM:

A new type aerial system which eliminates an outside aerial is also incorporated in this model. Included in the built-in super aerial system is a statically shielded loop for broadcast band reception. The feature of the built-in broadcast band statically shielded loop is that it may be turned to the position in which it picks up a minimum amount of interference or if interference is not present, the loop may be set in the position where best reception is obtained.

In addition, other features of design are automatic volume control, continuously variable tone control, base compensation, degenerated push pull pentode audio output.

POWER SUPPLY: 115 Volts, 50 to 60 Cycles, A. C.

POWER CONSUMPTION: 180 watts. (Model 40-205 only)

TUNING RANGES: 540 to 1600 K. C.

I. F. FREQUENCY: 470 K. C.

PHILCO TUBES USED: Receiver — 7C7, R. F. Amplifier; 6J8G, First Detector Oscillator; 78, I. F. Amplifier; 6Q7G, Second Detector, A. V. C. and First Audio; two (2) 42 Audio Output, and one 80 Rectifier.

Wireless Remote Control Amplifier — 78, First Control Amplifier; 6J7G, Second Control Amplifier; A. V. C.; 6ZY5G, A. V. C. and a 2A4G Thyratron Rectifier.

Wireless Remote Control Unit — One type 30.

AUDIO OUTPUT: 10 watts. (Model 40-205 only)

CABINET DIMENSIONS:

	Height	Width	Depth
Console	38	30	15⅝
Wireless Remote Control	5⅛	7¼	9⅛

Model 40-510 is a radio-phonograph combination assembled in a console cabinet consisting of a 12 tube, wireless remote control superheterodyne radio receiver and a Deluxe Inter-Mix Record Changer.

Model 40-216, 516.

TYPE CIRCUIT: Model 40-216, code 121, is a 14-tube wireless remote control and dial tuned receiver employing a superheterodyne circuit with three tuning ranges for reception of standard and short wave broadcast stations. Eight broadcast stations can be automatically tuned in from the remote control unit. The wireless remote control unit also increases and decreases volume and turns off the set without any connections between the receiver and the control unit. This model is also designed to receive the sound of a television program tuned in by Philco Television sets. A Philco wireless record player can also be set up for use with this receiver.

PHILCO BUILT-IN SUPER AERIAL SYSTEM:

A new type aerial system which eliminates an outside aerial is also incorporated in this model. Included in the built-in super aerial system is a statically shielded loop for broadcast band reception and a short wave receiving loop. The feature of the built-in broadcast band statically shielded loop is that it may be turned to the position in which it picks up a minimum amount of interference or if interference is not present, the loop may be set in the position where best reception is obtained.

In addition other features of design are automatic volume control, continuously variable tone control, base compensation, degenerated push pull pentode audio output. Outside aerial connections are also provided for remote localities where station signal strength is exceptionally weak.

POWER SUPPLY: 115 Volts, 50 to 60 Cycles, A. C.

POWER CONSUMPTION: 190 watts. (Model 40-216 only)

TUNING RANGES: 540 to 1600 K.C., 1.6 to 4.5 M.C., 6.0 to 18.0 M.C.

I. F. FREQUENCY: 470 K. C.

PHILCO TUBES USED: Receiver — 6J7G, R. F. Amplifier; 6A8G, Converter; 78, I. F. Amplifier; 6Q7G, Second Detector, A. V. C. and First Audio; 37, Phase Inverter; two 42 Audio Output, and one 80, Rectifier.

Wireless Remote Control Amplifier — 78, First Control Amplifier; 6J7G, Second Control Amplifier; 6J5G, A. V. C., 6ZY5G and 2A4G, Rectifier.

Wireless Remote Control Unit — 1 type 30 tube.

AUDIO OUTPUT: 10 watts.

Model 40-516 is a radio-phonograph combination assembled in a console cabinet consisting of a 14 tube, wireless remote control superheterodyne radio receiver and a Deluxe Inter-Mix Record Changer.

ADJUSTMENT OF WIRELESS REMOTE CONTROL CIRCUITS

Models 40-205, 40-216 and 40-510, 40-516.

ADJUSTING CONTROL FREQUENCY AMPLIFIER

The wireless remote control models are shipped with 5 different control frequencies which range from 350 to 400 K. C. These frequencies are identified by code numbers appearing on the serial number ticket and on the rear of the chassis. The code numbers and frequencies are as follows:

Code 5.....355 K. C. Code 7.....375 K. C.
Code 6.....367 K. C. Code 8.....383 K. C.
Code 9.....395 K. C.

The purpose of the different control frequencies is to prevent interaction between two or more wireless remote control models which are on the same floor or exceptionally close together. When several wireless remote control models are to be located close together, it will be necessary to use different control frequencies. These frequencies should be 20 K. C. apart. For example, if three models are to be operated at the same time and are closely situated, it will be advisable to adjust the control frequency of the first set to 355 K. C., the second set to 375 K. C., and the third set to 395 K. C.

In order to realign or change the control frequency of these models, the following equipment is required:

1. Philco Model 077 signal generator with a loop attached to the output terminal. (A few turns of wire 12 inch in diameter).

2. Philco wireless remote control aligning adapter. Part No. 45-2769.

3. Philco aligning screw driver, Part No. 45-2610.

With this apparatus the control frequency is adjusted as follows:

1. Remove the 2A4G control tube from its socket and replace with the aligning adapter. Connect the red lead of the aligning adapter to the positive terminal of the vacuum tube voltmeter. The black lead of the adapter is connected to the negative terminal of the vacuum tube voltmeter.

2. Remove the 78 control amplifier tube, its shield and the shield of the 6J7G tube. Apply power to the set and turn the range selector disc to "remote".

3. Attach the "high" side of the signal generator output to the grid of the 6J7G tube. Set the generator modulation control to "mod on" and turn the attenuator control about one-fourth on.

4. The control frequency to which the control amplifier is tuned can now be determined by tuning the signal generator between 350 and 400 K. C. When the signal generator is tuned to the control frequency, the vacuum tube voltmeter will show maximum deflection. If this frequency is to be used, leave the signal generator at this point or turn the indicator to any other frequency desired between 350 and 400 K. C.

5. After the control frequency has been found or changed, compensators (103A), (103B) Model 40-216; and (74A), (74B) Model 40-205 are adjusted for maximum indication on the vacuum tube voltmeter.

6. After adjusting this circuit, replace the 78 tube and shields in their sockets and remove the signal generator lead from the grid of the 6J7G tube.

7. Place the small loop mentioned above into the "high" and "ground" of the signal generator output terminals and place the signal generator near the secondary inductor loop in the bottom of the cabinet. When doing this, do not disturb the setting of the signal generator indicator. Turn the sensitivity control located on the right rear of the chassis toward the position marked "extreme" then adjust compensators (119), (115) Model 40-216; (90), (85) Model 40-205 for maximum reading on the vacuum tube voltmeter.

8. Next adjust the secondary inductor loop compensator (121) in the Model 216 and (92) Model 205 located in the bottom of the cabinet. This compensator is encased in a cardboard container that is attached to one corner of a loop. Extreme care should be used in adjusting the compensator to the exact point of resonance as the secondary inductor is a very sharply tuned circuit.

9. If the vacuum tube voltmeter pointer goes off scale when adjusting the compensators, turn the attenuator control of the signal generator toward the "off" position. After these compensators are adjusted to maximum, the control amplifier is tuned to the frequency selected.

PHILCO RADIO & TELEV. CORP.

MODEL 40-205
MODEL 40-216
MODEL 40-510
MODEL 40-516
Alignment
Remote Cont. Notes

ALIGNING OF COMPENSATING CONDENSERS

EQUIPMENT REQUIRED

(1) **Signal Generator.** In order to properly adjust this receiver a calibrated signal generator such as Philco Model 077 is required. This signal generator covers a frequency range of 540 to 36,000 K. C.

(2) **Indicating Device.** To obtain maximum signal strength and accurate adjustment of the padders a vacuum tube voltmeter and circuit tester such as Philco Models 027 and 028 is recommended. These testers also contain an audio output meter which may be used as an indicating device.

(3) **Aligning Tools.** Fiber handle screw driver Philco Part No. 45-2610. When using the vacuum tube voltmeter for adjusting the set, an aligning adaptor Part No. 45-2767 is required.

CONNECTING ALIGNING INSTRUMENTS

VACUUM TUBE VOLTMETER: To use the vacuum tube voltmeter as an aligning indicator it should be connected to the A. V. C. circuit as follows:

1. Connect the negative (—) terminal of the voltmeter through a 2 meg. resistor to the converter grid (6J8G) Model 205; (6A8G) Model 216. The resistor must be connected directly to the grid of the tube and the voltmeter wire attached to the resistor.

2. Connect the positive (+) terminal to the chassis ground terminal.

AUDIO OUTPUT METER: If this type of meter is used as an aligning indicator, it should be connected to the plate terminals of the 42 tubes. Adjust the meter for the 0 to 30 volt A. C. scale.

After connecting the aligning meter, adjust the compensators in the order as shown in the tabulation below. Locations of the compensators are shown in Fig. 6 and 7, page No. 6. If the output meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.

SIGNAL GENERATOR: When adjusting the I. F. padders, the high side of the signal generator is connected through a .1 mfd. condenser to terminal No. 1 of the loop terminal panel at the rear of the chassis. The ground or low side of the signal generator is connected to the chassis of the receiver.

When aligning the R. F. padders a loop antenna is made from a few turns of wire and connected to the signal generator output terminals; the loop is then placed two or three feet from the loop in the cabinet. Do not remove the receiver loop from the cabinet. It is necessary when adjusting the padders, that the receiver be left in the cabinet.

Receiver Circuit Adjustments — Model 40-216 and MODEL 40-516.

Operation	SIGNAL GENERATOR		RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dial Setting	Dial Setting	Control Setting	Adjust Compensators	
1	78 I. F. Grid	470 K.C.	580 K.C.	Vol. Max. Range Switch "Brdcst"	38A, 38B	Turn Out 33B Full
2	6A8G Det. Osc. Grid	470 K.C.	580 K.C.	Vol. Max. Range Switch "Brdcst"	33C, 33A, 33B	Note A
3	Use Loop on Generator	18.0 M.C.	18.0 M.C.	Vol. Max. Range Switch "Short Wave"	22B, 124A, 2A	Note C, Note D
4	Use Loop on Generator	1500 K.C.	1500 K.C.	Vol. Max. Range Switch "Brdcst"	22, 13X, 3X	Note A
5	Use Loop on Generator	580 K.C.	580 K.C.	Vol. Max. Range Switch "Brdcst"	23	Rollgang
6	Use Loop on Generator	1550 K.C.	1550 K.C.	Vol. Max. Range Switch "Brdcst"	22	
7	Use Loop on Generator	3.5 M.C.	3.5 M.C.	Vol. Max. Range Switch "Police"	22A	Note B

Receiver Circuit Adjustments — Model 40-205 and MODEL 40-510.

Operation	SIGNAL GENERATOR		RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dial Setting	Dial Setting	Control Setting	Adjust Compensators	
1	78 Grid	470 K.C.	580 K.C.	Vol. Max. Range Switch "Brdcst"	14A, 14B	Turn Out 13B Full
2	6J8G Grid	470 K.C.	580 K.C.	Vol. Max. Range Switch "Brdcst"	13A, 13C, 13B, 14A	
3	Loop	1500 K.C.	1500 K.C.	Vol. Max. Range Switch "Brdcst"	95B, 95A	Note A
4	Loop	580 K.C.	580 K.C.	Vol. Max. Range Switch "Brdcst"	7	Rollgang when Adjusting Padder
5	Loop	1500 K.C.	1500 K.C.	Vol. Max. Range Switch "Brdcst"	95B, 95A	Note B

NOTE A — Dial Calibration: In order to adjust the receiver correctly the dial must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows: With the tuning condenser closed (maximum capacity), set the dial pointer on the extreme left index line at the low frequency end of the broadcast scale. The arrangement of the drive cable and dial pointer in shown in Fig. 5.

NOTE C — If two peaks (signals) are observed on the aligning meter when adjusting the oscillator padder No. 22A tune the padder to the second peak from the maximum capacity position (screw all the way in).

NOTE D — If two peaks (signals) are observed on the aligning meter when adjusting the R. F. and loop padders 124A and 2A, tune the padders to the first peak signal from the maximum capacity position (screw all the way in). When adjusting the padders to this first peak roll the tuning condenser (rock) slightly back and forth to obtain the maximum readings on the aligning meter.

NOTE B — See Remote Control Amplifier adjustments.

ADJUSTING WIRELESS REMOTE CONTROL UNIT

The wireless remote control unit is now adjusted to the control frequency of the amplifier as follows:

1. Turn off the signal generator, then dial any one of the stations indicated on the remote control unit by pulling the selector to the stop position; release the selector and at the same time press the stop down and hold it in this position.

2. Now bring the wireless remote control unit close to the receiver. Using a padding wrench, Philco Part No. 3164, tune the compensator (127) Fig. 3, located on the bottom of the remote control unit until a maximum voltage reading is indicated on the vacuum tube voltmeter. When tuning this compensator, it should be done very slowly so as not to pass over the frequency to which the control amplifier is tuned.

3. After adjusting the compensator with the sensitivity control on the receiver in the "extreme" position, the remote control unit is adjusted for maximum sensitivity by setting the sensitivity control in the "near" position and placing the remote control unit a few feet away from the receiver. The compensator (127) Fig. 3, is then adjusted again for maximum voltage reading of the vacuum tube voltmeter.

4. After making these adjustments, remove the aligning adapter from the socket and replace the 2A4G tube. The wireless remote control unit should now be adjusted to the same frequency as the control frequency in the receiver.

MODEL 40-205
MODEL 40-510
Chassis, Trimmers

PHILCO RADIO & TELEV. CORP.

Stepper Unit Adjustments

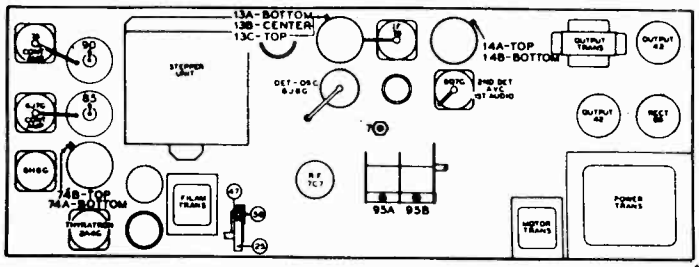
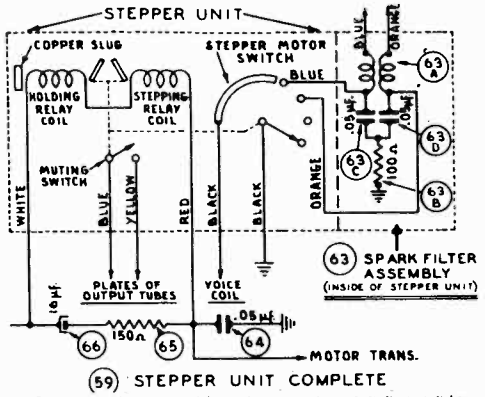


FIG. 6. LOCATIONS OF COMPENSATORS, MODEL 40-205.



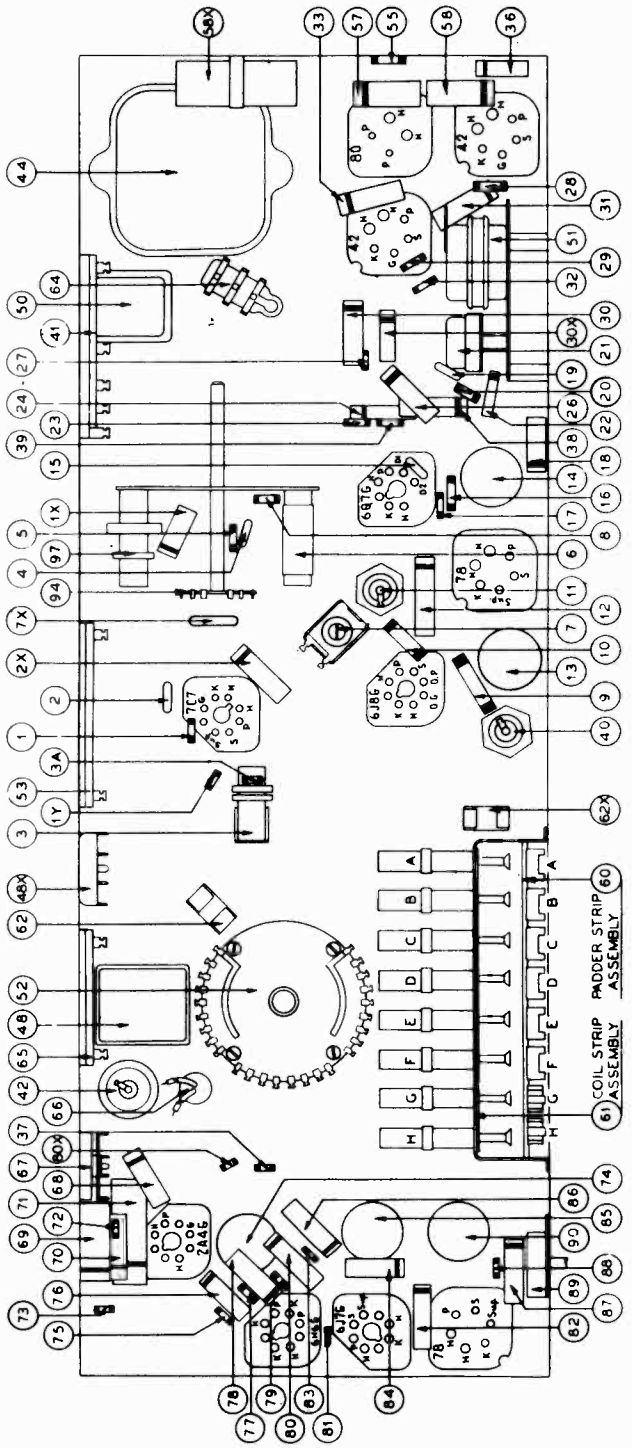


FIG. 1. LOCATIONS OF PARTS, UNDERSIDE OF CHASSIS.

Adjusting Wireless Remote Control for Reception of Stations

NOTE: In Model 40-510 No. 8 position is used for phonograph. This position is already connected and will not need adjustment.

The procedure for setting up stations on the wireless remote control receivers is similar to the procedure in setting up Philco electric automatic tuning models. The eight push buttons, however, are automatically dialed by the remote control unit instead of by pushing buttons. To set up stations on these models for best reception, a signal generator, Philco Model 077 and a vacuum tube voltmeter Philco Model 027 or 028 should be used. With this equipment proceed as follows:

1. Select and remove the desired eight station call letters from the large station tab card supplied with the receiver. Insert the station tabs in the apertures (windows) of the bezel. The lowest frequency station is placed in the first window on the left and the remaining station tabs in the order of increasing frequency. Turn "on" power switch.

2. Remove from the small call letter card the tab of the first low frequency station. Insert the tab in the third aperture on the right side of the bezel on the remote control unit dial. Transparent tabs are also supplied to be placed over each call letter. The remaining call letter tabs are then placed in the order of increasing frequency around the bezel from right to left (counter clock-wise).

3. Insert the loud and soft tabs in the first and second windows respectively on the right hand side of the bezel.

4. Connect the negative terminal of the vacuum tube voltmeter through a 2 meg. resistor to the grid of the 78 I. F. tube. The resistor must be connected directly to the grid of the tube and the voltmeter attached to the resistor at this point. Connect the positive terminal to the chassis ground terminal.

5. Attach a loop consisting of a few turns of wire to the output terminals of the Model 077 signal generator. Turn the signal generator modulation control to "mod on". Turn the receiver range selector switch to "Broadcast" and manually tune in the lowest frequency station desired. This station should be between 540 and 1030 K. C. The signal generator is then tuned to the frequency of the station being received. A beat note should then be heard when the volume control is turned on.

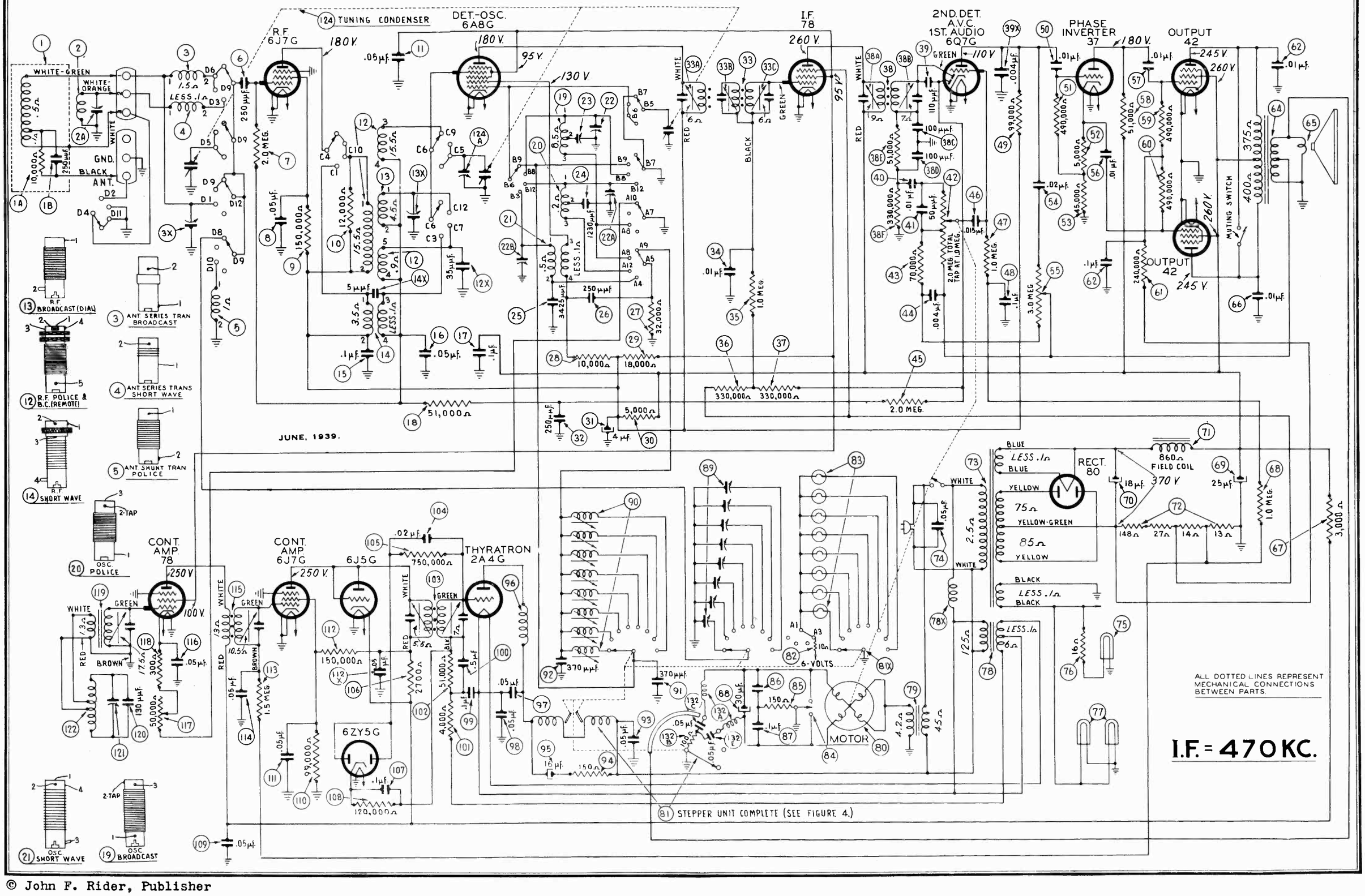
6. Turn the range selector disc of the receiver to "remote". Dial first low frequency station on the right side of the bezel of the remote control unit.

7. Using a padding screw driver, adjust the first 540 to 1030 K. C. "Osc" padder (bottom row of holes) at the left rear of the chassis, until the station identified by the modulated signal of the generator is tuned in to maximum on the vacuum tube voltmeter. Next adjust the first 540 to 1030 K. C. "Ant" padder (top row of holes) for maximum indication on the voltmeter.

8. Turn the signal generator off the station frequency and readjust the "Ant" and "Osc" padders with the station signal for maximum reading on the voltmeter. This should be done with the volume control of the receiver adjusted for low volume. This procedure is repeated for each of the remaining stations to be set up. The next station to be set up should be within the frequency range of 540 to 1030 K. C. of the second set of padders. The third station is tuned in by the third set of padders and should be within a frequency range of 670 to 1160 K. C. The remaining stations are then set up in the order of increasing frequency.

PHILCO RADIO & TELEV. CORP.

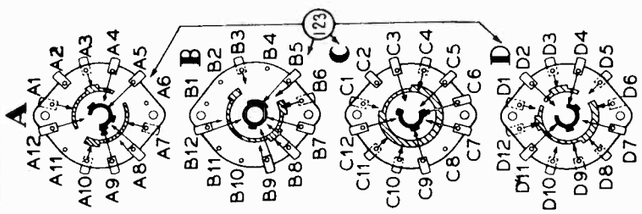
MODEL 40-216
Schematic, Voltage



Chassis, Trimmers
Stepper Unit, Dial

PHILCO RADIO & TELEV. CORP.

MODEL 40-216
MODEL 40-516



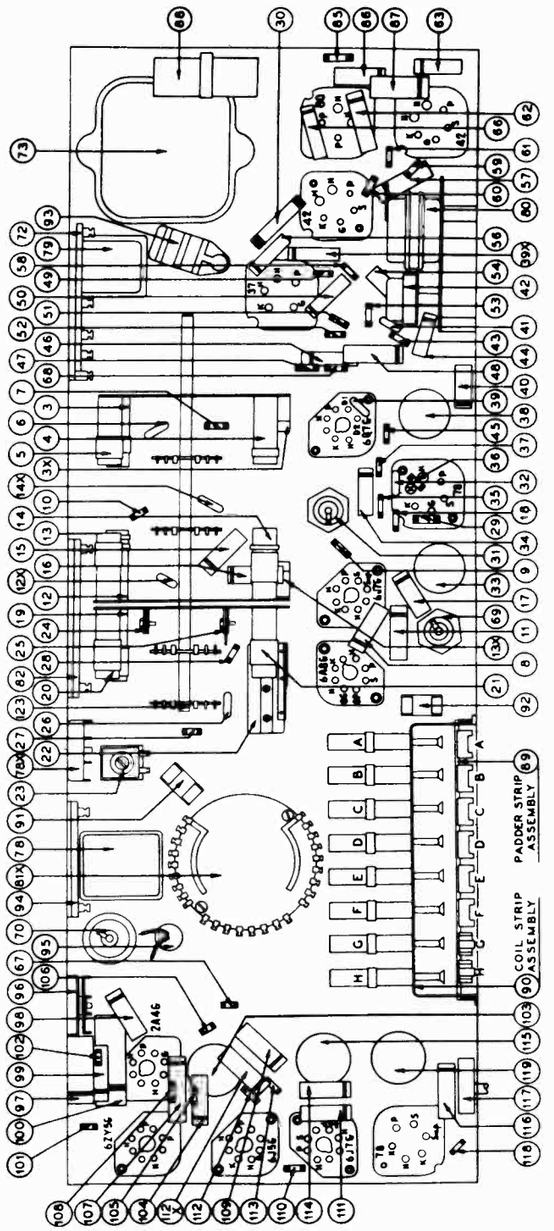


FIG. 1. MODEL 40-216 PART LOCATIONS, UNDERSIDE OF CHASSIS.

=NOTE=
SWITCHES SHOWN IN POSITION No. 1 (REMOTE) FROM REAR OF CHASSIS, BOTTOM VIEW.
LETTERS INDICATE POSITION OF SWITCH WAFERS FROM CENTER OF CHASSIS.
SOLID AREA INDICATES REAR OF SWITCH WAFER.
SHADED AREA INDICATES FRONT OF SWITCH WAFER.

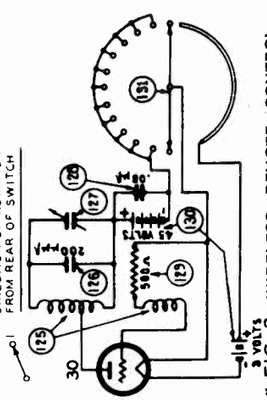


FIG. 3. WIRELESS REMOTE CONTROL UNIT SCHEMATIC DIAGRAM.

* In model 40-516 No. 8 position is used for phonograph. This position is already connected and will not need adjustment.

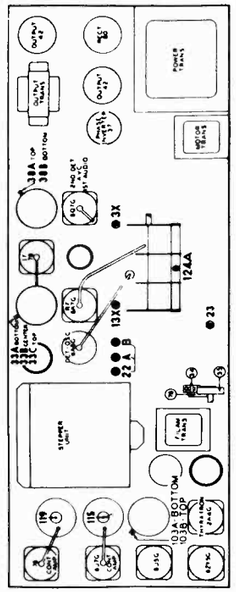


FIG. 4. LOCATIONS OF COMPENSATORS, MODEL 40-216.

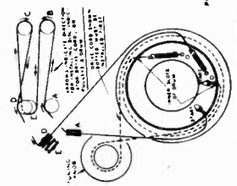


FIG. 5. DIAL POINTER AND CABLE ARRANGEMENT. MODELS 40-205, 40-216.

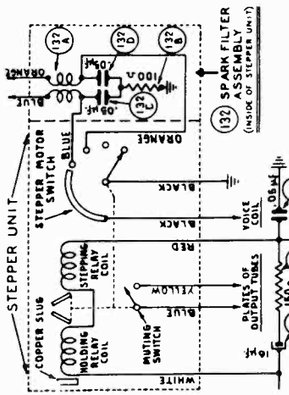


FIG. 2. INTERNAL WIRING OF STEPPER UNIT. NUMBERS CORRESPOND TO SCHEMATIC.

MODEL 40-205
MODEL 40-216

PHILCO RADIO & TELEV. CORP.

Parts Lists

Replacement Parts

Model 40-205

SCHE. No.	DESCRIPTION	PART No.
1	Resistor (1.0 meg., ½ watt)	33-510339
1X	Tubular Cond. (.05 mfd.)	30-4519
1Y	Resistor (330,000 ohms, ½ watt)	33-433339
2	Mica Cond. (200 mmfd.)	30-1078
2X	Tubular Cond. (.05 mfd.)	30-4123
3	R. F. Trans.	32-3282
3A	Resistor (12,000 ohms, ½ watt)	33-312339
4	Mica Cond. (250 mmfd.)	30-1032
5	Resistor (32,000 ohms, ½ watt)	33-332339
6	Oscillator Trans.	32-3278
7	Compensator	31-6230
7X	Mica Cond. (15 mmfd.)	30-1139
8	Resistor (10,000 ohms, ½ watt)	33-310339
9	Resistor (5,000 ohms, 2 watts)	33-250539
10	Resistor (13,000 ohms, 1 watt)	33-313439
11	Electrolytic Cond. (4 mfd., 250 V.)	30-2334
12	Tubular Cond. (.05 mfd.)	30-4123
13	1st I. F. Trans. Assy.	32-3089
14	2nd I. F. Trans. Assy.	32-3645
15	Mica Cond. (110 mmfd.)	30-1041
16	Resistor (2.0 meg., ½ watt)	33-520339
17	Resistor (1.0 meg., ½ watt)	33-510339
18	Tubular Cond. (.01 mfd.)	30-4479
19	Mica Cond. (50 mmfd.)	30-1029
20	Resistor (70,000 ohms, ½ watt)	33-370339
21	Volume Control (2.0 meg.)	33-5300
22	Tubular Cond. (.004 mfd.)	30-4334
23	Resistor (1.0 meg., ½ watt)	33-510339
24	Tubular Cond. (.015 mfd.)	30-4481
25	Tone Control (3.0 meg.)	33-5287
26	Tubular Cond. (.02 mfd.)	30-4481
27	Resistor (99,000 ohms, ½ watt)	33-399339
28	Resistor (330,000 ohms, ½ watt)	33-433339
29	Resistor (490,000 ohms, ½ watt)	33-449339
30	Tubular Cond. (.02 mfd.)	30-4477
30X	Tubular Cond. (.006 mfd.)	30-4445
31	Tubular Cond. (.01 mfd.)	30-4501
32	Resistor (3500 ohms, ½ watt)	33-235339
33	Tubular Cond. (.01 mfd.)	30-4501
34	Output Trans.	32-7997
35	Cone and Voice Coil Assy.	
	(Spkr. Part No. 36-1450-2)	36-4089
	(Spkr. Part No. 36-1450-4)	36-4111
36	Tubular Cond. (.01 mfd.)	30-4501
37	Resistor (3000 ohms, ½ watt)	33-230339
38	Tubular Cond. (.1 mfd.)	30-4499
39	Resistor (1.0 meg., ½ watt)	33-510339
40	Electrolytic Cond. (25 mfd., 300 V.)	30-2380
41	Bias Resistor (Wirewound)	33-3361
42	Electrolytic Cond. (18 mfd., 475 V.)	30-2200
43	Field Coil (Replace Spkr. Part No. 36-1450)	
44	Power Trans. (115 V., 50-60 cycles)	32-7999
	Power Trans. (115 V., 25-40 cycles)	32-8013
45	Condenser (.05 mfd., 115 V. Plug)	34-2476
46	Pilot Lamp (Bullseye)	34-2210
47	Pilot Lamp Resistor (16 ohms, 1 watt)	33-016431
48	Filament Trans. (115 V., 50-60 cycles)	32-7993
	Filament Trans. (115 V., 25-40 cycles)	32-8016
48X	Choke Coil	32-1281
49	Pilot Lamps (Dial)	34-2064
50	Motor Trans. (115 V., 50-60 cycles)	32-7990
	Motor Trans. (115 V., 25-40 cycles)	32-8015
51	Volume Control Motor Assy.	35-1151
52	Rotary Switch	42-1468
53	Bias Resistor (Wirewound, 10 ohms)	33-3363
54	Pilot Lamps (Station Indicator)	34-2064
55	Resistor (150 ohms, ½ watt)	33-115339
56	Volume Control Switch (Motor Control)	42-1469
57	Tubular Cond. (.1 mfd.)	30-4499
58	Tubular Cond. (.1 mfd.)	30-4499
58X	Electrolytic Cond. (30 mfd., 30 V.)	30-2361
59	Stepper Unit Complete	38-9689
60	Compensator Strip (Pushbutton)	31-6264
60A	Compensator No. 1	
60B	Compensator No. 2	
	540-1030 K.C., Part of 60	
60C	Compensator No. 3	
60D	Compensator No. 4	
	670-1160 K.C., Part of 60	
60E	Compensator No. 5	
60F	Compensator No. 6	
	900-1470 K.C., Part of 60	
60G	Compensator No. 7	
60H	Compensator No. 8	
	1170-1600 K.C., Part of 60	
61	Coil Assy. (Pushbuttons)	
61A	Oscillator Coil No. 1	
61B	Oscillator Coil No. 2	
	540-1030 K.C.	32-3042
61C	Oscillator Coil No. 3	
61D	Oscillator Coil No. 4	
	670-1160 K.C.	32-3042
61E	Oscillator Coil No. 5	
61F	Oscillator Coil No. 6	
	900-1470 K.C.	32-3041
61G	Oscillator Coil No. 7	
61H	Oscillator Coil No. 8	
	1170-1600 K.C.	32-3041
62	Silver Mica Cond. (370 mmfd.)	30-1110
62X	Silver Mica Cond. (370 mmfd.)	30-1110
63	Spark Filter Assy.	
63A	Spark Filter Choke	32-3276
63B	Resistor (100 ohms, ½ watt)	33-110339
63C	Tubular Cond. (.05 mfd.)	30-4444
63D	Tubular Cond. (.05 mfd.)	30-4444
64	Bakelite Cond. (.05 mfd.)	3615-56
65	Resistor (150 ohms, Wirewound)	33-3362
66	Electrolytic Cond. (16 mfd., 150 V.)	30-2387
67	Choke Coil	32-1281
68	Tubular Cond. (.05 mfd.)	30-4123
69	Tubular Cond. (.05 mfd.)	30-4123
70	Tubular Cond. (.1 mfd.)	30-4499
71	Tubular Cond. (.5 mfd.)	30-4551
72	Resistor (51,000 ohms, ½ watt)	33-351339
73	Resistor (4,000 ohms, ½ watt)	33-240339
74	No. 3 Control Amp. Coil	32-3275
75	Resistor (750,003 ohms, ½ watt)	33-475339
76	Tubular Cond. (.02 mfd.)	30-4516
77	Resistor (120,000 ohms, ½ watt)	33-412339
78	Tubular Cond. (.1 mfd.)	30-4455
79	Resistor (150,000 ohms, ½ watt)	33-415339
80	Tubular Cond. (.05 mfd.)	30-4123
80X	Resistor (2700 ohms, ½ watt)	33-227339
81	Resistor (99,000 ohms, ½ watt)	33-399339
82	Tubular Cond. (.05 mfd.)	30-4123
83	Resistor (1.5 meg., ½ watt)	33-515339
84	Tubular Cond. (.05 mfd.)	30-4519
85	No. 2 Control Amp. Coil	32-3087
86	Tubular Cond. (.05 mfd.)	30-4123
87	Tubular Cond. (.05 mfd.)	30-4444
88	Resistor (300 ohms, ½ watt)	33-130339
89	Sensitivity Control (50,000 ohms)	33-5295
90	No. 1 Control Amp. Coil	32-3086
91	Silver Mica Cond. (155 mfd.)	30-1121
92	Air Padder (Secondary Inductor)	31-6268
93	Secondary Inductor	40-6414
94	Wave Switch	42-1454
95	Tuning Cond.	31-2311
96	Loop Assembly	38-9882
96A	Mica Cond. (250 mmfd.)	61-0033
96B	Resistor (10,000 ohms, ½ watt)	33-310339
97	Ant. Series Trans.	32-3226

MISCELLANEOUS PARTS

DESCRIPTION	PART No.
Bezel	38-9931
Bezel Gasket and Staple Assy.	38-9734
Bezel Screws	W-1834
Cable and Plug (Power Supply)	L-3176
Cabinet	10403A
Drive Cord (Tuning Cond.)	31-2320
Drive Cord (Pointer)	31-2320
Dial	27-5537
Disc (Tuning)	27-4766
Disc (Tone Control)	27-4764
Disc (Volume Control)	27-4765
Disc (Wave Switch)	27-4767
Pilot Lamp Assy. (R. H. Bracket)	38-9694
Pilot Lamp Assy. (L. H. Bracket)	38-9711
Pilot Lamp Assy. (Station Lights)	38-9709
Pilot Lamp Assy. (Cabinet Bullseye)	38-9712
Pilot Lamp Jewel (Bullseye)	27-4777
Socket (4 prong, type 80 tube)	27-5044
Socket (6 prong, type 42 and 78 tubes)	27-6036
Socket (6 prong, Octal, 6J5G, 6Q7G tubes, etc.)	27-6088
Socket (7 prong, Octal, 6J7G tubes)	27-6057
Socket (7 prong, Octal, 6A8G tube)	27-6099
Speaker	38-1450
Spring (Drive Cords)	28-8913
Tab (Television)	27-9447
Washer (Keyed Washer, Tuning Disc)	56-1029
Washer (Spring Washer, Tuning Disc)	6717

Model 40-216

MISCELLANEOUS PARTS

DESCRIPTION	PART No.
Bezel	56-1509
Bezel Gasket and Staple Assy.	38-9734
Cabinet	10403A
Cable (Power Supply)	38-9931
Dial	27-5535
Drive Cord (Tuning Cond.)	31-2315
Drive Cord (Pointer)	31-2320
Disc (Tuning)	27-4768
Disc (Volume)	27-4765
Disc (Wave Switch)	27-4767
Disc (Tone Control)	27-4764
Pilot Lamp Assy. (R. H. Bracket)	38-9894
Pilot Lamp Assy. (L. H. Bracket)	38-9711
Pilot Lamp Assy. (Station Lights)	38-9709
Pilot Lamp Assy. (Cabinet Bullseye)	38-9712
Pilot Light Jewel (Bullseye)	27-4777
Socket (4 prong, type 80 tube)	27-6044
Socket (5 prong, type 37 tube)	27-6038
Socket (6 prong, type 42 and 78 tubes)	27-6036
Socket (Octal, type 6J5G, 6Q7G tubes, etc.)	27-6086
Socket (Octal, type 6J7G tube)	27-6057
Socket (Octal, type 6A8G tubes)	27-6099
Speaker	38-1450
Spring (Drive Cords)	28-8913
Tab (Television)	27-9447
Washer (Keyed Washer Tuning Disc)	56-1029
Washer (Spring Washer Tuning Disc)	6717

Replacement Parts

Model 40-216

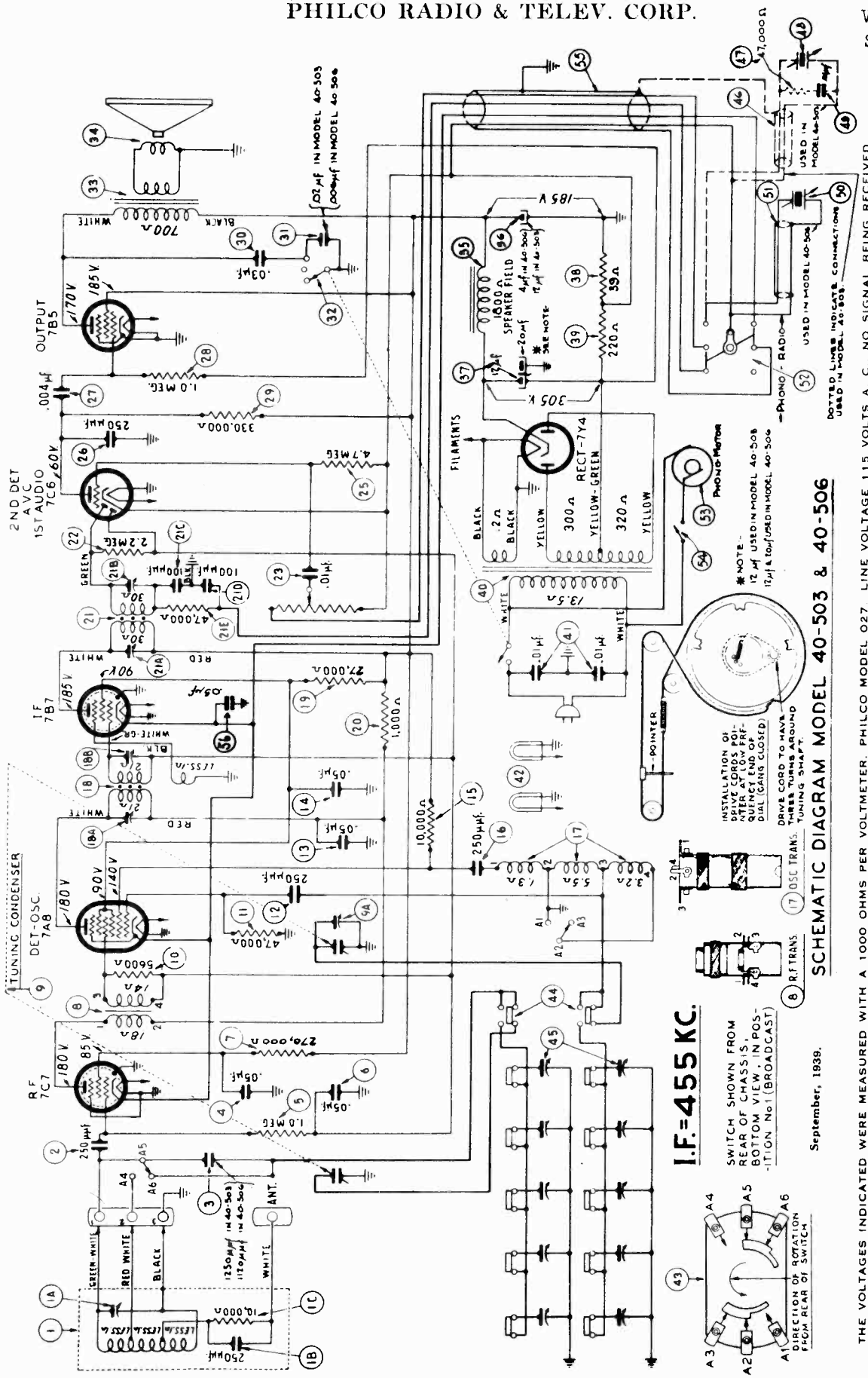
SCHE. No.	DESCRIPTION	PART No.
1	Loop Assy. (Broadcast)	38-9882
1A	Resistor (10,000 ohms, ½ watt)	33-310339
1B	Mica Cond. (250 mmfd.)	61-0033
2	Loop Assy. (Short Wave)	38-9933
2A	Compensator	31-6236
3	Ant. Series Trans. (Broadcast)	32-3291
3X	Compensator	31-6212
4	Ant. Series Trans. (Short Wave)	32-3293
5	Ant. Trans. (Police Shunt)	32-3292
6	Mica Cond. (250 mmfd.)	61-0033
7	Resistor (2.0 meg., ½ watt)	33-520339
8	Tubular Cond. (.05 mfd.)	30-4123
9	Resistor (150,000 ohms, ½ watt)	33-415339
10	Resistor (12,000 ohms, ½ watt)	33-312339
11	Tubular Cond. (.05 mfd.)	30-4123
12	R. F. Trans. (Broadcast, Pushbutton and Police)	32-3230
12X	Mica Condenser (35 mmfd.)	30-1141
13	R. F. Trans. (Broadcast Manual)	32-3227
13X	Compensator	31-6212
14	R. F. Trans. (Short Wave)	32-3046
14X	Mica Cond. (5 mmfd.)	30-1097
15	Tubular Cond. (.1 mfd.)	30-4455
16	Tubular Cond. (.05 mfd.)	30-4455
17	Tubular Cond. (.1 mfd.)	30-4455
18	Resistor (51,000 ohms, ½ watt)	33-351339
19	Oscillator Trans. (Broadcast)	32-3231
20	Oscillator Trans. (Police)	32-3294
21	Oscillator Trans. (Short Wave)	32-3051
22	Compensator (3 section, oscillator)	31-6266
23	Compensator (Broadcast, Low Frequency)	31-6230
24	Tracking Cond. (1230 mmfd.)	31-6262
25	Tracking Cond. (3425 mmfd.)	31-6263
26	Mica Cond. (250 mmfd.)	61-0033
27	Resistor (32,000 ohms, ½ watt)	33-332339
28	Resistor (10,000 ohms, ½ watt)	33-310339
29	Resistor (180,000 ohms, ½ watt)	33-318339
30	Resistor (5,000 ohms, 2 watt)	33-250539
31	Electrolytic Cond. (4 mfd., 250 V.)	30-2334
32	Mica Cond. (50 mmfd.)	61-0033
33	1st I. F. Trans. Assy.	32-3089
34	Tubular Cond. (.01 mfd.)	30-4573
35	Resistor (1.0 meg., ½ watt)	33-510339
36	Resistor (330,000 ohms, ½ watt)	33-433339
37	Resistor (330,000 ohms, ½ watt)	33-433339
38	2nd I. F. Trans. Assy.	32-3645
39	Mica Cond. (110 mmfd.)	30-1031
39X	Tubular Cond. (.004 mfd.)	30-4578
40	Tubular Cond. (.01 mfd.)	30-4479
41	Mica Cond. (50 mmfd.)	30-1029
42	Volume Control	33-5300
43	Resistor (70,000 ohms, ½ watt)	33-370339
44	Tubular Cond. (.004 mfd.)	30-4334
45	Resistor (2.0 meg., ½ watt)	33-520339
46	Tubular Cond. (.015 mfd.)	30-4529
47	Resistor (1.0 meg., ½ watt)	33-510339
48	Tubular Cond. (.1 mfd.)	30-4527
49	Resistor (99,000 ohms, ½ watt)	33-399339
50	Tubular Cond. (.01 mfd.)	30-4169
51	Resistor (490,000 ohms, ½ watt)	33-449339
52	Resistor (5,000 ohms, ½ watt)	33-250339
53	Resistor (45,000 ohms, ½ watt)	33-345339
54	Tubular Cond. (.02 mfd.)	30-4481
55	Tone Control (3.0 meg.)	33-5287
56	Tubular Cond. (.01 mfd.)	30-4572
57	Tubular Cond. (.01 mfd.)	30-4572
58	Resistor (51,000 ohms, ½ watt)	33-351339
59	Resistor (490,000 ohms, ½ watt)	33-449339
60	Resistor (490,000 ohms, ½ watt)	33-449339
61	Resistor (240,000 ohms, ½ watt)	33-424339
62	Tubular Cond. (.1 mfd.)	30-4499
63	Tubular Cond. (.01 mfd.)	30-4501
64	Output Trans.	32-7996
65	Cone and Voice Coil Assy.	
	(Spkr. Part No. 36-1450-2)	36-4089
	(Spkr. Part No. 36-1450-4)	36-4111
66	Tubular Cond. (.01 mfd.)	30-4501
67	Resistor (3,000 ohms, ½ watt)	33-230339
68	Resistor (1.0 meg., ½ watt)	33-510339
69	Electrolytic Cond. (25 mfd., 300 V.)	30-2360
70	Electrolytic Cond. (18 mfd., 475 V.)	30-2200
71	Field Coil (Replace Spkr. Part No. 36-1450)	
72	Resistor (Wirewound, Bias)	33-3364
73	Power Trans. (115 V., 50-60 cycles)	32-8001
	Power Trans. (115 V., 25-40 cycles)	32-8017
74	Bypass Cond. (.05 mfd., 110 V. Plug)	30-4576
75	Pilot Lamp (Bullseye)	34-2210
76	Pilot Lamp Resistor (16 ohms)	33-016331
77	Pilot Lamps (Dial)	34-2064
78	Filament Trans. (115 V., 50-60 cycles)	32-7993
	Filament Trans. (115 V., 25-40 cycles)	32-8016
78X	Choke Coil	32-1281
79	Motor Trans. (115 V., 50-60 cycles)	32-7990
	Motor Trans. (115 V., 25-40 cycles)	32-8015
80	Motor Assy. (Volume Control)	35-1151
81	Stepper Unit (Complete)	38-9689
81X	Rotary Switch (Stepper Unit)	42-1468
82	B. C. Resistor (Wirewound, 10 ohms)	33-3363
83	Pilot Lamp Assy. (Station Indicator)	34-2064
84	Switch (Volume Control-Motor)	42-1469
85	Resistor (150 ohms, ½ watt)	33-115339
86	Tubular Cond. (.1 mfd.)	30-4499
87	Tubular Cond. (.1 mfd.)	30-4499
88	Electrolytic Cond. (30 mfd., 30 V.)	30-2361
89	Padder Strip (Pushbuttons)	31-6264
89A	Compensator No. 1	
89B	Compensator No. 2	
	540-1030 K.C., Part of 89	
89C	Compensator No. 3	
89D	Compensator No. 4	
	670-1160 K.C., Part of 89	
89E	Compensator No. 5	
89F	Compensator No. 6	
	900-1470 K.C., Part of 89	
89G	Compensator No. 7	
89H	Compensator No. 8	
	1100-1600 K.C., Part of 89	
90	Elec. Pushbutton Trans. Assy. (6 Trans.)	32-3091
90A	Osc. Trans. No. 1	
90B	Osc. Trans. No. 2	
	540-1030 K.C.	32-3042
90C	Osc. Trans. No. 3	
90D	Osc. Trans. No. 4	
	670-1160 K.C.	32-3042
90E	Osc. Trans. No. 5	
90F	Osc. Trans. No. 6	
	900-1470 K.C.	32-3041
90G	Osc. Trans. No. 7	
90H	Osc. Trans. No. 8	
	1100-1600 K.C.	32-3041
91	Silver Mica Cond. (370 mmfd.)	30-1110
92	Silver Mica Cond. (370 mmfd.)	30-1110
93	Bakelite Cond. (.05 mfd.)	3615SG
94	Resistor (150 ohms)	33-3362
95	Electrolytic Cond. (16 mfd., 200 V.)	30-2356
96	Choke Coil	32-1281
97	Tubular Cond. (.05 mfd.)	30-4123
98	Tubular Cond. (.05 mfd.)	30-4123
99	Tubular Cond. (.1 mfd.)	30-4499
100	Tubular Cond. (.5 mfd.)	30-4551
101	Resistor (4000 ohms, ½ watt)	33-240339
102	Resistor (51,000 ohms, ½ watt)	33-351339
103	No. 3 Control Amp. Trans.	32-3275
104	Tubular Cond. (.02 mfd.)	30-4516
105	Resistor (750,000 ohms, ½ watt)	33-475339
106	Resistor (2700 ohms, ½ watt)	33-227339
107	Tubular Cond. (.1 mfd.)	30-4455
108	Resistor (120,000 ohms, ½ watt)	33-412339
109	Tubular Cond. (.05 mfd.)	30-4123
110	Resistor (99,000 ohms, ½ watt)	33-399339
111	Tubular Cond. (.05 mfd.)	30-4123
112	Resistor (150,000 ohms, ½ watt)	33-415339
112X	Tubular Cond. (.05 mfd.)	30-4123
113	Resistor (1.5 meg., ½ watt)	33-515339
114	Tubular Cond. (.05 mfd.)	30-4519
115	No. 2 Control Amp. Trans.	32-3087
116	Tubular Cond. (.05 mfd.)	30-4444
117	Sensitivity Control	33-5295
118	Resistor (300 ohms, ½ watt)	33-130339
119	No. 1 Control Amp. Trans.	32-3086
120	Silver Mica Cond. (130 mmfd.)	30-1122
121	Compensator (Secondary Inductor)	31-6268
122	Secondary Inductor (Mystery Tuner)	40-6415
123	Wave Switch	42-1537
124	Tuning Cond.	31-2417

WIRELESS REMOTE CONTROL UNIT

125	Primary Inductor	32-3097
126	Silver Mica Cond. (200 mmfd.)	30-1115
127	Tubular Cond. (.05 mfd.)	30-4444
128	Air Padder	31-6268
129	Resistor (500 ohms, ½ watt)	33-150339
130	Mystery Pack (Battery)	41-8023
131	Dial Unit (Pulser)	38-9704
132	Spark Filter Assy. (Inside of Stepper Unit)	38-9898
132A	Spark Filter Choke	32-3276
132B	Resistor (100 ohms, ½ watt)	33-110339
132C	Tubular Cond. (.05 mfd.)	30-4444
132D	Tubular Cond. (.05 mfd.)	30-4444

PHILCO RADIO & TELEV. CORP.

MODELS 40-503, 40-506
Voltage
Schematic



THE VOLTAGES INDICATED WERE MEASURED WITH A 1000 OHMS PER VOLTMETER. PHILCO MODEL 027. LINE VOLTAGE 115 VOLTS A. C., NO SIGNAL BEING RECEIVED.

Model 40-503 is assembled in a table model cabinet and consists of a semi-automatic crystal pickup mechanism which will play 10" or 12" records. The pickup is placed on the record automatically when the lid is closed.

Model 40-506 is assembled in a console type cabinet and consists of a manually operated crystal pickup and will play 10" or 12" records. An automatic switch is provided on this model that starts the phonograph motor when the pickup is lifted from the mounting.

FOR OTHER DATA, SEE INDEX

POWER CONSUMPTION:
Model 40-503—65 watts.
Model 40-506—65 watts.

Replacement Parts — Models 40-503 and 40-506

SCHE. No.	DESCRIPTION	PART No.
1	Loop Assembly	38-9926
1A	Compensator	31-6318
1B	Mica Condenser (250 mmfd.)	61-0033
1C	Resist. (10,000 ohms, ½ watt)	33-310339
2	Mica Condenser (250 mmfd.)	61-0033
3	Mica Condenser (1250 mmfd., 40-503)	5886
	(1120 mmfd., 40-506)	30-1140
4	Tubular Condenser (.05 mfd.)	30-4518
5	Resistor (1.0 meg., ½ watt)	33-510339
6	Tubular Condenser (.05 mfd.)	30-4518
7	Resis. (270,000 ohms, ½ watt)	33-427339
8	R. F. Transformer	32-3283
9	Tuning Condenser	31-2374
10	Resistor (5600 ohms, ½ watt)	33-256339
11	Resist. (47,000 ohms, ½ watt)	33-347339
12	Mica Condenser (250 mmfd.)	61-0033
13	Tubular Condenser (.05 mfd.)	30-4518
14	Tubular Condenser (.05 mfd.)	30-4518
15	Resist. (10,000 ohms, ½ watt)	33-310339
16	Mica Condenser (250 mmfd.)	61-0033
17	Oscillator Transformer	32-3212
18	1st I. F. Trans. Assembly	32-3210
19	Resistor (27,000 ohms, 1 watt)	33-327439
20	Resistor (1,000 ohms, ½ watt)	33-210339
21	2nd I. F. Trans. Assembly	32-3281
22	Resistor (2.2 meg., ½ watt)	33-522339
23	Tubular Condenser (.01 mfd.)	30-4572
24	Volume Control (.5 meg.)	33-5332
25	Resistor (4.7 meg., ½ watt)	33-547339
26	Mica Condenser (250 mmfd.)	61-0033
27	Tubular Cond. (.004 mfd.)	30-4578
28	Resistor (1.0 meg., ½ watt)	33-510339
29	Resis. (330,000 ohms, ½ watt)	33-433339
30	Tubular Condenser (.03 mfd.)	30-4449
31	Tubular Condenser (.02 mfd., 40-503)	30-4481
	(.006 mfd., 40-506)	30-4504
32	Tone Control & On-Off Switch	42-1520
33	Output Transformer	32-8063
34	Cone & Voice Coil Assembly: For Spkr. 36-1484-2, 40-503	36-4126
	For Spkr. 36-1487-2, 40-506	36-4088
	For Spkr. 36-1487-3, 40-506	36-4128
35	Field Coil (For 40-503, Replace Spkr.)	36-1484
	(For 40-506, Replace Spkr.)	36-1487
36	Electrolytic Condenser (12 mfd., 475 V., 40-503)	30-2410
	(4 mfd., 400 V., 40-506)	30-2411
37	Electrolytic Condenser (12 mfd., 475 V, 40-503)	30-2410
	(12-20 mfd., 475 V., 40-506)	30-2437
38	Resistor (39 ohms, ½ watt)	33-039339
39	Resistor (220 ohms, 1 watt)	33-122431
40	Power Transformer (115 V., 50-60 cycles)	32-8064
41	Bakelite Cond. (.01-.01 mfd.)	3903-DG
42	Pilot Lamps	34-2064
43	Wave Switch	42-1494
44	Pushbutton Switch	42-1528
45	Padder Strip	31-6315
46	Pickup Cable (Model 40-503)	
47	Resistor (47,000 ohms, ½ watt, Model 40-503)	33-347339
48	Crystal Cartridge (Pickup, Model 40-503)	415-1027
49	Condenser, Tubular (.01 mfd.)	30-4518
50	Crystal Cartridge (Pickup, Model 40-506)	415-1027
51	Pickup Cable (Model 40-506)	
52	Radio-Phono. Switch	42-1523
53	Motor (110 V., 60 cycles)	35-2021
54	Motor Switch (40-506)	42-1536
	Motor Switch (40-503)	42-1498
55	Cable (Radio-Phono)	L-3217
56	Condenser (.05 mfd.)	30-4518

MISCELLANEOUS PARTS

Cabinet (40-503)	10406
Cabinet (40-506)	10408A
Cable (Power)	L-3199
Cable (Speaker)	41-3430
Cable (Radio-Phono)	L-3217
Dial Scale	27-5506
Drive Cord (Pointer Drive)	31-2399
Drive Cord (Cond. Drive)	31-2400
Drive Drum (Tuning)	38-9883
Escutcheon (Station Tubes)	28-5742
Knobs (Vol., Tone., Wave Sw.)	27-4332
Knob (Pushbutton Switch)	27-4824
Motor (Phono) Model 40-503	35-2021
Motor Con. Plug (Female)	41-3507
Motor Connecting Plug (Male, 40-503, 40-506)	27-4863
Motor Switch	42-1536
Pilot Lamp	34-2064
Pilot Light Socket Assy.	38-9904
Pointer	56-1532
Plate Switch	28-2401
Pickup Assembly (40-503)	35-2028
Pickup Assembly (40-506)	35-2042
Shaft (Tuning)	56-6052
Spring (Cond. Drive Cord)	28-8751
Spring (Pointer Drive Cord)	28-8953
Spring (Tuning Shaft Assy.)	28-8955
Speaker (40-503)	36-1484
Speaker (40-506)	36-1487
Switch (Motor)	42-1498
Sockets	55-0575
Tab Kit (Station Call Letters)	40-6473

MOUNTING PARTS

Sleeve (Chassis Mtg.)	28-5274
Screw (Chassis Mtg., 40-503)	W-2030
Screw (Chassis Mtg., 40-506)	W-783
Screw (Motor Mtg.)	W-599
Screw (Pickup Mtg.)	W-2027
"T" Nut (Motor Mtg.)	W-1758
Washer (Motor Mtg.)	W-1366
"C" Washer (Tuning Shaft)	28-2043
Drive Cord Assy. (Pointer)	31-2398
Drive Cord Assy. (Tun. Cond.)	31-2400
Dial	27-5507
Escutcheon (Push-Buttons)	28-5742
Escutcheon Pin	W-1074
Insul. Bushing (Drive Shaft)	27-9437
Knobs (Tuning, Tone, Volume, Wave Switch)	27-4332
Knobs (Push-Buttons)	27-4824
Pilot Lamp Socket Assembly	38-9904
Pointer	56-1532
Rubber Bushing (Tuning Condenser Drive)	27-9432
Spring (Tuning, Drive Cord)	28-8751
Spring (Pointer, Drive Cord)	28-8953
Spring (Tuning Shaft Assy.)	28-8955
Speaker	36-1489
Sockets (Loktal Tubes)	55-0575
Tuning Shaft	56-6052
Tuning Drive Drum Assembly	38-9883
Tab (Dial)	27-5526
Tab (Television)	27-9450
Tab Kit	40-6473
Washer (C Type, Tun. Shaft)	28-2043

Replacement Parts — Model 40-507

SCHE. No.	DESCRIPTION	PART No.
1	Loop Assembly (Broadcast)	38-9943
1A	Compensator	31-6308
1B	Mica Condenser (250 mmfd.)	61-0033
1C	Resist. (10,000 ohms, ½ watt)	33-310339
2	Loop Assembly (Short Wave)	38-9944
2A	Compensator	31-6320
3	Mica Condenser (5 mmfd.)	30-1097
4	Mica Condenser (1,000 mmfd.)	30-1063
5	Mica Condenser (250 mmfd.)	61-0033
6	Resistor (1.0 meg., ½ watt)	33-510339
7	Tubular Condenser (.05 mfd.)	30-4518
8	Tubular Condenser (.05 mfd.)	30-4518
9	Resist. (33,000 ohms, ½ watt)	33-333339
10	Resistor (390 ohms, ½ watt)	33-139331
11	Tubular Condenser (.05 mfd.)	30-4518
12	Resist. (47,000 ohms, ½ watt)	33-347339
13	Mica Condenser (100 mmfd.)	30-1128
14	Resist. (10,000 ohms, ½ watt)	33-310339
15	R. F. Transformer	32-3194
16	Resistor (150 ohms, ½ watt)	33-115331
17	Resist. (4700 ohms, ½ watt)	33-247339
18	Tubular Condenser (.2 mfd.)	30-4536
19	Tubular Condenser (.05 mfd.)	30-4518
20	Resistor (470 ohms, ½ watt)	33-147339
21	Oscillator Transformer	32-3195
22	Mica Condenser (250 mmfd.)	61-0033
23	Resist. (33,000 ohms, ½ watt)	33-333339
24	Silver Mica Cond. (500 mmfd.)	30-1138
25	Compensator (Two Section)	31-6317
26	Mica Condenser (5300 mmfd.)	30-1134
27	Tuning Condenser	31-2375
28	First I. F. Trans. Assembly	32-3210
29	Tubular Condenser (.05 mfd.)	30-4518
30	Resist. (33,000 ohms, ½ watt)	33-333339
31	Resistor (1,000 ohms, ½ watt)	33-210339
32	Resistor (4700 ohms, ½ watt)	33-247339
33	Second I. F. Trans. Assembly	32-3281
34	Resistor (2.2 meg., ½ watt)	33-522339
35	Volume Control (.5 meg.)	33-5289
36	Tubular Condenser (.01 mfd.)	30-4572
37	Resistor (4.7 meg., ½ watt)	33-547339
38	Mica Condenser (250 mmfd.)	61-0033
39	Tubular Cond. (.004 mfd.)	30-4578
40	Tubular Cond. (.003 mfd.)	30-4580
41	Resis. (330,000 ohms, ½ watt)	33-433339
42	Resistor (1.0 meg., ½ watt)	33-510339
43	Tone Control (.5 meg.) and On-Off Switch	33-5333
44	Tubular Cond. (.003 mfd.)	30-4580
45	Output Transformer	32-8071
46	Cone and Voice Coil Assembly (Spkr. Part No. 36-1489-2)	36-4089
47	Field Coil (Replace Spkr. Part No. 36-1489-2)	
48	Elect. Cond. (12 mfd., 400 V.)	30-2410
49	Elect. Cond. (12 mfd., 400 V.)	30-2410
50	Resistor (22 ohms, ½ watt)	33-022331
51	Resistor (220 ohms, 1 watt)	33-122431
52	Power Transformer (115 V., 50-60 cycles)	32-8068
53	Line Condenser (.01-.01 mfd.)	3903-ODG
54	Pilot Lamps	34-2064
55	Wave Switch	42-1495
56	Push-Button Switch	42-1528
57	Padder Strip	31-6316
58	Resist. (10,000 ohms, ½ watt)	33-310339
59	Tubular Condenser (.03 mfd.)	30-4517
60	Resist. (20,000 ohms, ½ watt)	33-320339
61	Radio-Phono Cable	L-3218
62	Radio-Phono Switch	42-1523
63	Pickup Cable	L-3195
64	Crystal Pickup Cartridge	35-2030
65	Motor	35-1205
66	Switch (Off-On Motor)	42-1548

MISCELLANEOUS PARTS

Automatic Record Changer	35-1180
Cable and Plug Assembly (Power Supply)	L-3199
Clip (Mtg. Osc. Coil)	28-5003

Replacement Parts — Model 40-525

SCHE. No.	DESCRIPTION	PART No.
1	Loop Assembly	38-9897
1A	Compensator	31-6308
1B	Mica Condenser (250 mmfd.)	61-0033
1C	Resist. (10,000 ohms, ½ watt)	33-310339
2	Mica Condenser (250 mmfd.)	61-0033
3	Mica Condenser (1120 mmfd.)	30-1140
4	Tubular Condenser (.05 mfd.)	30-4518
5	Resistor (1.0 meg., ½ watt)	33-510339
6	Tubular Condenser (.05 mfd.)	30-4518
7	Resis. (270,000 ohms, ½ watt)	33-427339
8	R. F. Transformer	32-3283
9	Tuning Condenser	31-2374
10	Resistor (5600 ohms, ½ watt)	33-256339
11	Resist. (47,000 ohms, ½ watt)	33-347339
12	Mica Condenser (250 mmfd.)	61-0033
13	Tubular Condenser (.05 mfd.)	30-4518
14	Tubular Condenser (.05 mfd.)	30-4518
15	Resist. (10,000 ohms, ½ watt)	33-310339
16	Mica Condenser (250 mmfd.)	61-0033
17	Oscillator Transformer	32-3212
18	1st I. F. Trans. Assembly	32-3210
19	Resistor (27,000 ohms, 1 watt)	33-327439
20	Resistor (1,000 ohms, ½ watt)	33-210339
21	2nd I. F. Trans. Assembly	32-3281
22	Resistor (2.2 meg., ½ watt)	33-522339
23	Tubular Condenser (.01 mfd.)	30-4572
24	Volume Control (.5 meg.)	33-5332
25	Resistor (4.7 meg., ½ watt)	33-547339
26	Mica Condenser (250 mmfd.)	61-0038
27	Tubular Cond. (.004 mfd.)	30-4578
28	Resistor (1.0 meg., ½ watt)	33-510339
29	Resis. (330,000 ohms, ½ watt)	33-433339
30	Tubular Cond. (.006 mfd.)	30-4445
31	Tubular Condenser (.02 mfd.)	30-4481
32	Tone Control & On-Off Switch	42-1520
33	Output Transformer	32-8063
34	Cone & Voice Coil Assembly: For Speaker 36-1480-3	36-4086
35	Field Coil (Replace Spkr. Part No. 36-1480)	
36	Electrolytic Condenser (4 mfd., 400 V.)	30-2401
37	Electrolytic Condenser (12-20 mfd., 475 V.)	30-2437
38	Resistor (39 ohms, ½ watt)	33-039339
39	Resistor (220 ohms, 1 watt)	33-122431
40	Power Transformer (115 V., 50-60 cycles)	32-8064
41	Bakelite Cond. (.01-.01 mfd.)	3903-DG
42	Pilot Lamps	34-2064
43	Wave Switch	42-1494
44	Pushbutton Switch	42-1528
45	Padder Strip	31-6315
46	Motor Switch	42-1548
47	Motor (110 volts, 60 cycles)	35-1204
48	Switch (Part of 46)	
49	Crystal Cartridge (Pickup)	35-2030
50	Pickup Cable Assembly Switch Section	41-3508
	Changer	318-1775
51	Radio-Phono Switch	42-1551
52	Cable (Radio-Phono Switch)	L-3217
53	Condenser (.05 mfd.)	30-4518

MISCELLANEOUS PARTS

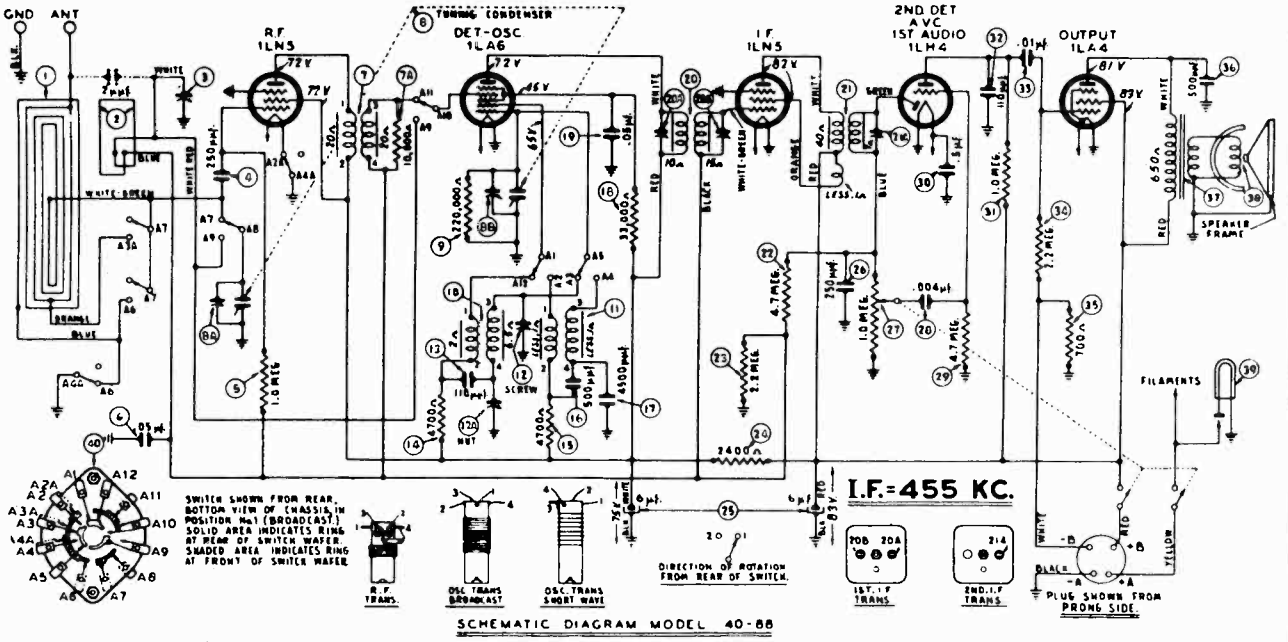
Automatic Record Changer	35-1180
Cabinet	10452-A
Cable (Power)	L-3199
Cable (Speaker)	41-3329
Cable (Radio-Phono)	L-3217
Dial Scale	27-5506
Drive Cord (Pointer Drive)	31-2399
Drive Cord (Cond. Drive)	31-2400
Drive Drum (Tuning)	38-9883
Escutcheon (Station Tabs)	28-5742
Knobs (Vol., Tone., Wave Sw.)	27-4332
Knob (Pushbutton Switch)	27-4824
Knob (Phono Off-On)	27-4627
Pilot Light Socket Assy.	38-9904
Pointer	56-1532
Shaft (Tuning)	318-1506
Spring (Cond. Drive Cord)	28-8751
Spring (Pointer Drive Cord)	28-8953
Spring (Tuning Shaft Assy.)	28-8955
Speaker	36-1480
Sockets	55-0575
Tab (Dial)	27-5526
Tab (Television)	27-9450
Tab Kit (Station Call Letters)	40-6473

MOUNTING PARTS

Nail Escutcheon Mounting	W-1074
Nut Speaker Mounting	W-124FA3
Nut Phono Switch Mtg.	W-684FA4
Screw (Chassis Mounting)	W-2068
Screw (Speaker Plug)	W-1714
Washer (Chassis Mounting)	W-410FA3
Washer (Speaker Mounting)	27-7467
"C" Washer (Tuning Shaft)	28-2043

PHILCO RADIO & TELEV. CORP.

MODEL 40-88(121)
Schematic, Voltage
Chassis, Trimmers



SCHEMATIC DIAGRAM MODEL 40-88

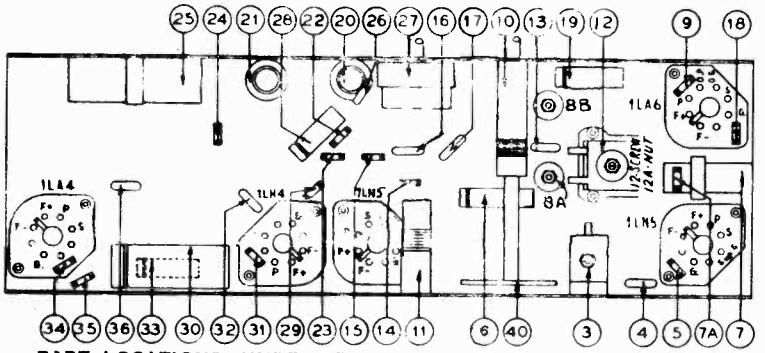
Replacement Parts — Model 40-88, Code 121

SCHE. No.	DESCRIPTION	PART No.
1	Loop Assembly (Broadcast)	38-9917
2	Loop Assembly (Short Wave)	38-9865
3	Compensator	31-6288
4	Mica Condenser (250 mmfd.)	61-0033
5	Resistor (1.0 meg., ½ watt)	33-510339
6	Tubular Condenser (.05 mfd.)	30-4519
7	R. F. Transformer Assembly	32-3219
7A	Resistor (10,000 ohms, ½ watt)	33-310339
8	Tuning Condenser Assembly	31-2378
9	Resistor (220,000 ohms, ½ watt)	33-422339
10	Oscillator Transformer (Broadcast)	32-3249
11	Oscillator Transformer (Short Wave)	32-3220
12	Compensator	31-6100
13	Mica Condenser (110 mmfd.)	30-1130
14	Resistor (4700 ohms, ½ watt)	33-347339
15	Resistor (4700 ohms, ½ watt)	33-247339
16	Mica Condenser (500 mmfd.)	30-1114
17	Mica Condenser (4500 mmfd.)	30-1109
18	Resistor (33,000 ohms, ½ watt)	33-333339
19	Tubular Condenser (.05 mfd.)	30-4519
20	1st I. F. Transformer Assembly	32-3222
21	2nd I. F. Transformer Assembly	32-3223
22	Resistor (4.7 meg., ½ watt)	33-547339
23	Resistor (2.2 meg., ½ watt)	33-522339
24	Resistor (2400 ohms, ½ watt)	33-224339
25	Electrolytic Condenrer (6-6 mf., 150 V.)	30-2388
26	Mica Condenser (250 mmfd.)	61-0033
27	Volume Control and On-Off Switch	33-5310
28	Tubular Condenser (.004 mfd.)	30-4578
29	Resistor (4.7 meg., ½ watt)	33-547339
30	Tubular Condenser (.5 mfd.)	30-4551
31	Resistor (1.0 meg., ½ watt)	33-510339
32	Mica Condenser (110 mmfd.)	30-1130
33	Tubular Condenser (.01 mfd.)	30-4572
34	Resistor (2.2 meg., ½ watt)	33-522339
35	Resistor (700 ohms, ½ watt)	33-170339
36	Mica Condenser (500 mmfd.)	30-1114
37	Output Transformer	32-8096
38	Cone and Voice Coil Assembly (Speaker Part No. 36-1482-3)	36-4121
39	Pilot Lamp	34-2246
40	Wave Switch	42-1499

MISCELLANEOUS PARTS

Bezel	27-4855
Cabinet	10414A
Clip (Coil Mounting)	28-5002
Drive Cord Assembly	31-2380
Dial	27-5511
Flag (On-Off Indication)	56-1418
Flag Bearing	56-6045
Flag Spring	28-8947
Flag Cam and Hub Assembly	38-9861
Gasket (Dial Mounting)	27-9472
Knobs (Tuning, Volume and Wave Switch)	27-4882
Pilot Lamp Socket Assembly	38-9839
Pointer	27-4868
Pushbutton (Pilot Lamp)	27-4844
Operating Finger (Pilot Lamp)	56-1487
Speaker	36-1482
Speaker Grille	56-1255
Spring (Pilot Lamp)	28-8952
Spring (Drive Cord)	28-8882
Spring (Wave Switch Centering)	28-8665
Snap Fastener (Dial Mounting)	28-4342
Sockets (Loktal)	55-0575
Tuning Shaft	56-6070
Tuning Drum	56-1486

FOR ALIGNMENT
SEE INDEX

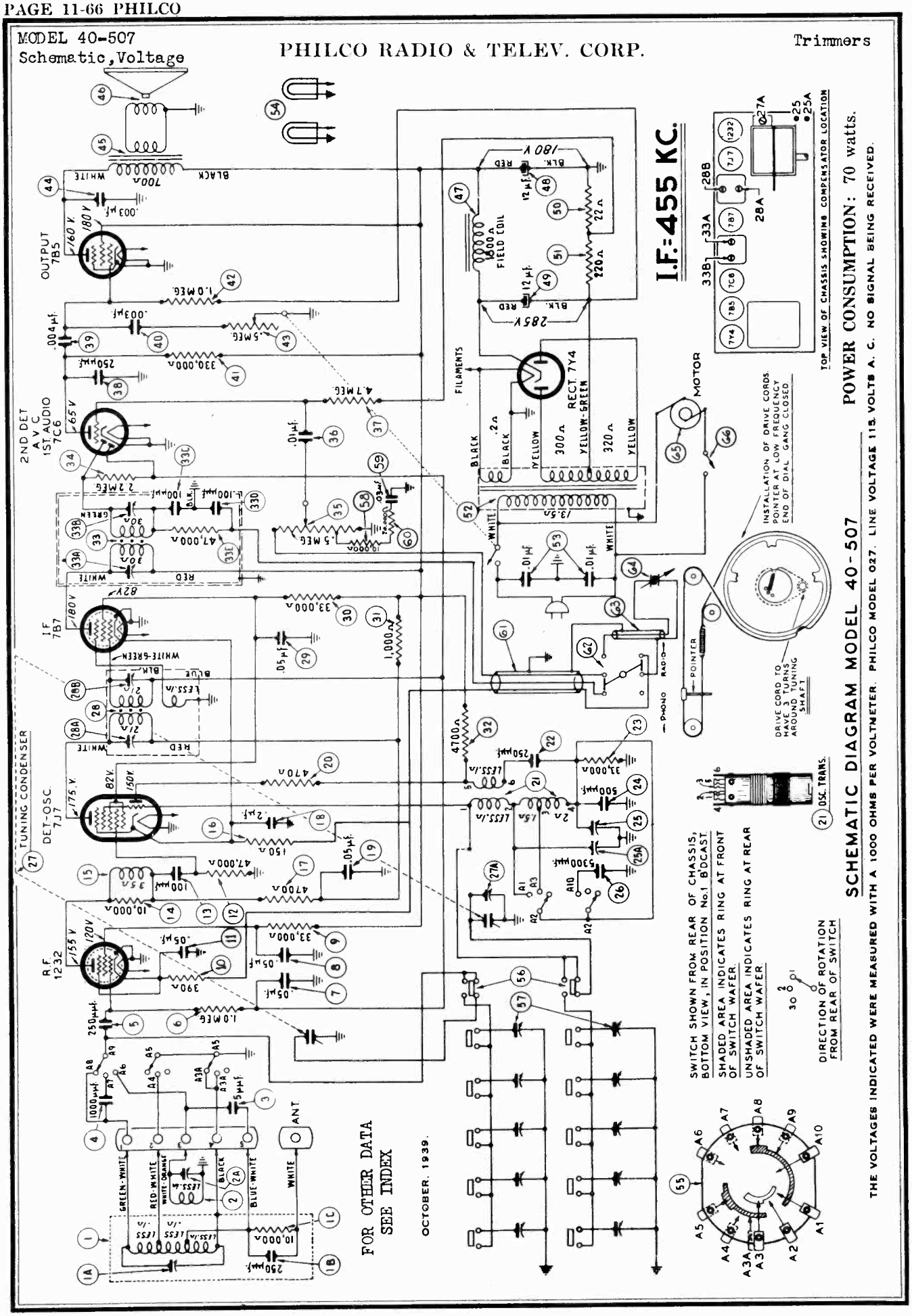


PART LOCATIONS, UNDERSIDE OF CHASSIS, MODEL 40-88

MODEL 40-507
Schematic, Voltage

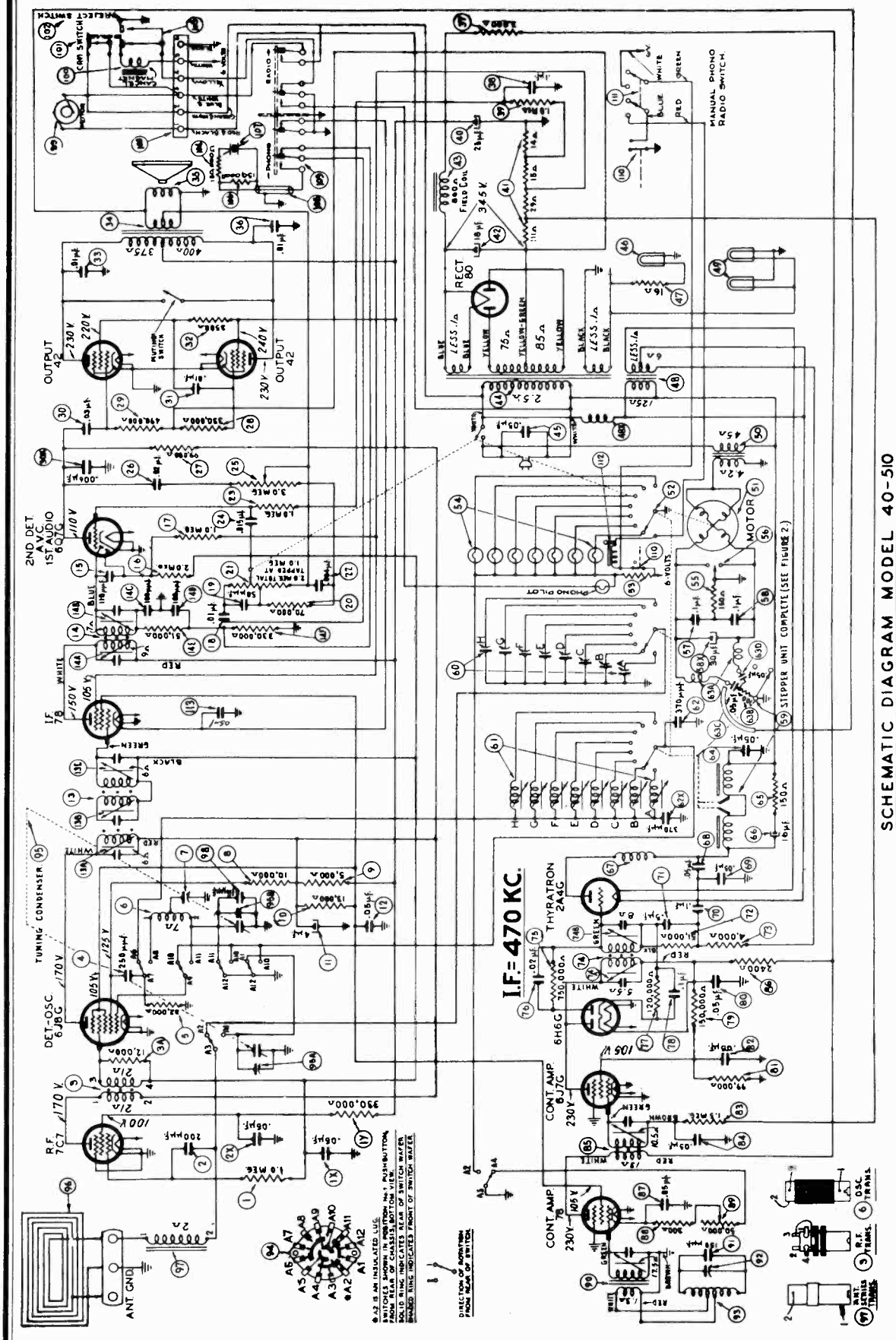
PHILCO RADIO & TELEV. CORP.

Trimmers



PHILCO RADIO & TELEV. CORP.

MODEL 40-510
Schematic, Voltage
Notes



VOLTAGES INDICATED AT TUBE ELEMENTS WERE MEASURED WITH A PHILCO MODEL 027 CIRCUIT TESTER AND VACUUM TUBE VOLTMETER.
LINE VOLTAGE 115 VOLTS A. C... NO SIGNAL BEING RECEIVED.

The Deluxe Inter-Mix Record Changer plays fourteen 10" and 12" records intermixed, fifteen 10" or thirteen 12" records at one loading. The record changer can be operated manually or from the wireless remote control circuit of the radio receiver. When using the wireless remote control to operate the phonograph, the Inter-Mix Record Changer can be started and stopped, records rejected and volume adjusted, from the remote control unit. The automatic record changer is selected by dialing "PHONO" position. This operates relay (112) which pulls in "Radio-Phono" switch (109) to the "PHONO" position. Records are also rejected by dialing the "PHONO" position on the wireless remote control unit. Phono relay (112) is connected to No. 8 contact of the pilot lamp section of rotary switch (52).

POWER CONSUMPTION: 220 Watts.
CABINET DIMENSIONS: 38¾" High 40½" Wide 21" Deep.

FOR OTHER DATA, SEE INDEX

MODEL 40-510
Stepper Unit, Parts
MODEL 40-516
Parts List

PHILCO RADIO & TELEV. CORP.

Replacement Parts — Model 40-510

SCHE. No.	DESCRIPTION	PART No.
1	Resistor (1.0 meg., ½ watt)	33-510339
1X	Tubular Cond. (.05 mfd.)	30-4519
1Y	Resistor (330,000 ohms, ½ watt)	33-433339
2	Mica Cond. (200 mmfd.)	30-1078
2X	Tubular Cond. (.05 mfd.)	30-4123
3	R. F. Trans.	32-3282
3A	Resistor (12,000 ohms, ½ watt)	33-312339
4	Mica Cond. (250 mmfd.)	30-1032
5	Resistor (32,000 ohms, ½ watt)	33-332339
6	Oscillator Trans.	32-3278
7	Compensator	31-6230
7X	Mica Cond. (15 mmfd.)	30-1139
8	Resistor (10,000 ohms, ½ watt)	33-310339
9	Resistor (5,000 ohms, 2 watts)	33-250539
10	Resistor (3,000 ohms, 1 watt)	33-130439
11	Electrolytic Cond. (4 mfd., 250 V.)	30-2334
12	Tubular Cond. (.05 mfd.)	30-4123
13	1st I. F. Trans. Assy.	32-3089
14	2nd I. F. Trans. Assy.	32-2645
15	Mica Cond. (110 mmfd.)	30-1031
16	Resistor (2.0 meg., ½ watt)	33-520339
17	Resistor (1.0 meg., ½ watt)	33-510339
18	Tubular Cond. (.01 mfd.)	30-4479
19	Mica Cond. (50 mmfd.)	30-1029
20	Resistor (70,000 ohms, ½ watt)	33-370339
21	Volume Control (2.0 meg.)	33-5200
22	Tubular Cond. (.004 mfd.)	30-4334
23	Resistor (1.0 meg., ½ watt)	33-510339
24	Tubular Cond. (.015 mfd.)	30-4358
25	Tone Control (3.0 meg.)	33-5287
26	Tubular Cond. (.02 mfd.)	30-4481
27	Resistor (99,000 ohms, ½ watt)	33-399339
28	Resistor (330,000 ohms, ½ watt)	33-433339
29	Resistor (490,000 ohms, ½ watt)	33-449339
30	Tubular Cond. (.03 mfd.)	30-4517
30X	Tubular Cond. (.006 mfd.)	30-4445
31	Tubular Cond. (.01 mfd.)	30-4501
32	Resistor (3500 ohms, ½ watt)	33-235339
33	Tubular Cond. (.01 mfd.)	30-4501
34	Output Trans.	32-7997
35	Cone and Voice Coil Assy. (Spkr. Part No. 36-1450-2)	36-4089
	(Spkr. Part No. 36-1450-4)	36-4111
36	Tubular Cond. (.01 mfd.)	30-4501
37	Resistor (3000 ohms, ½ watt)	33-230339
38	Tubular Cond. (.1 mfd.)	30-4499
39	Resistor (1.0 meg., ½ watt)	33-510339
40	Electrolytic Cond. (25 mfd., 300 V.)	30-2360
41	Bias Resistor (Wirewound)	33-3361
42	Electrolytic Cond. (18 mfd., 475 V.)	30-2200
43	Field Coil (Replace Spkr. Part No. 36-1450)	
44	Power Trans. (115 V., 50-60 cycles)	32-7999
	Power Trans. (115 V., 25-40 cycles)	32-8013
45	Condenser (.05 mfd., 115 V. Plug)	30-4576
46	Pilot Lamp (Bullseye)	34-2210
47	Pilot Lamp Resistor (16 ohms, 1 watt)	33-016431
48	Filament Trans. (115 V., 50-60 cycles)	32-7993
	Filament Trans. (115 V., 25-40 cycles)	32-8016
48X	Choke Coil	32-1281
49	Pilot Lamps (Dial)	34-2064
50	Motor Trans. (115 V., 50-60 cycles)	32-7990
	Motor Trans. (115 V., 25-40 cycles)	32-8015
51	Volume Control Motor Assy.	35-1151
52	Rotary Switch	42-1468
53	Bias Resistor (Wirewound, 10 ohms)	33-3363
54	Pilot Lamps (Station Indicator)	34-2064
55	Resistor (150 ohms, ½ watt)	33-115339
56	Volume Control Switch (Motor Control)	42-1469
57	Tubular Cond. (.1 mfd.)	30-4499
58	Tubular Cond. (.1 mfd.)	30-4499
58X	Electrolytic Cond. (30 mfd., 30 V.)	30-2361
59	Stepper Unit Complete	38-9689
60	Compensator Strip (Pushbutton)	31-6264
60A	Compensator No. 1	
60B	Compensator No. 2 540-1030 K.C., Part of 60	
60C	Compensator No. 3	
60D	Compensator No. 4 670-1160 K.C., Part of 60	
60E	Compensator No. 5	
60F	Compensator No. 6 900-1470 K.C., Part of 60	
60G	Compensator No. 7	
60H	Compensator No. 8 1170-1600 K.C., Part of 60	
61	Coil Assy. (Pushbuttons)	
61A	Oscillator Coil No. 1	
61B	Oscillator Coil No. 2 540-1030 K.C.	32-3042
61C	Oscillator Coil No. 3	
61D	Oscillator Coil No. 4 670-1160 K.C.	32-3042
61E	Oscillator Coil No. 5	
61F	Oscillator Coil No. 6 900-1470 K.C.	32-3041
61G	Oscillator Coil No. 7	
61H	Oscillator Coil No. 8 1170-1600 K.C.	32-3041
62	Silver Mica Cond. (370 mmfd.)	30-1110
62X	Silver Mica Cond. (370 mmfd.)	30-1110
63	Spark Filter Assy.	
63A	Super Choke	32-3276
63B	Resistor (100 ohms, ½ watt)	33-110339
63C	Tubular Cond. (.05 mfd.)	30-4444
63D	Tubular Cond. (.05 mfd.)	30-4444
64	Bakelite Cond. (.05 mfd.)	3615-SG
65	Resistor (150 ohms, Wirewound)	33-3362
66	Electrolytic Cond. (16 mfd., 150 V.)	30-2387
67	Choke Coil	32-1281
68	Tubular Cond. (.05 mfd.)	30-4123
69	Tubular Cond. (.05 mfd.)	30-4123
70	Tubular Cond. (.1 mfd.)	30-4499
71	Tubular Cond. (.05 mfd.)	30-4551
72	Resistor (51,000 ohms, ½ watt)	33-351339
73	Resistor (4,000 ohms, ½ watt)	33-240339
74	No. 3 Control Amp. Coil	32-3275
75	Resistor (750,000 ohms, ½ watt)	33-475339
76	Tubular Cond. (.02 mfd.)	30-4516
77	Resistor (120,000 ohms, ½ watt)	33-412339
78	Tubular Cond. (.01 mfd.)	30-4455
79	Resistor (150,000 ohms, ½ watt)	33-415339
80	Tubular Cond. (.05 mfd.)	30-4123
81	Resistor (99,000 ohms, ½ watt)	33-399339
82	Tubular Cond. (.05 mfd.)	30-4123
83	Resistor (1.5 meg., ½ watt)	33-515339
84	Tubular Cond. (.05 mfd.)	30-4519
85	No. 2 Control Amp. Coil	32-3087
86	Resistor (2700 ohms, ½ watt)	33-227339
87	Tubular Cond. (.05 mfd.)	30-4444
88	Resistor (300 ohms, ½ watt)	33-130339
89	Sensitivity Control (50,000 ohms)	33-5295
90	No. 1 Control Amp. Coil	32-3086
91	Silver Mica Cond. (155 mfd.)	30-1121
92	Air Padder (Secondary Inductor)	31-6268
93	Secondary Inductor	40-6414
94	Wave Switch	42-1454
95	Tuning Cond.	31-2311
95A	Part of Tuning Condenser (95)	
95B	Part of Tuning Condenser (95)	
96	Loop Assembly	38-9882
97	Loop Series Transformer	32-3226
98	Mica Condenser (15 mmfd.)	30-1139
99	Phono-Motor (115 V., 60 cycle)	35-1177
100	Reject Magnet (Record Changer)	42-1552
101	Cam Parallel Switch (Record Changer)	42-1555
102	Adjust. Screw (Tone Arm Reject Switch)	W-2100
103	Terminal Panel Record Changer	
104	Resistor (150,000 ohms)	33-415339
105	Contact Blade (Tone Arm Reject Switch)	56-1663
106	Resistor (150,000 ohms)	33-415339
107	Crystal Pick-up Cartridge	35-2030
108	Pick-up Cable (Record Changer)	41-3504
	Pick-up Cable (Chassis)	41-3496
109	Remote Phono Radio Switch (Operates from Relay 112, mounted in chassis)	42-1526
110	Auxiliary Sw. (Mntd. on Range Sw. Cam)	42-1531
111	Man. Phono Radio Sw. (Mntd. on Chngr.)	42-1533
112	Relay — Part of 109 (Operates Remote Phono Radio Switch 109)	
113	Condenser (.05 mfd., Tubular)	30-4519

MISCELLANEOUS PARTS

Automatic Record Changer Complete	35-1176
Arm (Operating Auxiliary Switch)	56-1563
Bezel	56-1511
Bezel Gasket Assembly	38-9734
Cable (Chassis to Changer)	41-3495
Cable and Plug Assembly (Pilot Lamp)	41-3502
Cable and Plug (Power Supply)	L-3196
Cabinet	10412A
Drive Cord Tuning Condenser	31-2350
Drive Cord Pointer	31-2320
Dial	27-5537
Disc (Tuning)	27-4766
Disc (Tone Control)	27-4764
Disc (Volume Control)	27-4765
Disc (Wave Switch)	27-4767
Escutcheon Plate (Radio Phono)	28-5403
Jewel Pilot Light	27-4777
Knob (Radio Phono Switch)	27-4627
Pilot Lamp Assembly (R. H. Bracket)	38-9694
Pilot Lamp Assembly (L. H. Bracket)	38-9711
Pilot Lamp Assembly (Station Lights)	38-9709
Socket Assembly Bull's-eye Jewel	38-9922
Socket (4 prong, type 80 tube)	27-6044
Socket (6 prong, type 42 and 78 tubes)	27-6036
Socket (6 prong, Octal, 6J5G, 6Q7G tubes)	27-6086
Socket (7 prong, Octal, 6J7G tube)	27-6057
Socket (7 prong, Octal, 6A8G tube)	27-6099
Speaker	36-1450
Spring (Drive Cords)	28-8913
Screw (Bezel)	W-1834
Screw (Mtg. Chassis)	W-4155
Tone Arm Assy. Com. (Record Changer)	35-2067
Turntable Assy. (Record Changer)	35-3039
Tab Television	27-9447
Washer (Keyed Washer, Tuning Disc)	56-1029
Washer (Spring Washer, Tuning Disc)	6717

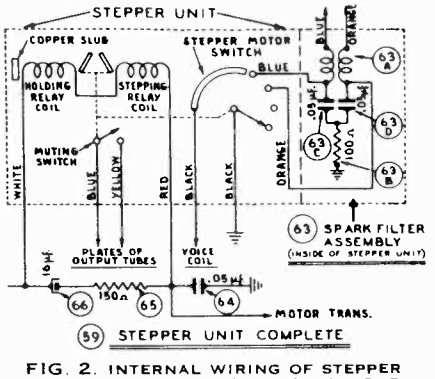


FIG. 2. INTERNAL WIRING OF STEPPER UNIT. NUMBERS CORRESPOND TO SCHEMATIC.

Replacement Parts — Model 40-516

SCHE. No.	DESCRIPTION	PART No.
1	Loop Assy. (Broadcast)	38-9882
1A	Resistor (10,000 ohms, ½ watt)	33-310339
1B	Mica Cond. (250 mmfd.)	61-0033
2	Loop Assy. (Short Wave)	38-9945
2A	Compensator	31-6226
3	Ant. Series Trans. (Broadcast)	32-3291
3X	Compensator	31-6212
4	Ant. Series Trans. (Short Wave)	32-3293
5	Ant. Trans. (Police Shunt)	32-3292
6	Mica Cond. (250 mmfd.)	61-0033
7	Resistor (2.0 meg., ½ watt)	33-520339
8	Tubular Cond. (.05 mfd.)	30-4123
9	Resistor (150,000 ohms, ½ watt)	33-415339
10	Resistor (12,000 ohms, ½ watt)	33-312339
11	Tubular Cond. (.05 mfd.)	30-4123
12	R. F. Trans. (Broadcast, Pushbutton and Police)	32-3230
12X	Mica Condenser (35 mmfd.)	30-1141
13	R. F. Trans. (Broadcast Manual)	32-3227
13X	Compensator	31-6212
14	R. F. Trans. (Short Wave)	32-3046
14X	Mica Cond. (5 mmfd.)	30-1097
15	Tubular Cond. (.1 mfd.)	30-4455
16	Tubular Cond. (.05 mfd.)	30-4519
17	Tubular Cond. (.1 mfd.)	30-4455
18	Resistor (51,000 ohms, ½ watt)	33-351339
19	Oscillator Trans. (Broadcast)	32-3231
20	Oscillator Trans. (Police)	32-3294
21	Oscillator Trans. (Short Wave)	32-3051
22	Compensator (3 section, oscillator)	31-6266
23	Compensator (Broadcast, Low Frefuency)	31-6230
24	Tracking Cond. (1230 mmfd.)	31-6262
25	Tracking Cord. (3425 mmfd.)	31-6263
26	Mica Cond. (250 mmfd.)	61-0033
27	Resistor (32,000 ohms, ½ watt)	33-332339
28	Resistor (10,000 ohms, ½ watt)	33-310339
29	Resistor (18,000 ohms, ½ watt)	33-318339
30	Resistor (5,000 ohms, 2 watt)	33-250539
31	Electrolytic Cond. (4 mfd., 250 V.)	30-2334
32	Mica Cond. (250 mmfd.)	61-0033
33	1st I. F. Trans. Assy.	32-3089
34	Tubular Cond. (.01 mfd.)	30-4572
34X	Condenser (.05 mfd., 200 V.)	30-4519
35	Resistor (1.0 meg., ½ watt)	33-510339
36	Resistor (330,000 ohms, ½ watt)	33-433339
37	Resistor (330,000 ohms, ½ watt)	33-433339
38	2nd I. F. Trans. Assy.	32-2645
39	Mica Cond. (110 mmfd.)	30-1031
39X	Tubular Cond. (.004 mfd.)	30-4478
40	Tubular Cond. (.01 mfd.)	30-4479
41	Mica Cond. (50 mmfd.)	30-1029
42	Volume Control	33-5300
43	Resistor (70,000 ohms, ½ watt)	33-370339
44	Tubular Cond. (.004 mfd.)	30-4334
45	Resistor (2.0 meg., ½ watt)	33-520339
46	Tubular Cond. (.015 mfd.)	30-4358
47	Resistor (1.0 meg., ½ watt)	33-510339
48	Tubular Cond. (.1 mfd.)	30-4527
49	Resistor (99,000 ohms, ½ watt)	33-399339
50	Tubular Cond. (.01 mfd.)	30-4469
51	Resistor (490,000 ohms, ½ watt)	33-449339
52	Resistor (5,000 ohms, ½ watt)	33-250339
53	Resistor (45,000 ohms, ½ watt)	33-345339
54	Tubular Cond. (.02 mfd.)	30-4481
55	Tone Control (3.0 meg.)	33-5287
56	Tubular Cond. (.01 mfd.)	30-4572
57	Tubular Cond. (.01 mfd.)	30-4572
58	Resistor (51,000 ohms, ½ watt)	33-351339
59	Resistor (490,000 ohms, ½ watt)	33-449339
60	Resistor (490,000 ohms, ½ watt)	33-449339
61	Resistor (240,000 ohms, ½ watt)	33-424339
62	Tubular Cond. (.1 mfd.)	30-4499
63	Tubular Cond. (.01 mfd.)	30-4501
64	Output Trans.	32-7996
65	Cone and Voice Coil Assy. (Spkr. Part No. 36-1450-2)	36-4089
	(Spkr. Part No. 36-1450-4)	36-4111
66	Tubular Cond. (.01 mfd.)	30-4501
67	Resistor (3,000 ohms, ½ watt)	33-230339
68	Resistor (1.0 meg., ½ watt)	33-510339
69	Electrolytic Cond. (25 mfd., 300 V.)	30-2360
70	Electrolytic Cond. (18 mfd., 475 V.)	30-2200
71	Field Coil (Replace Spkr. Part No. 36-1450)	
72	Resistor (Wirewound, Bias)	33-3364
73	Power Trans. (115 V., 50-60 cycles)	32-8001
	Power Trans. (115 V., 25-40 cycles)	32-8017
74	Bypass Cond. (.05 mfd., 110 V. Plug)	30-4576
75	Pilot Lamp (Bullseye)	34-2210
76	Pilot Lamp Resistor (16 ohms)	33-016331
77	Pilot Lamps (Dial)	34-2064
78	Filament Trans. (115 V., 50-60 cycles)	32-7993
	Filament Trans. (115 V., 25-40 cycles)	32-8016
78X	Choke Coil	32-1281
79	Motor Trans. (115 V., 50-60 cycles)	32-7990
	Motor Trans. (115 V., 25-40 cycles)	32-8015
80	Motor Assy. (Volume Control)	35-1151
81	Stepper Unit (Complete)	38-9689
81X	Rotary Switch (Stepper Unit)	42-1468
82	B. C. Resistor (Wirewound, 10 ohms)	33-3363
83	Pilot Lamps (Station Indicator)	34-2064
84	Switch (Volume Control-Motor)	42-1469
85	Resistor (150 ohms, ½ watt)	33-115339
86	Tubular Cond. (.1 mfd.)	30-4499
87	Tubular Cond. (.1 mfd.)	30-4499
88	Electrolytic Cond. (30 mfd., 30 V.)	30-2361
89	Padder Strip (Pushbuttons)	31-6264
89A	Compensator No. 1	
89B	Compensator No. 2 540-1030 K. C., Part of 89	
89C	Compensator No. 3	
89D	Compensator No. 4 670-1160 K. C., Part of 89	
89E	Compensator No. 5	
89F	Compensator No. 6 900-1470 K. C., Part of 89	
89G	Compensator No. 7	
89H	Compensator No. 8 1170-1600 K. C., Part of 89	
90	Elec. Pushbutton Trans. Assy. (8 Trans.)	32-3091
90A	Osc. Trans. No. 1	
90B	Osc. Trans. No. 2 540-1030 K. C.	32-3042
90C	Osc. Trans. No. 3	
90D	Osc. Trans. No. 4 670-1160 K. C.	32-3042
90E	Osc. Trans. No. 5	
90F	Osc. Trans. No. 6 900-1470 K. C.	32-3041
90G	Osc. Trans. No. 7	
90H	Osc. Trans. No. 8 1100-1600 K. C.	32-3041
91	Silver Mica Cond. (370 mmfd.)	30-1110
92	Silver Mica Cond. (370 mmfd.)	30-1110
93	Bakelite Cond. (.05 mfd.)	3615SG
94	Resistor (150 ohms)	33-3362
95	Electrolytic Cond. (16 mfd., 200 V.)	30-2356
96	Choke Coil	32-1281
97	Tubular Cond. (.05 mfd.)	30-4123
98	Tubular Cond. (.05 mfd.)	30-4123
99	Tubular Cond. (.1 mfd.)	30-4499
100	Tubular Cond. (.5 mfd.)	30-4551
101	Resistor (4000 ohms, ½ watt)	33-240339
102	Resistor (51,000 ohms, ½ watt)	33-351339
103	No. 3 Control Amp. Trans.	32-3275
104	Tubular Cond. (.02 mfd.)	30-4516
105	Resistor (750,000 ohms, ½ watt)	33-475339
106	Resistor (2700 ohms, ½ watt)	33-227339
107	Tubular Cond. (.1 mfd.)	30-4455
108	Resistor (120,000 ohms, ½ watt)	33-412339
109	Tubular Cond. (.05 mfd.)	30-4123
110	Resistor (99,000 ohms, ½ watt)	33-399339
111	Tubular Cond. (.05 mfd.)	30-4123
112	Resistor (150,000 ohms, ½ watt)	33-415339
112X	Tubular Cond. (.05 mfd.)	30-4123
113	Resistor (1.5 meg., ½ watt)	33-515339
114	Tubular Cond. (.05 mfd.)	30-4519
115	No. 2 Control Amp. Trans.	32-3087
116	Tubular Cond. (.05 mfd.)	30-4444
117	Sensitivity Control	33-5295
118	Resistor (300 ohms, ½ watt)	33-130339

SCHE. No.	DESCRIPTION	PART No.
119	No. 1 Control Amp. Trans.	32-3086
120	Silver Mica Cond. (130 mmfd.)	30-1122
121	Compensator (Secondary Inductor)	31-6268
122	Secondary Inductor (Mystery Tuning)	40-6415
123	Wave Switch	42-1454
124	Tuning Cond.	31-2417

WIRELESS REMOTE CONTROL UNIT

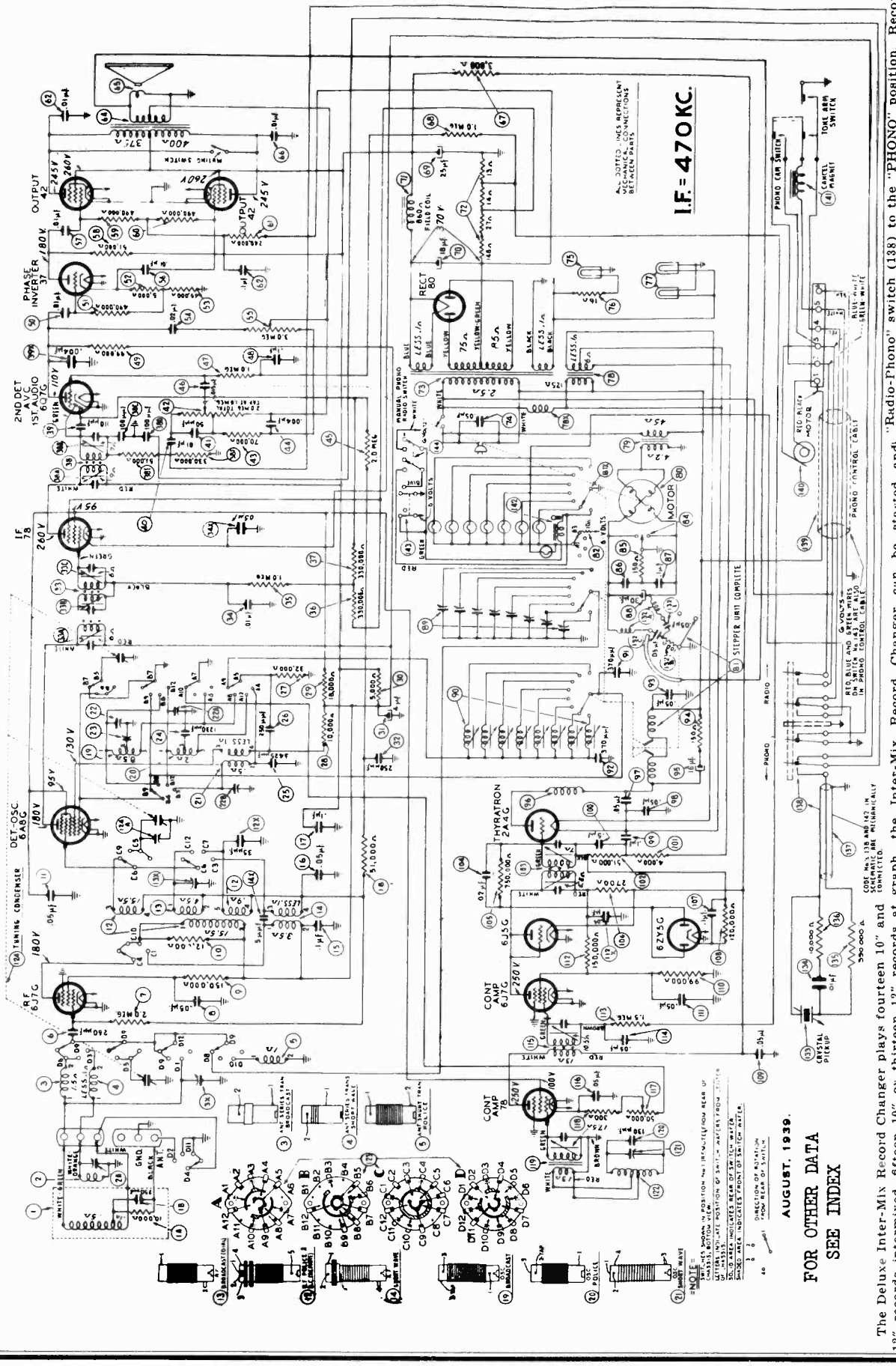
125	Primary Inductor	32-3097
126	Silver Mica Cond. (200 mmfd.)	30-1115
127	Tubular Cond. (.05 mfd.)	30-4519
128	Air Padder	31-6268
129	Resistor (500 ohms, ½ watt)	33-150339
130	Mystery Pack (Battery)	41-8023
131	Dial Unit (Pulser)	38-9704
132	Spark Filter Assy. (Inside of Sepper Unit)	38-9898
132A	Spark Filter Choke	32-3276
132B	Resistor (100 ohms, ½ watt)	33-110339
132C	Tubular Cond. (.05 mfd.)	30-4444
132D	Tubular Cond. (.05 mfd.)	30-4444
133	Crystal Pickup Bakelite Case	35-2030
134	Condenser (.01 mfd., 200 V.)	30-4581
135	Resistor (330,000 ohms)	33-433339
136	Resistor (10,000 ohms)	33-310339
137	Pickup Cable	41-3504
138	Remote Phono Relay and Switch	42-1526
139	Cable Radio-Phono Switch	41-3517
140	Motor (Record Changer Mech.)	35-1177
141	Cancel Magnet	42-1552
142	Relay (Part of 138) Operates Remote Radio-Phono Switch 138	
143	Auxiliary Switch (Mounted on Range Switch Cam)	42-1531
144	Manual Radio-Phono Switch (Mounted on Changer) Removes power from record changer when range switch is in Brdcst., Police, or S. W.	42-1533

MISCELLANEOUS PARTS

Bezel	38-9932
Bezel Gasket and Staple Assy.	38-9734
Cable (Power Supply)	L-3176
Cable and Plug (Pilot Lamp Assy.)	41-3502
Dial	27-5535
Drive Cord (Tuning Cond.)	31-2315
Drive Cord (Pointer)	31-2320
Disc (Tuning)	27-4766
Disc (Volume)	27-4765
Disc (Wave Switch)	27-4767
Disc (Tone Control)	27-4764
Inter-Mix Record Changer (See Bulletin 332 for Service Information and Additional Parts)	35-1176
Knob Phono-Switch	27-4627
Loop Assembly (Broadcast)	38-9882
Loop Assembly (Shortwave)	38-9845
Plate (Radio-Phono)	28-5403
Pilot Lamp Assy.	38-9922
Pilot Lamp Assy. (R. H. Bracket)	38-9694
Pilot Lamp Assy. (L. H. Bracket)	38-9711
Pilot Lamp Assy. (Station Lights)	38-9709
Pilot Lamp Assy. (Cabinet Bullseye)	38-9712
Pilot Light Jewel (Bullseye)	27-4777
Speaker	36-1450
Socket (4 prong, type 80 tube)	27-6044
Socket (5 prong type 37 tube)	27-8035
Socket (6 prong, type 42 and 78 tubes)	27-6036
Socket (Octal, type 6J5G, 6Q7G tubes, etc.)	27-6086
Socket (Octal, type 6J7G tube)	27-6057
Socket (Octal, type 6A8G tube)	27-6099
Spring (Drive Cords)	28-8913
Tab (Television)	27-9447
Washer (Keyed Washer Tuning Disc)	56-1029
Washer (Spring Washer Tuning Disc)	6717

PHILCO RADIO & TELEV. CORP.

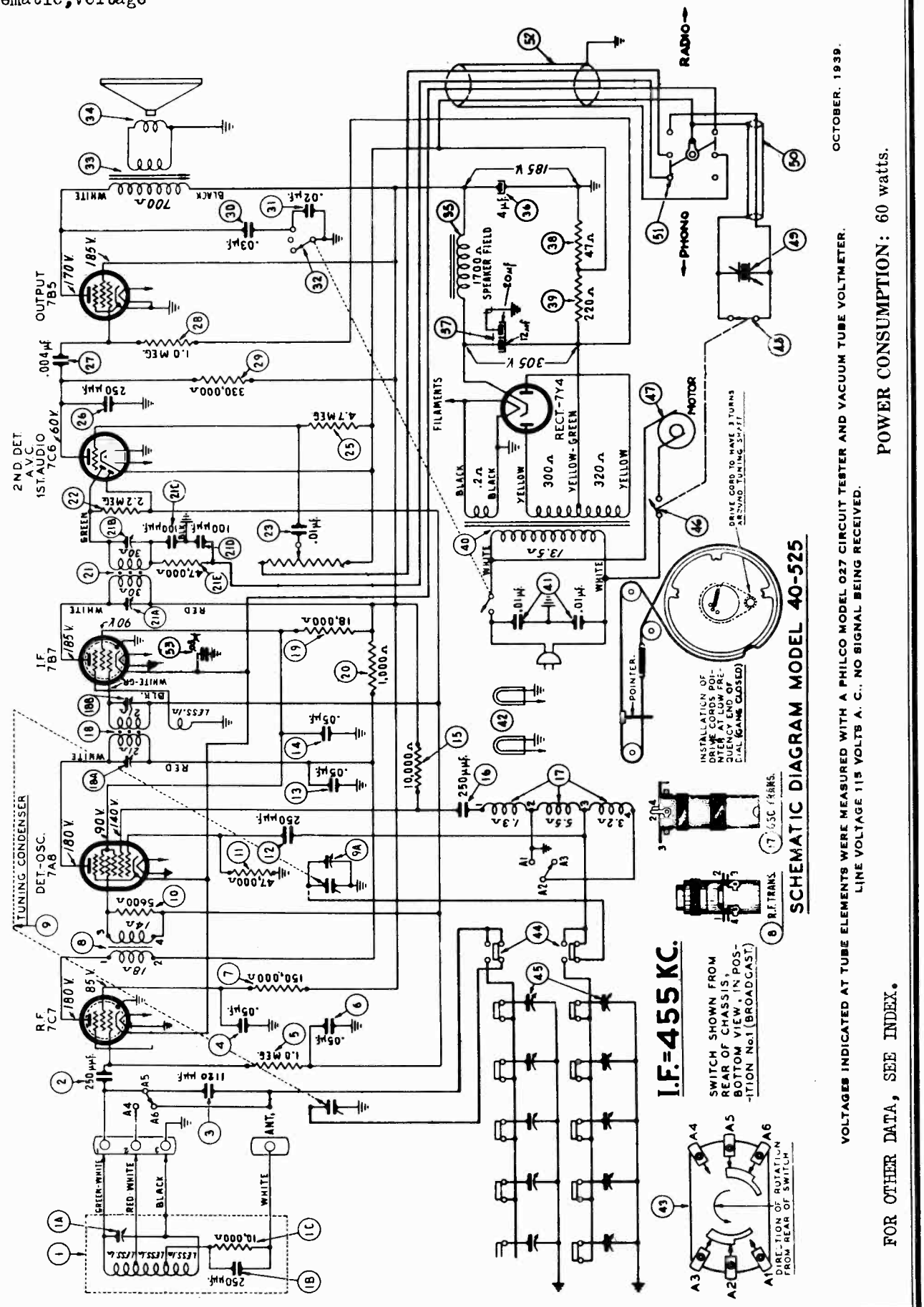
MODEL 40-516
Schematic, Voltage
Notes



The Deluxe Inter-Mix Record Changer plays fourteen 10" and twelve 12" records intermixed, fifteen 10" or thirteen 12" records at a time. the Inter-Mix Record Changer can be started and one loading. The record changer can be operated manually or stopped, records rejected and volume adjusted, from the remote wireless remote control unit. Phono relay (142) is connected from the wireless remote control circuit of the radio receiver. control unit. The automatic record changer is selected by dialing the "PHONO" position on the When using the wireless remote control to operate the phono- ing "PHONO" position. This operates relay (142) which pulls to No. 8 contact of the pilot lamp section of rotary switch (81X).

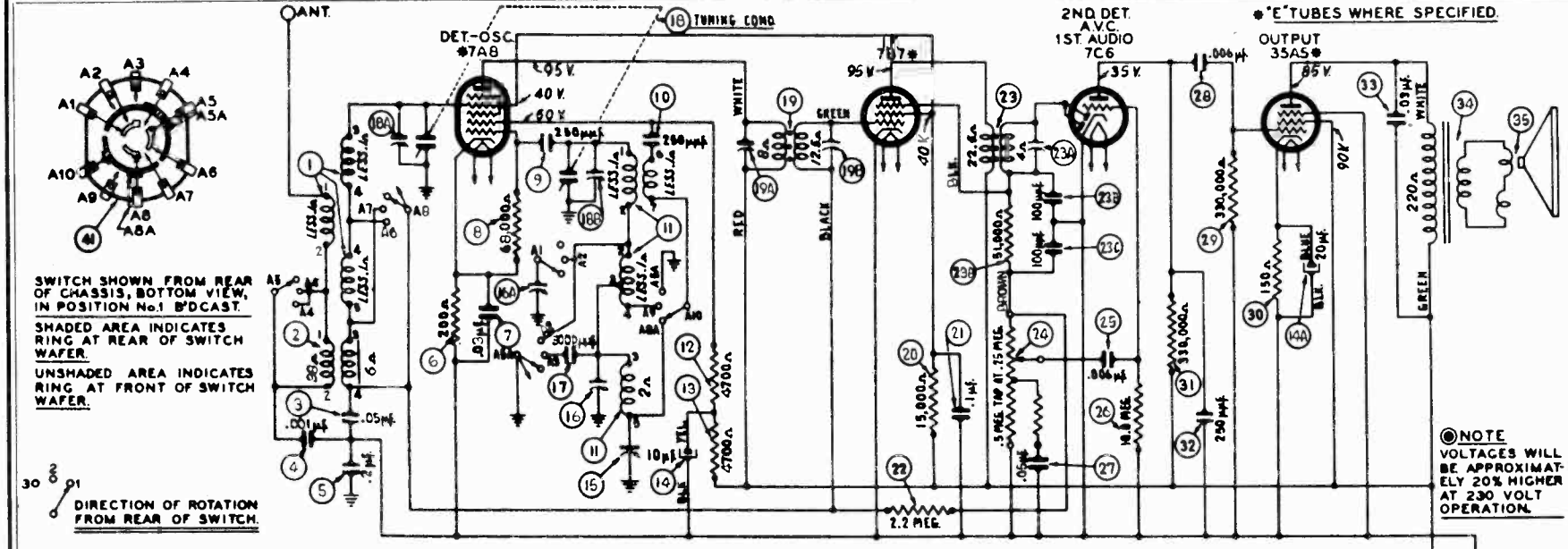
MODEL 40-525(121)
Schematic, Voltage

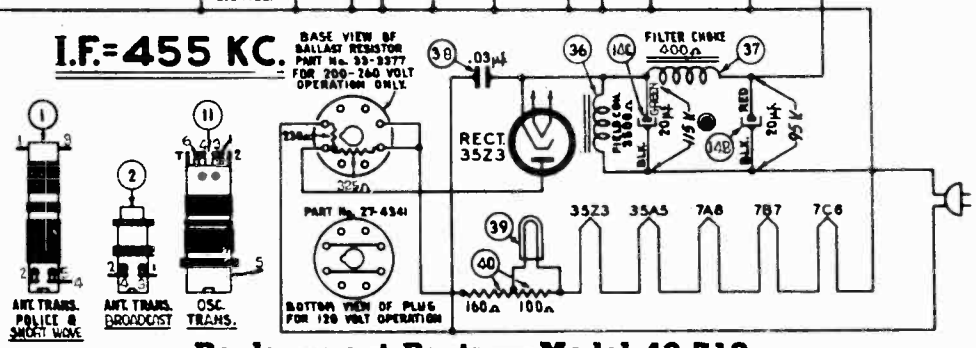
PHILCO RADIO & TELEV. CORP.



PHILCO RADIO & TELEV. CORP.

MODEL 40-710
Schematic, Voltage
Chassis, Trimmers





POWER SUPPLY: 100-130 or 200-260 volts A. C. or D. C. To operate the receiver on 200-260 volts A. C. or D. C. requires the use of a Ballast resistor, Part No. 33-3377 which can be obtained from your distributor. The Ballast resistor is inserted in the socket provided on the top of the chassis.

POWER CONSUMPTION: 120 volts, 35 watts; 240 volts, 70 watts.

TUNING RANGES:
530 to 1720 K. C. 2.3 to 7.4 M. C. 7.3 to 22 M. C.

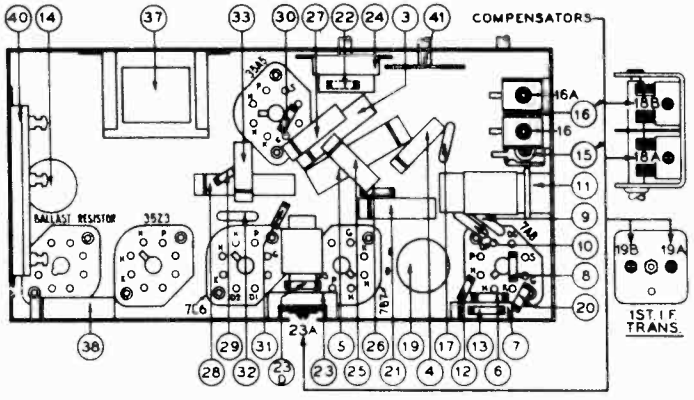


FIG. 2. PART LOCATIONS, UNDERSIDE OF CHASSIS.

JULY, 1939. FOR ALIGNMENT SEE INDEX

Replacement Parts — Model 40-710

SCHE. No.	DESCRIPTION	PART No.
1	Ant. Trans. (Police, Short Wave)	32-3295
2	Ant. Trans. (Broadcast)	32-3166
3	Tubular Cond. (.05 mfd.)	30-4609
4	Tubular Cond. (.001 mfd.)	30-4601
5	Tubular Cond. (.2 mfd.)	30-4594
6	Resistor (200 Ω, ½ watt)	33-120339
7	Tubular Cond. (.03 mfd.)	30-4585
8	Resistor (68,000 ohms, ½ watt)	33-368339
9	Mica Cond. (250 mmfd.)	30-1119
10	Mica Cond. (250 mmfd.)	30-1119
11	Oscillator Trans.	32-3296
12	Resistor (4700 ohms, ½ watt)	33-247339
13	Resistor (4700 ohms, ½ watt)	33-247339
14	Electrolytic Cond. (20,20,20,10 mf. 250V.)	30-2436
15	Compensator (single)	31-6289
16	Compensator (2 section)	31-6323
17	Mica Cond. (3000 mmfd.)	30-1028
18	Tuning Condenser	31-2410
19	1st I. F. Trans. Assy.	32-3297
20	Resistor (15,000 ohms, ½ watt)	33-315339
21	Tubular Cond. (.1 mfd.)	30-4586
22	Resistor (2.2 meg., ½ watt)	33-522339
23	2nd I. F. Trans. Assy.	32-2674
24	Volume Control (.5 meg.)	33-5336
25	Tubular Cond. (.006 mfd.)	30-4583
26	Resistor (10.0 meg., ½ watt)	33-610339
27	Tubular Cond. (.05 mfd.)	30-4519
28	Tubular Cond. (.006 mfd.)	30-4610
29	Resistor (330,000 ohms, ½ watt)	33-433339
30	Resistor (150 ohms, ½ watt)	33-115336
31	Resistor (330,000 ohms, ½ watt)	33-433339
32	Mica Cond. (250 mmfd.)	30-1119
33	Tubular Cond. (.03 mfd.)	30-4585
34	Output Trans.	32-8095
35	Cone and Voice Coil Assy. (Spkr. Part No. 36-1486-2)	36-4126
36	Field Coil (Replace Spkr. Part No. 36-1486)	
37	Filter Choke	32-8073
38	Tubular Cond. (.03 mfd.)	30-4520
39	Pilot Lamp	34-2068E
40	Filament Resistor	33-3372
41	Wave Switch	42-1534

MODEL 40-710
MODEL 40-715
Alignment

PHILCO RADIO & TELEV. CORP.

ALIGNMENT MODELS 40-710, 40-715

EQUIPMENT REQUIRED

(1) **Signal Generator.** In order to properly adjust this receiver, a calibrated signal generator such as Philco Model 077 A. C. or Model 177 battery operated are required. These signal generators cover a frequency range of 540 to 36,000 K. C.

(2) **Indicating Device.** To obtain maximum signal strength and accurate adjustment of the padders a vacuum tube voltmeter and circuit tester such as Philco Models 027 and 028 is recommended. These testers also contain an audio output meter which may be used as an indicating device.

(3) **Aligning Tools.** Fiber handle screw driver, Philco Part No. 45-2610.

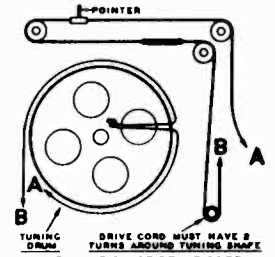
MODEL 40-710 CONNECTING ALIGNING INSTRUMENTS

Vacuum Tube Voltmeters: To use the vacuum tube voltmeter as an aligning indicator it should be connected to the A. V. C. circuit with the Philco aligning adaptor, Part No. 45-2767, as follows:

Remove the 7C6 tube from its socket and insert the aligning adaptor in the socket, then replace the tube in the adaptor. Connect the negative terminal of the vacuum tube voltmeter to the light colored wire which protrudes from the side of the adaptor. Attach the positive terminal of the voltmeter to the black wire.

Audio Output Meter: If this type of meter is used as an aligning indicator, it should be connected to the plate and screen terminals of the 35A5 tube. Adjust the meter for the 0 to 30 volt A. C. scale.

After connecting the aligning meter, adjust the compensators in the order as shown in the tabulation below. Locations of the compensators are shown in Fig. 2. If the output meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.



INSTALLATION OF DRIVE CORD
POINTER AT LOW FREQUENCY END OF DIAL.
GANG CLOSED

FIG. 1. DIAL CALIBRATION.

Operations in Order	SIGNAL GENERATOR			RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dummy Antenna Note A	Dial Setting	Dial Setting	Control Settings	Adjust Compensators	
1	7A8	.1 mfd.	455 K. C.	580 K. C.	Vol. Max. Range Switch "Brdcst"	23A, 19B, 19A	
2	Ant. & Chassis	400 ohms	20 M. C.	20 M. C.	Range Switch "S. W. 2"	18B, 18A	Note C
3	Ant. & Chassis	400 ohms	7.0 M. C.	7.0 M. C.	Range Switch "S. W. 1"	16A	Rollgang
4	Ant. & Chassis	200 mmfd.	1400 K. C.	1400 K. C.	Vol. Max. Range Switch "Brdcst"	16	Note B
5	Ant. & Chassis	200 mmfd.	580 K. C.	580 K. C.	Vol. Max. Range Switch "Brdcst"	15	Rollgang Repeat Oper. 4

NOTE A — The "Dummy Antenna" consists of a condenser or resistance connected in series with the signal generator output lead (high side). Use the capacity or resistance as specified in each step of the above procedure.

NOTE B — DIAL CALIBRATION: In order to adjust the receiver correctly the dial must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows: With the tuning condenser closed (maximum capacity), set the dial pointer on the first mark on the left edge (low frequency end) of the broadcast scale.

NOTE C — When adjusting compensator (18B) be sure to tune in the fundamental signal (20 M. C.) instead of the image signal. If the compensator is correctly adjusted, the image signal will be found by turning dial 910 K. C. below the fundamental signal, which will be 19.090 M. C.

MODEL 40-715 CONNECTING ALIGNING INSTRUMENTS

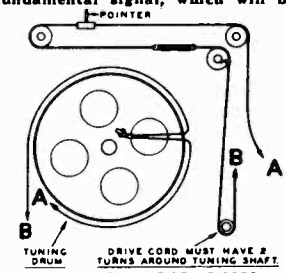
Vacuum Tube Voltmeter: To use the vacuum tube voltmeter as an aligning indicator it should be connected to the A. V. C. circuit as follows:

1. Connect the negative (—) terminal of the voltmeter through a 2 meg. resistor to the converter grid (6J8G). The resistor must be connected directly to the grid of the tube and the voltmeter wire attached to the resistor.

2. Connect the positive (+) terminal to the chassis ground terminal.

Audio Output Meter: If this type of meter is used as an aligning indicator, it should be connected to the plate and screen terminals of the 41 tube. Adjust the meter for the 0 to 30 volt A. C. scale.

After connecting the aligning meter, adjust the compensators in the order as shown in the tabulation below. Locations of the compensators are shown in Fig. 1. If the output meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.



INSTALLATION OF DRIVE CORD
POINTER AT LOW FREQUENCY END OF DIAL
GANG CLOSED

FIG. 1. DIAL CALIBRATION.

Operations in Order	SIGNAL GENERATOR			RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dummy Antenna Note A	Dial Setting	Dial Setting	Control Settings	Adjust Compensators	
1	6J8EG	.1 mfd.	455 K. C.	580 K. C.	Vol. Max. Tone Treble Range Switch "Brdcst"	24, 16B, 16A	
2	Ant. & Grnd.	200 mmfd.	1500 K. C.	1500 K. C.	Vol. Max. Tone Treble Range Switch "Brdcst"	9A, 15A	Note B
3	Ant. & Grnd.	200 mmfd.	580 K. C.	580 K. C.	Vol. Max. Tone Treble Range Switch "Brdcst"	11	Roll Gang Repeat Oper. 2
4	Ant. & Grnd.	400 ohms	7.0 M. C.	7.0 M. C.	Range Switch "Police"	9	Roll Gang
5	Ant. & Grnd.	400 ohms	20 M. C.	20 M. C.	Range Switch "S.W."	5A, 5	Note C

NOTE A — The "Dummy Antenna" consists of a condenser or resistance connected in series with the signal generator output lead (high side). Use the capacity or resistance as specified in each step of the above procedure.

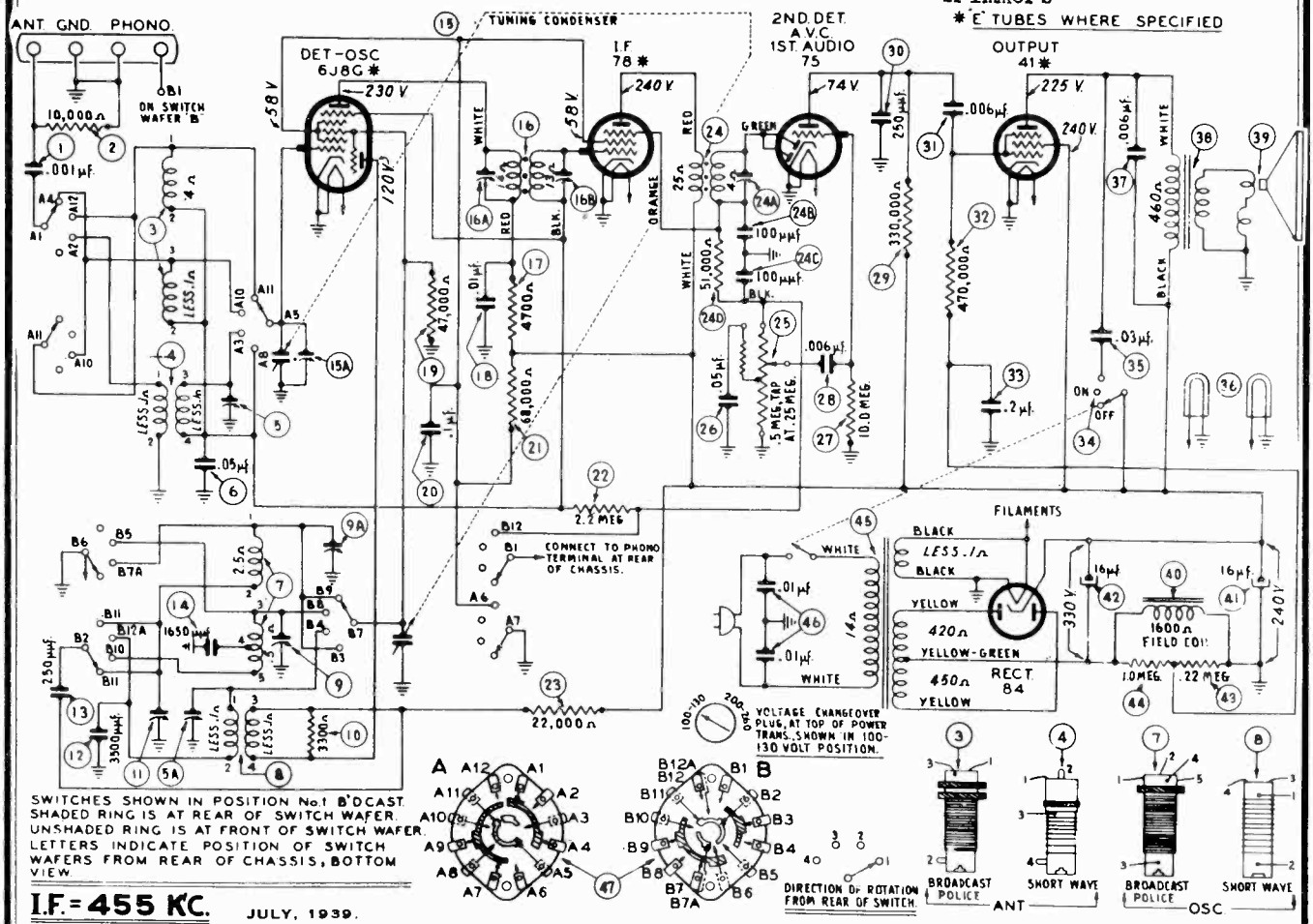
NOTE B — DIAL CALIBRATION: In order to adjust the receiver correctly the dial must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows: With the tuning condenser closed (maximum capacity), set the dial pointer on the first mark on the left edge (low frequency end) of the broadcast scale.

NOTE C — When adjusting compensator (5A) be sure to tune in the fundamental signal (20 M. C.) instead of the image signal. If the compensator is correctly adjusted, the image signal will be found by turning dial 910 K. C. below the fundamental signal, which will be 19.090 M. C.

PHILCO RADIO & TELEV. CORP. MODEL 40-715(121)

Schematic, Voltage, Chassis Trimmers

* E TUBES WHERE SPECIFIED



SWITCHES SHOWN IN POSITION No.1 B'DCAST. SHADED RING IS AT REAR OF SWITCH WAFER. UNSHADED RING IS AT FRONT OF SWITCH WAFER. LETTERS INDICATE POSITION OF SWITCH WAFERS FROM REAR OF CHASSIS, BOTTOM VIEW.

I.F. = 455 KC. JULY, 1939.

Replacement Parts — Model 40-715

SCHE. No.	DESCRIPTION	PART No.
1	Tubular Cond. (.001 mfd.)	30-4882
2	Resistor (10,000 ohms, ½ watt)	33-310339
3	Antenna Trans. (Broadcast, Police)	32-3141
4	Antenna Trans. (Short Wave)	32-3143
5	Compensator (2 section)	31-6287
5A	Compensator (Part of 5)	
6	Tubular Cond. (.05 mfd.)	30-4609
7	Oscillator Trans. (Broadcast, Police)	32-3142
8	Oscillator Trans. (Short Wave)	32-3144
9	Compensator (2 section)	31-6287
9A	Compensator (part of 2)	
10	Resistor (3300 ohms, ½ watt)	33-233339
11	Compensator (1 section)	31-6289
12	Mica Cond. (3500 mmfd.)	30-1094
13	Mica Cond. (250 mmfd.)	30-1119
14	Mica Cond. (1650 mmfd.)	5877
15	Tuning Condenser	31-2357
16	1st I. F. Transformer	32-3139
16A	Part of 16	
16B	Part of 16	
17	Resistor (4700 ohms, ½ watt)	33-247339
18	Tubular Cond. (.01 mfd.)	30-4572
19	Resistor (47,000 ohms, ½ watt)	33-347339
20	Tubular Cond. (.1 mfd.)	30-4527
21	Resistor (68,000 ohms, ½ watt)	33-368439
22	Resistor (2.2 meg., ½ watt)	33-522339
23	Resistor (22,000 ohms, ½ watt)	33-322339
24	2nd I. F. Transformer	32-3140
24A	Part of 24	
24B	Part of 24	
24C	Part of 24	
25	Volume Control (.5 meg.)	33-5305
26	Tubular Cond. (.05 mfd.)	30-4519
27	Resistor (10.0 meg., ½ watt)	33-610339
28	Tubular Cond. (.006 mfd.)	30-4563
29	Resistor (330,000 ohms, ½ watt)	33-433339
30	Mica Cond. (250 mmfd.)	30-1119
31	Tubular Cond. (.006 mfd.)	30-4610
32	Resistor (470,000 ohms, ½ watt)	33-447339
33	Tubular Cond. (.2 mfd.)	30-4587
34	Tone Control and On-Off Switch	42-1481
35	Tubular Cond. (.03 mfd.)	30-4517
36	Pilot Lamps	34-2064E
37	Tubular Cond. (.03 mfd.)	30-4591
38	Output Transformer	32-8018
39	Cone and Voice Coil Assembly (Spkr. Part No. 36-1452-2)	36-4193
40	Field Coil (Replace Spkr. Part No. 36-1452)	
41	Electrolytic Cond. (16 mfd., 300 V.)	30-2383
42	Electrolytic Cond. (16 mfd., 400 V.)	30-2364
43	Resistor (.22 meg., ½ watt)	33-422339
44	Resistor (1.0 meg., ½ watt)	33-510339
45	Power Transformer (100-130 V., 200-260 V., 50-60 cycles)	32-8008
46	Line Cond. (.01-.01 mfd.)	3903-ODG
47	Wave Switch	42-1480

MISCELLANEOUS PARTS

DESCRIPTION	PART No.
Clamp (Dial Mounting)	56-1271
Cabinet	10365A
Cable and Plug (Power Supply)	L-2289
A. C. Plug (Special)	L-1367
Dial	27-5469
Drive Cord Assembly (Pointer Operation)	31-2359
Gasket (Dial Mounting)	27-9258
Knobs (Tuning, Tone, Volume, Wave Sw.)	27-4332
Pilot Lamp Socket Assembly	38-9796
Pointer	56-1276
Speaker	36-1472
Socket (5 prong, type 84 tube)	27-6035
Socket (6 prong, type 41, 75 & 78 tubes)	27-6036
Socket (8 prong, Octal, type 6J8G tube)	27-6058
Spring Clip (Coil Mounting)	28-5002
Spring (Drive Cord)	28-8913
Station Card Shield	27-5437
Station Card Holder	56-1273
Tuning Condenser Drum	31-2353
Tuning Shaft and Bracket Assembly	31-2356

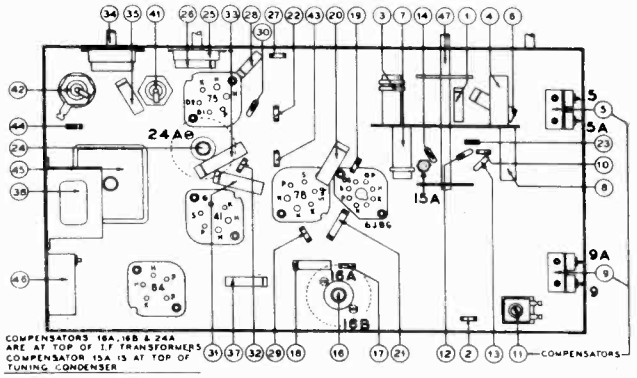


FIG. 2. PART LOCATIONS, UNDERSIDE OF CHASSIS.

MANY OF THE PARTS IN THIS PHILCO SUCH AS CONDENSERS AND RESISTORS, ARE HELD TO MUCH CLOSER TOLERANCE THAN STANDARD REPLACEMENT PARTS. GENUINE PHILCO REPLACEMENT PARTS MUST BE USED TO OBTAIN SATISFACTORY PERFORMANCE OF THIS MODEL.

SPECIFICATIONS

TYPE CIRCUIT: Model 40-715, code 121, is a five (5) tube A. C. operated radio employing a superheterodyne circuit with three tuning ranges for reception of Standard, Police and Shortwave Broadcast Stations. Connections are also provided for attaching a high impedance Electric Phonograph pick-up. In addition other features of design are: Automatic Volume Control; Three Point Tone Control; Bass Compensation; and special temperature and humidity-proof compensators for reducing frequency drift to a minimum.

FOR ALIGNMENT SEE INDEX

POWER SUPPLY: 100-130 or 200-260 volts A. C. The voltage ranges are selected by inserting the changeover plug as indicated on top of the power transformer.

POWER CONSUMPTION: 40 watts.

TUNING RANGES:
530 to 1720 K. C. 2.3 to 7.4 M. C. 7.3 to 22 M. C.

I. F. FREQUENCY: 455 K. C.

PHILCO TUBES: 6J8EG, Converter-Oscillator; 78E, I. F. Amplifier; 75, Second Detector, First Audio and A. V. C.; 41E, Audio Output; 84, Rectifier.

MODEL 40-725(121)
MODEL 40-755(121)
Alignment

PHILCO RADIO & TELEV. CORP.

Philco-Tropic Models 40-725, code 121 40-755, code 121

SPECIFICATIONS

Model 40-725

TYPE CIRCUIT: Model 40-725, code 121, is a six (6) tube A. C. operated receiver employing a superheterodyne circuit with three tuning ranges for reception of Standard, Police and Shortwave Broadcast Stations. Connections are also provided for attaching a high impedance Electric Phonograph pick-up. In addition other features of design are: Automatic Volume Control; Continuously Variable Tone Control; Bass Compensation, and special compensation for reducing frequency drift to a minimum.

POWER SUPPLY: 100-130 or 200-260 volt, 50-60 cycle, 60 watts. The voltage ranges are selected by inserting the plug as indicated on top of the power transformer.

TUNING RANGES:
530 to 1720 K. C. 2.3 to 7.4 M. C. 7.3 to 22 M. C.

I. F. FREQUENCY: 455 K. C.

PHILCO TUBES: 78E, R. F. Amplifier; 6J8EG, Converter-Oscillator; 78E, I. F. Amplifier; 75, Second Detector, First Audio, and A. V. C.; 41E, Pentode Audio Output; 84, Rectifier.

AUDIO OUTPUT: 2.5 watts.

AERIAL AND GROUND: To obtain maximum performance from this receiver, the Philco Safety Aerial, Part No. 40-6370 should be used and a good ground connection to the nearest water pipe or any other good ground.

CABINET DIMENSIONS:
Height, 14⅛". Width, 18⅛". Depth, 10¼".

Model 40-755

TYPE CIRCUIT: Model 40-755, code 121, is an eight (8) tube A. C. operated receiver employing a superheterodyne circuit with three tuning ranges for reception of Standard, Police and Shortwave Broadcast Stations. Connections are also provided for attaching a high impedance Electric Phonograph pick-up. Other features of design are: Automatic Volume Control; Continuously Variable Tone Control; Bass Compensation; Push-Pull Pentode Audio Output; Tuning Resonance Indicator, and special compensation for reducing frequency drift to a minimum.

POWER SUPPLY: 100-130 or 200-260 volt, 50 to 60 cycle, 83 watts. The voltage ranges are selected by inserting the plug as indicated on top of the power transformer.

TUNING RANGES:
530 to 1720 K. C. 2.3 to 7.4 M. C. 7.3 to 22 M. C.

I. F. FREQUENCY: 455 K. C.

PHILCO TUBES: 78E, R. F. Amplifier; 6J8EG, Converter-Oscillator; 78E, I. F. Amplifier; 75, Second Detector, First Audio, and A. V. C.; 76, Inverter; two 42E, Pentode Audio Output; 80, Rectifier.

AUDIO OUTPUT: 6 watts.

AERIAL AND GROUND: Same as Model 40-725.

CABINET DIMENSIONS:
Height, 14⅝". Width, 20". Depth, 10¼".

ALIGNING COMPENSATING CONDENSERS

EQUIPMENT REQUIRED

(1) **Signal Generator.** In order to properly adjust this receiver a calibrated signal generator such as Philco Model 077 A. C. or Model 177 battery operated are required. These signal generators cover a frequency range of 540 to 36,000 K. C.

(2) **Indicating Device.** To obtain maximum signal strength and accurate adjustment of the padders a vacuum tube voltmeter and circuit tester such as Philco Models 027 and 028 is recommended. These testers also contain an audio output meter which may be used as an indicating device.

(3) **Aligning Tools.** Fiber handle screw driver, Philco Part No. 45-2610.

CONNECTING ALIGNING INSTRUMENTS

Vacuum Tube Voltmeter: To use the vacuum tube voltmeter as an aligning indicator it should be connected to the A. V. C. circuit as follows:

1. Connect the negative (—) terminal of the voltmeter through a 2 meg. resistor to the converter grid (6J8G). The resistor must be connected directly to the grid of the tube and the voltmeter wire attached to the resistor.
2. Connect the positive (+) terminal to the chassis ground terminal.

Audio Output Meter: If this type of meter is used as an aligning indicator, it should be connected to the plate and screen terminals of the 41 tube. Adjust the meter for the 0 to 30 volt A. C. scale.

After connecting the aligning meter, adjust the compensators in the order as shown in the tabulation below. Locations of the compensators are shown in Fig. 1. If the output meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.

Operations In Order	SIGNAL GENERATOR			RECEIVER				SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dummy Antenna Note A	Dial Setting	Dial Setting	Control Settings	Adjust Compensators		
						Model 40-725	Model 40-755	
1	6J8G Grid and Ground	.1 mfd.	455 K. C.	580 K. C.	Vol. Max. Tone Treble	38B, 38A, 32B, 32A	39B, 39A, 33B, 33A	
2	Ant. & Grnd.	200 mmfd.	1500 K. C.	1500 K. C.	Vol. Max. Range Switch "Brdcst"	27, 22B, 22A	27, 32B, 32A	Note B
3	Ant. & Grnd.	200 mmfd.	580 K. C.	580 K. C.	Vol. Max.	23	23	Roll Gang
4	Ant. & Grnd.	200 mmfd.	1500 K. C.	1500 K. C.	Vol. Max.	27, 22B, 22A	27, 32B, 32A	
5	Ant. & Grnd.	400 ohms	6.0 M. C.	6.0 M. C.	Vol. Max. Tone Treble Range Switch "S.W.1"	27A	27A	Roll Gang
6	Ant. & Grnd.	400 ohms	20 M. C.	20 M. C.	Vol. Max. Tone Treble Range Switch "S.W.2"	29, 15, 5	29, 16, 5	Note C

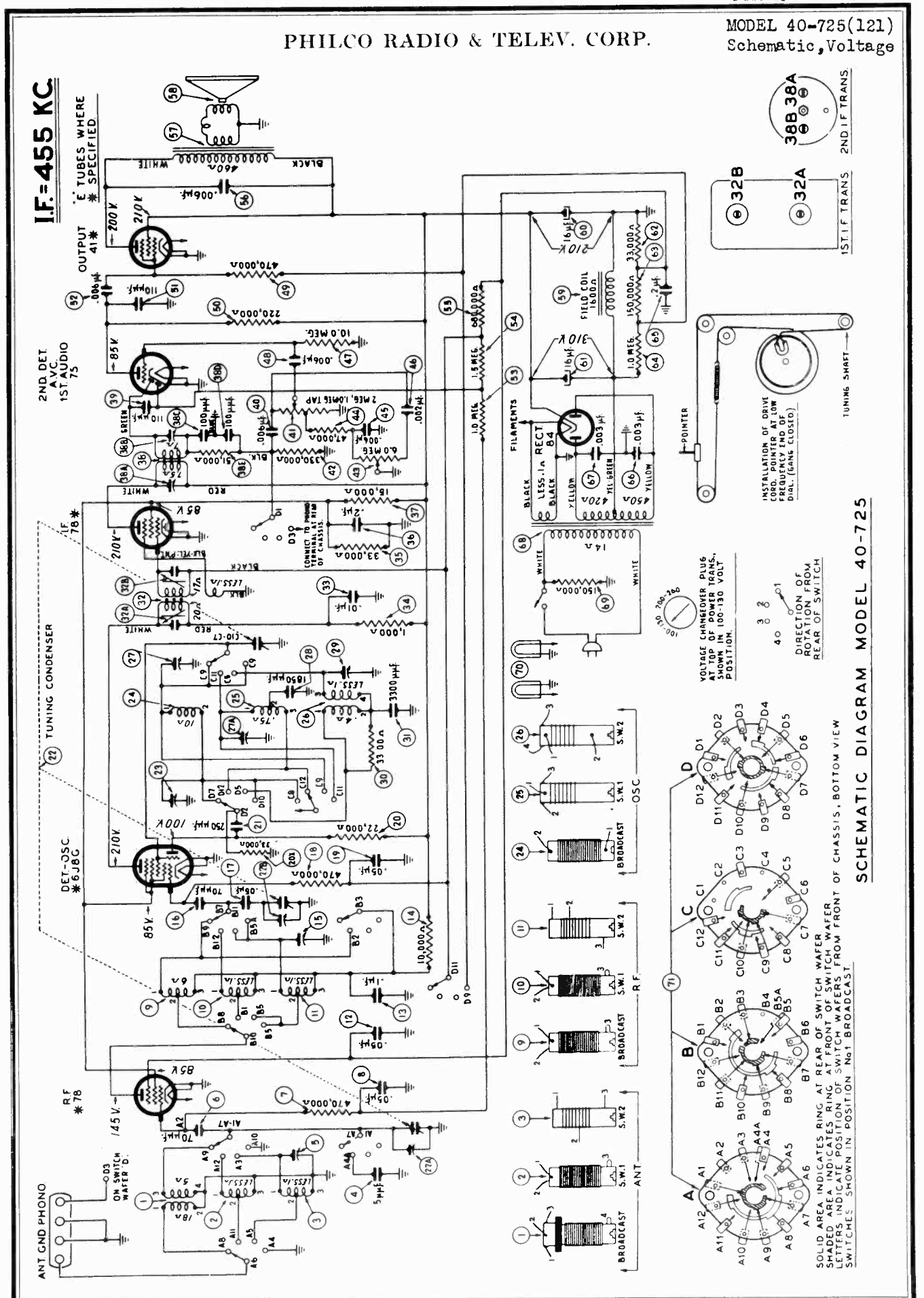
NOTE A — The "Dummy Antenna" consists of a condenser or resistance connected in series with the signal generator output lead (high side). Use the capacity or resistance as specified in each step of the above procedure.

NOTE B — DIAL CALIBRATION: In order to adjust the receiver correctly the dial must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows: With the tuning condenser closed (maximum capacity), set the dial pointer on the first mark on the left edge (low frequency end) of the broadcast scale.

NOTE C — When adjusting compensator (29) be sure to tune in the fundamental signal (20 M. C.) instead of the image signal. If the compensator is correctly adjusted, the image signal will be 910 K. C. below the fundamental signal, which will be 19.090 M. C.

PHILCO RADIO & TELEV. CORP.

MODEL 40-725(121)
Schematic, Voltage



MODEL 40-725(121)
MODEL 40-755(121)
Chassis, Parts

PHILCO RADIO & TELEV. CORP.

Model 40-725, Code 121 Replacement Parts

SCHE. No.	DESCRIPTION	PART No.
1	Antenna Transformer (Broadcast)	32-2588
2	Antenna Transformer (S. W. 1)	32-3191
3	Antenna Transformer (S. W. 2)	32-3196
4	Tubular Condenser (5 mmfd.)	30-1120
5	Compensator (Antenna S. W. 2)	31-6288
6	Mica Condenser (70 mmfd.)	30-1117
7	Resistor (470,000 ohms, 1/2 watt)	33-447339
8	Tubular Condenser (.05 mfd.)	30-4609
9	R. F. Transformer (Broadcast)	32-3189
10	R. F. Transformer (S. W. 1)	32-3190
11	R. F. Transformer (S. W. 2)	32-3197
12	Tubular Condenser (.05 mfd.)	30-4519
13	Tubular Condenser (.1 mfd.)	30-4611
14	Resistor (10,000 ohms, 1 watt)	33-310439
15	Compensator (R. F., S. W. 2)	31-6288
16	Mica Condenser (70 mmfd.)	30-1117
17	Tubular Condenser (.05 mfd.)	30-4519
18	Resistor (470,000 ohms, 1/2 watt)	33-447339
19	Tubular Condenser (.05 mfd.)	30-4609
20	Resistor (22,000 ohms, 1/2 watt)	33-322339
20X	Resistor (33,000 ohms, 1/2 watt)	33-333339
21	Mica Condenser 250 mmfd.)	30-1119
22	Tuning Condenser Assembly	31-2386
23	Compensator (Broadcast series)	31-6287
24	Oscillator Transformer (Broadcast)	32-3254
25	Oscillator Transformer (S. W. 1)	32-3094
26	Oscillator Transformer (S. W. 2)	32-3102
27	Compensator (Broadcast shunt)	31-2687
27A	Compensator (S. W. 1)	
28	Tracking Condenser (1850 mmfd.)	31-6310
29	Compensator (S. W. 2)	31-6288
30	Resistor (3300 ohms, 1/2 watt)	33-233339
31	Tracking Condenser (3300 mmfd.)	31-6311
32	1st I. F. Transformer Assembly	32-3187
33	Tubular Condenser (.01 mfd.)	30-4572
34	Resistor (1,000 ohms, 1/2 watt)	33-210339
35	Resistor (33,000 ohms, 1/2 watt)	33-333339
36	Tubular Condenser (.2 mfd.)	30-4587
37	Resistor (15,000 ohms, 1 watt)	33-315439
38	2nd I. F. Transformer Assemvly	32-3133
39	Mica Condenser (110 mmfd.)	30-1118
40	Tubular Condenser (.006 mfd.)	30-4583
41	Volume Control (2 meg.)	33-5296
42	Resistor (330,000 ohms, 1/2 watt)	33-433339
43	Tone Control and On-Off Switch	33-5299
44	Resistor (47,000 ohms, 1/2 watt)	33-347339
45	Tubular Condenser (.0005 mfd.)	30-4583
46	Tubular Condenser (.002 mfd.)	30-4579
47	Resistor (10.0 meg., 1/2 watt)	33-610339
48	Tubular Condenser (.006 mfd.)	30-4583
49	Resistor (470,000 ohms 1/2 watt)	33-447339
50	Resistor 220,000 ohms, 1/2 watt)	33-422339
51	Mica Condenser (110 mmfd.)	30-1118
52	Tubular Condenser (.0006 mfd.)	30-4610
53	Resistor (1.0 meg., 1/2 watt)	33-510339
54	Resistor (1.5 meg., 1/2 watt)	33-515339
55	Resistor (680,000 ohms, 1/2 watt)	33-468339
56	Tubular Condenser (.006 mfd.)	30-4583
57	Output Transformer	32-8018
58	Cone and Voice Coil Assembly (Speaker Part No. 36-1452-2)	36-4103
59	Field Coil (Replace Spkr. Part No. 36-1452)	
60	Electrolytic Condenser (16 mfd., 300 V.)	30-2319
61	Electrolytic Condenser (18 mfd., 400 V.)	30-2364
62	Resistor (33,000 ohms, 1/2 watt)	33-333339
63	Resistor (150,000 ohms, 1/2 watt)	33-415339
64	Resistor (1.0 meg., 1/2 watt)	33-510339
65	Tubular Condenser (.2 mfd.)	30-4587
66	Tubular Condenser (.003 mfd.)	30-4608

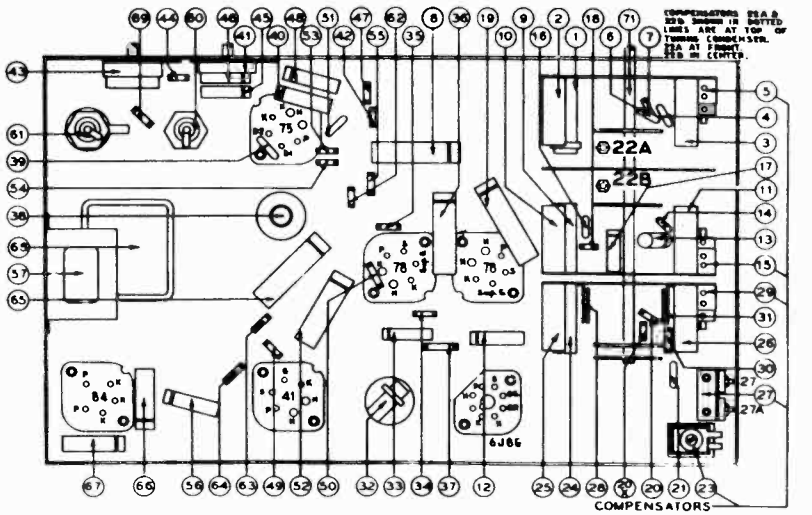


FIG. 1. MODEL 40-725 PART LOCATIONS, UNDERSIDE OF CHASSIS.

SCHE. No.	DESCRIPTION	PART No.
67	Tubular Condenser (.003 mfd.)	30-4608
68	Power Transformer (100-130 V., 200-260 V., 50-60 cycles)	32-8006
69	Resistor (150,000 ohms, 1/2 watt)	33-415339
70	Pilot Lamps	34-2064E
71	Wave Switch	42-1504

MISCELLANEOUS PARTS

DESCRIPTION	PART No.
Bezel	56-1222
Cable and Plug (Power Supply)	L-2289
Special Export Power Plug	L-1367
Cabinet	10417A
Dial	27-5544
Drive Cord Assembly	31-2330
Felt Strip (Bezel Mounting)	27-6225
Knob (Tuning)	27-4330
Knob (Tuning)	27-4862
Knob (Tone Control)	27-4872
Knobs (Volume and Wave Switch)	27-4332
Pilot Lamp Socket Assembly	38-9796
Pointer	56-1276
Screws (Bezel Mounting)	W-2071
Spring (Drive Cord)	28-8913
Spring Clip (Coil Mounting)	28-5002
Socket (5 prong, type 84 tube)	27-6035
Socket (6 prong, type 78, 41, 75 tubes)	27-6036
Socket (Octal, type 6J8G tube)	27-6058
Speaker	36-1452
Tuning Drum and Coupling	31-2327
Vernier Drive (Tuning)	31-2329

Model 40-755, Code 121 Replacement Parts

SCHE. No.	DESCRIPTION	PART No.
1	Antenna Transformer (Broadcast)	32-2588
2	Antenna Transformer (S. W. 1)	32-3191
3	Antenna Transformer (S. W. 2)	32-3196
4	Mica Condenser (5 mmfd.)	30-1120
5	Compensator	31-6288
6	Mica Condenser (70 mmfd.)	30-1117
7	Resistor (470,000 ohms, 1/2 watt)	33-447339
8	Tubular Condenser (.05 mfd.)	30-4609
9	R. F. Transformer (Broadcast)	32-3189
10	R. F. Transformer (S. W. 1)	32-3190
11	R. F. Transformer (S. W. 2)	32-3197
12	Tubular Condenser (.05 mfd.)	30-4519
13	Tubular Condenser (.1 mfd.)	30-4611
14	Resistor (10,000 ohms, 1 watt)	33-310439
15	Tubular Condenser (.05 mfd.)	30-4609
16	Compensator	31-6288
17	Tubular Condenser (.05 mfd.)	30-4519
18	Resistor (470,000 ohms, 1/2 watt)	33-447339
19	Resistor (22,000 ohms, 1/2 watt)	33-322339
20	Mica Condenser (70 mmfd.)	30-1117
21	Mica Condenser 250 mmfd.)	30-1119
22	Resistor (33,000 ohms, 1/2 watt)	33-333339
23	Compensator	31-6289
24	Oscillator Transformer (Broadcast)	32-3254
25	Oscillator Transformer (S. W. 1)	32-3094
26	Oscillator Transformer (S. W. 2)	32-3102
27	Compensator (2 sections)	31-6287
28	Tracking Condenser (1850 mmfd.)	31-6310
29	Compensator	31-6288
30	Resistor (3300 ohms, 1/2 watt)	33-233339
31	Tracking Condenser (3300 mmfd.)	31-6311
32	Tuning Condenser Assembly	31-2386
33	1st I. F. Transformer Assembly	32-3187
34	Tubular Condenser (.01 mfd.)	30-4572
35	Resistor (1,000 ohms, 1/2 watt)	33-210339
36	Resistor (33,000 ohms, 1/2 watt)	33-333339
37	Tubular Condenser (.5 mfd.)	30-4528
38	Resistor (15,000 ohms, 1 watt)	33-315439
39	2nd I. F. Transformer Assembly	32-3188
40	Mica Condenser (110 mmfd.)	30-1118
41	Tubular Condenser (.006 mfd.)	30-4583
42	Volume Control (2.0 meg.)	33-5298
43	Resistor (330,000 ohms, 1/2 watt)	33-433339
44	Tone Control and On-Off Switch	33-5299
45	Resistor (68,000 ohms, 1/2 watt)	33-368339
46	Tubular Condenser (.0005 mfd.)	30-4583
47	Tubular Condenser (.002 mfd.)	30-4579
48	Resistor 10.0 meg., 1/2 watt)	33-610339
49	Tubular Condenser (.006 mfd.)	30-4583
50	Resistor (100,000 ohms, 1/2 watt)	33-410339
51	Resistor (470,000 ohms, 1/2 watt)	33-447339
52	Mica Condenser (250 mmfd.)	30-1119
53	Tubular Condenser (.0006 mfd.)	30-4610
54	Resistor (4,700 ohms, 1/2 watt)	33-247339
55	Resistor (27,000 ohms, 1/2 watt)	33-327339
56	Resistor (33,000 ohms, 1/2 watt)	33-333339
57	Resistor (1.0 meg., 1/2 watt)	33-510339
58	Resistor (1.0 meg., 1/2 watt)	33-510339
59	Resistor (470,000 ohms, 1/2 watt)	33-447339
60	Resistor (470,000 ohms, 1/2 watt)	33-447339
61	Resistor (470,000 ohms, 1/2 watt)	33-447339
62	Tubular Condenser (.006 mfd.)	30-4610
63	Tubular Condenser (.0006 mfd.)	30-4610
64	Tubular Condenser (.003 mfd.)	30-4582
65	Output Transformer	32-8058
66	Cone And Voice Coil Assembly (Speakker Part No. 36-1453-4)	36-4104
	(Speaker Part No. 36-1460-3)	36-4105
67	Field Coil Replace Spkr. Part No. 36-1453 (T Cabinet) Replace Spkr. Part No. 36-1460 (XX Cabinet)	
68	Electrolytic Condenser (16 mfd., 400 V.)	30-2364

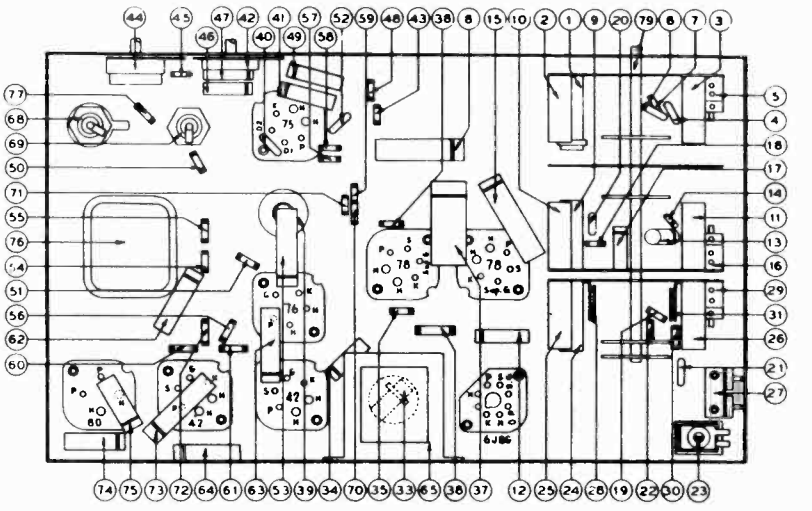


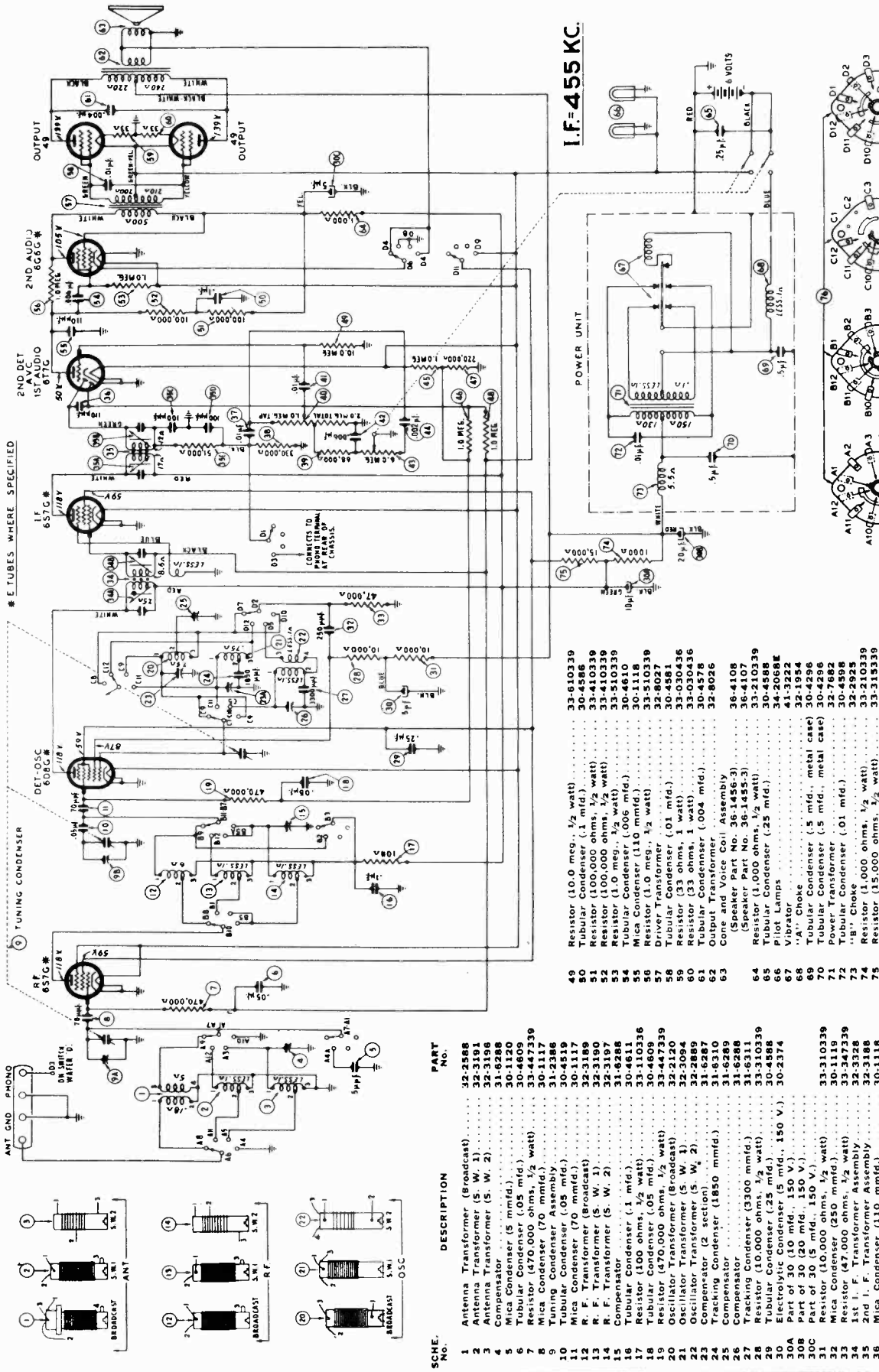
FIG. 2. MODEL 40-755 PART LOCATIONS, UNDERSIDE OF CHASSIS

SCHE. No.	DESCRIPTION	PART No.
69	Electrolytic Condenser (40 mfd., 300 V.)	30-2366
70	Resistor (39,000 ohms, 1/2 watt)	33-339339
71	Resistor (180,000 ohms, 1/2 watt)	33-418339
72	Resistor (1.0 meg., 1/2 watt)	33-510339
73	Tubular Condenser (.2 mfd.)	30-4587
74	Tubular Condenser (.003 mfd.)	30-4608
75	Tubular Condenser (.003 mfd.)	30-4608
76	Power Transformer (100-130 V., 200-260 V., 50-60 cycles)	32-8007
77	Resistor (150,000 ohms, 1/2 watt)	33-415339
78	Pilot Lamps	34-2064E
79	Wave Switch	42-1504
	Bezel	56-1222
	Cable and Plug (Power Supply)	L-2289
	(Special A. C. Export Plug)	L-1367
	Cabinet (40-755T)	10418A
	Cabinet (40-755XX)	10420A

DESCRIPTION	PART No.
Dial	27-5544
Drive Cord	31-2330
Felt Strip (Bezel Mounting)	27-6225
Knob (Tuning)	27-4330
Knob (Tuning)	27-4862
Knob (Volume and Wave Switch)	27-4332
Knob (Tone Control)	27-4872
Pointer	56-1276
Socket (5 prong, 78 tube)	27-6035
Socket (6 prong, type 78, 42, 75 tubes)	27-6036
Socket (4 prong, type 80 tube)	27-6044
Socket (Octal, type 6J8G tube)	27-6058
Speaker (Model 40-755T)	36-1453
Speaker (Model 40-755XX)	36-1460
Spring Clip (Coil Mounting)	28-5002
Spring (Drive Cord)	28-8913
Station Card Holder	56-1273
Tuning Drum and Coupling Assembly	31-2327
Vernier Drive (Tuning)	31-2329

PHILCO RADIO & TELEV. CORP.

MODEL 40-748(121)
Schematic, Voltage



SCHE. No.	DESCRIPTION	PART No.
1	Antenna Transformer (Broadcast)	32-2588
2	Antenna Transformer (S. W. 1)	32-3191
3	Antenna Transformer (S. W. 2)	32-3196
4	Compensator	31-6288
5	Mica Condenser (5 mmfd.)	30-1120
6	Tubular Condenser (.05 mfd.)	30-4609
7	Resistor (470,000 ohms, 1/2 watt)	33-447339
8	Mica Condenser (70 mmfd.)	30-1117
9	Tuning Condenser Assembly	31-2386
10	Tubular Condenser (.05 mfd.)	30-4519
11	Mica Condenser (70 mmfd.)	30-1117
12	R. F. Transformer (Broadcast)	32-3189
13	R. F. Transformer (S. W. 1)	32-3190
14	R. F. Transformer (S. W. 2)	32-3197
15	Compensator	31-6288
16	Tubular Condenser (.1 mfd.)	30-4611
17	Resistor (100 ohms, 1/2 watt)	33-110336
18	Tubular Condenser (.05 mfd.)	30-4609
19	Resistor (470,000 ohms, 1/2 watt)	33-447339
20	Oscillator Transformer (Broadcast)	32-2120
21	Oscillator Transformer (S. W. 1)	32-3094
22	Oscillator Transformer (S. W. 2)	32-2889
23	Compensator (2 section)	31-6287
24	Tracking Condenser (1850 mmfd.)	31-6310
25	Compensator	31-6289
26	Compensator	31-6288
27	Tracking Condenser (3300 mmfd.)	31-6311
28	Resistor (10,000 ohms, 1/2 watt)	33-310339
29	Tubular Condenser (.25 mfd.)	30-4588
30	Electrolytic Condenser (5 mfd., 150 V.)	30-2374
30A	Part of 30 (10 mfd., 150 V.)	
30B	Part of 30 (20 mfd., 150 V.)	
30C	Part of 30 (5 mfd., 150 V.)	
31	Resistor (10,000 ohms, 1/2 watt)	33-310339
32	Mica Condenser (250 mmfd.)	30-1119
33	Resistor (47,000 ohms, 1/2 watt)	33-347339
34	1st I. F. Transformer Assembly	32-3328
35	2nd I. F. Transformer Assembly	32-3188
36	Mica Condenser (110 mmfd.)	30-1118
37	Tubular Condenser (.01 mfd.)	30-4581
38	Resistor (330,000 ohms, 1/2 watt)	33-433339
39	Resistor (68,000 ohms, 1/2 watt)	33-368339
40	Volume Control (2.0 meg.)	33-5298
41	Tubular Condenser (.01 mfd.)	30-4581
42	Tubular Condenser (.006 mfd.)	30-4583
43	Tone Control and On-Off Switch	33-5303
44	Tubular Condenser (.002 mfd.)	30-4579
45	Resistor (1.0 meg., 1/2 watt)	33-510339
46	Resistor (1.0 meg., 1/2 watt)	33-510339
47	Resistor (220,000 ohms, 1/2 watt)	33-422339
48	Resistor (1.0 meg., 1/2 watt)	33-510339
49	Resistor (10.0 meg., 1/2 watt)	33-610339
50	Tubular Condenser (.1 mfd.)	30-4586
51	Resistor (100,000 ohms, 1/2 watt)	33-410339
52	Resistor (100,000 ohms, 1/2 watt)	33-410339
53	Resistor (1.0 meg., 1/2 watt)	33-510339
54	Tubular Condenser (.006 mfd.)	30-4610
55	Mica Condenser (110 mmfd.)	30-1118
56	Resistor (1.0 meg., 1/2 watt)	33-510339
57	Driver Transformer	32-8027
58	Tubular Condenser (.01 mfd.)	30-4581
59	Resistor (33 ohms, 1 watt)	33-030436
60	Resistor (33 ohms, 1 watt)	33-030436
61	Tubular Condenser (.004 mfd.)	30-4578
62	Output Transformer	32-8026
63	Cone and Voice Coil Assembly (Speaker Part No. 36-1456-3)	36-4108
	(Speaker Part No. 36-1455-3)	36-4107
64	Resistor (1,000 ohms, 1/2 watt)	33-210339
65	Tubular Condenser (.25 mfd.)	30-4588
66	Pilot Lamps	34-2068E
67	Vibrator	41-3222
68	"A" Choke	32-1954
69	Tubular Condenser (.5 mfd., metal case)	30-4296
70	Tubular Condenser (.5 mfd., metal case)	30-4296
71	Power Transformer	32-7682
72	Tubular Condenser (.01 mfd.)	30-4598
73	"B" Choke	32-2925
74	Resistor (1,000 ohms, 1/2 watt)	33-210339
75	Resistor (15,000 ohms, 1/2 watt)	33-315339
76	Wave Switch	42-1504
	Bezel (Battery)	56-1222
	Cable (Speaker)	41-3466
	Cabinet (T Model)	10418A
	Cabinet (XX Model)	10420A
	Dial	27-5544
	Drive Cord Assembly	27-5330
	Escutcheon Mounting	27-4330
	Knob (Tuning)	27-4332
	Knob (Vernier)	27-4862
	Knob (Volume and Wave Switch)	27-4872
	Knob (Tone Control)	27-4873
	Pointer	56-1276

NOTE
LETTERS INDICATE POSITION OF SWITCH WAFERS FROM FRONT OF CHASSIS; BOTTOM VIEW
SOLID RING IS AT REAR OF SWITCH WAFER
SHADED RING IS AT FRONT OF SWITCH WAFER
SWITCHES SHOWN IN POSITION No. 1 BROADCAST

MODEL 40-748(121)
Chassis, Trimmers
Alignment
MODEL S-1722
Tuner Data

PHILCO RADIO & TELEV. CORP.

PHILCO - TROPIC MODEL 40-748, CODE 121

SPECIFICATIONS

TYPE CIRCUIT: Model 40-748, code 121 is a 7 tube battery operated radio receiver employing a superheterodyne circuit with 3 tuning ranges for reception of standard, police, and shortwave broadcast stations. Connections are also provided for attaching an external high impedance electric phonograph pick-up. In addition other features of design are automatic volume control, continuously variable tone control, BASS compensation, and a push pull pentode audio output circuit. A vibrator is used for supplying the "B" voltage from the 6 volt storage battery.

POWER SUPPLY: 6 volt storage battery.

TUNING RANGES: 530-1720 K. C. 2.3-7.4 M. C. 7.3-22 M. C.

INTERMEDIATE FREQUENCY: 455 K. C.

PHILCO TUBES USED: 6S7EG, R. F. Amplifier; 6D8EG, Converter; 6S7EG, I. F. Amplifier; 6T7G, Second Detector A. V. C. and First Audio; 6G6EG, Second Audio; two 49, Output.

AUDIO OUTPUT: 2.5 watts.

AERIAL & GROUND: To obtain maximum performance from this receiver, the Philco Safety aerial, Part No. 40-6370 should be used. A good ground source to the nearest water pipe or any other grounding connection should be used.

CABINET DIMENSIONS: Height, 14⅝"; Width, 20"; Depth, 10¼".

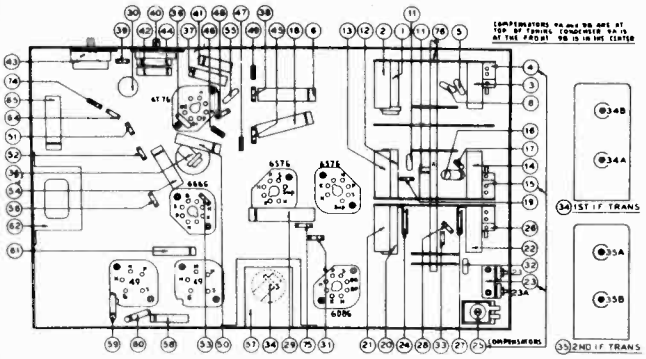


FIG. 1. PART LOCATIONS—UNDERSIDE OF CHASSIS.

MISCELLANEOUS PARTS

DESCRIPTION	PART No.
Speaker (T Cabinet)	36-1455
Speaker (XX Cabinet)	36-1456
Spring Clip (Coil Mounting)	28-5002
Spring (Drive Cord)	28-8913
Station Card Holder	56-1273
Socket (5 prong, type 49 tube)	27-6035
Socket (6 prong, vibrator)	27-6036
Socket (Loktal tubes)	27-6058
Shield (Tube, Half)	56-1072
Shield Cap	56-1073
Shield Base	56-1074
Rubber Cushion (Vibrator Mounting)	27-4287
Rubber Washer (Vibrator Unit Mounting)	27-4307
Rubber Corner (Chassis)	27-4564
Tuning Drum and Coupling Assembly	31-2327
Vernier Drive (Tuning)	31-2329

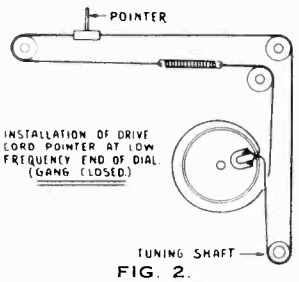


FIG. 2. INSTALLATION OF DRIVE CORD.

ALIGNMENT OF COMPENSATORS

Operations in Order	SIGNAL GENERATOR			RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dummy Antenna Note A	Dial Setting	Dial Setting	Control Settings	Adjust Compensators	
1	6D8EG Grid and Ground	.1 mfd.	455 K. C.	580 K. C.	Vol. Max. Tone-Treble Range Switch "Brdcst"	35A, 35B 34A, 34B	
2	Ant. & Grd.	200 mmfd.	1500 K. C.	1500 K. C.	Vol. Max. Range Switch "Brdcst"	23, 9B, 9A	Note B
3	Ant. & Grd.	200 mmfd.	580 K. C.	580 K. C.	Vol. Max.	25	Roll Gang
4	Ant. & Grd.	200 mmfd.	1500 K. C.	1500 K. C.	Vol. Max. Range Switch "Brdcst"	23, 9B, 9A	Note B
5	Ant. & Grd.	400 ohms	6.0 M. C.	6.0 M. C.	Vol. Max. Tone-Treble Range Switch "S. W. 1"	23A	Roll Gang
6	Ant. & Grd.	400 ohms	21 M. C.	21 M. C.	Vol. Max. Tone-Treble Range Switch "S. W. 2"	26, 15, 4	Note C

NOTE A — The "Dummy Antenna" consists of a condenser or resistance connected in series with the signal generator output lead (high side). Use the capacity or resistance as specified in each step of the above procedure.

NOTE B — DIAL CALIBRATION: In order to adjust the receiver correctly the dial must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows: With the tuning condenser closed (maximum capacity), set the dial pointer on the first mark on the left edge (low frequency end) of the broadcast scale.

NOTE C — When adjusting compensator (26) be sure to tune in the fundamental signal (21 M. C. — second signal from tight position of padder) instead of the image signal. If the compensator is correctly adjusted, the image signal will be found by turning the receiver dial 910 K. C. below the fundamental signal.

MODEL S-1722 SETTING UP THE RECEIVER FOR AUTOMATIC TUNING

1 — Turn the Receiver on and allow it to operate for TWENTY minutes. Remove the cover plate over the automatic tuning adjusting screws. This plate is on the front of the Receiver and is removed by removing two screws.

2 — Push the Automatic Station Selector button until the word "DIAL" appears in the indicator window. Tune in the station whose call letters are in the first position on the dial (the highest frequency station) and note the program. Push the Automatic Selector button once and this station's call letters will appear at the indicator window.

3 — With a small screwdriver, turn the No. 1 adjusting screw (See Fig. 3) in the lower column, to the right or left until this station is tuned in. Now adjust the corresponding screw in the upper column until maximum volume is obtained. Make these adjustments carefully, as it may be easy to pass by, the loudest point on some stations.

When adjusting for Automatic Tuning on strong local stations the antenna rod should be all the way down and the adjustments made with the car in a shielded area, such as in a steel constructed building or under a viaduct. This is necessary in order to obtain a weak signal so the adjustments can be accurately made.

4 — Press the Automatic Station Selector button until "DIAL" appears again in the indicator window and tune in the station whose call letters are in the second position on the automatic dial (the next lower frequency). Press the automatic button two times and adjust the number 2 set of adjusting screws.

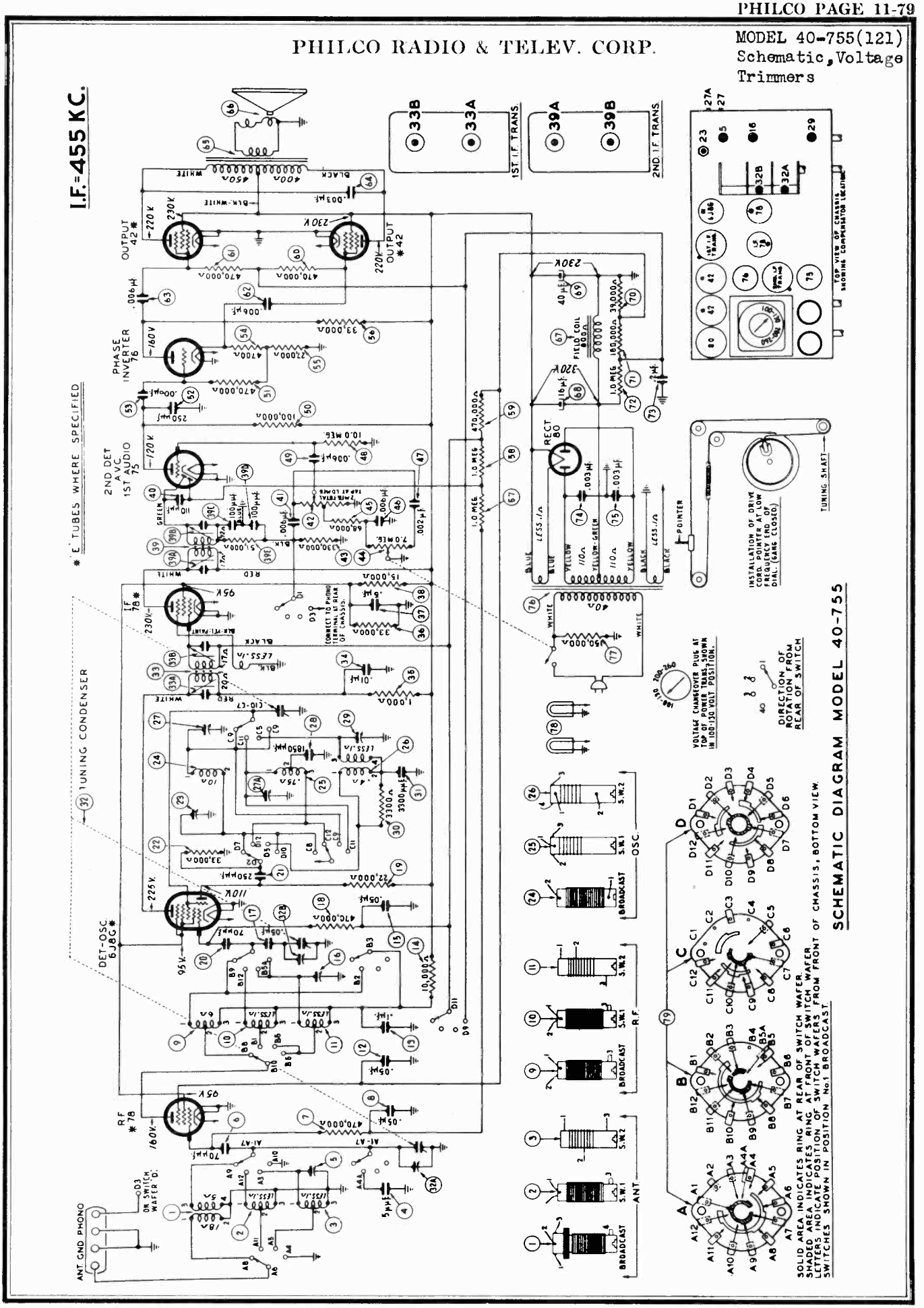
Repeat this procedure until each of the five pairs of adjusting screws has been tuned to its respective station.

IT IS NECESSARY THAT THE SETTING OF THE ADJUSTING SCREWS BE REPEATED TO BE SURE THEY ARE PROPERLY SET SO THAT MAXIMUM PERFORMANCE MAY BE HAD.

Make all adjustments for maximum reading on the output meter.

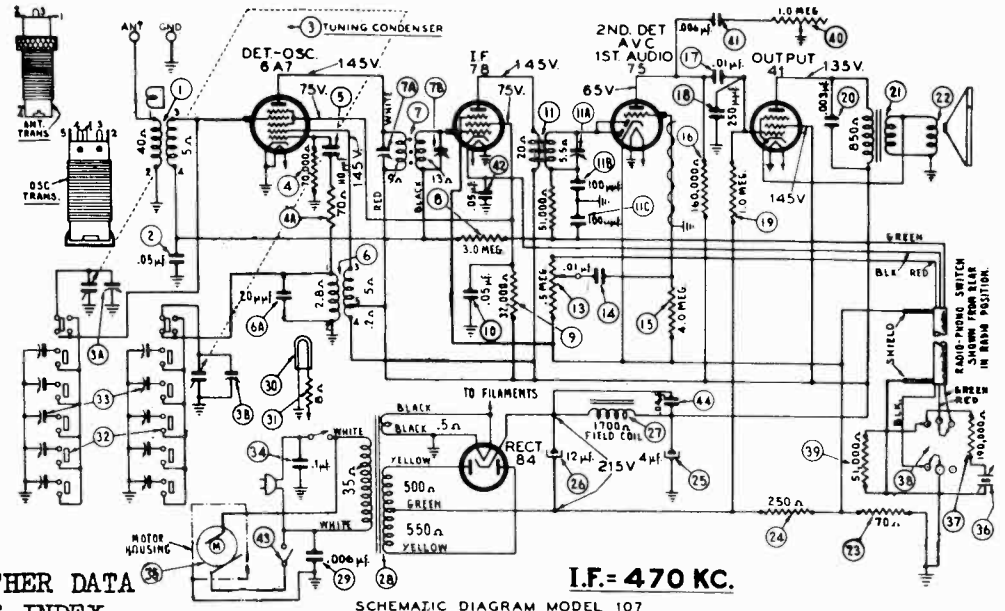
PHILCO RADIO & TELEV. CORP.

MODEL 40-755(121)
Schematic, Voltage
Trimmers



MODEL 107(121)
Runs 1,2
Schematic, Voltage
Notes

PHILCO RADIO & TELEV. CORP



FOR OTHER DATA SEE INDEX

I.F.= 470 KC.

SCHEMATIC DIAGRAM MODEL 107

SPECIFICATIONS

TYPE OF CIRCUIT:
Model 107, code 121 is a combination Automatic Record Changer, Phonograph and Electric push-button tuning radio receiver.

The Record Changer plays eight 10" records automatically and 12" records manually and employs a crystal pick-up.

The Radio Receiver employs a five tube A.C. operated superheterodyne circuit, covering standard broadcast frequencies: 530 to 1720 K.C., Automatic Volume Control, and Pentode Audio Output. Six Electric Automatic Push-Buttons are provided; five push-buttons are used for selecting any one of five stations in the standard broadcast range, and one push-button for changing to manual tuning. The procedure for adjusting the push-buttons for reception of stations will be found in the instructions supplied with each set.

INTERMEDIATE FREQUENCY: 470 K.C.

PHILCO TUBES USED:

6A7 First Detector Oscillator; 78, I.F. Amplifier; 75, Second Detector, A.V.C., First Audio; 41 Audio Output and 84, Rectifier.

POWER SUPPLY: 115 V., 50 to 60 cycle A.C.

Power Transformers are available for operation on 115 V., 25 to 40 cycles A.C.

POWER CONSUMPTION: 57 watts

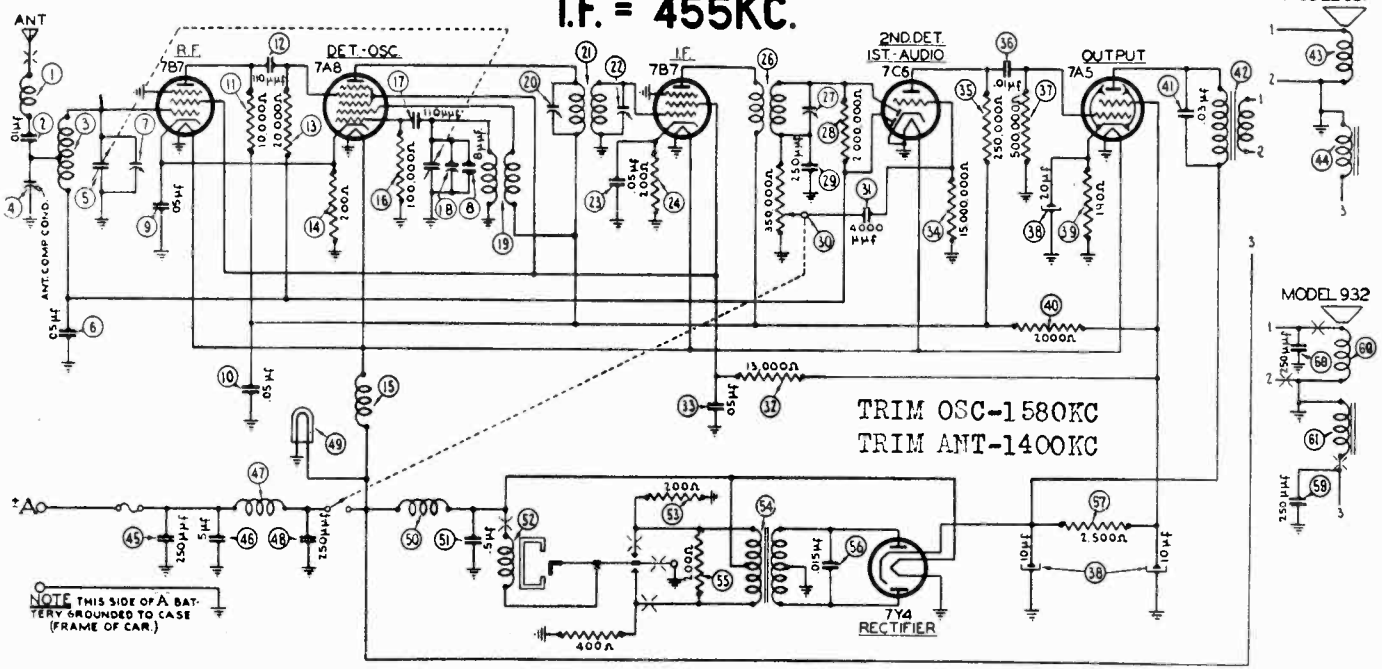
AUDIO OUTPUT: One (1) watt

The aligning instructions for the R.F. and I.F. Compensating condensers will be found under the model 39-7, code 121. (See Philco page 10-2)

Schem. No.	*Description*	*Part No.*
1	Antenna Transformer	32-3039
2	Tubular Condenser (.05 mfd.)	30-4519
3	Tuning Condenser	31-2338
4	Resistor (70,000 ohms, 1/2 watt)	33-370339
4A	Resistor (70 ohms, 1/2 watt)	33-070339
5	Mica Condenser (110 mmfd.)	30-1031
6	Oscillator Transformer	32-2122
6A	Mica Condenser (20 mmfd.)	30-1123
7	1st I.F. Transformer Assy.	32-3121
8	Resistor (3.0 meg., 1/2 watt)	33-530339
9	Resistor (32,000 ohms, 1/2 watt)	33-332339
10	Tubular Cond. (.05 mfd.)	30-4444
11	2nd I.F. Transformer Assy.	32-2674
12	Resistor (51,000 ohms, 1/2 watt)	33-351339
13	Volume Control (.5 meg.)	33-5254
14	Tubular Condenser (.01 mfd.)	30-4479
15	Resistor (4.0 meg., 1/2 watt)	33-540339
16	Resistor (160,000 ohms, 1/2 watt)	33-416339
17	Tubular Condenser (.01 mfd.)	30-4572
18	Mica Condenser (250 mmfd.)	30-1032
19	Resistor (1.0 meg., 1/2 watt)	33-510339
20	Tubular Condenser (.003 mfd.)	30-4582
21	Output Transformer	32-7980
22	Cone & Voice Coil Assembly	
	Speaker No. 36-1473-3	36-4120
	Speaker No. 36-1440-3	36-4086
23	Resistor (50 ohms, 1/2 watt)	33-050339
24	Resistor (250 ohms, 1/2 watt)	33-125339
25	Electrolytic Cond.	
	(Run 1- 6 mfd., 450 V.)	30-2265
	(Run 2- 10 mfd. 450 V.)	30-2404
26	Electrolytic Cond. (12 mfd., 300V.)	30-2404
27	Field Coil	
	(replace spkr. #36-1473-3)	
	(replace spkr. #36-1440-3)	
28	Power Trans. (115V., 50-60 cycles.	32-7979
29	Condenser (.006 mfd., moulded)	30-4423
30	Pilot Lamp	34-2064
31	Pilot Lamp Resistor (8 ohms, 1/2wt)	33-980331
32	Push Button Switch	42-1477
33	Padder Strip Assembly	31-6290
34	Tubular Cond. (.1 mfd.)	30-4122
35	Phono Motor (110 volt 60 cycle)	35-1163
36	Crystal Pick-up (metal case)	35-2041
	Crystal Pick-up (bakelite case)	35-2030
37	Resistor (190,000 ohms, 1/2 watt)	33-419339
38	Radio Phono Switch	42-1509
39	Resistor (51,000 ohms, 1/2 watt)	33-351339
40	Tone Control (1.0 meg.)	33-5320
41	Tubular Cond. (.006 mfd.)	30-4591
42	Tubular Cond. (.05 mfd.)	30-4519
43	Motor Switch	
44	Tubular Cond. (.04 mfd.)	30-4119
	Bezel Assembly (Dial)	56-1305
	Bezel Clamp	28-5153
	Knobs	27-4632
	Manual Tab	27-5460
	Push-button	27-4702
	Station tab holder	28-5661
	Visor Screen	27-5468
	Automatic Record Changer	35-1169

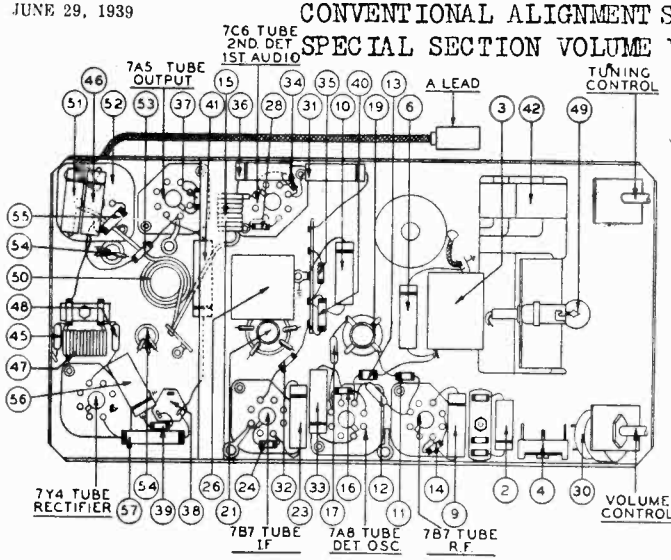
PHILCO RADIO & TELEV. CORP.

MODELS 931, 932 Schematic, Chassis Trimmers, Alignment



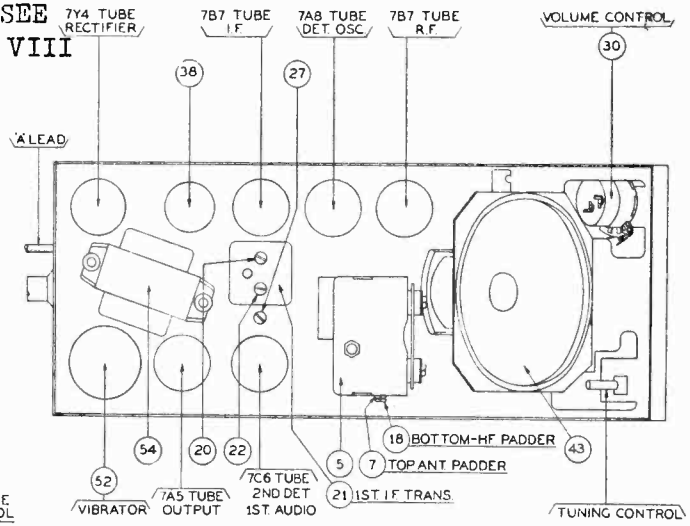
JUNE 29, 1939

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII



MODEL 931

*The Model 932 is similar to the Model 931. Speaker connections for both Models are shown



MODEL 931

No.	Description	Part No.
	Pointer (Model 931)	57-0794
	Pointer (Model 932)	57-0885
	Window Crystal	55-0501
	Tuning and Volume Knob	55-0547
	Back Strap	28-5998FA3
	Mounting Strap	57-0812FC36
	Complete Speaker	73-0027
	Loktal Socket	55-0575

PARTS LIST

No.	Description	Part No.
1	Antenna Choke	65-0102
2	Condenser (.01 mfd.)	61-0014
3	Antenna Transformer	65-0195
4	Antenna Compensator	63-0030
5	Tuning Condenser	63-0028
6	Condenser (.05 mfd.)	30-4444
7	First Padder (on Tun. Cond.)	
8	Condenser (8 mmfd.)	30-1106
9	Condenser (.05 mfd.)	30-4569
10	Condenser (.05 mfd.)	30-4569
11	Resistor (10,000 ohms)	33-310247
12	Condenser (110 mmfd.)	30-1031
13	Resistor (20,000 ohms)	33-320247
14	Resistor (200 ohms)	33-120346
15	Filament Choke	65-0158
16	Resistor (100,000 ohms)	33-410247
17	Condenser (110 mmfd.)	30-1031
18	Second Padder (on Tun. Cond.)	
19	Oscillator Transformer	65-0194
20	Padder (Pri. 1st I. F. Trans.)	
21	First I. F. Transformer	65-0191
22	Padder (Sec. 2nd I. F. Trans.)	
23	Condenser (.05 mfd.)	30-4569
24	Resistor (200 ohms)	33-120346
25	Second I. F. Transformer	65-0192
27	Padder (Pri. 1st I. F. Trans.)	
28	Resistor (2,000,000 ohms)	33-520247
29	Condenser (250 mmfd.)	61-0033
30	Volume Control (350,000 ohms) and On-Off Switch	67-0020
31	Condenser (4,000 mmfd.)	30-4456
32	Resistor (13,000 ohms)	33-313247
33	Condenser (.05 mfd.)	30-4569
34	Resistor (15,000,000 ohms)	33-615247
35	Resistor (250,000 ohms)	33-424247
36	Condenser (.01 mfd.)	61-0014
37	Resistor (500,000 ohms)	33-449247
38	Filter Condenser (10-10-20 mfd.)	61-0068
39	Resistor (190 ohms)	33-120346
40	Resistor (2,000 ohms)	33-220347
41	Condenser (.03 mfd.)	30-4449
42	Output Transformer (Model 931)	
42	Output Transformer (Model 932)	65-0221
43	Cone Kit (For 73-0027-1 Speaker)	91-0078
44	Field Coil	Not Replaceable
45	Condenser (250 mmfd.)	61-0033
46	Condenser (.5 mfd.)	61-0054
47	"A" Choke	32-1644
48	Condenser (250 mmfd.)	61-0033
49	Pilot Lamp	34-2039
50	Vibrator Choke	65-0204
51	Condenser (.5 mfd.)	61-0054
52	Vibrator	83-0017
53	Resistor (200 ohms)	33-120347
54	Power Transformer	65-0185
55	Resistor (200 ohms)	33-120347
56	Condenser (.015 mfd.)	30-4552
57	Resistor (2,500 ohms)	33-225447
58	Condenser (250 mmfd.)	61-0033
59	Condenser (250 mmfd.)	61-0033
60	Field Coil	Not Replaceable
61	Cone Kit (Model 932)	
	For 73-0024-3 Speaker	91-0068
	For 73-0024-2 Speaker	91-0028
	For 73-0025-2 Speaker	91-0065
	Drive Cord (16½")	55-0588
	Drive Cord (5¾")	55-0589
	Drive Cord (13¾")	55-0652
	Drive Cord (7⅝")	55-0653
	Dial Assembly (Model 931)	77-0346
	Dial Assembly (Model 932)	77-0358

MODEL 933
Alignment, Trimmers

PHILCO RADIO & TELEV. CORP.

MODEL 933
ADJUSTMENTS

All padding adjustments are carefully made at the factory and ordinarily no readjustments are necessary. However, when readjustments are required, the procedure given below must be followed in detail.

Equipment — Fully charged heavy duty storage battery or 6-volt power pack, 077 or 177 Philco Signal Generator, 027 Philco vacuum tube voltmeter and circuit tester and a 27-7159 Padding screw driver.

General — The vacuum tube voltmeter can be used as a "wireless" output meter as a convenient method for obtaining maximum output reading. Solder one end of a piece of wire to a strip of phosphor bronze approximately 1" wide, 6" long and .02" thick. Coil this strip so that it can be slipped over the top of the type 7B5 output tube, and make a fairly tight contact. Connect the other end of the wire to the "high" terminal of the vacuum tube voltmeter. Then connect a wire from the radio chassis to the "plus" terminal of the vacuum tube voltmeter.

With the Radio and signal generator set up for operation at the prescribed frequency, turn the Radio volume control on full and set the signal generator attenuator so that a half scale reading is obtained on the output meter. The signal in the speaker should be audible but not loud.

The shielding on the generator output lead must be connected to the Radio housing.

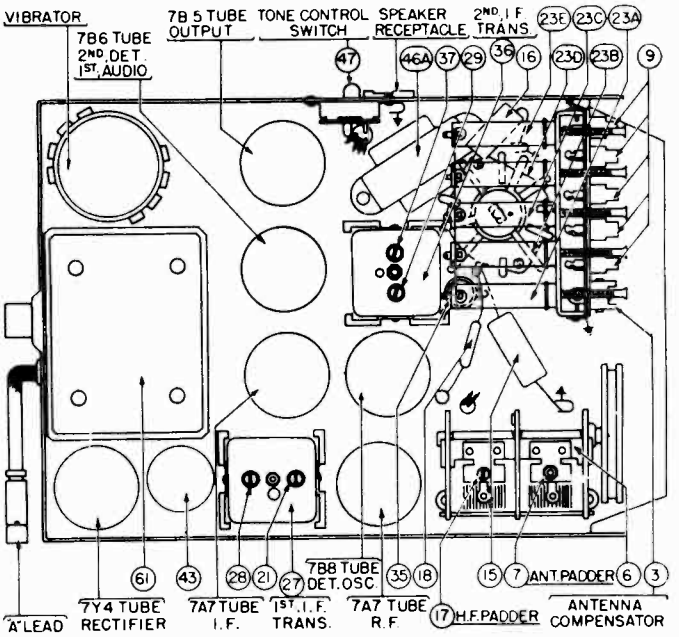


FIGURE 3

OPERATION	SIGNAL GENERATOR		DUMMY CAPACITY	SPECIAL INSTRUCTIONS	ADJUST PADDER
	FREQUENCY	CONNECTION			
1	Press the Automatic Station Selector button until "DIAL" appears in the window and stations can be tuned in by Manual Tuning.				
2	470 K.C.	To Antenna Receptacle on Radio	30 Mmfd. See Note 1	Turn Tuning Condenser Plates Out of Mesh as Far as They Will Go.	(37) (29) (28) (21)
3	1580 K.C.	To Antenna Receptacle on Radio	30 Mmfd. See Note 1	Set Tuning Condenser at 1580 K.C.	(17)
4	1500 K.C.	To Antenna Receptacle on Radio	30 Mmfd. See Note 1	Set Tuning Condenser at 1500 K.C.	(7) Note 2

Make all adjustments for maximum reading on the output meter.

NOTE 1 Connect the antenna lead, Part No. 41-3191, to the antenna receptacle in the radio. Connect a 30 Mmfd. Condenser in series between the signal generator and the antenna lead.

NOTE 2 When the antenna stage adjustment is made with the Radio installed in the car, the Radio antenna lead must be connected to the car antenna in the usual manner. Connect the signal generator output lead to a wire placed near the car antenna but not connected to it. Also adjust the antenna compensator (3) for maximum on a weak signal at approximately 1400 K.C.

PHILCO RADIO & TELEV. CORP.

MODEL 933
Schematic, Chassis

MODEL 933 SCHEMATIC

I.F. = 470KC

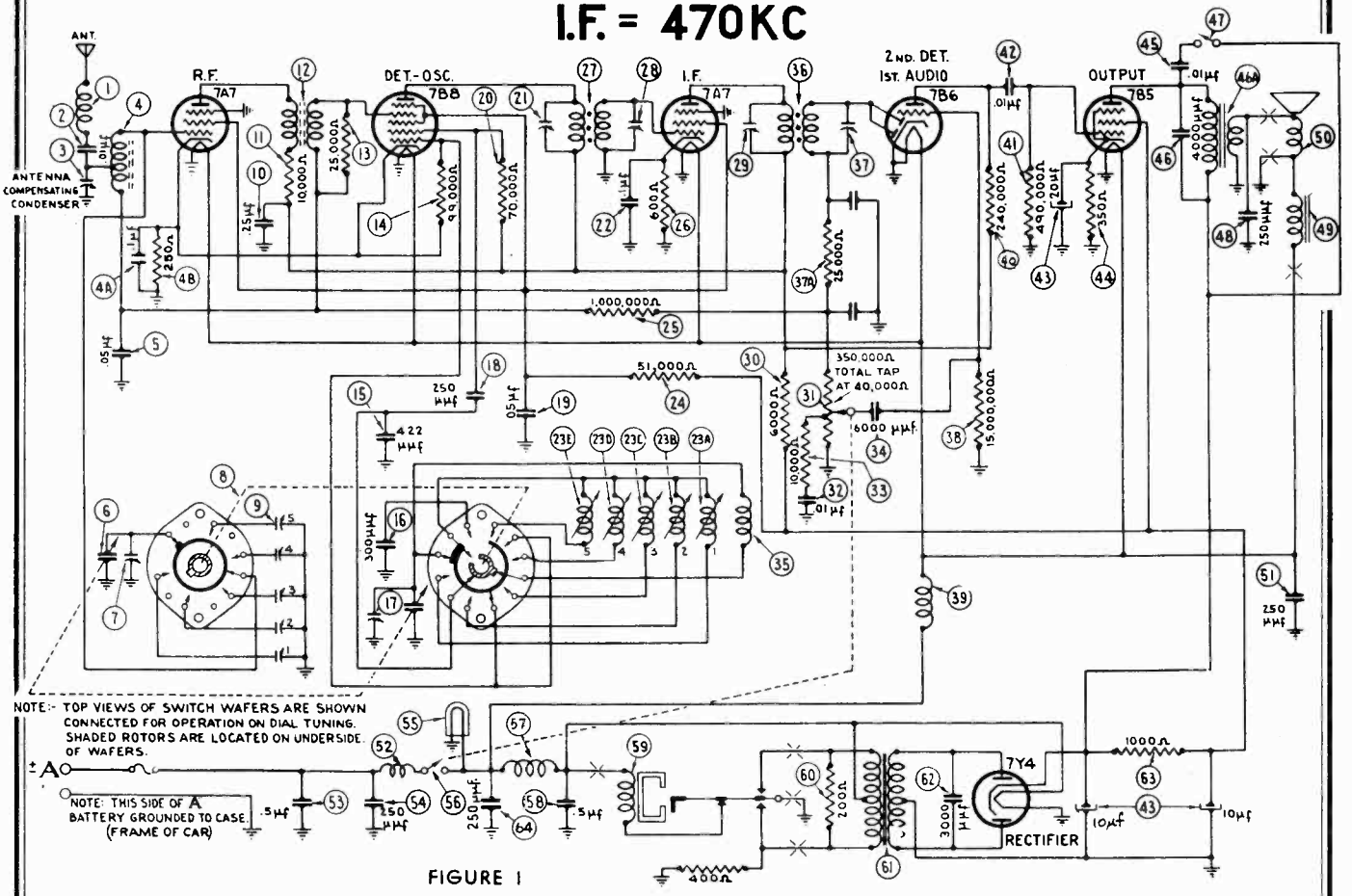


FIGURE 1

PARTS LIST

No.	Description	Part No.
1	Antenna Choke	65-0184
2	Condenser (.01 mfd.)	61-0014
3	Antenna Compensator	Part of 9
4	Antenna Transformer	65-0182
4a	Condenser (.01 mfd.)	30-4499
4b	Resistor (250 ohms)	33-125336
5	Condenser (.05 mfd.)	30-4444
6	Tuning Condenser	63-0024
7	First Padder (on Tun. Cond.)	
8	Wafer Switch	412-1024
9	Antenna Padder Assy.	77-0280
10	Condenser (.25 mfd.)	30-4446
11	Resistor (10,000 ohms)	33-310237
12	R. F. Transformer	65-0183
13	Resistor (25,000 ohms)	33-325337
14	Resistor (99,000 ohms)	33-399237
15	Silver Mica Condenser (422 mmfd.)	61-0066
16	Silver Mica Condenser (300 mmfd.)	61-0003
17	Second Padder (on Tun. Cond.)	
18	Condenser (250 mmfd.)	30-1038
19	Condenser (.05 mfd.)	30-4444
20	Resistor (70,000 ohms)	33-370337
21	Padder (Pri. 1st I. F. Trans.)	
22	Condenser (.1 mfd.)	30-4499
23a	Oscillator Transformer (1)	65-0169
23b	Oscillator Transformer (2)	65-0170
23c	Oscillator Transformer (3)	65-0171
23d	Oscillator Transformer (4)	65-0172
23e	Oscillator Transformer (5)	65-0173
24	Resistor (51,000 ohms)	33-351257
25	Resistor (1,000,000 ohms)	33-510237
26	Resistor (600 ohms)	33-160438
27	First I. F. Transformer	65-0160
28	Padder (Sec. 1st I. F. Trans.)	
29	Padder (Pri. 2nd I. F. Trans.)	
30	Resistor (6,000 ohms)	33-260337
31	Volume Control (350,000 ohms) and On-Off Switch	67-0019
32	Condenser (.01 mfd.)	61-0014
33	Resistor (10,000 ohms)	33-310237
34	Condenser (6,000-mmfd.)	30-4467
35	Oscillator Transformer (Dial)	65-0165
36	Second I. F. Transformer	65-0161
37	Padder (Sec. 2nd I. F. Trans.)	
37a	Resistor (25,000 ohms)	33-325237
38	Resistor (15,000,000 ohms)	33-615337
39	Filament Choke	65-0201
40	Resistor (240,000 ohms)	33-424337
41	Resistor (490,000 ohms)	33-449237
42	Condenser (.01 mfd.)	30-4124
43	Filter Condenser (10—10—20 mfd.)	61-0028
44	Resistor (350 ohms)	33-135336
45	Condenser (.01 mfd.)	30-4381
46	Condenser (4,000 mmfd.)	30-4185
46a	Output Transformer	65-0162
47	Tone Control Switch	42-1406
48	Condenser (250 mmfd.)	61-0033
49	Field Coil	Not Replaceable
50	Cone Kit	
	For 73-0024-3 Speaker	91-0068
	For 73-0024-3 Speaker	91-0028
	For 73-0025-2 Speaker	91-0065
51	Condenser (250 mmfd.)	61-0033
52	"A" Choke	65-0037
53	Condenser (.5 mfd.)	30-4565
54	Condenser (250 mmfd.)	61-0033
55	Pilot Lamp	34-2040
56	On-Off Switch and Volume Control	67-0019
57	Vibrator Choke	65-0075
58	Condenser (.5 mfd.)	30-4565
59	Vibrator	83-0017
60	Resistor (200 ohms)	33-120337
61	Power Transformer	65-0159
62	Condenser (3,000 mmfd.)	61-0059
63	Resistor (1,000 ohms)	33-210437
64	Condenser (250 mmfd.)	61-0033
	Dial Disc. and Drum Assy.	77-0323
	Station Indicator Dial	318-1395
	Dial Tabs	79-0343
	Push Button Knob	55-0474
	Loktal Socket	55-0575
	Back Strap	28-5998FA3
	Front Bracket	57-0753FC36
	Fuse	45-2559
	Fuse Lead	77-0235
	Interference Condenser	30-4007
	Distributor Resistor	33-1196

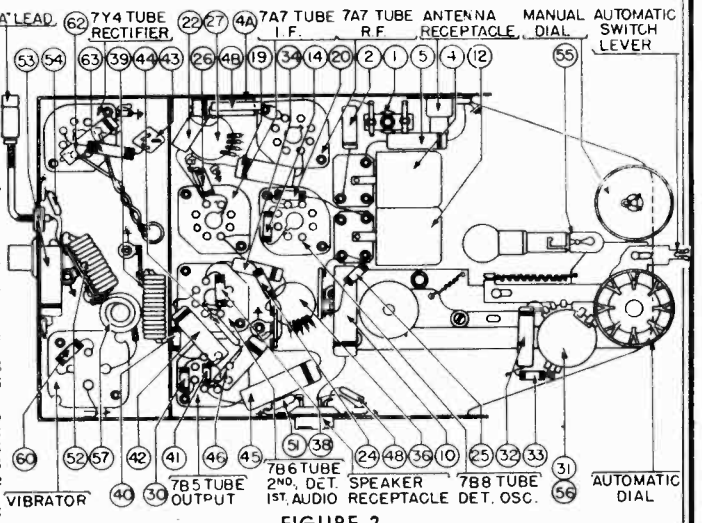


FIGURE 2

PHILCO AUTO RADIO

INSTALLING THE DIAL CORD ON THE
Chrysler Model C-1708 Lincoln Models L-1760, L-1761
Ford Model F-1740 Studebaker Models S-1722, S-1726

When installing new dial cords on the custom built radios, follow the procedure given below:

CHRYSLER MODEL C-1708

1. Remove the top cover, bottom cover and front housing.
2. Turn the radio upside down with the control shafts in front.
3. Turn the tuning control shaft CLOCKWISE to the stop position.
4. Hook the spring on one end of the cord.
5. Hook a paper clip through the eyelet of the cord to which the spring is attached and fasten the clip to the dial mounting bracket.
6. Place the long end of the cord over the rear wooden pulley. Wrap seven turns of cord CLOCKWISE around the back portion of the tuning shaft. Pass the cord through the slot in the collar of the shaft and wrap ¾ of a turn CLOCKWISE around the shaft in front of the collar. Run the cord over the front wooden pulley and fasten the other end of the cord to the spring. Then force the cord over the metal pulley at the top of the scale bracket.
7. Place the pointer on the dial cord and slide it to the first line above the 1500 mark.
8. Remove the paper clip and recheck the pointer setting, using a broadcast signal or a Philco Signal Generator. Slide the pointer along the dial cord to the correct frequency.
9. Replace the front housing and the top and bottom covers.

FORD MODEL F-1740 — LINCOLN MODELS L-1760 and L-1761

1. Remove the tuning condenser assembly from the front casting of the radio.
2. Remove the dial and shaft assembly from the tuning condenser bracket.
3. Remove the dial drum from the knob and shaft assembly.
4. Place the tuning condenser unit on the bench with the bracket to the back and the metal pulley facing up. The tuning condenser plates must be in mesh.
5. Connect one end of the cord to the link and hook the link on the right tab on the inside of the pulley. Feed the cord through the slot in the pulley and wrap one turn of cord CLOCKWISE around the pulley, keeping the cord to the right of the guide pin on the tuning condenser.
6. Hold the dial drum with the left hand and wrap two turns of cord COUNTER-CLOCKWISE around the spool, keeping the cord to the left of the pin in the spool. Loop one turn of cord around the pin. Then wrap one turn COUNTER-CLOCKWISE around the spool, keeping the cord to the right of the pin in the spool.
7. Place the knob and shaft on the spool, with the pin on the spool nearest to the knob and with the thin washer on the left side of the knob and the thick washer on the right side. Place the shaft in the grooves on the tuning condenser bracket.
8. Bring the cord COUNTER-CLOCKWISE around the idler pulley on the bracket and wrap five turns of cord CLOCKWISE around the knob shaft. Be sure the washer is against the end of the bracket.
9. Bring the cord CLOCKWISE around the pulley on the tuning condenser and connect the end of the cord to the link on the drum.
10. Hook the closed end of the tension spring to the tab on the left side of the pulley and hook the other end to both ends of the cord where it enters the pulley.
11. Replace the tuning condenser assembly.

STUDEBAKER MODEL S-1722

1. Remove the chassis from the housing.
2. Place the Receiver on the bench, right side up and with the shafts to the front.
3. Turn the tuning condenser plates in mesh.
4. Feed the loop on the short end of the cord through the hole in the back of the tuning shaft and pass the free end of the loop through the loop of the cord. Pull the cord tight.
5. Wrap 1½ turns of cord CLOCKWISE around the end of the tuning shaft and then ¾ of a turn CLOCKWISE around the tuning condenser drum.
6. Fasten the center loop of the cord to one end of the spring and fasten the other end of the spring in the hole in the drum.
7. Pass the long end of the cord around the idler pulley and through the hole in the sub-base.
8. Hold the cord and turn the radio over with the wiring side showing.
9. Wrap one turn of cord CLOCKWISE around the tuning dial drum.
10. Holding the cord with one hand, turn the tuning shaft CLOCKWISE until the stop position is reached.
11. Wrap 1½ turns of cord COUNTER-CLOCKWISE, around the tuning shaft in back of the front flange.
12. Feed the loop of the cord through the hole in the shaft and pass the free end of cord through the eyelet. The cord must have tension after it is assembled.
13. Assemble the Receiver in the housing.

STUDEBAKER MODEL S-1726

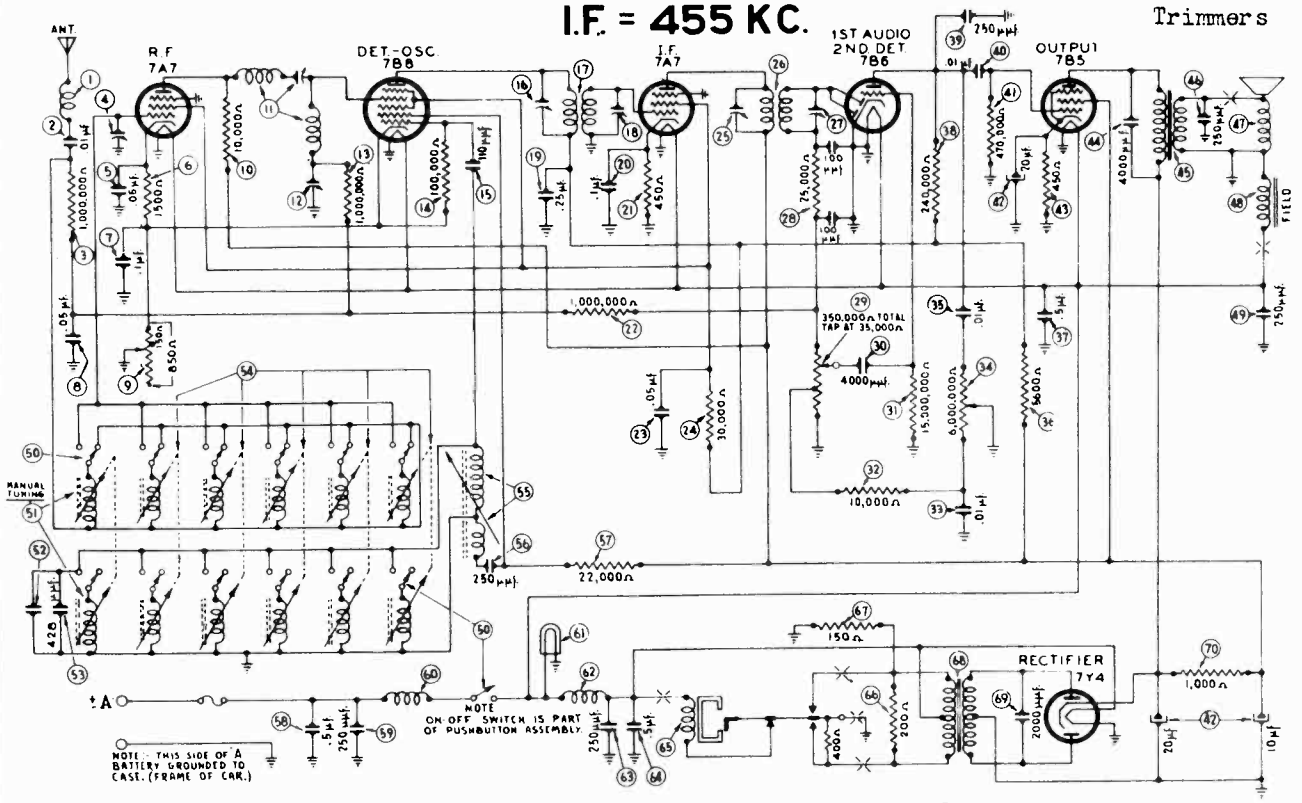
1. Remove the top cover, bottom cover and front housing.
2. Place the Receiver on the bench right side up with the control knobs in front.
3. Turn the tuning shaft clockwise as far as it will go.
4. Loosen the two set screws on the tuning shaft coupling, so that the shaft turns freely.
5. Place the small "U" spring in the slot at the back of the tuning shaft.
6. Hook one of the knotted ends of the cord into one of the hooks on the spring and turn the shaft clockwise until there are eight turns of cord on the shaft between the spring and the front shaft bracket.
7. Hook the remaining end of the cord to the other hook on the spring and turn the shaft counter-clockwise until one turn is wound on the back end of the shaft.
8. Hold the tuning shaft so that it does not turn and place the both cords COUNTER-CLOCKWISE over the two pulleys.
9. Bring the cord under the pointer with the front end of the cord in front of the guide bracket and the back end of the cord in back of the guide bracket.
10. Slide the pointer over to the right end of the guide bracket and place the large "U" spring under the pointer and through the slot, with the hook to the back.
11. With a fine piece of wire as a hook, feed the front end of the cord through the hole in the pointer from the bottom and fasten this loop to the hook on the "U" spring on the pointer.
12. Pull the cord tight and loop it over the pulley on the left end of the pointer guide bracket. Tighten the set screws on the tuning shaft coupling.
13. The pointer can be adjusted to the proper frequency by holding the tuning shaft and sliding the pointer along the guide bracket.
14. Replace the front housing and top and bottom covers.

October, 1939.

MODEL C-1708 Chrysler
Schematic, Chassis
Trimmers

PHILCO RADIO & TELEV. CORP.

I.F. = 455 KC.



SCHE. No.	DESCRIPTION	PART No.
1	Antenna Choke	65-0102
2	Condenser (.01 mfd.)	81-0014
3	Resistor (1,000,000 ohms)	33-510154
4	Antenna Padder	63-0035
5	Condenser (.05 mfd.)	30-4444
6	Resistor (1500 ohms)	33-215334
7	Condenser (.1 mfd.)	30-4499
8	Condenser (.05 mfd.)	30-4444
9	Sensitivity Control (1000 ohms)	67-0025
10	Resistor (10,000 ohms)	33-310454
11	Untuned R. F. Assembly	65-0271
12	I. F. Wave Trap Padder	
13	Resistor (1,000,000 ohms)	33-510154
14	Resistor (100,000 ohms)	33-410154
15	Condenser (110 mmfd.)	30-1031
16	Padder (Pri. 1st I. F. Trans.)	
17	First I. F. Transformer	65-0236
18	Padder (Sec. 1st I. F. Trans.)	
19	Condenser (.25 mfd.)	30-4604
20	Condenser (.1 mfd.)	30-4499
21	Resistor (450 ohms)	33-145438
22	Resistor (1,000,000 ohms)	33-510154
23	Condenser (.05 mfd.)	30-4444
24	Resistor (30,000 ohms)	33-330434
25	Padder (Pri. 2nd I. F. Trans.)	
26	Second I. F. Transformer	65-0237
27	Padder (Sec. 2nd I. F. Trans.)	
28	Resistor (25,000 ohms)	33-325154
29	Volume Control (350,000 ohms)	67-0022
30	Condenser (4000 mmfd.)	30-4334
31	Resistor (15,000,000 ohms)	33-615154
32	Resistor (10,000 ohms)	33-310154
33	Condenser (.01 mfd.)	30-4478
34	Tone Control (6,000,000 ohms)	67-0022
35	Condenser (.01 mfd.)	30-4479
36	Resistor (5600 ohms)	33-256334
37	Condenser (.5 mfd.)	81-0054
38	Resistor (240,000 ohms)	33-424354
39	Condenser (250 mmfd.)	61-0033
40	Condenser (.01 mfd.)	30-4148
41	Resistor (470,000 ohms)	33-447154
42	Filter Condenser (10-20-20 mfd.)	61-0072
43	Resistor (450 ohms)	33-145438
44	Condenser (4000 mmfd.)	61-0073
45	Output Transformer	65-0235
46	Condenser (250 mmfd.)	61-0033
47	Cone Kit (For 73-0030-2)	91-0086
	Cone Kit (For 73-0030-3)	91-0085
48	Field Coil	Not Replaceable
49	Condenser (250 mmfd.)	61-0033
50	Push-Button and On-Off Switch	85-0097
51	Inductive Tuning Unit	77-0440
52	Thermal Compensator	61-0080
53	Condenser (428 mmfd.)	61-0082
54	Push-Button Switch and Trans. Assy.	77-0369
55	Oscillator Tracking Coil	65-0229
56	Condenser (250 mmfd.)	61-0033
57	Resistor (22,000 ohms)	33-322454
58	Condenser (.5 mfd.)	30-4491
59	Condenser (250 mmfd.)	61-0033
60	"A" Choke	65-0248
61	Pilot Lamp	34-2039
62	Vibrator Choke	65-0222
63	Condenser (250 mmfd.)	61-0033
64	Condenser (.5 mfd.)	30-4565
65	Vibrator	83-0017
66	Resistor (200 ohms)	33-120354
67	Resistor (150 ohms)	33-115354
68	Power Transformer	65-0234
69	Condenser (2000 mmfd.)	61-0074
70	Resistor (1000 ohms)	33-210434
	Dial	55-0581
	Drive Cord	55-0688
	Pointer	57-0894
	Window Crystal	55-0679
	Tuning and Volume Knob (Motor Parts)	55-0651
	Tuning and Volume Knob (Dodge)	55-0683
	Tuning and Volume Knob (DeSoto)	55-0684
	Tuning and Volume Knob (Chrysler)	55-0685
	Push-Button Knob	55-0713
	Station Tab Window	55-0731
	Station Tab	55-0730
	Tone Control Lever (Ply., Chrys., Dod.)	57-1110FA7
	Tone Control Lever (DeSoto)	57-1110FA17
	Speaker Cable	95-0103
	Antenna Lead	95-0106

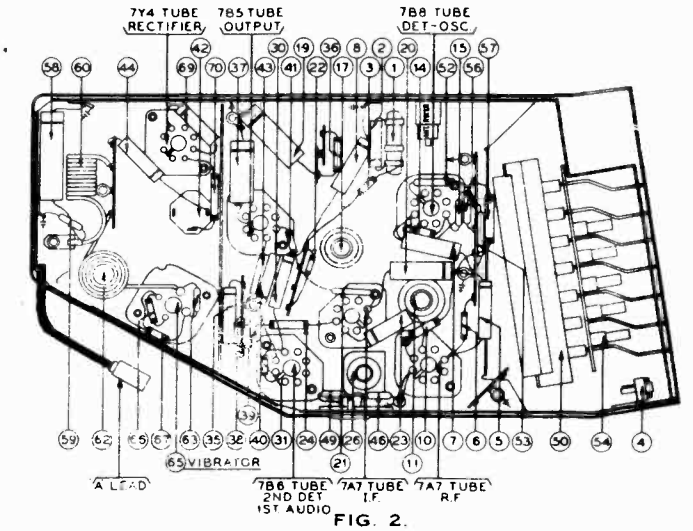
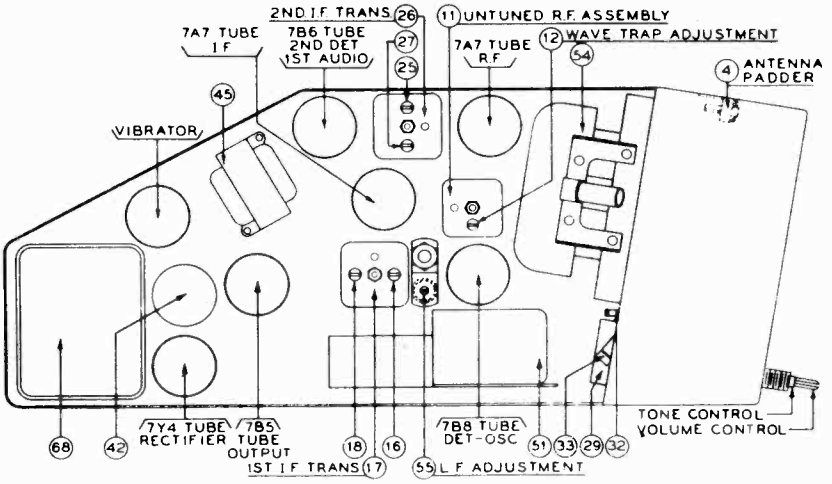


FIG. 2.



FOR ALIGNMENT SEE INDEX

September, 1939

MODEL C-1708
MODEL S-1722
Alignment

PHILCO RADIO & TELEV. CORP.

Model C - 1708
ADJUSTMENTS

All padding adjustments are carefully made at the factory and ordinarily no readjustments are necessary. However, when readjustments are required, the procedure given below must be followed in detail.

Equipment — Fully charged heavy duty storage battery or 6-volt power pack, 077 or 177 Philco Signal Generator, 027 Philco vacuum tube voltmeter and circuit tester and a 27-7159 Padding screw driver

General — The vacuum tube voltmeter can be used as a "wireless" output meter as a convenient method for obtaining maximum output reading. Solder one end of a piece of wire to a strip of phosphor bronze approximately 1" wide, 6" long and .02" thick. Coil this strip so that it can be slipped over the top of the type 7B5 output tube, and make a fairly tight contact. Connect the other end of the wire to the "high" terminal of the vacuum tube voltmeter. Then connect a wire from the radio chassis to the "plus" terminal of the vacuum tube voltmeter.

With the Radio and signal generator set up for operation at the prescribed frequency, turn the Radio volume control on full and set the signal generator attenuator so that a half scale reading is obtained on the output meter. The signal in the speaker should be audible but not loud.

The shielding on the generator output lead must be connected to the Radio housing.

OPERATIONS	SIGNAL GENERATOR		DUMMY CAPACITY	SPECIAL INSTRUCTIONS	ADJUST PADDER
	FREQUENCY	CONNECTION			
	Press the "DIAL" button and stations can be tuned in by "DIAL" tuning				
1	455 K. C.	To Antenna Receptacle on Radio	.1 mfd.	Note 1	(27) (25) (18) (16) (27) (25) (18) (16)
2	455 K. C.	To Antenna Receptacle on Radio	.1 mfd.	Note 1	(12) minimum
3	1400 K. C.	To Antenna Receptacle on Radio	20 mmfd. Note 2	Set tuning condenser at 1400 K. C.	(4)
4	580 K. C.	To Antenna Receptacle on Radio	20 mmfd. Note 2	Set tuning condenser at 580 K. C.	(55) Note 3
5	1400 K. C.	To Antenna Receptacle on Radio	20 mmfd. Note 2	Set tuning condenser at 1400 K. C.	(4) Note 4

Make all adjustments for maximum reading on the output meter unless otherwise specified.

NOTE 1 — Turn the tuning control knob clockwise as far as it will go.

NOTE 2 — Connect the Chrysler Antenna lead, Part No. 95-0106, to the antenna receptacle on the radio. Connect a 20 mmfd. Condenser in series between the signal generator and the antenna lead.

NOTE 3 — Rotate the tuning control when adjusting the Low Frequency screw (55). Tune to the signal and adjust the screw for maximum output. Turn the tuning control knob slightly, first one way then the other, for maximum output. Repeat this procedure until no further improvement is noticed.

NOTE 4 — When the Antenna Stage adjustment is made with the Radio installed in the car, the Radio Antenna lead must be connected to the Cowl Antenna in the usual manner. Connect the signal generator output lead to a wire placed near the car antenna lead but not connected to it and adjust padder (4) for maximum signal at 1400 K. C.

ALIGNMENT FOR MODEL S-1722

OPERATIONS	SIGNAL GENERATOR		DUMMY CAPACITY	SPECIAL INSTRUCTIONS	ADJUST PADDER
	FREQUENCY	CONNECTION			
1	Press the Automatic Station Selector button until "DIAL" appears in the window and stations can be tuned in by Manual Tuning.				
2	470 K. C.	To Grid of 78 I. F. Tube	.5 mfd.	Note 2	(25) (23) (15) (13)
3	1580 K. C.	To Antenna Receptacle on Radio	35 mmfd. See Note 1	Note 2	(54)
4	1360 K. C.	To Antenna Receptacle on Radio	35 mmfd. See Note 1	Set tuning condenser at 1360 K. C.	(47) Note 3

NOTE 1 — Connect the antenna lead, Part No. L-2765, to the antenna receptacle in the radio. Connect a 35 mmfd. Condenser in series between the signal generator and the antenna lead.

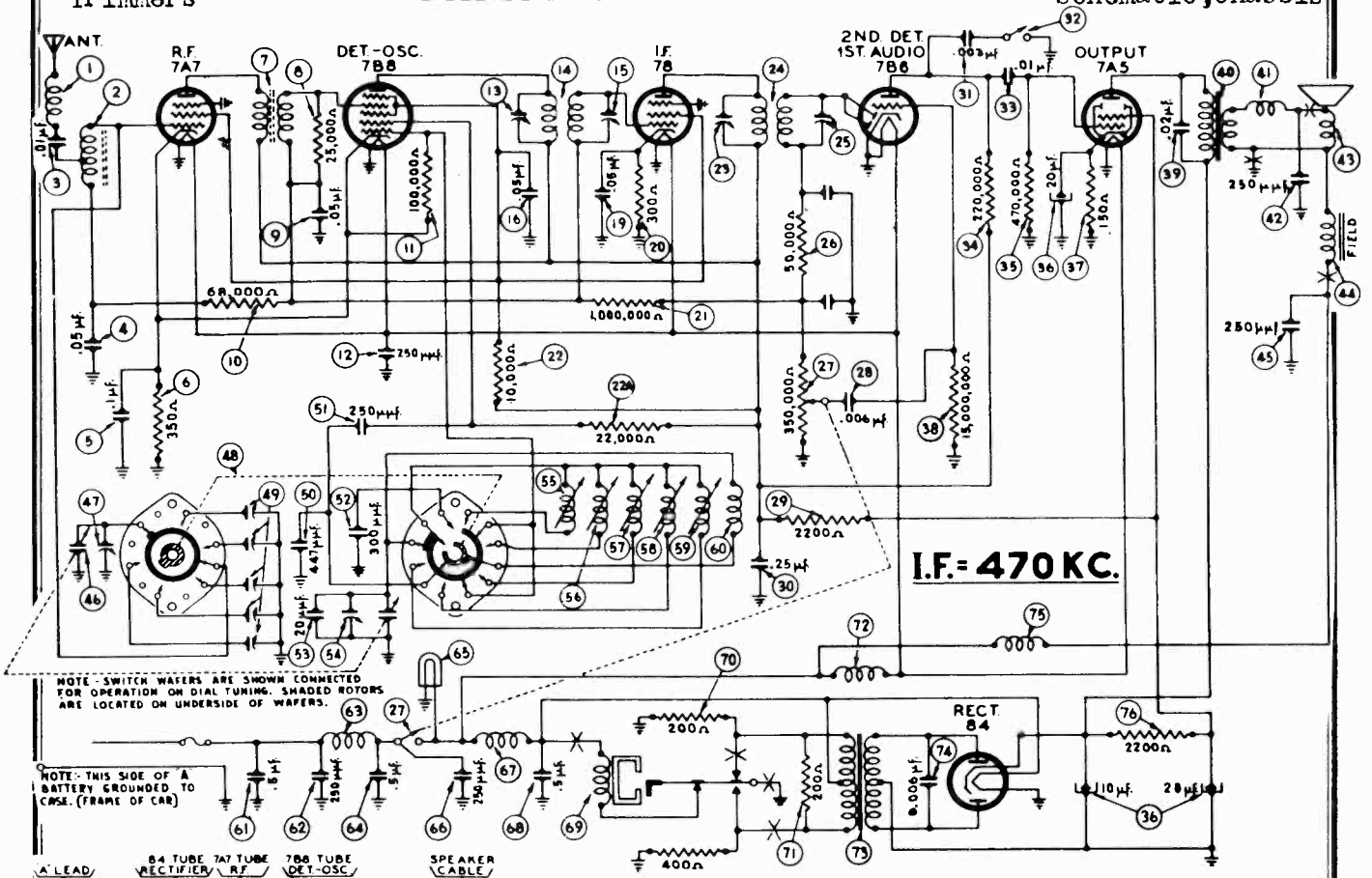
NOTE 2 — Turn the condenser rotor plates completely out of mesh as far as they will go.

NOTE 3 — When the antenna stage adjustment is made with the Radio installed in the car, the Radio antenna lead must be connected to the car antenna in the usual manner. Connect the signal generator output lead to a wire placed near the car antenna but not connected to it.

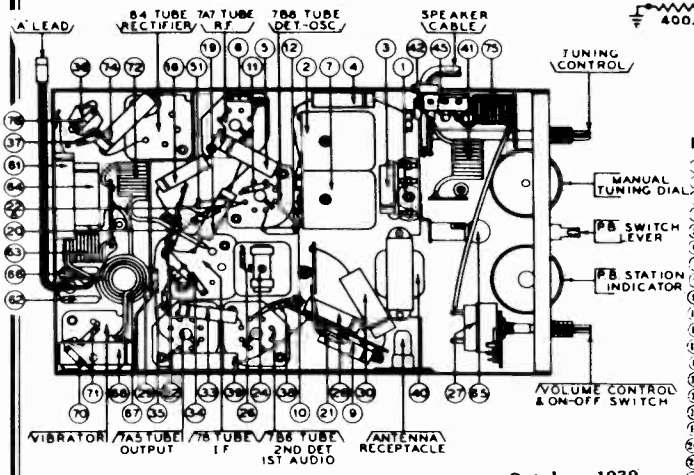
Studebaker
Trimmers

PHILCO RADIO & TELEV. CORP.

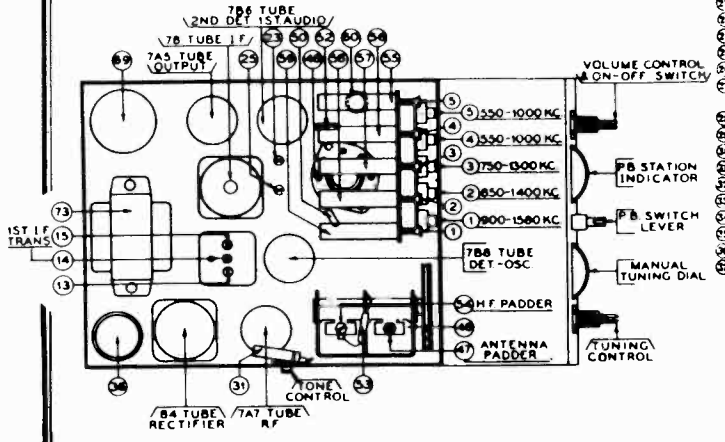
MODEL S-1722
Schematic, Chassis



FOR ALIGNMENT SEE INDEX



October, 1939.



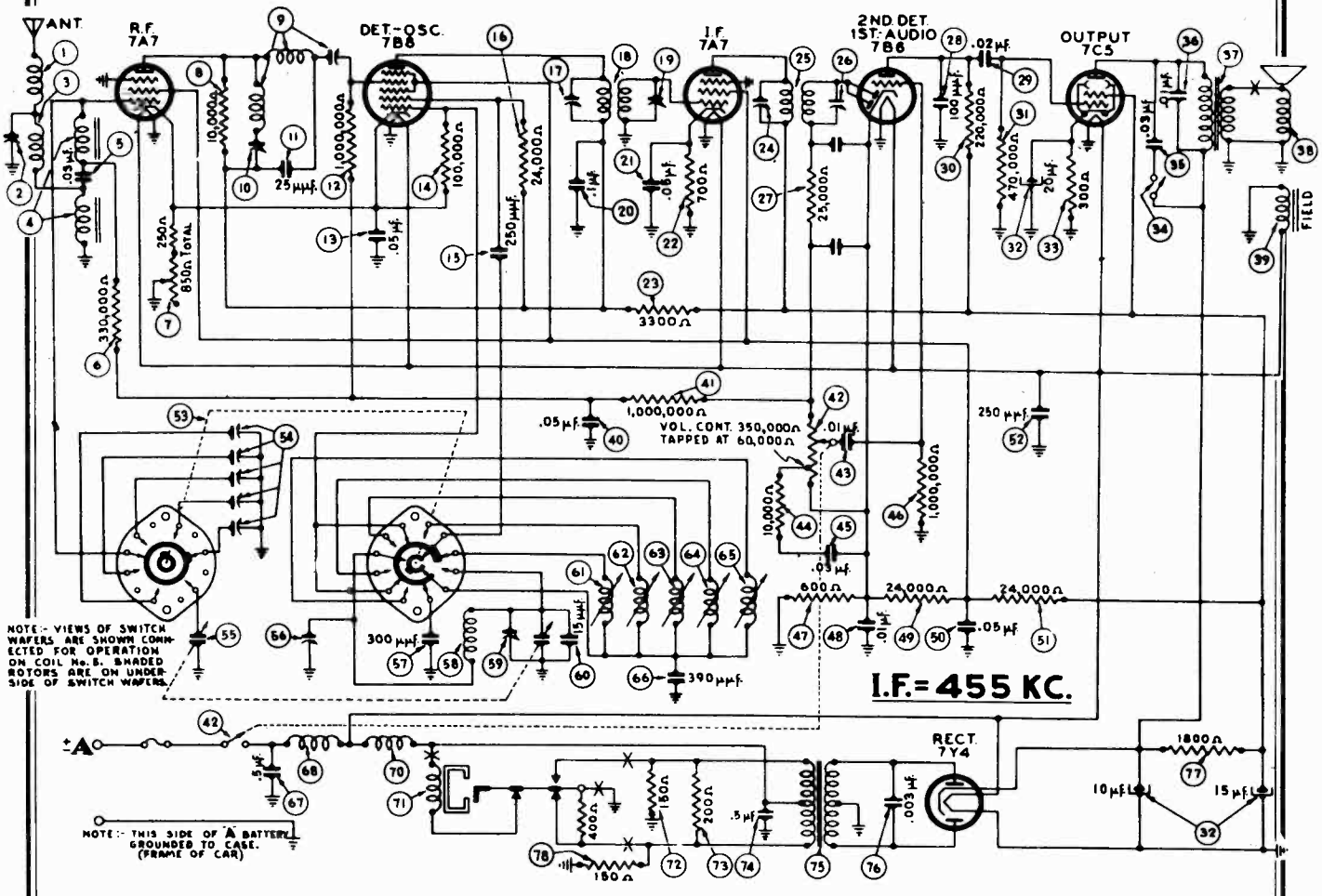
PARTS LIST

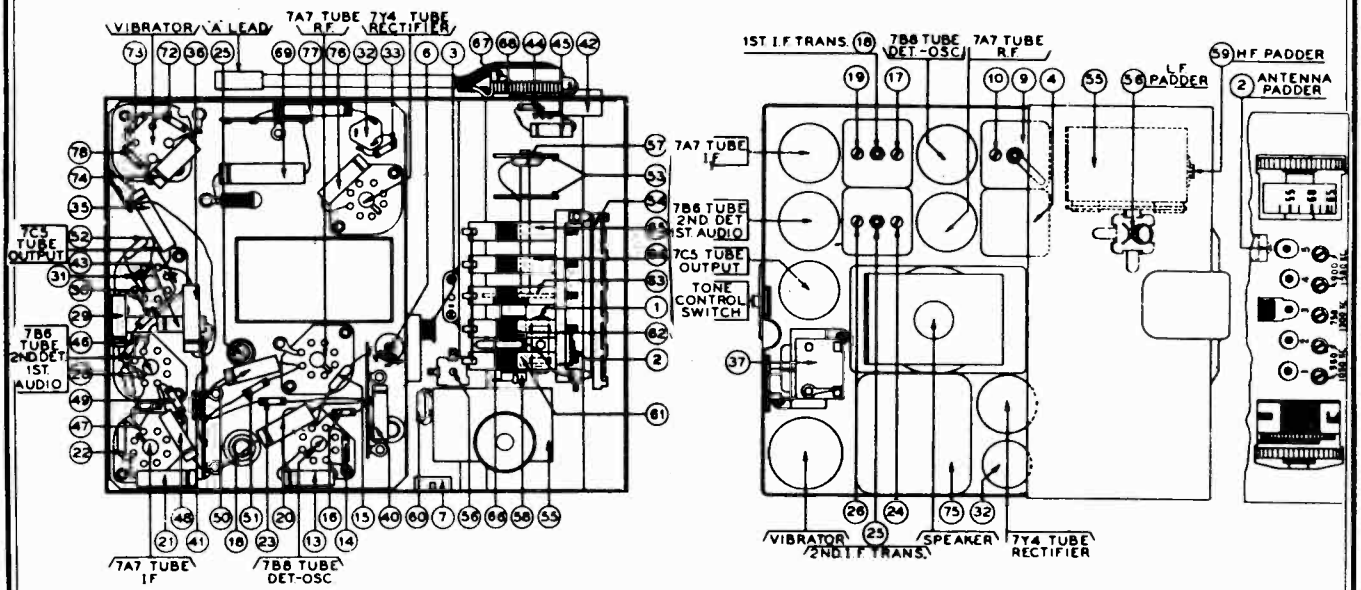
No.	Description	Part No.
1	Antenna Choke	65-0102
2	Antenna Transformer	65-0115
3	Condenser (.01 mfd.)	61-0014
4	Condenser (.05 mfd.)	30-4444
5	Condenser (.1 mfd.)	30-4499
6	Resistor (350 ohms)	33-135334
7	R. F. Transformer	65-0114
8	Resistor (25,000 ohms)	33-325334
9	Condenser (.05 mfd.)	30-4444
10	Resistor (68,000 ohms)	33-368354
11	Resistor (100,000 ohms)	33-410354
12	Condenser (250 mmfd.)	61-0033
13	Padder (Pri. 1st I. F. Trans.)	
14	First I. F. Transformer	65-0148
15	Padder (Sec. 1st I. F. Trans.)	
16	Condenser (.05 mfd.)	30-4444
19	Condenser (.05 mfd.)	30-4444
20	Resistor (300 ohms)	33-130334
21	Resistor (1,000,000 ohms)	33-510154
22	Resistor (10,000 ohms)	33-310334
22a	Resistor (22,000 ohms)	33-322334
23	Padder (Pri. 2nd I. F. Trans.)	
24	Second I. F. Transformer	65-0214
25	Padder (Sec. 2nd I. F. Trans.)	
26	Resistor (50,000 ohms)	33-350134
27	Volume Control (350,000 ohms) and On-Off Switch	67-0027
28	Condenser (6000 mmfd.)	30-4467
29	Resistor (2200 ohms)	33-222334
30	Condenser (.25 mfd.)	30-4446
31	Condenser (3000 mmfd.)	61-0078
32	Tone Control Switch	42-1406
33	Condenser (.01 mfd.)	30-4169
34	Resistor (220,000 ohms)	33-422334
35	Resistor (470,000 ohms)	33-447154
36	Filter Cond. (10-20-20 mfd.)	61-0076
37	Resistor (150 ohms)	33-115334
	Knob Base	28-4184FA8
	Fuel Gauge Resistor	77-0335
	Dial Assembly (Manual)	77-0352
	Dial Assembly (Automatic)	318-1374
	Radio Mounting Bracket	57-066?FA3
	Bezel	57-0670
	Mounting Spacer	57-0729
	Bezel Gasket and Grille Silk	77-0285
	Steering Col. Ground Strap	77-0336

No.	Description	Part No.
38	Resistor (15,000,000 ohms)	33-615154
39	Condenser (.02 mfd.)	61-0077
40	Output Transformer	65-0221
41	Choke	32-1561
42	Condenser (250 mmfd.)	61-0033
43	Cone and Voice Coil	91-0065
44	Field Coil	Not Replaceable
45	Condenser (250 mmfd.)	61-0033
46	Tuning Condenser	63-0023
47	First Padder (On Tun. Cond.)	
48	Wafer Switch	412-1023
49	Antenna Padder Assembly	77-0262
50	Sil. Mica Cond. (447 mmfd.)	61-0047
51	Condenser (250 mmfd.)	30-1038
52	Sil. Mica Cond. (300 mmfd.)	61-0003
53	Condenser (20 mmfd.)	61-0039
54	Second Padder (On Tun. Cond.)	
55	Oscil. Trans. (550-1000 K.C.)	65-0139
56	Oscil. Trans. (550-1000 K.C.)	65-0138
57	Oscil. Trans. (750-1300 K.C.)	65-0137
58	Oscil. Trans. (850-1400 K.C.)	65-0136
59	Oscil. Trans. (900-1580 K.C.)	65-0169
60	Oscil. Trans. (manual)	65-0134
61	Condenser (.5 mfd.)	61-0084
62	Condenser (250 mmfd.)	61-0033
63	"A" Choke	32-1644
64	Condenser (.5 mfd.)	61-0083
65	Pilot Lamp	34-2039
66	Condenser (250 mmfd.)	61-0033
67	Vibrator Choke	65-0151
68	Condenser (.5 mfd.)	61-0083
69	Vibrator	83-0017
70	Resistor (200 ohms)	33-120354
71	Resistor (200 ohms)	33-120354
72	Filament Choke	65-0158
73	Power Transformer	65-0260
74	Condenser (6000 mmfd.)	61-0052
75	Choke	32-1438
76	Resistor (2200 ohms)	33-222334
	Drive Cord	55-0413
	Speaker	73-0022
	Call Letter Kit	81-0143
	Push-Button	55-0412
	Push-Button	55-0482
	Tuning and Volume Knob	55-0486
	Tuning and Volume Knob	27-4689

MODEL F-1740 Ford
Schematic, Chassis
Trimmers

PHILCO RADIO & TELEV. CORP.





PHILCO RADIO & TELEV. CORP.

MODEL F-1740
Alignment, Tuner
Parts

PARTS LIST

No.	Description	Part No.
①	Antenna Choke	65-0283
②	Antenna Padder	Part of ㊾
③	Antenna Choke	65-0282
④	Antenna Transforme:	65-0268
⑤	Condenser (.03 mfd.)	61-0064
⑥	Resistor (330,000 ohms)	33-433234
⑦	Sensitivity Control	67-0029
⑧	Resistor (10,000 ohms)	33-310334
⑨	R. F. Transformer	65-0267
⑩	I. F. Wave Trap Padder	Part of ⑨
⑪	Condenser (25 mmfd.)	30-1108
⑫	Sil. Mica Cond. (300 mmfd.)	61-0003
⑬	Oscillator Trans. (Manual)	65-0252
⑭	H. F. Padder (on Tuning Cond.)	
⑮	Condenser (15 mmfd.)	61-0038
⑯	Oscil. Trans. (900-1580 K.C.)	65-0255
⑰	Oscil. Trans. (900-1580 K.C.)	65-0255
⑱	Oscil. Trans. (750-1300 K.C.)	65-0256
⑲	Oscil. Trans. (580-1050 K.C.)	65-0257
⑳	Oscil. Trans. (580-1050 K.C.)	65-0257
㉑	Sil. Mica Cond. (390 mmfd.)	61,0031
㉒	Condenser (.5 mfd.)	61-0084
㉓	"A" Choke	Part of ㉔
㉕	Vibrator Choke	Part of ㉔
㉔	Vibrator	83-0017
㉖	Resistor (150 ohms)	33-115334
㉗	Resistor (200 ohms)	33-120334
㉘	Condenser (.5 mfd.)	61-0083
㉙	Power Transformer	65-0278
㉚	Condenser (3000 mmfd.)	61-0059
㉛	Resistor (1800 ohms)	33-218534
㉜	Resistor (150 ohms)	33-115334
	Drive Cord	55-0881
	Indicator Scale (P. B.)	55-0695
	Dial Scale (Manual)	55-0821
	Manual Control Knob	55-0705
	Volume Control Knob	55-0706
	Push-Button	55-0704
	Bezel	55-0754
	Bezel Screws	97-0101
	Interference Condenser	61-0040
	Interference Condenser	61-0092
	Interference Condenser	30-4307
	Hook Bolt	97-0094FA3
	Wing Nut	97-0048FA3
	Gland Nut & Sleeve Assy.	77-0459
	Speaker	73-0036-2
	Pilot Lamp	34-2064
	Jumper Plug	57-1121
	Baffle Gasket	55-0707
㊱	Resistor (1,000,000 ohms)	33-510234
㊲	Condenser (.05 mfd.)	30-4569
㊳	Resistor (100,000 ohms)	33-410154
㊴	Condenser (250 mmfd.)	61-0034
㊵	Resistor (24,000 ohms)	33-324334
㊶	Padder (Pri. Ist I. F. Trans.)	
㊷	First I. F. Transformer	65-0265
㊸	Padder (Sec. Ist I. F. Trans.)	
㊹	Condenser (.1 mfd.)	30-4455
㊺	Condenser (.05 mfd.)	30-4569
㊻	Resistor (700 ohms)	33-170438
㊼	Resistor (3300 ohms)	33-233334
㊽	Padder (Pri. 2nd I. F. Trans.)	
㊾	Second I. F. Transformer	65-0264
㊿	Padder (Sec. 2nd I. F. Trans.)	
(51)	Resistor (25,000 ohms)	33-325234
(52)	Condenser (.100 mmfd.)	30-1031
(53)	Condenser (.02 mfd.)	30-4481
(54)	Resistor (220,000 ohms)	33-422334
(55)	Resistor (470,000 ohms)	33-447154
(56)	Filter Cond. (10-15-20 mfd.)	61-0089
(57)	Resistor (300 ohms)	33-130438
(58)	Tone Control Switch	42-1406-6
(59)	Condenser (.03 mfd.)	30-4447
(60)	Condenser (.01 mfd.)	30-4381
(61)	Output Transformer	65-0279
(62)	Replacement Cone	91-0086
(63)	Field Coil	Not Replaceable
(64)	Condenser (.05 mfd.)	30-4569
(65)	Resistor (1,000,000 ohms)	33-510154
(66)	Vol. Cont. & On-Off Switch	67-0026
(67)	Condenser (.01 mfd.)	61-0014
(68)	Resistor (10,000 ohms)	33-310154
(69)	Condenser (.03 mfd.)	61-0061
(70)	Resistor (1,000,000 ohms)	33-510154
(71)	Resistor (600 ohms)	33-160334
(72)	Condenser (.01 mfd.)	30-4479
(73)	Resistor (24,000 ohms)	33-324334
(74)	Condenser (.05 mfd.)	30-4569
(75)	Resistor (24,000 ohms)	33-324434
(76)	Condenser (250 mmfd.)	61-0033
(77)	Wafer Switch	77-0397
(78)	Antenna Padder Assembly	77-0391
(79)	Tuning Condenser	63-0036
(80)	Low Frequency Padder	63-0037

Model F-1740
ADJUSTMENTS

All padding adjustments are carefully made at the factory and ordinarily no readjustments are necessary. However, when readjustments are required, the procedure given below must be followed in detail.

Equipment — Fully charged heavy duty storage battery or 6-volt power pack, 077 or 177 Philco Signal Generator, 027 Philco vacuum tube voltmeter and circuit tester and a 27-7059 Padding screw driver.

General — The vacuum tube voltmeter can be used as an output meter, as a convenient method for obtaining maximum output reading. Connect one end of the test lead to the "high" terminal of the vacuum tube voltmeter and the other end to the jumper on the bottom of the radio. Then connect one end of the other test lead, from the "plus" terminal of the vacuum tube voltmeter to the radio chassis.

With the Radio and signal generator set up for operation at the prescribed frequency, turn the Radio volume control on full and set the signal generator attenuator so that a half scale reading is obtained on the output meter. The signal in the speaker should be audible but not loud.

All cover plates must be in place on the radio and screwed to the housing before attempting to adjust the radio.

OPERATIONS	SIGNAL GENERATOR FREQUENCY	SIGNAL GENERATOR CONNECTION	DUMMY CAPACITY	SPECIAL INSTRUCTIONS	ADJUST PADDER
Press the Automatic Station Selector button until "DIAL" appears in the window and stations can be tuned in by Manual Tuning.					
1	455 K. C.	To Antenna Receptacle on Radio	.1 mfd.	Note 2	㉖ ㉔ ⑲ ⑰ ㉖ ㉔ ⑲ ⑰
2	455 K. C.	To Antenna Receptacle on Radio	.1 mfd.	Note 2	⑩ Minimum
3	1580 K. C.	To Antenna Receptacle on Radio	See Note 1	Note 2	㊾
4	1400 K. C.	To Antenna Receptacle on Radio	See Note 1	Set Tuning Condenser at 1400 K. C.	②
5	580 K. C.	To Antenna Receptacle on Radio	See Note 1	Set Tuning Condenser at 580 K. C.	㉖ Note 3
6	1580 K. C.	To Antenna Receptacle on Radio	See Note 1	Note 2	㊾
7	1400 K. C.	To Antenna Receptacle on Radio	See Note 1	Set Tuning Condenser at 1400 K. C.	② Note 4

Make all adjustments for maximum reading on the output meter.

NOTE 1 — Connect the antenna lead part number 95-0120 to the antenna receptacle on the radio, in series with a 20 mmfd. condenser between the antenna lead and the signal generator. Ground the shield pigtail on the antenna lead to the signal generator.

NOTE 2 — Turn the condenser rotor plates completely out of mesh as far as they will go.

NOTE 3 — Rock the tuning condenser while adjusting the low frequency padder. Tune the condenser to the signal and adjust the padder for maximum output. Rotate the tuning condenser back and forth slightly for maximum output. Then readjust the padder for maximum output. Repeat this procedure until no further improvement is noticed.

NOTE 4 — When the antenna stage adjustment is made with the Radio installed in the car, the Radio antenna lead must be connected to the car antenna in the usual manner. Connect the signal generator output lead to a wire placed near the car antenna but not connected to it.

SETTING UP THE RADIO FOR AUTOMATIC TUNING

The Antenna and Rotomatic adjustments are easily accessible by removing the plastic bezel on the top of the radio. This bezel is held by two screws.

1 — Turn the radio on and allow it to operate for at least twenty minutes before starting any adjustments. All adjustments must be made with the antenna fully extended.

2 — Press the Rotomatic button until the world "Dial" appears on the Rotomatic indicator. Tune in a weak station on the manual dial between 1300 and 1400 kilocycles. Adjust the antenna padder ② (Fig. 3) until maximum volume is obtained. NOTE: This adjustment must be made first before any Rotomatic adjustments are made; otherwise, mis-tuning will result.

3 — Select five stations within the frequency range shown under each set of adjustment screws in Fig. 3.

4 — With "Dial" showing on the Rotomatic indicator, manually tune in the station to be set up on position No. 1 and identify the program.

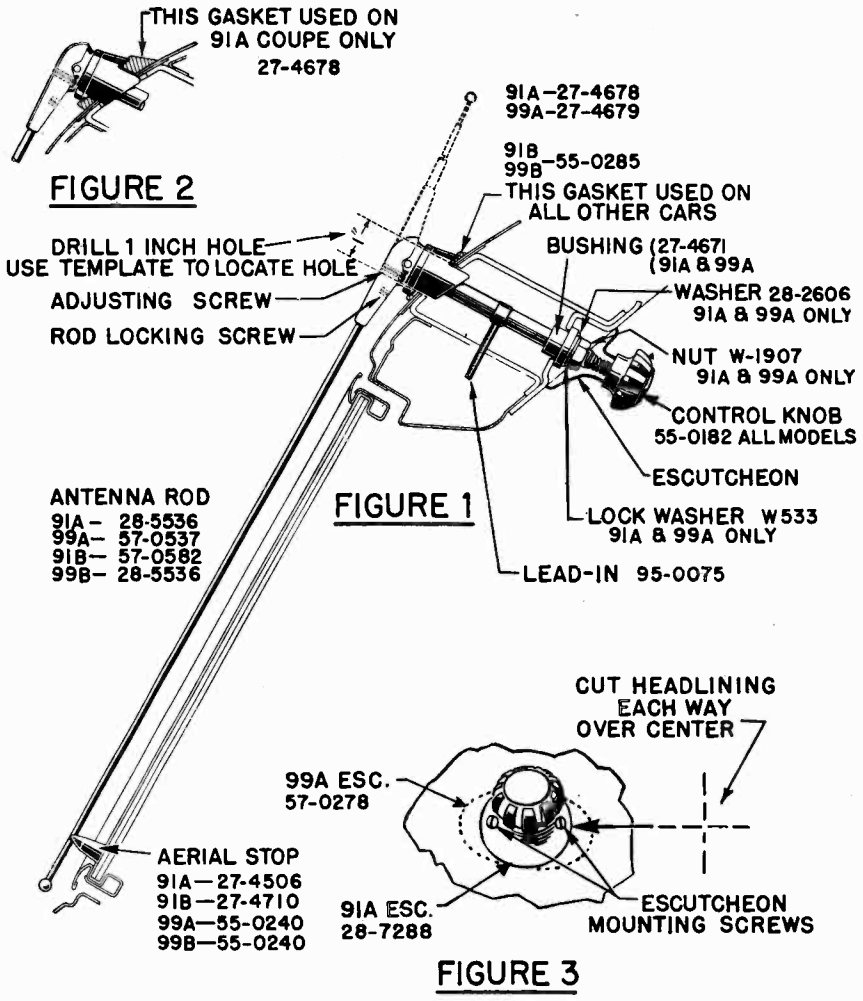
5 — Press the Rotomatic button until No. 1 appears on the Rotomatic indicator. Now adjust the top screw at position No. 1 until the station selected is brought in with loudest volume. Then adjust the slotted hex screw at the bottom until maximum volume is obtained. NOTE: Stations of higher frequencies are tuned in by turning the screws to the left or counter-clockwise. Lower frequency stations are tuned by turning to the right or clockwise.

6 — Proceed with setting up the remaining four stations in the same manner as described under Paragraph 4 and 5.

7 — Because there is some detuning of the coils due to the movements of the cores in adjacent coils, it is necessary to re-check the adjustments again, going back from Position No. 5 to No. 1 and again re-checking from No. 1 to No. 5. This is important for accurate reception while driving at a distance from the broadcasting stations.

8 — This final re-checking of adjustments should be made in an area of low signal strength in your service station or in some known "dead" spot where signals can just barely be heard.

1939 FORD ADJUSTABLE ANTENNA
(FOR CLOSED CARS — MODELS 91A AND 99A)



FORD ANTENNA PARTS LIST
(FORD 91A CLOSED CAR)

Ford Part No. 91A18813A — Philco Part No. 91-0038

Part No.	Description	List Price Each	Part No.	Description	List Price Each
*W-55FA1	Nut ... per 100	1.20	*27-4679	Gasket	.03
W-533	Lockwasher ... per 100	.90	*28-2606	Washer ... per 100	.50
W-679FA1	Lockwasher ... per 100	.45	*28-4696	Wrench	.10
*W-1907	Nut ... per 100	4.00	*28-7288	Escutcheon	.25
*W-1988FA8	Screw (Escutcheon Mtg.) ... per 100	1.50	*36-4043	Tow Strap	.02
27-4506	Antenna Stop	.06	*55-0182	Knob	.45
*27-4671	Bushing	.15	91-0049	Antenna Assembly	$3.75
27-4678	Gasket	.10	*95-0075	Antenna Lead	1.80

*Used on No. 116 car also.

FORD ANTENNA PARTS LIST
(FORD 91B OPEN CAR)

Ford Part No. 91A18813B — Philco Part No. 91-0051

Part No.	Description	List Price Each	Part No.	Description	List Price Each
*W-55	Nut ... per 100	$1.20	28-4696	Wrench	.10
*W-679FA1	Lockwasher ... per 100	.45	*55-0182	Knob	.45
W-1774FA8	Screw (Stop Mtg.)	.10	55-0285	Gasket	.03
27-4710	Antenna Stop	.15	55-0310	Threaded Bakelite Bushing	.25
28-2606	Washer ... per 100	.50	91-0044	Antenna Assembly	4.25
*Used on 91A car also.			*95-0075	Antenna Lead	1.30

FORD ANTENNA PARTS LIST
FOR 116 CLOSED CAR (MERCURY) (99A)

Ford Part No. 99A18813A — Philco Part No. 91-0031

Part No.	Description	List Price Each	Part No.	Description	List Price Each
W-55FA1	Nut ... per 100	1.20	28-4696	Wrench	.10
W-533	Lockwasher ... per 100	.90	36-4043	Tow Strap	.02
W-679FA1	Lockwasher ... per 100	.45	55-0182	Knob	.45
W-1907FA1	Nut ... per 100	4.00	55-0240	Antenna Stop	.10
W-1988FA8	Screw (Escutcheon Mtg.) ... per 100	1.50	57-0278	Escutcheon	.20
27-4671	Bushing	.15	91-0023	Antenna Assembly	$3.75
27-4679	Gasket	.03	95-0075	Antenna Lead	1.80
28-2606	Washer ... per 100	.50			

FORD ANTENNA PARTS LIST
FOR 116 OPEN CAR (MERCURY) (99B)

Ford Part No. 99A18813B — Philco Part No. 91-0039

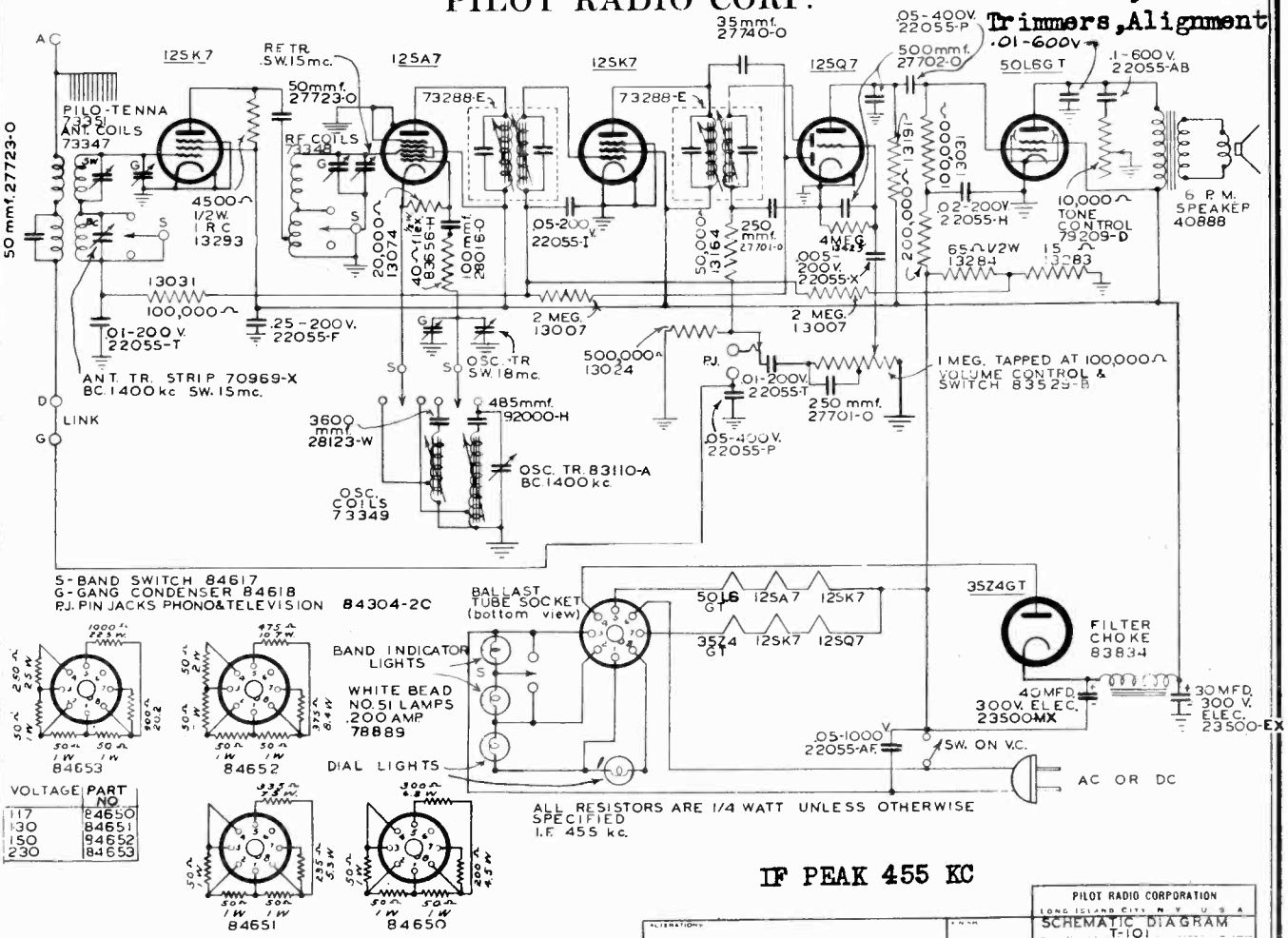
Part No.	Description	List Price Each	Part No.	Description	List Price Each
W-55	Nut ... per 100	$1.20	55-0240	Stop	.10
W-679	Lockwasher ... per 100	.45	55-0285	Gasket	.03
28-2606	Washer ... per 100	.50	55-0310	Threaded Bakelite Bushing	.25
28-4696	Allen Set Screw Wrench	.10	91-0045	Antenna Assembly	4.25
55-0182	Knob	.45	95-0075	Antenna Lead	1.30

Prices subject to change without notice

APRIL, 1939

PILOT RADIO CORP.

MODEL T-101
Schematic, Socket Trimmers, Alignment



IF PEAK 455 KC

PILOT RADIO CORPORATION
LONG ISLAND CITY N.Y. U.S.A.
SCHEMATIC DIAGRAM
T-101
DATE 3-5-40
25251
CLASSIFICATION T-101
THIS PRINT SUPERSEDES ALL OTHERS PRIOR TO [redacted]
DO NOT SCALE THIS PRINT

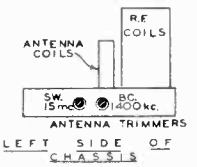
TUNING RANGE

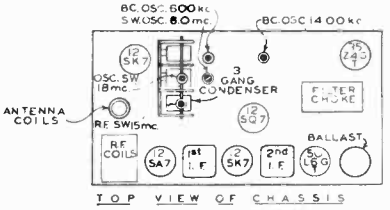
Broadcast Band 535 to 1720 kc.; or 561 to 174 meters
Short Wave Band 5.6 to 19.8 kc.; or 53.6 to 15.2 meters

ANTENNA

While this receiver is equipped with the new "Pilo-tenna" for the reception of local stations with good tone quality, it is recommended that a good outside antenna of the doublet type be installed for short wave or distant broadcast band reception and for the reduction of interfering noises due to other electrical devices.

When using a doublet antenna, connect one lead-in wire to terminal "A" at the rear of the chassis, and the other lead-in wire to terminal "D". Remove the connecting link from terminals "D" and "G" and connect terminal "G" to a ground such as a cold water pipe or radiator. If an ordinary single wire antenna is used, connect the lead-in wire to Terminal "A" on the rear of the chassis. Leave the link between "D" and "G" terminals and connect a ground wire under terminal "G".





SERVICE NOTES

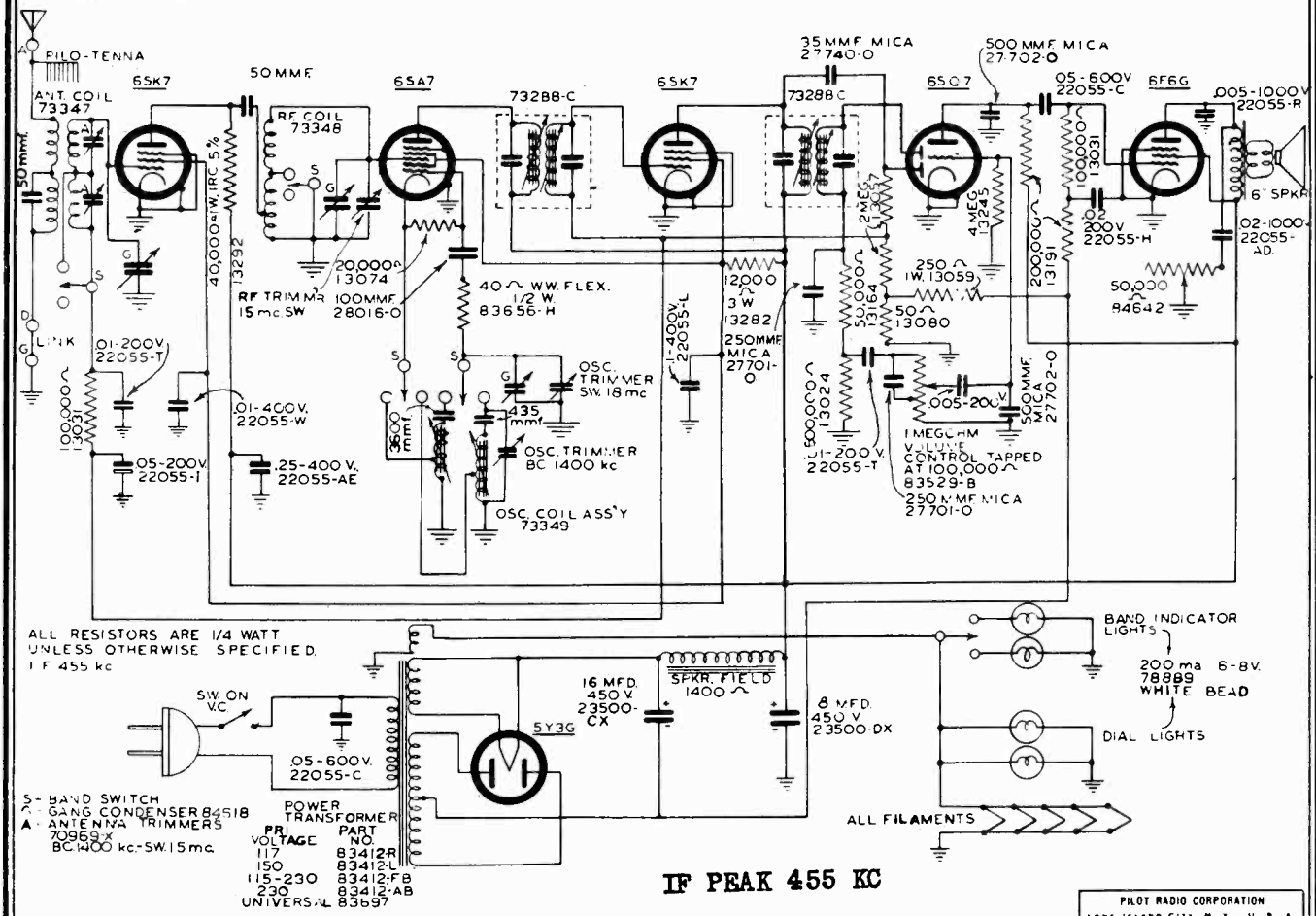
The location of all adjustments used in re-aligning this receiver, and the frequencies at which these adjustments should be made, are shown in the accompanying diagram.

When aligning the I. F. amplifier, the generator must be connected to the grid of the 12SA7 tube through a .1 mfd condenser. When aligning the receiver on the Broadcast Band, connect the generator to the Antenna wire through a .0002 mfd condenser, and on the short wave band use a 400 ohm carbon resistor.

PILOT RADIO CORPORATION
LONG ISLAND CITY N.Y. U.S.A.
TRIMMER LAYOUT
T-101
DATE 3-6-40
25256
T-101
THIS PRINT SUPERSEDES ALL OTHERS PRIOR TO [redacted]

MODEL T-102
Schematic, Socket
Alignment, Trimmers

PILOT RADIO CORP.



IF PEAK 455 KC

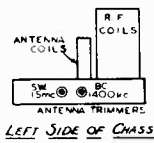
Broadcast Band 535 to 1720 kc.; or 561 to 174.0 meters
Short Wave Band 5.6 to 19.8 mc.; or 53.6 to 15.2 meters

PILOT RADIO CORPORATION LONG ISLAND CITY N.Y. U.S.A.	
ALTERATIONS	SCHEMATIC DIAGRAM T-102
CLASSIFICATION T-102	THIS PRINT SUPERSEDES ALL OTHERS PRIOR TO [redacted]
DO NOT SCALE THIS PRINT	DATE 2-20-40 — No. 2524S

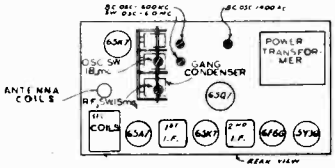
SERVICE NOTES

The location of all adjustments used in re-aligning this receiver, and the frequencies at which these adjustments should be made, are shown in the accompanying diagram.

When aligning the I. F. amplifier, the generator must be connected to the grid of the 6SA7 tube through a .1 mfd condenser. When aligning the receiver on the Broadcast Band, connect the generator to the Antenna wire through a .0002 mfd condenser, and on the short wave band use a 400 ohm carbon resistor.



LEFT SIDE OF CHASSIS

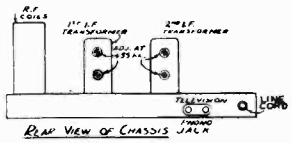


TOP VIEW OF CHASSIS

ANTENNA

While this receiver is equipped with the new "Pilo-tenna" for the reception of local stations with good tone quality, it is recommended that a good outside antenna of the doublet type be installed for short wave or distant broadcast band reception and for the reduction of interfering noises due to other electrical devices.

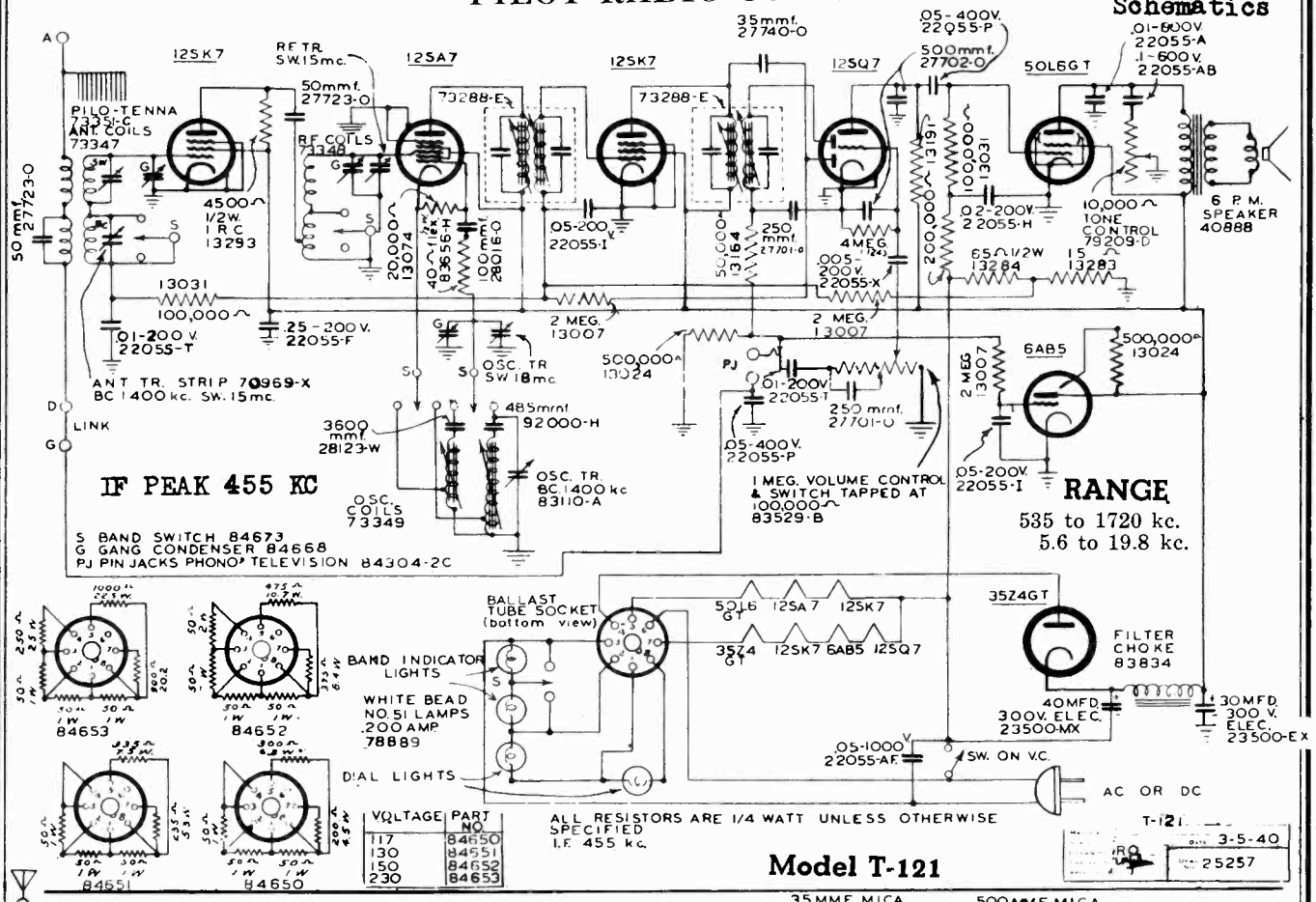
When using a doublet antenna, connect one lead-in wire to terminal "A" at the rear of the cabinet, and the other lead-in wire to terminal "D". Remove the connecting link from terminals "D" and "G" and connect terminal "G" to a ground such as a cold water pipe or radiator. If an ordinary single wire antenna is used, connect the lead-in wire to Terminal "A" on the rear of the cabinet. Leave the link between "D" and "G" terminals and connect a ground wire under terminal "G".

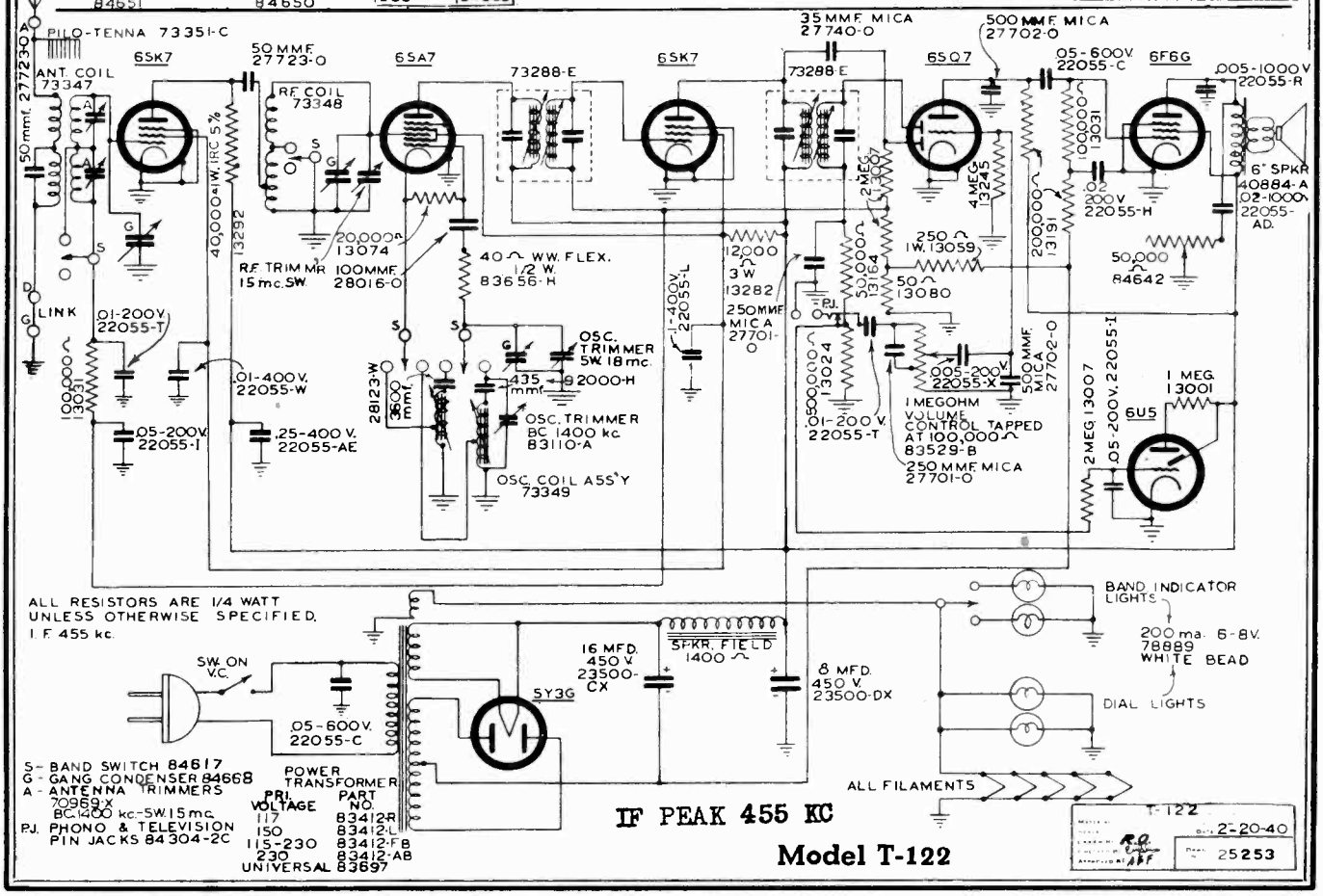


REAR VIEW OF CHASSIS

PILOT RADIO CORP.

MODEL T-121
MODEL T-122
Schematics

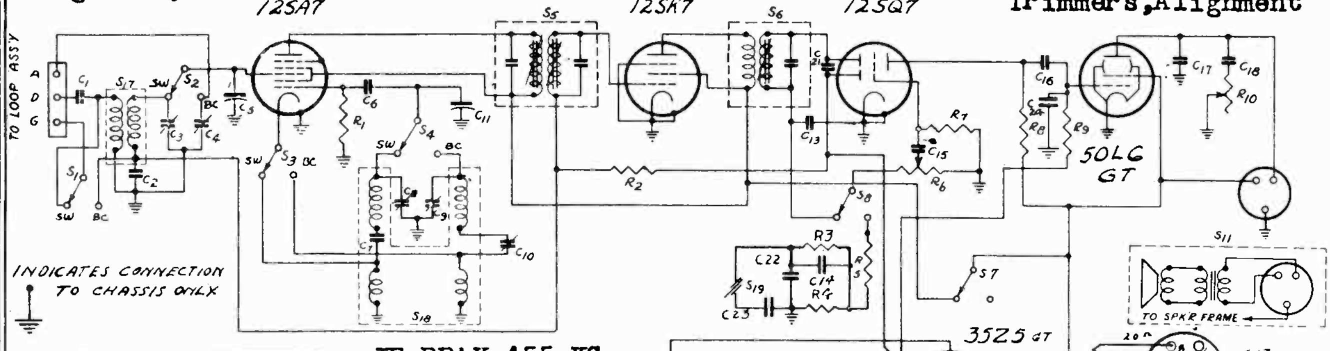




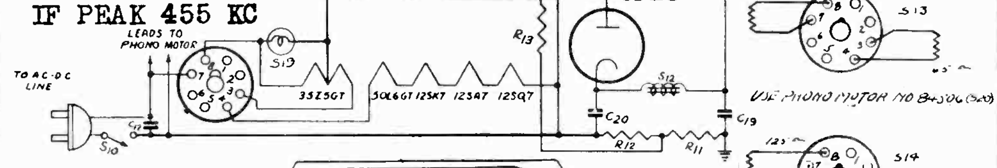
MODEL T-121
MODEL T-122
Alignment, Trimmers

PILOT RADIO CORP.

MODELS TP1062, TP1862
Schematic, Socket
Trimmers, Alignment

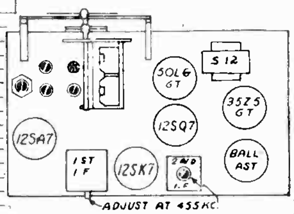


IF PEAK 455 KC



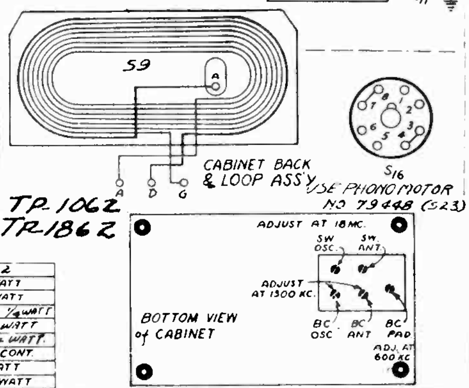
CONDENSERS FOR MODEL TP1062		
C1	22055-W	.01 MFD. , 400 V.
C4	22055-M	1 MFD , 200 V.
C3, C4	70969-K	TRIMMER ASSY
C5, C11	84037	GANG CONDENSER
C6	28016-0	.0001 MFD. MICA
C7	27794-W	.005 MFD. MICA
C8, C9	70969-E	TRIMMER ASS'Y
C10	79431-B	385 MMFD PADDER
C12	22055 AC	.02 MFD , 600 V.
C13	27701-0	.00025 MFD , MICA
C14	22055AT	.002 MFD 200 V
C15	22055 AU	.005 MFD , 400 V.
C16	22055 W	.01 MFD , 400 V
C17	22055 A	.01 MFD , 600 V.
C18	22055-AB	.1 MFD 600 V
C19, C20	23500-E	30 MFD , 300 V. ELEC
C21	27786-0	25 MMFD , MICA
C22	22055-T	.01 MFD. 200 V
C23	22055 AB	.1 MFD 600 V
C24	28122 D	.0004 MICA

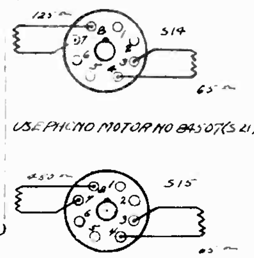
MISCELLANEOUS FOR MODEL TP1062		
S1 TO S4	84060-C	BAND SWITCH
S5	73192-D	1ST I F TRANS ASS'Y
S6	73267	2ND I F TRANS. ASS'Y
S7, S8	84060-C	PHONO-RADIO SWITCH
S10		SWITCH ON VOL CONTROL
S11	40880	8" P.M. SPEAKER
S12	83834	FILTER CHOKE
S13	84429	BALLAST TUBE 130 V.
S14	84430	BALLAST TUBE 150 V.
S15	84431	BALLAST TUBE 230 V
S16	84428	BALLAST TUBE 117 V
S17	73268	S.W. ANT COIL + WIRE ASSY
S18	73266	BC + S.W. OSC COIL ASSY
S19	72151	DIAL LAMP (BROWN BEAD 1/15 A)
S9	84036B	CABINET BACK - LOOP ASSY.
S20	84506	PHONO MOTOR FOR 130V.
S21	84507	PHONO MOTOR FOR 150V
S22	84508	PHONO MOTOR FOR 230V.
S23	79448	PHONO MOTOR FOR 117V



TP-1062
TR-1862

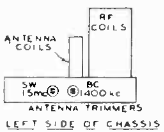
RESISTORS FOR MODEL TP1062		
R1	13074	20,000 OHMS, 1/4 WATT
R2, R13	13007	2 MEGOHMS , 1/4 WATT
R3	13031	100,000 OHMS, 1/4 WATT
R4	13117	15,000 OHMS 1/4 WATT
R5	13028	1000 OHM 1/4 WATT.
R6	79429-B	500,000 OHMS, VOL. CONT.
R7	13245	4 MEGOHMS , 1/4 WATT
R8	13147	300,000 OHMS , 1/4 WATT
R9	13024	500,000 OHMS, 1/4 WATT
R10	83447K	100,000 OHMS, TONE CONT.
R11	13283	15 OHMS , 1/4 WATT
R12	13284	65 OHMS. 1/2 WATT





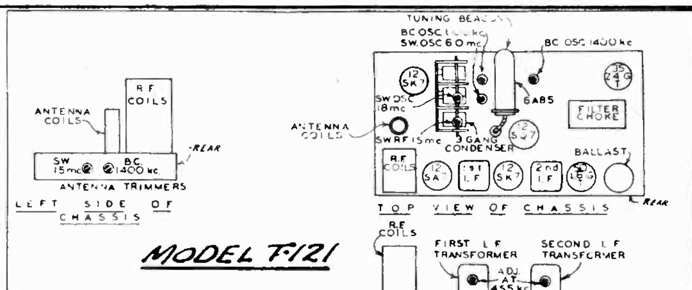
TP1062 — THIS PRINT SUPERSEDES ALL OTHERS PRIOR TO [redacted] — DO NOT SCALE THIS PRINT

PILOT RADIO CORPORATION
LONG ISLAND CITY N.Y. U.S.A.
SCHEMATIC WIRING DIAGRAM FOR MODEL TP1062
DATE NOV. 4 39
DWG. 25236



Broadcast Band:
535 to 1720 kc.

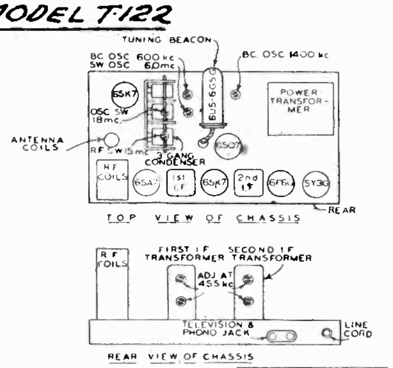
Short Wave Band:
5.6 to 19.8 mc.



MODEL T-121

PILOT RADIO CORPORATION
TRIMMER LAYOUT T-121
3-15-40
25258

MODEL T-122



T-122 — THIS PRINT SUPERSEDES ALL OTHERS PRIOR TO [redacted] — DO NOT SCALE THIS PRINT

PILOT RADIO CORPORATION
TRIMMER LAYOUT T-122
3-11-40
25254

MODEL T-121 ANTENNA MODEL T-122

When using a doublet antenna, connect one lead-in wire to terminal "A" at the rear of the chassis, and the other lead-in wire to terminal "D". Remove the connecting link from terminals "D" and "G" and connect terminal "G" to a ground such as a cold water pipe or radiator. If an ordinary single wire antenna is used, connect the lead-in wire to Terminal "A" on the rear of the chassis. Leave the link between "D" and "G" terminals and connect a ground wire under terminal "G".

SERVICE NOTES

The location of all adjustments used in re-aligning this receiver, and the frequencies at which these adjustments should be made; are shown in the accompanying diagram.

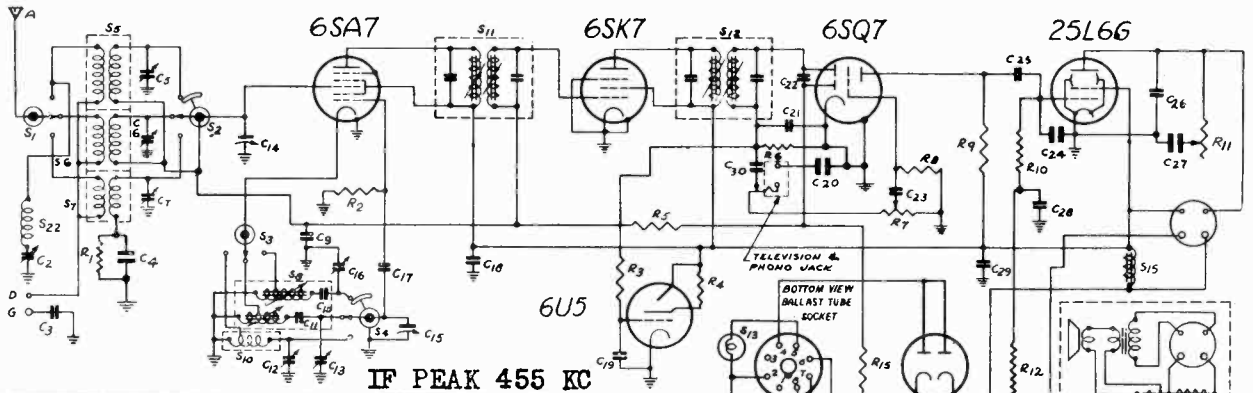
When aligning the I. F. amplifier, the generator must be connected to the grid of the* 12SA7 tube through a .1 mfd condenser. When aligning the receiver on the Broadcast Band, connect the generator to the Antenna wire through a .0002 mfd condenser, and on the short wave band use a 400 ohm carbon resistor.

* 6SA7 tube—MODEL T-122

Schematics, Socket Alignment, Trimmers

PILOT RADIO CORP.

MODEL T1264
MODEL T1351

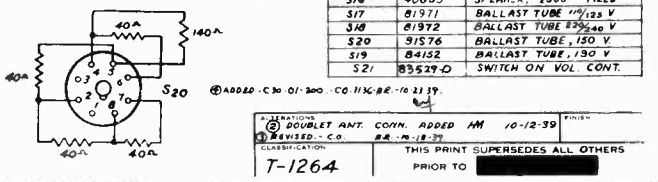


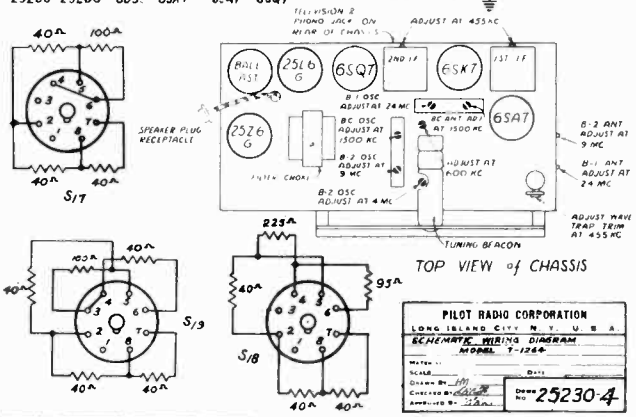
IF PEAK 455 KC

CONDENSENSERS FOR MODEL T-1264		
C3	22055-R	.005 MFD., 1000 V.
C5, C12	70969-J	TRIMMER ASS'Y
C6, C7	70969-E	TRIMMER ASS'Y
C13, C16	70969-F	TRIMMER ASS'Y
C21	27796-0	150 M MF. MICA
C4	28120-W	.005 MFD. MICA ±5%
C9	22055-1	.05 MFD., 200V
C11	28103-W	.0021 MFD. MICA
C10	92000-C	450 MMF. MICA
C17	26016-0	.0001 MFD. MICA
C18	22055-L	.1 MFD., 400 V.
C19, C30	22055-T	.01 MFD., 200 V
C20	22055-P	.05 MFD. 400 V
C22	27740-0	35 MMF., MICA
C23	22055-X	.003 MFD., 200 V.
C24	27702-0	500 MMF. MICA
C25,	22055-Z	.02 MFD., 400 V.
C28	22055-AU	.005 MFD. 400 V.
C26	22055-A	.01 MFD. 600 V
C27	22055-AB	.1 MFD., 600 V
C29	23500-EX	30 MFD. 300 V. ELEC.
C31	23500-EX	30 MFD., 300 V. ELEC.
C32	22055-U	.01 MFD., 1000 V.
C14, C15	84125	2 GANG COND.
C2	79455	WAVE TRAP TRIM.

RESISTORS FOR MODEL T-1264		
R4	13024	500,000 OHMS, 1/4 WATT
R2	13074	20,000 OHMS, 1/4 WATT
R3	13007	2 MEGOHMS, 1/4 WATT
R13	13284	65 OHMS, 1/2 WATT
R6	13205	50,000 OHMS, 1/4 WATT
R7	83529-D	1 MEGOHM VOL. CONT.
R8	13245	4 MEGOHMS, 1/4 WATT
R9	13191	200,000 OHMS, 1/4 WATT
R12	13171	250,000 OHMS, 1/4 WATT
R11	83447-D	100,000 OHMS, TONE CONT.
R10	13031	100,000 OHMS, 1/4 WATT
R1	13241	60,000 OHMS, 1/4 WATT
R15, R5	13007	2 MEGOHMS, 1/4 WATT
R14	13283	13 OHMS, 1/4 WATT

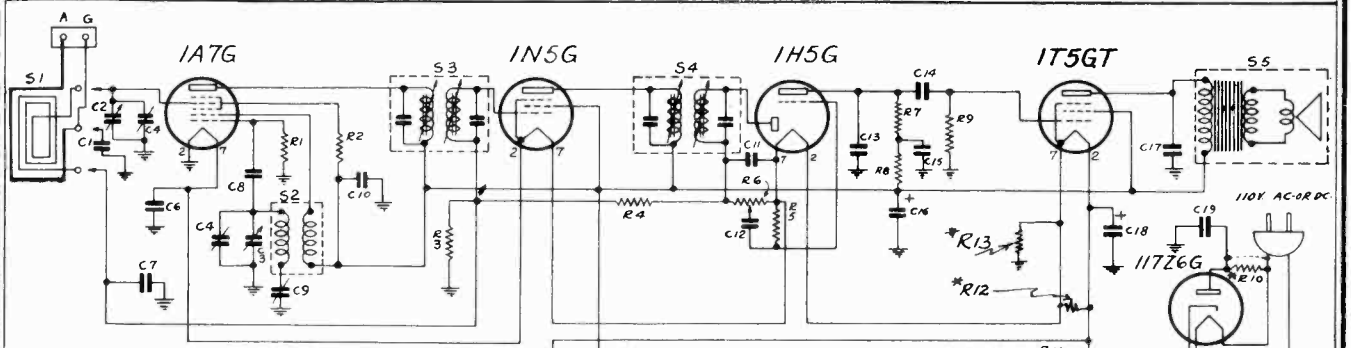
MISCELLANEOUS FOR MODEL T-1264		
S1 TO S4	84246	BAND SWITCH
S5	73306	B.C. ANT. COIL ASS'Y
S6	73307	ANT. COIL ASS'Y B-2
S7	73327	ANT COIL ASS'Y B-1
S8	73309	OSC. COIL ASS'Y BC.,B-2
S10	79310	OSC. COIL ASS'Y, B-1
S11	73288-C	1ST. I.F. TRANS. ASS'Y
S12	73289-C	2ND I.F. TRANS. ASS'Y
S13, S14	71282	PILOT LIGHT, .25A BLUE
S15	83834	FILTER CHOKE, 170 Ω
S16	40855	SPEAKER, 2500 Ω FIELD
S17	81971	BALLAST TUBE 110/125 V
S18	81972	BALLAST TUBE 230/240 V
S20	91576	BALLAST TUBE, 150 V.
S19	84152	BALLAST TUBE, 190 V
S21	83529-D	SWITCH ON VOL. CONT.





ALTERATIONS
② DOUBLET ANT. CONN. ADDED HM 10-12-39
① REVISED - C.O. BR. 10-18-39
FINISH
CLASSIFICATION T-1264
THIS PRINT SUPERSEDES ALL OTHERS PRIOR TO [redacted]

PILOT RADIO CORPORATION
LONG ISLAND CITY, N. Y. U. S. A.
SCHEMATIC WIRING DIAGRAM
MODEL T-1264
Material
Scale
Drawn By HM
Checked By
Approved By
Date
Dwg. No. 25230-4



CONDENSERS FOR T-1351		
C1	22055-W	.01 MFD. 400 V. PAPER COND.
C2 C3	84178	2 GANG COND.
C4 C5		TRIMMERS ON GANG COND.
C6	22055-F	.25 MFD. 200V. PAPER COND.
C7	22055-I	.05 MFD. 200V. PAPER COND.
C8 C13	28016-0	100 MMFD. MICA. COND.
C9	79431-B	385 MMFD. PADDER COND.
C10 C14	22055-T	.01-MFD. 200V. PAPER COND.
C11	27701-0	250-MMFD. MICA COND.
C12	22055-AT	.002 MFD. 200V. PAPER COND.
C15	22055-M	.1-MFD. 200V. PAPER COND.
C16 C20	23500-J	40 MFD. 150V. ELEC. COND.
C17	22055-AU	.005 MFD. 400 V PAPER COND.
C18	23500-G	30-MFD. 25V. ELEC. COND.
C19	22055-R	.005-MFD. 1000V. PAPER COND.
*R13	13003	300 OHMS 1/4 WATT
*R12	13203	200 OHMS 1/4 WATT

RESISTORS FOR T-1351			MISCELLANEOUS FOR T-1351		
R1	13191	200,000 OHMS 1/4 W. CARBON	S1	73282	ANT. LOOP ASS'Y.
R2	13241	60,000 OHMS 1/4 W. CARBON	S2	73271	OSC. COIL ASS'Y.
R3 R7	13001	1 MEGOHM 1/4 W. CARBON	S3	73288	1ST I.F. TRANS. ASS'Y.
R4 R9	13007	2 MEGOHMS 1/4 W. CARBON	S4	73289	2ND I.F. TRANS. ASS'Y.
R5	13244	15 MEGOHMS 1/4 W. CARBON	S5	40874	5" P M SPEAKER.
R6	84209	1 MEGOHM VOL. CONT. & SW.	S6	72127	60 MIL. 2 V. PILOT LIGHT
R8	13031	100,000 OHMS 1/4 W. CARBON	S7		400 OHM COIL ON RELAY
R10	83656-K	75 OHMS 1 1/2 W. FLEX. RES.	S8	84216	RELAY
R11	83039	1700 OHMS 5 W. WIRE WOUND.	S9		SWITCH ON VOL. CONT.

IF PEAK 455 KC

ALIGNING FREQUENCIES
BC. 1500 & 600 KC.

*R12, R13 ADDED TO LATE SETS.
R10 NOT USED ON LATE SETS.
**56-72151-150 MIL. 2 V. ON LATE SETS.

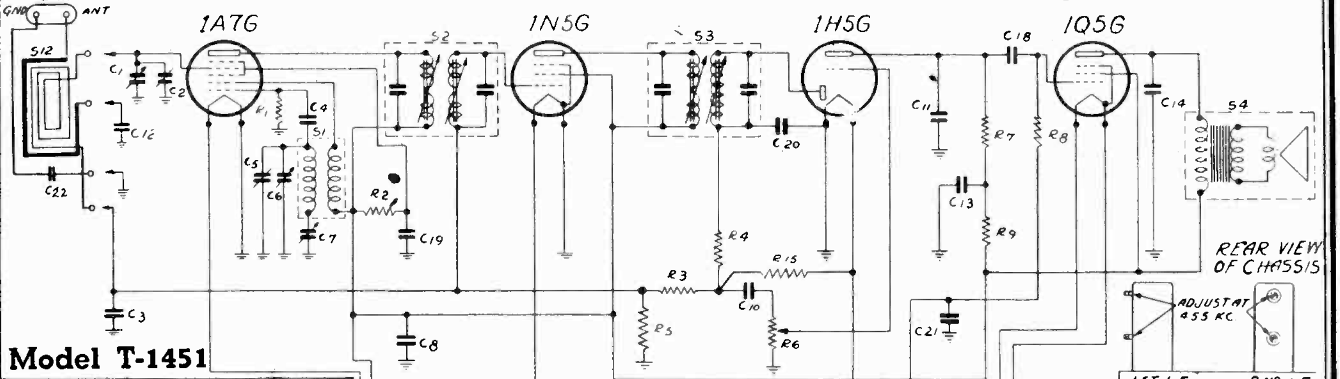
ALTERATIONS
FINISH
CLASSIFICATION T-1351
THIS PRINT SUPERSEDES ALL OTHERS PRIOR TO [redacted]
DO NOT SCALE THIS PRINT

PILOT RADIO CORPORATION
LONG ISLAND CITY, N. Y. U. S. A.
SCHEMATIC WIRING DIAGRAM
Material
Scale
Drawn By RR
Checked By
Approved By
Date 7-20-39
Dwg. No. **25225

MODEL T1451
MODELS T1664, T1764

PILOT RADIO CORP.

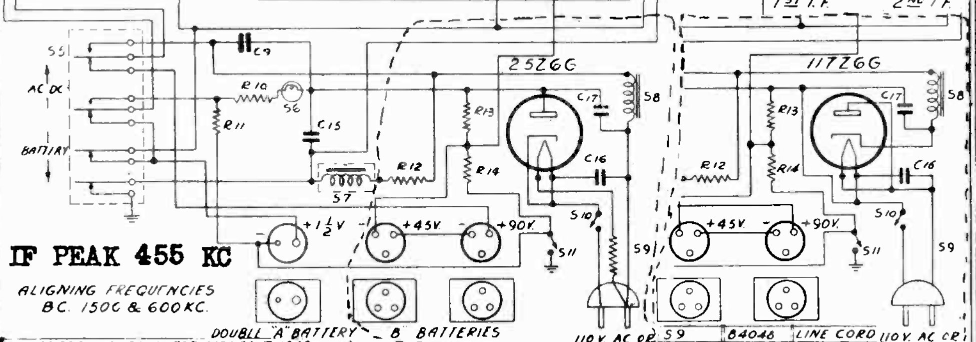
Schematics, Trimmers Alignment



Model T-1451

RESISTORS FOR MODEL T-1451		
R1	13191	200,000 OHMS 1/4 W CARBON
R2	13241	60,000 OHMS 1/4 W CARBON
R3 R5 R8	13223	3.3 MEGS. 1/4 W CARBON
R4	13164	50,000 OHMS 1/4 W CARBON
R6	84105	2 MEGS VOL. CONT & SWITCH
R7	13001	1-MEG. 1/4 W CARBON
R9	13031	100,000 OHMS 1/4 W CARBON
R10	83656 J	50 OHMS 1 W FLEXIBLE
R11	83656 G	25-OHMS .5 W FLEXIBLE
R12	84116	700-OHMS 8W. W.W IRONCLAD
R13	13019	2000-OHMS 1/4 W CARBON
R14	13048	800-OHMS 1/4 W CARBON
R15	13007	2 MEGS. 1/4 W. CARBON

CONDENSERS FOR MODEL T 1451		
C1 C6	84125	2 GANG COND
C2 C5	70969-J	ANT & OSC TRIMMER ASSY.
C3	22055 I	.05 MFD 200V PAPER COND.
C4 C11	28016 O	100 MMFD MICA COND.
C7	79431 B	385 MMFD PADDING COND
C16	22055 P	.05 MFD 400V PAPER COND
C9 C17	23500 J	40 MFD 150V ELEC. COND
C10	22491 E	.01 MFD. 200V. COND.
C12	22055 W	.01 MFD 400V PAPER COND.
C13	22055 M	.1 MFD 200V. PAPER COND.
C14	22055 K	.002 MFD 600V PAPER COND
C15	23500 G	30 MFD. 25V. ELEC. COND
C18 C19	22055 T	.01 MFD. 200V PAPER COND.
C20	27701-0	250 MMFD MICA COND.
C8	22055 AK	1.0 MFD. 200V PAPER COND.
C21	23500 B	10 MFD 25V. ELEC COND.
C22	22055 A	.01 MFD 600 V



IF PEAK 455 KC

ALIGNING FREQUENCIES
BC. 1500 & 600KC.

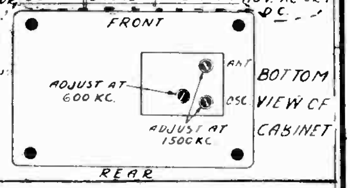
MISCELLANEOUS FOR MODEL T 1450		
S1	73271	OSC. COIL ASSY
S2	73277	1ST I.F. TRANS. ASSY
S3	73274	2ND I.F. TRANS ASS'Y
S4	40877	5 1/4 P.M. SPEAKER
S5 S7	84110	RELAY
S6	72151	DIAL LIGHT .15 AMPS.
S8	84115	CHOKE 5 HS 200Ω 100MA
S9	84106	LINE CORD 310W
S10 S11		SWITCHES ON VOL CONT.
S12	73264	ANT LOOP ASSY

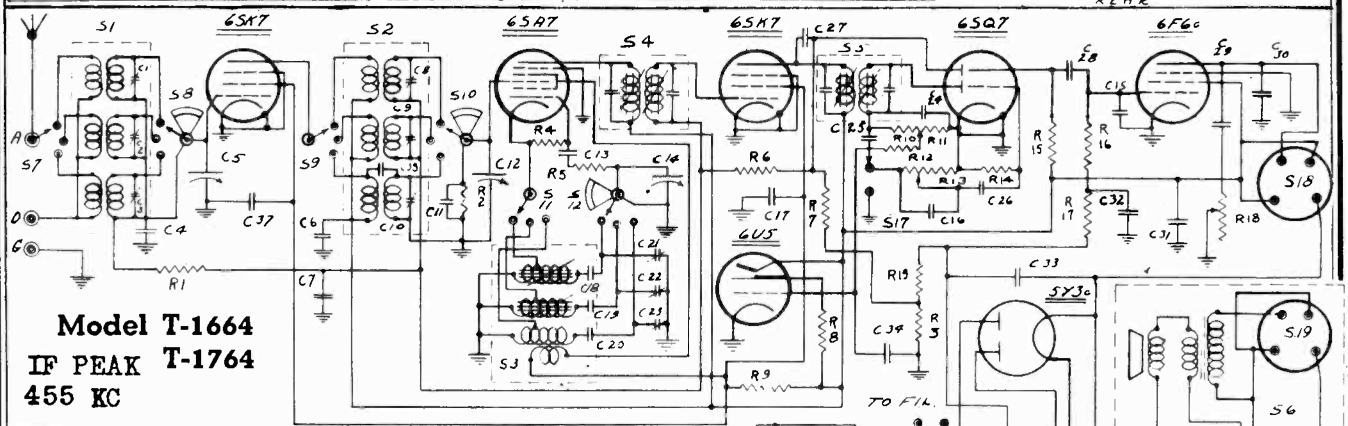
ALTERATIONS & DATE

② C2 C5 WAS 70969-E E.F. 5/16/39
④ R-14 WAS 1200 ... 1056 WAS 1C5G E.F. ... /39
⑤ C22 ADDED, AND NEW ANT GND CKT ...
⑥ DROPPED RESISTOR LINE CORD ... 25Z6G TUBE CO #3298 E.B.C.F. 11-15-39

DATE 5-11-39 E.F.

DWG. NO. 25221-5





Model T-1664 T-1764

IF PEAK 455 KC

RESISTORS FOR MODEL 1660		
R1, R16	13031	100,000 OHMS 1/4 WATT
R2, R8	13001	1 MEGOHM 1/4 WATT
R3	13080	30 OHMS 1/4 WATT
R4	13074	20000 OHMS 1/4 WATT
R5	83636-H	40 OHMS W.W. FLEX
R6, R7, R12	13007	2 MEGOHMS 1/4 WATT
R9	13282	12000 OHMS 3 WATT
R10 R11	13221	330,000 OHM 1/4 WATT.
R13	83529F	1 MEGOHM. VOL CONTROL
R14	13245	4 MEGOHMS. 1/4 WATT
R15	13191	200 000 OHMS 1/4 WATT
R17	13171	250 000 OHMS 1/4 WATT
R18	83447E	100 000 OHMS, TONE CONTROL
R19	13036	200, OHMS 1 WATT

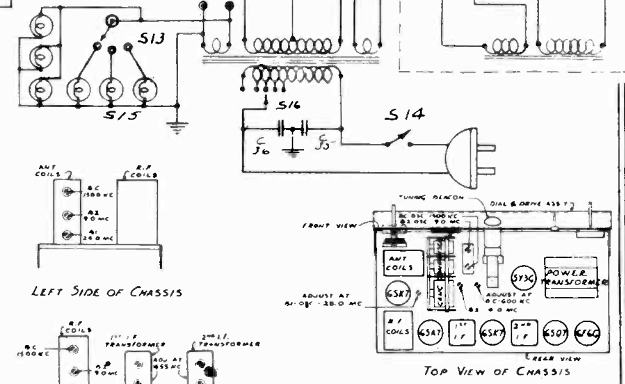
MISCELLANEOUS FOR MODEL 1660		
S1	73312	ANT COIL AND CAN ASSY
S2	73317	INT. STAGE COIL AND CAN ASSY
S3	73322	OSC. COIL AND CAN ASSY
S4	73192	1ST IF TRANSFORMER ASSY
S5	73193	2ND IF TRANSFORMER ASSY
S6	40849	8 IN SPEAKER
S6	408568	12 IN SPEAKER
S7 TO S13	84393	BAND SWITCH ASSY
S14		LINE SWITCH ON VOL CONTROL
S15	78889	DIAL LAMPS (WHITE BEAD)
S16	83697	PWR TRANSFORMER-UNIV
S16	83412-R	PWR TRANS. 117 VOLT 50/60 ~
S16	83412-AB	PWR TRANS 230 VOLT 50/60 ~
S16	83412-FB	PWR TRANS 115V-230V 50/60 ~

ALTERATIONS & DATE

② C2 C5 WAS 70969-E E.F. 5/16/39
④ R-14 WAS 1200 ... 1056 WAS 1C5G E.F. ... /39
⑤ C22 ADDED, AND NEW ANT GND CKT ...

CONDENSERS FOR MODEL 1660		
C1, C2, C3		TRIMMERS
C4 C7	22055 I	.05 MFD. 200 VOLT
C5, C12, C14	84407	3 GANG CONDENSER
C8 C9 C10		TRIMMERS
C11	22055 AY	.001 MFD. 200 VOLT
C13	27723-0	50 MMF MICA
C15	27702-0	500 MMF MICA
C16	27701-0	250 MMF MICA
C17, C37	22055 A	.01 MFD. 600V
C18	92000-C	450 MMF SILVER MICA
C19	27732	.0016 MFD. MICA
C20	28023 N	.0033 MFD MICA
C21, C22	70969-E	TRIMMERS
C24	28105	150 MMF MICA
C25, C32	22055 T	.01 MFD 200V
C26	22055 X	.005 MFD 200V
C27	28114-0	20 MMF MICA
C28	22055 AC	.02 MFD 600V
C29	22055 V	.03 MFD 1000V
C30	22055 R	.005 MFD. 1000V
C31	23500 D	8 MFD. 450V ELECT
C33	23500 C	16 MFD 450V ELECT
C34	22055 T	.01 MFD. 200V
C35, C36	22055 U	.01 MFD 1000V
C38	28120-0	5 MMF MICA
C23	83110-B	TRIMMER
C6	22055 C	.05 MFD. 600 VOLT

MISCELLANEOUS FOR MODEL 1660		
S16	83412 L	PWR TRANS 130V 25/60 ~
S17	84304	PHONO JACK
S18	FRONT VIEW OF PLUG	
S19	REAR VIEW OF SPEAKER PLUG	



T1660

THIS PRINT SUPERSEDES ALL OTHERS PRIOR TO [redacted]

DO NOT SCALE THIS PRINT

PILOT RADIO CORPORATION
LONG ISLAND CITY N.Y. U.S.A.
SCHEMATIC WIRING DIAGRAM MODEL T1660

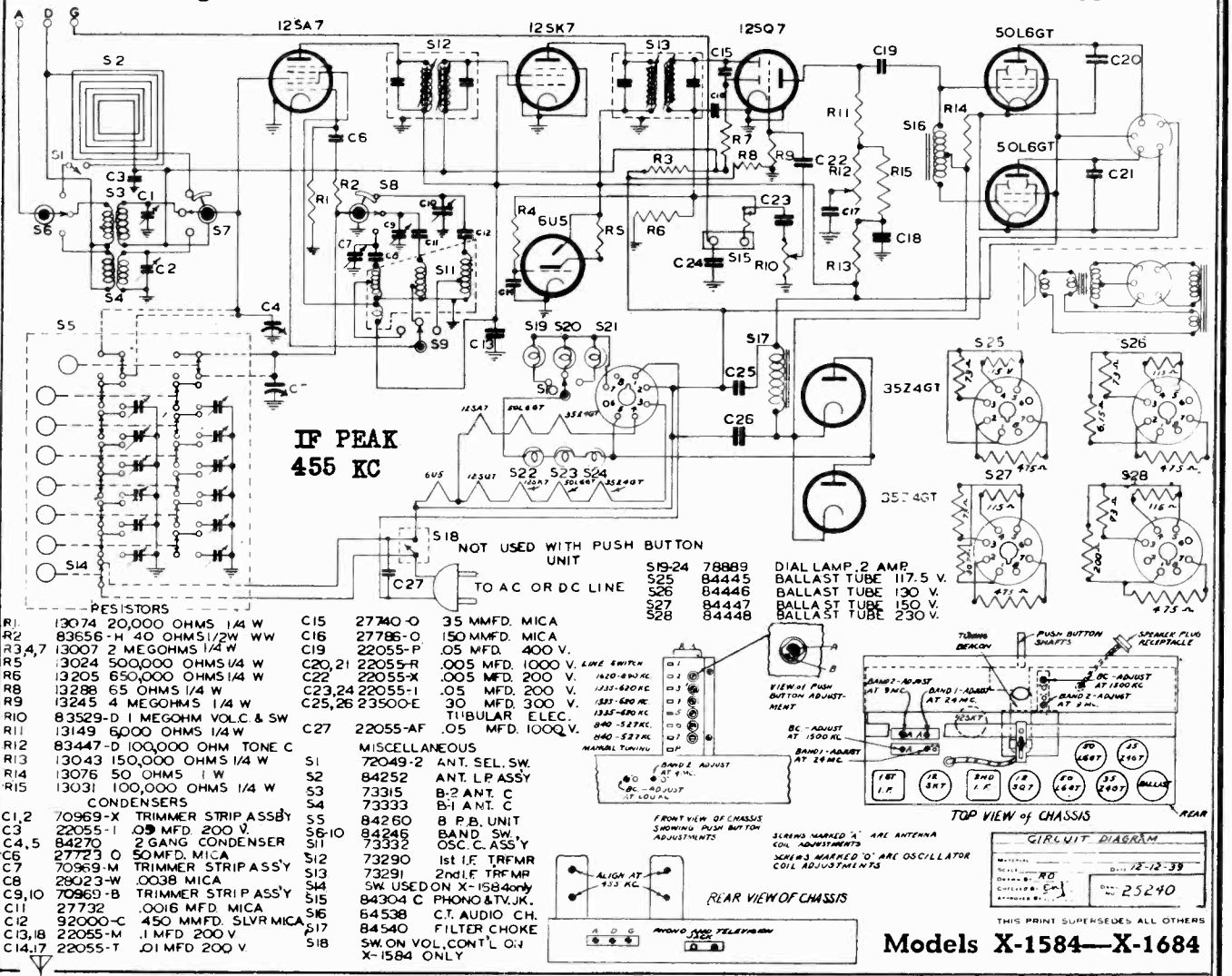
NOV 2-39

25234

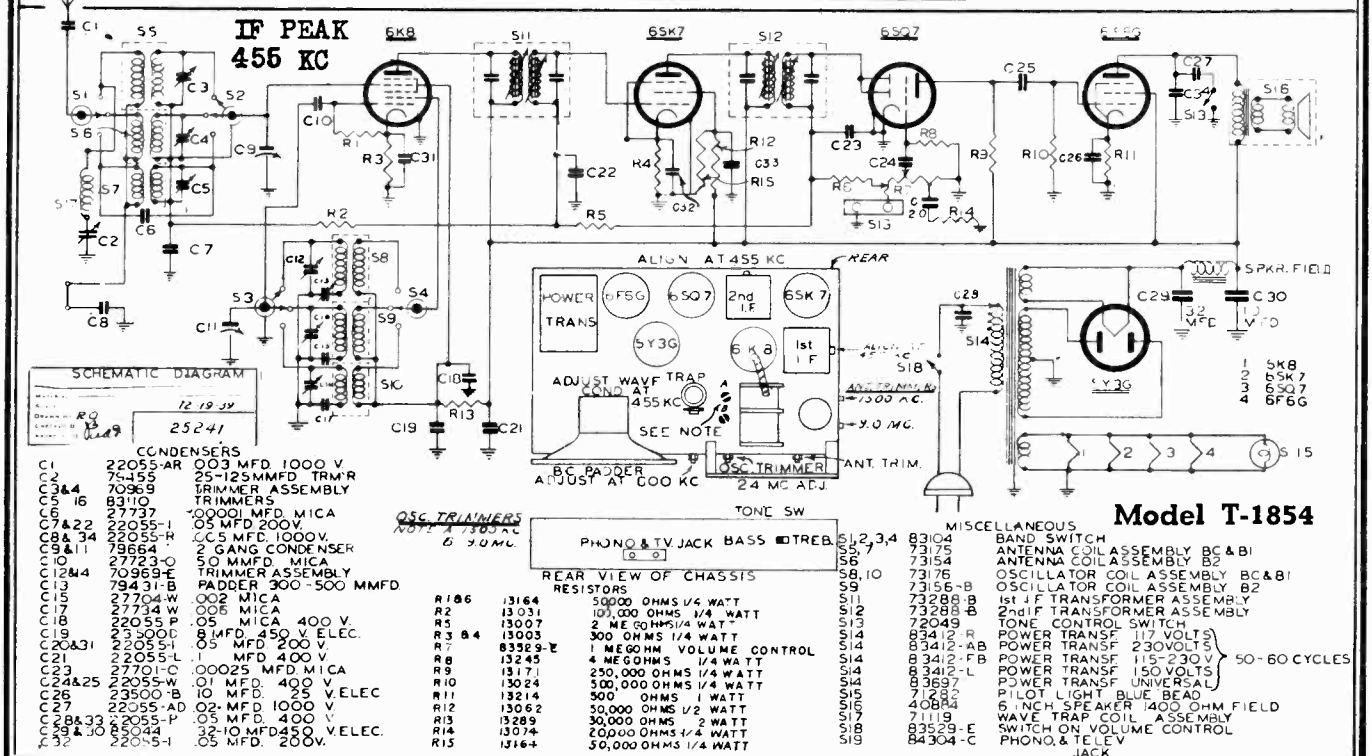
Schematics, Socket Trimmers, Alignment

PILOT RADIO CORP.

MODELS X1584, X1684
MODEL T1854



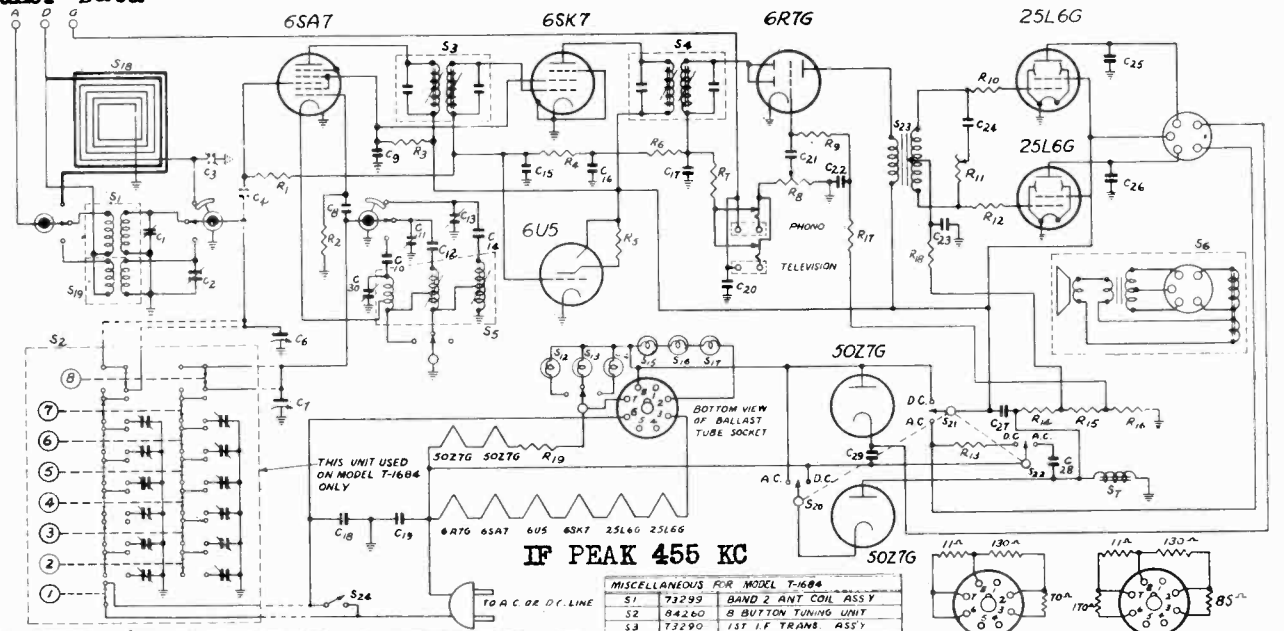
Models X-1584—X-1684



Model T-1854

MODELS T1584, T1684
Schematic, Socket
Alignment, Trimmers
Tuner Data

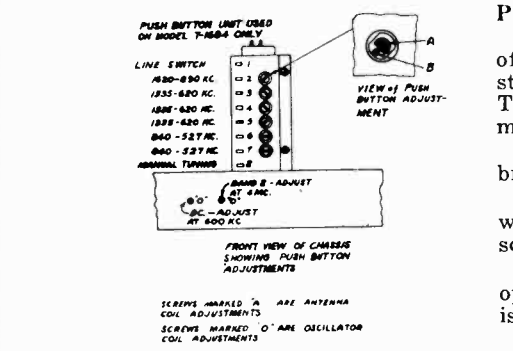
PILOT RADIO CORP.

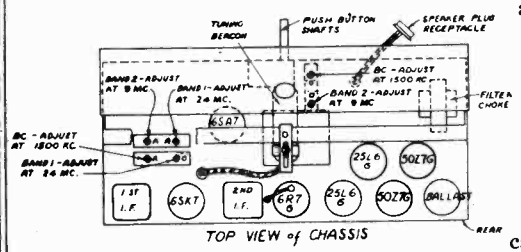


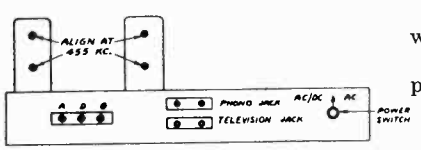
CONDENSERS FOR MODELS T-1584, T-1684			RESISTORS FOR MODELS T-1584, T-1684		
C1, C2	70969-X	TRIMMER STRIP ASSY	R1, R5, R9	13024	1/2 MEGOHM, 1/4 WATT
C3, C30	70969-J	TRIMMER STRIP ASSY	R2, R7	13074	20,000 OHMS, 1/4 WATT
C11, C13	70969-B	TRIMMER STRIP ASSY	R3	13082	2,000 OHMS, 1 WATT
C4	27701-D	250 MMF MICA	R4	13001	1 MEGOHM, 1/4 WATT
C5, C7	84270	GANG CONDENSER	R6	13007	2 MEGOHMS, 1/4 WATT
C8, C12	28046-D	100 MMF. MICA	R8	78986-B	1/2 MEGOHM VOL CONTROL
C9, C20	22055-I	.05 200 VOLTS PAPER	R10, R12	13012	500 OHMS, 1/4 WATT
C10	28023-W	.0038 MMF. MICA	R12	83441-D	750,000 OHMS, TONE CONTROL
C12	27732	.0016 MMF. MICA	R13	83039-B	300 OHMS, 10 WATTS
C14	92000-C	450 MMF SILVER CAP MICA	R14	19204	120,000 OHMS, 1/4 WATT
C15, C16	22055-M	.1 MFD - 200 VOLTS PAPER	R15	13043	150,000 OHMS, 1/4 WATT
C18, C19	76503-B	.01-.01 MFD 1000 VOLTS SHIELDED	R16	13200	75,000 OHMS, 1/4 WATT
C21	22055-AU	.005 MFD 400 VOLTS PAPER	R17, R18	13171	250,000 OHMS, 1/4 WATT
C25, C26	27055-R	.005 MFD 1000 VOLTS PAPER	R19	83656-M	110 OHMS 2 WATTS
C22, C23	22055-F	.25 MFD - 200 VOLTS PAPER			
C27	23500-E	30 MFD 300 VOLTS SMALL TUB			
C28, C29	23500-J	40 MFD - 150 VOLTS ELECTRO	RESISTORS FOR MODEL T-1584		
C24	22055-W	.01 400 VOLTS PAPER	R8	83529-D	1 MEGOHM VOL CONTROL WITH SWITCH S24

MISCELLANEOUS FOR MODEL T-1684		
S1	73299	BAND 2 ANT COIL ASSY
S2	84260	8 BUTTON TUNING UNIT
S3	73290	1ST I.F. TRANS. ASSY
S4	73291	2ND I.F. TRANS ASSY
S5	79292	OSCILLATOR COIL ASSY
S6	40875	8 AL DC SPEAKER, 700Ω FIELD
S7	84115-B	FILTER CHOKE
S8	81988	BALLAST TUBE 115 V
S9	81991	BALLAST TUBE 230 V
S10	81989	BALLAST TUBE 130 V
S11	81990	BALLAST TUBE 150 V
S12 TO S17	72151	DIAL LAMP, BROWN BEAD BULB
S18	84252	ANTENNA LOOP ASSY
S19	73238	BAND 1 ANT COIL ASSY
S20 TO S22	84262	POWER SELECTOR SWITCH
S23	83877	PUSH PULL INPUT TRANS. ASSY
MISCELLANEOUS FOR MODEL T-1580 SAME AS FOR MODEL T-1680 EXCEPT FOLLOWING		
S2		NOT USED

PILOT RADIO CORPORATION
LONG ISLAND CITY N Y U S A
SCHEMATIC CIRCUIT DIAGRAM
MODEL T-1584, MODEL T-1684
Date 9-19-39
Dwg. No. 25226
CLASSIFICATION T-1584 T-1684
THIS PRINT SUPERSEDES ALL OTHERS PRIOR TO [redacted]
DO NOT SCALE THIS PRINT







PUSH BUTTON CONTROLS:

The purpose of the topmost button (No. 1) is to shut off the power of the receiver. The following 6 push buttons are available for any 6 stations on the broadcast band in the tuning ranges designated below. The lowest button (No. 8) is to be pressed when you wish to operate the manual tuning control.

To set the 6 station buttons (No. 2 to 7) to various stations of the broadcast band, the operations noted below should be followed.

1. Remove the two screws above and below the push buttons in the wooden cover plate and lift off the plate. This will disclose the adjusting screws.

2. With a screw driver inserted in the larger of the two screws opposite the buttons, turn either right or left until the desired station is tuned in. Then make the final adjustment with the small screw.

The limiting wave lengths between which the various buttons can be adjusted are as follows: (buttons numbered from top to bottom).

Button No. 1—"OFF" power switch
Button No. 2—from 1620 kc. to 890 kc. and "ON" power switch
Button No. 3—from 1335 kc. to 620 kc. and "ON" power switch
Button No. 4—from 1335 kc. to 620 kc. and "ON" power switch
Button No. 5—from 1335 kc. to 620 kc. and "ON" power switch
Button No. 6—from 840 kc. to 527 kc. and "ON" power switch
Button No. 7—from 840 kc. to 527 kc. and "ON" power switch
Button No. 8—Manual Tuning and "ON" power switch

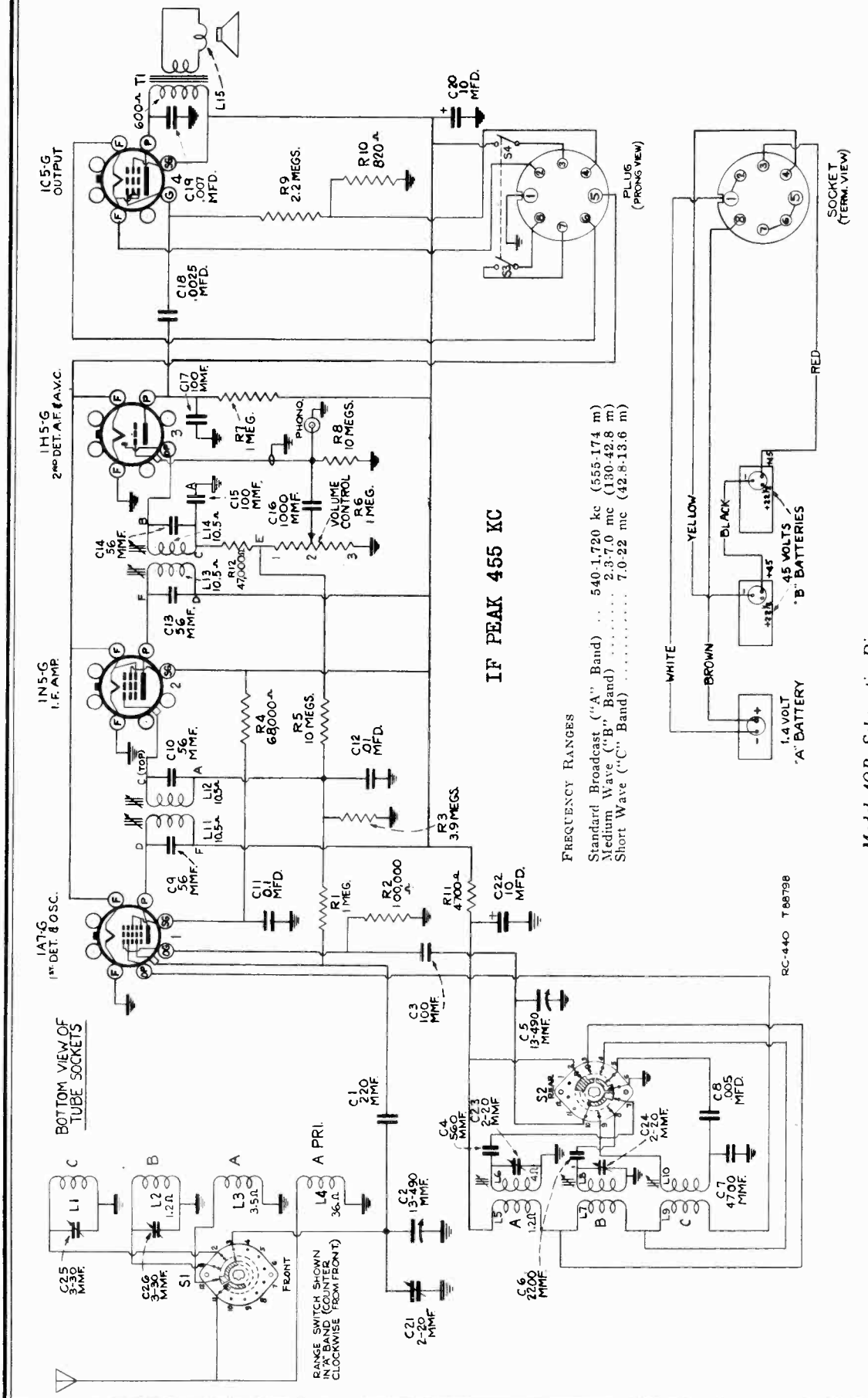
3. In the instruction envelope you will find a card with perforated call letters for most of the broadcasting stations.

Remove the desired one and insert it in the head of the push button whose shaft is next to the screw which has been adjusted to that station.

4. After all push buttons have been set, replace the front wooden plate.

RCA MFG. CO., INC.

MODEL 4QB, Ch. RC440
Schematic, Lead Dress



Model 4QB Schematic Diagram

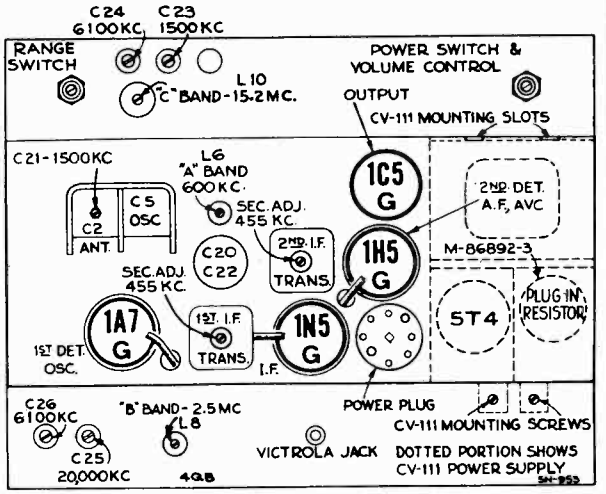
Precautionary Lead Dress:

1. Dress C3 (100 mmfd.) edgewise to chassis.
2. Dress the 1A7-G grid cap lead clear of chassis.
3. Dress green wire from C2 (antenna section of gang) to range switch away from chassis and other wires.
4. Dress blue lead from terminal "E" of 2nd I.F transformer around terminal "D" away from the 1H5-G and 1C5-G sockets, and close to the chassis.
5. Dress C16 (1,000 mmfd.) from grid of 1H5-G tube to volume control, and the green lead to the 1H5-G grid cap away from other wires.
6. Dress the red wire from the power plug to the power switch on the volume control away from the 1H5-G socket.
7. Blue lead from "C" band oscillator coil to 1A7-G No. 6 contact must be dressed away from chassis.
8. All tube shields must be tight.

MODEL 4QB
Alignment, Socket
Trimmers, Voltage
Chassis Wiring

RCA MFG. CO., INC.
Model 4QB Alignment Procedure

Steps	Connect the high side of the test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for maximum peak output—
1	1N5-G I-F grid cap, in series with .01 mfd.	455 kc	"A" band, quiet point at high-frequency end	L14 and L13 (2nd I-F Trans.)
2	1A7-G 1st-Det. grid cap, in series with .01 mfd.			L12 and L11† (1st I-F Trans.)
3	Antenna lead, in series with 200 mmfd.	1,500 kc	1,500 kc (152.5°) "A" band	Preset L6 (osc.) core 5/16-in. out. Peak C23 (osc.) and C21 (ant.)
4		600 kc	600 kc (33°) "A" band	L6 (osc.)**
5		Repeat steps 3 and 4		
6		6.1 mc	6.1 mc (151°) "B" band	Preset L8 (osc.) core ¼-in. out. Peak C24 (osc.)* and C26 (ant.)
7		2.5	2.5 mc (29.5°) "B" band	L8 (osc.)**
8		Repeat steps 6 and 7		
9	Antenna lead, in series with 300 ohms	15.2 mc	15.2 mc (122°) "C" band	L10 (osc.)
10		20 mc	20 mc (155.5°) "C" band	C25 (ant.)†† Rock gang
11	Antenna lead, in series with 200 mmfd.	1,500 kc	1,500 kc (152.5 kc) "A" band	C23 (osc.)



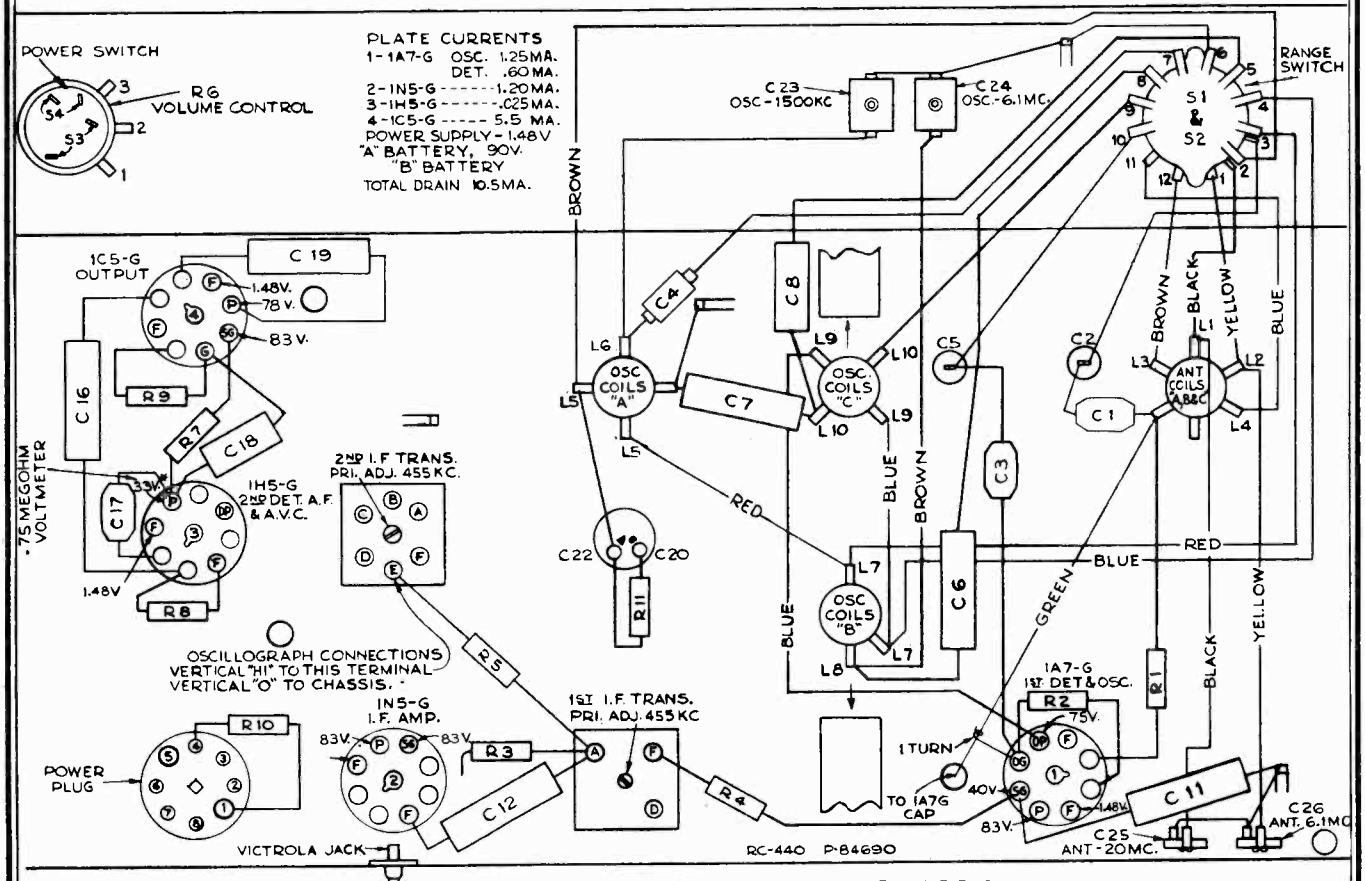
Model 4QB Top View

*Use minimum capacity peak if two peaks can be obtained.

**Rock gang slightly for peak output.

†Do not readjust L13 or L14 when test-osc. is applied to 1A7-G grid.

††Use maximum capacity peak if two peaks can be obtained.



BOTTOM VIEW - REAR OF CHASSIS

Model 4QB R-F Wiring Diagram and Socket Voltages

Voltages shown above are for battery operation.

RCA MFG. CO., INC.

MODEL 4QB4 MODEL 4QB
Alignment Notes, Drive Cord
MODEL CV-111 Power Supply
Schematic, Voltage, Notes

General Alignment Data for Models 4QB and 4QB4

(Refer to specific "Alignment Procedure" for each model)

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

Output Meter Alignment. — If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the ground terminal, and keep the output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment, therefore a calibration scale is attached to the rear of the drum which is mounted on the shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 45 degree mark on drum scale should be in an approximately horizontal position when the plates are fully meshed. The distance from the edge of the chassis to the drum must not exceed ⅜-inch. The drum is held to the shaft by means of a set screw, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang condenser frame, and bend the wire so that it points to the "0" mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 530 kc mark, (last mark at end of "A" scale) and gang condenser fully meshed. The indicator has a spring clip for attachment to the cable.

CV-111 A-C POWER SUPPLY UNIT

Power Rating	105-125/200-250 volts, 50-60 cycles, 65 watts
Rectifier Tube	RCA-5T4
Ballast Resistor Tube	Type 86892-3
Dial Lamp	Mazda 44, 6.3 volts, 0.25 amp.
Dimensions (inches)	5 x 3¼ x 6¾
Net Weight	5 lbs.

Miscellaneous Data

Battery Connections:

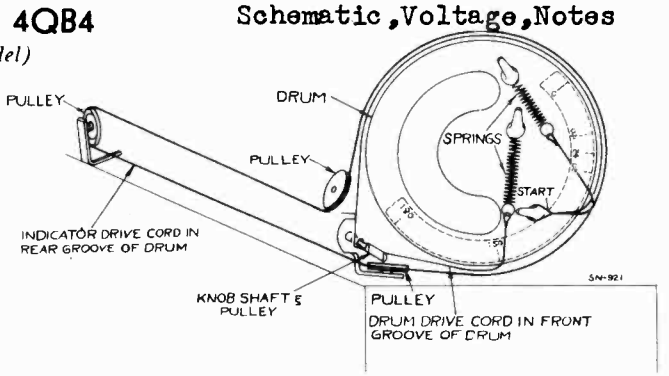
A four-wire cable with a plug at each end is provided for making connection from the 8-prong connector on chassis to a plug-in 1½-90 volt "A-B" battery pack.

When separate "A" and "B" batteries are used, it is necessary to use an adapter cable with a socket on one end and three plugs on the other end, connected as shown in the accompanying sketch.

With separate "A" and "B" batteries that have terminals instead of plug-in connectors, remove the three plugs on the adapter cable and connect the leads to the battery terminals, following the color code shown in the schematic diagram.

Victrola Attachment:

A jack is provided on the rear of chassis for connecting a Victrola Attachment into the audio-amplifying circuit. The cable from the Victrola Attachment should be terminated in a Stock No. 31048 plug to fit the jack.



Arrangement of Drive Cords for Tuning Condenser and Dial Indicator
(Drum shown with gang in maximum-capacity position)

POWER OUTPUT RATING

	Undistorted	Maximum
With Battery Supply	0.13 watt	0.23 watt
With A-C Supply	0.20 watt	0.46 watt

LOUDSPEAKER

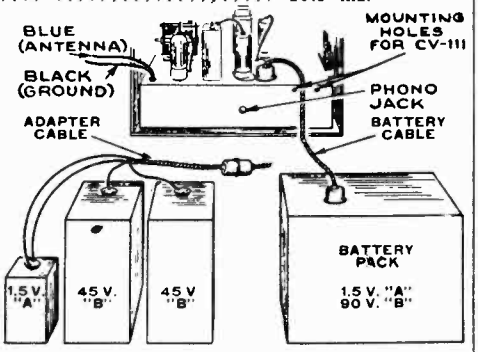
Type ..... 5-inch permanent-magnet dynamic
Voice-coil Impedance .... 3 ohms at 400 cycles

BATTERIES REQUIRED

One 1½-volt "A" battery, and
Two 45-volt "B" batteries, or
One 1½-90-volt battery pack.

BATTERY DRAIN

"A" ..... .25 amp.
"B" ..... 10.5 ma.

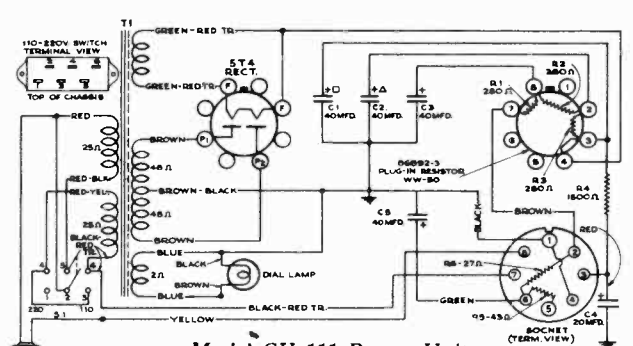


Separate "A" and "B" batteries or an "A-B" battery pack may be used.

CV-111 A-C Power Supply Unit

Models 4QB and 4QB4 may be operated on 105-125/200-250 volts, 50-60 cycle a-c power supply, by installing a CV-111 power supply unit on the chassis, as follows:

1. Remove the battery cable plug from the power plug on chassis.
2. Set the line power switch (on side of CV-111) to the correct position for the a-c voltage that is to be used.
3. Place the CV-111 on top of the radio chassis as shown in dotted lines in the top view. Press the dial light clip on the projection at low-frequency end of dial assembly. Insert the 8-prong socket (on cable from CV-111) into the power plug on chassis.
4. Fasten the power unit to the chassis. The front of the unit has two projections which fit into slots on the front of the chassis. Two projections on the rear of the unit have holes for fastening to the rear of the chassis with self-tapping screws.
5. **Caution**: Before connecting to the a-c supply, make certain that all tubes are firmly seated in their sockets. Always disconnect the a-c supply before removing or replacing tubes.
6. Reverse the a-c power plug for minimum hum.



Model CV-111 Power Unit

Socket Voltages, with CV-111 Power Supply Unit

(Line Supply Voltage, 117, or 234 volts)

Tube	1A7-G		1N5-G	1H5-G	1C5-G
Function	1st-Det.	Osc.	I. F.	2nd Det., A. F.	Output
Filament Voltage	1.3		1.3	1.3	1.28
Plate Voltage	95	85	95	40**	92
Screen Voltage	45		95		95
Plate Mils.	0.4	1.5	1.5	.03	9
Screen Mils.	.7		.35		1.75
Bias					6.1

Total "B" current, 15 mils. Total filament current, 146 mils.
**With 750,000 ohm voltmeter.

First Edition

Model 6Q4

STOCK No.	6Q4 DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES (RC 441-A)	
34602	Arm—Operating arm between knob shaft and range switch shaft	.25
10194	Ball—Steel ball	.02
31767	Board—Antenna-Ground board	.20
33821	Capacitor—Trimmer capacitor—4 sections, 3 of 2-10 mmfd. and 1 of 3-30 mmfd. (C18, C19, C20, C21)	.70
12714	Capacitor—Adjustable trimmer—2-12 mmfd. (C9, C11)	.50
33818	Capacitor—Trimmer capacitor—3 sections of 2-20 mmfd. each (C1, C2, C3, C44)	.30
33822	Capacitor—Trimmer capacitor—4 sections, of 3-30 mmfd. each (C1, C2, C3, C44)	.90
33762	Coil—Antenna coil A-B-C Band (L1, L2, L3, L4)	1.20
32823	Coil—Antenna coil X Band (L5, L6)	1.00
33763	Coil—Detector coil A-B-C Band (L11, L12, L13, L14)	1.80
33765	Coil—Detector coil X Band (L15)	.65
33764	Coil—Oscillator coil A-B-C Band (L7, L8, L9)	.80
32831	Coil—Oscillator coil X Band (L10)	.75
33756	Condenser—Variable tuning condenser (C4, C8, C23)	5.50
33816	Control—Tone control (S7, S8)	2.50
33814	Control—Volume control and power switch (R9, S9)	2.00
32634	Cord—Condenser drive cord	.10
32635	Cord—Indicator drive cord	.24
32713	Core—Core and stud for oscillator coils	.35
33770	Drive—Planetary tuning drive less balls, shafts, and shaft retainer	.90
33773	Drum—Variable tuning condenser drum and hub	.90
33185	Gear—Gear and hub for volume control and switch	.50
11891	Lamp—Pilot Lamp Mazda No. 44	.17
33787	Link—Operating link between knob shaft and range switch	.60
12471	Plate—Cushion socket mounting plate assembly less socket	.15
14281	Resistor—68 ohms, ½ watt (R1, R17)	.20
31388	Resistor—390 ohms, 1 watt (R10)	.22
13718	Resistor—2,200 ohms, ½ watt (R8)	.20
33489	Resistor—15,000 ohms 2½ watt (R5)	.55
13998	Resistor—22,000 ohms, ½ watt (R7)	.90
12454	Resistor—33,000 ohms, ½ watt (R3)	.20
17440	Resistor—56,000 ohms, 1—watt (R18)	.22
12285	Resistor—470,000 ohms, ½ watt (R12, R13)	.20
13730	Resistor—1 meg., ½ watt (R2, R4)	.20
12679	Resistor—2.2 meg., ½ watt (R6)	.20
13601	Resistor—10 meg., ½ watt (R11)	.20
34037	Retainer—Retaining washer for range switch shaft	.02
33772	Shaft—Range switch shaft	.35
33788	Shaft—Shaft and gear for tone control	.55
33771	Shaft—Tuning shaft	.15
14278	Socket—Single contact socket and plate for phonograph input	.25
12896	Capacitor—15 mmfd. (C43)	.35
13545	Capacitor—39 mmfd. (C18)	.35
12723	Capacitor—56 mmfd. (C24)	.35
12720	Capacitor—100 mmfd. (C42)	.35
32239	Capacitor—110 mmfd. (C26)	.30
30232	Capacitor—200 mmfd. (C6)	.35
12694	Capacitor—220 mmfd. (C5, C17, C22, C32)	.35
33760	Capacitor—220 mmfd. (C25, C27, C28)	.30
33235	Capacitor—580 mmfd. (C13)	.40
12811	Capacitor—3,600 mmfd. (C10)	.60
31405	Capacitor—6,000 mmfd. (C7)	.75
5107	Capacitor—.0025 mfd. (C34, C36)	.20
33584	Capacitor—.005 mfd. (C35, C38, C39)	.25
32787	Capacitor—.05 mfd. (C30)	.20
4839	Capacitor—0.1 mfd. (C29, C33, C46)	.30
33014	Capacitor—Comprising 3 sections of 10 mfd. and 1 section of 20 mfd. (C37, C40, C41, C46)	1.90
31251	Socket—Tube socket	.25
31418	Spring—Condenser drive cord spring	.05
13638	Spring—Indicator drive cord spring	.08
33763	Spring—Planetary tuning drive spring	.15
33758	Switch—Range switch (S1, S2, S3, S4, S5, S6)	2.45
33759	Transformer—First i-f transformer (L16, L17, C25, C26)	2.25
33761	Transformer—Second i-f transformer (L18, L19, C27, C28, R7)	2.50
31734	Transformer—Power transformer 110 volts, 25 cycle (T1)	10.35
31733	Transformer—Power transformer 110 volts, 60 cycle (T1)	4.75
31735	Transformer—Power transformer 105/130-140/160-200/250 volts, 50/60 cycle (T1)	10.80
	SPEAKER ASSEMBLIES (RL 79A-2)	
32807	Cap—Dust cap	.02
33966	Coil—Field coil (L23)	1.70
32906	Coil—Neutralizing coil (L22)	.25
33777	Cone—Cone complete with voice coil, suspension and dust cap (L21)	1.00
5118	Plug—3 prong male speaker plug	.25
32905	Transformer—Output transformer (T2)	1.35
	MISCELLANEOUS ASSEMBLIES	
33799	Dial—Dial scale	1.65
34295	Dial—Glass dial scale (Greek)	1.50
33797	Frame—Dial frame assembly complete less dial scale	2.20
34671	Knob—Range switch knob	.25
34570	Knob—Tone control knob	.20
34136	Knob—Tuning or volume control knob	.30
33774	Mounting—Speaker mounting hardware	.30
4982	Spring—Retaining spring for knob Stock No. 34136	.05
14270	Spring—Retaining spring for knob Stock No. 34570	.05
34138	Spring—Retaining spring for knob Stock No. 34571	.05

Model 6Q8

STOCK No.	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES (RC- 414—B)	
32830	Capacitor—2-gang trimmer, each section 2-20 mmfd. (C26, C27)	.40
32829	Capacitor—3-gang trimmer, each section 5-60 mmfd. (C5, C6, C8)	.55
12948	Capacitor—33 mmfd. (C28)	.35
30949	Capacitor—56 mmfd. (C14, C15)	.35
12723	Capacitor—68 mmfd. (C4)	.35
14282	Capacitor—100 mmfd. (C12, C13)	.30
32238	Capacitor—110 mmfd. (C18)	.30
30232	Capacitor—200 mmfd. (C9)	.35
12694	Capacitor—220 mmfd. (C3)	.35
12952	Capacitor—330 mmfd. (C19)	.35
32853	Capacitor—680 mmfd. (C7)	.35
13895	Capacitor—5600 mmfd. (C10)	.70
4838	Capacitor—.005 mfd. (C20, C21, C29)	.25
5148	Capacitor—.007 mfd. (C22)	.20
14393	Capacitor—.01 mfd. (C16)	.30
4839	Capacitor—0.1 mfd. (C17)	.30
32240	Capacitor—Electrolytic, 2 sections 10 mfd., one section 20 mfd. (C23, C24, C25)	1.45
32822	Coil—Antenna coil—A,C bands (L1, L2, L3, L4)	1.35
32823	Coil—Antenna coil—X band (L5, L6)	1.00
32707	Coil—Oscillator coil—A,C bands (L7, L8)	.95
32931	Coil—Oscillator coil—X band (L9)	.75
32917	Condenser—2-gang variable (C1, C2, C11)	2.60
32634	Cord—Drive cord	.10
32713	Core—Adjustable core and stud assembly for oscillator coils	.35
32838	Dial—Glass dial scale	.65
32835	Drum—Variable condenser drive drum complete	.55
11891	Lamp—Dial lamp	.17
32953	Plate—Dial back plate and pointer—less dial scale	1.60
5119	Plug—3-contact female for speaker cable	.25
32834	Pulley—Drive cord pulley and mounting bracket (1 pulley)	.25
32951	Pulley—Drive cord pulleys and mtg. bracket (3 pulleys)	.45
30681	Resistor—470 ohms, 1 watt (R10)	.22
31389	Resistor—12,000 ohms, 3½ watts (R3)	.50
12454	Resistor—33,000 ohms, ½ watt (R2)	.20
5132	Resistor—47,000 ohms, 1/10 watt (R5)	.15
12285	Resistor—470,000 ohms, ½ watt (R7)	.20
12013	Resistor—1 meg., 1/10 watt (R11)	.15
13730	Resistor—1 meg., ½ watt (R1)	.20
12679	Resistor—2.2 meg., ½ watt (R4)	.20
11668	Resistor—5.6 meg., ½ watt (R6)	.20
13601	Resistor—10 meg., ½ watt (R8)	.20
14343	Retainer—Retaining ring for holding tuning knob shaft	.03
32932	Shaft—Tuning knob shaft	.30
31365	Socket—Dial lamp socket	.30
32959	Socket—Magic Eye socket and bracket	.50
31251	Socket—Octal base tube socket	.25
14278	Socket—Phonograph input socket	.25
31418	Spring—Tension spring for drive cord	.05
32930	Switch—Range switch	1.20
32827	Switch—Voltage changeover switch (S4)	.35
14376	Transformer—First i. f. transformer (L10, L11, C12, C13)	2.45
32825	Transformer—Second i. f. transformer (R6, L12, L13, C14, C15, C18)	2.50
32910	Transformer—Power transformer 105-120 volts, 25-50 cycles (T1)	6.20
32911	Transformer—Power transformer 105-120 volts, 50-60 cycles (T1)	4.10
32852	Transformer—Power transformer 105-120, and 200-240 volts, 50-60 cycles (T1)	4.50
32928	Volume control and power switch (R6, S1)	2.50
	SPEAKER ASSEMBLIES (RL—79—2)	
32907	Cap—Speaker cone center dust cap	.02
32903	Coil—Speaker field coil (L14)	1.25
33906	Coil—Speaker hum neutralizing coil (L15)	.35
32934	Cone—Speaker cone and voice coil (L16)	1.65
5118	Plug—3-prong male for speaker	.25
32933	Speaker complete	5.50
32905	Transformer—Output transformer (T2)	1.35
	MISCELLANEOUS ASSEMBLIES	
32838	Dial—Dial scale and crystal	.65
33937	Knob—Range switch knob (small)	.20
33029	Knob—Tone control and switch knob (small)	.15
32935	Knob—Tuning knob (large)	.25
32936	Knob—Volume control knob (large)	.25
4982	Spring—Retaining spring for knob Stk. 32935	.05
14270	Spring—Retaining spring for knob Stk. Nos. 32936 or 32937	.05
30330	Spring—Retaining spring for knob Stk. 33029	.03

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

Model 6Q4X

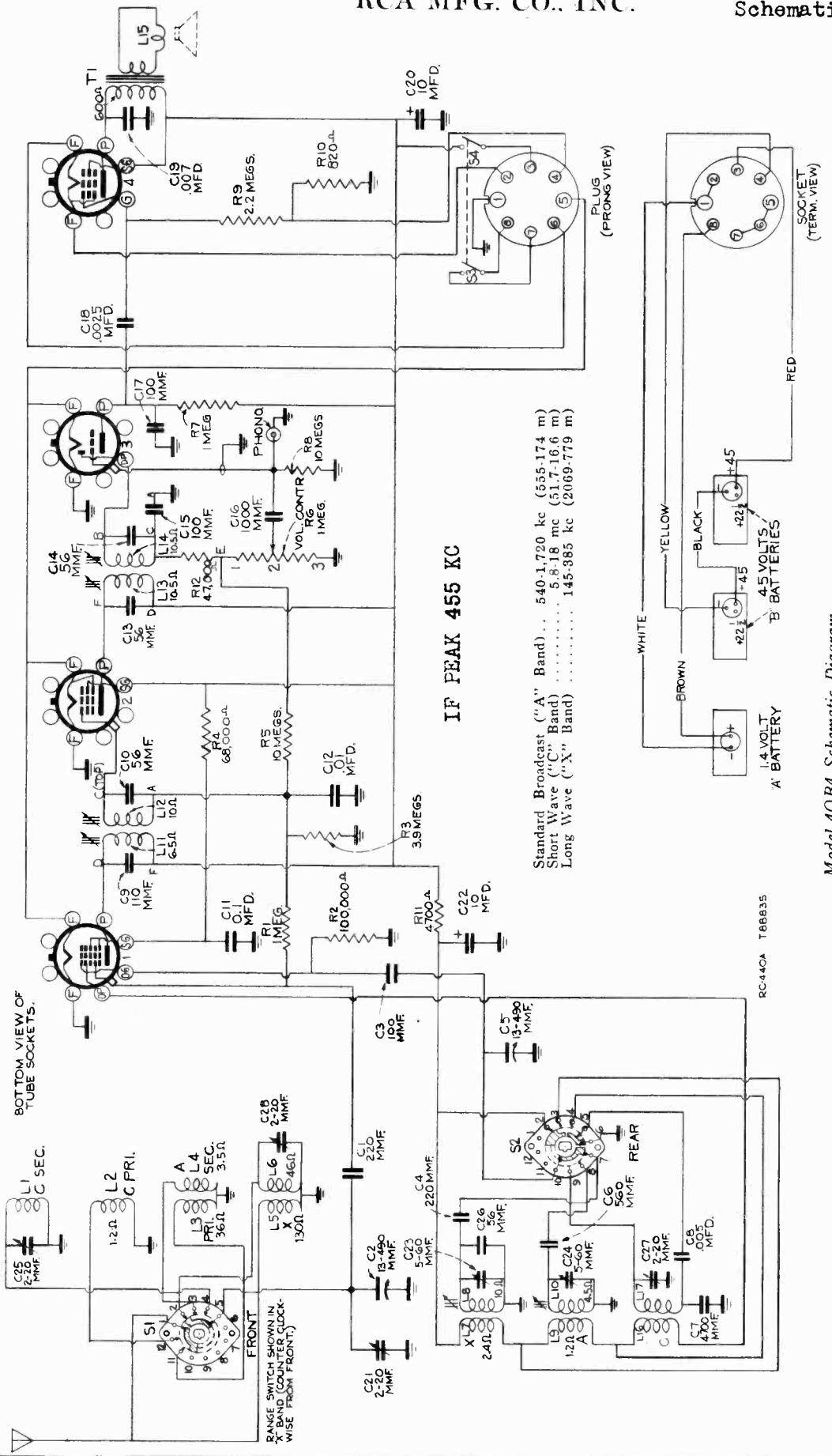
STOCK No.	6Q4X DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES (RC-442)	
10194	Ball—Steel ball	.02
33947	Ballast—Ballast resistor tube—Type 86892-4	2.50
12896	Capacitor—15 mmfd. (C43)	.35
13545	Capacitor—39 mmfd. (C18)	.35
12723	Capacitor—56 mmfd. (C24)	.35
12720	Capacitor—100 mmfd. (C31, C42)	.35
32239	Capacitor—110 mmfd. (C26)	.30
30232	Capacitor—200 mmfd. (C6)	.35
12694	Capacitor—220 mmfd. (C5, C17, C22, C32)	.35
33760	Capacitor—220 mmfd. (C25, C27, C28)	.30
33235	Capacitor—580 mmfd. (C13)	.40
12811	Capacitor—3,600 mmfd. (C10)	.60
31405	Capacitor—6,000 mmfd. (C7)	.75
5107	Capacitor—.0025 mfd. (C36)	.20
33584	Capacitor—.005 mfd. (C34, C35)	.25
4937	Capacitor—.01 mfd. (C38, C47, C48)	.25
4870	Capacitor—.025 mfd. (C39)	.20
32787	Capacitor—.05 mfd. (C30, C33, C46, C51)	.20
4839	Capacitor—0.1 mfd. (C29, C45, C49)	.30
12714	Capacitor—Trimmer capacitor—2-12 mfd. (C9, C11)	.50
33824	Capacitor—Comprising 2 sections of 40 mfd., 1 of 10 mfd. and 1 of 20 mfd. (C37, C40, C41, C50)	2.30
33762	Coil—Antenna coil—A-B-C bands (L1, L2, L3, L4)	1.20
32823	Coil—Antenna coil—X band (L5, L6)	1.00
33764	Coil—Oscillator coil—A-B-C bands (L7, L8, L9)	.80
32931	Coil—Oscillator coil—X band (L10)	.75
33763	Coil—Detector coil—A-B-C bands (L11, L12, L13, L14)	1.80
33765	Coil—Detector coil—X band (L15)	.65
33766	Condenser—Variable tuning condenser (C4, C8, C23)	5.50
33951	Control—Volume control and power switch (R9, S10)	2.00
32634	Cord—Variable tuning condenser drive cord	.10
32635	Cord—Indicator drive cord	.24
32713	Core—Core and stud assembly for oscillator coils	.35
33770	Drive—Planetary tuning drive complete, less shafts	.90
33773	Drum—Variable tuning condenser drum	.90
33185	Gear—Gear and hub for volume control and power switch	.50
33768	Gear—Shaft and gear for tone control	.55
31480	Lamp—Pilot lamp	.20
33767	Link—Operating link between knob, shaft and range switch	.60
33825	Plug—2-prong male plug for power input	.10
32709	Reactor—Filter reactor (L23)	1.40
33947	Resistor—Ballast resistor tube—Type 86892-4	2.50
33953	Resistor—Flexible resistor (R18, R19)	.20
14281	Resistor—68 ohms, ½ watt (R1)	.20
30680	Resistor—150 ohms, ½ watt (R10)	.20
14076	Resistor—820 ohms, ½ watt (R17)	.20
12194	Resistor—1,800 ohms, ½ watt (R16)	.20
13714	Resistor—5,600 ohms, ½ watt (R8)	.20
14284	Resistor—22,000 ohms, 1/10 watt (R7)	.15
12454	Resistor—33,000 ohms, ½ watt (R3)	.20
12284	Resistor—220,000 ohms, ½ watt (R12, R13)	.20
13730	Resistor—1 megohm, ½ watt (R2, R4)	.20
12679	Resistor—2.2 megohm, ½ watt (R6)	.20
13601	Resistor—10 megohm, ½ watt (R11)	.20
33180	Retainer—Planetary drive retaining ring	.02
33771	Shaft—Tuning knob shaft	.15
33772	Shaft—Range switch shaft	.35
31385	Socket—Lamp socket	.30
33742	Socket—Phonograph input socket	.20
30956	Socket—Speaker socket	.30
31251	Socket—Tube socket	.25
13838	Spring—Indicator drive cord spring	.08
33769	Spring—Planetary tuning drive spring	.15
33758	Switch—Range switch (S1, S2, S3, S4, S5, S6)	2.45
33816	Switch—Tone control, and phono. switch (S7, S8)	2.50
33759	Transformer—First i-f transformer (L16, L17, C25, C26)	2.25
33761	Transformer—Second i-f transformer (L18, L19, C27, C28, C31, R7)	2.50
33826	Transformer—Output transformer (T2)	1.80
33947	Tube—Ballast resistor tube—Type 86892-4	2.50
	SPEAKER ASSEMBLIES (84659-1)	
33962	Cone—Cone, voice coil and center suspension assembled in metal housing (L21)	2.10
33828	Speaker—Speaker complete	5.25
	MISCELLANEOUS ASSEMBLIES	
32836	Cord—Power cord complete with male and female connectors	1.00
34296	Dial—Glass dial scale (English)	1.80
34503	Dial—Glass dial scale (Arabic)	1.85
33797	Frame—Dial frame assembly complete, less dial	2.20
34136	Knob—Tuning or volume control knob	.30
34570	Knob—Tone control knob	.25
34571	Knob—Range switch knob	.25
33774	Mounting—Speaker hardware mounting	.30
4982	Spring—Retaining spring for knob, Stock No. 34136	.05
14270	Spring—Retaining spring for knob, Stock No. 34570	.05
34138	Spring—Retaining spring for knob, Stock No. 34571	.05

Model 8Q1

STOCK No.	DESCRIPTION	Unit List Price
	RECEIVER ASSEMBLIES (RC337)	
13916	Board—Antenna and ground terminal board	.25
12717	Board—Phonograph input terminal board	.22
31303	Bracket—Band indicator mounting bracket—less indicating strip, spring, and cord	.40
31755	Cable—Indicator pointer drive cable	.50
30768	Cap—Rubber cap for Magic Eye	.15
12714	Capacitor—Trimmer 2-12 mmfd. (C3, C5, C6, C14, C40)	.50
14392	Capacitor—4.7 mmfd. (C39)	.35
13200	Capacitor—10 mmfd. (C7, C18)	.35
31791	Capacitor—15 mmfd. (C2)	.30
31270	Capacitor—100 mmfd. (C22, C23, C26, C27)	.35
12724	Capacitor—120 mmfd. (C20, C33)	.35
13003	Capacitor—180 mmfd. (C28)	.35
12694	Capacitor—220 mmfd. (C12)	.35
12962	Capacitor—330 mmfd. (C1, C15)	.35
31790	Capacitor—630 mmfd. (C10)	.40
31792	Capacitor—1,000 mmfd. (C41)	.60
31405	Capacitor—6,000 mmfd. (C17)	.75
4838	Capacitor—.005 mfd. (C34, C37)	.25
14393	Capacitor—.01 mfd. (C29, C35)	.30
4870	Capacitor—.025 mfd. (C30)	.20
4886	Capacitor—.05 mfd. (C24)	.20
4839	Capacitor—0.1 mfd. (C11, C16)	.30
19484	Capacitor—0.25 mfd. (C25, C31, C36)	.30
5212	Capacitor—16 mfd. (C32)	1.35
31818	Clip—Magic Eye mounting clip	.15
31780	Coil—Antenna coil (L1, L2, L3, L4)	1.90
31782	Coil—Oscillator coil—"A" band only (L7)	.80
31783	Coil—Oscillator coil—"B" and "C" bands only (L5, L6)	1.05
31781	Coil—R-f coil (L8, L9, L10, L11)	2.15
31774	Condenser—3-gang variable tuning condenser (C4, C13, C19)	5.80
31278	Cord—Band indicator cord	.12
31786	Cord—Variable condenser drive cord	.25
31787	Drive—Two-speed drive and mounting bracket	1.95
31808	Drum—Variable condenser drive cord drum	.80
31304	Indicator—Band indicator strip	.15
11891	Lamp—Dial lamp	.17
31817	Plate—Cushion socket mounting plate — less socket	.10
5040	Plug—4-contact female plug for speaker cable	.30
14404	Plug—7-contact male plug for power input	.35
31788	Pulley—Two-speed drive pulley	.20
31280	Pulley—Indicator pointer drive cord pulley (large)	.10
31373	Pulley—Indicator pointer drive cord pulley (small)	.08
31272	Pulley—Range switch pulley	.20
14860	Resistor—18 ohms, ½ watt (R15)	.20
14528	Resistor—200 ohms, wire wound, 2½ watt (R16)	.30
31430	Resistor—6,200 ohms, 1½ watt (R13)	.22
13302	Resistor—10,000 ohms, 1/10 watt (R21)	.15
13045	Resistor—18,000 ohms, ½ watt (R7)	.20
14167	Resistor—27,000 ohms, 2 watt (R22)	.25
11300	Resistor—33,000 ohms, 1/10 watt (R4)	.15
12719	Resistor—82,000 ohms, 1/10 watt (R20)	.15
14560	Resistor—100,000 ohms, ½ watt (R11, R12)	.20
11398	Resistor—220,000 ohms, 1/10 watt (R10)	.15
12199	Resistor—270,000 ohms, ½ watt (R18)	.20
13005	Resistor—390,000 ohms, 1/10 watt (R19)	.15
12013	Resistor—1 meg., 1/10 watt (R1, R2, R5)	.15
6131	Resistor—2.2 meg., 1/10 watt (R6)	.15
14887	Retainer—Indicator drive cord pulley retainer	.01
4669	Screw—No. 8-32 x ¼-in. square head set screw for pulley, Stock Nos. 31272 and 31788, and drum, Stock No. 31808	.03
31364	Socket—Dial lamp socket	.20
13871	Socket—Magic Eye socket	.45
31251	Socket—Octal base tube socket	.25
31279	Spring—Band indicator tension spring	.03
13638	Spring—Tension spring for pointer drive cable, or variable condenser drive cord	.08
31778	Switch—Range switch (S1, S2, S3, S4)	1.65
31807	Tone Control and power switch (R17, S5, S6)	1.50
31267	Transformer—First i-f transformer (L12, L13, C22, C23)	2.20
31268	Transformer—Second i-f transformer (L14, L15, C26, C27)	2.05
31480	Volume Control (R9)	1.80
	SPEAKER ASSEMBLIES (RL63H-3)	
31825	Cap—Speaker cone center dust cap	.05
11469	Coil—Hum neutralizing coil (L17)	.30
12012	Coil—Speaker field coil (L18)	2.90
31310	Cone—Speaker cone and voice coil (L16)	1.75
31302	Plug—4-contact male plug for speaker	.25
31824	Speaker complete	10.45
14365	Transformer—Output transformer (T1)	2.00
	MISCELLANEOUS ASSEMBLIES	
31800	Dial—Dial scale and crystal	.90
31831	Escutcheon—Dial scale escutcheon — less dial scale and crystal	2.00
31801	Indicator—Indicator pointer and carriage	.45
31802	Knob—Station selector, tone control, volume control or range switch knob	.15
31287	Rod—Pointer carriage slide rod	.15
31306	Screen—Dial color screen and light diffuser	.45
14270	Spring—Retaining spring for knob Stock No. 31802	.05
31558	Spring—Stop spring for pointer slide rod	.02

RCA MFG. CO., INC.

MODEL 4QB4, Ch. RC440A
Schematic, Lead Dress



Model 4QB4 Schematic Diagram

Precautionary Lead Dress:

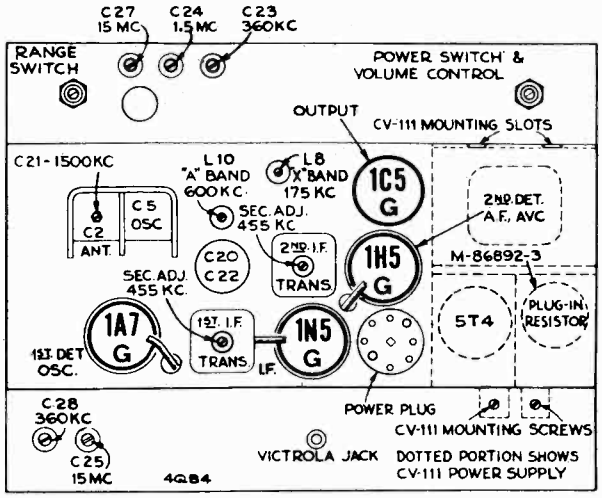
1. Dress C3 (100 mmfd.) edgewise to chassis.
2. Dress the 1A7-G grid cap lead clear of chassis.
3. Dress green wire from C2 (antenna section of gang) to range switch away from chassis and other wires.
4. Dress blue lead from terminal "E" of 2nd I.F transformer around terminal "D", away from the 1H5-G and 1C5-G sockets, and close to the chassis.
5. Dress C16 (1,000 mmfd.) from grid of 1H5-G tube to volume control, and the green lead to the 1H5-G grid cap away from other wires.
6. Dress the red wire from the power plug to the power switch on the volume control away from the 1H5-G socket.
7. Blue lead from "C" band oscillator coil to 1A7-G No. 6 contact must be dressed away from chassis.
8. All tube shields must be tight.

MODEL 4QB4
Alignment, Trimmers
Chassis Wiring, Socket
Voltage

RCA MFG. CO., INC.

Model 4QB4 Alignment Procedure

Steps	Connect the high side of the test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	1N5-G I-F grid cap, in series with .01 mfd.	455 kc	"A" Band, Quiet Point at high-frequency end	L14 and L13 (2nd I-F Trans.)
2	1A7-G 1st-Det. grid cap, in series with .01 mfd.			L12 and L11 (1st I-F Trans.)†
3	Antenna lead, in series with 200 mmfd.	1,500 kc (200 m)	1,500 kc (152.5°) "A" Band	Preset L10 (osc.) core 5/16-in. out Peak C24 (osc.) and C21 (ant.)
4		600 kc (500 m)	600 kc (33°)	L10 (osc.)**
5		Repeat steps 3 and 4.		
6		360 kc (833 m)	360 kc (161°) "X" Band	Preset L8 (osc.) core ¾-in. out Peak C23 (osc.) and C28 (ant.)
7		175 kc (1,710 m)	175 kc (55°) "X" Band	L8 (osc.)**
8		Repeat steps 6 and 7.		
9	Antenna lead, in series with 300 ohms	15 mc	15 mc (146°) "C" Band	C27 (osc.)* C25 (ant.)††
10	Antenna lead, in series with 200 mmfd.	1,500 kc (200 m)	1,500 kc (152.5°) "A" Band	C24 (osc.)



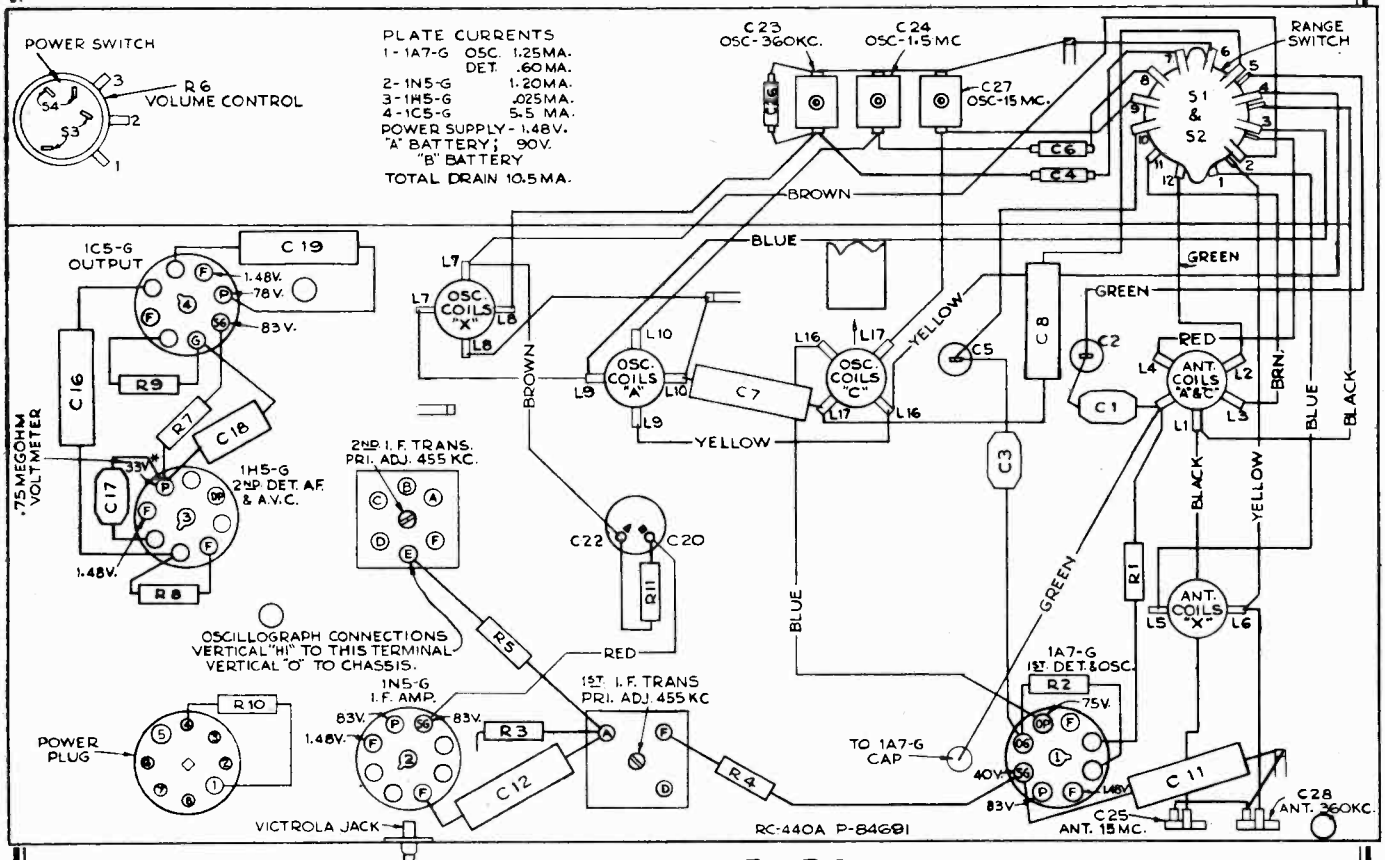
Model 4QB4 Top View

*Use minimum capacity peak if two peaks can be obtained.

**Rock gang slightly for peak output.

†Do not readjust L13 or L14 when test-osc. is applied to 1A7-G grid.

††Use maximum capacity peak if two peaks can be obtained.



BOTTOM VIEW - REAR OF CHASSIS

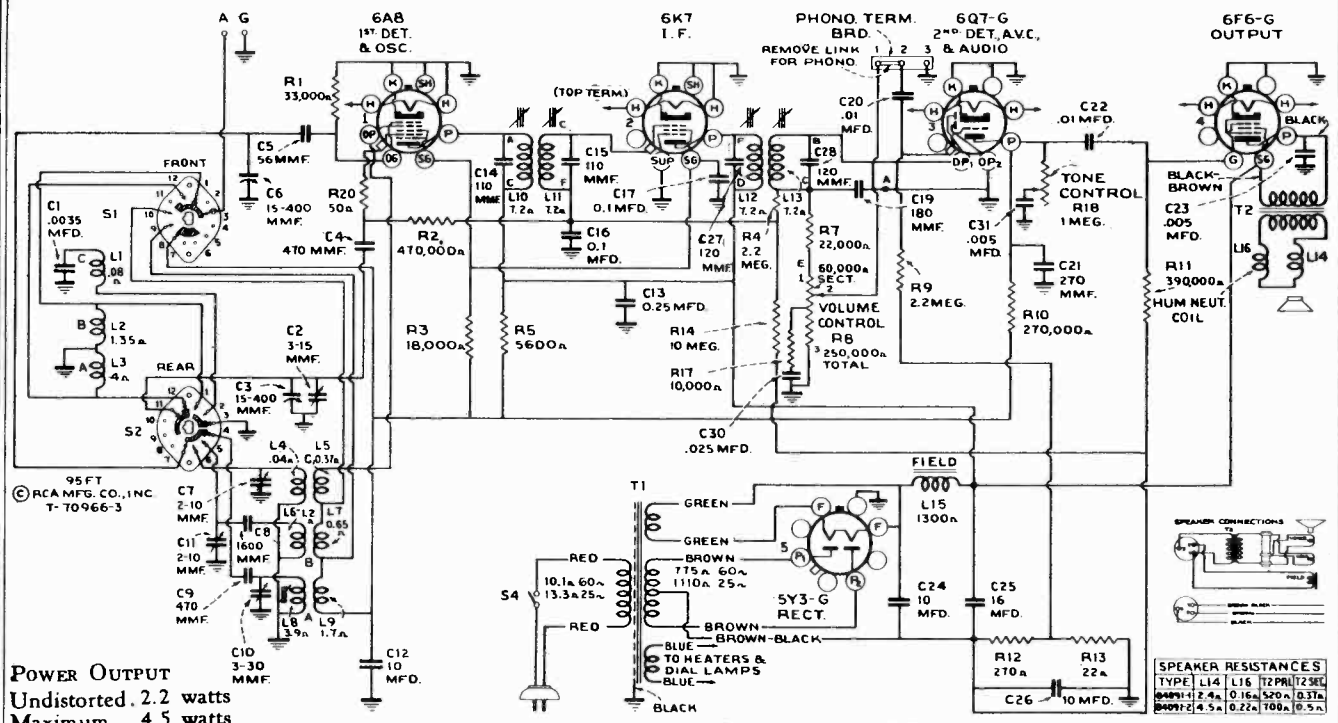
Model 4QB4 R-F Wiring Diagram and Socket Voltages

Voltages shown above are for battery operation.

Schematic
Chassis Wiring

RCA MFG. CO., INC.

MODEL 5Q1
(Formerly 95FT)



Power Output
Undistorted . 2.2 watts
Maximum . . 4.5 watts

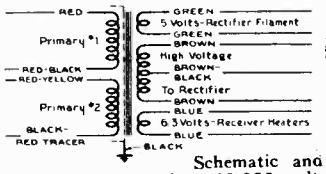
Power Supply Ratings
Rating A . . . . . 105-125 volts, 50-60 cycles, 75 watts.
Rating B . . . . . 105-125 volts, 25-60 cycles, 75 watts.
Rating C105-125/200-250 volts, 50-60 cycles, 75 watts.

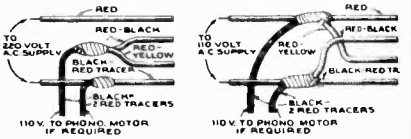
Loudspeaker . . . . . 6-inch electrodynamic

Type . . . . . { 84091-1, 84001-3 } 2.6 ohms at 400 cycles

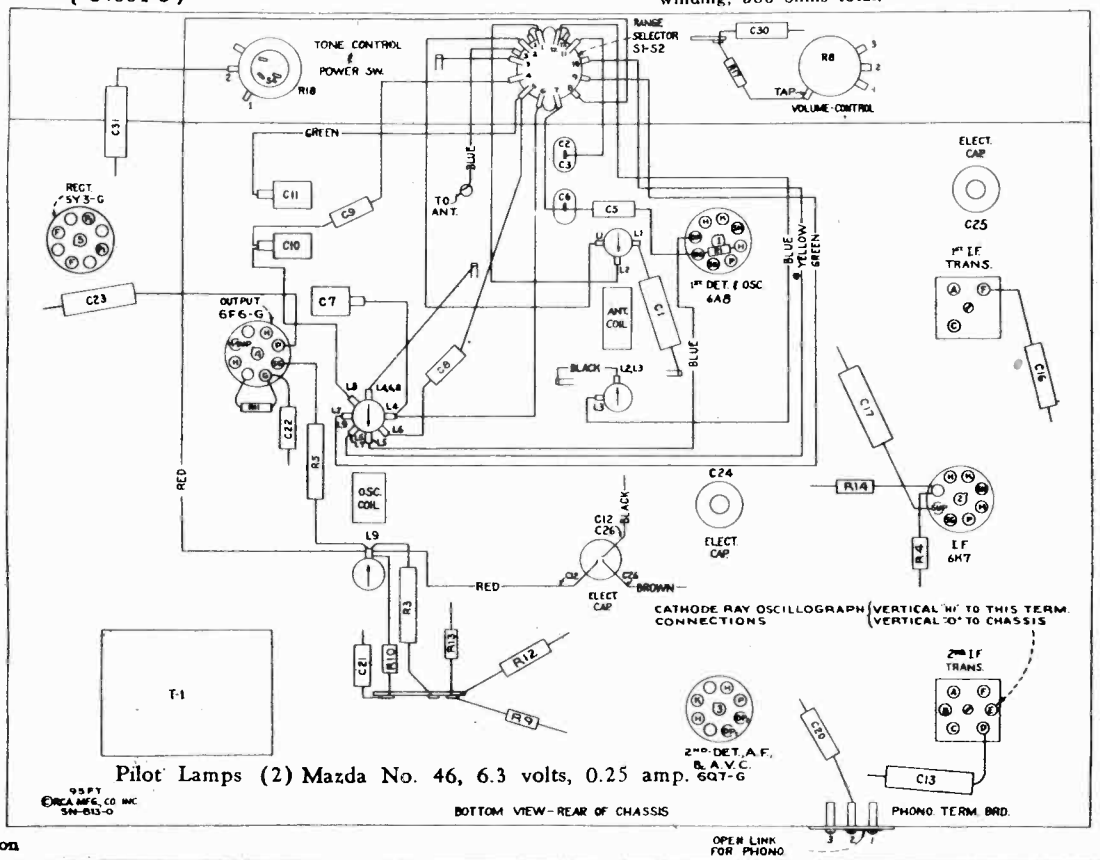
V. C. Impedance { 84091-2, 84001-6 } 4.7 ohms at 400 cycles

IF PEAK 455 KC





Schematic and primary lead connections for 110-220 volt power transformer (Stock No. 30607). Resistance of each primary winding, 10 ohms: High-voltage secondary winding, 386 ohms total.



Pilot Lamps (2) Mazda No. 46, 6.3 volts, 0.25 amp. 6Q7-G

1938
First Edition

MODEL 5Q1
Voltage, Alignment
Socket, Trimmers, Notes

RCA MFG. CO., INC.

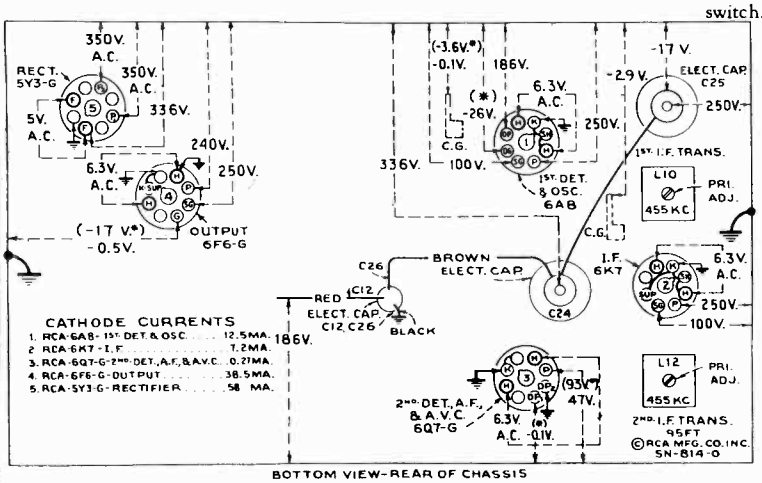
General Description and Service Data

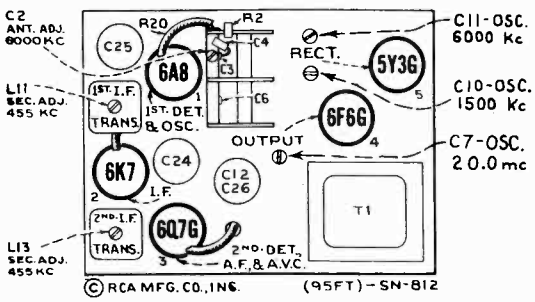
This receiver uses a three-band superheterodyne circuit in a table-type cabinet. Features of design include magnetite-core adjusted i-f transformers and low frequency "A" oscillator tracking; automatic volume control; phonograph terminal board; aural-compensated volume control; continuously variable tone control; dustproof electrodynamic loudspeaker and an edge-illuminated, straight-line dial.

Loudspeaker.—Centering of the loudspeaker voice coil is made in the usual manner with three narrow celluloid or paper feelers after first removing the front dust cover. This may be removed by softening its cement with a light application of acetone, using care not to allow the acetone to flow into the air gap. A dust cover should be cemented in place with ambroid upon completion of adjustment.

Precautionary Lead Dress.—(1) Keep leads from C1 as short as possible. (2) Dress yellow and green leads from range selector to oscillator coil between front apron and range selector. (3) Dress blue lead from oscillator coil to oscillator plate away from other parts. Maintain original length and size of the following: (4) bus lead from antenna coil L1 to range selector and (5) lead from oscillator coil to chassis.

Phonograph Attachment.—A terminal board is provided for connecting a phonograph into the audio amplifying circuit. RCA Victor Models R-93, R-93-A, R-93-B, R-93-C, R-93-2, or R-94 Record Players should be connected as follows: Open link between terminals 1 and 2 on terminal board. Connect yellow wire in Radio-Record switch cable to terminal 1, green to terminal 2, and shield extension to terminal 3. Tape unused red and blue leads separately. Connect a 2-conductor twisted cable between the Record Player binding posts and the screw terminals on Radio-Record switch.





L8, 600 kc osc. adjustment is accessible through hole in rear apron

Figure 1—Radiotron, Component Part, and Trimmer Locations

Figure 4—Radiotron Socket Voltages and Trimmer Locations

* Note: Values with star (*) are operating voltages. Values not starred are actual measured voltages.

Measurements made to chassis unless otherwise indicated.

Measurements made with set tuned to quiet point, volume control at minimum, using 1,000-ohm-per-volt meter, having ranges of 10, 50, 250, and 500 volts. (Use nearest range above the specified measured voltage.)

Values should hold within approximately ± 20% for 117-volt 60-cycle supply.

Alignment Procedure

With the gang tuning-condenser plates in full-mesh position, adjust the pointer to the low-frequency (end) calibration mark on the dial scale. The pointer is soldered in place on the drive cable.

Perform alignment in proper order, tabulated below, starting with No. 1 and following all operations across, then No. 2, etc. Adjustment locations are shown on figures 1 and 4.

Cathode-ray alignment is preferable; the connections to the chassis are shown on figure 3. If an output indicator is used, connect it across the loudspeaker voice-coil and advance the receiver volume control to full-volume position.

Connect the "low" output terminal of the test oscillator to the receiver "G" (ground) terminal for all alignment operations. Regulate the output of the test oscillator so that minimum signal is applied to the receiver to obtain an observable output indication. This will avoid a-v-c action.

The term "Dummy antenna" means the device which must be connected between the "high" test-oscillator output and the point of connection to the receiver in order to obtain ideal alignment. "No signal, 550-750 kc" means that the receiver should be tuned to a point between 550 and 750 kc where no signal or interference is received from a station or local (heterodyne) oscillator.

Order of Alignment	Test Oscillator: Connection to Receiver	Test Oscillator: Dummy Antenna	Test Oscillator: Frequency Setting	Range Selector	Receiver Dial Setting	Circuit to Adjust	Adjustment Symbols	Adjust to Obtain
1	6K7 I-F Grid Cap	.001 Mfd.	455 kc	"A" Left	No Signal 550-750 kc	2nd I-F Trans.	L12 and L13	Max. (peak)
2	6A8 Det. Grid Cap	.001 Mfd.	455 kc	"A"	No Signal 550-750 kc	1st I-F Trans.	L10 and L11	Max. (peak)
3	Ant. Term.	300 Ohms	6,000 kc	"B" Center	6,000 kc	"B" Osc.	C11	Max. (peak)*
4	Ant. Term.	300 Ohms	6,000 kc	"B"	6,000 kc	"B" Ant.	C2	Max. (peak)†
5	Ant. Term.	300 Ohms	20,000 kc	"C" Right	20,000 kc	"C" Osc.	C7	Max. (peak)‡
6	Ant. Term.	200 Mmfd.	600 kc	"A" Left	600 kc	"A" L-F Osc.	L8	Max. (peak)
7	Ant. Term.	200 Mmfd.	1,500 kc	"A"	1,500 kc	"A" H-F Osc.	C10	Max. (peak)
8	Ant. Term.	200 Mmfd.	600 kc	"A"	600 kc	"A" L-F Osc.	L8	Max. (peak)
9	Ant. Term.	200 Mmfd.	1,500 kc	"A"	1,500 kc	"A" H-F Osc.	C10	Max. (peak)

* Use minimum capacity peak if two peaks can be obtained.

† After this adjustment, check for image signal by shifting receiver dial to 5.09 mc.

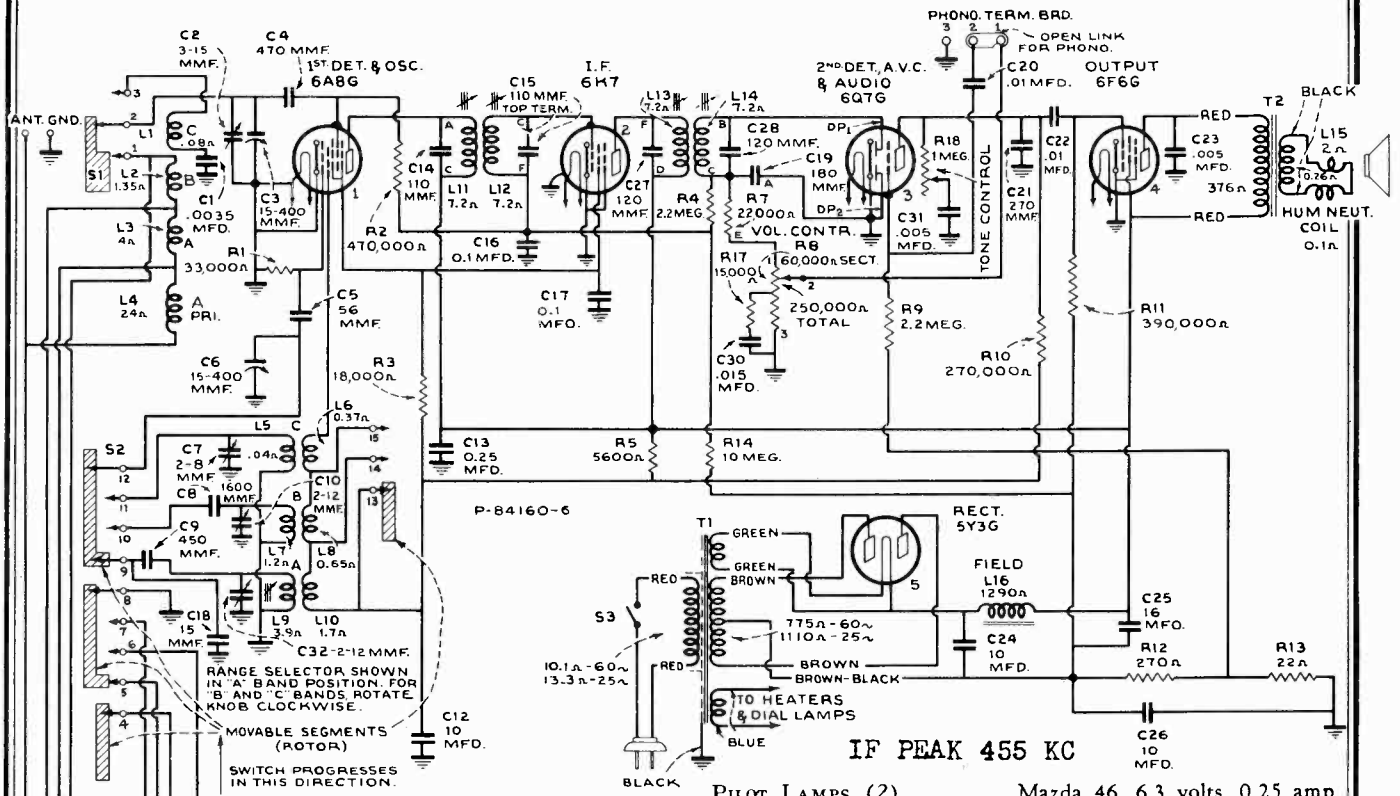
‡ Use maximum capacity peak if two peaks can be obtained. After this adjustment, check for image signal by shifting receiver dial to 20.91 mc.

Note that the heterodyne oscillator tracks above the signal frequency on bands "A" and "B," and below the signal frequency on band "C."

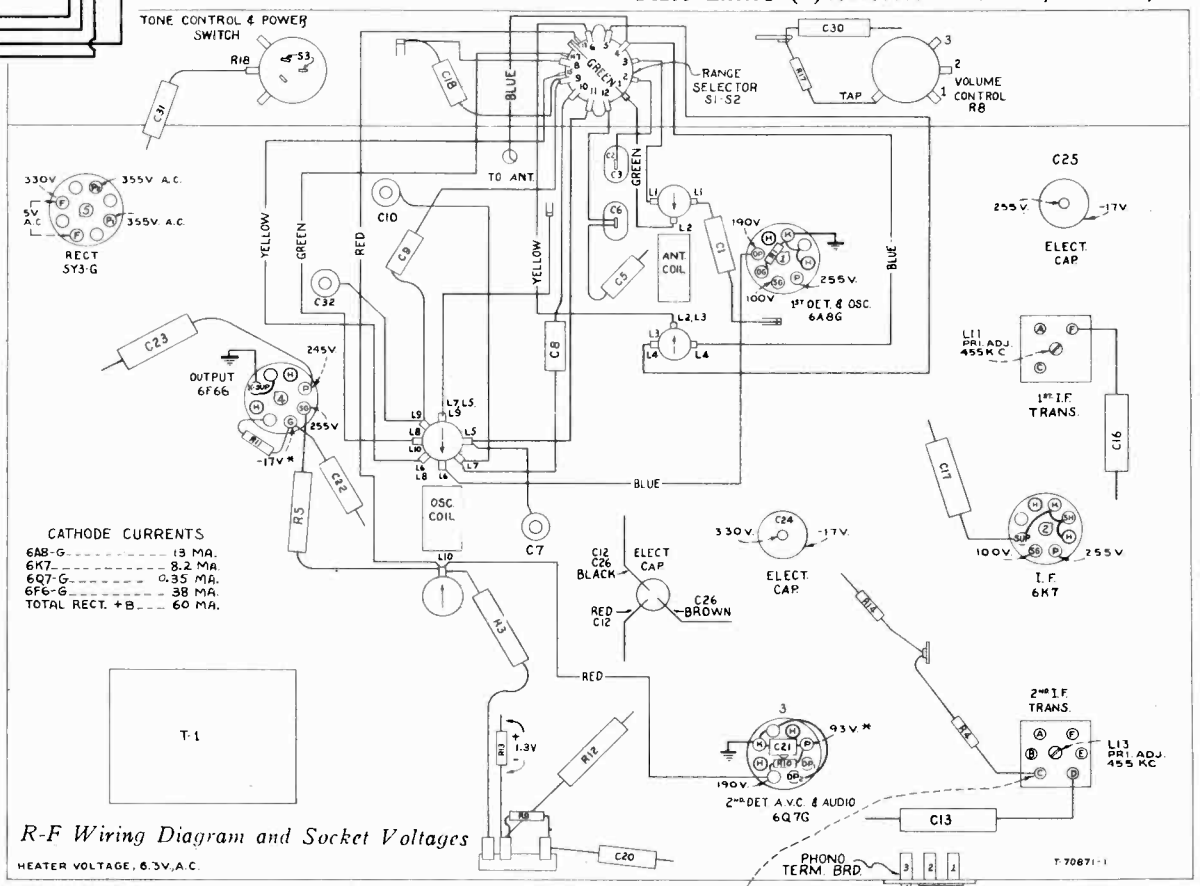
Schematic, Voltage
Chassis Wiring

RCA MFG. CO., INC.

MODEL 5Q2
Chassis RC325C



PILOT LAMPS (2)..... Mazda 46, 6.3 volts, 0.25 amp



R-F Wiring Diagram and Socket Voltages

BOTTOM VIEW - REAR OF CHASSIS

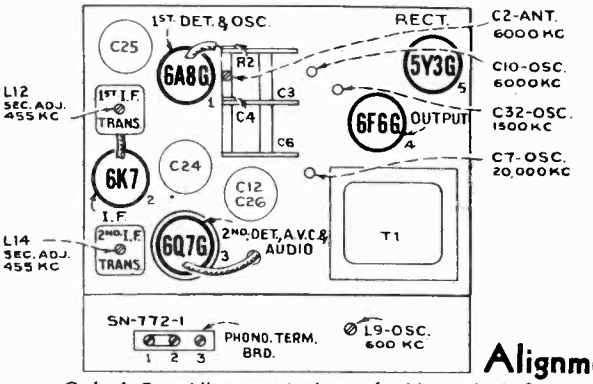
First Edition

Measurements made to chassis unless otherwise indicated, with set tuned to quiet point and volume control at minimum. Values should hold within ±20% with 115-volt a-c supply.

***NOTE:** Values with star (*) are operating voltages in circuits with high series resistance. The actual measured voltages will be lower, depending on the voltmeter loading.

MODEL 5Q2
Alignment, Socket
Trimmers, Phono, Data

RCA MFG. CO., INC.



Power Output Rating
Undistorted ..... 2.5 watts
Maximum ..... 4.5 watts
Loudspeaker (RL-63F-1)
Type ..... 8-inch Electrodynamic
V.C. Impedance ..... 2.2 ohms at 400 cycles
Power Supply Ratings
Rating A ..... 105-125 volts, 50-60 cycles, 75 watts
Rating B ..... 105-125 volts, 25-60 cycles, 75 watts
Rating C .... 105-125/200-250 volts, 50-60 cycles, 75 watts
Frequency Ranges
"Standard Broadcast" (A) ..... 540-1,720 kc (555-174 m)
"Medium Wave" (B) ..... 2.3-7.0 mc (130-42.8 m)
"Short Wave" (C) ..... 7.0-22.0 mc (42.8-13.6 m)
Intermediate Frequency ..... 455 kc

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

Pre-setting Dial.—With the gang condenser in full mesh, the dial pointer should be in line with the left-hand end of the dial scales. The pointer is soldered to the drive cable.

Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
1	6K7 I-F grid cap, in series with .01 mfd.	455 kc	"A" band, Quiet Point between 550-750 kc	L13 and L14 (2nd I-F Trans.)
2	6A8-G det. grid cap, in series with .01 mfd.	455 kc		L11 and L12 (1st I-F Trans.)
3	Antenna Terminal in series with 300 ohms	6 mc	6 mc "B" band	C10 (osc.) * C2 (ant.) †
4	Antenna Terminal in series with 300 ohms	20 mc	20 mc "C" band	C7 (osc.) **
5	Antenna Terminal in series with 200 mmf.	600 kc	600 kc "A" band	L9 (osc.)
6	Antenna Terminal in series with 200 mmf.	1,500 kc	1,500 kc "A" band	C32 (osc.) *
7	Repeat steps 5 and 6.			

* Use minimum capacity peak if two peaks can be obtained.

† After adjusting C2, check to determine that C10 has been adjusted to the correct peak by tuning the receiver to approximately 5.09 mc, where a weaker signal should be received.

** Use maximum capacity peak if two peaks can be obtained. Check to determine that C7 has been adjusted to the correct peak by tuning the receiver to approximately 20.91 mc, where a weaker signal should be received.

NOTE: The oscillator tracks 455 kc **above** the signal on **"A"** and **"B"** bands, and 455 kc **below** the signal on **"C"** band.

Miscellaneous Service Data

Loudspeaker.—To center the loudspeaker voice coil, first remove the front dust cover by applying acetone sparingly, then loosen the spider screws, insert three narrow feelers at equal distances in the gap, and tighten the spider screws. Remove the feelers, and fasten a dust cover in place with loudspeaker cement.

Victrola Attachment.—Terminals are provided on the rear of the chassis for convenient connection to a Victrola Attachment, such as R-93, R-93A, R-93B, R-93C, R-94, R-94-B. A Stock No. 9824 switch is required to change from radio to Victrola. The connections for this switch are as follows:

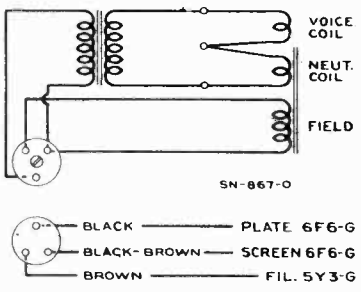
Connect the yellow lead in the switch cable to terminal No. 1.

Connect the green lead in the switch cable to terminal No. 2.

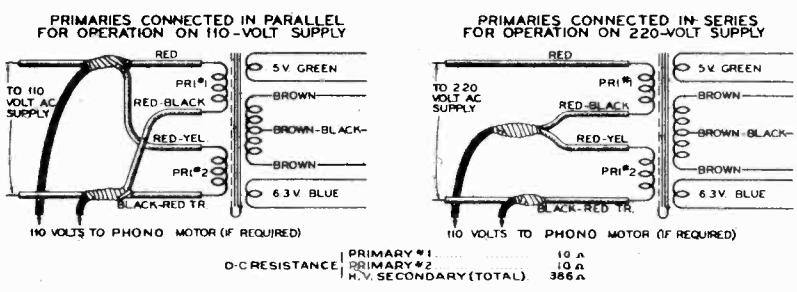
Connect the shielding of the cable to terminal No. 3.

Tape the ends of the blue and the red leads separately.

Connect the Victrola Attachment to the two clip-type connectors on the switch.



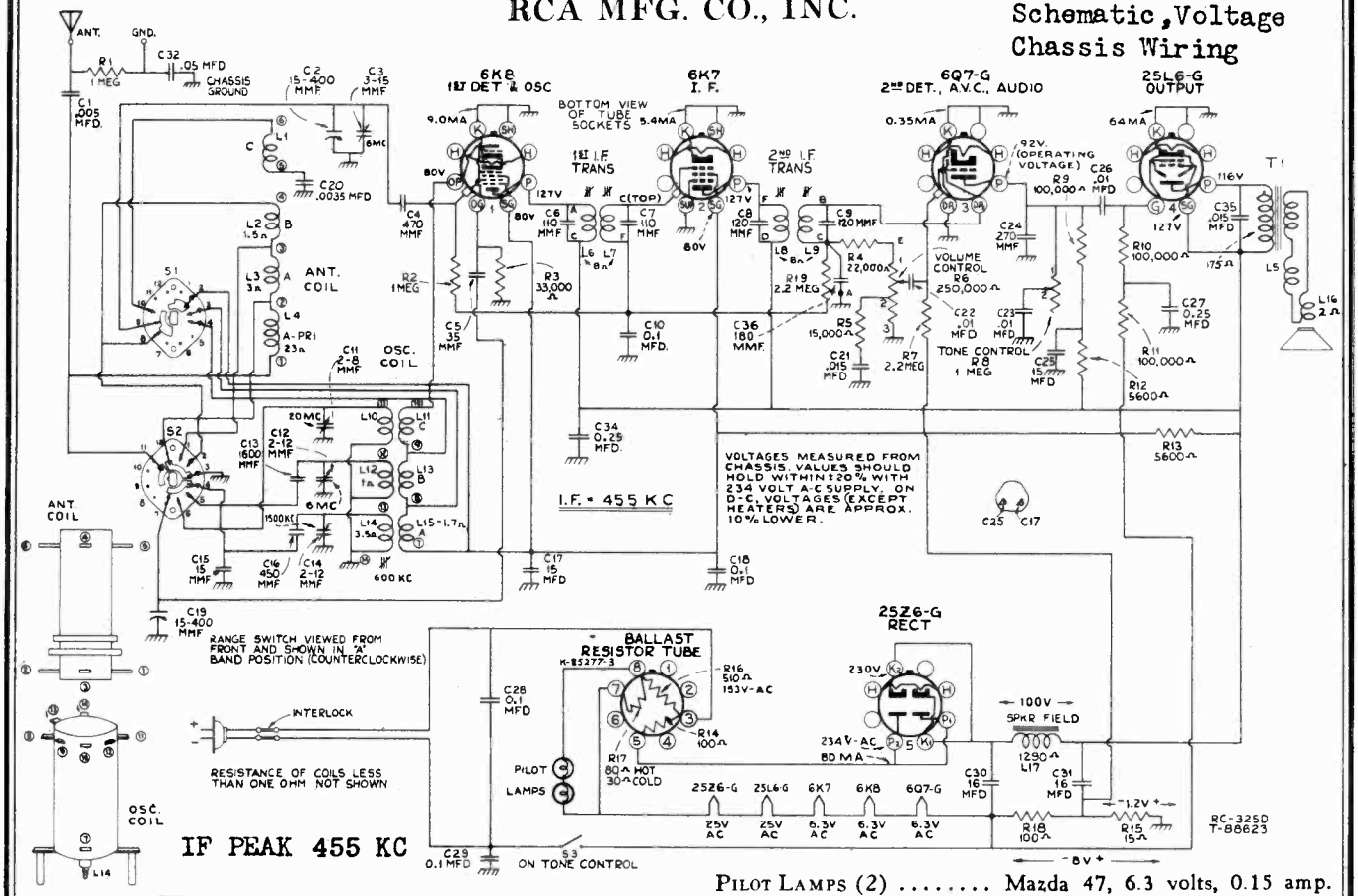
Connections and Colors of Speaker and Cable



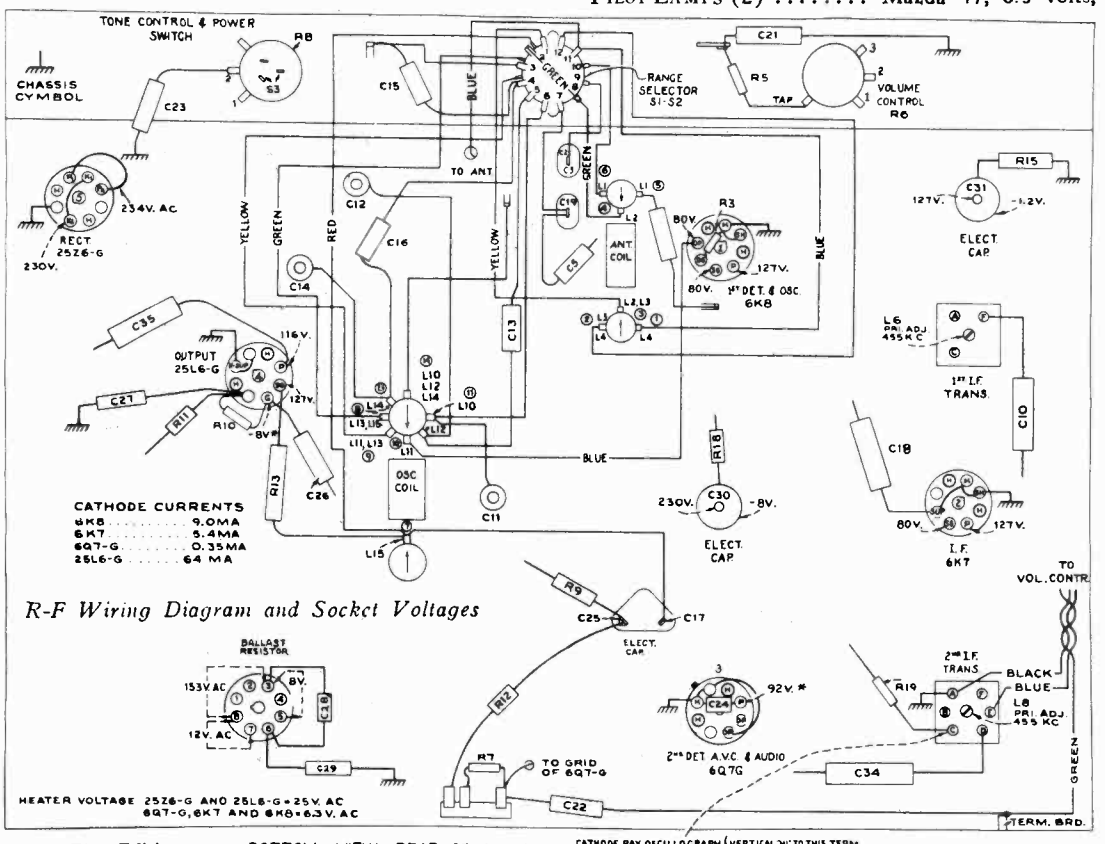
Connections of Universal Power Transformer Primary for 220 and 110 Volts

RCA MFG. CO., INC.

MODEL 5Q2X, Ch. RC325D
Schematic, Voltage
Chassis Wiring



PILOT LAMPS (2) ..... Mazda 47, 6.3 volts, 0.15 amp.



R-F Wiring Diagram and Socket Voltages

—1938— First Edition BOTTOM VIEW - REAR OF CHASSIS

Measurements made to chassis unless otherwise indicated, with set tuned to quiet point and volume control at minimum. Values should hold within ±20% with 234-volt a-c supply.

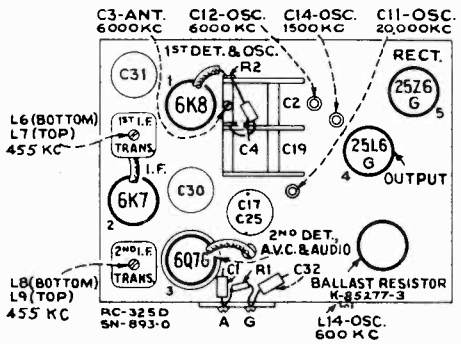
* **NOTE:** Values with star (*) are operating voltages in circuits with high series resistance. The actual measured voltages will be lower, depending on the voltmeter loading.

MODEL 5Q2X
Alignment, Socket, Trimmers
Lead Dress

RCA MFG. CO., INC.

Precautionary Lead Dress.—

1. Leads on C20 ("C" band tracking condenser) must be as short as possible.
2. Dress blue lead from oscillator plate away from all parts.
3. Dress speaker cable away from ballast tube.

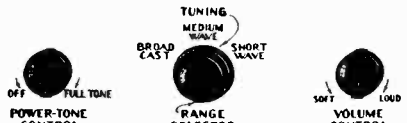


CAUTION: The chassis is connected to one side of the power supply. Avoid contact of chassis or parts to external ground when servicing.

4. Dress C22 (1st A.F. coupling condenser) against rear apron.

Power Supply Polarity.—

For operation on d-c, the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a-c, a similar reversal of the plug may reduce hum.



Location of Controls

POWER OUTPUT RATING

(A-C Operation)
Undistorted..... 1.7 watts
Maximum..... 2.7 watts
(D-C Operation)
Undistorted..... 1.4 watts
Maximum..... 2.3 watts

LOUDSPEAKER

Type..... 8-inch Electrodynamic
V.C. Impedance..... 2.2 ohms at 400 cycles

POWER SUPPLY RATINGS

A-C Rating..... 200-250 volts 50/60 cycles, 115 watts
D-C Rating..... 200-250 volts direct current, 105 watts

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the ground terminal, and keep the output as low as possible to avoid a-v-c action.

Pre-setting Dial.—With the gang condenser in full mesh, the dial pointer should be in line with the left-hand end of the dial scales. The pointer is soldered to the drive cable.

Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
1	6K7 I-F grid cap, in series with .01 mfd.	455 kc	"A" band, Quiet Point between 550-750 kc	L8 and L9 (2nd I-F Trans.)
2	6K8 det. grid cap, in series with .01 mfd.	455 kc		L6 and L7 (1st I-F Trans.)
3	Antenna Terminal in series with 300 ohms	6 mc	6 mc "B" band	C12 (osc.)* C3 (ant.)†
4	Antenna Terminal in series with 300 ohms	20 mc	20 mc "C" band	C11 (osc.)** (Rock In)
5	Antenna Terminal in series with 200 mmf.	600 kc	600 kc "A" band	L14 (osc.)
6	Antenna Terminal in series with 200 mmf.	1,500 kc	1,500 kc "A" band	C14 (osc.) (Rock In)
7	Repeat steps 5 and 6.			

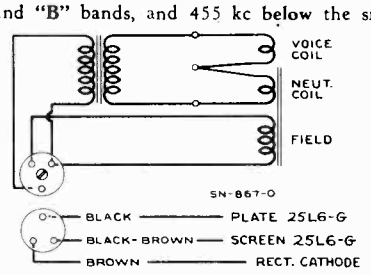
* Use **minimum** capacity peak if two peaks can be obtained.

† After adjusting C3, check to determine that C12 has been adjusted to the correct peak by tuning the receiver to approximately 5.09 mc, where a weaker signal should be received.

** Use **maximum** capacity peak if two peaks can be obtained. Check to determine that C11 has been adjusted to the correct peak by tuning the receiver to approximately 20.91 mc, where a weaker signal should be received.

NOTE: The oscillator tracks 455 kc **above** the signal on "A" and "B" bands, and 455 kc **below** the signal on "C" band.

Loudspeaker.—To center the loudspeaker voice coil, first remove the front dust cover, then loosen the spider screws, insert three narrow feelers at equal distances in the gap, and tighten the spider screws. Remove the feelers, and fasten a dust cover in place with loudspeaker cement.



At Right—Connections and Colors of Speaker and Cable

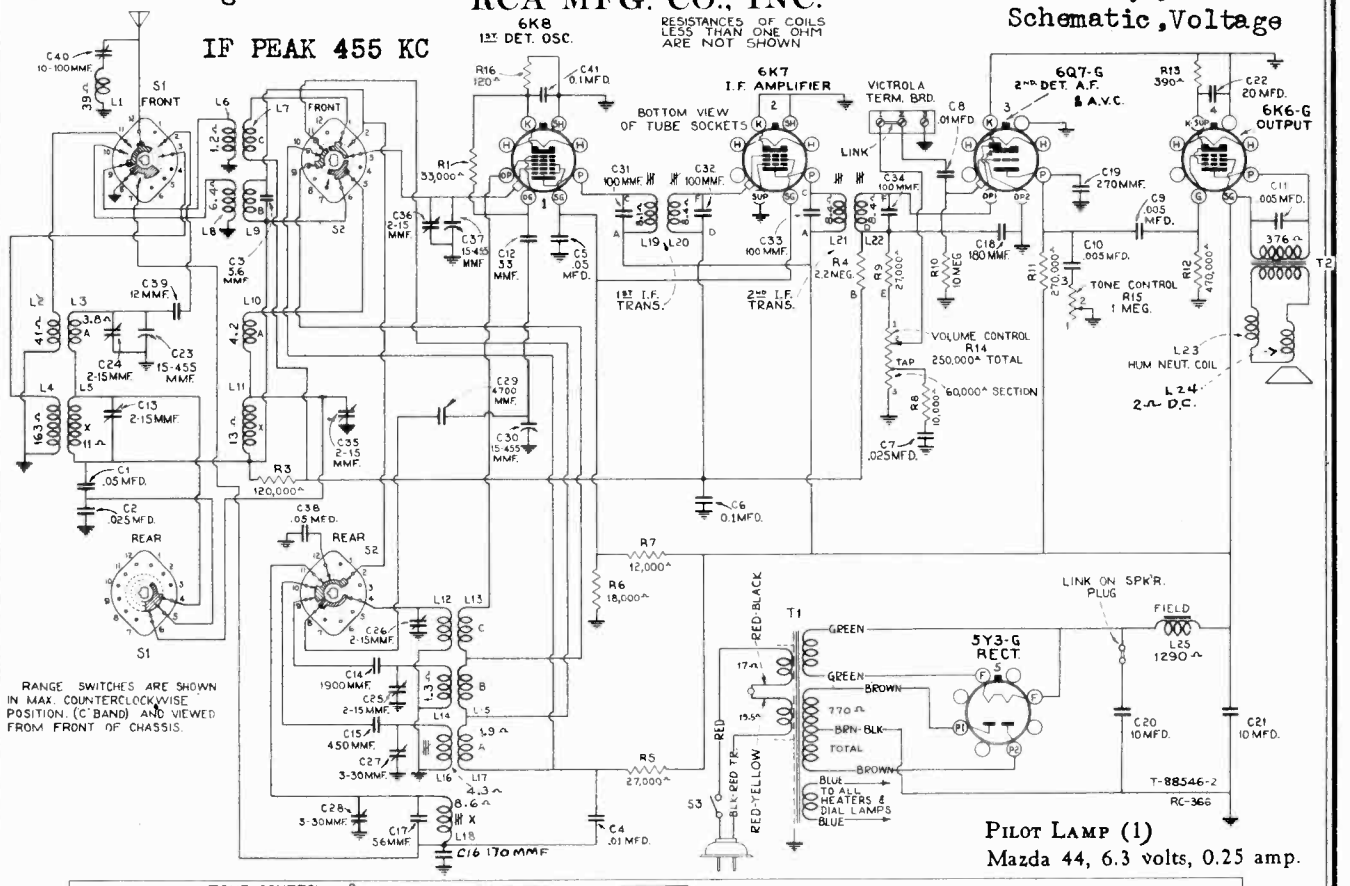
Chassis Wiring

RCA MFG. CO., INC.

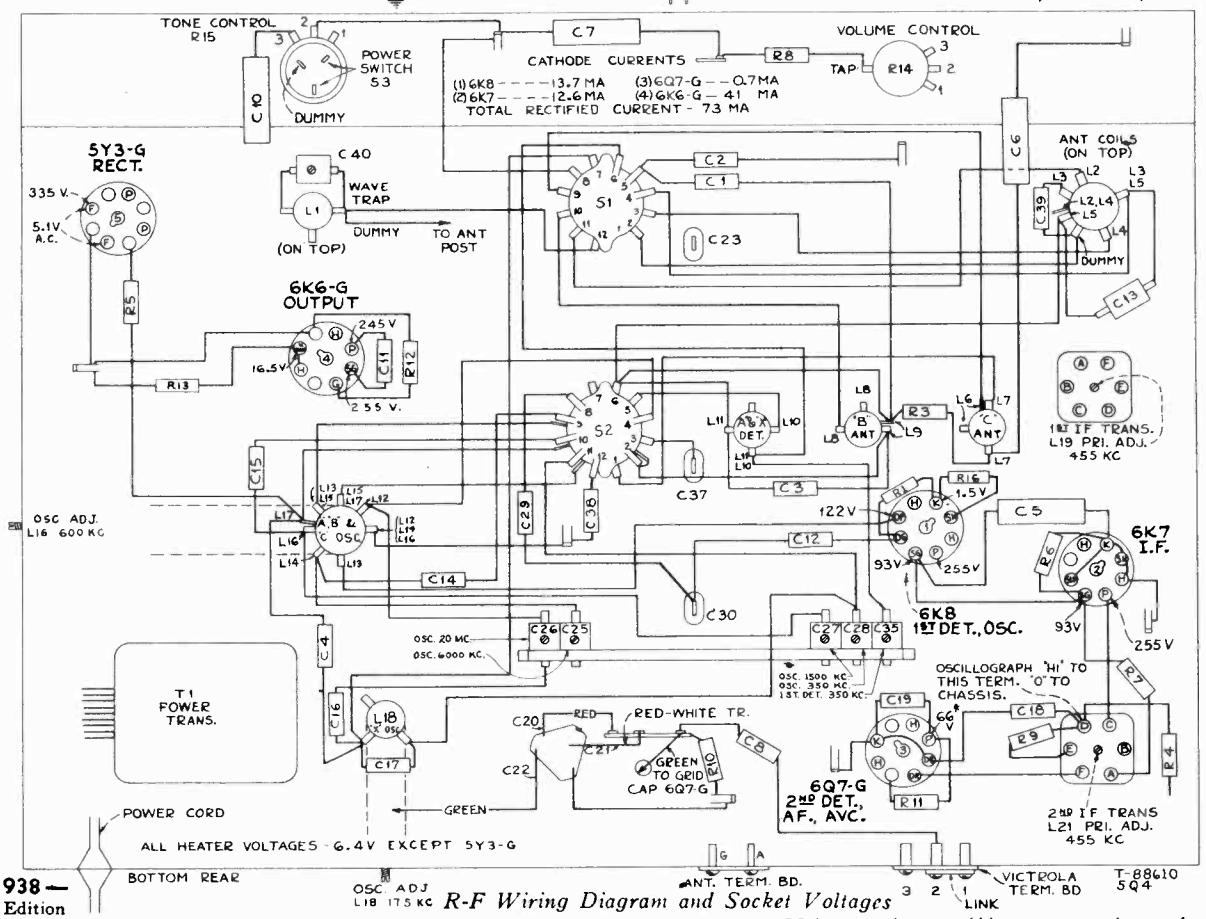
MODEL 5Q4, Ch. RC366
Schematic, Voltage

IF PEAK 455 KC

RESISTANCES OF COILS LESS THAN ONE OHM ARE NOT SHOWN



PILOT LAMP (1)
Mazda 44, 6.3 volts, 0.25 amp.



— 1938 —
First Edition

R-F Wiring Diagram and Socket Voltages

Measurements made to chassis unless otherwise indicated, set tuned to quiet point, volume control at minimum. Values should hold within ±20% with 117-volt a-c supply.

*NOTE: Values with star (*) are operating voltages in circuits with high series resistance. The actual measured voltages will be lower, depending on the voltmeter loading.

POWER OUTPUT RATING
Undistorted..... 2.5 watts
Maximum..... 4.5 watts

LOUDSPEAKER (RL-63H-3)
Type..... 8-inch Electrodynamic
V.C. Impedance. 2.2 ohms at 400 cycles

POWER SUPPLY RATINGS
Rating A..... 105-125 volts, 50-60 cycles, 75 watts
Rating B..... 105-125 volts, 25-60 cycles, 75 watts
Rating C..... 105-125/200-250 volts, 50-60 cycles, 75 watts

Loudspeaker.—To center the loudspeaker voice coil, first remove the front dust cover, then loosen the spider screws, insert three narrow feelers at equal distances in the gap, and tighten the spider screws. Remove the feelers, and fasten a dust cover in place with loudspeaker cement.

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a.v.c. action.

Pre-setting Dial.—With the gang condenser in full mesh, the dial pointer should be in line with the left end of the dial scales. The pointer is soldered to the drive cable.

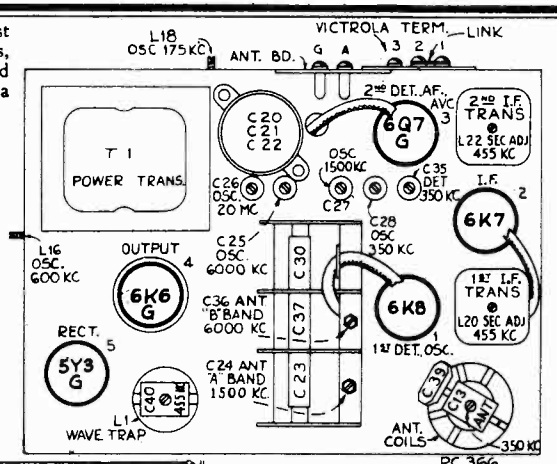
Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following to obtain maximum output
1	6K7 I-F grid cap in series with .01 mfd.	455 kc	"A" band No Station Point between 550-750 kc	L21 and L22 (2nd I-F transformer)
2	6K8 det. grid cap in series with .01 mfd.	455 kc		L19 and L20 (1st I-F transformer)
3	Antenna Terminal in series with 200 mmfd.	455 kc		C40 (wave trap) MINIMUM OUTPUT
4	Antenna Terminal in series with 300 ohms.	6 mc	6 mc "B" band	C25 (osc.) use MINIMUM capacity peak C36 (antenna) use MAXIMUM capacity peak*
5	Antenna Terminal in series with 300 ohms.	20 mc	20 mc "C" band	C28 (osc.) use MINIMUM capacity peak*
6	Antenna Terminal in series with 200 mmfd.	600 kc	600 kc "A" band	L16 (osc.) Rock Gang
7		1,500 kc	1,500 kc "A" band	C27 (oscillator) C24 (antenna)
8		600 kc	600 kc "A" band	L16 (osc.) Rock Gang
9		175 kc	175 kc "X" band	L18 (osc.) Rock Gang
10		350 kc	350 kc "X" band	C28 (oscillator) C35 (1st det.) C13 (antenna)
11		175 kc	175 kc "X" band	L18 (osc.) Rock Gang

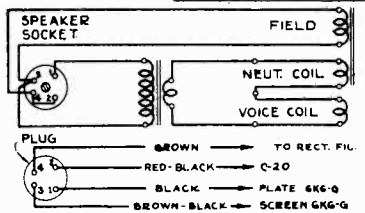
* Check to determine that trimmer has been adjusted to correct peak by tuning receiver approximately 910 kc lower, where a weaker signal should be heard.

Note: Oscillator tracks above the signal on all bands.

Precautionary Lead Dress.—

1. Dress blue lead from L7 to terminal 1 on range switch S2 clear of coils and other wires.
2. Dress bus from L12 to contact 4 on range switch S2 clear of other wiring.
3. Dress leads on C29 from gang to range switch short and clear of bus wires.
4. Dress leads from X and A band antenna coil close to underside of chassis.
5. Dress all plus B leads to terminal board under electrolytic between the board and the rear apron.
6. Dress blue lead from 6Q7-G plate to terminal 6 on 6K6-G close to chassis and in front of terminal board (under electrolytic).
7. Dress blue lead from antenna terminal close to top of chassis and clear of gang rotor.
8. Twisted leads from volume control must be dressed clear of self-tapping screws in corners of chassis.



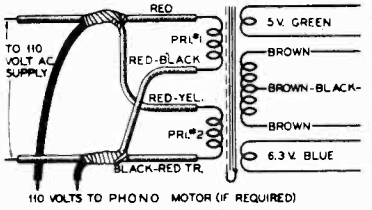


Connections of Loudspeaker and Cable

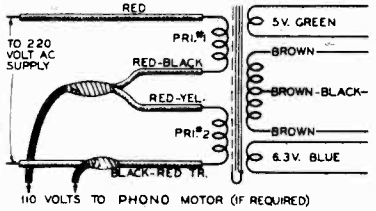
D-C RESISTANCE

PRIMARY #1	17 Ω
PRIMARY #2	19.5 Ω
H.V. SECONDARY (TOTAL)	770 Ω

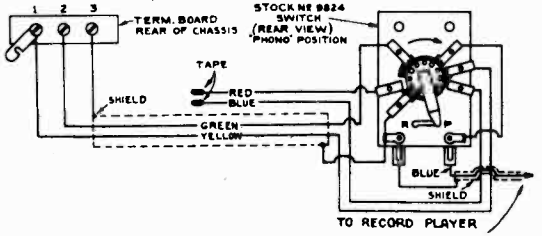
PRIMARIES CONNECTED IN PARALLEL FOR OPERATION ON 110-VOLT SUPPLY



PRIMARIES CONNECTED IN SERIES FOR OPERATION ON 220-VOLT SUPPLY



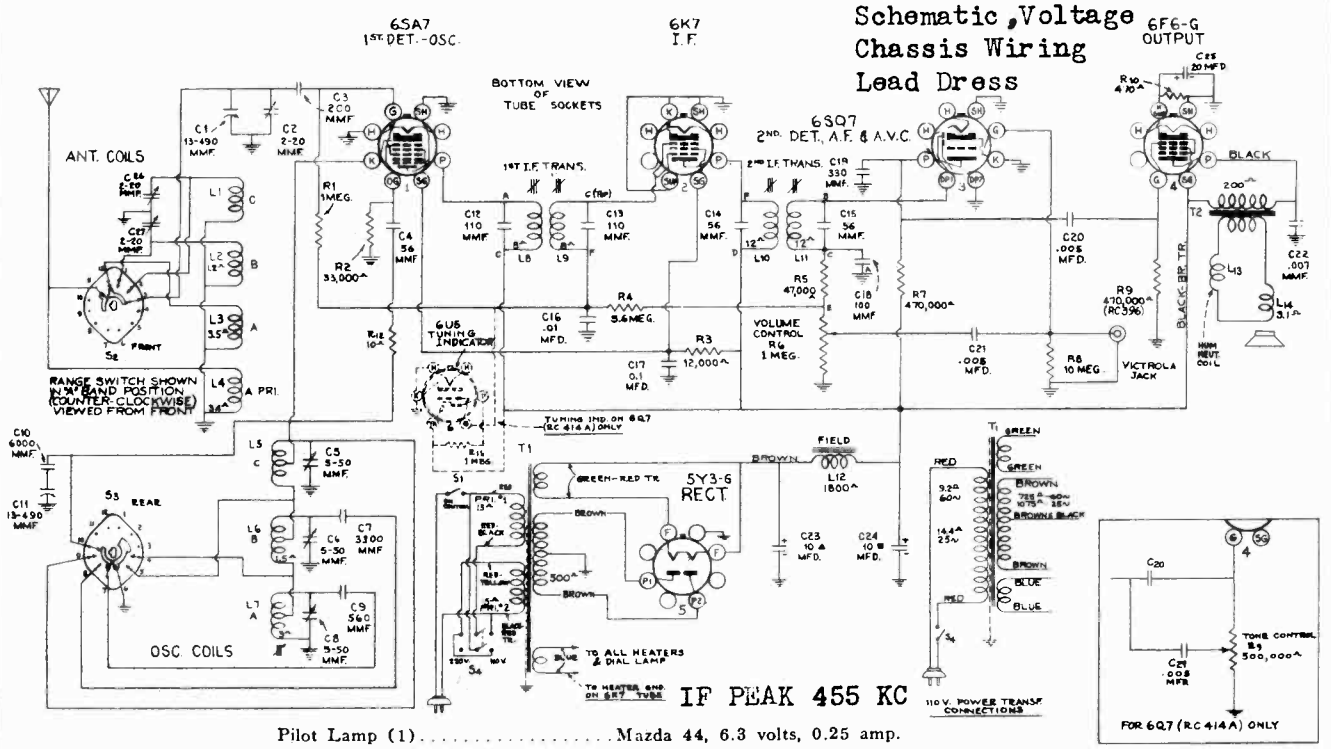
Connections of Universal Power Transformer Primary for 220 and 110 Volts



Victrola Attachment (Record Player).—Terminals are provided on the rear of the chassis for convenient connection to a Victrola Attachment (record player) such as the RCA R-93 and R-94 series. A stock No. 9824 switch may be used to change from radio to record player as shown at right.

RCA MFG. CO., INC.

MODELS 5Q5, 5Q5A to 5Q5E incl.
5Q55, 5Q56. Chassis RC-396
6Q7 Chassis RC-414A
Schematic, Voltage
Chassis Wiring
Lead Dress



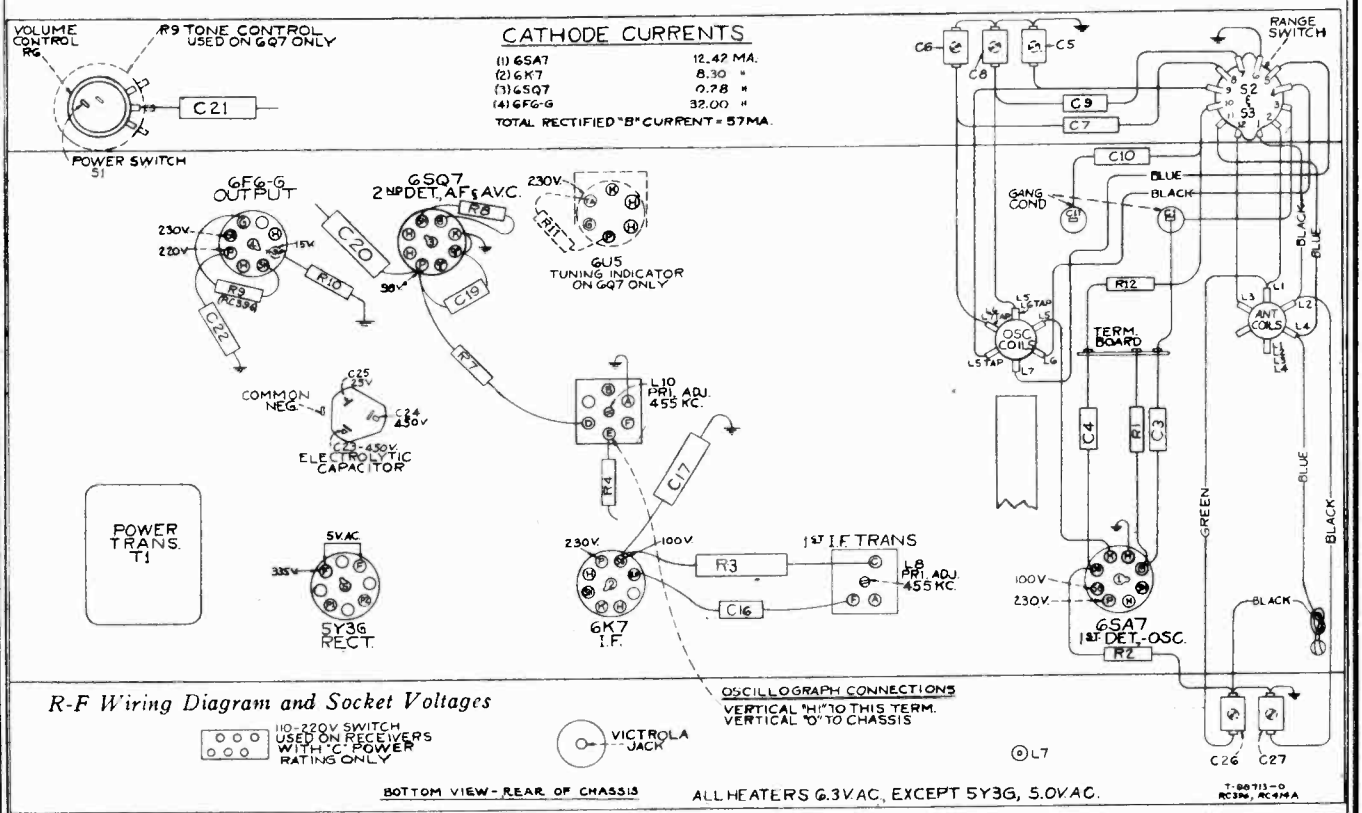
Pilot Lamp (1) ..... Mazda 44, 6.3 volts, 0.25 amp.

Precautionary Lead Dress

1. Lead from 2nd I.F. (E) to volume control should be kept close to chassis.
2. R.F. coil leads should be kept short and away from coil.
3. Leads to 6,000 mmf. (C10) should be as short as possible and condenser dressed away from chassis, bearing against 10 ohm (R12) resistor.

Victrola Attachment.—A jack is provided on the rear of chassis for connection to a Victrola Attachment. The cable from the attachment should be terminated in a Stock No. 31048 plug to fit the jack.

Loudspeaker.—To center the loudspeaker voice coil, first remove the front dust cover, then loosen the screws holding the spider assembly. Insert three narrow feelers into the air gap, and tighten the spider screws. Remove the feelers and fasten a dust cover in place with loudspeaker cement.



R-F Wiring Diagram and Socket Voltages

Measurements made to chassis unless otherwise indicated, with set tuned to quiet point and volume control at minimum. Values should hold within ± 20% with 117-volt a-c supply.

*NOTE: Values with star (*) are operating voltages in circuits with high series resistance. The actual measured voltages will be lower, depending on the voltmeter loading.

First Edition

MODELS 5Q5, 5Q5A to 5Q5E
5Q55, 5Q56, 6Q7

RCA MFG. CO., INC.

Alignment, Trimmers, Socket Drive Cords, Notes

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

Output Meter Alignment. — If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the ground terminal, and keep the output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment, therefore a calibration scale is attached to the rear of the drum which is mounted on the shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 45 degree mark on the drum scale (see "Drum Drive and Indicator Cord Assembly" drawings) must be in a horizontal position when the plates are fully meshed. The distance from the edge of the chassis to the drum must not exceed $\frac{3}{8}$-inch. The drum is held to the shaft by means of a set screw, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "0" mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 530 kc mark, and gang condenser fully meshed. The indicator has a spring clip for attachment to the cable.

Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
1	6K7 I-F grid cap, in series with .01 mfd.	455 kc	"A" Band quiet point between 550-750 kc	L10 and L11 (2nd I.F. trans.)
2	Tuning condenser stator (osc.) in series with .01 mfd. **	455 kc		L8 and L9 (1st I.F. trans.)
3	Antenna lead (blue) in series with 200 mmfd.	600 kc	600 kc (33°) "A" Band	L7†
4		1,500 kc	1,500 kc (152.4°) "A" Band	C2 (ant.) C8 (osc.)
5	Repeat steps 3 and 4			
6	Antenna lead (blue) in series with 400 ohms	20 mc	20 mc (155.4°) "C" Band	C5 (osc.) * C26 (ant.)
7		6 mc	6 mc (149°) "B" Band	C6 (osc.) * C27 (ant.)
8	Antenna lead (blue) in series with 200 mmf.	1,500 kc	1,500 kc (152.4°) "A" Band	C8 (osc.)

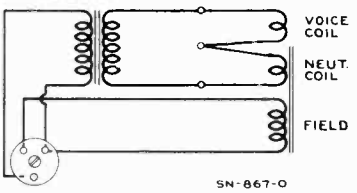
* Use minimum capacity peak if two peaks can be obtained.
† Rock gang condenser slightly while adjusting L7.
** Make test-oscillator connection to lug on tuning condenser stator (oscillator section) in series with .01 mfd. condenser.
Note.—Oscillator tracks 455 kc above signal on all bands.

LOUDSPEAKER

Type (5Q5, 5Q55, 5Q56) RL-78-2 ..... 5-inch Electrodynamic
(6Q7) ..... RL-79-2 ..... 6-inch Electrodynamic
Voice-Coil Impedance ..... 3.4 ohms at 400 cycles

POWER SUPPLY RATINGS

Rating A ..... 105-125 volts, 50-60 cycles, 70 watts
Rating B ..... 105-125 volts, 25-60 cycles, 70 watts
Rating C ..... 105-125/200-250 volts, 50-60 cycles, 70 watts



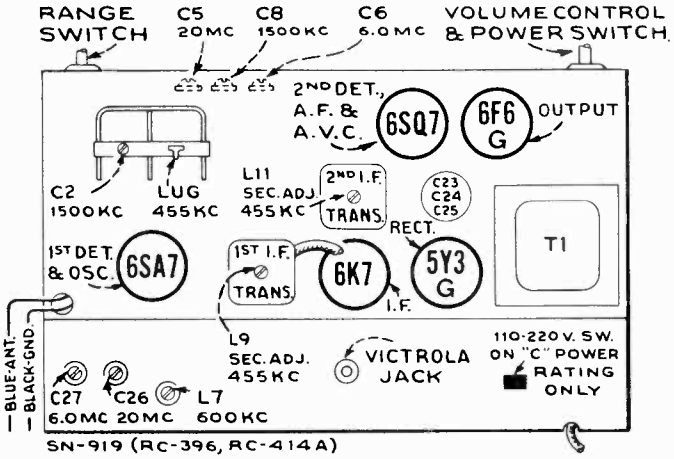
Connections and Colors of Speaker and Cable

POWER OUTPUT RATING

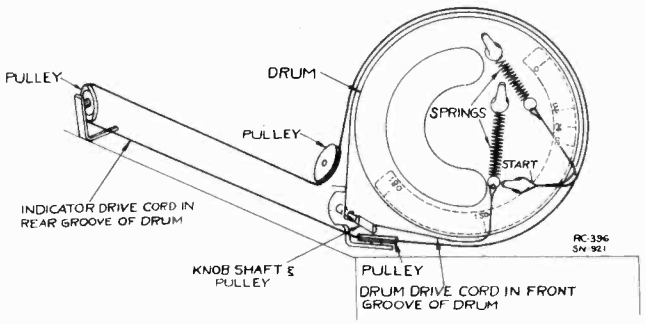
Undistorted ..... 1.5 watts
Maximum ..... 3.3 watts

FREQUENCY RANGES

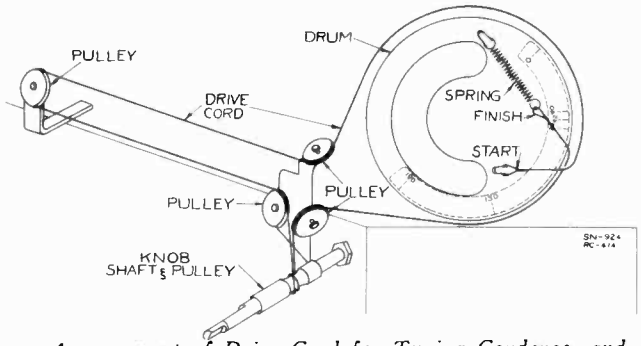
"Standard Broadcast" (A) ..... 540-1,720 kc (555-174 m)
"Medium Wave" (B) ..... 2.3-7.0 mc (130-42.8 m)
"Short Wave" (C) ..... 7.0-22.0 mc (42.8-13.6 m)
Intermediate Frequency ..... 455 kc



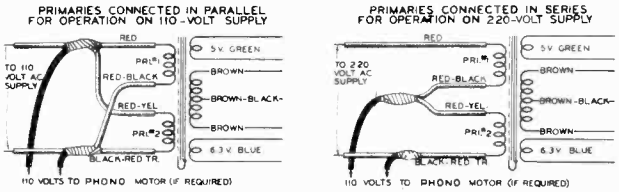
Tube and Trimmer Locations



Arrangement of Drive Cords for Tuning Condenser and Dial Indicator (Models 5Q5, 5Q55 and 5Q56) Drum Shown with Gang at Maximum Capacity

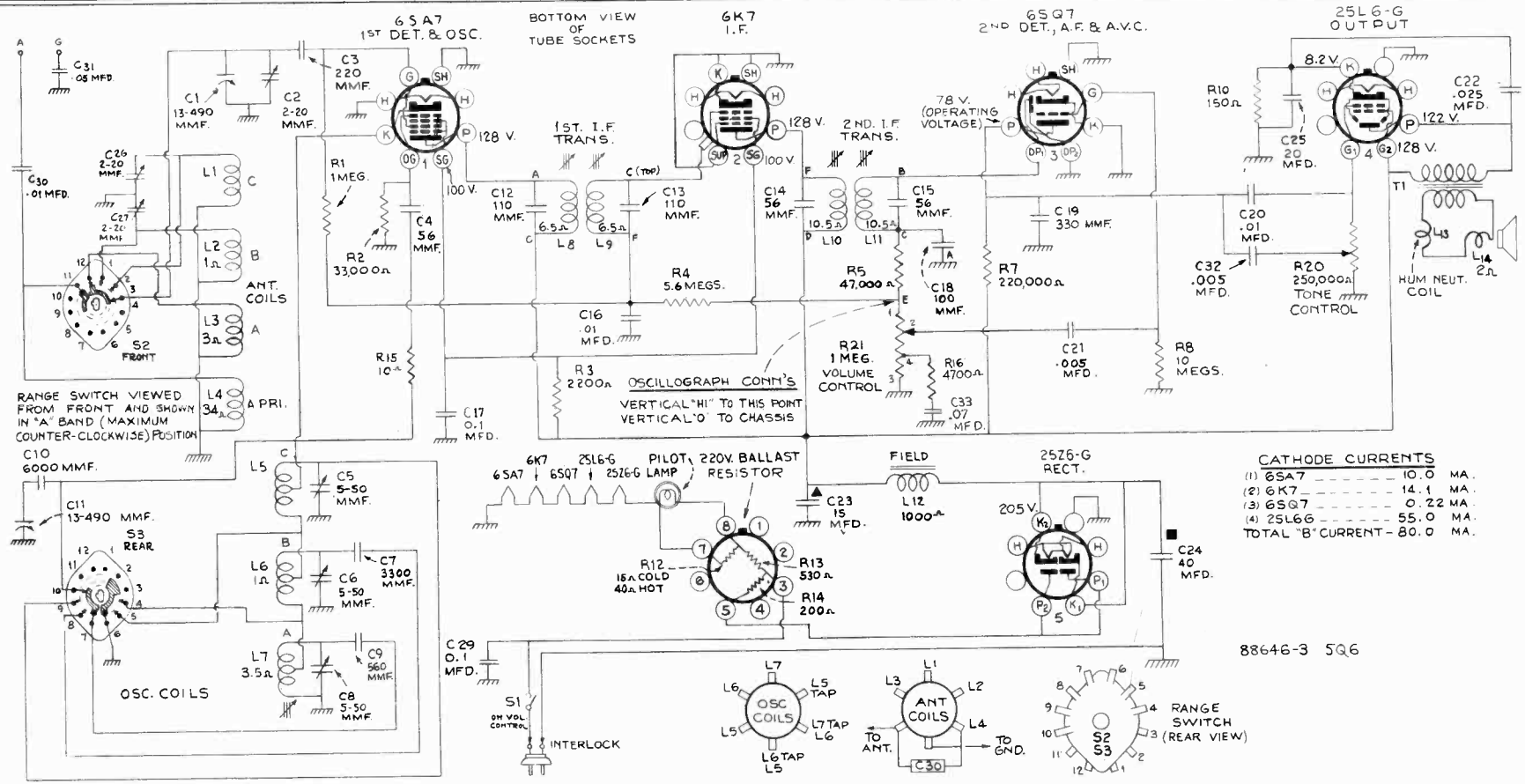


Arrangement of Drive Cord for Tuning Condenser and Dial Indicator (Model 6Q7) Drum Shown with Gang at Maximum Capacity



D-C Resistance { Primary No. 1 ..... 13 ohms
Primary No. 2 ..... 15 ohms
H. V. Secondary (Total) ..... 500 ohms

Connections of Universal Power Transformer Primary for 220 and 110 Volts



First Edition
1939

FREQUENCY RANGES
Standard Broadcast ("A" Band) ..... 540-1,720 kc (555-174 m)
Medium Wave ("B" Band) ..... 2.3-7.0 mc (130-42.8 m)
Short Wave ("C" Band) ..... 7.0-22 mc (42.8-13.6 m)

INTERMEDIATE FREQUENCY ..... 455 kc

General Description

Model 5Q6 is a three-band, table-type superheterodyne receiver housed in a plastic cabinet. It is designed for operation on 210-250 volts, 50-60 cycles AC, or 210-250 volts DC.

Features of design include: New type single-ended tubes (6SA7 and 6SQ7); magnetite core I-F transformers; magnetite core oscillator adjustment for "A" band; automatic volume control; bass compensation; electrodynamic loudspeaker; high-frequency tone control; straight-line dial; tropic-proof construction; streamline moulded cabinet.

Power Supply Polarity:

For operation on d-c, the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a-c, a similar reversal of the plug may reduce hum.

TUBE COMPLEMENT
(1) RCA-6SA7 ..... Detector-Oscillator
(2) RCA-6K7 ..... I-F Amplifier
(3) RCA-6SQ7 ... 2nd Detector, A.V.C., and A-F Amplifier
(4) RCA-25L6-G ..... Power Output
(5) RCA-25Z6-G ..... Rectifier

PILOT LAMP ..... Mazda No. 47, 6.3 volts, 0.15 amp.
Ballast Tube ..... RCA Stock No. 32849 for 210-250 volt operation.

POWER OUTPUT RATING
(210-250 Volt Operation)
Undistorted ..... 1.5 watts
Maximum ..... 2.7 watts

LOUDSPEAKER (84557-2)
Type 5-inch
V. C. Impedance ..... 2.2 ohms at 400 cycles

POWER SUPPLY RATINGS
210-250 volts, 50-60 cycles ..... 125 watts
210-250 volts, direct current ..... 125 watts

MODEL 5Q6, Chassis RC-477A
Alignment, Trimmers, Socket
Drive Cord, Notes

RCA MFG. CO., INC.

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the schematic.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver ground lead (black), and keep the output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the rear of the drum which is mounted on the front shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 135° mark on the drum scale must be vertical, and directly under the center of the gang-condenser shaft when the plates are fully meshed. The drum is held to the shaft by means of a set screw, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the 0° mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 530 kc mark, and gang condenser fully meshed. The indicator has a spring clip for attachment to the cable.

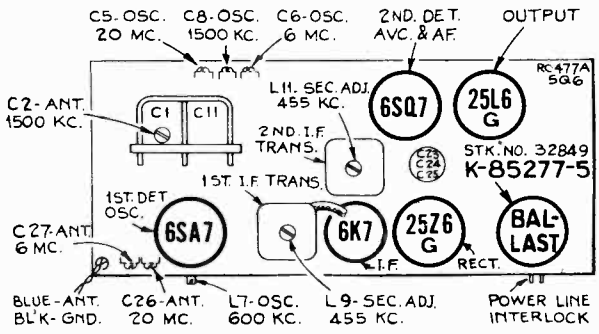
Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
1	6K7 I-F grid cap, in series with .01 mfd.	455 kc	"A" Band quiet point between 550-750 kc	L10 and L11 (2nd I.F. trans.)
2	Tuning condenser stator (osc.) in series with .01 mfd. **	455 kc		L8 and L9 (1st I.F. trans.)
3	Antenna lead in series with 200 mmfd.	600 kc	600 kc (33°) "A" Band	L7†
4		1,500 kc	1,500 kc (152.4°) "A" Band	C2 (ant.) C8 (osc.)
5	Repeat steps 3 and 4			
6	Antenna lead in series with 400 ohms	20 mc	20 mc (155.4°) "C" Band	C5 (osc.)* C26 (ant.)
7		6 mc	6 mc (148°) "B" Band	C6 (osc.)* C27 (ant.)
8	Antenna lead in series with 200 mmf.	1,500 kc	1,500 kc (152.4°) "A" Band	C8 (osc.)

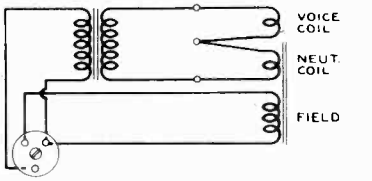
* Use minimum capacity peak if two peaks can be obtained.

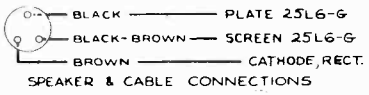
† Rock gang condenser slightly while adjusting L7.

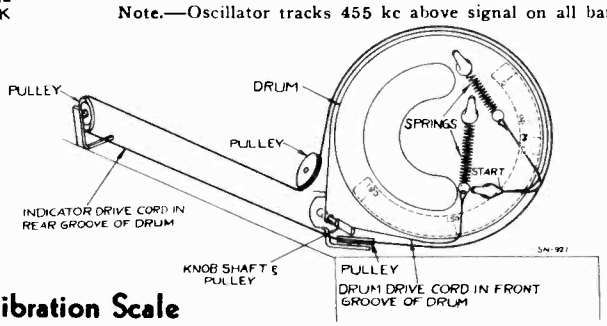
** Make test-oscillator connection to lug on tuning condenser stator (oscillator section) in series with .01 mfd. condenser.

Note.—Oscillator tracks 455 kc above signal on all bands.

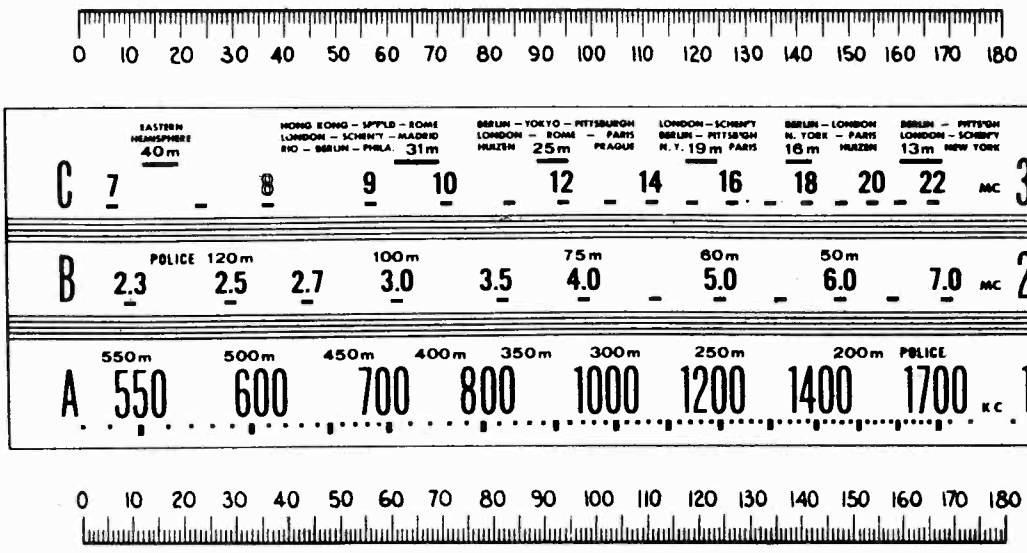








Calibration Scale



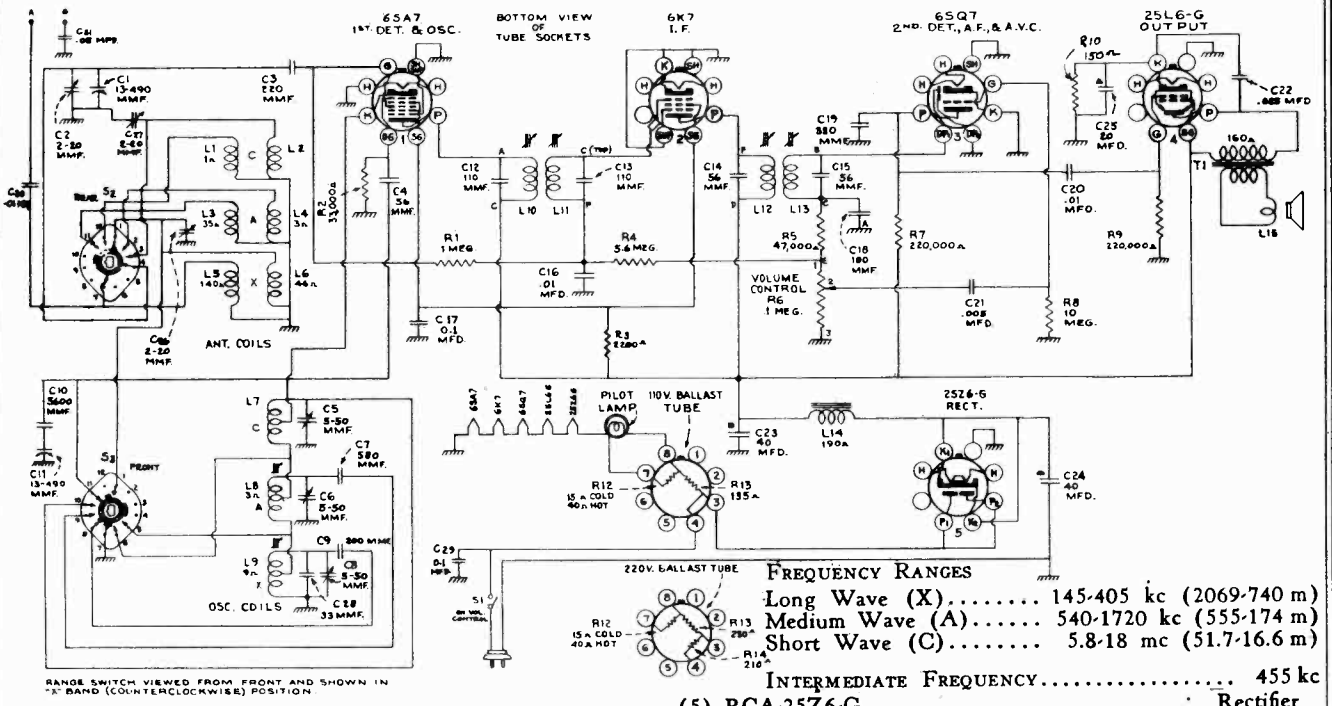
Reduced Reproduction of Receiver Dial, and Corresponding 0-180° Calibration Scales

The corresponding position of the dial indicator for any setting of the calibration scale can be determined by drawing a line from this point on the bottom calibration scale to the same point on the top calibration scale. For example: 33° on the calibration scale corresponds to approximately 7.9 mc on "C" band, and 600 kc on "A" band, etc. Read instructions under "Alignment Procedure."

Chassis Wiring, Lead Dress

RCA MFG. CO. INC.

MODEL 5Q8, Chassis RC-396B
Schematic, Voltage



Frequency Ranges

Long Wave (X)	145-405 kc	(2069-740 m)
Medium Wave (A)	540-1720 kc	(555-174 m)
Short Wave (C)	5.8-18 mc	(51.7-16.6 m)

Intermediate Frequency ..... 455 kc
(5) RCA-25Z6-G ..... Rectifier
Ballast Tubes ..... RCA Stock No. 32544 for 105-125 volt operation; RCA Stock No. 32850 for 210-250 volt operation.
Pilot Lamp ..... Mazda No. 47, 6.3 volts, 0.15 amp.

Loudspeaker
Type 5-inch
V. C. Impedance ..... 3.0 ohms at 400 cycles

Power Output Rating
(210-250 Volt Operation)

Undistorted	1.5 watts
Maximum	2.7 watts

(105-125 Volt Operation)

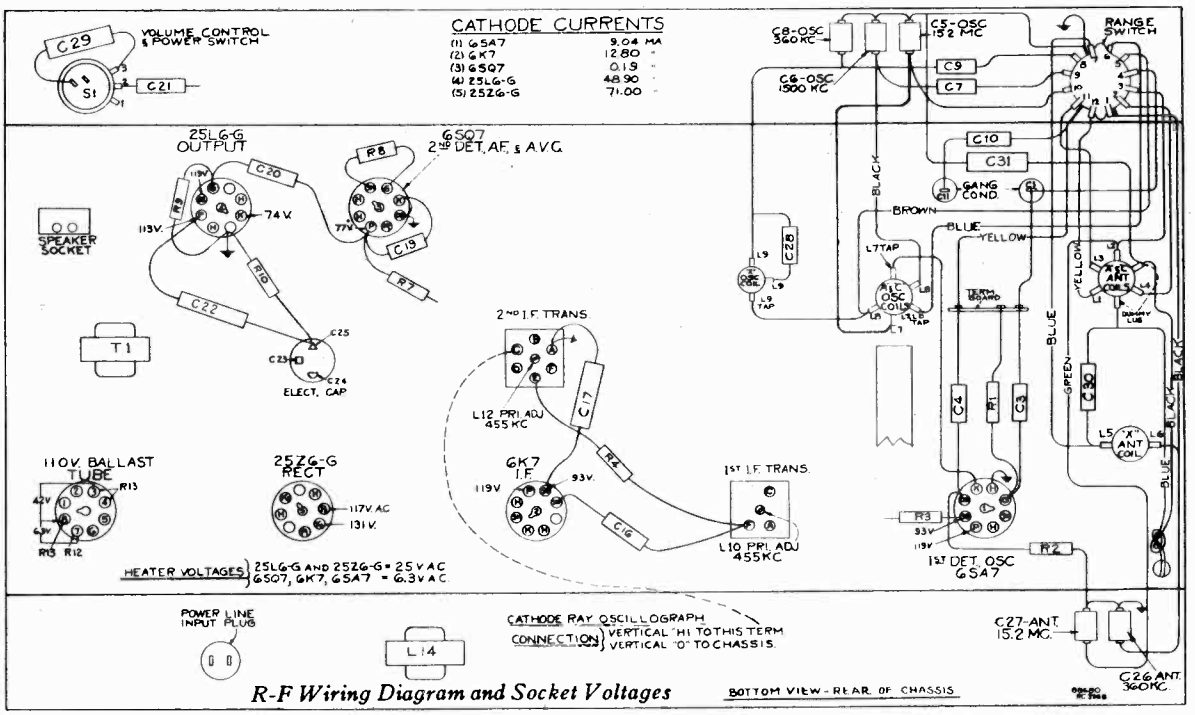
Undistorted	1.7 watts
Maximum	2.9 watts

Power Supply Ratings

105-125 volts, AC-DC	65 watts
210-250 volts, AC-DC	125 watts

Precautionary Lead Dress:

1. Lead from 2nd I-F transformer to volume control should be kept close to the chassis and dressed against front apron.
2. C-10 should be dressed away from the antenna section of the variable condenser (C-1).



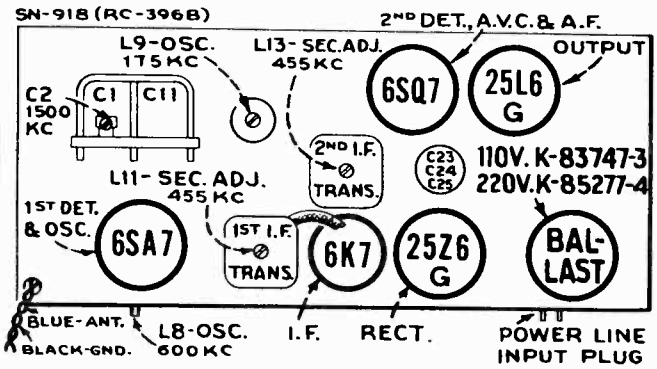
R-F Wiring Diagram and Socket Voltages

Measurements made to chassis unless otherwise indicated, with set tuned to quiet point and volume control at minimum. Values should hold within ±20% with 117-volt a-c supply.

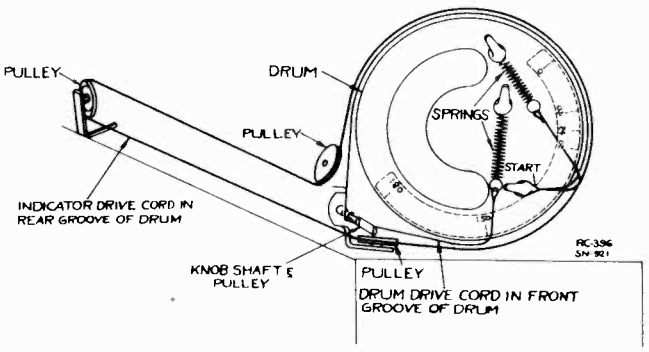
***NOTE:** Values with star (*) are operating voltages in circuits with high series resistance. The actual measured voltages will be lower, depending on the voltmeter loading.

MODEL 5Q8, Chassis RC-396B
Alignment, Trimmers
Drive Cord , Socket

RCA MFG. CO., INC.



Tube and Trimmer Locations



Arrangement of Drive Cords for Tuning Condenser and Dial Indicator

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum. — The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the rear of the drum which is mounted on the front shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 135° mark on the drum scale must be vertical, and directly under the center of the gang-condenser shaft when the plates are fully meshed. The drum is held to the shaft by means of one set screw, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the 0° mark on the calibration scale when the plates are fully meshed.

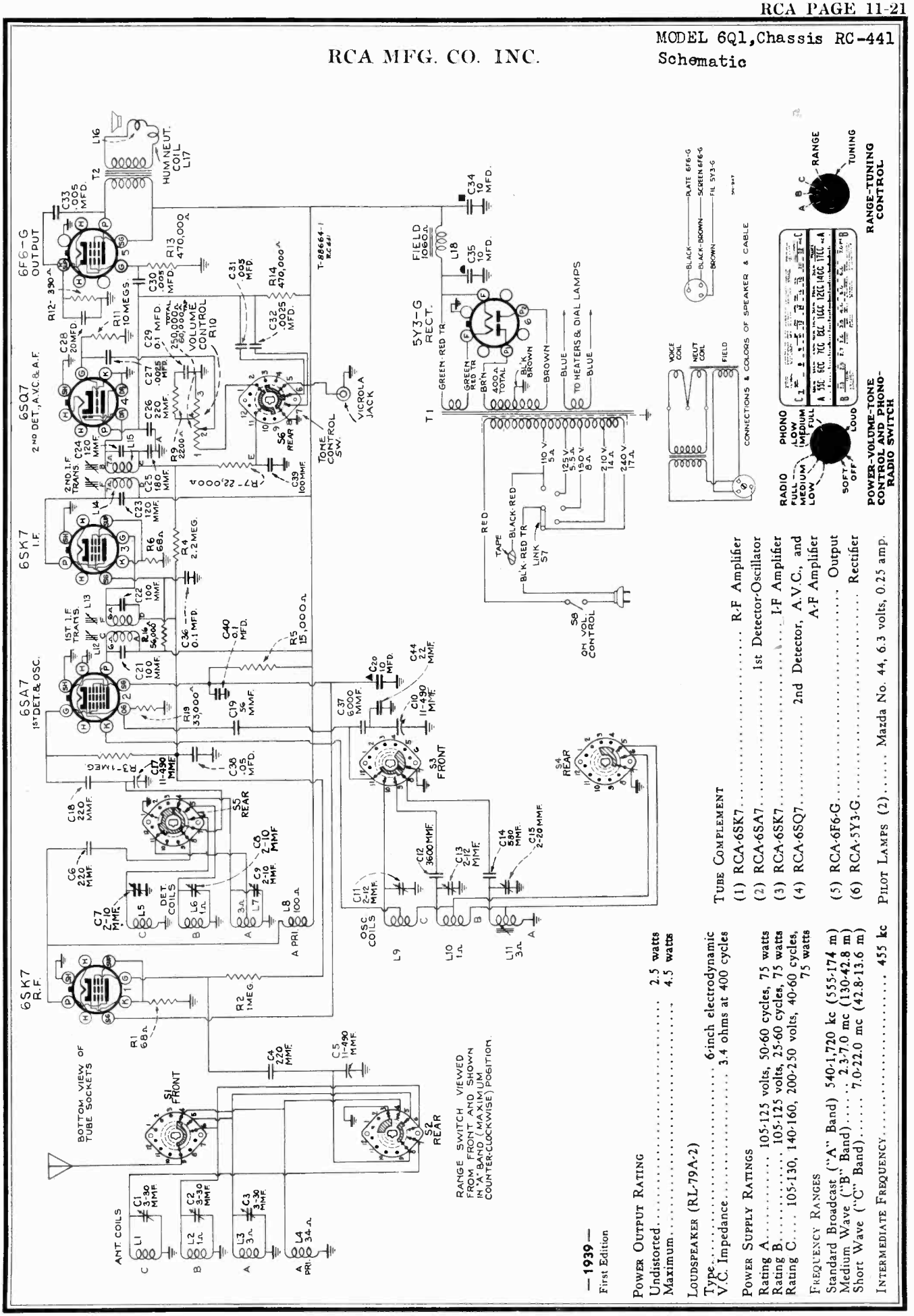
Steps	Connect the high side of the test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
1	6K7 I-F grid cap in series with .01 mfd.	455 kc	"A" Band Quiet Point between 550-750 kc	L12 and L13 (2nd I-F Trans.)
2	6SA7 det. grid in series with .01 mfd.	455 kc		L10 and L11 (1st I-F Trans.)
3	Ant. terminal in series with 200 mmf.	1,500 kc	1,500 kc (152.4°) "A" Band	C6 (osc.) C2 (ant.)
4	Ant. terminal in series with 200 mmf.	600 kc	600 kc (33°) "A" Band	L8 (osc.)
5	Repeat steps 3 and 4			
6	Ant. terminal in series with 200 mmf.	360 kc	360 kc (151.5°) "X" Band	C8 (osc.) C26 (ant.)
7	Ant. terminal in series with 200 mmf.	175 kc	175 kc (53.3°) "X" Band	L9 (osc.)
8	Repeat steps 6 and 7			
9	Ant. terminal in series with 300 ohms	15.2 mc	15.2 mc (147.2°) "C" Band	C5 (osc.)* C27 (ant.)
10	Ant. terminal in series with 200 mmf.	360 kc	360 kc (151.5°) "X" Band	C8 (osc.)
11	Ant. terminal in series with 200 mmf.	1,500 kc	1,500 kc (152.4°) "A" Band	C6 (osc.)

*Use minimum capacity peak if two can be obtained. Check to determine that C5 is adjusted to correct peak by tuning receiver to approximately 14.29 mc where a weaker signal should be received.

NOTE: Oscillator tracks **above** signal on all bands.

RCA MFG. CO. INC.

MODEL 6Q1, Chassis RC-441
Schematic



— 1939 —
First Edition

Power Output Rating
Undistorted ..... 2.5 watts
Maximum ..... 4.5 watts

Loudspeaker (RL-79A-2)
Type ..... 6-inch electrodynamic
V.C. Impedance ..... 3.4 ohms at 400 cycles

Power Supply Ratings
Rating A ..... 105-125 volts, 50-60 cycles, 75 watts
Rating B ..... 105-125 volts, 25-60 cycles, 75 watts
Rating C .... 105-130, 140-160, 200-250 volts, 40-60 cycles, 75 watts

Frequency Ranges
Standard Broadcast ("A" Band) 540-1,720 kc (555-174 m)
Medium Wave ("B" Band) ..... 2.3-7.0 mc (130-42.8 m)
Short Wave ("C" Band) ..... 7.0-22.0 mc (42.8-13.6 m)

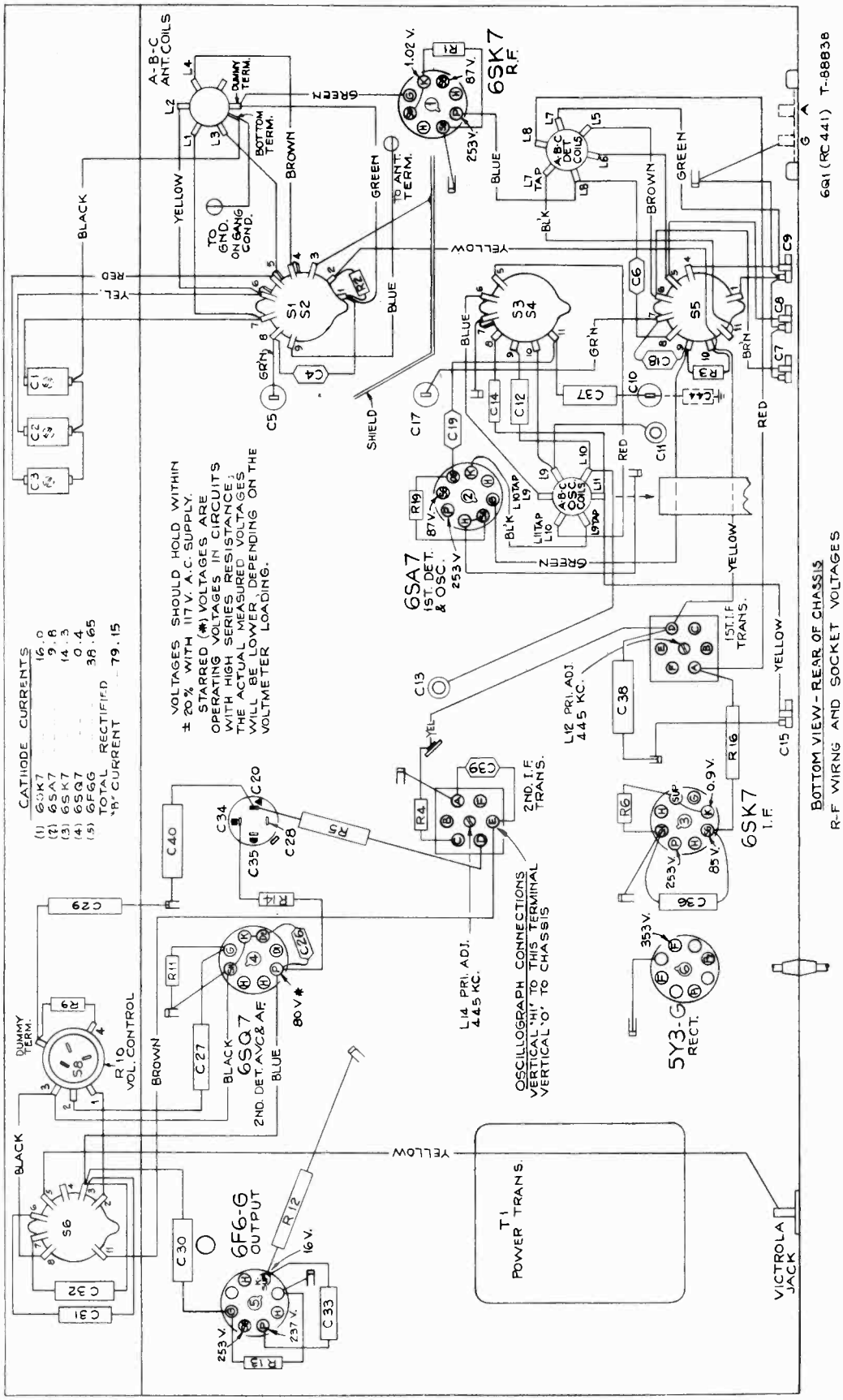
Intermediate Frequency ..... 455 kc

Tube Complement
(1) RCA-6SK7 ..... R-F Amplifier
(2) RCA-6SA7 ..... 1st Detector-Oscillator
(3) RCA-6SK7 ..... I-F Amplifier
(4) RCA-6SQ7 ..... 2nd Detector, A.V.C., and A-F Amplifier
(5) RCA-6F6-G ..... Output
(6) RCA-5Y3-G ..... Rectifier

Pilot Lamps (2) ..... Mazda No. 44, 6.3 volts, 0.25 amp.

MODEL 6Q1, Chassis RC-441
Chassis Wiring, Voltage
Lead Dress

RCA MFG. CO. INC.



Precautionary Lead Dress:

1. Dress yellow lead from antenna coil to first section of range switch away from adjoining wires.
2. Dress green lead from middle section of gang and green lead from 6SA7 to the rear section of the range switch. away from chassis, ground leads, other wires and capacitors.
3. Dress brown lead, from detector coil to rear section of the range switch away from the detector coil; loop brown lead toward rear apron.
4. Dress black lead from 2nd I. F. transformer "B" to 6SQ7 socket against chassis.
5. Twist power leads together, and dress away from 6SQ7 socket.
6. Dress blue lead from 6SK7 (R-F) socket to detector coil away from chassis, ground shields and other wires.
7. Dress black lead from antenna trimmer (C1) to antenna coil away from range switch link action.
8. Dress black speaker lead around output socket toward power transformer, against base.
9. Keep green lead of 6SK7 R-F grid circuit away from blue antenna lead.

RCA MFG. CO., INC.

MODEL 6Q1, Chassis RC-441
Alignment, Trimmers, Socket
Drive Cord and Controls

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

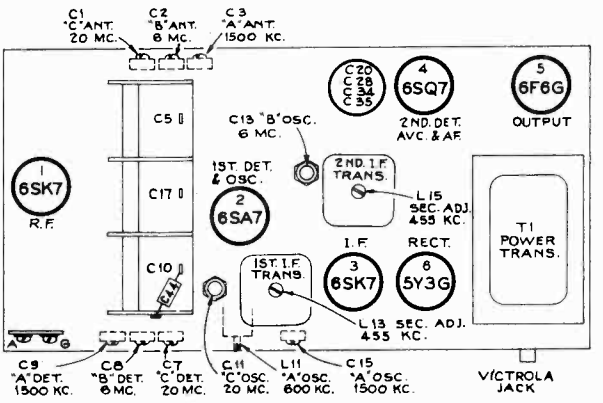
Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum. — The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the rear of the drum which is mounted on the front shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 180° mark on the drum scale must be vertical, and directly over the center of the gang-condenser shaft when the plates are fully meshed. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the 180° mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 530 kc mark, and gang condenser fully meshed.

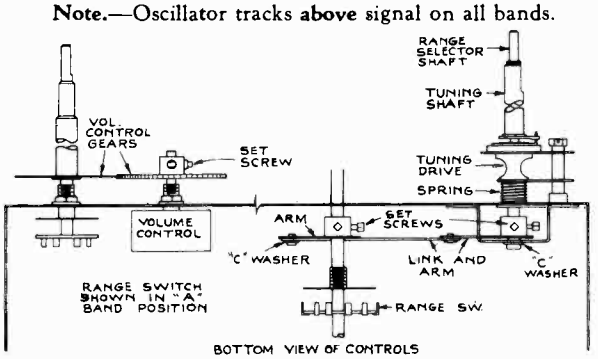


Steps	Connect the high side of the test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	6SK7 I-F grid in series with .01 mfd.	455 kc	"A" Band Quiet point between 550-750 kc	L14 and L15 (2nd I-F trans.)
2	6SA7 grid in series with .01 mfd.			L12 and L13 (1st I-F trans.)
3	Ant. terminal in series with 200 mmfd.	600 kc	600 kc (148°) "A" Band	L11 (osc.) Rock gang
4		1,500 kc	1,500 kc (28°) "A" Band	C15 (osc.) C9 (det.) C3 (ant.)
5	Repeat steps 3 and 4.			
6	Ant. terminal in series with 300 ohms	6 mc	6 mc (31°) "B" Band	C13 (osc.)* C8 (det.) C2 (ant.)
7		20 mc	20 mc (23°) "C" Band	C11 (osc.)** C7 (det.) C1 (ant.)

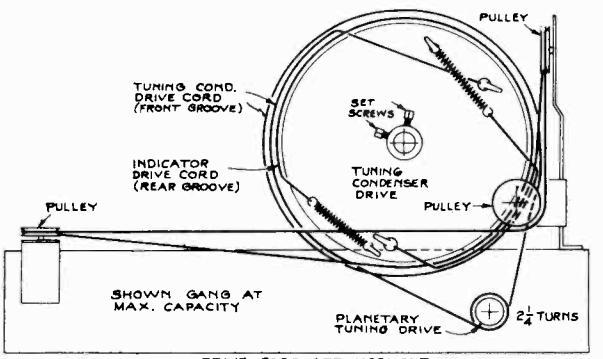
* Use **minimum** capacity peak if two can be obtained. Check to determine that C13 has been adjusted to the correct peak by tuning receiver to approximately 5.09 mc where a weaker signal should be received.

** Use **minimum** capacity peak if two can be obtained. Check to determine that C11 has been adjusted to the correct peak by tuning the receiver to approximately 19.09 mc where a weaker signal should be received.

Note.—Oscillator tracks **above** signal on all bands.



BOTTOM VIEW OF CONTROLS



DRIVE CORD ARRANGEMENT

MODEL 6Q4, Chassis RC-441A
Alignment, Trimmers
Drive Cord, Socket

RCA MFG. CO., INC.
Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

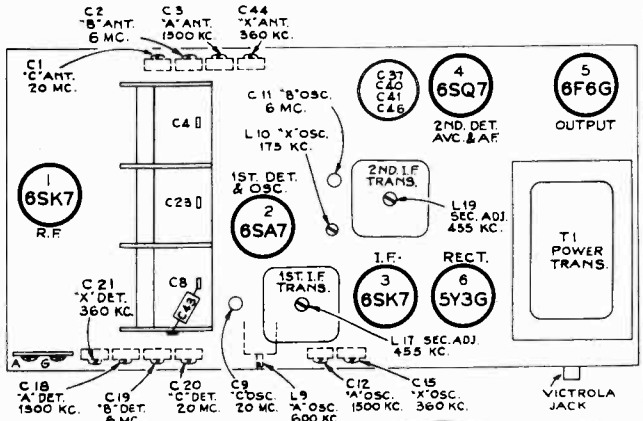
Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

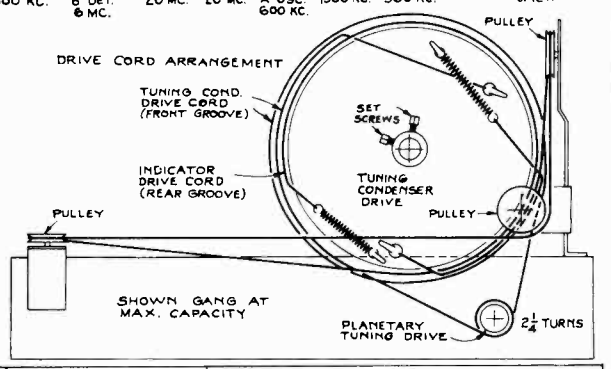
Calibration Scale on Indicator-Drive-Cord Drum. — The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the rear of the drum which is mounted on the front shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 180° mark on the drum scale must be vertical, and directly over the center of the gang-condenser shaft when the plates are fully meshed. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the 180° mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 530 kc mark, and gang condenser fully meshed.





Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	Turn tone control to 3rd position (sharp) from maximum counter-clockwise.			
2	6SK7 I-F grid in series with .01 mfd.	455 kc	"A" Band Quiet point between 550-750 kc	L18 and L19 (2nd I-F trans.)
3	6SA7 grid in series with .01 mfd.			L16 and L17 (1st I-F trans.)
4	Turn tone control to 4th position (broad) from maximum counter-clockwise and check I-F response which should be a slightly double-peaked curve. Leave tone control in 3rd position (sharp) for the following steps.			
5	Ant. terminal in series with 200 mmfd.	360 kc	360 kc (31.5°) "X" Band	C15 (osc.)† C21 (det.) C44 (ant.)
6		175 kc	175 kc (127.2°) "X" Band	L10 (osc.) Rock gang
7		1,500 kc	1,500 kc (28°) "A" Band	C12 (osc.)†† C18 (det.) C3 (ant.)
8		600 kc	600 kc (148°) "A" Band	L9 (osc.) Rock gang
9	Repeat steps 5, 6, 7, and 8.			
10	Ant. terminal in series with 300 ohms	6 mc	6 mc (30°) "B" Band	C11 (osc.)* C19 (det.) C2 (ant.)
11		20 mc	20 mc (23°) "C" Band	C9 (osc.)** C20 (det.) C1 (ant.)

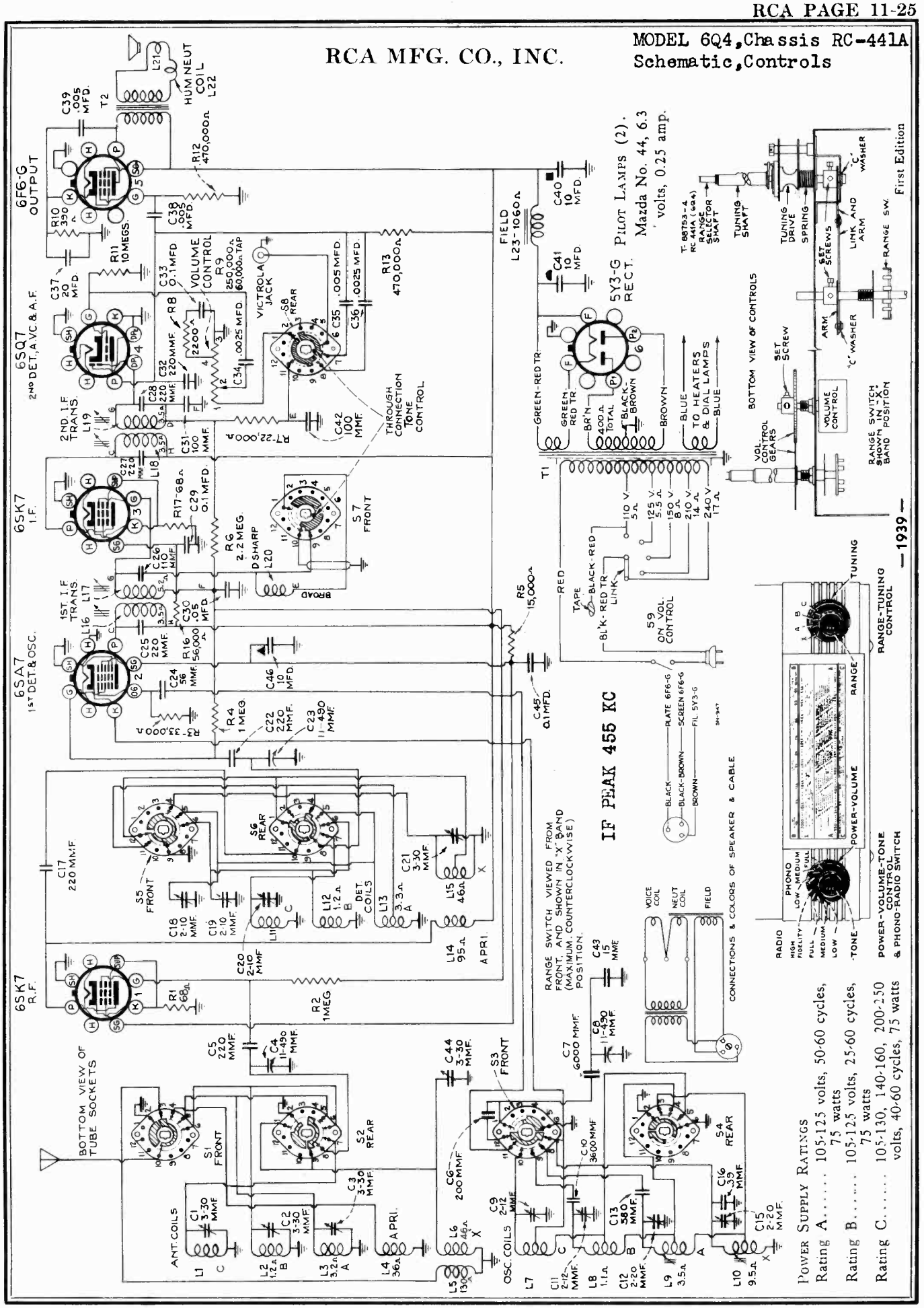
* Use **minimum** capacity peak if two can be obtained. Check to determine that C11 has been adjusted to the correct peak by tuning receiver to approximately 5.09 mc where a weaker signal should be received.

** Use **minimum** capacity peak if two can be obtained. Check to determine that C9 has been adjusted to the correct peak by tuning receiver to approximately 19.09 mc where a weaker signal should be received.

† Preset L10 core approximately ½-inch out before adjusting C15.

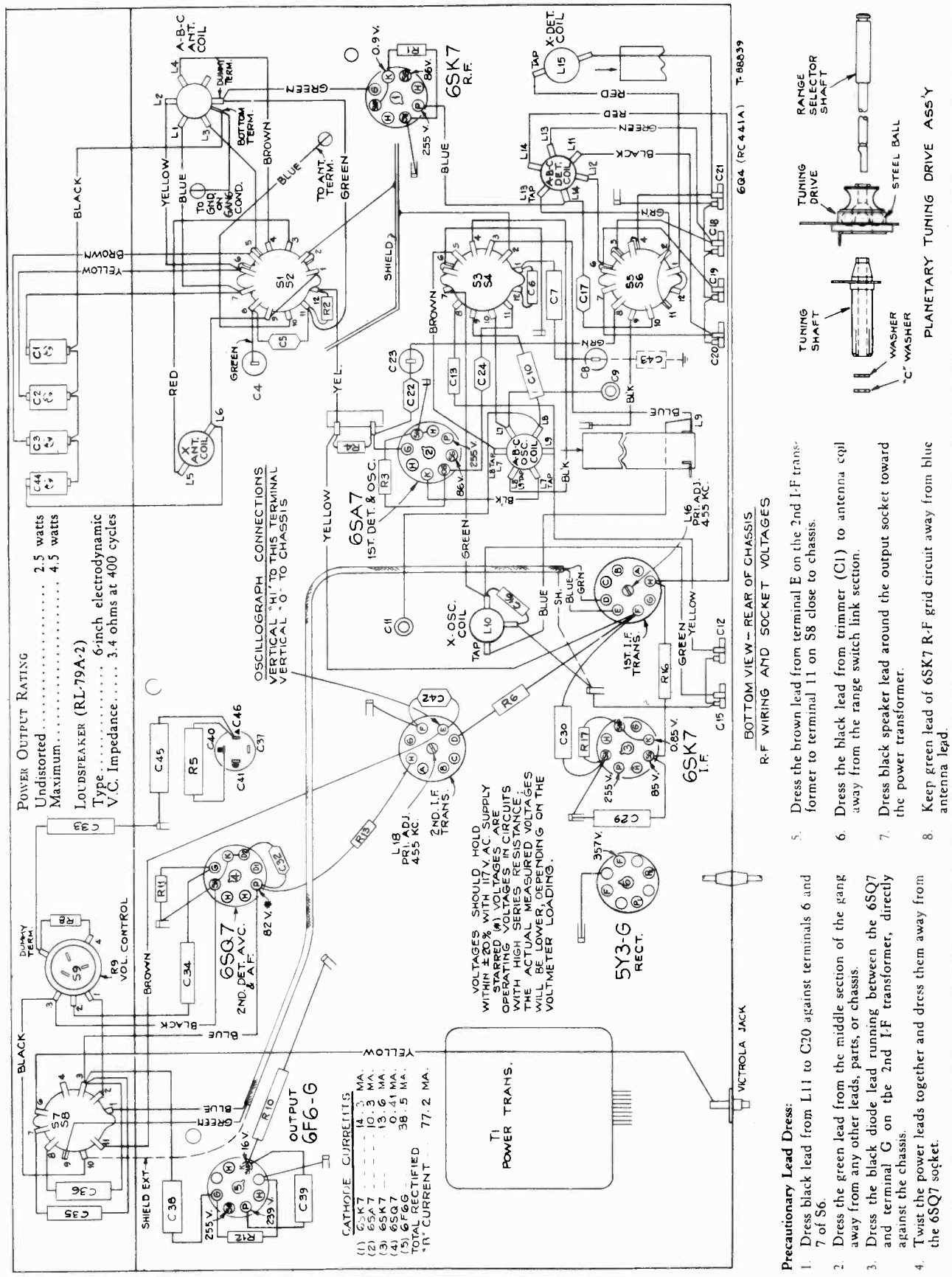
†† Preset L9 core screw flush with apron before adjusting C12.

Note.—Oscillator tracks **above** signal on all bands.



MODEL 6Q4, Chassis RC-441A
Chassis Wiring, Voltage
Lead Dress

RCA MFG. CO., INC.

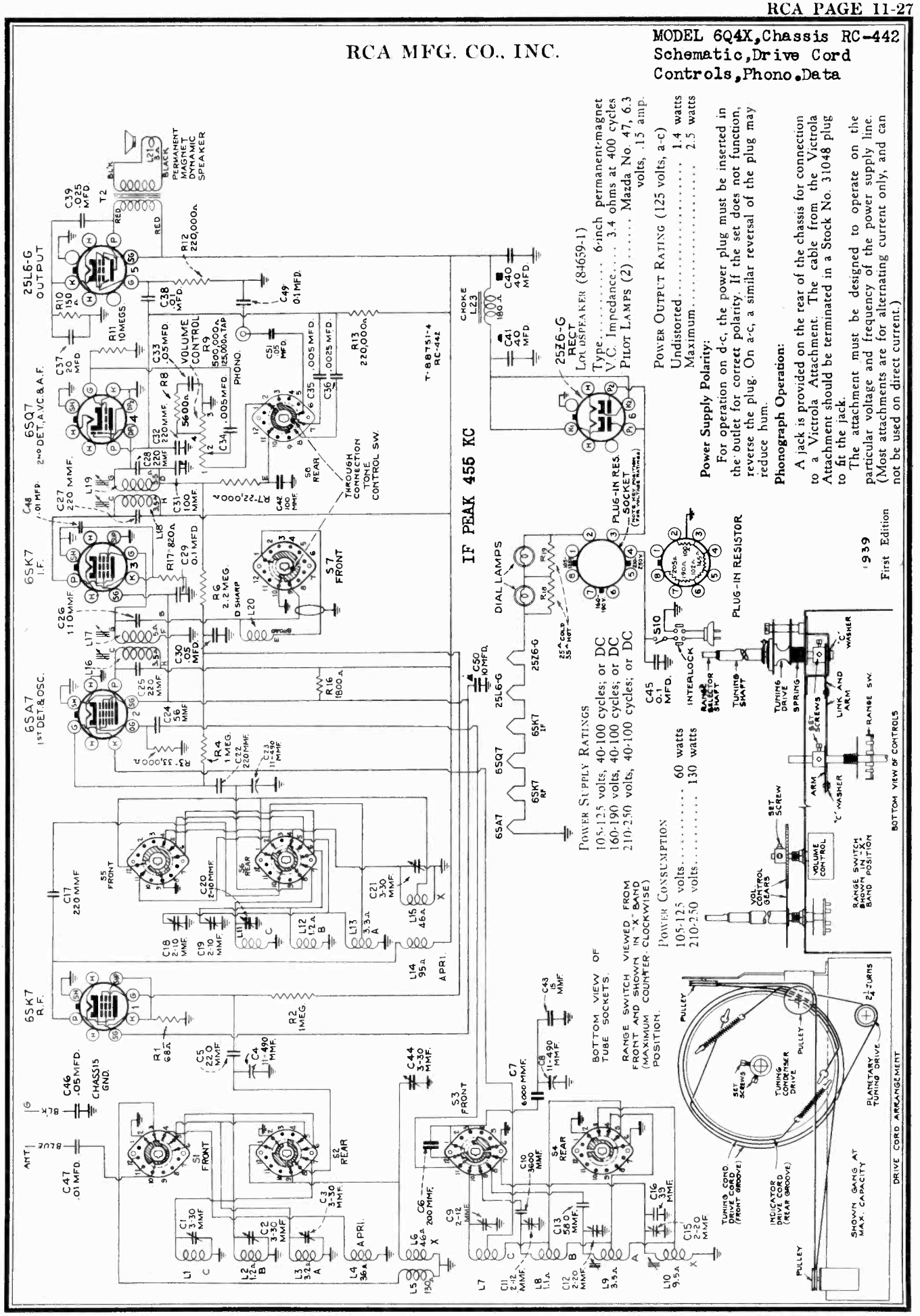


Precautionary Lead Dress:

1. Dress black lead from L11 to C20 against terminals 6 and 7 of S6.
2. Dress the green lead from the middle section of the gang away from any other leads, parts, or chassis.
3. Dress the black diode lead running between the 6SQ7 and terminal G on the 2nd I-F transformer, directly against the chassis.
4. Twist the power leads together and dress them away from the 6SQ7 socket.
5. Dress the brown lead from terminal E on the 2nd I-F transformer to terminal 11 on S8 close to chassis.
6. Dress the black lead from trimmer (C1) to antenna coil away from the range switch link section.
7. Dress black speaker lead around the output socket toward the power transformer.
8. Keep green lead of 6SK7 R-F grid circuit away from blue antenna lead.

RCA MFG. CO., INC.

MODEL 6Q4X, Chassis RC-442
Schematic, Drive Cord
Controls, Phono. Data



Power Consumption

105-125 volts	60 watts
210-250 volts	130 watts

Power Supply Ratings

105-125 volts, 40-100 cycles; or DC
160-190 volts, 40-100 cycles; or DC
210-250 volts, 40-100 cycles; or DC

Power Output Rating (125 volts, a-c)

Undistorted	1.4 watts
Maximum	2.5 watts

Power Supply Polarity:

For operation on d-c, the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a-c, a similar reversal of the plug may reduce hum.

Phonograph Operation:

A jack is provided on the rear of the chassis for connection to a Victrola Attachment. The cable from the Victrola Attachment should be terminated in a Stock No. 31048 plug to fit the jack.

The attachment must be designed to operate on the particular voltage and frequency of the power supply line. (Most attachments are for alternating current only, and can not be used on direct current.)

Loudspeaker (84659-1)
Type ..... 6-inch permanent-magnet
V.C. Impedance ..... 3.4 ohms at 400 cycles
Pilot Lamps (2) ..... Mazda No. 47, 6.3 volts, .15 amp.

1939
First Edition

MODEL 6Q4X, Chassis RC-442
Alignment, Trimmers
Socket

RCA MFG. CO., INC.
Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

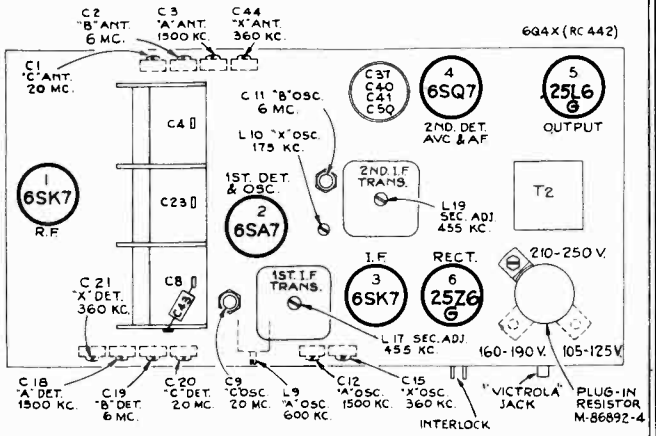
Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the black lead and keep the output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum. — The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the rear of the drum which is mounted on the front shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

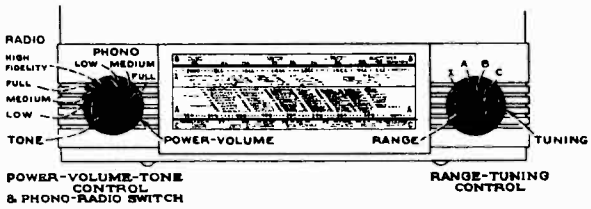
As the first step in r-f alignment, check the position of the drum. The 180° mark on the drum scale must be vertical, and directly over the center of the gang-condenser shaft when the plates are fully meshed. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the 180° mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 530 kc mark, and gang condenser fully meshed.



SEE 6Q4 FOR PLANETARY TUNING DRIVE ASS'Y



Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	Turn tone control to 3rd position (sharp) from maximum counter-clockwise.			
2	6SK7 I-F grid in series with .01 mfd.	455 kc	"A" Band Quiet point between 550-750 kc	L18 and L19 (2nd I-F trans.)
3	6SA7 grid in series with .01 mfd.			L16 and L17 (1st I-F trans.)
4	Turn tone control to 4th position (broad) from maximum counter-clockwise and check I-F response which should be a slightly double-peaked curve. Leave tone control in 3rd position (sharp) for the following steps.			
5	Ant. terminal in series with 200 mmfd.	360 kc	360 kc (31.5°) "X" Band	C15 (osc.)† C21 (det.) C44 (ant.)
6		175 kc	175 kc (127.2°) "X" Band	L10 (osc.) Rock gang
7		1,500 kc	1,500 kc (28°) "A" Band	C12 (osc.)†† C18 (det.) C3 (ant.)
8		600 kc	600 kc (148°) "A" Band	L9 (osc.) Rock gang
9	Repeat steps 5, 6, 7, and 8.			
10	Ant. terminal in series with 300 ohms	6 mc	6 mc (30°) "B" Band	C11 (osc.)* C19 (det.) C2 (ant.)
11		20 mc	20 mc (23°) "C" Band	C9 (osc.)** C20 (det.) C1 (ant.)

* Use **minimum** capacity peak if two can be obtained. Check to determine that C11 has been adjusted to the correct peak by tuning receiver to approximately 5.09 mc where a weaker signal should be received.

** Use **minimum** capacity peak if two can be obtained. Check to determine that C9 has been adjusted to the correct peak by tuning receiver to approximately 19.09 mc where a weaker signal should be received.

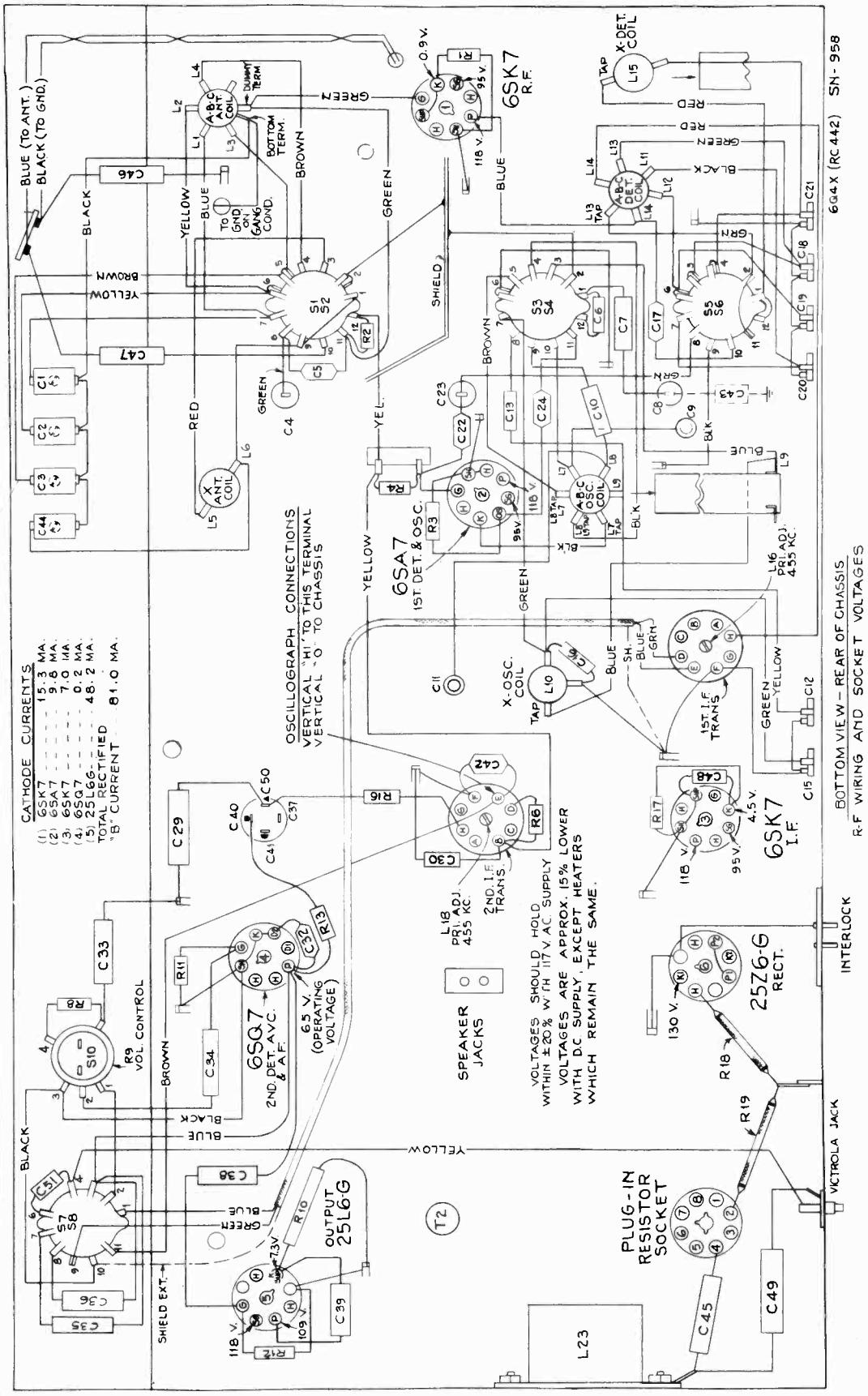
† Preset L10 core approximately ½-inch out before adjusting C15.

†† Preset L9 core screw flush with apron before adjusting C12.

Note.—Oscillator tracks **above** signal on all bands.

RCA MFG. CO., INC.

MODEL 6Q4X, Chassis RC-442
Chassis Wiring, Voltage
Lead Dress

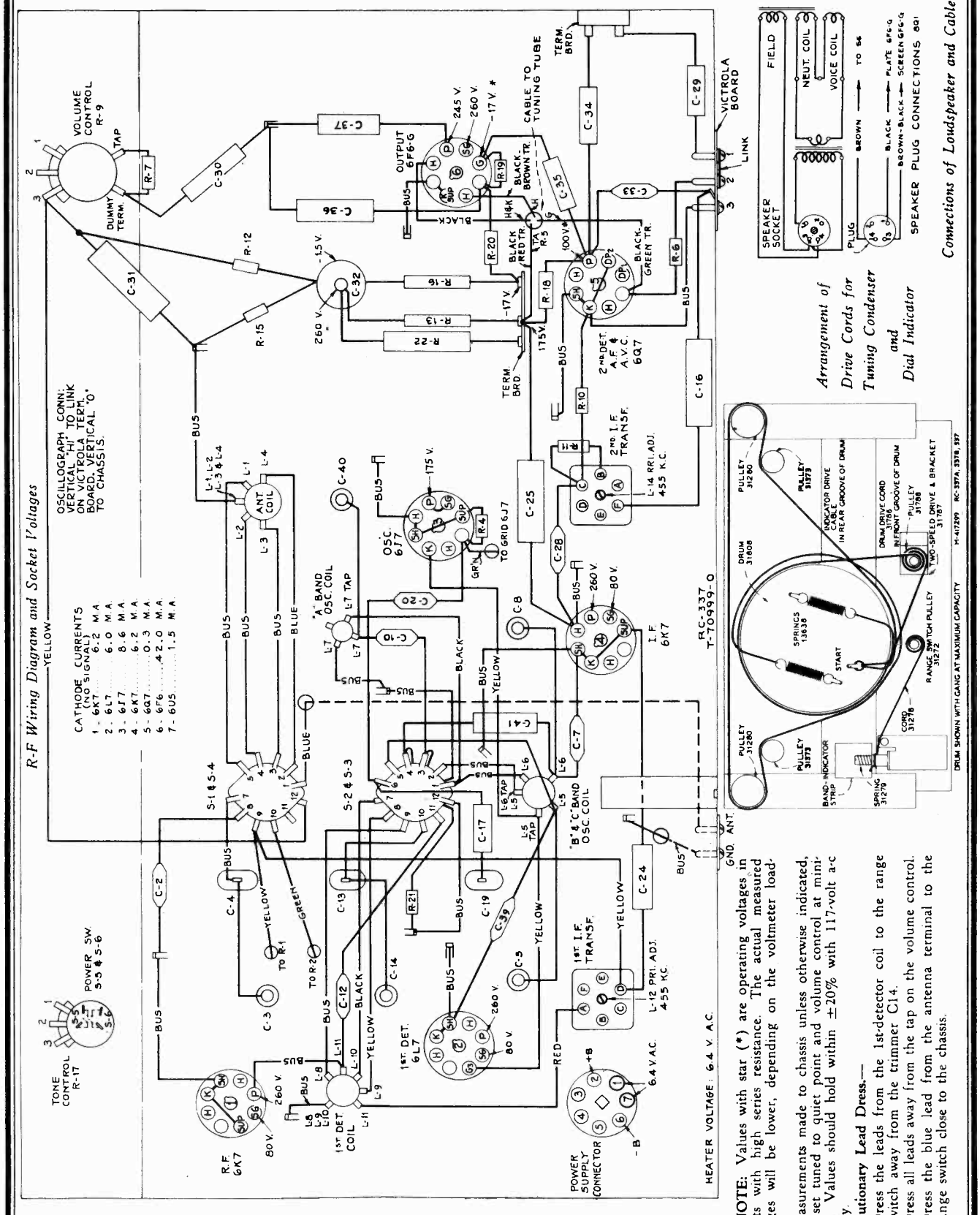


Precautionary Lead Dress:

1. Dress black lead from L11 to C20 against terminals 6 and 7 of S6.
2. Dress the green lead from the middle section of the gang away from any other leads, parts, or chassis.
3. Dress the black diode lead running between the 6SQ7 and terminal G on the 2nd I-F transformer, directly against the chassis.
4. Twist the power leads together and dress them away from the 6SQ7 socket.
5. Dress the brown lead from terminal E on the 2nd I-F transformer to terminal 11 on S8 against the chassis.
6. Dress the black lead from trimmer (C1) to antenna coil away from the range switch link action.

MODEL 8Q1, Chassis RC-337
Chassis Wiring, Voltage
Lead Dress

RCA MFG. CO., INC.



* **NOTE:** Values with star (*) are operating voltages in circuits with high series resistance. The actual measured voltages will be lower, depending on the voltmeter loading.

Measurements made to chassis unless otherwise indicated, with set tuned to quiet point and volume control at minimum. Values should hold within ±20% with 117-volt a-c supply.

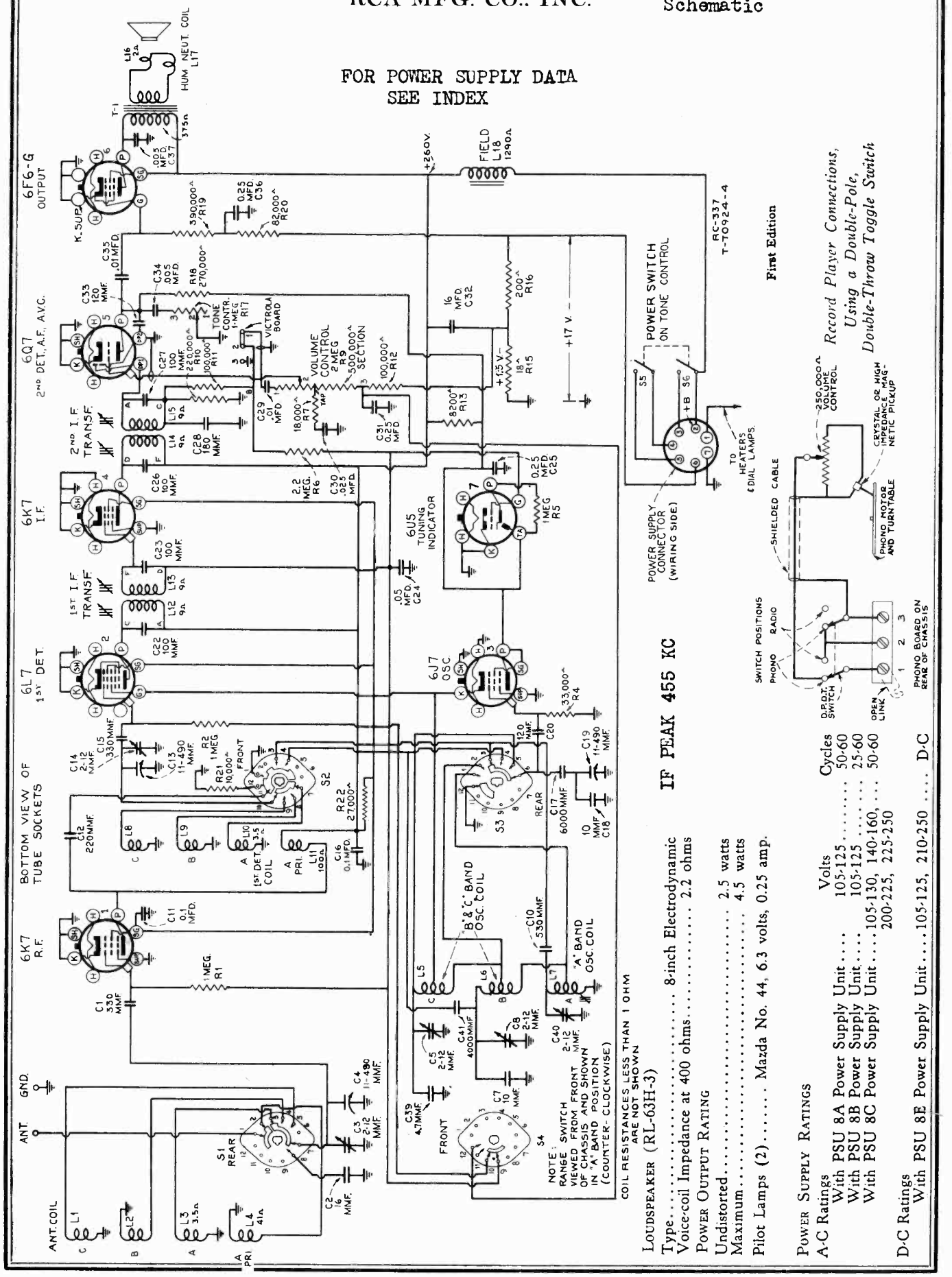
Precautionary Lead Dress.—

1. Dress the leads from the 1st-detector coil to the range switch away from the trimmer C14.
2. Dress all leads away from the tap on the volume control.
3. Dress the blue lead from the antenna terminal to the range switch close to the chassis.

RCA MFG. CO., INC.

MODEL 8Q1, Chassis RC-337
Schematic

FOR POWER SUPPLY DATA
SEE INDEX



IF PEAK 455 KC

First Edition

Record Player Connections, Using a Double-Pole, Double-Throw Toggle Switch

LOUDSPEAKER (RL-63H-3)

Type..... 8-inch Electrodynamic
Voice-coil Impedance at 400 ohms..... 2.2 ohms

POWER OUTPUT RATING

Undistorted..... 2.5 watts
Maximum..... 4.5 watts

Pilot Lamps (2)..... Mazda No. 44, 6.3 volts, 0.25 amp.

POWER SUPPLY RATINGS

	Volts	Cycles
A-C Ratings		
With PSU 8A Power Supply Unit....	105-125.....	50-60
With PSU 8B Power Supply Unit....	105-125.....	25-60
With PSU 8C Power Supply Unit....105-130, 140-160,...		50-60
200-225, 225-250		
D-C Ratings		
With PSU 8E Power Supply Unit....105-125, 210-250		D-C

MODEL 8Q1, Chassis RC-337
Alignment, Trimmers,
Socket

RCA MFG. CO., INC.

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver ground terminal (G), and keep the output as low as possible to avoid a-v-c action.

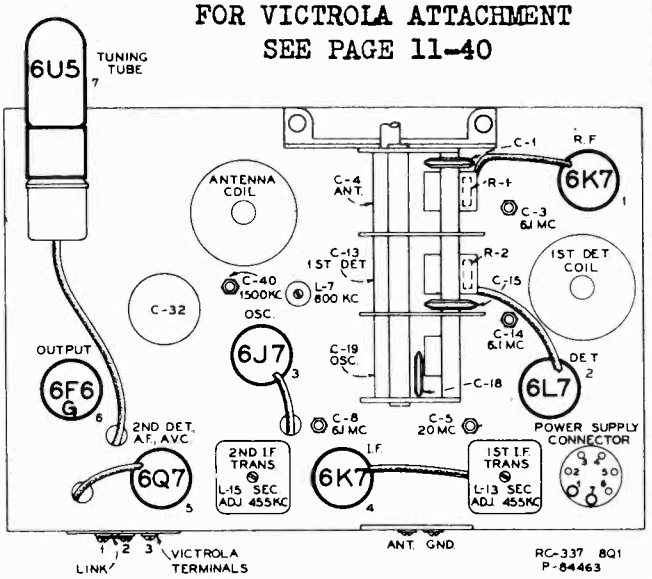
Calibration Scale on Indicator-Drive-Cord drum. — The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the rear of the drum which is mounted on the front shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 180° mark on the drum scale must be vertical, and directly over the center of the gang-condenser shaft when the plates are fully meshed. The surface of the drum must be flush with the end of the gang-condenser shaft. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

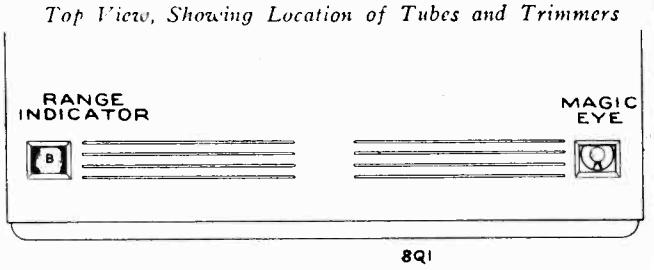
Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "180°" mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the left-hand end marked on the dial scales, and gang-condenser fully meshed. The indicator has a spring clip for attachment to the cable.

FOR VICTROLA ATTACHMENT
SEE PAGE 11-40

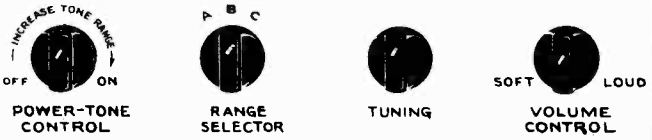


Top View, Showing Location of Tubes and Trimmers



At Right—*Location of Controls*

To turn on the set, turn the power-tone control fully clockwise, past the snap of the switch. This is the full-range tone position. To switch off the set, turn this knob fully counter-clockwise.



Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
1	6K7 I-F grid cap, in series with .01 mfd.	455 kc	"C" band, Quiet Point.	L14 and L15 (2nd I-F Trans.)
2	6L7 1st-Det. grid cap, in series with .01 mfd.			L12 and L13 (1st I-F Trans.)
3	Antenna Terminal, in series with 300 ohms	6.1 mc	6.1 mc (29°) "B" band	C8 (osc.)* C14 (det.)** C3 (ant.)
3A	Check to determine that C8 has been adjusted to the correct peak by turning radio to 5.19 mc (50°) where a weaker signal should be received.			
4	Antenna Terminal, in series with 300 ohms	20 mc	20 mc (23.5°) "C" band	C5 (osc.)*
4A	Check to determine that C5 has been adjusted to the correct peak by turning radio to 19.09 mc (29.5°) where a weaker signal should be received.			
5	Antenna Terminal, in series with 200 mmf.	1,500 kc	1,500 kc (31°) "A" band	C40 (osc.)
6	Antenna Terminal, in series with 200 mmf.	600 kc	600 kc (144.5°) "A" band	L7 (osc.)†
7	Repeat Step No. 5			

* Use **minimum** capacity peak (plunger out) if two peaks can be obtained.

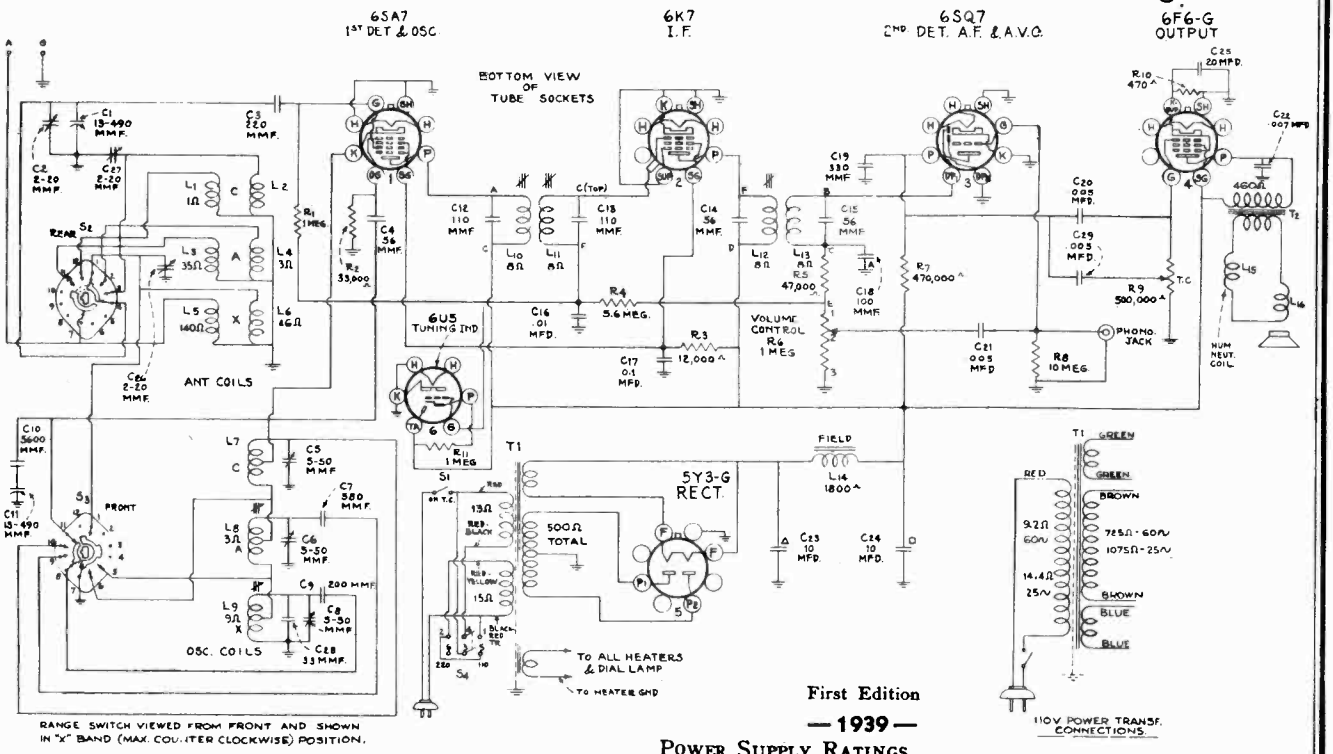
** Rock gang condenser slightly while peaking C14, and use **maximum** capacity peak if two peaks can be obtained.

† Rock gang condenser slightly while peaking L7 for maximum output.

NOTE: The oscillator tracks 455 kc above the signal on all bands.

RCA MFG. CO., INC.

MODEL 6Q8, Chassis 414B
Schematic, Voltage
Chassis Wiring



First Edition

—1939—

PILOT LAMP ..... Mazda No. 44, 6.3 volts, 0.25 amp.

POWER OUTPUT RATING
(105-125 Volt Operation)

Undistorted	1.5 watts
Maximum	3.3 watts

POWER SUPPLY RATINGS

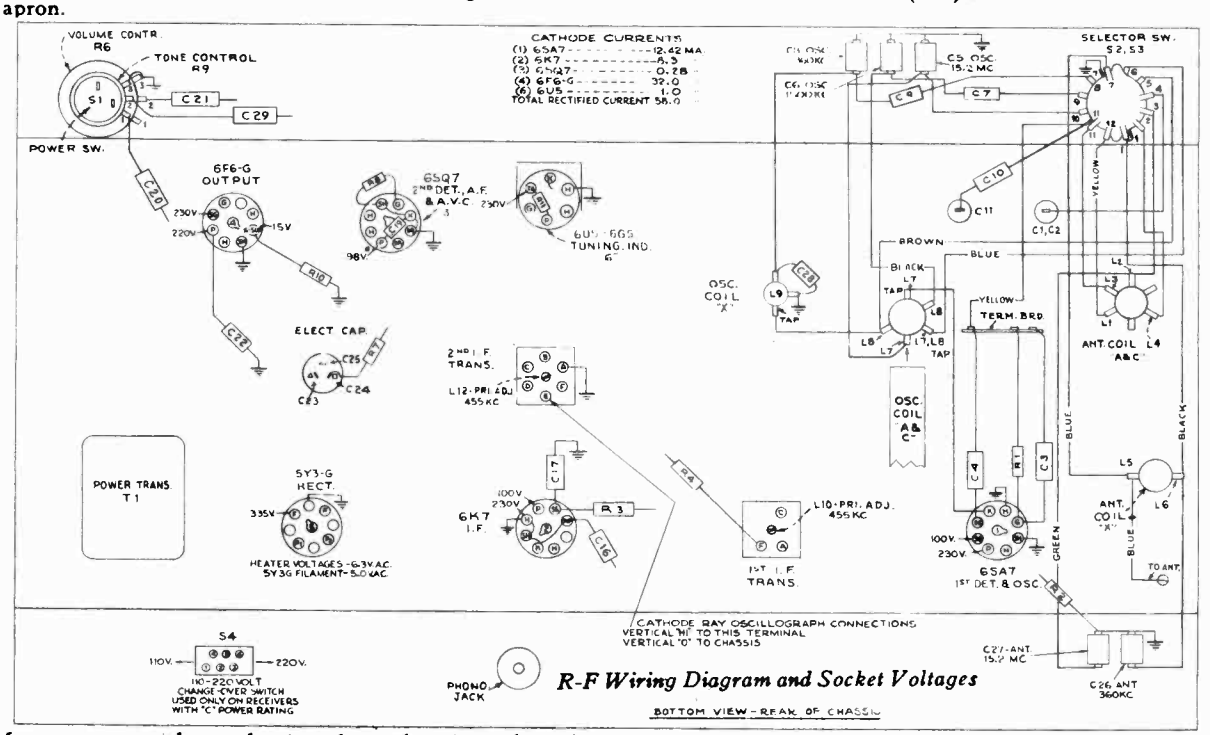
Rating A	105-125 volts, 50-60 cycles
Rating B	105-125 volts, 25 cycles, 75 watts
Rating C	105-125; 200-250 volts, 50-60 cycles, 75 watts

LOUDSPEAKER

Type	6-inch electrodynamic
V. C. Impedance	3.4 ohms at 400 cycles

Precautionary Lead Dress:

1. Lead from 2nd I-F transformer to volume control should be kept close to the chassis and dressed against front apron.
2. C-10 should be dressed away from the antenna section of the variable condenser (C-1).



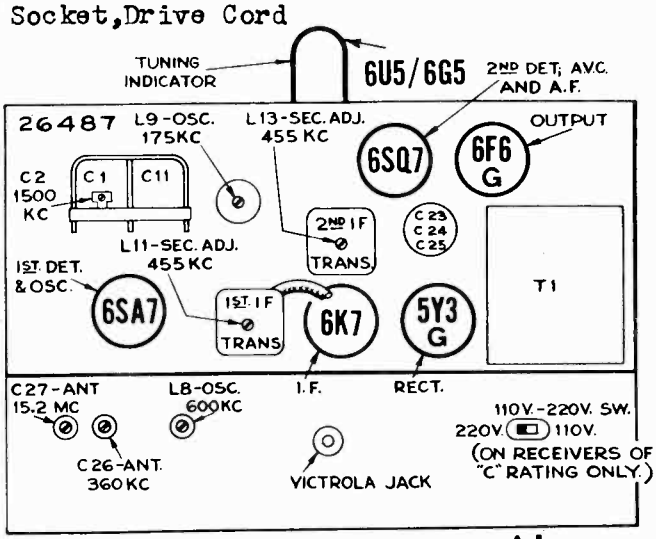
R-F Wiring Diagram and Socket Voltages

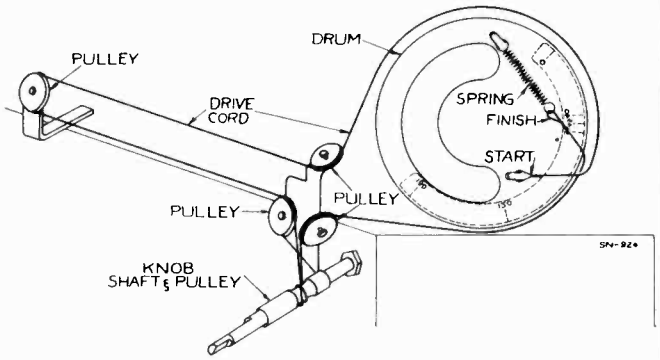
Measurements made to chassis unless otherwise indicated, with set tuned to quiet point and volume control at minimum. Values should hold within ±20% with 117-volt a-c supply.

* **NOTE:** Values with star (*) are operating voltages in circuits with high series resistance. The actual measured voltages will be lower, depending on the voltmeter loading.

MODEL 6Q8, Chassis RC-414B
Alignment, Trimmers
Socket, Drive Cord

RCA MFG. CO., INC.





Arrangement of Drive Cords for Tuning Condenser and Dial Indicator

At Left—Tube and Trimmer Locations

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum. — The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the rear of the drum which is mounted on the front shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 135° mark on the drum scale must be vertical, and directly under the center of the gang-condenser shaft when the plates are fully meshed. The drum is held to the shaft by means of one set screw, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the 0° mark on the calibration scale when the plates are fully meshed.

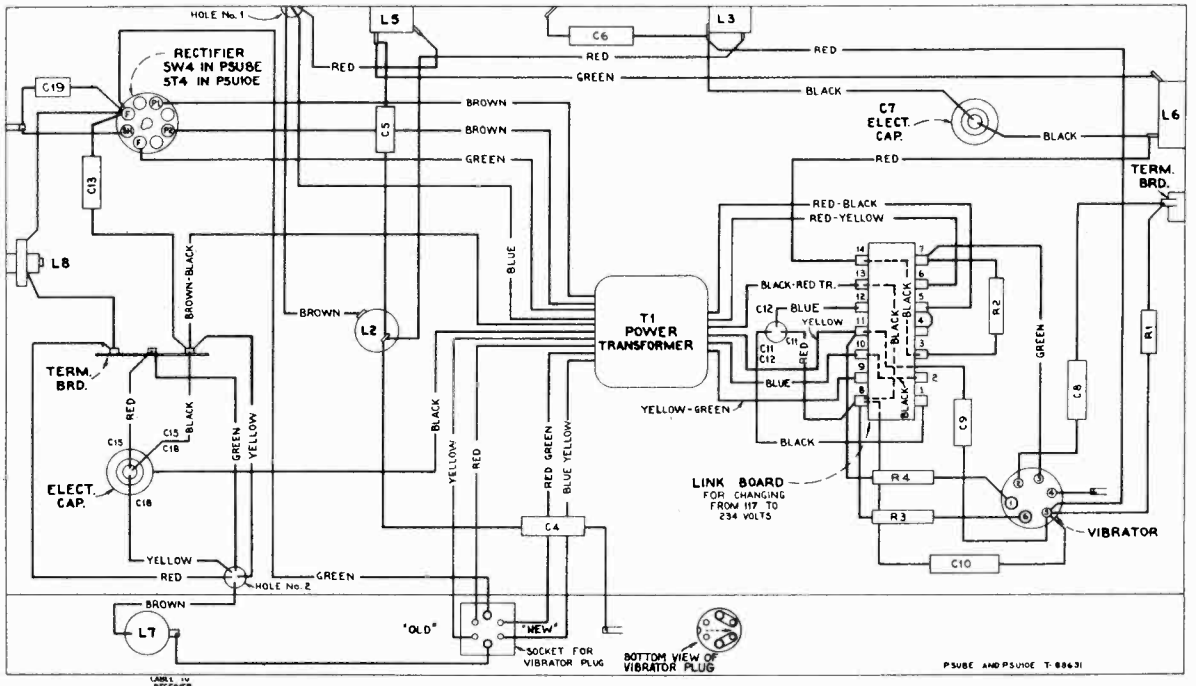
Steps	Connect the high side of the test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
1	6K7 I-F grid cap in series with .01 mfd.	455 kc	"A" Band Quiet Point between 550-750 kc	L12 and L13 (2nd I-F Trans.)
2	6SA7 det. grid in series with .01 mfd.	455 kc		L10 and L11 (1st I-F Trans.)
3	Ant. terminal in series with 200 mmf.	1,500 kc	1,500 kc (152.4°) "A" Band	C6 (osc.) C2 (ant.)
4	Ant. terminal in series with 200 mmf.	600 kc	600 kc (33°) "A" Band	L8 (osc.) Rock Gang
5	Repeat steps 3 and 4			
6	Ant. terminal in series with 200 mmf.	360 kc	360 kc (151.5°) "X" Band	C8 (osc.) C26 (ant.)
7	Ant. terminal in series with 200 mmf.	175 kc	175 kc (53.3°) "X" Band	L9 (osc.) Rock Gang
8	Repeat steps 6 and 7			
9	Ant. terminal in series with 300 ohms	15.2 mc	15.2 mc (147.2°) "C" Band	C5 (osc.)* C27 (ant.)
10	Ant. terminal in series with 200 mmf.	360 kc	360 kc (151.5°) "X" Band	C8 (osc.)
11	Ant. terminal in series with 200 mmf.	1,500 kc	1,500 kc (152.4°) "A" Band	C6 (osc.)

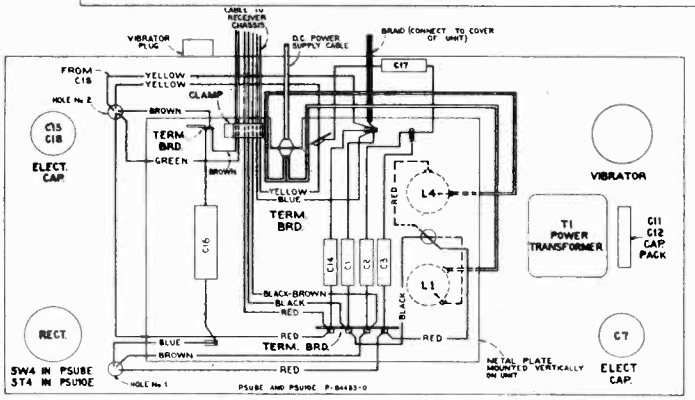
*Use minimum capacity peak if two can be obtained. Check to determine that C5 is adjusted to correct peak by tuning receiver to approximately 14.29 mc where a weaker signal should be received.

NOTE: Oscillator tracks above signal on all bands.

RCA MFG. CO., INC.

MODELS PSU 8E, 10E
Schematic, Chassis Wiring





Above—

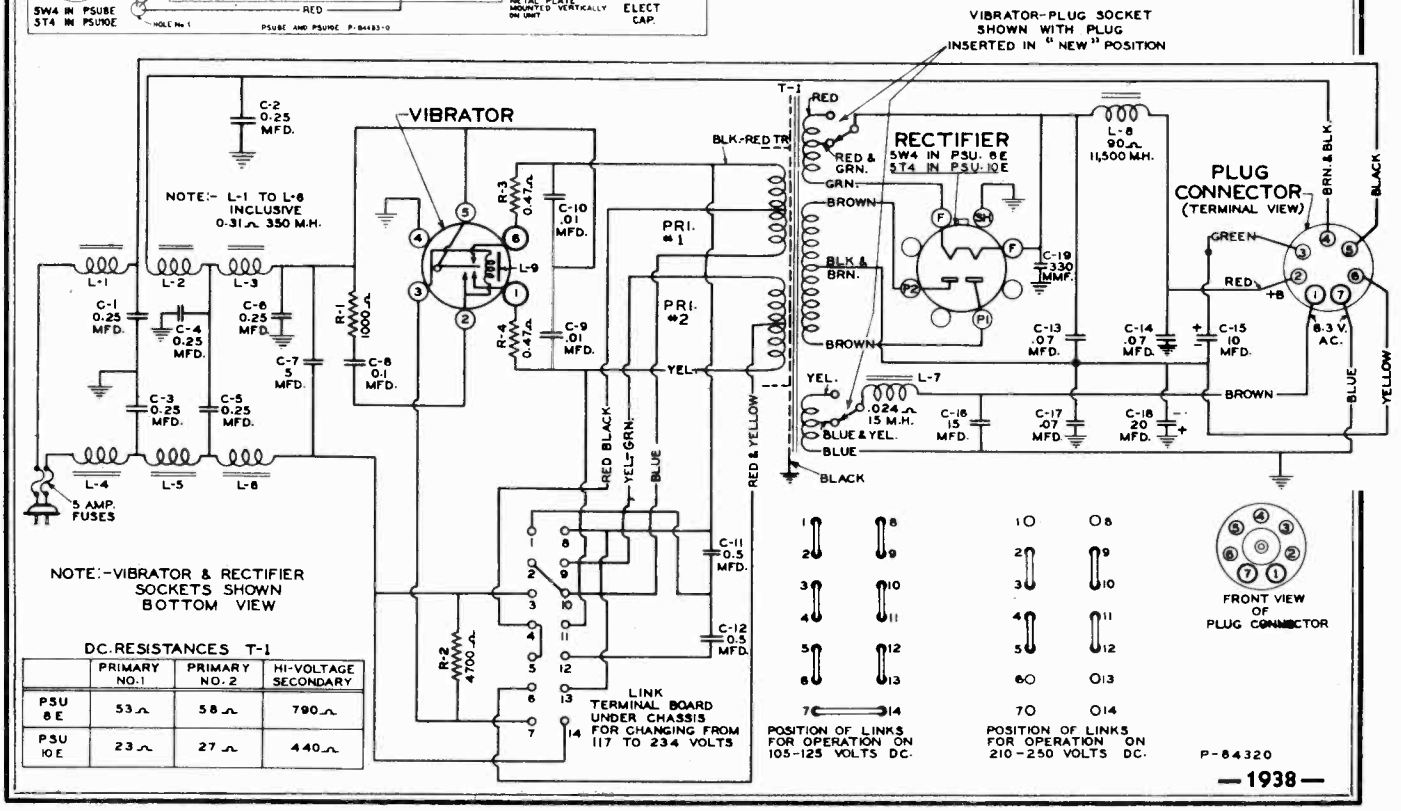
Bottom View of D-C Power Unit

At Left—

Top View of D-C Power Unit

Below—

Schematic Diagram



DC RESISTANCES T-1

	PRIMARY NO.1	PRIMARY NO.2	HI-VOLTAGE SECONDARY
PSU 8E	53Ω	58Ω	790Ω
PSU 10E	23Ω	27Ω	440Ω

MODELS PSU 8E,10E
Voltage,Notes,Parts

RCA MFG. CO., INC.

PSU 8E and 10E D-C Power Supply Units

Each d-c unit is equipped with an 18-inch 7-wire cable, with a 7-contact female receptacle which plugs into a 7-prong male connector on the receiver chassis. The d-c power cord (double conductor) is 6-feet long and is provided with a fused plug. The units are approximately 12½-inches long, 5½-inches wide, and 8½-inches high.

GOOD GROUND IS ESSENTIAL.—It is necessary to provide a good ground connection to the receiver chassis. The ground lead should be heavy wire, as short as possible, connected to a water pipe by means of an approved ground clamp. If a water pipe ground is not available, a buried metal plate or screen may be used. This should have an area of approximately 20 square feet and should be buried one or two feet in moist ground. The connection to the plate should be electrically good, mechanically solid, and permanent.

Grounding Power Supply Unit.—A flexible metal braid is connected from the PSU chassis to the case of the unit, and another length of braid extends from the case for connection to the receiver chassis. Loosen one of the self-tapping screws on the rear of the chassis, and attach the braid under this screw. It is important to see that these connections are made correctly at the time of installation.

Magic Wave Antenna Recommended.—In cases where the line or vibrator interference is found to be objectionable, the use of an RCA Magic Wave Antenna (Stock No. 9812) is recommended in conjunction with a good ground as specified above.

Link Board for Changing from 117 to 234 Volts.—A link board is mounted under the chassis of the PSU for making connections to permit operation on 105-125 volts d.c., or on 210-250 volts d.c. The correct position of the links for each voltage range is shown in the schematic diagram. The links must be arranged correctly in the link board for the particular voltage range on which the unit is to be operated, otherwise damage to the receiver may result.

Vibrator Plug.—The heater windings on the power transformer are tapped and connected to a six-contact socket on the rear of the PSU chassis. A plug fits into this socket in two positions only. An arrow on the plug points to markings "NEW" or "OLD" on the case of the unit. When the vibrator is new, the plug is inserted with the arrow pointing to "NEW." In the course of time, when the vibrator is worn to an extent where the dial lights burn dull or red instead of with their usual brilliancy, the plug should be removed and re-inserted with the arrow pointing to "OLD." (In this position, all the turns of the heater windings are connected, thus bringing the heater voltage up to normal.)

The number of operating hours to the time when it is necessary to turn the plug to "OLD" is not an indication of the ultimate life of the vibrator: For example, with high line voltage, the plug may usually be left at "NEW" for practically the entire useful life of the vibrator; but with low line voltage, it may be necessary to turn the plug to "OLD" after a time corresponding to a small fraction of the total life of the vibrator.

Testing.—The simplest way to check PSU 8E or 10E is to plug it into a receiver for which it is designed. (First check the position of the links for the particular line voltage.) Note whether the dial lamps in the receiver light with normal brilliancy, and measure the rectified "B" voltage at the receiver to determine whether it is normal.

If a receiver is not available, dummy loads may be connected to the unit as specified in the table below.

The supply current must be measured with a d-c ammeter, not a meter of the ac-dc type, inasmuch as the r.m.s. value of the current is considerably higher than the d-c current. The heater voltage must be measured with an r.m.s. meter (thermo-coupled), not with an average meter (rectifier type), on account of the square wave shape. If an accurate thermo-coupled meter is not available, the heater voltage may be checked by observing the brilliancy of the dial lamps in the receiver. They will glow dull or red if the heater voltage is low.

Precautionary Lead Dress. — (1) Dress all leads on the power transformer primary and the buffer capacitors away from the line chokes. (2) Leads to C19 must be as short as possible. (3) The rectifier filament leads should be run close to each other, and dressed away from the filter chokes. (4) D-C power cord must not touch power transformer. (5) Keep antenna and ground leads away from PSU and PSU cables.

PSU	Supply Volts DC	Heater Load (ohms)	Rectifier Load (ohms)	Supply Current D-C amps.	Heater Voltage (A.C.)		Rectified Voltage (D.C.)		Used With Models
					Max.	Min.	Max.	Min.	
8E	117	2.2	4,900	0.90	7.85	7.1	400	360	8Q1, and 8Q4
	234	2.2	4,900	0.50	7.85	7.1	400	360	
10E	117	1.4	3,400	1.10	7.4	6.6	400	360	10Q1, 12Q4, 12QK
	234	1.4	3,400	.65	7.4	6.6	400	360	

NOTE: The heater and rectifier dummy load resistors should be capable of handling 50 watts. Connect the heater load across terminals 1 and 7 on the 7-contact plug. Connect the rectifier load resistor across terminals 2 and 6 on the 7-contact plug. Connect a jumper from terminal 2 to 3, and from 4 to 5 on this plug. Check position of links before turning power on.

Replacement Parts

Insist on genuine factory-tested parts, which are readily identified and may be purchased from authorized dealers.

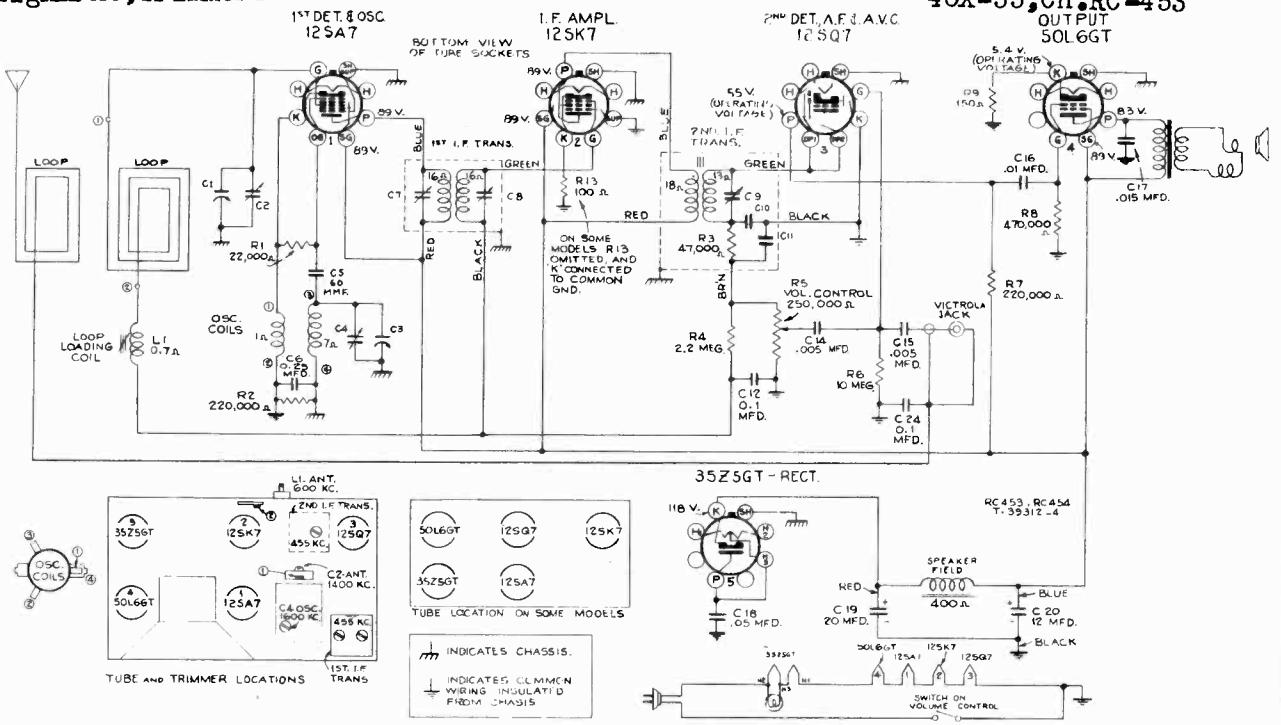
STOCK No.	DESCRIPTION	Unit List Price	STOCK No.	DESCRIPTION	Unit List Price
	DC POWER SUPPLY (PSU-8E and PSU-10E)		32053	Coil—Choke coil (L8)	.60
			5140	Fuse—5 amp. fuse	.10
			30557	Plug—Fused plug less fuses and power cord	.55
12952	Capacitor—330 mmfd. (C18)	.35	32052	Plug—6-contact power change plug	.30
4937	Capacitor—.01 mfd. (C9, C10)	.25	14409	Plug—7-contact female plug for power supply cable	.45
14626	Capacitor—.07 mfd. (C13, C14, C17)	.25			
4839	Capacitor—0.1 mfd. (C8)	.30	32064	Resistor—0.47 ohms, flexible type (R3, R4)	.15
12484	Capacitor—0.25 mfd. (C1, C2, C3, C4, C5, C6)	.30	4687	Resistor—1,000 ohms, ½ watt (R1)	.20
32049	Capacitor—Comprising two sections of 0.5 mfd. each (C11, C12)	3.20	11768	Resistor—4,700 ohms, 2 watt (R2)	.25
			32051	Socket—6-contact power change socket	.20
32048	Capacitor—5 mfd. (C7)	1.50	31251	Socket—Tube socket	.25
32047	Capacitor—Comprising one section 10 mfd. and one section 20 mfd. (C15, C18)	1.55	14312	Socket—Vibrator socket	.25
			32062	Transformer—Power transformer (PSU-8E only)	11.90
32045	Capacitor—15 mfd. (C16)	.70	32063	Transformer—Power transformer (PSU-10E only)	18.50
32046	Coil—Choke coil (L1, L2, L3, L4, L5, L6)	.80			
31794	Coil—Choke coil (L7)	.65	32050	Vibrator	10.40

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

2nd Production
Schematic, Socket, Voltage
Alignment, Trimmers

RCA MFG. CO., INC.

MODELS 9TX-50, 9TX-50M
Chassis RC454; 40X-52,
40X-55, Ch. RC-453



Steps	Connect the test oscillator to—	Tune test-osc. to—	Turn Radio Dial to—	Adjust the following for maximum peak output
1	Tuning Condenser stator (ant.) in series with .1 mfd.	455 kc	Quiet point at 1,600 kc end of dial	C7, C8, C9 (1st and 2nd I-F transformers)
2	Radiation Loop consisting of 2 turns of wire 18 in. in diameter located 4 to 6 feet from receiver	1,650 kc	Full clockwise (out of mesh)	C4 (oscillator)
3		600 kc	Resonance on 600 kc signal	L1 (Loop inductance)
4		1,400 kc	Resonance on 1,400 kc signal	C2 (Antenna)

Precautionary Lead Dress:

1. Green and blue leads from 1st I.F. transformer must be kept separated.

2. Dress yellow lead from loudspeaker under green lead from hum bucking coil to prevent it from touching the 50L6GT.

POWER SUPPLY RATINGS

A-C Rating ..... 105-125 volts, 50-60 cycles, 30 watts
D-C Rating ..... 105-125 volts, direct current, 30 watts

POWER OUTPUT (125 volt, 60 cycle supply)

Undistorted ..... .6 watts
Maximum ..... 2.0 watts

LOUDSPEAKER

Type ..... 5-inch Electrodynamic

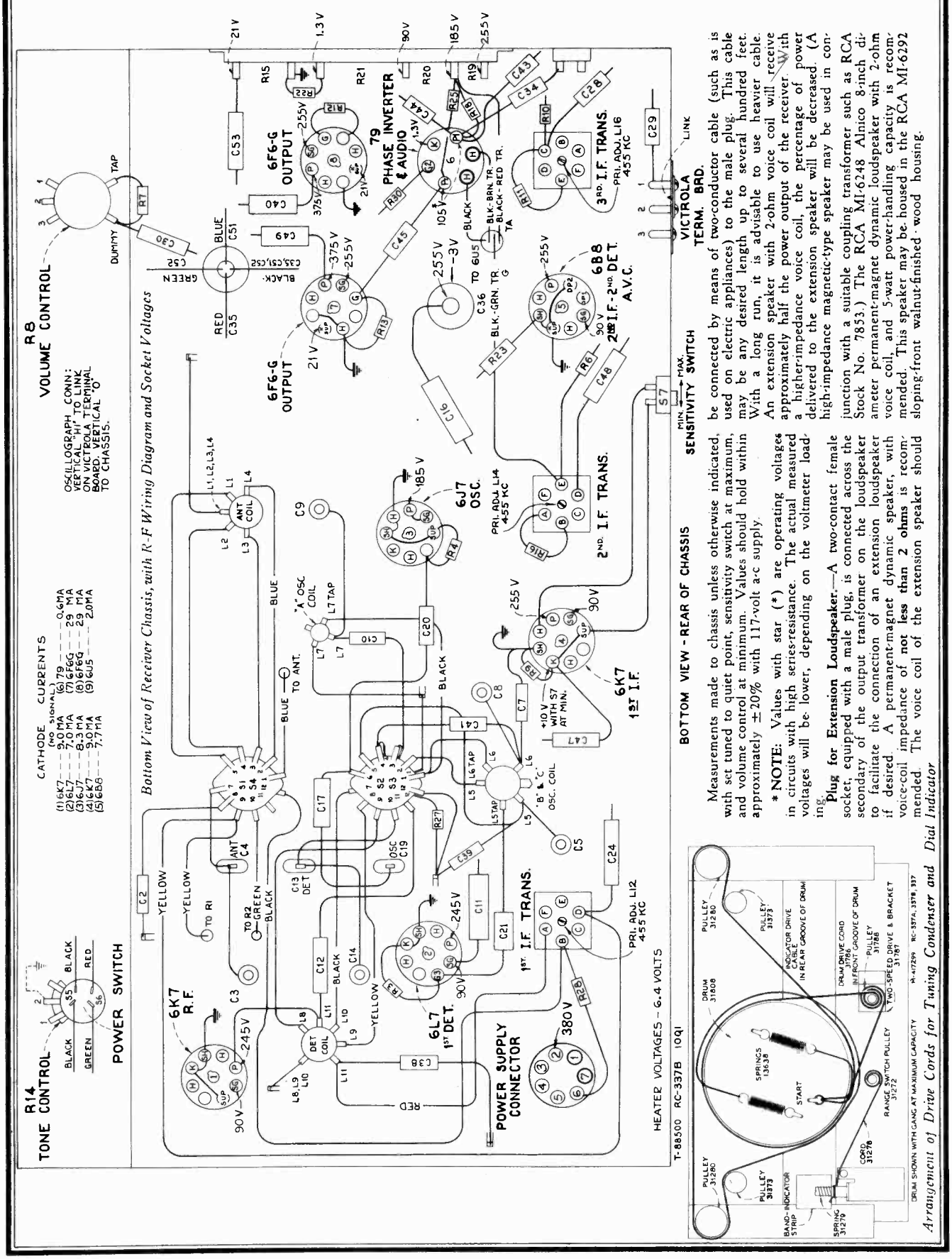
STOCK No.	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES (RC-453, RC-454)	
34444	Bracket—Dial and lamp support (9TX-50, 50M)	.30
34447	Capacitor—Mica trimmer, 2.5 to 30 mmfd. (C1)	XX
13057	Capacitor—60 mmfd. (C5)	.35
4838	Capacitor—.005 mfd. (C14, C15)	.25
4937	Capacitor—.01 mfd. (C16)	.25
11315	Capacitor—.015 mfd. (C17)	.20
32787	Capacitor—.05 mfd. (C18)	.20
4839	Capacitor—0.1 mfd. (C12, C24)	.30
12484	Capacitor—0.25 mfd. (C6)	.30
34597	Capacitor—Electrolytic comprising 1 section of 20 mfd. and 1 section of 12 mfd. (C19, C20)	.90
34592	Coil—Loop loading coil	XX
34443	Coil—Oscillator coil	XX
34448	Condenser—Variable tuning condenser (40X-52, 55)	XX
34440	Condenser—Variable tuning condenser (9TX-50, 50M)	XX
32545	Control—Volume control and power switch (40X-52, 55)	1.50
33291	Control—Volume control and power switch (9TX-50, 50M)	1.50
32634	Cord—Tuning condenser drive cord	.10
34567	Drum—Variable tuning condenser drive drum (40X-52, 55)	.35
34446	Eyelet—Used as pulley for drive cord (9TX-50, 50M)	XX
11765	Lamp—Dial lamp	.15
34445	Pointer—Dial pointer (9TX-50, 50M)	XX
14439	Resistor—100 ohms, ½ watt (R13)	.20
13428	Resistor—150 ohms, ½ watt (R9)	.20
13998	Resistor—22,000 ohms, ½ watt (R1)	.20
12264	Resistor—220,000 ohms, ½ watt (R2, R7)	.20
34332	Shaft—Tuning condenser drive shaft (9TX-50, 50M)	XX
34449	Socket—Dial lamp socket	XX
31319	Socket—Tube socket	.25
30585	Spring—Tuning condenser drive cord spring (40X52, 55)	.06
31615	Spring—Drive cord spring (9TX-50, 50M)	.06
34441	Transformer—1st I.F. transformer	XX
34442	Transformer—2nd I.F. transformer	XX
12285	Resistor—470,000 ohms, ½ watt (R8)	.20
12679	Resistor—2.2 megohm, ½ watt (R4)	.20
13601	Resistor—10 megohm, ½ watt (R6)	.20
33061	Shaft—Tuning condenser drive shaft (40X-52, 55)	.20
	SPEAKER ASSEMBLIES 40X-55 (RL86-1)	
32907	Cap—Dust cap	.02
35066	Cone—Cone complete with voice coil	XX
34450	Speaker—5" dynamic speaker complete with cone and voice coil less output transformer	XX
35056	Transformer—Output transformer	XX
	SPEAKER ASSEMBLIES (40X-52, 9TX-50 and 9TX-50M) (39223-1)	
35065	Cone—Cone complete with voice coil	XX
34450	Speaker—5" dynamic speaker complete with cone and voice coil less output transformer	XX
34174	Transformer—Output transformer	1.25
	MISCELLANEOUS	
33744	Dial—Dial scale—glass (40X-52, 55)	.50
33289	Dial—Dial scale (9TX-50, 50M)	.40
34016	Knob—Walnut tuning or volume control knob (40X-52, 55)	.15
34015	Knob—Tuning or volume control knob (9TX-50, 50M)	.15

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

XX Price upon application to your RCA Victor Parts Distributor.

MODEL 10Q1, Chassis RC-337B
Chassis Wiring, Voltage
Drive Cord, Notes

RCA MFG. CO., INC.



Measurements made to chassis unless otherwise indicated, with set tuned to quiet point, sensitivity switch at maximum, and volume control at minimum. Values should hold within approximately ±20% with 117-volt a-c supply.

* **NOTE:** Values with star (*) are operating voltages in circuits with high series-resistance. The actual measured voltages will be lower, depending on the voltmeter loading.

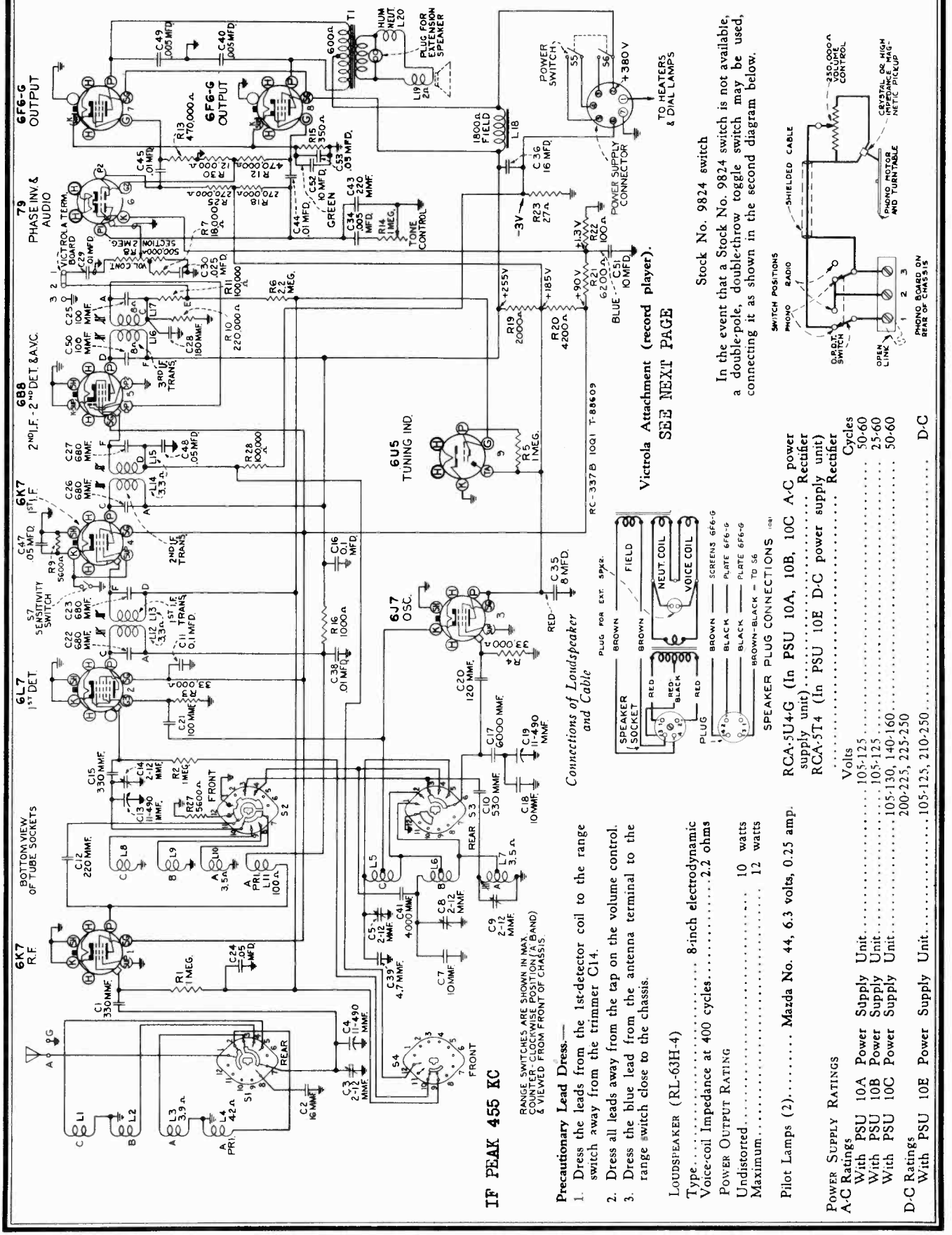
Plug for Extension Loudspeaker.—A two-contact female socket, equipped with a male plug, is connected across the secondary of the output transformer on the loudspeaker to facilitate the connection of an extension loudspeaker if desired. A permanent-magnet dynamic speaker, with voice-coil impedance of **not less than 2 ohms** is recommended. The voice coil of the extension speaker should be connected by means of two-conductor cable (such as is used on electric appliances) to the male plug. This cable may be any desired length up to several hundred feet. With a long run, it is advisable to use heavier cable. An extension speaker with 2-ohm voice coil will receive approximately half the power output of the receiver. With a higher-impedance voice coil, the percentage of power delivered to the extension speaker will be decreased. (A high-impedance magnetic-type speaker may be used in conjunction with a suitable coupling transformer such as RCA Stock No. 7853.) The RCA MI-6248 Alnico 8-inch dimeter permanent-magnet dynamic loudspeaker with 2-ohm voice coil, and 5-watt power-handling capacity is recommended. This speaker may be housed in the RCA MI-6292 sloping-front walnut-finished wood housing.

Arrangement of Drive Cords for Tuning Condenser and Dial Indicator

RCA MFG. CO., INC.

MODEL 10Q1, Chassis RC-377B
Schematic, Lead Dress
Phono. Connections

FOR POWER SUPPLY
DATA SEE INDEX



Stock No. 9824 switch

In the event that a Stock No. 9824 switch is not available, a double-pole, double-throw toggle switch may be used, connecting it as shown in the second diagram below.

Precautionary Lead Dress.—

1. Dress the leads from the 1st-detector coil to the range switch away from the trimmer C14.
2. Dress all leads away from the tap on the volume control.
3. Dress the blue lead from the antenna terminal to the range switch close to the chassis.

LOUDSPEAKER (RL-63H-4)

Type ..... 8-inch electrodynamic
Voice-coil Impedance at 400 cycles ..... 2.2 ohms

POWER OUTPUT RATING

Undistorted ..... 10 watts
Maximum ..... 12 watts

Pilot Lamps (2) ..... Mazda No. 44, 6.3 volts, 0.25 amp.

POWER SUPPLY RATINGS

	Volts	Cycles
A-C Ratings		
With PSU 10A Power Supply Unit	105-125	50-60
With PSU 10B Power Supply Unit	105-125	25-60
With PSU 10C Power Supply Unit	105-130, 140-160	50-60
	200-225, 225-250	
D-C Ratings		
With PSU 10E Power Supply Unit	105-125, 210-250	D-C

RCA-5U4-G (In PSU 10A, 10B, 10C A-C power supply unit) ..... Rectifier
RCA-5T4 (In PSU 10E D-C power supply unit) ..... Rectifier

MODEL 10Q1, Chassis RC-377B
Alignment, Trimmers, Socket
Victrola Attachment

RCA MFG. CO., INC.

MODEL 8Q1
Record Player

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver ground terminal (G), and keep the output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord drum. — The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the rear of the drum which is mounted on the front shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 180° mark on the drum scale must be vertical, and directly over the center of the gang-condenser shaft when the plates are fully meshed. The surface of the drum must be flush with the end of the gang-condenser shaft. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "180°" mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the left-hand end marked on the dial scales, and gang-condenser fully meshed. The indicator has a spring clip for attachment to the cable.

Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
Leave sensitivity switch open (minimum sensitivity) for all alignment operations.				
1	6B8 2nd I-F grid cap, in series with .01 mfd.	455 kc	"C" band Quiet Point.	L16 and L17 (3rd I-F Trans.)
2	6K7 1st I-F grid cap, in series with .01 mfd.			L14 and L15 (2nd I-F Trans.)
3	6L7 1st Det. grid cap, in series with .01 mfd.			L12 and L13 (1st I-F Trans.)
4	Antenna Terminal, in series with 300 ohms	6.1 mc	6.1 mc (29°) "B" band	C8 (osc.)* C14 (det.)† C3 (ant.)
5	Antenna Terminal, in series with 300 ohms	20 mc	20 mc (23.5°) "C" band	C5 (osc.)††
6	Antenna Terminal, in series with 200 mmf.	1,500 kc	1,500 kc (31°) "A" band	C9 (osc.)
7	Antenna Terminal, in series with 200 mmf.	600 kc	600 kc (144.5°) "A" band	L7 (osc.)‡
8	Repeat Step No. 6			

* Use **minimum** capacity peak if two peaks can be obtained.

† Rock the gang condenser slightly, and use the **maximum** capacity peak if two peaks can be obtained with trimmer C14. Check to determine that C8 has been adjusted to the correct peak by turning the receiver to 5.19 mc (50°), where a weaker signal should be received.

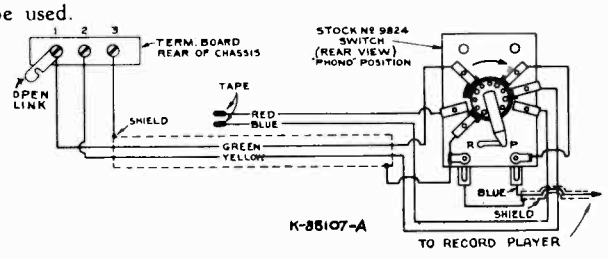
†† Use **minimum** capacity peak if two peaks can be obtained. Check to determine that C5 has been adjusted to the correct peak by turning the receiver dial to 19.09 mc (29.5°), where a weaker signal should be received.

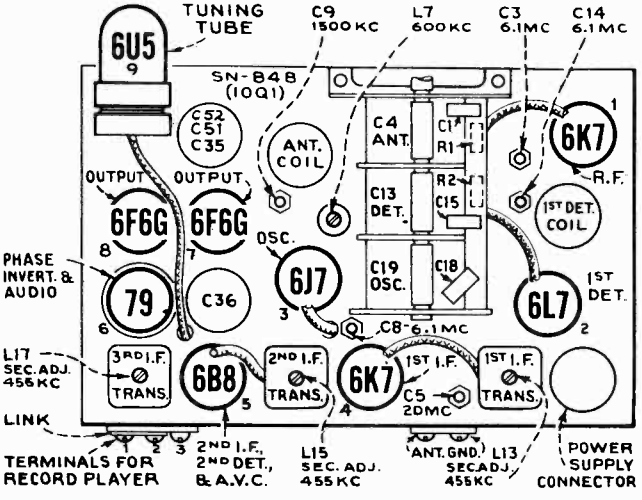
‡ Rock gang condenser slightly while peaking L7 for maximum output.

NOTE: Oscillator tracks 455 kc **above** the signal on all bands.

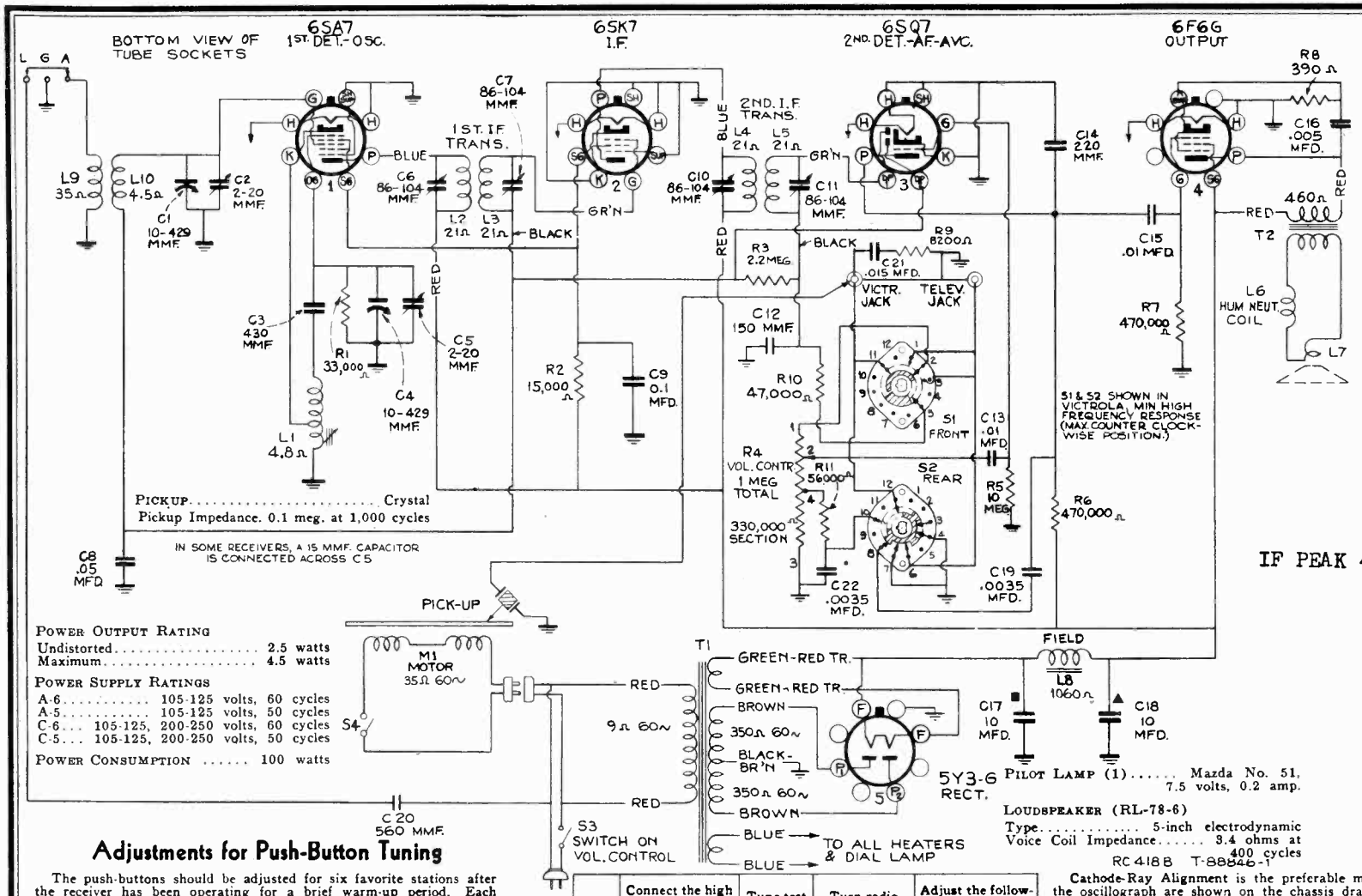
USED ALSO WITH MODEL 8Q1

Victrola Attachment (Record Player).—Terminals are provided on the rear of the chassis for convenient connection to a Victrola Attachment (record player) such as the RCA R93 and R94 series. A stock No. 9824 switch may be used to change from radio to record player. The connections of this switch are shown. In the event that a No. 9824 switch is not available, a double-pole double-throw toggle switch may be used.





Top View, Showing Location of Tubes and Trimmers



PICKUP..... Crystal
Pickup Impedance. 0.1 meg. at 1,000 cycles

POWER OUTPUT RATING

Undistorted..... 2.5 watts
Maximum..... 4.5 watts

POWER SUPPLY RATINGS

A-6..... 105-125 volts, 60 cycles
A-5..... 105-125 volts, 50 cycles
C-6... 105-125, 200-250 volts, 60 cycles
C-5... 105-125, 200-250 volts, 50 cycles

POWER CONSUMPTION ..... 100 watts

IF PEAK 455 KC

PILOT LAMP (1)..... Mazda No. 51, 7.5 volts, 0.2 amp.

LOUDSPEAKER (RL-78-6)

Type..... 5-inch electrodynamic
Voice Coil Impedance..... 3.4 ohms at 400 cycles

RC 418 B T-88846-1

Adjustments for Push-Button Tuning

The push-buttons should be adjusted for six favorite stations after the receiver has been operating for a brief warm-up period. Each button may be set up to any standard broadcast station. The preferable arrangement is to adjust for stations in the order of frequency, from low to high. Proceed as follows:

1. Pull off the push-buttons and loosen the push-button rods with a small screwdriver.

2. Turn the accessory switch to "Radio" position and accurately tune in the station for which the first button is to be set.

3. Press in push-button rod No. 1 (left) with the screwdriver, as far as it will go without undue pressure, hold in, retune station with manual control if necessary for best reception, and then carefully tighten up the rod. Do not tighten more than ½ turn after the rod begins to grip or damage to the mechanism may result.

4. Replace the push-button on its shaft.

5. Proceed in a similar manner for the remainder of the push-buttons.

6. Insert the station marker tabs in the recesses above the push-buttons.

Steps	Connect the high side of the test-osc. to—	Tune test osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	Antenna Terminal	455 kc	Quiet Point between 1,720-1,500 kc	C10 and C11 (2nd I-F trans.)
2				C6 and C7 (1st I-F trans.)
3	Ant. terminal in series with 200 mmfd.	1,500 kc	1,500 kc calibration mark	C5 (osc.) C2 (ant.)
4		600 kc	600 kc calibration mark	L1 (osc.)*
5	Repeat step 3			

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown on the chassis drawing.

Output Meter Alignment.—If this method is used, connect the output meter across the voice coil, and turn the receiver volume control to maximum.

Test Oscillator.—For all alignment operations, connect the low side of the test oscillator to the receiver chassis, and keep the oscillator output as low as possible to avoid a-v-c action.

Calibration Marks.—The tuning dial is fastened in the cabinet and can not be used for reference during alignment. Therefore calibration marks have been stamped in the plate on the front of the chassis as shown in the accompanying drawing. These marks are used for reference during alignment.

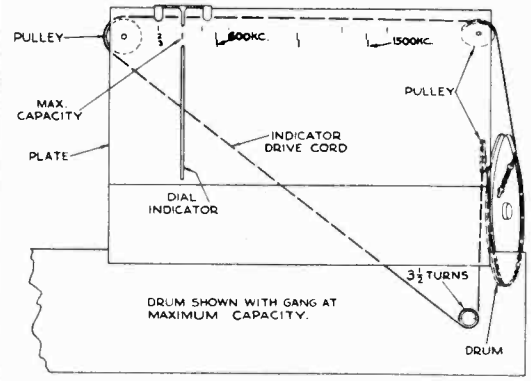
Dial Indicator Adjustment.—With the gang condenser in full mesh, the indicator should point to the extreme left (low frequency) mark on the dial scale.

Note.—Oscillator tracks above signal.

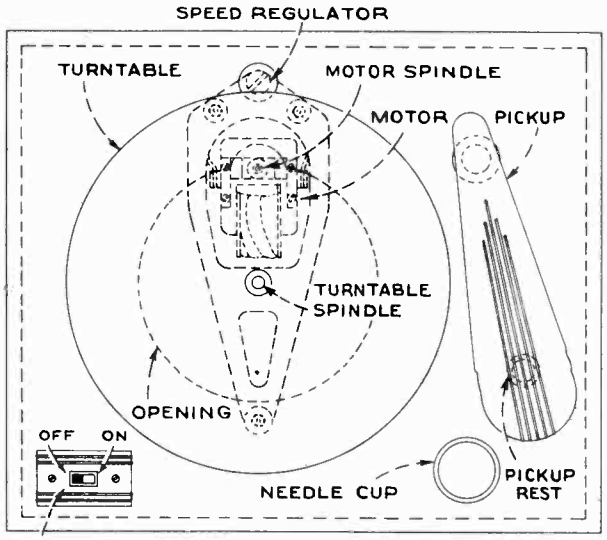
* Rock gang condenser slightly while adjusting L1.

MODEL U10, Chassis RC-418B
Chassis Wiring, Voltage
Socket, Trimmers, Lead Dress
Phono., Drive Cord Data

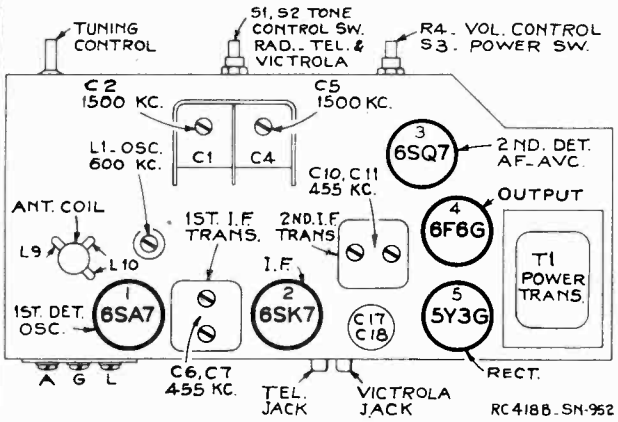
RCA MFG. CO., INC.



DIAL MECHANISM AND CALIBRATION MARKS.

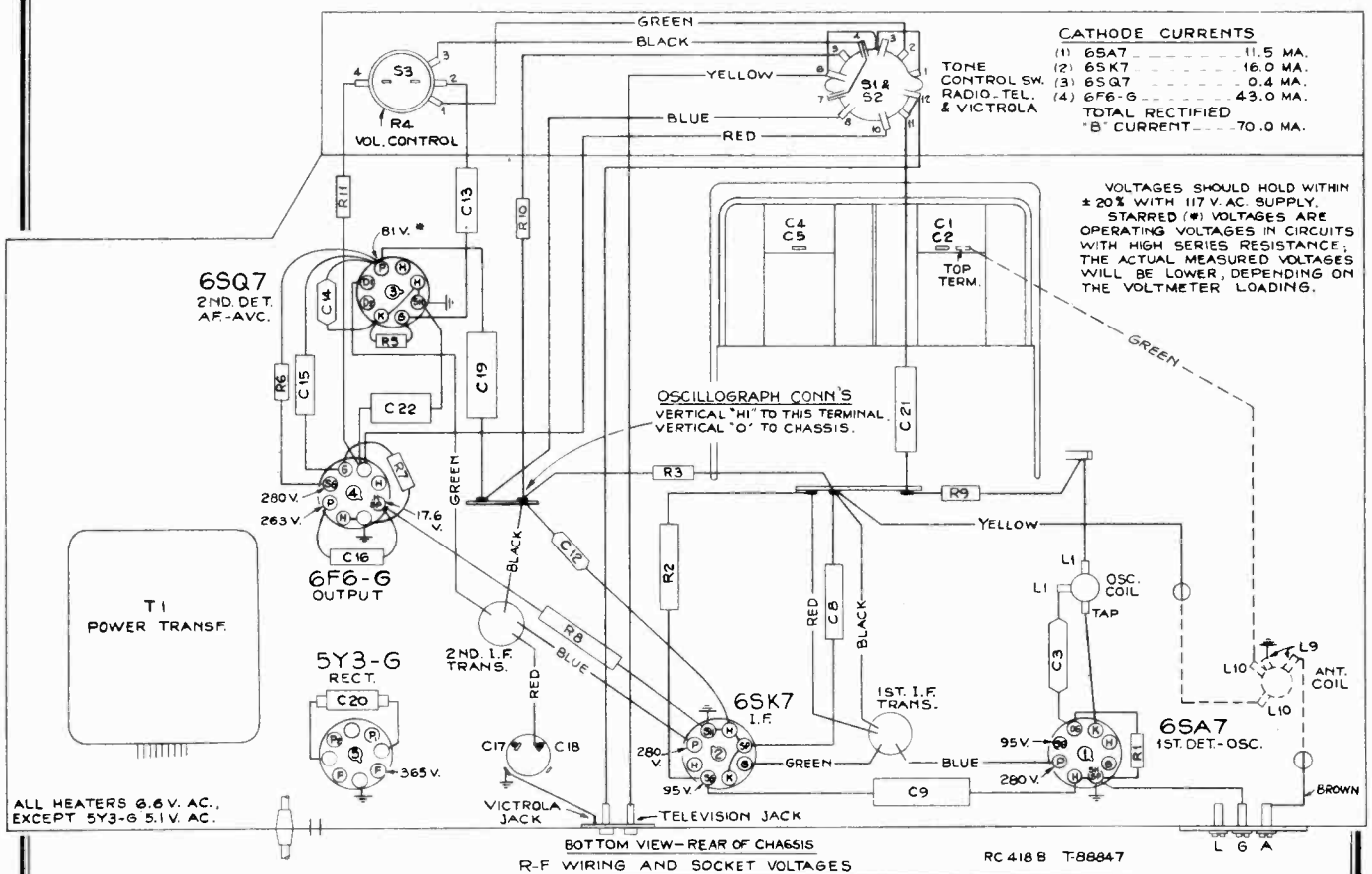


TURNTABLE SWITCH



PRECAUTIONARY LEAD DRESS.—

1. Power cord leads must be dressed up away from 6SQ7 socket, and toward end of chassis.
2. Green lead 2nd I.F. to 6SQ7 must be dressed against base.
3. Blue lead 2nd I.F. to 6SK7 must be dressed close to base.
4. Green and blue leads from 1st I.F. transformer must be dressed close to base.
5. Red lead from "L" terminal on antenna board to 5Y3G socket must be dressed against base.
6. Green lead from gang to 6SA7 socket must be dressed toward side apron away from other parts.

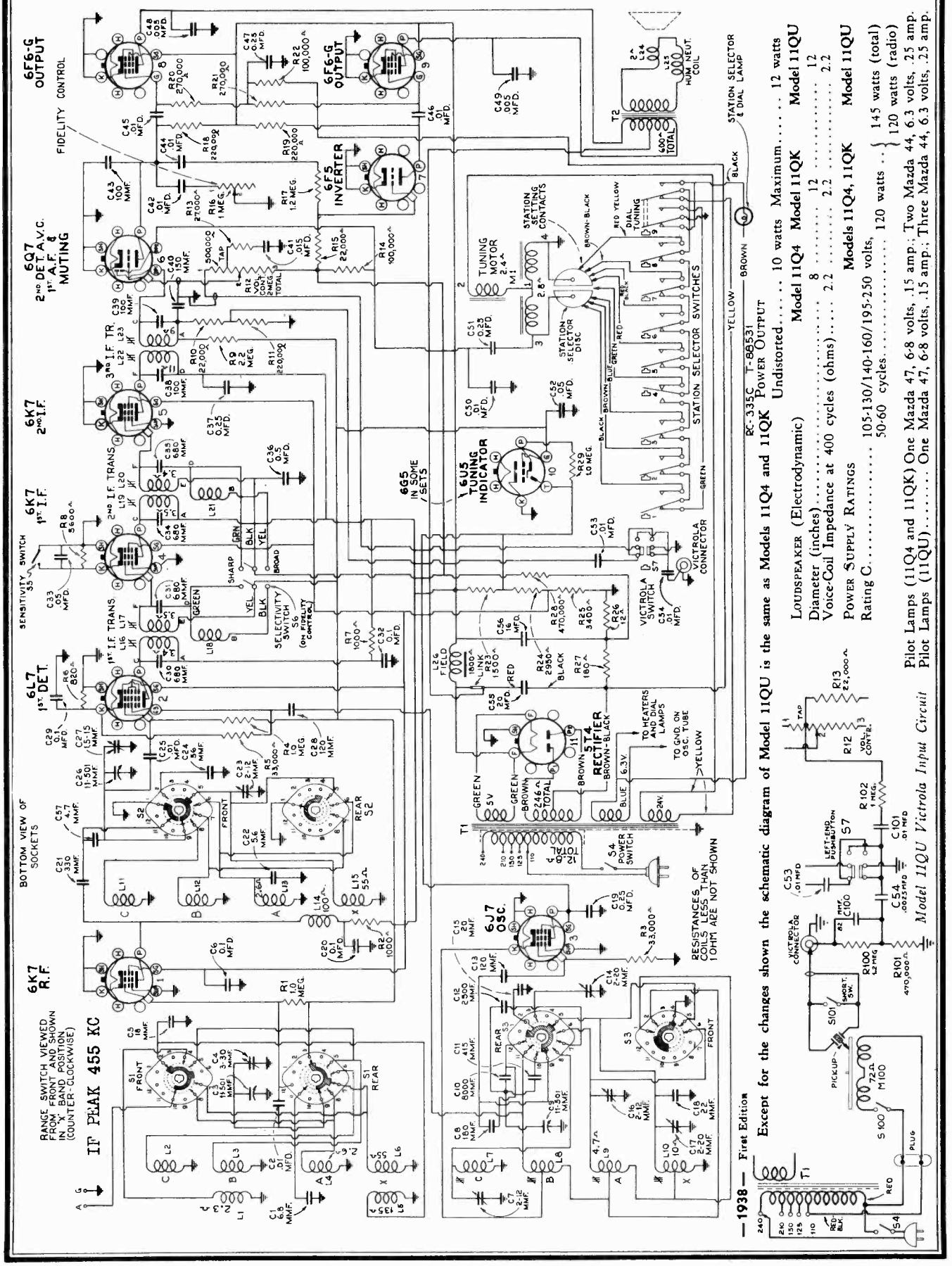


BOTTOM VIEW—REAR OF CHASSIS
R-F WIRING AND SOCKET VOLTAGES

RC 418 B T-88847

RCA MFG. CO., INC.

MODELS 11Q4, 11QK Chassis RC-335C
11QU, Chassis RC-335E
Schematic, Changes

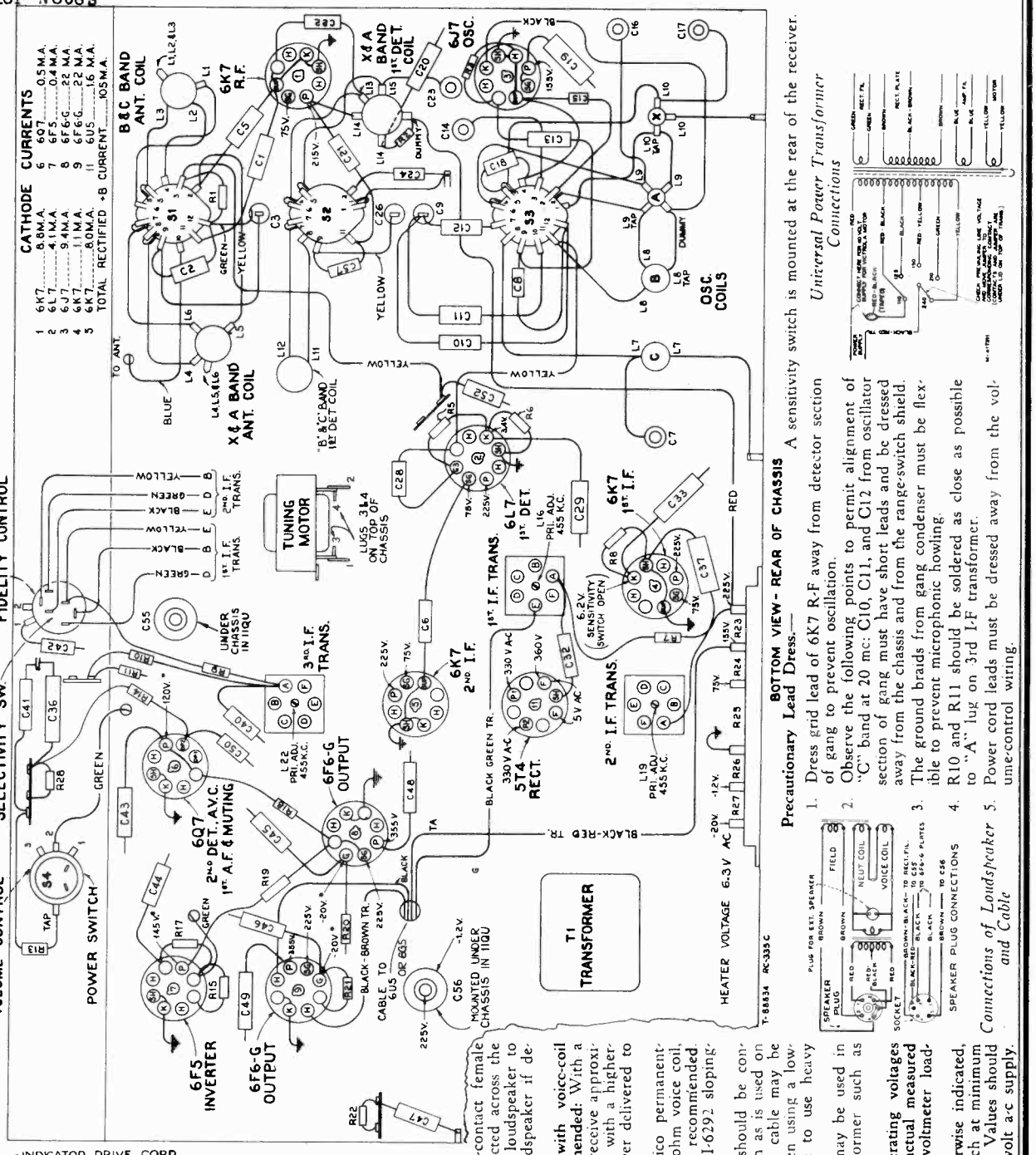


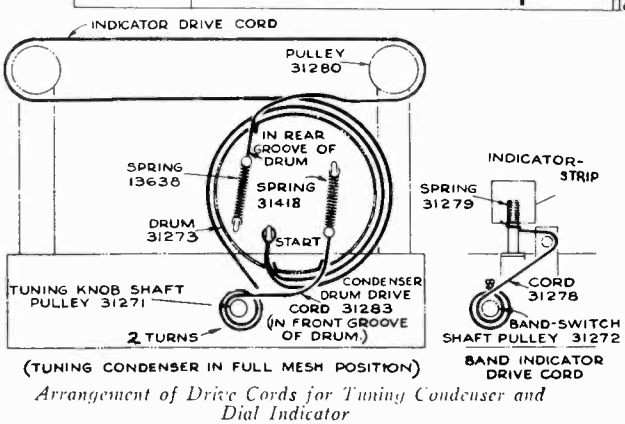
MODELS 11Q4,11QK,11QU
Chassis Wiring,Voltage
Lead Dress,Drive Cord
Speaker Notes

RCA MFG. CO., INC.

R-F Wiring Diagram and Socket Voltages, Models 11Q4 and 11QK

Model 11QU is the same, except for the Victrola connections, which are shown in a separate diagram





Arrangement of Drive Cords for Tuning Condenser and Dial Indicator

Plug for Extension Loudspeaker.—A two-contact female socket, equipped with a male plug, is connected across the secondary of the output transformer on the loudspeaker to facilitate the connection of an extension loudspeaker if desired.

A permanent-magnet dynamic speaker, with voice-coil impedance of not less than 2 ohms is recommended: With a 2-ohm voice coil, the extension speaker will receive approximately half the power output of the receiver; with a higher impedance voice coil, the percentage of power delivered to the extension speaker will be decreased.

The RCA MI-6248 8-inch diameter Alnico permanent-magnet dynamic loudspeaker, which has a 2-ohm voice coil, and a power-handling capacity of 5 watts, is recommended. This speaker may be housed in the RCA MI-6292 sloping-front walnut-finished wood housing.

The voice coil of the extension speaker should be connected by means of two-conductor cable, such as is used on electrical appliances, to the male plug. The cable may be any desired length, but with a long run, when using a low-impedance extension speaker, it is advisable to use heavy cable.

A high-impedance magnetic-type speaker may be used in conjunction with a suitable coupling transformer such as RCA Stock No. 7853.

* **NOTE:** Values with star (*) are operating voltages in circuits with high series-resistance. The actual measured voltages will be lower, depending on the voltmeter loading.

Measurements made to chassis unless otherwise indicated, with set tuned to quiet point, sensitivity switch at minimum (opened), and volume control at minimum. Values should hold within approximately ±20% with 110-volt a-c supply.

Precautionary Lead Dress.—

1. Dress grid lead of 6K7 R-F away from detector section of gang to prevent oscillation.
2. Observe the following points to permit alignment of "C" band at 20 mc: C10, C11, and C12 from oscillator section of gang must have short leads and be dressed away from the chassis and from the range-switch shield.
3. The ground braids from gang condenser must be flexible to prevent microphonic howling.
4. R10 and R11 should be soldered as close as possible to "A" lug on 3rd I-F transformer.
5. Power cord leads must be dressed away from the volume-control wiring.

A sensitivity switch is mounted at the rear of the receiver.

Universal Power Transformer Connections

Connections of Loudspeaker and Cable

RCA MFG. CO., INC.
Alignment Procedure

MODELS 11Q4, 11QK, 11QU
Alignment, Trimmers
Socket

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

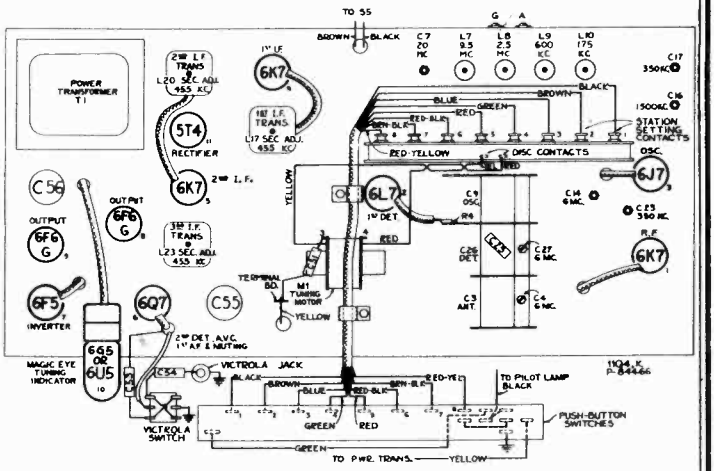
Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver ground terminal (G), and keep the output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum. — The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the rear of the drum which is mounted on the front shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 0° mark on the drum scale must be vertical, and directly over the center of the gang-condenser shaft when the plates are fully meshed. The surface of the drum must be flush with the end of the gang-condenser shaft. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "0°" mark on the calibration scale when the plates are fully meshed.



Top View, Showing Location of Tubes and Trimmers

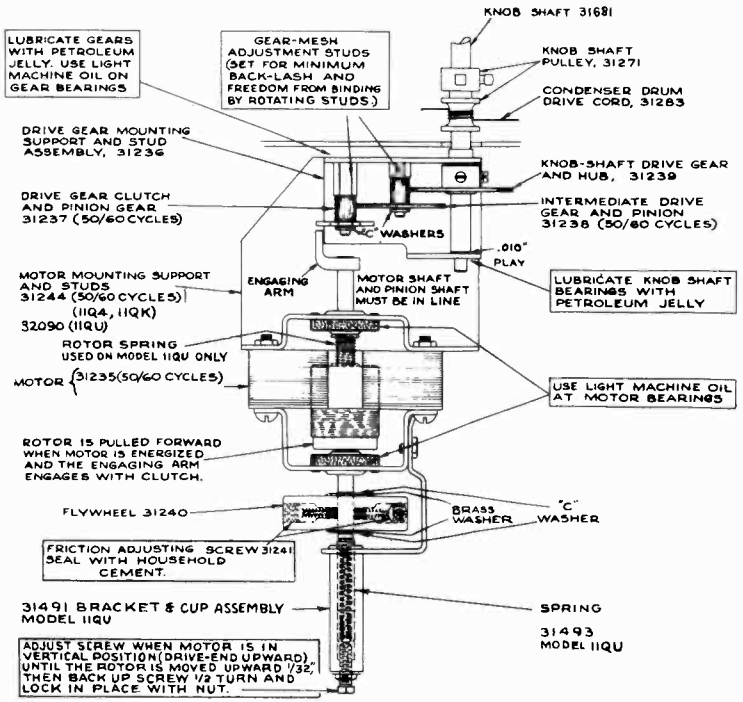
Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the left-hand end mark on the dial scales and gang condenser fully meshed. The indicator has a spring clip for attachment to the cable.

Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following to obtain maximum output
1	Turn fidelity control counter-clockwise (sharp), and sensitivity switch at minimum (open).			
2	6K7 2nd I-F grid cap in series with .01 mfd.	455 kc	"A" band, Quiet Point between 550-750 kc	L22 and L23 (3rd I-F Trans.)
3	6K7 1st I-F grid cap in series with .01 mfd.			L19 and L20 (2nd I-F Trans.)
4	6L7 1st-det. grid cap in series with .01 mfd.			L16 and L17 (1st I-F Trans.)
5	Turn fidelity switch clockwise (broad) and check I-F response which should be a double-peaked curve. Leave fidelity counter-clockwise (sharp) for all of the following steps.			
6	Antennna Terminal in series with 300 ohms	2.5 mc	2.5 mc ("B") 24½°	L8 (osc.)
7		6.0 mc	6.0 mc ("B") 147°	C14 (osc.) Use minimum capacity peak C27 (det.) Use maximum capacity peak C4 (ant.) Use maximum capacity peak*
8		9.5 mc	9.5 mc ("C") 55°	L7 (osc.)
9		20 mc	20 mc ("C") 153°	C7 (osc.) Use minimum capacity peak*
10	Antennna Terminal in series with 200 mmf.	600 kc	600 kc ("A") 24½°	L9 (osc.) Rock gang
11		1,500 kc	1,500 kc ("A") 151½°	C16 (osc.)
12	Repeat steps 10 and 11.			
13	Antennna Terminal in series with 200 mmf.	175 kc	175 kc ("X") 53½°	L10 (osc.)
14		350 kc	350 kc ("X") 145½°	C17 (osc.) C23 (det.)
15	Repeat steps 13 and 14.			

* Check to determine that the oscillator trimmer has been adjusted to the correct peak by tuning the receiver approximately 910 kc lower, where a weaker signal should be received.

NOTE: The oscillator tracks 455 kc above the signal on all bands.

Electric Tuning Mechanism



Motor and Gear Mechanism

There must be 1/32-inch clearance between the end of the engaging arm and the face of the intermediate gear when the motor is in its full forward position

The circuit of the electric tuning mechanism is shown in the schematic diagram, and the mechanical details are illustrated below.

The action can be understood by following a cycle of operation:

When a station button is pushed in, it completes the 24-volt circuit through the corresponding station-setting contact and one-half of the brass selector disc, which is connected to one side of the motor field coil. This energizes the motor, and the rotor is pulled forward, engaging with the gear train that drives the tuning condenser and selector disc. The condenser and disc rotate until the insulation line comes under the particular station-setting contact, and the motor circuit is broken. Inertia carries the insulation line past the station-setting contact which then makes contact to the other half of the disc. This completes the circuit to the other side of the motor field coil, causing the motor to reverse. The floating flywheel is still turning in the original direction and therefore slows down the reversal movement of the motor; as a result the selector disc is moved slowly back until the insulation line is under the station-setting contact, when the circuit is broken and the mechanism stops.

Oscillation of Tuning Mechanism

The principal of operation necessitates that the mechanism go through several quick reversals on arriving at the desired station frequency and before reaching a dead stop. Three of four reversals are normal. The number of reversals and consistency of operation depends mainly on the flywheel friction adjustment, however, in some cases the selector disc and station setting contacts are involved. The following suggestions may be helpful where excessive pointer oscillation is experienced.

Oscillation on Certain Buttons Only

(1) Check contact tip of selector assembly for loose fit in body. See that nose of contact is not burned nor distorted out of correct shape. Replace tip if necessary; do not attempt to file the tips.

(2) Clean the insulating gap of selector disc, being sure to remove all metal particles and metallic fragments from beveled edges of the brass. Each contact should be checked to assure that clearance exists (approx. .010-In) between it and the disc when stopped in position on the station.

(3) Inspect the insulating gap to see that it has not changed shape due to bending or warping. Replace the disc if cleaning and adjustment fail to give correct operation.

Oscillation On All Buttons

(1) Slow oscillation indicates friction adjustment of flywheel is too tight. Loosen set screw in flywheel slightly.

(2) Rapid oscillation indicates friction adjustment is too loose. Tighten set screw in flywheel slightly.

(3) If definite adjustment cannot be reached, remove spring from behind flywheel set screw and increase its length by stretching; replace and make the necessary adjustments. Install a new spring if necessary.

(4) See that leather friction pad is not binding in its hole, and that it is saturated with lubricant. "Neats-Foot" oil should be used for this purpose.

(5) Incorrect balance of the flywheel sometimes prevents correct adjustment. The standard service replacement flywheel Stock No. 31240 may be used to definitely eliminate this cause.

(6) The number of oscillations varies somewhat with line voltage.

(7) Stability of adjustment is slightly better if made after a brief run-in period.

Adjustment of Selector Disc

The brass selector disc is fastened to the rear shaft of the tuning condenser by means of two set-screws. When the condenser is at maximum (plates fully meshed) the insulation line should be horizontal, with the beveled operating-end at the left (viewed from rear).

The selector disc should be set so that the contact-tip plungers in the station-setting contacts project not more than 1/16-in. from the body of the contacts.

Lubrication

Motor bearings and **gear bearings**; use light machine oil.

Gear faces; use "Pure Oil No. 611" or petroleum jelly.

Dial-indicator pulleys and **rails**; use "Castordag" or petroleum jelly.

Selector disc; apply *thin* film of petroleum jelly.

Friction leather on flywheel; apply "neats-foot" oil. When replacing leather, soak it for at least 24 hours in neats-foot oil, and insert in flywheel while dripping.

Muting Circuit

When the electric tuning mechanism is in action, the motor-supply voltage is fed into a diode rectifier circuit which applies a high bias to the first-audio amplifier. This prevents audio amplification and makes the set quiet or "mute" while the mechanism is operating.

Armchair Control Unit

When a Model G8A Armchair Control is connected to the receiver it duplicates the action of the push-buttons on the front panel when No. 1 button is pressed down. The black lead from push-button No. 1 is unsoldered from No. 1 station-setting contact and soldered to a terminal board which is to be mounted on the frame of selector mechanism. If desired one of the other seven station buttons on the set may be used in place of No. 1 button.

This arrangement allows the use of only seven of the eight buttons when tuning in stations at the set, but allows the use of the entire eight buttons on the Armchair Control. In operating the G8A Armchair Control the push-button must be held down until the station has been tuned in. Care must be taken not to hold two of the station-buttons down at one time as both windings of the motor may be engaged instantaneously causing the motor to be inoperative and overheated.

Component Parts of Station Setting Contact

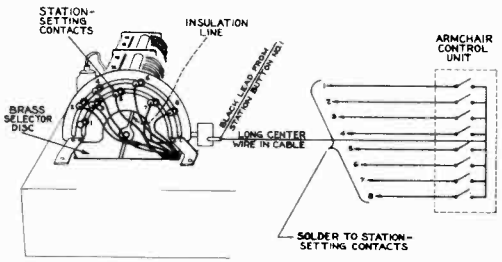
ADJUSTMENTS FOR ELECTRIC TUNING

1. Make a list of the desired eight stations, arranged in order from low to high frequencies.
2. Turn range selector to "A" band, turn power on, and allow a few minutes for warming up.
3. Press down the "dial-tuning" (right-hand) button.
4. Manually tune in the first station on the list, using the "Magic Eye" for accurate tuning.
5. Hold down the "dial-tuning" button, and press down station button No. 1 (second from left). Both buttons will stay down. Move adjusting pin No. 1 to the insulating line on the disc at rear of gang. When the pin is correctly centered on the insulating line, the central dial lamp will go completely out.
6. Press down any other button in order to release the dial-tuning button and station button No. 1. Then press down station button No. 1 again. The electric tuning mechanism will function to tune in the station, and the central dial lamp will stay on.
7. Repeat this process for the remaining stations.

Station-Setting Contacts and Selector Disc

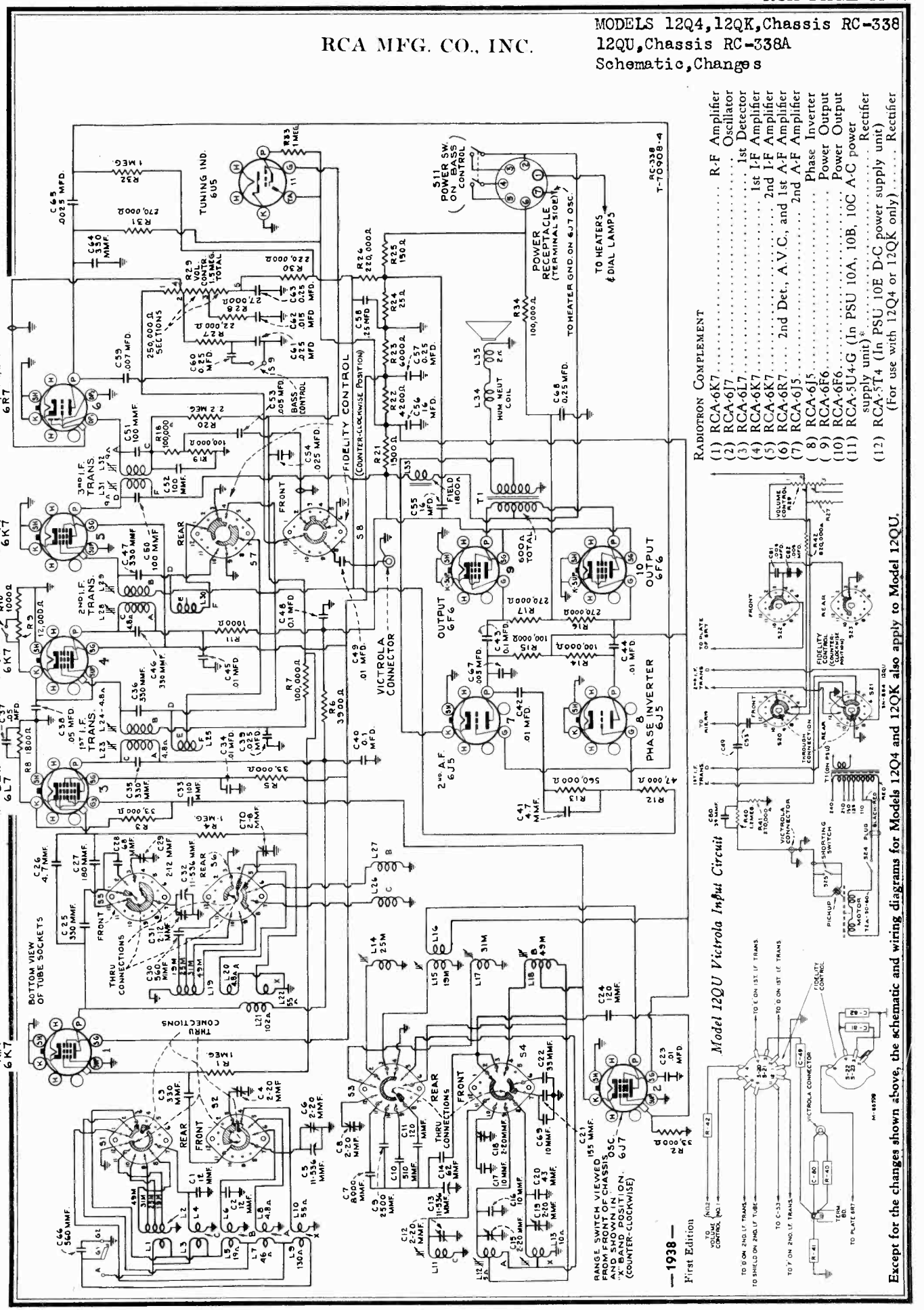
This illustration shows connections for a G8A Armchair Control Unit. This unit is not supplied with the receiver but may be added as an accessory.

Station Button	Color of Lead To Station-Setting Contact
No. 1	Black
No. 2	Brown
No. 3	Blue
No. 4	Green
No. 5	Red
No. 6	Red-black
No. 7	Brown-black
No. 8	Red-yellow

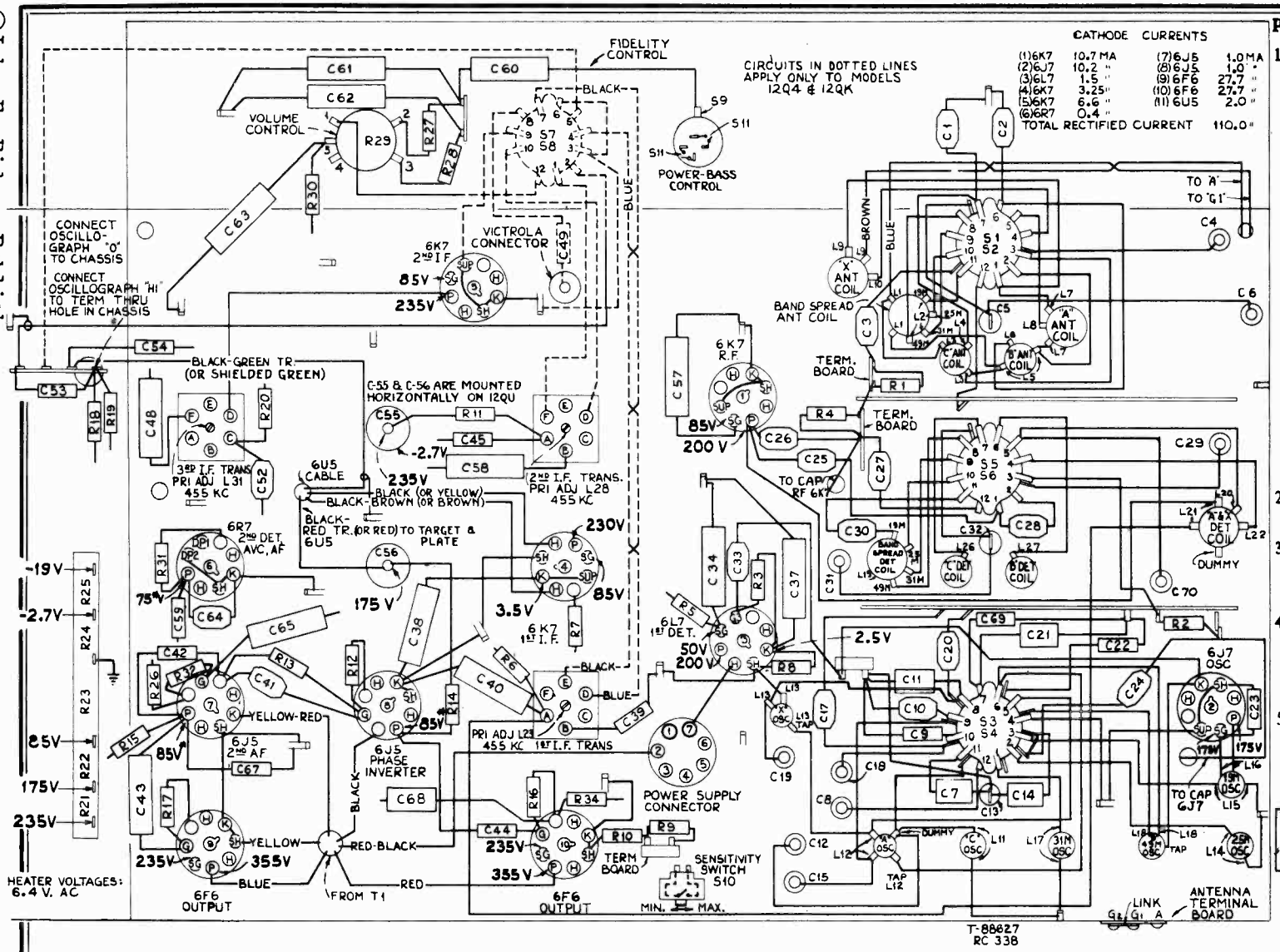


RCA MFG. CO., INC.

MODELS 12Q4, 12QK, Chassis RC-338
12QU, Chassis RC-338A
Schematic, Changes



Except for the changes shown above, the schematic and wiring diagrams for Models 12Q4 and 12QK also apply to Model 12QU.



R-F Wiring Diagram and Socket Voltages, Models 12Q4 and 12QK

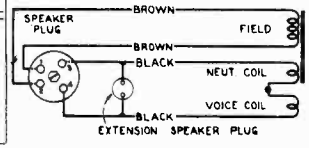
Model 12QU is the same except for the Victrola connections, which are shown in a separate diagram.

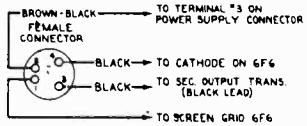
***NOTE:** Values with star (*) are operating voltages in circuits with high series-resistance. The actual measured voltages will be lower, depending on the voltmeter loading.

Measurements made to chassis unless otherwise indicated, with set tuned to quiet point, sensitivity switch at maximum (closed), and volume control at minimum. Values should hold within approximately ±20% with 117-volt a-c supply.

Precautionary Lead Dress.—

1. The following leads should be dressed away from other parts and chassis:
   a. All leads to the bottom of the tuning gang.
   b. All capacitor leads to oscillator section of range switch.
   c. Yellow lead from lug No. 10 on S4 to dummy lug on "A" oscillator coil.
   d. Yellow lead from pin No. 8 on 6J7 oscillator socket to terminal board.
   e. Yellow and green leads from "X" detector coil (should be dressed away from each other as well as other parts).
2. Dress all leads away from phono jack and C49.
3. Twisted leads of "B" oscillator coil must be soldered together within ¼-inch of coil tube.
4. The brown, black, and blue leads in back of the oscillator coils should be dressed away from coil windings.
5. R13 and C41 must be dressed away from pin No. 7 of 6J5 (tube No. 7).





Connections of Loudspeaker and Cable

RCA MFG. CO., INC.

MODELS 12Q4,12QK,12QU
Socket,Trimmers
Drive Cord Data
Power Supply Notes

FOR POWER SUPPLY
DATA SEE INDEX

Specifications

FREQUENCY RANGES

Long Wave ("X" Band)	150-400 kc (2,000-750 m)	49 Meter Spread Band	5.92-6.23 mc
Medium Wave ("A" Band)	530-1,625 kc (566-184.6 m)	31 Meter Spread Band	9.48-9.70 mc
Short Wave 1 ("B" Band)	2.3-7.0 mc (130-42.8 m)	25 Meter Spread Band	11.68-11.94 mc
Short Wave 2 ("C" Band)	7.0-22 mc (42.8-13.6 m)	19 Meter Spread Band	15.08-15.39 mc

INTERMEDIATE FREQUENCY ..... 455 kc

PHONOGRAPH (Model 12QU only)

Type	Automatic
Record Capacity	Eight 10-inch or seven 12-inch
Turntable Speed	78 r.p.m. (adjustable)
Type Pickup	Crystal
Pickup Impedance	100,000 ohms at 1,000 cycles

PILOT LAMPS

Models 12Q4 and 12QK	One 6.3-volt, 0.15-amp., Mazda No. 47; two 6.3-volt, 0.25 amp., Mazda No. 44
Model 12QU	One 6.3-volt, 0.15-amp., Mazda No. 47; three 6.3-volt, 0.25 amp., Mazda No. 44

POWER OUTPUT RATING

Undistorted	10 watts
Maximum	12 watts

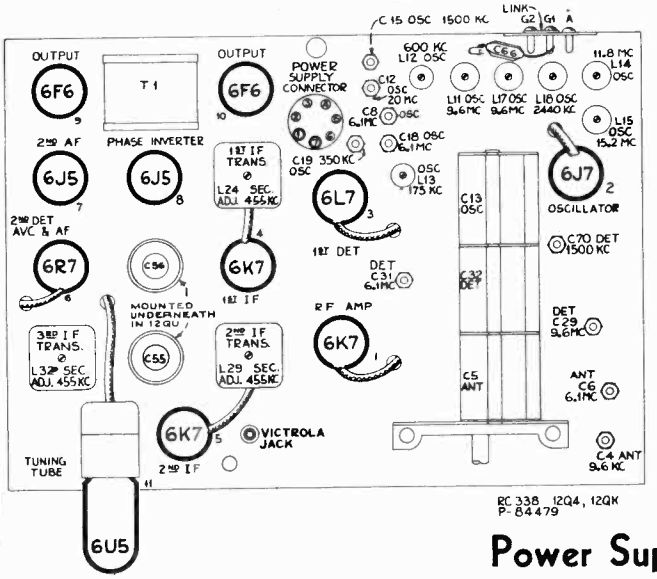
LOUDSPEAKER (RL-70H-3)

Type	12-inch electrodynamic
Voice Coil Impedance at 400 cycles	2.2 ohms

POWER SUPPLY RATINGS

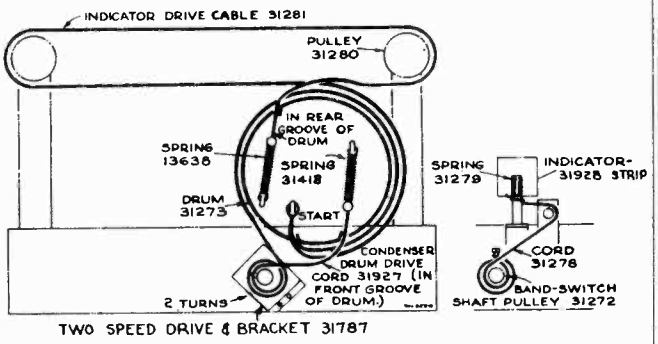
		12Q4, 12QK	12QU * Radio	12QU * Total
A-C Ratings				
With PSU 10A Power Supply Unit	105-125 volts, 50-60 cycles	125 watts	125 watts	150 watts
With PSU 10B Power Supply Unit	105-125 volts, 25-60 cycles	125 watts		
With PSU 10C Power Supply Unit	105-130, 140-160, 200-250 volts, 50-60 cycles	125 watts	125 watts	150 watts
D-C Ratings				
With PSU 10E Power Supply Unit	105-125, 210-250 volts D-C	(See text for current consumption ratings)		

* Model 12QU may be used with PSU 10A or 10C *only*.



RC 338 12Q4, 12QK
P-84479

At Left—Location of Tubes and Trimmers



TWO SPEED DRIVE & BRACKET 31787

(TUNING CONDENSER IN FULL MESH POSITION)

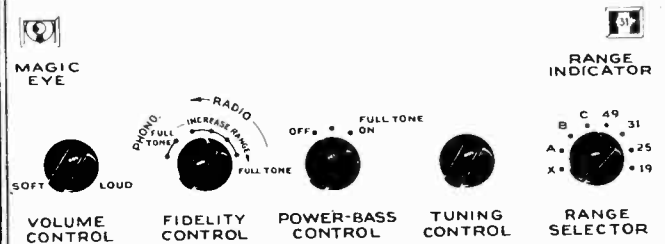
***Above**—Arrangement of Drive Cords for Tuning Condenser and Dial Indicator*

Power Supply Units

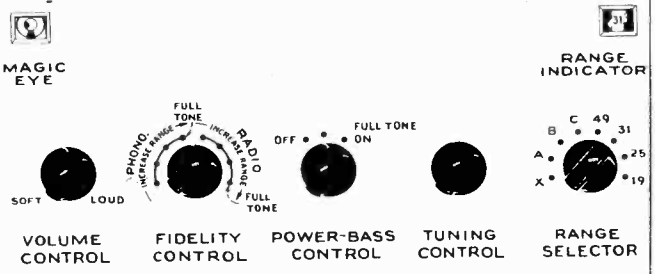
Models 12Q4, 12QK, and 12QU have seven-prong connectors for connection to a separate power supply unit. Units are available in different ratings for a.c. and d.c. operation, as listed under "Power Supply Ratings" in the electrical specifications. It should be noted, however, that Model 12QU may be used with a.c. units PSU 10A or 10C **only.**

When Model 12Q4 or Model 12QK is used with a d.c. Power Supply Unit, the measured current drain is 0.7 amperes from a 234 volt supply, and 1.4 amperes from a 117 volt supply. These current values may vary as much as 30% when measured by various types of ammeters, due to the rectangular wave-shape of the vibrator current.

Service data, diagrams, and replacement parts lists for the power supply units are printed in separate service data sheets which should be referred to for further information.



Location of Controls, Models 12Q4 and 12QK



Location of Controls, Model 12QU

Purpose and Function of Fidelity Control

Position	MODELS 12QK AND 12Q4 For Use On	I-F Channel	Audio Channel
1 (Extreme Counter-clockwise)	Record Player	———	Min. highs
2	Record Player	———	Max. highs
3	Distant Stations	Sharp	Min. highs
4	Distant Stations	Sharp	Max. highs
5	Local and Medium Distant Stations	Medium	Max. highs
6 (Extreme Clockwise)	Local Stations	Broad	Max. highs

Position	MODEL 12QU For Use On	I-F Channel	Audio Channel
1 (Extreme Counter-clockwise)	Victrola	———	Min. highs
2	Victrola	———	Medium No. 1
3	Victrola	———	Medium No. 2
4	Victrola	———	Max. highs
5	Distant Stations	Sharp	Min. highs
6	Distant Stations	Sharp	Max. highs
7	Local and Medium Distant Stations	Medium	Max. highs
8 (Extreme Clockwise)	Local Stations	Broad	Max. highs

Miscellaneous Service Data

Plug for Extension Loudspeaker.—A two-contact female socket, equipped with a male plug, is connected across the output circuit on the loudspeaker to facilitate the connection of an extension loudspeaker if desired.

A permanent-magnet dynamic speaker, with voice-coil impedance of not less than 2 ohms is recommended: With a 2-ohm voice coil, the extension speaker will receive approximately half the power output of the receiver; with a higher-impedance voice coil, the percentage of power delivered to the extension speaker will be decreased.

The RCA MI-6248 8-inch diameter Alnico permanent-magnet dynamic loudspeaker, which has a 2-ohm voice coil, and a power-handling capacity of 5 watts, is recommended. This speaker may be housed in the RCA MI-6292 sloping-front, walnut-finished wood housing.

The voice coil of the extension speaker should be connected by means of two-conductor cable, such as is used on electrical appliances, to the male plug. The cable may be any desired length, but with a long run, when using a low-impedance extension speaker, it is advisable to use heavy cable.

A high-impedance magnetic-type speaker may be used in conjunction with a suitable coupling transformer such as RCA Stock No. 7853.

Victrola Attachment (record player).—A jack located on the top near the front of the chassis is provided for connecting a Victrola Attachment (record player) into the audio amplifying circuit on Models 12Q4 and 12QK. The cable running from the Victrola Attachment should be terminated in a Stock No. 31048 plug to fit the jack.

Antenna Connections.—Three terminals ("A," "G1," and "G2") are provided on the rear of the chassis. Connect the antenna to "A." Connect "G1" to a nearby ground. A link connects "G1" and "G2." In case of electrical interference (especially on "X" band) open the link and connect "G2" separately to ground. This also applies when a d.c. power supply is used.

ALIGNMENT PROCEDURE

Alignment using the Cathode Ray Oscillograph is much the preferable method because of the variable selectivity features of these instruments. The curves shown illustrate the general shape of the i-f selectivity curves for different settings of the fidelity control, when i-f channel is properly aligned. Connections for the oscillograph are shown in the bottom view of the receiver chassis. Use short, unshielded leads to oscillograph, and well-shielded leads from test oscillator. If possible, use 30 or 40 kc sweep frequency for i-f alignment.

Output Meter Alignment.—If this method is used, connect meter across voice coil, and turn receiver volume control to maximum. Disregard steps 5 and 5A of alignment table. However, a listening check should be made to check operation of fidelity control, after receiver has been aligned.

Test Oscillator.—For all alignment operations connect the "Gnd" side of test oscillator to chassis, the high side as indicated in table, and keep output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment, therefore a calibration scale is attached to the rear of the indicator-drive-cord drum which is mounted on the front shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The "0" mark on the drum scale must be vertical, and directly over the center of the gang-condenser shaft when the plates are fully meshed. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

To determine the corresponding frequency for any setting of the calibration scales, refer to the accompanying drawing which shows the dial with 0-180° calibration scales drawn at top and bottom.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "0" mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the left-hand end calibration marks on the dial scales, and gang condenser fully meshed. The indicator has a spring clip for attachment to the cable.

Spread-Band Alignment.—The most satisfactory method of aligning or checking the spread-band ranges is on actual reception of short-wave stations of known frequency, by adjusting the magnetite-core oscillator coil for each band so that these stations come in at the correct points on the dial.

In exceptional cases, when the set is being serviced in a location where the noise level is high enough to prevent reception of short-wave stations, a test-oscillator may be used for alignment, but an extremely high degree of accuracy is required in the frequency settings of the test-oscillator, as a slight error will produce considerable inaccuracy on the spread-band dials. The frequency settings of the test-oscillator may he checked by one or both of the following methods:

1. Determine the exact dial settings of the test-oscillator (for frequencies at or close to the specified alignment frequencies) by zero-beating the test-oscillator against short-wave stations of known frequency.
2. Use harmonics of the standard-broadcast range of a test-oscillator, first checking the frequency settings on this range by means of a crystal calibrator (RCA Stock No. 9572), or by zero-beating against standard broadcast stations.

When a test oscillator is employed for spread-band alignment, a final check should be made on actual reception of short-wave stations of known frequency, and the magnetite-core oscillator coil for each band should be re-adjusted so that the stations come in at the correct points on the dial.

For additional information, refer to booklet "RCA Victor Receiver Alignment."

Using RCA Stock No. 150 Test Oscillator.—When using this oscillator for spread-band alignment, insert an open-circuit plug in the "EXT. MOD." jack, and set the test-oscillator dial 800 kc lower than the desired frequency for the four lower frequency ranges, and 800 kc higher than the desired frequency for the two high ranges. This provides an unmodulated signal of the desired frequency and the magic eye may be used as an output indicator for this unmodulated signal.

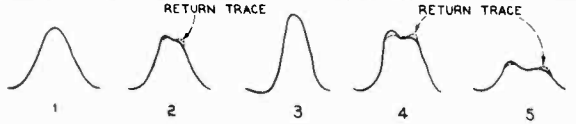
Alignment Table

Step	Connect high side of test-osc. to—	Tune test osc. to—	Turn radio dial to—	Adjust following for maximum peak output	Check Selectivity Curve No.
1	Turn fidelity control to 3rd position from maximum clockwise, sensitivity switch min. (open)				
2	6K7 2nd I.F. grid cap in series with .01 mfd.	455 kc	"A" band Quiet Point between 550-750 kc	L31 and L32 3rd I-F Trans.	1
3	6K7 1st I.F. grid cap in series with .01 mfd.			L28 and L29 2nd I-F Trans.	2
4	6L7 1st-det. grid cap in series with .01 mfd.			L23 and L24 1st I-F Trans.	3
5	Turn fidelity control one position back from full clockwise				4
5A	Turn fidelity control full clockwise				5
6	Turn fidelity control to 3rd position from maximum clockwise for the following operations				
7	Antenna Terminal, in series with 200 mmf.	2,440 kc	"B" band 2.44 mc (16°)	L18 (osc.) †	
8	Antenna Terminal, in series with 300 ohms	6,100 kc	"B" band 6.1 mc (150°)	C18 (osc.) C31 (det.) ** C6 (ant.) **	* NOTE: In step 18 only, the oscillator tracks on low side of signal; use maximum capacity peak (plunger in) if two peaks can be obtained. All other oscillator adjustments use minimum inductance or capacity peak (plunger out), if two peaks can be obtained.
9	Antenna Terminal, in series with 200 mmfd.	600 kc	"A" band 600 kc (36°)	L12 (osc.) Rock Gang	
10		1,500 kc	"A" band 1,500 kc (158°)	C15 (osc.) C70 (det.)	
11		600 kc	"A" band 600 kc (36°)	L12 (osc.) Rock Gang	
12		175 kc	"X" band 175 kc (54°)	L13 (osc.) Rock Gang	
13		350 kc	"X" band 350 kc (147°)	C19 (osc.)	
14		175 kc	"X" band 175 kc (54°)	L13 (osc.) Rock Gang	
15	Antenna Terminal, in series with 300 ohms	9,600 kc	"C" band 9.6 mc (58.5°)	L11 (osc.) ††	
16		20,000 kc	"C" band 20 mc (157°)	C12 (osc.)	
17		9,600 kc	"31M" band 9.6 mc (100°)	L17 (osc.) C29 (det.) C4 (ant.)	
18*		6,100 kc	"49M" band 6.1 mc (106°)	C8 (osc.)	
19		11,800 kc	"25M" band 11.8 mc (90°)	L14 (osc.)	
20		15,200 kc	"19M" band 15.2 mc (78°)	L15 (osc.)	

** Use maximum capacity peak if two can be obtained.

† Before adjusting L18, set C18 so it projects approximately 2 inches above top of chassis.

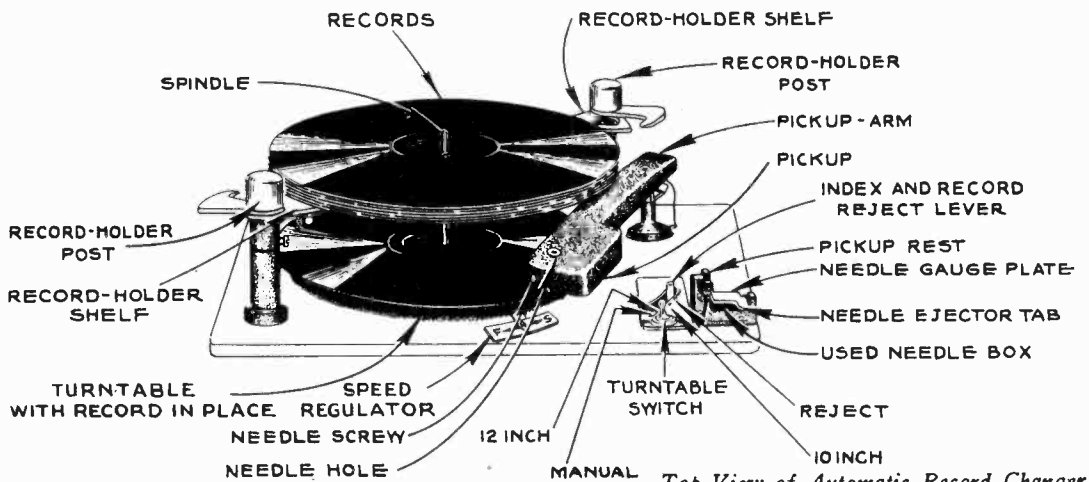
†† Before adjusting L11, set C12 so it projects approximately 2 inches above top of chassis.



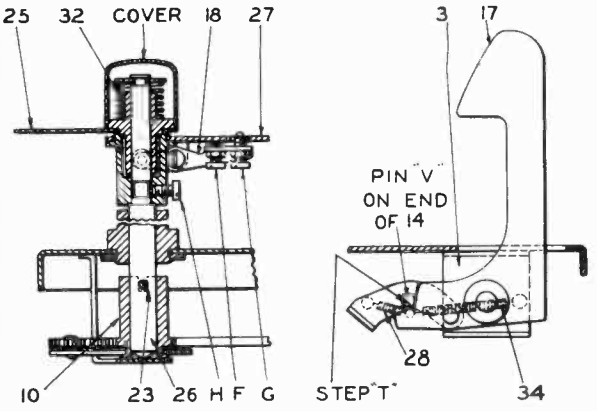
I-F Selectivity Curves

RCA MFG. CO., INC.

MODEL 11QU
MODEL 12QU
Record Changer Assembly

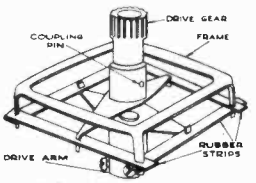


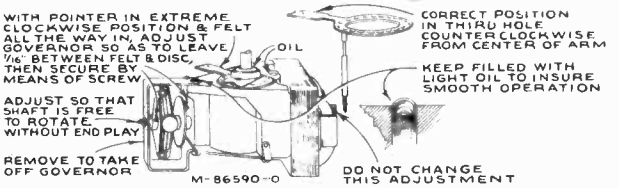
Top View of Automatic Record Changer



Details of Record Shelf Posts, and Locating Lever Assemblies

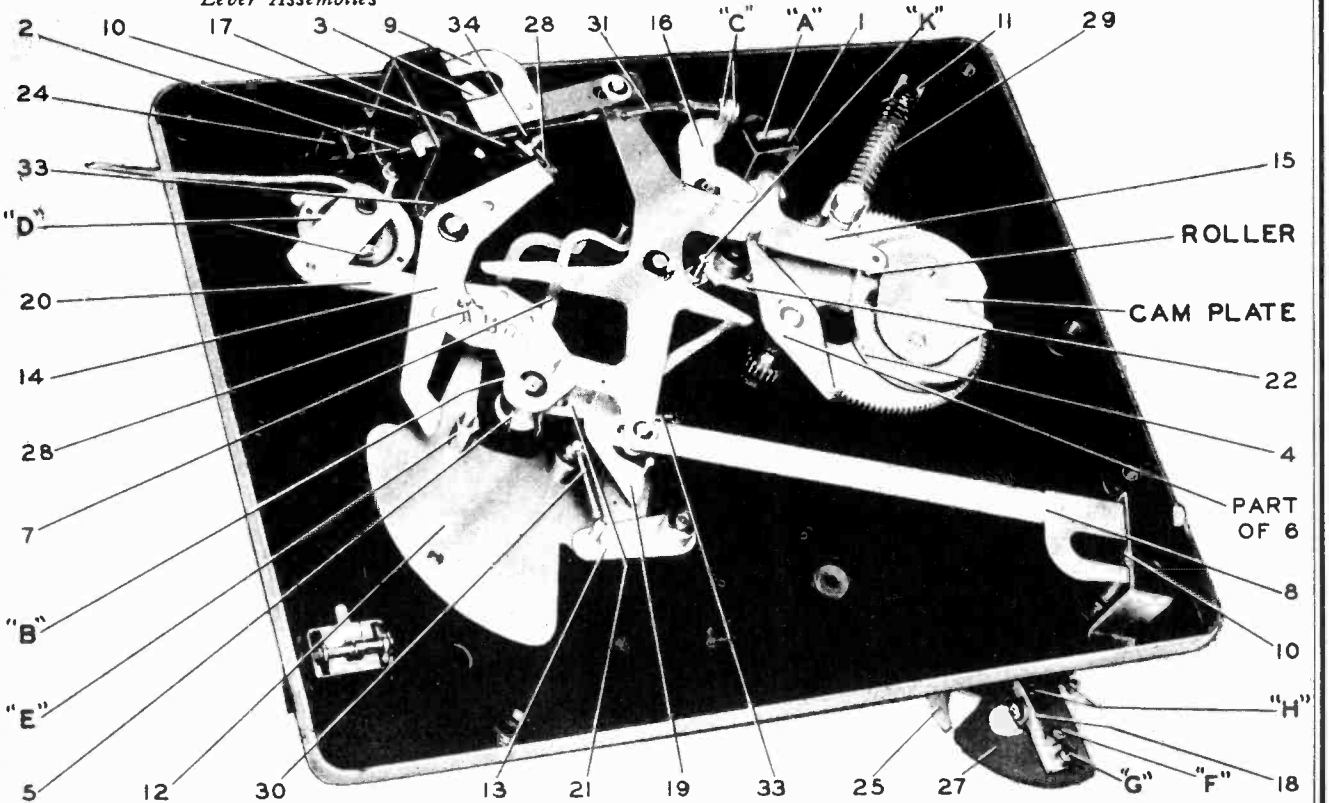
Motor Data and Coupling





Bottom View of Automatic Record Changer

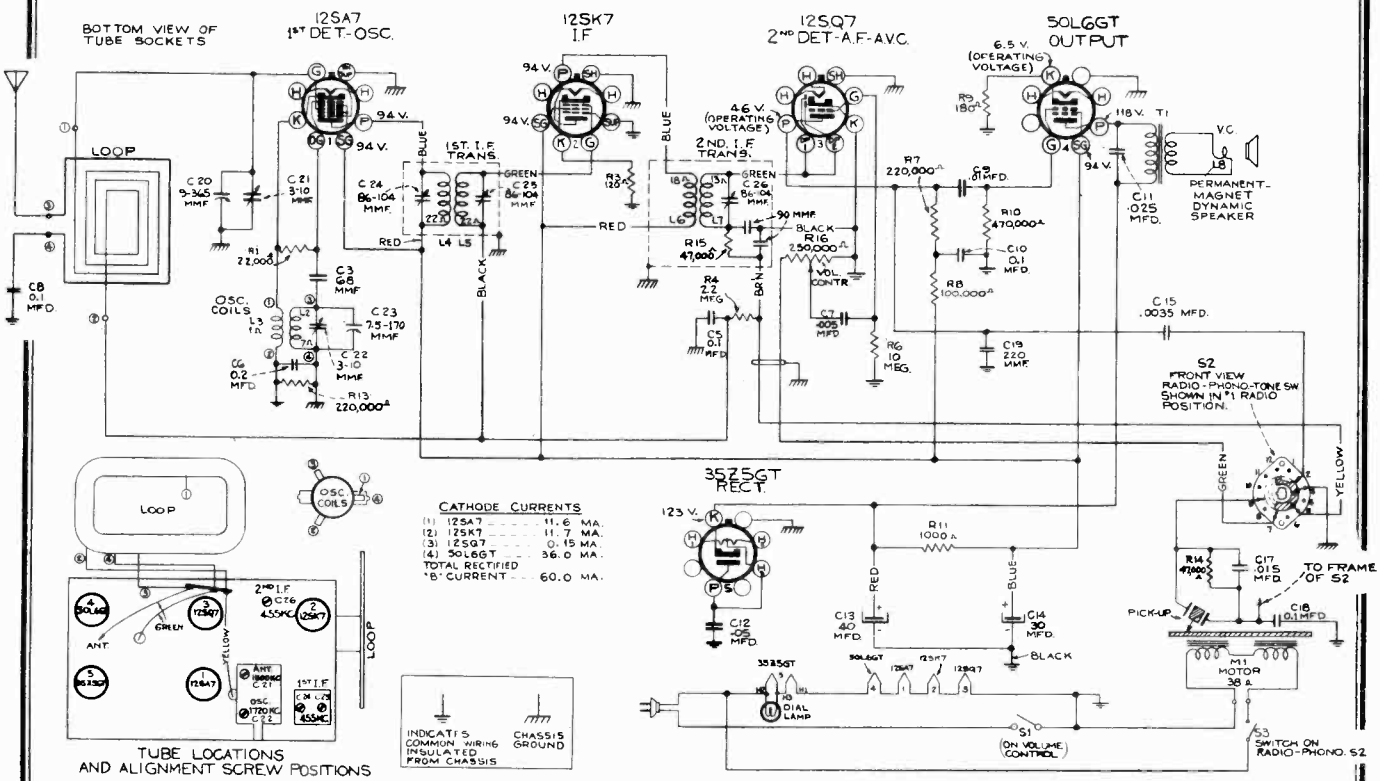
NOTE: Numbers refer to parts—letters refer to adjustments.



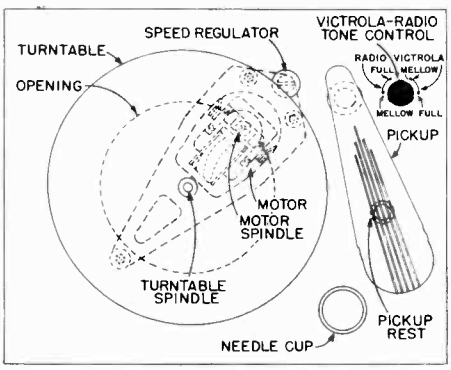
See Model RP-139-A for MISCELLANEOUS SERVICE HINTS ADJUSTMENTS

MODEL U9, Chassis RC482B
Schematic, Voltage, Socket Alignment, Trimmers, Phono.

RCA MFG. CO., INC.



TUBE LOCATIONS AND ALIGNMENT SCREW POSITIONS



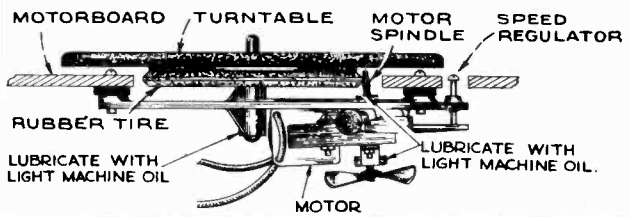
PHONOGRAPH MECHANISM.—

The phonograph motor is self-starting and operates the turntable through friction drive between the motor spindle and the rubber tire on the underside of the turntable.

The rubber driving tire on the turntable should never be removed since it is ground in to be concentric with the spindle. If replacement is required, the entire turntable should be replaced.

The speed regulator raises and lowers the motor. This changes the driving ratio between the motor and the turntable due to the motor spindle being conical in shape. It is important to adjust this regulator for a turntable speed of 78 r.p.m. WHILE PLAYING A 10-INCH RECORD WITH THE NEEDLE APPROXIMATELY ONE INCH FROM THE OUTER EDGE OF THE RECORD.

Lubrication.—The motor should be lubricated as follows: Place a few drops of S.A.E. 20 (or equivalent) on the turntable spindle and saturate the oil retaining felt pads on the motor shaft with S.A.E. 10 oil. This oiling process should be repeated once or twice a year. CAUTION.—THE MOTOR DRIVE SPINDLE AND RUBBER DRIVING TIRE ON THE TURNTABLE MUST BE KEPT CLEAN AND ENTIRELY FREE FROM OIL AND GREASE AT ALL TIMES.



FREQUENCY RANGE

Standard Broadcast and one Police Band	540-1,720 kc
INTERMEDIATE FREQUENCY	455 kc
PILOT LAMP (1)	Mazda No. 51, 7.5 volts, 0.2 amp.

LOUDSPEAKER (84843-1 or RL81-2)

Type		5-inch P M Dynamic
Voice Coil Impedance	(84843-1)	3.4 ohms at 400 cycles
	(RL81-2)	4.5 ohms at 400 cycles
PICKUP		Crystal
Pickup Impedance		0.1 meg. at 1,000 cycles

POWER OUTPUT RATING

Undistorted	0.71 watts
Maximum	1.36 watts

POWER SUPPLY RATINGS

A-6	105-125 volts, 60 cycles
A-5	105-125 volts, 50 cycles
POWER CONSUMPTION	55 watts

Alignment Procedure

Output Meter Alignment.—Connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test Oscillator.—Connect the low side of the test oscillator to the receiver chassis through a 0.01 mfd capacitor, and keep the output as low as possible.

Pre-Setting Dial.—With gang condenser in full mesh, the pointer should coincide with the left hand mark stamped in the dial backplate.

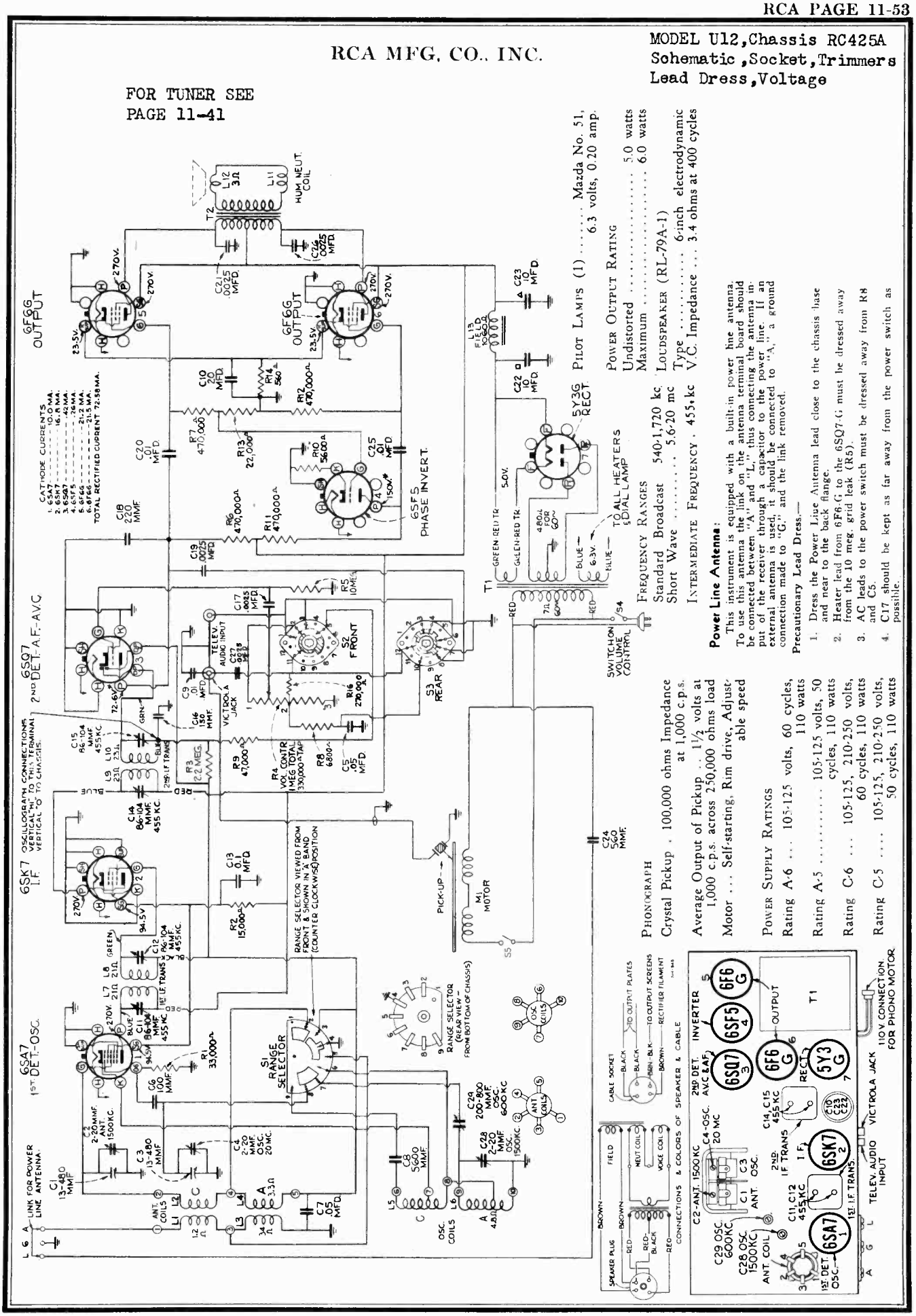
Antenna.—This set is equipped with a built-in loop antenna. If an outdoor antenna is used, it may be connected to the green antenna lead, stapled to the base of the cabinet. The antenna should not be longer than 100 feet including the lead-in. If it is longer, connect a 100 mmfd. capacitor in series with the lead-in.

Steps	Connect the high side of test oscillator to—	Tune test osc. to—	Turn radio dial to—	Adjust the following for max. output—
1	Tuning Cond. stator (det.) in series with 0.01 mfd.	455 kc	Quiet Point at 1,600 kc end of dial	C24, C25, C26 (1st and 2nd I-F transformers)
2	Antenna lead (green) in series with 100 mmfd.	1,720 kc	Full Clockwise (out of mesh)	C22 (osc.)
3		1,500 kc	Resonance on 1,500 kc signal	C21 (ant.)

RCA MFG. CO., INC.

MODEL U12, Chassis RC425A
Schematic, Socket, Trimmers
Lead Dress, Voltage

FOR TUNER SEE
PAGE 11-41



PILOT LAMPS (1) ..... Mazda No. 51, 6.3 volts, 0.20 amp.

POWER OUTPUT RATING
Undistorted ..... 5.0 watts
Maximum ..... 6.0 watts

LOUDSPEAKER (RL-79A-1)
Type ..... 6-inch electrodynamic
V.C. Impedance ... 3.4 ohms at 400 cycles

FREQUENCY RANGES
Standard Broadcast 540-1,720 kc.
Short Wave ..... 5.6-20 mc

INTERMEDIATE FREQUENCY . 455 kc

PHONOGRAPH
Crystal Pickup . 100,000 ohms Impedance at 1,000 c.p.s.
Average Output of Pickup .. 1½ volts at 1,000 c.p.s. across 250,000 ohms load
Motor ... Self-starting, Rim drive, Adjustable speed

POWER SUPPLY RATINGS
Rating A-6 ... 105-125 volts, 60 cycles, 110 watts
Rating A-5 ..... 105-125 volts, 50 cycles, 110 watts
Rating C-6 ... 105-125, 210-250 volts, 60 cycles, 110 watts
Rating C-5 ..... 105-125, 210-250 volts, 50 cycles, 110 watts

Power Line Antenna:

This instrument is equipped with a built-in power line antenna. To use this antenna the link on the antenna terminal board should be connected between "A" and "L," thus connecting the antenna input of the receiver through a capacitor to the power line. If an external antenna is used, it should be connected to "A," a ground connection made to "G," and the link removed.

Precautionary Lead Dress.—

1. Dress the Power Line Antenna lead close to the chassis base and near to the back flange.
2. Heater lead from 6F6-G to the 6SQ7-G must be dressed away from the 10 meg. grid leak (R5).
3. AC leads to the power switch must be dressed away from R8 and C5.
4. C17 should be kept as far away from the power switch as possible.

CHASSIS ASSEMBLIES (RC-425A)

33719	Belt—Tuning unit push arm belt	.05
33718	Board—Antenna-ground board	.20
33629	Capacitor—Trimmer capacitor, one section 2-20 mmfd., and one section 300-800 mmfd. (C9, C10)	.60
12720	Capacitor—100 mmfd. (C6)	.35
12725	Capacitor—150 mmfd. (C16)	.35
12694	Capacitor—220 mmfd. (C18)	.35
12537	Capacitor—560 mmfd. (C24)	.35
13895	Capacitor—5,600 mmfd. (C8)	.70
5107	Capacitor—.0025 mfd. (C19, C21, C26)	.20
34459	Capacitor—.0025 mfd. (C17, C27)	.40
4937	Capacitor—.01 mfd. (C9, C20, C25)	.25
32787	Capacitor—.05 mfd. (C7)	.20
4839	Capacitor—0.1 mfd. (C13)	.30
32240	Capacitor—Comprising 2 sections of 10 mfd., and 1 section of 20 mfd. (C10, C22, C23)	1.45
33732	Coil—Antenna coil (L1, L2, L3, L4)	1.45
33733	Coil—Oscillator coil (L5, L6)	.70
33776	Control—Volume control and power switch (R4, S4)	2.00
32634	Cord—Braided silk drive cord	.10
33633	Indicator—Station selector indicator pointer	.20
11765	Lamp—Pilot lamp	.15
33727	Plate—Dial plate assembly—less dial	.90
5119	Plug—4-contact female plug for speaker cable	.25
14439	Resistor—100 ohms, ½ watt (R15)	.20
17214	Resistor—560 ohms, 2 watts (R14)	.22
13714	Resistor—5,600 ohms, ½ watt (R10)	.20
12265	Resistor—6,800 ohms, ½ watt (R8)	.20
33489	Resistor—15,000 ohms, 2½ watts (R2)	.55
13998	Resistor—22,000 ohms, ½ watt (R13)	.20
12454	Resistor—33,000 ohms, ½ watt (R1)	.20
12412	Resistor—47,000 ohms, ½ watt (R9)	.20
12199	Resistor—270,000 ohms, ½ watt (R16)	.20
12285	Resistor—470,000 ohms, ½ watt (R6, R7, R11, R12)	.20
12679	Resistor—2.2 meg., ½ watt (R3)	.20
13601	Resistor—10 meg., ½ watt (R5)	.20
33735	Screw—Push button lock screw	.05
33725	Shaft—Tuning drive shaft	.30
33514	Socket—Phonograph input socket	.25
31364	Socket—Pilot lamp socket	.20
31319	Socket—Tube base socket	.25
31418	Spring—Indicator drive cord spring	.05
33720	Spring—Push arm return spring	.02
33946	Switch—Range switch	.75
33894	Switch—Tone control, phono. or television switch (S2, S3)	1.00
33722	Transformer—First i-f transformer (L7, L8, C11, C12)	1.60
33895	Transformer—Second i-f transformer (L9, L10, C14, C15)	1.50
33619	Transformer—Power transformer—105-125 volts, 25-60 cycles (T1)	6.40
34261	Transformer—Power transformer—110 volts, 60 cycles	4.00
31575	Transformer—Power transformer—105-125, 200-250 volts, 50-60 cycles (T1)	8.35

MOTOR ASSEMBLIES

33897	Base—Motor base and ball assembled	.80
33902	Motor—Complete motor 105-125 volts, 60 cycle (M1)	3.70
34496	Motor—Complete motor 105-125 volts, 50 cycle (M1)	4.60
33896	Mounting—Motor cradle mounting hardware and retainer	.10

SPEAKER ASSEMBLIES (RL-79A-1)

32907	Cap—Dust cap	.02
33601	Coil—Field coil (L13)	1.25
32906	Coil—Neutralizing coil (L11)	.25
32934	Cone—Cone complete with voice coil, center suspension and rim gaskets (L12)	1.65
5039	Plug—4-prong male speaker plug	.30
33599	Transformer—Output transformer (T2)	1.35

AUTOMATIC SWITCH ASSEMBLIES

32863	Cam—Cam assembly comprising main and auxiliary cam, hub and set screws	.65
32864	Lever—Actuating lever with roller and mercury switch clip	.45
31118	Screw—No. 10-32 x 5/16 fillister head cone pointed set screw	.06
32868	Spring—Actuating lever tension spring	.05
32867	Spring—Cam tension spring	.05
32865	Support—Switch support and terminal board	.40
32866	Switch—Mercury tube with leads (S5)	1.75
31608	Washer—"C" washer for holding actuating lever	.01

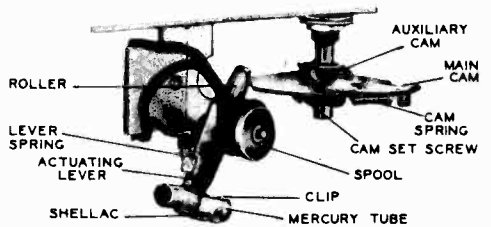
PICKUP ASSEMBLIES

33906	Arm—Pickup arm—shell only	.45
33908	Base—Pickup support arm base and retainer	.35
33905	Crystal—Pickup crystal cartridge	4.25
33907	Support—Pickup support arm complete—less base	.80

MISCELLANEOUS ASSEMBLIES

33731	Button—Push button assembly	.15
31456	Cover—8-protective covers for push button marker	.08
33910	Cup—New needle cup	.30
33909	Cup—Used needle cup	1.00
34270	Dial—Glass dial scale	1.50
33637	Escutcheon—Dial glass escutcheon	.80
13085	Hinge—Cabinet lid hinge	.22
33942	Knob—Tone control or range switch knob	.25
30863	Knob—Tuning or volume control knob	.15
33973	Marker—Push button markers	.45
33901	Mounting—1 set motor mounting hardware	.30
33530	Mounting—Pickup mounting hardware	.10
30870	Plug—2-prong male connectors	.35
31048	Plug—2-conductor male plug for pickup lead	.15
30900	Spring—Retaining spring for knobs, Stock Nos. 30863, 33942 and button No. 33731	.05
31164	Support—Cabinet lid support	.45
33899	Turntable—Complete with rubber drive ring	3.70

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.



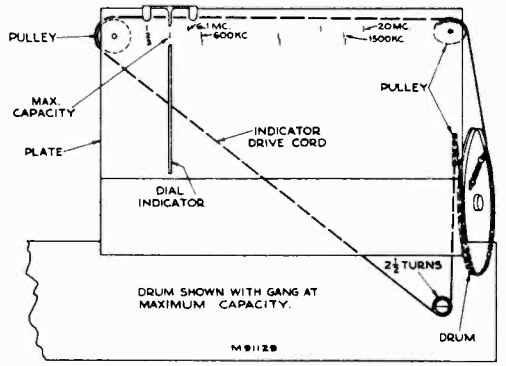
MERCURY SWITCH MECHANISM
(VIEWED FROM FRONT SHOWN WITH PICKUP IN REST POSITION)

The speed regulator raises and lowers the motor. This changes the driving ratio between the motor and the turntable due to the motor spindle being conical in shape. It is important to adjust this regulator for a turntable speed of 78 r.p.m. WHILE PLAYING A 10-INCH RECORD WITH THE NEEDLE APPROXIMATELY ONE INCH FROM THE OUTER EDGE OF THE RECORD.

The motor switch is automatic for both starting and stopping, and when properly adjusted, will turn the motor on as the pickup is moved from the pickup rest toward the turntable. The switch should be adjusted so that it will snap into the "off" position when the pickup needle is 1¾ inches from the center line of the turntable shaft. The motor may be shut off at any time by placing the pickup on the pickup rest.

Lubrication.—The motor should be lubricated as follows: Place a few drops of S.A.E. 20 (or equivalent) on the turntable spindle and saturate the oil retaining felt pads on the motor shaft with S.A.E. 10 oil. This oiling process should be repeated once or twice a year. CAUTION.—THE MOTOR DRIVE SPINDLE AND RUBBER DRIVING TIRE ON THE TURNTABLE MUST BE KEPT CLEAN AND ENTIRELY FREE FROM OIL AND GREASE AT ALL TIMES.

Calibration Marks.—The tuning dial is fastened in the cabinet and can not be used for reference during alignment. Therefore calibration marks corresponding to dial readings of 600 kc, 1,500 kc, 6.1 mc, and 20 kc have been stamped in the plate on the front of the chassis as shown in the accompanying drawing. These marks are used for reference during alignment.



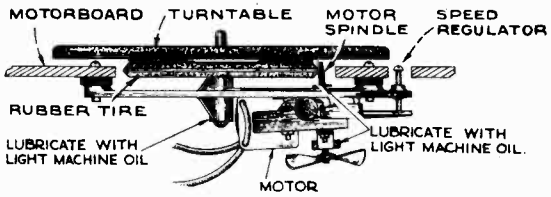
DIAL MECHANISM AND CALIBRATION MARKS.

Dial Indicator Adjustment.—With the gang condenser in full mesh, the indicator should point to the mark at the extreme left (low frequency) end of the dial scale.

Step	Connect the high side of the test-osc. to—	Tune test osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	Antenna terminal	455 kc	"A" Band Quiet Point between 550-750 kc	C14 and C15 (2nd I-F Trans.)
2				C11 and C12 (1st I-F Trans.)
3	Ant. terminal in series with 300 ohms	20 mc	"C" Band 20 mc calibration mark	C4 (osc.)*
4	Ant. terminal in series with 200 mmf.	1,500 kc	"A" Band 1,500 kc calibration mark	C28 (osc.) C2 (ant.)
5		600 kc	"A" Band 600 kc calibration mark	C29 (osc.) Rock Gang
6	Repeat step 4			

* Use minimum peak if two can be obtained. Check to determine that C4 has been adjusted properly by tuning receiver to approximately 19.09 mc where a weaker signal should be received.

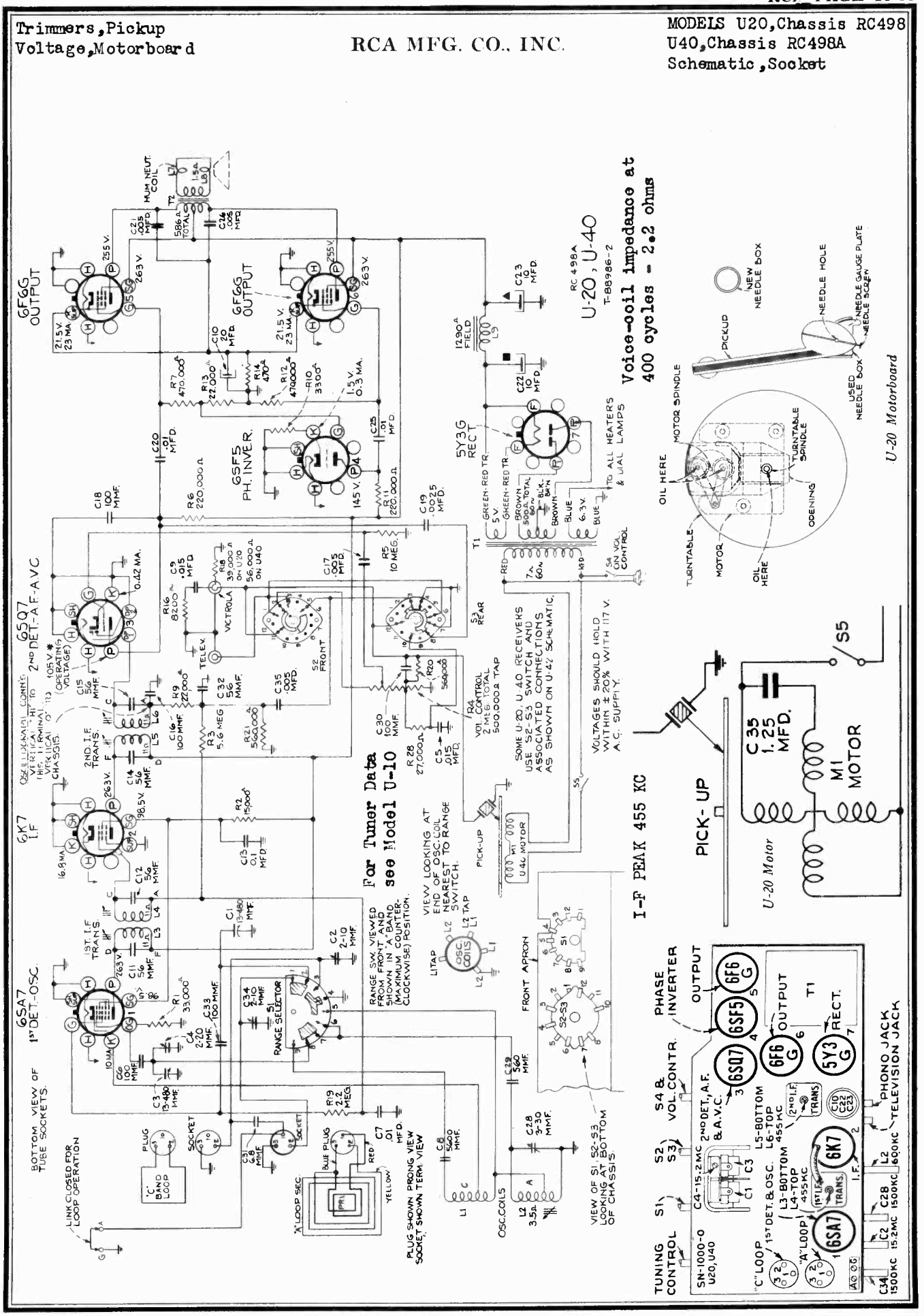
Note: Oscillator tracks above signal on both bands.



Trimmers, Pickup
Voltage, Motorboard

RCA MFG. CO., INC.

MODELS U20, Chassis RC498
U40, Chassis RC498A
Schematic, Socket



MODELS U20, Ch. RC498, U40
Ch. RC498A, U42, Ch. RC498B
Alignment, Phono. Speaker
Parts List

Replacement Parts

Insist on genuine factory-tested parts, which are readily identified and may be purchased from authorized dealers.

STOCK No.	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES	
33719	Belt—Push button station setting belt (Models U-40, U-42)	.05
34724	Board—"Antenna-Ground" board	.25
30766	Cap—Rubber cap for "Magic Eye" (Model U-42)	.15
34725	Capacitor—Trimmer comprising 1 section of 3-30 mmfd. and 2 sections of 2-10 mmfd. (Models U-20, U-42) (C2, C4, C28) mfd.	.80
34852	Capacitor—Trimmer comprising 1 section of 3-30 mmfd. and 2 sections of 2-10 mmfd. (Model U-40) (C2, C4, C28)	.60
14079	Capacitor—6.8 mmfd. (C31)	.35
12723	Capacitor—56 mmfd. (C32)	.35
30949	Capacitor—56 mmfd. (C11, C18, C14, C15)	.25
12720	Capacitor—100 mmfd. (C6, C16, C18, C30, C33)	.35
12537	Capacitor—680 mmfd. (C29)	.35
15898	Capacitor—6,600 mmfd. (C8)	.70
34456	Capacitor—.0025 mfd. (C19)	.80
33584	Capacitor—.005 mfd. (C17, C21, C35)	.25
4937	Capacitor—.01 mfd. (C7, C20, C25)	.25
11315	Capacitor—.015 mfd. (C5, C9) (C9 Models U-20 and U-40 only)	.20
32785	Capacitor—.02 mfd. (C9) model U-42 only	.20
4839	Capacitor—.1 mfd. (C13)	.30
32240	Capacitor—Electrolytic comprising 2 sections of 10 mfd. and 1 section of 20 mfd. (C10, C22, C23)	1.45
34285	Clip—"Magic Eye" clip (Model U-42)	.25
32707	Coil—Oscillator coil (L1, L2)	.95
34721	Control—Volume control and power switch (R4, S4)	2.00
32834	Cord—Tuning condenser drive cord	.10
32713	Core—Adjustable core and stud for oscillator coil (Models U-20, U-42)	.35
34863	Core—Adjustable core and stud for oscillator coil (Model U-40)	.20
33633	Indicator—Station selector indicator	.20
11891	Lamp—Dial lamp	.17
34407	Plate—Dial plate less condenser (Models U-40, U-20)	1.75
34798	Plate—Dial plate complete less tuner and push button (Model U-42)	.35
30886	Plug—2-contact female plug for motor lead (Models U-20, U-40)	.35
34723	Plug—3-contact plug for antenna loop	.15
5040	Plug—4-contact female plug for speaker leads	.30
14404	Plug—7-contact female plug for battery cable (Model U-42)	.35
30546	Resistor—470 ohms, ½ watt (R14)	.20
12312	Resistor—5,300 ohms, ½ watt (R10)	.20
13714	Resistor—5,800 ohms, ½ watt (R16) (Model U-42 only)	.20
14075	Resistor—8,200 ohms, ½ watt (R16) (Model U-20 and U-40 only)	.20
33489	Resistor—15,000 ohms, 2½ watts (R2)	.55
13998	Resistor—22,900 ohms, ½ watt (R9, R13)	.20
12738	Resistor—27,000 ohms, ½ watt (R8, R18) (some models U-42 only)	.20
12454	Resistor—33,000 ohms, ½ watt (R1)	.20
12266	Resistor—39,000 ohms, ½ watt (R18) (Model U-20 only)	.20
12286	Resistor—56,000 ohms, ½ watt (R18) (Model U-40 only)	.20
12264	Resistor—220,000 ohms, ½ watt (R6, R11)	.20
12285	Resistor—470,000 ohms, ½ watt (R7, R12)	.20
12486	Resistor—560,000 ohms, ½ watt (R20, R21)	.20
12013	Resistor—1 megohm, 1/10 watt (R22) (U-42 only)	.15
12079	Resistor—2.2 megohm, ½ watt (R19)	.20
11668	Resistor—5.6 megohm, ½ watt (R5)	.20
13601	Resistor—10 megohm, ½ watt (R3)	.20
33735	Screw—Push arm adjusting screw	.05
34411	Shaft—Tuning condenser drive shaft	.20
31384	Socket—Dial lamp socket	.20
34799	Socket—"Magic Eye" socket (Model U-42)	.30
33514	Socket—Phonograph input socket	.25
31319	Socket—Tube socket	.25
31418	Spring—Drive cord spring	.05
34726	Spring—Push arm return spring .018 dia. wire	.05
33720	Spring—Push arm return spring (Model U-42)	.09
34720	Switch—Radio, Phono, Television, Tone switch (S2, S3)	1.50
34722	Switch—Range switch (S1)	.95
33263	Transformer—1st i.f. transformer (L3, L4, C11, C12)	2.30
34719	Transformer—2nd i.f. transformer (L5, L6, C14, C15)	1.75
32144	Transformer—Power transformer, 105-120 volts, 60-60 cycles (Models U-40, U-20) (T1)	4.75
33726	Washer—Retaining washer for shaft, Stock No. 34611	.02
	PICKUP AND ARM ASSEMBLIES U-20	
33906	Arm—Pickup arm—shell only	.45
33908	Base—Pickup support arm base and retainer	.35
33905	Crystal—Pickup crystal cartridge	4.25
33907	Support—Pickup support arm complete—less base	.80

STOCK No.	DESCRIPTION	Unit List Price
	MOTOR ASSEMBLIES U-20	
34416	Arm—Drive wheel support arm (long)	xx
34415	Arm—Idler wheel support arm (short)	.50
34516	Armature—Motor armature complete	xx
34515	Bushing—Motor mounting rubber bushings	xx
34413	Capacitor—3.25 mfd., 60 cycle motor starting capacitor for motor, Stock No. 34412 (C36)	1.65
34514	Cover—Bakelite top end shell for motor	xx
34414	Idler—Rubber tired idler or drive wheel	1.20
34412	Motor—105-125 volt, 60 cycle phono. motor—less pulleys, capacitor and motor cradle (M1)	xx
34418	Plate—Motor support plate complete with turntable bearing	1.00
14887	Retainer—Idler wheel retainer spring	.01
34437	Spindle—Turntable spindle	xx
34417	Spring—Idler arm tension spring	xx
	AUTOMATIC SWITCH ASSEMBLIES U-20	
34419	Base—Pickup arm mounting base	.35
32865	Bracket—Switch bracket and terminal board	.40
34308	Cam—Switch cam assembly with spring	.55
32864	Lever—Switch actuating lever, roller, and clip	.45
34309	Mounting—Pickup arm base mounting (rubber grommet, washers, and nut)	.20
34311	Ring—Retaining ring for pickup arm pivot shaft	.05
14195	Screw—No. 10-32 x 5/16 set screw for switch cam hub	.05
34314	Shaft—Pickup arm pivot shaft—for crystal pickup	.65
34310	Spool—Insulating spool for switch leads	.10
32868	Spring—Switch lever spring	.05
32867	Spring—Tension spring for switch cam	.05
32866	Switch—Mercury tube and leads (S5)	1.75
31808	Washer—Retaining washer for switch lever	.01
	POWER SUPPLY ASSEMBLIES U-42	
30868	Plug—2-contact female plug for motor leads	.35
14409	Plug—7-contact plug for power supply cable	.45
31319	Socket—Tube socket	.25
32144	Transformer—Power transformer, 105-120 volts, 60-60 cycles	4.75
	SPEAKER ASSEMBLIES (RL-70K1)	
31825	Cap—Dust cap	.02
34705	Cone—Cone complete with voice coil (L8)	1.35
34728	Diffuser—Speaker diffuser	.80
5039	Plug—4-prong speaker plug	.30
34727	Speaker—12-inch dynamic complete with cone and voice coil—less output transformer and plug	9.55
33444	Transformer—Output transformer (T2)	2.00
	MISCELLANEOUS ASSEMBLIES	
33731	Button—Push button	.15
33730	Clamp—Dial clamp (Model U-20)	.15
31456	Cover—Protective cover for markers (Models U-20, U-42)	.08
33910	Cup—Needle cup (Model U-20)	.30
33909	Cup—Used needle cup (Model U-20)	1.00
34730	Dial—Glass dial scale (Models U-40, U-20)	1.50
34867	Dial—Glass dial scale (Model U-42)	1.50
34420	Escutcheon—Dial scale and push button escutcheon	1.80
34583	Frame—"C" band antenna loop frame	.50
34792	Gasket—Rubber gasket for motorboard (Model U-42)	1.10
30698	Hinge—Lid hinge (Model U-20)	.95
34871	Hinge—Door hinge—L.H. for 1 door (Model U-42)	.45
34870	Hinge—Door hinge—R.H. for 1 door (Model U-42)	.45
13103	Jewel—Pilot lamp jewel (Models U-40, U-42)	.15
33434	Knob—Tuning tone control, range switch or volume control and power switch knob	.30*
31480	Lamp—Dial lamp (Model U-42)	.20
34800	Loop—"A" band loop antenna (Model U-20)	6.00
34729	Loop—Antenna loop (Model U-40)	5.25
34868	Loop—Antenna loop for "A" band (Model U-42)	5.50
33973	Marker—Station selector push button markers (Model U-20)	.45
34866	Marker—Station markers (Model U-42)	.50
34872	Pin—Complete set of dowel pins for antenna loop (Model U-42)	.25
30870	Plug—2-prong male connector for motor lead (Model U-20)	.35
32611	Plug—3-prong plugs for antenna loops (Model U-20)	.10
32641	Plug—3-prong male plug for loops (Models U-40, U-42)	.10
31048	Plug—Phono plug for pickup lead (Model U-20)	.15
34869	Pull—Door pull (Model U-42)	.35
35172	Rubber—Sponge rubber strip for doors	xx
32870	Screen—Compartment lamp screen (Models U-40, U-42)	1.00
31364	Socket—Dial lamp socket (Model U-42)	.20
14270	Spring—Retaining spring for knob, Stock No. 33434	.05
31470	Spring—Motorboard spring mounting hardware (Models U-40, U-42)	.10
30900	Spring—Retaining spring for button, Stock No. 33731	.05
34423	Support—Lid support (Model U-20)	1.35
34422	Turntable—Phonograph turntable less spindle (Model U-20)	.75

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

xx Price upon application to your RCA Victor Parts Distributor.

POWER OUTPUT

Undistorted ..... 5 watts, Maximum ..... 6 watts

POWER SUPPLY RATINGS (U-20)

A-6 ..... 105-125 volts, 60 cycles, 110 watts total
A-5 ..... 105-125 volts, 50 cycles, 110 watts total
B-2 ..... 105-125 volts, 25 cycles, 110 watts total
C-6 ..... 105-125/210-250 volts, 60 cycles, 110 watts total
C-5 ..... 105-125/210-250 volts, 50 cycles, 110 watts total

POWER SUPPLY RATINGS (U-40, U-42)

A-6 ..... 105-125 volts, 60 cycles, 110 watts total
A-5 ..... 105-125 volts, 50 cycles, 110 watts total
B-2 ..... 105-125 volts, 25 cycles, 110 watts total
C-6 ..... 105-130/140-160/200-250 volts, 60 cycles, 110 watts total
C-5 ..... 105-130/140-160/200-250 volts, 50 cycles, 110 watts total

Alignment Procedure

Before proceeding with alignment the following lead dress should be carefully checked.

1. Dress AC switch leads away from 6SF5 tube socket.
2. Do not twist loop leads together or around each other. Spacing between leads from "C" band loop to chassis is important—see alignment step "5" below.
3. "High side" leads from loop sockets, range switch, oscillator coil, and trimmers must be dressed away from chassis and each other.
4. Dress C-6 and C-33 away from each other.
5. Dress C-17 away from power switch leads.

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown on the chassis schematics.

Output Meter Alignment.—If this method is used, connect the output meter across the voice coil, and turn the receiver volume control to maximum.

Test Oscillator.—For all alignment operations, keep the oscillator output as low as possible to avoid a-v-c action.

Calibration Marks.—The tuning dial is fastened in the cabinet and can not be used for reference during alignment. Therefore calibration marks have been stamped in the plate on the front of the chassis as shown in the accompanying drawing. These marks are used for reference during alignment.

Dial Indicator Adjustment.—With the gang condenser in full mesh, the indicator should point to the extreme left (low frequency) mark on the dial scale.

For additional details, refer to booklet "RCA Victor Receiver Alignment."

Steps	Connect test-osc. output to—	Tune test-osc. to—	Turn radio dial to	Adjust the following for maximum peak output
1	I-F grid through 0.1 mfd capacitor and ground	455 kc	Quiet point between 1,720-1,500 kc	L5 and L6 (2nd I-F trans.)
2	1st det. grid through 0.1 mfd capacitor and ground			L3 and L4 (1st I-F trans.)
3		15.2 mc	15.2 mc	C-4 oscillator*
4	Radiation loop consisting of two turns of wire 18 inches in diameter located 4 to 6 feet from receiver	15.2 mc	Rock at 15.2 mc	C-2 antenna† while rocking
5		6.1 mc	6.1 mc	Spacing between leads from "C" band loop to chassis
6		15.2 mc	Rock at 15.2 mc	C-2 antenna† while rocking
7		1,500 kc	1,500 kc	C-34 antenna C-28 oscillator
8		600 kc	Rock at 600 kc	L-2 oscillator while rocking
9		1,500 kc	1,500 kc	C-34 antenna C-28 oscillator

When making adjustments 4 to 9 inclusive the chassis must be in the cabinet, both loops connected, and all leads in their normal positions. When mounting chassis in cabinet if calibration marks on dial plate do not line up with dial scale mounted on cabinet move pointer to agree with dial scale on cabinet.

* Oscillator should track on high frequency side of signal. If two peaks are obtained use high frequency (minimum capacity) peak.

† If two peaks can be obtained use low frequency (maximum capacity) peak

Phonograph Information

The U-20 phonograph motor has its bearing filled with oil and sealed at the factory and hence should not require lubrication in the field. However the two rubber tired idler pulleys should have their bearings lubricated occasionally with S.A.E. 10 oil. Care should be taken not to get any oil, grease, or other foreign matter on the rubber tires. These tires and the motor spindle should be cleaned occasionally with quick drying naphtha.

The turntable spindle bearing should also be lubricated occasionally with S.A.E. 10 oil.

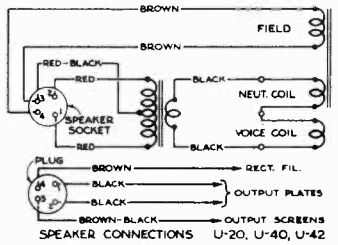
For information regarding the automatic record changers used in models U-40 and U-42 refer to service note No. 41 covering these mechanisms.

Antennas

Each of these receivers is equipped with two loop antennas ("C" band horizontal and fixed, and "A" band vertical and rotatable). During installation the "A" band loop should be rotated to the position giving maximum signal strength and freedom from noise. If desired, an outside antenna and ground can be connected to the terminals provided and when this is done the link between these terminals must be opened. However for loop operation this link must be closed

Centering Loudspeaker Cone

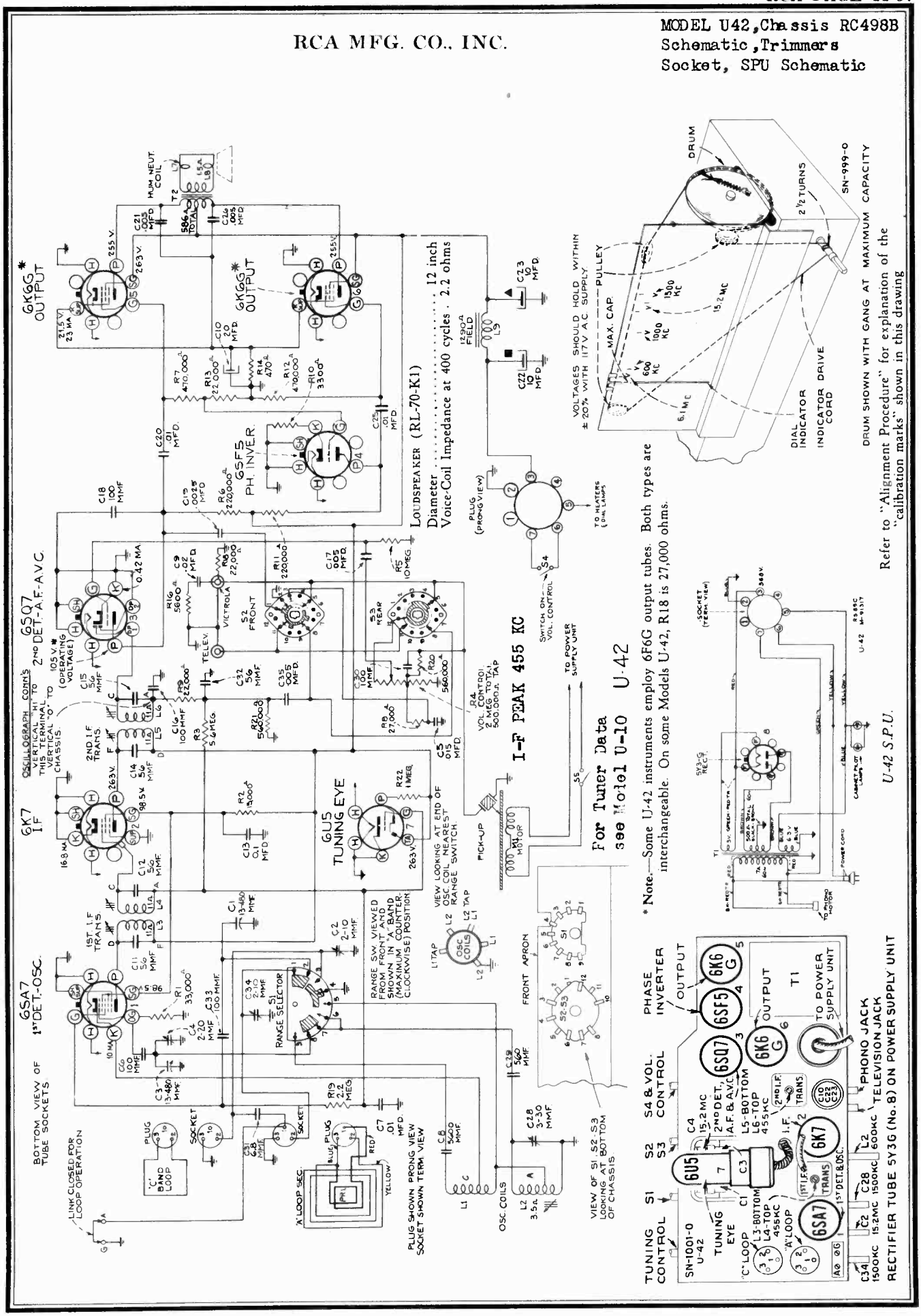
The loudspeaker cone centering support is fastened to the field frame by two screws accessible from the rear of the speaker. The cone can usually be recentered by loosening these screws and moving the support around until the proper position is found without disturbing the dust cover. However, in some cases it may be necessary to remove the front dust cover and insert spacers between the voice coil and pole piece in order to obtain proper centering. A new dust cover should then be installed.



SPEAKER CONNECTIONS U-20, U-40, U-42

RCA MFG. CO., INC.

MODEL U42, Chassis RC498B
Schematic, Trimmers
Socket, SPU Schematic



Pilot Lamps (4) ..... 1 Mazda 44, 6.3 volts, 0.25 amp.; 3 Mazda 47, 6.3 volts, 0.15 amp.

POWER SUPPLY RATINGS

A-6	105-125 volts,	60 cycles, 115 watts
A	105-125 volts,	50-60 cycles, 115 watts
B-2	105-125 volts,	25 cycles, 115 watts
C-6	100-130/140-160/200-250 volts,	60 cycles, 115 watts
C	100-130/140-160/200-250 volts,	50-60 cycles, 115 watts

POWER OUTPUT

Undistorted ..... 5 watts
Maximum ..... 5.5 watts

PHONOGRAPH

Type ..... Automatic
Record Capacity ..... Eight 10-inch or seven 12-inch
Turntable Speed ..... 78 r.p.m. adjustable

Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio-dial to—	Adjust the following for max. peak output
1	6K7 I-F grid cap, in series with .01 mfd.	455 kc	"A" band, Quiet Point between 550-750 kc	L12 and L13 (2nd I-F Transformer)
2	6A8G det. grid cap, in series with .01 mfd.	455 kc		L10 and L11 (1st I-F Transformer)
3	Antenna Terminal, in series with 200 mmf.	600 kc	600 kc (150.5°) "A" band	L9
4		1,500 kc	1,500 kc (28°) "A" band	C25 (osc.) C30 (ant.)
5	Repeat steps 3 and 4.			
6	Antenna Terminal, in series with 400 ohms.	6 mc	6 mc (26.5°) "B" band	C23 (osc.)*
7		20 mc	20 mc (22°) "C" band	C21 (osc.)*
8	Follow "Adjustments for Electric Tuning."			

LOUDSPEAKER (RL-70-H5)

Type ..... 12-inch Electrodynamic
Voice Coil Impedance ..... 2.2 ohms at 400 cycles

PICKUP

Type ..... Crystal
Impedance ..... 100,000 ohms at 1,000 cycles
Average Output ..... 1.5 volts at 1,000 cycles across 500,000 ohm load

Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the rear of the drum which is mounted on the front shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 180° mark on the drum scale must be vertical, and directly over the center of the gang-condenser shaft when the plates are fully meshed. The distance from the front of the chassis to the drum must not exceed ¼-inch. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "180°" mark on the calibration scale when the plates are fully meshed.

*Use minimum capacity peak if two peaks can be obtained, and rock gang condenser slightly while adjusting C23 and C21.

Note.—Oscillator tracks 455 kc above signal on all bands.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, move the dial indicator on the drive cable to the left-hand end mark on dial, with gang condenser fully meshed.

STOCK No.	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES (RC-386-B)	
14517	Board—Antenna ground terminal board	.25
30752	Bracket—Magic Eye mounting bracket	.25
31400	Capacitor—Triple adjustable trimmer, two sections 2-10 mmfd., one section 3-30 mmfd. (C21, C23, C25)	.50
32486	Capacitor—Antenna coil trimmer capacitor bank 20-470 mmfd. (C31, C32, C33, C34, C35, C36)	1.40
12722	Capacitor—18 mmfd. (C1)	.35
13141	Capacitor—47 mmfd. (C13)	.35
12723	Capacitor—68 mmfd. (C5, C46)	.35
12720	Capacitor—100 mmfd. (C39)	.35
14262	Capacitor—109 mmfd. (C5, C8)	.30
12404	Capacitor—120 mmfd. (C7, C8)	.30
13003	Capacitor—180 mmfd. (C37)	.35
14712	Capacitor—180 mmfd. (C2)	.30
32492	Capacitor—530 mmfd. (C24)	.40
31435	Capacitor—750 mmfd. (C28)	.40
4881	Capacitor—3,300 mmfd. (C22)	.60
31405	Capacitor—5,000 mmfd. (C27)	.75
5107	Capacitor—.0025 mfd. (C16)	.20
4838	Capacitor—.005 mfd. (C14, C17, C43)	.25
4858	Capacitor—.01 mfd. (C10, C40, C41, C42)	.25
14393	Capacitor—.01 mfd. (C11, C15)	.30
30882	Capacitor—.05 mfd. (C4, C9, C38)	.20
30867	Capacitor—0.5 mfd. (C20)	.30
32145	Capacitor—4 mfd. (C12)	.70
32142	Capacitor—Comprising two 10 mfd., one 20 mfd. sections (C18, C19, C44)	1.90
31382	Clip—Oscillator coil and core mounting clip	.04
32493	Coil—Antenna coil—A, B, and C bands (L1, L2, L3, L43)	1.35
31951	Coil—Oscillator coil—A, B, and C bands (L4, L5, L7, L9)	1.40
31383	Coil—Oscillator coil—A band (L41, L42)	.30
32487	Coil—Oscillator coil— A band (L39, L40)	.35
31385	Coil—Oscillator coil—A band (L37, L38)	.30
31389	Condenser—2-gang variable tuning condenser (C28, C29, C30)	2.65
31386	Control—Volume control, tone control, and on-off switch (R6, R13, S3)	3.00
32635	Cord—Indicator pointer drive cord	.24
32634	Cord—Variable condenser drum drive cord	.10
30905	Core—Adjustable core and stud for i-f transformer	.35
31388	Core—Adjustable core and stud for oscillator coil, Stock Nos. 31383, 32487, and 31385	.15
12800	Core—Adjustable core for oscillator coil, Stock No. 31951	.35
31372	Drum—Variable condenser drive cord drum and calibration dial	.65
11891	Lamp—Pilot, compartment lamp	.17
31480	Lamp—Dial and "Electric Tuning" lamp	.20
30868	Plug—2-contact female plug for motor cable	.35
5040	Plug—4-contact female plug for speaker cable	.30
31373	Pulley—Drive cord pulley	.08
32113	Resistor—Voltage divider comprising one 11,000 ohm, one 3,000 ohm, one 22 ohm, and one 270 ohm sections (R14, R22, R23, R24)	.90
30545	Resistor—180 ohms, ½ watt (R8)	.20
5114	Resistor—15,000 ohms, 1 watt (R17)	.22
14284	Resistor—22,000 ohms, 1/10 watt (R4)	.15
12454	Resistor—33,000 ohms, ½ watt (R2, R12)	.20
12266	Resistor—39,000 ohms, ½ watt (R7)	.20
14560	Resistor—100,000 ohms, ½ watt (R25)	.20
11398	Resistor—220,000 ohms, 1/10 watt (R5)	.15
12199	Resistor—270,000 ohms, ½ watt (R15, R19)	.20
14983	Resistor—330,000 ohms, ½ watt (R9)	.20
13479	Resistor—390,000 ohms, ½ watt (R20, R21)	.20
12486	Resistor—560,000 ohms, ½ watt (R18)	.20
30963	Resistor—820,000 ohms, ½ watt (R11)	.20
12013	Resistor—1 meg., 1/10 watt (R16)	.15
13730	Resistor—1 meg., ½ watt (R1, R26)	.20
30208	Resistor—1.2 meg., ½ watt (R10)	.20
12679	Resistor—2.2 meg., ½ watt (R3)	.20
14343	Retainer—Retaining spring for station selector knob shaft	.03
14887	Retainer—Drive cord pulley retainer	.01
4669	Screw—No. 8-32 square head set screw for drum, Stock No. 31372	.03
31368	Shaft—Station selector knob shaft and pulley	.30
3682	Shield—Tube shield	.22
30888	Socket—2-contact female socket for motor power cable	.35
12493	Socket—5-contact female socket for speaker cable	.30
13871	Socket—Magic Eye socket	.45
14278	Socket—Pickup input socket	.25
31251	Socket—Tube socket	.25
31418	Spring—Indicator or drum drive cord tension spring	.05
32491	Switch—Range switch (S1, S2)	1.15
32498	Switch—Station selector push-button switch and Radio-Record switch (S4, S5, S31, S32, S33, S34, S35, S36, S37, S38, S39, S40, S41, S42, S43, S44, S45)	3.85
14376	Transformer—First i-f transformer (L10, L11, C5, C6)	2.45
14283	Transformer—Second i-f transformer (L12, L13, C7, C8, C37, R4, R5)	3.80

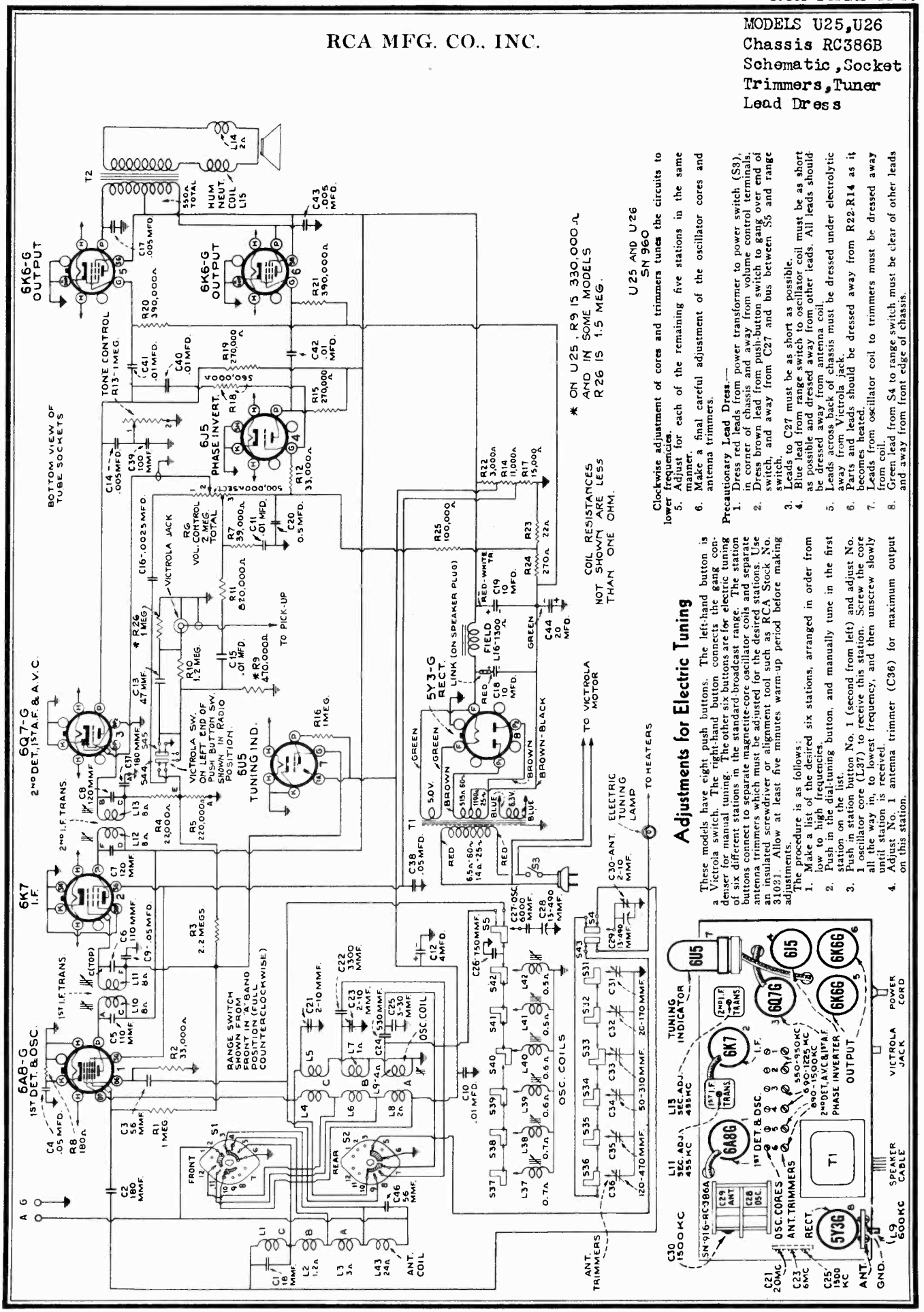
STOCK No.	DESCRIPTION	Unit List Price
31445	Transformer—Power transformer 105-125 volts, 25-60 cycles (T1)	7.80
31446	Transformer—Power transformer 100-130/140-160/200-250 volts, 50-60 cycles (T1)	8.05
32144	Transformer—Power transformer 105-125 volts, 50-60 cycles (T1)	4.75
	OPERATING MECHANISM	
31134	Bracket—Pickup locating lever mounting bracket (3)	.30
32878	Cam—Cam and gear assembly (4)	2.80
6808	Clutch—Trip lever friction clutch assembly (5)	.35
31146	Coupling—Motor coupling complete with turntable drive gear, rubber strips, motor coupling, and drive arm (6)	1.80
31129	Cover—Cap for top of record post	.45
31116	Finger—Trip lever friction finger assembly (7)	.45
31119	Gear—Long arm and rack gear for front left-hand record post (8)	.60
31120	Gear—Short arm and rack gear for rear right-hand record post (9)	.55
31121	Gear—Record post gear (10)	.90
31123	Guide—Main lever spring guide (11)	.40
31114	Lever—Index lever assembly (12)	.75
31137	Lever—Index lever tension spring lever (13)	.30
31138	Lever—Locating lever and pawl assembly (14)	.70
31113	Lever—Main lever assembly (15)	1.35
31140	Lever—Pickup lift cable lever and spring assembly (16)	.55
31135	Lever—Pickup locating lever assembly (17)	.85
31130	Lever—Record separator elevating lever complete with adjustment screws (18)	.80
31132	Lever—Trip detaining lever (19)	.30
31115	Lever—Trip lever assembly (20)	1.85
31131	Lever—Trip regulator lever (21)	.25
31133	Pawl—Trip pawl assembly (22)	.80
31124	Pin—Record post drive pin (23)	.04
14207	Roller—Pickup lift cable roller and bracket assembly (24)	.55
31118	Screw—Cone pointed set screw for trip lever hub or record post shelf	.06
4563	Screw—Pickup lift cable screw and nuts	.04
14114	Screw—Set screw for flexible coupling	.05
31117	Screw—Special screw to adjust friction clutch tension	.03
31126	Separator—Record separator knife (25)	.75
31122	Shaft—Record separator post shaft (26)	.40
31125	Shelf—Record post shelf assembly (27)	1.25
31141	Spindle—Turntable spindle shaft	1.40
3678	Spring—Cam pawl tension spring on main gear	.04
14190	Spring—Pickup locating lever short spring or locating lever pawl tension spring (28)	.08
32882	Spring—Main lever tension spring (29)	.05
31136	Spring—Index lever tension spring (30)	.05
3666	Spring—Pickup lift cable tension spring (31)	.04
31127	Spring—Record separator pressure spring (32)	.02
14191	Spring—Trip detaining lever tension spring (33)	.04
31875	Spring—Pickup locating lever tension spring (34)	.04
32438	Spring—Locating lever tension spring (35)	.05
31147	Strip—Complete set of rubber strips for flexible coupling	.40
31139	Turntable Assembly—less spindle	3.35
31128	Washers—"C" washer for top of record post	.04
31143	Washers—Turntable thrust washers (1 steel, 1 bronze, 1 felt)	.15
	MOTORBOARD ASSEMBLIES	
31149	Base—Tone arm mounting base	.35
32927	Board—Record changer base complete with all welded and riveted posts and bearings—less all operating parts	6.30
14209	Bumper—Main lever rubber bumper (1)	.08
9848	Cup—Used needle cup, rest, and lid complete	.75
32877	Escutcheon—Index escutcheon	.40
31151	Guide—Pickup lift cable guide (coil spring) (2)	.10
31150	Mounting—Pickup arm base rubber mounting complete	.45
31155	Spring—Needle cup lid tension spring	.04
	MOTOR ASSEMBLIES	
31626	Field—Complete coil and laminations for 25 cycle motor	9.30
31619	Field—Complete coil and lamination for 50-60 cycle motor	7.80
31618	Field—Complete coil and laminations for 60 cycle motor	8.50
31624	Governor—Governor complete for 25 cycle motor	3.05
11703	Governor—Governor complete for 50-60 cycle motor	3.05
31623	Governor—Governor complete for 60 cycle motor	2.80
31448	Motor—105-125 volts, 25 cycles (M1)	23.70
31163	Motor—105-125 volts, 50-60 cycles (M1)	20.50
31157	Motor—105-125 volts, 60 cycles (M1)	17.75
30870	Plug—2-contact male plug for motor power cable	.35
31417	Screw—Complete set of motor mounting screws, washers, and spacers—for 25 cycle models only	.40
31158	Screw—Complete set of motor mounting screws, washers, and spacers—for 50-60 cycle models only	.25
31636	Shaft—Turntable spindle shaft and gear for 25 cycle motor	1.90
31634	Shaft—Turntable spindle shaft and gear for 50-60 and 60 cycle motor	1.70
32913	Spring—Governor weight and spring for 25 cycle motor	.25
32914	Spring—Governor weight and spring for 50-60 cycle motor	.30
32912	Spring—Governor weight and spring for 60 cycle motor	.25
32875	Switch—Motor control switch (S6)	.30
	PICKUP AND ARM ASSEMBLIES	
33098	Arm—Pickup arm, less crystal and cable	2.60
32635	Cable—Pickup arm lift cable and clips	.24
32556	Cable—Shielded cable and plug	.75
31156	Crystal—Pickup crystal cartridge and needle screw	4.25
33114	Damper—Viscoloid damper for armature	.15
31160	Screw—Pickup needle screw	.12
31161	Shaft—Pickup pivot arm and shaft assembly	.45
	SPEAKER ASSEMBLIES (RL-70H-5)	
13866	Cap—Dust cap for cone center	.03
12012	Coil—Field coil (L16)	2.90
11469	Coil—Neutralizing coil (L15)	.30
31275	Cone—Speaker cone and voice coil (L14)	1.75
31539	Plug—5-contact male plug for speaker	.25
32148	Speaker complete	12.10
14534	Transformer—Output transformer (T2)	2.10
14357	Washer—Spring washer to hold field coil securely	.06
	MISCELLANEOUS ASSEMBLIES	
12038	Band—Rubber band for Magic Eye	.02
31397	Button—Station selector push-button	.15
13103	Cap—Pilot light jewel	.15
31458	Cover—8 protective covers for push-button markers	.08
31541	Cushion—Motor plate mounting cushions and clamps sufficient for one instrument	.50
32495	Dial—Glass dial scale (Model U25 only)	.75
32494	Dial—Glass dial scale (Model U26 only)	.75
31407	Escutcheon—Magic Eye or Electric Tuning indicator escutcheon	.25
31395	Escutcheon—Tuning dial escutcheon only, less push-buttons and dial scale	1.15
30898	Hinge—Lid hinge complete with screws	.95
4585	Hinge—One upper and one lower door hinge (Model U26 only)	.60
31564	Holder—Needle card holder	.50
31543	Indicator—Electric tuning indicator disc	.25
31392	Indicator—Indicator pointer, carriage and clip	.30
31355	Knob—Range switch knob	.12
14359	Knob—Station selector knob	.20
31391	Knob—Tone control knob	.15
30773	Knob—Volume control knob	.15
31460	Marker—"Dial Tuning" push-button marker (Model U25 only)	.04
31458	Marker—"Dial Tuning" push-button marker (Model U26 only)	.01
31459	Marker—"Victrola" push-button marker (Model U25 only)	.04
31457	Marker—"Victrola" push-button marker (Model U26 only)	.01
31590	Markers—1 set station call letter markers (Model U25 only)	.40
31589	Markers—1 set station call letter markers (Model U26 only)	.35
11210	Screw—Chassis mounting, screws, washers, and lockwashers	.05
31393	Screen—Dial color screen	.40
32870	Screen—Phono. compartment lamp screen	1.00
33083	Spring—Actuating spring for lid support (Model U26 only)	.50
30330	Spring—Retaining spring for knob, Stock No. 31391	.03
14270	Spring—Retaining spring for knob, Stock Nos. 30773 and 31355	.05
4982	Spring—Retaining spring for knob, Stock No. 14359	.05
31470	Spring—Motorboard suspension top spring, bottom spring, screw, and lockwasher (4 req'd)	.10
33081	Support—Right-hand lid support (Model U26 only)	1.90
33082	Support—Left-hand lid support (Model U26 only)	1.90
31478	Support—Lid support (Model U25)	2.20

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

RCA MFG. CO., INC.

RCA MFG. CO., INC.

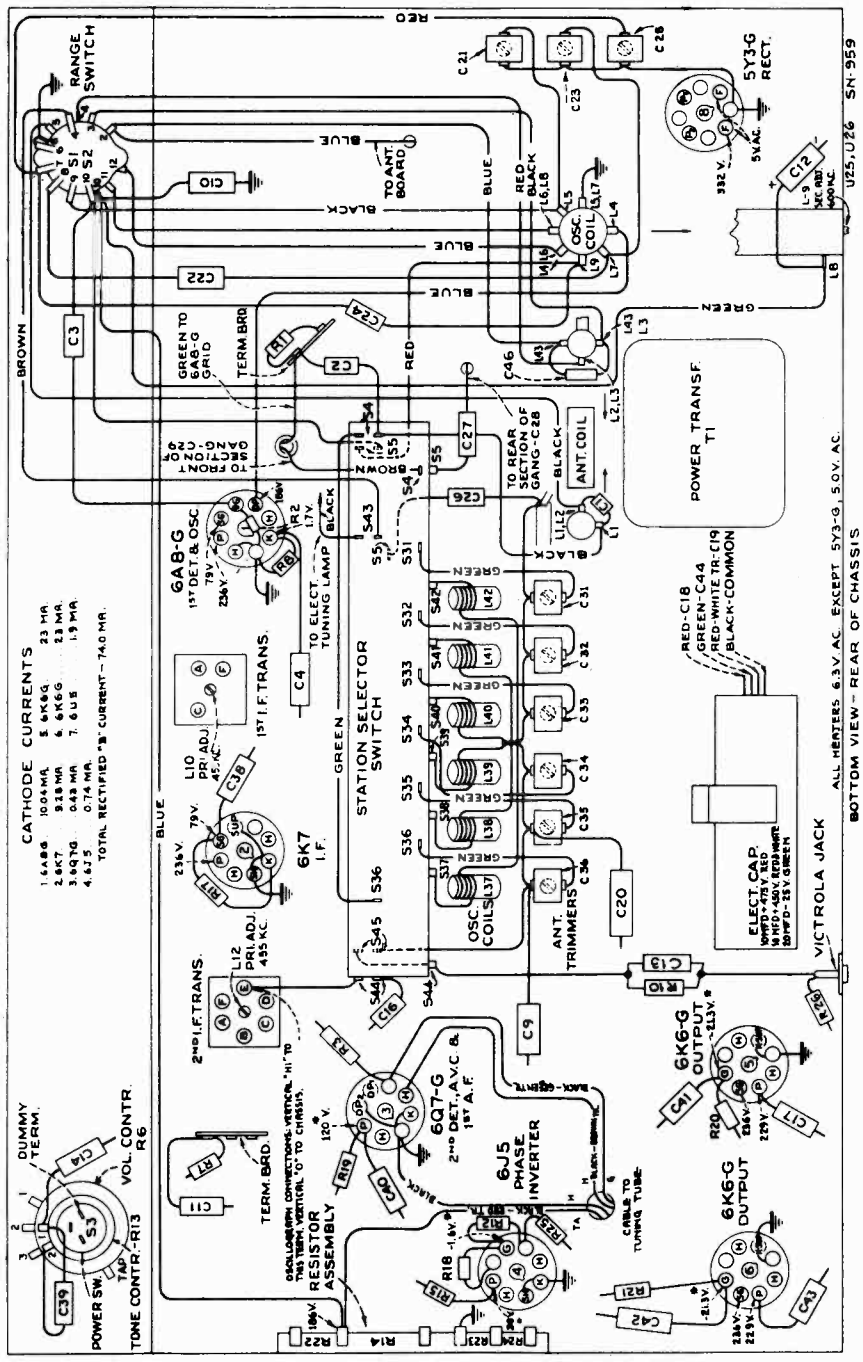
MODELS U25, U26
Chassis RC386B
Schematic, Socket
Trimmers, Tuner
Lead Dress

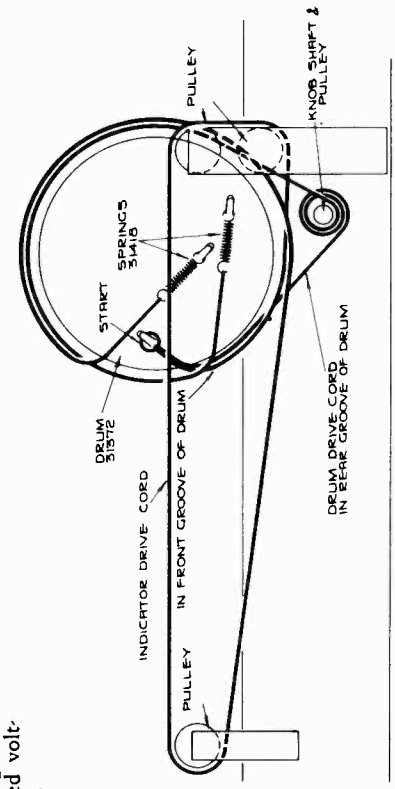


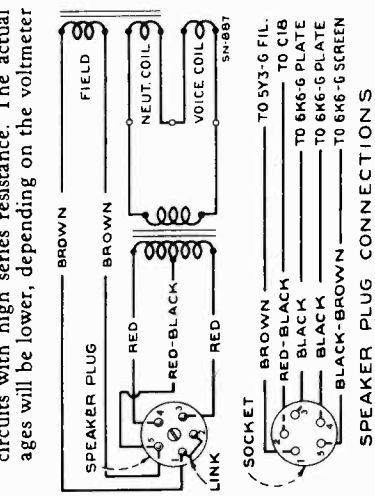
MODELS U25,U26
Chassis RC386B
Chassis Wiring
Voltage,Dial Drive

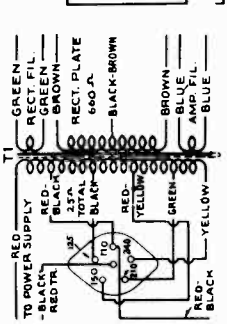
RCA MFG. CO., INC.

FOR PHONOGRAPH DATA SEE
RCA PAGES 10-51 AND
10-52 in VOLUME X









* NOTE: Values with star (*) are operating voltages in circuits with high series resistance. The actual measured voltages will be lower, depending on the voltmeter loading.

Installation, Operation
Lead Dress, Parts

RCA MFG. CO., INC.

MODEL OSC-22
Wireless Oscillator
Schematic, Voltage

Specifications **OSC-22** —1939 No. 28— First Edition

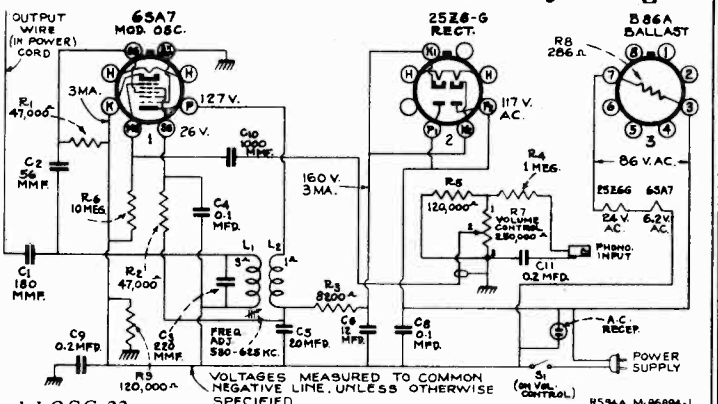
Wireless Oscillator

FREQUENCY RANGE..... Approx. 530-625 kc
TUBE COMPLEMENT
(1) RCA-6SA7..... Modulator—Oscillator
(2) RCA-25Z6-G..... Half-Wave Rectifier
(3) Type B-88-A..... Ballast Resistor

POWER SUPPLY RATINGS
A-C Rating.... 105-125 volts, 25-60 cycles, 35 watts
D-C Rating..... 105-125 volts, 35 watts

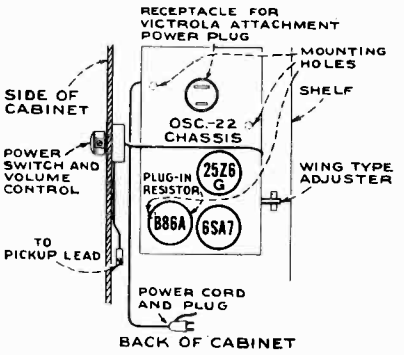
DIMENSIONS
Chassis Base..... 7½-in. x 4½-in x 2½-in.

Precautionary Lead Dress.—
1. Keep 110-volt leads away from oscillator coil.
2. Leads to oscillator coil must be short and direct.



Model OSC-22

Schematic Diagram



The RCA Victor Wireless Oscillator is an adapter unit used to convert your Victrola Attachment, such as the RCA Victor Model VA-22, into a wireless record player. This permits you to play phonograph records through your radio receiver without any connecting wires from the Victrola Attachment to the Radio Receiver.

INSTALLATION

Certain RCA Victrola Attachments such as the VA-22 are provided with a side shelf inside the cabinet for mounting the Wireless Oscillator. Three holes are drilled in the shelf correctly spaced for the oscillator mounting bolts to go through and screw into the holes in the OSC-22 chassis base. To install the OSC-22 first detach the VA-22 power cord from the electric outlet, then:

1. Look in the back of the VA-22 or similar Victrola cabinet and locate the connection from the pickup to the volume control on the side of the cabinet. This is a length of wire with a connector plug on one end. Disconnect the plug from the bayonet socket and then loosen the set screw and remove the knob and the volume control on the other end of the wire, together with the wire, from the VA-22 cabinet. It is attached to the cabinet by a nut and washer.
2. Mount the OSC-22 on the cabinet shelf with the three mounting screws and washers provided.
3. Mount the OSC-22 Power Switch and Volume Control unit in the location from which the VA-22 volume control was removed, using the washer and nut taken from the VA-22 volume control. Be sure that the locating pin on the new control is in the correct position. Attach knob on shaft of Power Switch and Volume Control unit and tighten up the set screw.
4. Insert the pickup plug into the connector on the cable of the newly installed Volume Control of the OSC-22.
5. Insert the plug on the end of the VA-22 power cord into the power receptacle on the OSC-22 chassis base.
6. Insert the plug on the end of the OSC-22 power cord into the electric outlet.

OPERATION

CONTROLS AND MOVING MECHANISM

In order to obtain best reproduction, the newly installed Volume Control should first be turned on about 2/3 full and the Volume Control on your radio receiver turned to the point that gives the greatest volume you are likely to require. Then all control of volume may be made with the knob on the Wireless Victrola Attachment. In particularly noisy locations it may be preferable to set the Volume Control of the Wireless Victrola Attachment at about 2/3 full and regulate with the volume control knob on the receiver.

The Victrola Adjustment.—On the back of the OSC-22 chassis is a small adjusting rod to give reproduction at the most convenient point on your radio receiver dial. With your radio receiver in operation, set the Tuning Control to bring the pointer on the Standard Broadcast Scale to a point at the low frequency end between 530 and about 630 kilocycles, 530 is preferable, at which no station can be obtained. Then set your Wireless Victrola Attachment in operation and turn the adjusting rod on the OSC-22 slowly and carefully until the record reproduction is heard at its best.

Antenna Modification.—If, due to your particular special conditions, insufficient volume or excessive noise interference affects record reproduction, a simple remedy is to connect a wire from the Wireless Victrola Attachment to your radio antenna lead. This is easily accomplished by means of a length of wire to cover the distance between the Victrola Attachment and Radio Receiver. One end of this should be wound 3 or 4 turns around the outside of the short wire projecting from the OSC-22 plug on the power cord. The other end of the wire should be wound 3 or 4 turns around the outside of the receiver antenna lead. When an RCA Master Antenna is used, the wire should be wound around the counterpoise lead where it is attached to the A-3 terminal of your radio receiver antenna terminal board.

Radio Receiver Controls.—Your radio receiver picks up the record selection as it does a broadcast program. So after the Victrola Adjustment is made, you must tune your radio receiver to the signal from the Wireless Victrola Attachment between 530 and about 630 kilocycles. Do this according to the instructions for operating your particular receiver and turn the Tuning Control to bring the pointer on the dial scale to the low frequency end of the Standard Broadcast band, about 530 to 630 kilocycles, and tune in accurately with the Wireless Victrola Attachment playing a selection. This point is your "Victrola" station. If you have a radio with Push Button Tuning you can set a push button and label it "Victrola." *The push button or switch labeled "Victrola," "Record Player" or "Phono" on RCA Victor Radio Receivers previous to 1939 is of no use with the Wireless Victrola Attachment.*

PLAYING

Plug the power cord from the OSC-22 into a convenient house outlet, then to play records proceed as follows:

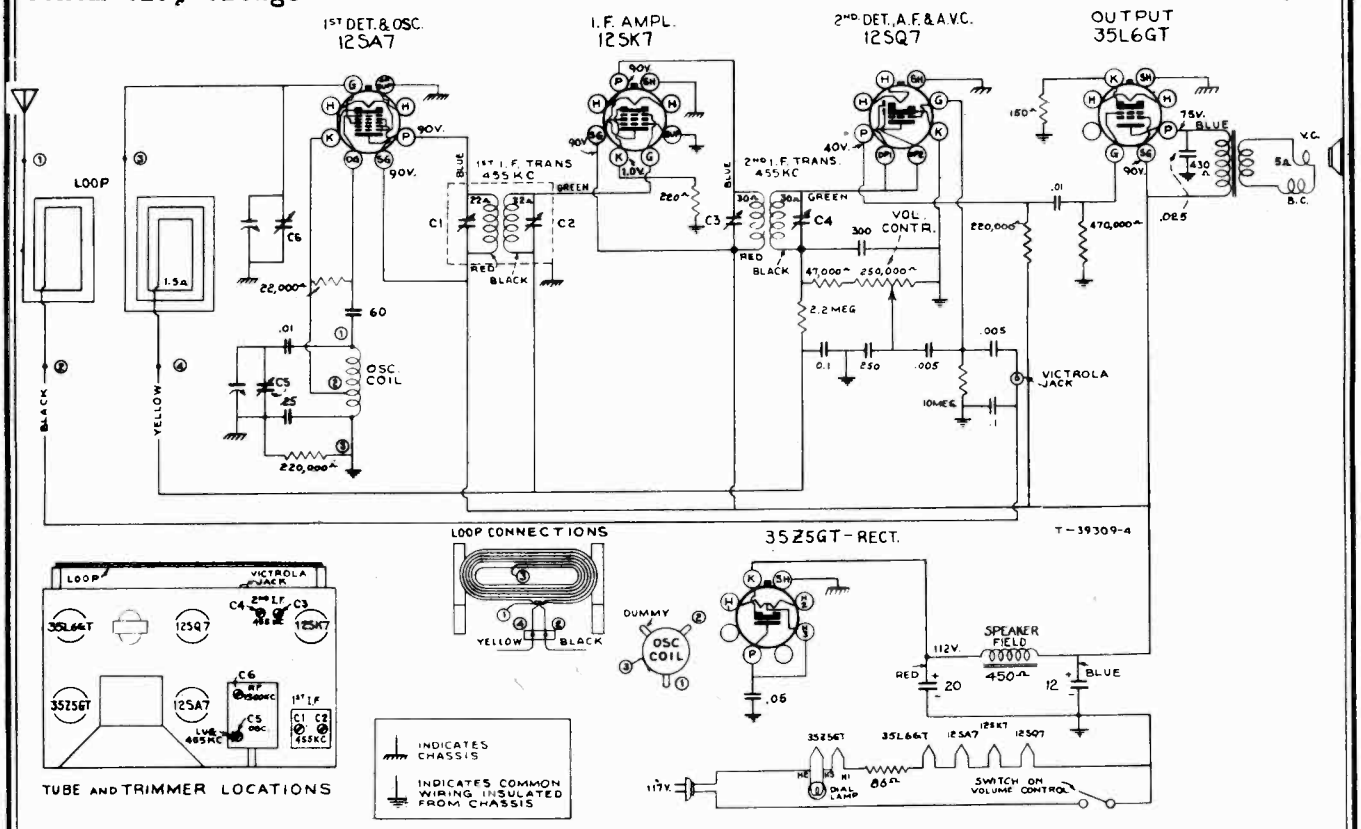
1. Turn on the power to your radio receiver.
2. Set the tuning knob to your new "Victrola" station (530 to 630 kilocycles), or if you have specially adjusted a push button, press it.
3. Turn on power to the Wireless Victrola Attachment.
4. Make the set-up for playing records in accordance with the original instructions accompanying the Victrola Attachment.
5. Turn the Wireless Victrola Attachment Volume Control about 2/3 fully clockwise.
6. Adjust radio receiver Tuning knob to accurately tune in the phonograph selection.
7. Turn Radio Receiver Volume Control to give the loudest reproduction you are likely to require.
8. Adjust the Wireless Victrola Attachment Volume Control to suit.
9. Adjust radio receiver Tone Control if desirable.

STOCK No.	DESCRIPTION	Unit List Price	STOCK No.	DESCRIPTION	Unit List Price
	ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.				
33793	Ballast—Ballast resistor tube—Type B86A (R8)	.80	33792	Receptacle—A.C. receptacle	.45
12723	Capacitor—56 mmfd. (C2)	.35	33793	Resistor—Ballast resistor tube—Type B86A (R8)	.80
13003	Capacitor—180 mmfd. (C1)	.35	14075	Resistor—8,200 ohms, ½ watt (R3)	.20
12694	Capacitor—220 mmfd. (C3)	.35	12412	Resistor—47,000 ohms, ½ watt (R1, R2)	.20
4839	Capacitor—0.1 mfd. (C4, C8)	.30	13734	Resistor—120,000 ohms, ½ watt (R5, R9)	.20
33834	Capacitor—0.2 mfd. (C9, C11)	.30	13730	Resistor—1 meg., ½ watt (R4)	.20
32576	Capacitor—Electrolytic, one section 20 mfd., and one section 12 mfd. (C5, C6)	.90	13601	Resistor—10 meg., ½ watt (R6)	.20
12635	Capacitor—1,000 mfd. (C10)	.50	31251	Socket—Tube socket	.25
32501	Coil—Oscillator coil (L1, L2)	1.00	33793	Tube—Ballast resistor tube—Type B86A (R8)	.80
			33794	Volume control and switch (R7, S1)	1.50

MODELS 40X-30, Ch. RC405C
40X-31, Chassis 405D
Schematic, Voltage

RCA MFG. CO., INC.

Alignment, Trimmers
Socket, Lead Dress



—1939 No. 34—

Features of design include: New Type single-ended tubes (12SA7, 12SK7, and 12SQ7); edge-lighted dial; dust proof electrodynamic loudspeaker; "Magic Loop"; Television-Victrola Jack; and Beam Power Output.

First Edition

Electrical and Mechanical Specifications

FREQUENCY RANGE ..... 540-1,680 kc
Intermediate Frequency ..... 455 kc

TUBE COMPLEMENT
(1) RCA-12SA7 ..... 1st-Detector-Oscillator
(2) RCA-12SK7 ..... I-F Amplifier
(3) RCA-12SQ7 ..... 2nd-Detector, 1st A-F, and A.V.C.
(4) RCA-35L6GT ..... Power Output
(5) RCA-35Z5GT ..... Half-Wave Rectifier
Dial Lamp (1) ..... Mazda 51, 7.5 volts, 0.2 amp.

POWER SUPPLY RATINGS
A-C Rating ..... 105-125 volts, 50-60 cycles, 30 watts
D-C Rating ..... 105-125 volts, direct current, 30 watts

POWER OUTPUT (125 volt, 60 cycle supply)
Undistorted ..... .6 watts
Maximum ..... 2.0 watts

LOUDSPEAKER
Type ..... 4-inch Electrodynamic
Cabinet Dimensions (inches) .. Height 5-1/16, Width 8¼, Depth 4¼
Weight (net) ..... 4¾ pounds

Alignment Procedure

Output Meter Alignment.—Connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—Connect the low side of the test-oscillator to the receiver chassis, through a .01 mfd. capacitor, and keep the output as low as possible.

Pre-setting Dial.—With gang condenser in full mesh, the pointer should be horizontal.

Antenna.—The set is equipped with a built-in loop antenna. If an outdoor antenna is used, it may be connected to the "ANT." terminal on rear of cabinet. It should not be longer than 100 feet, including lead-in. If it is longer, connect a 100 to 200 mmf. capacitor in series with the lead-in.

Power-Supply Polarity.—For operation on d-c, the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a-c, reversal of the plug may reduce hum.

Victrola Attachment.—A jack is provided on the rear of cabinet for connecting a Victrola Attachment into the audio-amplifying circuit. The cable from the Victrola Attachment should be terminated in a Stock No. 31048 plug to fit the jack.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	Tuning condenser stator (osc.) in series with .01 mfd.	455 kc	Quiet point at 1,600 kc end of dial	C1, C2, C3, C4 (1st and 2nd I-F transformers)
2	Antenna term. of ant. loop in series with 100 mmfd.	1,680 kc	Full clockwise (out of mesh)	C5 (oscillator)
3		1,500 kc	Resonance on 1,500 kc signal	C6 (antenna)

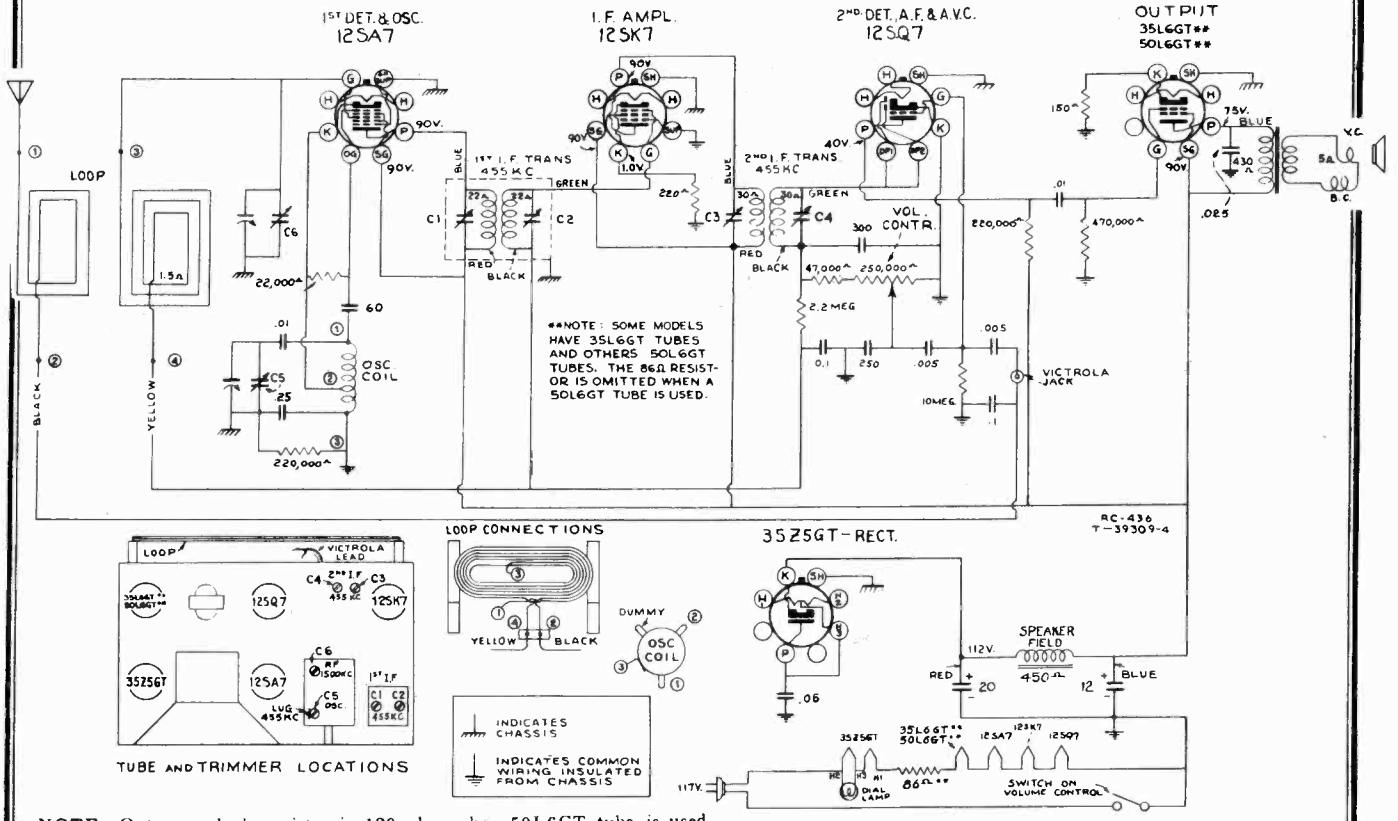
Precautionary Lead Dress

1. Dress 2nd I-F green lead close to chassis and under other parts.
2. Dress lead from gang condenser to grid of 12SA7 close to chassis and away from 12SQ7 socket.
3. Dress blue 1st I-F lead under volume control close to chassis.
4. Dress blue 2nd I-F lead close to chassis and behind 12SK7 socket.

Alignment, Trimmers
Socket, Lead Dress

RCA MFG. CO., INC.

MODELS 40X-50 to 40X-57
Chassis RC-436
Schematic, Voltage



TUBE AND TRIMMER LOCATIONS

NOTE: Output cathode resistor is 120 ohm when 50L6GT tube is used.

Pre-setting Dial.—With gang condenser in full mesh, the pointer should be horizontal.

Antenna.—The set is equipped with a built-in loop antenna. If an outdoor antenna is used, it may be connected to the "ANT" terminal on rear of cabinet. It should not be longer than 100 feet, including lead-in. If it is longer, connect a 100 to 200 mmf. capacitor in series with the lead-in.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	Tuning condenser stator (osc.) in series with .01 mfd.	455 kc	Quiet point at 1,600 kc end of dial	C1, C2, C3, C4 (1st and 2nd I-F transformers)
2	Antenna term. of ant. loop in series with 100 mmfd.	1,720 kc	Full clockwise (out of mesh)	C5 (oscillator)
3		1,500 kc	Resonance on 1,500 kc signal	C6 (antenna)

Precautionary Lead Dress

1. Dress 2nd I-F green lead close to chassis and under other parts.
2. Dress lead from gang condenser to grid of 12SA7 close to chassis and away from 12SQ7 socket.
3. Dress blue 1st I-F lead under volume control close to chassis.
4. Dress blue 2nd I-F lead close to chassis and behind 12SK7 socket.

Power Supply Ratings

A-C Rating ..... 105-125 volts, 50-60 cycles, 30 watts
D-C Rating ..... 105-125 volts, direct current, 30 watts

Power Output (125 volt, 60 cycle supply)

Undistorted ..... .6 watts
Maximum ..... 2.0 watts

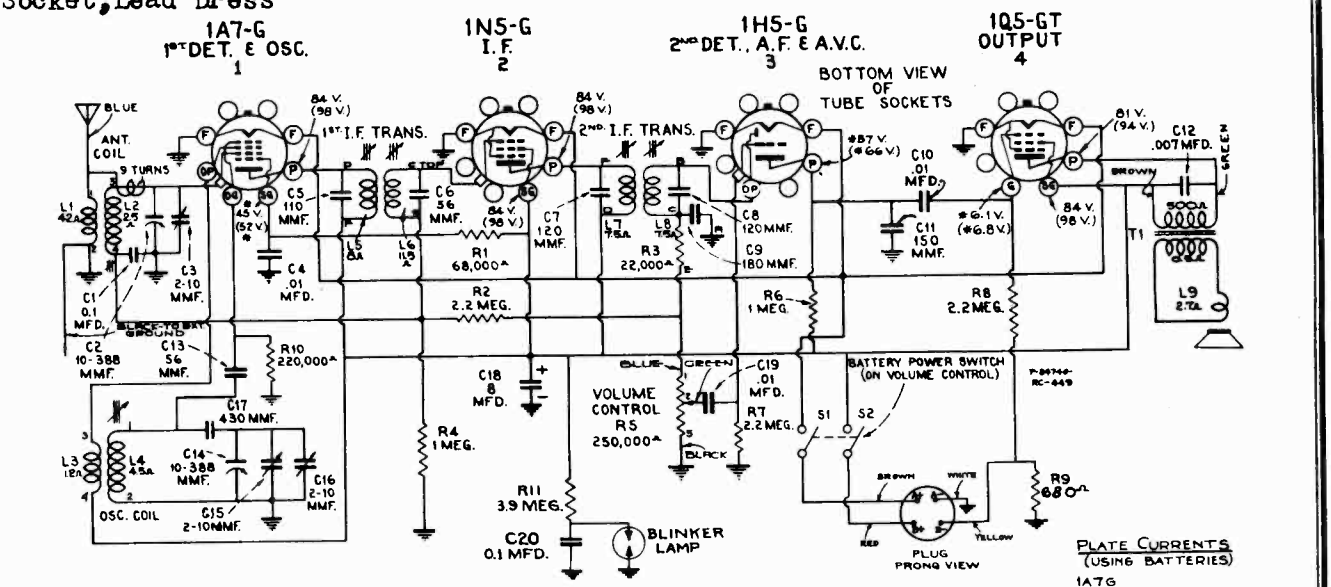
STOCK No.	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES (RC-436)	
33745	Cable—Phono. cable	.30
13057	Capacitor—60 mmfd.	.35
12488	Capacitor—250 mmfd.	.35
12952	Capacitor—300 mmfd.	.35
4838	Capacitor—.005 mfd.	.25
4870	Capacitor—.025 mfd.	.20
32787	Capacitor—.05 mfd.	.20
4839	Capacitor—.1 mfd.	.30
12484	Capacitor—.25 mfd.	.30
32576	Capacitor—Electrolytic, 20-12 mfd.	.90
32968	Capacitor—Variable tuning	2.25
32962	Coil—Oscillator coil	.60
32634	Cord—Drive cord	.10
33743	Drum—Drive drum	.40
31480	Lamp—Pilot lamp	.20
33663	Loop—Complete antenna loop	1.20
33558	Resistor—86 ohms	.15
12071	Resistor—120 ohms, ½ watt	.20
13428	Resistor—150 ohms, ½ watt	.20
14561	Resistor—220 ohms, ½ watt	.20
13998	Resistor—22,000 ohms, ½ watt	.20
12412	Resistor—47,000 ohms, ½ watt	.20
12264	Resistor—220,000 ohms, ½ watt	.20
12285	Resistor—470,000 ohms, ½ watt	.20
12679	Resistor—2.2 meg., ½ watt	.20
13601	Resistor—10 meg., ½ watt	.20
33061	Shaft—Drive shaft	.20
30585	Spring—Drive cord spring	.06
33557	Socket—Dial light socket	.30
32537	Socket—Tube socket	.20
32966	Transformer—I-F input transformer	1.25
32967	Transformer—I-F output transformer	1.05
32545	Volume control	1.50
	SPEAKER ASSEMBLIES (39105-2)	
32963	Speaker—Complete with transformer	3.95
32964	Transformer—Output transformer	1.25

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

MODELS BK41, BT41
Chassis RC-449
Schematic, Voltage
Alignment, Trimmers
Socket, Lead Dress

RCA MFG. CO., INC.

MODEL CV40, S.P.U.
Schematic

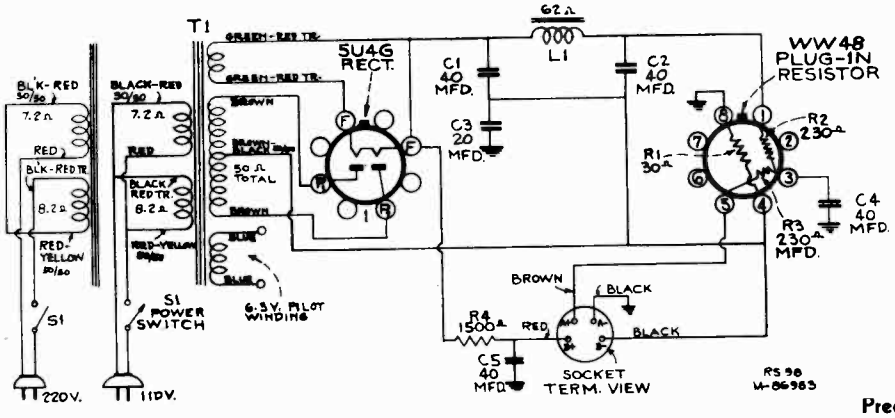


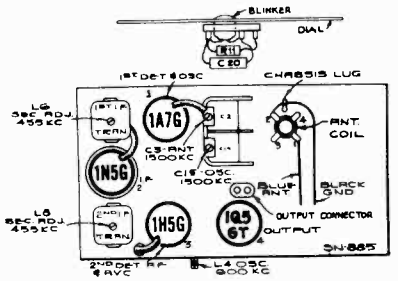
STARRED (*) VOLTAGES ARE OPERATING VOLTAGES IN CIRCUITS WITH HIGH SERIES RESISTANCE; THE ACTUAL MEASURED VOLTAGES WILL BE LOWER, DEPENDING ON THE VOLTMETER LOADING.

VOLTAGES IN PARENTHESES ARE THOSE OBTAINED BY USING POWER SUPPLY CV-40. WHEN BATTERIES ARE USED VOLTAGES NOT IN PARENTHESES APPLY.

PLATE CURRENTS (USING BATTERIES)

1A7G	
OSC.	0.85 MA.
DET.	0.49 MA.
1N5G	1.2 MA.
1H5G	.026 MA.
1Q5GT	6.0 MA.





Schematic Diagram—Model CV-40

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
No. 1	1N5-G I-F grid cap, in series with 0.01 mfd.	455 kc	Quiet point between 550-750 kc	L7 and L8 (2nd I-F transformer)
No. 2	1A7-G 1st-det. grid cap in series with 0.01 mfd.	455 kc		L5 and L6 (1st I-F transformer)
No. 3	Antenna lead, in series with 200 mmfd.	600 kc	600 kc	L4 (oscillator) L2 (antenna)
No. 4	Antenna lead, in series with 200 mmfd.	1,500 kc	1,500 kc	C15† (oscillator) C3 (antenna)

† Trimmer C16 on gang condenser should be unscrewed one complete turn from tight, before adjusting C15.

Cathode-ray Alignment is the preferable method. Connections for the oscillograph are as follows: Vertical "Hi" to E on the 2nd I-F transformer, Vertical "O" to chassis.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Pre-setting Dial.—With gang condenser in full mesh, the pointer should be horizontal.

Precautionary Lead Dress

1. Red lead from second i-f transformer to screen terminal of 1N5-G must be dressed close to and along edge of chassis.
2. Twisted green wire from antenna coil to gang must be 9 turns and kept clear of rotor.
3. Blue and green leads to volume control must be dressed close to chassis and between gang and front apron.
4. The opening in the shield of the 1N5-G should be turned away from the chassis and the i-f transformers.
5. Antenna and ground wires shoud be twisted together.

CV-40
Rectifier RCA-5U4-G
Plug-in Resistor ..... WW48, Stock No. 34563

POWER OUTPUT (Battery Operation)
Undistorted ..... 0.125 watt
Maximum ..... 0.300 watt

LOUDSPEAKER
Type ..... Permanent Magnet Dynamic
Diameter ..... BK41, 8 inches; BT41, 5 inches
Voice Coil-Impedance BK41, 2.2 ohms; BT41, 3.0 ohms at 400 cycles

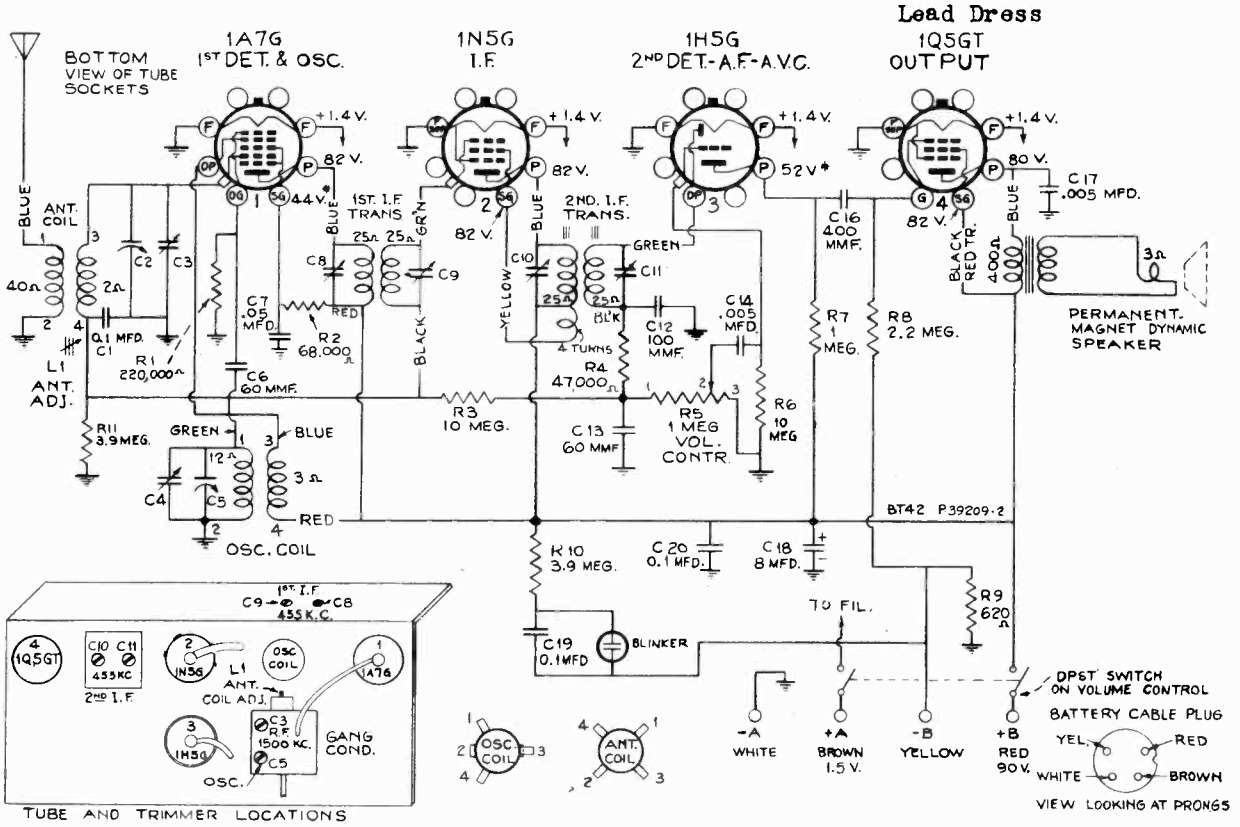
BATTERY REQUIRED
Combination 1½ volt-90 volt A-B Pack

CURRENT CONSUMPTION
"A" at 1.4 volts, 0.25 amp.
"B" at 90 volts, 9.4 ma.
A-C Operation

Use of power unit CV-40 with either Model BK41 or BT41 adapts that receiver for A-C operation.

RCA MFG. CO., INC.

MODEL BT42, Chassis RC408A
Schematic, Voltage, Socket
Alignment, Trimmers
Lead Dress



— 1939 No. 32 —

General Description

The RCA Victor Model BT-42 is a table type battery operated radio receiver.

Features of design include: On and off "Economy" Blinker; 4 RCA 1.4 volt low drain tubes; large horizontal dial; magnetite core transformers; automatic volume control; 16 to 1 tuning ratio; 5" permanent magnet speaker, and an available converter unit (CV40) to convert the receiver to 110 volt AC operation.

Electrical and Mechanical Specifications

Frequency Range	540-1,720 kc
Intermediate Frequency	455 kc

RCA TUBE COMPLEMENT

(1) RCA-1A7-G	1st-Det.—Osc.
(2) RCA-1N5-G	I-F Amplifier
(3) RCA-1H5-G	2nd-Det., A-F, and A.V.C.
(4) RCA-1Q5-G	Output

BATTERIES REQUIRED
1 "A"—"B" Pack (Eveready No. 748 or equivalent).

CURRENT CONSUMPTION
"A," 0.24 ampere—"B," 10 milliamperes.

POWER OUTPUT

Undistorted	0.15 watt
Maximum	0.25 watt

LOUDSPEAKER

Type	5-inch permanent-magnet dynamic
Voice-coil Impedance	3.3 ohms at 400 cycles

Cabinet Dimensions (inches)	Height 9¾, Width 17½, Depth 9¾
Weight—Shipping weight	16 pounds
Tuning Drive Ratio	16 to 1

Alignment Procedure

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-oscillator.—For all alignment operations, keep the output as low as possible to avoid a-v-c action.

Pre-setting Dial.—With the gang condenser fully out of mesh, the indicator should point to the extreme right (high frequency) mark on the dial scale.

CAUTION.—When ready to install or replace batteries or tubes or to make any repairs or changes, be sure to turn off power switch.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn Radio Dial to—	Adjust the following for max. peak output—
1	1A7G 1st-Det. grid cap, in series with .01 mfd.	455 kc	Quiet point at 550 kc End of Dial	C8, C9, C10, C11 (1st and 2nd I-F transformers)
2	Antenna lead (blue) in series with 100 mmfd.	1,500 kc	1,500 kc	C5 (oscillator)
3		600 kc	600 kc	L1 (antenna)*
4		1,500 kc	1,500 kc	C3 (antenna)

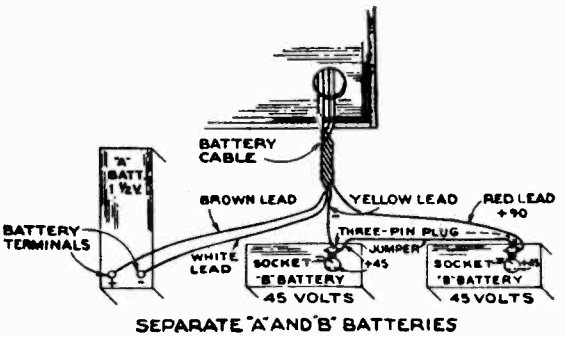
* When adjusting L1 (antenna), trimmer C3 should be in a minimum capacity position (unscrewed).

Precautionary Lead Dress.—

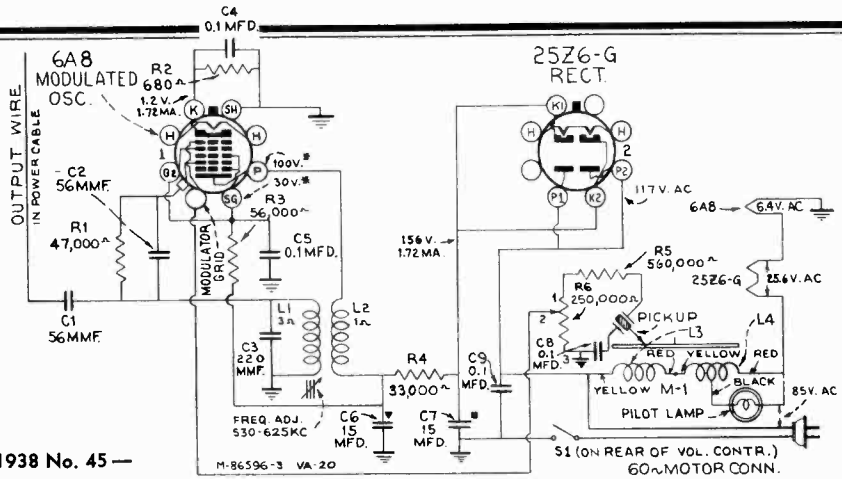
1. All filament (brown) and B+ (red) leads must be dressed away from unshielded I.F. coil.

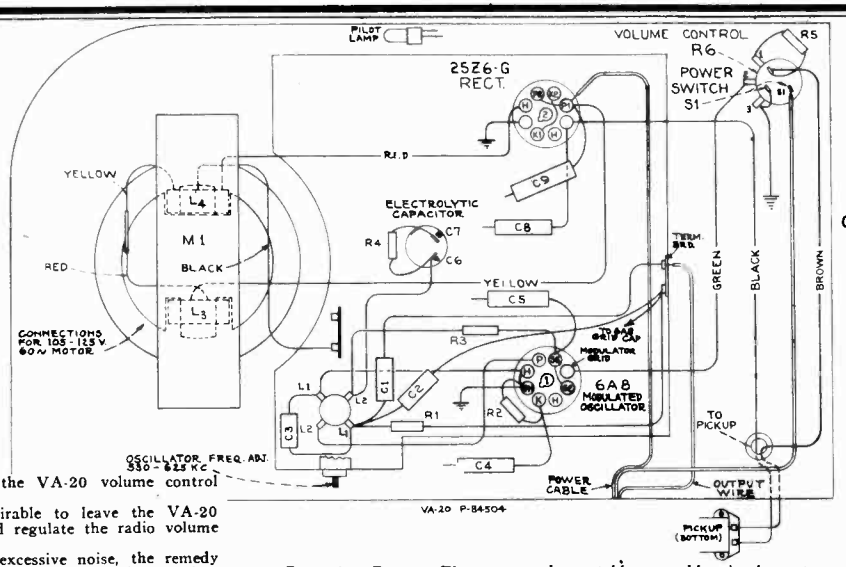
2. Green grid lead of 1A7G tube to be twisted around antenna (blue) lead for capacity coupling.

3. Red and brown battery cable leads to be dressed and held against front apron with tape.



SEPARATE "A" AND "B" BATTERIES





General Description

The crystal pickup in Model VA-20 is connected through a volume control to grid No. 1 in an RCA-6A8 tube which functions as a modulated r-f oscillator. The oscillator frequency can be adjusted from 530 to 625 kc by means of a magnetite core in the oscillator transformer, L1-L2. (This is a screwdriver adjustment at the rear of the cabinet.) An output wire is connected to the grid circuit of the oscillator, and is run parallel with the power cable. The output is sufficient to permit operation within approximately 20 feet of a radio receiver.

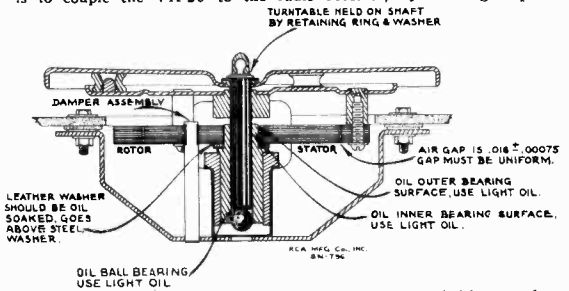
Electrical and Mechanical Specifications

Frequency Range	530-625 kc
Tube Complement	
(1) RCA-6A8	Modulator-Oscillator
(2) RCA-25Z6-G	Half-Wave Rectifier
Dial Lamp	Mazda 47, 6-8 volts, .15 amp.
Power Supply Ratings	
A-6	105-125 volts, 60 cycles, 50 watts
A-5	105-125 volts, 50 cycles, 50 watts
Motor	
Type	Synchronous (Manual Starting)
Turntable Speed	78 r.p.m.
Pickup	
Type	Crystal
Pickup Impedance	100,000 ohms at 1000 cycles
Average Output Voltage	1½ volts at 1000 cycles with 250,000 ohm load.
Cabinet Dimensions	
Height	3⅜ inches
Width	12½ inches
Depth	8½ inches
Over-All Height	5 inches
Turntable Diameter	7 inches

Weight 7¼ lbs. (net), 9¼ lbs. (shipping)

Set-Up Procedure

1. Insert plug in power supply outlet, and turn the power-switch—volume control knob on top of VA-20 to full clockwise position. Start a record on the VA-20. The motor is a synchronous manual-starting type, and requires a clockwise spin to start.
2. Tune the radio receiving set to a quiet point between 530-625 kc.
3. Tune the oscillator in the VA-20 to this frequency by adjusting the button on the rear of the VA-20 cabinet to obtain peak output on the receiver. Clockwise rotation decreases the frequency; counter-clockwise rotation increases the frequency.
4. Adjust the radio volume control for the highest volume that is likely to be required, and then use the VA-20 volume control for further adjustment.
5. In noisy locations, it may be desirable to leave the VA-20 volume control turned full clockwise, and regulate the radio volume control for the desired level.
6. If there is insufficient volume, or excessive noise, the remedy is to couple the VA-20 to the radio receiver, by running a piece



of insulated wire between the two units: Wrap one end (three or four turns) around the antenna lead-in on the radio, and wrap the other end (three or four turns) around the short wire that projects from the plug on the power cord of the VA-20. With an RCA Master Antenna, wrap the wire around the counter-poise lead where it attaches to the receiver (terminal A3) or to the coupling unit (terminal B).

7. If the radio receiver has push-button tuning, one of the buttons may be set up to tune in the VA-20 oscillator frequency. This button should be marked "Record Player."

Motor Data

Smooth starting and running will be insured by keeping the bearings well cleaned and oiled.

Hum and Vibration.—A small amount of hum when starting, decreasing to a negligible amount when running, is normal. If excessive vibration occurs it may be due to:

1. Insufficient lubrication, or any failure that will cause binding.
2. Leather washer not oiled. (Check to make certain that the leather washer is above the steel washer.)
3. Motor not properly supported from motor board.
4. Burrs on poles of rotor or stator. Remove with fine emery cloth.

The damper spring must fit without binding or chattering in the slot in the stator. The stator must be free to deflect in either direction between the limits of the damper spring. The damper spring must exert approximately equal force in restoring the stator to its mid-position when the stator is deflected manually in each direction.

Removing Rotor.—The rotor and turntable assembly simply rests on the ball bearing at bottom of vertical bearing. Remove by lifting upward.

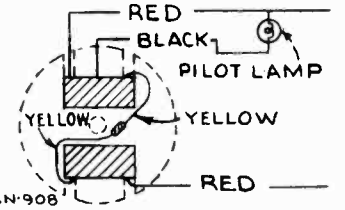
Rotor Adjustment.—Remove motor from cabinet. Loosen the three screws that hold the rotor to the turntable, insert three 16-mil shims at equal distances around the gap between the rotor and stator, and then carefully tighten the three screws. The top of rotor must be flush with top of stator; add additional steel washers beneath the stator if necessary.

*Note: Voltages with star (*) are operating voltages in circuits with high series resistance. The actual measured voltage will be lower, depending on the voltmeter loading. Voltages are measured to chassis, unless otherwise indicated. Values should hold within approximately ± 20% with 117-volt a-c supply.

Precautionary Lead Dress

1. The power supply cord must be dressed between chassis and top of cabinet, away from grid of 6A8, and entirely away from 25Z6-G.
2. All leads to oscillator coil must be as short as possible.
3. All motor leads must be dressed away from rotor.
4. Pickup leads must be dressed away from the top grid of 6A8, and kept away from the 25Z6-G.

Caution: Do not remove turntable from motor while power is turned on, as damage to the tubes will result.



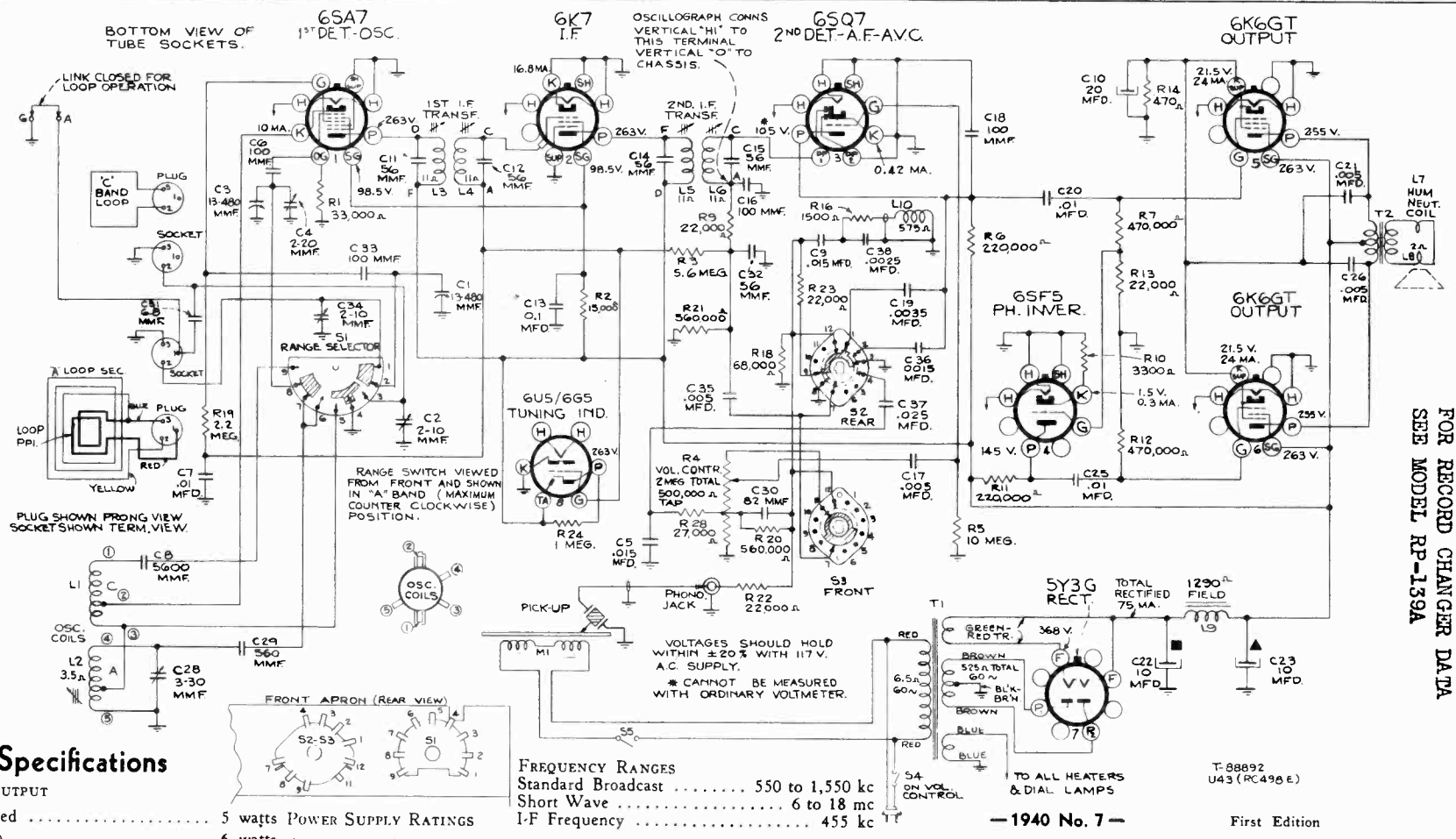
50-Cycle Motor Coil Assembly and Connections
D-C resistance of each coil:

105-125 volts, 60 cycles	36 ohms
105-125 volts, 50 cycles	40 ohms

RCA MFG. CO., INC.

MODEL U-43, Chassis RC498E
Schematic, Voltage, Tuner

FOR RECORD CHANGER DATA
SEE MODEL RP-139A



Specifications

POWER OUTPUT

Undistorted ..... 5 watts
Maximum ..... 6 watts

PILOT LAMPS (2) ... Mazda No. 44 6.3 volts, 0.25 amps.

POWER SUPPLY RATINGS

A6 ..... 105-125 volts, 60 cycles, 110 watts
A5 ..... 105-125 volts, 50 cycles, 110 watts
B2 ..... 105-125 volts, 25 cycles, 110 watts
C6 ..... 105-130/140-160/200-250 volts, 60 cycles, 110 watts
C5 ..... 105-130/140-160/200-250 volts, 50 cycles, 110 watts

FREQUENCY RANGES

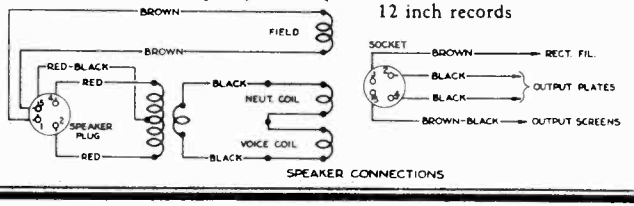
Standard Broadcast ..... 550 to 1,550 kc
Short Wave ..... 6 to 18 mc
I-F Frequency ..... 455 kc

LOUDSPEAKER (RL70L1)

Type ..... 12 inch electrodynamic
Voice Coil Impedance at 400 cycles .2.2 ohms

AUTOMATIC PHONOGRAPH

Pickup ..... Crystal
Record Capacity ... Eight 10 inch or seven 12 inch records



SPEAKER CONNECTIONS

Adjustments for Push-Button Tuning

The push-buttons should be adjusted for six favorite stations after the receiver has been operating for a brief warm-up period. Each button may be set up to any standard broadcast station. The preferable arrangement is to adjust for stations in the order of frequency, from low to high. Proceed as follows:

1. Pull off the push-buttons and loosen the push-button rods with a small screwdriver.

2. Set the radio-phono switch to "radio" position and accurately tune in the station for which the first button is to be set.

3. Press in push-button rod No. 1 (left) with the screwdriver, as far as it will go without undue pressure, hold in, retune station with manual control if necessary for best reception, and then carefully tighten up the rod. Do not tighten more than ¼ turn after the rod begins to grip or damage to the mechanism may result.

4. Replace the push-button on its shaft.

5. Proceed in a similar manner for the remainder of the push-buttons.

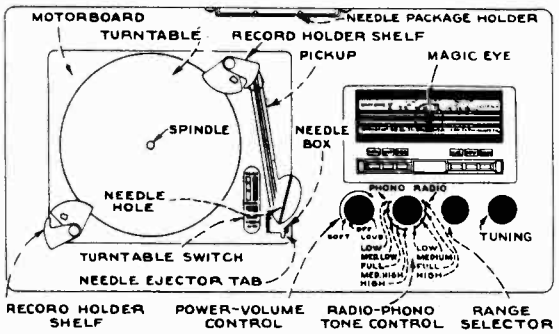
6. Insert the station marker tabs in the recesses above the push-buttons.

First Edition

MODEL U-43,Ch.RC498E
Alignment,Trimmers
Socket,Dial Mechanism

RCA MFG. CO., INC.

Alignment Procedure



Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown on the chassis schematic.

Output Meter Alignment.—If this method is used, connect the output meter across the voice coil, and turn the receiver volume control to maximum.

Test Oscillator.—For all alignment operations, keep the oscillator output as low as possible to avoid a-v-c action.

Calibration Marks.—The tuning dial is fastened in the cabinet and can not be used for reference during alignment. Therefore calibration marks have been stamped in the plate on the front of the chassis as shown in the accompanying drawing. These marks are used for reference during alignment.

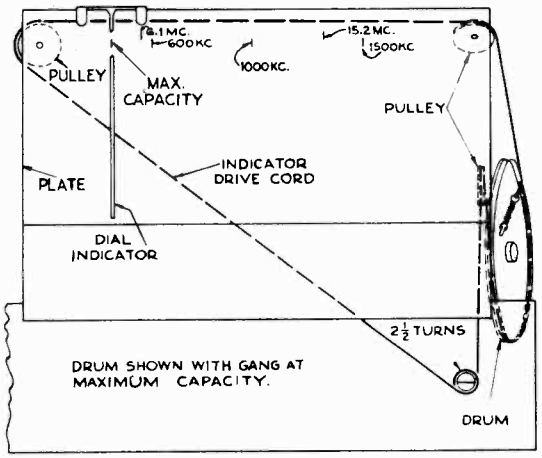
Dial Indicator Adjustment.—With the gang condenser in full mesh, the indicator should point to the extreme left (low frequency) mark on the dial scale.

Steps	Connect test-osc. output to—	Tune test-osc. to—	Turn radio dial to	Adjust the following for maximum peak output
1	I-F grid through 0.1 mfd capacitor and ground	455 kc	Quiet point between 1,720-1,500 kc	L5 and L6 (2nd I-F trans.)
2	1st det. grid through 0.1 mfd capacitor and ground			L3 and L4 (1st I-F trans.)
3		15.2 mc	15.2 mc	C-4 oscillator*
4	Radiation loop consisting of two turns of wire 18 inches in diameter located 4 to 6 feet from receiver	15.2 mc	Rock at 15.2 mc	C-2 antenna† while rocking
5		6.1 mc	6.1 mc	Spacing between leads from "C" band loop to chassis
6		15.2 mc	Rock at 15.2 mc	C-2 antenna† while rocking
7		1,500 kc	1,500 kc	C-34 antenna C-28 oscillator
8		600 kc	Rock at 600 kc	L-2 oscillator while rocking
9		1,500 kc	1,500 kc	C-34 antenna C-28 oscillator

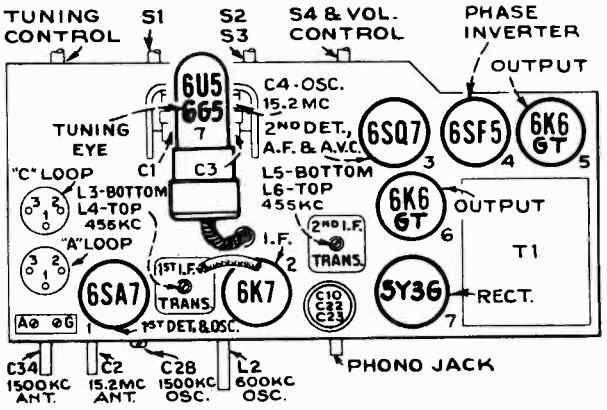
When making adjustments 4 to 9 inclusive the chassis must be in the cabinet, both loops connected, and all leads in their normal positions. When mounting chassis in cabinet if calibration marks on dial plate do not line up with dial scale mounted on cabinet move pointer to agree with dial scale on cabinet.

* Oscillator should track on high frequency side of signal. If two peaks are obtained use high frequency (minimum capacity) peak.

† If two peaks can be obtained use low frequency (maximum capacity) peak.



Dial-Indicator and Drive Mechanism

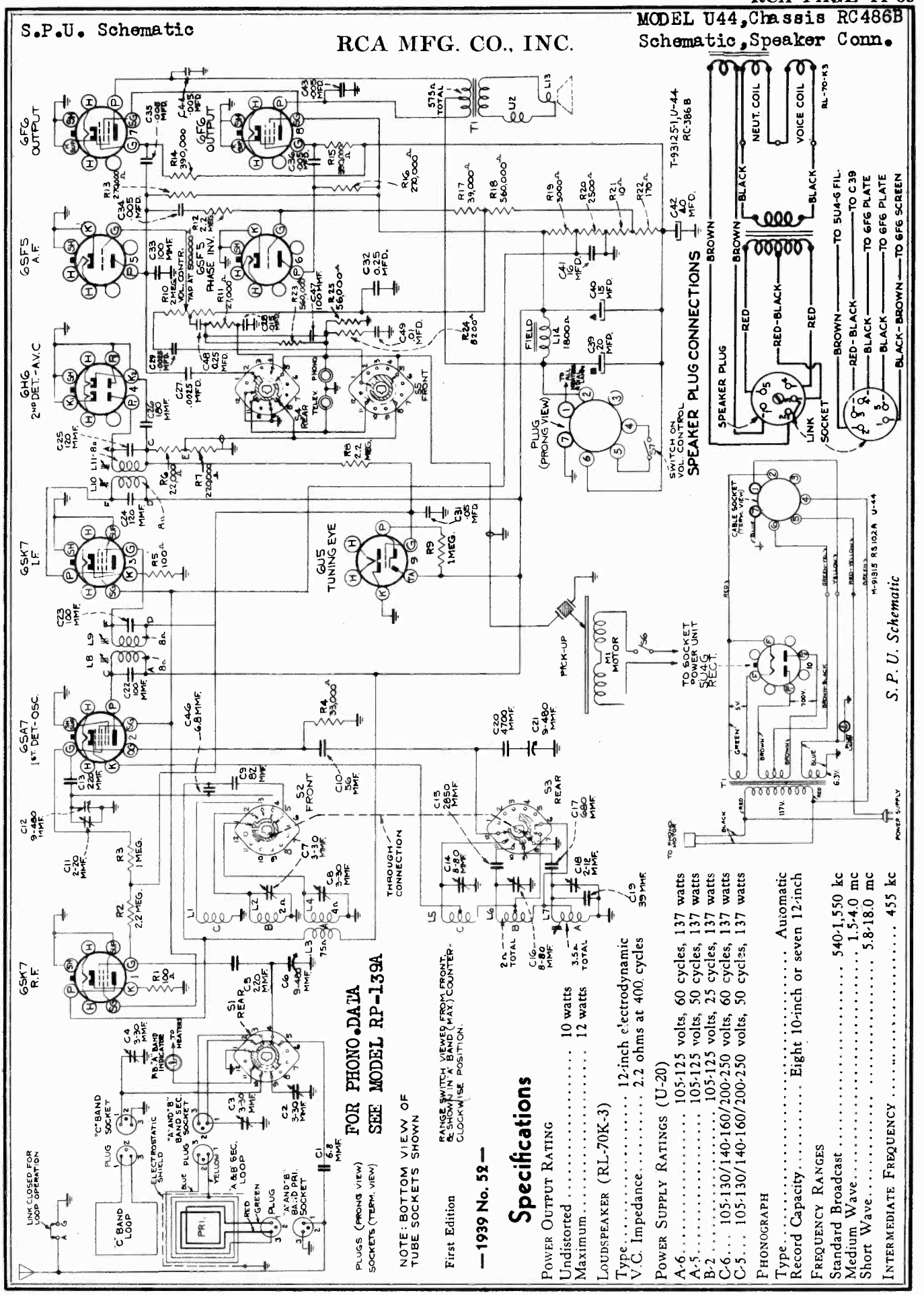


Tube and Trimmer Locations

S.P.U. Schematic

RCA MFG. CO., INC.

MODEL U44, Chassis RC486B
Schematic, Speaker Conn.



Specifications

Power Output Rating

Undistorted ..... 10 watts
Maximum ..... 12 watts

Loudspeaker (RL-70K-3)

Type ..... 12-inch electrodynamic
V.C. Impedance ..... 2.2 ohms at 400 cycles

Power Supply Ratings (U-20)

A-6 ..... 105-125 volts, 60 cycles, 137 watts
A-5 ..... 105-125 volts, 50 cycles, 137 watts
B-2 ..... 105-125 volts, 25 cycles, 137 watts
C-6 ... 105-130/140-160/200-250 volts, 60 cycles, 137 watts
C-5 ... 105-130/140-160/200-250 volts, 50 cycles, 137 watts

Phonograph

Type ..... Automatic
Record Capacity ..... Eight 10-inch or seven 12-inch

Frequency Ranges

Standard Broadcast ..... 540-1,550 kc
Medium Wave ..... 1.5-4.0 mc
Short Wave ..... 5.8-18.0 mc

Intermediate Frequency ..... 455 kc

MODEL U44, Chassis RC486B

Chassis Wiring, Voltage

RCA MFG. CO., INC.

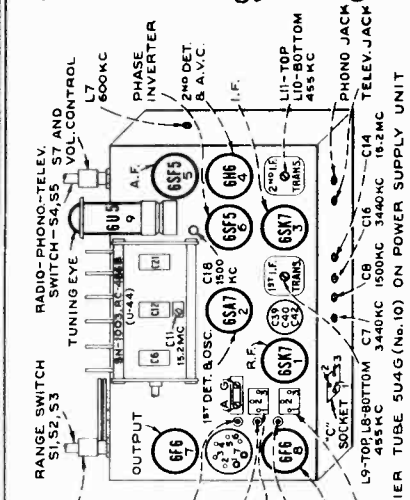
Tuner, Trimmers, Socket

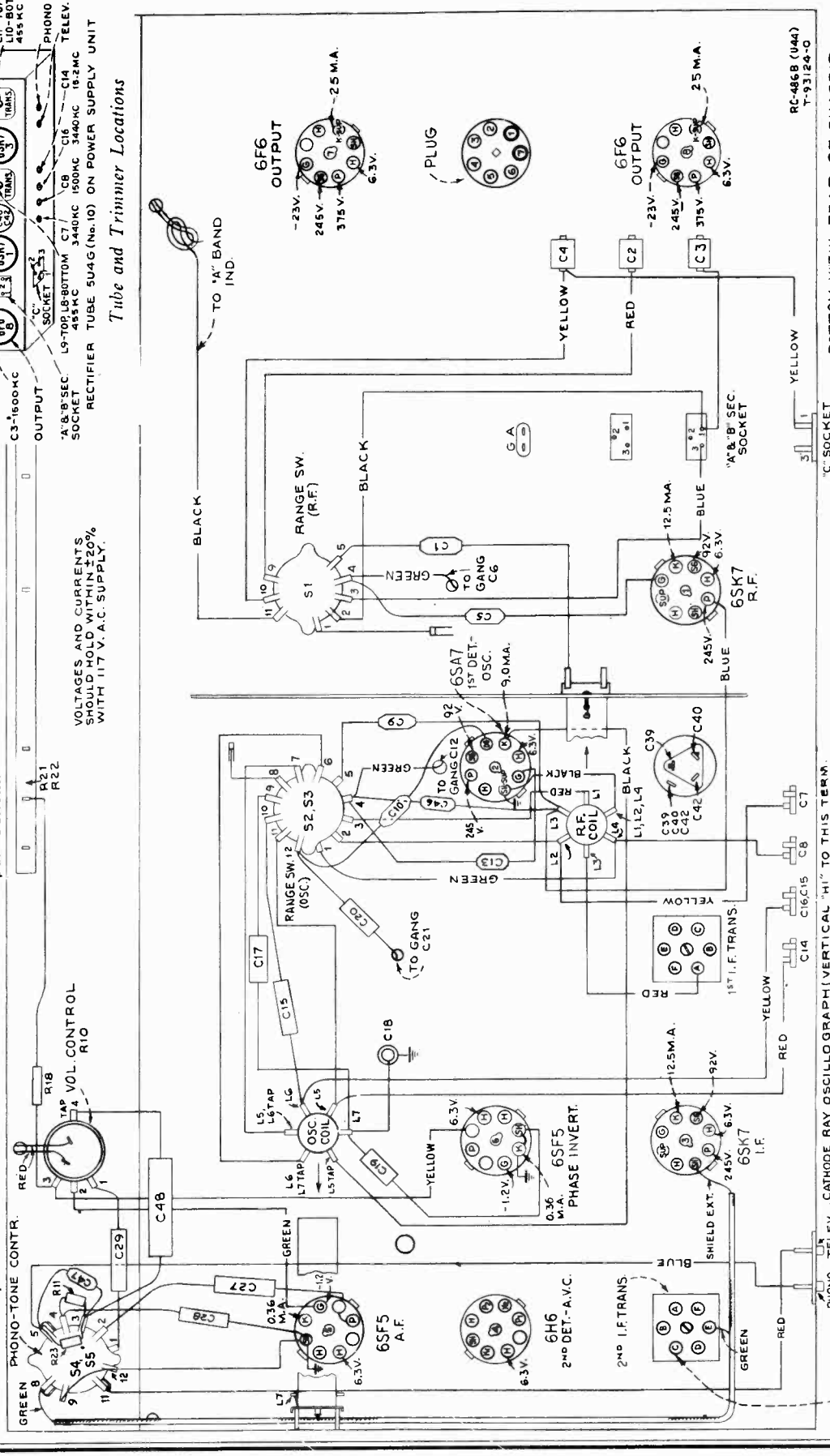
Adjustments for Push-Button Tuning

The push-buttons should be adjusted for six favorite stations after the receiver has been operating for a brief warm-up period. Each button may be set up to any standard broadcast station. The preferable arrangement is to adjust for stations in the order of frequency, from low to high. Proceed as follows:

1. Remove station marker tabs; reach through tab holes in escutcheon with small screwdriver and loosen push-button rods.
2. Set the radio-phono-television switch to "radio" position and accurately tune in the station for which the first button is to be set.
3. Press in push-button rod No. 1 with the screwdriver, as far as it will go without undue pressure, hold in, retune station with manual control if necessary for best reception, and then carefully tighten up the rod. Do not tighten more than ¼ turn after the rod begins to grip or damage to the mechanism may result.
4. Proceed in a similar manner for the remainder of the push-buttons.
5. Insert the station marker tabs in the recesses adjacent to the push-buttons.

Tube and Trimmer Locations





RCA MFG. CO., INC.

MODEL U44, Chassis RC486B
Alignment, Lead Dress

Antennas

This receiver is equipped with two loop antennas ("C" band horizontal and fixed, and "A" and "B" band vertical, shielded, and rotatable). During installation the "A" and "B" band loop should be rotated to the position giving maximum signal strength and freedom from noise. If desired, an outside antenna and ground can be connected to the terminals provided and when this is done the link between these terminals must be opened. However, for loop operation this link must be closed. If such an antenna is used it should be approximately 100 feet long.

Centering Loudspeaker Cone

The loudspeaker cone centering support is fastened to the field frame by two screws accessible from the rear of the speaker. The cone can usually be recentered by loosening these screws and moving the support around until the proper position is found without disturbing the dust cover. However, in some cases it may be necessary to remove the front dust cover and insert spacers between the voice coil and pole piece in order to obtain proper centering. A new dust cover should then be installed.

Alignment Procedure

Before proceeding with alignment the following lead dress should be carefully checked:

1. A.C. leads at volume control dressed away from audio leads.
2. C-29 dressed close to chassis.
3. C-48 dressed under volume control.
4. Dress C-44 and 6F6 plate leads away from antenna leads.
5. Leads to phono and television jacks dressed close to end of chassis.
6. Red lead from R.F. coil to range switch short and direct as possible.
7. Leads to loop sockets dressed away from chassis and other leads.
8. Green lead from volume control arm to A.F. grid close to chassis.

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis wiring drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator. — For all alignment operations, keep the six steps in alignment the low side of the test-oscillator should be connected to the receiver chassis. Following step 6, the signal must be radiated (see alignment table).

output as low as possible to avoid a-v-c action. For the first

Calibration Scale on Indicator-Drive-Cord Drum. — The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the tuning drum. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 240° mark on the drum scale must be vertical and directly above the center of the shaft of the tuning drum when the plates are fully meshed. The drum is held to the shaft by means of two set-screws, which must be tightened securely when the drum is in the correct position.

On the inner side of the tuning drum are two projections which serve as stops to prevent extreme rotation of the gang condenser. The tuning drum should be set so that the stop limiting clockwise movement of the drum takes effect just as the gang condenser plates are becoming fully meshed, thus preventing stress on the gang due to extreme rotation.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the chassis, and bend the wire so that it points to the 240° mark on the calibration scale when the plates are fully meshed.

Steps	Connect the high side of the test-osc to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	6SK7 I-F grid in series with .01 mfd.	455 kc	"A" band Quiet point near 600 kc	L10 and L11 (2nd I-F trans.)
2	6SA7 det. grid in series with .01 mfd.			L8 and L9 (1st I-F trans.)
3	6SK7 R-F grid in series with 0.1 mfd.	15.2 mc	15.2 mc (47°) "C" band	C14 (osc.)* C11 (det.)***
4		3.44 mc	3.44 mc (57°) "B" band	C16 (osc.)** C7 (det.)
5		600 kc	600 kc (200°) "A" band	L7 (osc.) Rock gang
6		1,500 kc	1,500 kc (22°) "A" band	C18 (osc.) C8 (det.)
7	Radiation loop consisting of two turns of wire 18 inches in diameter located 4 to 6 feet from receiver	15.2 mc	15.2 mc "C" band	C4 (ant.)
8		6.1 mc	6.1 mc "C" band	Inductance of "C" band loop†
9		Repeat step 7		
10		3.44 mc	3.44 mc "B" band	C2 (ant.)
11		1,500 kc	1,500 kc "A" band	C3 (ant.)
12		600 kc	600 kc "A" band	L7 (osc.) Rock gang
13		1,500 kc	1,500 kc "A" band	C18 (osc.) C8 (det.)

Note.—For steps 7 to 13 inclusive the chassis must be in the cabinet, all loop leads connected and in their normal positions. The dial indicator pointer must be fastened to the drive cord in such a position that it is at the 530 kc mark on "A" scale when the gang condenser plates are fully meshed.

* Use **minimum** capacity peak if two can be obtained. Check to determine that C14 has been adjusted to the correct peak by tuning the receiver to approximately 14.29 mc where a weaker signal should be received.

** Use **minimum** capacity peak if two can be obtained. Check to determine that C16 has been adjusted to the correct peak by tuning the receiver to approximately 2.53 mc where a weaker signal should be received.

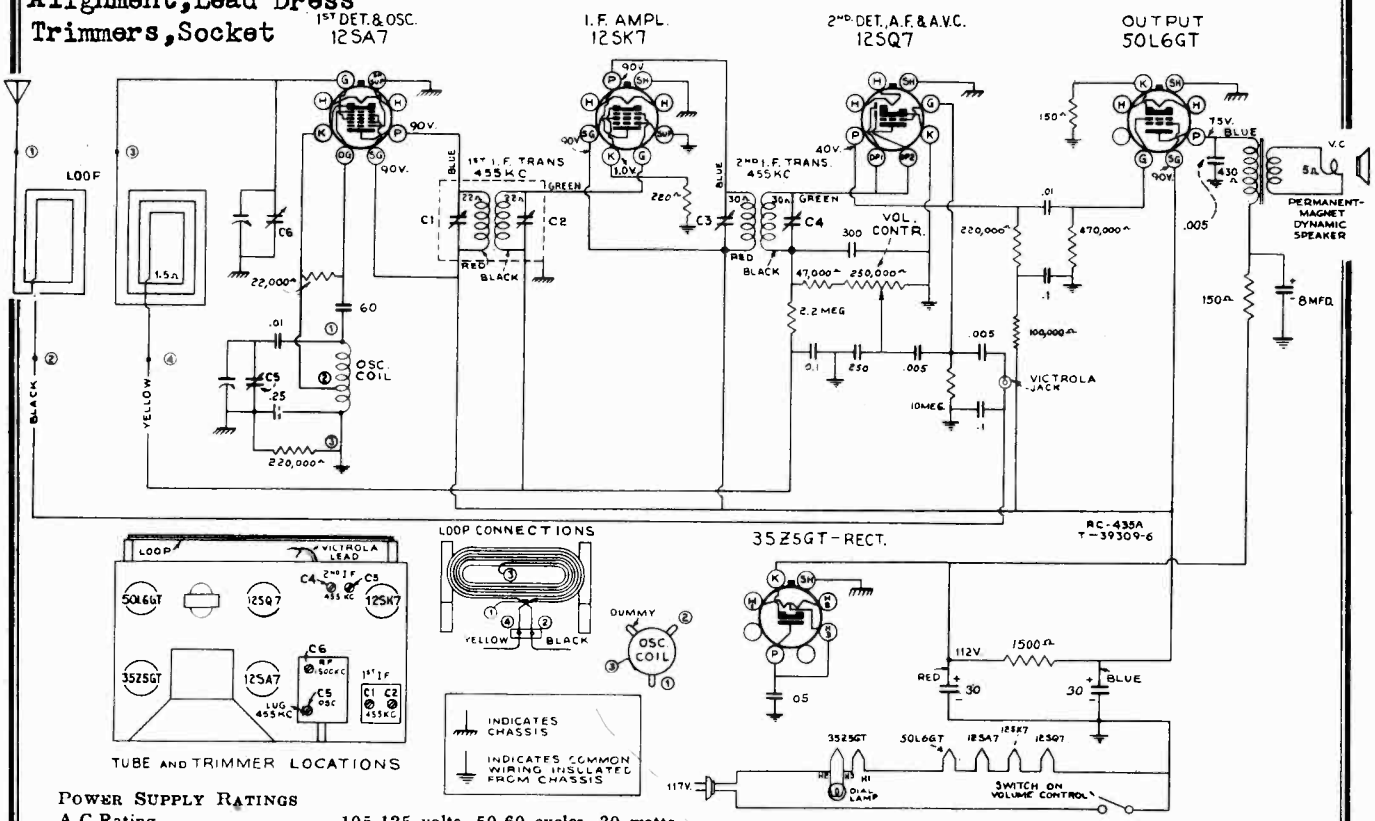
*** Use **maximum** capacity peak if two peaks can be obtained and rock gang condenser while adjusting.

† Adjust the inductance of "C" band loop by varying the spacing between the leads of the loop. Moving the leads closer together decreases the inductance and tunes the loop to a higher frequency; moving the leads farther apart increases the inductance and tunes the loop to a lower frequency.

Important.—The oscillator tracks **above** the signal on all bands.

MODELS 45E, 45E-m, 45E-W
Chassis RC-435A
Schematic, Voltage
Alignment, Lead Dress
Trimmers, Socket

RCA MFG. CO., INC.



TUBE AND TRIMMER LOCATIONS

POWER SUPPLY RATINGS

A-C Rating ..... 105-125 volts, 50-60 cycles, 30 watts
D-C Rating ..... 105-125 volts, direct current, 30 watts

POWER OUTPUT (125 volt, 60 cycle supply)

Undistorted ..... .6 watts
Maximum ..... 2.0 watts

LOUDSPEAKER

Type ..... 5-inch permanent magnet dynamic

Pre-Setting Dial.—With gang condenser in full mesh, the pointer should be adjusted so that top edge of pointer just touches rivet in dial plate.

Antenna.—The set is equipped with a built-in loop antenna. If an outdoor antenna is used, it may be connected to the "ANT" terminal on rear of cabinet. It should not be longer than 100 feet, including lead-in. If it is longer, connect a 100 to 200 mmf. capacitor in series with the lead-in.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	Tuning condenser stator (osc.) in series with .01 mfd.	455 kc	Quiet point at 1,600 kc end of dial	C1, C2, C3, C4 (1st and 2nd I-F transformers)
2	Antenna term. of ant. loop in series with 100 mmfd.	1,720 kc	Full clockwise (out of mesh)	C5 (oscillator)
3		1,500 kc	Resonance on 1,500 kc signal	C6 (antenna)

Precautionary Lead Dress

1. Dress 2nd I-F green lead close to chassis and under other parts.
2. Dress lead from gang condenser to grid of 12SA7 close to chassis and away from 12SQ7 socket.
3. Dress blue 1st I-F lead under volume control close to chassis.
4. Dress blue 2nd I-F lead close to chassis and behind 12SK7 socket.

STOCK No.	DESCRIPTION	Unit List Price
33296	Spring—Retaining spring for drum	.08
32966	Transformer—First I-F transformer	1.25
32967	Transformer—Second I-F transformer	1.05
33291	Volume control and switch	1.50
	SPEAKER ASSEMBLIES (39213-1)	
33853	Cone—Speaker cone and voice coil	1.75
33851	Speaker complete	4.50
33854	Transformer—Output transformer	1.20
	CHASSIS ASSEMBLIES	
13057	Capacitor—60 mmfd.	.35
12488	Capacitor—250 mmfd.	.35
12952	Capacitor—300 mmfd.	.35
4838	Capacitor—.005 mfd.	.25
32787	Capacitor—.05 mfd.	.20
4839	Capacitor—0.1 mfd.	.30
12484	Capacitor—0.25 mfd.	.30
33952	Capacitor—Electrolytic, 8 mfd.	.50
33850	Capacitor—Electrolytic, 2 sections 30 mfd. each	1.00
34259	Coil—Oscillator coil	.60
32968	Condenser—Variable tuning condenser	2.25
32634	Cord—Drive cord	.10
33662	Drum—Drive drum	.25
33295	Indicator—Dial pointer	.25

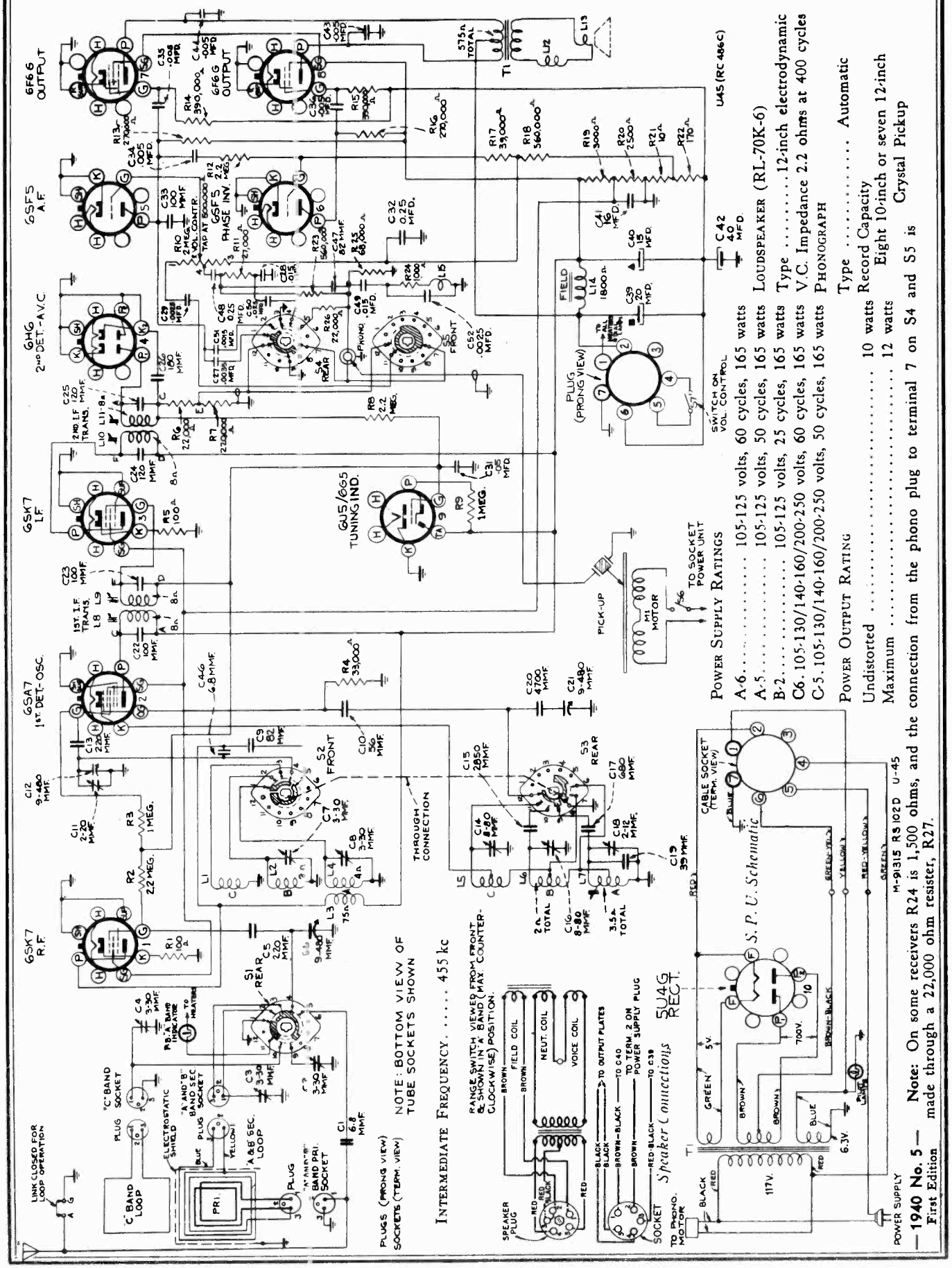
Stock No.	DESCRIPTION	Unit List Price
11765	Lamp—Dial lamp	.15
33663	Loop—Antenna loop complete	1.20
33294	Pulley—Drive cord pulley	.02
13428	Resistor—150 ohms, ½ watt	.20
14561	Resistor—220 ohms, ½ watt	.20
3153	Resistor—1,500 ohms, 1 watt	.22
13998	Resistor—22,000 ohms, ½ watt	.20
12412	Resistor—47,000 ohms, ½ watt	.20
14560	Resistor—100,000 ohms, ½ watt	.20
12264	Resistor—220,000 ohms, ½ watt	.20
12199	Resistor—270,000 ohms, ½ watt	.20
12679	Resistor—2.2 meg., ½ watt	.20
33293	Shaft—Tuning knob shaft and bushing	.30
33557	Socket—Dial lamp socket	.30
32537	Socket—Tube socket	.20
31615	Spring—Drive cord spring	.02

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

FOR PHONO DATA SEE MODEL RP-139A

RCA MFG. CO., INC.

MODEL U45, Chassis RC-486C
Schematic



POWER SUPPLY RATINGS

A-6 ..... 105-125 volts, 60 cycles, 165 watts
A-5 ..... 105-125 volts, 50 cycles, 165 watts
B-2 ..... 105-125 volts, 25 cycles, 165 watts
C6. 105-130/140-160/200-250 volts, 60 cycles, 165 watts
C-5. 105-130/140-160/200-250 volts, 50 cycles, 165 watts

POWER OUTPUT RATING

Undistorted ..... 10 watts
Maximum ..... 12 watts

LOUDSPEAKER (RL-70K-6)

Type .....12-inch electrodynamic
V.C. Impedance 2.2 ohms at 400 cycles

PHONOGRAPH

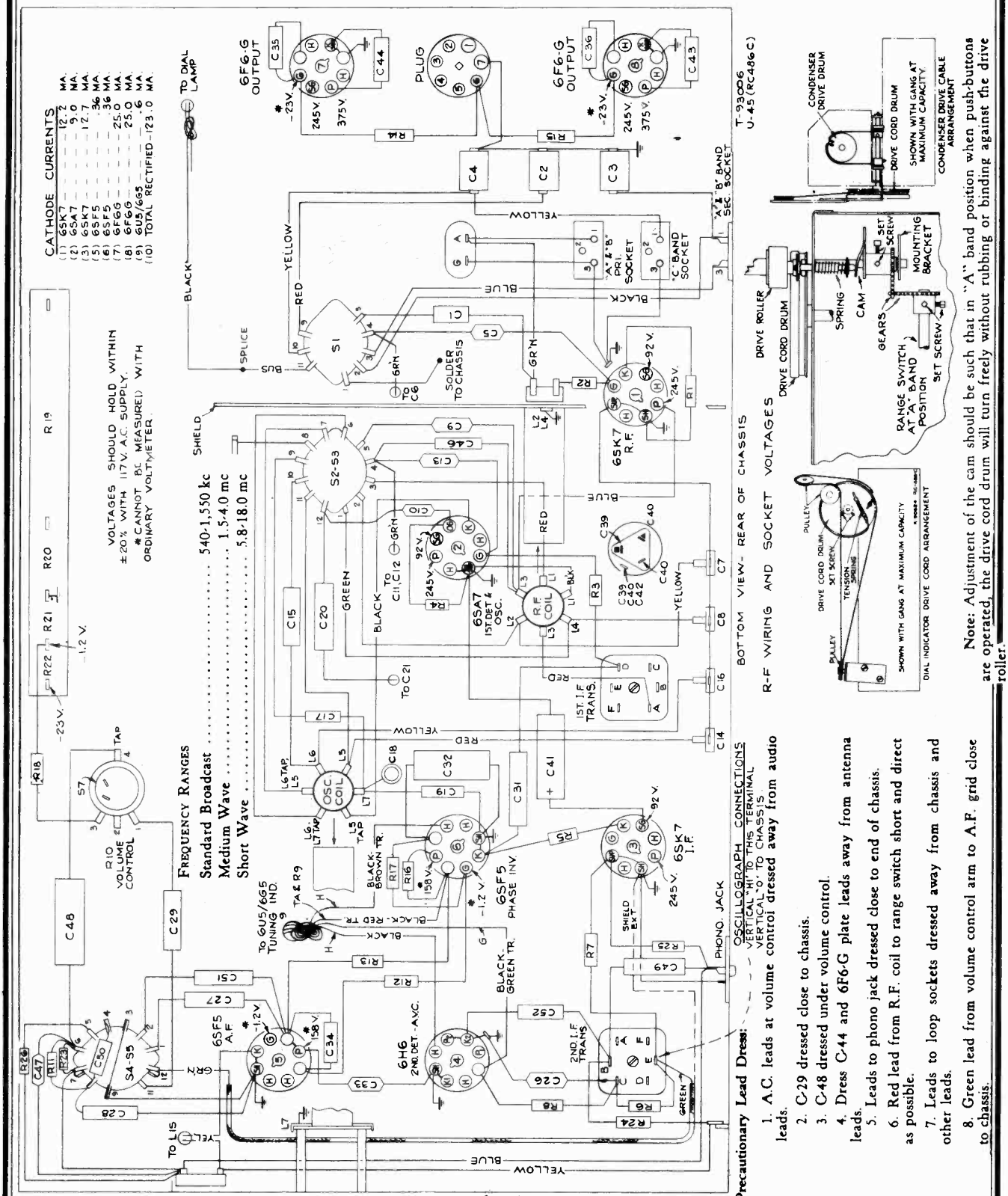
Type ..... Automatic
Record Capacity
Eight 10-inch or seven 12-inch
Crystal Pickup

Note: On some receivers R24 is 1,500 ohms, and the connection from the phono plug to terminal 7 on S4 and S5 is made through a 22,000 ohm resister, R27.

MODEL U45, Chassis RC486C
Chassis Wiring, Voltage

RCA MFG. CO., INC.

Lead Dress, Tuner



Precautionary Lead Dress:

1. A.C. leads at volume control dressed away from audio leads.
2. C-29 dressed close to chassis.
3. C-48 dressed under volume control.
4. Dress C-44 and 6F6-G plate leads away from antenna leads.
5. Leads to phono jack dressed close to end of chassis.
6. Red lead from R.F. coil to range switch short and direct as possible.
7. Leads to loop sockets dressed away from chassis and other leads.
8. Green lead from volume control arm to A.F. grid close to chassis.

Note: Adjustment of the cam should be such that in "A" band position when push-buttons are operated, the drive cord drum will turn freely without rubbing or binding against the drive roller.

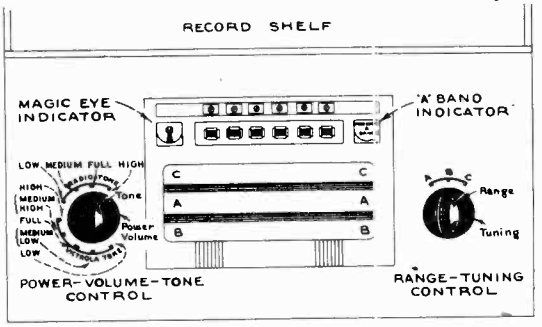
Adjustments for Push-Button Tuning

The push-buttons should be adjusted for six favorite stations after the receiver has been operating for a brief warm-up period. Each button may be set up to any standard broadcast station. The preferable arrangement is to adjust for stations in the order of frequency, from low to high. Proceed as follows:

1. Remove station marker tabs; reach through tab holes in escutcheon with small screwdriver and loosen push-button rods.
2. Set the radio-phono switch to "radio" position and accurately tune in the station for which the first button is to be set.
3. Press in push-button rod No. 1 with the screwdriver, as far as it will go without undue pressure, hold in, retune station with manual control if necessary for best reception, and then carefully tighten up the rod. Do not tighten more than ¼ turn after the rod begins to grip or damage to the mechanism may result.
4. Proceed in a similar manner for the remainder of the push-buttons.
5. Insert the station marker tabs in the recesses adjacent to the push-buttons.

MODEL U45, Chassis RC486C
Alignment, Trimmers
Socket

RCA MFG. CO., INC.



Controls

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis wiring drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator. — For all alignment operations, keep the output as low as possible to avoid a-v-c action. For the first six steps in alignment the low side of the test-oscillator should be connected to the receiver chassis. Following step 6, the signal must be radiated (see alignment table).

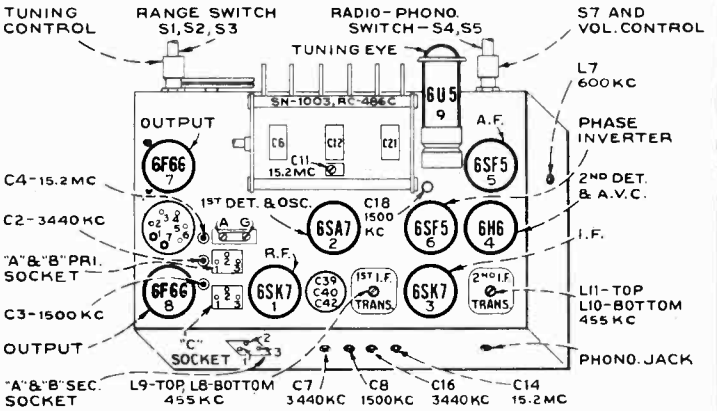
Calibration Scale on Indicator-Drive-Cord Drum. — The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the tuning drum. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

Alignment Procedure

As the first step in r-f alignment, check the position of the drum. The 240° mark on the drum scale must be vertical and directly above the center of the shaft of the tuning drum when the plates are fully meshed. The drum is held to the shaft by means of two set-screws, which must be tightened securely when the drum is in the correct position.

On the inner side of the tuning drum are two projections which serve as stops to prevent extreme rotation of the gang condenser. The tuning drum should be set so that the stop limiting clockwise movement of the drum takes effect just as the gang condenser plates are becoming fully meshed, thus preventing stress on the gang due to extreme rotation.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the chassis, and bend the wire so that it points to the 240° mark on the calibration scale when the plates are fully meshed.



RECTIFIER TUBE 5U4G (No. 10) ON POWER SUPPLY UNIT

Steps	Connect the high side of the test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	6SK7 I-F grid in series with .01 mfd.	455 kc	"A" band Quiet point near 600 kc	L10 and L11 (2nd I-F trans.)
2	6SA7 det. grid in series with .01 mfd.			L8 and L9 (1st I-F trans.)
3	6SK7 R-F grid in series with 0.1 mfd.	15.2 mc	15.2 mc (47°) "C" band	C14 (osc.)* C11 (det.)***
4		3.44 mc	3.44 mc (57°) "B" band	C16 (osc.)** C7 (det.)
5		600 kc	600 kc (200°) "A" band	L7 (osc.) Rock gang
6		1,500 kc	1,500 kc (22°) "A" band	C18 (osc.) C8 (det.)
7	Radiation loop consisting of two turns of wire 18 inches in diameter located 4 to 6 feet from receiver	15.2 mc	15.2 mc "C" band	C4 (ant.)
8		6.1 mc	6.1 mc "C" band	Inductance of "C" band loop†
9		Repeat step 7		
10		3.44 mc	3.44 mc "B" band	C2 (ant.)
11		1,500 kc	1,500 kc "A" band	C3 (ant.)
12		600 kc	600 kc "A" band	L7 (osc.) Rock gang
13		1,500 kc	1,500 kc "A" band	C18 (osc.) C8 (det.)

Note.—For steps 7 to 13 inclusive the chassis must be in the cabinet, all loop leads connected and in their normal positions. The dial indicator pointer must be fastened to the drive cord in such a position that it is at the 530 kc mark on "A" scale when the gang condenser plates are fully meshed.

* Use **minimum** capacity peak if two can be obtained. Check to determine that C14 has been adjusted to the correct peak by tuning the receiver to approximately 14.29 mc where a weaker signal should be received.

** Use **minimum** capacity peak if two can be obtained. Check to determine that C16 has been adjusted to the correct peak by tuning the receiver to approximately 2.53 mc where a weaker signal should be received.

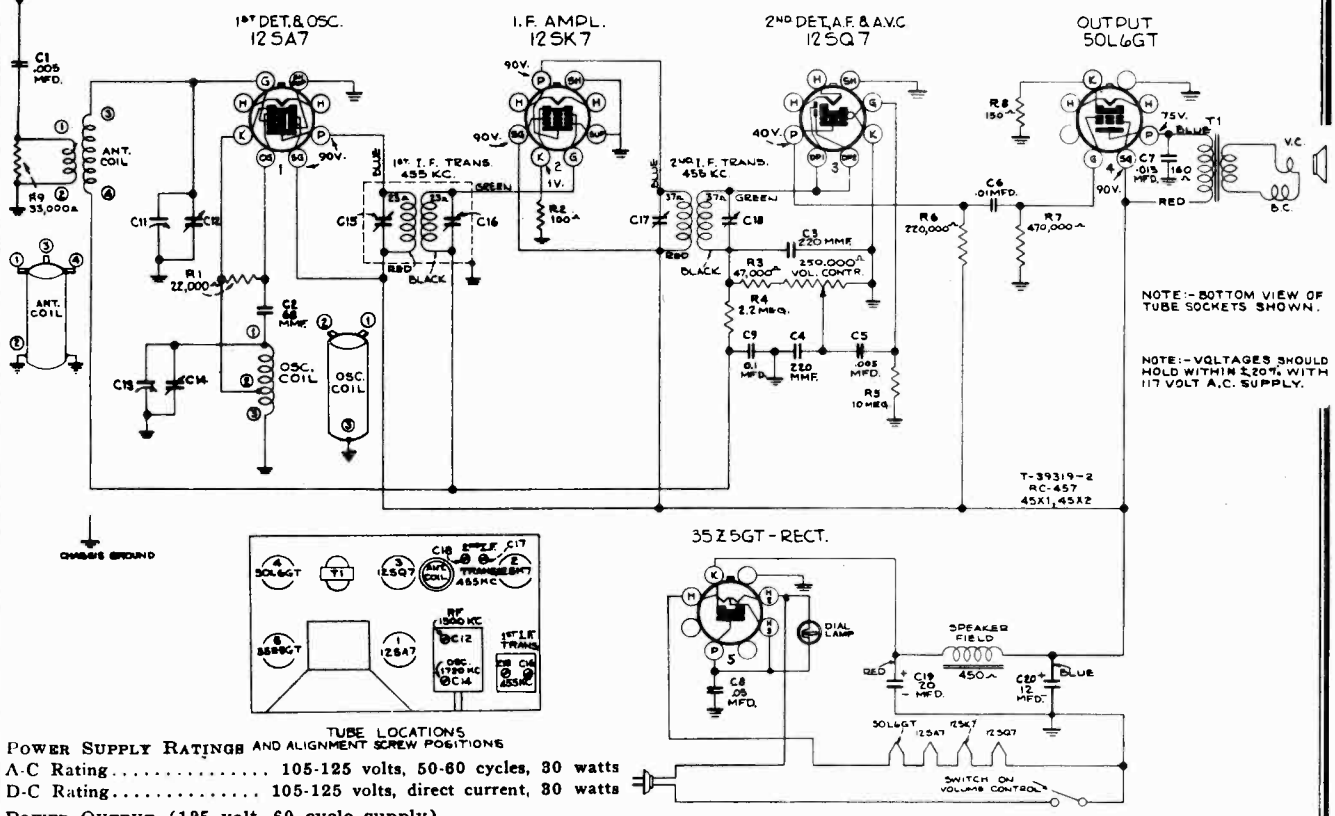
*** Use **maximum** capacity peak if two peaks can be obtained and rock gang condenser while adjusting.

† Adjust the inductance of "C" band loop by varying the spacing between the leads of the loop. Moving the leads closer together decreases the inductance and tunes the loop to a higher frequency; moving the leads farther apart increases the inductance and tunes the loop to a lower frequency.

Important.—The oscillator tracks **above** the signal on all bands.

MODELS 45X1, 45X2
Chassis RC457
Schematic, Voltage
Alignment, Socket
Trimmers

RCA MFG. CO., INC.



POWER SUPPLY RATINGS AND ALIGNMENT SCREW POSITIONS

A-C Rating ..... 105-125 volts, 50-60 cycles, 30 watts
D-C Rating ..... 105-125 volts, direct current, 30 watts

POWER OUTPUT (125 volt, 60 cycle supply)

Undistorted ..... .6 watts
Maximum ..... 2.0 watts

LOUDSPEAKER

Type ..... 4-inch Electrodynamic

Output Meter Alignment. — Connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator. — Connect the low side of the test-oscillator to the receiver chassis, through a .01 mfd. capacitor, and keep the output as low as possible.

Power-Supply Polarity. — For operation on d-c, the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a-c, reversal of the plug may reduce hum.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	Tuning condenser stator (osc.) in series with .01 mfd.	455 kc	Quiet point at 1,600 kc end of dial	C15, C16, C17, C18 (1st and 2nd I-F transformers)
2	Antenna term. of ant. trans. in series with 100 mmfd.	1,720 kc	Full clockwise (out of mesh)	C14 (oscillator)
3		1,500 kc	Resonance on 1,500 kc signal	C12 (antenna)

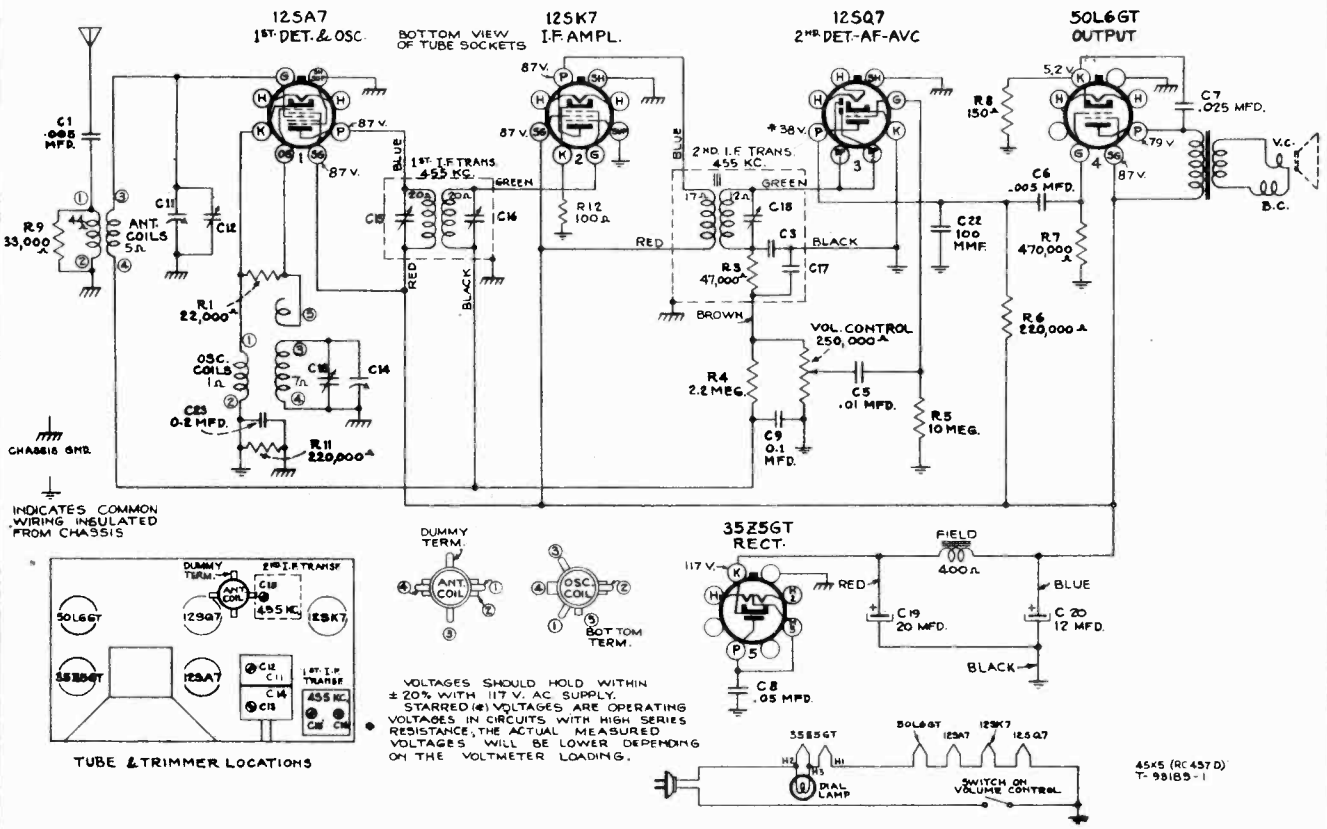
STOCK No.	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES	
13057	Capacitor—68 mmfd. (C2)	.35
12694	Capacitor—220 mmfd. (C3, C4)	.35
33584	Capacitor—.005 mfd. (C1, C5)	.25
4937	Capacitor—.01 mfd. (C6)	.25
30856	Capacitor—.015 mfd. (C7)	.90
32787	Capacitor—.05 mfd. (C8)	.20
4839	Capacitor—0.1 mfd. (C9)	.30
32576	Capacitor—Electrolytic comprising 1 section of 20 mfd and 1 section of 12 mfd.	.90
35115	Coil—Antenna coil	.80
35116	Coil—Oscillator coil	.60
34843	Condenser—Variable tuning condenser	2.20
35113	Control—Volume control and power switch	1.50
32634	Cord—Drive cord	.10
35117	Drum—Tuning condenser drive drum	.40
11765	Lamp—Dial lamp	.15
31193	Lead—Antenna lead	.50
14439	Resistor—100 ohms, ½ watt (R2)	.20
30880	Resistor—150 ohms, ½ watt (R8)	.20
13998	Resistor—22,000 ohms, ½ watt (R1)	.20
12412	Resistor—47,000 ohms, ½ watt (R3)	.20
12264	Resistor—220,000 ohms, ½ watt (R6)	.20
12285	Resistor—470,000 ohms, ½ watt (R7)	.20
12679	Resistor—2.2 megohms, ½ watt (R4)	.20
13601	Resistor—10 megohms, ½ watt (R5)	.20
33305	Shaft—Condenser drive shaft	.25
35118	Shield—Shield can for I.F. transformer Stock No. 35114	.35
32969	Socket—Dial lamp socket	.25
31319	Socket—Tube socket	.25
30585	Spring—Drive cord tension spring	.06
34848	Transformer—Audio transformer	1.25
35114	Transformer—1st I.F. transformer	1.20
33301	Transformer—2nd I.F. transformer	1.20
	SPEAKER ASSEMBLIES (39105-505)	
35120	Cone—Cone complete with voice coil	1.50
35119	Speaker—4-inch dynamic speaker complete	2.85
	MISCELLANEOUS ASSEMBLIES (RR-572)	
35122	Back—Cabinet back for Model 45X1	.25
35125	Back—Cabinet back for Model 45X2	.25
35124	Dial—Glass dial scale	1.00
33317	Fastener—Push on fastener	.02
35123	Knob—Ivory tuning or volume control knob for Model 45X2	.10
35121	Knob—Walnut tuning or volume control knob for Model 45X1	.10
35126	Spring—Retaining spring for knobs Stock No. 35121 and 35123	.03

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

Alignment, Trimmers
Socket, Lead Dress

RCA MFG. CO., INC.

MODELS 45X5, 45X6
Chassis RC457D
Schematic, Voltage



—1940 No. 1—

Features of design include: New Type single-ended tubes (12SA7, 12SK7, and 12SQ7); edge-lighted dial; dust proof electrodynamic loudspeaker; and Beam Power Output.

First Edition

Electrical and Mechanical Specifications

FREQUENCY RANGE	540-1,680 kc
Intermediate Frequency	455 kc

TUBE COMPLEMENT

(1) RCA-12SA7	1st-Detector-Oscillator
(2) RCA-12SK7	I-F Amplifier
(3) RCA-12SQ7	2nd-Detector, 1st A-F, and A.V.C.
(4) RCA-50L6GT	Power Output
(5) RCA-35Z5GT	Half-Wave Rectifier
Dial Lamp (1)	Mazda 51, 7.5 volts, 0.2 amp.

POWER SUPPLY RATINGS

A-C Rating	105-125 volts, 50-60 cycles, 30 watts
D-C Rating	105-125 volts, direct current, 30 watts

POWER OUTPUT (125 volt, 60 cycle supply)

Undistorted	1.0 watts
Maximum	1.25 watts

LOUDSPEAKER

Type	4-inch Electrodynamic
Cabinet Dimensions (inches)	Height 5-1/16, Width 8½, Depth 4½
Weight (net)	4 pounds

Alignment Procedure

Output Meter Alignment.—Connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For I-F alignment, connect the low side of the test-oscillator to the receiver chassis through a .01 mfd. capacitor, and keep the output as low as possible.

Pre-Setting Dial.—With gang condenser in full mesh, the pointer should be adjusted so that it is vertical.

Antenna.—The set is equipped with length of antenna wire. Do not connect the antenna to ground. If an outdoor antenna is used, it should not be longer than 100 feet, including lead-in. If it is longer, connect a 100 to 200 mmf. capacitor in series with the lead-in.

Power-Supply Polarity.—For operation on d-c, the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a-c, reversal of the plug may reduce hum.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	12SK7 I-F grid in series with .01 mfd.	455 kc	Quiet point at 1,600 kc end of dial	C18 (2nd I-F trans.)
2	Tuning condenser stator (osc.) in series with .01 mfd.			C15 and C16 (1st I-F trans.)
3	Antenna term. of ant. trans. in series with 100 mmfd.	1,720 kc	Full clockwise (out of mesh)	C13 (oscillator)
4		1,400 kc	Resonance on 1,400 kc signal	C12 (antenna)

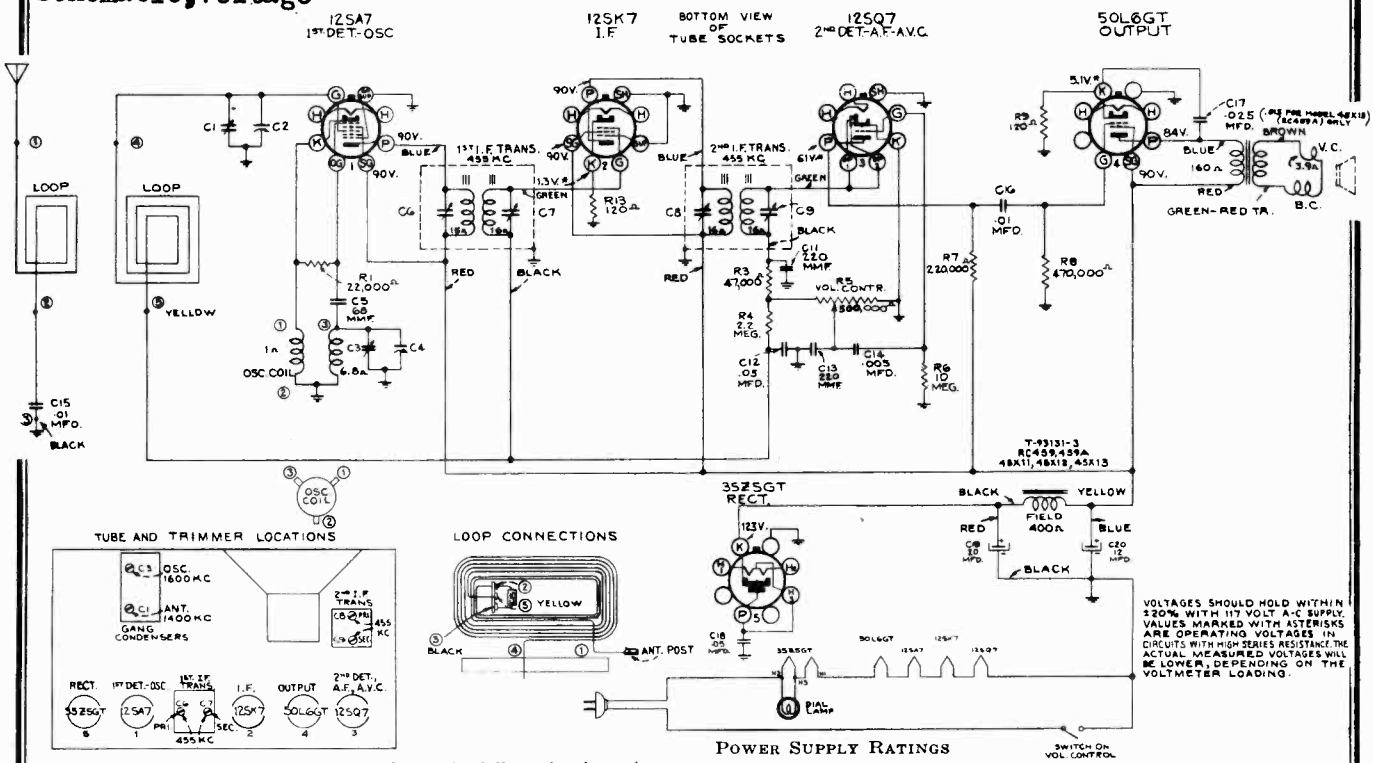
Precautionary Lead Dress

1. Green and blue leads from 1st I.F. transformer should be dressed apart and against chassis.
2. Blue lead of the 2nd I.F. transformer must be dressed against the shield and down between the tube socket and chassis.
3. Dress green diode lead away from 12SQ7 grid resistor and condenser.

MODELS 45X11, 45X12
Chassis RC-459
Schematic, Voltage

RCA MFG. CO., INC.

Alignment, Trimmers
Socket, lead Dress



VOLTAGES SHOULD HOLD WITHIN ±20% WITH 117 VOLT A-C SUPPLY. VALUES MARKED WITH ASTERISKS ARE OPERATING VOLTAGES IN CIRCUITS WITH HIGH SERIES RESISTANCE. THE ACTUAL MEASURED VOLTAGES WILL BE LOWER, DEPENDING ON THE VOLTMETER LOADING.

Pre-Setting Dial.—With gang condenser in full mesh, the pointer should be adjusted so that pointer is vertical.

Antenna.—The set is equipped with a built-in loop antenna. If an outdoor antenna is used, it may be connected to the "ANT" terminal on rear of cabinet. It should not be longer than 100 feet, including lead-in. If it is longer, connect a 100 to 200 mmf. capacitor in series with the lead-in.

Power-Supply Polarity.—For operation on d-c, the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a-c, reversal of the plug may reduce hum.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	12SK7 (I-F) grid in series with .01 mfd.	455 kc	Quiet point at 600 kc end of dial	C8, C9 (2nd I-F trans.)
2	Tuning condenser stator (ant.) in series with .01 mfd.			C6, C7 (1st I-F trans.)
3	Radiation loop consisting of two turns of wire 18 inches in diameter	1,600 kc	Full clockwise (out of mesh)	C3 (oscillator)
4		1,400 kc	Resonance on 1,400 kc signal	C1 (antenna)

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

STOCK No.	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES (RC-459) (RC-459A)	
13057	Capacitor—68 mmfd. (C5)	.35
12694	Capacitor—220 mmfd. (C11, C13)	.35
33584	Capacitor—.005 mfd. (C14)	.25
4937	Capacitor—.01 mfd. (C15, C16)	.25
11315	Capacitor—.015 mfd. (C17) (RC-459A)	.20
30938	Capacitor—.025 mfd. (C17) (RC-459)	.20
32787	Capacitor—.05 mfd. (C12)	.20
32576	Capacitor—Electrolytic comprising 1 section of 20 mfd. and 1 section of 12 mfd.	.90
34443	Coil—Oscillator coil	.60
35053	Condenser—Variable tuning condenser less drive drum	2.00
35057	Control—Volume control and power switch	1.50
32634	Cord—Tuning condenser drive cord	.10
35063	Drum—Tuning condenser drive drum	.30
35062	Indicator—Station selector indicator	.20
11765	Lamp—Dial lamp	.15
35061	Loop—Antenna loop complete	1.95
12071	Resistor—120 ohms, ½ watt (R13)	.20
32535	Resistor—120 ohms, ½ watt (R9)	.20
13998	Resistor—22,000 ohms, ½ watt (R1)	.20
12412	Resistor—47,000 ohms, ½ watt (R3)	.20
12264	Resistor—220,000 ohms, ½ watt (R7)	.20
12285	Resistor—470,000 ohms, ½ watt (R8)	.20
12679	Resistor—2.2 megohms, ½ watt (R4)	.20
13601	Resistor—10 megohms, ½ watt (R6)	.20
35059	Scale—Dial scale	.65

POWER SUPPLY RATINGS

A-C Rating ..... 105-125 volts, 50-60 cycles, 30 watts
D-C Rating ..... 105-125 volts, direct current, 30 watts

POWER OUTPUT (125 volt, 60 cycle supply)

Undistorted ..... 1.0 watts
Maximum ..... 1.5 watts

Precautionary Lead Dress

1. Audio coupling capacitor to volume control must be dressed under the terminal board and down against the corner of the chassis.

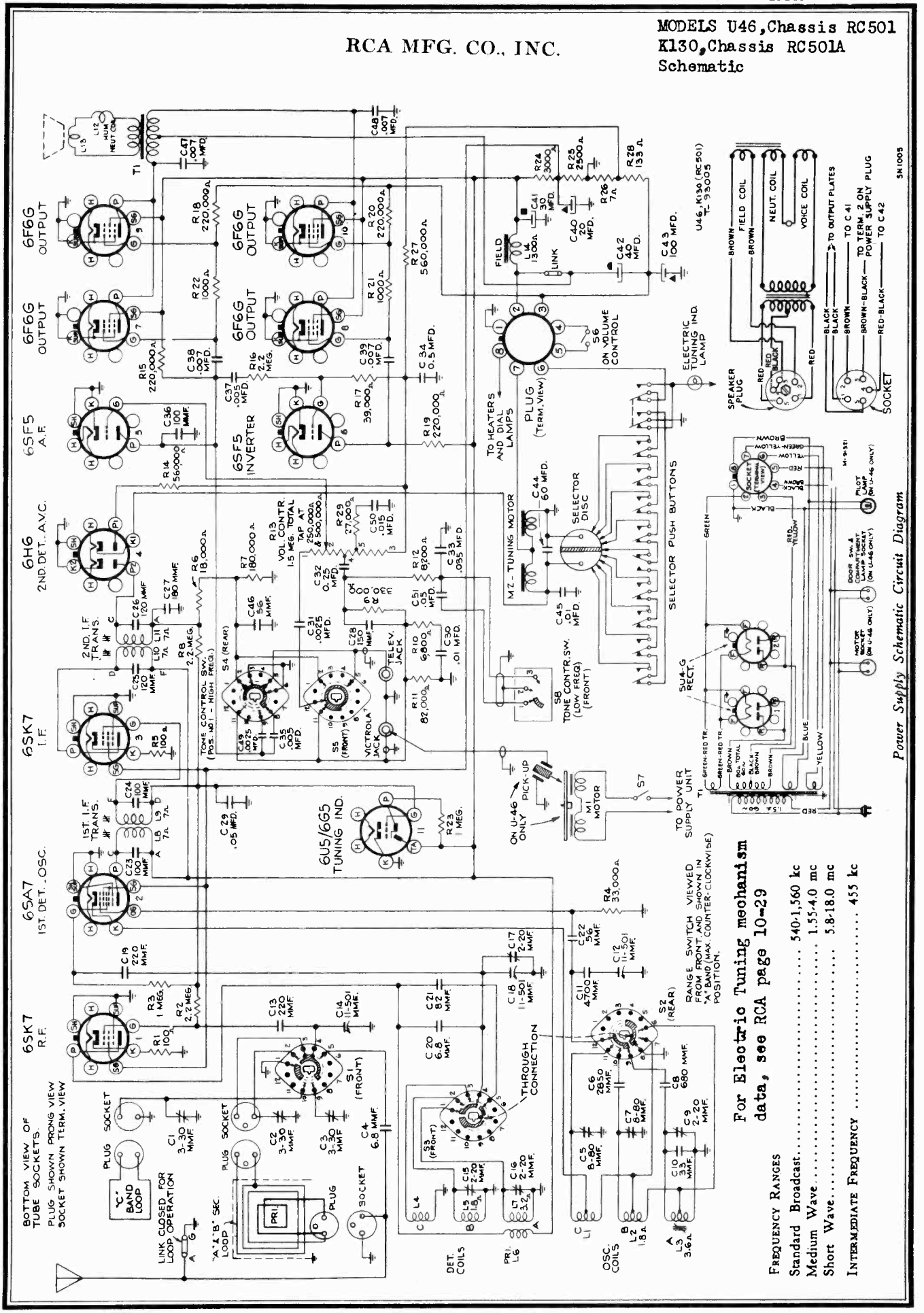
2. The voice coil leads from the output transformer to the speaker must be dressed away from the terminal on the terminal-board to which the above audio coupling capacitor is connected.

3. The output tube bypass condenser must be dressed away from the 12SQ7 tube.

STOCK No.	DESCRIPTION	Unit List Price
35058	Shaft—Tuning condenser drive shaft	.20
34449	Socket—Dial lamp socket	.30
31319	Socket—Tube socket	.25
30585	Spring—Drive cord tension spring	.06
35056	Transformer—Output transformer	1.30
35054	Transformer—1st I.F. transformer	1.75
35055	Transformer—2nd I.F. transformer	1.75
	SPEAKER ASSEMBLIES (39223-2)	
35065	Cone—Cone complete with voice coil	1.20
34174	Transformer—Output transformer	1.25
	SPEAKER ASSEMBLIES (RL 86-2)	
32907	Cap—Dust cap	.02
35066	Cone—Cone complete with voice coil	1.30
34450	Speaker—5-inch dynamic speaker complete with cone and voice coil less output transformer	3.25

RCA MFG. CO., INC.

MODELS U46, Chassis RC501
K130, Chassis RC501A
Schematic



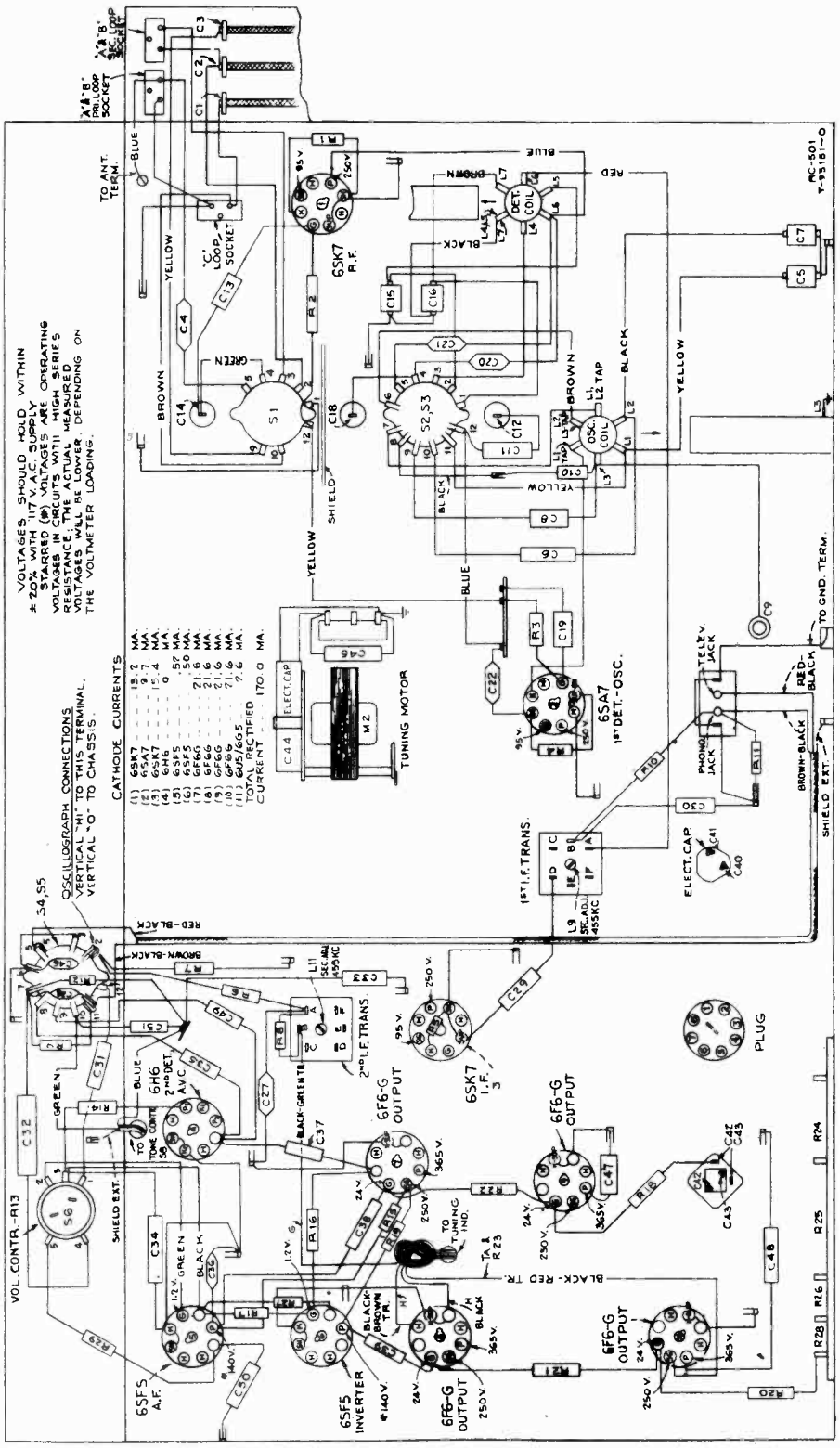
For Electric Tuning mechanism data, see RCA page 10-29

FREQUENCY RANGES

Standard Broadcast	540-1,560 kc
Medium Wave	1.55-4.0 mc
Short Wave	5.8-18.0 mc
INTERMEDIATE FREQUENCY	455 kc

MODELS U46, K130
Chassis Wiring, Voltage

RCA MFG. CO., INC.



R-F Wiring Diagram and Socket Voltages

PILOT LAMPS ..... { Mazda No. 44, 6.3 volts, 0.25 amp. / Mazda No. 47, 6.3 volts, 0.15 amp.

LOUDSPEAKER (RL-76B-5)
Type ..... 12-inch electrodynamic
V.C. Impedance ..... 11.5 ohms at 400 cycles

POWER OUTPUT RATING
Undistorted ..... 20 watts
Maximum ..... 22 watts

PHONOGRAPH (Model U-46 only)
Type ..... Automatic
Record Capacity ..... Eight 10-inch or Seven 12-inch
Turntable Speed ..... 78 r.p.m. (Adjustable)
Type Pickup ..... Crystal
Pickup Impedance ..... 100,000 ohms at 1,000 cycles

POWER SUPPLY RATINGS K-130 (U-46, 50 watts additional)
Rating A ..... 105-125 volts, 50-60 cycles, 200 watts
Rating B ..... 105-125 volts, 25-60 cycles, 200 watts
Rating C ..... 105-130, 140-160, 200-250 volts, 40-60 cycles, 200 watts

MODELS U-46, K-130

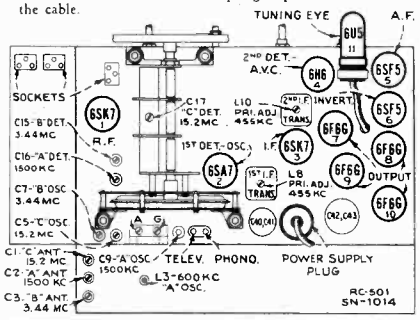
Test-Oscillator.—For all alignment operations, keep the output as low as possible to avoid a-v-c action. For the first eight steps in alignment the low side of the test-oscillator should be connected to the receiver chassis. Following step 8, the signal must be radiated.

Calibration Scale on Indicator-Drive-Cord Drum. — The tuning dial is fastened in the cabinet and cannot be used for reference during the first eight steps of alignment; therefore, a calibration scale is attached to the tuning drum. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 180° mark on the drum scale must be vertical and directly under the center of the shaft of the tuning drum when the plates are fully meshed. The drum is held to the shaft by means of two set-screws, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the chassis, and bend the wire so that it points to the 0° mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 530 kc mark, and gang condenser fully meshed. The indicator has a spring clip for attachment to the cable.



Steps	Connect the high side of the test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	6SK7 I-F grid in series with .01 mfd.	455 kc	"A" band quiet point	L10 and L11 (2nd I-F trans.)
2	6SA7 det. grid in series with .01 mfd.			L8 and L9 (1st I-F trans.)
2A	With input to 6SA7 grid, do not re-adjust 2nd I-F trans. after 1st I-F trans. has been adjusted.			
3	Front section of gang in series with .01 mfd.	15.2 mc	"C" band 15.2 mc (144°)	C5 (osc.)* C17 (det.)** Rock gang
4		3.44 mc	"B" band 3.44 mc (136°)	C7 (osc.)* C15 (det.)**
5		600 kc	"A" band 600 kc (29.5°)	L3 (osc.)
6		1,500 kc	"A" band 1,500 kc (165°)	C9 (osc.) C16 (det.)
7		600 kc	"A" band 600 kc (295°)	L3 (osc.) Rock gang
8		Repeat step 6		
9	Following step 8, a radiated signal must be used for the remainder of the alignment. One or two turns of wire forming a loop approximately 18 inches in diameter connected across the output of a test-oscillator such as RCA Model 153, or Stock No. 9595 (TMV-97C), etc., will be suitable. For the adjustments using the radiated signal, the chassis must be placed in the cabinet and the receiver loops connected.	15.2 mc	"C" band; 15.2 mc	C1 (ant.)
10		6.1 mc	"C" band; 6.1 mc	Inductance of "C" band loop†
11		Repeat step 9		
12		3.44 mc	"B" band; 3.44 mc	C3 (ant.)
13		1,500 kc	"A" band; 1,500 kc	C2 (ant.)
14		600 kc	"A" band; 600 kc	L3 (osc.) Rock gang
15		1,500 kc	"A" band; 1,500 kc	C9 (osc.) C16 (det.)

* Use minimum capacity peak if two can be obtained. Check for selection of correct peak by tuning receiver approximately 910 kc lower where a weaker signal should be received.

** Use maximum capacity peak if two can be obtained.

† Adjust the inductance of "C" band loop by varying the spacing between the leads of the loop. Moving the leads closer together decreases the inductance and tunes the loop to a higher frequency; moving the leads farther apart increases the inductance and tunes the loop to a lower frequency.

Important.—The oscillator tracks above the signal on all bands.

MODEL K-50, 2nd Production

Precautionary Lead Dress:

Before proceeding with alignment dress power cord leads away from 6SQ7 socket and close as possible to end of chassis; dress ground wire to volume control between power leads and audio grid; and dress lead from phono switch to volume control as far away from power leads as possible.

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown on the chassis schematics.

Output Meter Alignment.—If this method is used, connect the output meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator. — For all alignment operations, keep the oscillator output as low as possible to avoid a-v-c action.

Calibration Marks. — The tuning dial is fastened in the cabinet and can not be used for reference during alignment. Therefore calibration marks have been stamped in the plate on the front of the chassis as shown in the accompanying drawing. These marks are used for reference during alignment.

Dial Indicator Adjustment. — With the gang condenser in full mesh, the indicator should point to the extreme left (low frequency) mark on the dial scale.

Steps	Connect test-osc. output to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	I-F grid through 0.1 mfd. capacitor and ground	455 kc	Quiet point between 600-700 kc	L4 and L5 (2nd I-F trans.)
2	1st det. grid through 0.1 mfd. capacitor and ground			L2 and L3 (1st I-F trans.)
3	Radiation loop consisting of two turns of wire 18 inches in diameter located 4 to 6 feet from receiver	1,500 kc	1,500 kc	C2 antenna C5 oscillator*
4		600 kc	Rock at 600 kc	L1 oscillator while rocking
5		1,500 kc	1,500 kc	C2 antenna C5 oscillator*

When making adjustments 3 to 5 inclusive the chassis must be in the cabinet, the loop connected, and all leads in their normal positions. When mounting chassis in cabinet if calibration marks on dial plate do not line up with dial scale mounted on cabinet move pointer to agree with dial scale on cabinet.

* Oscillator should track on high frequency side of signal.

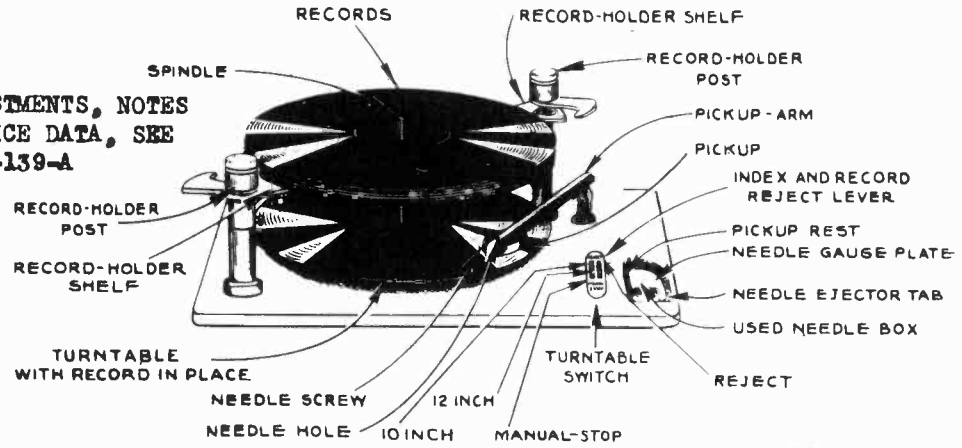
STOCK No.	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES (RC-497)	
33719	Belt—Adjusting belt for push button arms	.05
34724	Board—Antenna-Ground board	.25
33817	Capacitor—Mica trimmer comprising 1 section of 2-20 mmfd. (C2, C5)	.30
12948	Capacitor—33 mmfd. (C26)	.35
30949	Capacitor—56 mmfd. (C6, C7, C10, C11)	.25
12723	Capacitor—56 mmfd. (C23)	.35
12720	Capacitor—100 mmfd. (C12, C24)	.35
12894	Capacitor—220 mmfd. (C14)	.35
12537	Capacitor—560 mmfd. (C3)	.35
30303	Capacitor—.0035 mfd. (C22)	.40
33584	Capacitor—.005 mfd. (C13, C16, C27)	.25
4937	Capacitor—.01 mfd. (C8, C15, C21)	.25
4839	Capacitor—0.1 mfd. (C9)	.30
32240	Capacitor—Electrolytic comprising 2 sections of 10 mfd. and 1 section of 20 mfd.	1.45
33724	Coil—Oscillator coil	.75
33635	Condenser—6 button tuning condenser	5.15
33630	Control—Tone control	1.00
34796	Control—Volume control and power switch	2.00
32634	Cord—Drive cord	.10
33633	Indicator—Station selector indicator	.20
11765	Lamp—Dial lamp	.15
34795	Plate—Dial plate complete less tuner and dial	1.00
5119	Plug—3 contact female plug for speaker cable	.25
31388	Resistor—390 ohms, 1 watt (R8)	.22
33489	Resistor—15,000 ohms, 2½ watt (R2)	.55
13998	Resistor—22,000 ohms, ½ watt (R12)	.20
12738	Resistor—27,000 ohms, ½ watt (R10)	.20
12454	Resistor—33,000 ohms, ½ watt (R1)	.20
12285	Resistor—470,000 ohms, ½ watt (R6, R7)	.20
12486	Resistor—560,000 ohms, ½ watt (R13)	.20
12679	Resistor—2.2 megohms, ½ watt (R11)	.20
11668	Resistor—5.6 megohms, ½ watt (R3)	.20
13601	Resistor—10 megohms, ½ watt (R5)	.20
33735	Screw—Push button adjusting and locking screw	.05
33725	Shaft—Drive shaft	.30
34411	Shaft—Drive shaft	.20
34723	Socket—Antenna loop socket	.15
31364	Socket—Dial lamp socket	.20
14278	Socket—Phonograph input socket and jack	.25
31319	Socket—Tube socket	.25
31418	Spring—Drive cord spring	.05
33720	Spring—Push button arm return spring	.02
33634	Switch—"Radio-Phono" switch	.30
31575	Transformer—Power transformer (100-120 and 200-240) volt 50-60 cycle	8.35
33112	Transformer—Power transformer 105-125 volt, 50-60 cycle	4.30
33618	Transformer—Power transformer 110 volt, 25-60 cycle	6.40
32263	Transformer—1st I.F. transformer	2.30
34719	Transformer—2nd I.F. transformer	1.75
33726	Washer—"C" washer for drive shaft	.02
	SPEAKER ASSEMBLIES (RL-7012)	
31825	Cap—Dust cap	.02
11469	Coil—Neutralizing coil (L6)	.30
33116	Coil—Speaker field coil (L8)	2.10
31275	Cone—Speaker cone and voice coil (L7)	1.75
5118	Plug—3 contact male connector plug	.25
33779	Transformer—Output transformer (T2)	1.50
	MISCELLANEOUS ASSEMBLIES	
33731	Button—Push button	.15
31456	Cover—Protective cover for push button markers	.08
34801	Dial—Glass dial scale	1.50
33637	Escutcheon—Dial and push button escutcheon	.80
30863	Knob—Tuning, tone control, or volume control knob	.15
34800	Loop—Antenna loop	6.00
33973	Marker—Station markers	.45
32641	Plug—3 prong male plug for antenna loop	.10
30900	Spring—Retaining spring for knob Stock 30863 and Button Stock 33731	.05

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

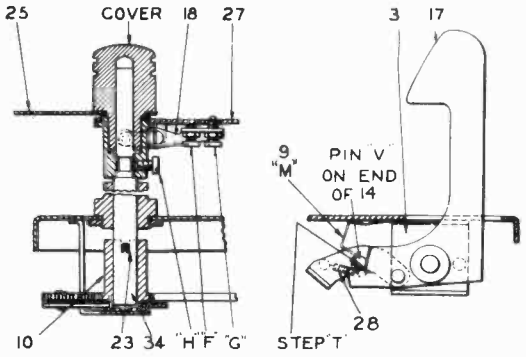
MODELS U46, K130
Record Changer
Assembly

RCA MFG. CO., INC.

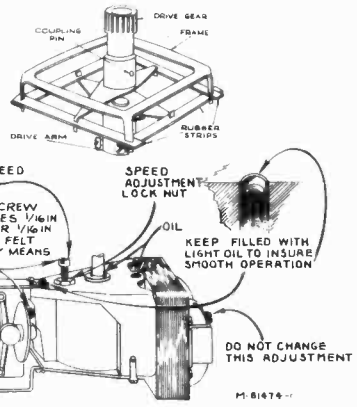
FOR ADJUSTMENTS, NOTES AND SERVICE DATA, SEE MODEL RP-139-A



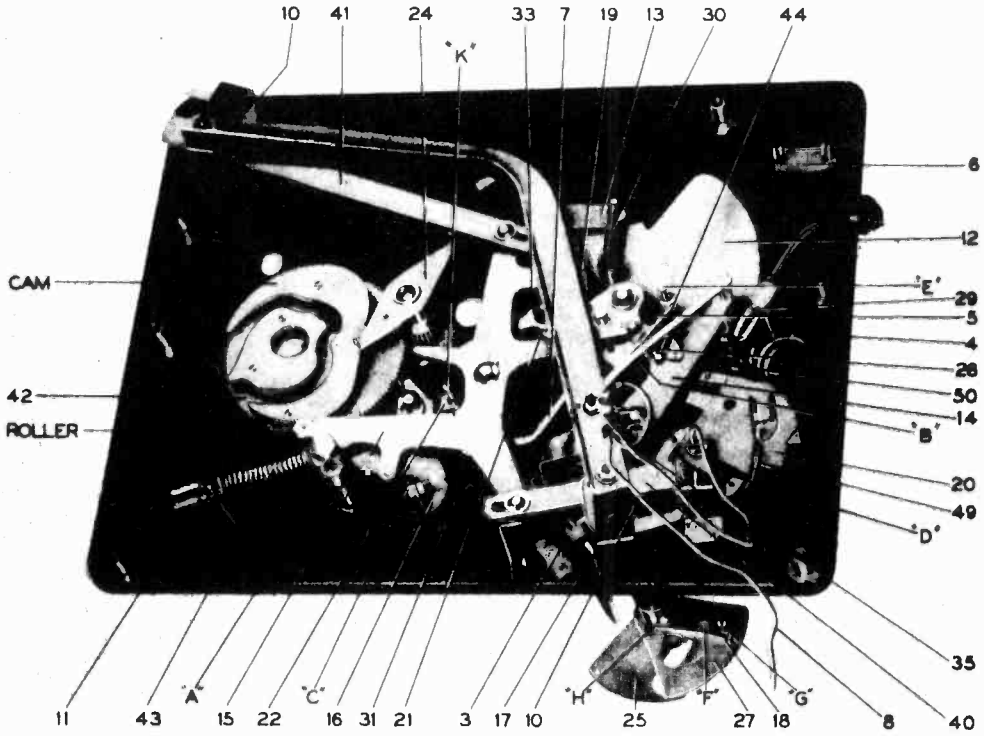
Top View of Automatic Record Changer



Details of Record Shelf Posts and Lever Assemblies



Motor Data and Coupling



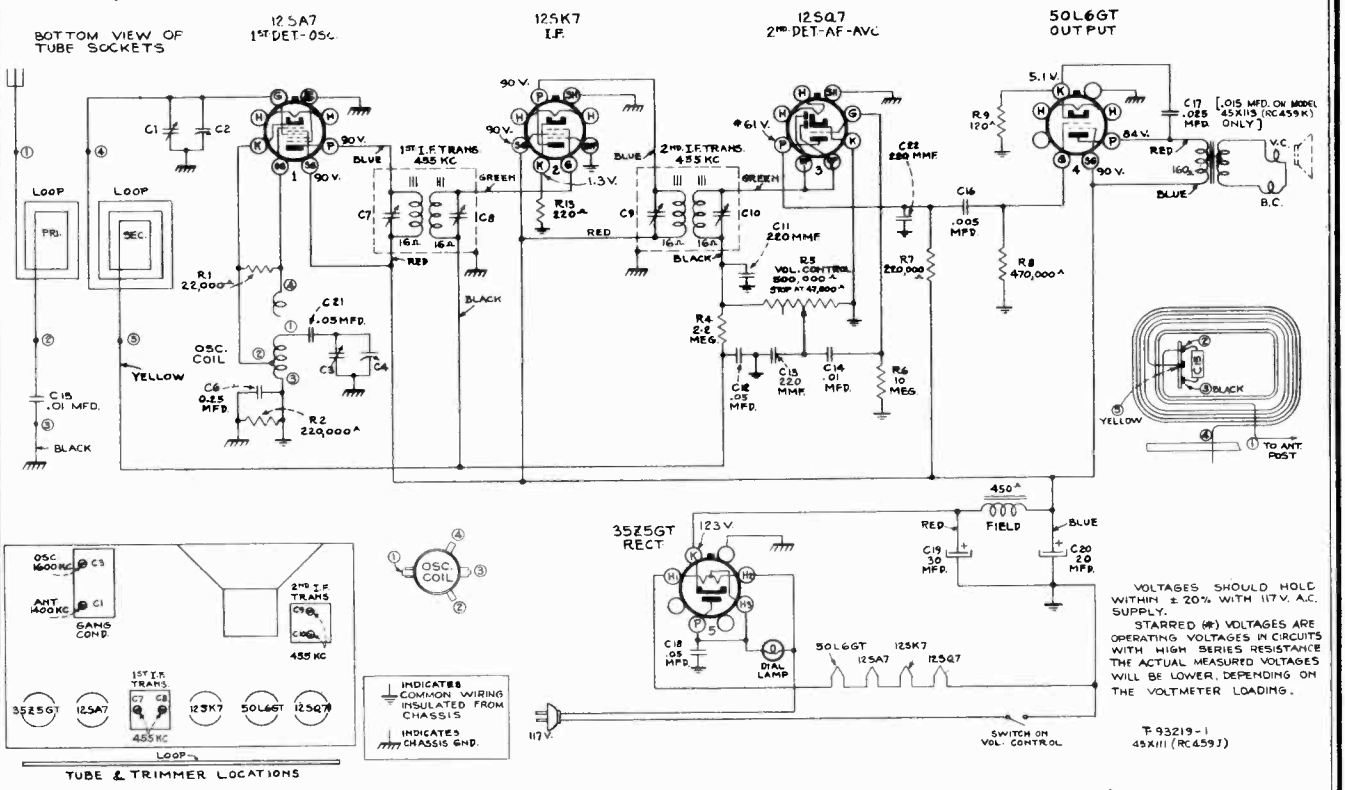
Bottom View of Automatic Record Changer

NOTE: Numbers refer to parts—letters refer to adjustments.

Schematic, Voltage
Alignment, Trimmers
Socket, Lead Dress

RCA MFG. CO., INC.

MODELS 45X111, 45X112
Ch. RC459J, 45X113
Chassis RC459K



—1940 No. 2—

Features of design include: New type single-ended tubes (12SA7, 12SK7, and 12SQ7); clock-type dial; dust-proofed electrodynamic loudspeaker; "Magic Loop"; and Beam Power Output.

First Edition

Electrical and Mechanical Specifications

FREQUENCY RANGE ..... 550-1,600 kc

Intermediate Frequency ..... 455 kc

TUBE COMPLEMENT

(1) RCA-12SA7 ..... 1st-Detector—Oscillator
(2) RCA-12SK7 ..... I-F Amplifier
(3) RCA-12SQ7 ..... 2nd-Detector, 1st A-F, and A.V.C.
(4) RCA-50L6GT ..... Power Output
(5) RCA-35Z5GT ..... Rectifier
Dial Lamp (1) ..... Mazda 51, 7.5 volts, .20 amp.

POWER SUPPLY RATINGS

A-C Rating ..... 105-125 volts, 50-60 cycles, 30 watts
D-C Rating ..... 105-125 volts, direct current, 30 watts

POWER OUTPUT (125 volt, 60 cycle supply)

Undistorted ..... .8 watts
Maximum ..... 1.3 watts

LOUDSPEAKER

Type ..... 5-inch electrodynamic

Model	Weight (shipping)	Description	Cabinet Dimensions (inches)
45X111	8½ lbs.	Mahogany plastic finish	6 19/32 x 9 25/32 x 5¾
45X112	8½ lbs.	Antique-ivory plastic finish	6 19/32 x 9 25/32 x 5¾
45X113	10 lbs.	Walnut finish	8⅛ x 13⅛ x 6 5/16

Alignment Procedure

Output Meter Alignment.—Connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For I-F alignment, connect the low side of the test-oscillator to the receiver chassis through a .01 mfd. capacitor, and keep the output as low as possible.

Pre-Setting Dial.—With gang condenser in full mesh, the pointer should be adjusted so that it is vertical.

Antenna.—The set is equipped with a built-in loop antenna. If an outdoor antenna is used, it may be connected to the "ANT" terminal on rear of cabinet. It should not be longer than 100 feet, including lead-in. If it is longer, connect a 100 to 200 mmf. capacitor in series with the lead-in.

Power-Supply Polarity.—For operation on d-c, the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a-c, reversal of the plug may reduce hum.

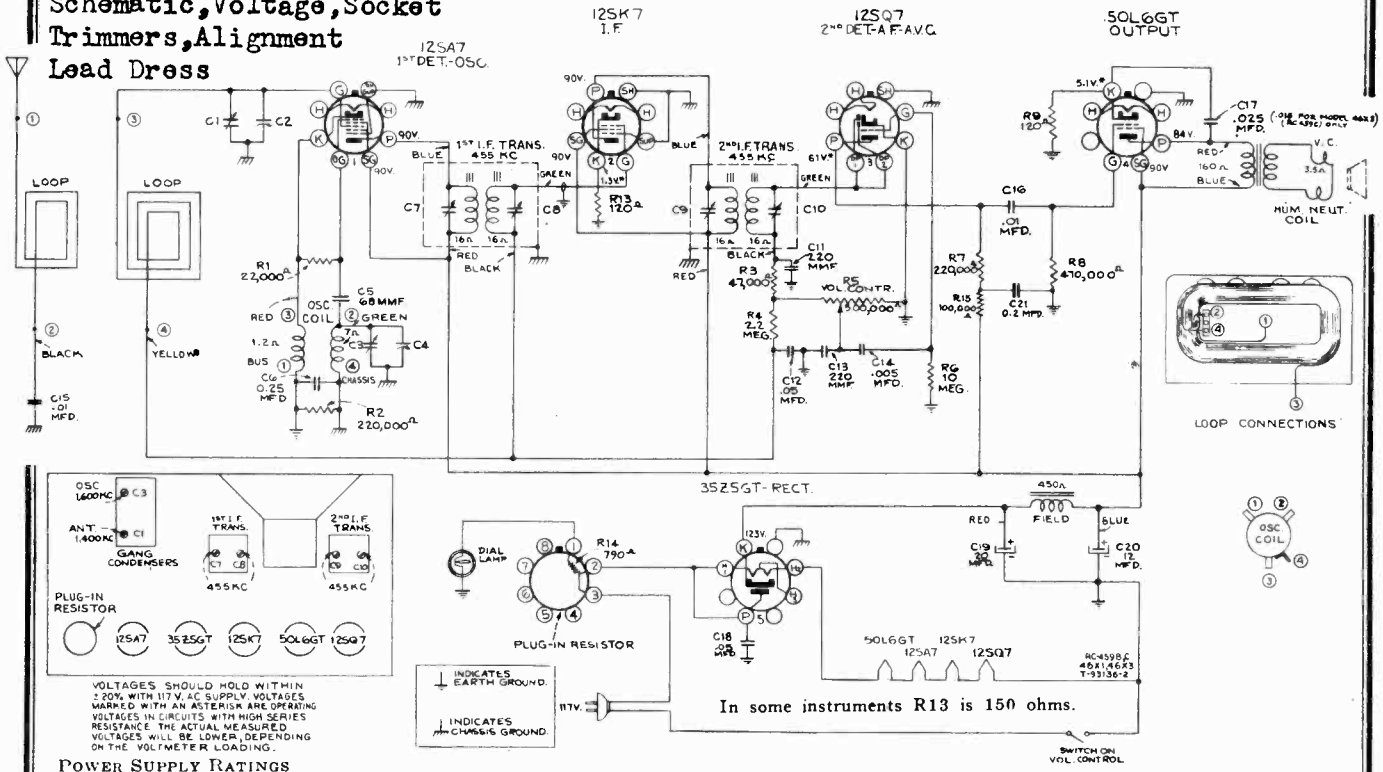
Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	12SK7 I-F grid in series with .01 mfd.	455 kc	Quiet point at 1,600 kc end of dial	C9 and C10 (2nd I-F trans.)
2	Tuning condenser stator (osc.) in series with .01 mfd.			C7 and C8 (1st I-F trans.)
3	Radiation loop consisting of two turns of wire 18 inches in diameter	1,600 kc	Full clockwise (out of mesh)	C3 (oscillator)
4		1,400 kc	Resonance on 1,400 kc signal	C1 (antenna)

Precautionary Lead Dress

1. Dress grid lead of 12SK7 close to chassis under condenser (C12).
2. Dress green and blue leads from i-f transformers close to chassis and away from each other.
3. Dress leads from terminal board on loop support away from loop.

MODELS 46X1, 46X2, Ch. RC459B, 46X3, Chassis RC459C Schematic, Voltage, Socket Trimmers, Alignment Lead Dress

RCA MFG. CO., INC.



VOLTAGES SHOULD HOLD WITHIN ±20% WITH 117 V. AC SUPPLY. VOLTAGES MARKED WITH AN ASTERISK ARE OPERATING VOLTAGES IN CIRCUITS WITH HIGH SERIES RESISTANCE. THE ACTUAL MEASURED VOLTAGES WILL BE LOWER, DEPENDING ON THE VOLTMETER LOADING.

In some instruments R13 is 150 ohms.

Power Supply Ratings

A-C Rating ..... 105-125 volts, 50-60 cycles, 50 watts
D-C Rating ..... 105-125 volts, direct current, 50 watts

Power Output (125 volt, 60 cycle supply)

Undistorted ..... .6 watts
Maximum ..... 2.0 watts

Pre-Setting Dial.—With gang condenser in full mesh, the pointer should be adjusted so that it is vertical.

Antenna.—The set is equipped with a built-in loop antenna. If an outdoor antenna is used, it may be connected to the "ANT" terminal on rear of cabinet. It should not be longer than 100 feet, including lead-in. If it is longer, connect a 100 to 200 mmf. capacitor in series with the lead-in.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	12SK7 I-F grid in series with .01 mfd.	455 kc	Quiet point at 1,600 kc end of dial	C9 and C10 (2nd I-F trans.)
2	Tuning condenser stator (osc.) in series with .01 mfd.			C7 and C8 (1st I-F trans.)
3	Radiation loop consisting of two turns of wire 18 inches in diameter	1,600 kc	Full clockwise (out of mesh)	C3 (oscillator)
4		1,400 kc	Resonance on 1,400 kc signal	C1 (antenna)

Precautionary Lead Dress

1. Dress grid lead of 12SK7 close to chassis under condenser (C12).
2. Dress green and blue leads from i-f transformers close to chassis and away from each other.
3. Dress leads from terminal board on loop support away from loop.

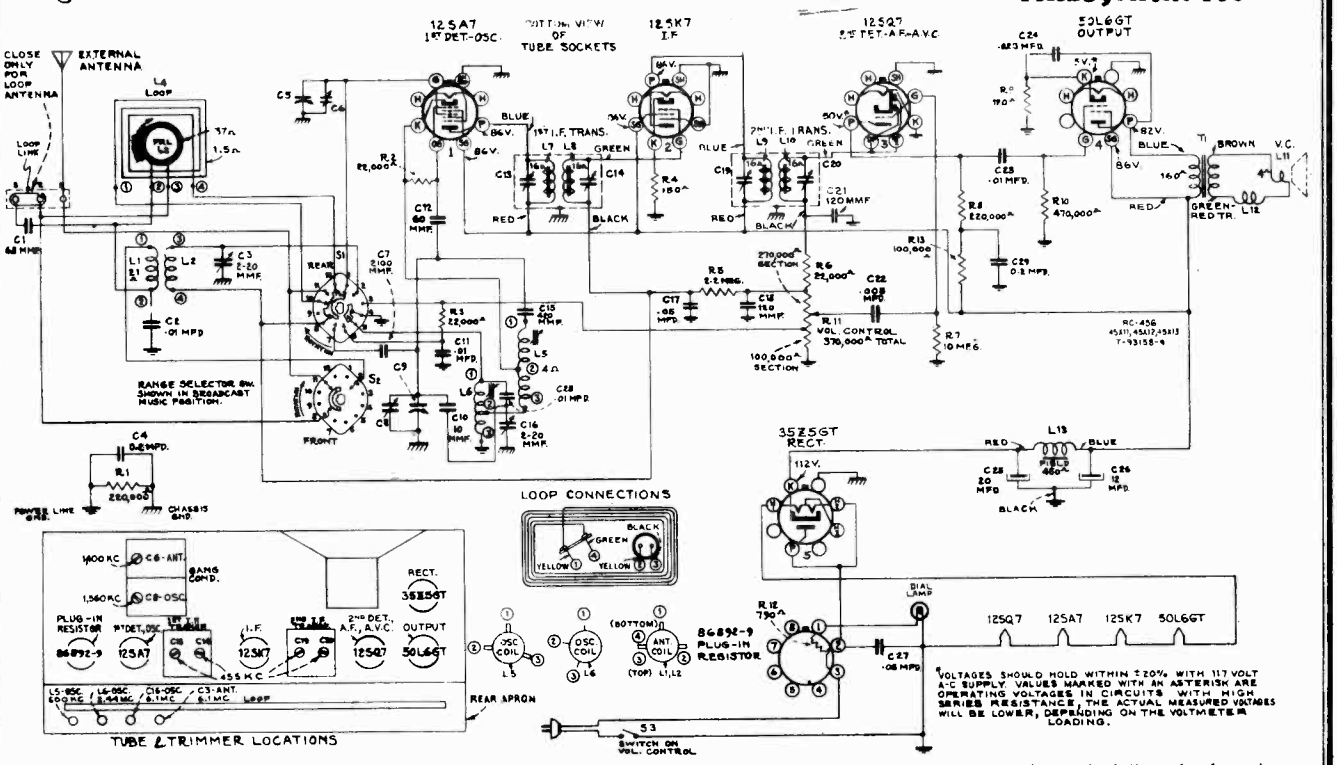
STOCK No.	DESCRIPTION	Unit List Price
	SPEAKER ASSEMBLIES (39223-2)	
35065	Cone—Cone complete with voice coil	1.20
34174	Transformer—Output transformer	1.25
	SPEAKER ASSEMBLIES (RL 86-5)	
32907	Cap—Dust cap	.02
35066	Cone—Cone complete with voice coil	1.30
34450	Speaker 5" dynamic speaker complete with cone and voice coil less output transformer	3.25
	CHASSIS ASSEMBLIES (RC-459B and RC-459C)	
35000	Ballast—Ballast tube resistor	.80
13057	Capacitor—68 mmfd. (C5)	.35
12694	Capacitor—220 mmfd. (C11, C13)	.35
33584	Capacitor—.005 mfd. (C14)	.25
4937	Capacitor—.01 mfd. (C15, C16)	.25
11315	Capacitor—.015 mfd. (C17)	.20
30938	Capacitor—.025 mfd. (C17)	.20
32787	Capacitor—.05 mfd. (C12, C18)	.20
34505	Capacitor—.2 mfd. (C21)	.30
12484	Capacitor—0.25 mfd. (C6)	.30
35064	Capacitor—Electrolytic comprising 1 section of 20 mfd. and 1 section of 12 mfd	.75
34443	Coil—Oscillator coil	.60
35053	Condenser—Variable tuning condenser *less drive drum*	2.00
35057	Control—Volume control and power switch	1.50
32634	Cord—Tuning condenser drive cord	.10
35063	Drum—Tuning condenser drive drum	.30
35062	Indicator—Station selector indicator	.20

STOCK No.	DESCRIPTION	Unit List Price
31480	Lamp—Dial lamp	.20
35061	Loop—Antenna loop complete	1.95
12071	Resistor—120 ohms, ½ watt (R13)	.20
32535	Resistor—120 ohms, ½ watt (R9)	.20
13998	Resistor—22,000 ohms, ½ watt (R1)	.20
12412	Resistor—47,000 ohms, ½ watt (R3)	.20
11281	Resistor—100,000 ohms, 1/10 watt (R15)	.15
12264	Resistor—220,000 ohms, ½ watt (R2)	.20
12285	Resistor—470,000 ohms, ½ watt (R8)	.20
12679	Resistor—2.2 megohms, ½ watt (R4)	.20
13601	Resistor—10 megohms, ½ watt (R6)	.20
35000	Resistor—Ballast tube resistor	.80
35060	Scale—Dial scale	.65
35058	Shaft—Tuning condenser drive shaft	.20
34449	Socket—Dial lamp socket	.30
31319	Socket—Tube socket	.25
30585	Spring—Drive cord tension spring	.06
35056	Transformer—Output transformer	1.30
35054	Transformer—1st I.F. transformer	1.75
35055	Transformer—2nd I.F. transformer	1.75
35000	Tube—Ballast tube resistor	.80

Schematic, Voltage
Socket, Trimmers
Alignment

RCA MFG. CO., INC.

MODELS 46X11, 46X12
Chassis RC-456
46X13, Ch. RC456A



Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	12SK7 grid in series with .01 mfd.	455 kc	"Standard Broadcast" band quiet point with gang nearly open	L9 and L10 (2nd I-F Trans.)
2	12SA7 grid in series with .01 mfd.			L7 and L8 (1st I-F Trans.)
3	Ant. terminal 1 in series with 200 mmfd. Link closed	600 kc	600 kc "Standard Broadcast" band	L5 (osc.)
4		1,560 kc	Pointer at second from bottom mark at extreme right edge of dial plate* "Standard Broadcast" band	C8 (osc.)
5		1,400 kc	Resonance on 1,400 kc signal "Standard Broadcast" band	C6 (ant.)
6		600 kc	Resonance on 600 kc signal "Standard Broadcast" band	L5 (osc.) Rock gang
7	Repeat steps 4, 5, and 6			
8	Ant. terminal 1 in series with 200 mmfd. Link closed	6.1 mc	Pointer on dot at extreme right edge of dial* "Short Wave" band	C16 (osc.)** C3 (ant.) Rock gang
9		2.44 mc	Resonance on 2.44 mc signal "Short Wave" band	L6 (osc.) Rock gang
10	Repeat steps 8 and 9			

*These calibration marks are concealed when chassis is in cabinet.
**Use minimum capacity peak if two can be obtained. Check for selection of correct peak by tuning receiver to approximately 5.19 mc where a weaker signal should be received.

Pre-Setting Pointer.—With gang condenser in full mesh, the pointer should be adjusted to a horizontal position.

Antenna.—The set is equipped with a built-in loop antenna. If the loop antenna is used, the antenna terminal board link should be closed. This link should be open when an external antenna is used. Connect the external antenna to terminal 1. If an antenna longer than 100 feet (including lead-in) is used, connect a 100 to 200 mmf. capacitor in series with the lead-in.

Loudspeaker

Type ..... 5-inch electrodynamic
V.C. Impedance ..... 4 ohms at 400 cycles

Power Supply Ratings

A-C Rating ..... 105-125 volts, 50-60 cycles, 50 watts
D-C Rating ..... 105-125 volts, direct current, 50 watts

Power Output Rating

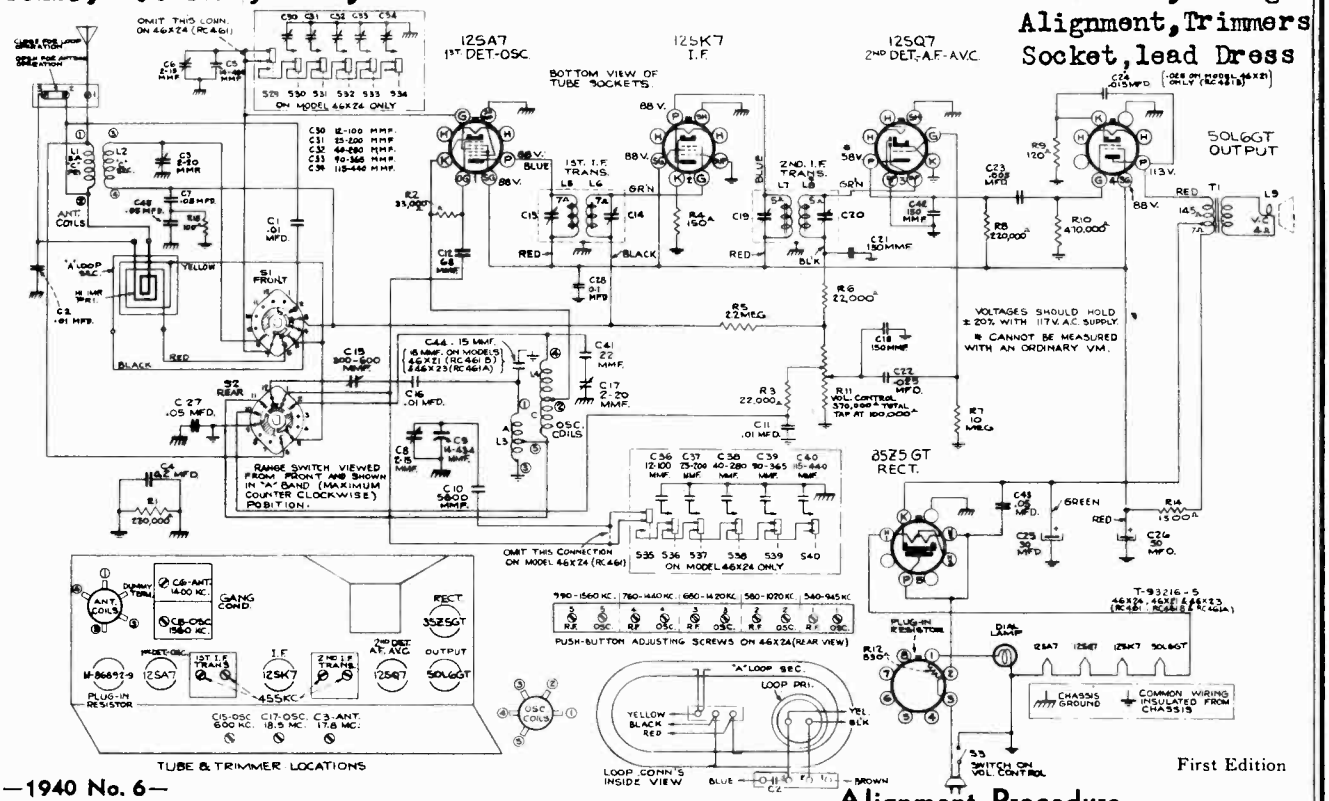
Undistorted ..... 1 watt
Maximum ..... 2 watts

32830	Capacitor—Mica trimmer comprising 2 sections of 2-20 mmfd. (C3, C16)	.40
13200	Capacitor—10 mmfd. (C10)	.35
12724	Capacitor—120 mmfd. (C18, C21)	.35
31870	Capacitor—415 mmfd. (C15)	.30
35099	Capacitor—2,100 mmfd. (C7)	.45
33584	Capacitor—.005 mfd. (C22)	.25
4937	Capacitor—.01 mfd. (C2, C11, C23, C28)	.25
4870	Capacitor—.025 mfd. (C24)	.20
32787	Capacitor—.05 mfd. (C17, C27)	.20
34505	Capacitor—0.2 mfd. (C4, C29)	.30
32576	Capacitor—Electrolytic, comprising 1 section of 20 mfd., and 1 section of 12 mfd. (C25, C26)	.90
31296	Coil—"A" band oscillator coil (L5)	1.05
35090	Coil—Antenna coil—"B" band (L1, L2)	.80
35096	Coil—Loop loading coil (L3)	.50
35251	Coil—Oscillator coil—"B" band (L6)	.70
35082	Condenser—Variable tuning condenser—less drum	2.10
35086	Control—Volume control and power switch	2.00
32634	Cord—Drive cord	.10
35093	Dial—Dial scale	.50
35083	Drum—Tuning condenser drive drum	.35
35091	Indicator—Station selector indicator	.25
31480	Lamp—Dial lamp	.20
35095	Loop—Antenna loop complete	2.50
35092	Plate—Dial plate—less dial scale	.30
35000	Resistor—Ballast tube resistor	.80
30936	Resistor—120 ohms, 1 watt (R9)	.22
13428	Resistor—150 ohms, ½ watt (R4)	.20
13998	Resistor—22,000 ohms, ½ watt (R2, R3, R6)	.20
14560	Resistor—100,000 ohms, ½ watt (R13)	.20
12264	Resistor—220,000 ohms, ½ watt (R1, R8)	.20
12285	Resistor—470,000 ohms, ½ watt (R10)	.20
12679	Resistor—2.2 meg., ½ watt (R5)	.20
13601	Resistor—10 meg., ½ watt (R7)	.20

MODELS 46X21,Ch.RC461A
46X23,Ch.RC461B,46X24,

RCA MFG. CO., INC.

Chassis RC461
Schematic,Voltage
Alignment,Trimmers
Socket,lead Dress



First Edition

—1940 No. 6—

Specifications

Frequency Ranges 550-1,550 kc and 6-18 mc

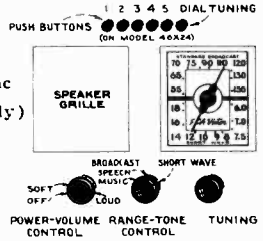
PUSH BUTTON RANGES (Model 46X24 only)

(1) Approximately 540- 945 kc
(2) Approximately 580-1,020 kc
(3) Approximately 650-1,320 kc
(4) Approximately 760-1,440 kc
(5) Approximately 990-1,560 kc

Intermediate Frequency . . . . 455 kc

POWER OUTPUT RATING

Undistorted . . . . . 1.1 watts
Maximum . . . . . 1.4 watts



Dial and Controls

LOUDSPEAKER (RL81A1)

Type . . . . . 5-inch permanent magnet dynamic
Voice Coil Impedance at 400 Cycles . . . . . 4.5 ohms

POWER SUPPLY RATINGS

A-C Rating . . . . . 105-125 volts, 50-60 cycles, 50 watts
D-C Rating . . . . . 105-125 volts, direct current, 50 watts

Adjustments for Electric Tuning:

The push buttons and corresponding frequency ranges are given in the schematic diagram. Allow the set to warm up for about 15 minutes and proceed as follows:

(1) List five desired stations in order of the push button ranges.

(2) Push in the dial tuning (right hand) button and manually tune in the first station on the list.

(3) Press button No. 1. Turn R-F screw half way in; next turn the oscillator screw entirely in and then gradually back out until the station is heard.

(4) Adjust the R-F trimmer for maximum output. (Clockwise adjustment of oscillator and R-F trimmers tunes the circuits to lower frequencies.)

(5) By turning the set to a position in which reception is weak a final more accurate adjustment may be made.

(6) Adjust for each of the remaining stations in a similar manner and place corresponding station tabs in recesses above buttons. A "Dial Tuning" tab should be above button No. 6.

Precautionary Lead Dress:

(1) Dress all leads away from oscillator and antenna coils.
(2) Dress cathode resistor (R4) and B+ lead across 12SK7 socket between plate and grid terminals.
(3) (46X24 only) Dress leads to push button switch straight up and parallel so that they do not touch each other.
(4) Dress black lead from 1st I-F transformer over green lead.
(5) Keep plate-cathode bypass (C43) of rectifier tube away from volume control.

Alignment Procedure

Output Meter Alignment.—Connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—Connect the low side of the test-oscillator to the receiver chassis through a .01 mfd. capacitor, and keep the output as low as possible.

Pre-Setting Pointer.—With gang condenser in full mesh, the pointer should be adjusted to a horizontal position.

Antenna.—The set is equipped with a built-in loop antenna. If the loop antenna is used, the antenna terminal board link should be closed. This link should be open when an external antenna is used. Connect the external antenna to terminal 1. If an antenna longer than 100 feet (including lead-in) is used, connect a 100 to 200 mmf. capacitor in series with the lead-in.

Power-Supply Polarity.—For operation on d-c, the power plug must be inserted in the outlet for correct polarity. If the set does not operate, reverse the plug. On a-c, reversal of the plug may reduce hum.

Step	Connect high side of test oscillator to—	Tune test oscillator to—	Turn radio dial to—	Adjust following for max. output—
1	Grid 12SK7 in series with 0.01 mfd.	455 kc	"A" Band Quiet Point at 1,550 kc end of dial	C19 and C20 (2nd I-F Trans.)
2	Grid 12SA7 in series with 0.01 mfd.			C13 and C14 (1st I-F Trans.)
3	Antenna in series with 200 mmfd.	600 kc	"A" Band 600 kc	C15 (osc.)
4		1,560 kc	"A" Band Full Clockwise	C8 (osc.)
5		1,400 kc	Resonance on 1,400 kc "A" Band	C6 (ant.)
6	Repeat steps 3 (rock in), 4 and 5			
7	Antenna in series with 300 ohms	18.5 kc	"C" Band Full Clockwise	C17 (osc.)*
8		17.8 kc	"C" Band Resonance on 17.8 kc Signal	C3 (ant.)
9	Repeat steps 7 and 8			

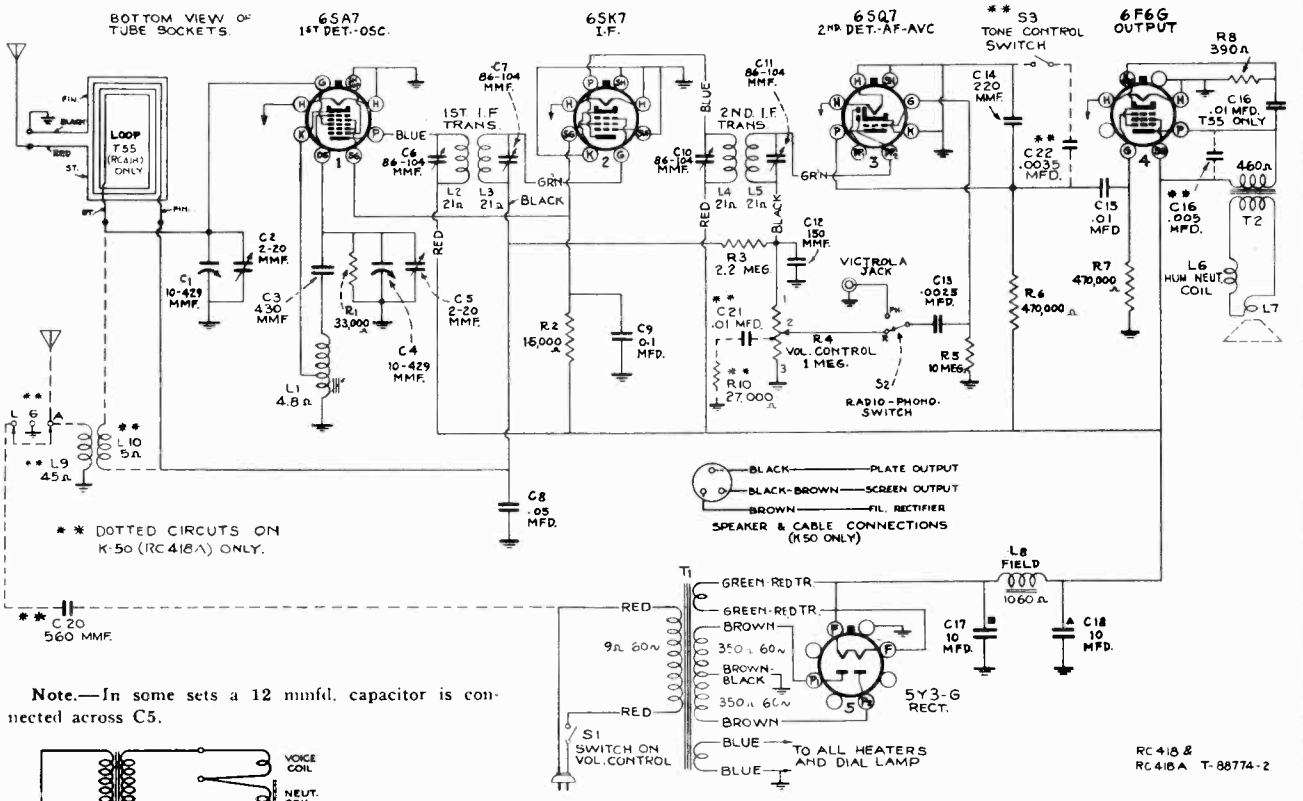
* Use minimum capacity peak if two can be obtained.

Note: Oscillator tracks above signal on all bands.

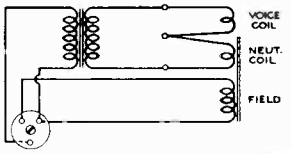
RCA MFG. CO., INC.

MODELS K50, Ch. RC418A
T55, T56, Ch. RC418
Schematic, Voltage
Chassis Wiring

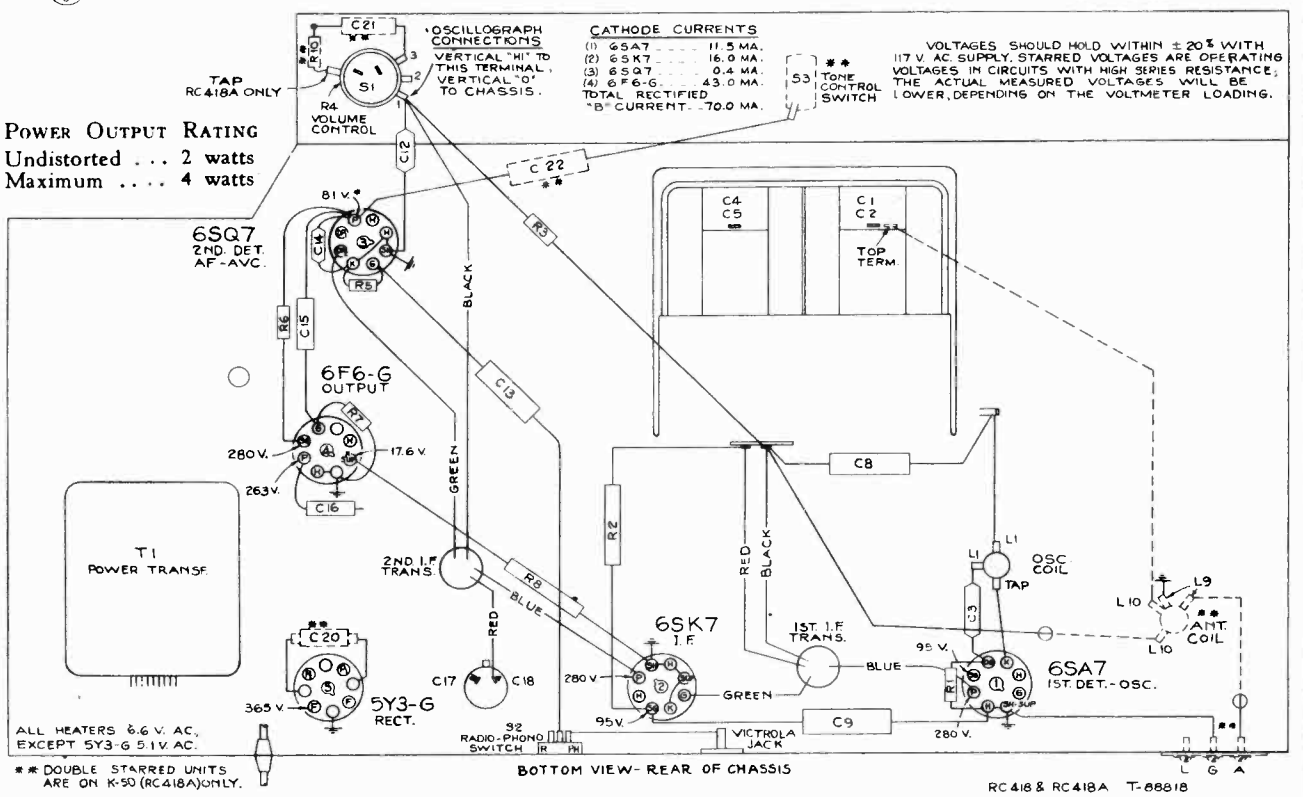
FOR TUNER DATA SEE PAGE 11-41



Note.—In some sets a 12 mmfd. capacitor is connected across C5.



LOUDSPEAKER	T55	K50
Type	5 inch electrodynamic	12 inch electrodynamic
V. C. impedance at 400 cycles	3.4 ohms	2.2 ohms



R-F Wiring Diagram and Socket Voltages

STOCK No.	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES	
	Model T-55 (RC-418) Model K-50 (RC-418A)	
33719	Belt—Tuning unit push arm belt	.05
33718	Board—Antenna-Ground terminal board	.20
12725	Capacitor—150 mmfd. (C12)	.35
12694	Capacitor—220 mmfd. (C14)	.35
32599	Capacitor—430 mmfd. (C3)	.35
12537	Capacitor—560 mmfd. (C20) Model K50	.35
5107	Capacitor—.0025 mfd. (C13)	.20
30303	Capacitor—.0035 mfd. (C22) Model K50	.40
33584	Capacitor—.005 mfd. (C16) Model K50	.25
4937	Capacitor—.01 mfd. (C15, C16, C21) (C16 in Model T55 only) (C21 in Model K50 only)	.25
32787	Capacitor—.05 mfd. (C8)	.20
4839	Capacitor—0.1 mfd. (C9)	.30
33775	Coil—Antenna coil (L9, L10) Model K50	.90
33724	Coil—Oscillator coil (L1)	.75
32342	Condenser—Electrolytic, 2 sections 10 mfd. each (C17, C18)	1.20
33630	Control—Tone control (S3) Model K50	1.00
32634	Cord—Drive cord	.10
33633	Indicator—Dial scale pointer	.20
11765	Lamp—Dial lamp	.15
33431	Link—Antenna terminal board link	.02
33721	Loop—Antenna loop Model T55	1.00
33727	Plate—Dial plate assembly	.90
31388	Resistor—390 ohms, 1 watt (R8)	.22
33489	Resistor—15,000 ohms, 2½ watts (R2)	.55
12738	Resistor—27,000 ohms, ½ watt (R10) Model K50	.20
12454	Resistor—33,000 ohms, ½ watt (R1)	.20
12285	Resistor—470,000 ohms, ½ watt (R6, R7)	.20
12679	Resistor—2.2 meg., ½ watt (R3)	.20
13601	Resistor—10 meg., ½ watt (R5)	.20
33725	Shaft—Tuning knob shaft	.30
31364	Socket—Dial lamp socket	.20
14278	Socket—Phono-input socket	.25
5119	Socket—3 contact female for speaker cable—Model K50	.25
31319	Socket—Tube socket	.25
31418	Spring—Drive cord spring	.05
33720	Spring—Push arm return spring	.02
33634	Switch—Radio-Phono switch (S2)	.30
33722	Transformer—First i-f transformer (L2, L3, C6, C7)	1.60
33723	Transformer—Second i-f transformer (L4, L5, C10, C11)	1.60
31575	Transformer—Power transformer 110-220 volts, 60 cycle (T1)	8.35
33619	Transformer—Power transformer 105-120 volts, 25-60 cycle (T1)	7.75
33112	Transformer—Power transformer 105-120 volts, 50-60 cycle (T1)	4.30
33631	Volume control and power switch (R4, S1) Model T55	1.50
33776	Volume control and power switch (R4, S1) Model K50	2.00
33726	Washer—"C" washer for tuning shaft	.02
	SPEAKER ASSEMBLIES (Model T55) (RL-78-6)	
32907	Cap—Cone center dust cap	.02
32906	Coil—Hum neutralizing coil (L6)	.25
33601	Coil—Speaker field coil (L8)	1.25
32904	Cone—Speaker cone and voice coil (L7)	1.20
32905	Transformer—Output transformer (T2)	1.35
	SPEAKER ASSEMBLIES (Model K50) (RL-70J-2)	
31825	Cap—Cone center dust cap	.05
11469	Coil—Hum neutralizing coil (L6)	.30
33116	Coil—Speaker field coil (L8)	2.10
31275	Cone—Speaker cone and voice coil (L7)	1.75
5118	Plug—3 contact male for speaker	.25
33779	Transformer—Output transformer (T2)	

Calibration Marks.—The tuning dial is fastened in the cabinet and can not be used for reference during alignment. Therefore calibration marks have been stamped in the plate on the front of the chassis as shown in the accompanying drawing. These marks are used for reference during alignment.

Dial Indicator Adjustment.—With the gang condenser in full mesh, the indicator should point to the extreme left (low frequency) mark on the dial scale.

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

Steps	Connect the high side of the test-osc. to—	Tune test osc. to—	Turn radio dial to	Adjust the following for maximum peak output
1	Antenna terminal	455 kc	Quiet Point between 1,720-1,500 kc	C10 and C11 (2nd I-F trans.)
2	Antenna terminal			C6 and C7 (1st I-F trans.)
3	Ant. terminal in series with 200 mmfd.	1,500 kc	1,500 kc calibration mark	C5 (osc.) C2 (ant.)
4		600 kc	600 kc calibration mark	L1 (osc.) (Rock in)
5	Repeat step 3			

Note.—Oscillator tracks above signal.

To center the loudspeaker voice coil, first remove the front dust cover then loosen the spider screws, insert three narrow feelers in the gap, and tighten the spider screws. Remove the feelers and fasten a dust cover in place with loudspeaker cement.

Precautionary Lead Dress.—

1. Power cord leads must be dressed up away from 6SQ7 socket, and toward end of chassis.

2. Green lead 2nd I.F. to 6SQ7 must be dressed against base.

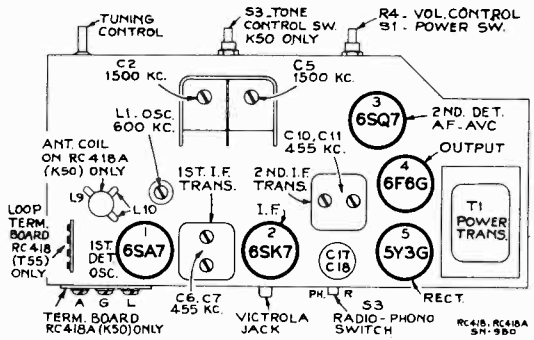
3. Blue lead 2nd I.F. to 6SK7 must be dressed close to base.

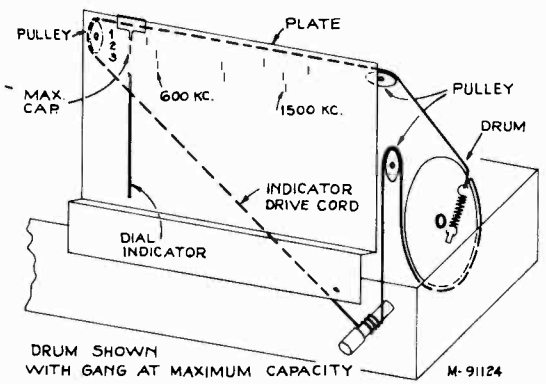
4. Green and blue leads from 1st I.F. transformer must be dressed close to base.

5. Capacitor from volume control center tap to 6SQ7 socket must be dressed so that its body is between AC terminal on control and opening in chassis for gang condenser.

6. Red lead from "L" terminal on antenna board to 5Y3G socket must be dressed against base.

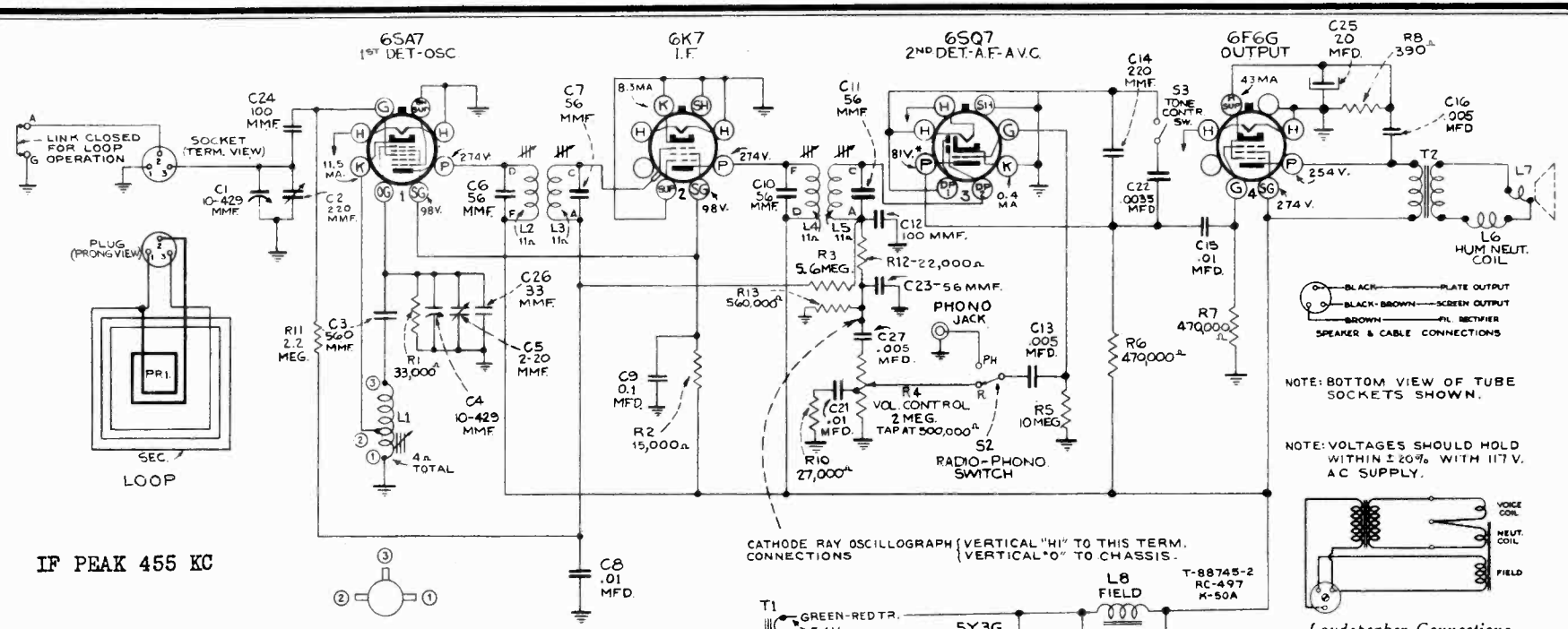
7. Green lead from gang to 6SA7 socket must be dressed toward side apron away from other parts.

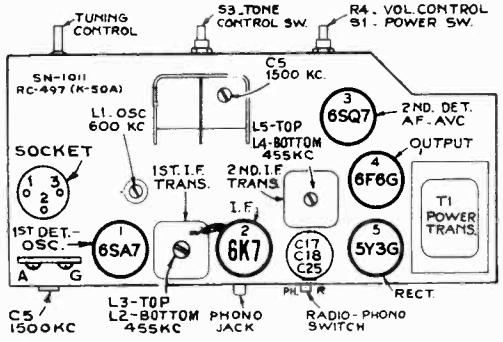




Dial-Indicator and Drive Mechanism

Refer to "Alignment Procedure" for explanation of the "calibration marks" shown in this drawing





Centering Loudspeaker Cone

To center the loudspeaker voice coil, first remove the front dust cover, then loosen the spider screws, insert three narrow feelers in the gap, and tighten the spider screws. Remove the feelers and fasten a dust cover in place with loudspeaker cement

FOR TUNER DATA SEE PAGE 11-41

POWER OUTPUT RATING

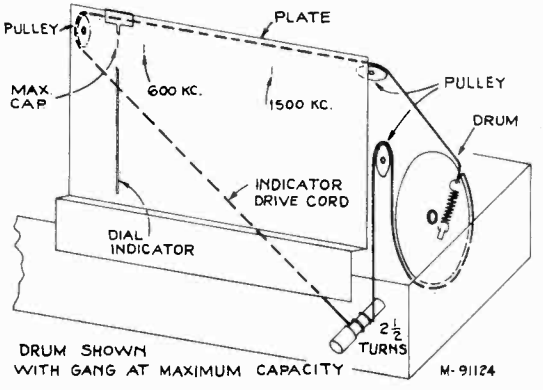
Undistorted	2 watts
Maximum	4 watts

POWER SUPPLY RATINGS

Rating A	105-125 volts, 50-60 cycles, 75 watts
Rating B	105-125 volts, 25-60 cycles, 75 watts
Rating C	105-125, 200-250 volts, 50-60 cycles, 75 watts

LOUDSPEAKER

Type	12-inch electrodynamic
V. C. impedance at 400 cycles	2.2 ohms

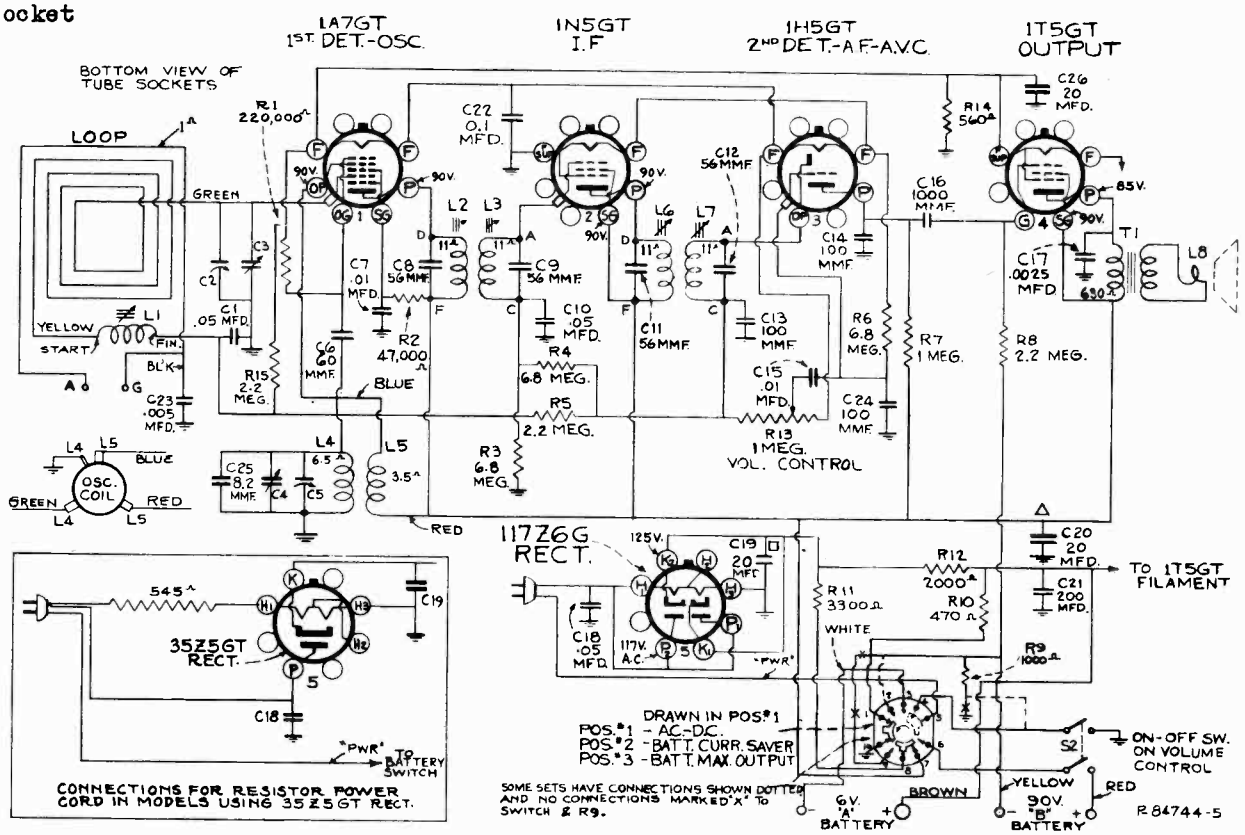


Dial Indicator and Drive Mechanism

Refer to "Alignment Procedure" for explanation of the "calibration marks" shown in this drawing

MODELS BP55, BP56, BP85
Chassis RC-455
Schematic, Voltage
Alignment, Trimmers
Socket

RCA MFG. CO., INC.



Schematic Circuit Diagram

Measurements are made to chassis unless otherwise indicated, with set tuned to quiet point. Values should hold within approximately 20% with rated battery voltage.

LINE CURRENT SUPPLY
110 to 125 volts, AC 50 or 60 cycles, or DC

BATTERIES REQUIRED
"A" one 6 volt dry plug-in type (Eveready No. 747 or equivalent)
"B" two 45 volt dry plug-in type. (Eveready No. 482 or equivalent)

Frequency Range	540-1,600 kc
Intermediate Frequency	455 kc

CURRENT CONSUMPTION
"A," 0.05 ampere—"B," 10.5 milliamperes full power; 6.0 milliamperes save power.

POWER OUTPUT

Undistorted	0.125 watt
Maximum	0.17 watt

LOUDSPEAKER

Type	5-inch permanent-magnet dynamic
Voice-coil Impedance	4.5 ohms at 400 cycles

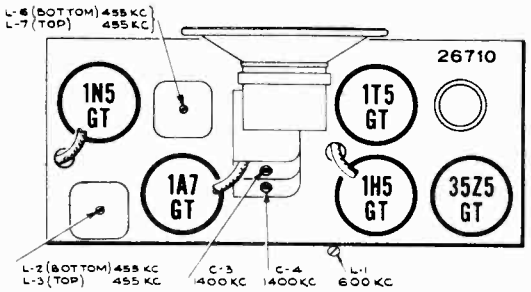
Alignment Procedure

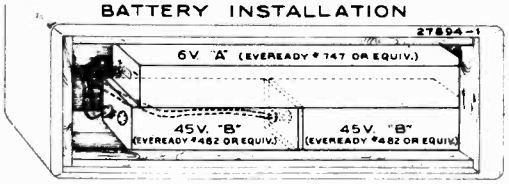
Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-oscillator.—For all alignment operations, keep the output as low as possible to avoid a-v-c action.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	1A7GT 1st-Det. grid cap, in series with .01 mfd.	455 kc	Quiet point at 1,600 kc end of dial	L2, L3, L6, L7 (1st and 2nd I-F transformers)
2		1,600 kc	1,600 kc	C4 osc.
3	radiated signal near 600 kc		signal frequency	L1
4	radiated signal near 1,400 kc		signal frequency	C3
5	radiated signal near 600 kc		signal frequency	L1

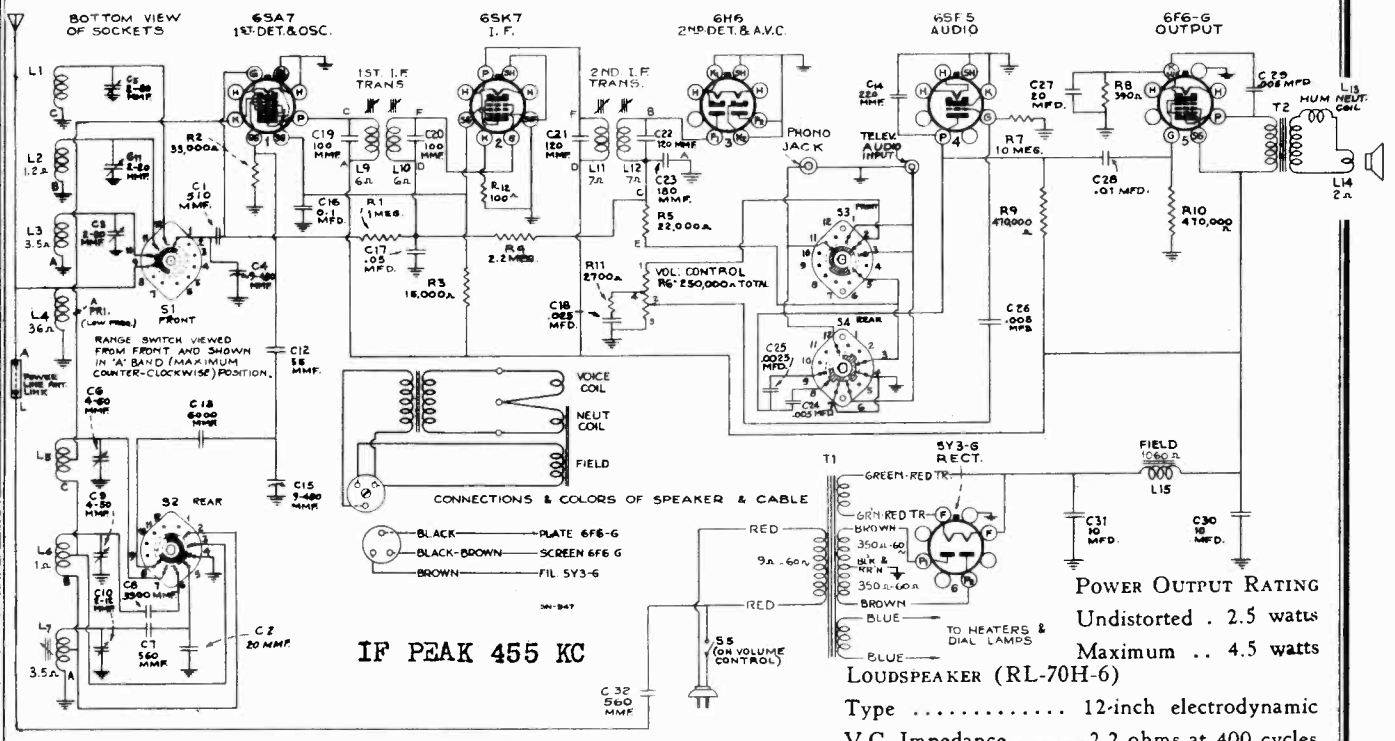
For steps 3, 4, and 5 the chassis must be in the cabinet and the batteries in place and connected. L-1 is then reached through the small hole in the cabinet which is normally covered with a small plug located farthest away from C-3 and C-3 is reached through an eyelet in the speaker-grille. If a broadcast signal is used it should be weak to avoid a-v-c action. Turning loop to minimum pickup position will sometimes be helpful. If no broadcast signal is available connect test oscillator output to a suitable radiation loop located several feet away from receiver.





RCA MFG. CO., INC.

MODEL K60, Chassis RC415
Schematic, Voltage
Chassis Wiring, Changes



Power Output Rating

Undistorted . 2.5 watts

Maximum .. 4.5 watts

Loudspeaker (RL-70H-6)

Type ..... 12-inch electrodynamic

V.C. Impedance .....2.2 ohms at 400 cycles

Note: On some receivers the following circuit modifications are in effect:

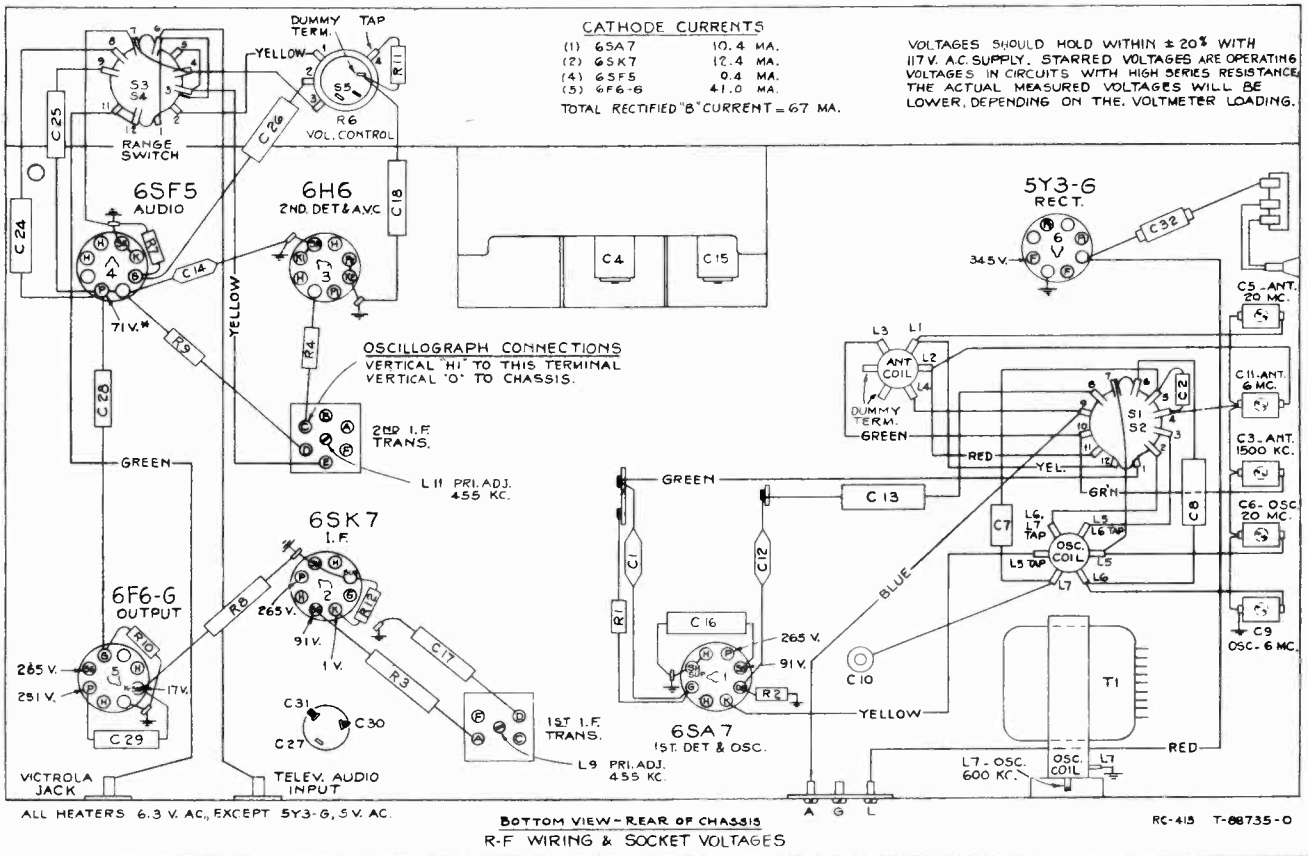
1. R11 is 4,700 ohms, and C18 is .05 mfd.
2. C1 is 470 mmfd.
3. There are three types of 2nd I-F transformers in use.

a. The first type (Stock No. 14308) has C23 and R5 mounted inside the case, and is connected exactly as shown above.

b. In the second type R5 is omitted and the lead from S4 connects to C instead of E. E is not used.

c. In the third type R5 is omitted and C23 is connected externally from C to ground. E is not used. The lead from the diode plate connects to A instead of B. When replacing this transformer with Stock No. 14308, remove the external C23 and connect the replacement transformer as shown in the above diagram.

Important: Stock No. 14308 is used as replacement for all three of the above types, and should be connected as shown in the diagram.



MODEL K60, Chassis RC415
MODEL K80, Chassis RC415A
Alignment, Trimmers
Socket

RCA MFG. CO., INC.

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord-Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the tuning drum. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 180° mark on the drum scale must be vertical and directly under the center of the shaft of the tuning drum when the plates are fully meshed. The drum is held to the shaft by means of two set-screws, which must be tightened securely when the drum is in the correct position.

On the inner side of the tuning drum are two projections which serve as stops to prevent extreme rotation of the gang condenser. The tuning drum should be set so that the stop limiting clockwise movement of the drum takes effect just as the gang condenser plates are becoming fully meshed, thus preventing stress on the gang due to extreme rotation.

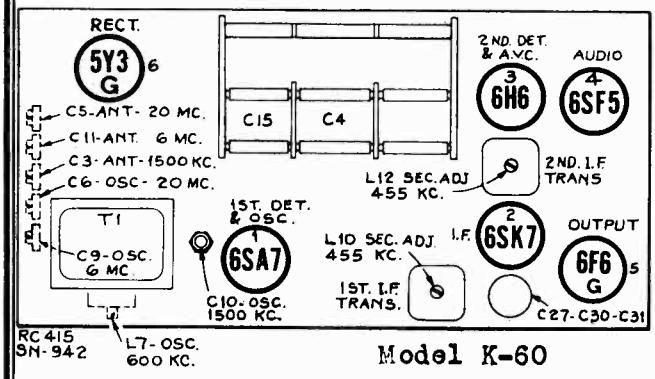
Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the chassis, and bend the wire so that it points to the 0° mark on the calibration scale when the plates are fully meshed.

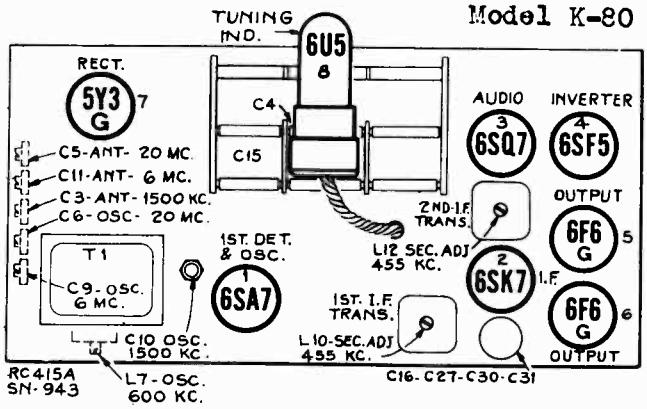
Steps	Connect the high side of the test-osc. to—	Tune test osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	6SK7 grid in series with .01 mfd.	455 kc	"A" Band Quiet Point between 550-750 kc	L11 and L12 (2nd I-F Trans.)
2	6SA7 grid in series with .01 mfd.			L9 and L10 (1st I-F Trans.)
3	Ant. terminal in series with 300 ohms	20 mc	20 mc (200°) "C" Band	C6 (osc.)* C5 (ant.)
4		6 mc	6 mc (187.5°) "B" Band	C9 (osc.)** C11 (ant.)
5	Ant. terminal in series with 200 mmfd.	1,500 kc	1,500 kc (198.25°) "A" Band	C10 (osc.) C3 (ant.)
6		600 kc	600 kc (39.75°) "A" Band	L7 (osc.) Rock Gang
7	Repeat step 5.			

* Use minimum capacity peak if two can be obtained. Check to determine that C6 has been adjusted to correct peak by tuning receiver to approximately 19.09 mc where a weaker signal should be received.

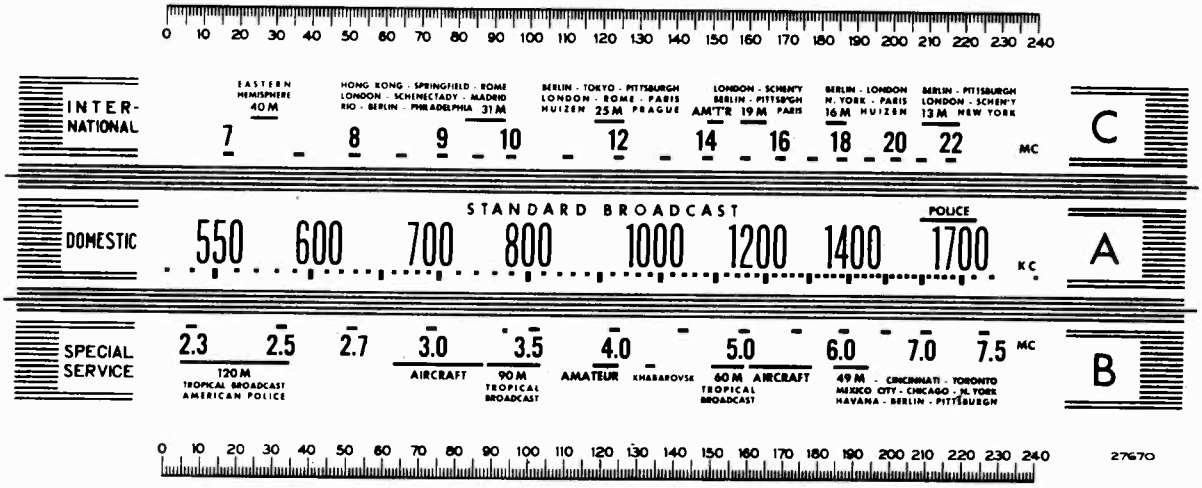
** Use minimum capacity peak if two can be obtained. Check to determine that C9 has been adjusted to correct peak by tuning receiver to approximatelv 5.09 mc where a weaker signal should be received.

Note: Oscillator tracks above signal on all bands.





Calibration Scale



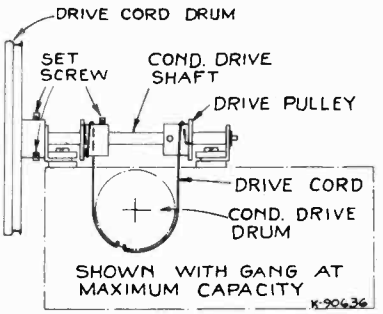
Receiver Dial Scales, and Corresponding 0-240° Calibration Scales

The corresponding position of the dial indicator for any setting of the calibration scale can be determined by drawing a line from this point on the bottom calibration scale to the same point on the top calibration scale. For example 39.75° on the calibration scale corresponds to 600 kc on "A" band. Read instructions under "Alignment Procedure."

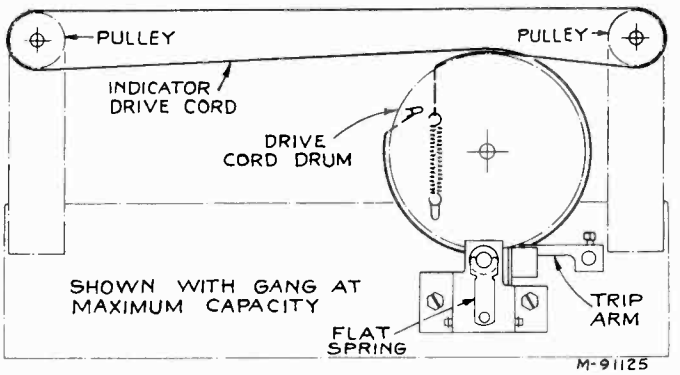
MODEL K105
Drive Cord Data

RCA MFG. CO., INC.

MODEL K60, Chassis RC415
MODEL K80, Chassis RC415A
Dial Data, Parts List

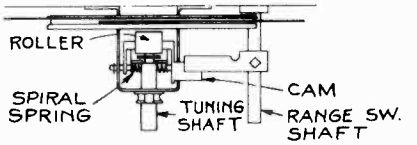


CONDENSER DRIVE CORD ARRANGEMENT



Note: In the Dial Indicator Drive Cord Assembly drawing at the right the mechanism is shown with the range switch in the "A" band position. In this position the trip arm on the range switch shaft must be adjusted so that when push-buttons are operated, the drive cord drum will turn freely without rubbing or binding against the drive roller.

DIAL INDICATOR DRIVE CORD ASSEMBLY.



TOP VIEW

STOCK No.	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES (RC-415A)	
33620	Arm—Push arm and cam assembly on tuning unit—less lock screw	.35
33432	Arm—Trip arm and set screw located on range switch shaft	.15
33430	Board—Antenna and ground terminal board	.20
30766	Cap—Rubber cap for Magic Eye—Model K80 only	.15
12714	Capacitor—Air-trimmer, 2-12 mmfd. (C10)	.50
33429	Capacitor—Trimmer capacitor bank, 2 sections 4-50 mmfd., and 3 sections 2-20 mmfd. (C3, C5, C6, C9, C11)	.80
31871	Capacitor—20 mmfd. (C2)	.40
12723	Capacitor—56 mmfd. (C12)	.35
30904	Capacitor—100 mmfd. (C19, C20)	.25
12404	Capacitor—120 mmfd. (C21, C22)	.30
14712	Capacitor—180 mmfd. (C23)	.30
30232	Capacitor—220 mmfd. (C14)	.35
30608	Capacitor—510 mmfd. (C1)	.35
31433	Capacitor—560 mmfd. (C7)	.35
12537	Capacitor—560 mmfd. (C32)	.35
31403	Capacitor—3,300 mmfd. (C8)	.60
31405	Capacitor—6,000 mmfd. (C13)	.75
5107	Capacitor—.0025 mfd. (C25)	.20
4838	Capacitor—.005 mfd. (C24, C26, C29, C33,* C35)*	.25
4937	Capacitor—.01 mfd. (C28)	.25
32787	Capacitor—.05 mfd., 400 V. (C17, C34)[a]	.20
32786	Capacitor—0.1 mfd. (C18)	.25
33014	Capacitor—Electrolytic, 3 sections 10 mfd., one section 20 mfd. (C16, C27, C30, C31)	1.90
32821	Coil—Antenna coil (L1, L2, L3, L4)	1.35
32824	Coil—Oscillator coil (L5, L6, L7)	1.00
33424	Control—Tone control (S3, S4)	1.15
33425	Control—Volume control and power switch (R6, S5)	2.00
32635	Cord—Condenser drive cord	.24
32634	Cord—Drive cord	.10
32713	Core—Adjustable core and stud for oscillator coil	.35
33627	Drum—Condenser drive drum	.25
33174	Drum—Drive cord drum with set screws and calibrator dial	.65
11891	Lamp—Dial lamp	.17
33625	Plate—Front guide plate for push arms	.25
5040	Plug—4-contact female for speaker cable	.30
33427	Pulley—Drive cord pulley and mounting bracket	.30
33626	Pulley—Drive pulley—less bronze drive cord	.25
14439	Resistor—100 ohms, ½ watt (R12)	.20
30735	Resistor—560 ohms, 1 watt (R8)	.22
13714	Resistor—5,600 ohms, ½ watt (R11)	.20
12265	Resistor—6,800 ohms, ½ watt (R17)	.20
33489	Resistor—15,000 ohms, 2.5 watt (R3)	.55
14284	Resistor—22,000 ohms, 1/10 watt (R5)	.15
12454	Resistor—33,000 ohms, ½ watt (R2)	.20
12285	Resistor—470,000 ohms, ½ watt (R9, R10, R14,* R16)*	.20
12013	Resistor—1 meg., 1/10 watt (R13)*	.15
13730	Resistor—1 meg., ½ watt (R1)	.20
12679	Resistor—2.2 meg., ½ watt (R4)*	.20
13601	Resistor—10 meg., ½ watt (R7, R15)*	.20
30340	Retainer—Retainer for shaft of tuning shaft cam and arm	.02
33419	Roller—Friction roller for tuning knob shaft	.10
4669	Screw—No. 8-32 square head set screw for drum	.03
33621	Screw—Push arm lock screw	.05
33624	Shaft—Tuning condenser drive shaft and washer	.15
33422	Shaft—Tuning shaft—less friction roller	.20
31364	Socket—Dial lamp socket	.20
13871	Socket—Magic Eye tube socket*	.45
14278	Socket—Phonograph or Television input socket	.25
31319	Socket—Tube socket	.25
33175	Spring—Drive cord tension spring	.05
33623	Spring—Drive drum cord spring	.04
33622	Spring—Push arm return spring	.08
33421	Spring—Tuning shaft flat spring	.10
33420	Spring—Tuning shaft cam spiral spring	.06
33426	Switch—Range switch (S1, S2)	1.10
33428	Transformer—First i-f transformer (L9, L10, C19, C20)	1.95
14308	Transformer—Second i-f transformer (L11, L12, C21, C22, C23, R5)	2.90
33618	Transformer—Power transformer—105-120 volts, 25 cycle (T1)	6.40
33112	Transformer—Power transformer—105-120 volts, 50-60 cycle (T1)	4.30
	SPEAKER ASSEMBLIES (RL-70J1)	
31825	Cap—Cone center dust cap	.05
11469	Coil—Hum neutralizing coil (L13)	.30
33116	Coil—Speaker field coil (L15)	2.10
31275	Cone—Speaker cone, voice coil, and dust cap (L14)	1.75
5039	Plug—4-prong male, for speaker*	.30
33444	Transformer—Output transformer (T2)*	2.00
	MISCELLANEOUS ASSEMBLIES	
33473	Button—Push button	.10
30716	Clip—Magic Eye clip	.25
33437	Dial—Dial scale (glass)	1.10
33439	Escutcheon—Dial escutcheon—less push buttons	2.20
33435	Frame—Dial scale holder, mounting brackets, pointer, and Magic Eye bracket and clip assembled—less dial*	2.50
34383	Indicator—Dial pointer, carriage, and clip	.40
33434	Knob—Volume control, tone control, range switch, or station selector knob	.30
33431	Link—Link for "Antenna-Ground" terminal board	.02
33842	Marker—Station selectors call letter markers	.25
33438	Screw—Thumb screw for Magic Eye clip*	.05
34143	Shaft—Pointer carriage slide rod	.15
14270	Spring—Retaining spring for knob	.05

[a] C18 in Model K80

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE. * IN MODEL K80 ONLY

NOTE: Above Parts List applies to both Model K-60 and K-80 except for items noted. Items on the right apply only to Model K-60.

4839	Capacitor—0.1 mfd. (C16)	.30
32240	Capacitor—Electrolytic, 2 sections 10 mfd., one section 20 mfd. (C27, C30, C31)	1.45
5119	Plug—3-contact female for speaker cable	.25
31388	Resistor—390 ohms, 1 watt (R8)	.22
30146	Resistor—4,700 ohms, ½ watt (R11)	.20
	SPEAKER ASSEMBLIES (RL-70H6)	
5118	Plug—3-contact male, for speaker	.25
31301	Transformer—Output transformer (T2)	1.70
33436	Frame—Dial scale holder, mounting brackets, and pointer assembled—less dial	2.35

Replacement Parts

Insist on genuine factory-tested parts, which are readily identified and may be purchased from authorized dealers.

STOCK No.	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES	
33620	Arm—Push arm and cam assembly on tuning unit —less lock screw	.35
33432	Arm—Trip arm and set screw located on range switch shaft	.15
34574	Board—"Ant.-Grd." terminal board	.20
12581	Cap—i-f transformer shield cap	.25
30766	Cap—Rubber cap for Magic Eye — Models K-80, K-81	.15
34573	Capacitor—Trimmer, 2 sections 2-10 mmfd. each	.35
34572	Capacitor—Trimmer, 2 sections 4-50 mmfd. each	.35
12714	Capacitor—Air-trimmer, 2-12 mmfd. (C10)	.50
14079	Capacitor—6.8 mmfd. (C3)	.35
34580	Capacitor—39 mmfd. (C2)	XX
12723	Capacitor—56 mmfd. (C12)	.35
30949	Capacitor—56 mmfd. (C21, C22)	.25
30904	Capacitor—100 mmfd. (C19, C20)	.25
30232	Capacitor—220 mmfd. (C14)	.35
30433	Capacitor—470 mmfd. (C1)	.35
34581	Capacitor—850 mmfd. (C7)	.40
30057	Capacitor—2,700 mmfd. (C9)	.55
31399	Capacitor—4,700 mmfd. (C13)	.60
5107	Capacitor—.0025 mfd. (C25)	.20
33584	Capacitor—.005 mfd. (C18—Model K-60 only), (C35 — Models K-80, K-81), (C37 — All Models)	.25
4838	Capacitor—.005 mfd. (C24, C26, C29)	.25
4937	Capacitor—.01 mfd. (C18—Models K-80, K-81), (C28—All Models)	.25
32787	Capacitor—.05 mfd. (C34—Models K-80, K-81), (C17—All Models)	.20
4839	Capacitor—0.1 mfd. (C16) (Model K-60 only)	.30
32786	Capacitor—0.1 mfd.	.25
32240	Capacitor—Electrolytic, 2 sections 10 mfd., one section 20 mfd. (C27, C30, C31) (Model K-60 only)	1.45
33014	Capacitor—Electrolytic, 3 sections 10 mfd., one section 20 mfd. (C18, C27, C30, C31) (K-80, K-81)	1.90
34579	Coil—Oscillator coil	.80
34578	Control—Tone control	1.35
3695	Control—Volume control and power switch	XX
32635	Cord—Condenser drive cord	.24
32634	Cord—Drive cord	.10
32713	Core—Adjustable core and stud for oscillator coil	.35
33627	Drum—Condenser drive drum	.25
33174	Drum—Drive cord drum with set screws and calibrator dial	.65
11891	Lamp—Dial lamp	.17
33625	Plate—Front guide plate for push arms	.25
5119	Plug—3-contact female for speaker cable (Model K-60-A only)	.25
5040	Plug—4-contact female for speaker cable (Models K-80, K-81)	.30
33427	Pulley—Drive cord pulley and mounting bracket	.30
33626	Pulley—Drive pulley—less bronze drive cord	.25
31388	Resistor—390 ohms, 1 watt (R8) (Model K-60 only)	.22
30735	Resistor—560 ohms, 1 watt (R8) (Models K-80, K-81)	.22
14024	Resistor—2,700 ohms, ½ watt (R11, R15) (Models K-80, K-81)	.20
12695	Resistor—15,000 ohms, ½ watt (R17) (Models K-80, K-81)	.20
33489	Resistor—15,000 ohms, 2.5 watt (R3)	.55
12454	Resistor—33,000 ohms, ½ watt (R2)	.20
5132	Resistor—47,000 ohms, 1/10 watt	.15
12412	Resistor—47,000 ohms, ½ watt (R11) (Model K-60 only)	.20
12286	Resistor—56,000 ohms, ½ watt (R11) (Models K-80, K-81)	.20
12285	Resistor—470,000 ohms, ½ watt	.20
12013	Resistor—1 meg., 1/10 watt (R13) (Models K-80, K-81)	.15
12679	Resistor—2.2 meg., ½ watt (R4)	.20
30271	Resistor—4.7 meg., ½ watt (R1)	.20
13601	Resistor—10 meg., ½ watt (R7)	.20
30340	Retainer—Retainer for shaft of tuning shaft cam and arm	.02
33419	Roller—Friction roller for tuning knob shaft	.10
4669	Screw—No. 8-32 square head set screw for drum	.03
33621	Screw—Push arm lock screw	.05
33624	Shaft—Tuning condenser drive shaft and washer	.15
33422	Shaft—Tuning shaft—less friction roller	.20
34575	Socket—3-contact female, for loop input	.20
31364	Socket—Dial lamp socket	.20
13871	Socket—Magic Eye tube socket (Models K-80, K-81)	.45
14278	Socket—Phonograph or Television input socket	.25
31319	Socket—Tube socket	.25
33175	Spring—Drive cord tension spring	.05
33623	Spring—Drive drum cord spring	.04
33622	Spring—Push arm return spring	.08
33421	Spring—Tuning shaft flat spring	.10
33420	Spring—Tuning shaft cam spiral spring	.06
34577	Switch—Range switch	1.55
14376	Transformer—First i-f transformer	2.45
32825	Transformer—Second i-f transformer	2.50
33618	Transformer—Power transformer—105-120 volts, 25-60 cycle (T1)	6.40
33112	Transformer—Power transformer—105-120 volts, 50-60 cycle (T1)	4.30
	SPEAKER ASSEMBLIES (K-60) (RL-70H6)	
31825	Cap—Cone center dust cap	.02
11469	Coil—Hum neutralizing coil	.30
33116	Coil—Speaker field coil	2.10
31275	Cone—Speaker cone, voice coil and dust cap	1.75
5118	Plug—3-contact male, for speaker	.25
31301	Transformer—Output transformer (T2)	1.70
	SPEAKER ASSEMBLIES (K-80, K-81, K-80-X) (RL-70J1)	
31825	Cap—Cone center dust cap	.02
11469	Coil—Hum neutralizing coil	.30
33116	Coil—Speaker field coil	2.10
31275	Cone—Speaker cone, voice coil and dust cap	1.75
5039	Plug—4 prong male, for speaker	.30
33444	Transformer—Output transformer (T2)	2.00
	MISCELLANEOUS ASSEMBLIES	
33474	Button—Push button (K-60, K-80)	.10
34994	Button—Push button (K-81)	XX
34992	Cap—Spindle cap for antenna loop (K-81)	XX
30716	Clip—Magic Eye clip (K-60, K-80)	.25
34582	Dial—Dial scale (glass) (K-60, K-80)	1.25
34997	Dial—Dial scale (glass) (K-81)	
33439	Escutcheon—Dial escutcheon—less push buttons (K-60, K-80)	2.20
34993	Escutcheon—Dial scale and push button escutcheon (K-81)	XX
33436	Frame—Dial scale holder, mounting brackets, and pointer assembled—less dial	2.35
34096	Frame—Dial frame complete with brackets—*less* pointer guide rods, pointer and carriage, dial scale and Magic Eye clip (K-81)	XX
33435	Frame—Dial scale holder, mounting brackets, pointer, and Magic Eye bracket and clip assembled—less dial (K-60, K-80)	2.50
34583	Frame—Frame only for "C" band loop—less wire and plug	.30
34383	Indicator—Dial pointer, carriage, and clip	.40
34998	Knob—Tuning, tone control, range switch, volume control and power switch or antenna loop shaft knob (K-81)	XX
33434	Knob—Volume control, tone control, range switch or station selector knob (K-80, K-80)	.30
34988	Loop—"A" and "B" band loop complete for K-60	XX
34991	Loop—"A" and "B" band antenna loop complete (K-81)	XX
33842	Marker—Station selector markers	.25
34872	Pin—Complete set of dowel pins for antenna loop (K-60, K-80)	.25
34990	Plug—2-prong male plug for antenna loop—"C" band (K-81)	XX
32641	Plug—3-prong male plug for "A" and "B" band antenna loop	.10
31482	Screw—No. 8-32 square head set screw (K-81)	.03
33438	Screw—Thumb screw for Magic Eye clip (K-60, K-80)	.05
34995	Shaft—Flexible shaft for antenna loop (K-81)	XX
34491	Shaft—Pointer and carriage guide rods (K-81)	.15
14270	Spring—Retaining spring for knob	.05

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

XX Price upon application to your RCA Victor Parts Distributor.

Calibration Scale on Indicator-Drive-Cord-Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference when the chassis is removed; therefore, a calibration scale is attached to the tuning drum. The setting of the gang condenser is read on this scale, which is calibrated in degrees.

As the first step in r-f alignment, check the position of the drum. The 180° mark on the drum scale must be vertical and directly under the center of the shaft of the tuning drum when the plates are fully meshed. The drum is held to the shaft by means of two set-screws, which must be tightened securely when the drum is in the correct position.

On the inner side of the tuning drum are two projections which serve as stops to prevent extreme rotation of the gang condenser. The tuning drum should be set so that the stop limiting clockwise movement of the drum takes effect just as the gang condenser plates are becoming fully meshed, thus preventing stress on the gang due to extreme rotation.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the chassis, and bend the wire so that it points to the 0° mark on the calibration scale when the plates are fully meshed.

Steps	Connect test-osc. output to—	Tune test-osc. to—	Turn radio dial to	Adjust the following for maximum peak output
1	1st-det. grid, in series with .01 mfd.	455 kc	"C" band quiet point	L6 and L7 (2nd I-F trans.) L4 and L5 (1st I-F trans.)
2		15 mc	191° "C" band	C6 (osc.)*
3		2.44 mc	115° "B" band	C9 (osc.)
4	Fasten chassis in cabinet, see that link is closed on the antenna board, attach dial indicator to drive cord, with indicator at 530 kc mark and gang at maximum capacity.			
5	Radiation loop consisting of two turns of wire 18 inches in diameter located 4 to 6 feet from receiver	15 mc	15 mc signal "C" band	C11 Rock gang
6		6.0 mc	6.0 mc signal "C" band	"C" loop leads**
7		Repeat step 5		
8		600 kc	600 kc "A" band	L3 (osc.) Rock gang
9		1,500 kc	1,500 kc "A" band	C10 (osc.) C36 (loop)
10	Repeat steps 8 and 9			
11		2.44 mc	2.44 kc "B" band	C9 (osc.) Rock gang

* Use minimum capacity peak if two peaks can be obtained.
** Adjust spacing between two leads from "C" band loop.
NOTE: Oscillator tracks above signal on all bands.

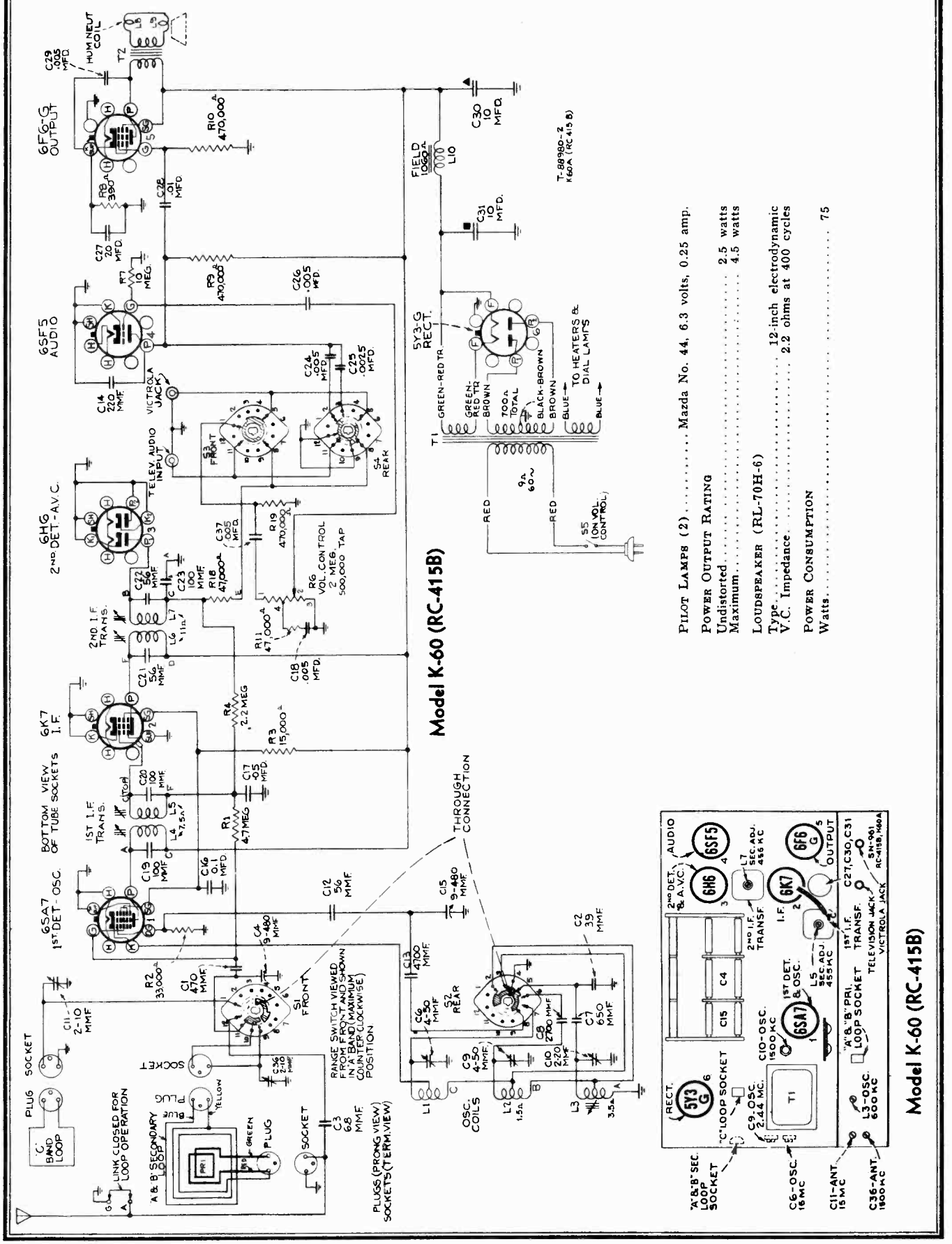
The push-buttons should be adjusted for eight favorite stations after the receiver is operating, and has had a brief warm-up period.

Any standard broadcast stations may be chosen. The preferable arrangement is to adjust for stations in the order of frequency, from low to high. Proceed as follows:

1. Loosen the push-button screws in back of the station-marker recesses.
2. Set Accessory-Tone Knob to "Radio" and turn the range selector to "A."
3. Press in the tuning knob and accurately tune in the first station.
4. With station accurately tuned in, press in the first push-button and tighten the screw.
5. Place the station marker tab in the recess.
6. Proceed in a similar manner to adjust the remainder of the push-buttons.

RCA MFG. CO., INC.

MODELS K60, K62, Ch. RC415B
(With Loop)
Schematic, Socket, Trimmers



PILOT LAMPS (2) ..... Mazda No. 44, 6.3 volts, 0.25 amp.

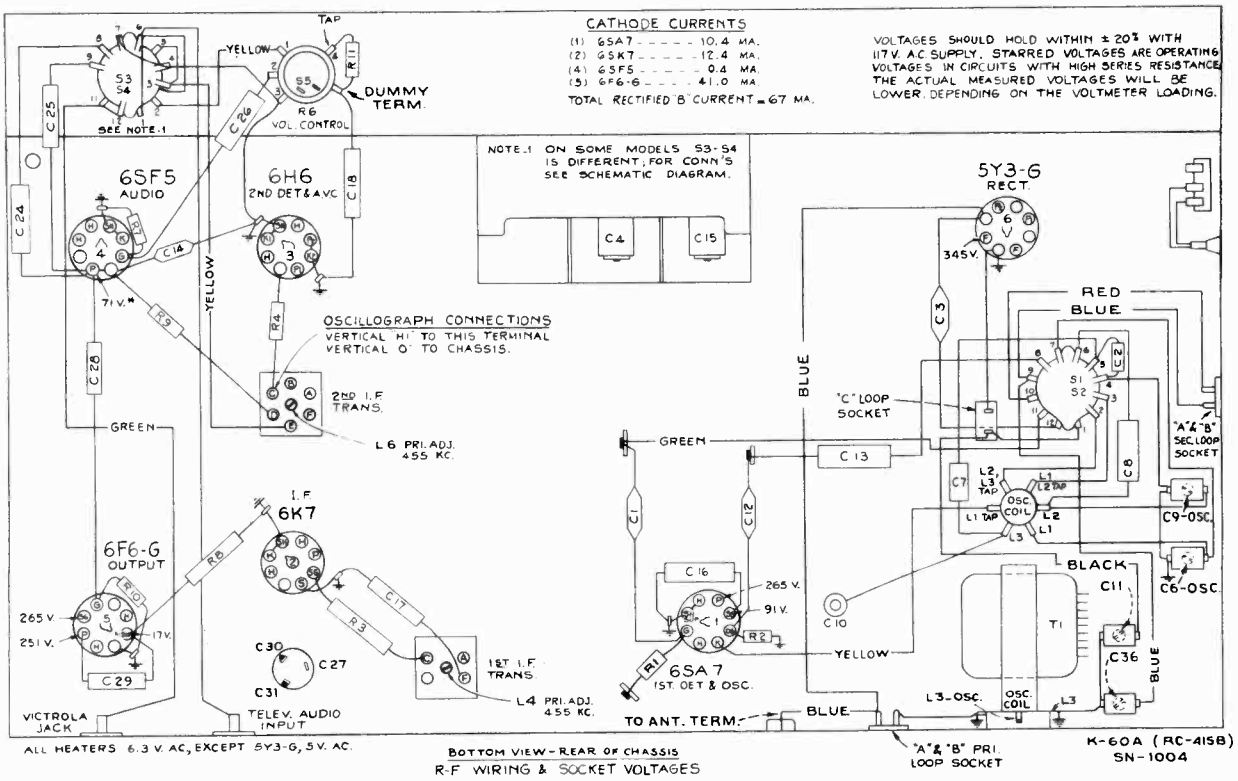
POWER OUTPUT RATING
Undistorted ..... 2.5 watts
Maximum ..... 4.5 watts

LOUDSPEAKER (RL-70H-6)
Type ..... 12-inch electrodynamic
V.C. Impedance ..... 2.2 ohms at 400 cycles

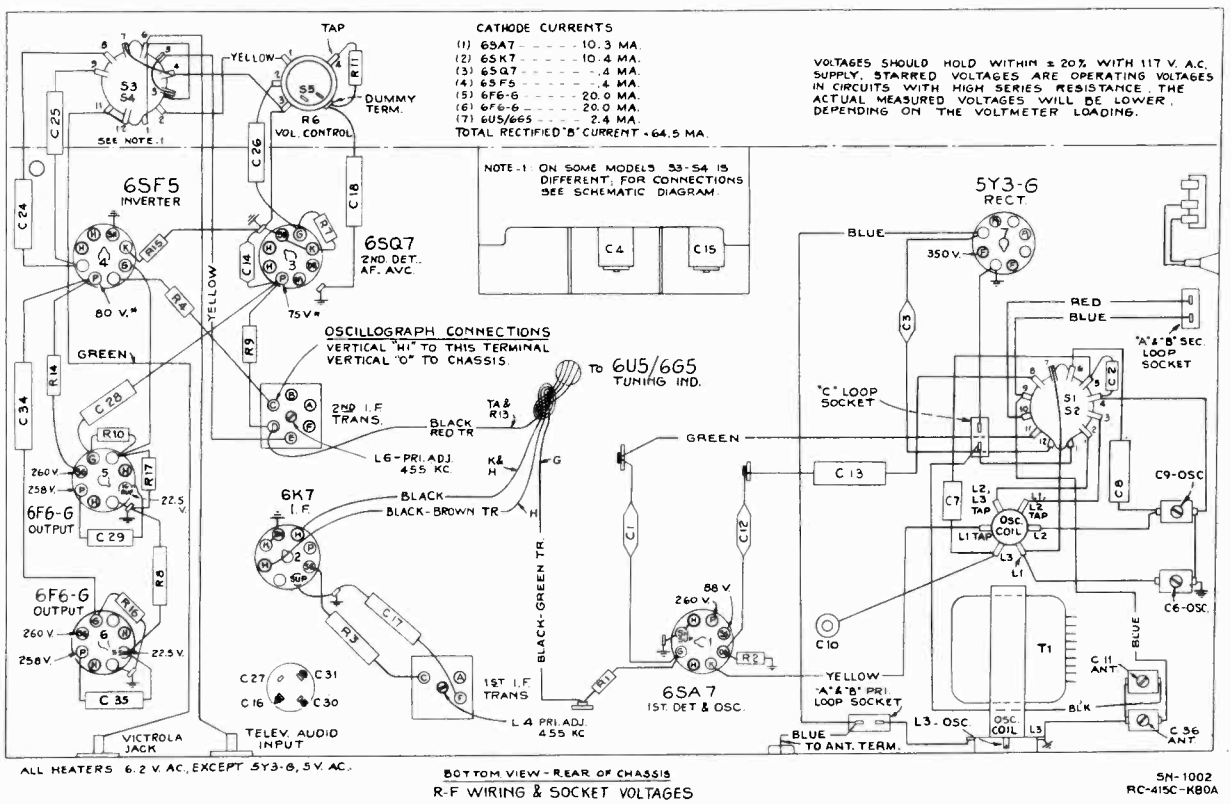
POWER CONSUMPTION
Watts 75

MODELS K60,K62,Ch.RC415B
MODELS K80,Ch.RC415C,RC415D
K81,K82,Chassis RC415C
Chassis Wiring,Voltage

RCA MFG. CO., INC.



Model K-60 (RC-415B)

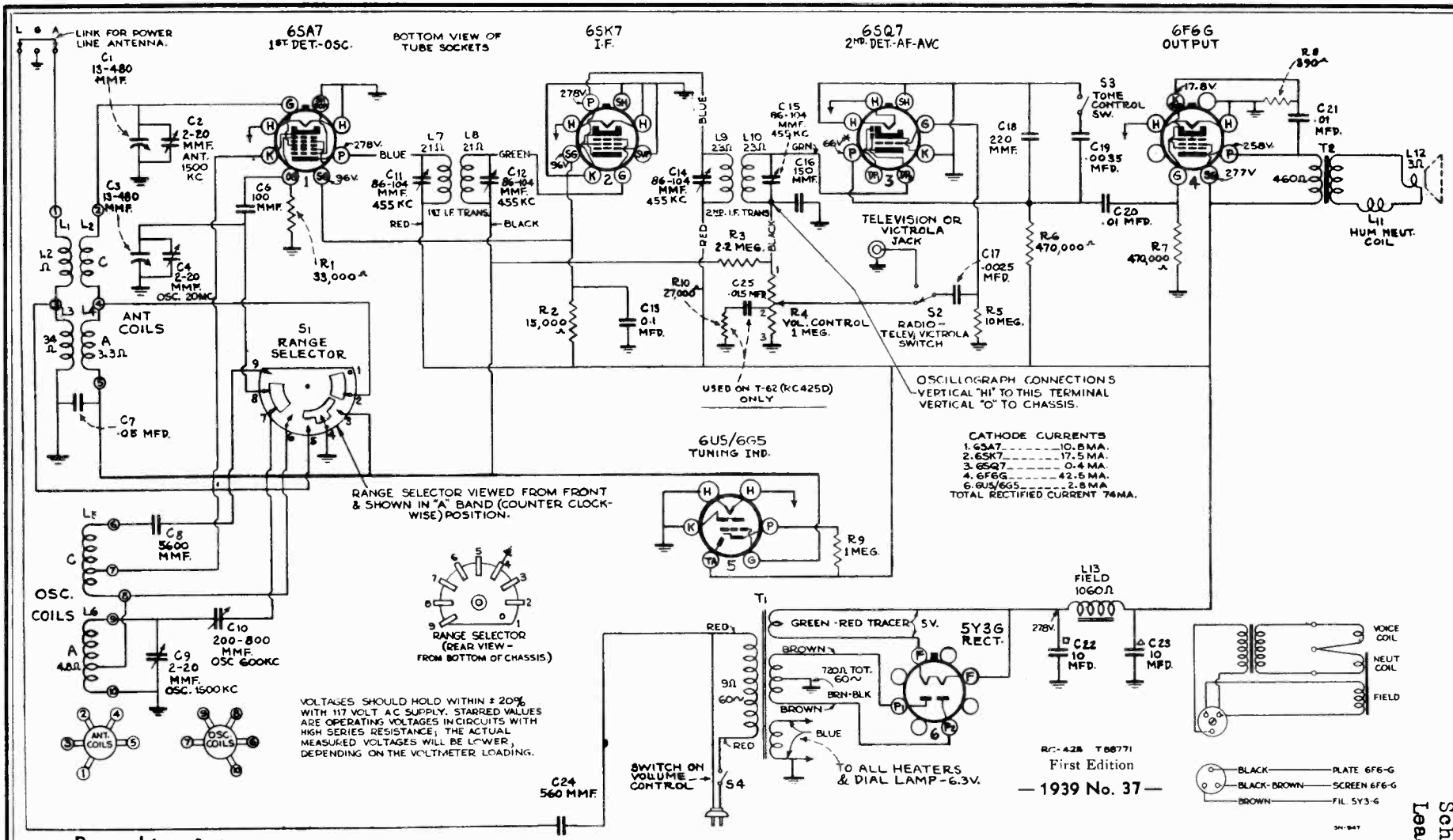


Models K-80 (RC-415C, RC-415D), and K-81 (RC-415C)

** The Tuning Indicator is not used in RC-415D*

RCA MFG. CO., INC.

MODELS T60, Ch. RC425
T62, Chassis RC425D
Schematic, Voltage
Lead Dress



Power Line Antenna

Each of these models is equipped with a built-in power line antenna. To use this antenna, the link on the antenna terminal board should be connected between "A" and "L", thus connecting the antenna input of the receiver through a capacitor to the powerline. If an outside antenna is used, it should be connected to "A", a ground connection made to "G", and the link removed.

LOUDSPEAKER (T-60, RL-78-6; T-62, RL-79A-4)

Type ..... T-60, 5-inch electrodynamic; T-62, 6-inch electrodynamic

V. C. Impedance ..... 3.4 ohms at 400 cycles

POWER SUPPLY RATINGS

Rating A ..... 105-125 volts, 50-60 cycles, 80 watts

Rating B ..... 105-125 volts, 25-60 cycles, 80 watts

Rating C ..... 100-130, 140-160, 195-250 volts, 40-60 cycles, 80 watts

PILOT LAMP (1) .....Mazda No. 51, 6.3 volts, 0.20 amp.

FREQUENCY RANGES

Standard Broadcast ..... 540-1,720 kc

Short Wave ..... 5.6-20 mc

INTERMEDIATE FREQUENCY ..... 455 kc

POWER OUTPUT RATING

Undistorted ..... 2.2 watts

Maximum ..... 4.2 watts

CONNECTIONS & COLORS OF SPEAKER & CABLE (MODEL T-62 ONLY)

Precautionary Lead Dress.—

1. Dress the Power Line Antenna lead close to the chassis base and near the back flange.
2. Power switch leads should be dressed around the 6SQ7 socket.

MODELS T60,T62
Alignment,Trimmers
Socket,Tuner,Dial Data

RCA MFG. CO., INC.

Alignment Procedure

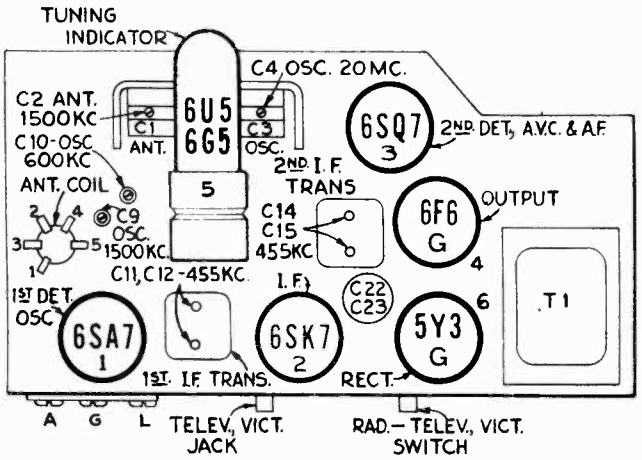
Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid A.V.C. action.

Calibration Marks.—The tuning dial is fastened in the cabinet and can not be used for reference during alignment. Therefore calibration marks corresponding to dial readings of 600 kc, 1,500 kc, 6.1 mc, and 20 mc have been stamped in the plate on the front of the chassis as shown in the accompanying drawing. These marks are used for reference during alignment.

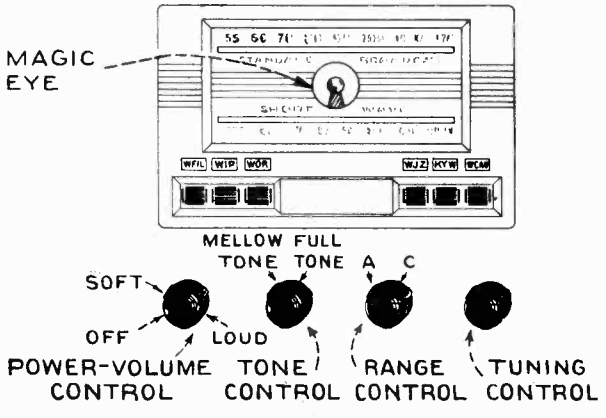
Dial Indicator Adjustment.—With the gang condenser in full mesh, the indicator should point to the mark at the extreme left (low frequency) end of the dial scale.

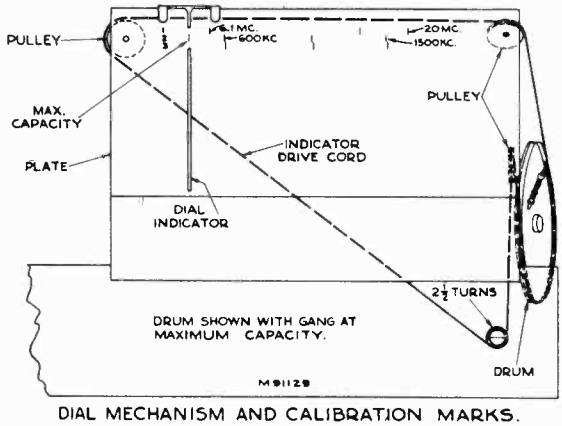


Steps	Connect the high side of the test osc. to—	Tune test osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	Antenna terminal	455 kc	"A" Band Quiet point between 550-750 kc	C14 and C15 (2nd I-F trans.)
2				C11 and C12 (1st I-F trans.)
3	Antenna terminal in series with 300 ohms	20 mc	"C" Band 20 mc calibration mark	C4 (osc.)*
4	Antenna terminal in series with 200 mmf.	1,500 kc	"A" Band 1,500 kc calibration mark	C9 (osc.) C2 (ant.)
5		600 kc	"A" Band 600 kc calibration mark	C10 (osc.) Rock gang
6	Repeat step 4			

* Use **minimum** peak if two can be obtained. Check to determine that C4 has been adjusted properly by tuning receiver to approximately 19.09 mc where a weaker signal should be received.

Note: Oscillator tracks **above** signal on both bands.





DIAL MECHANISM AND CALIBRATION MARKS.

Adjustments for Push-Button Tuning

The push-buttons should be adjusted for six favorite stations after the receiver has been operating for a brief warm-up period. Each button may be set up to any standard broadcast station. The preferable arrangement is to adjust for stations in the order of frequency, from low to high. Proceed as follows:

1. Pull off the push-buttons and loosen the push-button rods with a small screwdriver.

2. Turn the accessory switch on the back apron of the chassis to "Radio" position and accurately tune in the station for which the first button is to be set.

3. Press in the first push-button rod (left) with the screwdriver, as far as it will go without undue pressure, hold in, retune station with manual control if necessary for best reception, and then carefully tighten up the rod. Do not tighten more than ¼ turn after the rod begins to grip or damage to the mechanism may result.

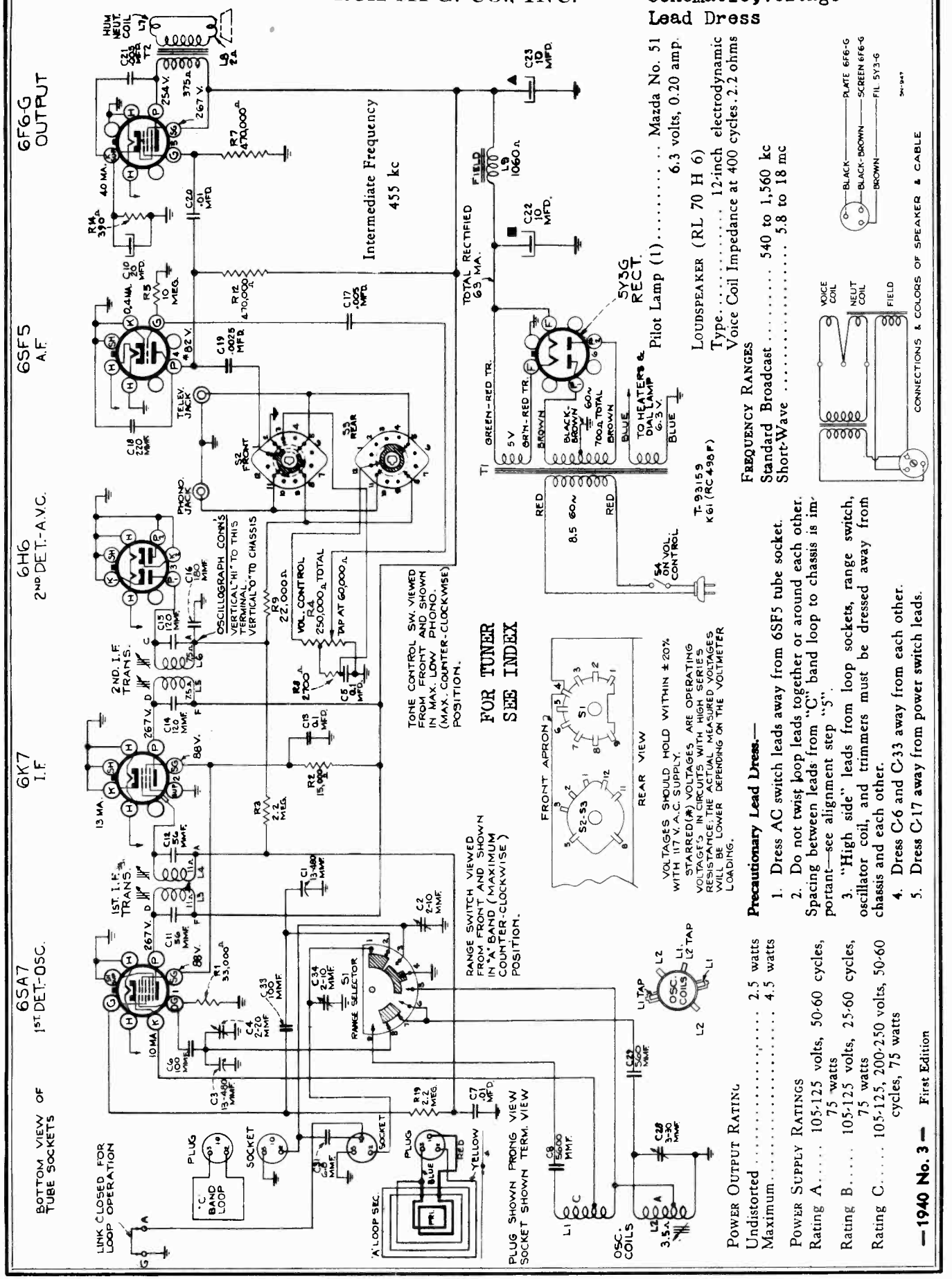
4. Replace the push-button on its shaft.

5. Proceed in a similar manner for the remainder of the push-buttons.

6. Insert the station marker tabs in the recesses above the push-buttons.

RCA MFG. CO., INC.

MODEL K61, Chassis RC498F
Schematic, Voltage
Lead Dress



Power Output Rating

Undistorted ..... 2.5 watts
Maximum ..... 4.5 watts

Power Supply Ratings

Rating A..... 105-125 volts, 50-60 cycles, 75 watts
Rating B..... 105-125 volts, 25-60 cycles, 75 watts
Rating C..... 105-125, 200-250 volts, 50-60 cycles, 75 watts

Precautionary Lead Dress.—

1. Dress AC switch leads away from 6SF5 tube socket.
2. Do not twist loop leads together or around each other. Spacing between leads from "C" band loop to chassis is important—see alignment step "5".
3. "High side" leads from loop sockets, range switch, oscillator coil, and trimmers must be dressed away from chassis and each other.
4. Dress C-6 and C-33 away from each other.
5. Dress C17 away from power switch leads.

Pilot Lamp (1) ..... Mazda No. 51 6.3 volts, 0.20 amp.

Loudspeaker (RL 70 H 6)
Type ..... 12-inch electrodynamic
Voice Coil Impedance at 400 cycles. 2.2 ohms

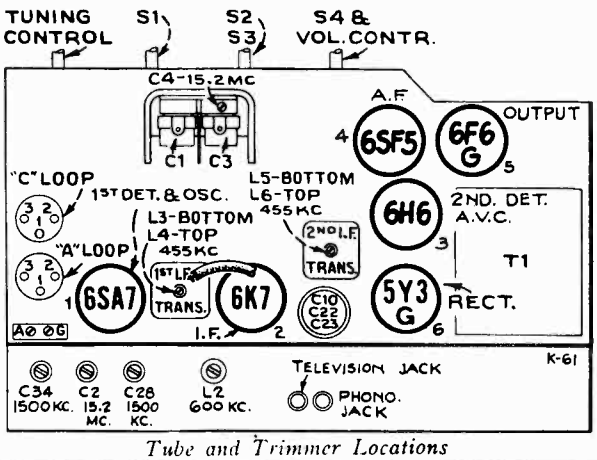
Frequency Ranges

Standard Broadcast ..... 540 to 1,560 kc
Short-Wave ..... 5.8 to 18 mc

MODEL K61, Chassis RC498F
Alignment, Trimmers
Socket, Dial Data

RCA MFG. CO., INC.

Alignment Procedure



Tube and Trimmer Locations

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown on the chassis schematic.

Output Meter Alignment.—If this method is used, connect the output meter across the voice coil, and turn the receiver volume control to maximum.

Test Oscillator.—For all alignment operations, keep the oscillator output as low as possible to avoid a-v-c action.

Calibration Marks.—The tuning dial is fastened in the cabinet and can not be used for reference during alignment. Therefore calibration marks have been stamped in the plate on the front of the chassis as shown in the accompanying drawing. These marks are used for reference during alignment.

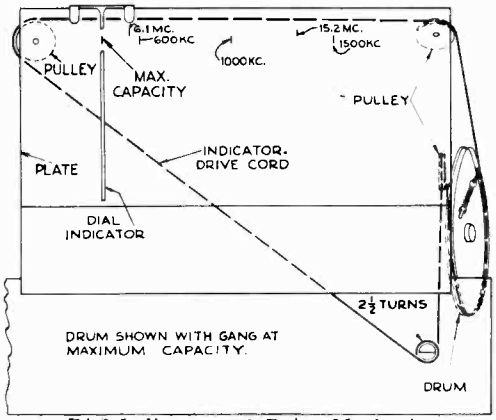
Dial Indicator Adjustment.—With the gang condenser in full mesh, the indicator should point to the extreme left (low frequency) mark on the dial scale.

Steps	Connect test-osc. output to—	Tune test-osc. to—	Turn radio dial to	Adjust the following for maximum peak output
1	I-F grid through 0.1 mfd capacitor and ground	455 kc	Quiet point between 1,720-1,500 kc	L5 and L6 (2nd I-F trans.)
2	1st det. grid through 0.1 mfd capacitor and ground			L3 and L4 (1st I-F trans.)
3		15.2 mc	15.2 mc	C-4 oscillator*
4	Radiation loop consisting of two turns of wire 18 inches in diameter located 4 to 6 feet from receiver	15.2 mc	Rock at 15.2 mc	C-2 antenna† while rocking
5		6.1 mc	6.1 mc	Spacing between leads from "C" band loop to chassis
6		15.2 mc	Rock at 15.2 mc	C-2 antenna† while rocking
7		1,500 kc	1,500 kc	C-34 antenna C-28 oscillator
8		600 kc	Rock at 600 kc	L-2 oscillator while rocking
9		1,500 kc	1,500 kc	C-34 antenna C-28 oscillator

When making adjustments 4 to 9 inclusive the chassis must be in the cabinet, both loops connected, and all leads in their normal positions. When mounting chassis in cabinet if calibration marks on dial plate do not line up with dial scale mounted on cabinet move pointer to agree with dial scale on cabinet.

* Oscillator should track on high frequency side of signal. If two peaks are obtained use high frequency (minimum capacity) peak.

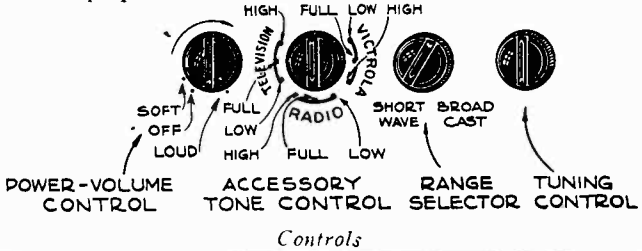
† If two peaks can be obtained use low frequency (maximum capacity) peak.



Dial Indicator and Drive Mechanism

Antennas

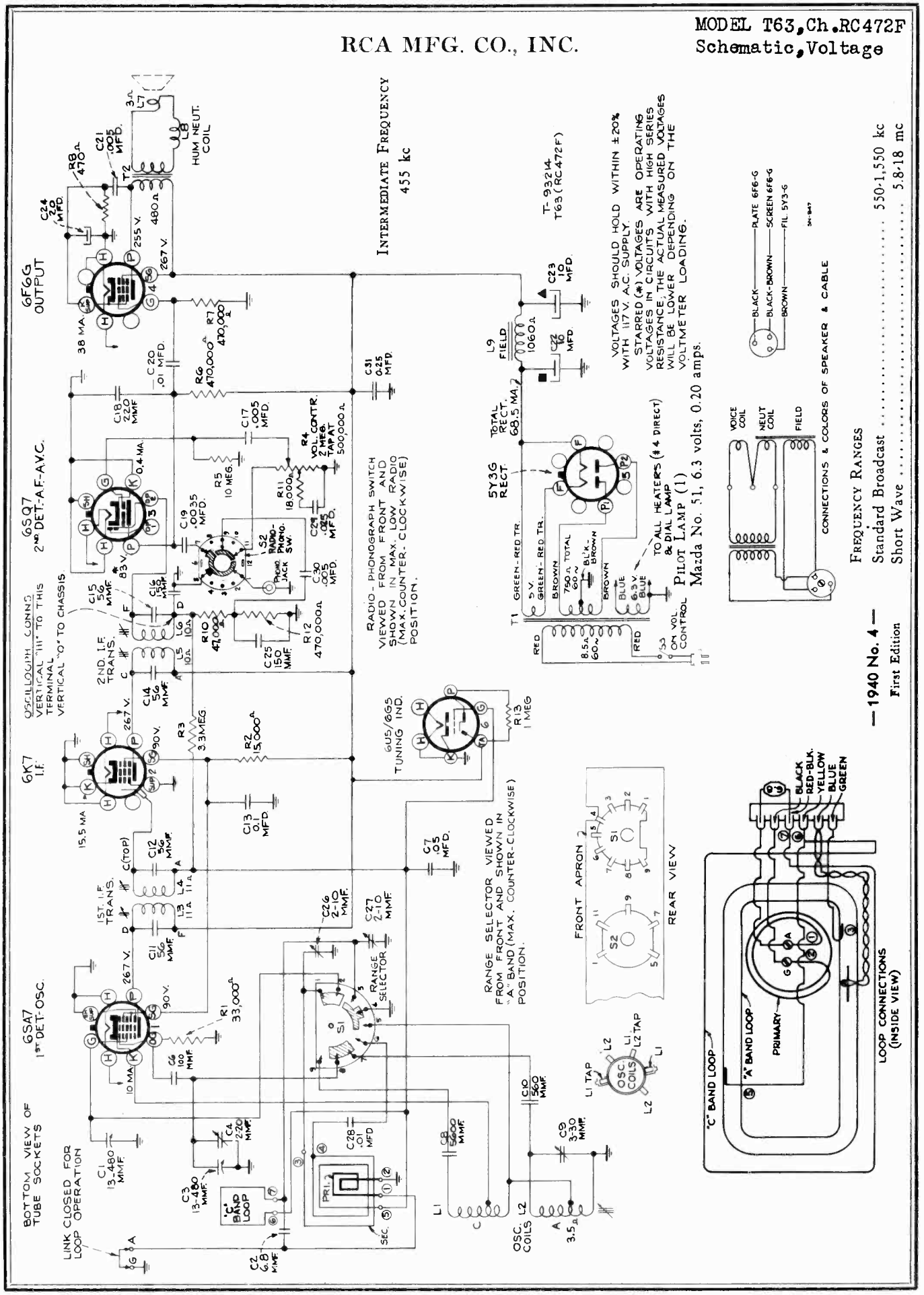
This receiver is equipped with two loop antennas ("C" band horizontal and fixed, and "A" band vertical and rotatable). During operation the "A" band loop should be rotated to the position giving maximum signal strength and freedom from noise. If desired, an outside antenna and ground can be connected to the terminals provided and when this is done the link between these terminals must be opened. However, for loop operation this link must be closed.



Controls

RCA MFG. CO., INC.

MODEL T63, Ch. RC472F
Schematic, Voltage



MODEL T63,Ch.RC472F
Alignment,Trimmers
Socket,Dial Data
Tuner

RCA MFG. CO., INC.

MODEL K61
Tuner Data

POWER OUTPUT RATING

Undistorted	2.5 watts
Maximum	4.5 watts

LOUDSPEAKER (RL 79 A 4)

Type	6 inch Electrodynamic
Voice Coil Impedance at 400 Cycles	3.4 ohms

POWER SUPPLY RATINGS

Rating A	105-125 volts, 50-60 cycles, 75 watts
Rating B	105-125 volts, 25-60 cycles, 75 watts
Rating C	105-125, 200-250 volts, 50-60 cycles, 75 watts

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the schematic drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, keep the output as low as possible to avoid a-v-c action. The low side of the test-oscillator should be connected to the receiver chassis.

Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the tuning drum. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the chassis, and bend the wire so that it points to the 0° mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, adjust the dial indicator along the drive cable to the 540 kc mark, gang condenser fully meshed. The indicator has a clip for attachment to the cable.

Precautionary Lead Dress:

(1) Dress C8 (Oscillator coil to range switch) and its leads away from surrounding wires and chassis.

(2) Dress R2 (Screen to B+) away from surrounding wires and parts.

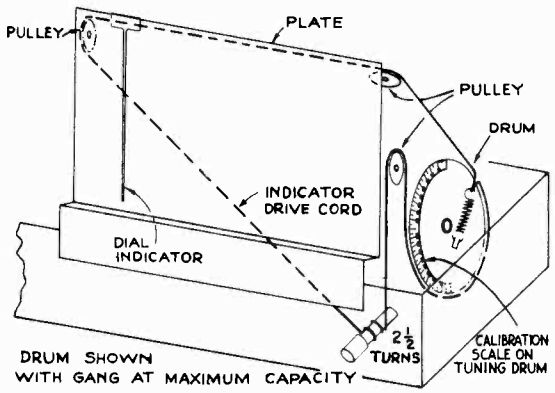
(3) Dress power switch leads away from 6SQ7 and 6F6G tube sockets.

Steps	Connect high side of test-osc. to—	Tune test osc. to—	Turn radio Dial to	Adjust the following for max. peak output
1	Grid of 6K7 through 0.01 mfd.	455 kc	"A" band Quiet point between 550-750 kc	L5 and L6 (2nd I-F trans.)
2	Grid of 6SA7 through 0.01 mfd.			L3 and L4 (1st I-F trans.)
3	Antenna terminal through 300 ohms	15 mc	"C" band 15 mc (132°)	C4 osc.* C27 ant.**
4	Antenna terminal through 200 mmfd.	600 kc	"A" band 600 kc (23.5°)	L2 osc. (Rock in)
5		1,500 kc	"A" band 1,500 kc (156.5°)	C9 osc. C26 ant.
6	Repeat Steps 4 and 5			

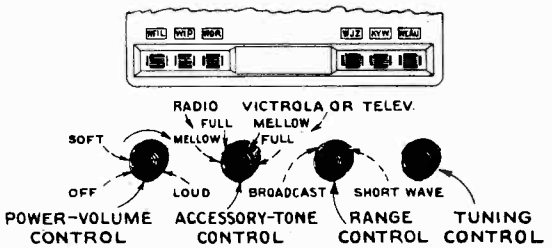
* Use minimum capacity peak if two can be obtained.
** Use maximum capacity peak if two can be obtained.
NOTE: Oscillator tracks above signal on all bands.

ANTENNAS

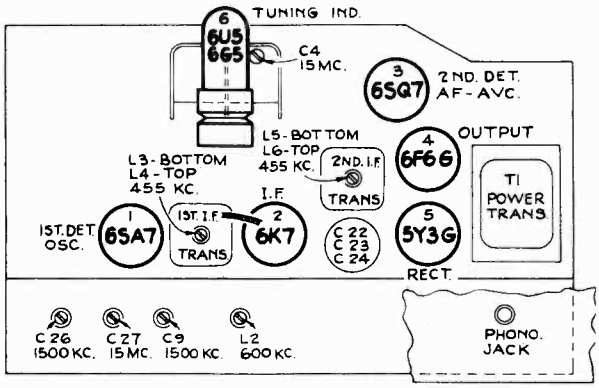
This receiver is equipped with a loop antenna for "A" and "C" bands. Both loops are fixed in position being mounted vertically from the rear of the chassis. For best performance the receiver should be turned to a position giving maximum signal strength and freedom from noise. The loop connections are shown in a separate diagram. If desired, an external antenna and ground can be connected to the terminals provided. In this case the link between these terminals must be opened; however, for loop operation this link must be closed.



Dial Indicator and Drive Mechanism



Dial and Controls



Tube and Trimmer Locations

Adjustments for Push-Button Tuning

The push-buttons should be adjusted for six favorite stations after the receiver has been operating for a brief warm-up period. Each button may be set up for any standard broadcast station. The preferable arrangement is to adjust for stations in the order of frequency, from low to high. Proceed as follows:

1. Pull off the push-buttons and loosen the push-button rods with a small screwdriver.

2. Set the receiver for "Radio" operation, range selector on "Broadcast", and accurately tune in the station for which the first button is to be set.

3. Press in the first push-button rod (left) with the screwdriver as far as it will go without undue pressure, hold in, retune station with manual control if necessary for best reception, and then carefully tighten up the rod. Do not tighten more than ¼ turn after the rod begins to grip or damage to the mechanism may result.

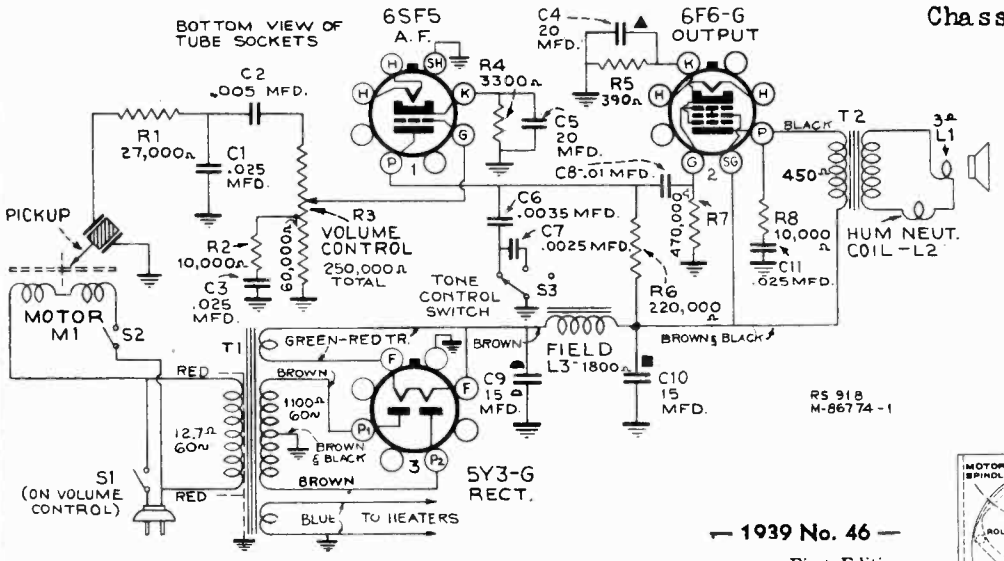
4. Replace the push-button on its shaft.

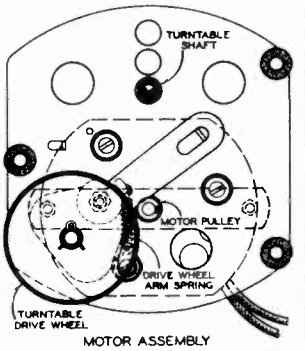
5. Proceed in a similar manner for the remainder of the push-buttons.

6. Insert the station marker tabs in the recesses above the push-buttons.

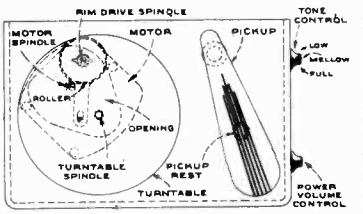
RCA MFG. CO., INC.

MODEL R60, Chassis RS91B
Victrola
Schematic, Voltage
Chassis Wiring, Assembly





MOTOR ASSEMBLY



— 1939 No. 46 —
First Edition

VICTROLA MODEL R-60

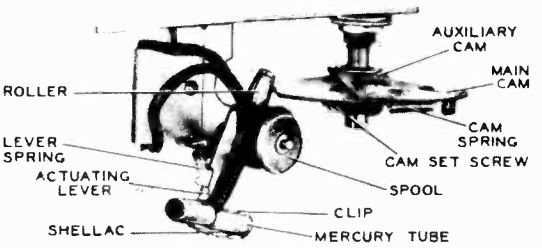
(phonograph only) RS-91B

The Victrola Model R-60 consists of a crystal pickup, a two-stage audio amplifier, a six-inch electrodynamic speaker, and a rim-drive motor turntable mechanism with automatic mercury switch for starting and stopping—all housed in a wood cabinet of modern design and appearance.

The phonograph motor is a self-starting, constant-speed induction type. It should be lubricated every six months by applying a few drops of light machine oil to the top and bottom motor spindle bearings, to the turntable spindle, and to the turntable drive wheel bearing.

CAUTION: Keep oil away from drive bushing on top of motor spindle and from rubber driving tire on turntable drive wheel.

The motor switch is automatic for both starting and stopping, and when properly adjusted, will turn the motor on as the pickup is moved from the pickup rest toward the turntable. The switch should be adjusted so that it will snap into the "off" position when the pickup needle is 1¾ inches from the center line of the spindle. The motor may be shut off at any time by placing the pickup on the pickup rest.



MERCURY SWITCH MECHANISM
(VIEWED FROM FRONT
SHOWN WITH PICKUP IN REST POSITION)

Specifications

POWER SUPPLY RATINGS

A-6 ..... 105-125 volts, 60 cycles, 90 watts
A-5 ..... 105-125 volts, 50 cycles, 90 watts

LOUDSPEAKER (RL-79-2)

Type ..... 6-inch electrodynamic
V. C. Impedance at 400 cycles ..... 3.4 ohms

TUBE COMPLEMENT

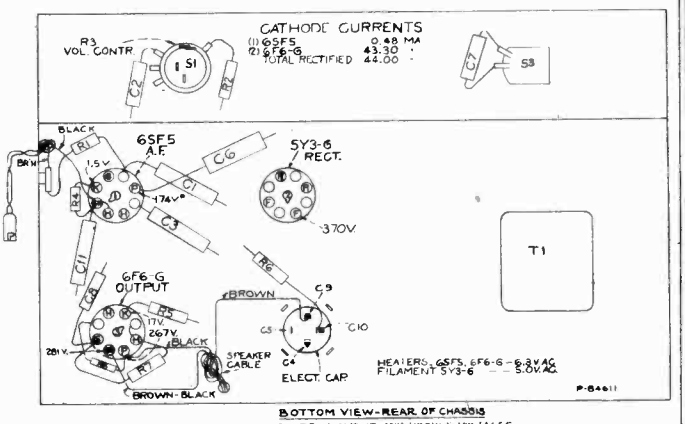
(1) RCA—6SF5 ..... A-F Amplifier
(2) RCA—6F6-G ..... Output
(3) RCA—5Y3-G ..... Rectifier

PICKUP

Type ..... Crystal
Impedance ..... 100,000 ohms at 400 cycles
Average Output .... 1½ volts at 1,000 cycles with 250,000 ohms load

	Height	Width	Depth
Cabinet Dimensions (inches)	8 1/16	14	9¾
Chassis Base Dimensions (inches) ..	2¼	7⅜	4¼

Overall Chassis Height ..... 6½ inches
Weight ..... 20 lbs. (shipping)



BOTTOM VIEW—REAR OF CHASSIS
PARTS LAYOUT AND SOCKET VOLTAGES

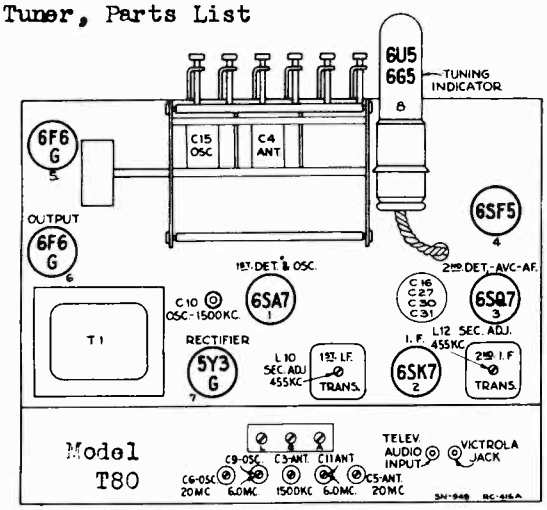
***NOTE:** Values with star (*) are operating voltages in circuits with high series-resistance, and when measured will read lower depending on the voltmeter loading.

Measurements made to chassis unless otherwise indicated. Values should hold within approximately ±20% with 117-volt a-c supply.

MODELS T64,T65,Ch.RC416
MODEL T80,Chassis RC416A
Tuner, Parts List

RCA MFG. CO., INC.

MODEL T80,
Socket,Trimmers



The push-buttons should be adjusted for six favorite stations after the receiver is operating, and has had a brief warm-up period.

Any standard broadcast stations may be chosen. The preferable arrangement is to adjust for stations in the order of frequency, from low to high. Proceed as follows:

1. Loosen the push-button screws in back of the station-marker recesses.
2. Set Accessory-Tone Knob to "Radio" and turn the range selector to "A," so that the "A" band indicator lights up.
3. Press in the tuning knob and accurately tune in the first station.
4. With station accurately tuned in, press in the first push-button and tighten the screw.
5. Place the station marker tab in the recess.
6. Proceed in a similar manner to adjust the remainder of the push-buttons.

STOCK No.	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES (RC-416A)	
33620	Arm—Push arm and cam assembly on tuning unit—less lock screw	.35
33430	Board—Antenna and ground terminal board	.20
34268	Cap—Rubber cap for tuning tube	.10
12714	Capacitor—Air trimmer, 2-12 mmfd. (C10)	.50
33429	Capacitor—Trimmer capacitor bank, two 4-50 mmfd., three 2-20 mmfd., sections (C3, C5, C6, C9, C11)	.80
32792	Capacitor—25 mmfd. (C2)	.40
12723	Capacitor—56 mmfd. (C12)	.35
30904	Capacitor—100 mmfd. (C19, C20)	.25
12404	Capacitor—120 mmfd. (C21, C22)	.30
14712	Capacitor—180 mmfd. (C23)	.30
12694	Capacitor—220 mmfd. (C14)	.35
30433	Capacitor—470 mmfd. (C1)	.35
12537	Capacitor—560 mmfd. (C32)	.35
31433	Capacitor—560 mmfd. (C7)	.35
31403	Capacitor—3,300 mmfd. (C8)	.60
31405	Capacitor—6,000 mmfd. (C13)	.75
5107	Capacitor—.0025 mfd. (C25)	.20
4838	Capacitor—.005 mfd. (C24, C26, C29, C33, C35)*	.25
4937	Capacitor—.01 mfd. (C28)	.25
4870	Capacitor—.025 mfd. (C18)	.20
32787	Capacitor—.05 mfd. (C17, C34)*	.20
33014	Capacitor—Electrolytic, three 10 mfd., and one 20 mfd. sections (C16, C27, C30, C31)	1.90
33508	Clip—Magic Eye mounting clip and bracket	.25
32821	Coil—Antenna coil (L1, L2, L3, L4)	1.35
32824	Coil—Oscillator coil (L5, L6, L7)	1.00
32635	Cord—Condenser drive cord	.24
32634	Cord—Drive cord	.10
32713	Core—Adjustable core and stud for oscillator coil	.35
33627	Drum—Condenser drive drum	.25
34267	Drum—Drive cord drum	.65
33186	Gear—Volume control knob shaft and gear	.40
33185	Gear—Volume control gear and hub, with set screws	.50
11891	Lamp—Dial lamp	.17
33431	Link—Antenna and ground terminal board link	.02
34041	Link—Link complete with arm and cam for operating range switch	.50
33628	Plate—Front guide plate for push arms	.25
13871	Plug—Eye cable plug	.45
5040	Plug—Speaker cable plug	.30
33509	Pulley—Drive cord pulley and bracket (1 pulley)	.20
33510	Pulley—Drive cord pulleys and bracket (2 pulleys)	.45
33626	Pulley—Drive pulley	.25
14439	Resistor—100 ohms, ½ watt (R12)	.20
30735	Resistor—560 ohms, 1 watt (R8)	.22
12265	Resistor—6,800 ohms, ½ watt (R17)*	.20
14559	Resistor—10,000 ohms, ½ watt (R11)	.20
33489	Resistor—15,000 ohms, 2.5 watts (R3)	.55
14284	Resistor—22,000 ohms, 1/10 watt (R5)	.15
12454	Resistor—33,000 ohms, ½ watt (R2)	.20
12285	Resistor—470,000 ohms, ½ watt (R9, R10, R14, R16)*	.20
12013	Resistor—1 meg., 1/10 watt (R13)	.15
13730	Resistor—1 meg., ½ watt (R1)	.20
12679	Resistor—2.2 meg., ½ watt (R4)	.20
13601	Resistor—10 meg., ½ watt (R7, R15)	.20
14343	Retainer—Retaining ring for volume control knob shaft	.03
34040	Ring—Retaining ring for tuning shaft	.02
4669	Screw—No. 8-32 sq. hd. set screw for volume control gear and drum	.03
33621	Screw—Push arm lock screw	.05
34039	Shaft—Range switch knob shaft	.15
33624	Shaft—Tuning condenser drive shaft and washer	.15
34038	Shaft—Tuning knob shaft with rubber drive roller and pulley assembled	.60
33545	Shield—Dial lamp shield	.05
31364	Socket—Dial lamp socket	.20
33514	Socket—Phonograph and Television socket	.25
31319	Socket—Tube socket	.25
33544	Spring—Drive cord tension spring	.05
33623	Spring—Drive drum cord spring	.04
33622	Spring—Push arm return spring	.08
34042	Spring—Spring and pin for range switch shaft	.20
33515	Spring—Tension spring for spring and pin	.02
33513	Switch—Range switch (S1, S2)	1.05
33511	Tone Control, Television and Phono switch (S3, S4)	1.10
33428	Transformer—First i-f transformer (L9, L10, C19, C20)	1.95
14308	Transformer—Second i-f transformer (L11, L12, C21, C22, C23, R5)	2.90
33619	Transformer—Power transformer 105-120 volts, 25-60 cycles (T1)	6.40
33112	Transformer—Power transformer 105-120 volts, 50-60 cycles (T1)	4.30
31446	Transformer—Power transformer—Universal—60 cycle (T1)	6.40
33512	Volume control and power switch (R6, S5)	2.00
33726	Washer—"C" washer for spring and pin	.02
34037	Washer—"C" washer for tuning shaft	.02
	SPEAKER ASSEMBLIES (RL79-5)	
32907	Cap—Cone center dust cap	.02
32906	Coil—Hum neutralizing coil	.25
33547	Coil—Speaker field coil	1.00
32934	Cone—Speaker cone and voice coil	1.65
5039	Plug—4-prong male speaker connection plug*	.30
33599	Transformer—Speaker output transformer*	1.35
	MISCELLANEOUS ASSEMBLIES	
33474	Button—Push button	.10
33552	Dial—Glass dial scale	1.80
33549	Escutcheon—Dial and push button escutcheon—less buttons and screen	1.95
33551	Frame—Dial frame, holder, and pointer assembled—less dial	1.70
33471	Knob—Volume control knob	.25
33553	Knob—Range selector knob	.30
33470	Knob—Tone control knob	.20
33505	Knob—Tuning control knob	.30
33842	Marker—Station selector call letter markers	.25
33550	Screen—"Push Button "A" Band" marker screen	.20
30330	Spring—Retaining spring for knob, Stock No. 33470	.03
14270	Spring—Retaining spring for knob, Stock No. 33553 and Stock No. 33471	.05
4982	Spring—Retaining spring for knob, Stock No. 33505	.05

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

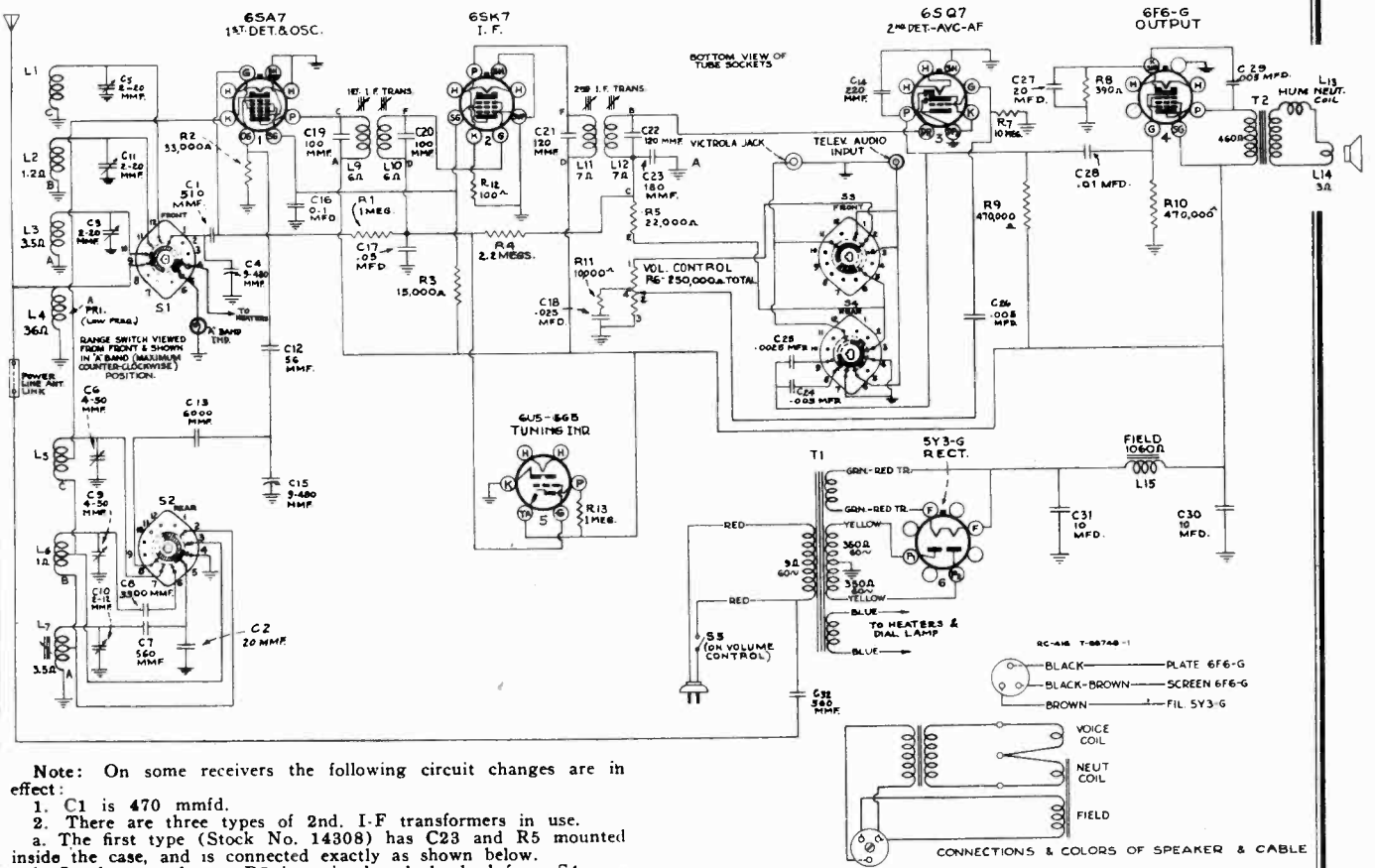
* Model T-80 only

NOTE: Above Parts List applies to both Models T-64 and T-80, except for the items noted. Items on the right apply only to Model T-64.

4839	Capacitor—0.1 mfd. (C16)	.30
32240	Capacitor—Electrolytic, two 10 mfd., and one 20 mfd. sections (C27, C30, C31)	1.45
31388	Resistor—390 ohms, 1 watt (R8)	.22
5119	Plug—Speaker cable plug	.25
	SPEAKER ASSEMBLIES (RL-79-4)	
5118	Plug—3-contact male plug for speaker	.25
32905	Transformer—Output transformer (T2)	1.35

RCA MFG. CO., INC.

MODELS T64, T65, Ch. RC416
Schematic, Voltage
Chassis Wiring, Changes



Note: On some receivers the following circuit changes are in effect:

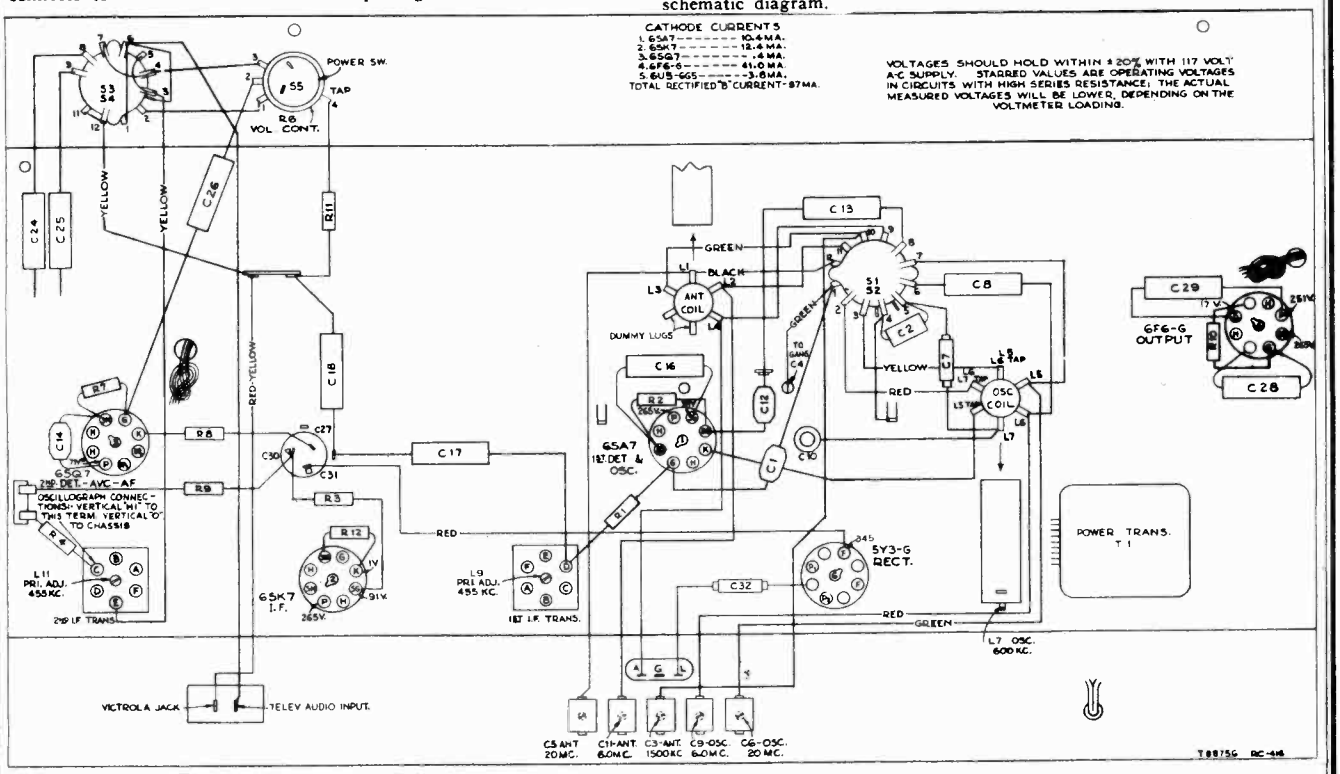
1. C1 is 470 mmfd.
2. There are three types of 2nd. I-F transformers in use.

a. The first type (Stock No. 14308) has C23 and R5 mounted inside the case, and is connected exactly as shown below.

b. In the second type R5 is omitted and the lead from S4 connects to C instead of E. E is not used.

c. In the third type R5 is omitted and C23 is connected externally from C to ground. E is not used. The lead from the diode plate connects to A instead of B. When replacing this transformer with Stock No. 14308, remove the external C23 and connect the replacement transformer as shown in the schematic diagram.

Important: Stock No. 14308 is used as replacement for all three of the above types, and should be connected as shown in the schematic diagram.



R-F WIRING & SOCKET VOLTAGES

MODEL T64,T65,Ch.RC416
Alignment,Trimmers
Socket,Drive Cable

RCA MFG. CO., INC.

POWER SUPPLY RATINGS

Rating A..... 105-125 volts, 50-60 cycles, 75 watts

Rating B..... 105-125 volts, 25-60 cycles, 75 watts

Rating C..... 100-130, 140-160, 195-250 volts, 40-60 cycles, 75 watts

PILOT LAMPS (2).. Mazda No. 44, 6.3 volts, 0.25 amp.

POWER OUTPUT RATING

Undistorted..... 2.5 watts
Maximum..... 4.5 watts

LOUDSPEAKER (RL-79-4)

Type..... 6-inch Electrodynamic
V.C. Impedance..... 3.4 ohms at 400 cycles

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord-Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the tuning drum. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 240° mark on the drum scale must be vertical and directly above the center of the shaft of the tuning drum when the plates are fully meshed. The drum is held to the shaft by means of two set-screws, which must be tightened securely when the drum is in the correct position.

On the inner side of the tuning drum are two projections which serve as stops to prevent extreme rotation of the gang condenser. The tuning drum should be set so that the stop limiting clockwise movement of the drum takes effect just as the gang condenser plates are becoming fully meshed, thus preventing stress on the gang due to extreme rotation.

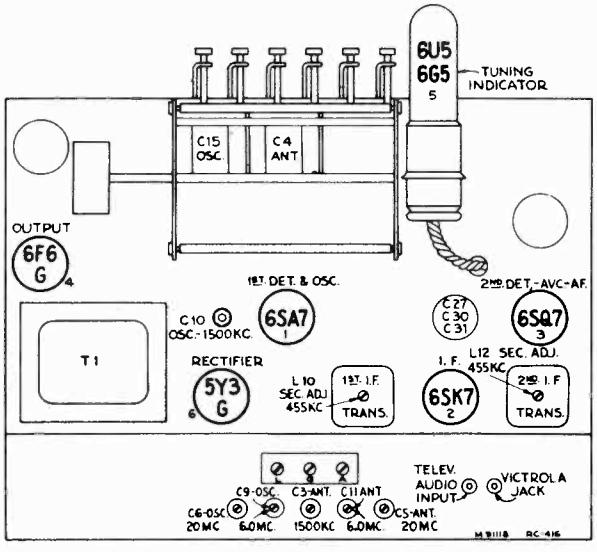
Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the chassis, and bend the wire so that it points to the 240° mark on the calibration scale when the plates are fully meshed.

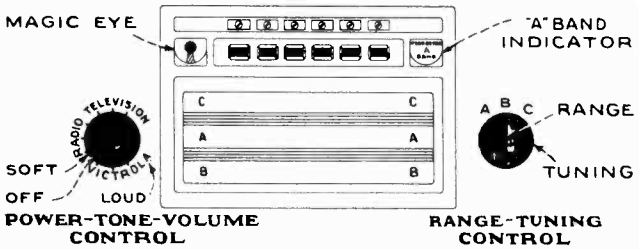
Steps	Connect the high side of the test-osc. to—	Tune test osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	6SK7 grid in series with .01 mfd.	455 kc	"A" Band Quiet Point between 550-750 kc	L11 and L12 (2nd I-F Trans.)
2	6SA7 grid in series with .01 mfd.			L9 and L10 (1st I-F Trans.)
3	Ant. terminal in series with 300 ohms	20 mc	20 mc (40°) "C" Band	C6 (osc.)* C5 (ant.)
4		6 mc	6 mc (52.5°) "B" Band	C9 (osc.)** C11 (ant.)
5	Ant. terminal in series with 200 mmfd.	1,500 kc	1,500 kc (41.75°) "A" Band	C10 (osc.) C3 (ant.)
6		600 kc	600 kc (200.25°) "A" Band	L7 (osc.) Rock Gang
7	Repeat step 5.			

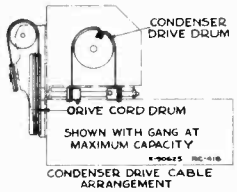
* Use minimum capacity peak if two can be obtained. Check to determine that C6 has been adjusted to correct peak by tuning receiver to approximately 19.09 mc where a weaker signal should be received.

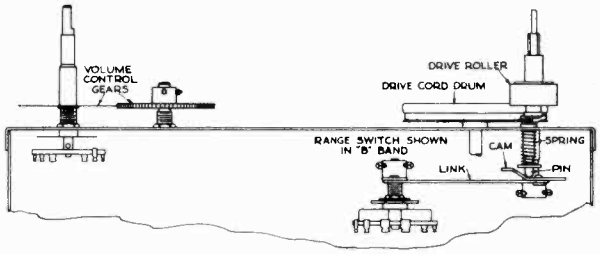
** Use minimum capacity peak if two can be obtained. Check to determine that C9 has been adjusted to correct peak by tuning receiver to approximately 5.09 mc where a weaker signal should be received.

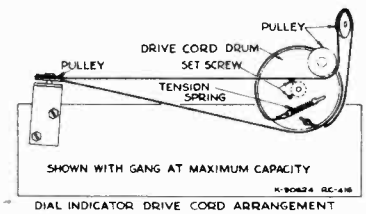
Note: Oscillator tracks above signal on all bands.







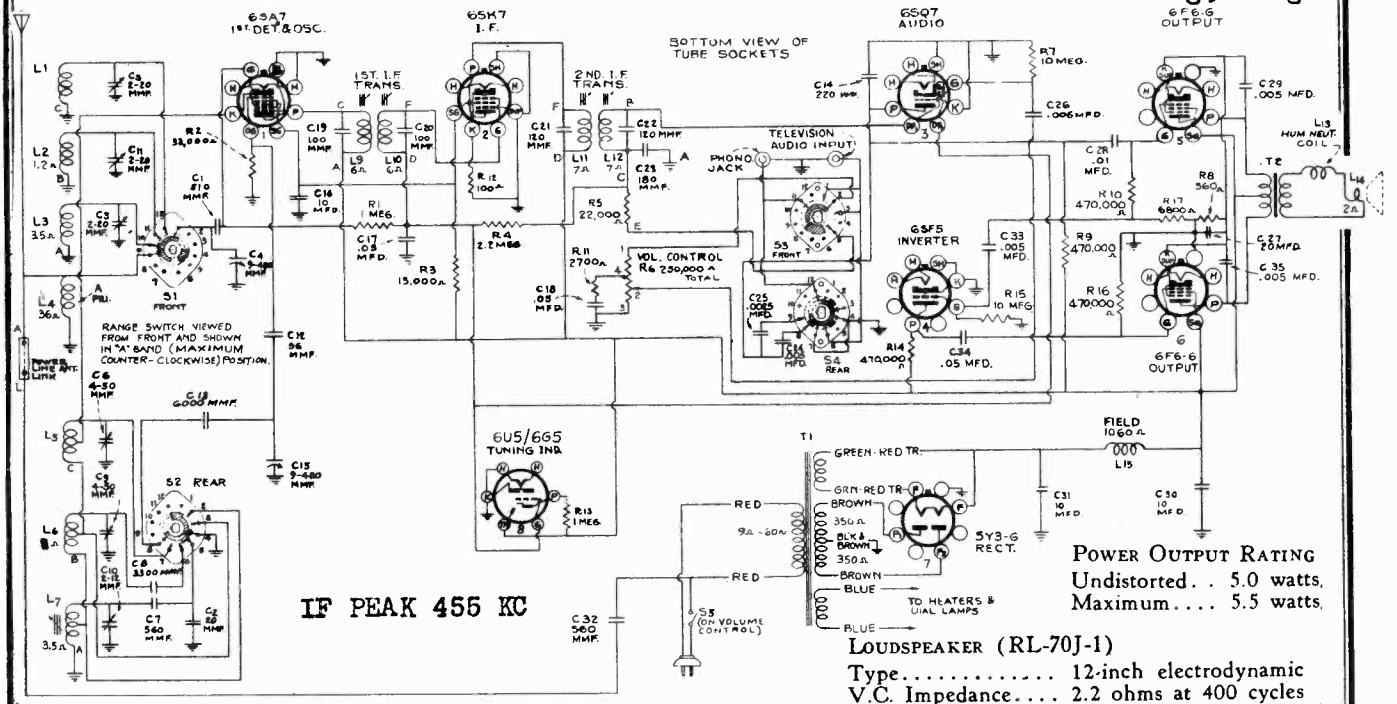




Note! Adjustment of the link and cam should be such that in "A" band position when push-buttons are operated, the drive cord drum will turn freely without rubbing or binding against the drive roller.

RCA MFG. CO., INC.

MODEL K80, Ch. RC415A
Schematic, Voltage
Chassis Wiring, Changes

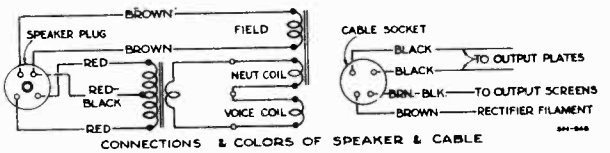


POWER OUTPUT RATING

Undistorted . . 5.0 watts.
Maximum . . . . 5.5 watts.

LOUDSPEAKER (RL-70J-1)

Type . . . . . 12-inch electrodynamic
V.C. Impedance . . . . 2.2 ohms at 400 cycles



CONNECTIONS & COLORS OF SPEAKER & CABLE

Note: On some receivers the following circuit modifications are in effect:

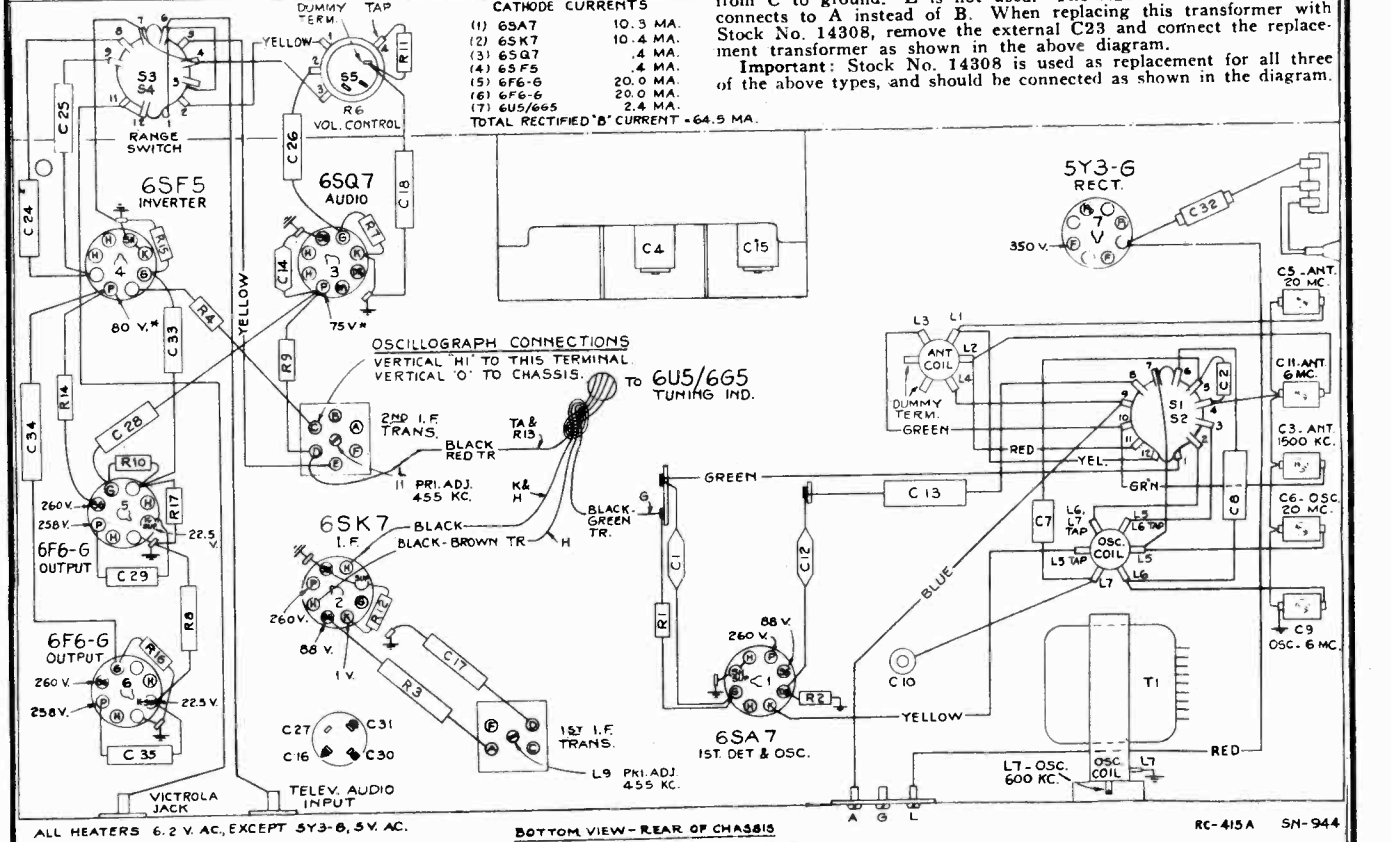
1. R11 is 5,600 ohms, and C18 is 0.1 mfd.
2. C1 is 470 mmfd.; R15 is 2,700 ohms and is connected from cathode of 6SF5 Inverter to ground; R17 is 15,000 ohms; and C33 is omitted.
3. There are three types of 2nd I-F transformers in use.
   a. The first type (Stock No. 14308) has C23 and R5 mounted inside the case, and is connected exactly as shown above.
   b. In the second type R5 is omitted and the lead from S4 connects to C instead of E. E is not used.
   c. In the third type R5 is omitted and C23 is connected externally from C to ground. E is not used. The lead from the diode plate connects to A instead of B. When replacing this transformer with Stock No. 14308, remove the external C23 and connect the replacement transformer as shown in the above diagram.

Important: Stock No. 14308 is used as replacement for all three of the above types, and should be connected as shown in the diagram.

CATHODE CURRENTS

(1) 6SA7	10.3 MA.
(2) 6SK7	10.4 MA.
(3) 6SQ7	.4 MA.
(4) 6SF5	.4 MA.
(5) 6F6-G	20.0 MA.
(6) 6F6-G	20.0 MA.
(7) 6U5/6G5	2.4 MA.

TOTAL RECTIFIED "B" CURRENT - 64.5 MA.



ALL HEATERS 6.2 V. AC., EXCEPT 5Y3-G, 5 V. AC.

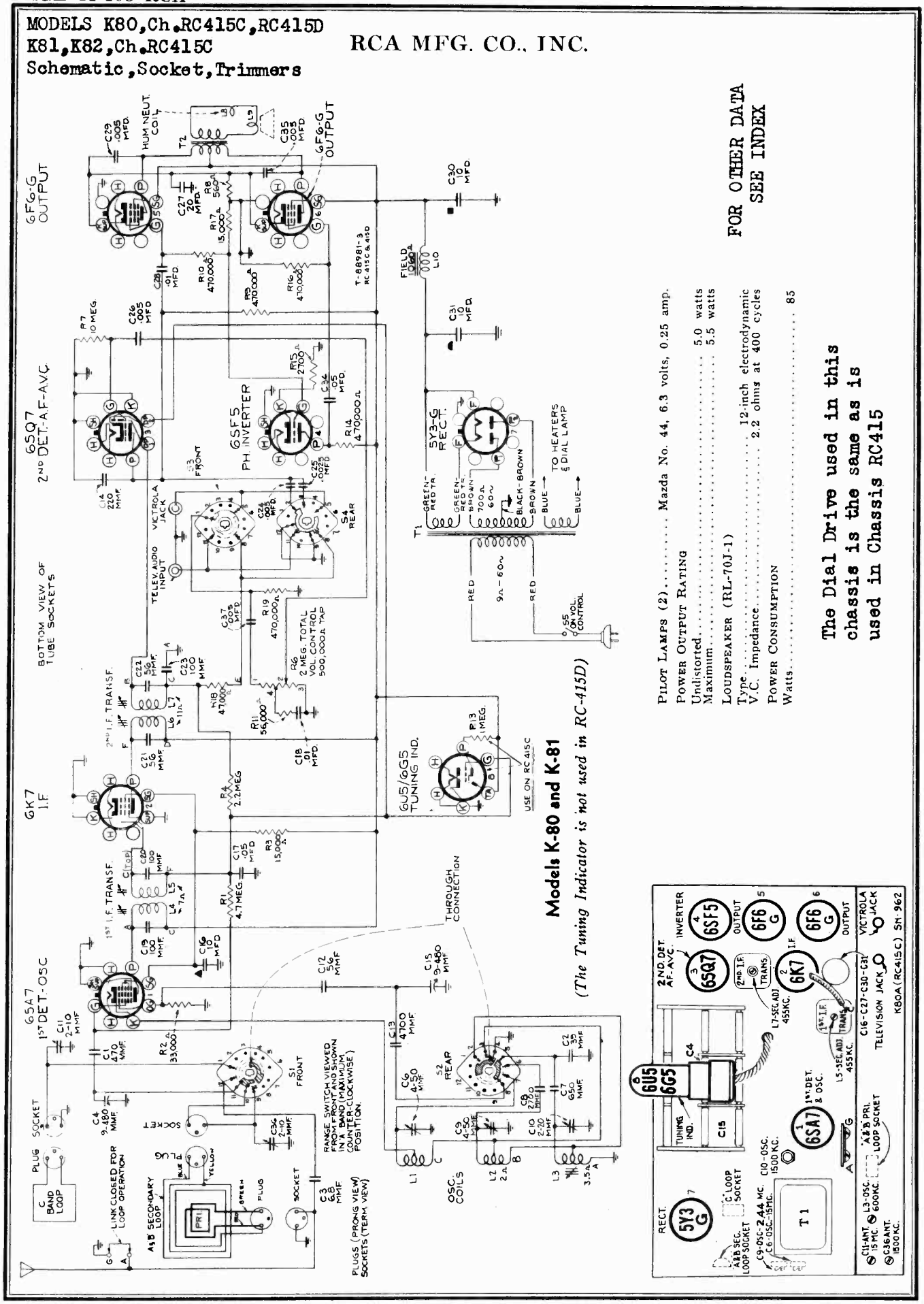
BOTTOM VIEW - REAR OF CHASSIS

R-F WIRING & SOCKET VOLTAGES

RC-415A SN-944

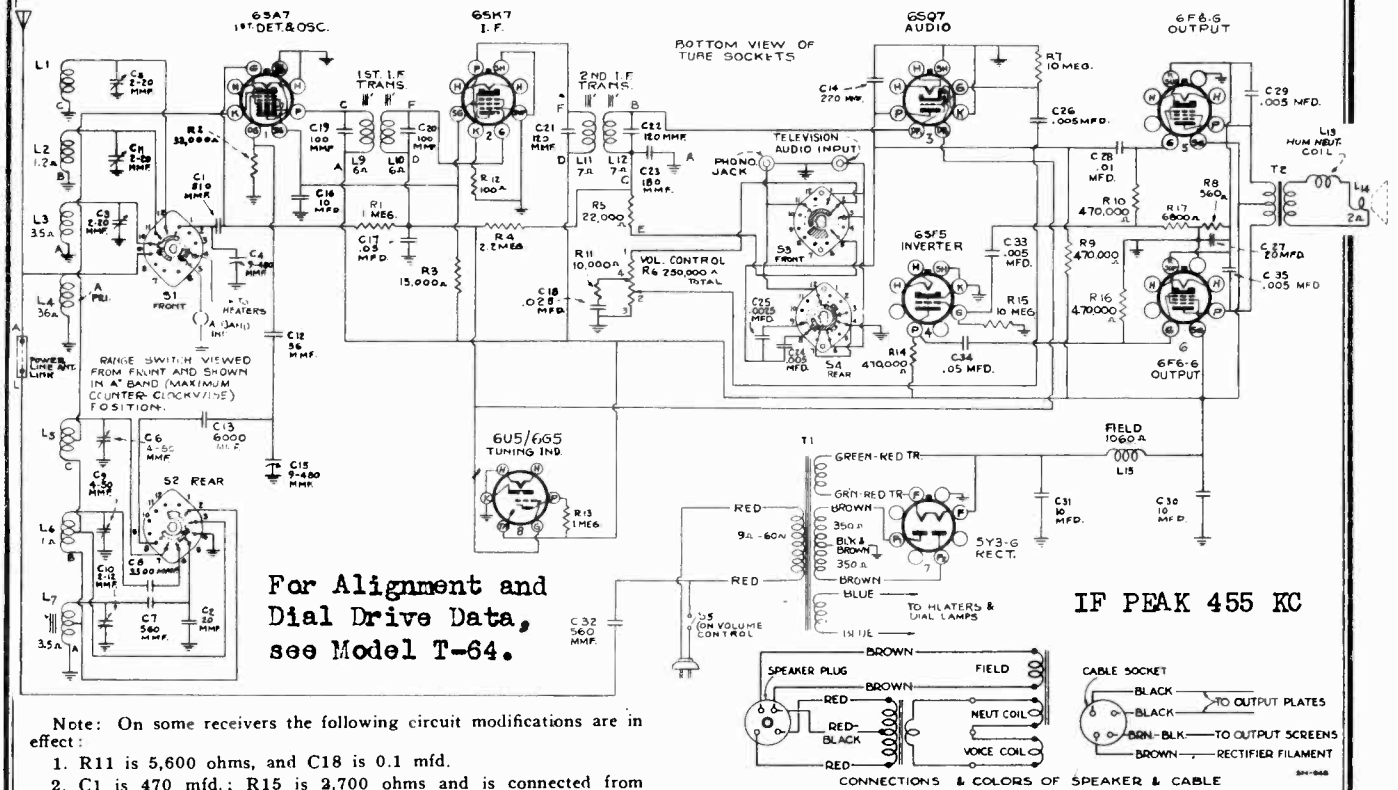
MODELS K80,Ch.RC415C,RC415D
K81,K82,Ch.RC415C
Schematic,Socket,Trimmers

RCA MFG. CO., INC.



RCA MFG. CO., INC.

MODEL T80, Ch. RC416A
Schematic, Voltage
Chassis Wiring



For Alignment and Dial Drive Data, see Model T-64.

IF PEAK 455 KC

CONNECTIONS & COLORS OF SPEAKER & CABLE

Note: On some receivers the following circuit modifications are in effect:

1. R11 is 5,600 ohms, and C18 is 0.1 mfd.

2. C1 is 470 mfd.; R15 is 2,700 ohms and is connected from cathode of 6SF5 Inverter to ground; R17 is 15,000 ohms; and C33 is omitted.

3. There are three types of 2nd I-F transformers in use.

a. The first type (Stock No. 14308) has C23 and R5 mounted inside the case, and is connected exactly as shown below.

b. In the second type R5 is omitted and the lead from S4 connects to C instead of E. E is not used.

c. In the third type R5 is omitted and C23 is connected externally from C to ground. E is not used. The lead from the diode plate connects to A instead of B. When replacing this transformer with Stock No. 14308, remove the external C23 and connect the replacement transformer as shown in the schematic diagram.

Important: Stock No. 14308 is used as replacement for all three of the above types, and should be connected as shown in the schematic diagram.

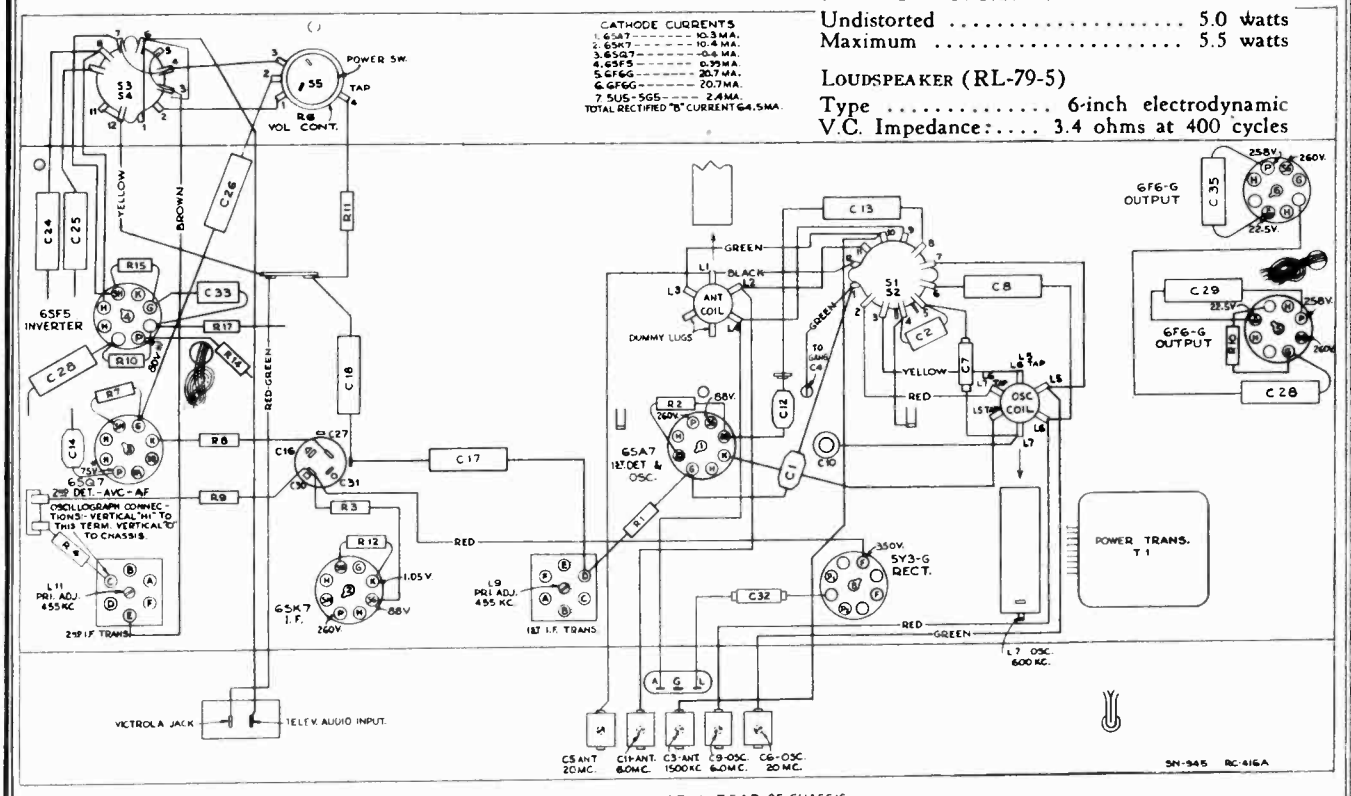
CATHODE CURRENTS
1. 6SA7 ------ 10.3 MA.
2. 6SK7 ------ 10.4 MA.
3. 6SQ7 ------ 0.4 MA.
4. 6SF5 ------ 0.39 MA.
5. 6F6G ------ 20.7 MA.
6. 6F6G ------ 20.7 MA.
7. 5US-5G5 ---- 2.4 MA.
TOTAL RECTIFIED "B" CURRENT 64.5 MA.

POWER OUTPUT RATING

Undistorted ..... 5.0 watts
Maximum ..... 5.5 watts

LOUDSPEAKER (RL-79-5)

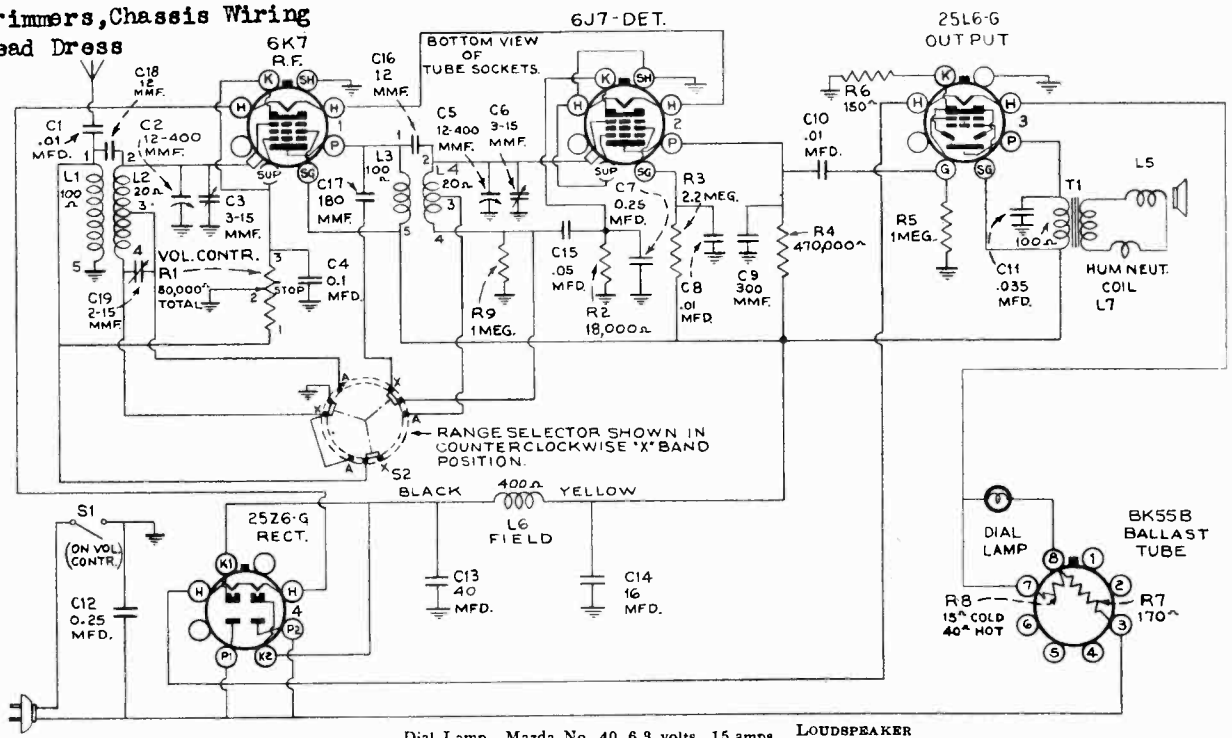
Type ..... 6-inch electrodynamic
V.C. Impedance:.... 3.4 ohms at 400 cycles



BOTTOM VIEW—REAR OF CHASSIS

MODEL 95XLW
Chassis RC-345F
Schematic, Voltage, Socket
Trimmers, Chassis Wiring
Lead Dress

RCA MFG. CO., INC.



Power Supply Ratings

A-C Rating ..... 105-125 volts, 25-60 cycles, 50 watts
D-C Rating ..... 105-125 volts, 50 watts

Frequency Ranges

Long Wave (X) ..... 150-360 kc
Standard Broadcast (A) ..... 530-1,500 kc

Dial Lamp. Mazda No. 40, 6.3 volts, .15 amps.

Loudspeaker

Type ..... 5-inch electrodynamic
Voice-Coil Impedance ... 3 ohms at 400 cycles

Power Output

(125 volt, 60 cycle supply)
Undistorted ..... 1.0 watt
Maximum ..... 1.5 watts

Alignment Procedure

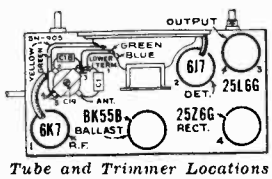
CAUTION: The chassis is connected to one side of the power line. Avoid contact of chassis or parts to external ground when servicing.

Turn pointer, while holding tuning knob, so that the pointer is horizontal and pointing to low frequency end when the gang condenser is at maximum.

Reel up the antenna wire, and connect the high side of test-oscillator through an 80 mmfd. capacitor to the antenna terminal on the antenna transformer. Connect low side of oscillator to receiver chassis through a 0.1 capacitor. Keep antenna roll and lead clear of chassis during alignment.

To align "A" band, turn range switch to "A" band (clockwise) position, turn receiver dial to 1,500 kc, tune test-oscillator to 1,500 kc, connect an output meter across the voice coil, and turn volume control to maximum. Adjust the two trimmers (C3 and C6) on side of gang condenser for maximum output, using lowest possible output from test-oscillator.

To align "X" band, turn range switch to "X" band (counter-clockwise) position, tune test-oscillator to 360 kc, and adjust C19 for maximum output. The gang should be rocked during "X" band alignment.



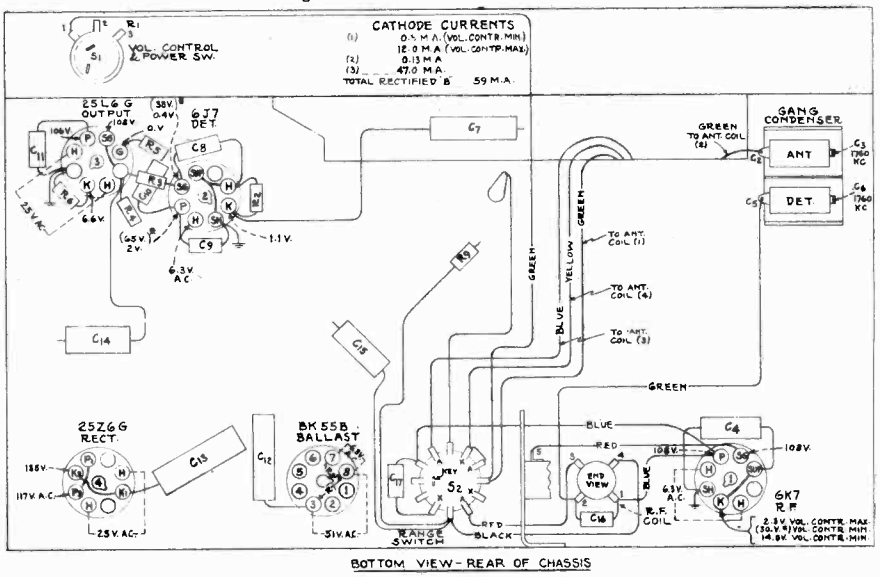
Tube and Trimmer Locations

* Note: Values with (*) are operating voltages.
Values not starred are actual measured voltages.

Measurements made to chassis unless otherwise indicated.

Measurements made with set tuned to quiet point, volume control at minimum, using 1,000-ohm-per-volt meter, having ranges of 10, 50, and 250 volts. (Use nearest range above the specified measured voltage.)

Values should hold within approximately ± 20% for 117-volt 60-cycle a-c supply. On d-c, voltages are approximately 10% lower, except heaters, which remain the same.



BOTTOM VIEW - REAR OF CHASSIS

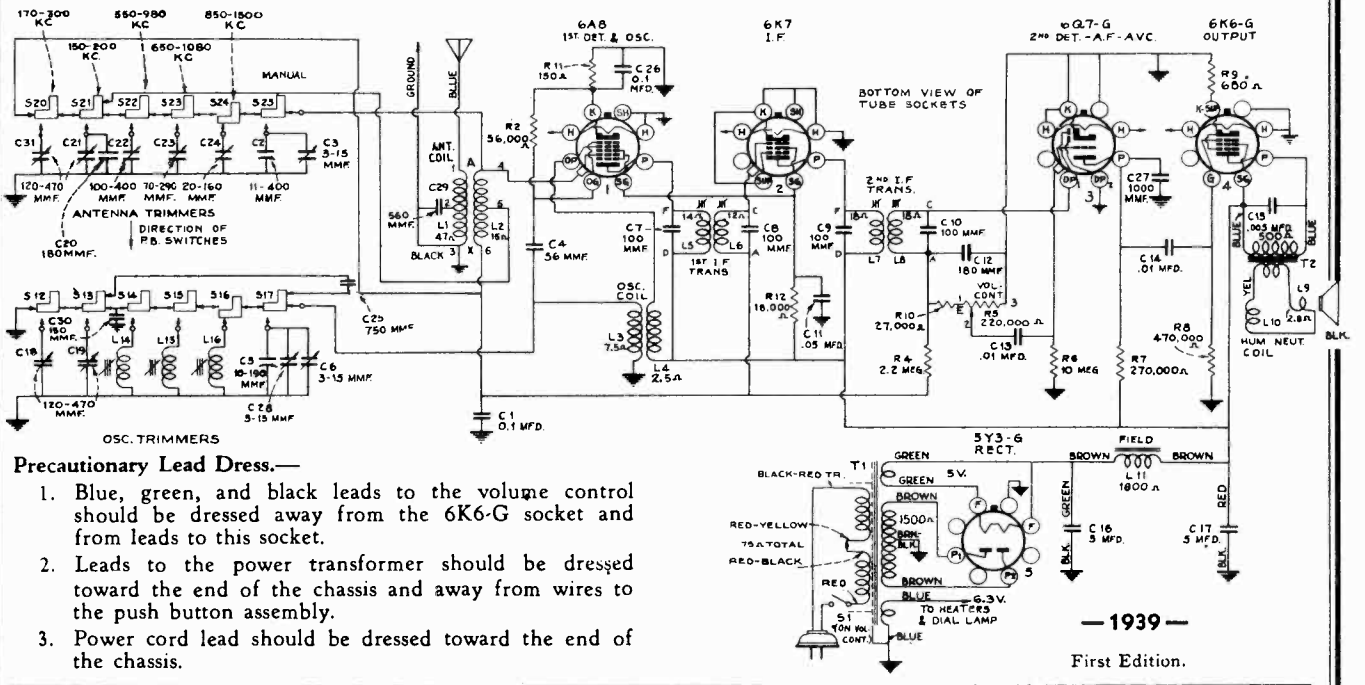
Precautionary Lead Dress

1. Dress power cord away from yellow lead to volume control.
2. Dress all leads away from antenna coil.

   Green lead from gang to detector coil must be dressed under switch shaft and over detector coil (looking from bottom of chassis).
4. Yellow lead from volume control to 6K7 cathode must be dressed down against rear apron of chassis.
5. Green lead from switch to volume control must be dressed away from all other wires.
6. All leads to detector coil, except green lead in No. 3 (above) must be dressed down against the chassis base.

RCA MFG. CO., INC.

MODEL 95T5LW
Chassis RC-348F
Schematic, Voltage
Chassis Wiring, Lead Dress

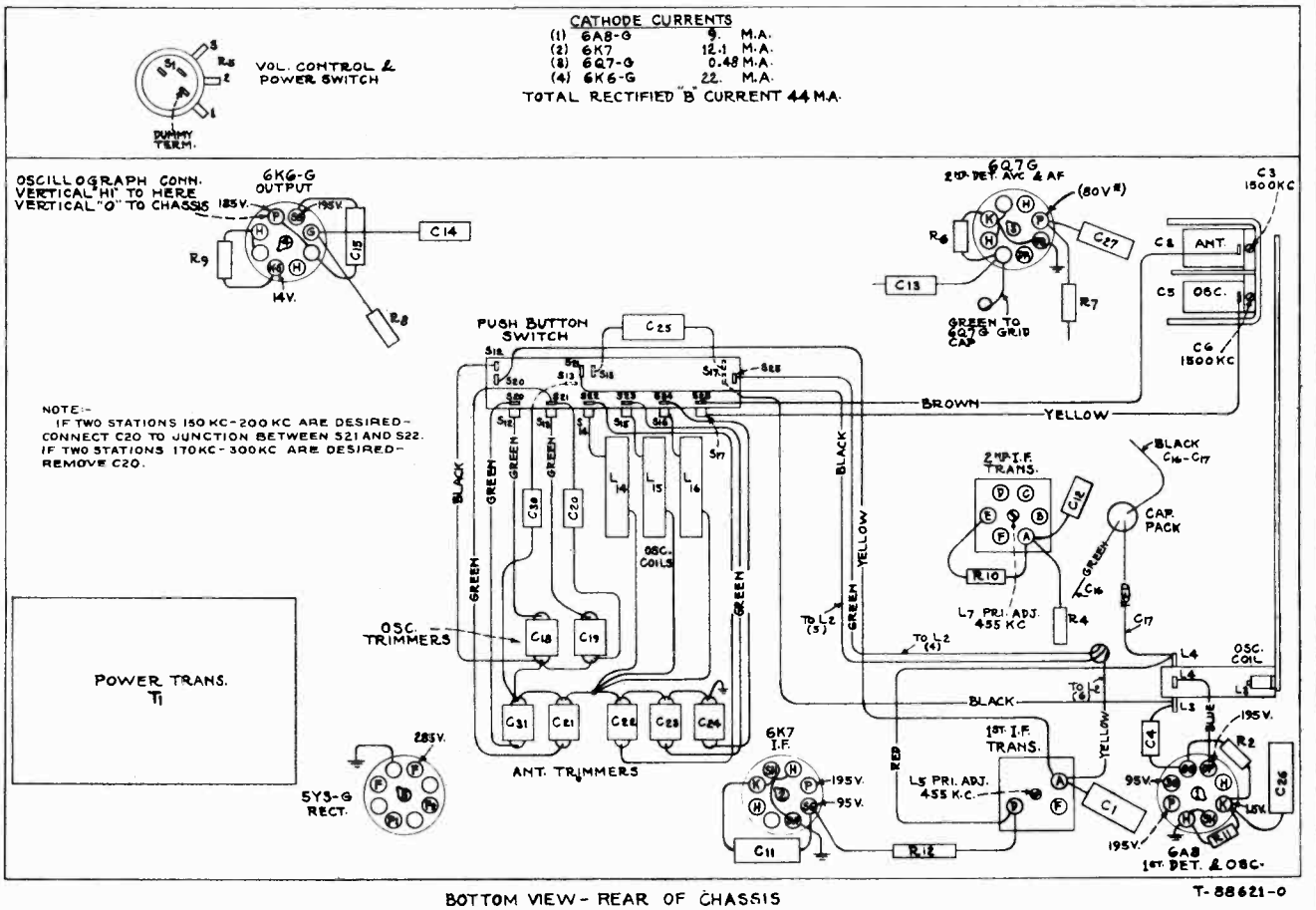


Precautionary Lead Dress.—

1. Blue, green, and black leads to the volume control should be dressed away from the 6K6-G socket and from leads to this socket.
2. Leads to the power transformer should be dressed toward the end of the chassis and away from wires to the push button assembly.
3. Power cord lead should be dressed toward the end of the chassis.

—1939—

First Edition.



BOTTOM VIEW - REAR OF CHASSIS

T-88621-0

R-F Wiring Diagram and Socket Voltages

Measurements made to chassis unless otherwise indicated, with set tuned to quiet point and volume control at minimum. Values should hold within approximately ±20% with 117-volt a-c supply.

***NOTE:** Values with star (*) are operating voltages in circuits with high series-resistance. The actual measured voltages will be lower, depending on the voltmeter loading.

Adjustments for Electric Tuning

Push Button Ranges:

Two stations between approximately 150- 300 kc
One station between approximately 550- 980 kc
One station between approximately 650-1,080 kc
One station between approximately 850-1,500 kc

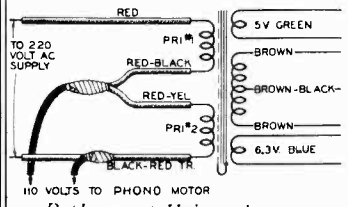
This model has six push buttons. The right-hand button connects the gang condenser for dial tuning. The other five buttons are for electric tuning of five different stations. The station buttons connect to separate magnetite-core coils and trimmers and to separate antenna trimmers which must be adjusted for the desired stations. Use an insulated screwdriver or alignment tool such as RCA Stock No. 31031. Allow at least five minutes warm-up period before making adjustments. Use a regular antenna for preliminary adjustments.

The procedure is as follows:

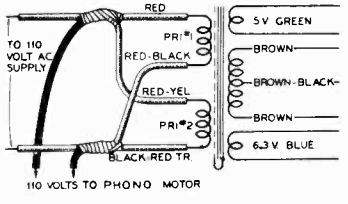
1. Make a list of the desired stations, arranged in the order of the push button ranges shown on the schematic diagram.
2. To adjust buttons Nos. 1 and 2, best results are obtained by using a test-oscillator. Using a separate receiver, tune in the desired station for button No. 1 and zero-beat the test-oscillator against the carrier of this station. Then, keeping the same setting on the test-oscillator, connect its output to the antenna of the 95T5LW. Adjust the antenna and oscillator trimmers of button No. 1 for maximum output. Proceed in a similar fashion for button No. 2.
3. To adjust buttons Nos. 3, 4 and 5, proceed as follows:
   a. Push in the dial-tuning (right-hand) button, and manually tune in the third station on the list.
   b. Push in station-button No. 3 and adjust No. 3 oscillator core (L14) to receive this station. Screw the core all the way in, to lowest frequency, and then unscrew slowly until the station is received.
   c. Adjust No. 3 antenna trimmer (C22) for maximum output on this station.
   d. Adjust for each of the remaining stations in a similar manner.

   (Clockwise adjustment of oscillator and antenna trimmers tunes the circuits to lower frequencies.)
   e. Make a final careful adjustment of the oscillator and antenna trimmers, using one or two feet of wire as an antenna to insure sharp peaking.

PRIMARIES CONNECTED IN SERIES FOR OPERATION ON 220-VOLT SUPPLY



PRIMARIES CONNECTED IN PARALLEL FOR OPERATION ON 110-VOLT SUPPLY



Replacement Universal Power Transformer

D-C RESISTANCE		
PRIMARY #1	34.8 Ω
PRIMARY #2	39.8 Ω
H.V. SECONDARY (TOTAL)	1390 Ω

Power Supply Ratings

Rating A ..... 105-125 volts, 50-60 cycles, 50 watts
Rating C ..... 100-120, 200-240 volts, 50-60 cycles, 50 watts

Power Output

Undistorted ..... 1.0 watt
Maximum ..... 1.5 watts

Loudspeaker

Type ..... 5-inch Electrodynamic
V.C. Impedance ..... 3.1 ohms at 400 cycles

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing. Turn the receiver volume control to maximum.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

Calibration Marks. — The tuning dial is fastened in the cabinet and can not be used for reference during alignment. Therefore calibration marks corresponding to dial readings of 600 kc and 1,500 kc have been stamped in the plate on the front of the chassis, as shown in the accompanying drawing. These marks are used for reference during alignment.

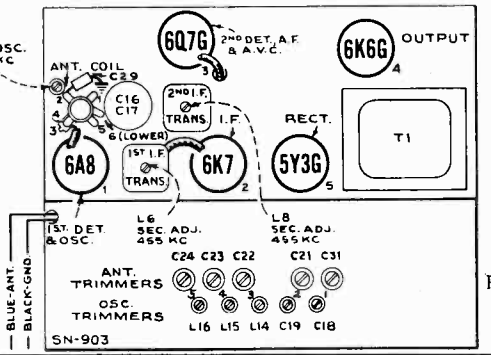
Drum and Dial Indicator Adjustment. — As the first step in r-f alignment, check the position of the drum on the front shaft of the gang condenser. With the gang at maximum (full mesh) the drum set-screw should be pointing directly down as shown in the drawing. With the drum in this position, and the gang at maximum, move the dial indicator along the drive cord to coincide with the left-hand line as shown. The indicator is held to the drive cord by means of spring clips.

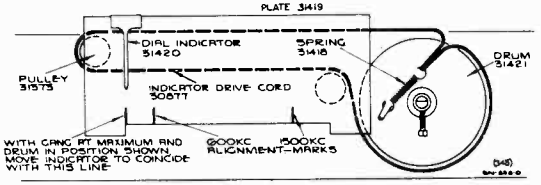
After completion of alignment, and after the chassis has been fastened in the cabinet, turn the gang to maximum and note whether the dial indicator is at the left-hand end mark on the dial; if it is not, loosen the drum set-screw (which is accessible through a slot in the bottom of the cabinet), turn the drum slightly so that the indicator is at this mark, and then tighten the set-screw.

After completion of alignment, seal the i-f core-adjustment screws with household cement.

Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
1	6K7 I-F grid cap, in series with .01 mfd.	455 kc	Quiet point between 550-750 kc	L7 and L8 (2nd I-F Trans.)
2	6A8-G grid cap, in series with .01 mfd.	455 kc		L5 and L6 (1st I-F Trans.)
3	Antenna lead (blue) in series with 200 mmf.	1,500 kc	1,500 kc calibration mark	C6 (osc.)* C3 (ant.)
4	Follow "Adjustments for Electric Tuning."			

*** The oscillator section of the gang condenser has two trimmers, one on top, accessible through a hole in the chassis, and the other on bottom. It may be necessary to adjust both of these trimmers to secure a peak on 1,500 kc.**



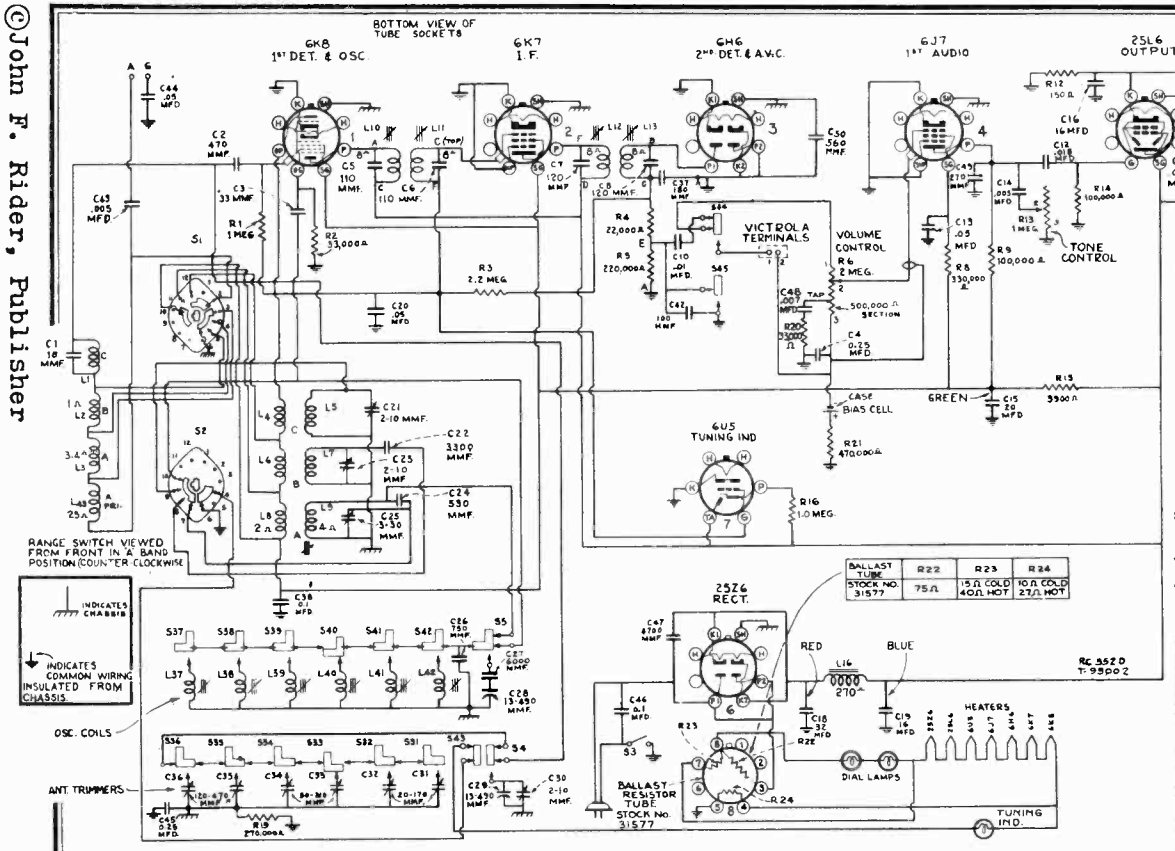


DRUM SHOWN WITH GANG AT MAXIMUM CAPACITY

Dial-Indicator and Drive Mechanism

Refer to "Alignment Procedure" for explanation of the "calibration marks" shown in this drawing

At Left—*Tube and Trimmer Locations*



Alignment Procedure

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver ground terminal (G), and keep the output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the rear of the drum which is mounted on the front shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 180° mark on the drum scale must be vertical, and directly over the center of the gang-condenser shaft when the plates are fully meshed. The distance from the front of the chassis to the drum must not exceed ⅛-inch. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "180°" mark on the calibration scale when the plates are fully meshed.

Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio-dial to—	Adjust the following for max. peak output
1	6K7 I-F grid cap, in series with .01 mfd.	455 kc	"A" band, Quiet Point between 550-750 kc	L12 and L13 (2nd I-F Transformer)
2	6K8 det. grid cap, in series with .01 mfd.	455 kc		L10 and L11 (1st I-F Transformer)
3	Antenna Terminal, in series with 200 mmf.	600 kc	600 kc (150.5°) "A" band	L9
4		1,500 kc	1,500 kc (28°) "A" band	C25 (osc.) C30 (ant.)
5	Repeat steps 3 and 4.			
6	Antenna Terminal, in series with 400 ohms.	6 mc	6 mc (26.5°) "B" band	C23 (osc.)*
7		20 mc	20 mc (22°) "C" band	C21 (osc.)*
8	Follow "Adjustments for Electric Tuning."			

*Use minimum capacity peak if two peaks can be obtained, and rock gang condenser slightly while adjusting C23 and C21.

Note.—Oscillator tracks 455 kc above signal on all bands.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, move the dial indicator on the drive cable to the left-hand end mark on dial, with gang condenser fully meshed.

Adjustments for Electric Tuning

These models have eight push buttons. The left-hand button is a Victrola switch. The right-hand button connects the gang condenser for manual tuning. The other six buttons are for electric tuning of six different stations in the standard-broadcast range. The station buttons connect to separate magnetite-core oscillator coils and separate antenna trimmers which must be adjusted for the desired stations. Use an insulated screwdriver or alignment tool such as RCA Stock No. 31031. Allow at least five minutes warm-up period before making adjustments.

The procedure is as follows:

1. Make a list of the desired six stations, arranged in order from low to high frequencies.
2. Push in the dial-tuning button, and manually tune in the first station on the list.
3. Push in station button No. 1 (second from left) and adjust No. 1 oscillator core (L37) to receive this station. Screw the core all the way in, to lowest frequency, and then unscrew slowly until station is received.
4. Adjust No. 1 antenna trimmer (C36) for maximum output on this station.

Clockwise adjustment of cores and trimmers tunes the circuits to lower frequencies.

5. Adjust for each of the remaining five stations in the same manner.
6. Make a final careful adjustment of the oscillator cores and antenna trimmers.

Pilot Lamps..... Mazda 47, 6.3 volts, .15 amp.

POWER OUTPUT

Undistorted ..... 1.5 watts
Maximum ..... 2.5 watts

POWER SUPPLY RATING

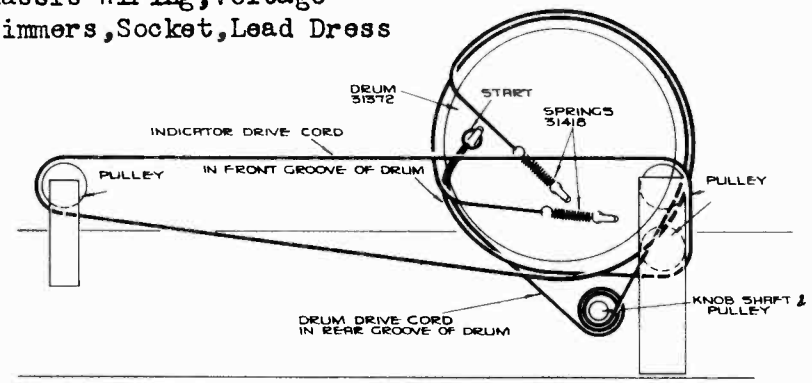
A-C Rating 105-125 volts, 25-60 cycles, 55 watts
D-C Rating ..... 105-125 volts, 55 watts

LOUDSPEAKER (PERMANENT-MAGNET DYNAMIC)

Diameter ..... 6 inches
V. C. Impedance at 400 cycles ..... 3 ohms

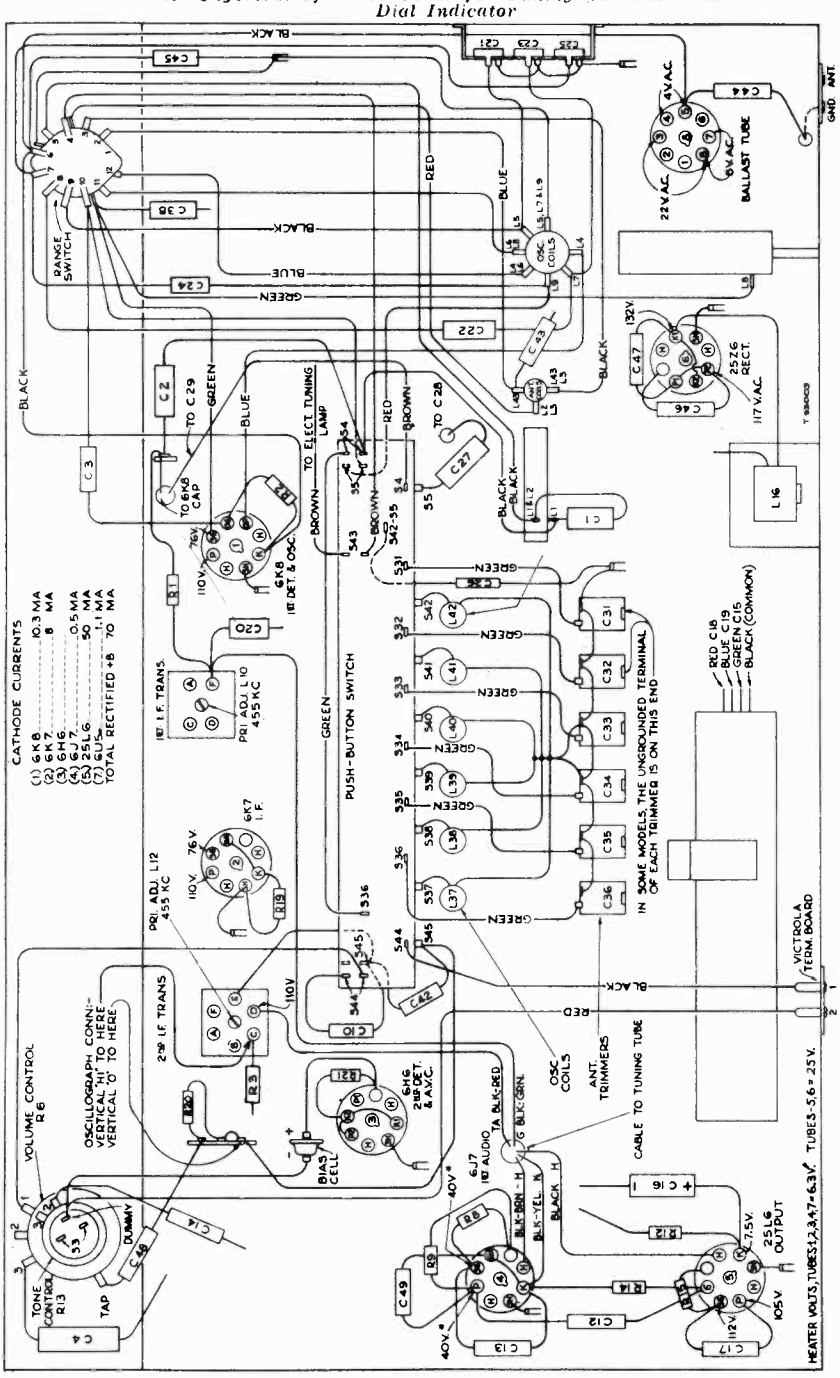
MODEL 98T2, Ch. RC352D
Chassis Wiring, Voltage
Trimmers, Socket, Lead Dress

RCA MFG. CO., INC.

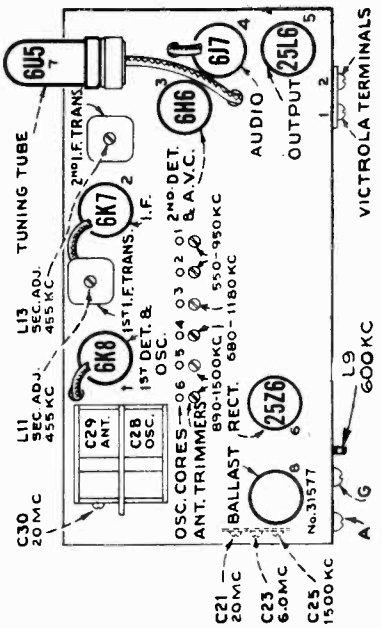


DRUM SHOWN WITH GANG AT MAXIMUM CAPACITY

Arrangement of Drive Cords for Tuning Condenser and Dial Indicator



R-F Wiring Diagram and Socket Voltages



Measurements made to low side of tone control unless otherwise indicated, with set tuned to quiet point and volume control at minimum. Values should hold within approximately ± 20% with 117-volt a-c supply. On d-c, voltages are approximately 10% lower, except heaters, which remain the same.

* NOTE: Values with star (*) are operating voltages in circuits with high series-resistance. The actual measured voltages will be lower, depending on the voltmeter loading.

Precautionary Lead Dress.—

1. Dress the bias cell clear of all bus leads.
2. Leads from S43 must be dressed in front of range switch.
3. Blue lead from range switch to L5 must be short and clear of other leads.
4. Dress leads away from antenna and oscillator coils.
5. Leads across back of chassis must be dressed under electrolytic to prevent approaching Victrola jack.
6. Green lead from range switch to rear contact on oscillator coil must be dressed close to base.

RCA MFG. CO., INC.

MODEL 98T2, Ch. RC352D
Parts List

Miscellaneous Service Notes

Bias Cell.—The bias cell provides approximately 1-volt bias for the 1st audio grid. The cell should never be shorted, not measured with an ordinary voltmeter or other device that draws current. The cell may be checked by measuring the 1st-audio cathode current with a new tested 6J7 tube in this socket. The current should be approximately ½ milliampere. If it is appreciably greater than ½ mil., install a new bias cell.

Victrola Attachment.—Two screw-type terminals, numbered 1 and 2, are provided on the rear apron of the chassis for connection to a Victrola Attachment, such as the R-93, R-93B, etc. *(When A-C supply is available.)*

Care must be taken that these terminals are never connected in any way to the chassis, otherwise injury will result to the bias cell. To safeguard against this possibility, the following precautions should be observed in connecting the Victrola Attachment to the receiver.

Victrola Attachment with shielded cable.—If the shielded cable has a plug connector, remove the plug, connect the shielding to terminal 1, and connect the lead (inside the shielding) to terminal 2. Tape the shielding for a sufficient distance to prevent the possibility of it shorting against the chassis.

Victrola Attachment with twisted-pair cable.—Connect the low-side of the Attachment to terminal No. 1, and the high-side of the Attachment to terminal No. 2. (In some Attachments, the lead from the low-side is black, and the lead from the high-side is black-brown.)

Power-Supply Polarity.—For operation on d-c, the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the position of the plug. For operation on a-c, a similar reversal of the plug may reduce hum.

REPLACEMENT PARTS

Insist on genuine factory-tested parts, which are readily identified and may be purchased from authorized dealers.

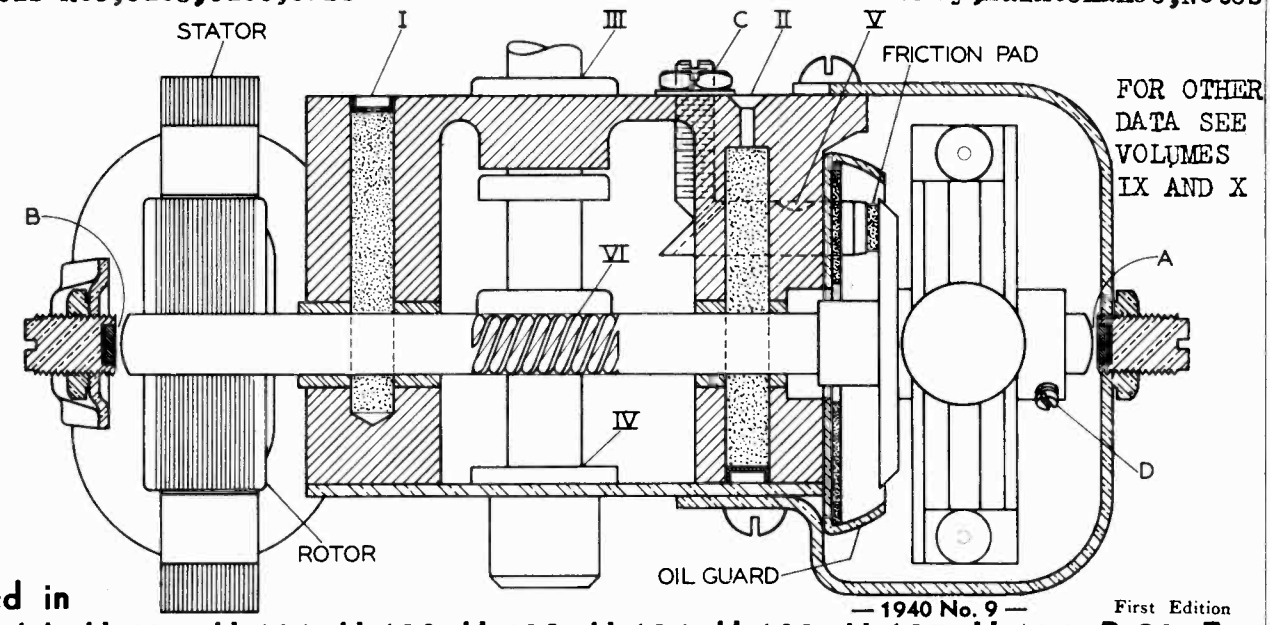
STOCK No.	DESCRIPTION	Unit List Price
	RECEIVER ASSEMBLIES	
31577	Ballast—Ballast resistor tube (R22, R23, R24)	.80
31767	Board—Antenna-ground terminal board	.20
31579	Board—Phonograph terminal board	.20
30752	Bracket—Bracket for holding Magic Eye tube	.25
14338	Bushing—Variable condenser mounting bushing and screws	.08
30766	Cap—Cap for Magic Eye	.15
31400	Capacitor—Adjustable trimmer capacitor, two sections 2-10 mmfd. and one section 3-30 mmfd. (C21, C23, C25)	.50
32486	Capacitor—Antenna coil trimmer capacitor bank—20-470 mmfd. (C31, C32, C33, C34, C35, C36)	1.40
12948	Capacitor—33 mmfd. (C3)	.35
12722	Capacitor—18 mmfd. (C1)	.35
12720	Capacitor—100 mmfd. (C42)	.35
14262	Capacitor—109 mmfd. (C5, C6)	.30
12404	Capacitor—120 mmfd. (C7, C8)	.30
14712	Capacitor—180 mmfd. (C37)	.30
12488	Capacitor—270 mmfd. (C49)	.35
30433	Capacitor—470 mmfd. (C2)	.35
32492	Capacitor—530 mmfd. (C24)	.40
12537	Capacitor—560 mmfd. (C50)	.35
31435	Capacitor—750 mmfd. (C26)	.40
4881	Capacitor—3,300 mmfd. (C22)	.60
12897	Capacitor—4,700 mmfd. (C47)	.65
31405	Capacitor—6,000 mmfd. (C27)	.75
5148	Capacitor—.007 mfd. (C48)	.20
4838	Capacitor—.005 mfd. (C14, C43)	.25
14393	Capacitor—.01 mfd. (C10)	.30
11315	Capacitor—.015 mfd. (C12, C17)	.20
4886	Capacitor—.05 mfd. (C13, C20, C44)	.20
4839	Capacitor—0.1 mfd. (C38, C46)	.30
12484	Capacitor—0.25 mfd. (C4, C45)	.30
31323	Capacitor—16 mfd. (C16)	.65
31576	Capacitor—Comprising one 32 mfd., one 20 mfd., and one 16 mfd. section (C15, C18, C19)	2.15
31581	Cell—Bias cell	.25
31382	Clip—Mounting clip for coils and cores on oscillator bank	.04
32493	Coil—Antenna coil (L1, L2, L3, L43)	1.35
31951	Coil—Oscillator coil (L4, L5, L6, L7, L8, L9, C24)	1.40
31385	Coil—Push button oscillator coil (L37, L38)	.30
32487	Coil—Push button oscillator coil (L39, L40)	.35
31383	Coil—Push button oscillator coil (L41, L42)	.30
31369	Condenser—2-gang variable tuning condenser (C28, C29, C30)	2.65
5119	Connector—3-contact female connector plug for reproducer cable	.25
32668	Control—Volume control, tone control, and on-off switch (R6, R13, S3)	3.00
32634	Cord—Drum drive cord	.10
32635	Cord—Indicator pointer drive cord	.24
31386	Core—Adjustable core and stud assembly for oscillator bank	.15
12800	Core—Adjustable core and stud for oscillator coil, Stock No. 31951	.35
31372	Drum—Variable condenser drive cord drum and calibrator	.65
31580	Holder—Bias cell holder	.15
32552	Indicator—Dial pointer	.20
31480	Lamp—Dial lamp (Mazda No. 47)	.20
32670	Plate—Dial color plate, pointer slide, and lamp brackets assembled	.75
31373	Pulley—Drive cord pulley	.08
5066	Reactor (L16)	1.65
31577	Resistor—Ballast resistor (R22, R23, R24)	.80
30880	Resistor—150 ohms, ½ watt (R12)	.20
30694	Resistor—3,900 ohms, ½ watt (R15)	.20
14284	Resistor—22,000 ohms, 1/10 watt (R4)	.15
12454	Resistor—33,000 ohms, ½ watt (R2, R20)	.20
14560	Resistor—100,000 ohms, ½ watt (R9, R14)	.20
11398	Resistor—220,000 ohms, 1/10 watt (R5)	.15
12199	Resistor—270,000 ohms, ½ watt (R19)	.20
14983	Resistor—330,000 ohms, ½ watt (R8)	.20
12285	Resistor—470,000 ohms, ½ watt (R21)	.20
13730	Resistor—1 meg., ½ watt (R1)	.20
12013	Resistor—1 meg., 1/10 watt (R16)	.15
12679	Resistor—2.2 meg., ½ watt (R3)	.20
14343	Retainer—Drive cord pulley retainer	.03
14887	Retainer—Retainer for drive cord pulley	.01
4669	Screw—No. 8-32 square head set screw for drum, Stock No. 31372	.03
32671	Shaft—Station selector knob shaft and pulley	.35
12110	Shield—Radiotron shield cap	.14
31365	Socket—Dial lamp socket	.30
13871	Socket—Magic Eye socket	.45
31251	Socket—Tube socket	.25
31970	Spring—Tension spring for station selector push button switch latch bar	.05
31418	Spring—Indicator or drum drive cord tension spring	.05
31370	Switch—Push button selector switch (S4, S5, S31, S32, S33, S34, S35, S36, S37, S38, S39, S40, S41, S42, S43, S44, S45)	3.85
33009	Switch—Range switch (S1, S2)	1.15
14376	Transformer—First i-f transformer (L10, L11, C5, C6)	2.45
14283	Transformer—Second i-f transformer (L12, L13, C7, C8, C37, R4, R5)	3.80
31577	Tube—Ballast resistor tube (R22, R23, R24)	.80
	SPEAKER ASSEMBLIES (84307-1)	
31665	Cone—Speaker cone and voice coil (L14)	3.20
5118	Plug—3-contact male plug for speaker	.25
31664	Speaker complete	6.30
31666	Transformer—Output transformer (T1)	1.20
	MISCELLANEOUS ASSEMBLIES	
31397	Button—Station selector push button	.15
31456	Cover—8-protective covers for push button markers	.08
32673	Dial—Station selector dial scale (glass)	.60
32674	Escutcheon—Station selector escutcheon less dial scale and push buttons	3.85
31355	Knob—Range switch knob	.12
14359	Knob—Station selector knob	.20
31391	Knob—Tone control knob	.15
30773	Knob—Volume control knob	.15
31458	Marker—"Dial Tuning" push button marker	.01
31457	Marker—"Record Player" push button marker	.01
31589	Marker—Station call letters push button markers	.35
4982	Spring—Retaining spring for knob, Stock No. 14359	.05
30330	Spring—Retaining spring for knob, Stock No. 31391	.03
14270	Spring—Retaining spring for knob, Stock Nos. 30773 and 31355	.05

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

MODEL Governor Motors for Models R98,U103,U105,U124

RCA MFG. CO., INC.

U125,U126,U130,U132,U134 Assembly,Maintenance,Notes



— 1940 No. 9 — First Edition

Used in Models U-125, U-126, U-130, U-132, U-134, U-103, U-105, U-124, R-98, Etc.

Lubrication and Adjustment

To assure normal and satisfactory operation, every motor requiring service should be lubricated and adjusted as follows:—

(1) Remove motor end brackets, bottom cover containing lower spindle bearing, and governor. Slide vertical spindle downward, remove C-washer; then push upward to disengage worm gear. Slide rotor and shaft from motor.

(2) Clean rotor bearings and rotor shaft thoroughly with "Carbona" or "benzine." Flush oil reservoirs I and II with the same solvent, preferably after removing oil wicks.

(3) Remove governor felt friction pad V. Replace this pad with revised type Stock No. 34058, being certain to saturate thoroughly with oil.

(4) Put slight amount of oil in each rotor bearing, and reinsert rotor shaft. See that shaft revolves freely when in position.

(5) Oil bearing IV, grease gear VI, and re-install bottom cover; checking to assure that vertical spindle revolves freely and worm is properly meshed after cover is in place and screws tightened. Do not misplace small disc of bottom thrust bearing.

(6) Inspect governor to see that springs move freely under retaining washers, and that governor is otherwise in good condition. Install on rotor shaft, checking for possible bind of sleeve on the shaft.

(7) Replace end brackets containing thrust screws "A" and "B"

(8) Adjust thrust screw "A" so that **one** steel lamination of rotor shows beyond the stator laminations as illustrated. This positions rotor at the electrical center of the stator, for maximum torque.

(9) Adjust thrust screw "B" to provide 1/16 inch clearance from end of rotor shaft.

(10) Fill both wells I and II with oil. At least 30-50 drops are required. Also oil bearing III.

(11) Position governor so that when it is fully contracted (closed), the friction disc is aligned with outer edge of oil guard. Tighten set screw "D".

(12) Connect motor to source of power, and adjust screw "C" to give 78 R.P.M. After allowing motor to run a short time, to compress felt pad. It may be necessary to recheck position of governor to give sufficient range of speed adjustment.

(13) Test motor, after allowing it to reach operating temperature, by grasping spindle and noting relative amount of force required to cause governor to contract. Also stall motor, and release, to see that governor has "snappy" response.

Special Notes

(1) Do not interchange parts of different motors, especially bearings, shafts, or gears.

(2) Where a new rotor or turntable spindle is installed, allow motor to run-in for eight hours; preferably under load.

(3) The motor should not be tested or used at temperatures below 65 degrees Fahrenheit.

(4) Where thrust bearing screw "A" is badly worn or does not have a fibre insert, replace with RCA Stock No. 31616.

(5) Governor motors should be thoroughly lubricated after approximately 300-500 hours of operation. This is equivalent to 1-2 years usage in the average home.

Lubricant Specifications

Only **mineral** base oils and greases should be used.

(1) For points requiring oil, use a type having a high viscosity index (with a viscosity rating of SAE 20-30), such as "Esso Motor Oil, Uniflo No. 3."

(2) For points requiring grease, a light gear grease having good clinging properties, such as "Cities Service No. 7035-A1" or "Koolmotor Universal Trojan No. 1", should be used.

Governor Waver — Causes

Drifting of motor speed at a slow rate, or erratic shift to other than normal speed, is generally caused by (1) binding of rotor or spindle bearings due to lack of lubrication, (2) scored shafts or bearings, (3) binding due to tight adjustment of thrust bearing "B", (4) binding of turntable spindle bearing on motor board (where used), (5) improper centering of motor with respect to turntable spindle.

Governor Chatter — Causes

When the governor rattles or flutters rapidly, accompanied by excessive mechanical noise, the likely source of trouble is (1) glazed felt friction pad due to lack of lubrication, (2) rotor not centrally positioned in stator, (3) thrust bearing "A" worn, (4) mis-aligned or rough governor disc.

Heavy Duty Motor

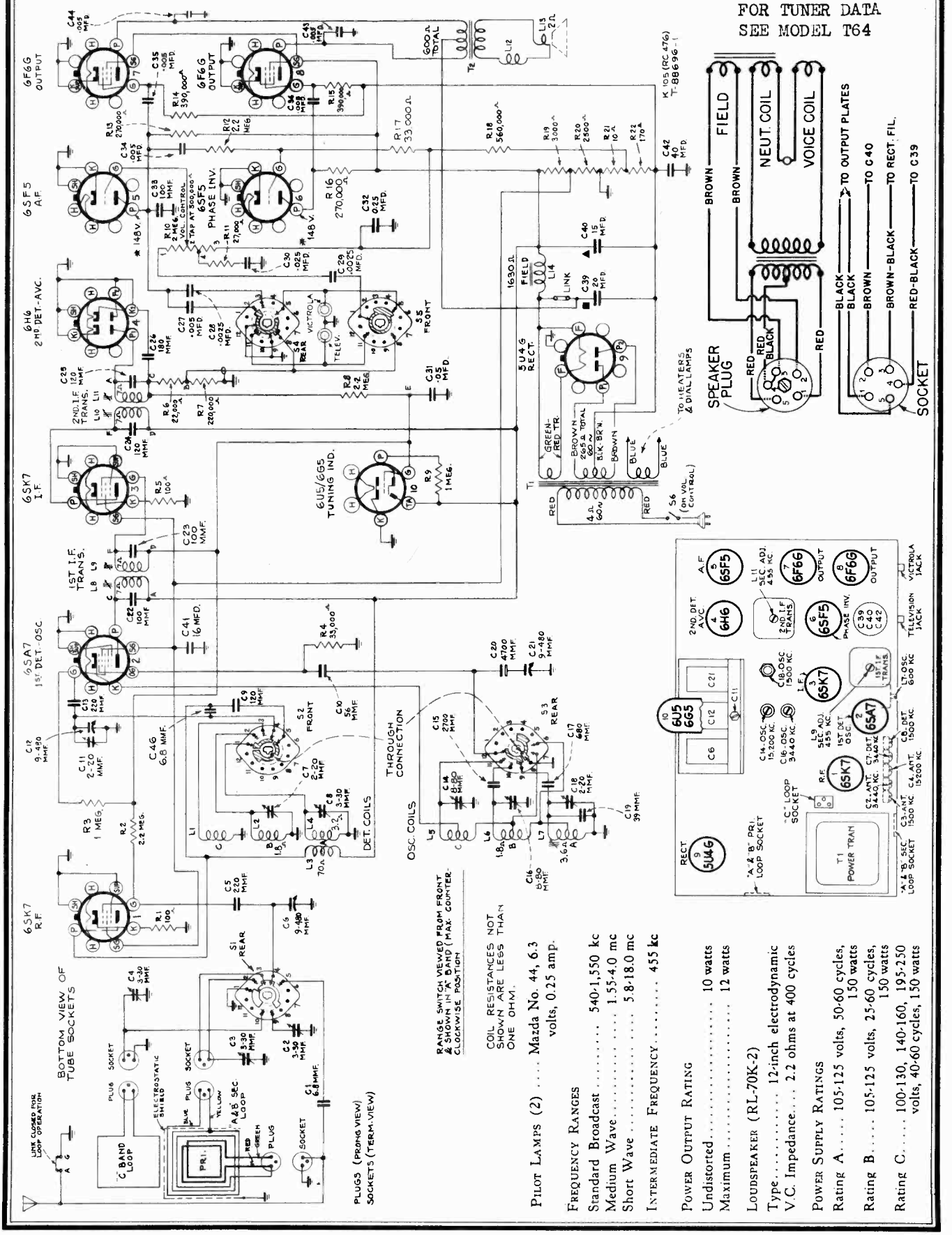
A heavy duty motor Stock No. 31163 is available for replacement of the Stock No. 31157 type used in Models U125, U126, U128, U132, U134, etc., at a nominal exchange price. The larger motor has a higher torque specification, will operate normally over greater ranges of voltage and frequency, and gives increased life before relubricaton is required.

FOR DRIVE DATA
SEE MODEL K60

RCA MFG. CO., INC.

MODEL K105, Chassis RC476
Schematic, Socket, Trimmers

FOR TUNER DATA
SEE MODEL T64



PILOT LAMPS (2) ..... Mazda No. 44, 6.3 volts, 0.25 amp.

FREQUENCY RANGES
Standard Broadcast ..... 540-1,550 kc
Medium Wave ..... 1.55-4.0 mc
Short Wave ..... 5.8-18.0 mc

INTERMEDIATE FREQUENCY ..... 455 kc

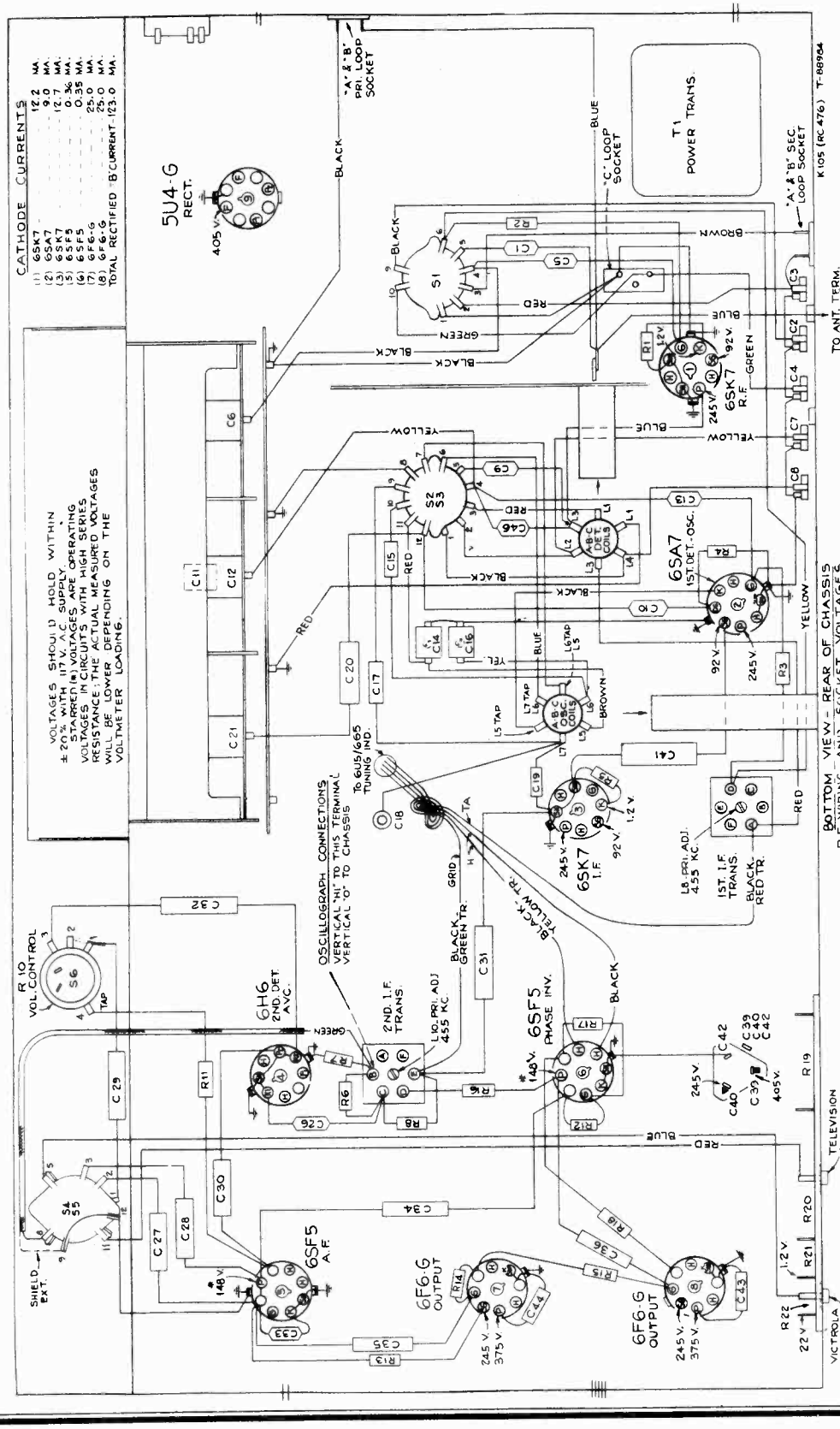
POWER OUTPUT RATING
Undistorted ..... 10 watts
Maximum ..... 12 watts

LOUDSPEAKER (RL-70K-2)
Type ..... 12-inch electrodynamic
V.C. Impedance ... 2.2 ohms at 400 cycles

POWER SUPPLY RATINGS
Rating A ..... 105-125 volts, 50-60 cycles, 150 watts
Rating B ..... 105-125 volts, 25-60 cycles, 150 watts
Rating C ..... 100-130, 140-160, 195-250 volts, 40-60 cycles, 150 watts

MODEL K105,Ch.RC476
Voltage,Chassis Wiring
Lead Dress

RCA MFG. CO., INC.



Precautionary Lead Dress:

1. Dress 4,000-mmfd. roll capacitor from the range switch to the gang condenser (C21) away from the chassis.
2. Dress 2,700-mmfd. capacitor connected from the oscillator coil (L6) to the range switch away from the bus wire directly beneath it.
3. Dress leads from phono and television plugs to tone control switch away from the speaker leads, terminal No. 3 (plate) of the output leads and away from the 6H6.
4. Dress red AC leads to power switch away from 6H6 and away from volume control terminals.
5. Leads from power transformer must be dressed close to base away from trimmer bank and oscillator coil.
6. All leads from trimmers should be dressed away from chassis base and range switch.
7. Green, blue, and brown leads from loop terminal boards should be dressed away from chassis base and range switch.

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, keep the output as low as possible to avoid a-v-c action. For the first six steps in alignment the low side of the test-oscillator should be connected to the receiver chassis. Following step 6, the signal must be radiated (see note under alignment table).

Calibration Scale on Indicator-Drive-Cord Drum. — The tuning dial is fastened in the cabinet and cannot be used for reference during the first six steps of alignment; therefore, a calibration scale is attached to the tuning drum. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 180° mark on the drum scale must be vertical and directly under the center of the shaft of the tuning drum when the plates are fully meshed. The drum is held to the shaft by means of two set-screws, which must be tightened securely when the drum is in the correct position.

On the inner side of the tuning drum are two projections which serve as stops to prevent extreme rotation of the gang condenser. The tuning drum should be set so that the stop limiting clockwise movement of the drum takes effect just as the gang condenser plates are becoming fully meshed, thus preventing stress on the gang due to extreme rotation.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the chassis, and bend the wire so that it points to the 0° mark on the calibration scale when the plates are fully meshed.

Steps	Connect the high side of the test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	6SK7 I-F grid in series with .01 mfd.	455 kc	"B" band Quiet point between 1.5-2.0 mc	L10 and L11 (2nd I-F trans.)
2	6SA7 det. grid in series with .01 mfd.			L8 and L9 (1st I-F trans.)
3	6SK7 R-F grid in series with 0.1 mfd.	15.2 mc	15.2 mc (192°) "C" band	C14 (osc.)* C11 (det.) Rock Gang
4		3.44 mc	3.44 mc (183°) "B" band	C16 (osc.)** C7 (det.)
5		600 kc	600 kc (38.5°) "A" band	L7 (osc.) Rock gang
6		1,500 kc	1,500 kc (216°) "A" band	C18 (osc.) C8 (det.)
7	Radiate signal (See note)	15.2 mc	15.2 mc "C" band	C4 (ant.)
8		6.1 mc	6.1 mc "C" band	Inductance of "C" band loop†
9		Repeat step 7		
10		3.44 mc	3.44 mc "B" band	C2 (ant.)
11		1,500 kc	1,500 kc "A" band	C3 (ant.)
12		600 kc	600 kc "A" band	L7 (osc.) Rock Gang
13		1,500 kc	1,500 kc "A" band	C18 (osc.) C8 (det.)

Note.—Following step 6, a radiated signal must be used for the remainder of the alignment. One or two turns of wire forming a loop approximately 18 inches in diameter connected across the output of a test-oscillator such as RCA Model 153, or Stock No. 9595 (TMV-97C), etc., will be suitable. For the adjustments using the radiated signal, the chassis must be placed in the cabinet and the receiver loops connected. The radiating loop should be placed near enough to the receiver loop to provide ample signal strength for alignment.

* Use **minimum** capacity peak if two can be obtained. Check to determine that C14 has been adjusted to the correct peak by tuning the receiver to approximately 14.29 mc where a weaker signal should be received.

** Use **minimum** capacity peak if two can be obtained. Check to determine that C16 has been adjusted to the correct peak by tuning the receiver to approximately 2.53 mc where a weaker signal should be received.

† Adjust the inductance of "C" band loop by varying the spacing between the leads of the loop. Moving the leads closer together decreases the inductance and tunes the loop to a higher frequency; moving the leads farther apart increases the inductance and tunes the loop to a lower frequency.

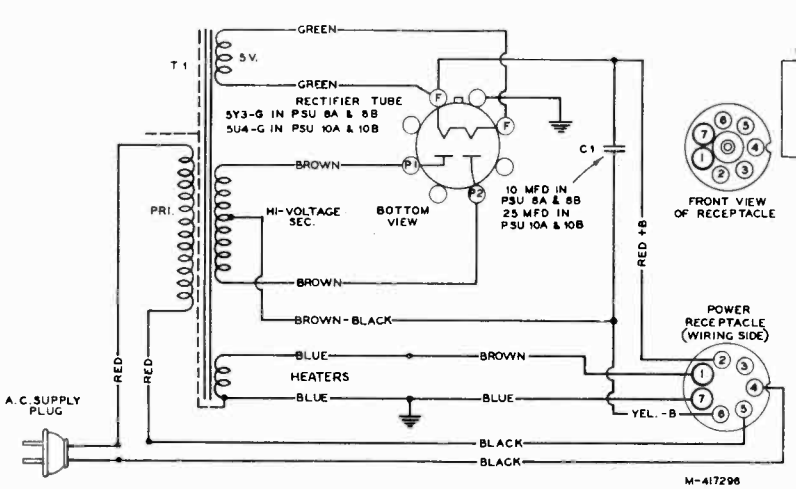
Important.—The oscillator tracks **above** the signal on all bands.

REPLACEMENT PARTS

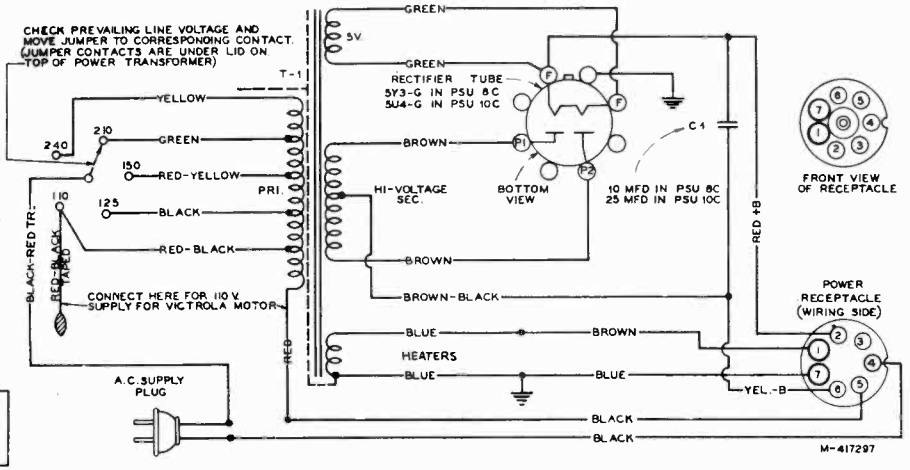
Insist on genuine factory-tested parts, which are readily identified and may be purchased from authorized dealers.

STOCK No.	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES (RC-476)	
33820	Arm—Push arm and cam assembly on tuning unit—less lock screw	.35
34574	Board—"Antenna-Ground" board	.20
30766	Cap—Rubber cap for Tuning Indicator	.15
12884	Capacitor—Air trimmer—2-20 mmfd. (C18)	.60
34701	Capacitor—Trimmer comprising 4 sections of 3-30 mmfd. and 1 section of 2-20 mmfd. (C2, C3, C4, C7, C8)	.80
34702	Capacitor—Trimmer comprising 2 sections of 8-80 mmfd. (C14, C16)	.40
14079	Capacitor—6.8 mmfd. (C1, C46)	.35
13545	Capacitor—39 mmfd. (C19)	.35
12723	Capacitor—56 mmfd. (C10)	.35
12720	Capacitor—100 mmfd. (C35)	.35
34699	Capacitor—100 mmfd. (C22, C23)	.30
12724	Capacitor—120 mmfd. (C9)	.35
34700	Capacitor—120 mmfd. (C24, C25)	.30
13003	Capacitor—180 mmfd. (C26)	.35
12694	Capacitor—220 mmfd. (C5, C13)	.35
31552	Capacitor—680 mmfd. (C17)	.40
30067	Capacitor—2,700 mmfd. (C15)	.55
31399	Capacitor—4,700 mmfd. (C20)	.65
34459	Capacitor—.0025 mfd. (C28, C29)	.20
33584	Capacitor—.006 mfd. (C27, C34, C35, C36, C43, C44)	.25
4870	Capacitor—.025 mfd. (C30)	.20
32787	Capacitor—.05 mfd. (C31)	.20
12484	Capacitor—0.25 mfd. (C32)	.30
31323	Capacitor—16 mfd. (C41)	.65
34533	Capacitor—Electrolytic comprising 1 section of 20 mfd., 1 section of 15 mfd. and 1 section of 40 mfd.	1.80
34579	Coil—Oscillator coil	.80
34697	Coil—R.F. coil	2.00
32634	Cord—Tuning condenser drum drive cord	.10
32713	Core—Core and stud for oscillator coil	.35
34578	Control—Tone control	1.35
34695	Control—Volume control and power switch	2.00
33627	Drum—Condenser drive drum	.25
33174	Drum—Tuning condenser drive drum	.65
34632	Gear—Gear sector for range switch	.55
11891	Lamp—Dial lamp	.17
33427	Pulley—Drive cord pulley and mounting bracket	.30
35005	Pulley—Drive pulley less bronze drive cord	.20
34537	Resistor—Voltage divider comprising 1 section of 3,000 ohms, 1 section of 2,500 ohms, 1 section of 10 ohms, and 1 section of 170 ohms (R19, R20, R21, R22)	.95
14439	Resistor—100 ohms, ½ watt (R1, R5)	.20
13998	Resistor—22,000 ohms, ½ watt (R6)	.20
12738	Resistor—27,000 ohms, ½ watt (R11)	.20
12454	Resistor—33,000 ohms, ½ watt (R4, R17)	.20
12264	Resistor—220,000 ohms, ½ watt (R7)	.20
12199	Resistor—270,000 ohms, ½ watt (R13, R16)	.20
13479	Resistor—390,000 ohms, ½ watt (R14, R15)	.20
12488	Resistor—560,000 ohms, ½ watt (R18)	.20
12013	Resistor—1 megohm, 1/10 watt (R9)	.15
13730	Resistor—1 megohm, ½ watt (R3)	.20
12679	Resistor—2.2 megohm, ½ watt (R2, R8, R12)	.20
30340	Retainer—Retainer for shaft of tuning shaft cam and arm	.02
33419	Roller—Friction roller for tuning knob shaft	.10
31613	Screw—No. 8-32 milled head set screw for drum, Stock No. 33176	.02
14350	Screw—No. 8-32 square head set screw for gear, Stock No. 34532	.03
33621	Screw—Push arm lock screw	.05
34703	Shaft—Range switch shaft	.15
33422	Shaft—Tuning shaft less friction roller	.20
31364	Socket—Dial lamp socket	.20
13871	Socket—Tuning Indicator socket	.45
14278	Socket—Phonograph input socket	.25
34575	Socket—2-terminal loop socket	.20
31319	Socket—Tube socket	.25
33175	Spring—Drive cord spring	.05
33622	Spring—Push arm return spring	.08
34694	Spring—Tuning shaft cam spiral spring	.10
33421	Spring—Tuning shaft flat spring	.10
34696	Switch—Range switch	3.00
34698	Transformer—First i-f transformer	1.75
34524	Transformer—Second i-f transformer	2.20
34693	Transformer—Power transformer—110 volts, 25 cycles	6.00
34539	Transformer—Power transformer—105-125 volts, 50-60 cycles	4.75
	SPEAKER ASSEMBLIES (RL-70K-5)	
31825	Cap—Dust cap	.02
35170	Coil—Field coil	2.90
11469	Coil—Neutralizing coil	.30
34773	Cone—Cone complete with voice coil	1.45
34728	Diffuser	.80
31539	Plug—5-prong male plug for speaker	.25
14534	Transformer—Output transformer	2.10
	MISCELLANEOUS ASSEMBLIES	
35046	Bearing—Antenna loop bearing comprising spindle and pivot	.70
33474	Button—Push button	.10
34285	Clip—Tuning Indicator clip	.25
35045	Dowel—1 set of dowel pins for loop antenna	.10
33439	Escutcheon—Station selector escutcheon less push buttons	2.20
34706	Frame—Dial frame complete with brackets less dial, pointer, pointer guide rods and Tuning Indicator clip	1.10
34583	Frame—Frame only for "C" band loop	.30
34383	Indicator—Station selector indicator	.40
33434	Knob—Tuning, tone control, range switch or power switch and volume control knob	.30
35132	Loop—"A" and "B" band antenna loop	11.80
33842	Marker—Push button station markers	.25
34990	Plug—2-prong male plug for "C" band loop	.10
32641	Plug—3-prong male plug for "A" and "B" band loop	.10
34708	Scale—Glass dial scale	2.15
35049	Shaft—Flexible shaft assembly to turn loop	.85
34491	Shaft—Pointer carriage guide shaft	.15
14270	Spring—Retaining spring for knob, Stock No. 33434	.05

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.



Schematic Circuit Diagram of Power Supply Units PSU 8A, 8B, 10A, and 10B



Schematic Diagram of Power Supply Units PSU 8C and 10C

PSU 8A, 8B, 8C, 10A, 10B and 10C A-C Power Supply Units

General Description

Certain models of the "Q" Line of RCA Victor "Magic Brain" 1938 radio receivers are designed for use with a separate plug-in power supply unit. Different units are available to permit operation on a-c power supplies of various voltages and cycles, and also on 110 or 220 volts d-c.

Service data and diagrams for the a-c units are contained in this sheet: The d-c units are described in a separate sheet.

Each a-c unit is equipped with an 18-inch 6-wire cable with a 7-contact female receptacle which plugs into a 7-prong male connector on the receiver chassis. The a-c power cord is 6 feet long. The units are approximately 7½ inches long, 4¼ inches wide, and 6 inches high.

Testing.—To check an a-c power unit when a receiver is not available, connect a 50-watt resistor (4,800 ohms for PSU 8A, 8B, 8C, and 3,450 ohms for PSU 10A, 10B and 10C) across contacts 2 and 6 on the power receptacle. Connect a jumper across contacts 4 and 5. Measure the d-c voltage across the resistor, which should be approximately 375 volts, with 117 volts supply on the 117-volt tap.

Specifications

Type	Rating		Radiotron Rectifier	D-C Output	Heater (A-C)	Used with Models	D-C Resis., T1		Net Weight (pounds)
	Voltage	Cycles					Pri. ohms Total	Sec. ohms Total	
PSU 8A	105-125	50/60	5Y3-G	375 volts at 78 milliamps	6.45 V 3 amps	8Q1 and 8Q4	6.4	535	7
PSU 8B	105-125	25/60					8.3	705	9½
PSU 8C	Universal*	50/60					17.4	455	11½
PSU 10A	105-125	50/60	5U4-G	380 volts at 110 milliamps	6.36 V 5 amps	10Q1, 12Q4, 12QK, 12QU**	3.0	250	9
PSU 10B	105-125	25/60					3.9	250	13
PSU 10C	Universal*	50/60					8.9	190	15

* The universal can be set for 105-117, 117-130, 140-160, 200-225, or 225-250 volt supply.
** Model 12QU has a phonograph motor designed for 50/60 cycle operation only, and uses either PSU 10A, or 10C.

First Edition

REPLACEMENT PARTS

Insist on genuine factory-tested parts, which are readily identified and may be purchased from authorized dealers.

STOCK No.	DESCRIPTION	Unit List Price	STOCK No.	DESCRIPTION	Unit List Price
31739	Cable—6-conductor power output cable with plug	1.20	31734	Transformer—Power transformer 105-125 volts, 25-60 cycle (T1) (PSU 8B only)	10.35
11203	Capacitor—10 mfd. (C1) (PSU 8A, 8B or 8C only)	1.15	31737	Transformer—Power transformer 105-125 volts, 25-60 cycle (T1) (PSU 10B only)	14.30
14531	Capacitor—25 mfd. (C1) (PSU 10A, 10B or 10C only)	1.55	31735	Transformer—Power transformer 105-130, 140-160, 200-250 volts, 50-60 cycle (T1) (PSU 8C only)	10.80
14409	Plug—7-contact plug for power output cable	.45			
31251	Socket—Rectifier tube socket	.25			
31733	Transformer—Power transformer 105-125 volts, 50-60 cycle (T1) (PSU 8A only)	7.70	31738	Transformer—Power transformer, 105-130, 140-160, 200-250 volts, 50-60 cycle (T1) (PSU 10C only)	14.95
31736	Transformer—Power transformer 105-125 volts, 50-60 cycle (T1) (PSU 10A only)	10.75			

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE

RCA MFG. CO., INC.

MODEL RP139A
MODEL RP145
Adjustments, Notes
Parts

The RP-139-A and RP-145 automatic record changers are very similar in design and construction. Most of the parts and adjustments are identical on both. The RP-139-A turntable is driven through a worm gear in the motor housing while the RP-145 turntable is driven through a friction drive disc mounted on the turntable spindle.

On Model RP-145 it is important that the drive motor spindle, and rubber tires on main driving disc and idler pulley be kept clean and free from oil, grease, dirt, or any foreign matter at all times. Any quick-drying naphtha is satisfactory for cleaning these parts. The RP-145 drive motor bearing is lubricated from an oil well filled and sealed at the factory. It should not require lubrication in the field.

The RP-145 turntable is not removable from the spindle. However, the rubber tired driving disc is fastened to the spindle by means of a tapered pin "24." If necessary to remove these parts the tapered pin should first be removed. The driving disc can then be removed from the spindle and the turntable and spindle assembly lifted upward from the motorboard. If this is done, great care should be taken not to bend the spindle. At the same time the spindle bearing should be oiled and the cup and ball thrust bearing oiled and checked for proper position.

Before servicing the automatic record changer, inspect the assembly to see that all levers, parts, gears, springs, etc., are in good order and are correctly assembled.

A bind or jam in the mechanism can usually be relieved by rotating the turntable in the reverse direction.

The changer can be conveniently rotated through its change cycle by pushing the index lever to "Reject" and revolving the turntable by hand. Six turntable revolutions are required for one change cycle.

If the record changer or cabinet is not perfectly level, normal operation is likely to be affected.

The 10 and 12 inch records must be absolutely flat for smooth operation.

A pickup shorting switch, located under the motorboard, operates when the pickup is moved outward to the pickup rest.

MISCELLANEOUS SERVICE HINTS

Incorrect adjustment of a particular mechanism of the changer is generally exhibited in a specific mode of improper operation. The following relations between effects on operation and the usual misadjustments will enable ready adjustment in most cases.

1. For any irregularity of operation, the adjustment of the main lever "15" should be checked first as in "A."
2. Needle does not land properly on both 10 and 12 inch records—Make complete adjustments "D" and "E."
3. Needle does not land properly on 12 inch record but correct on 10 inch—Effect adjustment "E."
4. Failure to trip at end of record—Increase clutch "5" friction by means of screw "B." Also, see that levers "7" and "12" are free to move without touching each other.
5. Pickup strikes lower record of stack or drags across top record on turntable—Adjust lift cable per adjustment "C."
6. Needle does not track after landing—Friction clutch "5" adjustment "B" may be too tight; bind in tone arm vertical bearing; levers "7" and "12" fouled; or pickup output cable twisted.
7. Cycle commences before record is complete—Record is defective, or adjustment "B" of friction clutch "5" is too tight.
8. Wow in record reproduction—Record is defective; or instrument is not being operated at normal room temperature; on Model RP-145 oil, grease, dirt, or other foreign matter on motor spindle, main driving disc or idler pulley rubber tire. Clean with any quick drying naphtha. Also, on RP-145 the motor support bracket "N" should be moved in its mounting holes until the motor spindle is parallel to the turntable spindle and exactly at right angles to the main driving disc "29." The bracket mounting nuts should then be securely tightened.
9. Record knives strike edge of records—Records warped, record edges are rough; or knife adjustments "F" and "G" are incorrect.
10. Record not released properly—Adjust record shelf assemblies in respect to shaft by means of adjustment "H."
11. When playing both types of records mixed and needle either lands in 10 inch position on 12 inch record or misses record entirely—Increase tension of mixed record discriminating lever spring "M."

ADJUSTMENTS

A. Main Lever.—This lever is basically important in that it interlinks the various individual mechanisms which control needle landing, tripping, record separation, etc. Rotate the turntable until the changer is out-of-cycle, and check rubber bumper bracket (A). The roller should clear the nose of the cam plate by approximately 1/16 inch.

B. Friction Clutch.—The motion of the tone arm toward the center of the record is transmitted to the trip pawl "22" by the trip lever "7" through a friction clutch "5." If the motion of the pickup is abruptly accelerated or becomes irregular due to swinging in the eccentric groove, the trip finger "7" moves the trip pawl "22" into engagement with the pawl on the main gear, and the change cycle is started. Proper adjustment of the friction clutch "5" occurs when movement of the tone arm causes positive movement of the trip pawl "22" without tendency of the clutch to slip. The friction should be just enough to prevent slippage, and is adjustable by means of screw "B." If adjustment is too tight, the needle will repeat grooves; if too loose, tripping will not occur at the end of the record.

C. Pickup Lift Cable Screw.—During the record change cycle, lever "16" is actuated by the main lever "15" so as to raise the tone arm clear of the record by means of the pickup lift cable. To adjust pickup for proper elevation, stop the changer "in-cycle" at the point where pickup is raised to the maximum height above turntable plate, and has not moved outward; at this point adjust locknuts "C" to obtain 1 inch spacing between needle point and turntable top surface.

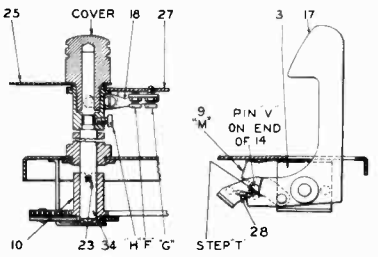
D. & E. Needle Landing on Record.—The relation of coupling between the tone arm vertical shaft and lever "20" determines the landing position of the needle on a 10 inch record. Position of eccentric stud "E" governs the landing of the needle on a 12 inch record; this, however, is dependent on the proper 10 inch adjustment.

To adjust for needle landing, place 10 inch record on turntable, push index lever to reject position and return to the 10 inch position; see that pickup locating lever "17" is tilted fully toward turntable; rotate mechanism through cycle until needle is just ready to land on the record; then see that pin "V" on lever "14" is in contact with "Step T" on lever "17." The correct point of landing is 4⅞ inches from the nearest side of the turntable spindle; loosen the two screws "D" and adjust horizontal position of tone arm to proper dimension, being careful not to disturb levers "14" and "17." Leave approximately 1/32 inch end play between hub of lever "20" and pickup base bearing, and tighten the blunt nose screw "D"; run mechanism through several cycles as a check, then tighten cone pointed screw "D."

After adjusting for needle landing on a 10 inch record, place 12 inch record on turntable; push index lever to reject and return to 12 inch position; rotate mechanism through cycle until needle is just ready to land on the record; the correct point of landing is 5⅛ inches from nearest side of spindle. If the landing is incorrect, turn stud "E" until the eccentric end adjusts lever "14" to give correct needle landing. The eccentric end of the stud must always be toward the rear of the motorboard, otherwise incorrect landing may occur with 10 inch records.

F. & G. Record Separating Knife.—The upper plate (knife) "25" on each of the record posts serves to separate the lower record from the stack and to support the remaining records during the change cycle. It is essential that the spacing between the knife and the rotating record shelf "27" be accurately maintained. The spacing for the 10 inch record is nominally .055 inch, and for the 12 inch record is .075 inch.

To adjust, rotate the knife to the point of minimum vertical separation from the record shelf and turn screw and locknut "F" to give .052—.058 inch separation. Screw "G" must not be depressed during this adjustment. After setting screw "F," adjust screw "G" so that when its tip is depressed flush with top of record shelf, the vertical spacing between the knife, in its lowest rotational position, and the shelf, is .072—.078 inch.



H. Record Support Shelf.—The record shelf revolves during the change cycle to allow the lower record to drop onto the turntable. Both posts are rotated simultaneously by a gear and rack coupled to the main lever "15," and it is necessary that adjustment be such that the record is released from both shelves at the same instant. To adjust, place a 12 inch record on the turntable, rotate mechanism into cycle to the point where both separating knives have turned clockwise as far as the mechanism will turn them; lift record upward until it is in contact with both separating knives. Then loosen screws "H" and shift record shelves "27" so that the curved inner edges of the shelves are uniformly spaced approximately 1/16 inch from the record edge. Some backlash will be present in the rotation of these shelves. They should be adjusted so that the backlash permits them to move away from the record but not closer than the approximate 1/16 inch specified above. Tighten the blunt nose screw "H," run mechanism through cycle several times to check action, then tighten cone pointed screw "H."

If record shelves or knives are bent, or not perfectly horizontal, improper operation and jamming of mechanism will occur.

J. Tone Arm Rest Support (not shown).—When the changer is out-of-cycle, the front lower edge of the pickup head should be 5/16 inch above surface of motorboard. This may be adjusted by bending the tone arm support bracket, which is associated with the tone arm mounting base, in the required direction.

K. Trip Pawl Stop Pin.—The position of the trip pawl stop pin "K" in relation to the main lever "15" governs the point at which the roller enters the cam. By bending the pin support either toward or away from trip pawl bearing stud, the roller can be made to enter the cam later or earlier, respectively. This adjustment should be made so that the roller definitely clears the cam outer guide as well as the nose of the cam plate.

Lubrication.—Petrolatum or petroleum jelly should be applied to cam, main gear, spindle pinion gear, and gears of record posts.

Light machine oil should be used in the tone arm vertical bearing, record post bearings, and all other bearings of various levers and pulleys on underside of motorboard. The turntable spindle bearing of RP-145 must be lubricated from the top of the motorboard. Using an oil can with a long spout, reach in between the turntable and motorboard and apply oil directly to the spindle.

On Model RP-139-A apply a few drops of light machine oil (S.A.E.-10) to the motor oil hole adjacent to the spindle bearing after each 1,000 hours of operation. The oil hole has a screw plug.

Do not allow oil or grease to come in contact with rubber mounting of tone arm base, rubber bumper, rubber spindle cap, or rubber parts of friction drive mechanism of Model RP-145.

STOCK No.	DESCRIPTION	Unit List Price
	PICKUP ARM ASSEMBLIES	
33906	Arm—Pickup arm shell	.45
33977	Cable—Pickup shielded cable (8)	.80
33905	Crystal—Pickup cartridge and needle screw (RP-139-A only)	4.25
35171	Crystal—Pickup cartridge and needle screw (RP-145 only)	xx
33976	Pin—Used to fasten pivot arm in pickup arm shell	.03
33974	Screw—Needle screw	.15
33975	Shaft—Pickup pivot shaft and pivot arm	1.40
	MOTOR ASSEMBLIES (Model RP-139A)	
32956	Coil—Field coil and laminations for 25 cycle motor	7.15
32955	Coil—Field coil and laminations for 50 cycle motor	5.90
32954	Coil—Field coil and laminations for 60 cycle motor	5.35
32960	Gear—Motor spindle gear and pin	.75
32873	Motor—Motor complete, 25 cycle, 110 volt AC	15.95
32872	Motor—Motor complete, 50 cycle, 110 volt AC	13.75
32871	Motor—Motor complete, 60 cycle, 110 volt AC	13.25
30870	Plug—2-prong male plug—used on motor leads	.35
32959	Spindle—Turntable spindle complete with metal pinion and fibre gear for 25 cycle motor	2.90
32958	Spindle—Turntable spindle complete with metal pinion and fibre gear for 50 cycle motor	2.90
32957	Spindle—Turntable spindle complete with metal pinion and fibre gear for 60 cycle motor	2.90
32875	Switch—Motor control switch (4)	.30
	MOTOR ASSEMBLIES (Model RP-145)	
34513	Armature—Complete armature and shaft for 60 cycle motor	xx
34512	Cap—Bakelite cap for motor	xx
34365	Capacitor—1.25 mfd., for 60 cycle motor (38)	1.75
34364	Motor—105/125 volts, 60 cycle, complete with capacitor (37)	6.75
30870	Plug—2-prong male plug for motor leads	.35
	MOTORBOARD ASSEMBLIES (Model RP-139A)	
33981	Base—Pickup arm mounting base	.80
33978	Board—Motorboard complete with bearings and posts less operating mechanism	6.50
33909	Cup—Used needle cup, lid, and pickup arm rest (6)	1.00
33979	Escutcheon—Index escutcheon	.50
31150	Mounting—Pickup arm base rubber mounting complete	.45
31155	Spring—Used needle cup lid spring (49)	.04
	MOTORBOARD ASSEMBLIES (Model RP-145)	
33981	Base—Pickup arm mounting base	.80
34363	Board—Motorboard complete with bearings and posts—less operating mechanism	6.70
33909	Cup—Used cup, lid, and pickup arm rest (6)	1.00
33979	Escutcheon—Index escutcheon	.50
31150	Mounting—Pickup arm base rubber mounting complete	.45
31155	Spring—Used needle cup lid spring (49)	.04
32875	Switch—Motor switch (4)	.30
	OPERATING MECHANISM	
10129	Ball—Steel ball for turntable bearing (Model RP-145)	.02
33984	Bracket—Record discriminating lever mounting bracket (3)	.20
33987	Cam—Cam and drive gear (42)	2.00
6808	Clutch—Trip lever clutch (5)	.35
34369	Cup—Turntable bearing cup (Model RP-145) (36)	.20
32883	Damper—Rubber drive sleeve and damper plate for motor spindle (Model RP-139A) (45, 46)	.30
34367	Disc—Turntable drive disc and tire (Model RP-145) (29)	2.25
31116	Finger—Trip lever friction finger (7)	.45
32879	Gear—Long arm and rack gear (41)	.60
31121	Gear—Record separator shaft gear (10)	.90
32880	Gear—Short arm and rack gear (40)	.55
34368	Grommet—Rubber grommet for motor mounting (Model RP-145) (48)	.08
31151	Guide—Lift cable guide spring (2)	.10
33982	Guide—Main spring guide (11)	.10
34370	Idler—Turntable idler wheel and arm (Model RP-145) (39)	.60
33986	Lever—Index lever (12)	.80
31138	Lever—Locating lever and pawl (14)	.70
33985	Lever—Main lever (15)	1.05
33993	Lever—10-inch and 12-inch record discriminating lever (17)	.85
31140	Lever—Pickup lift cable lever and spring (16)	.55
31130	Lever—Record separator elevating lever with adjustment screws (18)	.80
31132	Lever—Trip detaining lever (19)	.30
34874	Lever—Trip lever assembly (20)	1.85
31131	Lever—Trip regulator lever (21)	.25
33992	Link—Index lever setting link and button	.20
31137	Pawl—Index lever pawl (13)	.30
31133	Pawl—Trip pawl assembly (22)	.80
31535	Pin—Drive pin for turntable drive disc (Model RP-145) (24)	.03
31124	Pin—Pin to fasten gear on record separator shaft (23)	.04
31118	Screw—Cone pointed set screw for record separator shelf ("H")	.08
14198	Screw—No. 10-32 cone pointed set screw for trip lever hub ("D")	.05
33983	Screw—Record separator elevating lever pivot screw	.15
31117	Screw—Special to adjust friction clutch	.03
33990	Separator—Record separator knife (25)	1.85
33988	Shaft—Record separator shaft (34)	.70
33989	Shelf—Record separator shelf (27)	1.25
3676	Spring—Cam gear pawl spring	.04
31136	Spring—Index lever pawl spring (30)	.05
3666	Spring—Lift cable spring (31)	.04
32438	Spring—Locating lever spring (35)	.05
32882	Spring—Main lever tension spring (43)	.05
34878	Spring—Pickup arm starting spring (26)	.10
14190	Spring—Record discriminating lever pawl spring or locating lever pawl spring (28)	.08
33994	Spring—Record discriminating lever spring (flat) (9)	.05
14191	Spring—Trip detaining lever spring (33)	.04
34372	Spring—Turntable idler wheel spring (Model RP-145) (47)	.10
34371	Support—Turntable drive and motor support (Model RP-145)	.70
34875	Switch—Pickup shorting switch (44)	.45
33991	Turntable—(Model RP-139A)	3.00
34366	Turntable and Spindle Shaft—(Model RP-145) (32)	3.35
34373	Washer—"C" washer for mounting idler wheel and arm (Model RP-145)	.03

xx Price upon application to your RCA Victor Parts Distributor.

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

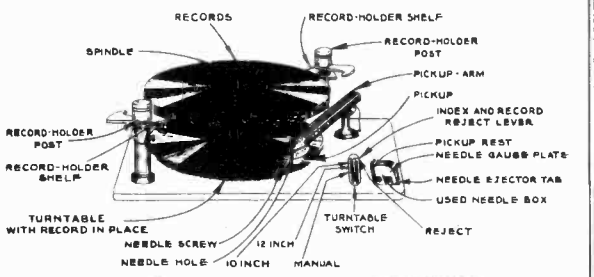
MODEL RP139A
MODEL RP145

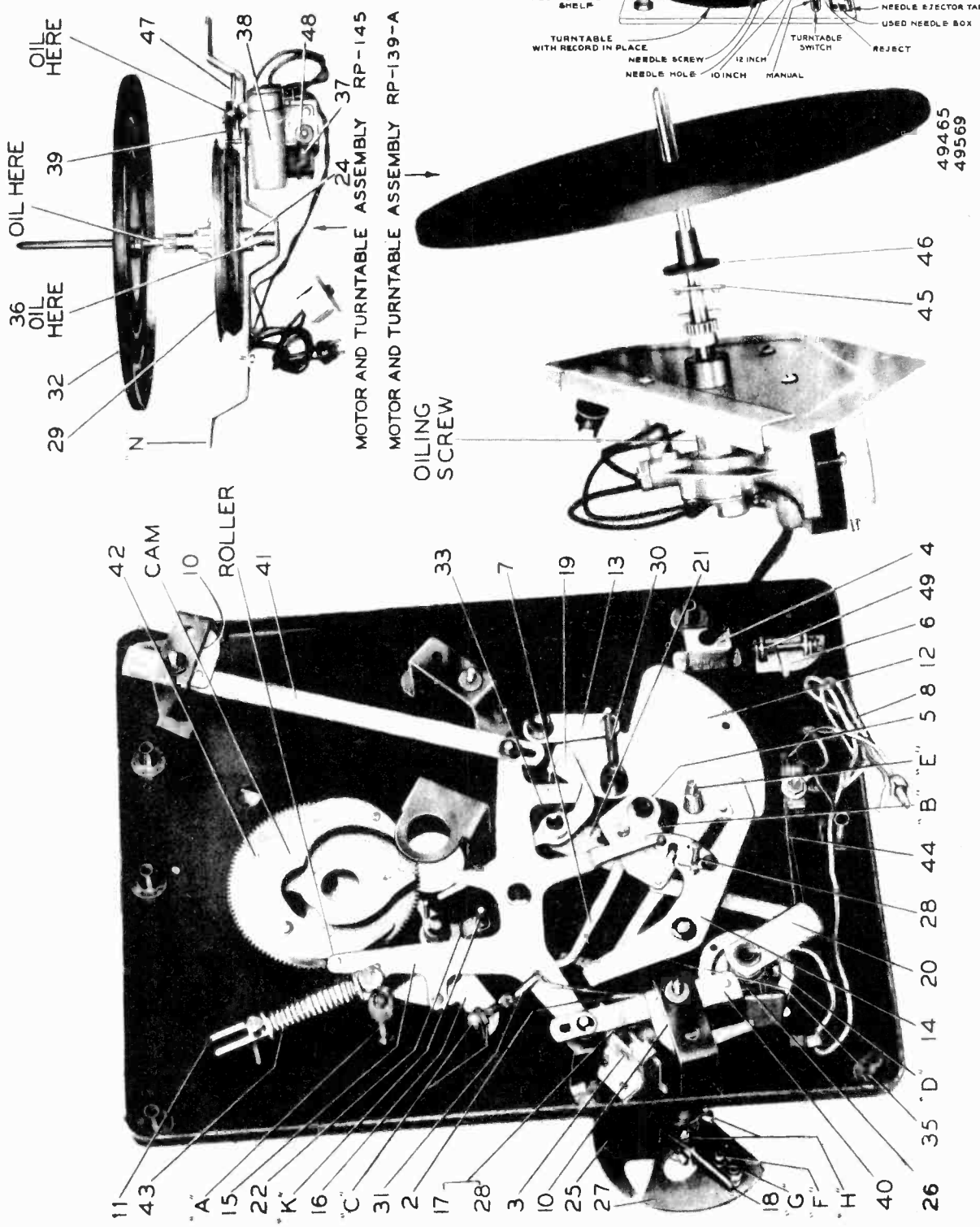
RCA MFG. CO., INC.

Assembly, Ratings

These record changers are available for operation on voltages and frequencies as follows:

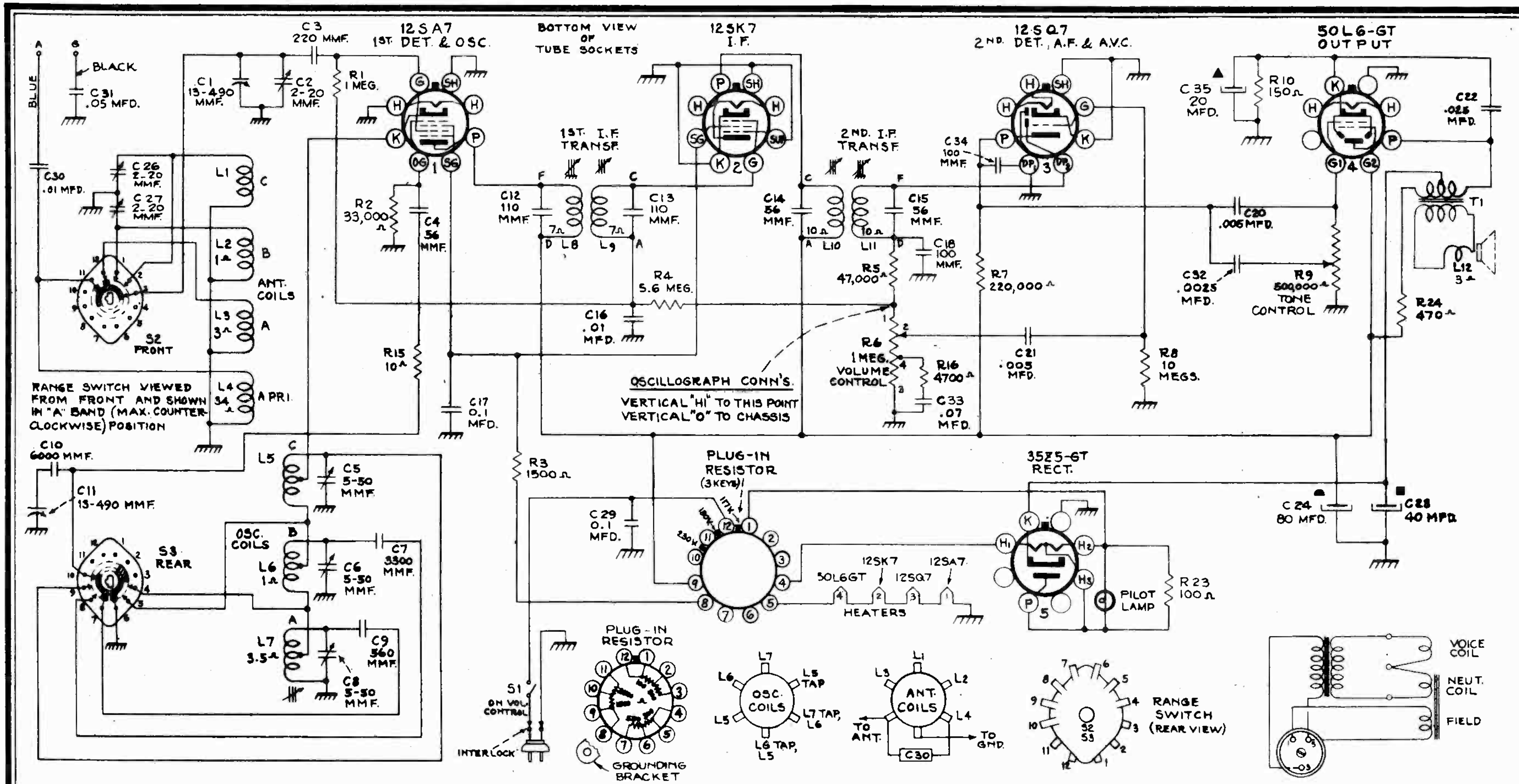
RP-139-A	105-125 volts, 60 cycles, 21 watts
RP-139-A	105-125 volts, 50 cycles, 21 watts
RP-139-A	105-125 volts, 25 cycles, 22 watts
RP-145	105-125 volts, 60 cycles, 15 watts
RP-145	105-125 volts, 50 cycles, 15 watts





MODEL 5Q66
Ch.RC-477C
Schematic, Voltage

RCA MFG. CO., INC.



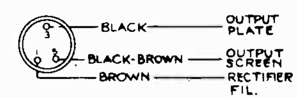
TUBES	117 V. SUPPLY				180 V. SUPPLY				230 V. SUPPLY			
	VOLTAGE			CURRENT	VOLTAGE			CURRENT	VOLTAGE			CURRENT
	P	SG	K	K	P	SG	K	K	P	SG	K	K
(1) 12SA7	106	89	—	8.3	137	98	—	12.8	146	87	—	12.8
(2) 12SK7	106	89	—	16.0	137	98	—	17.9	146	87	—	17.9
(3) 12SQ7	58*	—	—	.2	70*	—	—	.3	74*	—	—	.3
(4) 50L6-GT	114	106	6.5	45.8	142	137	8.3	50.0	157	146	8.9	52.0
(5) 35Z5-GT	—	—	119	70.3	—	—	150	80.0	—	—	160	83.0

VOLTAGES SHOULD HOLD WITHIN ± 20%.

* CANNOT BE MEASURED WITH AN ORDINARY VOLTMETER.

— 1940 —

First Edition



SPEAKER AND CABLE CONNECTIONS

T-93176
5Q66 (RC477C)

Frequency Ranges
Standard Broadcast ("A" Band). 540-1,720 kc (555-174 m)
Medium Wave ("B" Band)....... 2.3-7.0 mc (130-42.8 m)
Short Wave ("C" Band).......... 7.0-22 mc (42.8-13.6 m)

Intermediate Frequency........................ 455 kc

Power Output Rating
(210-250 Volt Operation)
Undistorted.................................. 3.0 watts
Maximum..................................... 4.5 watts

Loudspeaker (84905-501)
Type.. 5-inch
V. C. Impedance................. 4.5 ohms at 400 cycles

Power Supply Ratings
105-125 volts................................ 30 watts
160-180 volts................................ 45 watts
210-250 volts................................ 60 watts

Pilot Lamp..........Mazda No. 47, 6.3 volts, 0.15 amp.

Ballast Tube..................... RCA Stock No. 35748

MODEL 5Q66
Alignment, Trimmers
Socket

RCA MFG. CO., INC.

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the schematic.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver ground lead (black), and keep the output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the rear of the drum which is mounted on the front shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 135° mark on the drum scale must be vertical, and directly under the center of the gang-condenser shaft when the plates are fully meshed. The drum is held to the shaft by means of a set screw, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the 0° mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 530 kc mark, and gang condenser fully meshed. The indicator has a spring clip for attachment to the cable.

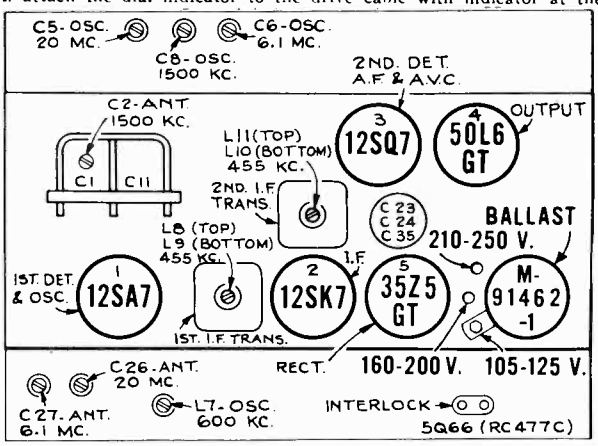
Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
1	12SK7 I-F grid in series with .01 mfd.	455 kc	"A" Band quiet point between 550-750 kc	L10 and L11 (2nd I.F. trans.)
2	Tuning condenser stator (osc.) in series with .01 mfd. **	455 kc		L8 and L9 (1st I.F. trans.)
3	Antenna lead in series with 200 mmfd.	600 kc	600 kc (33°) "A" Band	L7†
4		1,500 kc	1,500 kc (152.4°) "A" Band	C2 (ant.) C8 (osc.)
5	Repeat steps 3 and 4			
6	Antenna lead in series with 400 ohms	20 mc	20 mc (155.4°) "C" Band	C5 (osc.)* C26 (ant.)
7		6 mc	6 mc (148°) "B" Band	C6 (osc.)* C27 (ant.)
8	Antenna lead in series with 200 mmf.	1,500 kc	1,500 kc (152.4°) "A" Band	C8 (osc.)

* Use minimum capacity peak if two peaks can be obtained.

† Rock gang condenser slightly while adjusting L7.

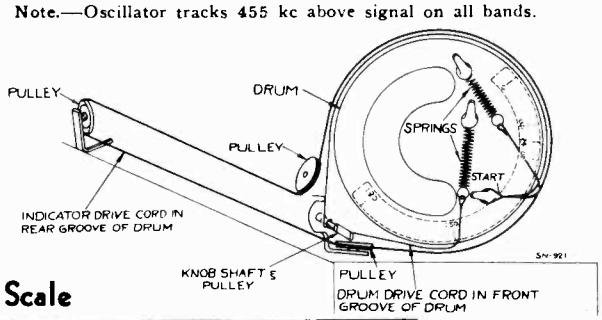
** Make test-oscillator connection to lug on tuning condenser stator (oscillator section) in series with .01 mfd. condenser.

Note.—Oscillator tracks 455 kc above signal on all bands.

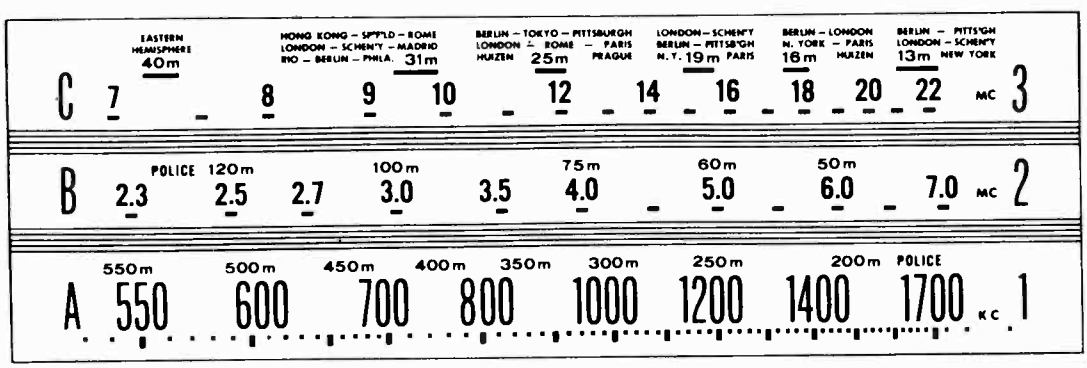


Above—Top View

At Right—Dial Mechanism



Calibration Scale

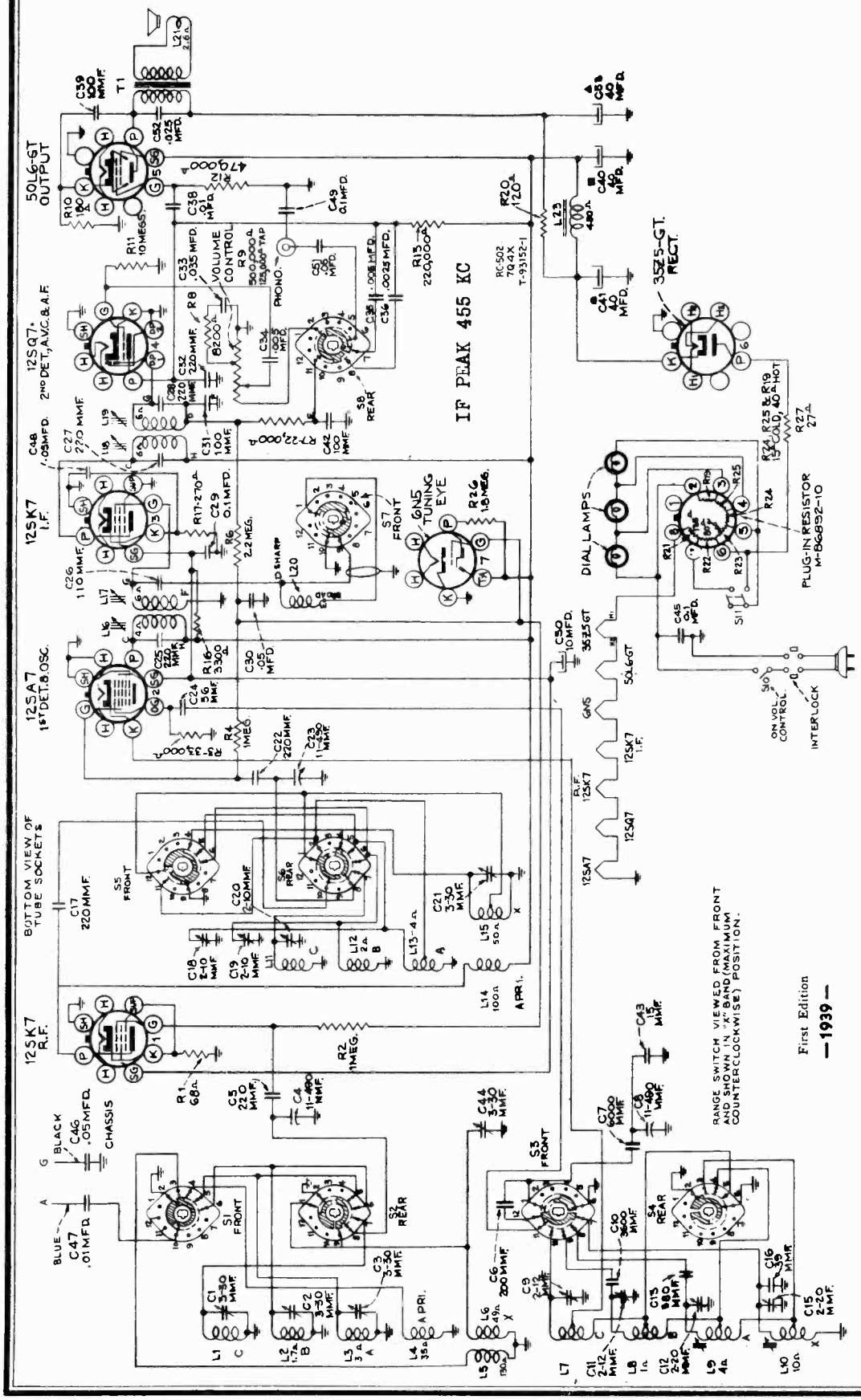


Reduced Reproduction of Receiver Dial, and Corresponding 0-180° Calibration Scales

The corresponding position of the dial indicator for any setting of the calibration scale can be determined by drawing a line from this point on the bottom calibration scale to the same point on the top calibration scale. For example: 33° on the calibration scale corresponds to approximately 7.9 mc on "C" band, and 600 kc on "A" band, etc. Read instructions under "Alignment Procedure."

RCA MFG. CO., INC.

MODEL 7Q4X
Ch. RC-502
Schematic



Pilot Lamps (3)..... Mazda No. 47, 6.3 volts, .15 amp. Loudspeaker (RL-90-1)

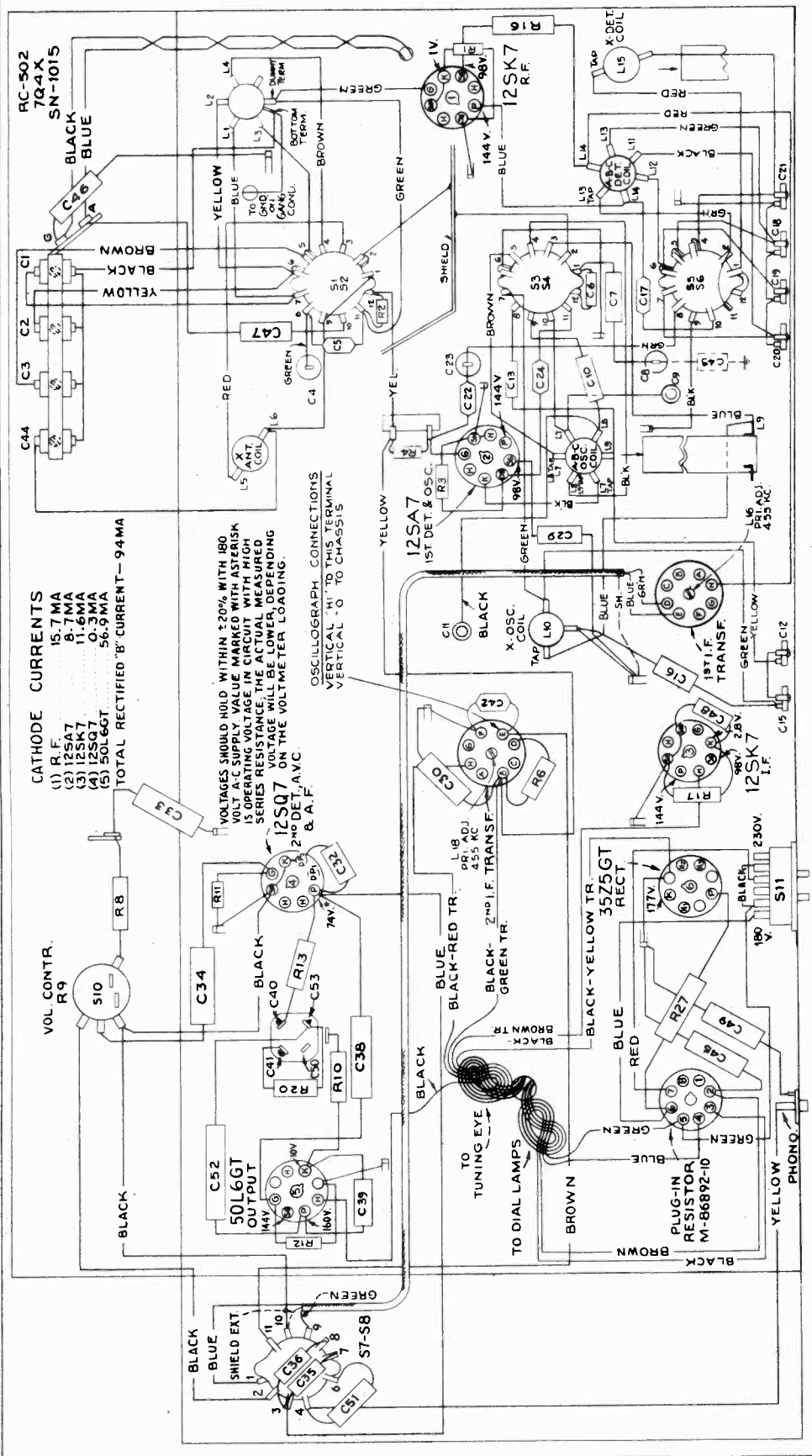
Power Supply Ratings	
160-200 volts, 40-100 cycles	60 watts
160-200 volts, Direct Current	60 watts
210-250 volts, 40-100 cycles	70 watts
210-250 volts, Direct Current	70 watts

Type	8-inch permanent magnet dynamic
Voice Coil Impedance	2.6 ohms at 400 cycles
Power Output Rating	
Undistorted	3.5 watts
Maximum	4.5 watts

Frequency Ranges	
"X" Band	145-405 kc (2,069-740 m)
Standard Broadcast ("A")	540-1,720 kc (555-174 m)
"B" Band	2.3-7.0 mc (130-42.8 m)
"C" Band	7.0-22.0 mc (42.8-13.6 m)
Intermediate Frequency	455 kc

MODEL 7Q4X
Chassis Wiring, Voltage
Phono. Data, Lead Dress

RCA MFG. CO., INC.



Phonograph Operation:

A jack is provided on the rear of the chassis for connection to a phonograph attachment. The cable from the phonograph attachment should be terminated in a Stock No. 31048 plug to fit the jack.

The attachment must be designed to operate on the particular voltage and frequency of the power supply line. (Most attachments are for alternating current only, and can not be used on direct current.)

Precautionary Lead Dress:

1. Dress the black diode lead running between the 12SQ7 and terminal G on the 2nd I.F. transformer, directly against the chassis.

2. Dress the brown lead from terminal E on the 2nd I.F. transformer to terminal 11 on S8 against the chassis.

3. Dress the phono lead from phono jack to switch along the side of the chassis.

4. Dress the filament lead from No. 8 of the 12SQ7 to 12SK7 R.F. behind the 12SQ7 socket and away from diode and plate.

5. Dress C34 and R11 along chassis above volume control.

Caution!

Before replacing ballast resistor, check rectifier and plate circuits to be sure that there are no shorts which would cause the ballast to burn out.

RCA TUBE COMPLEMENT

(1) RCA-12SK7 ..... R-F Amplifier
(2) RCA-12SA7 ..... 1st Detector, Oscillator
(3) RCA-12SK7 ..... I-F Amplifier
(4) RCA-12SQ7 ... 2nd Detector, A.V.C., Audio Amplifier
(5) RCA-50L6GT ..... Output
(6) RCA-35Z5GT ..... Rectifier
(7) RCA-6N5 ..... Tuning Indicator

RCA MFG. CO., INC.
Alignment Procedure

MODEL 7Q4X
Alignment, Trimmers
Socket

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

Output Meter Alignment. — If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

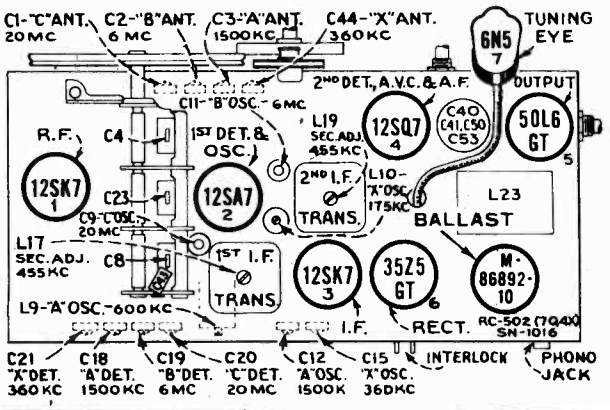
Test-Oscillator. — For all alignment operations, connect the low side of the test-oscillator to the black lead and keep the output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum. — The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the rear of the drum which is mounted on the front shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 0° mark on the drum scale must be vertical, and directly over the center of the gang-condenser shaft when the plates are fully meshed. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the 0° mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 530 kc mark, and gang condenser fully meshed.



Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	Turn tone control to 3rd position (sharp) from maximum counter-clockwise.			
2	12SK7 I-F grid in series with .01 mfd.	455 kc	"A" band Quiet point between 550-750 kc	L18 and L19 (2nd I-F trans.)
3	12SA7 grid in series with .01 mfd.			L16 and L17 (1st I-F trans.)
4	Turn tone control to 4th position (broad) from maximum counter-clockwise and check I-F response which should be a slightly double-peaked curve. Leave tone control in 3rd position (sharp) for the following steps.			
5	Ant. lead in series with 200 mmfd.	360 kc	360 kc (149°) "X" band	C15 (osc.)† C21 (det.) C44 (ant.)
6		175 kc	175 kc (53°) "X" band	L10 (osc.) Rock gang
7		1,500 kc	1,500 kc (152°) "A" band	C12 (osc.)†† C18 (det.) C3 (ant.)
8		600 kc	600 kc (32°) "A" band	L9 (osc.) Rock gang
9	Repeat steps 5, 6, 7, and 8.			
10	Ant. lead in series with 300 ohms	6 mc	6 mc (149°) "B" band	C11 (osc.)* C19 (det.) C2 (ant.)
11		20 mc	20 mc (157°) "C" band	C9 (osc.)** C20 (det.) C1 (ant.)

* Use **minimum** capacity peak if two can be obtained. Check to determine that C11 has been adjusted to the correct peak by tuning receiver to approximately 5.09 mc where a weaker signal should be received.

** Use **minimum** capacity peak if two can be obtained. Check to determine that C9 has been adjusted to the correct peak by tuning receiver to approximately 19.09 mc where a weaker signal should be received.

† Preset L10 core approximately ½-inch out before adjusting C15.

†† Preset L9 core screw flush with apron before adjusting C12.

Note.—Oscillator tracks above signal on all bands.

MODELS 8QB,8QBK
Ch. RC-336
Alignment,Trimmers
Socket

RCA MFG. CO., INC.

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

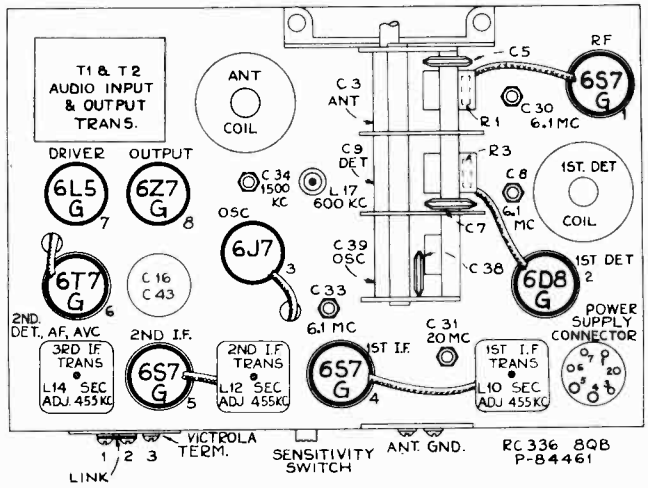
Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver ground terminal (G), and keep the output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum. — The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the rear of the drum which is mounted on the front shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 180° mark on the drum scale must be vertical, and directly over the center of the gang-condenser shaft when the plates are fully meshed. The surface of the drum must be flush with the end of the gang-condenser shaft. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "180°" mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the left-hand end mark on the dial scales and gang condenser fully meshed. The indicator has a spring clip for attachment to the cable.



Top View, Showing Location of Tubes and Trimmers

Location of Controls

The pilot lights are illuminated by pressing in the volume-control knob. (The pilot lights are not controlled by this action when the receiver is operated with the CV-110 a-c power supply unit.) Sensitivity switch is on rear of chassis.

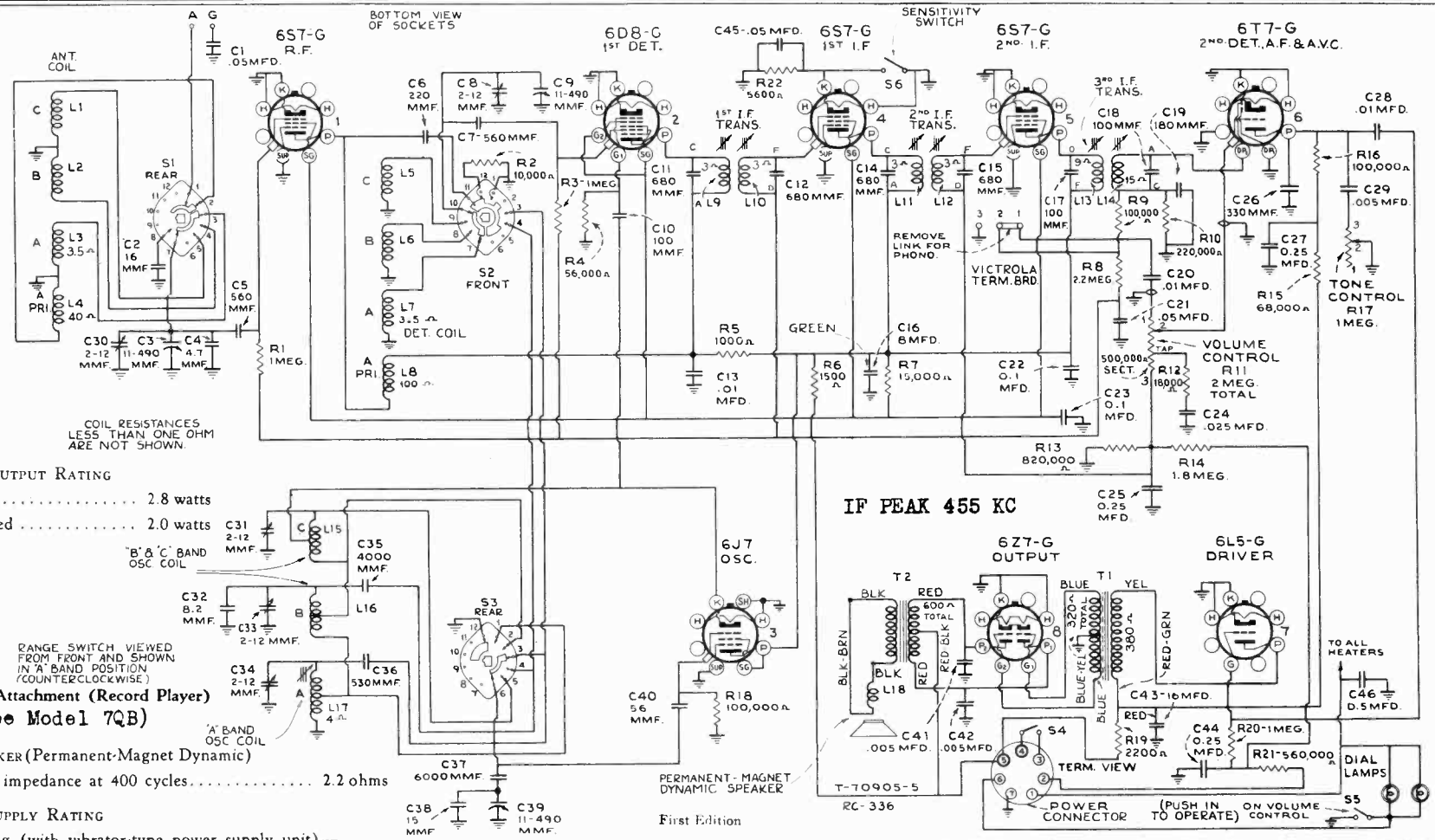
Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
Leave the sensitivity switch open (minimum sensitivity) during all alignment operations.				
1	6S7-G 2nd-I.F. grid cap, in series with .01 mfd.	455 kc	"B" band, Quiet point.	L13 and L14 (3rd I-F Trans.)
2	6S7-G 1st-I.F. grid cap, in series with .01 mfd.			L11 and L12 (2nd I-F Trans.)
3	6D8-G 1st-det. grid cap, in series with .01 mfd.			L9 and L10 (1st I-F Trans.)
4	Antenna Terminal, in series with 300 ohms	6.1 mc	6.1 mc (29°) "B" band	C33 (osc.)* C8 (det.)† C30 (ant.)
4A	Check to determine that C33 has been adjusted to correct peak by turning radio to 5.19 mc (50°), where a weaker signal should be received.			
5	Antenna Terminal, in series with 300 ohms	20 mc	20 mc (23.5°) "C" band	C31 (osc.)*
5A	Check to determine that C31 has been adjusted to correct peak by turning radio to 19.09 mc (29.5°), where a weaker signal should be received.			
6	Antenna Terminal, in series with 200 mmf.	1,500 kc	1,500 kc (31°) "A" band	C34 (osc.)*
7	Antenna Terminal in series with 200 mmf.	600 kc	600 kc (144.5°) "A" band	L17 (osc.)††
8	Repeat Step No. 6.			

* Use **minimum** capacity peak (plunger out) if two peaks can be obtained.

† Rock the gang condenser slightly while adjusting C8, and use **maximum** capacity peak if two peaks can be obtained.

†† Rock the gang condenser slightly while adjusting L17 for maximum output.

NOTE: The oscillator tracks 455 kc **above** the signal on all bands.



POWER OUTPUT RATING

Maximum ..... 2.8 watts

Undistorted ..... 2.0 watts

LOUDSPEAKER (Permanent-Magnet Dynamic)

Voice-coil impedance at 400 cycles ..... 2.2 ohms

POWER SUPPLY RATING

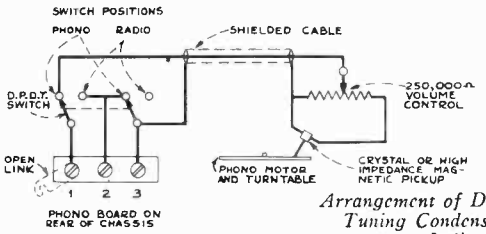
D-C Rating (with vibrator-type power supply unit)—6.3 volts, 3.5 amps.

A-C Rating (with CV-110 A-C power supply unit)—105-117, 117-130, 140-160, 200-225, 225-250 volts, 25-60 cycles.

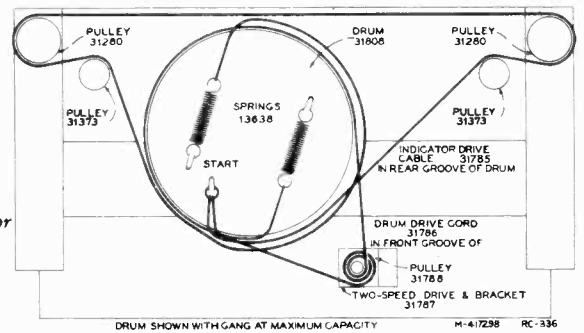
PILOT LAMPS (2) ..... Mazda No. 44, 6.3 volts, 0.25 amp.

Precautionary Lead Dress.—

1. Dress the leads from 1st-detector coil to range switch away from trimmer C8.
2. Dress all leads away from the tap on the volume control.
3. Dress the blue lead from the antenna terminal to the range switch close to chassis.
4. Grid-cap connectors must not ground to tube shields.
5. Dress black lead from terminal 7 on power connector into corner and close to side of chassis.



Record Player Connections, Using a Double-Pole, Double-Throw Toggle Switch



Arrangement of Drive Cords for Tuning Condenser and Dial Indicator

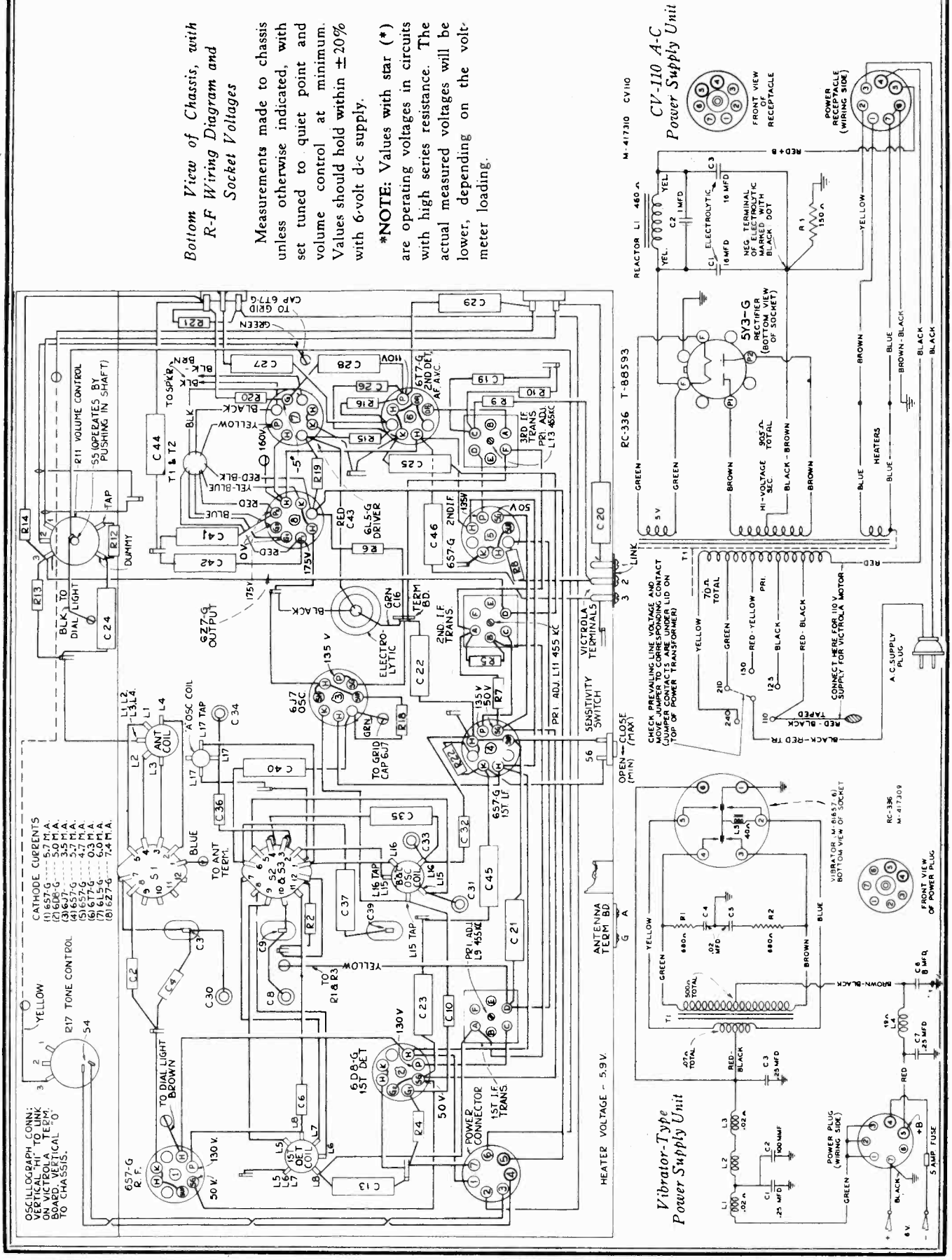
MODELS 8QB,8QBK
Chassis Wiring,Voltage
SPU Schematics

RCA MFG. CO., INC.

Bottom View of Chassis, with R-F Wiring Diagram and Socket Voltages

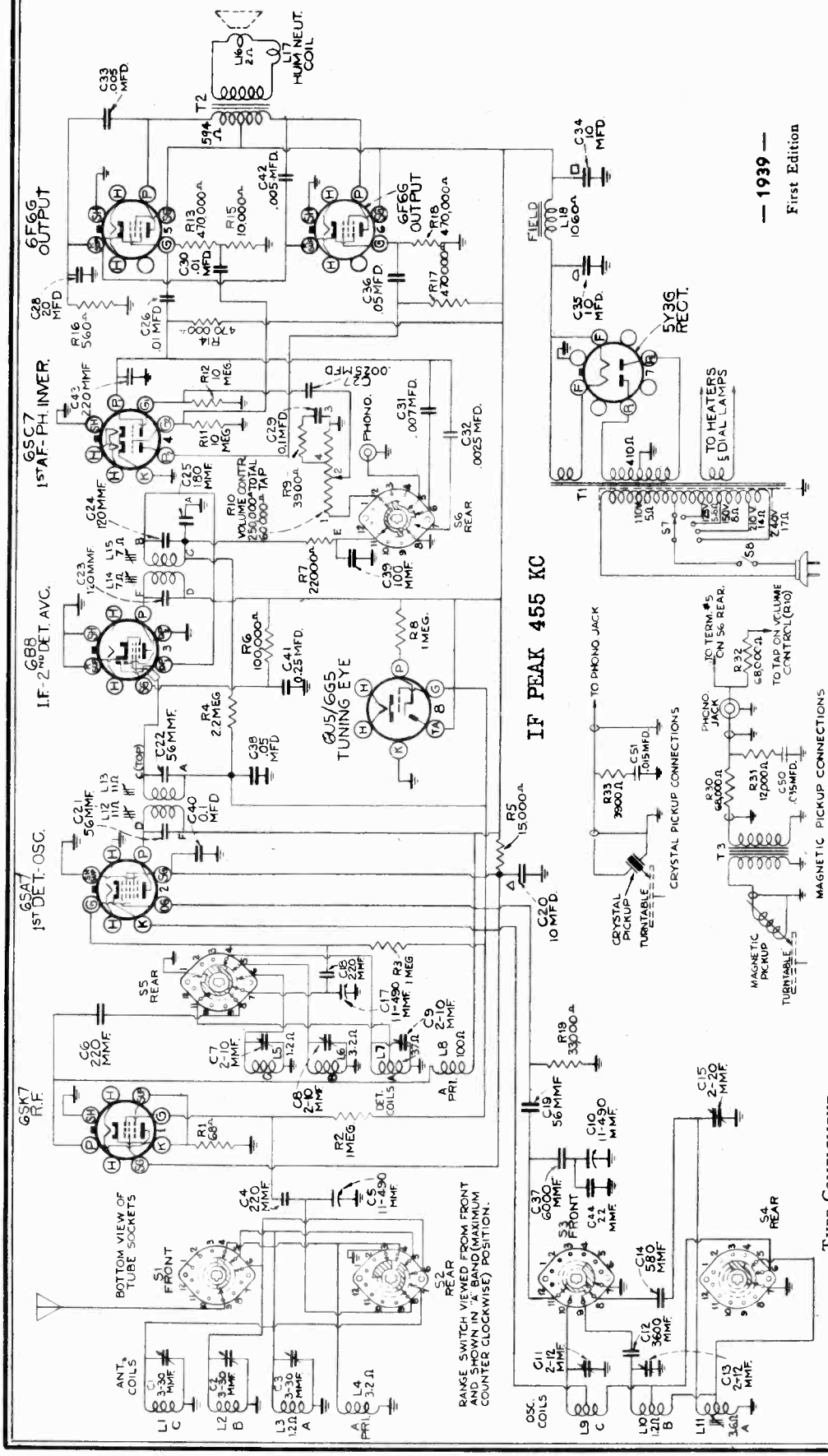
Measurements made to chassis unless otherwise indicated, with set tuned to quiet point and volume control at minimum. Values should hold within ±20% with 6-volt d-c supply.

***NOTE:** Values with star (*) are operating voltages in circuits with high series resistance. The actual measured voltages will be lower, depending on the voltmeter loading.



RCA MFG. CO., INC.

MODELS 8Q2, Ch. RC-443
8QU5C, 8QU5M, Ch. RC-443B
Schematic, Lead Dress



Tube Complement

(1) RCA-6SK7 ..... R-F Amplifier
(2) RCA-6SA7 ..... 1st Detector-Oscillator
(3) RCA-6B8 ..... I-F Amplifier, 2nd Det., A.V.C.
(4) RCA-6SC7 ..... A-F Amplifier, Phase Inverter
(5) RCA-6F6-G ..... Power Output
(6) RCA-6F6-G ..... Power Output
(7) RCA-5Y3-G ..... Rectifier
(8) RCA-6U5/6G5 ..... Tuning Indicator

Frequency Ranges

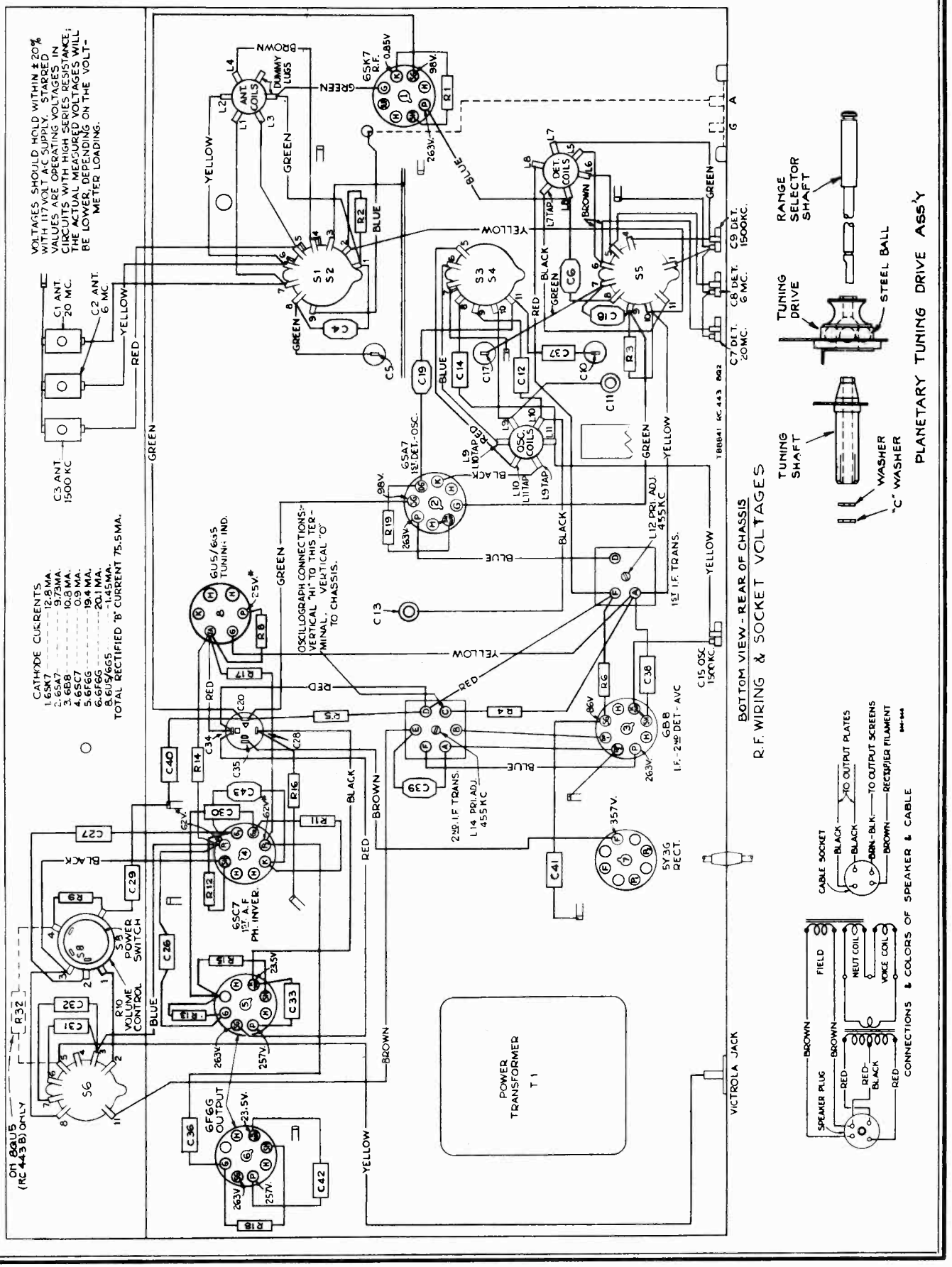
Standard Broadcast ("A" Band) ..... 540-1,720 kc (555-174 m)
Medium Wave ("B" Band) ..... 2.3-7.0 mc (130-42.8 m)
Short Wave ("C" Band) ..... 7.0-22.0 mc (42.8-13.6 m)

Precautionary Lead Dress:

1. Leads from L5 and L6 to terminals 5 and 6 on S5, and the leads from these terminals to C7 and C8, should be dressed as far as possible from parts at ground potential.
2. The lead from the detector gang (C17) to terminal 7 on S5, and the lead from the 6SA7 grid to terminal 9 on S5 should be kept away from ground and from parts in the oscillator grid circuit, such as C37, C19, S3 and S4.
3. The lead from terminal E on the second I-F transformer to terminal 11 on S6 should be dressed against the sub-base.
4. The lead from the plate of the 6SK7 (R-F) to L8 should be dressed away from parts at ground potential.
5. The lead from the grid of the 6SK7 (R-F) to terminal 1 on S1 should be kept as far as possible from the antenna lead running to terminal 9 on S1.

MODELS 8Q2,8QU5C,8QU5M
Chassis Wiring,Voltage

RCA MFG. CO., INC.



RCA MFG. CO., INC.
Specifications

MODELS 8Q2, 8QU5C, 8QU5M
Alignment, Trimmers
Socket, Notes

INTERMEDIATE FREQUENCY ..... 455 kc

CRYSTAL PICKUP
Impedance ..... 100,000 ohms at 1,000 c.p.s.
Average Output ... 1.5 volts at 1,000 c.p.s. across 500,000 ohms load

PILOT LAMPS (3) ... 2-Mazda No. 44, 6.3 volts, 0.25 amp.; 1-Mazda No. 47, 6.3 volts, 0.15 amp

POWER OUTPUT RATING
Undistorted ..... 4.5 watts
Maximum ..... 5.5 watts

LOUDSPEAKER (RL-63J-6)
Type ..... 8-inch electrodynamic
V.C Impedance ..... 2.2 ohms at 400 c.p.s.

PHONOGRAPH MOTOR ..... self-starting, constant-speed, induction type

MAGNETIC PICKUP
Impedance ..... 96 ohms at 1,000 c.p.s.
Average Output .. 0.14 volts at 400 c.p.s. across open circuit

POWER SUPPLY RATINGS
8Q2:
Rating A ..... 105-125 volts, 50-60 cycles, 75 watts
Rating B ..... 105-125 volts, 25-60 cycles, 75 watts
Rating C ..... 100-130, 140-160, 195-250 volts, 40-60 cycles, 75 watts

8QU5C and 8QU5M
Rating A5 ..... 105-125 volts, 50 cycles, 105 watts
Rating A6 ..... 105-125 volts, 60 cycles, 105 watts
Rating C5 ..... 105-125; 200-250 volts, 50 cycles, 105 watts
Rating C6 ..... 105-125; 200-250 volts, 60 cycles, 105 watts

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the rear of the drum which is mounted on the front shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

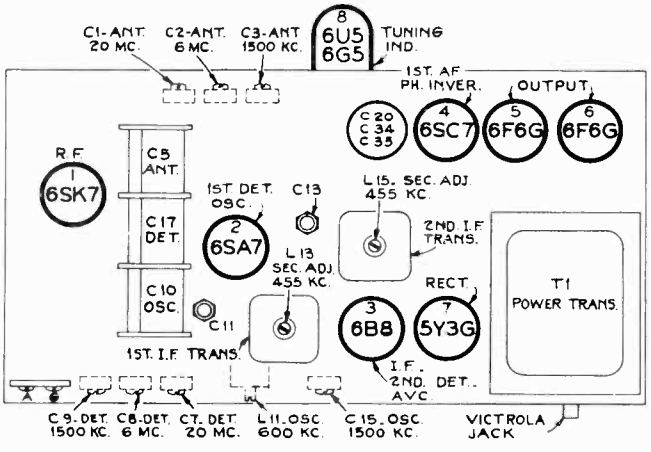
As the first step in r-f alignment, check the position of the drum. The 180° mark on the drum scale must be vertical, and directly over the center of the gang-condenser shaft when the plates are fully meshed. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

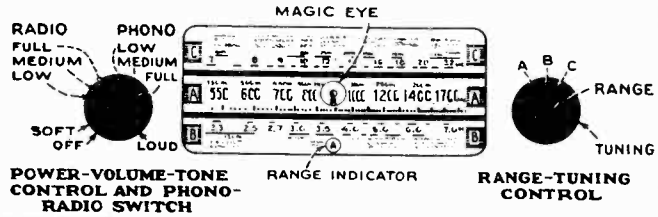
Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the 180° mark on the calibration scale when the plates are fully meshed.

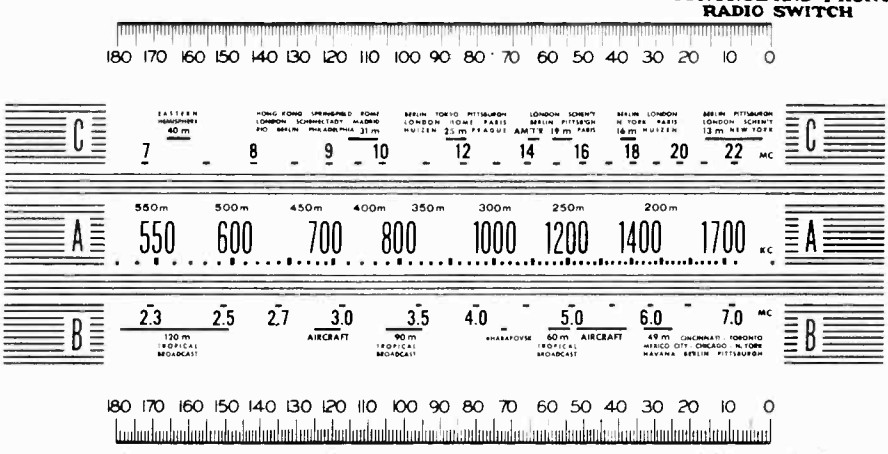
Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 530 kc mark, and gang condenser fully meshed. The indicator has a spring clip for attachment to the cable.

Steps	Connect the high side of test-osc. to	Tune test-osc. to	Turn radio dial to	Adjust the following for maximum peak output
1	6B8-I-F grid in series with .01 mfd.	455 kc	Quiet point on "C" Band	L14 and L15 (2nd I-F Trans.)
2	Stator of middle section of gang [C17] in series with .01 mfd.			L12 and L13 (1st I-F Trans.)
3	Ant. terminal in series with 200 mmfd.	600 kc	600 kc (148°) "A" Band	L11 (osc.) Rock gang
4		1,500 kc	1,500 kc (28°) "A" Band	C15 (osc.)* C9 (det.)† C3 (ant.)
5	Ant. terminal in series with 300 ohms	6.1 mc	6.1 mc (29°) "B" Band	C13 (osc.)* C8 (det.)† C2 (ant.)
6		20 mc	20 mc (23°) "C" Band	C11 (osc.)* C7 (det.)† C2 (ant.)

* Use minimum capacity peak if two peaks can be obtained.
† Use maximum capacity peak if two peaks can be obtained.
NOTE: Oscillator tracks 455 kc above signal on all bands.







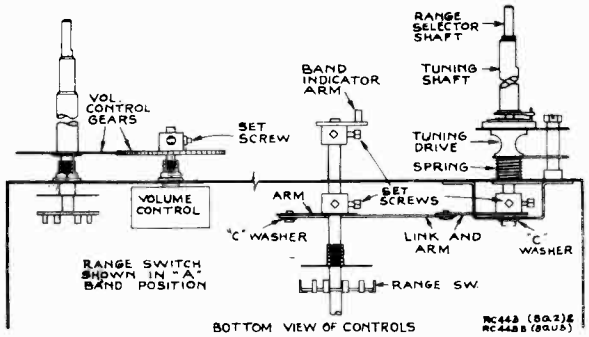
Calibration Scale

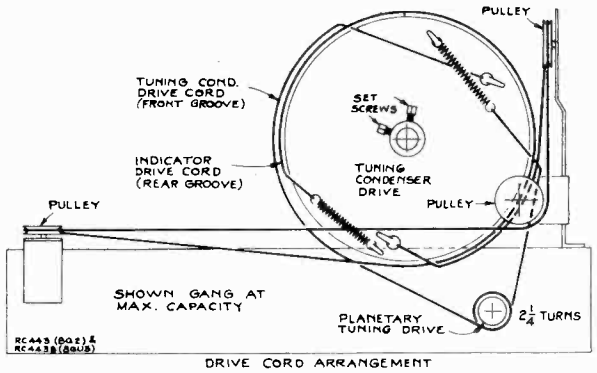
Reduced Reproduction of Receiver Dial, and Corresponding 0-180° Calibration Scales

The corresponding position of the dial indicator for any setting of the calibration scale can be determined by drawing a line from this point on the bottom calibration scale to the same point on the top calibration scale. For example: 33° on the calibration scale corresponds to approximately 7.9 mc on "C" band, and 600 kc on "A" band, etc. Read instructions under "Alignment Procedure."

MODELS 8Q2,8QU5C,8QU5M
Phonograph Data

RCA MFG. CO., INC.





Victrola Data

The 8QU5M is equipped with a magnetic pickup, and the 8QU5C with a crystal pickup. The output of the crystal pickup is fed directly into the Victrola jack at the rear of the chassis. On instruments using a magnetic pickup, a transformer and compensating circuit are used between the pickup and the Victrola jack (see schematic diagram). The transformer has two jacks, the larger one (primary) for input from the pickup and the smaller one (secondary) for output to the compensating circuit. The components of the compensating circuit are mounted externally to the chassis on a terminal board in the rear of the cabinet.

The phonograph motor is a self-starting, constant-speed induction type. It should be lubricated every six months by applying a few drops of light machine oil to the spindle bearing and oil hole.

The motor spindle is tapered, and a conical rubber piece fits snugly on the spindle. The hole in the turntable bushing is tapered to fit the rubber. This provides an excellent self-centering floating mounting.

A metal washer is placed on the spindle under the rubber piece. The washer has ears on the under side which fit over a pin that projects through the spindle.

The motor switch is automatic for both starting and stopping, and when properly adjusted, will turn the motor on as the pickup is moved from the pickup rest toward the turntable. The switch should be adjusted so that it will snap into the "off" position when the pickup needle is 1⅞ inches from the center line of the spindle shaft. The motor may be shut off at any time by placing the pickup on the pickup rest.

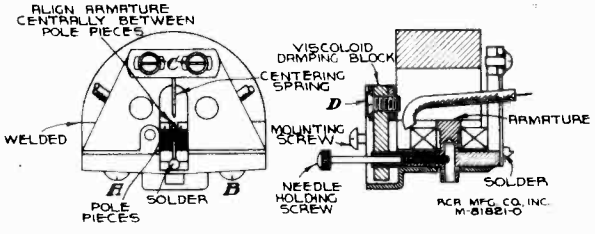
Crystal Pickup:

The crystal pickup is sealed in a metal case; if failure occurs, do not attempt to repair the unit, but install a new crystal unit.

Magnetic Pickup:

The magnetic pickup used is of an improved design. The horseshoe magnet is rigidly welded to the pole pieces and is irremovable. There is a centering spring attached to the armature to maintain proper adjustment and to provide a limiting effect on the movement of the armature. Service operations which may be necessary on the pickup are as follows:

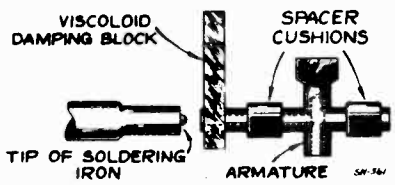
Centering Armature.—Refer to the figure showing the pickup inner structure. The armature is shown in its proper relation to the magnet pole pieces, i. e., exactly centered. Whenever this centering adjustment has been disturbed it will be necessary to remove the pickup mechanism from the tone arm for re-adjustment. Unsolder the two leads from the lugs on the terminal board at the rear of the pickup.



Insert a small rod or nail into the armature needle hole and tighten the needle holding screw to hold the rod securely. If the armature clamping screws A and B have not been disturbed, screws C should be loosened which will permit the armature to be moved from side to side, the rod acting as a lever to perform this operation. The proper adjustment is obtained when the armature is brought to the mid position between the pole pieces. Screws C should then be tightened. The armature position should then be central between the pole pieces and at right angles to them. Check to make sure that the armature is not touching the coil. The air gap between the pole pieces and the armature should be kept free from dust, filings, and other foreign material which would obstruct the movement of the pickup armature.

Replacing Coil.—Whenever there is defective operation due to an open or shorted pickup coil, this coil should be replaced. Remove the pickup mechanism and terminal board. Remove screws A and B and the magnet assembly. Remove the bakelite coil support (with coil attached) and insert the new coil support assembly in its place, after which replace the magnet assembly and center the armature as described above, then re-assemble the remainder of the unit. Only rosin core solder should be used for soldering the coil leads and pick-up leads to the pickup terminal board. This same type of solder should be used when necessary for soldering the centering spring to the armature.

Magnetizing.—Loss of magnetization will not usually occur when the pickup has received normal care because the magnet and pole pieces are one unit and the magnetic circuit remains practically closed at all times. When the pickup has been mishandled, subjected to a strong a-c field, jolted, or dropped, there may be an appreciable loss of magnetic strength, in which case it will be necessary to re-magnetize the entire structure. To do this, it will be necessary to first remove the pickup mechanism from the tone arm, and then remove the magnet assembly. Place the magnet assembly on the poles of a standard pickup magnetizer such as the RCA Stock No. 9549 Pickup Magnetizer and charge the magnet in accordance with the instructions accompanying the magnetizer. It is preferable to check the polarity of the pickup magnet and to remagnetize it so that the same polarity is maintained.



Damping Block.—The viscoloid damping block which is attached to the front end of the armature shank serves to reduce undesirable resonances and to cause the frequency response to be uniform. Should it be necessary to replace this damping block, the pickup mechanism should be removed from the tone arm. Remove screw D and the damping block from the pickup assembly. Make sure that the shaft of the armature which contacts the viscoloid is clean. Then insert the new damping block so that it occupies the same position as that of the original block, and is in correct vertical alignment with the armature. The hole in the block is somewhat smaller than the diameter of the armature in order to permit a snug fit. With the damping block properly aligned on the armature, screw D with its washer should then be replaced. Heat should be applied to the armature (viscoloid side) so that the damping block will fuse at the point of contact and become rigidly attached to the armature. A special-tip soldering iron, constructed as shown, will be found very useful in performing this operation. The iron should be applied only long enough to slightly melt the block, causing a small bulge on both sides.

REPLACEMENT PARTS

Models 8Q2, 8QU5C, 8QU5M Insist on genuine factory-tested parts, which are readily identified and may be purchased from authorized dealers.

STOCK No.	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES (RC-443 and RC-443B)	
34133	Arm—Band indicator arm — located on range switch shaft	.45
34502	Arm—Operating arm on range switch shaft	.25
10194	Ball—Steel ball	.02
31767	Board—Antenna ground terminal board	.20
34131	Bracket—Drive cord pulley and brackets	.55
33819	Capacitor—Trimmer capacitor — 3 sections of 2-10 mmfd. each	.60
12714	Capacitor—Air trimmer capacitor—2-12 mmfd. (C11, C13)	.50
33817	Capacitor—Trimmer capacitor—1 section of 2-20 mmfd. (C15)	.30
33820	Capacitor—Trimmer capacitor — 3 sections of 3-30 mmfd. each (C1, C2, C3)	.60
31868	Capacitor—22 mmfd. (C44)	.30
12723	Capacitor—56 mmfd. (C19)	.35
30949	Capacitor—56 mmfd. (C21, C22)	.25
12729	Capacitor—100 mmfd. (C39)	.35
12404	Capacitor—120 mmfd. (C23, C24)	.30
14712	Capacitor—180 mmfd. (C25)	.30
12694	Capacitor—220 mmfd. (C4, C6, C18, C43)	.35
33235	Capacitor—560 mmfd. (C14)	.40
12811	Capacitor—3,600 mmfd. (C12)	.60
31405	Capacitor—6,000 mmfd. (C37)	.75
5107	Capacitor—.0026 mfd. (C27, C32)	.20
4838	Capacitor—.005 mfd. (C33, C42)	.25
13033	Capacitor—.007 mfd. (C31)	.25
4858	Capacitor—.01 mfd. (C26, C30)	.25
32787	Capacitor—.05 mfd. (C36, C38)	.20
32786	Capacitor—0.1 mfd. (C29, C40)	.25
12684	Capacitor—0.25 mfd. (C41)	.30
33014	Capacitor—Comprising 3 sections of 10 mfd., 450 volts, and 1 section of 20 mfd., 25 volts (C20, C28, C34, C35)	1.90
33762	Coil—Antenna coil—A-B-C bands (L1, L2, L3, L4)	1.20
33763	Coil—Detector coil—A-B-C bands (L5, L6, L7, L8)	1.60
32824	Coil—Oscillator coil—A-B-C bands (L9, L10, L11)	1.00
33756	Condenser—Variable tuning condenser (C5, C10, C17)	5.50
33814	Control—Volume control and switch (R10, S8)	2.00
32635	Cord—Indicator drive cord	.24
32834	Cord—Tuning condenser drive cord	.10
32713	Core—Adjustable core and stud for oscillator coils	.35
33770	Drive—Phantary tuning drive—less shafts and balls, and shaft retainer	.90
33773	Drum—Variable tuning condenser drum and hub	.80
33185	Gear—Shaft and gear for volume control	.50
34132	Gear—Shaft and gear for tone control	.55
11891	Lamp—Pilot lamp	.17
33767	Link—Operating link and arm on range switch knob shaft	.60
5040	Plug—4-contact female plug for speaker cable	.30
34130	Pulley—Drive pulley and brackets	.30
14281	Resistor—68 ohms, ½ watt (R1)	.20
17214	Resistor—560 ohms, 2 watt (R16)	.22
12955	Resistor—3,900 ohms, ½ watt (R9)	.20
14559	Resistor—10,000 ohms, ½ watt (R15)	.20
33489	Resistor—10,000 ohms, 2½ watt (R5)	.55
14284	Resistor—22,000 ohms, 1/10 watt (R7)	.15
12454	Resistor—33,000 ohms, ½ watt (R19)	.20
3252	Resistor—100,000 ohms, ½ watt (R6)	.20
12285	Resistor—470,000 ohms, ½ watt (R13, R14, R17, R18)	.20
13730	Resistor—1 megohm, ½ watt (R2, R3, R8)	.20
12679	Resistor—2.2 megohms, ½ watt (R4)	.20
13601	Resistor—10 megohms, ½ watt (R11, R12)	.20
14550	Screw—No. 8-32 x 11/32 square head set screw for gear and drum	.03
34134	Shaft—Range switch shaft	.80
34135	Shaft—Tuning knob shaft	.70
33829	Socket—Magic Eye bracket and socket	.50
14278	Socket—Phonograph input socket	.25
31361	Socket—Pilot lamp socket	.20
31251	Socket—Tube socket	.25
13638	Spring—Indicator drive cord spring	.08
33769	Spring—Planetary tuning drive spring	.15
31418	Spring—Tuning condenser drive cord spring	.05
33757	Switch—Range switch (S1, S2, S3, S4, S5)	2.25
34602	Switch—Tone control (S6)	1.25
32285	Transformer—1st I.F. transformer (L12, L13, C21, C22)	2.30
14308	Transformer—2nd I.F. transformer (L14, L15, C23, C24, C25, R7)	2.90
31734	Transformer—Power transformer—105/125 volts, 25/60 cycle (T1)	10.35
31733	Transformer—Power transformer—105/125 volts, 50/60 cycle (T1)	4.75
31735	Transformer — Power transformer — 105/130, 140/160, 200/250 volts, 50/60 cycle (T1, S7)	10.80
	MOTOR ASSEMBLIES (Model 8QU5-C) (Model 8QU5-M)	
32850	Field—Motor field coils and laminations, 110 volts, 50 cycle	5.10
32336	Field—Motor field coils and laminations, 110 volts, 60 cycle	5.10
33220	Motor—105-125 volts, 50 cycles—less mounting plate	11.25
33219	Motor—105-125 volts, 60 cycles—less mounting plate	10.75
33361	Shaft—Turntable spindle shaft and gear — 50 cycle	1.40
33360	Shaft—Turntable spindle shaft and gear — 60 cycle	1.40
34304	Arm—Pickup arm—less unit cable and pivot arm	1.80
34303	Arm—Pivot arm and set screw	3.40
14291	Armature—Pickup armature	1.45
14930	Coil—Pickup coil	1.20
14292	Damper—Pickup armature damper	.35
32928	Pickup Unit—Magnet, coil, needle screw, and armature, assembled	4.95
34300	Screw—No. 6-32 x ¼ headless set screw for pick-up pivot arm	.15
3811	Screw—Needle screw	.10
	PICKUP AND ARM ASSEMBLIES (Model 8QU5-C)	
34305	Arm—Pickup arm—less crystal, cable, and pivot arm	1.80
34306	Arm—Pickup pivot arm with set screw	.80
34550	Bushing—Rubber bushing for pickup pivot arm	.05
34307	Crystal—Pickup crystal cartridge and needle screw	3.75
33529	Screw—Needle screw	.10
34300	Screw—No. 8-32 x ¼ headless set screw for pick-up pivot arm	.15
	AUTOMATIC SWITCH ASSEMBLIES (Model 8QU5-C) (Model 8QU5-M)	
34315	Base—Pickup arm base for crystal pickup — Model 8QU5-C	.85
34312	Base—Pickup arm base for magnetic pickup—Model 8QU5-M	.30
32865	Bracket—Switch bracket and terminal board	.40
34308	Cam—Switch cam assembly with spring	.55
32864	Lever—Switch actuating lever, roller, and clip	.45
34309	Mounting—Pickup arm base mounting (rubber grommet, washers, and nut)	.20
34311	Ring—Retaining ring for pickup arm pivot shaft	.05
14195	Screw—No. 10-32 x 5/16 set screw for switch cam hub	.05
34314	Shaft—Pickup arm pivot shaft—for crystal pick-up—Model 8QU5-C	.65
34313	Shaft—Pickup arm pivot shaft — for magnetic pickup—Model 8QU5-M	.65
34310	Spool—Insulating spool for switch leads	.10
32868	Spring—Switch lever spring	.05
32867	Spring—Tension spring for switch cam	.05
32866	Switch—Mercury tube and leads	1.75
31808	Washer—Retaining washer for switch lever	.01
	SPEAKER ASSEMBLIES (RL-63-J6)	
31825	Cap—Dust cap	.02
12079	Coil—Field coil (L18)	3.30
11469	Coil—Neutralizing coil (L17)	.30
34274	Cone—Cone, complete with voice coil and dust cap (L16)	1.50
5039	Plug—4-prong male for speaker	.30
14554	Transformer—Output transformer (T2)	2.10
	MISCELLANEOUS ASSEMBLIES	
32610	Bumper—Rubber bumper for pickup arm — Models 8QU5-C and 8QU5-M	.10
34308	Cam — Actuating cam for automatic switch — Models 8QU5-C and 8QU5-M	.55
11315	Capacitor—.015 mfd.—Model 8QU5-C (C51)	.20
5196	Capacitor—.035 mfd.—Model 8QU5-M (C50)	.20
33680	Cup—Needle cup—Models 8QU5-C and 8QU5-M	.15
31464	Damper—Turntable rubber drive sleeve and metal damper plate—Models 8QU5-C and 8QU5-M	.30
34142	Dial—Dial glass scale	1.95
34140	Frame—Dial frame less pointers, dial glass and guide rods	2.50
13085	Hinge—Cabinet lid hinge—Models 8QU5-C and 8QU5-M	.22
11607	Holder—Packaged needle holder—Models 8QU5-C and 8QU5-M	.85
34144	Indicator—Band indicator strip	.30
34141	Indicator—Station selector indicator and carriage	.40
34139	Knob—Range switch knob	.20
34137	Knob—Tone control knob	.20
34138	Knob—Volume control or tuning knob	.30
31048	Plug—2-contact male plug for phono. input cable —Models 8QU5-C and 8QU5-M	.15
12955	Resistor—3,900 ohms, ½ watt—Model 8QU5-C (R33)	.20
30128	Resistor—12,000 ohms, ½ watt—Model 8QU5-M (R31)	.20
13715	Resistor—68,000 ohms, ½ watt—Model 8QU5-M (R30)	.20
34568	Rest—Pickup rest—Models 8QU5-C and 8QU5-M	.40
34143	Rod—Dial pointer slide rod—Models 8QU5-C and 8QU5-M	.15
34491	Rod—Pointer carriage guide rod—Model 8Q2	.15
34316	Screw—Motor mounting screws, washers, and spacers (sufficient for 1 motor) — Models 8QU5-C and 8QU5-M	.40
14195	Screw—No. 10-32 set screw for cam, Stock No. 34308	.05
34145	Slide—Band indicator slide less strip	.30
32867	Spring—Actuating cam spring	.05
4982	Spring—Retaining spring for knob, Stock No. 34136	.05
14270	Spring—Retaining spring for knob, Stock No. 34137	.05
34138	Spring—Retaining spring for knob, Stock No. 34139	.05
31164	Support—Cabinet lid support—Models 8QU5-C and 8QU5-M	.45
14609	Transformer — Phono. input transformer for model with magnetic pickup—Model 8QU5-M	4.15
33532	Turntable—10-inch turntable—Models 8QU5-C and 8QU5-M	2.90

Model 8Q4

STOCK No.	DESCRIPTION	Unit List Price
	RECEIVER ASSEMBLIES (RC-337A)	
31815	Board—Antenna and ground terminal board	.20
12717	Board—Phonograph input terminal board	.22
31303	Bracket—Band indicator mounting bracket—less indicating strip, spring, and cord	.40
31820	Cable—Indicator pointer drive cable	.55
30766	Cap—Rubber cap for Magic Eye	.15
12607	Cap—Top shield cap for first or second i-f transformer	.20
12714	Capacitor—Trimmer 2-12 mmfd. (C1, C3, C10, C11, C35, C37, C38, C39)	.50
14079	Capacitor—6.8 mmfd. (C54)	.35
13200	Capacitor—10 mmfd. (C42, C45)	.35
12722	Capacitor—18 mmfd. (C2)	.35
13545	Capacitor—39 mmfd. (C44)	.35
13270	Capacitor—100 mmfd. (C17, C18)	.35
31813	Capacitor—120 mmfd. (C15, C16, C51, C53)	.30
12724	Capacitor—120 mmfd. (C24, C49)	.35
13003	Capacitor—180 mmfd. (C19, C49)	.35
12952	Capacitor—330 mmfd. (C5, C7, C8)	.35
31790	Capacitor—530 mmfd. (C42)	.40
31792	Capacitor—4,000 mmfd. (C36)	.60
31405	Capacitor—6,000 mmfd. (C47)	.75
4838	Capacitor—.005 mfd. (C26, C28)	.25
14393	Capacitor—.01 mfd. (C21, C22, C25)	.30
11315	Capacitor—.015 mfd. (C50)	.20
4866	Capacitor—.05 mfd. (C20)	.20
4839	Capacitor—0.1 mfd. (C6, C50)	.30
12484	Capacitor—0.25 mfd. (C93)	.30
5212	Capacitor—16 mfd. (C29)	1.35
31818	Clip—Magic Eye mounting clip	.10
31810	Coil—Antenna coil (L1, L2, L3, L4, L5)	2.50
31782	Coil—Oscillator coil—"A" band only (L13)	.80
31783	Coil—Oscillator coil—"B" and "C" bands only (L11, L12)	1.05
31812	Coil—Oscillator coil—"X" band only (L14)	.80
31811	Coil—R-f coil (L6, L7, L8, L9, L10)	2.40
31774	Condenser—3-gang variable tuning condenser (C4, C9, C48)	5.80
31278	Cord—Band indicator cord	.12
31788	Cord—Variable condenser drive cord	.25
31787	Drive—Two-speed drive and mounting bracket	1.95
31808	Drum—Variable condenser drive cord drum	.80
31819	Indicator—Band indicator strip	.15
11891	Lamp—Dial lamp	.17
31817	Plate—Cushion socket mounting plate — less socket	.10
5040	Plug—4-contact female plug for speaker cable	.30
14404	Plug—7-contact male plug for power input	.35
31788	Pulley—Two-speed drive pulley	.20
31280	Pulley—Indicator pointer drive cord pulley (large)	.10
31373	Pulley—Indicator pointer drive cord pulley (small)	.08
31272	Pulley—Range switch pulley	.20
14660	Resistor—18 ohms, ½ watt (R15)	.20
14526	Resistor—200 ohms, wire-wound, 2½ watt (R14)	.50
11837	Resistor—1,000 ohms, 1/10 watt (R22)	.15
13204	Resistor—8,200 ohms, 2 watt (R16)	.25
13362	Resistor—10,000 ohms, 1/10 watt (R23)	.15
14559	Resistor—10,000 ohms, ½ watt (R20)	.20
14284	Resistor—22,000 ohms, 1/10 watt (R6)	.15
12738	Resistor—27,000 ohms, ½ watt (R8)	.20
14167	Resistor—27,000 ohms, 2 watt (R21)	.25
11300	Resistor—33,000 ohms, 1/10 watt (R19)	.15
14023	Resistor—82,000 ohms, ½ watt (R13)	.20
14560	Resistor—100,000 ohms, ½ watt (R9)	.20
11453	Resistor—270,000 ohms, 1/10 watt (R5)	.15
12199	Resistor—270,000 ohms, ½ watt (R11)	.20
13005	Resistor—390,000 ohms, 1/10 watt (R12)	.15
12013	Resistor—1 meg., 1/10 watt (R3, R2, R18)	.15
5131	Resistor—2.2 meg., 1/10 watt (R4)	.15
14887	Retainer—Indicator drive cord pulley retainer	.01
4669	Screw—No. 8-32 x 3 8-in. square head set screw for pulley, Stock Nos. 31272 and 31788, and drum, Stock No. 31808	.03
31364	Socket—Dial lamp socket	.20
13871	Socket—Magic Eye socket	.45
31251	Socket—Octal base tube socket	.25
31279	Spring—Band indicator tension spring	.03
13838	Spring—Tension spring for pointer drive cable, or variable condenser drive cord	.08
31823	Switch—D.P.S.T. power switch with leads (S5, S8)	1.40
31806	Switch—Range switch (S1, S2, S3, S4, S6, S7)	2.25
31846	Tone Control and selector switch (R16, S6)	1.50
31063	Transformer—First i-f transformer (L15, L16, L24, C15, C16)	2.25
31064	Transformer—Second i-f transformer (L22, L23, L25, C51, C53)	2.25
31268	Transformer—Third i-f transformer (L17, L18, L17, C18)	2.05
31450	Volume Control (R7)	1.50
	SPEAKER ASSEMBLIES (RL63J-1)	
31825	Cap—Speaker cone center dust cap	.05
11469	Coil—Hum neutralizing coil (L20)	.30
12012	Coil—Speaker field coil (L21)	2.80
31828	Cone—Speaker cone and voice coil (L19)	1.85
31826	Plug—4-contact male plug for speaker	.30
31827	Speaker—Complete	10.45
14365	Transformer—Output transformer (T1)	2.00
	MISCELLANEOUS ASSEMBLIES	
31834	Dial—Dial scale and crystal	1.20
31832	Escutcheon—Dial scale escutcheon — less dial scale and crystal	2.40
31717	Indicator—Indicator pointer and carriage	.40
31802	Knob—Station selector, tone control, volume control or range switch knob	.15
30868	Plug—2-contact female plug for speaker cable	.35
30870	Plug—2-contact male plug for speaker cable	.35
31287	Rod—Pointer carriage slide rod	.15
14270	Spring—Retaining spring for knob, Stock No. 31802	.05
31558	Spring—Stop spring for pointer slide rod	.02

Model 95T5LW

STOCK No.	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES (RC-348-F)	
32918	Capacitor—Antenna trimmer capacitor bank (C31, C21, C22, C23, C24)	1.20
32817	Capacitor—Trimmer capacitor bank (C18, C19)	.70
12723	Capacitor—56 mmfd. (C4)	.35
30904	Capacitor—100 mmfd. (C7, C8, C9, C10)	.25
12725	Capacitor—150 mmfd. (C30)	.35
13003	Capacitor—180 mmfd. (C12, C20)	.35
12537	Capacitor—660 mmfd. (C29)	.35
31435	Capacitor—750 mmfd. (C25)	.40
12685	Capacitor—1,000 mmfd. (C27)	.50
4858	Capacitor—.005 mfd. (C15)	.25
14393	Capacitor—.01 mfd. (C13, C14)	.30
4866	Capacitor—.05 mfd. (C11)	.20
30899	Capacitor—0.1 mfd. (C1, C26)	.30
31493	Capacitor—Comprising 2 sections 5 mfd. each (C16, C17)	1.40
31382	Clip—Oscillator coil and core mounting clip	.04
32218	Coil—Antenna coil (L1, L2)	1.90
31098	Coil—Oscillator coil (L3, L4)	.85
31383	Coil—Oscillator coil (L16)	.30
31384	Coil—Oscillator coil (L15)	.30
31415	Coil—Oscillator coil (L14)	.30
31097	Condenser—2-gang variable tuning condenser (C2, C3, C5, C6, C28)	2.70
30877	Cord—Indicator drive cord	.20
30908	Core—Adjustable core and stud for i-f transformers	.35
31386	Core—Adjustable core and stud for oscillator coils	.15
31421	Drum—Variable condenser drive cord drum	.45
32219	Indicator—Station selector indicator pointer	.20
11891	Lamp—Dial lamp	.17
31419	Plate—Dial color plate	.12
31373	Pulley—Indicator drive cord pulley	.08
13428	Resistor—150 ohms, ½ watt (R11)	.20
31024	Resistor—680 ohms, ½ watt (R9)	.20
30161	Resistor—18,000 ohms, 1 watt (R12)	.22
12788	Resistor—27,000 ohms, ½ watt (R10)	.20
12286	Resistor—56,000 ohms, ½ watt (R2)	.20
12199	Resistor—270,000 ohms, ½ watt (R7)	.20
12285	Resistor—470,000 ohms, ½ watt (R8)	.20
12679	Resistor—2.2 meg., ½ watt (R4)	.20
13601	Resistor—10 meg., ½ watt (R6)	.20
14887	Retainer—Pulley retainer	.01
14350	Screw—No. 8-32 square head set screw for drum Stock No. 31421	.03
31364	Socket—Dial lamp socket	.20
31251	Socket—Tube socket	.25
31418	Spring—Indicator drive cord tension spring	.05
32215	Switch—Push button station selector switch (S12, S13, S14, S15, S16, S17, S20, S21, S22, S23, S24, S25)	3.00
31412	Volume control and power switch (R5, S1)	1.50
30902	Transformer—First i-f transformer (L5, L6, C7, C8)	1.90
30903	Transformer—Second i-f transformer (L7, L8, C9, C10)	1.80
31410	Transformer—Power transformer, 100-120 and 200-210 volts, 50-60 cycle (T1)	6.80
	SPEAKER ASSEMBLIES (Speaker 84326-2)	
31473	Cone—Speaker cone and voice coil (L9)	1.70
31472	Speaker—Complete	4.05
31474	Transformer—Output transformer (T2)	1.65
	MISCELLANEOUS ASSEMBLIES	
31428	Button—Station selector switch push button	.06
32220	Dial—Station selector dial scale	.45
31095	Discs—10 celluloid protector discs for call letter markers	.10
30863	Knob—Volume control and power switch, or tuning condenser knob	.15
30871	Marker—Station call letter markers	.40
30900	Spring—Retaining spring for knob Stock No. 30863	.06

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

RCA MFG. CO., INC.

MODELS 8Q2, 8QU5C, 8QU5M
MODEL 8Q4
MODEL 95T5LW
Parts Lists

MODEL 8Q4
Ch.RC-337A
Alignment,Trimmers
Socket

RCA MFG. CO., INC.
Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

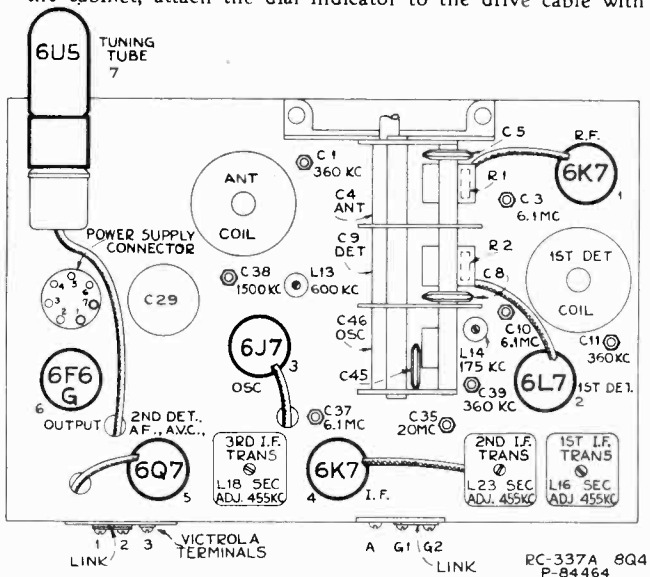
Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum. — The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the rear of the drum which is mounted on the front shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 180° mark on the drum scale must be vertical, and directly over the center of the gang-condenser shaft when the plates are fully meshed. The surface of the drum must be flush with the end of the gang-condenser shaft. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "180°" mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with



indicator at the left-hand marks on the dial scale, and gang condenser fully meshed. The indicator has a spring clip for attachment to the cable.

Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
1	6K7 I-F grid cap, with 300 ohm resistor from cap to chassis	455 kc	———	L17 and L18* (3rd I-F Trans.)
2	6L7 1st-Det. grid cap, with 300 ohm resistor from cap to chassis, regular grid lead removed from cap	455 kc	Fidelity control counter-clockwise (sharp)	L23 and L22 (2nd I-F Trans.) and L16 and L15** (1st I-F Trans.)
3	Antenna terminal (A), in series with 300 ohms	6.1 mc	6.1 mc (28.2°) "B" band	C37 (osc.)*** C10 (det.)† C3 (ant.)
4	Antenna terminal, in series with 300 ohms	20 mc	20 mc (22.5°) "C" band	C35 (osc.)††
5	Antenna terminal, in series with 200 mmf.	1,500 kc	1,500 kc (32°) "A" band	C38 (osc.)
6	Antenna terminal, in series with 200 mmf.	600 kc	600 kc (143.8°) "A" band	L13 (osc.)
7	Repeat steps 5 and 6.			
8	Adjust C39 so that it projects approximately 15/16-inch above top of chassis.			
9	Antenna terminal, in series with 200 mmf.	175 kc	175 kc (121.3°) "X" band	L14 (osc.)
10	Antenna terminal, in series with 200 mmfd.	360 kc	360 kc (30.2°) "X" band	C39 (osc.) C11 (det.) C1 (ant.)
11	Repeat oscillator adjustments in steps 9 and 10.			

* Adjust for coincident response curves when using oscillograph.

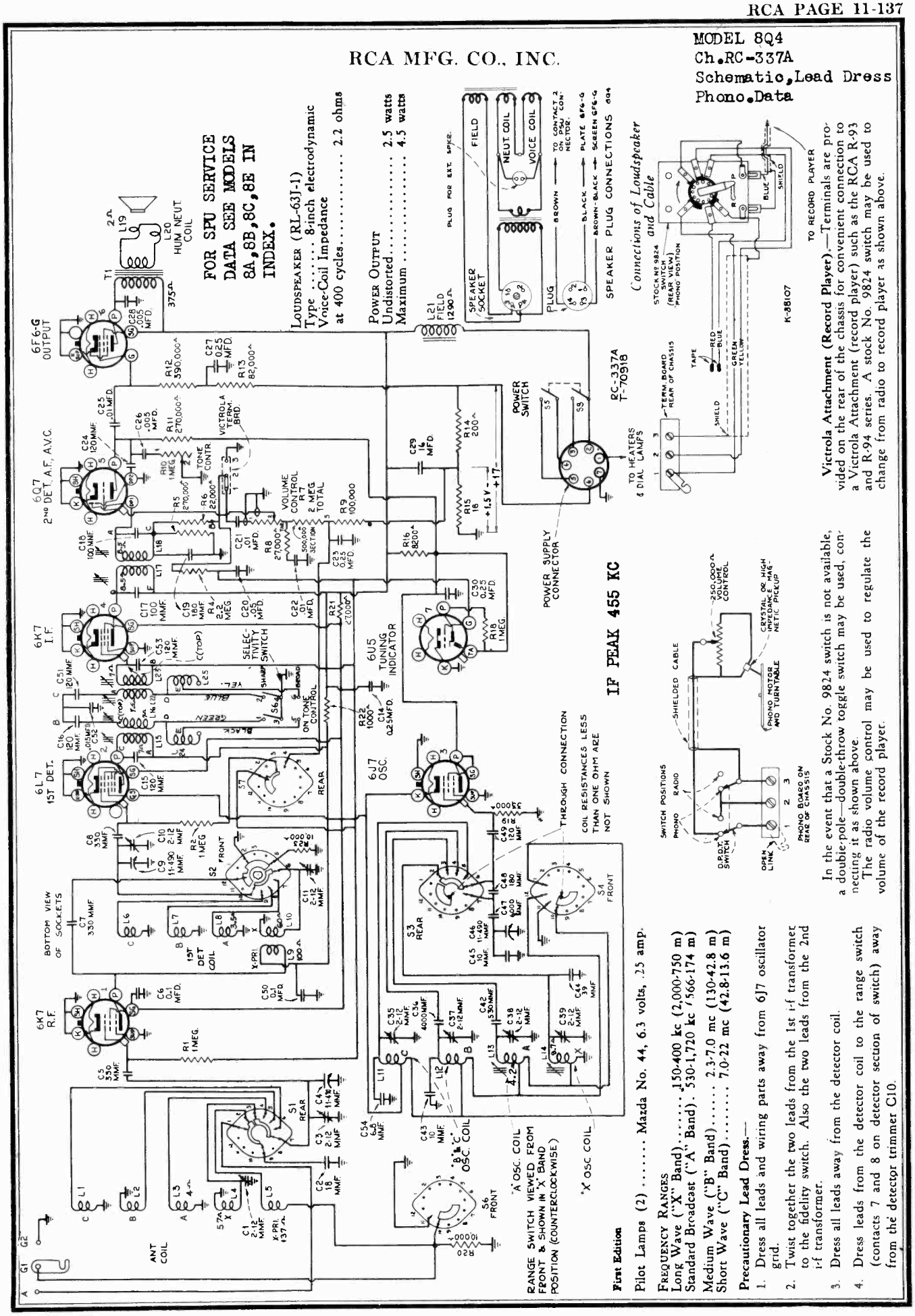
** Readjust L23, L22, L16, and L15 several times to secure coincident curves. Turn fidelity control full clockwise (broad) and check response, which should be symmetrical, and with **greater** gain than on sharp.

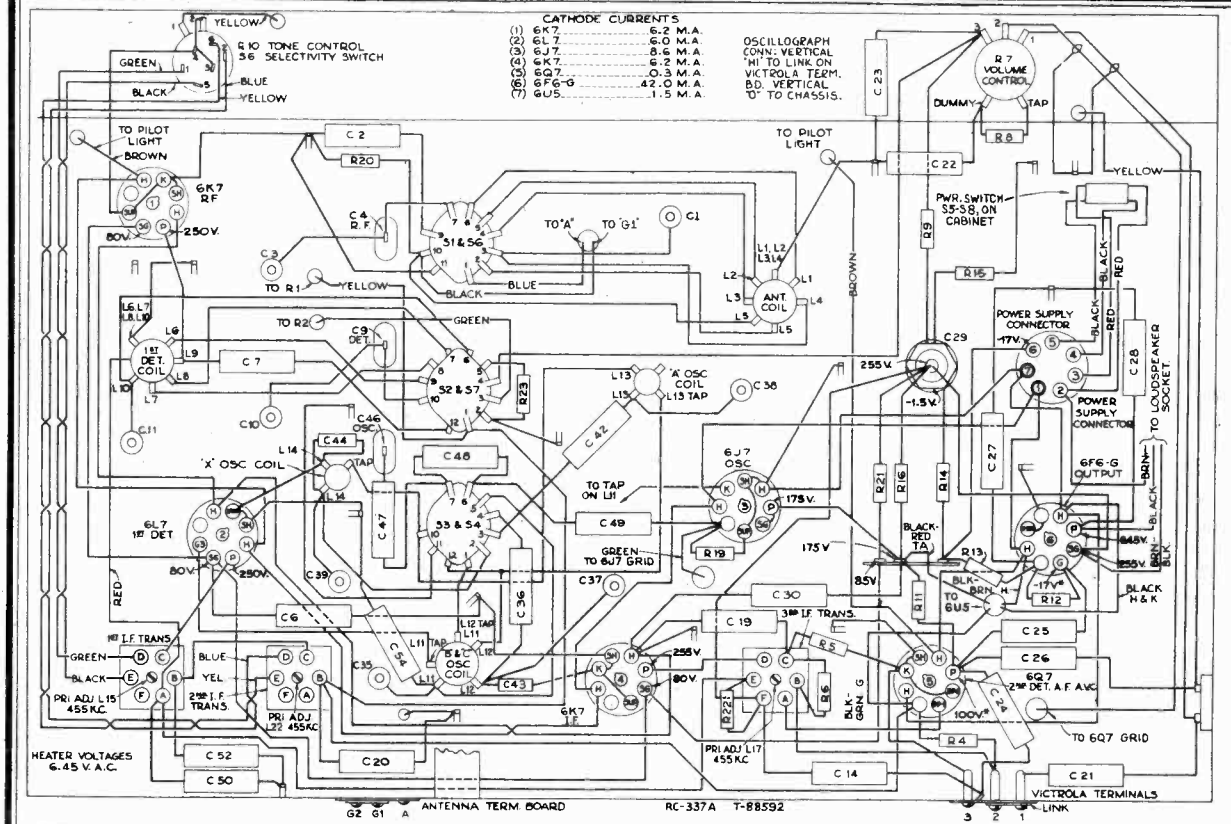
*** Use **minimum** capacity peak if two peaks can be obtained with C37.

† Rock the gang condenser slightly and use **maximum** capacity peak if two peaks can be obtained with C10. Check to determine that C37 has been adjusted to the correct peak by turning receiver to 5.19 mc (50°) where a weaker signal should be received.

†† Use **minimum** capacity peak if two peaks can be obtained, and check to determine that C35 has been adjusted to the correct peak by turning the receiver to 19.09 mc (27½°) where a weaker signal should be received.

NOTE: The oscillator tracks 455 kc **above** the signal on all bands.





Bottom View of Chassis, with R-F Wiring Diagram and Socket Voltages

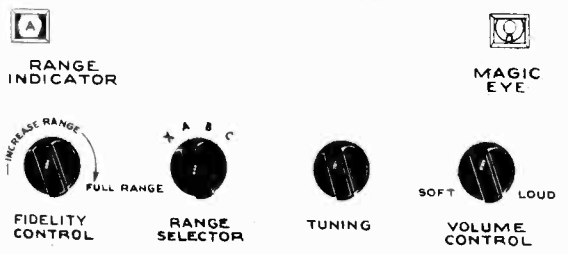
Measurements made to chassis unless otherwise indicated, with set tuned to quiet point and volume control at minimum. Values should hold within approximately ±20% with 117-volt a-c supply.

* **NOTE:** Values with star (*) are operating voltages in circuits with high series-resistance. The actual measured voltages will be lower, depending on the voltmeter loading.

Miscellaneous Service Data

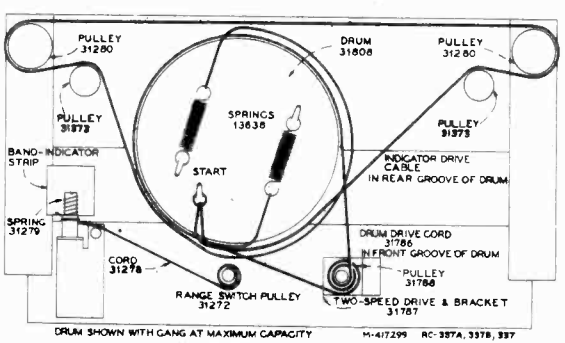
Plug for Extension Loudspeaker.—A two-contact female socket, equipped with a male plug, is connected across the secondary of the output transformer on the loudspeaker to facilitate the connection of an extension loudspeaker if desired. A permanent-magnet dynamic speaker, with voice-coil impedance of **not less than 2 ohms** is recommended. The voice coil of the extension speaker should be connected by means of two-conductor cable (such as is used on electric appliances) to the male plug. This cable may be any desired length up to several hundred feet. With a long run, it is advisable to use heavier cable. An extension speaker with 2-ohm voice coil will receive approximately half the power output of the receiver. With a higher-impedance voice coil, the percentage of power delivered to the extension speaker will be decreased. (A high-impedance magnetic-type speaker may be used in conjunction with a suitable coupling transformer such as RCA Stock No. 7853.) The RCA MI-6248 Alnico 8-inch diameter permanent-magnet dynamic loudspeaker with 2-ohm voice coil, and 5-watt power-handling capacity is recommended. This speaker may be housed in the RCA MI-6292 sloping-front walnut-finished wood housing.

Antenna Connections.—Three terminals ("A," "G1," and "G2") are provided on the rear of chassis. Connect the antenna to "A." Connect "G1" to a nearby ground. A link connects "G1" and "G2." In case of electrical interference (especially on "X" band) open the link and connect "G2" separately to ground. This also applies when a D-C power supply is used.



Location of Controls

A toggle-type power switch is mounted on the right-hand side of the cabinet



Arrangement of Drive Cords for Tuning Condenser and Dial Indicator

Power Supply Units

Model 8Q4 has a seven-prong connector for connection to a separate power supply unit. Units are available in different ratings for a-c and d-c operation, as listed under "Power Supply Ratings" in the electrical specifications.

The d-c power supply unit (PSU 8E) is too large to be mounted inside the cabinet and may be placed on the table behind the receiver, or in any other convenient location that permits plugging into the connector on the receiver chassis.

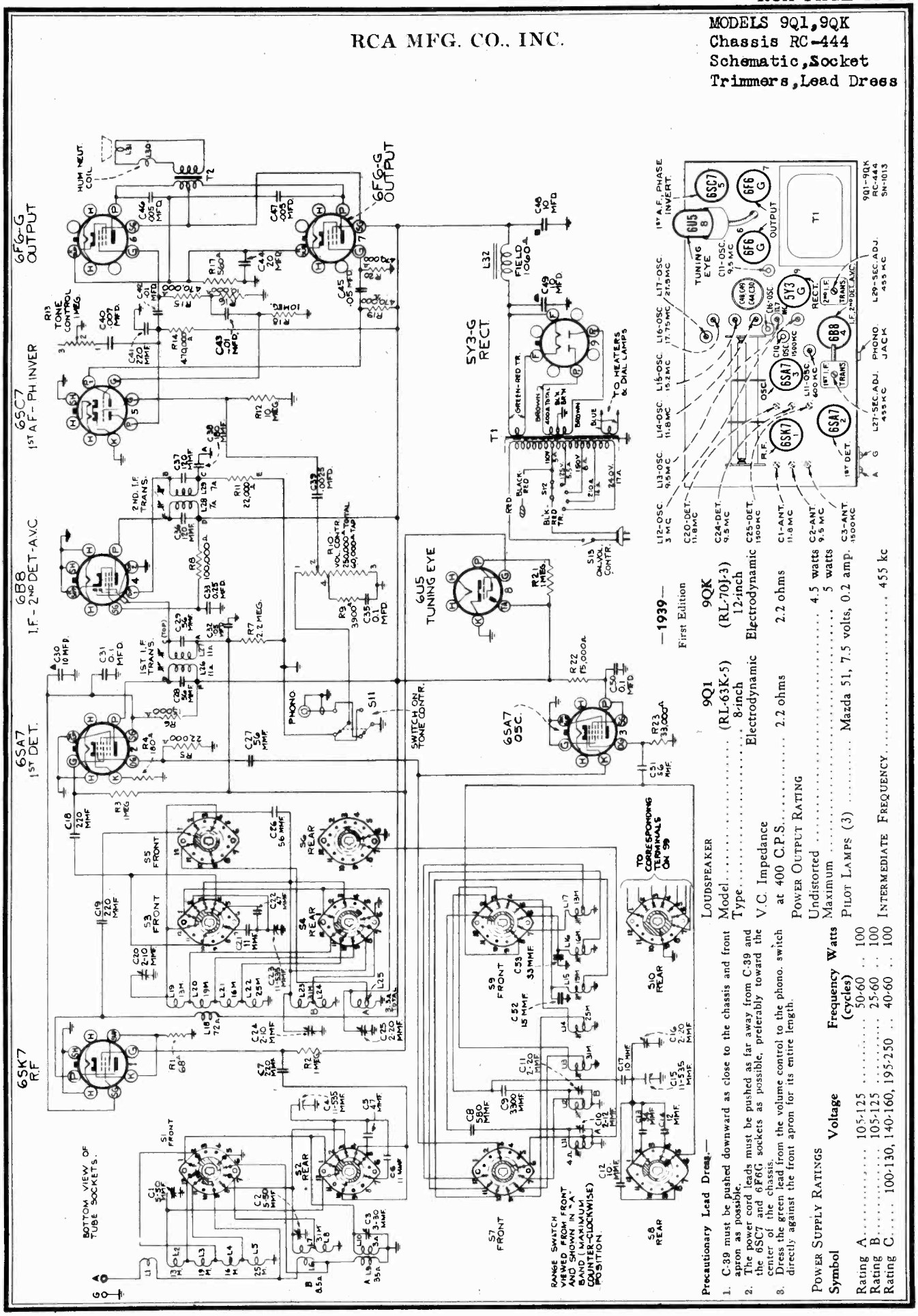
Service data, diagrams, and replacement parts lists for the power supply units are printed in separate service data sheets, which should be referred to for further information.

Power Supply Ratings

	Volts	Cycles
A-C Ratings		
With PSU 8A	105-125	50-60
With PSU 8B	105-125	25-60
With PSU 8C	105-130, 140-160, 200-225, 225-250	50-60
D-C Rating		
With PSU 8E	105-125, 210-250	D-C

RCA MFG. CO., INC.

MODELS 9Q1, 9QK
Chassis RC-444
Schematic, Socket
Trimmers, Lead Dress



—1939—
First Edition

	9Q1	9QK
Loudspeaker		
Model	(RL-63K-5)	(RL-70J-3)
Type	8-inch Electrodynamic	12-inch Electrodynamic
V.C. Impedance	2.2 ohms	2.2 ohms
Power Output Rating		
Undistorted	4.5 watts	
Maximum	5 watts	
Pilot Lamps (3)	Mazda 51, 7.5 volts, 0.2 amp.	
Intermediate Frequency	455 kc	

Precautionary Lead Dress.—

1. C-39 must be pushed downward as close to the chassis and front apron as possible.
2. The power cord leads must be pushed as far away from C-39 and the 6SC7 and 6F6G sockets as possible, preferably toward the center of the chassis.
3. Dress the green lead from the volume control to the phono. switch directly against the front apron for its entire length.

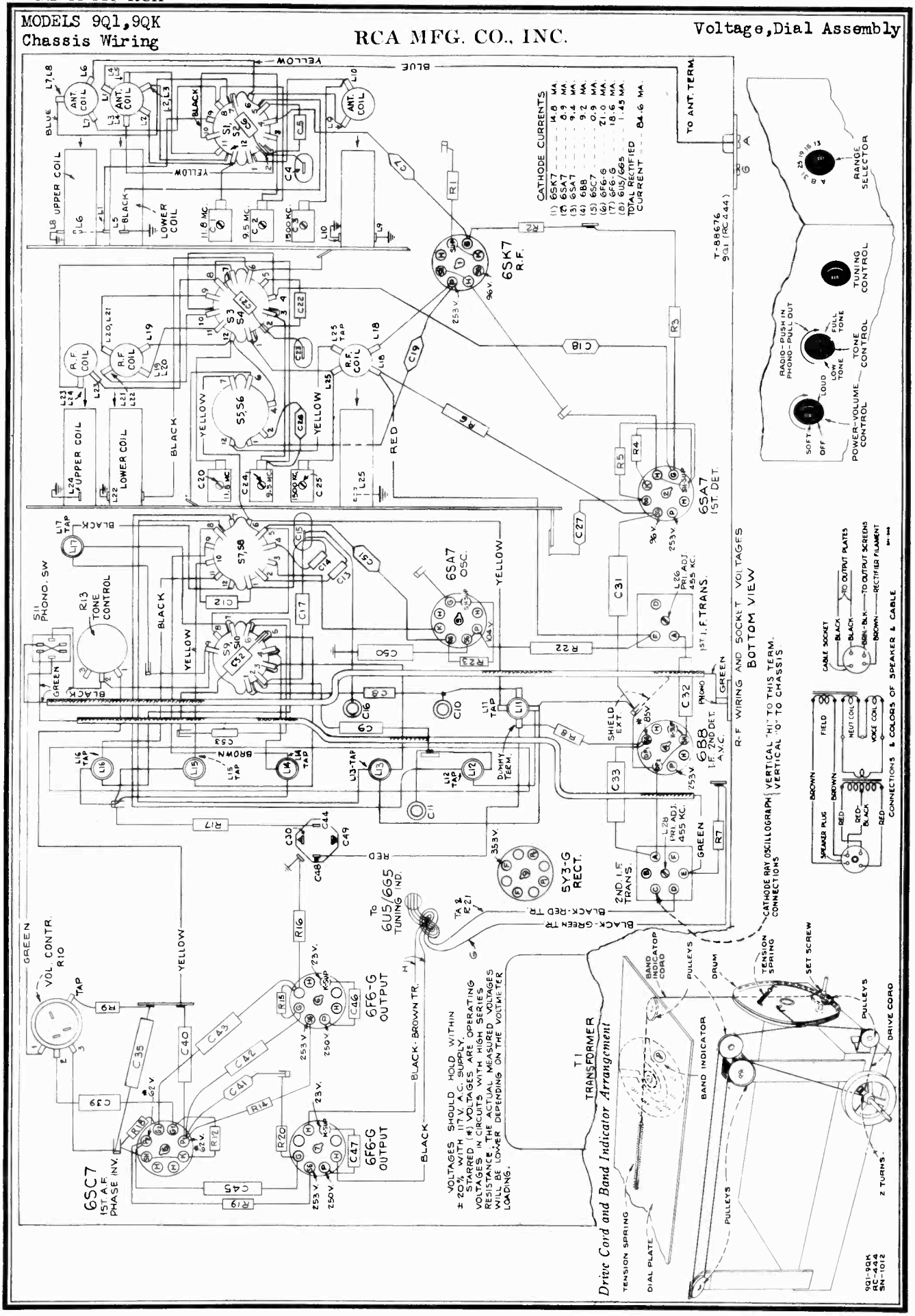
Power Supply Ratings

Symbol	Voltage	Frequency (cycles)	Watts
Rating A	105-125	50-60	100
Rating B	105-125	25-60	100
Rating C	100-130, 140-160, 195-250	40-60	100

MODELS 9Q1,9QK
Chassis Wiring

RCA MFG. CO., INC.

Voltage,Dial Assembly



RCA MFG. CO., INC.

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment, therefore a calibration scale is attached to the indicator-drive-cord drum which is mounted on the shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The "0" mark on the drum scale must be vertical, and directly over the center of the gang-condenser shaft when the plates are fully meshed. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

To determine the corresponding frequency for any setting of the calbration scales, refer to the accompanying drawing which shows the dial with 0-180° calibration scales drawn at top and bottom.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "0" mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 530 kc mark, and gang condenser fully meshed. The indicator has a spring clip for attachment to the cable.

Spread-Band Alignment.—The most satisfactory method of aligning or checking the spread-band ranges is on actual reception of short-wave stations of known frequency, by adjusting the magnetite-core oscillator coil for each band so that these stations come in at the correct points on the dial.

In exceptional cases, when the set is being serviced in a location where the noise level is high enough to prevent reception of short-wave stations, a test-oscillator may be used for alignment, but an extremely high degree of accuracy is required in the frequency settings of the test-oscillator, as a slight error will produce considerable inaccuracy on the spread-band dials. The frequency settings of the test-oscillator may be checked by one or both of the following methods:

1. Determine the exact dial settings of the test-oscillator (for frequencies at or close to the specified alignment frequencies) by zero-beating the test-oscillator against short-wave stations of known frequency.
2. Use harmonics of the standard-broadcast range of a test-oscillator, first checking the frequency settings on this range by means of a crystal calibrator (RCA Stock No. 9572), or by zero-beating against standard broadcast stations.

When a test oscillator is employed for spread-band alignment, a final check should be made on actual reception of short-wave stations of known frequency, and the magnetite-core oscillator coil for each band should be re-adjusted so that the stations come in at the correct points on the dial.

Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Range switch	Turn radio dial to—	Adjust the following for max. peak output
1	6B8 I-F Grid in series with .01 mfd.	455 kc	A	Quiet Point Near 0°	L29 and L28 (2nd I.F. Trans.)
2	6SA7 1st Detector Grid in series with .01 mfd.				L27 and L26 (1st I.F. Trans.)
3	Antenna Terminal in series with 300 ohms	9.5 mc	31M	20°	L13 (osc.)* C24 (det.)† C2 (ant.)
4		11.7 mc		171°	C16 (osc.)*
4A		Check to determine that C16 has been adjusted to the correct peak by turning radio to 10.8 mc (141°) where a weaker signal should be received.			
5		9.5 mc	B	180°	C11 (osc.)*
5A		Check to determine that C11 has been adjusted to the correct peak by turning radio to 8.6 mc (156°) where a weaker signal should be received.			
6		3.0 mc	B	0°	L12 (osc.)* (Rock Gang)
7	Antenna Terminal in series with 200 mmf.	1,500 kc	A	149°	C10 (osc.) C3 (ant.) C25 (det.)
8		600 kc		27°	L11 (osc.) (Rock Gang)
8A		Repeat steps 7 and 8.			
9	Antenna Terminal in series with 300 ohms	11.8 mc	25M	33°	L14 (osc.)* C20 (det.)† C1 (ant.)
10		15.2 mc	19M	37°	L15 (osc.)*
11		17.75 mc	16M	40°	L16 (osc.)**
12		21.5 mc	13M	55°	L17 (osc.)**

* Use peak with plunger out if two peaks can be obtained. ** Use peak with plunger in if two peaks can be obtained.
† Rock gang condenser slightly while peaking. Use maximum capacity peak if two peaks can be obtained.
Note: Oscillator tracks above signal on A, B, 31M, 25M and 19M bands; below signal on 16M and 13M bands.

MODEL 9Q4

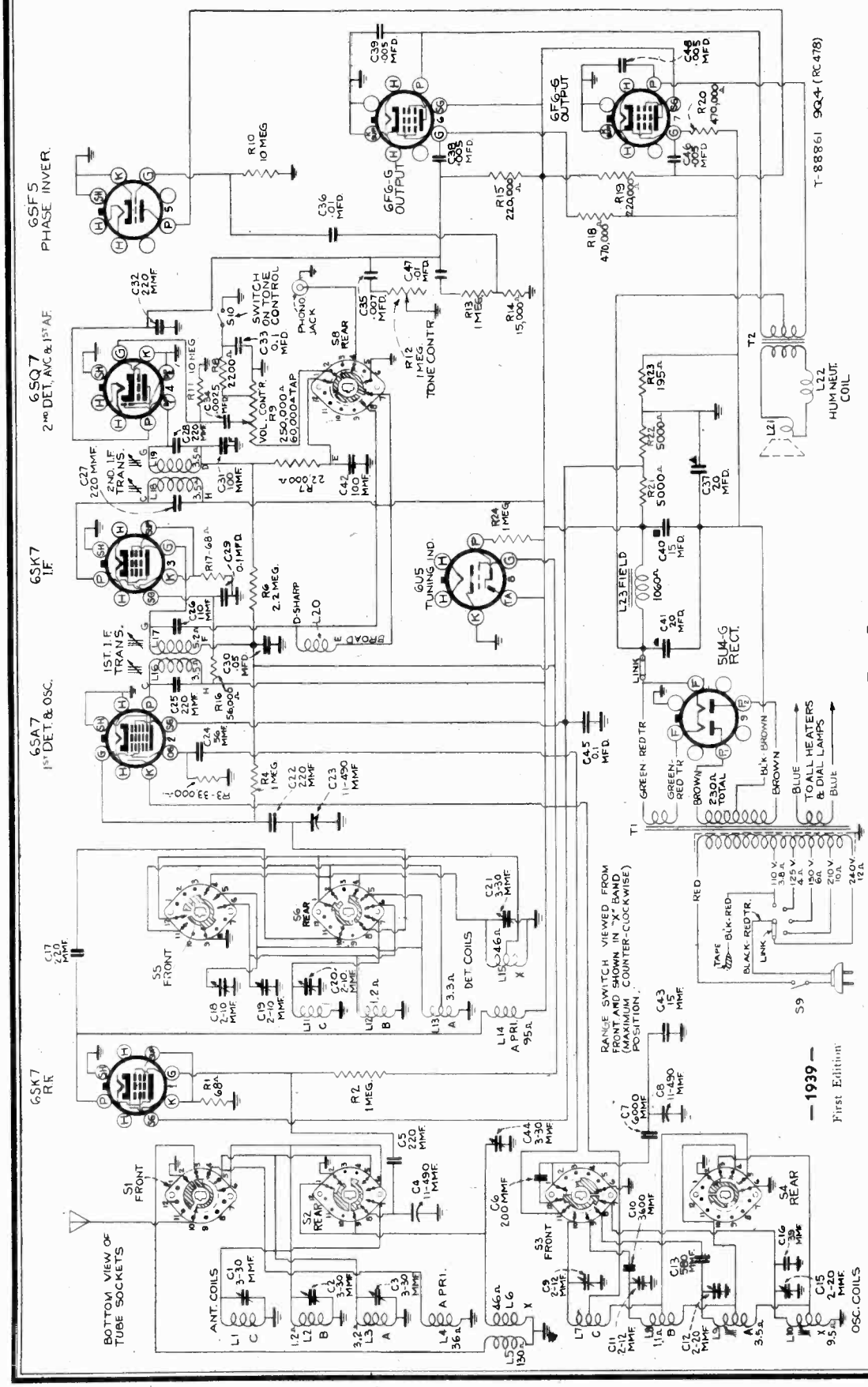
STOCK No.	DESCRIPTION
	CHASSIS ASSEMBLIES (RC-478)
34401	Arm—Arm and hub for band indicator less cable—fastens on range switch shaft
34400	Belt—Drive belt
31767	Board—"Ant.-Grd." terminal board
32635	Cable—Cable and clips for band indicator
33821	Capacitor—Mica trimmer—3 sections 2-10 mmfd. and 1 section 3-30 mmfd. (C18, C19, C20, C21)
12714	Capacitor—Air trimmer, 2-12 mmfd. (C9, C11)
33818	Capacitor—Mica trimmer, 2 sections 2-20 mmfd. each (C12, C15)
12896	Capacitor—15 mmfd. (C43)
33822	Capacitor—Mica trimmer, 4 sections 3-30 mmfd. each (C1, C2, C3, C44)
13545	Capacitor—39 mmfd. (C16)
12723	Capacitor—56 mmfd. (C24)
12720	Capacitor—100 mmfd. (C42, C31)
32239	Capacitor—110 mmfd. (C26)
30232	Capacitor—200 mmfd. (C6)
12694	Capacitor—220 mmfd. (C5, C17, C22, C32)
33760	Capacitor—220 mmfd. (C25, C27, C28)
33235	Capacitor—580 mmfd. (C13)
12811	Capacitor—3,600 mmfd. (C10)
31405	Capacitor—6,000 mmfd. (C7)
34459	Capacitor—.0025 mfd. (C34)
33584	Capacitor—.005 mfd. (C38, C39, C46, C48)
5148	Capacitor—.007 mfd. (C35)
4937	Capacitor—.01 mfd. (C36, C47)
32787	Capacitor—.05 mfd. (C30)
4839	Capacitor—0.1 mfd. (C29, C33, C45)
34393	Capacitor—Electrolytic—2 sections 20 mfd. and 1 section 15 mfd. (C37, C40, C41)
33762	Coil—Antenna coil A-B-C Bands (L1, L2, L3, L4)
32823	Coil—Antenna coil X Band (L5, L6)
33763	Coil—Detector coil A-B-C Bands (L11, L12, L13, L14)
33765	Coil—Detector coil X Band (L15)
33764	Coil—Oscillator coil A-B-C Bands (L7, L8, L9)
32931	Coil—Oscillator coil X Band (L10)
33756	Condenser—3-gang variable tuning condenser (C4, C8, C23)
34595	Control—Tone control (R12)
32634	Cord—Pointer drive cord
32713	Core—Adjustable core and stud for A-B-C Band coil
34392	Drum—Variable condenser drive drum
11891	Lamp—Dial lamp
14028	Nut—Clamping nut for air trimmer
31817	Plate—Cushion socket mounting plate, less socket
12493	Plug—5-contact female plug for speaker cable
34399	Pulley—Drive belt pulley and set screws for tuning knob shaft
34398	Pulley—Drive belt pulley and set screws for intermediate drive shaft
31373	Pulley—Drive cord pulley for L.H. support
34402	Pulley—Drive cord pulley and bracket for R.H. support
34394	Pulley—L.H. support and drive cord pulleys (2) assembled, less loose pulley
34395	Pulley—R.H. support and drive cord pulleys (2) assembled, less loose pulley and bracket
14281	Resistor—68 ohms, ½ watt (R1, R17)
13716	Resistor—2,200 ohms, ½ watt (R8)
34189	Resistor—Voltage divider, 2 sections 5,000 ohms and 1 section 195 ohms (R21, R22, R23)
12695	Resistor—15,000 ohms, ½ watt (R14)
13998	Resistor—22,000 ohms, ½ watt (R7)
12454	Resistor—33,000 ohms, ½ watt (R3)
30650	Resistor—56,000 ohms, ½ watt (R16)
12264	Resistor—220,000 ohms, ½ watt (R15, R19)
12285	Resistor—470,000 ohms, ½ watt (R18, R20)
12013	Resistor—1 megohm, 1/10 watt (R24)
13730	Resistor—1 megohm, ½ watt (R2, R4, R13)
12679	Resistor—2.2 megohm, ½ watt (R6)
13601	Resistor—10 megohm, ½ watt (R11, R10)
30340	Retainer—Retaining clip for pulley, Stock No. 31373
34396	Shaft—Intermediate tuning drive shaft, and drive cord pulley—less drive belt pulley and set screws
34397	Shaft—Intermediate tuning drive shaft, and flywheel—less drive belt pulley and set screws
31364	Socket—Dial lamp socket
34864	Socket—Magic Eye socket
14278	Socket—Phono. input socket
31251	Socket—Tube socket
31418	Spring—Pointer drive cord tension spring
34391	Switch—Phono. switch and fidelity control switch (S8)
34390	Switch—Range switch (S1, S2, S3, S4, S5, S6)
34596	Switch—Slide switch for tone control (S10)
33759	Transformer—First i-f transformer (L16, L17, L20, C25, C26)
33761	Transformer—Second i-f transformer (L18, L19, C27, C28, C31, R7)
34183	Transformer—Power transformer — 100/130, 140/160, 195/250 volts, 50/60 cycles (T1)
34389	Volume Control—Volume control and power switch (R9, S9)
33726	Washer—"C" washer for tuning shaft
	SPEAKER ASSEMBLIES (RL63K3)
31825	Cap—Dust cap
34615	Cone—Cone complete with voice coil (L2)
31539	Plug—5-prong male plug for speaker
34691	Speaker—8-inch dynamic complete with cone and voice coil—less output transformer
14534	Transformer—Output transformer (T2)

MODEL 9Q1, 9QK

STOCK No.	DESCRIPTION
	CHASSIS ASSEMBLIES
14517	Board—"Antenna-Ground" board
34665	Bracket—Drive cord bracket and pulley—long bracket with one pulley
34660	Bracket—Drive cord bracket and pulley—short bracket with one pulley
34656	Bracket—Drive cord bracket and pulleys—long bracket with two pulleys
12714	Capacitor—Air trimmer—2-12 mmfd. (C10)
12884	Capacitor—Air trimmer—long—2-20 mmfd. (C11, C16)
34654	Capacitor—Trimmer comprising 2 sections of 2.5-10 mmfd. and 1 section of 2.5-20 mmfd. (C20, C24, C25)
34653	Capacitor—Trimmer comprising 2 sections of 5-50 mmfd. and 1 section of 3-30 mmfd. (C1, C2, C3)
13200	Capacitor—10 mmfd. (C12, C17)
34668	Capacitor—11 mmfd. (C6, C21)
33380	Capacitor—12 mmfd. (C14)
12896	Capacitor—15 mmfd. (C52)
12948	Capacitor—33 mmfd. (C53)
34670	Capacitor—34 mmfd. (C13)
13141	Capacitor—47 mmfd. (C5, C22)
12723	Capacitor—56 mmfd. (C26, C27, C51)
30949	Capacitor—56 mmfd. (C28, C29)
31813	Capacitor—120 mmfd. (C36, C37)
14712	Capacitor—180 mmfd. (C38)
12694	Capacitor—220 mmfd. (C7, C18, C19, C41)
33235	Capacitor—580 mmfd. (C8)
31403	Capacitor—3,300 mmfd. (C9)
34459	Capacitor—.0025 mfd. (C39)
33584	Capacitor—.005 mfd. (C46, C47)
5148	Capacitor—.007 mfd. (C40)
4937	Capacitor—.01 mfd. (C42, C43)
32787	Capacitor—.05 mfd. (C32, C45)
4839	Capacitor—0.1 mfd. (C31, C35, C50)
12484	Capacitor—0.25 mfd. (C33)
33014	Capacitor—Electrolytic comprising 3 sections of 10 mfd. and 1 section of 20 mfd. (C30, C44, C48, C49)
34648	Coil—Antenna coil—AT160
34649	Coil—Antenna coil—AT161
34647	Coil—Antenna coil—AT163
31782	Coil—Oscillator coil for "A" band
34659	Coil—Oscillator coil for "B" band and 31 meter bands
34661	Coil—Oscillator coil for 13 meter band
34657	Coil—Oscillator coil for 16 meter and 19 meter bands
34658	Coil—Oscillator coil for 25 meter band
34652	Coil—R. F. coil—RFT 108A
34651	Coil—R. F. coil—RFT 110
34650	Coil—R. F. coil—RFT 112
34645	Condenser—Variable tuning condenser
34666	Control—Tone control
34667	Control—Volume control and power switch
34662	Cord—Tuning condenser drive cord
34392	Drum—Variable tuning condenser drive drum
11765	Lamp—Dial lamp
5040	Plug—4 contact female plug for speaker
34663	Pulley—Range switch pulley and hub
14281	Resistor—68 ohms, ½ watt (R1)
30545	Resistor—180 ohms, ½ watt (R4)
30735	Resistor—560 ohms, 1 watt (R17)
12955	Resistor—3,900 ohms, ½ watt (R9)
14559	Resistor—10,000 ohms ½ watt (R16)
33489	Resistor—15,000 ohms 2½ watt (R6, R22)
14284	Resistor—22,000 ohms 1/10 watt
13998	Resistor—22,000 ohms ½ watt (R5)
12454	Resistor—33,000 ohms ½ watt (R23)
14560	Resistor—100,000 ohms ½ watt (R8)
12285	Resistor—470,000 ohms ½ watt (R14, R15, R19, R20)
12013	Resistor—1 meg., 1/10 watt (R21)
13730	Resistor—1 megohm ½ watt (R2, R3)
12679	Resistor—2.2 megohm ½ watt (R7)
13601	Resistor—10 megohm ½ watt (R12, R18)
4669	Screw—No. 8-32 square head set screw for drum Stock No. 34392
14350	Screw—Square head set screw for pulley Stock No. 34663
34655	Shaft—Tuning knob shaft and flywheel
31364	Socket—Dial lamp socket
34864	Socket—Magic Eye socket
14278	Socket—Phonograph input socket
31251	Socket—Tube socket
13638	Spring—Tuning condenser drive drum spring
34646	Switch—Range switch
34664	Switch—Slide switch for tone control
32263	Transformer—1st I.F. transformer
14308	Transformer—2nd I.F. transformer
31734	Transformer—Power transformer—110 volts 25 cycle
31735	Transformer—Power transformer—Universal 50-60 cycle
31733	Transformer—Power transformer—110 volt 60 cycle
	SPEAKER ASSEMBLIES MODEL 9Q1 (RL-63K5)
31825	Cap—Dust cap
34615	Cone—Cone complete with voice coil
5039	Plug—4 contact male plug for speaker
34671	Speaker—8" Dynamic complete with cone and voice coil less output transformer and plug
14534	Transformer—Output transformer
	SPEAKER ASSEMBLIES MODEL 9QK (RL-70J3)
31825	Cap—Dust cap
12079	Coil—Field coil
11469	Coil—Neutralizing coil
31275	Cone—Cone complete with voice coil
5039	Plug—4 prong male plug for speaker
14534	Transformer—Output transformer

RCA MFG. CO., INC.

MODEL 9Q4
Chassis RC-478
Schematic



INTERMEDIATE FREQUENCY ..... 455 kc

POWER OUTPUT RATING
Undistorted ..... 10 watts
Maximum ..... 12 watts

LOUDSPEAKER (RL-63K-3)
Type ..... 8-inch electrodynamic
V.C. Impedance ..... 2.2 ohms at 400 cycles

TUBE COMPLEMENT
(1) RCA-6SK7 ..... R-F Amplifier
(2) RCA-6SA7 ..... 1st Detector-Oscillator
(3) RCA-6SK7 ..... I-F Amplifier
(4) RCA-6SQ7 ..... 2nd Detector, A.V.C., and A-F Amplifier
(5) RCA-6SF5 ..... Phase Inverter
(6) RCA-6F6-G ..... Output
(7) RCA-6F6-G ..... Output
(8) RCA-6U5/6G5 ..... Tuning Indicator
(9) RCA-5U4-G ..... Rectifier

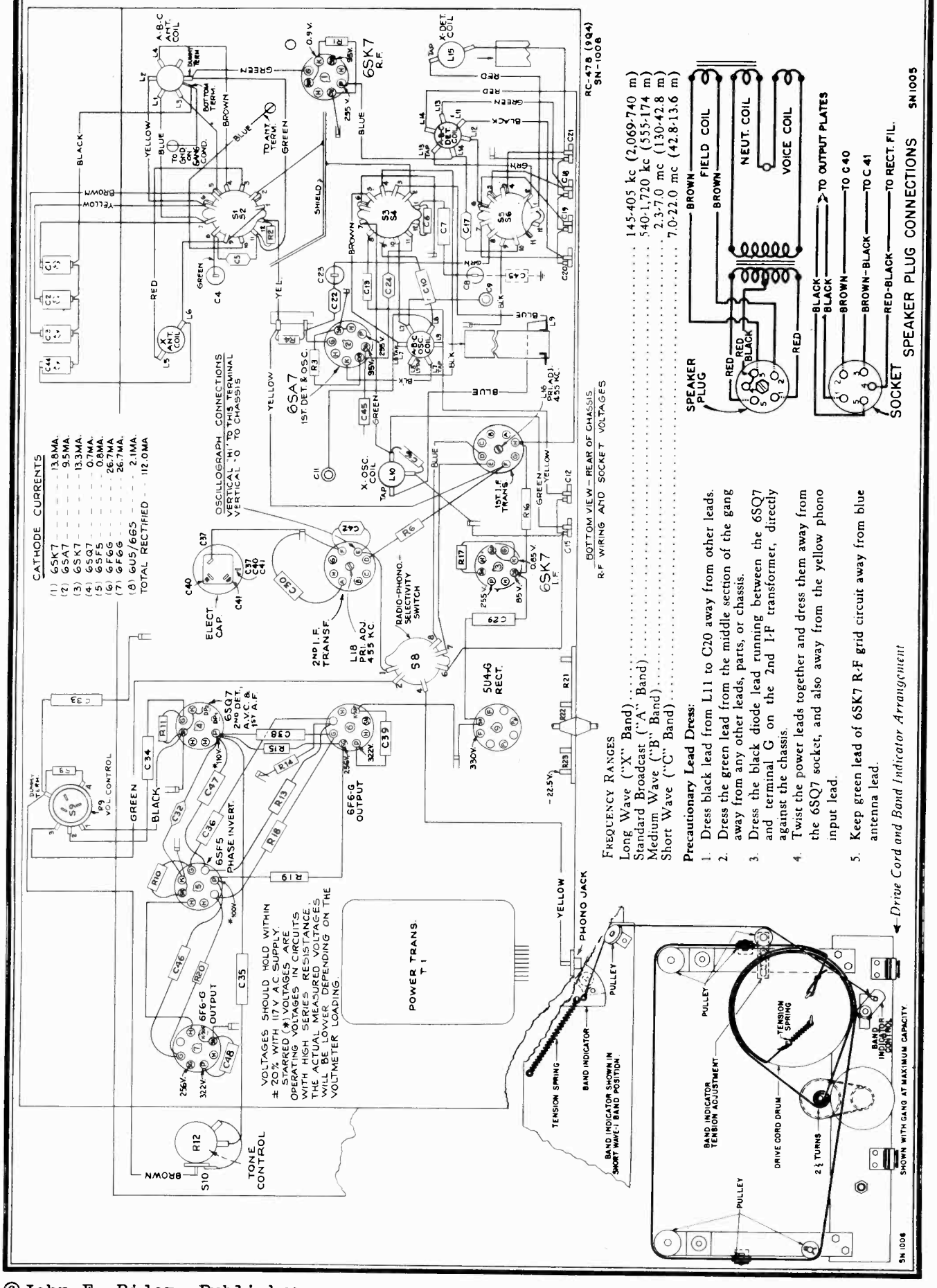
PILOT LAMPS (2) ..... Mazda No. 44, 6.3 volts, 0.25 amp.

POWER SUPPLY RATINGS
Rating A ..... 105-125 volts, 50-60 cycles, 115 watts
Rating B ..... 105-125 volts, 25-60 cycles, 115 watts
Rating C ..... 105-130, 140-160, 200-250 volts, 40-60 cycles, 115 watts

MODEL 9Q4
Chassis Wiring, Voltage

RCA MFG. CO., INC.

Lead Dress, Dial Data



FREQUENCY RANGES

Long Wave ("X" Band)	145-405 kc (2,069-740 m)
Standard Broadcast ("A" Band)	540-1,720 kc (555-174 m)
Medium Wave ("B" Band)	2.3-7.0 mc (130-42.8 m)
Short Wave ("C" Band)	7.0-22.0 mc (42.8-13.6 m)

Precautionary Lead Dress:

1. Dress black lead from L11 to C20 away from other leads.
2. Dress the green lead from the middle section of the gang away from any other leads, parts, or chassis.
3. Dress the black diode lead running between the 6SQ7 and terminal G on the 2nd I-F transformer, directly against the chassis.
4. Twist the power leads together and dress them away from the 6SQ7 socket, and also away from the yellow phono input lead.
5. Keep green lead of 6SK7 R-F grid circuit away from blue antenna lead.

Drive Cord and Band Indicator Arrangement

RCA MFG. CO., INC.

MODEL 9Q4
Alignment, Trimmers
Socket

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

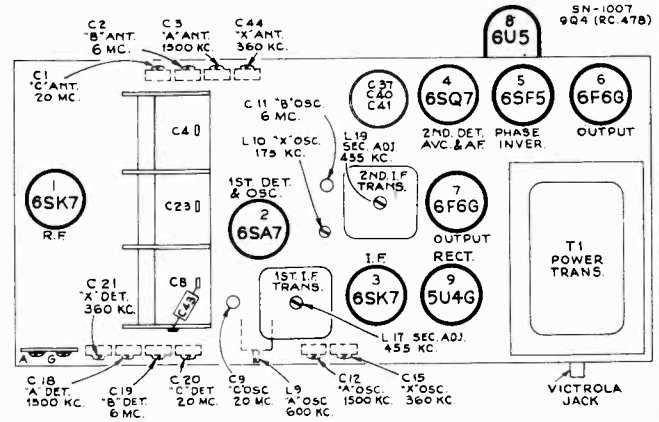
Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

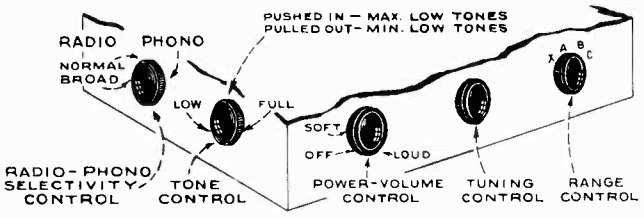
Calibration Scale on Indicator-Drive-Cord Drum. — The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the rear of the drum which is mounted on the front shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 0° mark on the drum scale must be vertical, and directly over the center of the gang-condenser shaft when the plates are fully meshed. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the 0° mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 530 kc mark, and gang condenser fully meshed.





Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	Turn tone control to 2nd position (sharp) from maximum counter-clockwise.			
2	6SK7 I-F grid in series with .01 mfd.	455 kc	"A" Band Quiet point between 550-750 kc	L18 and L19 (2nd I-F trans.)
3	6SA7 grid in series with .01 mfd.			L16 and L17 (1st I-F trans.)
4	Turn tone control to maximum counter-clockwise (broad) position and check I-F response which should be a slightly double-peaked curve. Return tone control to 2nd position (sharp) for the following steps.			
5	Ant. terminal in series with 200 mmfd.	175 kc	175 kc (52.5°) "X" Band	L10 (osc.) Rock gang
6		360 kc	360 kc (148.5°) "X" Band	C15 (osc.) C21 (det.) C44 (ant.)
7		600 kc	600 kc (32°) "A" Band	L9 (osc.) Rock gang
8		1,500 kc	1,500 kc (152°) "A" Band	C12 (osc.) C18 (det.) C3 (ant.)
9	Repeat steps 5, 6, 7, and 8.			
10	Ant. terminal in series with 300 ohms	6.1 mc	6.1 mc (151°) "B" Band	C11 (osc.)* C19 (det.) C2 (ant.)
11		20 mc	20 mc (157°) "C" Band	C9 (osc.)** C20 (det.) C1 (ant.)

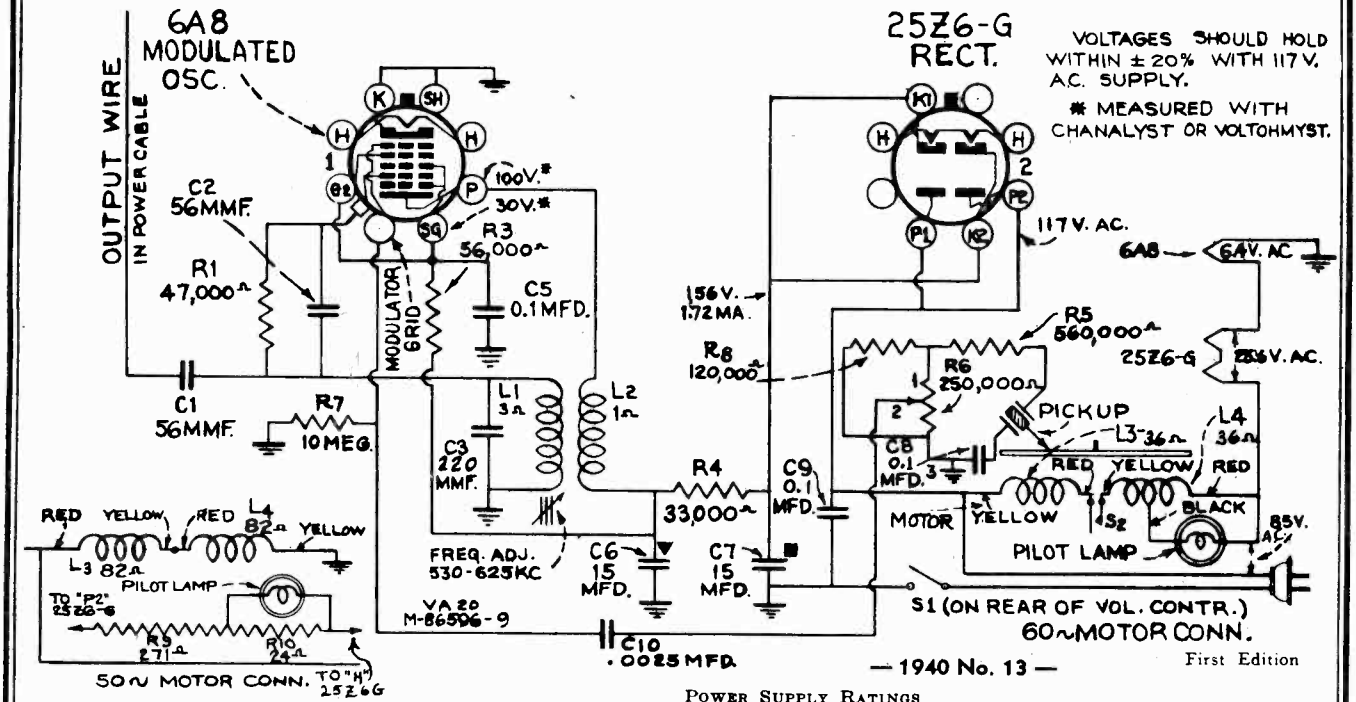
* Use **minimum** capacity peak if two can be obtained. Check to determine that C11 has been adjusted to the correct peak by tuning receiver to approximately 5.19 mc where a weaker signal should be received.

** Use **minimum** capacity peak if two can be obtained. Check to determine that C9 has been adjusted to the correct peak by tuning receiver to approximately 19.09 mc where a weaker signal should be received.

Note.—Oscillator tracks **above** signal on all bands.

MODEL VA-21
Wireless Record Player
Schematic, Voltage
Adjustments, Notes

RCA MFG. CO., INC.



— 1940 No. 13 —
First Edition

General Description

The crystal pickup in Model VA-21 is connected through a volume control to grid No. 1 in an RCA-6A8 tube which functions as a modulated r-f oscillator. The oscillator frequency can be adjusted from 530 to 625 kc by means of a magnetite core in the oscillator transformer, L1-L2. (This is a screwdriver adjustment at the rear of the cabinet.) An output wire is connected to the grid circuit of the oscillator, and is run parallel with the power cable. The output is sufficient to permit operation within approximately 20 feet of a radio receiver.

Set-Up Procedure

1. Insert plug in power supply outlet, and turn the power-switch—volume control knob on top of VA-21 to full clockwise position. Start a record on the VA-21. The motor is a synchronous manual-starting type, and requires a clockwise spin to start.

2. Tune the radio receiving set to a quiet point between 530-625 kc.

3. Tune the oscillator in the VA-21 to this frequency by adjusting the button on the rear of the VA-21 cabinet to obtain peak output on the receiver. Clockwise rotation decreases the frequency; counter-clockwise rotation increases the frequency.

4. Adjust the radio volume control for the highest volume that is likely to be required, and then use the VA-21 volume control for further adjustment.

5. In noisy locations, it may be desirable to leave the VA-21 volume control turned full clockwise, and regulate the radio volume control for the desired level.

6. If there is insufficient volume, or excessive noise, the remedy is to couple the VA-21 to the radio receiver, by running a piece of insulated wire between the two units: Wrap one end (three or four turns) around the antenna lead-in on the radio, and wrap the other end (three or four turns) around the short wire that projects from the plug on the power cord of the VA-21. With an RCA Master Antenna, wrap the wire around the counter-poise lead where it attaches to the receiver (terminal A3) or to the coupling unit (terminal B). With a loop receiver, place the end of the wire close to the loop.

7. If the radio receiver has push-button tuning, one of the buttons may be set up to tune in the VA-21 oscillator frequency. This button should be marked "Record Player."

Precautionary Lead Dress

1. The power supply cord must be dressed between chassis and top of cabinet, away from grid of 6A8, and entirely away from 25Z6-G.

2. All leads to oscillator coil must be as short as possible.

3. All motor leads must be dressed away from rotor.

4. Pickup leads must be dressed away from the top grid of 6A8, and kept away from the 25Z6-G.

Power Supply Ratings

A-6	105-125 volts, 60 cycles, 50 watts
A-5	105-125 volts, 50 cycles, 50 watts

Motor

Type	Synchronous (Manual Starting)
Turntable Speed	78 r.p.m.

Pickup

Type	Crystal
Pickup Impedance	100,000 ohms at 1000 cycles
Average Output Voltage	1½ volts at 1000 cycles with 250,000 ohm load.

Motor Data

Smooth starting and running will be insured by keeping the bearings well cleaned and oiled.

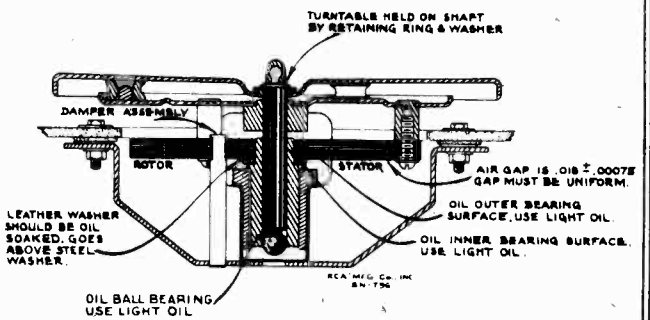
Hum and Vibration.—A small amount of hum when starting, decreasing to a negligible amount when running, is normal. If excessive vibration occurs it may be due to:

1. Insufficient lubrication, or any failure that will cause binding.
2. Leather washer not oiled. (Check to make certain that the leather washer is above the steel washer.)
3. Motor not properly supported from motor board.
4. Burrs on poles of rotor or stator. Remove with fine emery cloth.

The damper spring must fit without binding or chattering in the slot in the stator. The stator must be free to deflect in either direction between the limits of the damper spring. The damper spring must exert approximately equal force in restoring the stator to its mid-position when the stator is deflected manually in each direction.

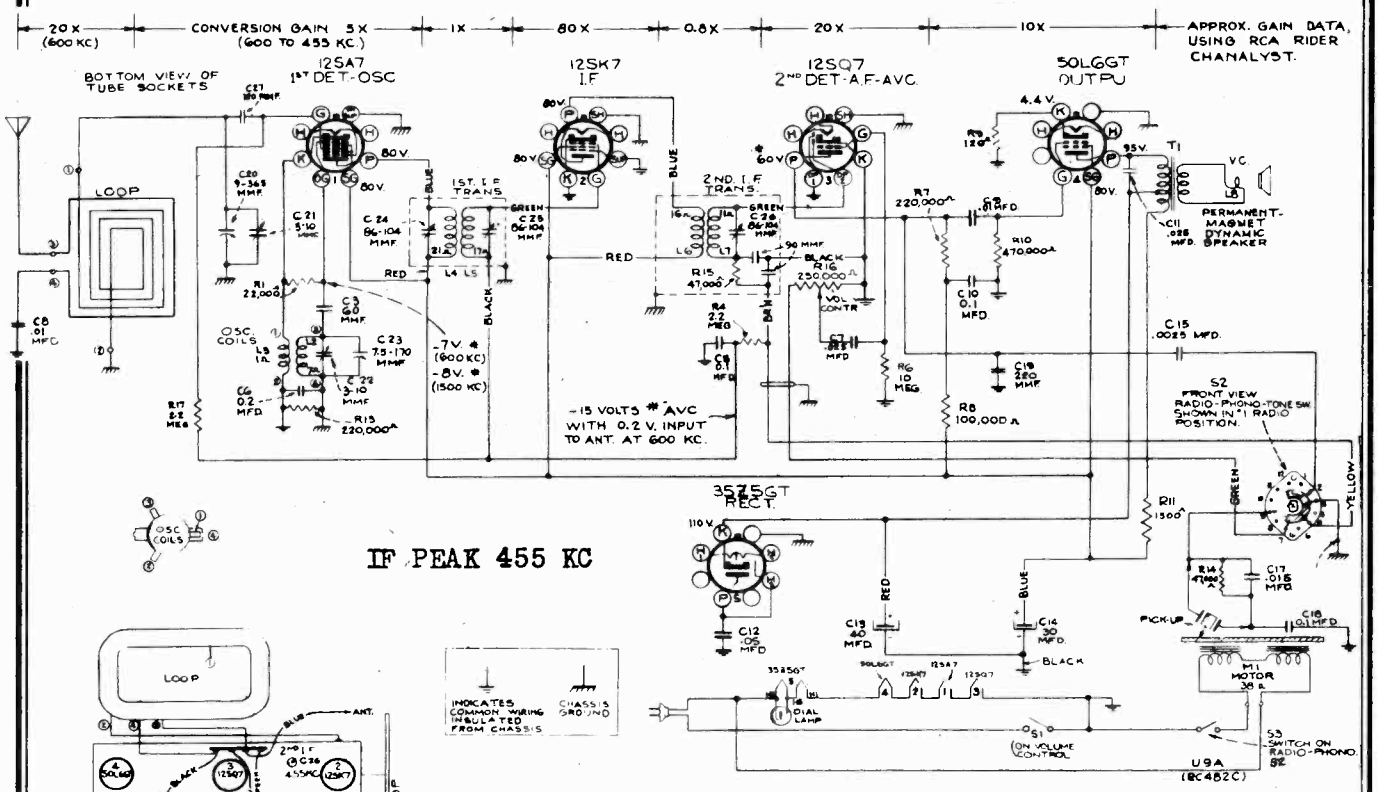
Removing Rotor.—The rotor and turntable assembly simply rests on the ball bearing at bottom of vertical hearing. Remove by lifting upward.

Rotor Adjustment.—Remove motor from cabinet. Loosen the three screws that hold the rotor to the turntable, insert three 16-mil shims at equal distances around the gap between the rotor and stator, and then carefully tighten the three screws. The top of rotor must be flush with top of stator; add additional steel washers beneath the stator if necessary.

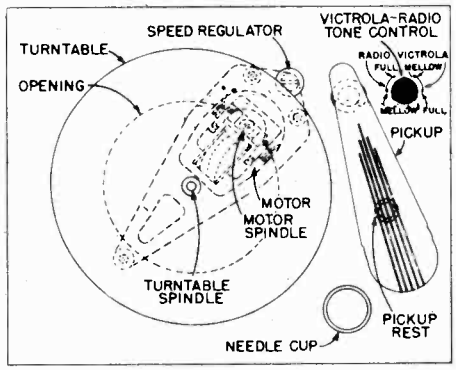


RCA MFG. CO., INC.

MODEL U9(2nd Production) Schematic,Gain,Voltage Alignment,Trimmers,Socket Lead Dress,Phono.Data



VOLTAGES SHOULD HOLD WITHIN ±20% WITH 117V. AC SUPPLY.
* MEASURED WITH CHANALYST, OR VOLTOHMYST.



—1940 No. 12—

Alignment Procedure

Output Meter Alignment.—Connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test Oscillator.—Connect the low side of the test oscillator to the receiver chassis through a 0.01 mfd capacitor, and keep the output as low as possible.

Pre-Setting Dial.—With gang condenser in full mesh, the pointer should coincide with the left hand mark stamped in the dial back-plate.

Antenna.—This set is equipped with a built-in loop antenna. If an outdoor antenna is used, it may be connected to the green antenna lead, stapled to the base of the cabinet. The antenna should not be longer than 100 feet including the lead-in. If it is longer, connect a 100 mmfd. capacitor in series with the lead-in.

Steps	Connect the high side of test oscillator to—	Tune test osc. to—	Turn radio dial to—	Adjust the following for max. output—
1	Tuning Cond. stator (det.) in series with 0.01 mfd.	455 kc	Quiet Point at 1,600 kc end of dial	C24, C25, C26 (1st and 2nd I-F transformers)
2	Antenna lead (green) in series with 100 mmfd.	1,720 kc	Full Clockwise (out of mesh)	C22 (osc.)
3		1,500 kc	Resonance on 1,500 kc signal	C21 (ant.)

LEAD	DRESS
black-high side of AC line	Away from R10; C9, R7 and C15; against side of chassis
heaters	down against chassis
C7, C9, C19, C15, R6, R7, R10, Shield Cable (green and yellow)	up away from chassis
blue and brown leads from phono switch	Tape to shielded cable away from phone switch black leads
green converter lead	Against base and away from diode lead
green diode lead	Away from 12SQ7 grid

First Edition

MODEL U9(2nd Production)
Phono.Data,Parts List

RCA MFG. CO., INC.

Miscellaneous Service Data

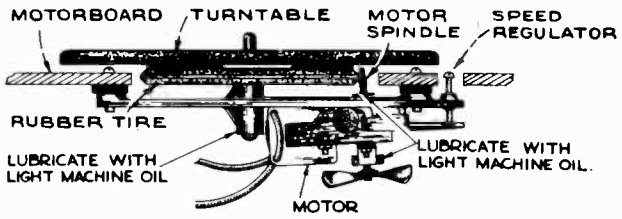
PHONOGRAPH MECHANISM.—

The phonograph motor is self-starting and operates the turntable through friction drive between the motor spindle and the rubber tire on the underside of the turntable.

The rubber driving tire on the turntable should never be removed since it is ground in to be concentric with the spindle. If replacement is required, the entire turntable should be replaced.

The speed regulator raises and lowers the motor. This changes the driving ratio between the motor and the turntable due to the motor spindle being conical in shape. It is important to adjust this regulator for a turntable speed of 78 r.p.m. WHILE PLAYING A 10-INCH RECORD WITH THE NEEDLE APPROXIMATELY ONE INCH FROM THE OUTER EDGE OF THE RECORD.

Lubrication.—The motor should be lubricated as follows: Place a few drops of S.A.E. 20 (or equivalent) on the turntable spindle and saturate the oil retaining felt pads on the motor shaft with S.A.E. 10 oil. This oiling process should be repeated once or twice a year. **CAUTION.—THE MOTOR DRIVE SPINDLE AND RUBBER DRIVING TIRE ON THE TURNTABLE MUST BE KEPT CLEAN AND ENTIRELY FREE FROM OIL AND GREASE AT ALL TIMES.**



Electrical and Mechanical Specifications

FREQUENCY RANGE
Standard Broadcast and one Police Band ..... 540-1,720 kc

INTERMEDIATE FREQUENCY ..... 455 kc

TUBE COMPLEMENT
(1) RCA-12SA7 ..... 1st Detector—Oscillator
(2) RCA-12SK7 ..... I-F Amplifier
(3) RCA-12SQ7 ..... 2nd Detector, A.V.C., A.F.
(4) RCA-50L6GT ..... Power Output
(5) RCA-35Z5GT ..... Rectifier

PILOT LAMP (1) ..... Mazda No. 51, 7.5 volts, 0.2 amp.

LOUDSPEAKER (RL-81-A3)
Type ..... 5-inch P M Dynamic
Voice Coil Impedance ..... 4.0 ohms at 400 cycles

PICKUP ..... Crystal
Pickup Impedance ..... 0.1 meg. at 1,000 cycles

PHONO MECHANISM ..... Self-starting motor, Edge-driven turntable, Adjustable Speed

POWER OUTPUT RATING
Undistorted ..... 0.71 watts
Maximum ..... 1.36 watts

POWER SUPPLY RATINGS
A-6 ..... 105-125 volts, 60 cycles
A-5 ..... 105-125 volts, 50 cycles

POWER CONSUMPTION ..... 55 watts

CABINET DIMENSIONS
10-5/16 in. high ..... 17-7/16 in. wide ..... 13⅜ in. deep
Tuning Drive Ratio ..... 12 to 1
Shipping Weight ..... 23½ lbs.
Net Weight ..... 22 lbs.

Replacement Parts

Insist on genuine factory-tested parts, which are readily identified and may be purchased from authorized dealers.

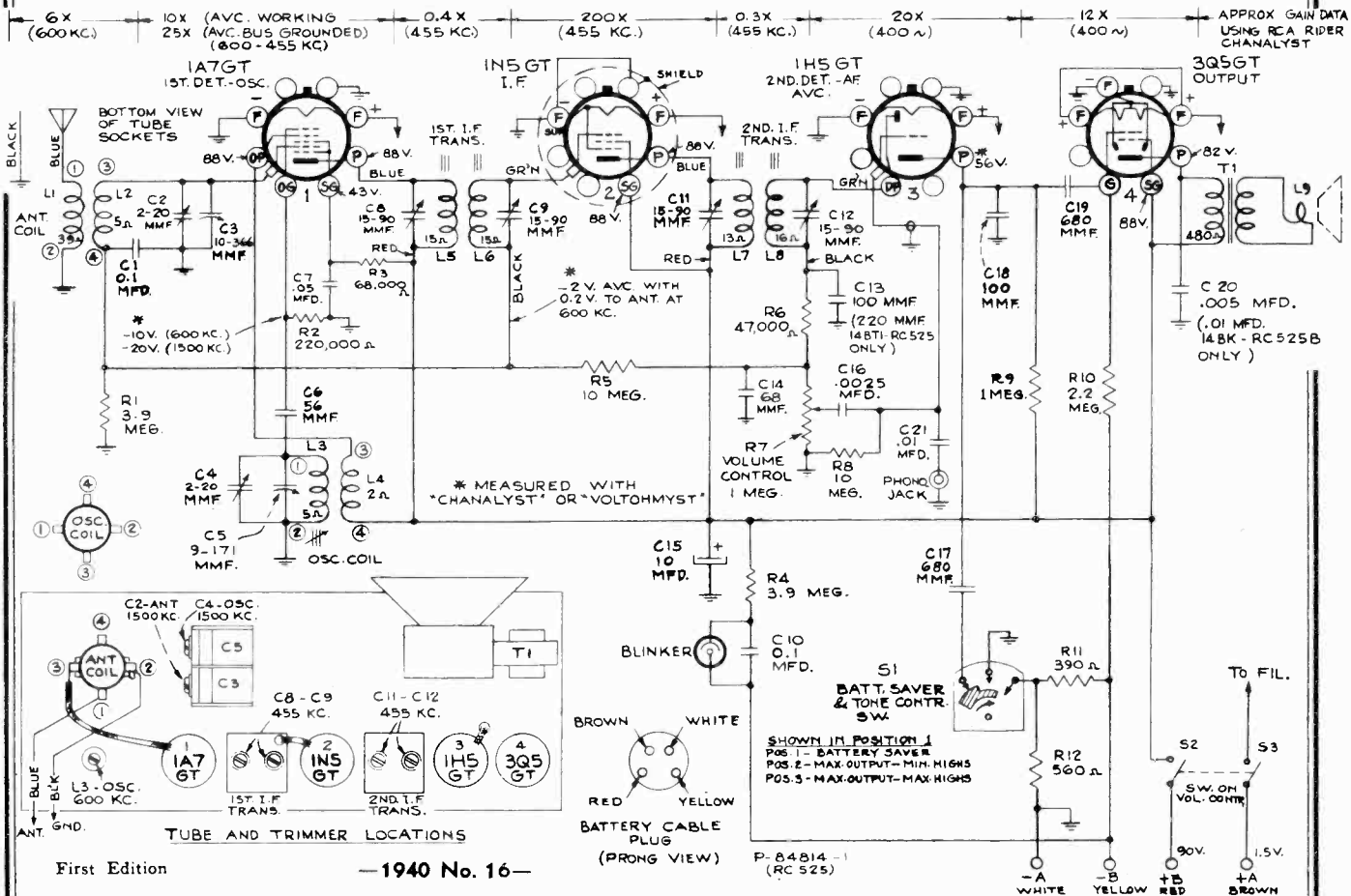
STOCK No.	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES (RC-482C)	
12724	Capacitor—120 mmfd. (C27)	.35
13057	Capacitor—68 mmfd. (C3)	.35
34459	Capacitor—.0025 mfd. (C15)	.20
11315	Capacitor—.015 mfd. (C17)	.20
30938	Capacitor—.025 mfd. (C7, C11)	.20
4937	Capacitor—.01 mfd. (C8, C9)	.25
32787	Capacitor—.05 mfd. (C12)	.20
4839	Capacitor—0.1 mfd. (C5, C10, C18)	.30
34505	Capacitor—0.2 mfd. (C6)	.30
34873	Capacitor—Electrolytic comprising 1 section of 40 mfd. and 1 section of 30 mfd.	1.00
34443	Coil—Oscillator coil	.60
34843	Condenser—Tuning condenser	2.20
34034	Control—Volume control and power switch	1.50
32634	Cord—Drive cord	.10
33453	Drum—Drive cord drum	.50
34841	Frame—Dial and drive frame complete—less indicator drive cord, tuning shaft and drive drum	1.45
34842	Indicator—Station selector indicator	.30
11765	Lamp—Dial lamp	.15
35130	Loop—Antenna loop	1.45
30868	Plug—2-contact female plug for motor cable	.35
5119	Plug—3-contact female plug for speaker cable	.25
12071	Resistor—120 ohms, ½ watt (R9)	.20
3153	Resistor—1,500 ohms, 1 watt (R11)	.22
13998	Resistor—22,000 ohms, ½ watt (R1)	.20
5132	Resistor—47,000 ohms, 1 10 watt	.15
12412	Resistor—47,000 ohms, ½ watt (R14)	.20
14560	Resistor—100,000 ohms, ½ watt (R8)	.20
12264	Resistor—220,000 ohms, ½ watt (R7, R13)	.20
12285	Resistor—470,000 ohms, ½ watt (R10)	.20
12679	Resistor—2.2 meg., ½ watt (R4, R17)	.20
13601	Resistor—10 meg., ½ watt (R6)	.20
34033	Shaft—Tuning shaft	.25
34449	Socket—Dial lamp socket	.30
32537	Socket—Tube socket	.20
33296	Spring—Retaining spring for drum Stock No. 33453	.06
34844	Transformer—First I-F transformer	1.25
34442	Transformer—Second I-F transformer	1.50
11908	Washer—"C" washer for holding shaft Stock No. 34033	.03

STOCK No.	DESCRIPTION	Unit List Price
	MOTOR ASSEMBLIES	
32654	Ball—Ball for turntable bearing	.06
33897	Base—Motor base and ball assembled	.80
33902	Motor—Complete motor 105-125 volts, 60 cycle (M1)	3.70
34496	Motor—Complete motor 105-125 volts, 50 cycle (M1)	4.60
33896	Mounting—Motor cradle mounting hardware and retainer	.10
	PICKUP AND ARM ASSEMBLIES	
33591	Arm—Pickup arm only—less cartridge, base and cable	.50
34481	Arm—Pickup pivot arm and shaft	.70
34482	Base—Pickup mounting base	.30
34758	Bushing—Rubber bushing and metal bushing for pickup pivot arm shaft	.15
33122	Crystal—Pickup crystal cartridge and needle screw	3.75
34311	Ring—Retaining ring for pivot shaft	.05
33529	Screw—Needle screw	.10
	SPEAKER ASSEMBLIES (RL-81A3)	
32907	Cap—Dust cap	.02
35570	Cone—Cone complete with voice coil	1.35
5118	Plug—3-prong male plug for speaker	.25
35904	Transformer—Output transformer	1.45
	MISCELLANEOUS ASSEMBLIES	
33680	Cup—Needle cup	.15
34849	Dial—Glass dial scale	1.50
34850	Hinge—Lid hinge	.25
33942	Knob—"Radio-Phono." switch knob	.25
30863	Knob—Tuning or volume control and power switch knob	.15
30870	Plug—2-contact male plug for motor leads	.35
32610	Rest—Rubber pickup rest	.10
30900	Spring—Retaining spring for knobs Stock No. 33942 and 30863	.05
32627	Support—Lid support	.40
33467	Switch—Combination "Radio-Phono." switch tone control	1.35
33899	Turntable—Turntable complete with spindle and rubber drive tire	3.70

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

RCA MFG. CO., INC.

MODELS 14BT1, 14BT2, 14BK
Ch. RC-525, RC-525A, RC-525B
Schematic, Gain, Voltage
Alignment, Trimmers, Socket
Lead Dress, Batt. Connection



First Edition —1940 No. 16—

Frequency Range	540-1,720 kc
Intermediate Frequency	455 kc

LOUDSPEAKER

Type	Permanent-magnet	Dynamic
Diameter (14BT1, 14BT2)	5 in.	(14BK) 6 in.
Voice Coil Impedance (14BT1, 14BT2)	4 ohms	(14BK) 3.4 ohms

POWER OUTPUT

	Switch at "Battery Saver"	Switch at "Music" or "Speech"
Undistorted	.065 watts	.140 watts
Maximum	.180 watts	.250 watts

BATTERIES REQUIRED

1 "A"—"B" Pack (Burgess Type 17GD60 or equivalent).

CURRENT CONSUMPTION

"A" 0.25 amperes
"B" { 7.3 m.a. (switch at "Battery Saver" position).
{ 11.8 m.a. (switch at "Music" or "Speech" position).

Alignment Procedure

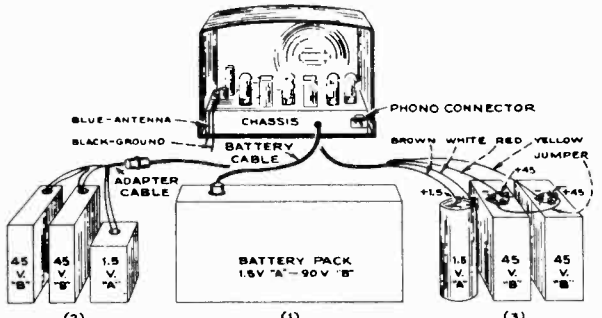
Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

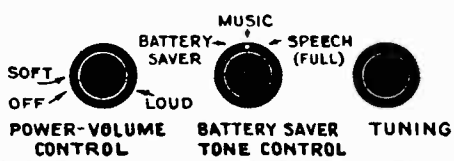
Test-oscillator.—For all alignment operations, keep the output as low as possible to avoid a-v-c action.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	1N5-GT grid cap, in series with .01 mfd.	455 kc	Quiet point between 550-750 kc	C11 and C12 (2nd I-F transformer)
2	1A7-GT grid cap, in series with .01 mfd.	455 kc		C8 and C9 (1st I-F transformer)
3	Antenna terminal, in series with 200 mmfd. Connect low side of test-osc. to "G" term.	1500 kc	1500 kc	C4 (osc.) C2 (ant.)
4		600 kc	600 kc	L3 (osc.) Rock in
5	Repeat steps 3 and 4			

Precautionary Lead Dress

1. The phono input leads should be dressed away from 3Q5GT output leads.
2. C21 should be dressed away from the 3Q5GT output leads.
3. The lead from the 3Q5GT plate to output transformer should be dressed under clip and away from audio input plate leads.





MODELS 14BT1,14BT2,14BK
MODELS 16K,16T2,16T3
MODEL 16T4
Parts Lists

RCA MFG. CO., INC.

MODELS 14BT1, 14BT2 and 14BK

Chassis Nos. RC-525, 525A, 525B

Replacement Parts

Insist on genuine factory-tested parts, which are readily identified and may be purchased from authorized dealers

STOCK No.	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES	
36088	Bearing—Tuning shaft bearing and nut	.10
35097	Can—Shield can for 1-F transformer Stock No. 36084	.30
36083	Can—Shield can for 1-F transformer Stock No. 36083	.30
12723	Capacitor—66 mmfd.	.35
13057	Capacitor—68 mmfd.	.35
12720	Capacitor—100 mmfd.	.35
12694	Capacitor—220 mmfd.	.35
14498	Capacitor—680 mmfd.	.45
34459	Capacitor—.0025 mfd.	.20
33584	Capacitor—.005 mfd.	.25
4937	Capacitor—.01 mfd.	.25
32787	Capacitor—.05 mfd.	.20
4839	Capacitor—0.1 mfd.	.30
33911	Capacitor—Electrolytic 10 mfd., 150 volts	.70
36085	Coil—Antenna coil	1.00
36092	Coil—Oscillator coil	.50
36091	Condenser—Variable tuning condenser Models 14BT2 and 14BK	2.25
36079	Condenser—Variable tuning condenser Model BT1	2.25
36080	Control—Volume control and power switch	1.50
32634	Cord—Drive cord	.10
36093	Core—Adjustable core and stud for oscillator coil	.15
36087	Frame—Dial frame complete with pulleys Models 14BT2 and 14BK	.75
36086	Frame—Dial frame—less dial—Model 14BT1	.30
35091	Indicator—Station selector indicator Model 14BT1	.25
36090	Indicator—Station selector indicator Model 14BT2 and 14BK	.20
34256	Lamp—Blinker lamp	1.35
5119	Plug—3-prong male plug for speaker cable	.25
30560	Plug—4-prong male plug for battery cable	.20
32280	Pulley—Drive cord pulley	.10
12261	Resistor—390 ohms, ½ watt	.20
12414	Resistor—560 ohms, ½ watt	.20
12412	Resistor—47,000 ohms, ½ watt	.20
13715	Resistor—68,000 ohms, ½ watt	.20
12264	Resistor—220,000 ohms, ½ watt	.20
13730	Resistor—1 meg., ½ watt	.20
12679	Resistor—2.2 meg., ½ watt	.20
13167	Resistor—3.9 meg., ½ watt	.20
13601	Resistor—10 meg., ½ watt	.20
36089	Shaft—Tuning shaft	.10
35787	Socket—Phono. input socket only	.15
31319	Socket—Tube socket	.25
33175	Spring—Drive cord spring	.05
31261	Spring—Oscillator coil mounting spring	.01
35098	Spring—Spring to hold transformer in shield can	.08
36081	Switch—Battery saver and tone switch	.75
36082	Transformer—First 1-F transformer—less shield can	1.40
36084	Transformer—Second 1-F transformer—less shield can	1.40
34373	Washer—"C" washer for tuning shaft	.03
	SPEAKER ASSEMBLIES Model 14BT1, 14BT2 (RL-85-4)	
32907	Cap—Dust cap	.02
36095	Cone—Cone complete with voice coil	.75
36098	Transformer—Output transformer	1.25
	SPEAKER ASSEMBLIES (RL-92-3) Model 14BK	
32907	Cap—Dust cap	.02
36077	Cone—Cone complete with voice coil	1.25
5118	Plug—3-prong male plug for speaker	.25
36098	Transformer—Output transformer	1.25
	MISCELLANEOUS ASSEMBLIES	
35104	Crystal—Eacutcheon and crystal—Model 14BT1	1.00
36099	Decalcomania—Control marker decal	.05
36100	Dial—Dial scale—Model 14BTL	.50
36102	Dial—Glass dial scale—Model 14BK	1.00
36101	Dial—Glass dial scale—Model 14BT2	.80
35937	Escutcheon—Dial scale escutcheon—less dial for Model 14BK	1.25
35915	Escutcheon—Dial scale escutcheon—less dial—Model 14BT2	.90
35678	Fastener—Push-on fastener for crystal Stock No. 35104	.02
36297	Knob—Volume control, power switch, tone switch, or tuning knob	.25
30900	Spring—Retaining spring for knobs	.05

MODEL 16T4

Chassis No. RC-509

STOCK No.	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES (RC-509)	
34785	Board—"Antenna-Ground" board	.20
35857	Capacitor—Mica trimmer—1 section of 3-30 mmfd. and 1 section of 8-80 mmfd.	.35
35866	Capacitor—Mica trummer—3 sections of 8-80 mmfd.	.50
35869	Capacitor—Mica trimmer comprising 1 section of 10-160 mmfd., 2 sections of 25-250 mmfd., 1 section of 50-400 mmfd., and 1 section of 100-540 mmfd.	1.00
12720	Capacitor—100 mmfd. (C1, C5, C7)	.35
34699	Capacitor—100 mmfd.	.30
34700	Capacitor—120 mmfd.	.30
13003	Capacitor—180 mmfd. (C18)	.35
12952	Capacitor—330 mmfd. (C19)	.35
35877	Capacitor—720 mmfd. (C27)	.45
13895	Capacitor—5,800 mmfd. (C32)	.70
34459	Capacitor—.0025 mfd. (C33)	.20
33640	Capacitor—.005 mfd. (C20, C21, C23, C31)	.25
4937	Capacitor—.01 mfd. (C6)	.25
32787	Capacitor—.05 mfd. (C4)	.20
4839	Capacitor—0.1 mfd. (C15, C30)	.30
35858	Capacitor—Electrolytic comprising 2 sections of 10 mfd., 450 volts and 1 section of 20 mfd., 25 volts	1.70
35876	Coil—Coil and resistor assembly (L2 and R16)	.30
35785	Coil—Loop primary (L1)	.50
35789	Coil—Oscillator coil	1.15
35803	Coil—Oscillator coils for push button switch	.30
35874	Condenser—Variable tuning condenser	2.85
35860	Control—Tone control	1.10
35859	Control—Volume control and power switch	2.00
32634	Cord—Drive cord	.10
36871	Core—Adjusting core and stud for oscillator coils	.55
35788	Core—Core and stud for oscillator coil	.15
35870	Indicator—Station selector indicator	.20
35855	Loop—Antenna loop complete	3.00
35856	Loop—Antenna loop winding	.80
35872	Plate—Dial back plate	.95
32289	Pulley—Drive cord pulley and rivet	.10
30681	Resistor—470 ohms, 1 watt (R14)	.22
14720	Resistor—1,000 ohms, ½ watt (R3)	.20
14024	Resistor—2,700 ohms, ½ watt (R17)	.20
30694	Resistor—3,900 ohms, ½ watt (R1)	.20
35875	Resistor—12,000 ohms, 3 watts (R7)	.35
13998	Resistor—22,000 ohms, ½ watt (R9)	.20
12454	Resistor—33,000 ohms, ½ watt (R5)	.20
12412	Resistor—47,000 ohms, ½ watt (R4)	.20
12285	Resistor—470,000 ohms, ½ watt (R11, R13)	.20
12679	Resistor—2.2 meg., ½ watt (R2, R8)	.20
13601	Resistor—10 meg., ½ watt (R12)	.20
35862	Shaft—Tuning shaft	.20
35772	Shield—Power transformer bottom shield	.30
35934	Shield—Power transformer top shield assembly	.85
31364	Socket—Dial lamp socket	.20
35787	Socket—Phono. input socket	.15
31251	Socket—Tube socket	.25
31418	Spring—Drive cord spring	.05
35868	Switch—Push button switch	3.15
35863	Switch—Range switch	1.80
35836	Transformer—First 1-F transformer	1.70
35790	Transformer—Second 1-F transformer	1.60
35588	Transformer—Power transformer—110 volts, 25 cycle	6.30
35853	Transformer—Power transformer—less end shields 110 volts, 60 cycle	3.45
33726	Washer—"C" washer for tuning shaft	.02
	SPEAKER ASSEMBLIES (RL-79B1)	
35849	Cap—Dust cap	.03
35880	Coil—Field coil	1.50
35441	Cone—Cone complete with voice coil	1.25
35393	Transformer—Output transformer	1.50
	MISCELLANEOUS ASSEMBLIES	
35883	Button—Push button (dark brown)	.15
36299	Button—Push button (light brown)	XX
35919	Decalcomania—Control panel decal	.10
35393	Decalcomania—"Television" decal	.05
35916	Dial—Glass dial scale	1.25
35915	Escutcheon—Dial scale escutcheon—less dial	.90
35881	Escutcheon—Push button escutcheon	.85
35814	Knob—Tone control or range switch knob (dark brown)	.25
36297	Knob—Tone control or range switch knob (light brown)	XX
35775	Knob—Tuning or volume control knob (dark brown)	.25
36298	Knob—Tuning or volume control knob (light brown)	XX
11765	Lamp—Dial lamp	.15
33842	Marker—Station selector marker	.25
34053	Spring—Retaining spring for button Stock No. 35883	.02
30900	Spring—Retaining spring for knobs Stock Nos. 35814 and 35775	.05

MODELS 16K, 16T2 and 16T3

Chassis No. RC-509C RC-509B RC-509A

Replacement Parts

Insist on genuine factory-tested parts, which are readily identified and may be purchased from authorized dealers.

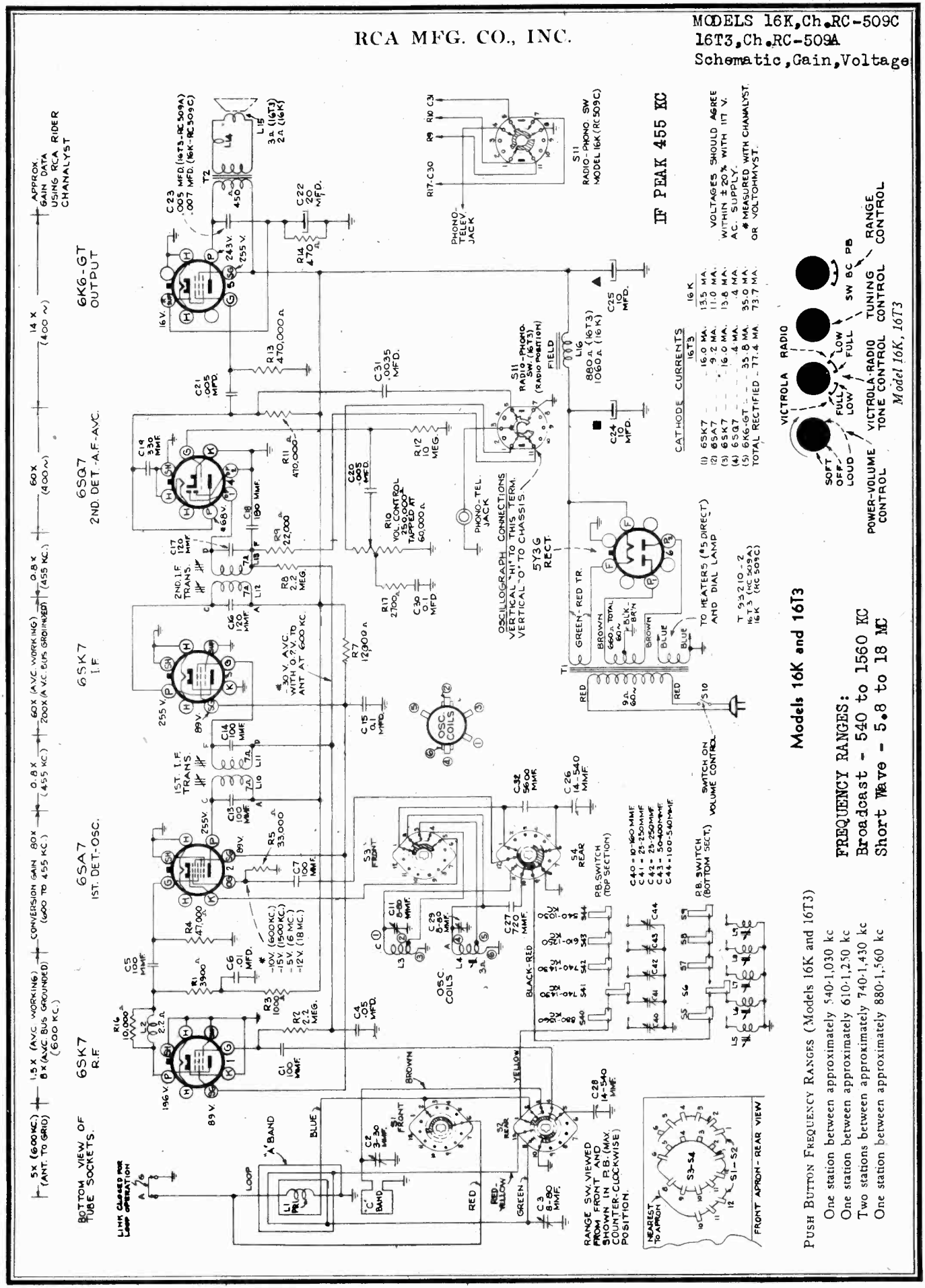
STOCK No.	DESCRIPTION	Unit List Price
	MODEL 16T2 (RC-509B) MODEL 16T3 (RC-509A) MODEL 16K (RC-509C)	
34785	Board—"Antenna-Ground" board	.20
35857	Capacitor—Mica trimmer—1 section of 3-30 mmfd. and 1 section of 8-80 mmfd.	.35
35867	Capacitor—Mica trimmer comprising 2 sections of 8-80 mmfd.	.40
35869	Capacitor—Mica trimmer comprising 1 section of 10-160 mmfd., 2 sections of 25-250 mmfd., 1 section of 50-400 mmfd., and 1 section of 100-540 mmfd. (Models 16T3 and 16K)	1.00
34699	Capacitor—100 mmfd., mica	.30
12720	Capacitor—100 mmfd., moulded	.35
34700	Capacitor—120 mmfd.	.30
13003	Capacitor—180 mmfd.	.35
12952	Capacitor—330 mmfd.	.35
35877	Capacitor—720 mmfd.	.45
13895	Capacitor—5,800 mmfd.	.70
30303	Capacitor—.0035 mfd. (Models 16T2 and 16T3)	.40
33640	Capacitor—.005 mfd.	.25
5148	Capacitor—.007 mfd.	.20
4937	Capacitor—.01 mfd.	.25
32787	Capacitor—.05 mfd.	.20
4839	Capacitor—0.1 mfd.	.30
35858	Capacitor—Electrolytic comprising 2 sections of 10 mfd., 450 volts, and 1 section of 20 mfd., 25 volts	1.70
35876	Coil—Coil and resistor assembly [R16 and L2 (L4 in 16T2)]	.30
35785	Coil—Loop primary (L1)	.50
35803	Coil—Oscillator coils for push button switch—(Models 16T3 and 16K)	.30
35854	Coil—Oscillator coil	.85
35874	Condenser—Variable tuning condenser	2.85
35861	Control—Tone control—(Models 16T3 and 16T2)	.95
35935	Control—Tone control—(Model 16K)	.90
35859	Control—Volume control and power switch	2.00
32634	Cord—Drive cord	.10
35871	Core—Adjusting core and stud for oscillator coils—(Models 16T3 and 16K)	.55
35788	Core—Core and stud for oscillator coil	.15
35870	Indicator—Station selector indicator	.20
35856	Loop—Antenna loop winding	.80
35855	Loop—Antenna loop complete	3.00
35938	Plate—Dial back plate—(Model 16K)	.95
35873	Plate—Dial back plate—(Model 16T2)	.80
35872	Plate—Dial back plate—(Model 16T3)	.95
5119	Plug—3-contact female plug for speaker cable—(Model 16K)	.25
32289	Pulley—Drive cord pulley and rivet	.10
30681	Resistor—470 ohms, 1 watt	.22
14720	Resistor—1,000 ohms, ½ watt	.20
14024	Resistor—2,700 ohms, ½ watt	.20
30694	Resistor—3,900 ohms, ½ watt	.20
35875	Resistor—12,000 ohms, 3 watts	.35
13998	Resistor—22,000 ohms, ½ watt	.20
12454	Resistor—33,000 ohms, ½ watt	.20
12412	Resistor—47,000 ohms, ½ watt	.20
12285	Resistor—470,000 ohms, ½ watt	.20
12679	Resistor—2.2 meg., ½ watt	.20
13601	Resistor—10 meg., ½ watt	.20
35862	Shaft—Tuning shaft	.20
35772	Shield—Power transformer bottom shield	.30
35934	Shield—Power transformer top shield assembly	.85
31364	Socket—Dial lamp socket	.20
35787	Socket—Phono. input socket	.15
31251	Socket—Tube socket	.25
31418	Spring—Drive cord spring	.05
35868	Switch—Push button switch—(Models 16T3 and 16K)	3.15
35863	Switch—Range switch—(Models 16T3 and 16K)	1.95
35865	Switch—Range switch—(Model 16T2)	1.20
35836	Transformer—First 1-F transformer	1.70
35790	Transformer—Second 1-F transformer	1.60
35588	Transformer—Power transformer—110 volts, 25 cycle	6.30
35587	Transformer—Power transformer—110 volts, 60 cycle—(Model 16K)	4.00
35853	Transformer—Power transformer—less end shields—110 volts, 60 cycle (Models 16T2 and 16T3)	3.45
33726	Washer—"C" washer for tuning shaft	.02
	SPEAKER ASSEMBLIES (RL-70H6) Model 16K	
31825	Cap—Cone center dust cap	.02
11469	Coil—Hum neutralizing coil	.30
33116	Coil—Speaker field coil	2.10
31275	Cone—Speaker cone, voice coil, and dust cap	1.50
5118	Plug—3-contact male for speaker	.25
31301	Transformer—Output transformer	1.70
	SPEAKER ASSEMBLIES (RL-79B1) Models 16T2 and 16T3	
35849	Cap—Dust cap	.03
35880	Coil—Field coil	1.50
35441	Cone—Cone complete with voice coil	1.25
35879	Transformer—Output transformer	1.50
	MISCELLANEOUS ASSEMBLIES	
35883	Button—Push button—(Models 16T3 and 16K) (dark brown)	.15
36299	Button—Push button (light brown)	XX
35921	Decalcomania—Control panel decal—(Model 16T2)	.10
35920	Decalcomania—Control panel decal—(Models 16T3 and 16K)	.10
35393	Decalcomania—"Television" decal	.05
35938	Dial—Glass dial scale—(Model 16K)	1.00
35918	Dial—Glass dial scale—(Model 16T2)	1.00
35917	Dial—Glass dial scale—(Model 16T3)	1.00
35937	Escutcheon—Dial scale escutcheon—(Model 16K)	1.25
35882	Escutcheon—Dial scale escutcheon—(Model 16T2)	.85
35915	Escutcheon—Dial scale escutcheon—less dial—(Model 16T3)	.90
35881	Escutcheon—Push button escutcheon—(Models 16T3 and 16K)	.85
35814	Knob—Tone control or range switch knob (dark brown)	.25
36297	Knob—Tone control or range switch knob (light brown)	XX
35775	Knob—Tuning or volume control knob (dark brown)	.25
36298	Knob—Tuning or volume control knob (light brown)	XX
11765	Lamp—Dial lamp	.15
33842	Marker—Station selector marker	.25
34053	Spring—Retaining spring for button Stock No. 35883	.02
30900	Spring—Retaining spring for knobs Stock Nos. 35814 and 35775	.05

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

XX—Price upon application to your local RCA Victor Parts Distributor.

RCA MFG. CO., INC.

MODELS 16K, Ch. RC-509C
16T3, Ch. RC-509A
Schematic, Gain, Voltage



MODELS 16K,16T2,16T3
Alignment,Trimmers
Socket

RCA MFG. CO., INC.

Models 16K, 16T2, 16T3

PILOT LAMP..... Mazda No. 51, 7.5 volts, 0.20 amp.

POWER OUTPUT RATING

Undistorted	2.5 watts
Maximum	4.5 watts

LOUDSPEAKERS	16K	16T2, 16T3
Size	12-inch	6-inch
V. C. impedance at 400 cycles	2.2 ohms	3.4 ohms
Identification Number	RL-70H6	RL-79B1

POWER SUPPLY RATINGS

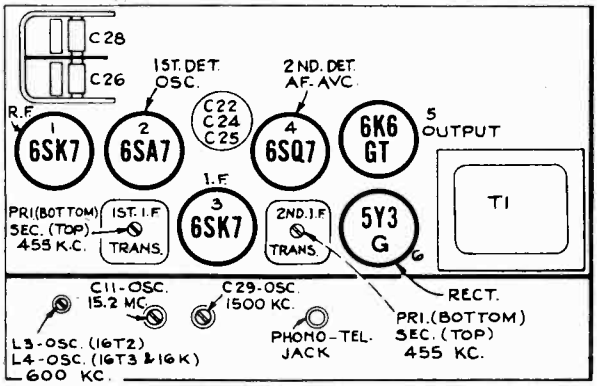
105-125 volts, 50-60 cycles	70 watts
105-125 volts, 25-60 cycles	70 watts
105-125, 200-250 volts, 50-60 cycles	70 watts

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the schematic diagrams.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

Electronic Voltmeter.—The electronic voltmeter in the Chanalyst or Volt Ohmyst provides an unexcelled output indicator. It should be connected to the AVC bus, and the test-oscillator output adjusted to produce several volts of AVC.



Calibration Scale.—The glass tuning dial may be easily removed from the cabinet and temporarily attached to the chassis for quick reference during alignment. In the event that only the chassis is returned for service, and the cabinet with its tuning dial is left in the customer's home, the calibration scale printed in this service note can be used in conjunction with an ordinary 12-inch ruler as an accurate and convenient substitute for the regular dial.

Each method is described below.

Using Tuning Dial.—

1. Slide out the flat spring clamp at each end of the dial, and remove the glass dial from the cabinet.

2. With gang in full mesh, move the dial pointer to the reference mark at the left-hand end of the dial backing plate.

3. Place the glass dial under the pointer so that the extreme left scale graduations coincide with the pointer. Use scotch tape to hold the glass dial in this position.

4. After completion of alignment, replace the glass dial in cabinet, taking care that the fibre light shields are in correct position at ends of dial.

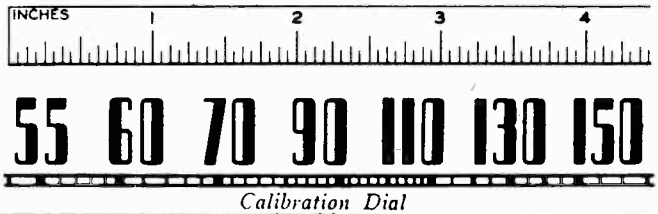
Using Calibration Scale.—

1. With gang in full mesh, move the dial pointer to the reference mark at the left-hand end of the dial backing plate.

2. Place a flat 12-inch ruler on the dial backing plate so the left-end of ruler is at the reference mark at left-end of backing plate. Temporarily fasten the ruler with scotch tape to the backing plate.

3. Refer to calibration scale printed in this service note. This is a reduced reproduction of the dial with an inch-scale drawn at top and bottom. To find the correct pointer position in inches for any desired frequency, draw a vertical line through this frequency on the calibration scale. For example, 1,500 kc is approximately 4 inches from the reference mark.

Dial-Pointer Adjustment.—After the chassis is replaced in cabinet, move the dial pointer (if necessary) so that it is at the left-hand graduation on the dial with the gang in full mesh.



Calibration Dial

Steps	Connect the high side of the test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for maximum peak output—
1	I-F grid, in series with .01 mfd.	455 kc	"A" band, Quiet Point at 1,500 kc end of dial	L7 and L8 (2nd I.F. Trans.)
2	1st det. grid, in series with .01 mfd.			L5 and L6 (1st I.F. Trans.)
3	Antenna terminal, in series with 300 ohms (link open)	15.2 mc	15.2 mc "C" band	C11 (osc.)* C2 (ant.)
4	Antenna terminal, in series with 200 mmfd. (link open)	1,500 kc	1,500 kc "A" band	C29 (osc.) C3 (ant.)
5		600 kc	600 kc "A" band	L3 (in 16T2) L4 (in 16K and 16T2) Rock in
6	Repeat steps 4 and 5.			

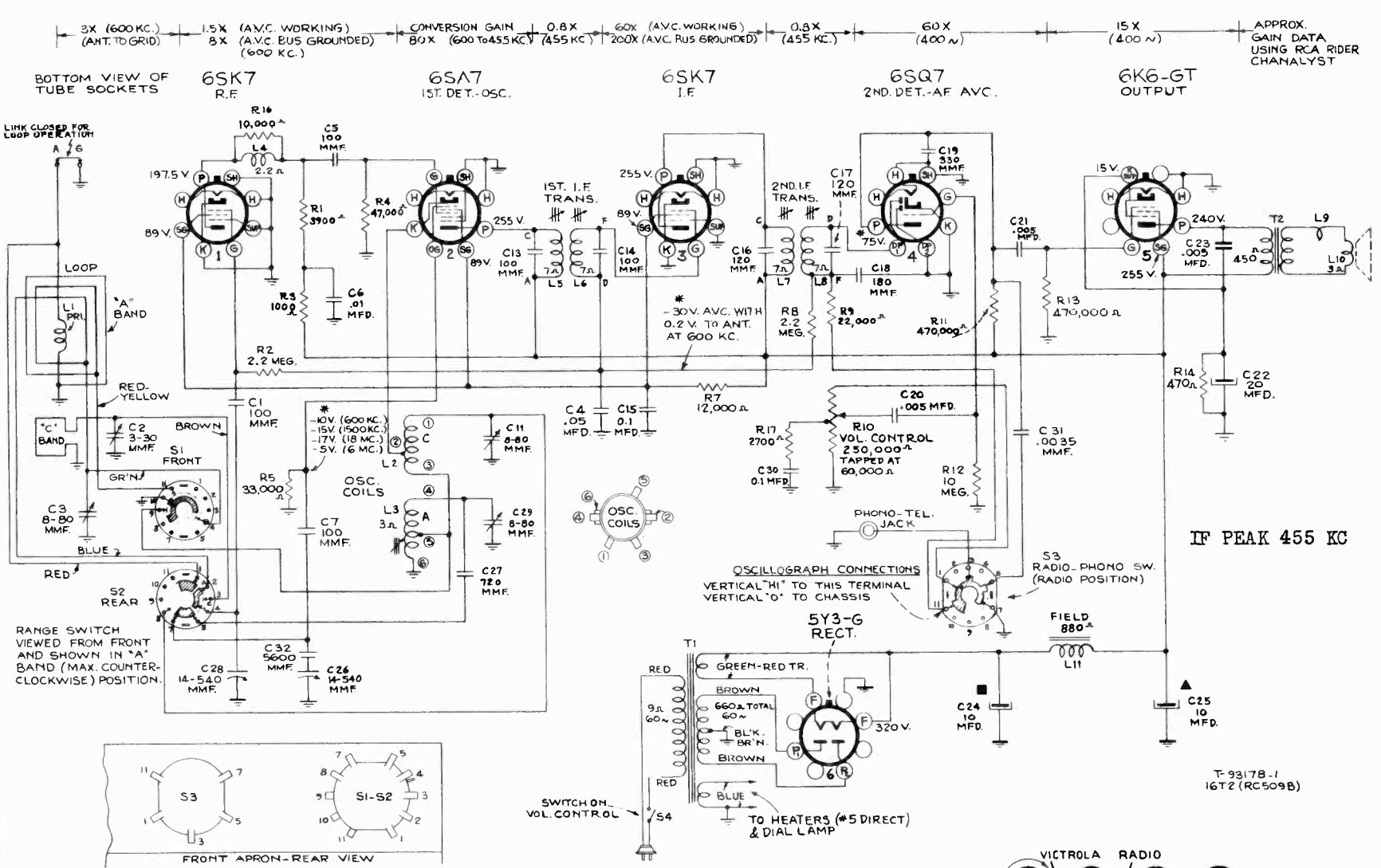
In case of instability during R-F alignment, connect a 27,000 ohm 1/4 watt resistor across "D" and "F" of 2nd I-F transformer.

* Use **minimum** capacity peak if two peaks can be obtained. Check to determine that the correct peak has been used, by tuning receiver to 14.29 mc, where a weaker signal should be received.

Note: Oscillator tracks **above** signal on both bands.

RCA MFG. CO., INC.

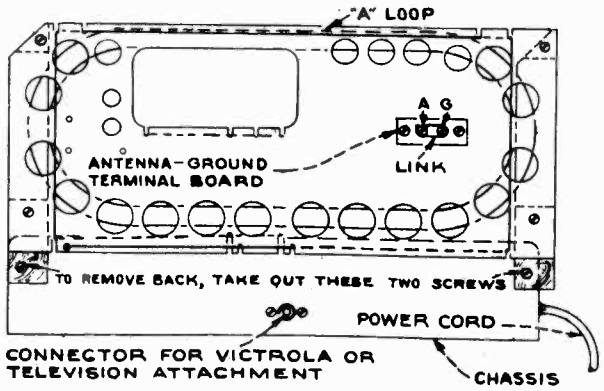
MODEL 16T2, Ch. RC-509B
Schematic, Gain, Voltage



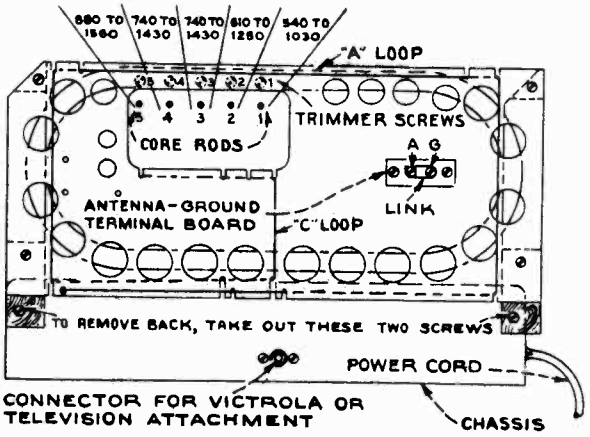
MODELS 16K,16T3
Tuner Data,Trimmers
Loop Connections,Dial

RCA MFG. CO., INC.

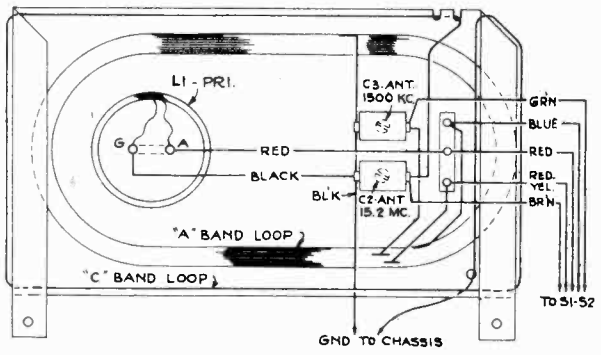
MODEL 16T2
Loop Connections,Dial
Lead Dress,all models



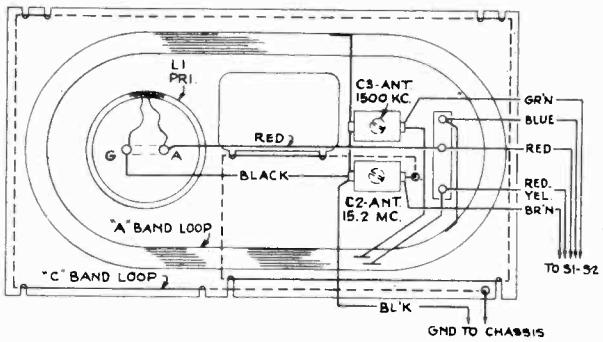
Model 16T2



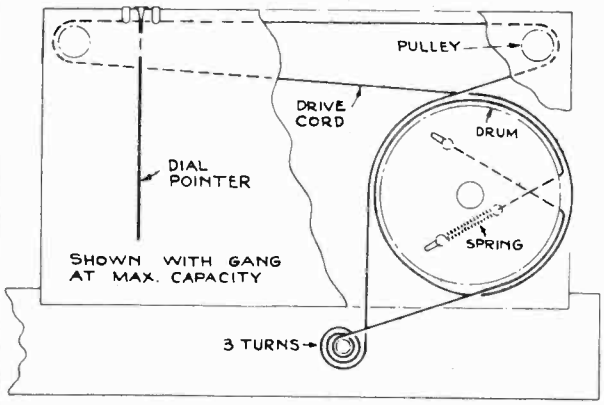
Model 16K, 16T3



Model 16T2



Model 16K, 16T3



Precautionary Lead Dress.—

1. Dress red leads from C band trimmer to coil and switch away from each other (16T2).
2. Keep bus from range switch to lance short as possible (16T2).
3. Tape together red, blue, and brown leads from chassis to loop (16T2).
4. Dress yellow lead from IF to tone switch up away from chassis.
5. Dress C-20 from volume control up away from chassis.
6. Keep grid end of R-12 as short as possible.
7. Dress C-30 away from red and brown A.C. leads.
8. Dress power transformer leads down against chassis.
9. Dress brown power transformer leads back away from IF transformer.

At left—Dial Drive in Models 16K, 16T2, 16T3

Push Button Adjustment (Models 16K and 16T3)

The push buttons connect to separate magnetite-core oscillator coils and separate loop circuit trimmers which must be adjusted for the desired stations. Use an insulated screwdriver or alignment tool such as RCA Stock No. 31031. Allow about five minutes warm-up period before making adjustments.

The procedure is as follows:

1. Make a list of the five desired stations, arranged in order from low to high frequencies.
2. Turn the range switch to the broadcast (BC) position and manually tune in the first station on the list.
3. Turn range switch to push-button (PB) position and press in the left-hand button.
4. Unscrew the push-button loop trimmers to minimum capacity.
5. Adjust L9 to receive the first station. To secure the best adjustment, rotate the set for least pickup, and adjust L9 for peak output.
6. Adjust C44 for peak output on the first station.
7. Proceed in the same manner to adjust for the remaining four stations.

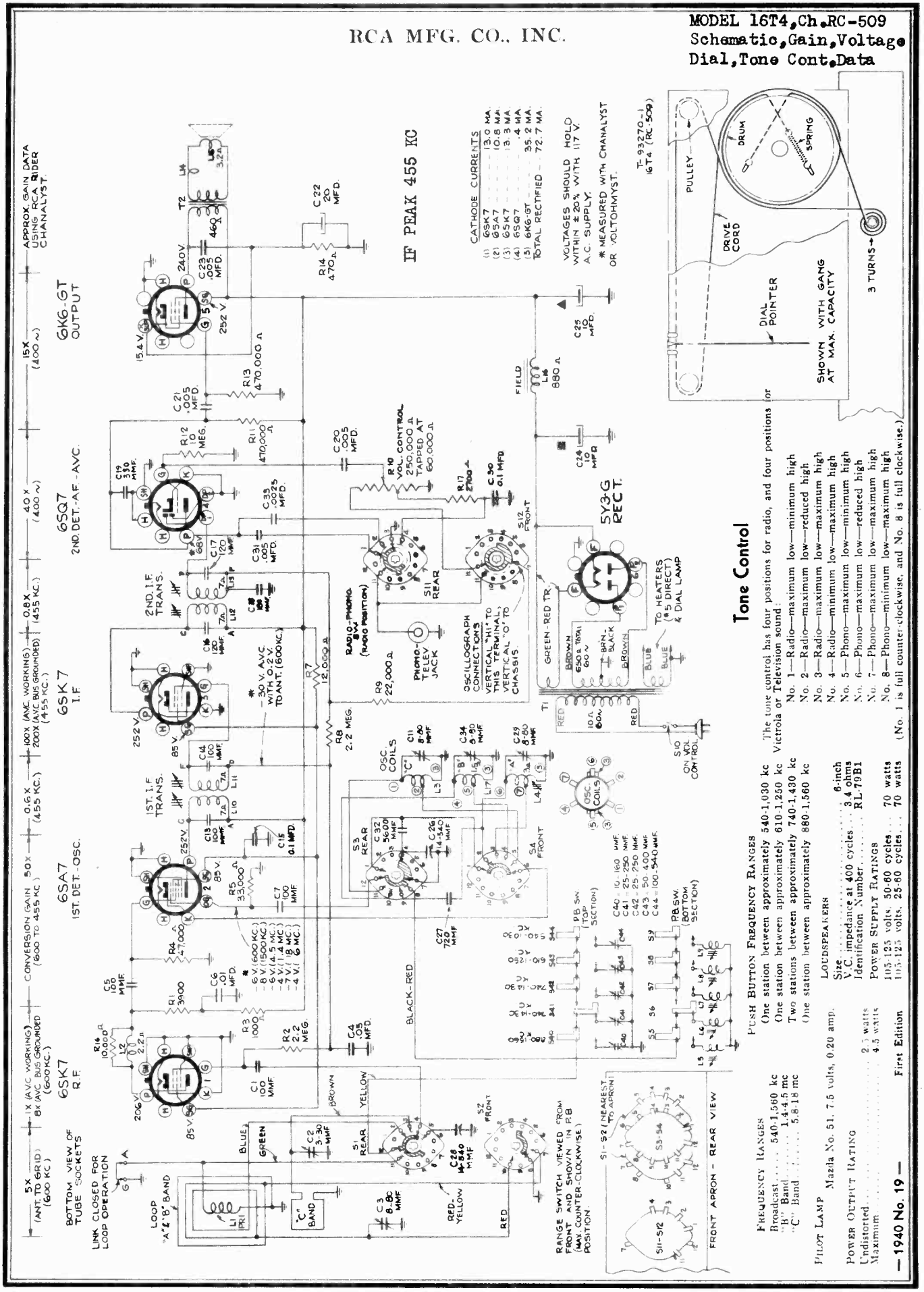
Owing to the relatively high R-F gain, it may be found that there are several settings of each push-button magnetite core that will bring in any particular station. The procedure outlined above (backing the push-button loop trimmers to minimum capacity before adjusting the cores) will reduce this effect.

On the 880 to 1,560 kc push-button, the higher frequency stations may be received with L5 either in or out (oscillator frequency either 455 kc below or 455 kc above the station frequency). The adjustment with this core in its out position (oscillator frequency 455 kc above the station frequency) is the correct one.

NOTE: Clockwise adjustment of cores and trimmers tunes the circuits to lower frequencies.

RCA MFG. CO., INC.

MODEL 16T4, Ch. RC-509
Schematic, Gain, Voltage
Dial, Tone Cont. Data



Tone Control

The tone control has four positions for radio, and four positions for Victrola or Television sound:

No. 1—Radio—maximum low—minimum high
No. 2—Radio—maximum low—reduced high
No. 3—Radio—maximum low—maximum high
No. 4—Radio—minimum low—maximum high
No. 5—Phono—maximum low—minimum high
No. 6—Phono—maximum low—reduced high
No. 7—Phono—maximum low—maximum high
No. 8—Phono—minimum low—maximum high

(No. 1 is full counter-clockwise, and No. 8 is full clockwise.)

PUSH BUTTON FREQUENCY RANGES

One station between approximately 540-1,030 kc
One station between approximately 610-1,250 kc
Two stations between approximately 740-1,430 kc
One station between approximately 880-1,560 kc

LOUDSPEAKERS

Size ... 6-inch
V.C. impedance at 400 cycles ... 3.4 ohms
Identification Number ... RL-79B1

POWER SUPPLY RATINGS

105-125 volts 50-60 cycles ... 70 watts
105-125 volts, 25-60 cycles ... 70 watts

FREQUENCY RANGES

Broadcast ... 540-1,560 kc
"B" Band ... 1.4-4.5 mc
"C" Band ... 5.8-18 mc

PILOT LAMP

Mazda No. 51, 7.5 volts, 0.20 amp.

POWER OUTPUT RATING

Undistorted ... 2.5 watts
Maximum ... 4.5 watts

First Edition

MODEL 16T4
Alignment, Trimmers, Socket
Tuner, Loop Connections

RCA MFG. CO., INC.

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the schematic diagrams.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

Electronic Voltmeter.—The electronic voltmeter in the Chanalyst or Volt Ohmyst provides an unexcelled output indicator. It should be connected to the AVC bus, and the test-oscillator output adjusted to produce several volts of AVC.

Calibration Scale.—The glass tuning dial may be easily removed from the cabinet and temporarily attached to the chassis for quick reference during alignment. Or, if necessary, the calibration scale printed in this service note can be used in conjunction with an ordinary 12-inch ruler as an accurate and convenient substitute for the regular dial.

Each method is described below.

Using Tuning Dial.—

1. Slide out the flat spring clamp at each end of the dial, and remove the glass dial from the cabinet.

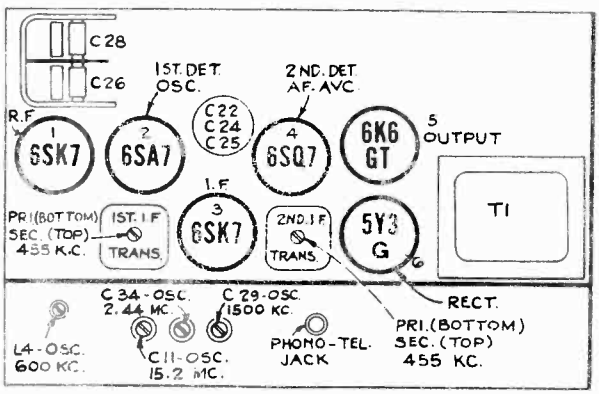
2. With gang in full mesh, move the dial pointer to the reference mark at the left-hand end of the dial backing plate.

3. Place the glass dial under the pointer so that the extreme left scale graduations coincide with the pointer. Use scotch tape to hold the glass dial in this position.

4. After completion of the alignment, replace the glass dial in cabinet, taking care that the fibre light shields are in correct position at ends of dial.

Using Calibration Scale.—

1. With gang in full mesh, move the dial pointer to the reference mark at the left-hand end of the dial backing plate.



2. Place a flat 12-inch ruler on the dial backing plate so the left-end of ruler is at the reference mark at left-end of backing plate. Temporarily fasten the ruler with scotch tape to the backing plate.

3. Refer to calibration scale printed in this service note. This is a reduced reproduction of the dial with an inch-scale drawn at top and bottom. To find the correct pointer position in inches for any desired frequency, draw a vertical line through this frequency on the calibration scale. For example, 1,500 kc is approximately 4 inches from the reference mark.

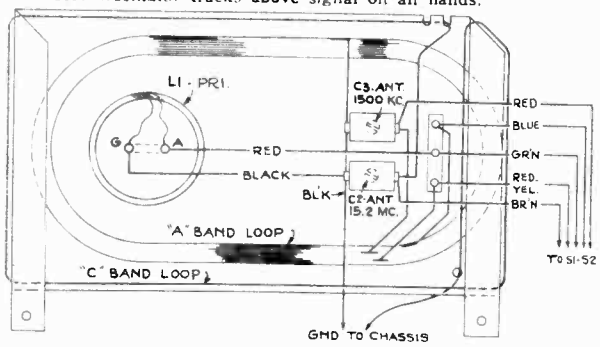
see Calibration Dial Model 16K

Dial-Pointer Adjustment.—After the chassis is replaced in cabinet, move the dial pointer (if necessary) so that it is at the left-hand graduation on the dial with the gang in full mesh.

Steps	Connect the high side of the test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for maximum peak output—
1	I-F grid, in series with .01	455 kc	"A" band, Quiet Point at 1,500 kc end of dial	L12 and L13 (2nd I.F. Trans.)
2	1st-Det. grid, in series with .01			L10 and L11 (1st I.F. Trans.)
3	Antenna terminal, in series with 300 ohms (link open)	15.2 mc	15.2 mc "C" band	C11 (osc.)* C2 (ant.)
4		2.44 mc	2.44 mc "B" band	C34 (osc.) Rock in
5	Antenna terminal, in series with 200 mmfd. (link open)	1,500 kc	1,500 kc "A" band	C29 (osc.) C3 (ant.)
6		600 kc	600 kc "A" band	L4 Rock in
7	Repeat steps 5 and 6.			

* Use minimum capacity peak if two peaks can be obtained. Check to determine that the correct peak has been used, by tuning receiver to 14.29 mc, where a weaker signal should be received.

Note: Oscillator tracks above signal on all bands.

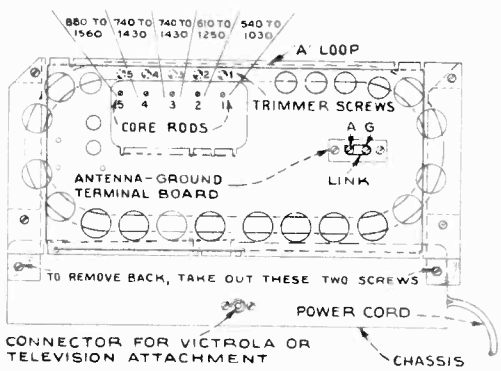


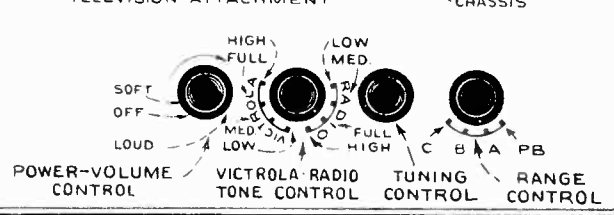
Push Button Adjustment

The push buttons connect to separate magnetite-core oscillator coils and separate antenna trimmers which must be adjusted for the desired stations. Use an insulated screwdriver or alignment tool such as RCA Stock No. 31031. Allow at least five minutes warm-up period before making adjustments.

In the event that the receiver is to be used with an external antenna use one or two feet of wire (as an antenna) to ensure sharp peaking during the final adjustment procedure. For loop operation, the link should be strapped across "A" and "G" terminals on back of set. In either case the procedure is as follows:

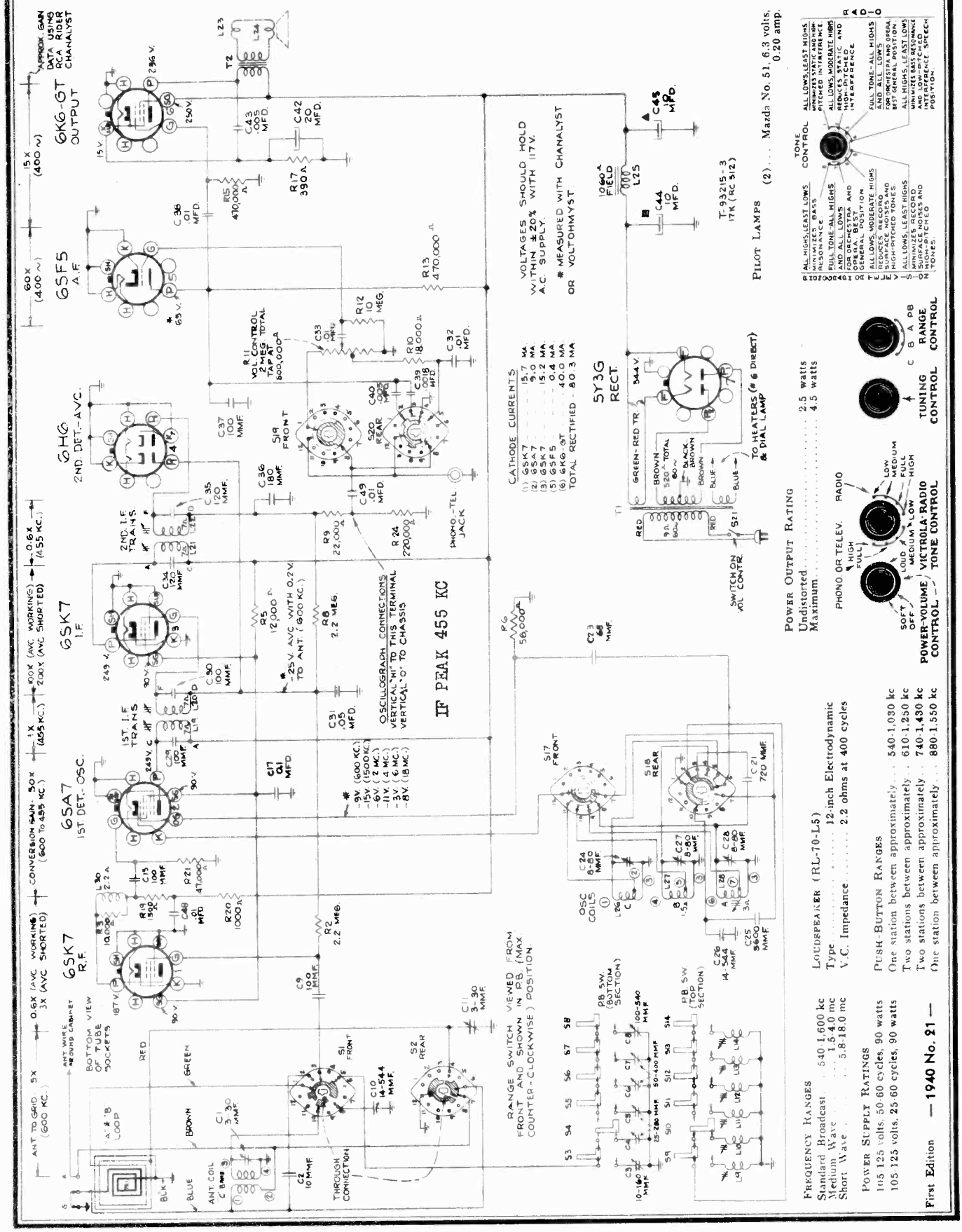
1. Make a list of the desired stations, arranged in order from low to high frequencies.
2. Turn the range selector to "A" band, and manually tune in the first station on the list.
3. Turn range selector to "PB" position, push in station button No. 1 (extreme left). Then adjust the No. 1 oscillator core (L9) to receive the station.
4. After oscillator core is adjusted properly, adjust C-44 for maximum output.
   Owing to the relatively high RF gain, it may be found that there are several settings of each push-button magnetite core that will bring in any particular station. In such cases it is advisable to unscrew the push-button loop trimmers to minimum capacity before adjusting the push-button magnetite cores.
   Clockwise adjustment of cores and trimmers tunes the circuits to lower frequencies.
5. Adjust for each of the remaining stations in the same manner.
6. Make a final careful adjustment of the oscillator cores and antenna trimmers.





RCA MFG. CO., INC.

MODEL 17K, Ch. RC-512
Schematic, Gain, Voltage



MODEL 17K
Alignment, Trimmers
Socket, Dial, Loop

RCA MFG. CO., INC.

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the schematic diagram.

Output Meter Alignment. — If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

Calibration for Alignment.—The proper dial calibration for alignment purposes can be set up in two ways:

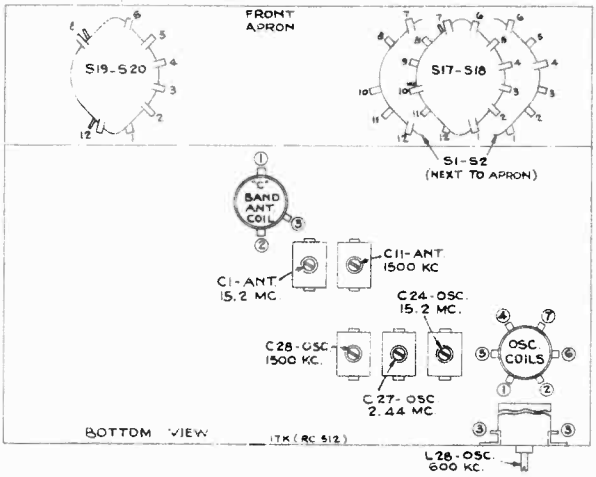
1. The dial may be removed from the cabinet by sliding out the two spring pieces which clamp it in its mounting position. The condenser plates should then be turned into full mesh, the pointer adjusted to the scratch at the left end of the dial backing plate, and the dial slipped under the pointer so that its extreme left calibration mark coincides with the pointer. The dial may be held in place with scotch tape. In this manner the actual receiver dial is used for alignment. When alignment is finished, the scale should be replaced including the fibre light shields which are folded under the ends of the glass scale.
2. A calibration scale is attached to the tuning drum. The correct setting of the gang, in degrees, for each alignment frequency is given in the alignment table. Check the position of the drum, making sure that the 0 degree scale mark is horizontal with the gang in full mesh.

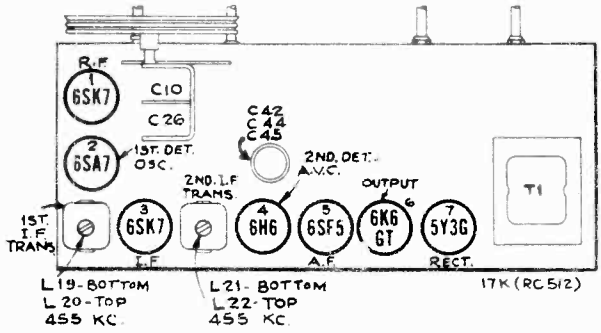
Pointer for Calibration Scale.—If method (2) is used, improvise a pointer for the calibration scale by fastening a piece of wire to the chassis, and bend the wire so that it points to the 0 degree mark on the calibration scale when the plates are fully meshed.

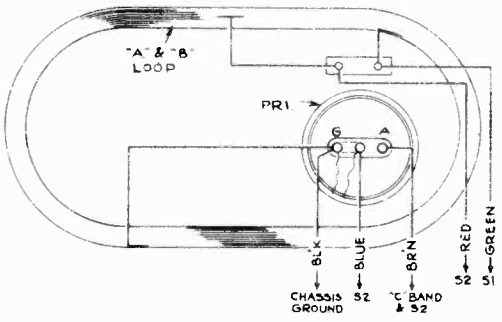
Steps	Connect high side of test oscillator to—	Tune test osc. to—	Turn radio dial to—	Adjust the following for maximum peak output—
1	6SK7 I-F grid in series with 0.01 mfd.	455 kc	"A" band Quiet Point between 550 and 750 kc	L-21 and L-22 (2nd I-F Trans.)
2	6SA7 grid in series with 0.01 mfd.			L-19 and L-20 (1st I-F Trans.)
3	Antenna terminal in series with 47 mmfd.	15.2 mc	15.2 mc (149°) "C" band	C-24 (Osc.)* C-1 (R-F) Rock gang
4	Antenna terminal in series with 200 mmf. (link open)	2.44 mc	2.44 mc (97°) "B" band	C-27 (Osc.)
5	Antenna terminal in series with 200 mmf.	600 kc	600 kc (30.5°) "A" band	L-28 (Rock in)
6	Antenna terminal in series with 200 mmf.	1,500 kc	1,500 kc (158°) "A" band	C-28 (Osc.) C-11 (R-F)
7	Repeat steps 5 and 6.			

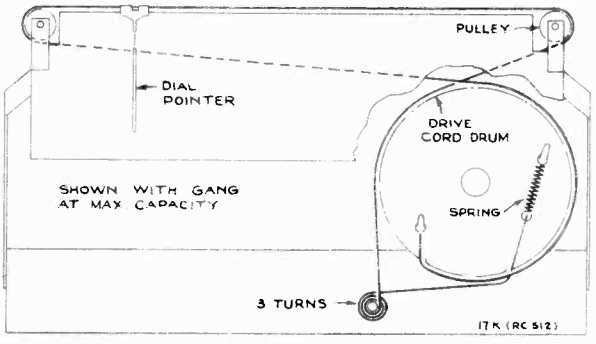
* Use minimum capacity peak if two can be obtained. Check to determine that C-24 has been adjusted to correct peak by tuning receiver to approximately 14.29 mc where a weaker signal should be received.

Note.—Oscillator tracks above signal on all bands.









RCA MFG. CO., INC.

MODEL 17K
Tuner Data, Parts

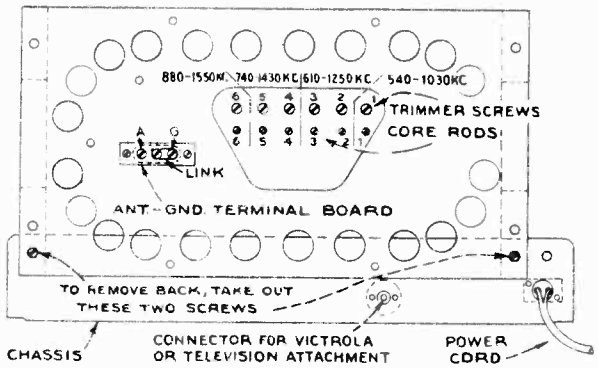
Push Button Adjustment

The station push buttons connect to separate magnetite-core oscillator coils and separate antenna trimmers which must he adjusted for the desired stations. Use an insulated screwdriver or alignment tool such as RCA Stock No. 31031. Allow at least five minutes warm-up period before making adjustments.

In the event that the receiver is to be used with an external antenna use one or two feet of wire (as an antenna) to ensure sharp peaking during the final adjustment procedure. For loop operation, the link should be strapped across terminals on back of set. In either case the procedure is as follows:

1. Make a list of the desired stations, arranged in order from low to high frequencies.
2. Turn the range selector to "A" band, and manually tune in the first station on the list.
3. After turning range selector to "PB" position, push in station button No. 1 (extreme left). Then adjust the No. 1 oscillator core (L-14) to receive the station.
4. After oscillator core is set correctly, adjust C-8 for maximum output.
   Clockwise adjustment of cores and trimmers tunes the circuits to lower frequencies.
5. Adjust for each of the remaining stations in the same manner.
6. Make a final careful adjustment of the oscillator cores and antenna trimmers.

Owing to the relatively high r-f gain, it may be found that a given station can be tuned in at several different settings of the



magnetite-core oscillator push-button coils. In such cases, it is advisable to unscrew the loop push-button trimmers to minimum capacity before adjusting the magnetite cores.

On the 880 to 1,550 kc push-button, the higher frequency stations may be received with L-9 either in or out (oscillator frequency either 455 kc below or 455 kc above the station frequency). The adjustment with this core in its out position (oscillator frequency 455 kc above the station frequency) is the correct one.

Replacement Parts

Insist on genuine factory-tested parts, which are readily identified and may be purchased from authorized dealers.

STOCK No.	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES (RC-512)	
34025	Board—"Antenna-Ground" board	.25
35795	Calibrator—Drive drum calibrator	.25
35792	Capacitor—Trimmer comprising 2 sections of 3-30 mmfd. each	.40
35791	Capacitor—Mica trimmer comprising 3 sections of 8-80 mmfd. each	.50
13200	Capacitor—10 mmfd.	.35
35804	Capacitor—Mica trimmer comprising 1 section of 10-160 mmfd., 2 sections of 25-250 mmfd., 2 sections of 50-400 mmfd., and 1 section of 100-540 mmfd.	1.15
13057	Capacitor—68 mmfd.	.35
12720	Capacitor—100 mmfd.	.35
13003	Capacitor—180 mmfd.	.35
35877	Capacitor—720 mmfd	.45
13895	Capacitor—5,600 mmfd.	.70
34506	Capacitor—.0018 mfd.	.25
33584	Capacitor—.005 mfd.	.25
4937	Capacitor—.01 mfd.	.25
32787	Capacitor—.05 mfd.	.20
4839	Capacitor—0.1 mfd.	.30
35858	Capacitor—Electrolytic comprising 2 sections of 10 mfd., 400 volts each and 1 section of 20 mfd., 25 volts	1.70
35965	Coil—Antenna coil—"C" band	.60
35876	Coil—Coil and resistor assembly	.30
36031	Coil—Loop loading coil	.50
35789	Coil—Oscillator coil	1.15
35803	Coil—Push button switch oscillator coil	.30
35960	Condenser—Variable tuning condenser	2.50
36249	Control—Tone control	1.15
36250	Control—Volume control and power switch	2.00
34662	Cord—Drive cord	.25
35788	Core—Adjusting core and stud for oscillator coil	.15
35871	Core—Adjusting core and stud for push button oscillator coils	.55
35794	Drum—Tuning condenser drive drum—less calibrator	.70
35799	Frame—Dial frame complete with lamp bracket and pulleys—less dial	2.00
35798	Indicator—Station selector indicator and carriage	.20
36029	Loop—Antenna loop complete	3.00
36030	Loop—Loop winding only	.75
36009	Plug—2-contact male plug for loop cable	.25
5119	Plug—3-contact female plug for speaker cable	.25
5040	Plug—4-contact female plug for speaker cable	.30
35787	Plug—Phono. input plug	.15
35973	Pulley—Drive cord pulley	.08
30498	Resistor—390 ohms, ½ watt	.20
14720	Resistor—1,000 ohms, ½ watt	.20
30654	Resistor—1,500 ohms, ½ watt	.20
35876	Resistor—10,000 ohms	.30
35875	Resistor—12,000 ohms, 3 watts	.35
13045	Resistor—18,000 ohms, ½ watt	.20
13998	Resistor—22,000 ohms, ½ watt	.20
12454	Resistor—33,000 ohms, ½ watt	.20
12412	Resistor—47,000 ohms, ½ watt	.20
12264	Resistor—220,000 ohms, ½ watt	.20
12285	Resistor—470,000 ohms, ½ watt	.20
12679	Resistor—2.2 meg., ½ watt	.20
13601	Resistor—10 meg., ½ watt	.20
35797	Shaft—Tuning shaft and pulley	.30
35772	Shield—Bottom end shield for power transformer	.30
35709	Shield—Top end shield for power transformer	.30
31364	Socket—Dial lamp socket	.20
31251	Socket—Tube socket	.25
31418	Spring—Drive cord spring	.05
36025	Switch—Push button selector switch	3.50
36024	Switch—Range switch	1.90
35636	Transformer—First I-F transformer	1.70
35790	Transformer—Second I-F transformer	1.60
35588	Transformer—Power transformer—110 volts, 25 cycle	6.30
35959	Transformer—Power transformer—110 volts, 60 cycle—less end shields	3.75
35969	Washer—"C" washer for tuning shaft	.02
	SPEAKER ASSEMBLIES (RL-70L5)	
13867	Cap—Dust cap	.03
12079	Coil—Field coil—1,060 ohms	2.70
11469	Coil—Neutralizing coil	.30
36145	Cone—Cone complete with voice coil	1.50
5118	Plug—3-prong male speaker plug	.25
31301	Transformer—Output transformer	1.70
	MISCELLANEOUS ASSEMBLIES	
36027	Bezel—Push button bezel—less buttons	.75
35883	Button—Push button—dark brown	.15
36299	Button—Push button—light brown	.15
35914	Decalcomania—Control panel decal	.10
36028	Dial—Glass dial scale	1.20
36026	Escutcheon—Dial scale escutcheon—less dial	1.75
35814	Knob—Range switch or tone control knob—dark brown	.25
36297	Knob—Range switch or tone control knob—light brown	.25
35775	Knob—Tuning or volume control knob—dark brown	.25
36298	Knob—Tuning or volume control knob—light brown	.25
11765	Lamp—Dial lamp	.15
36149	Marker—Push button station marker	.35
36007	Mounting—Antenna loop mounting hardware	.10
33774	Mounting—Speaker mounting hardware comprising 1 eyelet and 1 grommet	.30
34053	Spring—Retaining spring for button Stock No. 35883 and 36299	.02
30900	Spring—Retaining spring for knob Stock No. 35775, 35814, 36297, 36298	.05

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

MODEL 18T
Tuner Data, Parts

RCA MFG. CO., INC.

Push Button Adjustment

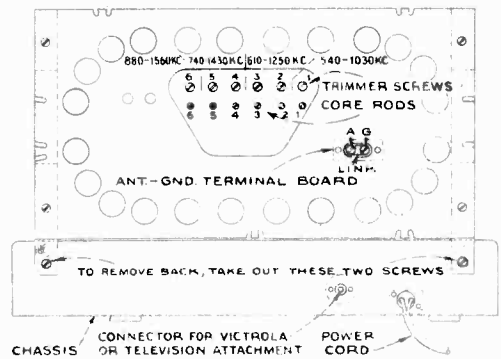
Six station push buttons connect to separate magnetite-core oscillator coils and separate antenna trimmers which must be adjusted for the desired stations. Use an insulated screwdriver or alignment tool such as RCA Stock No. 31031. Allow at least five minutes warm-up period before making adjustments.

In the event that the receiver is to be used with an external antenna use one or two feet of wire (as an antenna) to ensure sharp peaking during the final adjustment procedure. For loop operation, the link should be strapped across "A" and "G" terminals on back of set. In either case the procedure is as follows:

1. Make a list of the desired six stations, arranged in order from low to high frequencies.
2. Turn the range selector to "A" band, and manually tune in the first station on the list.
3. After turning range selector to "PB" position, push in station button No. 1 (extreme left). Then adjust the No. 1 oscillator core (L-14) to receive the station. It may be necessary to maintain approximate tracking between antenna and oscillator to receive weak stations. Approximate tracking will be indicated by noise, when tuned off a station, which will disappear when the station is correctly tuned.
4. After oscillator core is adjusted properly, adjust C-8 for maximum output.

   Clockwise adjustment of cores and trimmers tunes the circuits to lower frequencies.
5. Adjust for each of the five remaining stations in the same manner.
6. Make a final careful adjustment of the oscillator cores and antenna trimmers.

Owing to the relatively high RF gain, it may be found that there are several settings of each push-button magnetite core that will bring in any particular station. In such cases, it is advisable to unscrew the push-button loop trimmers to minimum capacity before adjusting the push-button magnetite cores.



Replacement Parts

Insist on genuine factory-tested parts, which are readily identified and may be purchased from authorized dealers.

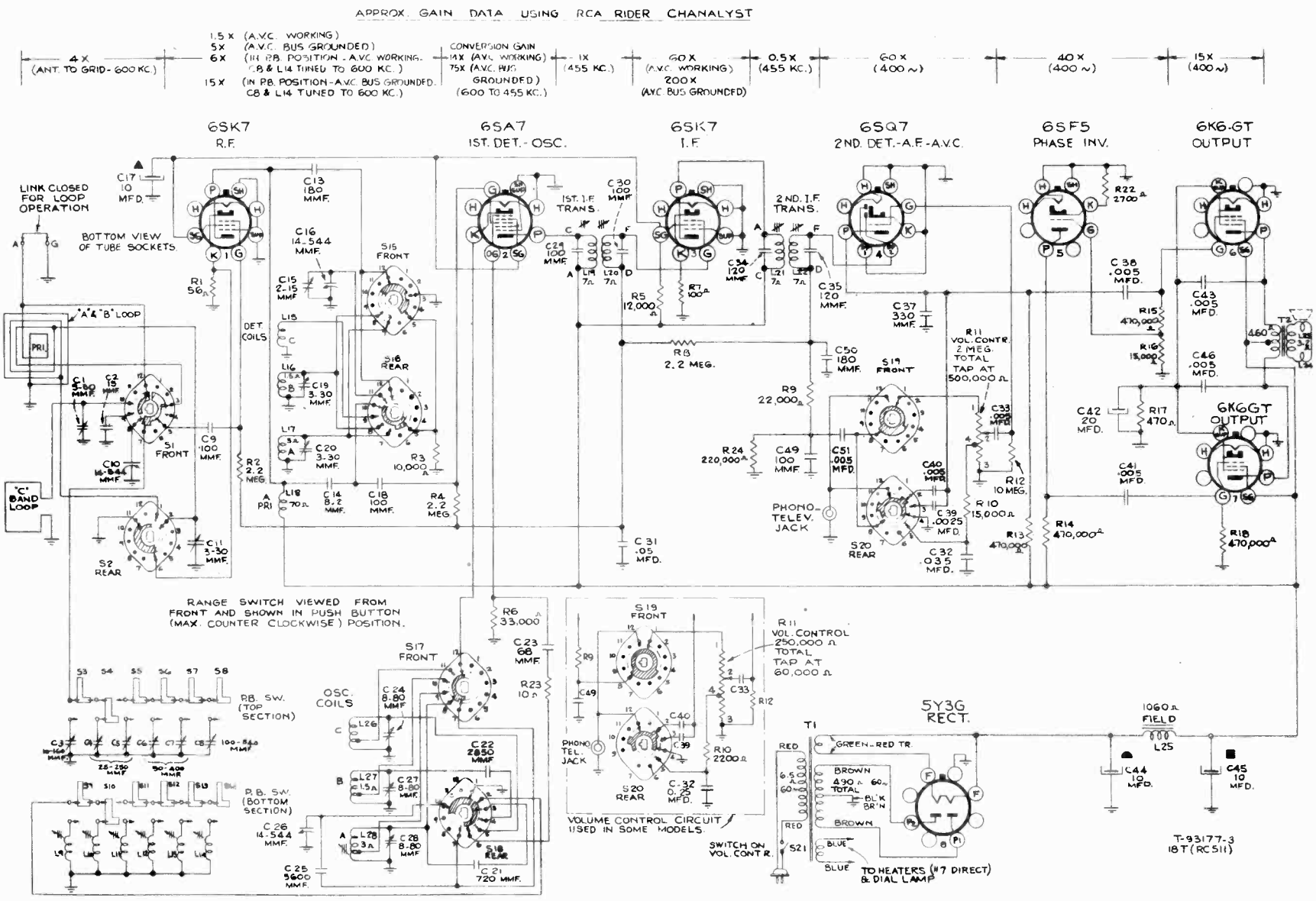
STOCK No.	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES (RC-511)	
34785	Board—"Antenna-Ground" board	.20
31292	Capacitor—Mica trimmer for loop—comprising 2 sections of 3-30 mmfd.	.40
35792	Capacitor—Mica trimmer—comprising 2 sections of 3-30 mmfd.	.40
35791	Capacitor—Mica trimmer—comprising 3 sections of 8-80 mmfd.	.50
13001	Capacitor—8.2 mmfd.	.35
35804	Capacitor—Mica trimmer — comprising 1 section of 10-160 mmfd., 2 sections of 25-250 mmfd., 2 sections of 50-400 mmfd. and 1 section of 100-540 mmfd.	1.15
12898	Capacitor—15 mmfd.	.35
13057	Capacitor—68 mmfd.	.35
34699	Capacitor—100 mmfd. (in 1st I.F. can)	.30
12720	Capacitor—100 mmfd.	.35
34700	Capacitor—120 mmfd.	.30
13003	Capacitor—180 mmfd.	.35
12952	Capacitor—330 mmfd.	.35
35877	Capacitor—720 mmfd.	.45
34787	Capacitor—2,850 mmfd.	.50
13895	Capacitor—5,600 mmfd.	.70
34459	Capacitor—.0025 mfd.	.20
33584	Capacitor—.005 mfd.	.25
32787	Capacitor—.05 mfd.	.20
12484	Capacitor—0.25 mfd.	.30
33014	Capacitor—Electrolytic — comprising 3 sections of 10 mfd. and 1 section of 20 mfd.	1.90
35785	Coil—Loop primary (L1)	.50
35803	Coil—Push button oscillator coil	.30
35789	Coil—Oscillator coil	1.15
35805	Coil—R. F. coil	1.15
35796	Condenser—Variable tuning condenser	4.00
35807	Control—Volume control (½ meg.) and power switch	2.00
36250	Control—Volume control (2 meg.) and power switch	XX
32634	Cord—Drive cord	.10
35788	Core—Core and stud for oscillator coil	.15
35795	Dial—Calibrator dial	.25
35794	Drum—Tuning condenser drive drum—less calibrator	.70
35799	Frame—Dial frame complete—less dial scale	2.00
35798	Indicator—Station selector indicator	.20
35786	Loop—Antenna loop winding	.50
35784	Loop—Complete antenna loop with trimmer, coil and "Antenna-Ground" board	3.60
13988	Resistor—10 ohm, ½ watt	.20
13220	Resistor—56 ohm, ½ watt	.20
14439	Resistor—100 ohm, ½ watt	.20
35885	Resistor—470 ohm, 2 watt	.25
13716	Resistor—2,200 ohm, ½ watt	.20
14024	Resistor—2,700 ohm, ½ watt	.20
14559	Resistor—10,000 ohm, ½ watt	.20
35875	Resistor—12,000 ohm, 3 watt	.35
12695	Resistor—15,000 ohm, ½ watt	.20
13998	Resistor—22,000 ohm, ½ watt	.20
12454	Resistor—33,000 ohm, ½ watt	.20
12264	Resistor—220,000 ohms, ½ watt	.20
12285	Resistor—470,000 ohm, ½ watt	.20
12679	Resistor—2.2 megohm, ½ watt	.20
13601	Resistor—10 megohm, ½ watt	.20
14350	Screw—No. 8-32 square-head set-screw for drum	.03
35797	Shaft—Tuning shaft and pulley	.30
31364	Socket—Dial lamp socket	.20
35787	Socket—Phonograph input socket	.15
31251	Socket—Tube socket	.25
31418	Spring—Drive cord spring	.05
35802	Switch—Push button switch — less coils and trimmer	2.75
35793	Switch—Range switch	2.20
36249	Switch—Tone switch	XX
35636	Transformer—First I.F. transformer	1.70
35790	Transformer—Second I.F. transformer	1.60
35588	Transformer—Power transformer, 110 volt, 25 cycle	6.30
35800	Transformer—Power transformer, 110 volt, 60 cycle	4.75
33726	Washer—"C" washer for tuning shaft	.02
	SPEAKER ASSEMBLIES (RL79A5)	
35849	Cap—Speaker cone dust cap	.03
35810	Coil—Field coil, 1,060 ohm	1.70
35441	Cone—Cone complete with voice coil	1.25
35809	Transformer—Output transformer	1.35
	MISCELLANEOUS ASSEMBLIES	
35813	Bezel—Push button bezel	1.10
35812	Button—Push button (dark brown)	.15
36300	Button—Push button (light brown)	XX
35914	Decalcomania—Control panel decal	.10
35362	Decalcomania—"RCA Victor" decal	.05
35811	Dial—Glass dial scale	1.75
35814	Knob—Range or tone switch knob (dark brown)	.25
36297	Knob—Range or tone switch knob (light brown)	XX
35775	Knob—Tuning or volume control knob (dark brown)	.25
36298	Knob—Tuning or volume control knob (light brown)	XX
11765	Lamp—Dial lamp	.15
36149	Marker—Push button marker	XX
30900	Spring—Retaining spring for knobs, Stock No. 35814	.05

XX—Price upon application to your RCA Distributor.

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

RCA MFG. CO., INC.

MODEL 18T, Ch. RC-511
Schematic, Gain



— 1940 No. 11 —

Electrical Specifications

Frequency Ranges

Broadcast	540-1,560 kc
Medium Wave	1.56-4.0 mc
Short Wave	5.8-18.0 mc
Intermediate Frequency	455 kc

Push-Button Ranges

One station between approximately	540-1,030 kc
Two stations between approximately	610-1,250 kc
Two stations between approximately	740-1,430 kc
One station between approximately	880-1,560 kc

Pilot Lamps

(2) . . . Mazda No. 51, 6.3 volts, 0.20 amp.

Power Output Rating

Undistorted	5.0 watts
Maximum	5.5 watts

Loudspeaker (RL-79-A5)

Type	6-inch Electrodynamic
V.C. Impedance	3.4 ohms at 400 cycles

Power Supply Ratings

105-125 volts, 50-60 cycles, 90 watts
105-125 volts, 25-60 cycles, 90 watts

First Edition

MODEL 18T
Alignment, Trimmers
Socket, Dial, Loop
Tone Cont. Data

RCA MFG. CO., INC.

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

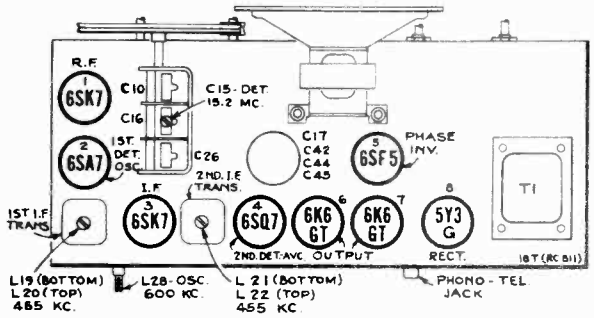
Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

Calibration for Alignment.—The proper dial calibration for alignment purposes can be set up in two ways:

1. The dial may be removed from the cabinet by sliding out the two spring pieces which clamp it in its mounting position. The condenser plates should then be turned into full mesh, the pointer adjusted to the scratch at the left end of the dial backing plate, and the dial slipped under the pointer so that its extreme left calibration mark coincides with the pointer. The dial may be held in place with scotch tape. In this manner the actual receiver dial is used for alignment. When alignment is finished, the scale should be replaced including the fibre light shields which are folded under the ends of the glass scale.
2. A calibration scale is attached to the tuning drum. The correct setting of the gang, in degrees, for each alignment frequency is given in the alignment table. Check the position of the drum, making sure that the 0 degree scale mark is horizontal with the gang in full mesh.

Pointer for Calibration Scale.—If method (2) is used, improvise a pointer for the calibration scale by fastening a piece of wire to the chassis, and bend the wire so that it points to the 0 degree mark on the calibration scale when the plates are fully meshed.

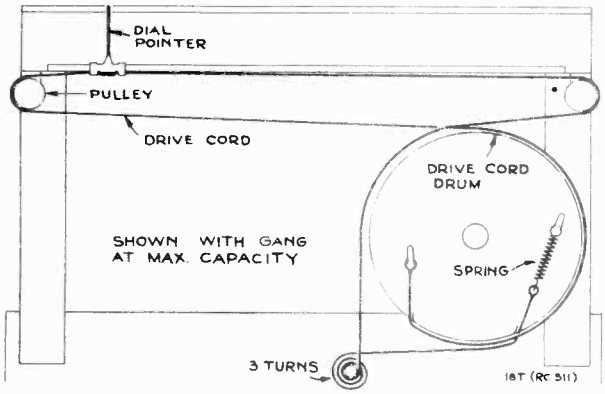


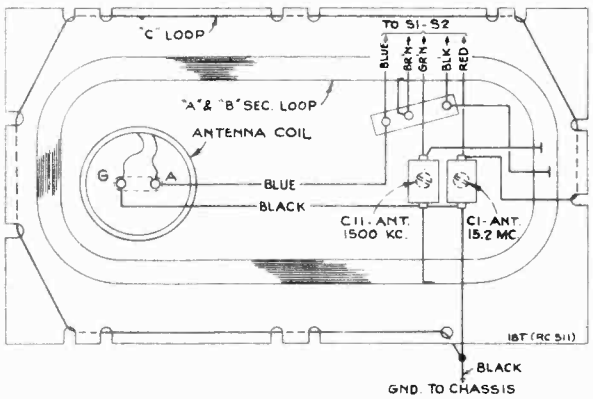
Steps	Connect high side of test oscillator to—	Tune test osc. to—	Turn radio dial to—	Adjust the following for maximum peak output—
1	6SK7 I-F grid in series with 0.01 mfd.	455 kc	"A" band Quiet Point between 550 and 750 kc	L-21 and L-22 (2nd I-F Trans.)
2	6SA7 grid in series with 0.01 mfd.			L-19 and L-20 (1st I-F Trans.)
3	Antenna terminal in series with 300 ohms ("A" antenna trimmer C-11, should be ¼ turn out)	15.2 mc	15.2 mc (149°) "C" band	C-24 (Osc.)* C-15 (Det.) Rock gang C-1 (R-F) Rock gang
4	Antenna terminal in series with 200 mmf.	2.44 mc	2.44 mc (91.5°) "B" band	C-27 (Osc.) C-19 (Det.)
5	Antenna terminal in series with 200 mmf. (Preset "A" osc. trimmer C-28 ¼ turn out)	600 kc	600 kc (33.2°) "A" band	L-28 Rock gang
6	Antenna terminal in series with 200 mmf.	1,500 kc	1,500 kc (163.4°) "A" band	C-28 (Osc.) C-20 (Det.) C-11 (R-F)
7	Repeat step 5, then 6			
8	Antenna terminal in series with 300 ohms	15.2 mc	15.2 mc "C" band	C-1 (R-F) Rock gang

* Use minimum capacity peak if two can be obtained. Check to determine that C-24 has been adjusted to correct peak by tuning receiver to approximately 14.29 mc where a weaker signal should be received.

Note.—Oscillator tracks above signal on all bands.

To reduce sensitivity during RF Alignment connect a 15,000 ohm, ½ watt resistor across secondary of 1st IF transformer.



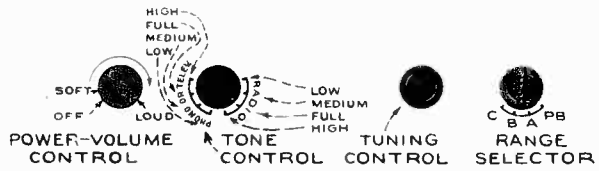


Tone Control

The tone control has four positions for radio, and four positions for Victrola or Television sound:

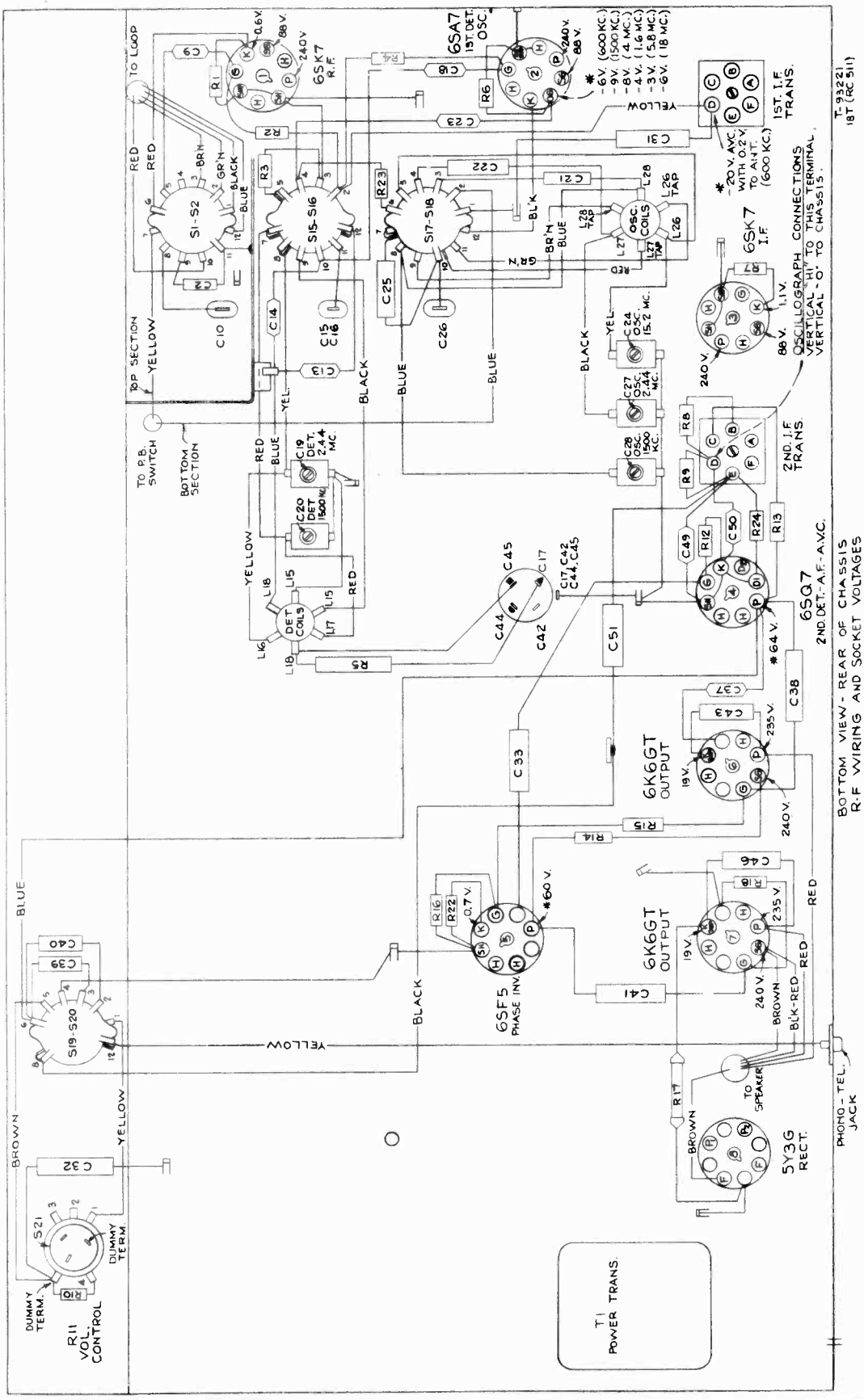
No. 1—Radio—maximum low—minimum high
No. 2—Radio—maximum low—reduced high
No. 3—Radio—maximum low—maximum high
No. 4—Radio—minimum low—maximum high
No. 5—Phono—maximum low—minimum high
No. 6—Phono—maximum low—reduced high
No. 7—Phono—maximum low—maximum high
No. 8—Phono—minimum low—maximum high

(No. 1 is full counter-clockwise, and No. 8 is full clockwise.)



RCA MFG. CO., INC.

MODEL 18T
Chassis Wiring, Voltage



CATHODE CURRENTS

(1)	6SK7	13.5 MA.
(2)	6SA7	8.6 MA.
(3)	6SK7	12.4 MA.
(4)	6SQ7	3 MA.
(5)	6SF5	3 MA.
(6)	6K6GT	22.5 MA.
(7)	6K6GT	22.5 MA.
(8)	TOTAL RECTIFIED	80.1 MA.

VOLTAGES SHOULD HOLD WITHIN ± 20% WITH 117 V. AC. SUPPLY.
* MEASURED WITH CHANALYST, OR VOLTOHMYST.

BOTTOM VIEW - REAR OF CHASSIS
R-F WIRING AND SOCKET VOLTAGES

TUBE COMPLEMENT

(1)	RCA-6SK7	R-F Amplifier
(2)	RCA-6SA7	1st Detector-Oscillator
(3)	RCA-6SK7	I-F Amplifier
(4)	RCA-6SQ7	2nd Detector, A.V.C. and A-F Amplifier
(5)	RCA-6SF5	Phase Inverter
(6)	RCA-6K6GT	Power Output
(7)	RCA-6K6GT	Power Output
(8)	RCA-5Y3-G	Rectifier

MODEL 19K
Tuner Data, Dial
Parts List

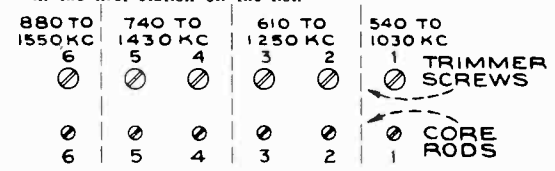
RCA MFG. CO., INC.

Adjustment for Electric Tuning

This model has six push buttons for electric tuning. The buttons connect to separate magnetite-core oscillator coils and separate antenna trimmers which must be adjusted for the desired stations. Use an insulated screwdriver or alignment tool such as RCA Stock No. 31031. Allow at least five minutes warm-up period before making adjustments.

The procedure is as follows:

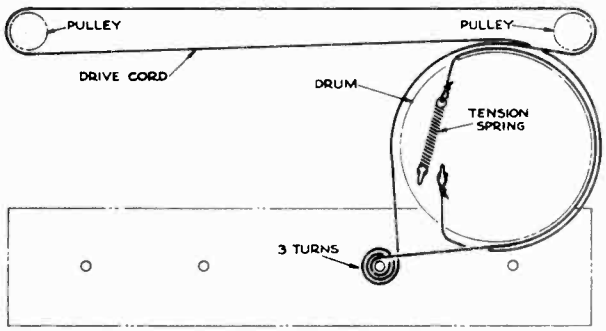
1. Make a list of the six desired stations, arranged in order from low to high frequencies.
2. Turn Range Control knob to "A" position, and manually tune in the first station on the list.



Push Button Adjustments

Turn the Loop Antenna to give minimum pickup of signal, no outside antenna should be used and link on antenna board should be closed.

3. Turn Range Control knob to "PB" and press push button No. 1 and adjust No. 1 oscillator core to receive this station. Screw the core all the way in, to lowest frequency, and then unscrew slowly until station is received.
4. Adjust No. 1 antenna trimmer for maximum output on this station.
   Owing to the relatively high R-F gain, it may be found that there are several settings of each push-button magnetite core that will bring in any particular station. In such cases it is advisable to unscrew the push button antenna trimmers to minimum capacity before adjusting the oscillator cores.
   Clockwise adjustment of cores and trimmers tunes the circuits to lower frequencies.
5. Adjust for each of the remaining five stations in the same manner.
6. After all six stations are tuned-in on the buttons, turn the Loop Antenna to a position giving the best signal pickup and make a final careful adjustment of all core rods until best reception is obtained for each. Outdoor antenna should now be reconnected if used.



Arrangement of Drive Cords for Tuning Condenser and Dial Indicator

Replacement Parts

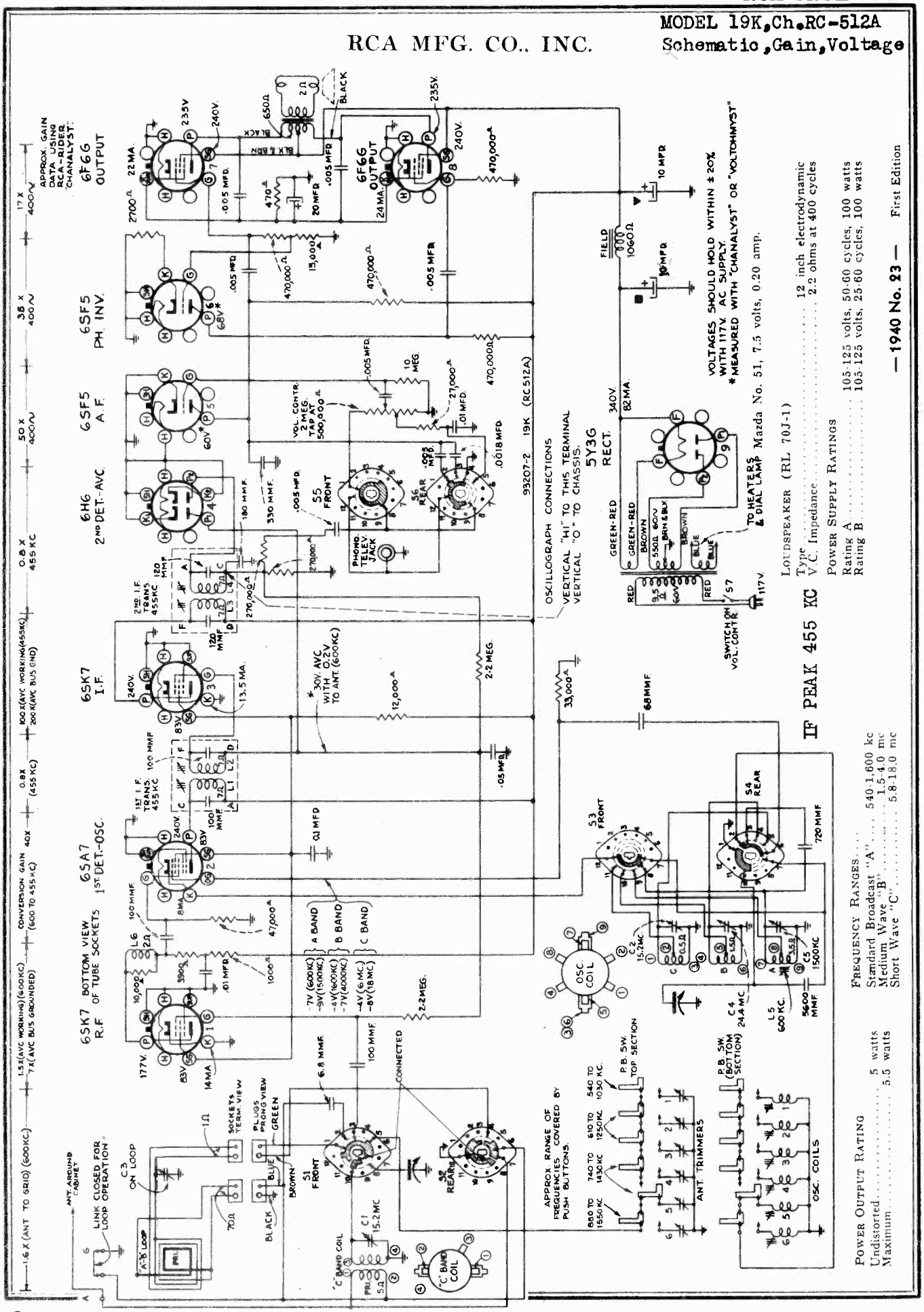
Insist on genuine factory-tested parts, which are readily identified and may be purchased from authorized dealers.

STOCK No.	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES (RC-512A)	
35966	Board—"Antenna-Ground" board	.20
35795	Calibrator—Drive drum calibrator	.25
35961	Capacitor—Mica trimmer (C1)	.25
14079	Capacitor—6.8 mmfd.	.35
35791	Capacitor—Mica trimmer comprising 3 sections (C2, C4, C5)	.50
35804	Capacitor—Mica trimmer comprising 6 sections for push buttons 1, 2, 3, 4, 5, 6	1.15
13057	Capacitor—68 mmfd.	.35
12720	Capacitor—100 mmfd., moulded	.35
34699	Capacitor—100 mmfd., mica	.30
34700	Capacitor—120 mmfd.	.30
13003	Capacitor—180 mmfd.	.35
12952	Capacitor—330 mmfd.	.35
35877	Capacitor—720 mmfd.	.45
13895	Capacitor—5,600 mmfd.	.70
34506	Capacitor—.0018 mfd.	.25
33584	Capacitor—.005 mfd.	.25
14393	Capacitor—.01 mfd.	.30
32787	Capacitor—.05 mfd.	.20
4839	Capacitor—0.1 mfd.	.30
35858	Capacitor—Electrolytic comprising 2 sections of 10 mfd., 400 volts each and 1 section of 20 mfd., 25 volts	1.70
35965	Coil—Antenna coil—"C" band	.60
35876	Coil—Coil and resistor assembly L6	.30
35789	Coil—Oscillator coil (A, B, C)	1.15
35803	Coil—Push button switch oscillator coil	.30
35960	Condenser—Variable tuning condenser	2.50
35962	Control—Volume control and power switch	2.00
34662	Cord—Drive cord	.25
35788	Core—Adjusting core and stud for oscillator coil (L5)	.15
35871	Core—Adjusting core and stud for push button oscillator coils 1, 2, 3, 4, 5, 6	.55
35794	Drum—Tuning condenser drive drum—less calibrator	.70
35970	Indicator—Station selector indicator and carriage	.30
35972	Plate—Dial plate complete with drive cord pulleys	1.10
36009	Plug—2-contact male plug for loop cable	.25
5040	Plug—4-contact female plug for speaker cable	.30
35973	Pulley—Drive cord pulley	.08
32165	Resistor—470 ohms, 2 watts	.25
14720	Resistor—1,000 ohms, ½ watt	.20
14024	Resistor—2,700 ohms, ½ watt	.20
30694	Resistor—3,900 ohms, ½ watt	.20
35875	Resistor—12,000 ohms, 3 watts	.35
12695	Resistor—15,000 ohms, ½ watt	.20
12738	Resistor—27,000 ohms, ½ watt	.20
12454	Resistor—33,000 ohms, ½ watt	.20
12412	Resistor—47,000 ohms, ½ watt	.20
12199	Resistor—270,000 ohms, ½ watt	.20
12285	Resistor—470,000 ohms, ½ watt	.20
12679	Resistor—2.2 meg., ½ watt	.20
13601	Resistor—10 meg., ½ watt	.20
35968	Shaft—Tuning shaft and pulley	.25
35772	Shield—Bottom shield for power transformer	.30
35709	Shield—Top shield for power transformer	.30
31364	Socket—Dial lamp socket	.20
31251	Socket—Tube socket	.25
31418	Spring—Drive cord spring	.05
35787	Socket—Phono. input socket	.15
35974	Support—Dial plate support	.65
35967	Switch—Push button selector switch	3.50
35964	Switch—Range switch (S1, S2, S3, S4)	1.90
35963	Switch—Tone switch (S5, S6)	1.00
35636	Transformer—First I-F transformer	1.70
35790	Transformer—Second I-F transformer	1.60
35588	Transformer—Power transformer—110 volts, 25 cycle	6.30
35959	Transformer—Power transformer—110 volts, 60 cycle—less end shields	3.75
35969	Washer—"C" washer for tuning shaft	.02
	SPEAKER ASSEMBLIES (RL-70J1)	
31825	Cap—Cone center dust cap	.02
11469	Coil—Hum neutralizing coil	.30
33116	Coil—Speaker field coil	2.10
31275	Cone—Speaker cone, voice coil, and dust cap	1.50
5039	Plug—4-prong male, for speaker	.30
33444	Transformer—Output transformer	2.00
	MISCELLANEOUS ASSEMBLIES	
36005	Button—Push button	.15
35998	Capacitor—Mica trimmer (C3) for loop	.25
36002	Coil—Loop primary coil	.40
35914	Decalcomania—Control panel decal	.10
36019	Dial—Glass dial scale	1.65
36006	Escutcheon—Dial scale escutcheon—less dial	2.75
36003	Knob—Tone or range switch knob	.25
36004	Knob—Tuning or volume control knob	.25
11765	Lamp—Dial lamp	.15
35997	Loop—Antenna loop	3.00
36149	Marker—Station selector push button markers	.35
36007	Mounting—Antenna loop mounting hardware	.10
35029	Mounting—Speaker mounting hardware	.35
35999	Socket—Two contact socket for antenna loop	.25
34053	Spring—Push button spring	.02
14270	Spring—Retaining spring for knobs	.05

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

RCA MFG. CO., INC.

MODEL 19K, Ch. RC-512A
Schematic, Gain, Voltage



— 1940 No. 23 — First Edition

MODEL 19K
Alignment, Trimmers
Socket, Speaker, Lead Dress

RCA MFG. CO., INC.

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the schematic drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment, therefore a calibration scale is attached to the indicator-drive-cord drum which is mounted on the shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The "90°" mark on the drum scale must be vertical, and directly under the center of the gang-condenser shaft when the plates are fully meshed. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

To determine the corresponding frequency for any setting of the calibration scales, refer to the accompanying drawing which shows the dial with 0-180° calibration scales drawn at top and bottom.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "0" mark on the calibration scale when the plates are fully meshed.

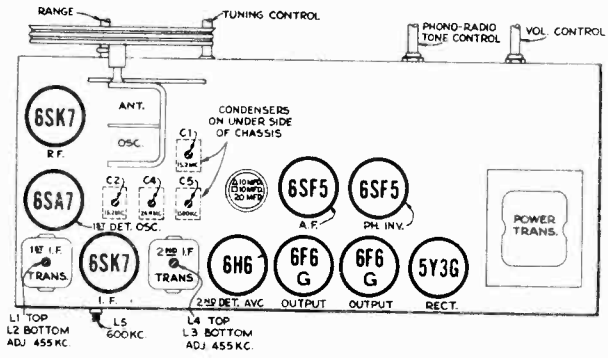
Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 540 kc mark, and gang condenser fully meshed. The indicator has a spring clip for attachment to the cable.

Preacautionary Lead Dress.—

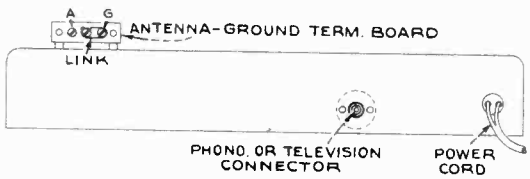
1. Dress 2nd I.F leads close to chassis.
2. Dress leads from volume control and tone switch away from filaments, diode and power leads.
3. Dress .005 mfd. volume control condenser away from electrolytic.

Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Range switch	Turn radio dial to—	Adjust the following for max. peak output
1	6SK7 I-F grid in series with .01 mfd.	455 kc	"A"	Quiet Point near 180°	L3 and L4 (2nd I-F Trans.)
2	6SA7 1st Detector in series with .01 mfd.				L1 and L2 (1st I-F Trans.)
3	Ant. terminal "A" in series with 47 mmf.	15.2 mc	"C"	148.5°	C1 (ant.) C2 (osc.)*
4	Ant. section of gang condenser in series with 300 ohms	2.44 mc	"B"	97°	C4 (osc.)*
5		1,500 kc	"A"	160°	C5 (osc.)*
6		600 kc		30°	L5 (osc.) (Rock gang)
7	Fasten chassis in cabinet. Connect loop, see that link is closed on the antenna board, attach dial indicator to drive cord, with indicator at 540 kc mark and gang at maximum capacity.				
8	Radiation loop consisting of two turns of wire 18 in. in diameter located 4 to 6 feet from receiver	1,500 kc	"A"	1,500 kc	C3 (ant.) (on loop)
9		600 kc		600 kc	L5 (osc.) (Rock gang)
10		Repeat steps 8 and 9			

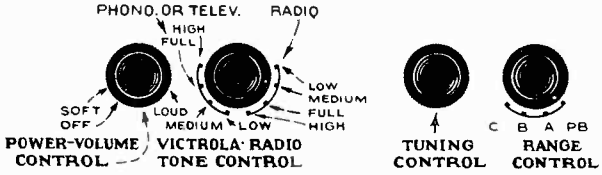
* Use minimum capacity peak of two peaks can be obtained.
Note: Oscillator tracks above signal on all bands.



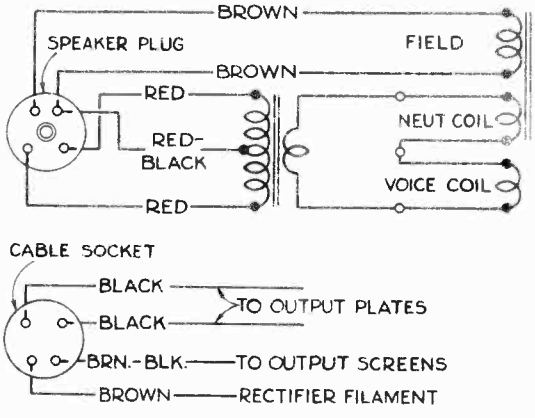
Tube and Trimmer Locations



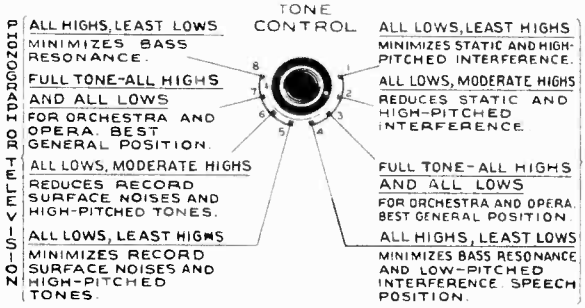
Back of Chassis



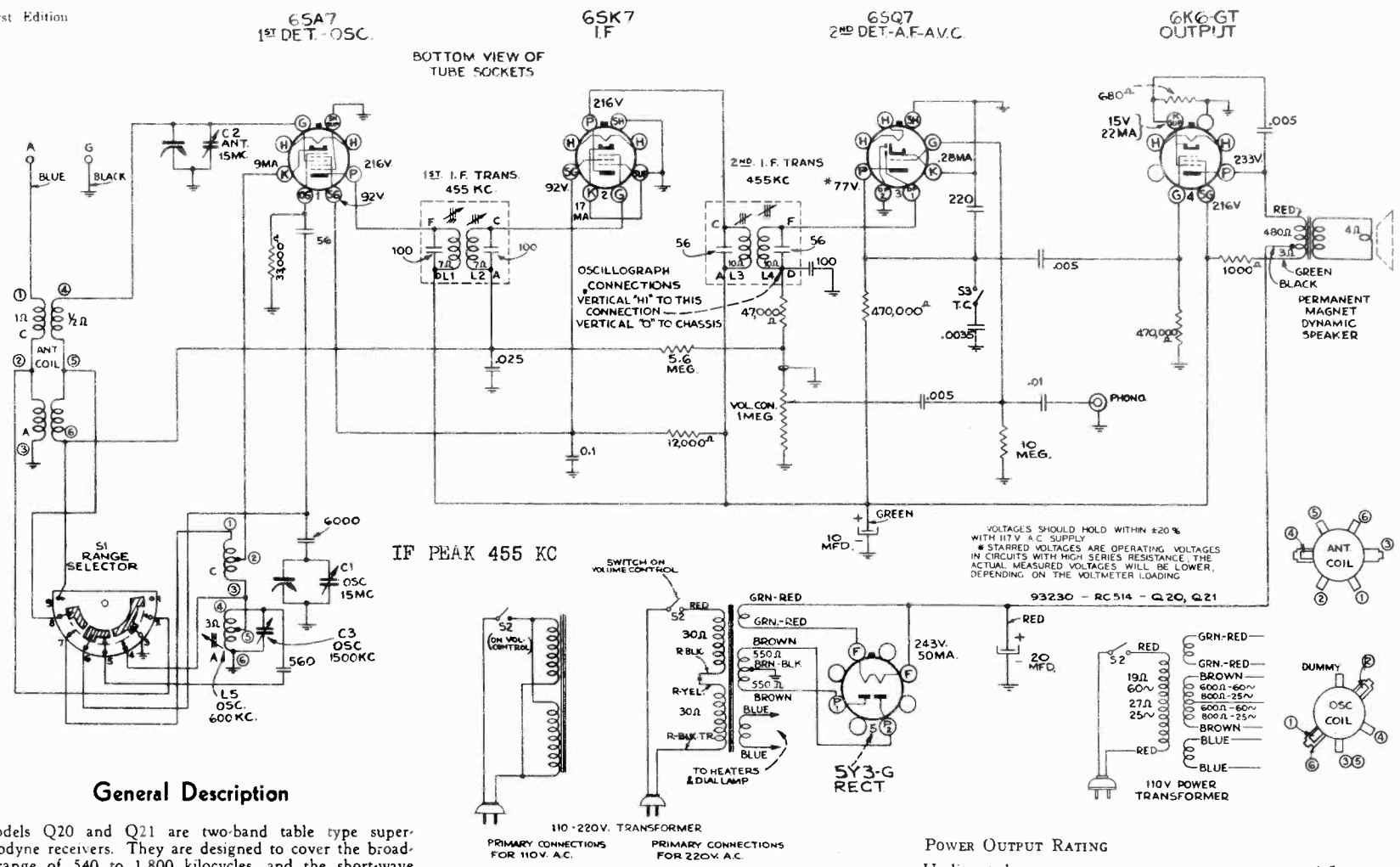
Location of Controls



Connections and Colors of Loudspeaker and Cable



Tone Control and Phono-Radio Switch



General Description

Models Q20 and Q21 are two-band table type superheterodyne receivers. They are designed to cover the broadcast range of 540 to 1,800 kilocycles, and the short-wave range from 4.5 to 18 megacycles.

Features of design include: Magnetite-core I.F. transformers; magnetite-core "A" band oscillator coil; automatic volume control, tone control; illuminated dial; jack for phonograph attachment; 25 to 1 ratio vernier tuning, and dust-proofed permanent-magnet dynamic loudspeaker.

Phonograph Attachment.—A jack is provided on the rear of chassis for connection to a phonograph attachment. The cable from the attachment should be terminated in a Stock No. 31048 plug to fit the jack.

Electrical Specifications

Pilot Lamp ..... Mazda 51, 7.5 volts, 0.2 amp.

POWER SUPPLY RATINGS

Rating A ..... 105-125 volts, 50-60 cycles, 50 watts
Rating B ..... 105-125 volts, 25-60 cycles, 50 watts
Rating C ..... 105-125, 200-250 volts, 50-60 cycles, 50 watts

POWER OUTPUT RATING

Undistorted ..... 1.5 watts
Maximum ..... 2.3 watts

LOUDSPEAKER

Type (RL-81-A2) ..... 5-inch permanent-magnet dynamic
Voice-coil Impedance ..... 4.5 ohms at 400 cycles

FREQUENCY RANGES

Standard Broadcast (A) ..... 540-1,800 kc (555-166 m)
Short Wave (C) ..... 4.5-18 mc (66.7-16.6 m)
Intermediate Frequency ..... 455 kc

MODELS Q20 and Q21

Chassis No. RC-514

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the schematic drawing.

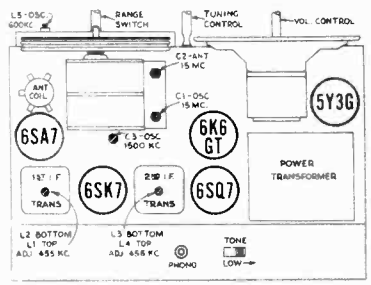
Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

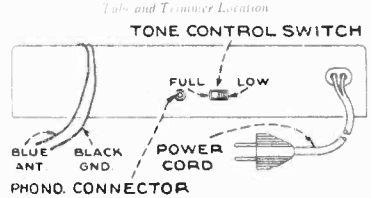
Pre-Setting Dial.—With gang condenser in full mesh, the pointer should be horizontal.

Precautionary Lead Dress.—

1. Green lead from oscillator section of var. condenser should be dressed away from antenna leads.
2. 6,000 mmfd. capacitor should bear against electrolytic capacitor.
3. Dress blue I.F. lead against chassis.
4. .005 volume control capacitor should be dressed away from output plate leads.



Tube and Trimmer Location



Back of Chassis

Controls

Steps	Connect test-osc. output to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	I-F grid through 0.1 mfd. capacitor and ground	455 kc	Quiet point between 550-750 kc	L-3 and L-4 (2nd I-F trans.)
2	1st det. grid through 0.1 mfd. capacitor and ground	455 kc		L-1 and L-2 (1st I-F trans.)
3	Antenna Lead in series with 300 ohms	15 mc	15 mc "C" band	C-1 oscillator*
4		15 mc	Rock at 15 mc	C-2 antenna† while rocking
5	Antenna terminal in series with 200 mmfd.	1,500 kc	1,500 kc "A" band	C-3 oscillator
6		600 kc	Rock at 600 kc "A" band	L-5 oscillator while rocking
7		1,500 kc	1,500 kc "A" band	C-3 oscillator

* Oscillator should track on high frequency side of signal. If two peaks are obtained use high frequency (minimum capacity) peak.

† If two peaks can be obtained use low frequency (maximum capacity) peak.

GAIN DATA

(as taken with the RCA-Rider Chanalyst)

		Approximate Gain
(A) R.F.—I-F Gain	(R.F.—I.F. Channel)	
1. Antenna to 6SA7 grid		8 at 600 kc
2. 6SA7 grid to plate (conversion 600 to 455 kc)		4
3. 6SA7 plate to 6SK7 grid		1 at 455 kc
4. 6SK7 grid to plate		80 at 455 kc
5. 6SK7 plate to 6SQ7 diode		7 at 455 kc
(B) A.F. Gain	(A.F. Channel)	
1. 6SQ7 grid to plate		50 at 400 cycles
2. 6K6GT grid to plate		10 at 400 cycles
(C) Oscillator Grid (OG-6SA7) Voltage		(Electronic Volt. Meter)
1. Oscillator Voltage at 600 kc		—12V
2. Oscillator Voltage at 1,500 kc		—16V
3. Oscillator Voltage at 4.5 mc		— 5V
4. Oscillator Voltage at 15 mc		— 9V
(D) A.V.C. Voltage	(Electronic Volt. Meter)	
With 0.2V input to antenna at 600 kc		—15V

Replacement Parts

Insist on genuine factory-tested parts, which are readily identified and may be purchased from authorized dealers.

STOCK No.	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES (RC-514)	
33817	Capacitor—Mica trimmer (C3)	.30
12723	Capacitor—58 mmfd.	.35
30949	Capacitor—56 mmfd. (2nd. I-F)	.25
34699	Capacitor—100 mmfd. (1st. I-F)	.30
12720	Capacitor—100 mmfd.	.35
12694	Capacitor—220 mmfd.	.35
12537	Capacitor—560 mmfd.	.35
31405	Capacitor—6,000 mmfd.	.75
30303	Capacitor—.0035 mfd.	.40
4838	Capacitor—.005 mfd.	.25
33584	Capacitor—.005 mfd.	.25
14393	Capacitor—.01 mfd.	.30
4870	Capacitor—.025 mfd.	.20
4839	Capacitor—0.1 mfd.	.30
35761	Capacitor—Electrolytic comprising 1 section of 20 mfd and 1 section of 10 mfd	.90
35782	Coil—Antenna coil	1.40
35783	Coil—Oscillator coil	.80
35780	Condenser—Variable tuning condenser	2.65
32713	Core—Adjusting core and stud for oscillator coil (L5)	.35
32634	Cord—Drive cord	.10
35770	Dial—Dial scale	.65
35768	Drum—Drive drum	.45
35668	Indicator—Station selector indicator	.25
11765	Lamp—Dial lamp—Mazda No. 51	.15
35769	Plate—Dial plate—less dial scale	.45
31024	Resistor—680 ohms, ½ watt	.20
30152	Resistor—1,000 ohms, 1 watt	.22
8073	Resistor—12,000 ohms, 2 watts	.25
12454	Resistor—33,000 ohms, ½ watt	.20
12412	Resistor—47,000 ohms, ½ watt	.20
12285	Resistor—470,000 ohms, ½ watt	.20
11668	Resistor—5.6 meg., ½ watt	.20
13601	Resistor—10 meg., ½ watt	.20
35771	Shaft—Tuning shaft	.20
35772	Shield—Bottom end shield for power transformer	.30
35709	Shield—Top end shield for power transformer	.30
35766	Socket—Dial lamp socket	.25
31251	Socket—Tube socket	.25
31319	Socket—Tube socket (6SA7)	.25
35759	Spring—Drive cord spring	.08
35767	Support—Tuning condenser support	.25
30953	Switch (S3)	.45
35765	Switch—Range switch (S1)	.85
35636	Transformer—First I-F transformer	1.70
35628	Transformer—Second I-F transformer	1.85
35758	Transformer—Power transformer—110 volts, 25 cycle—less end shields	5.25
35757	Transformer—Power transformer—110 volts, 60 cycle—less end shields	2.9'
35759	Transformer—Power transformer — Univ. 60 cycle	4.0(
35764	Volume control and power switch (S2)	1.50
33728	Washer—"C" washer for tuning shaft	.02
	SPEAKER ASSEMBLIES (RL-81A2)	
32907	Cap—Cone dust cap	.02
35570	Cone—Cone complete with voice coil	1.35
35774	Transformer—Output transformer	1.45
	MISCELLANEOUS ASSEMBLIES	
35104	Crystal—Escutcheon and crystal for Model Q20	1.00
35105	Crystal—Escutcheon and crystal for Model Q21	1.00
35678	Fastener—Push on fastener for crystal, Stock No. 35104	.02
35679	Knob—Tuning, range switch or volume control knob for Model Q20	.15
35775	Knob—Tuning, range switch or volume control knob for Model Q21	.25
30900	Spring—Retaining spring for knobs, Stock Nos. 35679 and 35775	.05

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

Models 45X-16, 45X-17

Chassis No. RC-459M

Replacement Parts

Insist on genuine factory-tested parts, which are readily identified and may be purchased from authorized dealers.

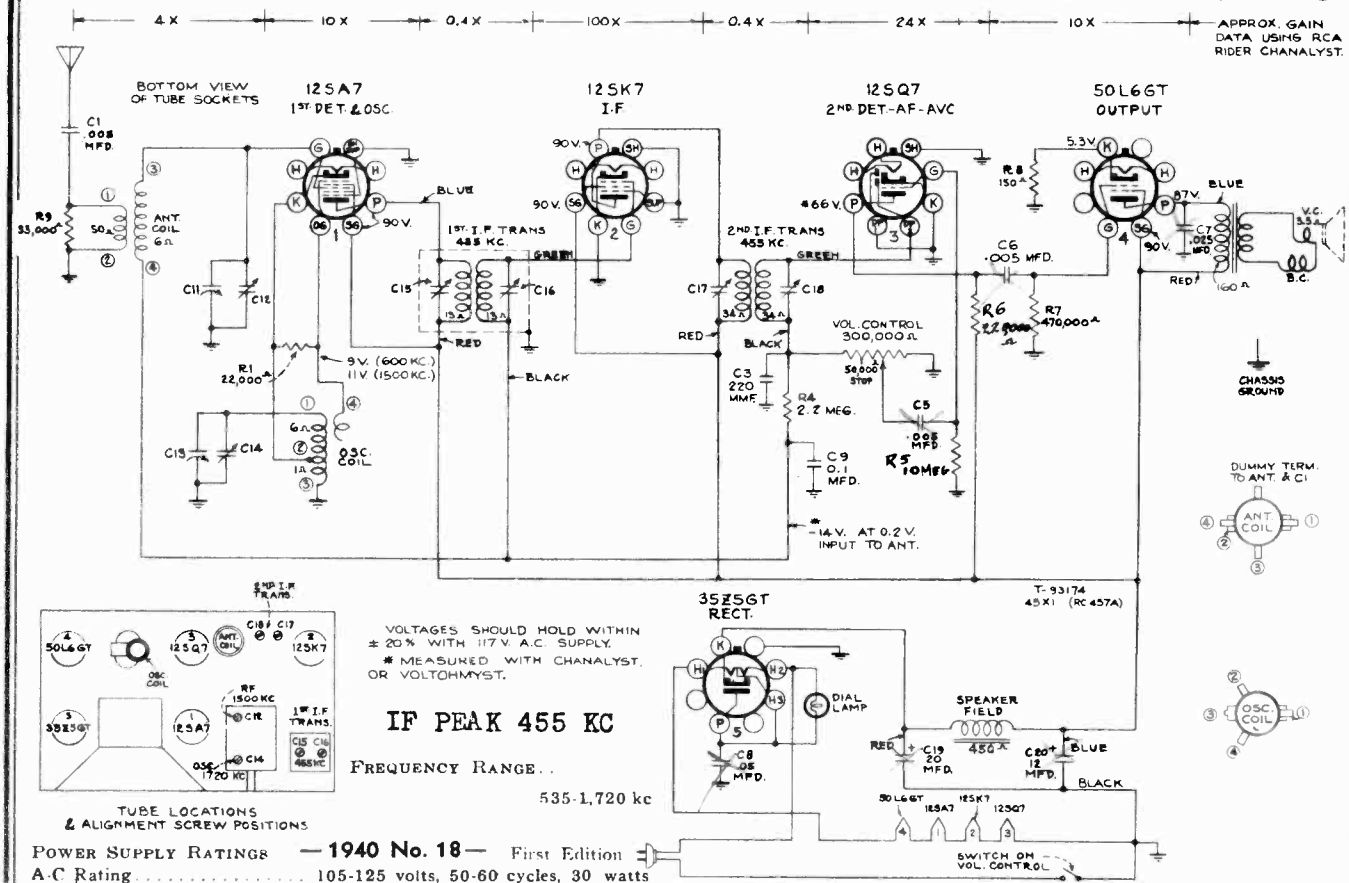
STOCK No.	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES (RC-459M)	
35097	Can—Shield can for transformers—Stock Nos. 35346 and 35347	.30
12694	Capacitor—220 mmfd.	.35
33584	Capacitor—.005 mfd.	.25
4937	Capacitor—.01 mfd.	.25
11315	Capacitor—.015 mfd.	.20
32787	Capacitor—.05 mfd.	.20
12484	Capacitor—0.25 mfd.	.30
35348	Capacitor—Electrolytic, comprising 1 section of 30 mfd., and 1 section of 20 mfd	.95
35571	Coil—Oscillator coil	.70
35534	Condenser—Variable tuning condenser	2.30
35344	Control—Volume control and power switch	1.50
32634	Cord—Drive cord	.10
35992	Dial—Dial scale	.65
35063	Drum—Drive drum	.30
35993	Frame—Dial frame—less dial	.25
35062	Indicator—Station selector indicator	.20
11765	Lamp—Dial lamp	.15
35061	Loop—Antenna loop	1.95
30189	Resistor—120 ohms, ½ watt	.20
14561	Resistor—220 ohms, ½ watt	.20
13998	Resistor—22,000 ohms, ½ watt	.20
12284	Resistor—220,000 ohms, ½ watt	.20
12285	Resistor—470,000 ohms, ½ watt	.20
12679	Resistor—2.2 meg., ½ watt	.20
13601	Resistor—10 meg., ½ watt	.20
35343	Shaft—Drive shaft	.10
34149	Socket—Dial lamp socket	.30
31251	Socket—Tube socket	.25
31418	Spring—Drive cord spring	.05
35098	Spring—Retaining spring for transformers Stock Nos. 35346 and 35347	.08
35056	Transformer—Audio transformer	1.30
35346	Transformer—First I-F transformer—less shield can	1.40
35347	Transformer—Second I-F transformer	1.40
34373	Washer—"C" washer for drive shaft	.03
	SPEAKER ASSEMBLIES (39223-502)	
35065	Cone—Cone complete with voice coil	1.20
	SPEAKER ASSEMBLIES (RL-86-2)	
32907	Cap—Dust cap	.02
35066	Cone—Cone complete with voice coil	1.30
34450	Speaker—5 inch dynamic speaker complete with cone and voice coil—less output transformer	3.25
	MISCELLANEOUS ASSEMBLIES	
36041	Back—Cabinet back for Model 45X16	.25
36042	Back—Cabinet back for Model 45X17	.25
35996	Bushing—Bushing and wood screw for rotor discs	.05
35079	Crystal—Dial scale escutcheon and crystal	.65
35595	Disc—Rotor disc (cardboard)	.10
35994	Disc—Stationary disc (masonite) and rubber feet	.40
33006	Foot—Rubber foot	.03
30863	Knob—Tuning or volume control knob	.15
30900	Spring—Retaining spring for knob	.05

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

Alignment, Trimmers
Socket, Parts

RCA MFG. CO., INC.

MODELS 45X3, 45X4
Chassis RC-457E
Schematic, Gain, Voltage



VOLTAGES SHOULD HOLD WITHIN ± 20% WITH 117 V. A.C. SUPPLY.
* MEASURED WITH CHANALYST OR VOLTOHMYST.

IF PEAK 455 KC

FREQUENCY RANGE . . 535-1,720 kc

POWER SUPPLY RATINGS — **1940 No. 18** — First Edition

A-C Rating . . . . . 105-125 volts, 50-60 cycles, 30 watts
D-C Rating . . . . . 105-125 volts, direct current, 30 watts

POWER OUTPUT
(117 volt, 60 cycle supply) . . . . . 1.0 watt

LOUDSPEAKER
Type . . . . . 4-inch Electrodynamic
Voice-coil impedance at 400 cycles . . . . . 4 ohms

Dial Lamp (1) . . . . . Mazda 51, 7.5 volts, 0.2 amp.

Alignment Procedure

Output Meter Alignment.—Connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—Connect the low side of the test-oscillator to the receiver chassis, through a .01 mfd. capacitor, and keep the output as low as possible.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	12SK7 grid in series with .001 mfd.	455 kc	Quiet Point at 1,600 kc end of dial	C17, C18 (2nd I-F Trans.)
2	12SA7 grid in series with .001 mfd.			C15, C16 (1st I-F Trans.)
3	Antenna term. of ant. trans. in series with 100 mmfd.	1,720 kc	Full clockwise (out of mesh)	C14 (oscillator)
4		1,500 kc	Resonance on 1,500 kc signal	C12 (antenna)

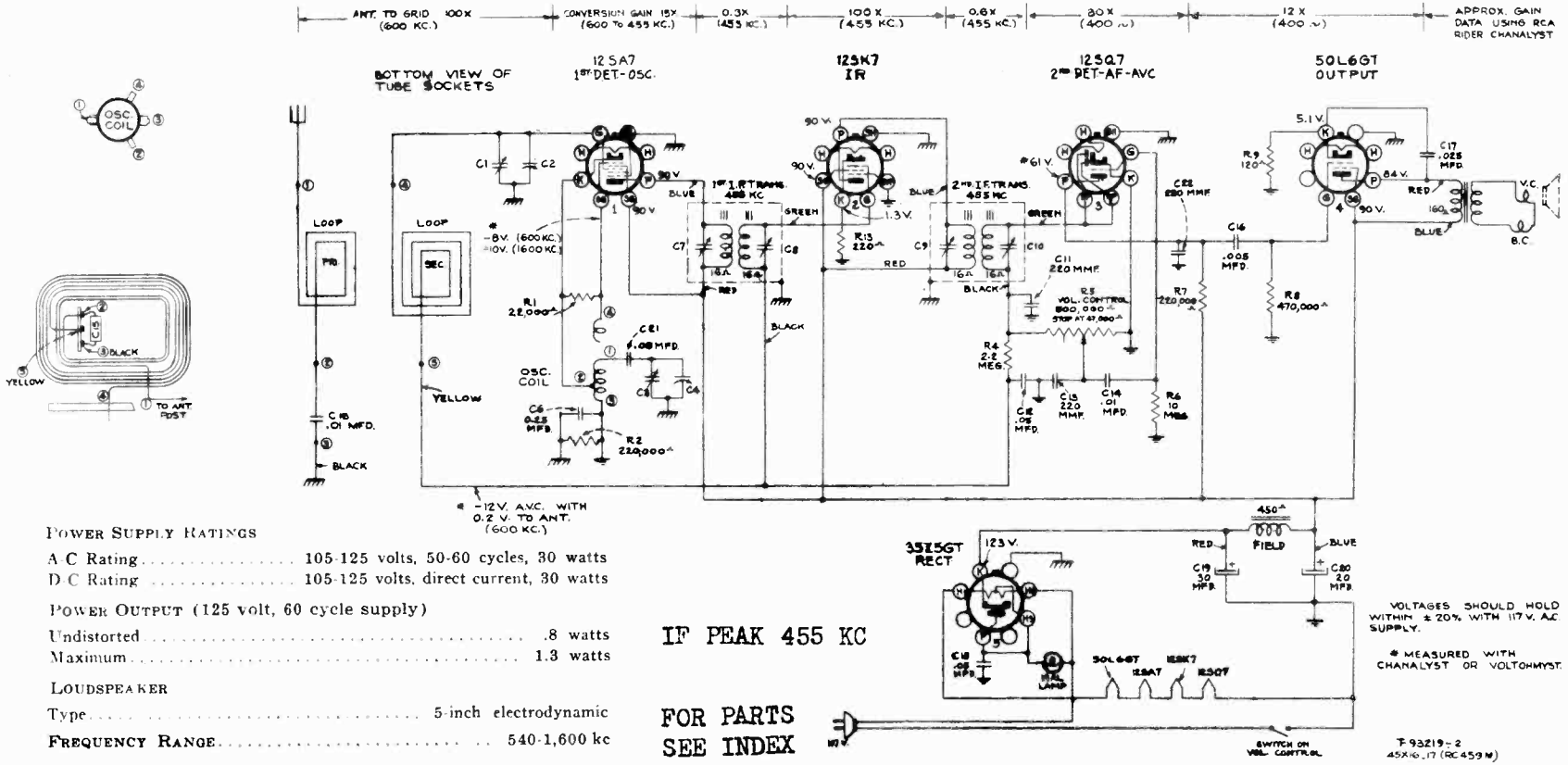
STOCK No.	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES (RC-457E)	
12694	Capacitor—220 mmfd.	.35
33584	Capacitor—.005 mfd.	.25
4870	Capacitor—.025 mfd.	.20
32787	Capacitor—.05 mfd.	.20
4839	Capacitor—0.1 mfd.	.30
32576	Capacitor—Electrolytic comprising 1 section of 20 mfd., and 1 section of 12 mfd.	.75
35115	Coil—Antenna coil	.80
35333	Coil—Oscillator coil	.65
35977	Condenser—Variable tuning condenser	2.40
35979	Control—Volume control and power switch	1.50
32634	Cord—Drive cord	.10
35982	Dial—Dial scale	.70
35980	Indicator—Station selector indicator	.25
11765	Lamp—Dial lamp	.15
31193	Lead—Antenna lead	.50
35981	Plate—Dial plate—less dial	.30
30880	Resistor—150 ohms, ½ watt	.20
13998	Resistor—22,000 ohms, ½ watt	.20
12454	Resistor—33,000 ohms, ½ watt	.20
12264	Resistor—220,000 ohms, ½ watt	.20
12285	Resistor—470,000 ohms, ½ watt	.20
12679	Resistor—2.2 meg., ½ watt	.20
13601	Resistor—10 meg., ½ watt	.20
35978	Shaft—Tuning shaft	.10
35332	Shield—Shield for first I-F transformer	.30
35345	Socket—Dial lamp socket	.25
31251	Socket—Tube socket	.25
30585	Spring—Drive cord spring	.06
35098	Spring—Spring to hold I-F transformer in shield can	.08
34846	Transformer—Audio transformer	1.25
35331	Transformer—First I-F transformer—less shield	1.10
33301	Transformer—Second I-F transformer	1.20
34373	Washer—"C" washer for tuning shaft	.03
	SPEAKER ASSEMBLIES (39105-505)	
35120	Cone—Cone complete with voice coil	1.15
35611	Speaker—Four inch dynamic speaker complete with cone and voice coil	3.10
	MISCELLANEOUS ASSEMBLIES	
36017	Back—Cabinet back—Model 45X3	.25
36018	Back—Cabinet back—Model 45X4	.25
35983	Bezel—Dial scale bezel and crystal	1.00
35121	Knob—Walnut volume control or tuning knob	.10
35126	Spring—Retaining spring for knob Stock No. 35121	.03

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

MODELS 45X16, 45X17
Chassis RC-459M

Schematic, Gain, Voltage
Alignment, Trimmers
Socket

RCA MFG. CO., INC.



IF PEAK 455 KC

FOR PARTS SEE INDEX

Power Supply Ratings

A.C Rating	105-125 volts, 50-60 cycles, 30 watts
D.C Rating	105-125 volts, direct current, 30 watts

Power Output (125 volt, 60 cycle supply)

Undistorted	.8 watts
Maximum	1.3 watts

Loudspeaker

Type	5-inch electrodynamic
Frequency Range	540-1,600 kc
Dial Lamp (1)	Mazda 51, 7.5 volts, .20 amp.

—1940 No. 22—

First Edition

Alignment Procedure

Output Meter Alignment.—Connect the meter across the voice coil, and turn the receiver volume control to maximum.

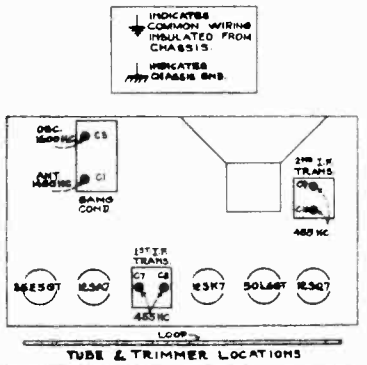
Test-Oscillator.—For I-F alignment, connect the low side of the test-oscillator to the receiver chassis through a .01 mfd. capacitor, and keep the output as low as possible.

Pre-Setting Dial.—With gang condenser in full mesh, the pointer should be adjusted so that it is vertical.

Antenna.—The set is equipped with a built-in loop antenna. If an outdoor antenna is used, it may be connected to the "ANT" terminal on rear of cabinet. It should not be longer than 100 feet, including lead-in. If it is longer, connect a 100 to 200 mmf. capacitor in series with the lead-in.

Power-Supply Polarity.—For operation on d-c, the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a-c, reversal of the plug may reduce hum.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	12SK7 I-F grid in series with .01 mfd.	455 kc	Quiet point at 1,600 kc end of dial	C9 and C10 (2nd I-F trans.)
2	Tuning condenser stator (osc.) in series with .01 mfd.			C7 and C8 (1st I-F trans.)
3	Radiation loop consisting of two turns of wire 18 inches in diameter	1,600 kc	Full clockwise (out of mesh)	C3 (oscillator)
4		1,400 kc	Resonance on 1,400 kc signal	C1 (antenna)



TUBE & TRIMMER LOCATIONS

RCA MFG. CO., INC.

Gain Data Instructions
Test Schematic

ANT. INPUT GAIN
5X (FIVE TIMES) AT 600KC
(FROM ANT. TERM TO RF GRID)

RF TUBE GAIN
1.5 X (AVC WORKING)
8 X (AVC GROUNDED)
600KC

CONVERSION GAIN
80X (600KC AT GRID
455KC AT PLATE)

1ST. IF TRANS.
0.8 X

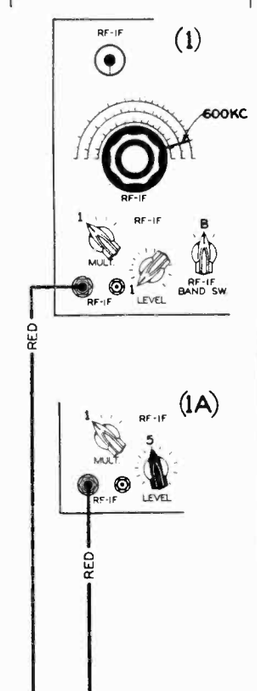
IF TUBE GAIN
60X (AVC WORKING)
200X (AVC SHORTED)

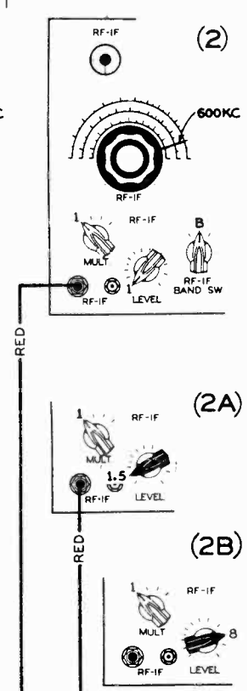
2ND. IF TRANS.
0.8 X

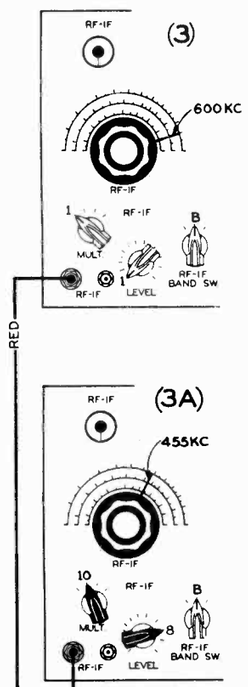
REFER TO STEP (G) IN TEXT

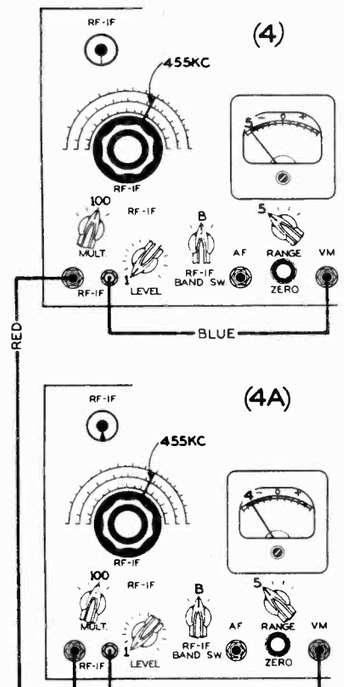
1ST. AUDIO GAIN
60X (AT 400 CYCLES)

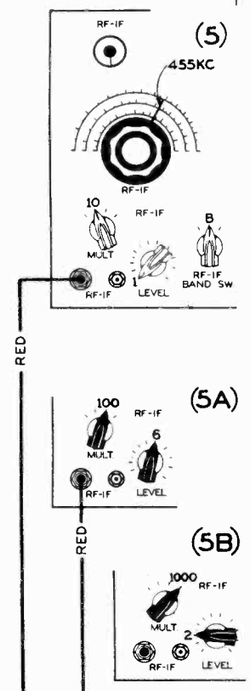
OUTPUT GAIN
14X (AT 400 CYCLES)

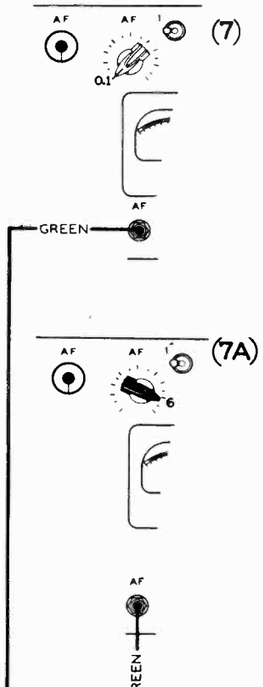


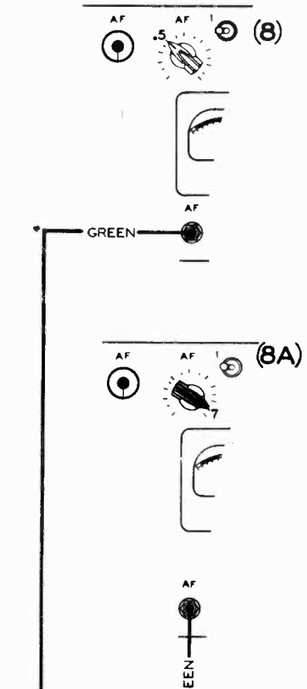












TEST-OSC 600 KC

CONNECT CHANALYST GROUND LEAD TO RADIO CHASSIS

LOOP 'A' BAND

L1 PRI

6SK7 R.F.

10,000Ω

2.2Ω

3900Ω

1000Ω

.01 MFD.

100 MMF.

2.2 MEG.

.05 MFD.

100 MMF.

47,000Ω

6SA7 1ST. DET.-

-10V. (600 KC.)
-15V. (1500 KC.)
-5V. (6 MC.)
-12V. (18 MC.)

100 MMF.

33,000Ω

1ST. I.F. TRANS.

6SK7 I.F.

-30 V. AVC WITH 0.2 V TO ANT. AT 600 KC.

2ND. I.F. TRANS.

2.2 MEG.

22000Ω

6SQ7 2ND. DET.-AF.-AVC.

180 MMF.

330 MMF.

.005 MFD.

470,000Ω

470,000Ω

6K6-GT OUTPUT

.005 MFD.

470Ω

20 MFD

.01 MFD.

2700Ω

.005 MFD

VOL. CONTROL 250,000Ω

10 MEG.

(9) OSC. GRID VOLTAGE

25

(10) AVC VOLTAGE

-30

125

LINE WATTS

WATTS

70

WATTS

-1940 No. 29-

First Edition

Introduction

Complete gain data is published in the Service Notes for RCA Victor 1941 radio receivers.

For speed and convenience, the gain data is printed on the schematic diagram of each model.

For the utmost utility in signal tracing, so that any trouble may be quickly narrowed down to a single point, the gain is given for each separate RF, IF and AF tube, and also for each RF and IF transformer. In addition, the AVC voltage is shown, and also the oscillator grid voltage on all frequency ranges.

Tube Gain Is Shown Both With and Without AVC

The gain data in RCA Victor Service Notes generally shows the gain of the RF, 1st-detector, and IF tubes both with and without automatic volume control.

In general, it is recommended that gain checks be made as outlined herein, first checking the gain with the AVC working, and then if there is any doubt with the AVC bus grounded.

The important thing in following this recommended procedure (where the signal is fed into the antenna circuit for all checks) is to keep the RF–IF channel at maximum sensitivity when establishing the level at the antenna terminal, at the grid of the RF tube, and at the grid of the detector tube, as shown at (1), (2), and (3) in the illustration.

This method is followed in obtaining the published RCA gain data on actual production samples.

On small sets, the gain is given only with the AVC working.

On certain models, the 1st-detector tube is not controlled by the AVC, and should therefore be measured with the AVC working.

In checking from primary to secondary on RF and IF transformers, the AVC should be left working to avoid possible grid current that would reduce the apparent gain of the transformers.

Gain Tolerance

Several variable factors influence the gain of sections in a receiver, including **tubes**, which may vary more than 25%, **AVC action, grid current** if the AVC is killed, **regeneration**, adjustment of the **tuned circuits, accuracy of tuning, line voltage**, and **experience** on the part of the operator.

Obviously it is impossible to specify definite receiver tolerances. Two-to-one variations may be regarded as normal.

Make Gain Checks With 600 kc Signal Fed into Antenna Terminal of Receiver

All gain checks throughout the entire receiver circuit (radio-frequency, intermediate-frequency, and audio-frequency sections) can be made with the signal generator connected to one point (the antenna terminal), and tuned to one frequency (600 kc).

This naturally simplifies the procedure and speeds up the work.

Preliminary Set-Up

Signal Generator Connections

Connect the output cable of the signal generator to the **antenna** and ground terminals of the receiver.

Dummy Antenna

Use the recommended dummy (usually 100, 200, or 300 mmfd.) in series with the antenna terminal.

Tune Signal Generator to 600 kc

Adjust the signal generator to 600 kc, or to some frequency near 600 kc that is free from local broadcast interference.

The exact frequency is not important. If the signal generator is slightly off calibration, set it to the 600 kc mark, because both the receiver and the Chanalyst will be tuned to the actual generator frequency even though this may be slightly above or below 600 kc. In other words, the generator frequency is the starting point, and both the receiver and the Chanalyst will be tuned to it.

Use 400 Cycle Audio Modulation (30%)

Set the signal generator to give 400 cycle internal audio modulation on the 600 kc signal. The percentage of modulation is not important in making gain checks, but the standard value of 30% is recommended.

Tune the Receiver to 600 kc

Tune the receiver carefully for peak output on the signal (assumed to he 600 kc) from the generator.

Connect Chanalyst Ground Lead to the Receiver Chassis

Connect the clip on the end of the Chanalyst ground lead (black) to the receiver chassis. (See note in reference to connection on a.c.-d.c. receivers.)

Tune RF-IF Channel to 600 kc

Place the Chanalyst RF-IF probe (red cable) on the receiver antenna terminal. Set the RF–IF controls as shown in step (1), and tune the RF–IF channel for peak output as indicated on the RF–IF magic eye.

Making Gain Checks

(Refer to drawing, which shows each step in checking a typical radio receiver.)

Step (1). Antenna Input Gain

With the RF–IF channel tuned to the 600 kc signal, and with the **level** and **multiplier** controls set at 1 and 1, as shown at (1) in the drawing, adjust the output of the signal generator until the RF–IF Magic Eye just closes (or electronic voltmeter reads –5 volts). See note about using the electronic voltmeter in conjunction with the magic eye.

Move the RF–IF probe from the antenna terminal to the grid prong of the RF tube. If there is a gain, the RF–IF magic eye will overlap. Adjust the **level** control until the eye is just closed. In this example, the **level** control has been turned from 1 to 5, indicating a voltage step-up or gain of five times from the antenna terminal to the grid of the first tube. (This is the gain from the antenna coil to the tuned loop.)

The service note for this particular model (Model 16T3) specifies an approximate gain of five times from the antenna terminal to the RF control grid. If the gain is appreciably less than 5 times, the tracking should be checked. The simplest and most definite method for doing this is described later.

Step (2). RF Tube Gain

Place RF–IF probe on grid of RF tube. Set RF–IF input controls as shown in (2). Adjust signal generator output until RF–IF Magic Eye is just closed.

Move RF–IF probe to plate of RF tube. Adjust **level** control until RF–IF eye just closes. If new **level** setting is 1.5, the gain from grid to plate is 1.5 times.

To check the RF tube gain without automatic volume control, ground the AVC bus as indicated in dotted lines. Repeat step (2) to establish a signal level on the grid. Then move the RF–IF probe to the plate of the RF tube, and adjust the **level** control until the RF–IF eye is just closed. In this example (2B) the **level** control is turned to 8, indicating an RF tube gain of eight times with the AVC killed.

Move the probe to the grid of the 1st-detector tube, which is resistance-coupled to the RF tube in this particular model. There should be only a slight drop through the coupling circuit.

Remove the AVC ground after this check.

With a receiver that has transformer coupling between the RF and 1st-detector tubes, check the gain from primary to secondary (with AVC working).

Step (3). 1st-Detector Conversion Gain

Place the RF–IF probe on 1st-detector control grid and turn RF–IF **level** and **multiplier** controls to 1 and 1. Adjust signal generator output so the RF–IF Magic Eye is just closed.

Move the RF–IF probe to the 1st-detector plate. Tune the RF–IF channel for peak output on the IF signal. Adjust **multiplier** and **level** controls so RF–IF Magic Eye is just closed.

In this example (3A) the **multiplier** is turned from 1 to 10 (10 times), and the **level** control is turned from 1 to 8 (8 times). The conversion gain is therefore 80 times.

The IF signal voltage across the plate circuit of the 1st-detector tube is 80 times greater than the 600 kc signal voltage across the 1st detector grid circuit.

If the conversion gain is appreciably less than specified, it may be due to incorrect IF alignment, but first try retuning the set for peak output. (The voltmeter channel provides an excellent output meter for this purpose by using it to measure AVC voltage.)

Step (4). Checking 1st-IF Transformer

In this step, there is a decrease or loss, instead of a gain, from primary to secondary of the 1st-IF transformer.

Place the RF–IF probe on the primary of the 1st-IF transformer and adjust the signal generator output so the RF–IF Magic Eye just closes, or so the electronic voltmeter indicates –5 volts.

Move the probe to the secondary. In this example (4A), the eye opens slightly, and the meter drops to –4 volts, indicating a loss of 5 to 4 or 0.8 times.

Step (5). IF Tube Gain

Place RF–IF probe on the IF grid. Set **multiplier** at 10 and **level** at 1. Adjust signal generator output so that RF–IF Magic Eye is just closed.

Move RF–IF probe to plate of the IF tube and adjust **multiplier** and **level** controls until eye is just closed.

In this example (5A) the **multiplier** is turned from 10 to 100 (10 times) and the **level** control is turned from 1 to 6 (6 times). The gain is therefore 10 times 6, or 60.

To check the IF gain with the AVC killed, connect the AVC bus to the chassis and repeat step (5) to establish a signal level on the IF grid.

Move the RF–IF probe to the plate of the IF tube and adjust the **multiplier** and **level** controls until the RF–IF Magic Eye just closes. In this example (5B), the **multiplier** is turned from 10 to 1,000 (100 times) and the **level** control is turned from 1 to 2. Therefore the IF gain is 100 times 2, or 200, with the AVC killed.

Remove the AVC bus ground after this check.

Step (6). Checking 2nd-IF Transformer

In this particular set, the 2nd-IF transformer has the same loss as the 1st-IF transformer, and is checked as in step (4), except with **multiplier** at 1,000.

Step (7). 1st-Audio Gain

(In making audio gain checks, the tone controls should be set for maximum response.)

Turn Chanalyst AF control to 0.1 and set AF toggle switch to 1.

Place the AF channel probe (green cable) on the arm of the receiver volume control. Adjust the receiver volume control so the AF channel Magic Eye just closes.

Move the probe to the 1st-audio grid. There should be only a slight drop through the coupling condenser.

With the AF channel probe on the grid of the 1st-audio tube, reset the receiver volume control so the AF eye is just closed.

Move the AF probe to the plate of the 1st-audio tube. Adjust the AF channel control so the AF eye is just closed. In this example (7A) the control is turned from 0.1 to 6.0, indicating a voltage step-up or gain of 60 times (0.1 divided into 6.0 equals 60).

Move the AF probe to the grid of the output tube. There should be only a slight drop through the coupling capacitor.

If the receiver has a phase inverter tube, check its gain in the same way as described for the 1st-audio tube.

Step (8). Output Stage Gain

Turn Chanalyst AF control to 0.5 and place AF probe on the grid of the output tube. Adjust the receiver volume control so the AF Magic Eye is just closed.

Move the probe to the plate of the output tube. Adjust the AF channel control so the AF eye is just closed. In this example (8A), the control is turned from 0.5 to 7.0, indicating a voltage step-up or gain of 14 times (0.5 divided into 7.0 equals 14).

With a push-pull (or parallel push pull) output stage, check each tube separately, with the other output tube (or tubes) removed from the set. This gives a definite check on each output tube. The published data gives the gain with all of the output tubes in operation.

Step (9). Measuring Oscillator Grid Voltage

Checking the oscillator grid current (by measuring the rectified oscillator signal across the oscillator grid leak) is a valuable and quick method of determining whether the oscillator is working throughout the range on each band.

Connect the electronic voltmeter channel probe (blue cable) to the oscillator grid. Observe the voltage reading while tuning across each band.

The published RCA gain data gives the oscillator grid voltage at the high-frequency and low-frequency end of each band.

It will be observed that the oscillator grid voltage generally increases when tuning through stations. The published data is taken at quiet points on the dial.

"Dead spots" or points where the oscillator ceases to work may be caused by absorption due to resonance in adjacent coils through defects in shorting action of the range switch and will show up as dips in the oscillator grid voltages.

Step (10). Measuring AVC Voltage

Connect the voltmeter channel probe (blue cable) to the AVC bus. Turn the signal generator from low output up to high output and observe the AVC voltage. It will be found to increase rapidly at first, and then more slowly up to an approximate maximum (in this particular example) of –30 volts.

In the published RCA gain data, the AVC voltage is given for a large input to the antenna. This input voltage is stated as a matter of record. The specified AVC voltage may be regarded as the approximate maximum.

Checking Oscillator Frequency

Place the oscillator channel probe (brown cable) near the oscillator circuit in the receiver. Tune the oscillator channel for maximum indication on the oscillator channel Magic Eye.

The correct oscillator frequency should equal the sum of the input signal frequency plus the intermediate frequency. In this particular example, the input signal is 600 kc, and the intermediate frequency is 455 kc, so the correct oscillator frequency is 600 plus 455, or 1,055 kc.

Wattage Indicator

Plug the Chanalyst into a 110-volt a.c supply, and plug the receiver into the Chanalyst **test watts receptacle**. Turn "on" the power switches of both Chanalyst and receiver. After a brief warm-up period, adjust the **watts** control so the **watts** Magic Eye just closes. The setting of the **watts** control indicates the power consumption of the receiver.

The rated power consumption of radio receivers (as printed in service data and on the chassis or cabinet labels) is seldom accurate to within 10% of the actual consumption.

Quick Over-All Gain Checks on RF, IF, and AF Sections

The approximate over-all gain of any section (RF, IF, or AF) can be found by multiplying together the gain (with AVC killed) of the parts that comprise the particular section.

Using the accompanying diagram as an example:

The RF section extends from the antenna terminal to the 1st-detector grid. This includes the antenna transformer (which in this case has a primary coil and a loop secondary) with a gain of 5, and the RF tube, with a gain of 8. The over-all RF gain is 5 times 8, or 40.

The 1st-detector conversion gain, and the 1st-IF transformer should be checked separately.

The IF tube and the 2nd-IF transformer may be checked as one section, feeding IF signal from the generator into the IF grid, with the multiplier and level controls at 1 and 1 to establish the lowest possible level on the IF grid.

The AF section extends from the 1st-AF grid to the output plate, and includes the 1st-AF tube and the output tube. The over-all AF gain is 60 times 14, or approximately 800.

Miscellaneous Data

Electronic Voltmeter May Be Used in Conjunction With the Magic Eye

When tuning the RF–IF channel, the electronic voltmeter may be used as an auxiliary resonance indicator, and for level checks as shown in step (4).

Connect the voltmeter cable (blue) between the VM jack and the RF–IF tip jack.

Set the **meter range** to 5, and, with no signal input to the RF–IF channel, adjust the **zero** control so the meter needle is at center zero.

When connected in this way, the meter indicates the rectified signal voltage at the grid of the RF–IF Magic Eye. Approximately –5 volts are required to just close the eye.

Tracking at 600 kc

In using the published gain data it is advisable to check, and if necessary adjust, the tracking between the RF tuned circuits and the oscillator circuit.

The following method is unequalled for speed and accuracy because no "rocking" of the gang condenser is necessary.

(a) Align the IF to the correct IF frequency.

(b) Feed a 600 kc signal into the antenna circuit of receiver through the specified dummy antenna.

(c) Place RF–IF probe (red cable) on grid of first tube in receiver, and tune the RF–IF channel to the 600 kc signal.

(d) Carefully turn the receiver gang condenser for maximum output on the RF–IF Magic Eye (not for maximum output on the receiver).

(e) Leave the receiver gang in this position even though the receiver dial may indicate 10 or 20 kc off, because this is the correct setting of the gang to tune the receiver's antenna circuit to 600 kc.

(f) Connect the electronic voltmeter probe (blue cable) to the AVC circuit of the receiver.

(g) Adjust the oscillator magnetite core or low-frequency padder for maximum AVC voltage as indicated on the electronic voltmeter.

Input to Loop Receivers

Some loop receivers have a link that must be opened when feeding the signal generator into the antenna terminal.

On console loop receivers, such as RCA Model 110K, if only the chassis has been brought in for service, and the loop is not available, connect the signal generator through an .01 mfd. capacitor to the control grid of the first tube. Tune the receiver for maximum AVC voltage on the 600 kc signal.

Chanalyst Ground Connection to AC-DC Receivers

On a.c.-d.c. receivers where one side of the 110-volt line is connected to the chassis, attach the Chanalyst ground lead to the receiver chassis.

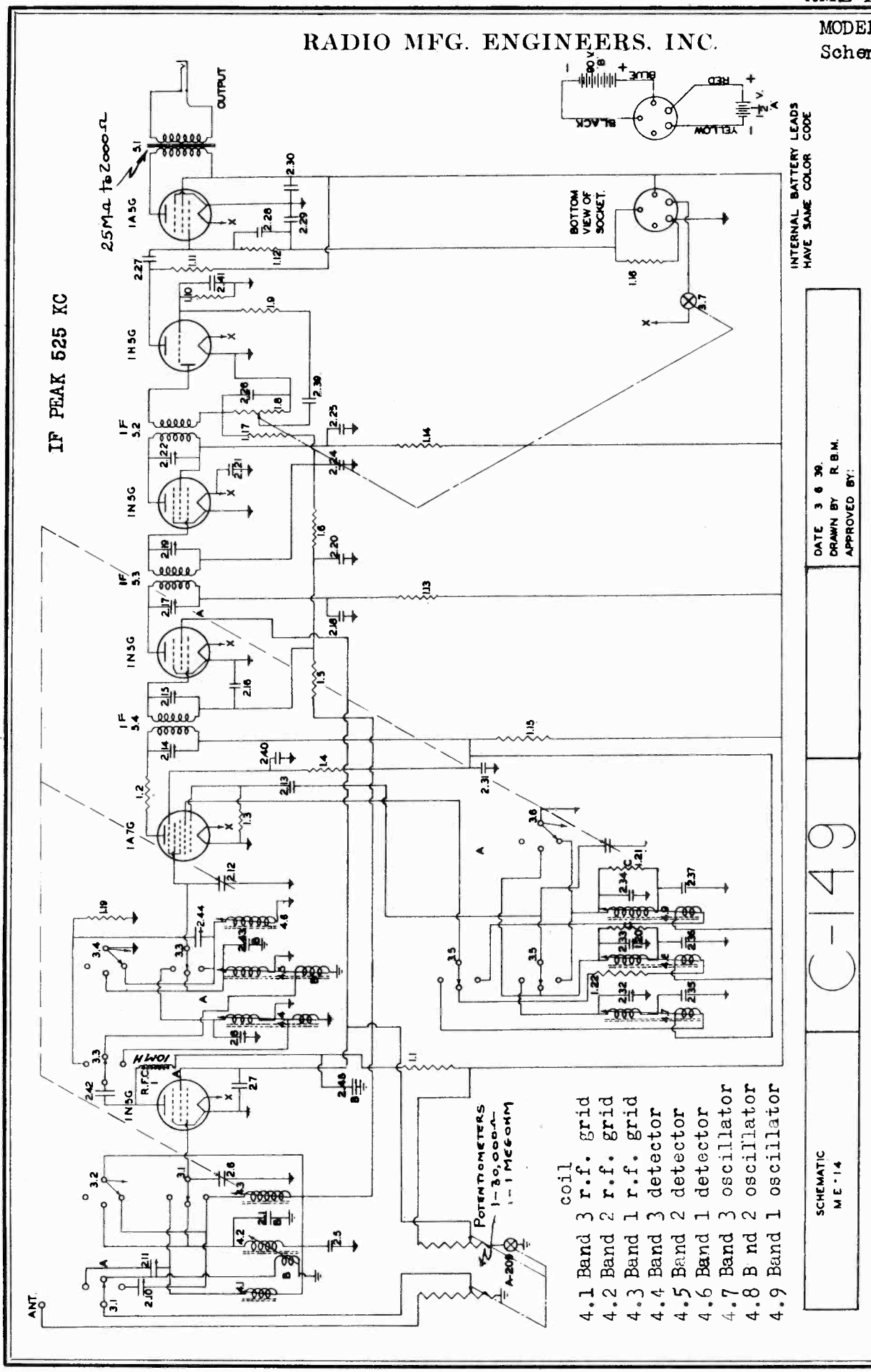
If the 110-volt line is isolated from the receiver chassis, connect the Chanalyst ground lead to the common negative wiring in the chassis.

In either of these cases it must be remembered that the receiver and the Chanalyst may be "hot," and due care must be taken to prevent grounding of either. The best method is to use an isolating power transformer as described below.

Isolating Power Transformer

When working on a.c.-d.c. receivers, it is becoming general practice to use a one-to-one ratio power transformer between the a.c. power supply and the receiver. This avoids grounding difficulties and certain hum conditions.

The isolation power transformer may be used in conjuction with the Chanalyst when testing a.c.-d.c. receivers by plugging one winding of the transformer into the Chanalyst **test-watts** receptacle, and connecting the a.c.-d.c. receiver to the other winding.



coil
4.1 Band 3 r.f. grid
4.2 Band 2 r.f. grid
4.3 Band 1 r.f. grid
4.4 Band 3 detector
4.5 Band 2 detector
4.6 Band 1 detector
4.7 Band 3 oscillator
4.8 B nd 2 oscillator
4.9 Band 1 oscillator

The power drawn from the batteries is very small--being .675 watts from the 90 volt "B" battery, represented by a current of 7.5 milliamperes; and a current from a 1.4 volt filament battery of 300 milliamperes.

MODEL ME-14
Alignment, Socket
Trimmers, Parts

RADIO MFG. ENGINEERS. INC.

The unit includes 6 tubes and is a superheterodyne type receiver, providing both manual and automatic volume control; coverage of the entire frequency range in three selective positions of the band switch, and an audio output of 100 milliwatts. 100 milliwatts of audio power is also sufficient to operate a small loudspeaker. However, the unit is primarily designed for headphone operation and a jack is provided on the rear apron of the chassis for the insertion of a standard headphone plug. The output impedance of this phone circuit carries no direct current through it, since it is the secondary of a transformer and it is designed to supply a 2000 ohm load. If a loudspeaker is used, a suitable transformer should be used with it to match it to the output of the receiver.

SERVICE NOTES

The intermediate frequency used in the ME-14 receiver is 525 kilocycles. Alignment can be achieved by inserting a signal of 525 kilocycles. By connecting a test oscillator generating 525 kilocycles (modulated) to the grid of the first detector tube, the intermediate frequency transformers labeled No. 1, No. 2, and No. 3 I.F. (See Figure 3) can be adjusted to maximum reading on an audio output meter connected directly across the headphones, or across a special plug inserted in the headphone jack. Alignment is made on a given signal of 525 kilocycles for maximum reading on the output meter. It is essential that the input signal put into the first detector tube be not more than 200 microvolts, since the automatic volume control will hold all variations constant if the signals are of this order or higher. If it is impossible to cut down the energy delivered by the test oscillator, by means of adjustments on the test oscillator itself, the "Manual Gain" control may be of some assistance, although its range insofar as controlling circuits behind the first detector is rather limited. About 10 volts of audio should be obtained for optimum adjustment purposes, and the output of the signal generator, or test oscillator, should be lowered to a point where about 10 volts are obtained for alignment at the optimum peak adjustments. This, of course, means that the "Audio Gain" control should be set for maximum audio output.

Distorted signals having a very broken and rough characteristic are usually due to the fact that the fialment battery is below its required voltage and needs replacement. The sensitivity of the instrument will, of course, fall off at the same time and the combination of the two conditions can be used as an indication that the filament battery has served its purpose.

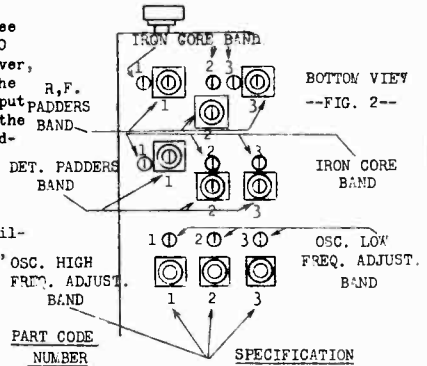
RADIO FREQUENCY ALIGNMENT

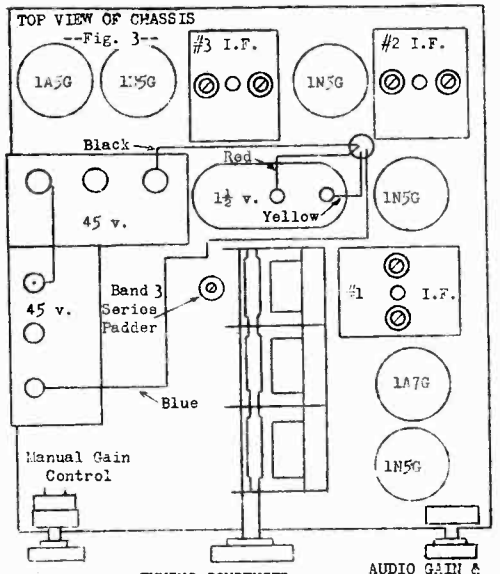
All of the controls for radio frequency alignment, except the series padder for low frequency calibration of Band 3, are available from the bottom of the chassis. In Figure 3 it will be seen that the oscillator padder, used for adjustment of the low frequency calibration of Band 3, is located near the center of the chassis between the "B" batteries and the last section of the variable condenser. The capacity of this condenser is increased with counterclockwise rotation of the screw-driver with which it is adjusted. Counterclockwise rotation decreases the frequency, and clockwise rotation increases the frequency.

For recalibrating the instrument is is only necessary to make sure that the pointer is set properly with respect to the rotors of the variable condenser, and this is done by setting the rotors at full mesh and having the pointer, at the same time, set to the horizontal line on the left end of the calibrated scale. Under these conditions and with frequencies of accurately known value the following alignment frequencies and their respective adjusters are listed as follows:

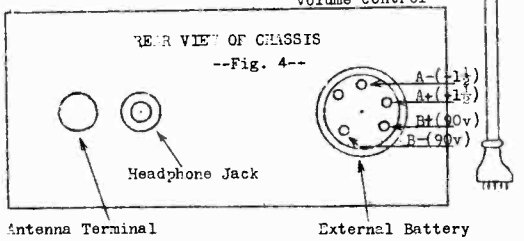
Band 1 .2 megacycles, Band 1 Oscillator Series Padder (See Figure 2)
Band 1 .4 megacycles, Band 1 Oscillator Parallel Padder (See Figure 2)
Band 2 700 kilocycles, use Band 2 Oscillator Series Padder (See Fig. 2)
Band 2 1200 kilocycles, use Band 2 Oscillator Parallel Padder (See Fig.2)
Band 3 2 megacycles, use Band 3 Series Padder, (See Figure 3)
Band 3 4 megacycles, use Band 3 Oscillator Parallel Padder (See Fig. 2)

After the calibration has been established by means of these adjustments, the respective bands are lined up, insofar as their radio frequency circuits are concerned, by adjustment of the respective Band padders for the radio frequency grid and the detector grid. Figure 2 shows the detector and r.f. padder for each band. Adjustments are to be made on a given modulated signal with an output meter across the headphones and adjustments left at the position giving maximum output meter reading.



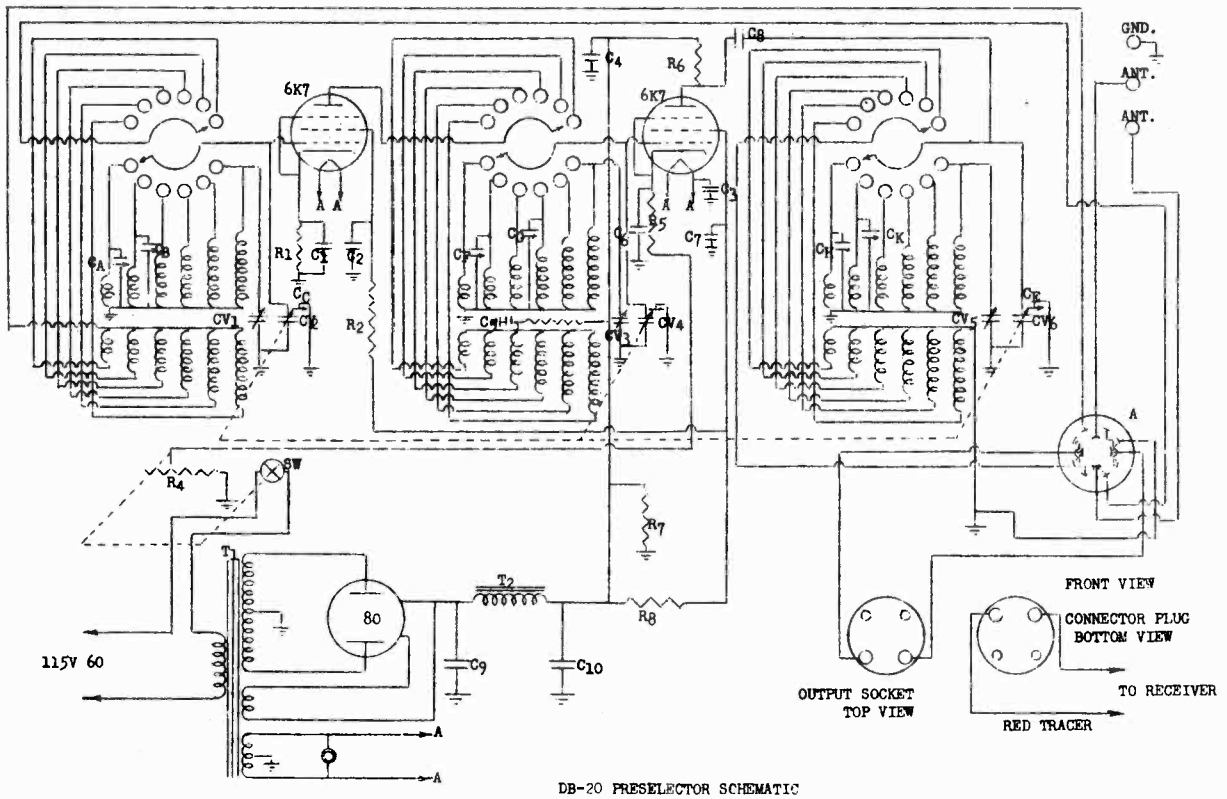


PART CODE NUMBER	SPECIFICATION
1.1	2000 ohms, 1/3 watt resistor
1.2	2000 ohms, 1/3 watt resistor
1.3	250,000 ohms, 1/3 watt resistor
1.4	100,000 ohms, 1/3 watt resistor
1.5	250,000 ohms, 1/3 watt resistor
1.6	100,000 ohms, 1/3 watt resistor
1.8	250,000 ohms, 1/3 watt resistor
1.9	5000 ohms, 1/3 watt resistor
1.10	250,000 ohms, 1/3 watt resistor
1.11	250,000 ohms, 1/3 watt resistor
1.12	250,000 ohms, 1/3 watt resistor
1.13	2000 ohms, 1/3 watt resistor
1.14	2000 ohms, 1/3 watt resistor
1.15	2000 ohms, 1/3 watt resistor
1.16	500 ohms, 1/2 watt resistor
1.17	1 megohm, 1/3 watt resistor
1.18	50,000 ohms, 1/3 watt resistor
1.19	100,000 ohms, 1/3 watt resistor
1.20	50,000 ohms, 1/3 watt resistor
1.21	100,000 ohms, 1/3 watt resistor
1.22	1,000 ohms, 1/3 watt resistor
2.1	30 μμfd adjustable padder
2.5	.1 μfd. 400 volt paper condenser
2.7	.1 μfd. 400 volt paper condenser
2.8	30 μμfd. adjustable padder
2.10	30 μμfd. adjustable padder
2.11	30 μμfd. adjustable padder
2.13	100 μμfd. mica condenser
2.14	I.F.Amplifier Trans. Adj. Trimmer
2.15	I.F. Amplifier Trans. Adj. Trimmer
2.16	deleted
2.17	I.F. Amplifier Trans. Adj. Trimmer
2.18	.1 μfd. 400 volt paper condenser
2.19	I.F. Amplifier Trans. Adj. Trimmer
2.20	.01 μfd. 400 volt paper condenser
2.21	.1 μfd. 400 volt paper condenser
2.22	I.F. Amplifier Trans. Adj. Trimmer
2.24	.01 μfd. 400 volt paper condenser
2.25	.1 μfd. 400 volt paper condenser
2.26	250 μμfd. mica condenser
2.27	.01 μfd. 400 volt paper condenser
2.28	250 μμfd. mica condenser
2.29	1 μfd. 200 volt paper condenser
2.30	1 μfd. 200 volt paper condenser
2.31	.1 μfd. 400 volt paper condenser
2.32	30 μμfd. adjustable padder
2.33	30 μμfd. adjustable padder
2.34	30 μμfd. adjustable padder
2.35	Band 3 Series Oscillator pad. 1000 μμfd.
2.36	Band 2 Series pad. 380 μμfd.
2.37	Band 1 Series Oscillator pad. 129 μμfd.
2.39	.01 μfd. 400 volt paper condenser
2.40	.01 μfd. 400 volt paper condenser
2.41	250 μμfd mica condenser
2.42	400 μμfd. mica condenser
2.43	30 mmfd. adjustable padder
2.44	30 mmfd. adjustable padder
2.45	.1 mfd. 400 volt paper condenser
2.46	.01 mfd. 400 volt paper condenser
3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7	Band Switch Section. On-Off Switch connected in tandem with audio volume control

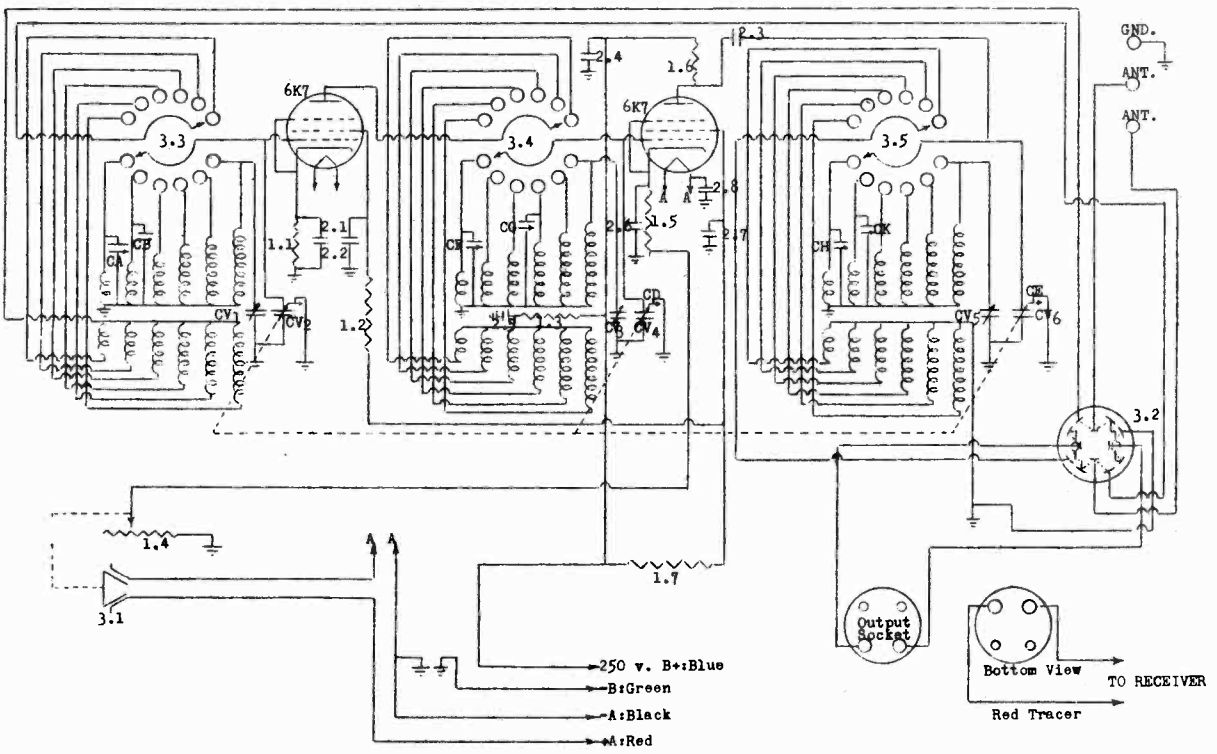


RADIO MFG. ENGINEERS, INC.

MODEL DB-20, Late
MODEL DB-20 Batt.
Schematics



DB-20 PRESELECTOR SCHEMATIC



DB-20 BATTERY OPERATED SCHEMATIC

MODEL DB-20,Late
MODEL DB-20 Batt.
Alignment,Trimmers
Voltage

RADIO MFG. ENGINEERS, INC.

The RME DB-20 Preselector is a compact efficient design of a straightforward radio frequency amplifier cascade with a specified input and output impedance. The input impedance is of a low value varying between 200 and 350 ohms over the frequency range covered by the tuning elements of the instrument. The output impedance varies over the same range in the same manner so that the insertion of this amplifier between the antenna and the RME-69 receiver incurs no mismatch in the coupling system and provides an increase in selectivity and gain due to its insertion.

The adjustment of the amplifier is calibrated on a scale in as close a manner as it is possible to calibrate such an instrument and tuning of the instrument should be done so that the setting of the indicator on the DB-20 scale is very close to the frequency being used. One check on this method is to set the tuning control of the amplifier to a position which gives a maximum meter reading on a given signal when used in conjunction with the RME-69 or any other receiver having a tuning indicator. In the absence of the tuning indicator background noise or signal strength may be used as an indication of optimum setting of the preamplifier and this will compensate for small variations which are bound to occur in the calibration of the instrument.

One side of the output circuit of the DB-20 is grounded and it is essential that the proper wire of the output cable be connected to the antenna post of the receiver with which it is used in order to provide proper operation for the combination. The high side or the ungrounded lead of the output cable is marked with a red tracer and this should be normally connected to the antenna terminal which would be used in the connection of a Marconi Antenna against ground in normal receiver operation without the DB-20. On the RME-69 receivor this is the outside terminal of the three-terminal input strip marked A - A - G. The other lead, which is a plain black wire, is to be connected to the middle antenna terminal and a ground jumper can be used to connect, A (center) to G on the terminal strip. In the case of a receiver being used with the DB-20 which has only a two-terminal input, that is antenna and ground, the black wire connects, of course, to the ground and the red tracer wire to the antenna terminal. A reversal of these leads will cause inefficient operation and probably no operation at all even when the antenna switch is thrown so that the antenna is connected directly to the receiver. This can be a source of trouble when poor operation is experienced.
A change-over switch is provided and consists merely of a four pole double throw switch indicated in Fig. 1 so that when it is thrown to the left the antenna is connected to the DB-20 and the DB-20 connected to the receiver input terminal. When the switch is thrown to the right the antenna is connected directly to the receiver and the DB-20 circuits are entirely removed from the picture.

PROCEDURE FOR ALIGNMENT OF THE RADIO FREQUENCY CIRCUIT

As an indicating device for alignment changes the meter on the RME-69 receiver can be used to indicate maximum signal being supplied the receiver from the DB-20. In the case of other communication receivers the same method may be used with their respective carrier level or R meter indication. In case the alignment is made with a receiver without carrier indicating devices an output meter can be used in the regular manner in which it is used for the alignment of receivers, but in this case, of course, it will be necessary to use a modulated signal input to the DB-20 to supply an audio component which can be used to operate the output meter.

All adjustments described should be adjusted to and left set at maximum meter readings be it carrier amplitude indicator or output as indicated on the output meter.

First set the receiver to 1000 Kc. and tune the DB-20 to 1000 Kc. which will be indicated on the main tuning dial and the band in which will be found 1000 Kc. is provided by setting the switch to position one (1). Set the pointer of the DB-20 on 1 Mc. reading of the scale and supply 1 Mc. signal input to the antenna terminal to the DB-20 setting the selector switch on the DB-20 (Fig.1) to the left position. When in this position adjust C_c, C_d and C_e for maximum meter reading.

Then switch to band two and three successively and check the setting at 2, 3, 4 and 5 megacycles. These frequencies, of course, will be checked by placing the band switch in the proper position required for tuning to these frequencies. The receiver, of course, must also be adjusted to these frequencies simultaneously with the DB-20.

The calibration for these frequencies will be found to be dependent on the settings of C_c, C_d and C_e which are made for 1000 Kc. on band one and will be in adjustment if band one is properly aligned.

Next turn the switch to position four and feed a signal of 7 Mc. into the receiver and adjust the tuning control of the DB-20 so that it sets on 7 Mc. Under these conditions check the setting of C_g for peak output. (Fig. 2).

Next set the band switch on position five and insert a signal of 14 Mc. into the receiver adjusting the tuning control of the DB-20 to 14 Mc. under these conditions adjust C_b, C_f and C_k for maximum output.

Next set the band switch to position six and set the tuning indicator to 30 Mc. on the scale and insert a signal of 30 Mc. into the DB-20. This condition obtained adjust C_a, C_d and C_h for maximum output.

During all of these settings and adjustments, of course, the receiver should be set to the same frequency as the DB-20 so that it will be able to receive the output of the DB-20 at the proper frequency.

The adjustments just described will assure maximum output due to alignment of the RF circuit in the DB-20.

The voltages to be expected at points indicated on the schematic diagram of Figure 13 are as follows:

1 to ground (volume control set to minimum)	26.6 volts.
1 to ground (volume control set to maximum)	3.4 volts.
2 to ground 265 volts	6 to ground 265 volts
3 to ground 100 volts	7 to ground 123 volts
4 to ground 3.4 volts	8 to ground 333 volts
5 to ground 333 volts	9 to ground 380 volts

A to A 6.6 volts at 115 volts line voltage AC

The following continuity checks should be made;

	Band (1)	Band (2)	Band (3)	Band (4)	Band (5)	Band (6)	
11 to ground	3.8	1.4	0.6	0.2	0.2	0.2	(ohms)
12 to 13	0.2	0.2	0.2	0.2	0.2	0.2	(ohms)
14 to 15	0.2	0.2	0.2	0.2	0.2	0.2	(ohms)
16 to ground	3.8	1.4	0.6	0.2	0.2	0.2	(ohms)
17 to ground	3.8	1.4	0.6	0.2	0.2	0.2	(ohms)

All measurements made with output cable and antenna disconnected and changeover switch in DB-20 position.

Voltages greater or smaller than these values listed by an amount exceeding 15% indicates difficulty in the power circuits of the receiver.

Resistances greater or less by 15% than the resistances listed indicates conditions other than normal in continuity in these circuits.

If the amplifier is dead as evidenced by a loss in signal strength on a given signal when the DB-20 is cut into the circuit the loss being compared with the signal received when the antenna is connected directly to the receiver may be due to a dead tube which is usually due to the fact that the filament is burned and can be ascertained by placing the hand on the tube to see whether or not it is warm or cold. If it is warm, of course, the filament is lit and probably the tube is satisfactory. If the tube is cold the filament is probably open and therefore the tube needs replacing. Of course, tubes can be defective from other reasons which can not be detected in this manner but must be ascertained by checking on a regular tube checker.

Another reason for a dead amplifier may be due to lack of voltage on elements of the tube and can be checked by the voltage check.

Cause of no voltage on the plate or screen of the tube can be due to short circuit in the by-passes of C_7, C_2, C_4, C_8, C_{10} or C_1 or an open resistor R_6, R_2, R_3 or an open choke T_2 or a burned out 80 rectifier tube or an open circuit in the antenna coil or the output coils of the DB-20 which can be checked by the continuity measurements listed above.

If the amplifier has very little gain (the average gain should be 3R's over that of the receiver itself) it is probably due to misalignment and can be corrected by the procedure described on pages 2 and 3, or there is a defective tube which is not providing all the gain that is standard and the tubes can be checked and replaced by tubes having suitable characteristics.

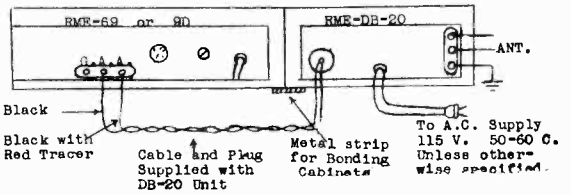
Additional information regarding special cases of trouble can be obtained from the Radio Mfg. Engineers by listing the details in a letter and writing direct to the factory.

METHOD OF CONNECTION OF THE DB-20 WITH THE RME-69 RECEIVER

The DB-20 unit is housed in a furniture steel crinkle finished cabinet which matches the height and appearance of the cabinet used to house the RME-69 receiver. It is designed to be placed at the left side of the receiver. Figure 1, Sheet 2, shows a sketch of the rear view of the DB-20 placed alongside of the receiver. In order to make sure that the two cabinets are well bonded together, it is advisable to make sure that all paint is cleaned from the adjacent cabinet bottom edges, and the two placed close together on a clean surface copper strip about three inches by ten inches long, or aluminum, or any metal of a non-ferrous kind with a clean surface.

The main factor to consider is that the two cabinets are properly connected to this ground. This prevents the possibility of any feedback due to the antenna of the DB-20 getting close to the output wires of the DB-20 and causing oscillation and also reduces the effect of signal leakage direct to the receiver due to the fact that the units are at a high impedance above ground. When this location and placement of the two units has been achieved, the connections can be made as indicated in Figure 1. The cable and plug indicated in the diagram are furnished with the DB-20 unit. In this twisted pair will be found one black wire and one black wire with red tracer. The black wire with the red tracer should be placed as indicated on the outside antenna post of the RME-69 Receiver. The black wire can be placed on the other antenna post and the ground should be connected to any good ground available. If it is certain that the bond is good, the ground as indicated on the DB-20 will be sufficient for the entire system.

Fig. 1



RADIO MFG. ENGINEERS, INC.

MODEL DB-20, Late
MODEL DB-20 Batt.
Trimmers, Chassis
Parts List

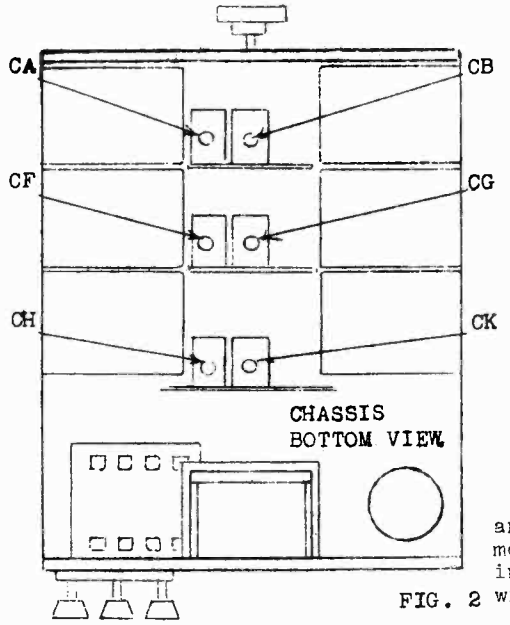
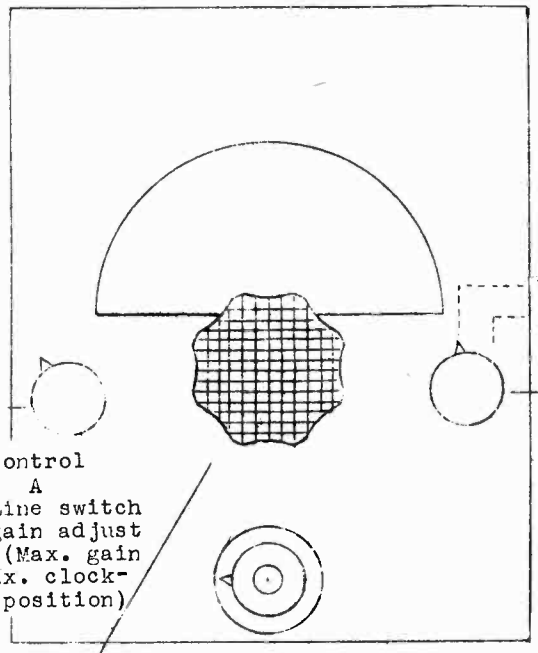


FIG. 2



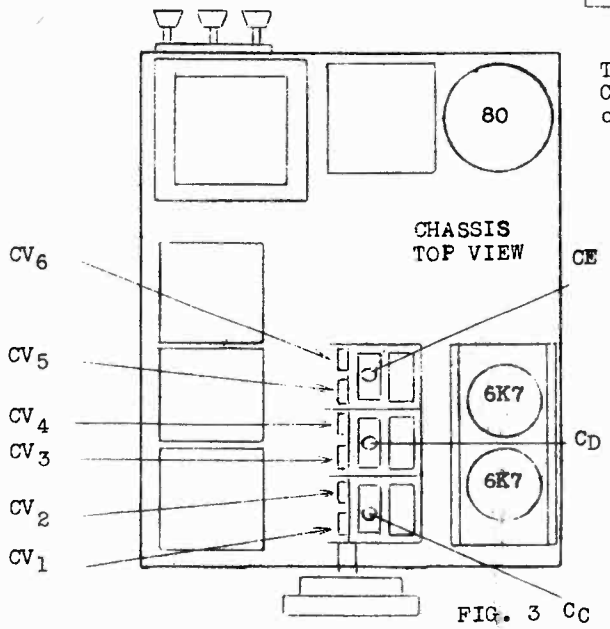


FIG. 3

PARTS LIST FOR DB-20

R_1 300 ohm		T_1	Power transformer
R_2 10,000 ohm		T_2	Filter choke
R_3 10,000 ohm			
R_4 30,000 ohm variable		C_a	5 - 30 μμfd adj. padder
R_5 300 ohm		C_b	5 - 50 μμfd adj. padder
R_6 10,000 ohm		C_f	5 - 30 μμfd adj. padder
R_7 15,000 ohm 10 watt		C_g	5 - 30 μμfd adj. padder
R_8 50,000 ohm 1 watt		C_h	5 - 30 μμfd adj. padder
	C_5 .01	C_k	5 - 50 μμfd adj. padder
C_1 .01	C_6 .01		
C_2 .01	C_7 .01	C_{V1-6}	Variable tuning condenser
C_3 .002	C_8 .0001		
C_4 .01	C_9 8 μfd.	C_c, C_d, C_e	Variable condenser trimmers
	C_{10} 12 μfd.		

BATTERY OPERATED DB-20 PARTS LIST

RESISTORS

1.1.....300 ohm
1.2..10,000 ohm
1.3..10,000 ohm
1.4..30,000 ohm variable
1.5.....300 ohm
1.6..10,000 ohm
1.7..50,000 ohm 1 watt

CONDENSERS

2.1..... .01
2.2..... .01
2.3..... .0001
2.4..... .01
2.5..... .01
2.6..... .01
2.7..... .01

CA	5 - 30 μμfd Adj. padder
CB	5 - 30 μμfd Adj. padder
CC	Variable condenser trimmers
CD	Variable condenser trimmers
CE	Variable condenser trimmers
CF	5 - 30 μμfd Adj. padder
CG	5 - 30 μμfd Adj. padder
CH	5 - 30 μμfd Adj. padder
CK	5 - 30 μμfd Adj. padder

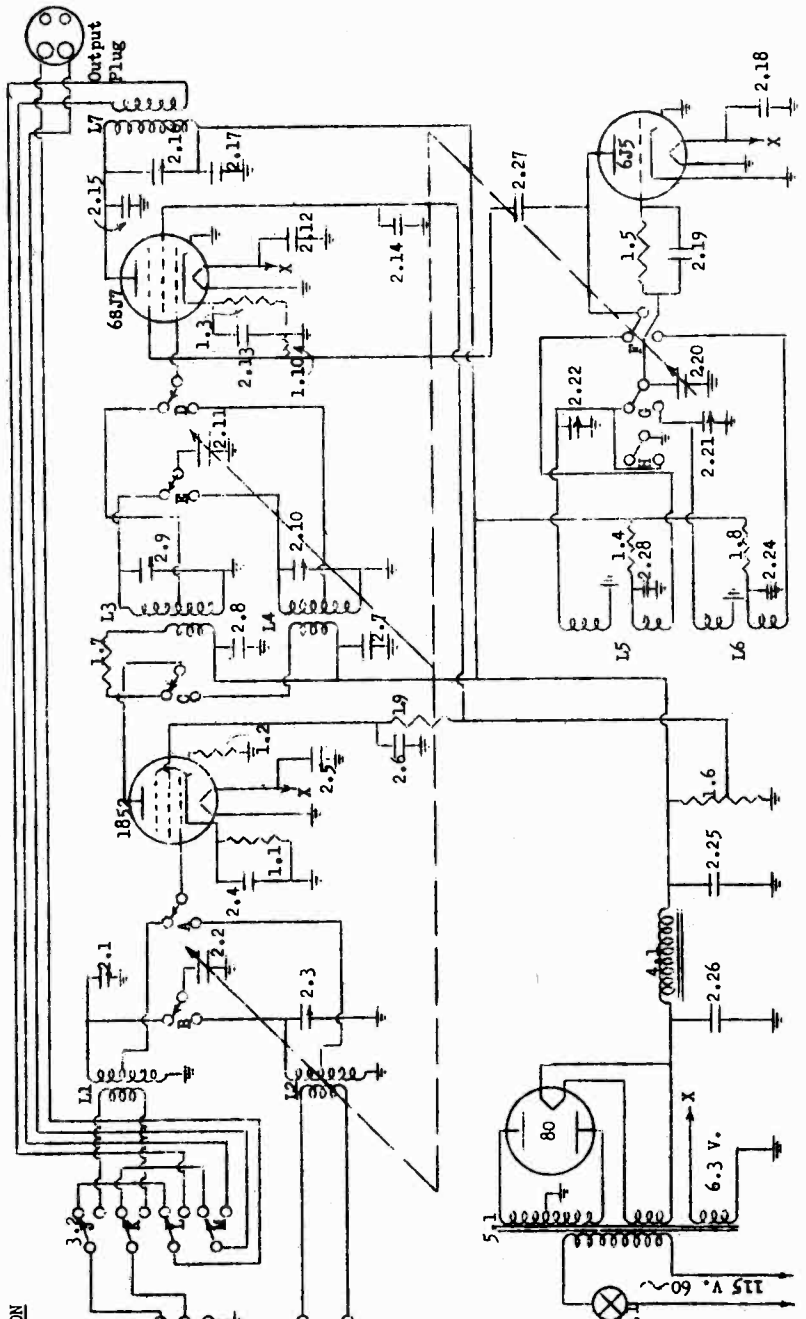
CV_1	Variable tuning condenser
CV_2	Variable tuning condenser
CV_3	Variable tuning condenser
CV_4	Variable tuning condenser
CV_5	Variable tuning condenser
CV_6	Variable tuning condenser

SWITCHES

3.1 Line switch
3.2 Antenna changeover switch
3.3 Band switch section
3.4 Band switch section
3.5 Band switch section

MODEL DM-30X
Schematic, Voltage

RADIO MFG. ENGINEERS, INC.



DM-30X SCHEMATIC

PART CODE NUMBER — SPECIFICATION

2.1	20 μμfd. condenser
2.2	Tuning condenser
2.3	20 μμfd. condenser
2.4	400 μμfd. condenser
2.5	400 μμfd. condenser
2.6	400 μμfd. condenser
2.7	400 μμfd. condenser
2.8	250 μμfd. condenser
2.9	20 μμfd. condenser
2.10	20 μμfd. condenser
2.11	Tuning Condenser
2.12	400 μμfd. condenser
2.13	400 μμfd. condenser
2.14	400 μμfd. condenser
2.15	50 μμfd. condenser
2.16	30 μμfd. condenser
2.17	.01 μfd. condenser
2.18	400 μμfd. condenser
2.19	100 μμfd. condenser
2.20	Tuning condenser
2.21	15 μμfd. condenser
2.22	15 μμfd. condenser
2.24	400 μμfd. mica condenser
2.25	15 μfd. condenser
2.26	10 μfd. condenser
2.27	50 μμfd. condenser
2.28	.002 μfd. mica condenser
3.1	S.P.S.T. Switch
3.2	(J,K,L,M) 4.P.D.T. Switch
A,B,C,D, E,F,G,H.	Band Switch
1.1	200 ohm, 1/3 watt resistor
1.2	35 ohm, 1/3 watt resistor
1.3	5000 ohms, 1/3 watt resistor
1.4	10,000 ohm, 1 watt resistor
1.5	5000 ohm, 1/3 watt resistor
1.6	15,000 ohm, 10 watts C.T.
1.7	35 ohm, 1/3 watt resistor
1.8	10,000 ohm, 1 watt resistor
1.9	5000 ohm, 1/3 watt resistor
1.10	1000 ohm, 1/3 watt resistor
4.1	Choke, 30 henries
5.1	Power transformer
L_1	Band 2 R.F. coil
L_2	Band 1 R.F. Coil
L_3	Band 2 Det. coil
L_4	Band 1 Det. coil
L_5	Band 2 Osc. coil
L_6	Band 1 Osc. coil
L_7	Output Coupling Transformer 1550KC

TEST VOLTAGES OF RME DM-30X

Measurements obtained with 115 v. A.C. line voltage:

R.F. Amplifier, cathode to ground	1 v. - 1.5 v.
R.F. Amplifier, plate to ground	210 v. - 240 v.
R.F. Amplifier, screen to ground	110 v. - 125 v.
Detector, cathode to ground	5 v. - 6 v.
Detector, plate to ground	210 v. - 240 v.
Detector, screen to ground	110 v. - 125 v.

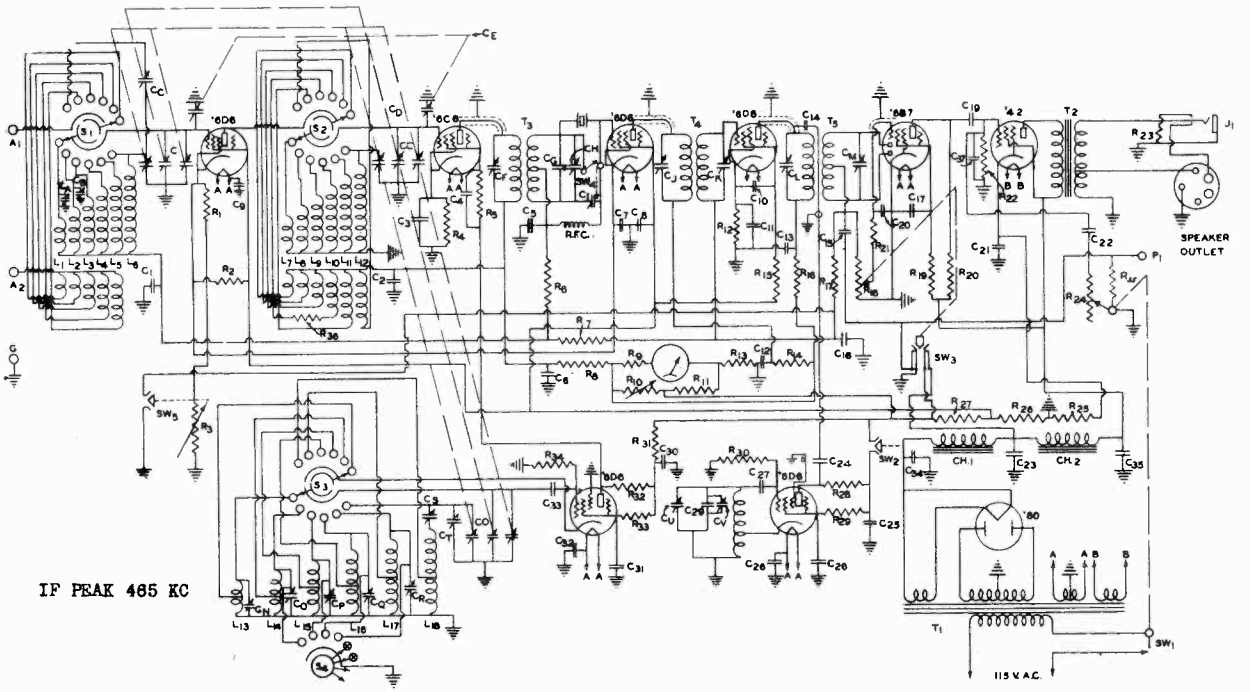
*Oscillator, plate to ground (oscillating) 125 v. - 140 v.
Osc., plate to ground (not oscillating).. 110 v. - 120 v.

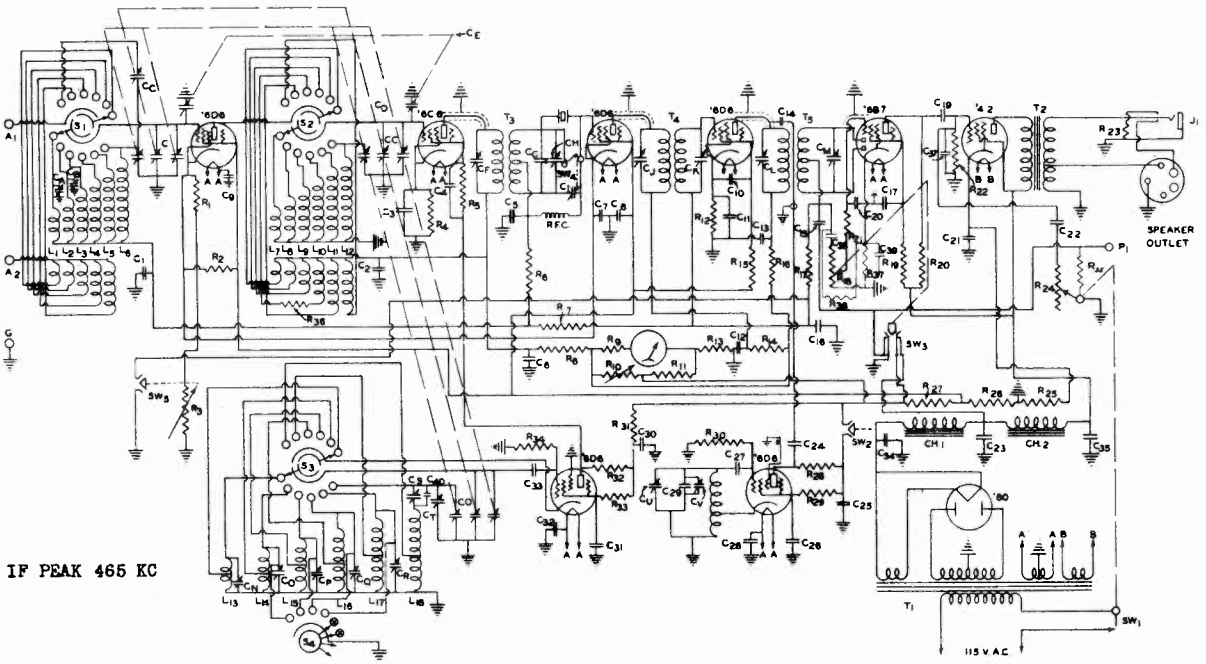
Note* This voltage must be measured at "B" plus end of plate coil to prevent application of voltmeter leads from affecting oscillator circuit.

This unit is in effect a frequency converter and therefore acts as a radio frequency amplifier and mixer tube with its oscillator in an over-all superheterodyne type of circuit. It must be used in connection with a regular receiver capable of tuning to a frequency of 1550 KC. The associated receiver therefore acts as an intermediate frequency amplifier unit and a demodulator and audio amplifier in order to reproduce the output of the expander.

MODEL 69 AC Late
MODEL 69AC Late Revised
Schematics

RADIO MFG. ENGINEERS. INC.

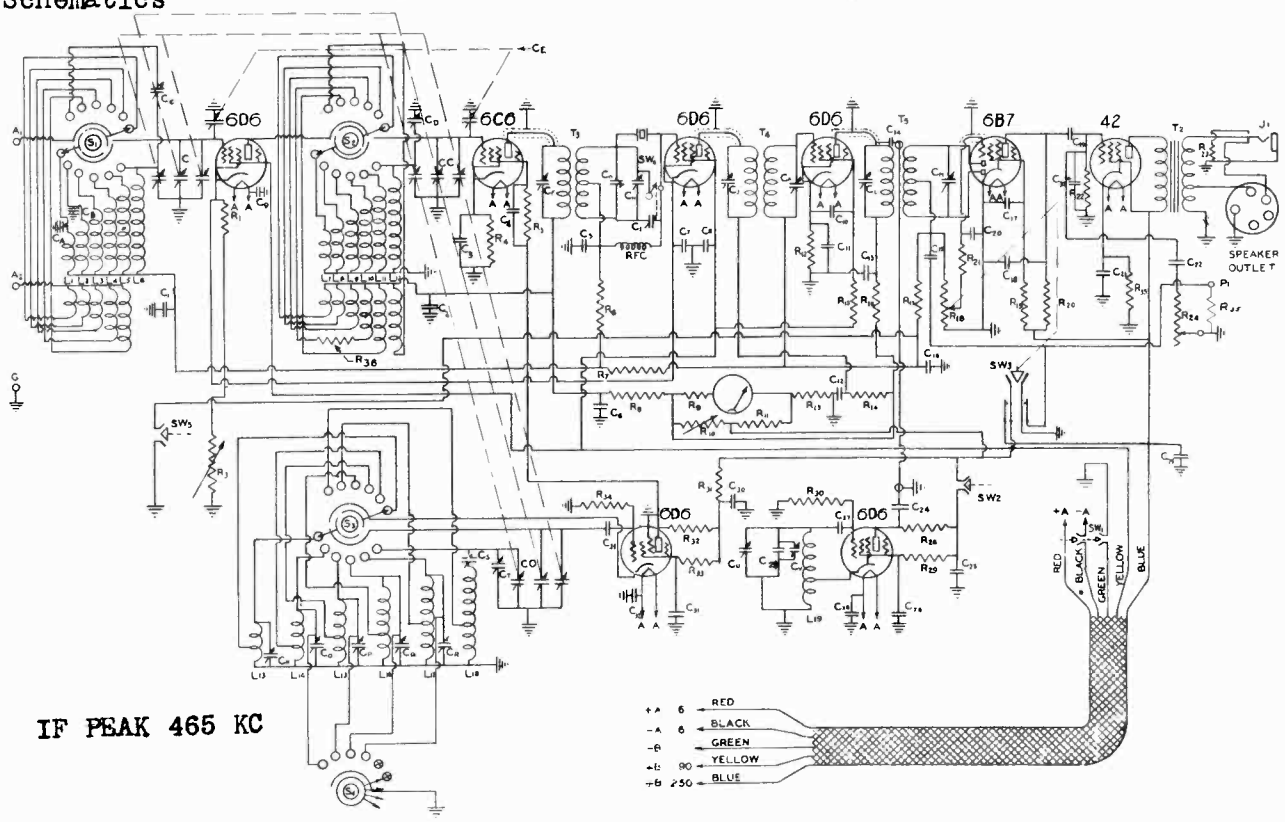




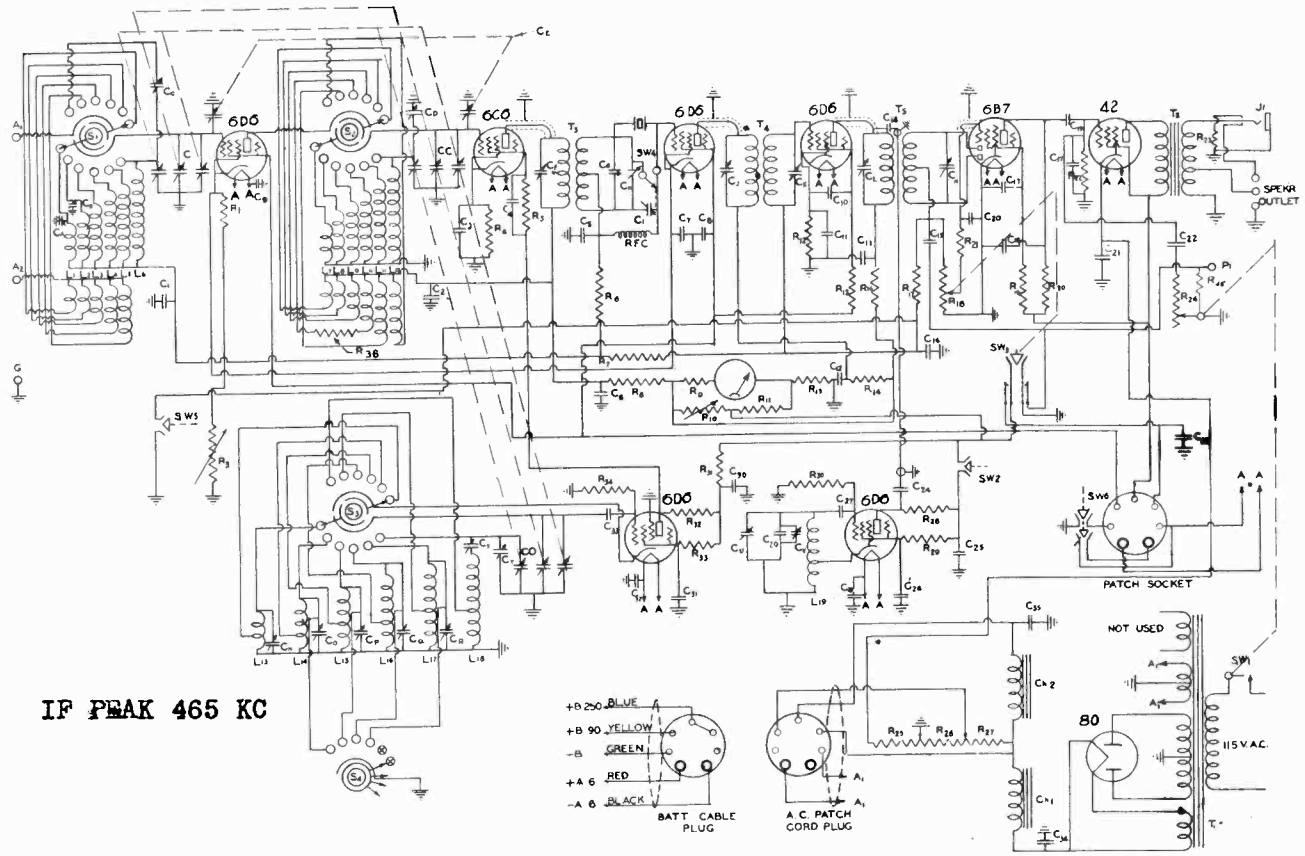
RADIO MFG. ENGINEERS, Inc.
111 HARRISON STREET PEORIA, ILLINOIS

MODEL 69A
MODEL 69B
Schematics

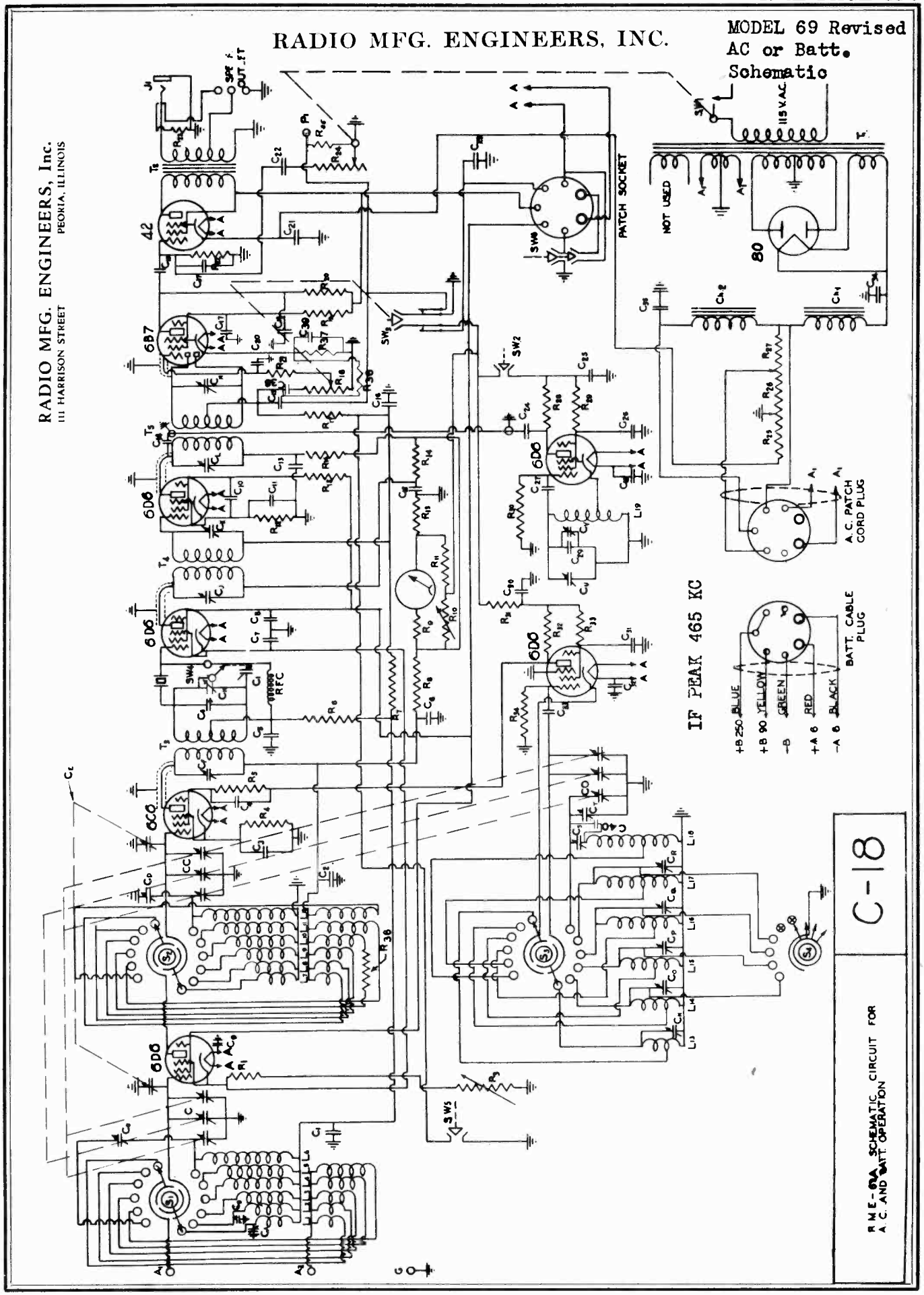
RADIO MFG. ENGINEERS, INC.



Schematic Diagram of RME 69-B for Battery Operation



Schematic Diagram of RME 69-A for AC or Battery Operation



RADIO MFG. ENGINEERS, INC.

LEGEND OF RESISTORS, CONDENSERS, CHOKES, AND TRANSFORMERS OF RME-69 RECEIVER SCHEMATIC DIAGRAM.

SPECIFICATION

C_a and C_b 30 μμfd. adjustable mica padders.
C_c 30 μμfd. mica padder.
C_d deleted.
C_e Dual section resonator control, 4 μμfd minimum, 30 μμfd maximum.
C_f, C_g, C_j, C_k, C_l, C_m. Adjustable trimming condensers in the intermediate frequency transformers.
C_h 25 μμfd midget air padder.
C_i 30 μμfd mica adjustable phasing condenser.
C_n, C_o, C_p, C_r 30 μμfd adjustable padders.
C_q 70 μμfd adjustable padder.
C_s .0004 mica condenser shunted by 70 μμfd. mica adjustable trimmer.
C_t Mica trimmer on the oscillator section of the main tuning condenser.
C_u 70 μμfd adjustable mica padder.
C_v 25 μμfd variable air condenser

C_1 .01 μfd 400 volts.
C_2 .01 μfd 400 volts.
C_3 .01 μfd 400 volts.
C_4 .01 μfd 400 volts.
C_5 .01 μfd 400 volts.
C_6 .1 μfd 400 volts.
C_7 .1 μfd 400 volts.
C_8 .1 μfd 400 volts.
C_9 .002 moulded mica condenser.
C_{10} .01 μfd 400 volts.
C_{11} .1 μfd 400 volts.
C_{12} .1 μfd 400 volts.
C_{13} .1 μfd 400 volts.
C_{14} 1" of shielded braid wrapped around plate lead of second intermediate frequency amplifier tube. Approximate capacity 10 μμfds.
C_{15} .00025 μμfd.
C_{16} .01 μfd. 400 volts.
C_{17} .1 μfd. 400 volts.
C_{19} .01 μfd 400 volts.
C_{20} .00025 μfd moulded mica condenser.
C_{21} 20 μfd 25 volt electrolytic.
C_{22} .01 μfd 400 volts.
C_{23} 12 μfd 450 volt electrolytic.
C_{24} .0001 moulded mica condenser.
C_{25} .01 μfd 400 volt electrolytic.
C_{26} .01 μfd 400 volts.
C_{27} .0001 μfd moulded mica.
C_{28} .01 μfd 400 volt.
C_{29} .00025 moulded ± 5%.
C_{30} .1 μfd 400 volts.
C_{31} .01 μfd. 400 volts.
C_{32} .01 μfd. 400 volts.
C_{33} .0001 μfd moulded ± 5%.
C_{34} 8 μfd 450 volt electrolytic.
C_{35} 8 μfd 450 volt electrolytic.
C_{37} .00025 μfd moulded condenser
C_{38} .1 μfd, 400 volts
C_{39} 20 μfd, 25 volt
C_{40} 400 μμfd, moulded mica

RFC 16 millhenries
CH_1 30 henries, 100 ma.
CH_2 30 henries, 50 ma.

L_1 Band 6 RF grid coil
L_2 Band 5 RF grid coil
L_3 Band 4 RF grid coil
L_4 Band 3 RF grid coil
L_5 Band 2 RF grid coil
L_6 Band 1 RF grid coil

S_1, S_2, S_3, S_4, Band Change Switch
SW_1 115 volt line switch
SW_2 Beat oscillator on and off switch
SW_3 Switch operated by control "H" for connecting monitor circuit and opening B supply to amplifier stage.
SW_4 Crystal switch for series of for paralllel
SW_5 Cut-off switch for removing AVC action (operated in tandem with R)

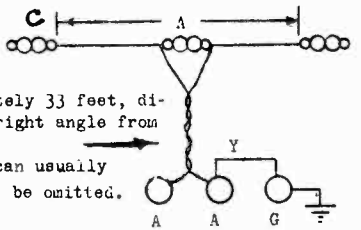
T_1 Main power trahsformer
T_2 Audio output transformer to 4,000 ohms and 600 ohms.
T_3 First intermediate frequency amplifier transformer.
T_4 Second intermediate frequency amplifier transformer.
T_5 Third intermediate frequency amplifier transformer.

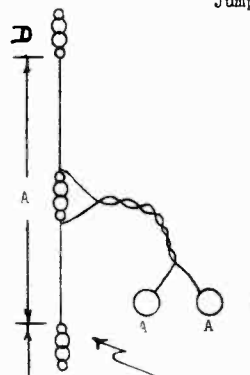
R_1 200 ohms, 1/2 watt
R_2 20,000 ohms, 1 watt
R_3 30,000 ohms, variable
R_4 5,000 ohms, 1/2 watt
R_5 1 megohm, 1/2 watt
R_6 250,000 ohms, 1/2 watt
R_7 100,000 ohms, 1/2 watt
R_8 2,000 ohms, 1/2 watt
R_9 500 ohms, 1/2 watt ±5%
R_{10} 200 ohms wire wound var. R meter balance
R_{11} 1,000 ohms. 1/2 watt
R_{12} 800 ohms, 1/2 watt
R_{13} 100,000 ohms, 2 watts
R_{14} 2,000 ohms, 1/2 watt
R_{15} 10,000 ohms, 1/2 watt
R_{16} 2,000 ohms, 1/2 watt
R_{17} 1 megohm, 1/2 watt
R_{18} 250,000 ohm potentiometer audio level control
R_{19} 1 megohm, 1/2 watt
R_{20} 100,000 ohms, 1/2 watt
R_{21} 50,000 ohms, 1/2 watt
R_{22} 250,000 ohms, 1/2 watt
R_{23} 5,000 ohms, 1/2 watt
R_{24} 1,000,000 ohms potentiometer
R_{25} 410 ohms bleeder section
R_{26} 7200 ohms, bleeder section
R_{27} 6800 ohms, bleeder section
R_{28} 10,000 ohms, 1/2 watt
R_{29} 100,000 ohms, 1/2 watt
R_{30} 100,000 ohms, 1/2 watt
R_{31} 2,000 ohms, 1/2 watt
R_{32} 2,000 ohms, 1/2 watt
R_{33} 50,000 ohms, 1/2 watt
R_{35} 10,000 ohms, 1/2 watt
R_{36} 5,000 ohms, 1/2 watt
R_{37} 1,000 ohms, 1/2 watt
R_{38} 100,000 ohms, 1/2 watt
R_{34} 50,000 ohms, 1/2 watt

L_7 Band 6 first detector grid coil
L_8 Band 5 first detector grid coil
L_9 Band 4 first detector grid coil
L_{10} Band 3 first detector grid coil
L_{11} Band 2 first detector grid coil
L_{12} Band 1 first detector grid coil
L_{13} Band 6 oscillator coil
L_{14} Band 5 oscillator coil
L_{15} Band 4 oscillator coil
L_{16} Band 3 oscillator coil
L_{17} Band 2 oscillator coil
L_{18} Band 1 oscillator coil

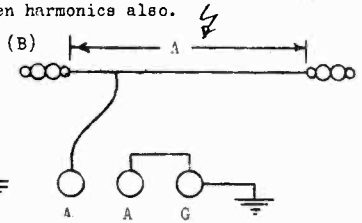
The antenna input impedance to an RME-69 Receiver varies in the vicinity of 250 to 350 ohms. The antenna supply should therefore be of the Marconi type which is fed at current maximum to the receiver or of the twisted pair type where impedances of lines involved are in the vicinity of the 250 ohms previously mentioned. For maximum selectivity insofar as the input circuit is concerned, the value of this impedance should be taken into account. Antennae which are supplying signal to the receiver at a high potential point should not be used in conjunction with the RME-69 Receiver because of the great loss in voltage transfer encountered in such a combination. The half-wave doublet type of antenna providing a tuned antenna system for a certain range of frequencies has certain marked directional characteristics. These directiona characteristics are evident in the fact that the greatest pick-up occurs in a direction at right angles to the axis of the antenna, forming in effect a Figure 8 pattern in which the lobes are located off the sides of the antenna instead of off the ends.

C-Optimum condition when A = ½ Not satisfactory for wide range freq. Excellent for any amateur band if A = ½ is in the middle of the band. For example For 20 meter band antenna should be designed for 14,200 KC.

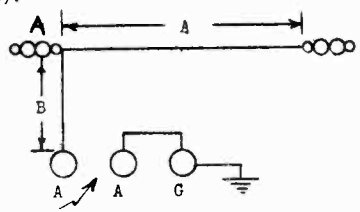




B Optimum signal input to receiver when A = ½ ; and feeder is tapped at proper distance from center. This antenna works quite well usually on even harmonics also.



D Dimensions same as those of C. Antenna good for one narrow band. (For example Amateur band). Is not directional



A General Marconi connection. Optimum condition exists when A plus B = ¾ ¼ ¼ etc.

RADIO MFG. ENGINEERS, INC.

MODEL 69
Voltage

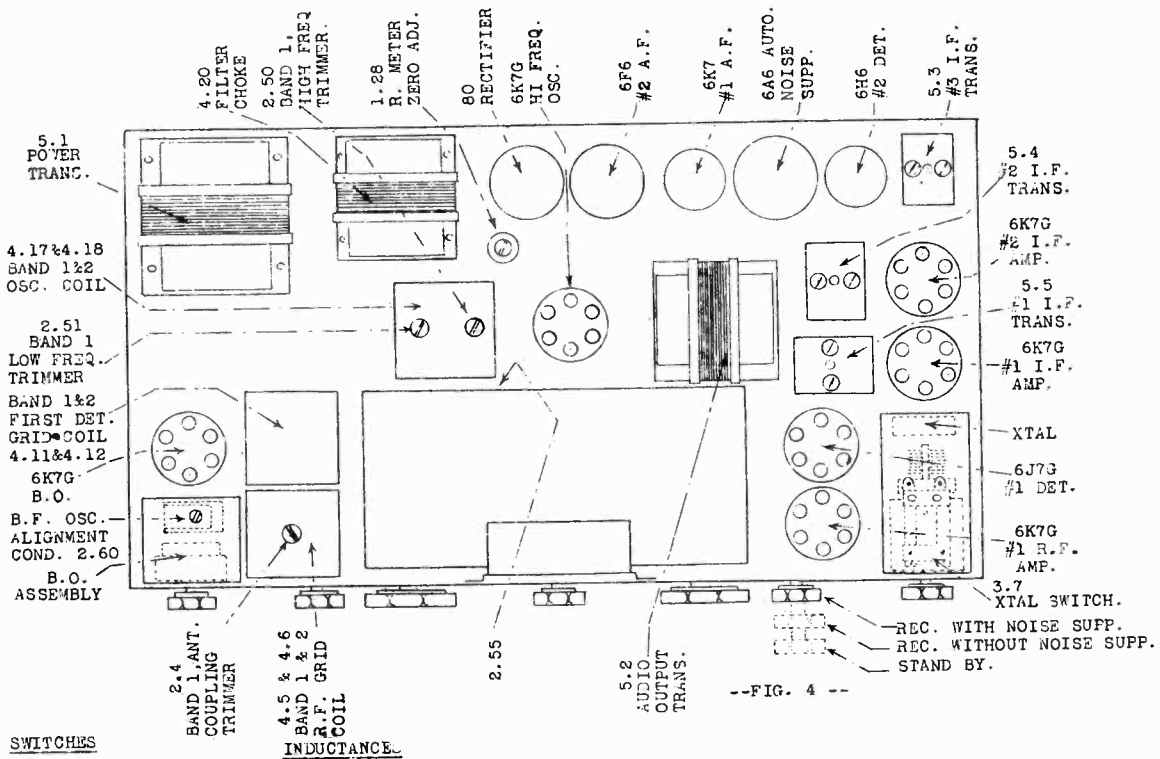
TEST VOLTAGES OBTAINED AT VARIOUS POINTS IN THE RECEIVER CIRCUIT (Measurements made with voltmeter having internal resistance of 1,000 ohms per volt. Instruments with other internal resistances give entirely different readings) Note: Line voltage should be 115 v.

PLACE TEST PRODS BETWEEN	CORRECT VOLTAGE (Switch "H" in toward panel)	CORRECT VOLTAGE (Switch "H" pulled outward fm. panel)
Radio frequency amplifier plate and ground	240 volts	0 volts
Radio frequency amplifier screen and ground	100 "	0 "
Radio frequency amplifier cathode and ground	3.2 "	0 "
First detector plates	240 "	0 "
First detector screen and ground	75 "	0 "
First detector cathode and ground	3.5 "	0 "
First intermediate frequency amplifier plate and ground	250 "	0 "
First intermediate frequency amplifier screen and ground	100 "	0 "
Intermediate frequency amplifier cathode and ground	3.2 "	0 "
(The same voltages apply to the second intermediate frequency amplifier tube elements)		
6B7 plate and ground	115 "	145 "
6B7 screen and ground	25 "	35 "
42 plate and ground	244 "	280 "
42 screen and ground	248 "	290 "
42 cathode and ground	16 "	18 "
80 rectifier filament and ground	258 "	335 "
Oscillator plate and ground	248 "	0 "
Oscillator screen and ground	115 "	0 "
Beat oscillator plate and ground	180 "	210 "
Beat oscillator screen and ground	100 "	130 "
The voltage across R-31	14 "	0 "

These voltages are subject to a fluctuation of plus or minus 15% without indication of material difficulties.

MODEL 70
Chassis, Socket,
Trimmers,
Switch Data

RADIO MFG. ENGINEERS, INC.



--FIG. 4 --

SWITCHES

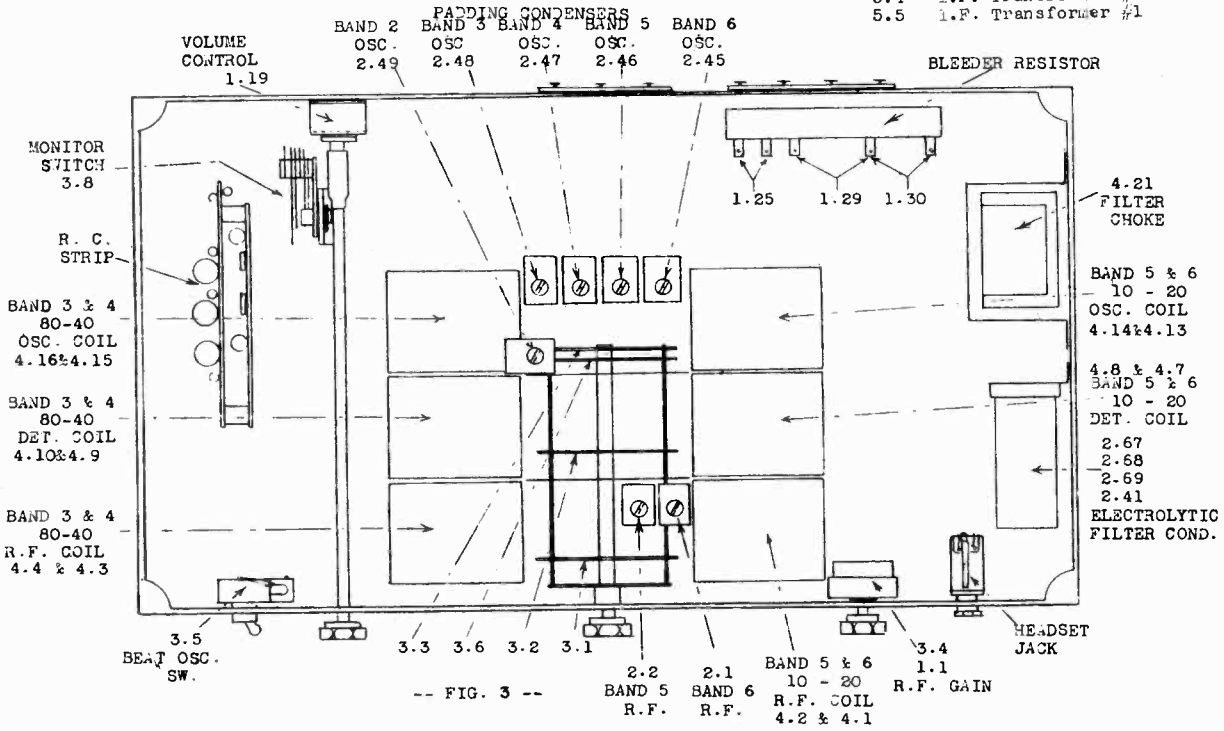
3.1	Band change switch
3.2	Band change switch
3.3	Band change switch
3.4	AVC On-Off
3.5	Beat Oscillator
3.6	Band change switch
3.7	Crystal switch
3.8	Noise suppressor and stand-by.
3.9	Line switch

INDUCTANCE

4.1	Band 6 R.F. Grid coil	4.10	Band 3 1st Det. coil	4.19	Beat Oscillator coil
4.2	Band 5 R.F. Grid coil	4.11	Band 2 1st Det. coil	4.20	30H 100MA Filter choke
4.3	Band 4 R.F. Grid coil	4.12	Band 1 1st Det. coil	4.21	30H 50 MA Filter choke
4.4	Band 3 R.F. Grid coil	4.13	Band 6 Osc. coil	RFC	10MH R.F. Choke
4.5	Band 2 R.F. Grid coil	4.14	Band 5 Osc. coil		
4.6	Band 1 R.F. Grid coil	4.15	Band 4 Osc. coil		
4.7	Band 6 1st Det. coil	4.16	Band 3 Osc. coil		
4.8	Band 5 1st Det. coil	4.17	Band 2 Osc. coil		
4.9	Band 4 1st Det. coil	4.18	Band 1 Osc. coil		

TRANSFORMERS

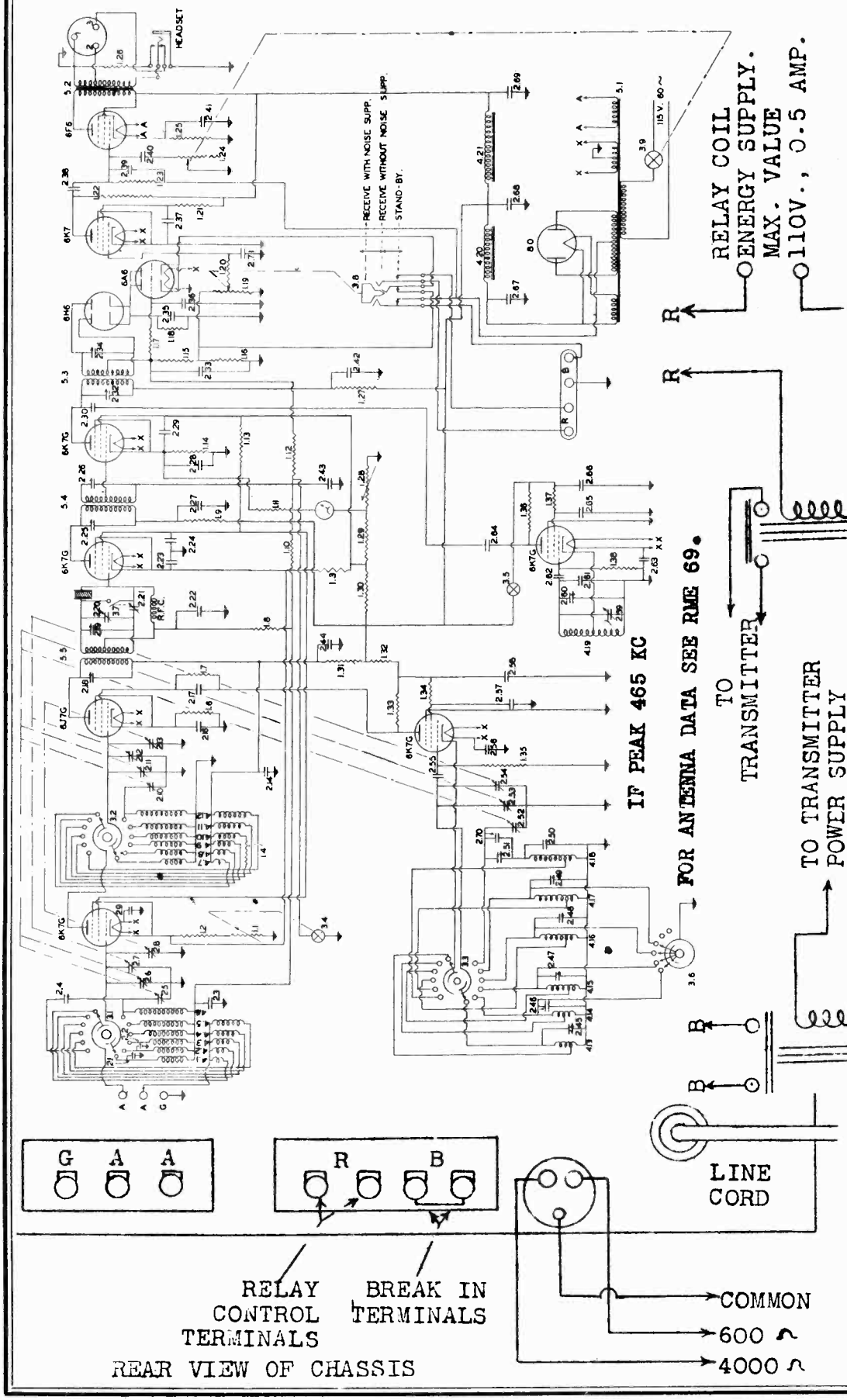
5.1	Power transformer
5.2	Audio transformer
5.3	I.F. Transformer #3
5.4	I.F. Transformer #2
5.5	I.F. Transformer #1



-- FIG. 3 --

RADIO MFG. ENGINEERS, INC.

MODEL 70
Schematic



RELAY TO CONTROL TRANSMITTER.

TYPICAL CIRCUIT DIAGRAM OF CONNECTING OF CONTROL OF RECEIVER. TERMINAL PAIR MARKED B ON RECEIVER CONNECT TO B - B. CIRCUIT BETWEEN B PAIR IS CLOSED WHEN RELAY OR REMOTE SWITCH IS CLOSED DURING TRANSMITTER STAND-BY PERIODS.

RELAY CONTROL CIRCUIT OF RECEIVER. LEADS R - R CONNECT TO TERMINAL PAIR MARKED R., ON RECEIVER.

RELAY CLOSES WHEN RECEIVER STAND-BY CONTROL IS PULLED OUTWARD FROM PANEL. (MAXIMUM POSITION)

TEST VOLTAGES OBTAINED AT VARIOUS POINTS IN THE RECEIVER CIRCUIT
(Measurements made with voltmeter having internal resistance of 1,000 ohms per volt. Instruments with other internal resistances give entirely different readings) Note: Line voltage should be 115v.

PLACE TEST PRODS BETWEEN	CORRECT VOLTAGE (Switch marked Audio level and Standby in toward panel)	CORRECT VOLTAGE (Switch marked Audio level and Standby out ward from panel.)
Radio frequency amplifier plate and ground.	240 volts	0 volts
Radio frequency amplifier screen and ground	100 volts	0 volts
Radio frequency amplifier cathode and ground	3.2 volts	0 volts
First detector plates	240 volts	0 volts
First detector screen and ground	75 volts	0 volts
First detector cathode and ground	3.5 volts	0 volts
First intermediate frequency amplifier screen and ground	100 volts	0 volts
First intermediate frequency amplifier plate and ground	250 volts	0 volts
6K7 Audio Amp. plate and ground	115 volts	0 volts
6K7 screen and ground	25 volts	0 volts
6F6 plate and ground	244 volts	0 volts
6F6 screen and ground	248 volts	0 volts
6F6 cathode and ground	16 volts	0 volts
80 rectifier filament and ground	258 volts	0 volts
Oscillator plate and ground	248 volts	0 volts
Oscillator screen and ground	115 volts	0 volts
Beat oscillator plate and ground	180 volts	0 volts
Beat oscillator screen and ground	100 volts	0 volts
The voltage across 1.32	14 volts	0 volts

These voltages are subject to a fluctuation of plus or minus 15% without indication of material difficulties.

RME-70 PARTS LIST

Resistors

1.1	30,000 ohm variable
1.2	150 ohm 1/2 watt
1.3	20,000 ohm 1 watt
1.4	5,000 ohm 1/2 watt
1.6	5,000 ohm 1/2 watt
1.7	1 megohm 1/2 watt
1.8	250,000 ohm 1/2 watt
1.9	2,000 ohm 1/2 watt
1.10	100,000 ohm 1/2 watt
1.11	35 ohm 1/2 watt
1.12	1 megohm 1/2 watt
1.13	5,000 ohm 1/2 watt
1.14	150 ohm 1/2 watt
1.15	50,000 ohm 1/2 watt
1.16	50,000 ohm 1/2 watt
1.17	1 megohm 1/2 watt
1.18	100,000 ohm 1/2 watt
1.19	250,000 ohm volume control
1.20	50,000 ohm 1/2 watt
1.21	1 megohm 1/2 watt
1.22	100,000 ohm 1/2 watt
1.23	250,000 ohm 1/2 watt
1.24	1 megohm potentiometer
1.25	410 ohm section of bleeder
1.26	5,000 ohm 1/2 watt
1.27	2,000 ohm 1/2 watt
1.28	200 ohm 4 meter pot.
1.29	7,200 ohm bleeder
1.30	6,800 ohm bleeder
1.31	2,000 ohm 1/2 watt
1.32	2,000 ohm 1/2 watt
1.33	2,000 ohm 1/2 watt
1.34	50,000 ohm 1/2 watt
1.35	50,000 ohm 1/2 watt
1.36	10,000 ohm 1/2 watt
1.37	100,000 ohm 1/2 watt
1.38	100,000 ohm 1/2 watt

Condensers

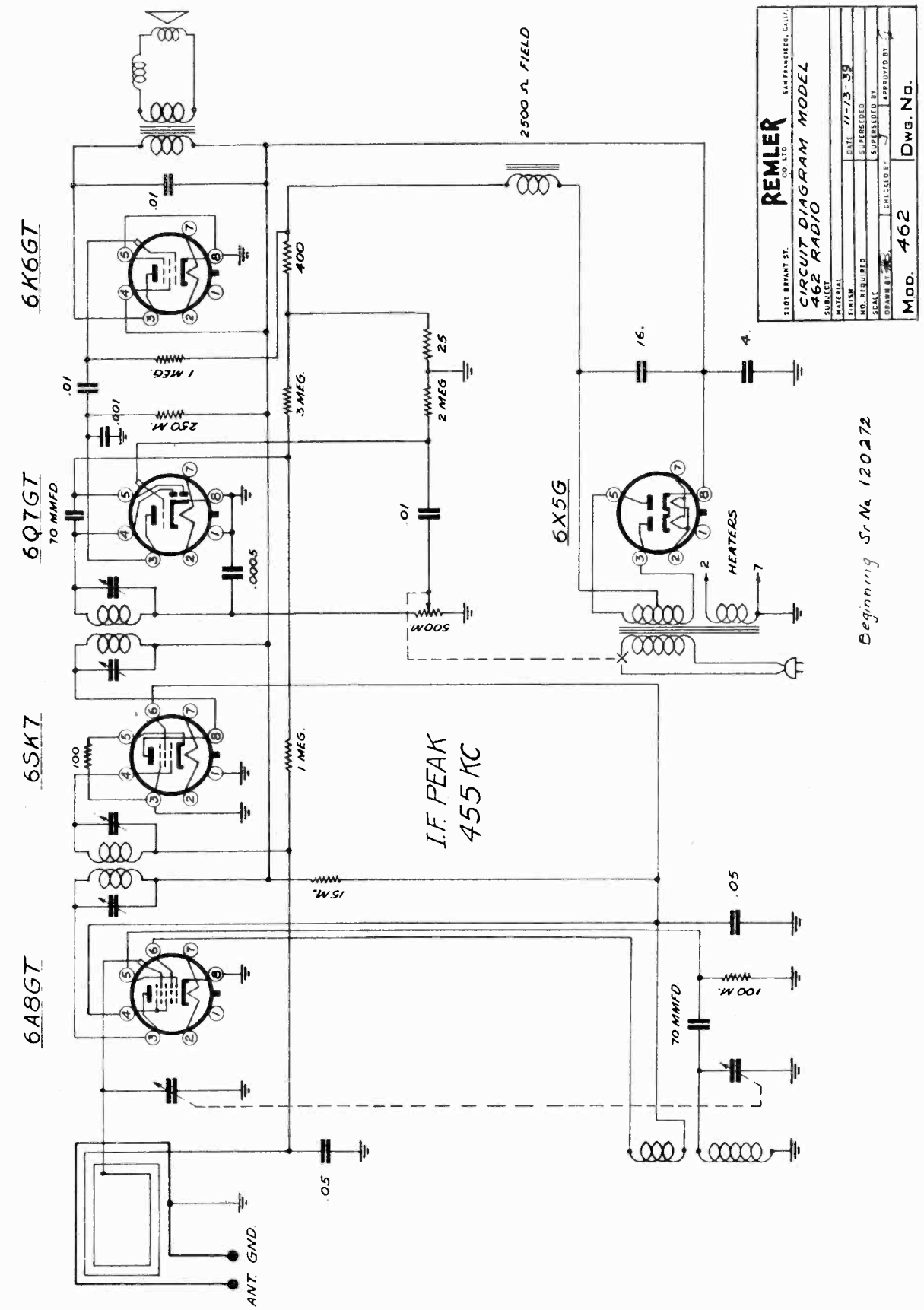
2.1	30 μμfd Adj.
2.2	30 μμfd Adj.
2.3	.01 μfd 400 volt
2.4	30 μμfd Adj.
2.5	Tuning condenser
2.6	Tuning condenser
2.7	Bandspread condenser
2.8	Resonator
2.9	.002 Mica
2.10	Tuning condenser
2.11	Tuning condenser
2.12	Bandspread condenser
2.13	Resonator
2.14	.01 400 volt
2.16	.01 400 volt

Condensers cont.

2.17	.01 400 volt
2.18	I.F. Trimmer
2.19	I.F. Trimmer
2.20	25 μμfd variable
2.21	30 μμfd Adj.
2.22	.01 400 volt
2.23	.1 400 volt
2.24	.1 400 volt
2.25	I.F. Trimmer
2.26	I.F. Trimmer
2.27	.1 400 volt
2.28	.1 400 volt
2.29	.01 400 volt
2.30	1" of shielded braid--Capacity approximately 10 μμfd.
2.32	I.F. Trimmer
2.33	.00005 Mica
2.34	I.F. Trimmer
2.35	.00005 Mica
2.36	.1 400 volt
2.37	.1 400 volt
2.38	.01 600 volt
2.39	.00025 Mica
2.40	.01 400 volt
2.41	40 μfd 25 v. electrolytic
2.42	.1 400 volt
2.43	.01 400 volt
2.44	.1 400 volt
2.45	30 μμfd Adj.
2.46	70 μμfd Adj.
2.47	50 μμfd Adj.
2.48	30 μμfd Adj.
2.49	30 μμfd Adj.
2.50	30 μμfd Adj.
2.51	.0004 Mica
2.52	Tuning condenser
2.53	Tuning condenser
2.54	Bandspread condenser
2.55	.0001 Mica 5% Tol.
2.56	.0004 Mica
2.57	.01 400 volt
2.58	.1 400 volt
2.59	25 μμfd variable
2.60	50 μμfd Adj.
2.61	.00025 Mica
2.62	.0001 Mica
2.63	.01 400 volt
2.64	.00025 Mica
2.65	.01 400 volt
2.66	.01 400 volt
2.67	10 μfd 450 V. Elec.
2.68	15 μfd 450 V. Elec.
2.69	15 μfd 450 V. Elec.
2.70	70 μμfd Adj.
2.71	.00025 Mica

REMLER COMPANY, LTD.

MODEL 462
Schematic



MODELS 463,464,465,470
Schematic,Tuner,Notes

REMLER COMPANY, LTD.

MODELS 463, 464, 465
and 470

This is a six tube superheterodyne receiver, operating on 110 - 120 volts, 50 or 60 cycles current.

INSTALLATION

This receiver may be used with the Built-In antenna where receiving conditions are favorable. When greater distance is required, or where receiving conditions are not satisfactory with the Built-In antenna, an outside antenna may be used. This outside aerial should be from 50 to 100 feet in length and should be connected to the terminal on the back of the cabinet marked A. The outside aerial should be run in as straight a line as possible and be kept clear of wires or other metal objects. A good ground connection to a water pipe is essential for clearest reception. The ground lead should be connected to the terminal marked G and should be as short as possible.

CONTROLS

The control on the left of the cabinet is the volume control and ON and OFF switch when in the extreme left position. On the right side of the receiver is located the station selector or tuning control. On Models 463, 465 and 470 the center knob controls the high frequency response. When turned to the left the full tone range of the program is reproduced. Turning the control to the right diminishes the higher frequency tones. A position approximately one quarter turn from the left position is satisfactory for most programs. On Model 464, this control is on the back of the receiver. The antenna switch on the back of the cabinet changes the connections to either the Built-In or Outside Aerial when one is used.

OPERATION

With the line cord connected turn the volume control about one half turn to the right and allow about one half minute for the tubes to properly heat. Select the desired station with the tuning control, varying the control until the tuning indicator produces the narrowest shadow. Adjust the volume control to the desired level and the tone control for the most pleasing response. For best quality be certain the station is properly tuned in as indicated by the tuning indicator.

AUTOMATIC PUSH BUTTON TUNING-MODELS 464 and 470

The push buttons are adjusted for selecting five stations as indicated by the call letters over the buttons. To receive any one of these stations, turn on the receiver as described above and depress the button corresponding to the desired station. Adjust the volume to the intensity required. To use the tuning control for selecting the stations, depress the DIAL button. Directions for changing the push button station set up are attached to the bottom of the cabinet.

PHONOGRAPH-MODEL 465

This model is provided with a record player which reproduces up to 12 inch recordings with the cabinet top closed. To change over to phonograph, turn the volume control to the right about half a turn and throw the record switch, located in the top of the cabinet, to the right. Volume and tone may be adjusted as with the radio operation. Use a heavy needle for best reproduction.

SERVICE DATA

The antenna switch on the back of the receiver changes the input circuit to either the enclosed loop antenna or to an outside aerial. The trimmer for this circuit is on the rear section of the variable condenser, while the oscillator trimmer is on the front section of the variable condenser. Trimmers for the I.F. circuits are adjustable through holes on the tops of the I.F. transformer shields. The intermediate frequency is 455 K.C.

Trimmers for the push button circuits are accessible through an opening in the bottom of the cabinet. The oscillator gang is nearest the front of the cabinet. The lowest frequency range sections are on the left.

The following tubes are used in this receiver:

6A8GT	-	Mixer Oscillator
6SK7	-	I.F. Amplifier
6SQ7	-	Detector - A.F. Amplifier
6V6GT	-	Power Amplifier
6X5G	-	Rectifier
6V5	-	Tuning Indicator

Type 46 dial lamps

Voltage Readings

A.C. Voltages

Line	120 volts
Heater	6 "

D.C. Voltages
From Ground to-

6X5G	Cathode	235 volts
6V6GT	Plate	225 "
6V6GT	Screen	235 "
6V6GT	Grid Bias Supply	18 "
6SQ7	Plate	110 "
6SQ7	Grid Bias Supply	1.1 "
6SK7	Plate	235 "
6SK7	Screen	105 "
6SK7	Cathode	1.3 "
6A8GT	Plate	235 "
6A8GT	Screen	105 "
6A8GT	Oscillator Plate	105 "

REMLER
CO. LTD
CIRCUIT DIAGRAM MODEL 463-470 RADIO
DATE 11/1/39
Mod. 463-470 Dwg. No.