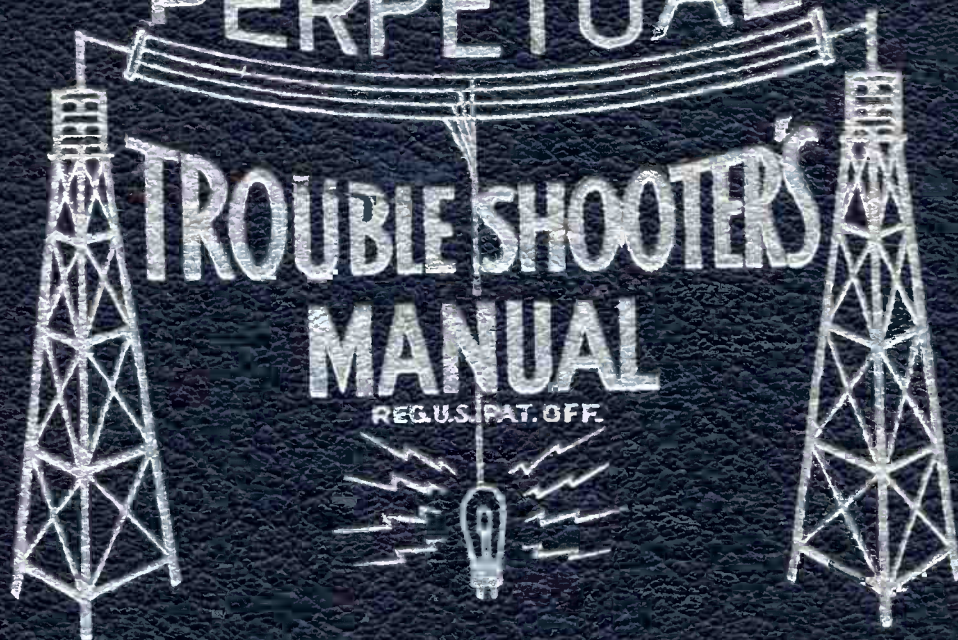


VOLUME XII

PERPETUAL



REG. U.S. PAT. OFF.

JOHN F. RIDER



DETROLA CORP.

MODELS 327, 3271, 3331, 3332

ALIGNMENT PROCEDURE

Turn the band switch to the Broadcast position.

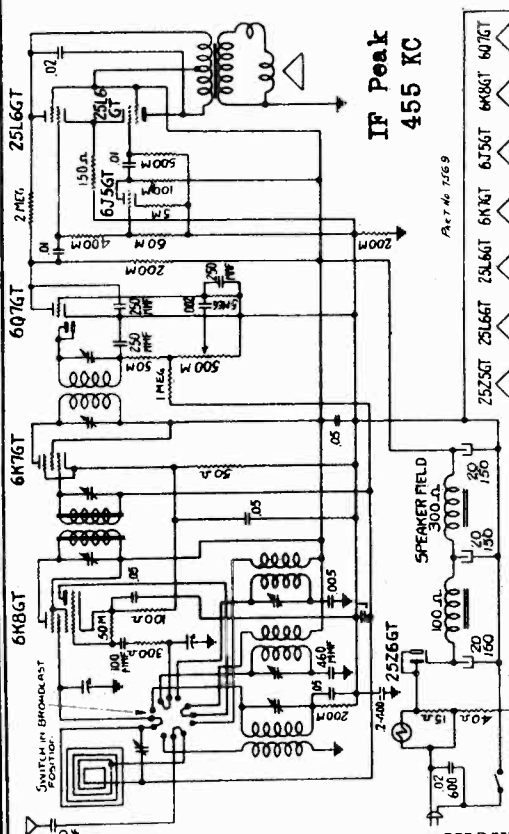
Connect an output meter across the speaker voice coil. The volume control should be set a few degrees from the maximum volume position. Use a weak signal from the generator, strong signals tend to cause improper adjustments.

IF alignment: Connect the signal generator ground to the receiver chassis through a .1 mfd. condenser. Using a .1 mfd. condenser in series with the high side of the generator, apply a 455 kc. signal to the grid of the 6K7GT tube and align the 2nd IF transformer. Connect to the grid of the 6K8 tube and align the 1st IF transformer. (See Tube Layout Diagram for location of these adjustments.) From this position recheck both transformers again.

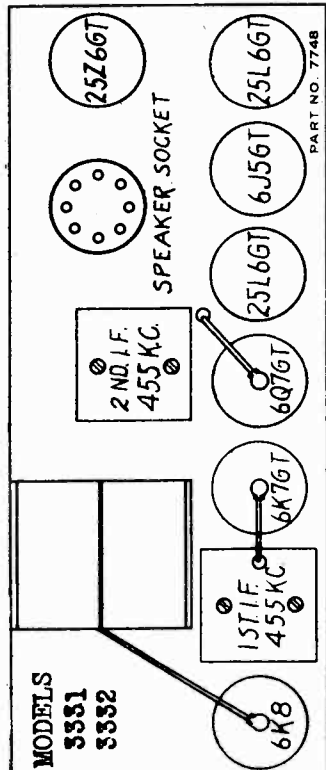
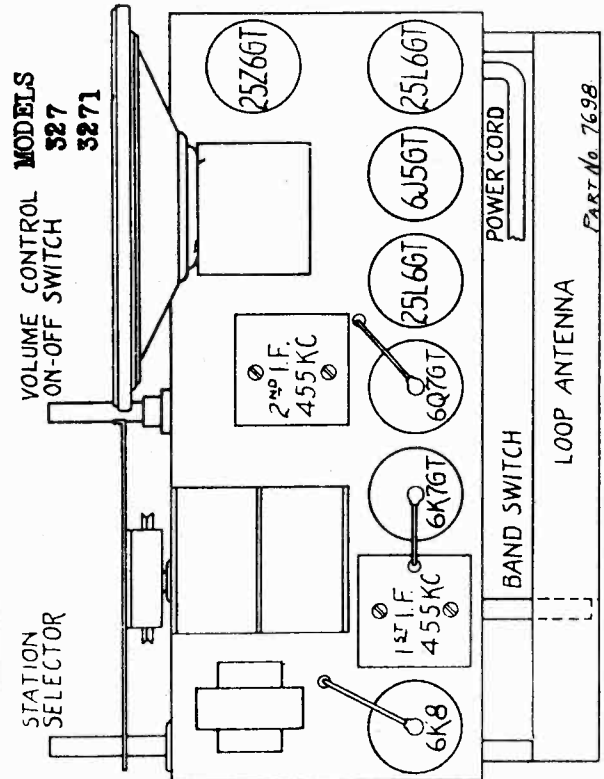
Broadcast Band Alignment: Turn the band switch to the Broadcast position, turn the tuning condenser all the way to the right, (minimum capacity), apply a 1720 kc. signal to the grid of the 6K8 tube and adjust the broadcast oscillator trimmer. The oscillator coil is under the right hand end of the chassis and this trimmer is the one nearest the front of the chassis. To align the loop antenna, connect a single turn loop across the terminals of the generator, place the receiver about one foot in front of the single turn loop, set the generator at about 1400 kc., tune in the signal and adjust the trimmer on the loop antenna assembly for maximum response.

Short Wave Alignment: Using a 400 ohm resistor between the high side of the generator and the antenna terminal (on the LOOP frame), turn the tuning condenser to minimum capacity, set the generator at 18,500 kc., and adjust the short wave oscillator trimmer. This trimmer is immediately in back of the broadcast oscillator trimmer. Set the generator at about 17,000 kc., tune in the signal and adjust the short wave antenna trimmer for maximum response. This trimmer is mounted on the loop antenna.

NOTE: If considerable hum appears when the generator is connected as described above use smaller condensers between the generator and the receiver. The best way is to use a 1:1 transformer to isolate either the receiver or the generator from the line. The adjustments of this receiver are very stable and no aligning should be attempted unless absolutely necessary.



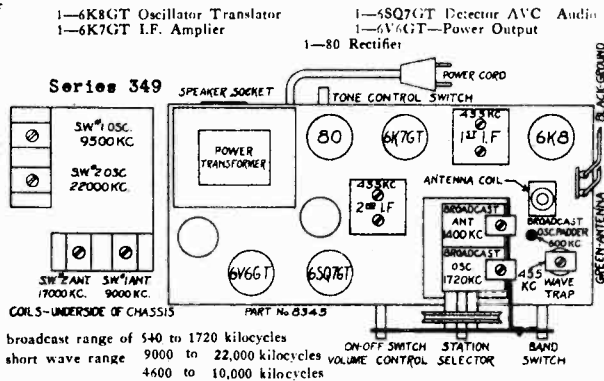
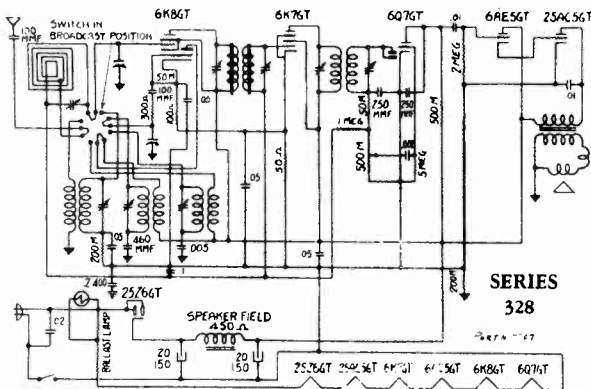
Part Number	Description	Part Number	Description
7564	Loop Antenna Assembly	6623	1st IF Transformer
7566	Oscillator Coil	6624	2nd IF Transformer
6625	Volume Control and Switch	7028	Antenna Reel and Wire
7567	Variable Condenser	7570	Dial Chart
5780	20 MF 150 Volt Electrolytic Condenser	7096	Pointer
7664	460 MIMF Padding Condenser	7746	8" Speaker
7660	Filter Choke 100 Ohm	7575	Wave Switch
7661	Candohm Resistor—15/40 Ohm	7576	Speaker, 5"
7326	150 Ohm Wire Wound Resistor		
			short wave range 5.55 to 18.5 megacycles •
			105 to 125 volts D.C. or 50-60 cycle A.C.
			broadcast range 540 to 1720 K.C.
			1—6K8 Translator-Oscillator
			6K7GT—Intermediate Frequency Amplifier
			1—6J5GT Phase Inverter
			2—25L6GT Power Output
			1—6Q7GT Detector-AVC-First Audio
			1—25Z6GT Rectifier



NO GROUND IS NECESSARY AND UNDER NO CONDITION SHOULD A GROUND CONNECTION BE MADE TO THIS RECEIVER.

MODEL 328  
MODEL 349

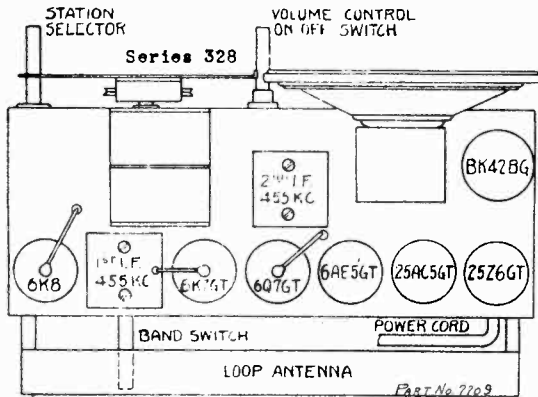
DETROLA CORP.



Part Number	Description	Series 328	Part Number	Description
7564	Loop Antenna Assembly		6623	1st IF Transformer
7566	Oscillator Coil		6624	2nd IF Transformer
6625	Volume Control and Switch		7028	Antenna Reel and Wire
7577	Variable Condenser		7570	Dial Chart
5780	20 MF 150 Volt Electrolytic Condenser		7096	Pointer
7644	400 MMF Padding Condenser		7710	Speaker, 5"
7575	Wave Switch			
5197	Ballast Tube			

- 6K7GT—Intermediate Frequency Amplifier
- 1—6K8 Translator-Oscillator
- 1—6Q7GT Detector-AVC-First Audio
- 1—6AE5GT Driver
- 1—25AC5GT Power Output
- 1—25Z6GT Rectifier

NO GROUND IS NECESSARY AND UNDER NO CONDITION SHOULD A GROUND CONNECTION BE MADE TO THIS RECEIVER.



ALIGNMENT PROCEDURE

328 SERIES

Turn the band switch to the Broadcast position. Connect an output meter across the speaker voice coil. The volume control should be set a few degrees from the maximum volume position. Use a weak signal from the generator, strong signals tend to cause improper adjustments.

**IF alignment:** Connect the signal generator ground to the receiver chassis through a .1 mfd. condenser. Using a .1 mfd. condenser in series with the high side of the generator, apply a 455 kc. signal to the grid of the 6K7GT tube and align the 2nd IF transformer. Connect to the grid of the 6K8 tube and align the 1st IF transformer. (See Tube Layout Diagram for location of these adjustments.) From this position check both transformers again.

**Broadcast Band Alignment:** Turn the band switch to the Broadcast position, turn the tuning condenser all the way to the right, (minimum capacity), apply a 1720 kc. signal to the grid of the 6K8 tube and adjust the broadcast oscillator trimmer. The oscillator coil is under the right hand end of the chassis and this trimmer is the one nearest the front of the chassis. To align the loop antenna, connect a single turn loop across the terminals of the generator, place the receiver about one foot in front of the single turn loop, set the generator at about 1400 kc., tune in the signal and adjust the trimmer on the loop antenna assembly for maximum response.

**Short Wave Alignment:** Using a 400 ohm resistor between the high side of the generator and the antenna terminal (on the LOOP frame), turn the tuning condenser to minimum capacity, set the generator at 18,500 kc., and adjust the short wave oscillator trimmer. This trimmer is immediately in back of the broadcast oscillator trimmer. Set the generator at about 17,000 kc., tune in the signal and adjust the short wave antenna trimmer for maximum response. This trimmer is mounted on the loop antenna.

**NOTE:** If considerable hum appears when the generator is connected as described above use smaller condensers between the generator and the receiver. The best way is to use a 1:1 transformer to isolate either the receiver or the generator from the line. The adjustments of this receiver are very stable and no aligning should be attempted unless absolutely necessary.

ALIGNMENT PROCEDURE SERIES 349

The alignment adjustments of this receiver are very stable. Should realignment be necessary, it should only be attempted by a competent technician with an accurately calibrated test oscillator or signal generator and an output meter with a one or two volt scale. The following realignment procedure should be followed exactly. For accurate alignment, all adjustments must be made with a weak signal. The location of the I.F. transformers and all trimmers and the frequencies at which they should be adjusted are shown on the diagram at the top of this page.

Connections

Connect the output meter across the speaker voice coil. Connect the ground side (outer cable) of the signal generator to the receiver chassis. These connections are used during the entire alignment. Other necessary connections are described in the following paragraphs.

Intermediate Frequency Alignment

Turn the band selector switch to the broadcast position ("B" on the band selector knob). Connect a .1 mfd. condenser to the output terminal of the signal generator and connect the other end of this condenser to the control grid of the 6K7GT tube. Do not disconnect the grid clip on the tube. Generate a weak 455 KC signal in the signal generator, and adjust the trimmer of the second I.F. transformer for maximum response in the output meter. If the signal measures above 1/2 volt during the adjustment, reduce its strength. Now transfer the connection of the signal generator through the .1 mfd. condenser to the grid of the 6K8GT tube and align the trimmers of the first I.F. transformer.

R. F. ALIGNMENT

Broadcast Band

Disconnect the .1 mfd. condenser from the output of the signal generator and in its place substitute a 200 or 250 mmf. condenser, connecting the other end of this condenser to the ANTENNA LEAD of the receiver. Turn the tuning condenser to about 600 KC. With the generator producing a fairly powerful signal of 455 KC, adjust the WAVE TRAP trimmer for MINIMUM RESPONSE. Set the tuning condenser of the receiver at minimum capacity (plates all the way out). Generate a weak signal of 1700 KC in the signal generator. Adjust the BROADCAST OSCILLATOR TRIMMER until the signal is tuned in. Next produce a weak signal of 1400 KC in the signal generator. Tune the receiver very carefully to the signal and adjust the BROADCAST ANTENNA TRIMMER for maximum response in the output meter. Produce a 600 KC signal in the signal generator and tuning the receiver carefully to this signal, adjust the BROADCAST OSCILLATOR PADDER for maximum response. The tuning condenser of the receiver should be rocked back and forth through the signal while varying the padder in order to assure perfect alignment.

Tune in a broadcast station of known frequency between 1200 and 800 KC and set the pointer to the proper calibration on the dial chart. Be sure to use a station whose frequency is reliable as the accuracy of calibration depends on this setting. Note that the square dots in the upper half of the black band are accurately calibrated for the frequencies of the broadcast band.

ALIGNMENT OF SHORT WAVE BANDS

S. W. Band No. 1

Rotate the band selector switch to the center position (No. 1 on band selector knob). Disconnect the 200 mmf. condenser from the output of the signal generator and in its place substitute a 400 ohm resistor which serves as a dummy antenna for aligning both short wave bands. The other end of the 400 ohm resistor is connected to the antenna lead of the receiver. Tune the receiver so that the pointer is at exactly 9500 KC. The pointer should bisect the small black dot to the right and slightly above the figures 9.5. Produce a weak signal of exactly 9500 KC in the signal generator. Screw the S. W. No. 1 OSCILLATOR TRIMMER all the way down and then unscrew it to the second peak at which the signal is heard. If the trimmer is not unscrewed to the second peak, the circuits will not be in proper relation and the calibration will be incorrect and there may also be a dead spot on some position on the dial. Next produce a signal of 9000 KC in the signal generator and tune this signal carefully in the receiver. If the signal can be heard at two places, the proper signal to tune is the one which is the closest to 9000 KC (the black dot above 9.0) on the dial chart of the receiver. Adjust the S. W. No. 1 ANTENNA TRIMMER until a definite peak is noted in the output meter. During this adjustment, rock the tuning condenser back and forth through the signal, while adjusting this trimmer in order to assure perfect alignment.

S. W. Band No. 2

Using exactly the same procedure and taking the same precautions as for S. W. Band No. 1, turn the band selector switch to the No. 2 position. Align the S. W. No. 2 OSCILLATOR TRIMMER at 21,000 KC, with signal generator producing a signal of 21,000 KC and with pointer indicating 21,000 KC on the dial chart. The pointer should bisect the light colored dot in the black band immediately at the right of the figure 22. Align the S. W. No. 2 ANTENNA TRIMMER at 17,000 KC with a 17,000 KC signal in the signal generator and be sure to tune the receiver to the signal nearest 17,000 KC on the dial chart (light colored dot in black band above and slightly to the right of figure 17). The same procedure of screwing the oscillator trimmer all the way down and then unscrewing on the second peak is followed and the same precautions of rocking the tuning condenser back and forth through the signal are followed to secure a proper alignment of this band.

DETROLA CORP.

MODEL 335A

ALIGNMENT PROCEDURE

Connect a high impedance AC voltmeter across loud-speaker terminals. Volume control should be set a few degrees back of maximum volume position. Use a weak signal from generator, strong signals tend to cause improper adjustments.

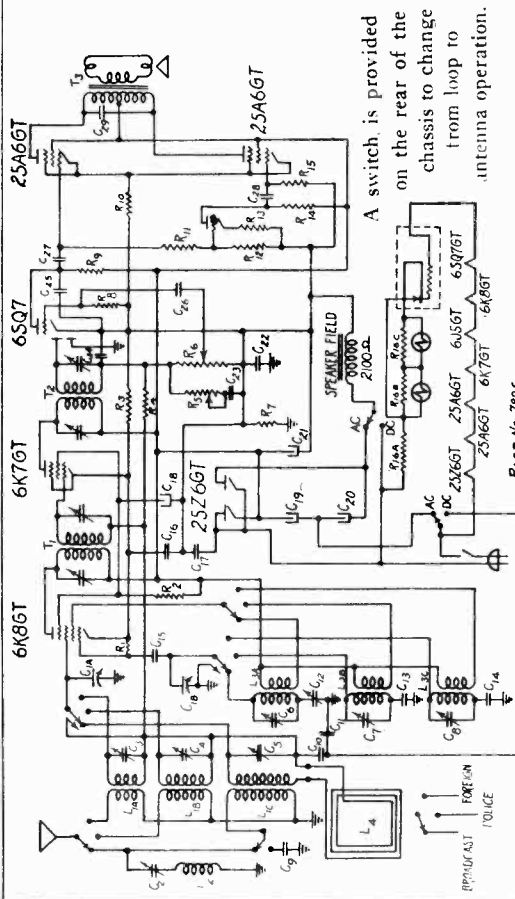
I.F.: Connect the generator ground to receiver chassis. Using .1 mfd. condenser in series with high side of generator, apply 455 kc. signal to grid of 6K7GT I.F. amplifier tube, and align transformer No. 2. Connect generator to grid of 6K8GT tube and align transformer No. 1.

RF: (See above diagram for location of trimmers.)

Using a 200 MMF. condenser in series with the high side of the generator, turn band selector switch to left hand position and the tuning condenser to about 600 kc. Feed a 455 kc. signal to the antenna and adjust wave trap trimmer for minimum response. With the tuning condenser at minimum capacity feed 1720 kc. signal to the antenna and adjust broadcast oscillator trimmer for top frequency. Set generator frequency at about 1400 kc. Adjust broadcast antenna trimmer. Set generator for 600 kc. tune receiver to signal and adjust the paddler. The tuning condenser should be rocked back and forth through the signal while varying the paddler in order to assure perfect alignment.

Using 400 ohm resistor in series with generator, set band selector in center position, set generator to 5825 kc. and adjust oscillator trimmer for top frequency. Set generator to 5000 kc. tune receiver to signal and adjust antenna trimmer.

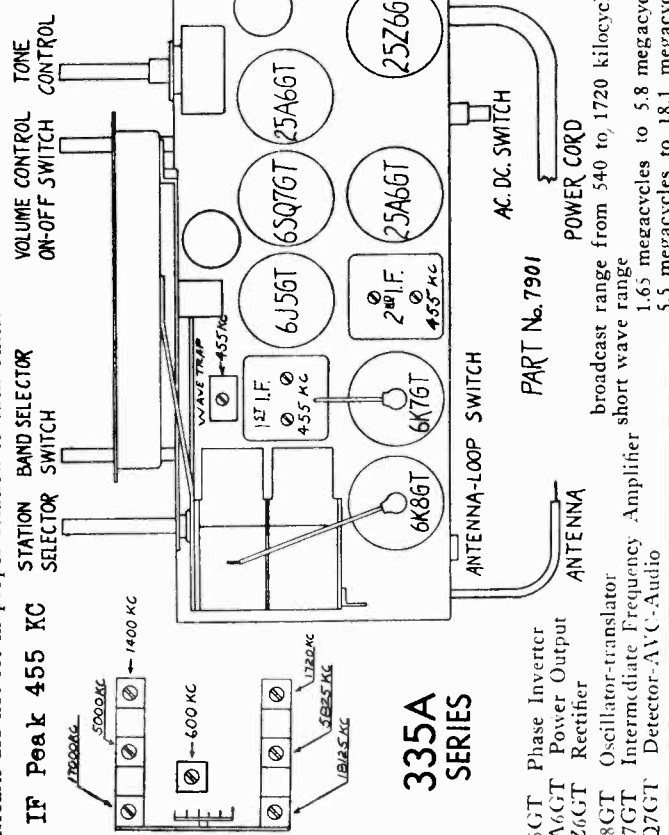
Turn band selector to extreme clockwise position. Using 400 ohm resistor in series with generator, set oscillator top frequency for 18,100 kc.—screw trimmer down tight, then unscrew to second peak. Set generator to 17,000 kc., tune receiver to signal and adjust antenna trimmer—screw trimmer down tight, then unscrew to first peak, rocking the tuning condenser back and forth through the signal while the adjustment is being made. Above procedure for alignment at 17,000 kc. must be followed exactly to insure proper tracking. A dead spot at about 12,000 kc. will result if antenna and oscillator circuits are not set in proper relation to each other.



Symbol	Part No.	Description	Part No.
C1a,b	7975	Variable Condenser	2726
C2	3272	Trimmer Cond. 140mmf.	R6
C3	1611	Trimmer Cond. 3-35 mmf.	R7
C4,5,6,7,8	2597	Trimmer Cond. 1-10 mmf.	R8
C9,25,24		250 mmf. Mica	R9
C10,16		.1 mfd. 200 volt	R10
C11,22	2560	.1 mfd. 400 volt	R11
C12	2560	250 mmf. Padder	R12
C13	2741	1330 mmf. 5%	R13
C14	2793	.006 mfd. 600 volt 10%	R14
C15		50 mmf Mica	R15
C17		.02 mfd. 600 volt	R16a,b,c
C18		4 mfd. 150 volt	L1a,b,c
C19	5779	Electrolytic	L2
C20	7892	Electrolytic	L3a,b,c
C21	7894	Electrolytic	L4
C23		.003 mfd. 600 volt	T1
C26		.01 mfd. 200 volt	T2
C27,28		.02 mfd. 400 volt	T3
C29		.005 mfd. 600 volt	
R1		50 M 1/3 watt	
R2		10 M 1/3 watt	
R3		150 ohm 1/3 watt	
R4		1 meg. 1/3 watt	
R5	2737	2 meg tone control	

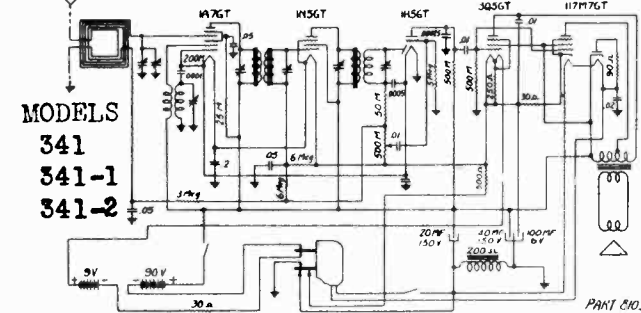
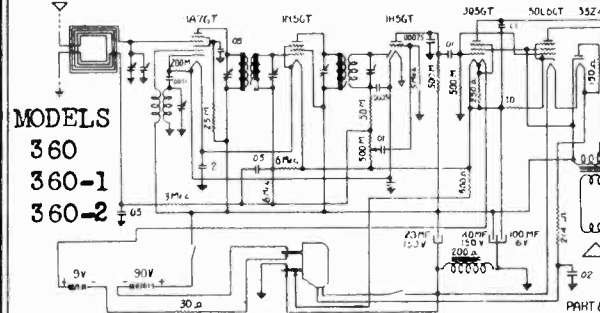
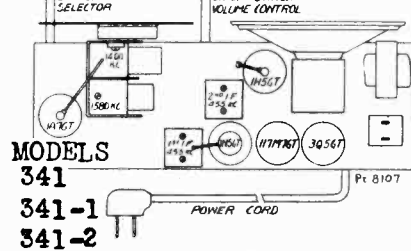
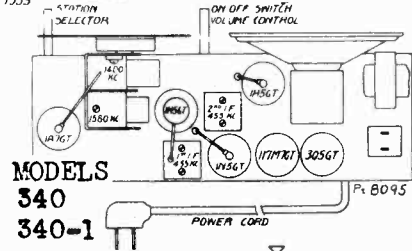
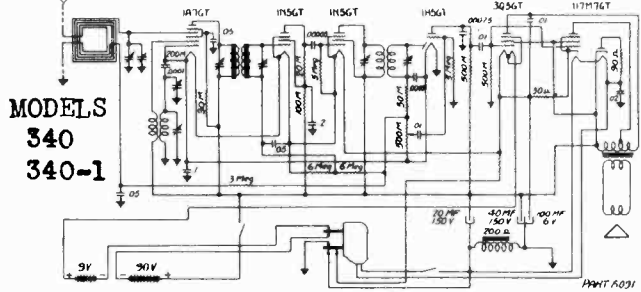
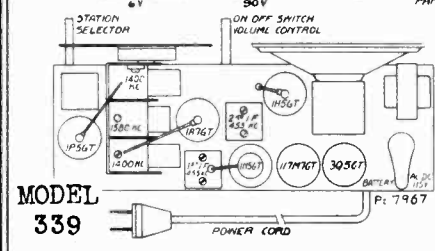
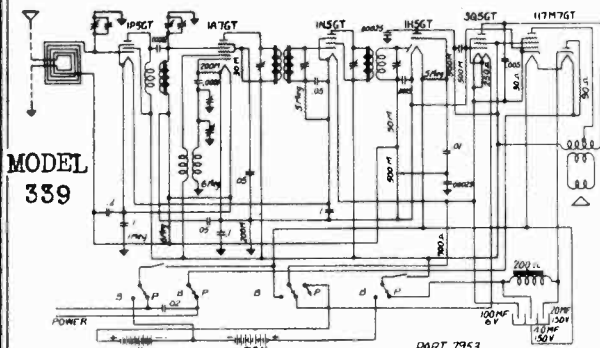
105 to 125 volts AC or DC. WHEN OPERATED ON DIRECT CURRENT THE SWITCH LOCATED ON THE BACK OF THE CHASSIS MUST BE TURNED TO THE DC POSITION. WHEN OPERATED ON ALTERNATING CURRENT THE SWITCH MUST BE IN THE AC POSITION.

NO GROUND IS NECESSARY—UNDER NO CONDITION SHOULD A GROUND WIRE BE ATTACHED TO THIS RECEIVER.



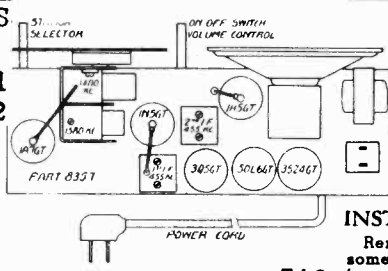


MODEL MODELS 340,340-1  
 339 MODELS 341,341-1,341-2 DETROLA CORP.  
 MODELS 360,360-1,360-2

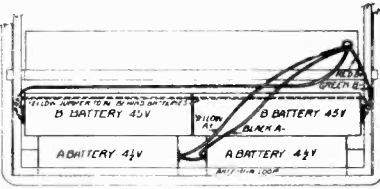


Part No. Description

6256	Oscillator Coil	for 360
7952	Volume Control	all 360-1
7958	Pointer	all 360-2
7954	Dial Indicator	models 360-2
7968	1st IF Transformer	
7969	2nd IF Transformer *	
8070	Dial Crystal	
8138	200 Ohm Choke	
8102	40MF 150V **	
	100MF 6V Dual Condenser	
5780	20MF 150V Condenser **	
7957	"A" Battery Plug	
6263	"B" Battery Plug	
7990	"A" Battery	
7991	"B" Battery	
6644	30 Ohm 10% Resistor	
8158	30 Ohm 5% Resistor	
8088	90 Ohm 5% Resistor	
7951	Loop Assembly ***	



for all models



**INSTRUCTIONS FOR BATTERY INSTALLATION**

Remove the batteries from the shipping carton. Save some of the packing. Pull the bottom of the loop away from the cabinet. Plug the "A" leads into the two "A" batteries and place the batteries in the bottom of the cabinet. Fold a piece of the packing and wedge between the two "A" batteries. Plug the "B" leads into the two 45 volt "B" batteries and place these batteries on top of the "A" batteries with the plus facing the sides of the cabinet. Before the "B" batteries are pushed all the way in, slip the loop over the "B" batteries then push the batteries and loop in as far as they will go. The long connection between the two "B" batteries should be towards the front of the cabinet away from the loop. Wedge some of the packing over the "B" batteries to keep them from being loose in the case.

**WARNING**

Be sure the switch is turned off when connecting batteries.

**ALIGNMENT PROCEDURE**

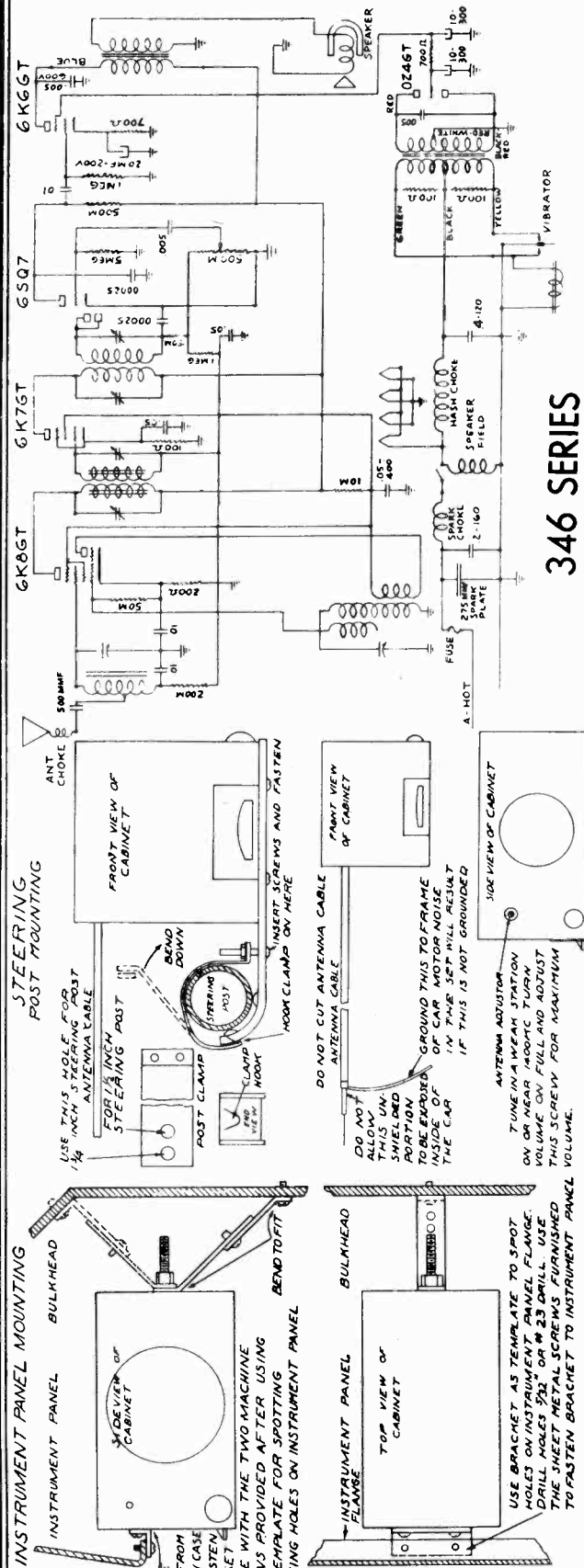
I.F. Frequency 455 KC. Set Range 540-1580 KC.  
 Connect the test oscillator, or signal generator, to the set as follows: Connect the "hot" side of the signal generator to the grid of the 1A7GT tube, and the ground side to the chassis. If the set is alined on AC or DC be sure that the test oscillator or signal generator is isolated from the receiver and line by either a transformer or .2MFD condensers in both test leads. An output meter should be connected across the voice coil leads of the speaker to indicate resonance. Align the I.F. trimmers at 455 KC. for maximum meter reading.  
 Turn the condenser plates all the way out. Set the test oscillator to 1580 KC and adjust the oscillator trimmer for maximum signal. Disconnect the test oscillator and tune in a weak station near 1400 KC. at full volume. Adjust the trimmer on the front of the variable condenser for maximum signal. When aligning the set do not set the receiver on or near a metal work bench or other large metal object, as it will affect the tracking of the receiver.

The power control switch is on the back of the chassis. Pushing this lever towards the center of the set connects the circuits for power operation, 115 V. AC-DC. With the lever in the other position the circuits are connected for battery operation.

**on all other models**  
 For power operation of the receiver it is only necessary to plug into a 115 volt AC or DC outlet. To connect the receiver for battery operation, plug the line cord into the socket provided in the back of the chassis. This makes all the necessary battery connections.  
**for all models**  
 Since in the power-operation position the batteries are completely disconnected, there is no need of disconnecting the batteries when using the receiver where power is available.  
**DO NOT USE A GROUND WHEN SET IS OPERATED OFF THE POWER LINES AS AN AC-DC SET.**

DETROLA CORP.

MODEL 346



346 SERIES

This receiver is designed to use only the whip type of antenna. Cowl or hinge pin mounting types or their equivalent should be used.

Part No.	Description	Part No.	Description
8205	Antenna Coil	8223	Speaker, 4 inch
8206	Oscillator Coil	6691	Front mounting bracket
6687	Volume Control	6686	Steering Post mounting bar
8211	10 x 10—350V x 20 25V	6696	Steering Post clamp
6715	.005-1200V Buffer condenser	6739	Dial Escutcheon
6682	Tuning Dial	6740	Volume control knob
		6694	Clamp bar (for screws)
		6746	Rear mounting straps

ANTENNA ADJUSTMENT

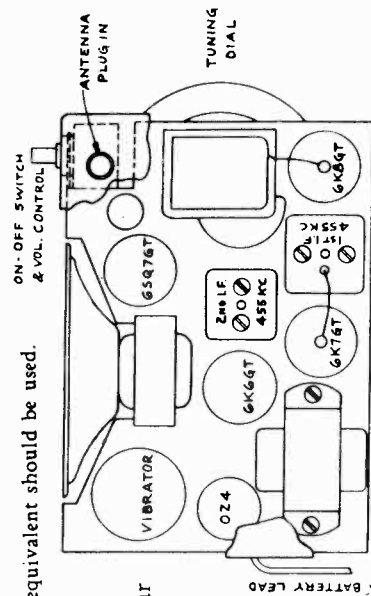
When the set is installed and the antenna is connected, tune in a weak station on or near 1400 kc. (140 on dial), turn volume full on, remove the upper snap button above the volume control, and with a long screwdriver, turn the adjusting screw in and out until maximum volume is obtained. Replace the snap button. The set is then adjusted.

ALIGNMENT

I.F. Frequency	455 KC.
Frequency Range	1550—540 KC.
Dummy Antenna	30 MMF.
Input to I.F.	1/10 MF.

To align the I.F., feed the signal generator or test oscillator through a 1/10 MF condenser to the grid of the 6K8 tube, ground the ground side of signal generator to the case. With volume control full on and a weak signal, adjust screws of 1st and 2nd I.F. transformers using a suitable output meter to indicate resonance.

The oscillator should be set at 1550 K.C. Turn variable condenser to minimum capacity and with a 30 MMF dummy antenna condenser connected to the antenna cable and a low signal input, set the oscillator to its top frequency. The antenna trimmer should be adjusted at 1400 KC. The antenna trimmer should be readjusted at this frequency when the set is installed in the car.



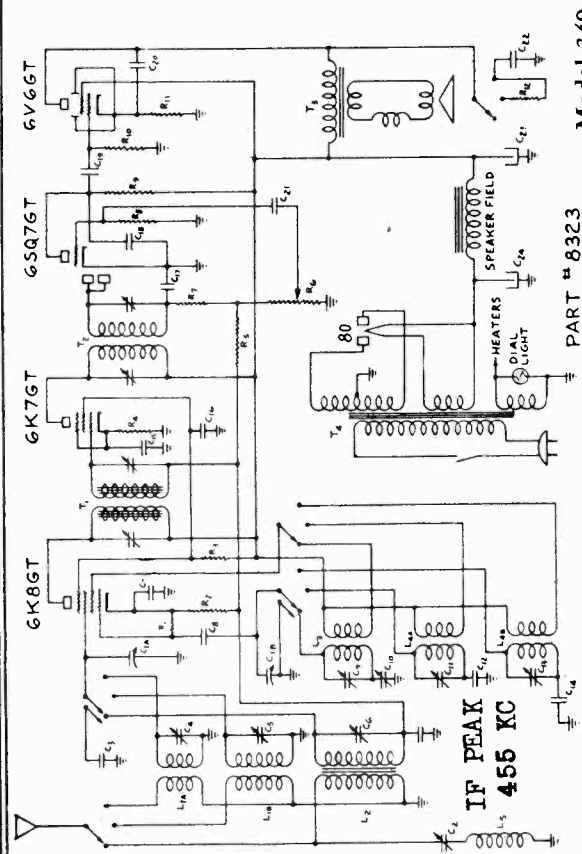
PART # 8227



**MODEL 349**  
**MODEL 372**  
**MODEL 3422**

**DETROLA CORP.**

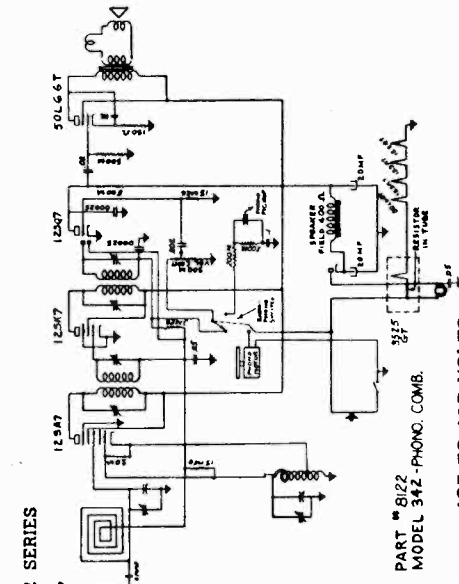
R8	5 Meg. 1/3 watt
R9	200 M 1/3 watt
R10	500 M 1/3 watt
R11	300 Ohm 1/3 watt
R13	25 M 1/3 watt
L1a,b	8334 2 Band S. W. Antenna Coil.
L2	8415 Broadcast Antenna Coil
L3	8336 Broadcast Oscillator Coil
L4a,b	8335 2 Band S. W. Oscillator Coil
T1	8325 Input IF Transformer
T2	8326 Output IF Transformer
T3	*Output Transformer
T4	8324 Universal Power Transformer
8369	Power Transformer
8337	Band Switch
8330	Dynamic Speaker 7 1/2"
6158	Dial Lamp (Mazda No. 47)
8319	Dial Chart
8343	Pointer
5142	Drive Pulley
8322	Drive Shaft
8373	Tone Control Switch
8374	Dial Lamp Socket



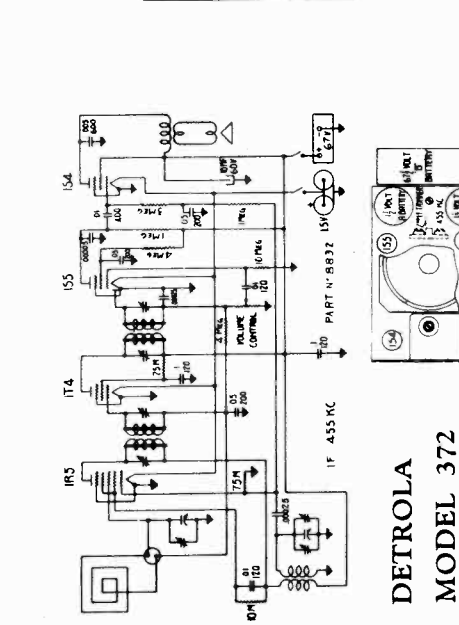
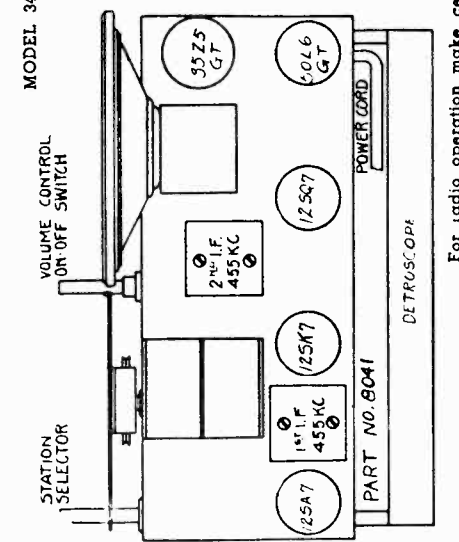
**Model 349**

Two types of power transformers are available for these receivers. Unless specifically stated otherwise on a tag attached to the receiver it is equipped with a transformer for operation on 105 to 125 volts 50 to 60 cycle alternating current.

The receivers equipped with UNIVERSAL POWER TRANSFORMERS will operate on 110, 120, 150, or 225 volts 50 to 60 cycles alternating current. A small cover on top of the transformer should be removed and the plug inserted in the proper clip for the voltage available.



**MODEL 3422 SERIES**



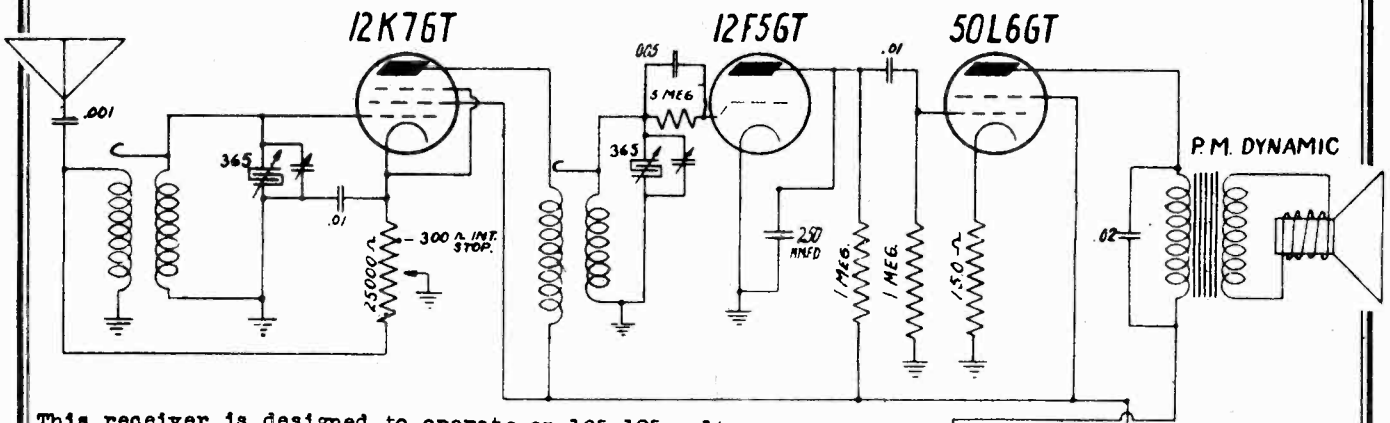
**DETROLA**  
**MODEL 372**  
**PORTABLE**  
**SUPERHETERODYNE**

For radio operation make certain that the Radio-Phono switch, which is on the phonograph motor panel, is turned to the left position.  
For phonograph operation turn the Radio Phono switch to the Phono position. THE AC-DC SWITCH MUST BE SET IN THE PROPER POSITION. (This switch is on the phonograph panel.)

105 TO 125 VOLTS.  
DIRECT OR ALTERNATING CURRENT.  
12SA7 Translocator  
12SQ7 Detector AVC  
12SK7 IF Amplifier  
50L6GT Output  
35Z5GT Rectifier

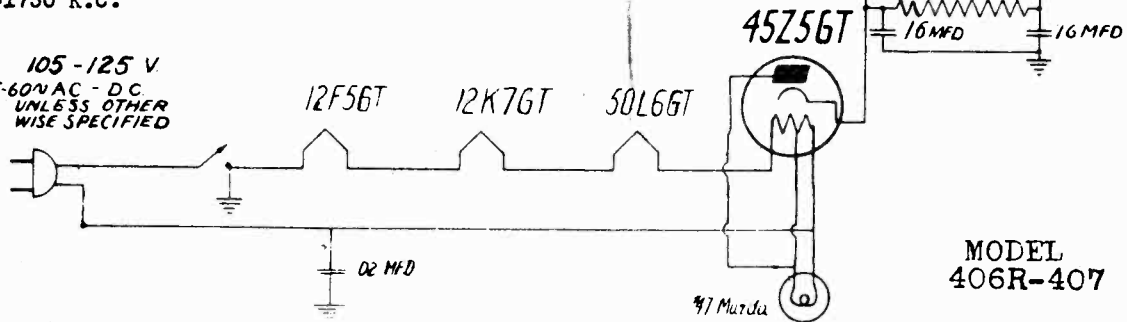
DEWALD RADIO MFG. CORP.

MODELS 406R, 407  
MODELS 501A, 561, 562

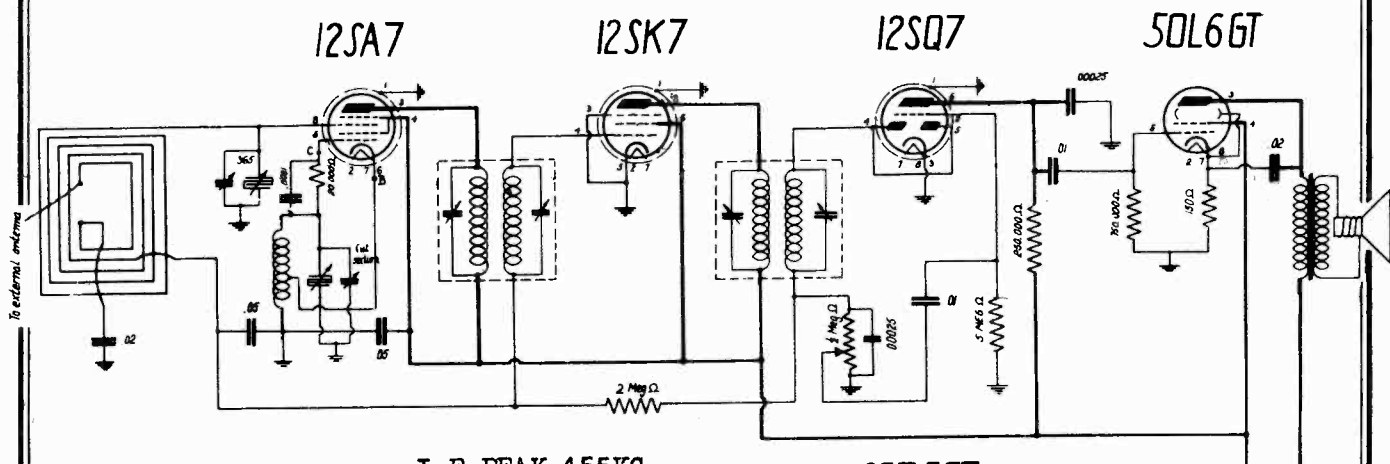


This receiver is designed to operate on 105-125 volts  
25-60 cycles A.C. or D.C. The broadcast range coverage is  
540-1750 K.C.

105-125 V  
25-60 AC - DC  
UNLESS OTHER  
WISE SPECIFIED



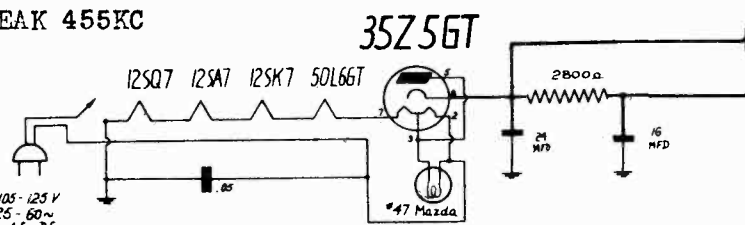
MODEL  
406R-407



I.F. PEAK 455KC

MODELS 501A, 561, 562

**To Calibrate Receiver**  
Attach hot side of signal gen. to one of the flexible ant. loop leads. Connect ground side to rec. chassis. Peak I.F. Trimmers at 455kc. Adj. rec. dial and sig. gen. to 1500kc and peak variable condenser trimmers to max.

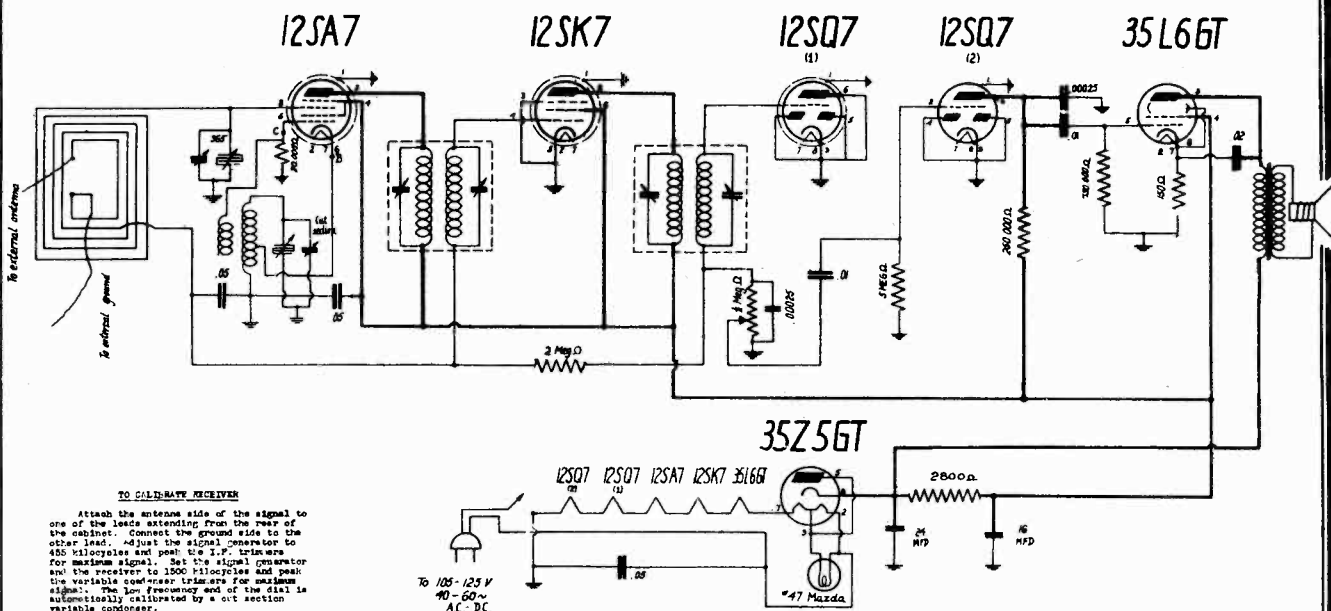


This model is a five tube superheterodyne receiver with full automatic volume control. A self-contained loop is incorporated which makes the use of an antenna unnecessary. The range coverage is 540-1700 kilocycles. The receiver has been designed to operate on 105-125 volts, 40-60 cycles A.C.-D.C. unless otherwise specified.



MODELS 410, 410A, 410R  
MODEL 666

DEWALD RADIO MFG. CORP.



**TO CALIBRATE RECEIVER**

Attach the antenna side of the signal to one of the leads extending from the rear of the cabinet. Connect the ground side to the other lead. Adjust the signal generator to 455 kilocycles and peak the i.f. trimmers for maximum signal. Set the signal generator and the receiver to 1500 kilocycles and peak the variable capacitor trimmers for maximum signal. The low frequency end of the dial is automatically calibrated by a cut section variable condenser.

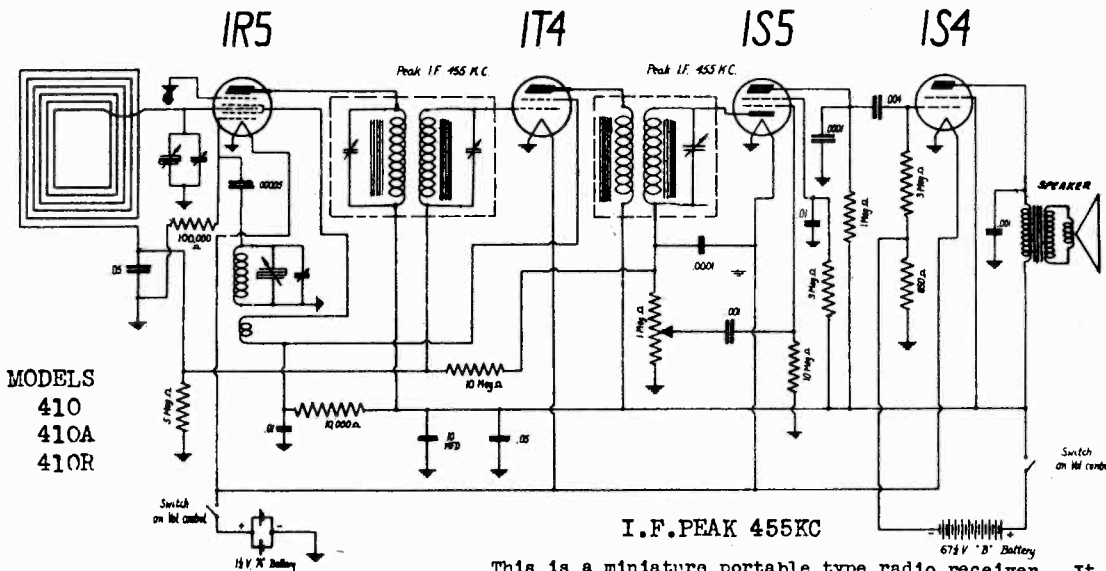
This model is a six tube superheterodyne receiver with full automatic volume control. A self-contained loop is incorporated which makes the use of an antenna unnecessary. The range coverage is 540-1700 kilocycles. The receiver has been designed to operate on 105-125 volts, 40-60 cycles A.C.-D.C. unless otherwise specified.

MODEL 666

**IMPORTANT:**

Since the loop used has a directional effect, it may be found necessary at times to turn the receiver for best reception on weaker stations.

I.F. PEAK 455KC



MODELS  
410  
410A  
410R

I.F. PEAK 455KC

This is a miniature portable type radio receiver. It employs a superheterodyne circuit with full automatic volume control. A self-contained antenna loop is incorporated, which makes the use of an outside aerial or ground unnecessary. The "A" supply consists of two dry-cell batteries, EVEREADY #950 or the equivalent. The "B" supply consists of one 67.5 volt battery, EVEREADY #467 or the equivalent. The range coverage is 540 to 1700 kilocycles.

**INSTALLATION OF BATTERIES**

Rest the cabinet on the knobs with the speaker grille facing you. Open up the door by sliding the latch of the lock toward the leather tab. Then pull on the tab. The dry cell batteries go on the right side. Slide them in the metal container so that the brass terminal of the battery runs along the narrow slot of the container (see sketch on cover). For the "B" battery, merely snap the two connectors to the battery and place it in the cabinet with the terminals toward the left.

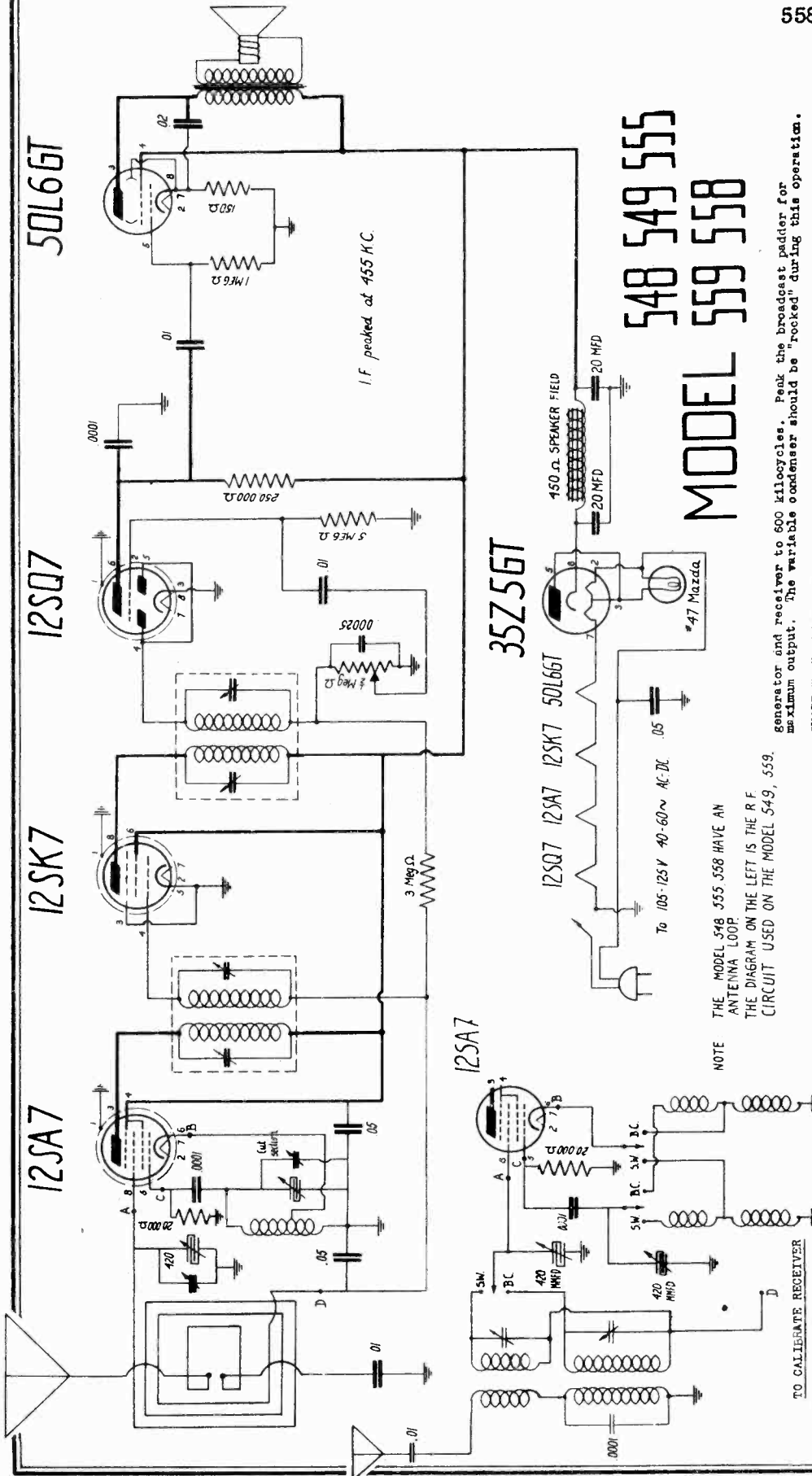
**LIST PRICE OF REPLACEMENT PARTS**

1621 1st I.F. coil	1.10
1622 2nd det. I.F.	1.10
1623 Antenna loop	.85
1624 oscillator coil	.40
2520 2 gang var. cond.	1.75
2521 8 mfd. electrolytic	1.00
3515 volume control	.90
5206 "B" battery cable	.30
7309 speaker	3.00
80026 knob	.15

PRICES SUBJECT TO CHANGE  
WITHOUT NOTICE

DEWALD RADIO MFG. CORP.

MODELS 548, 549, 555 (1940)  
558, 559



548 549 555  
MODEL 559 558

Generator and receiver to 800 kilocycles. Peak the broadcast paddler for maximum output. The variable condenser should be "rocked" during this operation.

SHORT WAVE ALIGNMENT

Slide the wave band switch button to the short wave position. Set the signal generator and receiver to 16 megacycles. Adjust the short wave oscillator coil trimmer until the generator signal is heard. Peak the short wave antenna coil trimmer for maximum output. The low frequency end of the dial is automatically adjusted.

HOW TO ADJUST THE PUSH BUTTONS

Insert a screw driver blade into the hole in the button which is to be adjusted. After engaging the blade in the adjusting screw slot, loosen the screw by turning it one complete revolution counterclockwise. Keep the blade engaged in the slot and bear down on the screw driver so that the adjusting screw will remain depressed. Tune in the desired station with the station selector knob. Maintain enough pressure on the screw driver to keep the adjusting screw depressed; and, at the same time tighten it by turning it in a clockwise direction. The adjustment may be checked by setting the pointer in any position, pushing the knob down as far as it will go and noting if the intended station is received. The remaining knobs can be adjusted in the same manner. After all adjustments have been made the station tabs and celluloid pieces may be placed in the recess on the buttons.

NOTE THE MODEL 548 555 558 HAVE AN ANTENNA LOOP. THE DIAGRAM ON THE LEFT IS THE R.F. CIRCUIT USED ON THE MODEL 549, 559.

BROADCAST ALIGNMENT  
Attach the antenna lead of the signal generator to the antenna lead of the receiver. Connect the ground side of the signal generator to the receiver chassis. If calibrating the model 549, the wave band switch should be in the broadcast position. Attach an output meter or resonance indicator across the primary leads of the speaker output transformer, or across the speaker voice coil. Adjust the signal generator to 455 kilocycles. Have the volume control in the maximum position. Peak the I.F. adjusting screws for maximum output. Do not use a greater generator signal than is necessary to obtain a good output level.

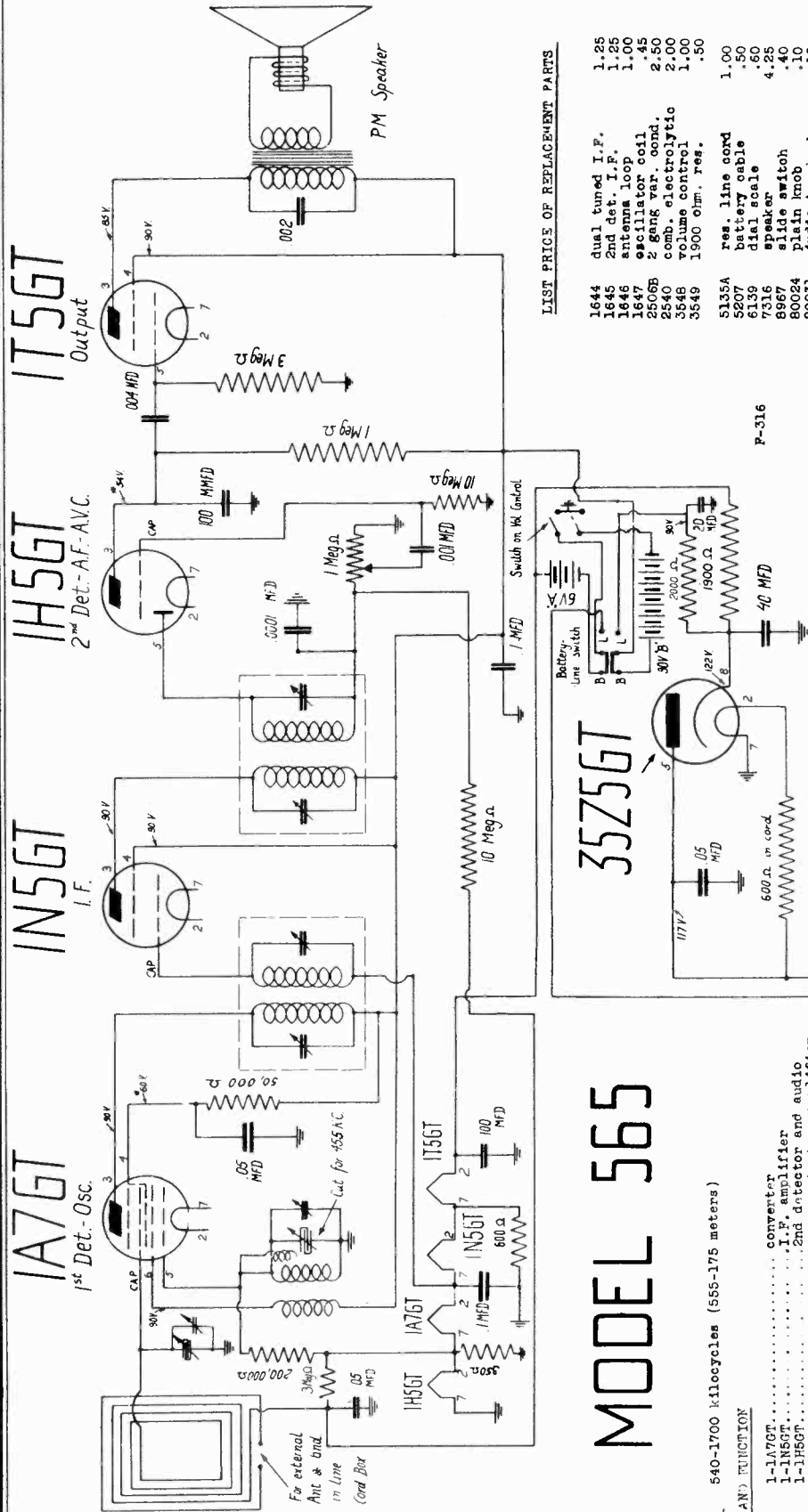
I.F. ALIGNMENT

The model 548 and 555 have the adjusting trimmers on the variable condenser. The model 549 has individual trimmers on each coil and no trimmers on the variable condenser. Set the signal generator and receiver dial to 1500 kilocycles. Adjust the broadcast oscillator trimmer screw until the signal from the generator is heard. Peak the antenna trimmer screw for maximum output. The low frequency end of the receiver on the model 548 and 555 is automatically adjusted. To adjust the low frequency of the model 549, set the signal



MODEL 565

DEWALD RADIO MFG. CORP.



**IMPORTANT** BE SURE THE RECEIVER IS TURNED "OFF" WHEN NOT IN USE. SINCE THE LOOP USED IN THE RECEIVER HAS A DIRECTIONAL EFFECT, IN ORDER TO OBTAIN BEST RECEPTION AND DECREASE NOISE INTERFERENCE, IT MAY BE FOUND NECESSARY AT TIMES TO TURN THE RECEIVER.

RANGE 540-1700 kilocycles (555-175 meters)

**TUBES AND FUNCTION**

- 1-1A7GT..... converter
- 1-1N5GT..... I.F. amplifier
- 1-1H5GT..... 2nd detector and audio power output amplifier
- 1-35Z5GT..... rectifier

**MODEL 565 PORTABLE BATTERY ELECTRIC RECEIVER**

The model 565 is a combination portable battery and electric receiver. It uses the latest low drain tubes and employs a circuit designed for low power consumption. An antenna loop is incorporated which makes the use of an outside aerial unnecessary for reception in most localities. The receiver will operate with an "A" supply of 6 volts and a "B" supply of 90 volts. It will also operate on 105-125 volts, 40-60 cycles A.C. or D.C. unless otherwise specified. Following is a list of manufacturers and their numbers of the batteries that may be used with this receiver. Other batteries may be used if the electrical and physical characteristics correspond to the recommended list.

"A" battery (one required)	# 747
EVEREADY	# 492
BRIGHT STAR	# 30-33
USALITE	# 640
RAY-O-VAC	# P5330
BURGESS	# 430
The life of the batteries is from 250-300 hours, when the receiver is used about four hours per day.	

**LIST PRICE OF REPLACEMENT PARTS**

- 1644 dual tuned I.F. 1.25
- 1645 2nd det. I.F. 1.25
- 1646 antenna loop 1.00
- 1647 exciter coil .45
- 2505B 2 gang. var. cond. 2.50
- 2540 comb. electrolytic 2.00
- 3548 volume control 1.00
- 3549 1900 ohm. res. .50
- 5135A res. line cord 1.00
- 5207 battery cable .50
- 6139 dial scale .60
- 7316 speaker 4.25
- 8967 slide switch .40
- 80024 slide knob .10
- 80031 indicator knob .15
- 90117 pointer .30

**PRICES SUBJECT TO CHANGE WITHOUT NOTICE**

**I. F. PEAK 455 KC**

**MODEL 565**

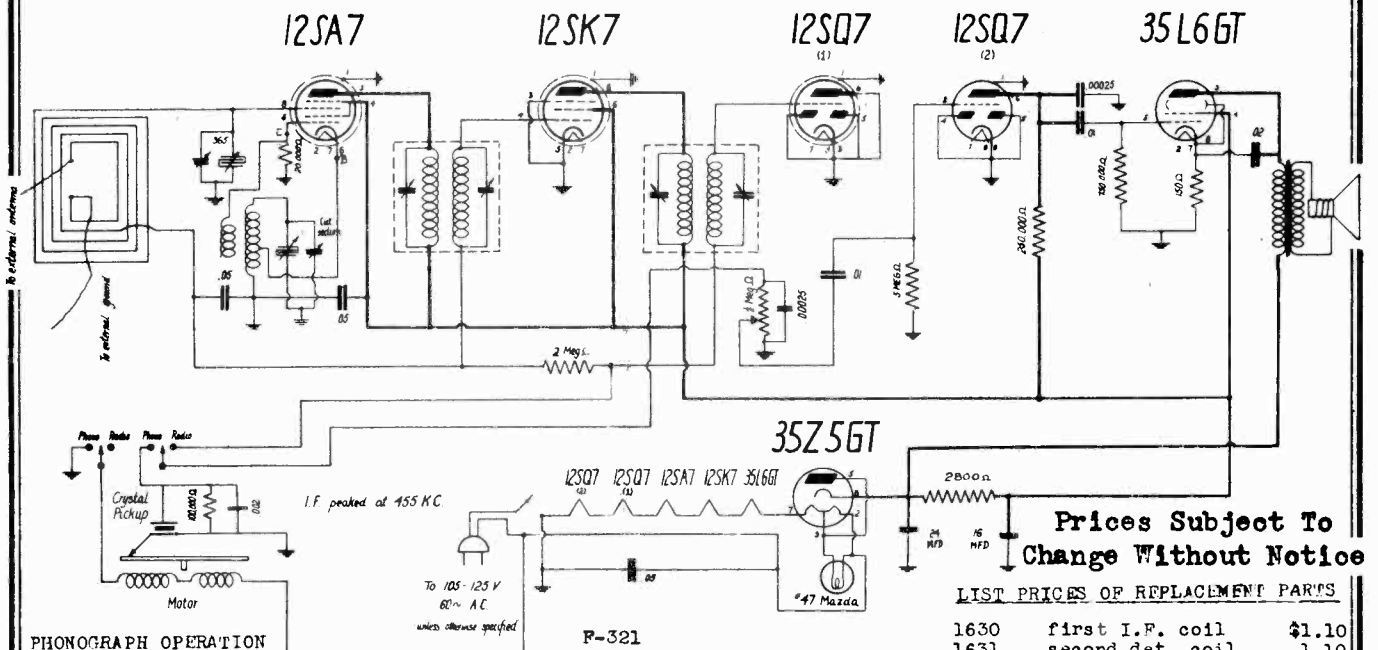
**BATTERY AND ELECTRIC POWER** When the back of the cabinet is open, a slide button switch may be seen. To operate the receiver on batteries, slide the button to the side marked BATT. Keep the line cord in the remaining space of the "A" battery compartment. When desiring to operate the receiver on electric power, the slide button should be on LINE position. Bring the line cord out of the cabinet so that when the back is closed, the cord is in the notch provided in the corner of the cabinet. The back of the cabinet should always be kept closed when operating the receiver.

The batteries may be installed or replaced without removing the antenna loop from the back. Care should be exercised not to break the loop connecting leads when connecting or disconnecting the batteries. The tubes are accessible so that they may be changed without removing the chassis from the cabinet.

**ANTENNA** In most locations the receiver will operate satisfactorily without an outside antenna. For unfavorable localities, additional signal pick up may be desired. To obtain this, attach an aerial to one of the leads inside the back. A ground wire may be attached to the other lead. Tape the connections well to prevent short-circuiting of leads together and ground.

DEWALD RADIO MFG. CORP.

MODEL 669  
MODEL 812



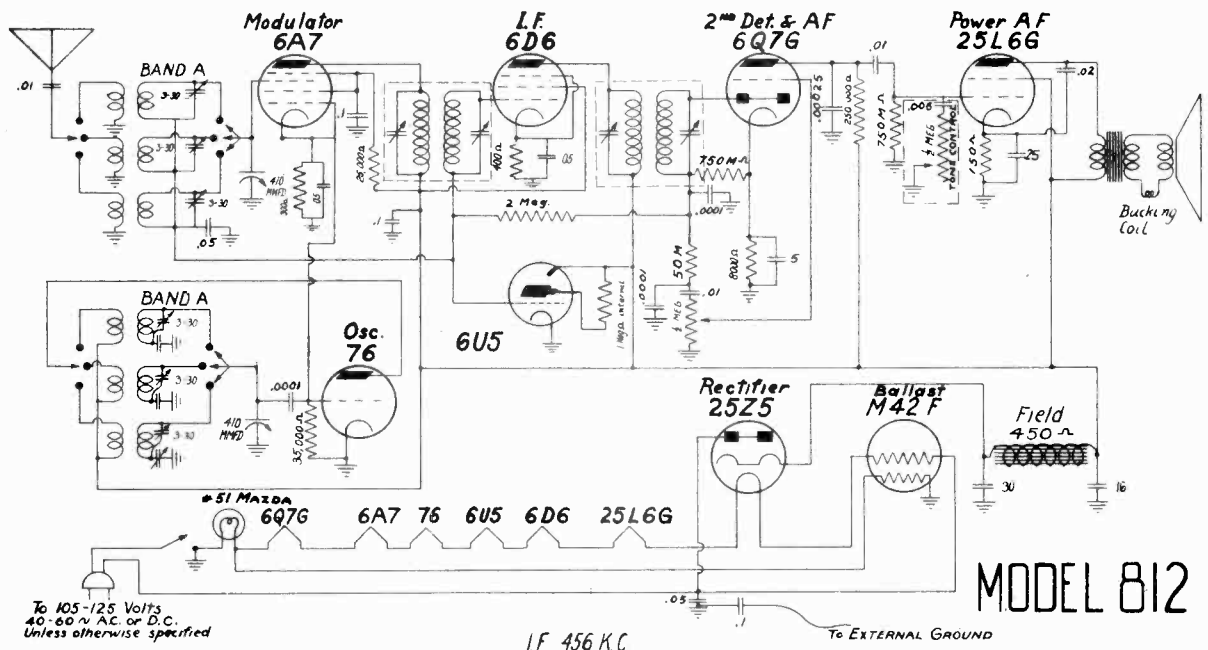
PHONOGRAPH OPERATION

The button on the top panel of the cabinet is the phono-radio switch. When the slide switch button is on the "radio" side, the receiver will pick up radio signals. When on the "phono" side, the turn table will begin to turn and phonograph records may be reproduced through the receiver. For best results, the lid cover should be closed while playing records.

The model 669 is a RADIO-PHONO combination that provides reproduction of recordings with good fidelity as well as regular radio broadcast reception. All types of records up to 12 inches may be played with the lid closed. A self-starting motor together with a crystal pick-up are used for phonograph reproduction. The radio receiver employs a superheterodyne circuit using the latest low drain tubes for low power consumption. A self-contained antenna loop is incorporated which makes the use of an outside antenna unnecessary in most localities. It will operate on 105-125 volts, 40-60 cycles A.C. or D.C. The phonograph motor will function on 105-125 volts, 60 cycles A.C. only, unless otherwise specified. A range of 540-1700 kilocycles is covered by the receiver.

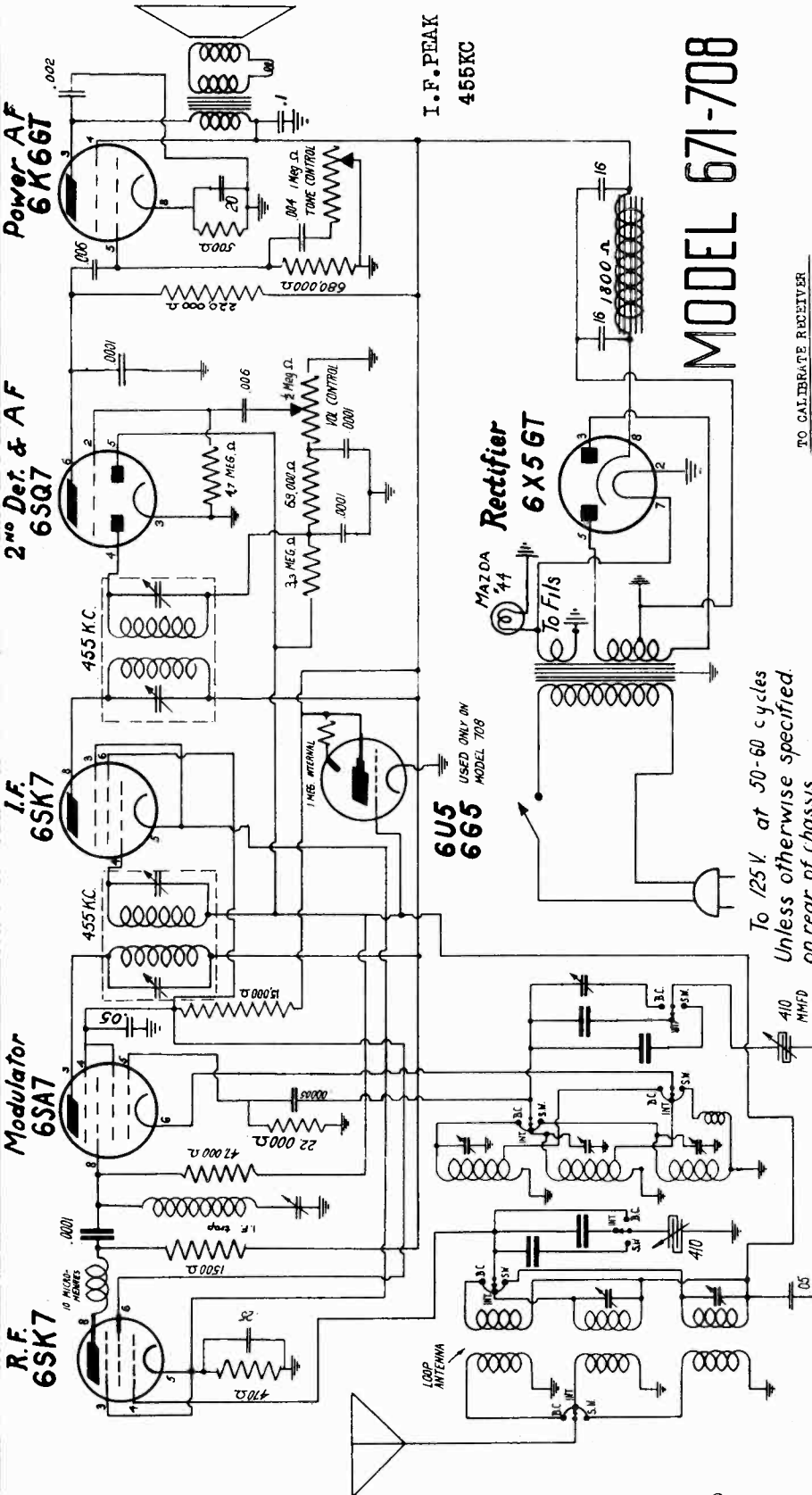
MODEL  
669

1630	first I.F. coil	\$1.10
1631	second det. coil	1.10
1632	loop antenna	.85
1633	oscillator coil	.45
2507	comb. electrolytic	1.10
2829	2 gang var. cond.	2.00
3519A	volume control	.90
4229	cabinet	15.00
6228	dial scale	.40
6229	dial crystal	.30
7311	speaker	\$3.50
8906	pick-up cartridge	5.00
8916	pilot lamp	.10
8939	phono switch	.40
8958	phono pick-up	5.25
8973	switch plate	.35
80032	knob	.20
80034	phono motor	6.00
80035	pilot socket	.30
90157	dial pointer	.25



MODEL 812

MODELS 671,708



MODEL 671-708

P-310

**I. F. PEAK 455 KC**

**I. F. ALIGNMENT** Connect antenna lead of the signal generator to antenna lead of receiver and ground lead of generator to receiver chassis. Short circuit front section of variable condenser. Adjust generator to 455 K.C. and peak I.F. trimmers or maximum signal.

**BROADCAST ALIGNMENT** Remove short from variable condenser. Have the wave band switch on broadcast position. Adjust the generator and receiver to 1500 K.C. Peak trimmers for maximum signal. Adjust generator and receiver to 600 K.C. and peak the broadcast padder for maximum signal. The variable condenser should be "rocked" during this operation.

**SHORT WAVE ALIGNMENT** For 4.7-10 K.C. Turn wave band switch knob to this band. Adjust the generator and receiver to 10 M.C. and peak the trimmers for maximum signal. The low frequency is automatically adjusted by a fixed calibrated padder. For 11.5-24 M.C. turn wave band switch knob to this band. Adjust the generator and receiver to 22 M.C. Peak trimmers for maximum signal. The low frequency is automatically adjusted by a fixed calibrated padder.

To 125 V. at 50-60 cycles. Unless otherwise specified. on rear of chassis

These models are superheterodyne receivers having full automatic volume control on all bands. They are designed to operate on 117 volts A.C. 50-60 cycles, unless otherwise specified. A slide instrument type dial with a high ratio tuning mechanism is used to facilitate station tuning. In addition a circuit incorporating a semi-band spread feature is provided for station selection on some parts of the short wave bands almost as close as on broadcast. The range coverage is 540-1650 K.C. (555-182 meters) 4.7-10 M.C. (64-30 meters) 11.5-24 M.C. (26-12.6 meters).

LIST PRICES OF REPLACEMENT PARTS

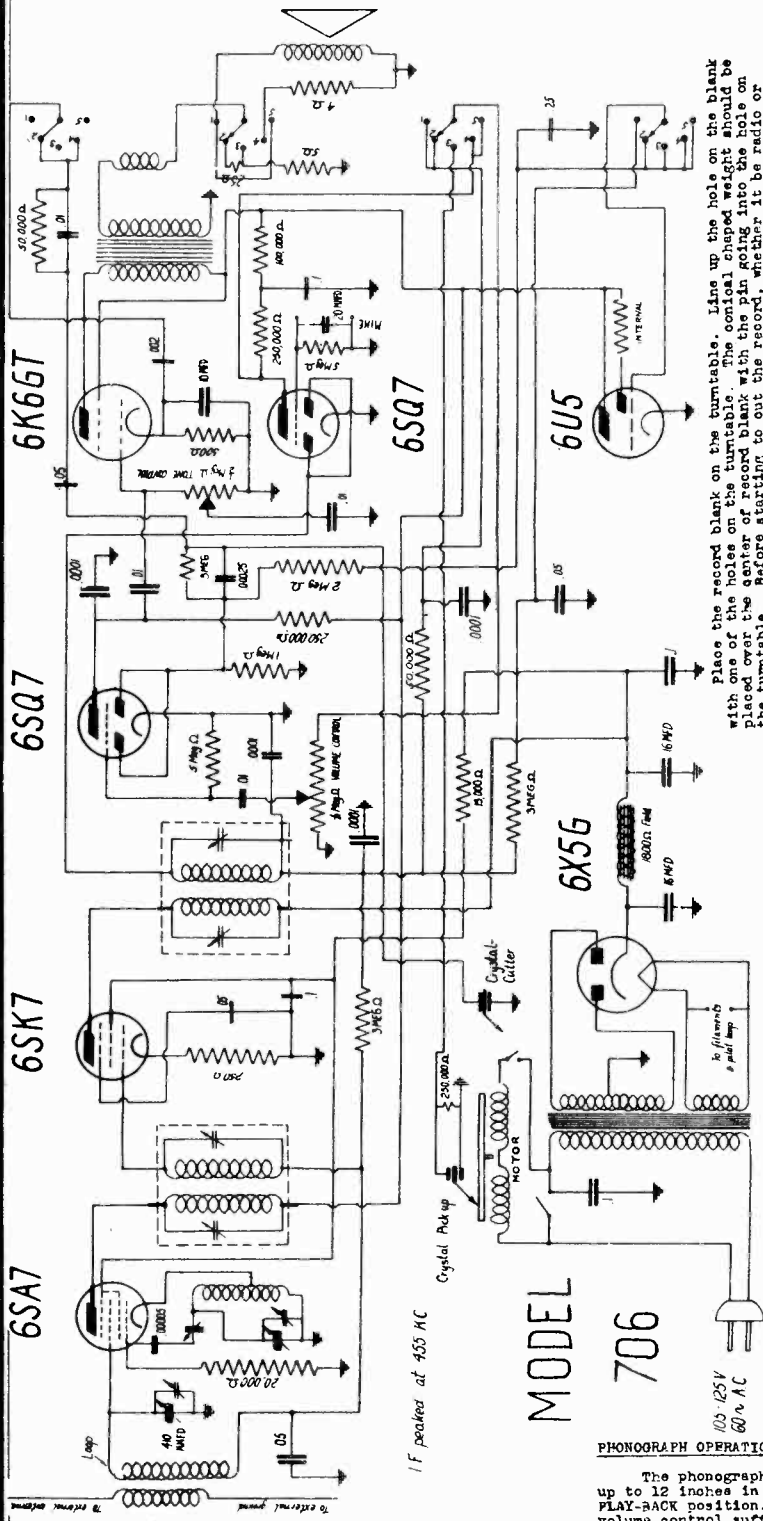
1473	wave trap coil	.35	3838	comb. vol. cont.	1.00
1637	power transformer	4.15	6232	dial scale	1.75
1638	comb. coil	1.75	7514	socket	4.50
1639	comb. ant. coil	1.25	8067	pilot lamp	.20
1640	antenna loop	1.00	80042	wave band assembly	2.00
1641	dual tuned I.F.	1.10	80043	plain knob	.20
1643	2nd det. I.F.	1.10	80044	indicator knob	.20
2534	tuned choke	1.25	90138	drive string	.15
2535A	2 gang var. cond.	2.00	90174	pilot lamp shade	.10
2534	comb electrolytic	1.25			
90174	pointer	.30			

**Prices Subject To Change Without Notice**



DEWALD RADIO MFG. CORP.

MODEL 706



TUBE COMPLEMENT

- 1-6SA7 - oscillator and first detector.
- 1-6SK7 - intermediate frequency amplifier.
- 1-6SQ7 - second detector, A.V.C. and first audio.
- 1-6K66T - power output.
- 1-6X5G - rectifier.
- 1-6U5 - tuning indicator.
- 1-6SQ7 - pre-amplifier.

This receiver has a superheterodyne circuit with full automatic volume control, and will operate on 105-125 volts, 60 cycles ALTERNATING CURRENT unless otherwise specified. An antenna loop has been incorporated which makes the use of an outside aerial or ground unnecessary. A large slide rule instrument type dial with a high tuning ratio is used to make tuning of stations easy and accurate. The range coverage is 540 to 1700 kilocycles. The recording instructions should be carefully read and followed for best results.

LIST PRICES OF REPLACEMENT PARTS					
1625	power transformer	5.00	7310	speaker	4.25
1626	first I.F. coil	1.10	8316	pilot lamp	.10
1627	second det. coil	1.10	8347A	pilot socket	.30
1628	antenna loop	1.50	80024	knob	.10
1329	oscillator coil	.50	80031	indicator knob	.15
2526A	variable cond.	2.50	80033	selector switch	1.30
2527	comb. electrolytic	1.75	80039	slide switch	.25
3430	volume control	1.00	9762	drive spring	.05
3432	tone control	.75	9943	dial pointer	.30
8113	dial scale	.85			

Prices Subject To Change Without Notice.

Place the record blank on the turntable. Line up the hole on the blank with one of the holes on the turntable. The conical shaped weight should be placed over the center of record blank with the pin going into the hole on the turntable. Before starting to cut the record, whether it be radio or microphone recording, the volume control must be adjusted so that the record will be properly cut. The correct adjustment can be chosen to match the "eye" tuning eye. Components in the record volume becomes great enough to cause over-cutting in the microphone records. For this reason it is necessary to close just before the groove on the record. For this reason it is necessary to be necessary to regulate the volume during the cutting because of variations of signal input to the receiver. The tone control should be adjusted to the "brilliant" position. After the recording has been made, the control may be used to adjust the tone to the desired shade.

Bring the cutting head over the record blank until the stylus is about 1/8 inch in from the edge of the record. Lower the cutting arm gently on the face of the disc. Press now on the cutting, it done automatically. However, these threads should be pushed off constantly while the record is being cut. The depth of cut may be observed by holding it in such a position that the light is reflected from the grooves. If the depth of cut is correct the grooves will appear to be as wide as the space between them. The cut may also be checked by the quality of the thread being cut. It should not be coarse and stiff nor light and flabby.

Should the cut be unsatisfactory, it may be due to a dulled cutting stylus. Proper adjustment of the recording arm. The depth of cut may be regulated by adjustment of the flat head screw on the top of the recording arm. Turning the screw to the left (counterclockwise) decreases the depth of cut. Turning the screw to the right (clockwise) increases the depth of cut.

MICROPHONE ADDRESS

The unit may be used on an audio amplifier. When the fire position selector switch knob is in the MICROPHONE ADDRESS position, any sound picked up by the microphone will be greatly amplified. Do not keep the microphone too close to the receiver. For it may cause a feedback howl. To avoid this effect another room.

Before attempting to cut any records, it is important to observe the following precautions.

1. Records up to 10 inches in diameter may be cut.
2. A proper cutting stylus must be used in the cutting head.
3. Insert the cutting stylus into the head so that the flat portion of it will face the knurled screw. The stylus is held in place by tightening the thumb screw.
4. Great care must be exercised whenever moving the cutting arm. It should be raised to an angle of about 45 degrees before moving it along a horizontal plane, in order to avoid injuring the feed mechanism.
5. A new cutting stylus will cut dozens of records satisfactorily before being dulled so that replacement is necessary.
6. Some record blanks are made of inflammable material. Do not bring the thread material cut from the record near a flame or have it come in contact with a hot object.
7. When not in use the cutting arm should be kept on the arm rest provided.

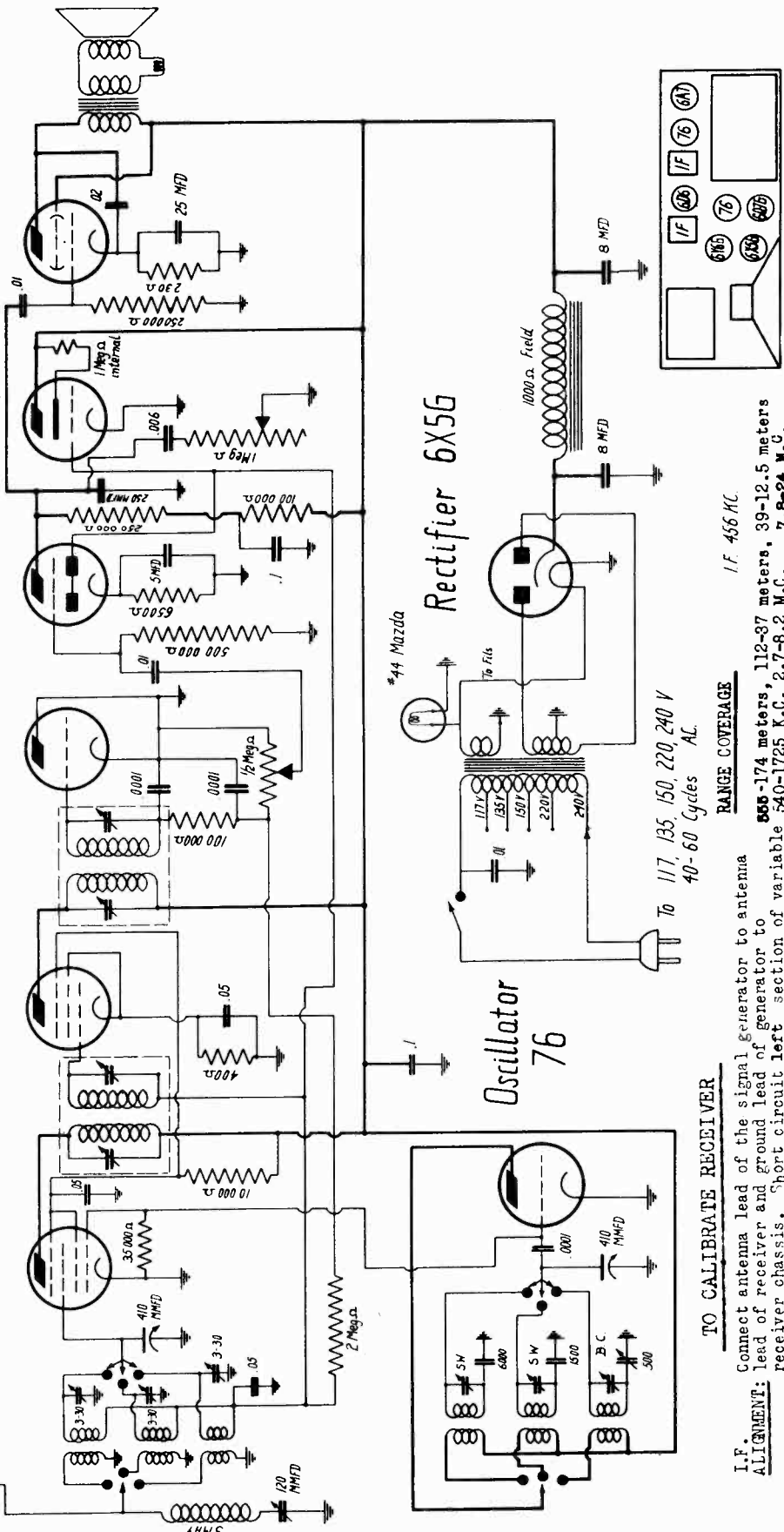
RECORD CUTTING PROCEDURE

Favorite radio programs may be easily recorded. Records may also be made of a person or group talking, singing, or playing instruments. The procedure for either type of recording is essentially the same. To make records of radio programs, the five point selector switch knob should be in the RADIO RECORDING position. When making microphone recordings the switch knob should be in the MICROPHONE RECORDING position, and the plug at the end of the microphone cable inserted in the microphone socket. The microphone should be held at a distance of 6 to 18 inches away from the sound.

PHONOGRAPH OPERATION

The phonograph unit will reproduce either home-made or commercial records up to 12 inches in diameter. Turn the SELECTOR SWITCH knob to the PHONOGRAPH FLAY-BACK position. Make certain the receiver power is turned "on" and the volume control sufficiently advanced to allow reproduction through the speaker. Slide the button of the switch on the motorboard to the "on" position. As soon as the turntable begins to spin, the pick-up arm (the one on the left of the cabinet) may be brought gently on the record. When not in use, this arm should be placed on the arm rest provided.

Modulator 6A7  
 1<sup>st</sup> I.F. 6D6  
 2<sup>nd</sup> Detector 76  
 1<sup>st</sup> Audio 6Q7G  
 Tuning Eye 6U5  
 Power Output 6Y6G



**TO CALIBRATE RECEIVER**

**I.F. ALIGNMENT:** Connect antenna lead of the signal generator to antenna lead of receiver and ground lead of generator to receiver chassis. Short circuit left section of variable condenser. Adjust generator to 456 K.C. and peak I.F. trimmers for maximum signal.

**BROADCAST ALIGNMENT:** Remove short from variable condenser. Have wave band switch on broadcast position. Adjust Generator and receiver to 1500 K.G. Peak trimmers for maximum signal. Adjust generator and receiver to 600 K.C., peak the broadcast padder for maximum signal. The variable condenser should be "rocked" during this operation.

**SHORT WAVE ALIGNMENT:** Turn wave band switch to this band. Adjust the generator and receiver to 7.0 M.C. and peak trimmers for maximum signal. The low frequency is automatically adjusted by a fixed calibrated padder. For 7.9-24 M.C. Turn wave band switch to this band.

**RANGE COVERAGE**

117, 135, 150, 220, 240 V  
 40-60 Cycles AC

**Rectifier 6X5G**

**Oscillator 76**

**I.F. 456 KC**

**RANGE COVERAGE**  
 555-174 meters, 112-37 meters, 39-12.5 meters  
 540-1725 K.C. 2.7-8.2 M.C. 7.9-24 M.C.

Adjust generator and receiver to 22 M.C. and peak trimmers for maximum signal. The low frequency is automatically adjusted by a fixed calibrated padder.

**HOW TO ADJUST THE PUSH-BUTTONS**

Tune in the desired station with the station selector knob. Determine which button is to be used to receive this station. Loosen this button by turning it in a counterclockwise direction approximately one full turn. Then push the button in as far as it will go and tighten with a coin in the button slot. The adjustment may be checked by setting the pointer in any position, pushing the button in as far as it will go and noting if the intended station is received. After all adjustments have been made the station tabs and celluloids may be put on the button.

DEWALD RADIO MFG. CORP.

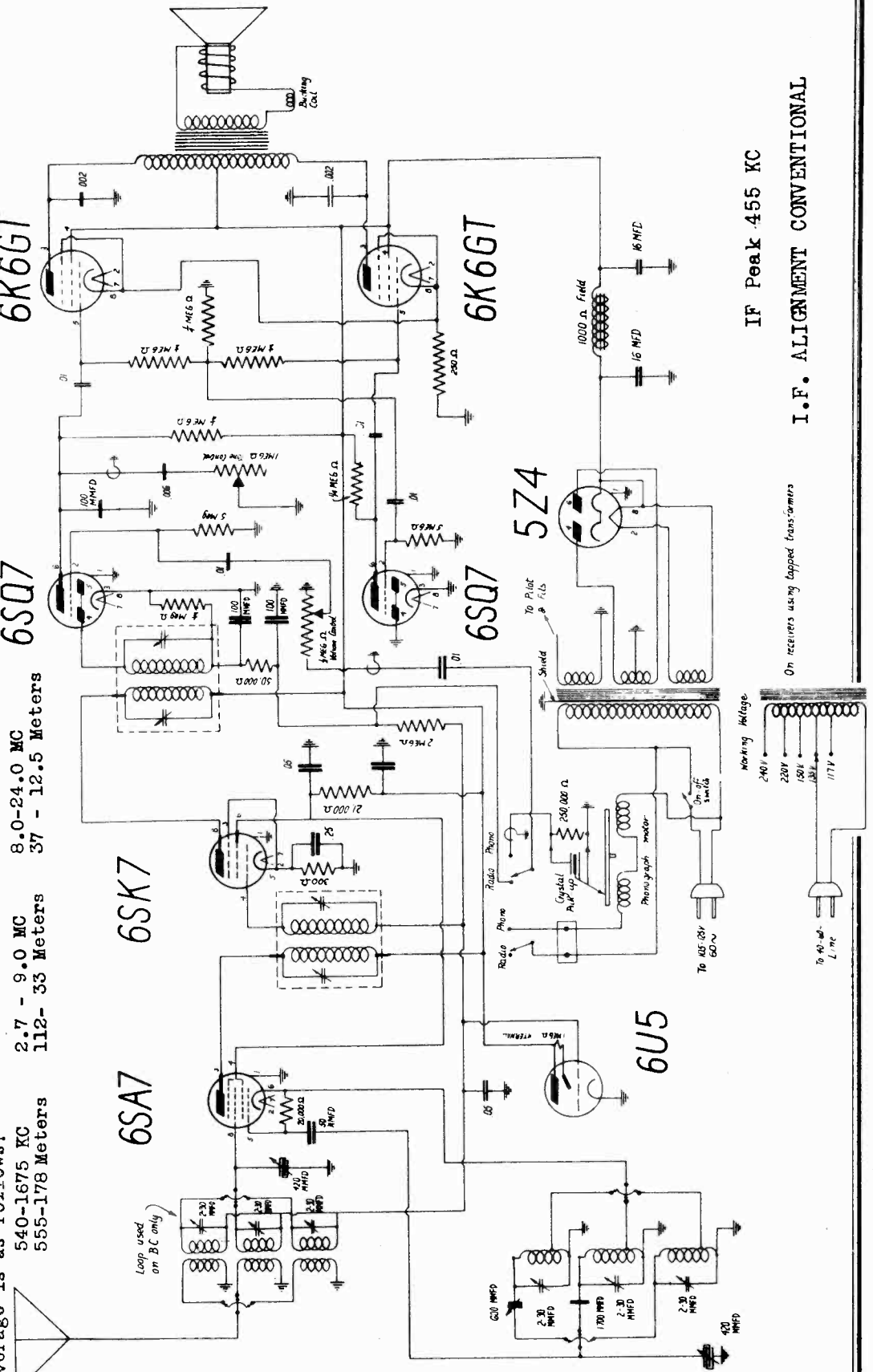
MODELS 814, 815,  
816, 817

- 6SA7 oscillator and first detector
- 6SK7 intermediate frequency amplifier
- 6SQ7 second detector, A.V.C. and first audio
- 6SQ7 phase inverter
- 6K6GT power output
- 5Z4 rectifier
- 6U5 tuning indicator

This model is a radio phonograph combination which operates on alternating current. It has full automatic volume control on all bands. The receivers with multi-tap transformers will operate on 117 V., 135 V., 150 V., 220 V., or 240 V., 40-60 cycles A.C. Those that do not have multi-tap transformers will operate on 117-volts, 60 cycles A.C. unless otherwise specified. A large slide rule instrument type dial with a high ratio tuning mechanism has been incorporated in order to make station tuning easy and accurate. An antenna loop which makes the use of an outside aerial unnecessary is also featured in these receivers. Provisions have been made for attaching a television unit to the receiver. The range coverage is as follows:

FOR OTHER DATA SEE INDEX

- 6SA7 540-1675 KC
- 6SK7 2.7 - 9.0 MC
- 6SQ7 8.0-24.0 MC
- 6K6GT 112-33 Meters
- 5Z4 37 - 12.5 Meters



IF Peak 455 KC  
I.F. ALIGNMENT CONVENTIONAL

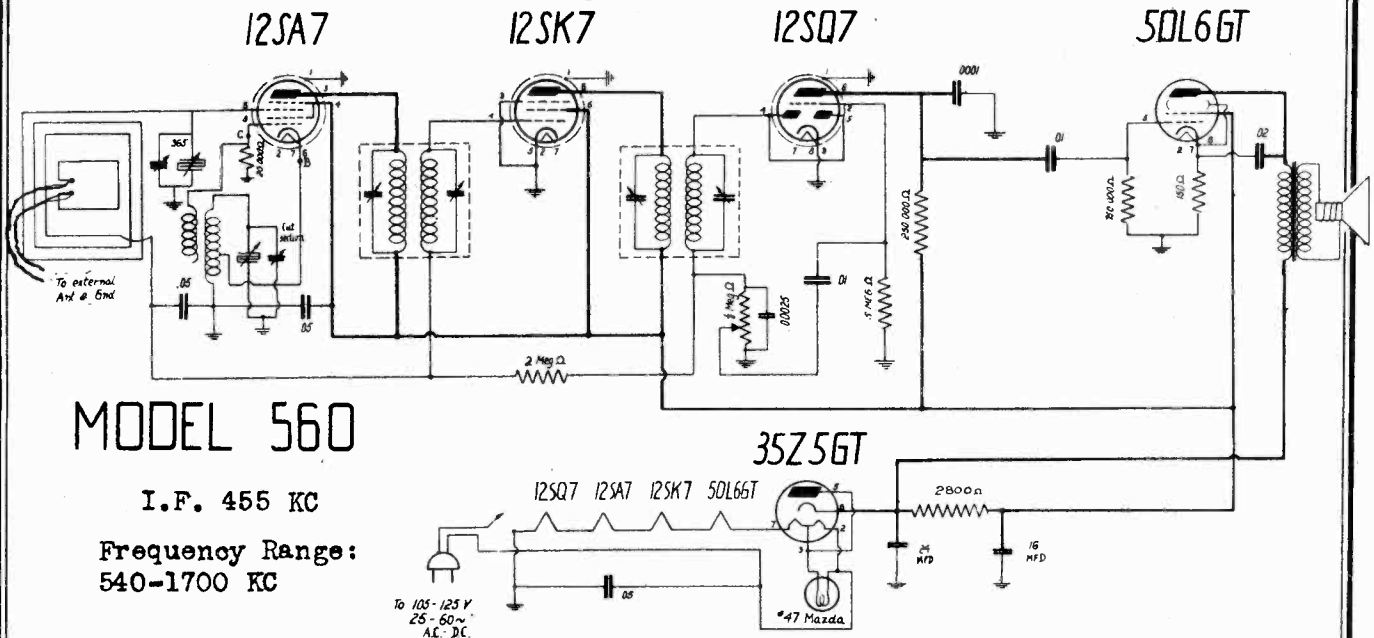
On receivers using tapped transformers





DEWALD RADIO MFG. CORP. MODELS 814,815,816,817  
MODELS 906,907,908  
MODEL 560

This model is a five tube superheterodyne receiver with full automatic volume control. A self-contained loop is incorporated which makes the use of an antenna unnecessary. The range coverage is 540-1700 kilocycles. The receiver has been designed to operate on 105-125 volts, 25-60 cycles A.C.-D.C., unless otherwise specified.



### MODEL 560

**ALIGNMENT:** Attach the hot side of signal generator to one of the flexible antenna loop leads. Connect the ground side to the other flexible lead. Adjust signal generator to 455 kc and peak I.F. trimmer screws for maximum signal. Adjust receiver dial and generator to 1500 kc peak the variable condenser trimmer screws for maximum gain.

MODELS 906,907,908, MODELS 814,815,816,817

### I.F. ALIGNMENT

Attach the antenna lead of the signal generator to the antenna lead of the receiver. Connect the ground side of the generator to the ground lead of the set. Turn the wave band switch knob of the receiver to broadcast position. Attach an output meter or resonance indicator across the primary leads of the speaker or across the voice coil terminals. Adjust the signal generator to 455 K.C. Have the volume control in the maximum position. Peak the I.F. adjusting screws to maximum output. Do not use a greater generator signal than is necessary to obtain a good output meter reading. For location of first and second I.F. transformers, see the tube layout diagram.

### BROADCAST ALIGNMENT

Keep the receiver in the broadcast position. Set the signal generator to 1500 KC. and adjust the broadcast oscillator coil trimmer screw until the signal from the generator is heard. Peak the broadcast antenna loop trimmer for maximum output. Tune the receiver and signal generator to 600 KC. Adjust the broadcast padder for maximum output. The variable condenser should be "rocked" during this operation.

### SHORT WAVE ALIGNMENT

To calibrate the 2.7-9.0 M.C. band, turn the wave band switch to this range. Adjust the receiver dial and signal generator to 8.0 megacycles. Turn the oscillator coil trimmer screw until the generator signal is heard. Peak the detector coil trimmer for maximum output. The low frequency is automatically adjusted by a fixed calibrated padder. To calibrate the 8.0 - 24.0 M.C. band, turn the wave band switch to this range. Adjust the receiver and signal generator to 22.0 megacycles and proceed adjusting the trimmers as for the 2.7-9.0 M.C. band.

MODELS 814, 815, 816, 817  
MODELS 906, 907, 908

DEWALD RADIO MFG. CORP.

NOTES ON RECORDING MODELS 906, 907, 908

Before attempting to cut any records, it is important to observe the following precautions.

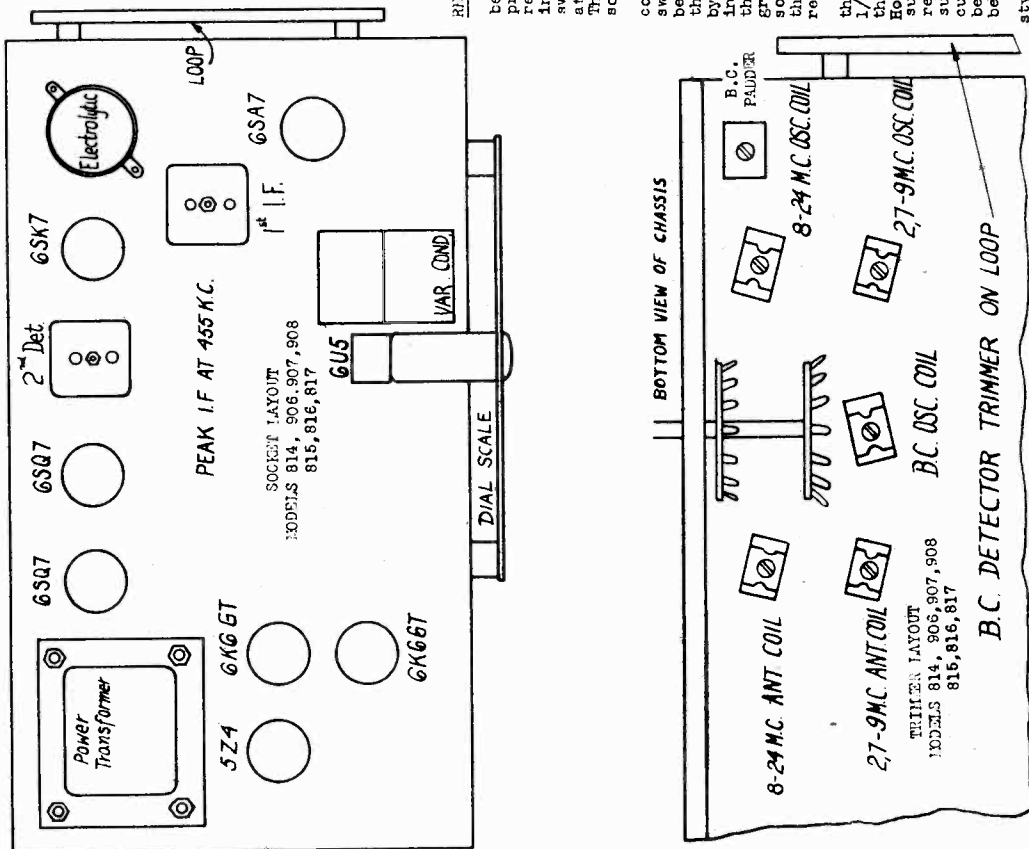
1. Records up to 10 inches in diameter may be cut.
2. A proper cutting stylus must be used in the cutting head.
3. Insert the cutting stylus into the head so that the flat portion of it will face the knurled thumb screw.
4. Tighten the cutting stylus in position by means of the knurled screw.
5. Great care must be exercised whenever moving the cutting arm, moving it along the horizontal plane, in order to avoid injury to the feed mechanism.
6. To check the adjustment of the cutting stylus, place a blank record on the turntable. Then bring the cutting head over the record and let it rest on the face of the record. If the cutting head is properly adjusted, it will be in a plane parallel to the record surface and the stylus perpendicular to it. This condition is obtained only when the nose of the recording arm is adjusted to the correct height of  $\frac{1}{4}$  inch above the record surface.
7. Whenever the recording arm is not being used, it should always be returned to its normal horizontal position to the right of the turntable. NEVER ALLOW THE CUTTING STYLUS TO REST ON THE TURNABLE.
8. A new cutting stylus will cut dozens of records satisfactorily before being dulled so that replacement is necessary. Do not bring the threaded material cut from the record near a flame, or have it come in contact with a hot object.

RECORD CUTTING PROCEDURE

Favorite radio programs may be easily recorded. Records may also be made of a person or group talking, singing, or playing instruments. The procedure for either type of recording is essentially the same. To make records of radio programs, the five point selector switch knob should be in the RADIO RECORDING position. When making microphone recordings the switch knob should be in the MICROPHONE RECORDING position, and the plug at the end of the microphone cable inserted in the microphone socket. The microphone should be held at a distance of 6 to 18 inches away from the sound.

Place the record blank on the turntable allowing the spring pin to come up through one of the small holes on the record. Snap the toggle switch to the "on" position. Before starting to cut the record, whether it be radio or microphone recording, the volume control must be adjusted so that the record will be properly cut. The correct adjustment can be made by watching the tuning eye located in the middle of the dial. Components in the circuit have been so chosen to permit the "eye" to close just before the recorded volume becomes great enough to cause overcutting into adjacent grooves on the record. For this reason, it is necessary to adjust the control so that the "eye" just closes when recording. It may be necessary to regulate the volume during the cutting because of variations of signal input to the receiver.

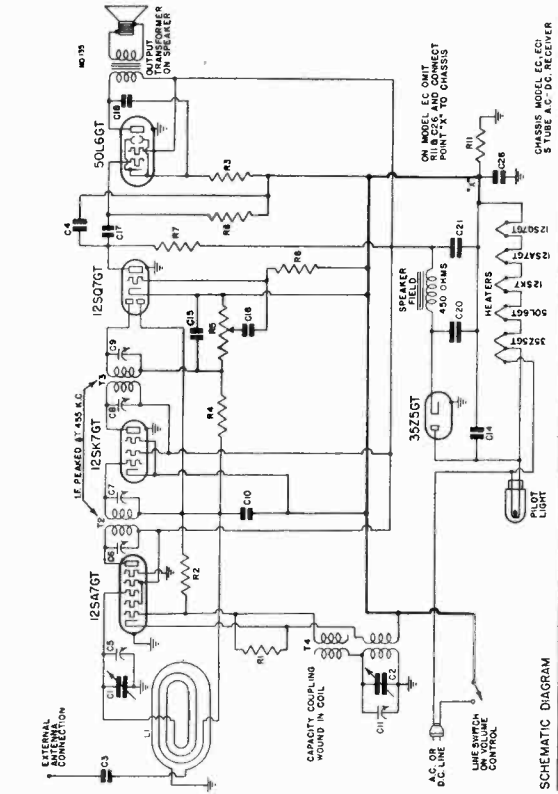
Raise the cutting head so that it is at about 45 degrees angle with the turntable. Bring it over the record until the cutting stylus is about 1/8 inch in from the edge of the record. Slowly lower the cutting arm onto the face of the disc. From now on, the cutting is done automatically. However, as the grooves are being cut, threads will appear on the record surface. These threads should be brushed off occasionally. When the record is finished, the depth of cut may be observed by holding it in such a position that a light is reflected from the grooves. If the depth of cut is correct, the grooves will appear to be about as wide as the space between them. The cut may also be checked by noting the quality of the space being cut. It should not be coarse and stiff, nor light and fluffy. Should the cut be unsatisfactory, it may be due to a dulled cutting stylus or improper adjustment of the recording arm. The depth of cut may be regulated by an adjustment of the flat head screw on the top of the recording arm. Turning the screw to the left (counterclockwise) decreases the depth of cut. Turning the screw to the right (clockwise) increases the depth of cut.



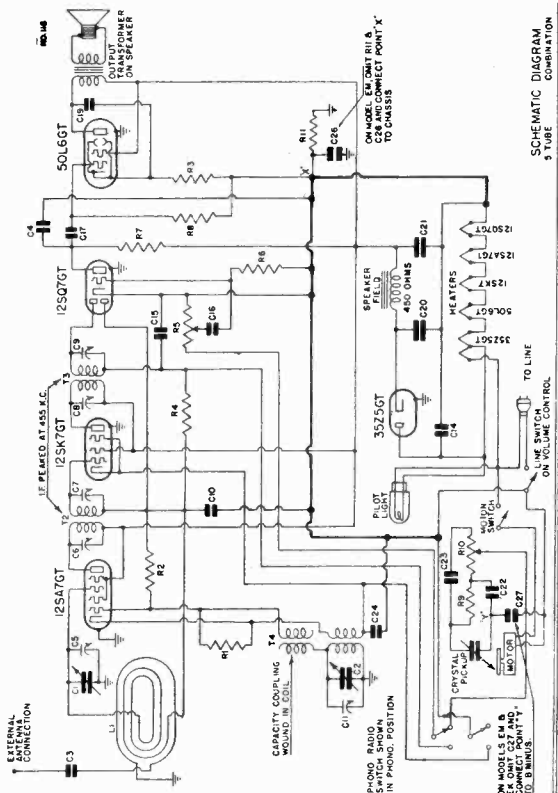


# EMERSON RADIO & PHONOGRAPH CORP.

Chassis EC, EC1, EK, EM, EMI



SCHMATIC DIAGRAM FOR MODELS EC AND EC1



SCHMATIC DIAGRAM COMBINATION

Readings should be taken with a 1000 ohm-per-volt meter. Voltages listed below are from point indicated to B minus (line switch) with the volume and antenna turned on full and no signal. Line voltages for these readings was 117.5 volts, a.c. All readings except heaters and cathodes were taken on 250 volt scale. Measurements made with 117.5 volts d.c. will be lower than those given below.

Tube	Plate	Screen	Cathode	Fil.
12SA7GT	88	88	0	12
12SK7GT	88	88	0	12
12SQ7GT	30	—	0	12
50L6GT	82	88	5.6	50

**DIAL CORD REPLACEMENT**  
For chassis using the narrow "V" shaped notch in the drive pulley use a half turn of cord, part number 68Z-870. For chassis using the drive pulley with a broad "U" shaped groove, use a turn and a half of cord, part number 78Z-870. The cord should be wound on the drive pulley and fasten it with one string near the notch in the pulley after which the spring may be hooked to the cord and pulley. The dial face should bear against the fibre washer when finally assembled.

**I-f Alignment**  
Swing the variable condenser to the minimum capacity position. Feed 455 kc to the grid of the 12SA7 tube through a .01 mf condenser and adjust the four i-f trimmers for maximum response.  
Note: The grid of the 12SA7 tube is connected to the stator lug of the rear variable condenser section. Connection may be made with a test clip.  
**R-f Alignment**  
Set the dial pointer at 1400. Set or adjust trimmer at 1400 kc and feed in output into loop antenna about 12 inches in diameter. Hold this radiating loop about 12 inches from and parallel to the receiver loop antenna. Advance the output of the signal generator until deflection is obtained on the output meter. Adjust trimmer of the oscillator trimmer (on front section of variable condenser) for maximum response. (On rear section of variable condenser) for maximum response.

If the loop antenna has been replaced it may be necessary to adjust the loop inductance as follows. Align at 1400. Set the pointer at 60 and feed 600 kc to the antenna lead. A portion of the outside turn of the loop may be swung to either side of the center to give maximum response. Realign at 1400.

**MODELS: EC-296, EC-301, EC-314, EC-315, EC-327, EC-336, EC-347, EC-353 and EC-366**

CHASSIS MODEL: EC  
COMBINATION RADIO AND PHONOGRAPH

**MODELS: EM-345, EM-346 and EM-382**  
(For operation on A.C. only)

**MODELS: EM2-345, EM2-346 and EM2-382**  
(For operation on A.C. or D.C.)

**MODEL: EK-377 and EK-403**  
(For operation on A.C. only)

**MODEL: EK-377 and EK-403**  
(For operation on A.C. or D.C.)

**MODEL: EM3-345 and EM3-346**  
(For operation on A.C. or D.C.)

CHASSIS MODEL: EMI  
COMBINATION RADIO AND PHONOGRAPH

**MODELS: EM1-345 and EM1-346**  
(For operation on A.C. only)

**MODELS: EM3-345 and EM3-346**  
(For operation on A.C. or D.C.)

**MODELS: EC1-296, EC1-301, EC1-314, EC1-315, EC1-327, EC1-336, EC1-347, EC1-353 and EC1-366**

CHASSIS MODEL: EC1  
COMBINATION RADIO AND PHONOGRAPH

**MODELS: EM1-345 and EM1-346**  
(For operation on A.C. only)

**MODELS: EM3-345 and EM3-346**  
(For operation on A.C. or D.C.)

- 1. EM chassis which use Motor, part numbers 61PM-46, 61PM-46A or 61PM-53A may use part number 8CPM-64 for replacement.
- 2. EK chassis use C19, .05 mf, 400 volt condenser.
- 3. Model EM-382 uses Motor 8CPM-64C

REPLACEMENTS: If replacements are made on the wiring distributed in the i-f section of the circuit, the receiver should be carefully re-aligned.  
**Location of Coils and Trimmer Adjustments**  
The first i-f transformer is mounted on top of the chassis deck to the right of the variable condenser. The trimmers are accessible through holes in the top of the can.  
The second i-f transformer is mounted on top of the chassis between the variable condenser and the speaker. The trimmers are accessible through holes in the top of the can.  
The trimmers for the antenna and oscillator coils are located on the oscillator coil.  
The trimmer on the front section is for the oscillator coil.  
The oscillator coil is located underneath the chassis. The loop antenna acts as this antenna coil.

**FREQUENCY RANGE:** 540-1600 kc.

MODEL FG-330  
Chassis FG  
MODEL FC-400  
Chassis FC

EMERSON RADIO & PHONOGRAPH CORP.

DIAL CORD REPLACEMENT

Draw the cord snugly around the condenser pulley and knot it, with no slack, near the notch in the pulley, after which the spring may be hooked to the cord and pulley. The dial face should bear against the fibre washer when finally assembled.

- L1 Loop antenna assembly (FC)
- L4 Loop antenna assembly (FG)
- T4 Oscillator coil
- T2 Double-tuned 455 kc first i-f transformer
- T3 Double-tuned 455 kc second i-f transformer
- R1 20,000 ohm 1/4 watt carbon resistor
- R3 140 ohm 1/2 watt wire-wound resistor
- R4 3 megohm 1/4 watt carbon resistor
- R5 Volume control .5 megohm with line switch (FC)
- R5 Volume control .5 megohm with line switch (FG)
- R6, R2 15 megohm 1/4 watt carbon resistor
- R7, R8 500,000 ohm 1/4 watt carbon resistor
- R11 200,000 ohm 1/4 watt carbon resistor
- C1, C2 Two-gang variable condenser (FC)
- C1, C2 Two-gang variable condenser (FG)
- C3, C16 0.002 mf, 600 volt tubular condenser
- C4, C15 0.002 mf, 600 volt tubular condenser
- C5, C11 Trimmers, part of variable condenser
- C6, C7, C8, C9 } Trimmers, part of variable condenser
- C10, C27 0.05 mf, 200 volt tubular condenser
- C14 0.05 mf, 400 volt tubular
- C17, C18 0.02 mf, 400 volt tubular condenser
- C20, C21 Dual 20 mf, 150 volt dry electrolytic condenser (FC)
- C20, C21 Dual 20 mf, 150 volt dry electrolytic condenser (FG)
- C24 0.1 mf, 200 volt tubular condenser
- C26 0.2 mf, 200 volt tubular condenser
- 7B5-409 5" dynamic speaker

R-f Alignment

Set the dial pointer at 140. Set the signal generator at 1400 kc and feed its output into a loop of wire about 12 inches in diameter. Hold this radiating loop about 12 inches from and parallel to the receiver loop antenna. Advance the output of the signal generator until deflection is obtained on the output meter. Adjust first the oscillator trimmer (on front section of variable condenser) then the antenna trimmer (on rear section of variable condenser) for maximum response.

If the loop antenna has been replaced it may be necessary to adjust the loop inductance as follows. Align at 140. Set the pointer at 60 and feed 600 kc to the antenna lead. A portion of the outside turn of the loop may be swung to either side of the center to give maximum response. Realign at 140.

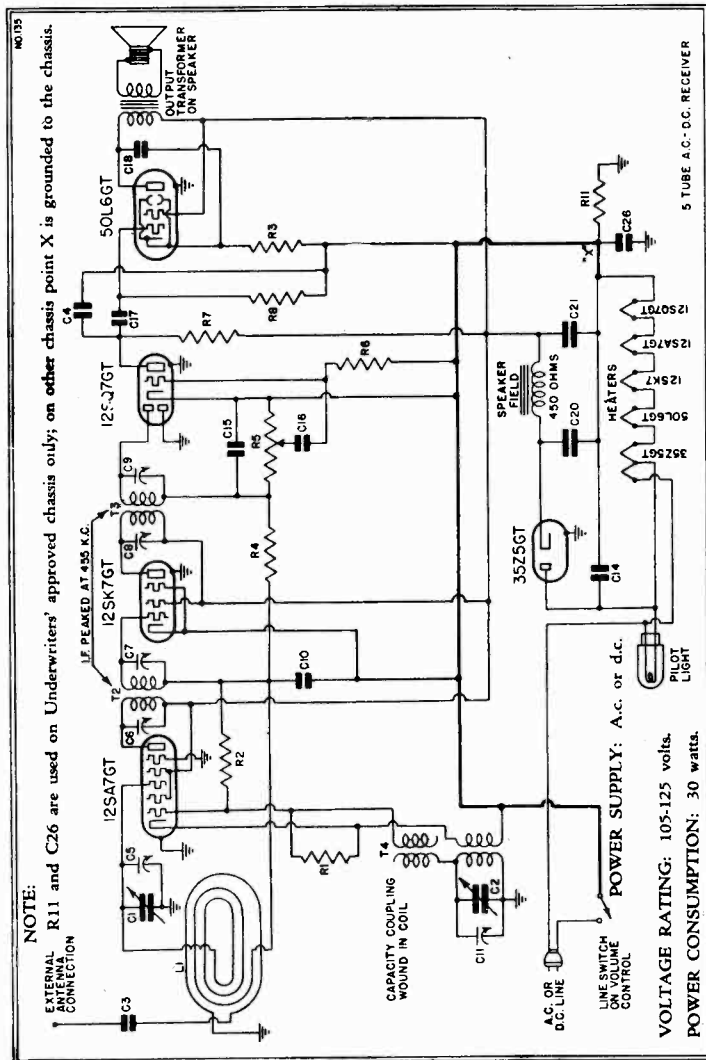
- TYPE: Single-band superheterodyne.
- FREQUENCY RANGE: 540-1600 kc.
- 12SA7GT, pentagrid oscillator-modulator
- 12SK7GT, first i-f amplifier
- 12SQ7GT, diode detector, a-f amplifier, a.v.c.
- 50L6GT, beam power output
- 35Z5GT, half-wave rectifier.

MODEL: FC-400

CHASSIS MODEL: FC

MODEL: FG-330

CHASSIS MODEL: FG



The oscillator coil is located underneath the chassis. The loop antenna acts as the antenna coil.

I-f Alignment

Swing the variable condenser to the minimum capacity position. Feed 455 kc to the grid of the 12SA7 tube through a .01 mf condenser and adjust the four i-f trimmers for maximum response.

Note: The grid of the 12SA7 tube is connected to the stator lug of the rear variable condenser section. Connection may be made with a test clip.

Tube	Plate	Screen	Cathode	Fil.
12SA7GT	88	88	0	12
12SK7GT	88	88	0	12
12SQ7GT	30	—	0	12
50L6GT	82	88	5.6	50

VOLTAGE ANALYSIS

Voltage at 35Z5 cathode—120 volts.  
Voltage across speaker field—32 volts.  
Voltage across pilot light—4.5 volts.

Location of Coils and Trimmer Adjustments

The first i-f transformer is mounted on top of the chassis deck to the right of the variable condenser. The trimmers are accessible through holes in the top of the can.

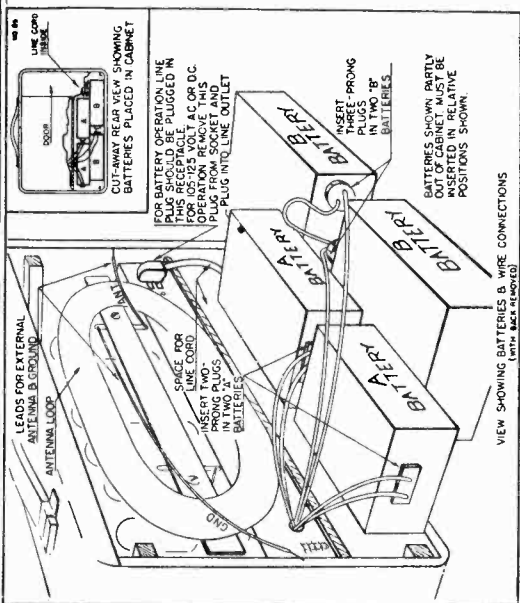
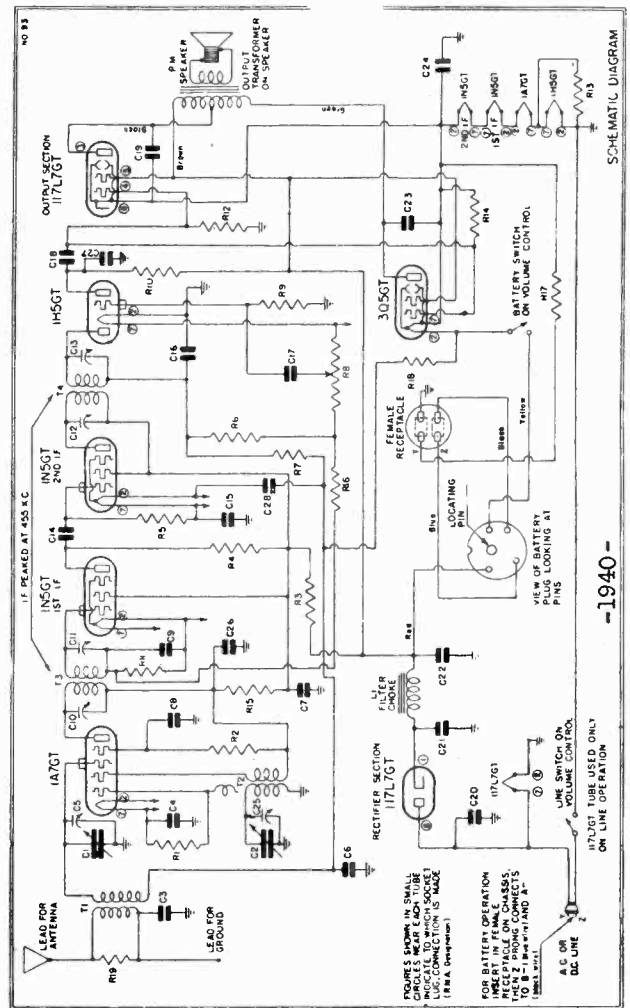
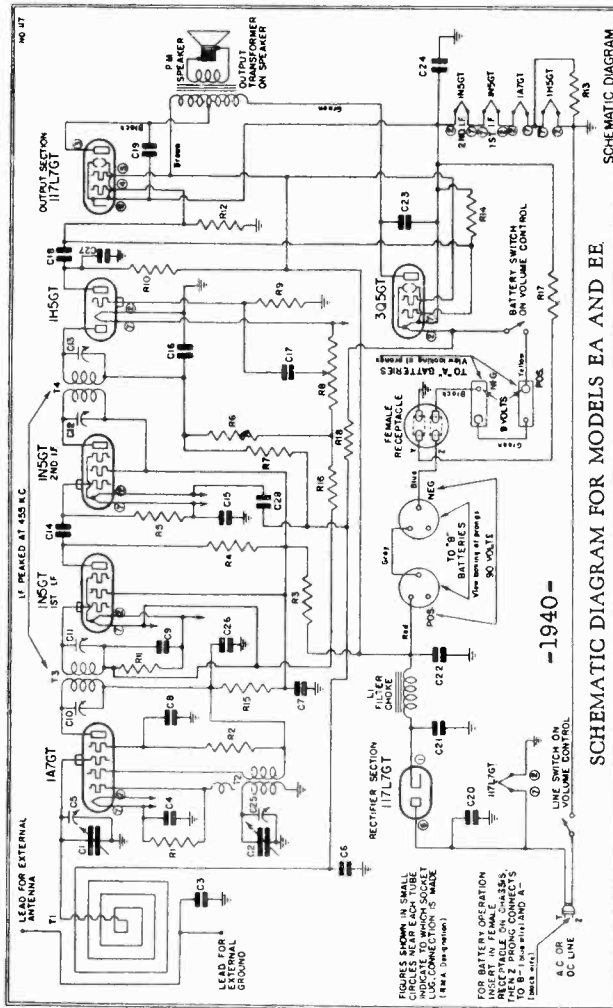
The second i-f transformer is mounted on top of the chassis between the variable condenser and the speaker. The trimmers are accessible through holes in the top of the can.

The trimmers for the antenna and oscillator coils are located on the variable condenser. The trimmer on the front section is for the oscillator coil.

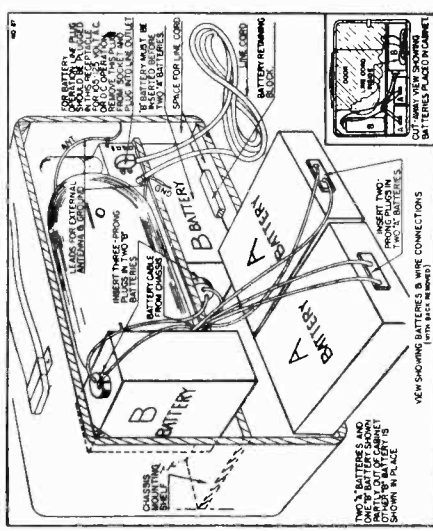
Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (line switch) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, a.c. All readings except heaters and cathodes were taken on 250 volt scale. Measurements made with 117.5 volts d.c. will be lower than those given below.

EMERSON RADIO & PHONOGRAPH CORP.

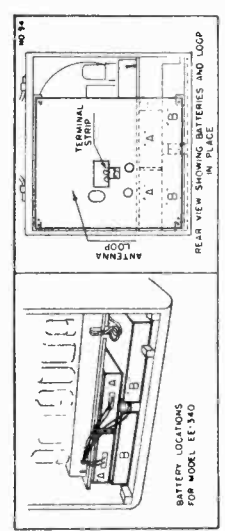
Chassis EA, EE,  
EB, EW



FOR MODEL EA-312, 338, 339, 385, 389 AND 390



FOR MODEL EA-337



FOR MODEL EE-340

TYPE: Universal (battery, a.c.-d.c.) superheterodyne.  
FREQUENCY RANGE: 540-1600 kc.

POWER SUPPLY: Battery, a.c. or d.c.  
VOLTAGE RATING: (Line operation) 105-125 volts, a.c.-d.c.  
POWER CONSUMPTION: (Line operation) 30 watts  
CURRENT DRAIN:  
(Battery operation) "A" battery 0.05 amp.  
"B" battery 0.01 amp.

In some 340 cabinets, the A batteries face the left end.  
See the diagram on the cabinet back.



Chassis EA, EE  
EB, EW

# EMERSON RADIO & PHONOGRAPH CORP.

The color coding of the battery cable is as follows:  
Yellow—A plus, 9 volts  
Black—A minus  
Red—B plus, 90 volts  
Blue—B minus  
Grid return—black  
Plate—blue  
B plus—red

The color coding of the i-f transformer leads is as follows:  
Grid—green  
Plate—blue  
B plus—red

## VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed are from point indicated to chassis with volume control turned on full and no signal. The battery voltages for these readings were: "A" 9.0 volts, "B" 90 volts.

Point	Tube	Plate	Screen	Osc. Plate	File
1A7GT	1A7GT	88	50	82	1.5
1N5GT, 1st i-f	1N5GT	88	50	88	1.5
1N5GT, 2nd i-f	1H5GT	88	88	88	1.5
3Q5GT	3Q5GT	27	—	—	1.5
50,000 ohm 1/4 watt carbon resistor	50,000 ohm 1/4 watt carbon resistor	85	88	88	3.0
30,000 ohm 1/4 watt carbon resistor	117L7GT (line operation only)	86	99	—	117
500 ohm 1/4 watt carbon resistor	117L7GT rectifier cathode (File No. 1 (line operation only))	125	—	—	—

**MODELS: EA-312, EA-338, EA-339, EA-357, EA-385 and EA-389**

CHASSIS MODEL: EA

**MODELS: EB-344 and EB-359**

CHASSIS MODEL: EB

**MODEL: EE-340 and EE-390**

CHASSIS MODEL: EE

**MODEL: EW-391**

CHASSIS MODEL: EW

## BATTERY COMPLEMENT

FOR MODELS EA, EE

Type	Battery No.	Req.
4 1/2 volt "A"	2	2
45 volt "B"	2	2

FOR MODELS EB, EW

Type	Battery No.	Req.
45 volt "B"	2	2

"A" and "B" Pack 1

C25, C5 Trimmer, part of variable condenser.

C28 0.015 mf, 200 volt tubular condenser

C28 (see production change no. 2)

0.0005 mf, 600 volt tubular condenser (EW)

40 mf, 25 volt dry electrolytic condenser

EA chassis bearing serial numbers below 3,606, 650 use: (a) Resistor R17, 1000 ohms, part number PR-79, (b) Battery cable, part number 8AW-268.

EA chassis bearing serial numbers below 3,625,961 use C23, 0.001 mf, part number NNC-199 in place of 0.01 mf, part number KC-58.

EA chassis which use speaker, part number 6XS-424, may use 7JS-443 for replacement.

EA chassis which use electrolytic, part number 6JC-426D, may use 6JC-426E for replacement.

EA chassis which use electrolytic, part number 6ZC-460, may use 7FC-451 for replacement.

## Location of Coils and Trimmer Adjustments

The oscillator coil is located beneath the chassis. The trimmer for the oscillator is on the front section of the variable condenser.

In Models EA and EE the loop antenna acts as the antenna coil. The trimmer for the loop is on the rear section of the variable condenser.

In Model EB the antenna coil is mounted to the speaker frame.

The i-f transformers are located in cans mounted on top of the chassis. The first i-f transformer is at the right of the variable condenser and the diode i-f transformer is to the left of the variable condenser. The trimming condensers for both transformers can be reached through holes in the tops of the cans.

## i-f Alignment

Swing variable condenser to minimum capacity position. Feed 455 kc to the grid of the 1A7GT tube through a 0.01 mf condenser. Adjust the four i-f trimmers for maximum response.

## R-f Alignment

Set the dial pointer at 140. Feed 1400 kc from the signal generator into a loop of wire one foot in diameter. Feed the signal to the loop antenna on the front of the chassis. Turn the volume control knob until a suitable deflection is obtained on the output meter. Adjust first the oscillator trimmer (on front section of variable condenser) then the antenna trimmer (on rear section of variable condenser) for maximum response.

If the loop antenna has been replaced it may be necessary to adjust the loop inductance. Align at 140. Set the dial at 60 and feed 600 kc to the radiating loop. A portion of the outside turn of the loop may then be swung to either side of the center to give maximum response. Realign at 140.

## Battery Installation

For Models 312, 338, 339, 385, 389 and 390.

To install and connect the batteries in this cabinet observe the following procedure:

1. Remove the back panel of the cabinet by taking out the screws.

2. Locate the battery cable coming from the receiver and identify the plugs on the cable ends.

3. Insert the three-prong plug on the battery cable into the two "B" batteries. Place the two batteries in the bottom of the cabinet. The plug ends of the battery cable should be pushed into the front of the cabinet. The wood blocks at the rear corners and rear center of the cabinet serve to hold the "B" batteries in place.

4. Insert the two-prong plug on the battery cable into the two "A" batteries. Place the "A" batteries, one at a time, in the "B" batteries in the cabinet. The plug ends of the "A" battery cable should be pushed into the left side of the "A" battery. Push the "A" battery to the left when placing them in the cabinet, in order to clear the small wood block in the front right-hand corner of the cabinet.

5. Replace the back panel of the cabinet and fasten it in place with the screws. See diagrams for other models.

If replacements are made in the r-f section of the circuit, the receiver should be carefully re-aligned.

A.C.D.C. Operation: In portable models open the small door at the back of the cabinet. It is important that this small door be left open while operating the receiver on either a.c. or d.c. power. Take out the line cord, removing the plug from its receptacle at the rear of the chassis. The receiver does not operate at first; remove the plug from the wall outlet, turn it half way around and re-insert it in the wall outlet, thus obtaining the proper polarity.

Battery Operation: Important: Remove the line plug from the electrical outlet. Insert the plug into the receptacle at the rear of the receiver. This is important since the receiver will not operate from batteries with the plug out of the receptacle. The loose portion of the cord can then be coiled and placed in the cabinet.

## Dial Cord Replacement

Dials which use the drive shaft pulley with a narrow "V" shaped groove use a half turn of drive cord, part no. 6RZ-870. Dials using the drive shaft pulley with a broad "U" shaped groove use a turn and a half of cord, part no. 7BZ-867A. The cord should be drawn snugly around the condenser pulley and knotted with no slack near the opening in the dial face groove after which the spring may be hooked to the dial face groove bearing against the fiber washer when finally assembled.

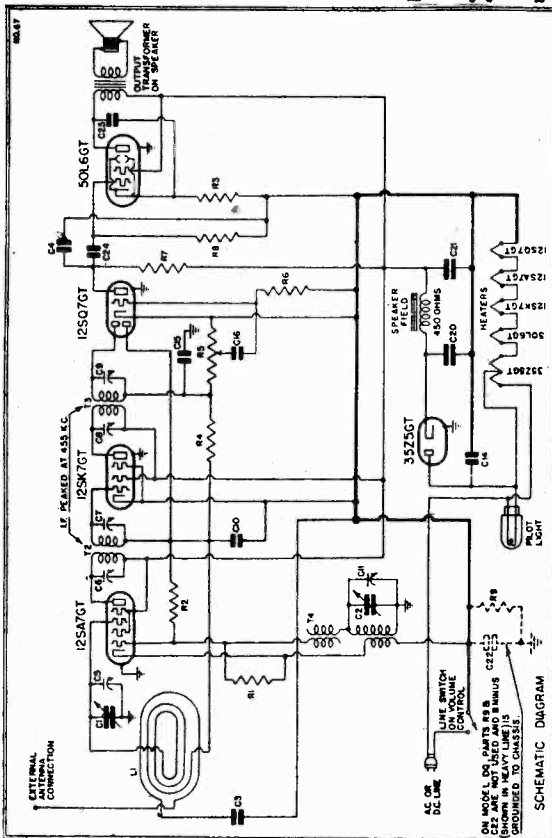
Eveready Part No.	Rayovac Part No.	Burgess Part No.
746 (plug-in type)	P83A or EM43 (plug-in type)	3G (plug-in type)
482 Minimax (plug-in type)	—	3G6D60 (plug-in type)

- 1—1A7GT, oscillator-modulator
- 1—1N5GT, 1st i-f amplifier
- 1—1N5GT, 2nd i-f amplifier
- 1—1H5GT, 2nd detector, a.v.c., a-f amplifier
- 1—3Q5GT, beam power output (battery operation)
- 1—117L7GT, beam power output and half-wave rectifier (line operation).

## PRODUCTION CHANGES

— EA, EB, EE, EW — 52

# EMERSON RADIO & PHONOGRAPH CORP. Chassis DQ, DQ1, EH, EH1



- MODEL DQ PARTS R8, C12 ARE NOT USED AND MINUS GRID RETURN IS CONNECTED TO CHASSIS.**
- SPEAKER FIELD CONTROL**
- VOLUME CONTROL**
- SCHEMATIC DIAGRAM**
- L1 Loop antenna assembly
  - T4 Oscillator coil (DQ1, EH1)
  - T4 Oscillator coil (DQ, EH) (see prod. ch. No. 1)
  - T2 Double-tuned 455 kc first i-f transformer
  - T3 Double-tuned 455 kc second i-f transformer
  - R1 20,000 ohm 1/2 watt carbon resistor
  - R3 140 ohm 1/2 watt wire-wound resistor
  - R4 3 megohm 1/2 watt carbon resistor
  - R5 Volume control .5 megohm with line switch (DQ-DQ1) (EH, EH1)
  - R6, R2 15 megohm 1/2 watt carbon resistor
  - R7, R8 500,000 ohm 1/2 watt carbon resistor
  - R9 200,000 ohm 1/2 watt carbon resistor (DQ1, EH1)
  - C1, C2 Two-gang variable condenser (DQ-DQ1)
  - C1 Two-gang variable condenser (EH, EH1)
  - C3, C11 Trimmers, part of variable condenser.
  - C6, C7, C8, C9 Trimmers, part of i-f transformers.
  - C10 0.1 mf, 200 volt tubular condenser
  - C14 0.05 mf, 400 volt tubular condenser
  - C15, C4 0.0002 mf, 600 volt tubular or mica condenser
  - C16, C3 0.002 mf, 600 volt tubular condenser
  - C25 0.01 mf, 400 volt tubular condenser (see production change no. 3)
  - C20, C21 Dual 20 mf, 150 volt dry electrolytic condenser (see production change no. 2)
  - C22 0.2 mf, 200 volt tubular condenser (DQ1, EH1)
  - C24 0.02 mf, 400 volt tubular condenser
  - 7KS-446 6 1/2" dynamic speaker (DQ1)
  - 8HS-090 8" dynamic speaker (EH)
  - 8HS-090A 8" dynamic speaker (EH1)
- MODELS: DQ-333, DQ-334, DQ-351 and DQ-398**
- CHASSIS MODEL: DQ**
- MODEL: EH-342**
- CHASSIS MODEL: EH**
- MODELS: DQ1-333 and DQ1-334**
- CHASSIS MODEL: DQ1**
- MODEL: EH1-342**
- CHASSIS MODEL: EH1**
- Listed under Re-examination Service of Underwriters Laboratories, Inc.
- DQ, DQ1, EH-52 1. Chassis DQ use both type oscillator coils listed above. For correct lug connections see Figure on next page. Notice on 7Q7-547 the low end of the coil returns to a lug which is connected to chassis on DQ and to B minus on DQ1. On coil 7Q7-547 the low end of the coil return to the mounting foot.
  - DQ, DQ1, EH-51 2. DQ chassis using (a) speaker 6QS-387 may use 7KS-446A for replacement. (b) electrolytic 6JC-466AU may use 6JC-426F for replacement.
  - DQ, DQ1, EH-51 3. EH, EH1 chassis use C25—.02 mf, 400 volt condenser.

**TYPE:** Single-band Superheterodyne.

**FREQUENCY RANGE:** 540-1600 kc.

**NUMBER OF TUBES:** Five.

**TYPE OF TUBES:**

- 1-12SA7GT, pentagrid oscillator-mixer
- 1-12SK7GT, first i-f amplifier
- 1-12S07GT, diode detector, a-f amplifier, a.v.c.
- 1-50L6GT, beam power output
- 1-35Z5GT, half-wave rectifier.

**POWER SUPPLY:** a.c. or d.c.

**VOLTAGE RATING:** 105-125 volts.

**POWER CONSUMPTION:** 30 watts.

If replacements are made or the wiring disturbed in the r-f section of the circuit, the receiver should be carefully re-aligned.

### Location of Coils and Trimmer Adjustments

The first i-f transformer is mounted on top of the chassis to the right of the variable condenser. The trimmers are accessible through holes in the top of the can.

The second i-f transformer is mounted on top of the chassis between the variable condenser and the speaker. The trimmers are accessible through holes in the top of the can.

The trimmers for the antenna and oscillator coils are located on the variable condenser. The trimmer on the front section is for the oscillator coil.

The oscillator coil is located underneath the chassis. The loop antenna acts as the antenna coil.

### DIAL CORD REPLACEMENT

Chassis which have the dial drive shaft pulley with a narrow "V" cut use a half turn of dial cord, part number 6RZ-870. Chassis which have the dial drive shaft pulley with a wide "V" cut use a full turn of dial cord, part number 7BZ-867A. This cord should be drawn snugly around the condenser pulley and knotted with no slack, after which the spring may be hooked to the cord and pulley. The dial face should bear against the fibre washer when finally assembled.

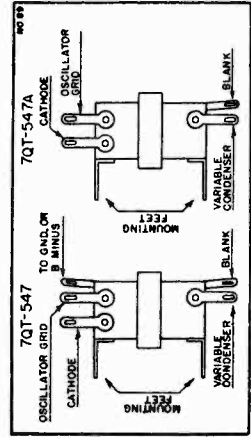
Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (line switch) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings except heaters and cathodes were taken on 250 volt scale. Measurements made with 117.5 volts d.c. will be lower than those given below.

### VOLTAGE ANALYSIS

Voltage at 35Z5 cathode—120 volts.  
Voltage across speaker field—32 volts.  
Voltage across pilot light—4.5 volts.

### PRODUCTION CHANGES

Notice on 7Q7-547 the low end of the coil returns to a lug which is connected to chassis on DQ and to B minus on DQ1. On coil 7Q7-547 the low end of the coil return to the mounting foot.



**Oscillator Coils—See Production Change No. 1**

An oscillator with frequencies of 455 and 1400 kc is required.

An output meter should be used across the voice coil or output transformer for observing maximum response.

Always use as weak a test signal as possible when aligning the receiver.

### I-f Alignment

Swing the variable condenser to the minimum capacity position. Feed 455 kc to the grid of the 12SA7 tube through a .01 mf condenser and adjust the four i-f trimmers for maximum response.

**Note:** The grid of the 12SA7 tube is connected to the lower end of the antenna coil. The antenna coil connection may be made with a test clip to the upper error lug. This lug is easily identified by the connection of the green lead to the loop.

### R-f Alignment

Set the dial pointer at 140. Set the signal generator at 1400 kc and feed its output into a loop of wire about 12 inches in diameter. Hold this radiating loop about 12 inches from and parallel to the antenna lead. Tune the signal generator until deflection is obtained on the output meter. Adjust first the oscillator trimmer (on front section of variable condenser) then the antenna trimmer (on rear section of variable condenser) for maximum response.

If the loop antenna has been replaced it may be necessary to adjust the loop inductance as follows. Align at 140. Set the signal generator at 1400 kc to the antenna lead. A portion of the outside turn of the loop is on the right side of the center to give maximum response. Readjust at 140.

Tube	Plate	Screen	Cathode	Fil.
12SA7GT	88	88	0	12
12SK7GT	88	88	0	12
12S07GT	30	—	0	12
50L6GT	82	88	—	5.6

# Chassis DY, DY1 EMERSON RADIO & PHONOGRAPH CORP.

## Location of Coils and Trimmer Adjustments

The first i-f transformer is mounted on top of the chassis deck to the right of the variable condenser. The trimmers are accessible through holes in the top of the can.

The second i-f transformer is mounted on top of the chassis between the variable condenser and the speaker. The trimmers are accessible through holes in the top of the can.

The loop antenna acts as the broadcast antenna coil. The short-wave antenna coil is the larger of the two coils mounted on the loop.

The trimmers for the antenna coils (loops) for both bands are located on a dual strip fastened to the loop board. The innermost trimmer is for short-wave and outermost trimmer for broadcast.

The oscillator coil is located underneath the chassis, just below the variable condenser. The trimmers for both bands are mounted on a dual strip beneath the first i-f transformer. The short-wave trimmer is the one farthest from the mounting foot.

**MODELS: DY-337  
DY-349  
DY-351**

CHASSIS MODEL: DY

**MODELS: DY1-337  
DY1-349  
DY1-351**

CHASSIS MODEL: DY1

(Listed under reexamination service of Underwriters' Laboratories, Inc.)

TYPE: Two-band superheterodyne.

FREQUENCY RANGES:

540-1600 kc.  
2.5-6.5 mc.

## PRODUCTION CHANGES

1. Chassis which use C27, C28—6JC-426B, may use 6JC-426H for replacement.
2. Chassis using speaker 7YS-476 may use 6MS-395 for replacement.
3. Chassis bearing serial number above 4,083,550 use 7YT-552B loading coil.
4. Chassis bearing serial number above 4,083,550 use 7YW-249B loop antenna assembly.

Readings should be taken with a 1000 ohm-per-volt meter. Voltages listed below are from point indicated to B minus (line switch) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings except heaters and cathodes were taken on 250 volt scale. Measurements made with 117.5 volts d.c. will be lower than those given below.

## VOLTAGE ANALYSIS

Voltage at 3Z5Z cathode—120 volts.  
Voltage across speaker field—32 volts.  
Voltage across pilot light—4.5 volts.

## R-f Alignment

Rotate the wave-band switch counter-clockwise to the short-wave position. Set the dial pointer at 6 megacycles and feed 6 megacycles from the signal generator into a loop of wire about 12 inches in diameter. Hold this radiating loop about 12 inches from the loop antenna and advance the output of the generator until a deflection is obtained on the output meter. Adjust first the short-wave oscillator trimmer (farthest from mounting foot, beneath the chassis) and then the antenna trimmer (innermost trimmer of dual trimmer strip on loop board) for maximum response.

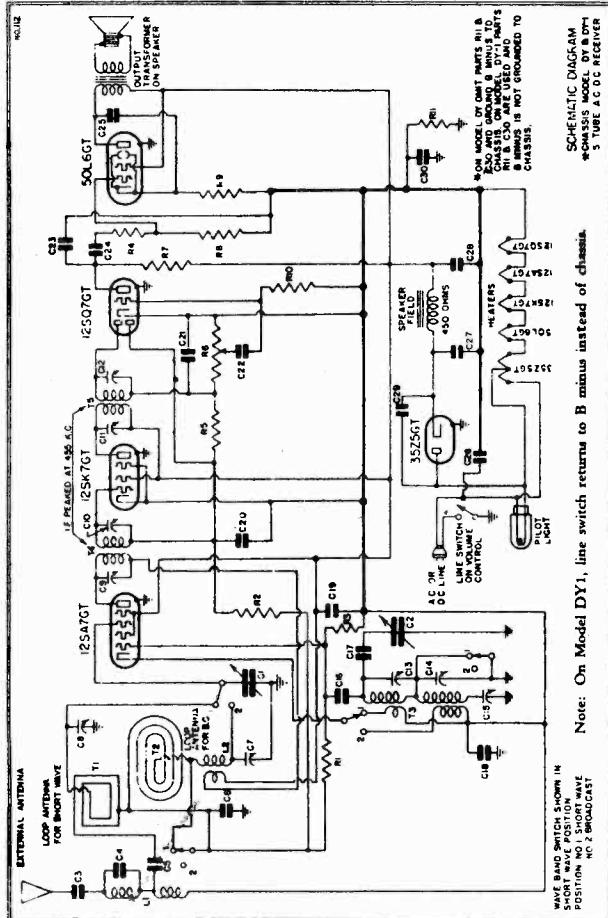
Without changing the above set-up, rotate the band-switch clockwise to the broadcast position, set the dial pointer at 150 kc and feed 1500 kc into the radiating loop. Adjust first the broadcast oscillator trimmer (closest to mounting foot, beneath the chassis), and then the antenna trimmer (outermost of dual trimmer on the loop) for maximum response. Rotate the dial pointer to 60, feed 600 kc into the radiating loop and adjust the broadcast response padder (mounted on the rear wall) for maximum response while rocking the variable back and forth. Repeat alignment at 1500 kc.

## DIAL CORD REPLACEMENT

Use a half turn of cord, part number 7BZ-867A. Draw the cord snugly around the condenser pulley and knot with the slack, after which the spring may be hooked to the cord and pulley. The dial face should bear against the fibre washer when finally assembled.

## I-f Alignment

Swing the variable condenser to the minimum capacity position. Feed 455 kc to the grid of the 12SA7 tube through a .01 mf condenser and adjust the four i-f trimmers for maximum response. Note: The grid of the 12SA7 tube is connected to the stator of the rear variable condenser section. Connection may be made with a rear clip to the stator lug. This lug is easily identified by the connection of the green lead to the loop.



- L1 Antenna choke and 455 kc first i-f transformer
- L2 Antenna choke and 455 kc wave-trap (DY)
- L3 Broadcast loop antenna loading coil (see production change No. 3)
- L4 -DY-DY1-51
- L5 -DY-DY1-52
- T1, T2 Two-band loop antenna assembly (see production change No. 4)
- T3 Two-band oscillator coil
- T4 Double-tuned 455 kc first i-f transformer
- T5 Double-tuned 455 kc second i-f transformer
- R1, R10 15 megohm 1/4 watt carbon resistor
- R2, R11 200,000 ohm 1/4 watt carbon resistor
- R3 20,000 ohm 1/4 watt carbon resistor
- R4 50,000 ohm 1/4 watt carbon resistor
- R5 2 megohm 1/4 watt carbon resistor
- R6 Volume control .5 megohm with line switch
- R7 500,000 ohm 1/4 watt carbon resistor
- R8 140 ohm, 1/4 watt wire-wound resistor
- R9 C29
- C1, C2 Two-gang variable condenser
- C3 0.006 mf, 600 volt tubular condenser
- C4 0.001 mf, part of L1, wave-trap assembly
- C5, C19 0.02 mf, 200 volt tubular condenser
- C6 0.0025 mf mica condenser
- C7, C8 Trimmers, part of loop antenna assembly.
- C9, C10, C11, C12 Trimmers, part of i-f transformers.
- C13, C14 Dual trimmer assembly
- C15 Single adjustable peaking condenser
- C16 0.00022 mf mica condenser
- C17 0.00114 mf mica condenser (coded 0.0011 mf)
- C18 0.01 mf, 400 volt tubular condenser
- C20 0.1 mf, 200 volt tubular condenser
- C21, C23 0.00022 mf, 600 volt tubular or mica condenser
- C22 0.002 mf, 600 volt tubular condenser
- C24 0.02 mf, 400 volt tubular condenser

Tube	Plate	Screen	Cathode	Fil.
12SA7GT	88	88	0	12
12SK7GT	88	88	0	12
12SQ7GT	30	—	0	12
3Z5L6GT	82	88	5.6	50

## TYPE OF TUBES:

- 12SA7GT, pentagrid oscillator-modulator
- 12SK7GT, first i-f amplifier
- 12SQ7GT, diode detector, a-f amplifier, a.v.c.
- 3Z5GT, beam power output
- 3Z5L6GT, half-wave rectifier.

POWER SUPPLY: a.c. or d.c.

VOLTAGE RATING: 105-125 volts.

POWER CONSUMPTION: 30 watts.

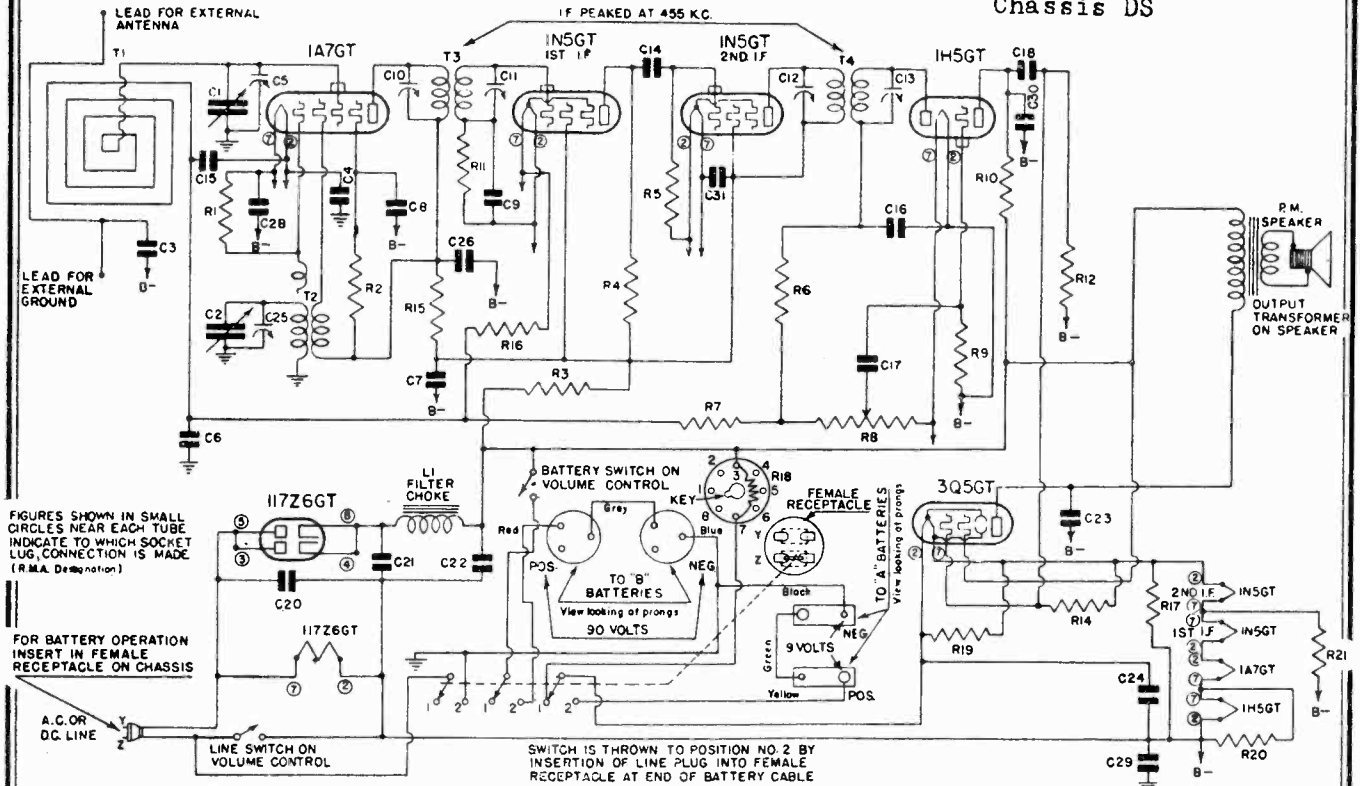
EMERSON RADIO & PHONOGRAPH CORP.

MODEL EA1-341

Chassis EA1

MODELS DS-365, DS-372

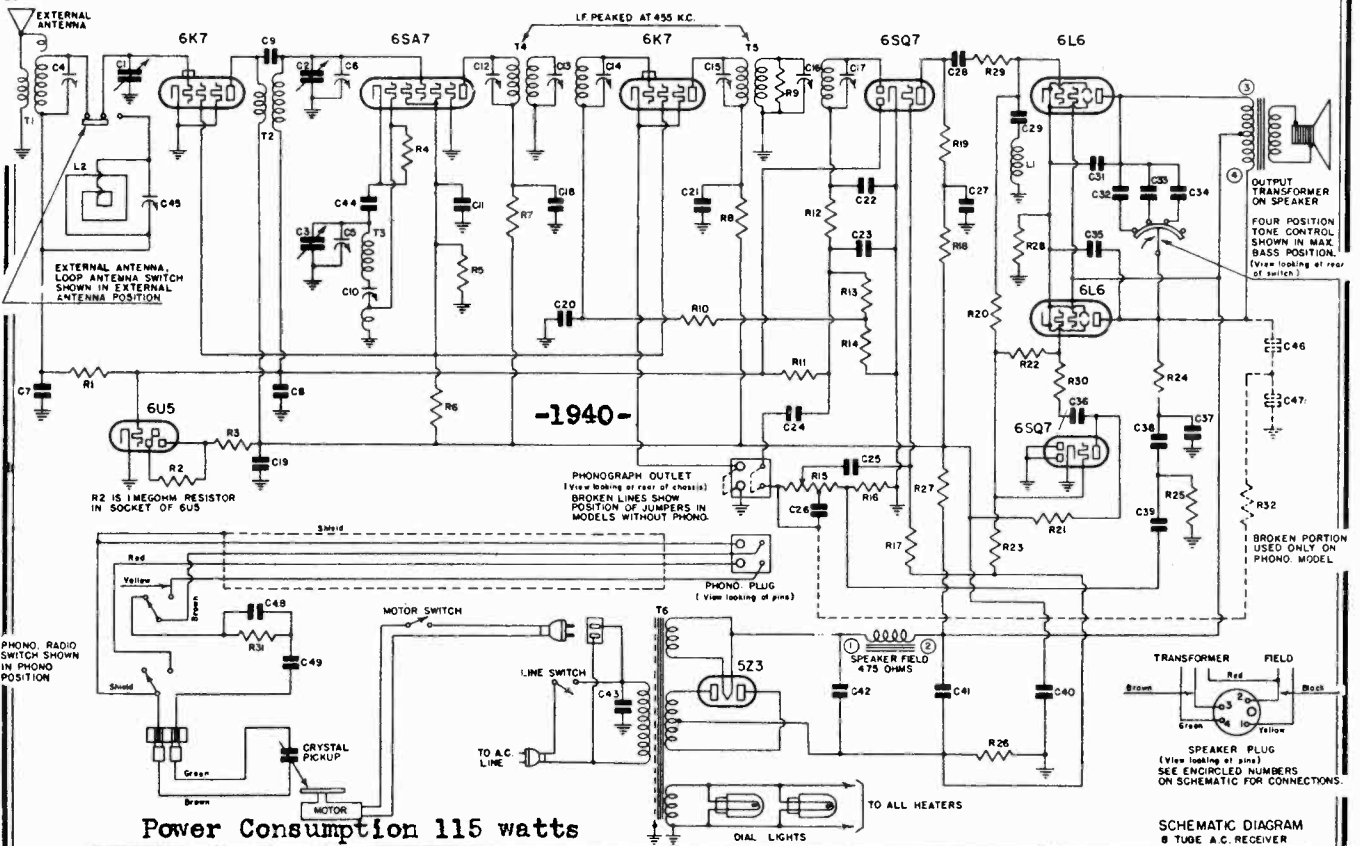
Chassis DS



MODEL: EA1-341

CHASSIS MODEL: EA1

TYPE: Universal (Battery, A.C.-D.C.) Superheterodyne.



PHONOGRAPH OUTLET IS AS SHOWN WHEN CHASSIS IS UPSIDE DOWN

MODELS: DS-365 DS-372

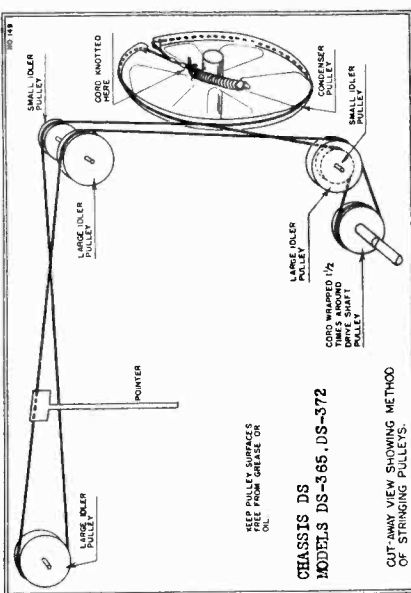
CHASSIS MODEL: DS

TYPE: Single-band superheterodyne.



MODEL EAI-341 EMERSON RADIO & PHONOGRAPH CORP. Chassis EAI MODELS DS-365, DS-372 Chassis DS

DS-365 DS-372 The switch located at the rear of the chassis is provided to allow the use of either the enclosed loop antenna or an external antenna. Push the switch to the left for use of external antenna.



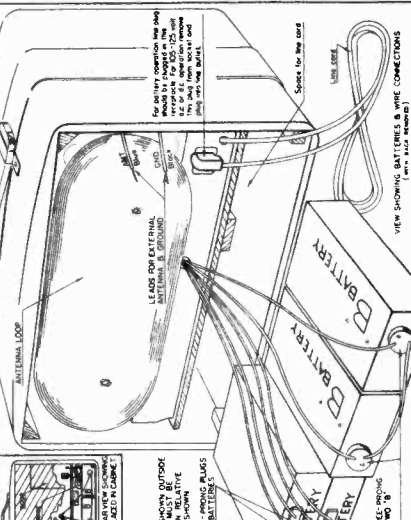
CHASSIS DS MODELS DS-365, DS-372 CUT-AWAY VIEW SHOWING METHOD OF STRINGING PULLEYS. KEEP PULLEY SURFACES FREE FROM GREASE OR OIL.

- PARTS R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12, R13, R14, R15, R16, R17, R18, R19, R20, R21, R22, R23, R24, R25, R26, R27, R28, R29, R30, R31, R32, R33, R34, R35, R36, R37, R38, R39, R40, R41, R42, R43, R44, R45, R46, R47, R48, R49, R50, R51, R52, R53, R54, R55, R56, R57, R58, R59, R60, R61, R62, R63, R64, R65, R66, R67, R68, R69, R70, R71, R72, R73, R74, R75, R76, R77, R78, R79, R80, R81, R82, R83, R84, R85, R86, R87, R88, R89, R90, R91, R92, R93, R94, R95, R96, R97, R98, R99, R100.

POWER SUPPLY: Battery, A.C. or D.C. VOLTAGE RATING: (Line operation) 105-125 volts, a.c.-d.c. POWER CONSUMPTION: (Line operation) 30 watts. CURRENT DRAIN: (Battery operation) 0.05 amp. at 9 volts. (A) battery 0.01 amp. at 90 volts.

CHASSIS EAI MODEL EAI-341 color coding of the i-f transformer leads Grid-green Plate-blue B plus-red

EAI-341 If replacements are made in the r-f section of the circuit, the receiver should be carefully re-aligned.



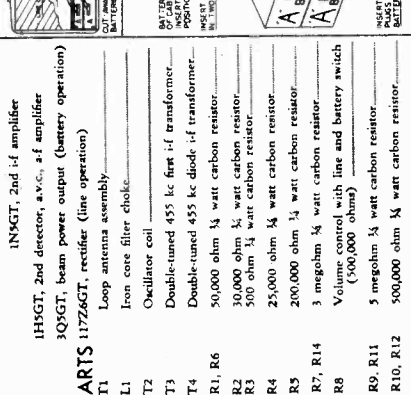
CHASSIS DS MODELS DS-365, DS-372 CUT-AWAY VIEW SHOWING METHOD OF STRINGING PULLEYS. KEEP PULLEY SURFACES FREE FROM GREASE OR OIL.

POWER SUPPLY: Battery, A.C. or D.C. VOLTAGE RATING: (Line operation) 105-125 volts, a.c.-d.c. POWER CONSUMPTION: (Line operation) 30 watts. CURRENT DRAIN: (Battery operation) 0.05 amp. at 9 volts. (A) battery 0.01 amp. at 90 volts.

CHASSIS EAI MODEL EAI-341 color coding of the i-f transformer leads Grid-green Plate-blue B plus-red

CHASSIS DS MODELS DS-365, DS-372 CUT-AWAY VIEW SHOWING METHOD OF STRINGING PULLEYS. KEEP PULLEY SURFACES FREE FROM GREASE OR OIL.

EAI-341 If replacements are made in the r-f section of the circuit, the receiver should be carefully re-aligned.



CHASSIS DS MODELS DS-365, DS-372 CUT-AWAY VIEW SHOWING METHOD OF STRINGING PULLEYS. KEEP PULLEY SURFACES FREE FROM GREASE OR OIL.

POWER SUPPLY: Battery, A.C. or D.C. VOLTAGE RATING: (Line operation) 105-125 volts, a.c.-d.c. POWER CONSUMPTION: (Line operation) 30 watts. CURRENT DRAIN: (Battery operation) 0.05 amp. at 9 volts. (A) battery 0.01 amp. at 90 volts.

CHASSIS EAI MODEL EAI-341 color coding of the i-f transformer leads Grid-green Plate-blue B plus-red

CHASSIS DS MODELS DS-365, DS-372 CUT-AWAY VIEW SHOWING METHOD OF STRINGING PULLEYS. KEEP PULLEY SURFACES FREE FROM GREASE OR OIL.

VOLTAGE ANALYSIS

Table with 3 columns: Tube, Plate, Screen, Fil. Rows include 1A7GT, 1N5GT, 1H5GT, 305GT.

PRODUCTION CHANGE

1. In DS-372 condenser C34 is 0.01 mf, 600 volt.

CHASSIS DS MODELS DS-365, DS-372 CUT-AWAY VIEW SHOWING METHOD OF STRINGING PULLEYS. KEEP PULLEY SURFACES FREE FROM GREASE OR OIL.

CHASSIS EAI MODEL EAI-341 color coding of the i-f transformer leads Grid-green Plate-blue B plus-red

Chassis DS

EMERSON RADIO & PHONOGRAPH CORP. MODELS DS-365, DS-372

**AUTOMATIC RECORD CHANGER**

**Controls and Moving Mechanism**

**INDEX AND RECORD REJECT LEVER.**—This lever is located near the right corner of the motorboard with its index plate marked for four positions: "MANUAL," "12," "10" and "REJECT." When you desire to change record selections or to start a new record, the mechanism is moved by the lever in the "12" position. To play either a series of 10-inch records, or 10- and 12-inch records mixed, the lever should be set at the "10" position.

To reject a record being played, or to start the record-changing cycle in case the record just played does not have the starting groove, the Index and Record Reject Lever is moved to the "REJECT" position and let go. The pickup will raise up and swing upwards and the next record will drop down. Upon releasing the lever, it will automatically return to the "10" position. If you are playing a series of 12-inch records, the lever should be set at the "12" position. To stop the record-changing cycle, keep the lever in its "MANUAL" position when not actually playing records automatically.

**TURNABLE SWITCH.**—The switch located just in front of the Index and Record Reject Lever controls the current to the turntable motor. To start the turntable, set the switch to the "ON" position. To stop the turntable, set the switch to the "OFF" position.

**PICKUP AND TOPLOADING NEEDLE SOCKET.**—The pickup is the new crystal type, with a hole in the top for insertion of needles. When not playing records, the pickup arm should be moved to the right toward the turntable and placed in the hole in the top of the extension. The edge of the small extension, which carries the needle, should be in the hole in the top of the pickup arm. The pickup must be in this position to insert a needle.

The pickup support plate with extension post, gauge plate and box holder is at the front of the motorboard on the right. The box holder is used for emptying, and is held in place by a spring piece on the bottom.

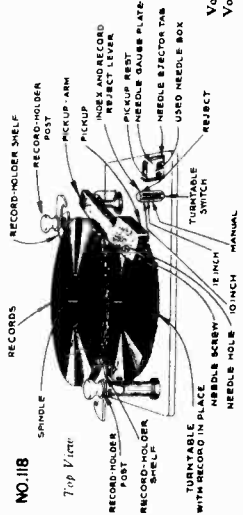
To insert a needle initially, loosen the needle screw on the front of the pickup, place needle in hole at top so that it drops down against the needle gauge plate and then tighten up the needle screw.

When changing a needle, place pickup in rest position, loosen needle screw and push pickup to the right to drop the needle into the hole in the box below. Then with pickup against extension post insert a new needle as described above.

**RECORD HOLDER SHELVES.**—To place a record on the turntable or to remove records, raise the record holder shelves vertically. To place a record on the turntable, push back vertical lever adjacent to the turntable post. You now have clear access to the turntable. Before loading the magazine for Automatic Operation swing the record holder shelves back into position.

**To Insert Needle**

The pickup must be over the needle gauge plate to insert or change needles. To insert a needle initially, loosen the needle screw on the front of the pickup, place needle in hole at top so that it drops down against the needle gauge plate and then tighten up the needle screw. The extending tab on the needle gauge plate operates the needle ejector. To change needles, place pickup in rest position, loosen needle screw and press the extending tab on needle gauge plate to drop the used needle back into position.



**Automatic Operation**

1. Turn the receiver "on" in the usual way, as explained above.
2. Rotate the phono-graph switch knob counter-clockwise to the "10" position. Wait about a minute for the tubes in the receiver to warm up.
3. See that the pickup is over the needle gauge plate with the needle in the hole in the top of the extension. Then throw the turntable switch "on." The turntable will revolve and the cycle of motion on the pickup arm will follow through. When the pickup arm comes down (and it can be moved by hand) the cycle is completed. Turn off the turntable switch.

4. The Index and Record Reject Lever is located near the right corner of the motorboard. With this lever at "Manual" position, place the series of records (up to eight 10-inch records, or up to 12 records) on the record holder posts. This is shown in the illustration.

5. Set the Index and Record Reject Lever to the proper position. With the lever at "10" position, the turntable motor will play a series of 12-inch records automatically. To play either a series of 10-inch records, or 10- and 12-inch records mixed, the lever should be set at the "10" position. To reject a record being played, or to start the record changing cycle in case the record just played does not have the starting groove, or to stop the record-changing cycle, the lever should be moved to the "REJECT" position and let go. The pickup will raise up and swing upwards and the next record will drop down. Upon releasing the lever, it will automatically return to the "10" position. When playing a series of 12-inch records, the lever should be returned to the "12" position after rejecting a record.

6. Throw the turntable switch to the "on" position. The turntable should start to revolve.

7. When turntable has attained speed, push the Index and Record Reject Lever to the "Reject" position. The first record will fall flop on the turntable and the pickup will move into position on the record.

8. Adjust to the desired volume by means of the regular receiver volume control.

9. Close the cabinet lid to eliminate normal mechanical noises due to needle vibration.

The whole series of records will now play without further attention, and the last record will repeat until the turntable is turned off. Allow the record-changing mechanism to complete its cycle before the turntable is stopped. Then lift the pickup, place it onto the pickup rest with the edge of the record and the lever in the "MANUAL" position. The record player is then ready for reloading, or for manual operation.

**MODEL DS-365, DS-372 CHASSIS DS ADJUSTMENTS**

An output meter should be used across the voice coil or speaker output transformer for observing maximum response. Use a standard dummy antenna or a .0002 mf condenser for aligning the antenna coil.

Always use as weak a test signal as possible during alignment. The last motion in adjusting trimmers should always be a tightening one, not a loosening one.

Never leave the trimmer with the outside plate so loose that there is no tension on the screw. Either bend the plate up or remove the screw entirely. Loose screws are a sure source of noise, drifting, and mis-tuning.

**VOLTAGE ANALYSIS**

Tube	Plate	Screen	Cathode	Heaters
6K7GT	245	70	0	6.3
6SA7GT	245	70	0	6.3
6K7GT	235	70	0	6.3
6SQ7GT (4th)	125	—	0	6.3
6SQ7GT (PL)	150	—	0	6.3
6L6 (2)	275	285	18.5	6.3

Readings should be taken with a 1000 ohms-per-volt meter, with the volume control turned on full and no signal. Line voltage for these readings was 117 volts, 60 cycles, a.c. All readings except B plus at rectifier, heaters, and cathode voltages were taken on 300 volt scale.

**I-f Alignment**

Push the switch at the rear of the chassis to "external antenna" and feed 455 kc through a .01 mf condenser to the grid of the 6K7 i-f tube. Unscrew the copper colored screw of the second i-f transformer as far as possible and then align the other trimmers of this transformer for maximum response. Shift the input to the grid of the 6SA7 (clip input to start lug of right end section of variable condenser) and repeat the same procedure on the first i-f transformer. Do not disturb the alignment of the second i-f transformer. Feed the signal again to the 6K7GT i-f tube, shunt the primary and secondary of the second i-f transformer with 25,000 ohm resistors, and adjust the tertiary (copper color) trimmer for maximum response. Again feed the signal to the 6SA7 shunt the primary and secondary of the first i-f transformer with resistors and then, without removing the shunting resistors from the second transformer, adjust the tertiary for maximum response. Do not disturb the alignment of any of the second i-f trimmers. Remove the resistors and sweep the signal generator through the band. The response should be quite flat with a slight peak in the middle, with a band width of about 10-12 kilocycles.

Visual alignment may be used in which case a similar procedure should be followed except that it will be unnecessary to shunt the transformers with resistors. With either method of adjustment, however, the alignment should be repeated until a satisfactory broad response curve is obtained or the fidelity of reception will be seriously impaired.

**R-f Alignment**

With the switch at the rear of the chassis in the position marked "external antenna" set the pointer at 60 and feed 600 kc to the external antenna lead through a standard dummy antenna or a 0.0002 mf mica condenser. Adjust the series paddler (located at the left of the variable condenser, on the top of the chassis) for maximum response. Move the pointer to 160, feed 1600 kc and align first the oscillator trimmer (right end condenser section) and then the interstage and antenna trimmers (see preceding for location) for maximum response. Return to 600 kc and adjust the series paddler (while rocking the variable back and forth) for maximum response. Realign at 1600 kc.

To align the loop, set the dial pointer at 160. Set the signal generator at 1600 kc and feed its output into a loop of wire about 12 inches in diameter. Hold this radiating loop about 12 inches from and parallel to the receiver loop antenna. Advance the output of the signal generator until deflection is obtained on the output meter and then adjust trimmer on loop for maximum response.

**Location of Coils and Trimmers**

The two triple-tuned i-f transformers are mounted in cans on the top of the chassis. The trimmers are available through holes in the tops of the cans. The copper colored screw is for the tertiary coil. The first i-f transformer is the one at the left side of the chassis.

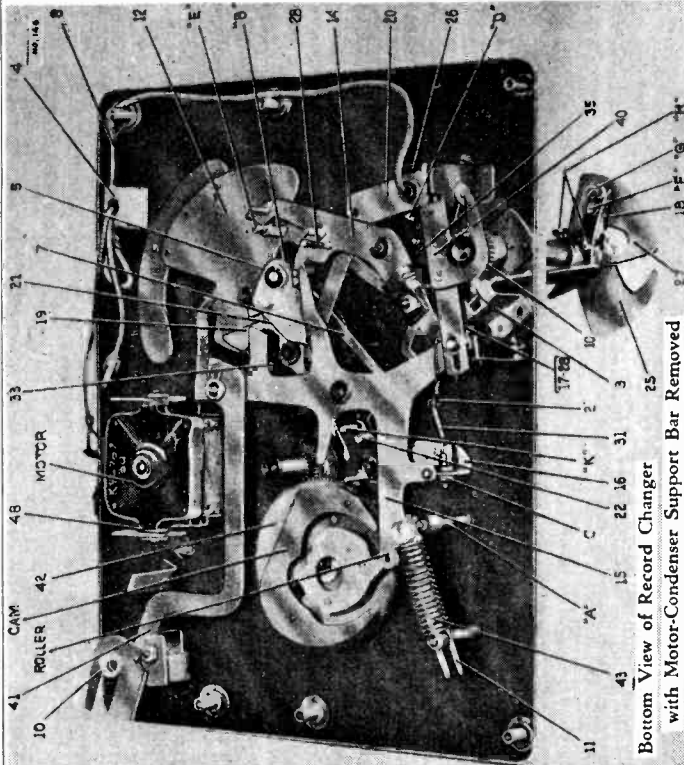
The broadcast antenna coil is the open coil on the top of the chassis between the 6SA7G and the 6K7GT i-f tube. The trimmer for the coil is mounted on top of the coil. The interstage coil is the larger of the two coils underneath the chassis. Its trimmer is located on the right end section of the variable condenser.

The oscillator coil is the smaller of the two coils underneath the chassis. Its trimmer is located on the center section of the variable condenser.

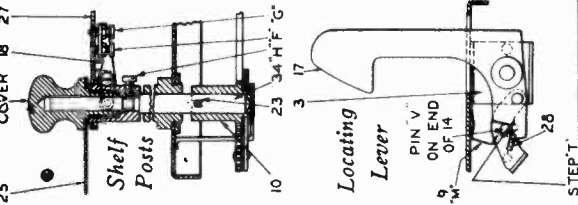
The trimmer for the loop is mounted on the loop board.

MODELS  
DS-365, DS-372  
CHASSIS DS

EMERSON RADIO & PHONOGRAPH CORP.



Bottom View of Record Changer with Motor-Condenser Support Bar Removed



STEP 1

AUTOMATIC RECORD CHANGER

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.
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. Needle lands in 10 inch position on 12 inch record or misses record when playing both types mixed—Increase tension of pickup locating lever spring.

landing. The eccentric end of the stud must always be toward the rear of the motor board, 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 adjustments 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 tone arm is at maximum distance outward from turntable; lift record upward until it is in contact with both separating knives, then loosen screws "H" and shift record shelves so that the curved inner edges of the shelves are uniformly spaced at least 1/16 inch from record edge. 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 motor board. 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 petrolatum 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 on underside of motor board.

The felt washer between the turntable and spindle bearing should be soaked in light engine oil whenever the turntable is removed, or as required for proper operation.

Do not allow oil or grease to come in contact with, rubber mounting of tone arm base, rubber bumper, or flexible coupling of drive motor.

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 mis-adjustments 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".

GENERAL INFORMATION

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 when using a mixture of the two sizes.

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. One adjustment is provided for the main lever. Rotate the turntable until the changer is out-of-cycle, and adjust rubber bumper bracket (A) so that the roller clears the nose of the cam plate by 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 the trip pawl "22" into engagement with 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 set that pin "V" on lever "14" in contact with "Step 1" on lever "17". The correct point of landing is 4-11/16 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 5-11/16 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

EMERSON RADIO & PHONOGRAPH CORP. Chassis DR, DR1

DIAL CORD REPLACEMENT

Use a half turn of cord, part number 7BZ-867A. Draw the cord snugly around the condenser pulley and knot with no slack, after which the spring may be hooked to the cord and pulley. The dial face should bear against the fibre washer when finally assembled.

Location of Coils and Trimmer Adjustments

The first i-f transformer is mounted on top of the chassis deck to the right of the variable condenser. The trimmers are accessible through holes in the top of the can.

The second i-f transformer is mounted on top of the chassis between the variable condenser and the speaker. The trimmers are accessible through holes in the top of the can.

The loop antenna acts as the broadcast antenna coil. The short-wave antenna coil is the larger of the two coils mounted on the loop frame.

The trimmers for the antenna coils for both bands are located on a dual strip behind the variable condenser. The upper trimmer is for broadcast, and lower for short-wave.

The oscillator coil is located underneath the chassis, just below the variable condenser. The trimmers for both bands are mounted on a dual strip beneath the first i-f transformer. The short-wave trimmer is the one closest to the mounting foot.

Voltages listed below are from point indicated to B minus (line voltage for these readings was 117.5 volts, 60 cycles, a.c. All measurements made with 117.5 volts d.c. will be lower than those given below.

VOLTAGE ANALYSIS Voltage across speaker field—120 volts. Voltage across pilot light—4.5 volts.

R-f Alignment

Rotate the wave band switch counter-clockwise to the short-wave position. Set the dial pointer at 16 megacycles and feed 16 megacycles from the signal generator into a loop of wire about 12 inches in diameter. Hold this radiating loop about 12 inches from the electrostatic antenna and advance the output of the generator until a deflection is obtained on the output meter. Adjust first the short-wave oscillator trimmer (closest to mounting foot—beneath the chassis) and then the antenna trimmer (lower of dual trimmer behind the variable) for maximum response.

Without changing the above set up, rotate the band switch clockwise to the broadcast position, set the dial pointer at 150 and feed 1500 kc into the radiating loop. Adjust first the broadcast oscillator trimmer (farthest from mounting foot—beneath the chassis) and then the antenna trimmer (upper of dual trimmer behind the variable) for maximum response. Rotate the dial to 60, feed 600 kc into the radiating loop and adjust the broadcast series paddler (mounted on the rear wall) for maximum response while rocking the variable back and forth. Repeat alignment at 1500 kc.

MODELS: DR-343  
DR-348  
DR-349  
DR-350  
DR-352

CHASSIS MODEL: DR

MODELS: DR1-343  
DR1-348  
DR1-350  
DR1-352

CHASSIS MODEL: DR 1  
Listed under Re-examination Service  
of Underwriter Laboratories, Inc.

TYPE: Two band superheterodyne.

FREQUENCY RANGES:

540-1600 kc.  
5.8-18.3 mc.

Readings should be taken with a 1000 ohm-per-volt meter. Voltages should be taken with the volume control turned on full and no signal. Line readings except heaters and cathodes were taken on 250 volt scale. Measurements made with 117.5 volts d.c. will be lower than those given below.

Tube	Plate	Screen	Cathode	FIL
12SA7GT	88	88	0	12
12SK7GT	88	88	0	12
12SQ7GT	30	—	0	12
50L6GT	82	88	5.6	50

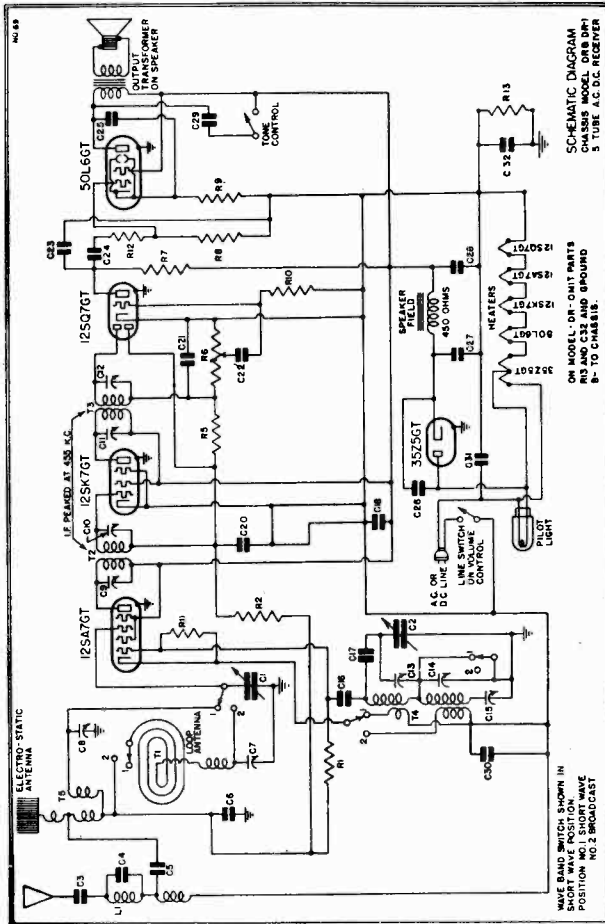
PRODUCTION CHANGES

1. Chassis bearing serial numbers below 3,630,550 use C5 and C8—0.015 mf, 400 volt tubular condenser.

I-f Alignment

Swing the variable condenser to the minimum capacity position. Feed 455 kc to the grid of the 12SA7 tube through a .01 mf mica condenser and adjust the four i-f trimmers for maximum response.

Note: The grid of the 12SA7 tube is connected to the stator lug of the rear variable condenser section. Connection may be made with a test clip to the upper stator lug. This lug is easily identified by the connection of the green lead to the loop.



L1 Antenna choke and 455 kc wave-trap  
T1 Loop antenna assembly  
T2 Double-tuned 455 kc first i-f transformer  
T3 Double-tuned 455 kc second i-f transformer  
T4 Two-band oscillator coil  
T5 Short-wave antenna coil

R1, R10 15 megohm 1/2 watt carbon resistor  
R2, R13 200,000 ohm 1/2 watt carbon resistor  
R7, R8 500,000 ohm 1/2 watt carbon resistor  
R5 3 megohm 1/2 watt carbon resistor  
R6 Volume control .5 megohm with line switch  
R9 140 ohm, 1/2 watt wire-wound resistor  
R11 20,000 ohm 1/2 watt carbon resistor  
R12 50,000 ohm 1/2 watt carbon resistor

C1, C2 Two-gang variable condenser  
C3 0.006 mf, 600 volt tubular condenser  
C4 0.001 mf, part of L1, wave-trap assembly  
C5, C18 0.002 mf, 200 volt tubular condenser  
(see production change no. 1.)  
C6 0.0025 mf mica condenser

C7, C8 Dual trimmer assembly  
C9, C10, C11, C12 Trimmers, part of i-f transformers.  
C13, C14 Dual trimmer assembly  
C15 Single adjustable padding condenser  
C16 0.00011 mf mica condenser  
C17 0.0016 mf mica condenser  
C18 0.0016 mf mica condenser  
C19 0.05 mf, 200 volt tubular condenser  
C20, C29 0.0002 mf, 600 volt tubular or mica condenser  
C21, C23 0.002 mf, 600 volt tubular condenser  
C22 0.02 mf, 400 volt tubular condenser  
C24 0.03 mf, 400 volt tubular condenser

C25 0.03 mf, 400 volt tubular condenser  
C26 0.01 mf, 600 volt tubular condenser  
C27, C28 Multiple dry electrolytic condenser, 150 volt. C27—20 mf; C28—40 mf.  
C30 0.01 mf, 400 volt tubular condenser  
C31 0.009 mf, 400 volt tubular condenser  
C32 0.2 mf, 200 volt tubular condenser  
7RS-452 6 1/2" dynamic speaker  
7RS-450 Wave-band switch  
7RS-451 Tone control switch

POWER SUPPLY: a.c. or d.c.  
VOLTAGE RATING: 105-125 volts.  
POWER CONSUMPTION: 30 watts.

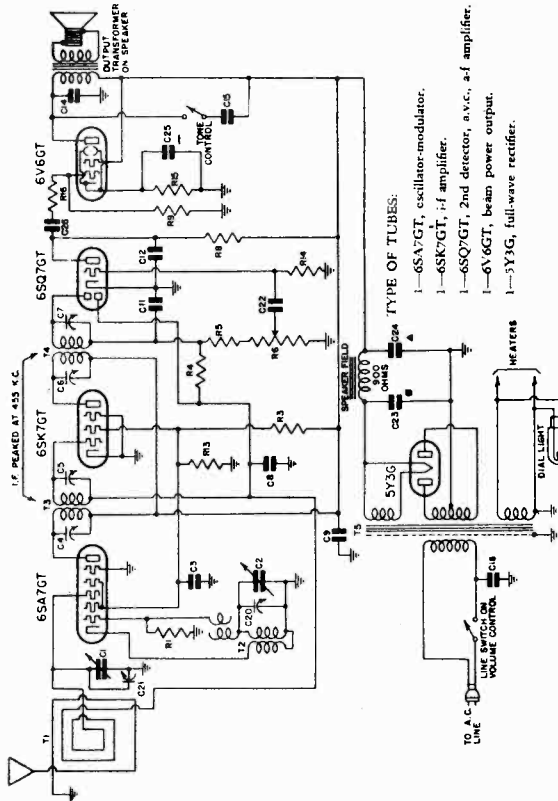
TYPE OF TUBES:  
12SA7GT, pentagrid oscillator-modulator  
12SK7GT, first i-f amplifier  
12SQ7GT, diode detector, a-f amplifier, a.v.c.  
50L6GT, beam power output  
35Z5GT, half-wave rectifier.

SOHEMATIC DIAGRAM  
CHASSIS MODEL DR, DR1  
5 TUBE, A.C. D.C. RECEIVER



MODEL ED-354  
Chassis ED

EMERSON RADIO & PHONOGRAPH CORP.



5 TUBE A.C. RECEIVER

**SCHMATIC DIAGRAM FOR CHASSIS BEARING SERIAL NUMBERS ABOVE 3816700**  
Readings should be taken with a 1000 ohm-per-volt meter. Voltages listed below are from point indicated to ground (chassis) with the volume control turned on full and no signal. Line voltage for these readings was 117 volts, 60 cycles, a.c. All readings except B plus at rectifier, heaters, and cathode voltages were taken on 300 volt scale.

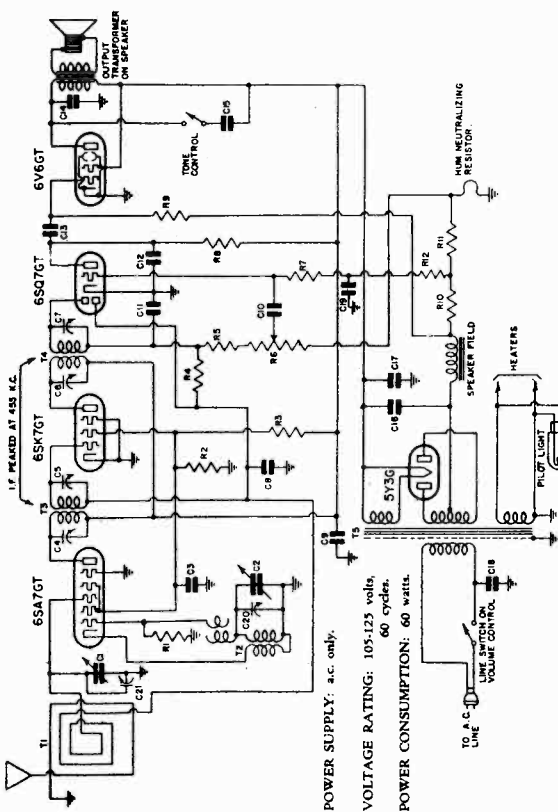
Tube	Plate	Screen	Cathode	File
6SA7GT	235	85	0	6.3 ac.
6SK7GT	255	85	0	6.3 ac.
6SQ7GT	110	0	0	6.3 ac.
6V6GT	245	255	0	6.3 ac.

**I-f Alignment**  
Swing the variable condenser to the minimum capacity position. Feed 455 kc to the grid of the 6SA7 tube through a .01 microfarad capacitor and adjust the four i-f trimmers for maximum response.

**Rf Alignment**  
Set the dial pointer at 150. Set the signal generator at 1500 kc and feed the output into a loop of wire about 12 inches in diameter. Hold the antenna coil at the center of the loop parallel to the receiver loop antenna. Advance the output of the signal generator until deflection is obtained on the output meter. Adjust first the oscillator trimmer (on front section of variable condenser) then the antenna trimmer (on rear section of variable condenser) for maximum response.

**Note:** The grid of the 6SA7 tube is connected to the rotor lug of the variable condenser section. Connection may be made with a test clip.

If the loop antenna has been replaced it may be necessary to adjust the loop inductance as follows. Align at 150. Set the signal generator at 1500 kc and feed the output into the loop of the outside turn of the loop may be swung to either side of the center to give maximum response. Realign at 150.



5 TUBE A.C. RECEIVER

**SCHMATIC DIAGRAM FOR CHASSIS BEARING SERIAL NUMBERS BELOW 3816700**  
Loop antenna assembly (see production change No. 1f)  
Oscillator coil (see production change No. 1a)  
Double-tuned 455 kc line i-f transformer  
Detector, amplifier, and oscillator transformer  
Power transformer, 117 volts, 60 cycles  
20,000 ohm 1/4 watt carbon resistor  
40,000 ohm 1/4 watt carbon resistor  
15,000 ohm 1/2 watt carbon resistor  
2 megohm 1/4 watt carbon resistor  
Volume control, .25 megohm with line switch  
250,000 ohm 1/4 watt carbon resistor  
500,000 ohm 1/4 watt carbon resistor  
180 ohm 1 watt wire-wound resistor  
28 ohm 1/4 watt wire-wound resistor  
10 megohm 1/4 watt carbon resistor  
240 ohm 1 watt carbon resistor  
50,000 ohm 1/4 watt carbon resistor  
Two-gang variable condenser (see production change No. 1b)  
LC-64  
.05 mf, 400 volt tubular condenser  
.01 mf, 400 volt tubular condenser  
.01 mf, 400 volt tubular condenser  
.01 mf, 400 volt tubular condenser  
.0005 mf, 600 volt tubular condenser  
0.0025 mf, 1000 volt tubular condenser  
16 mf, 450 volt electrolytic condenser  
16 mf, 450 volt electrolytic condenser (see production change No. 2)  
.01 mf, 400 volt molded condenser  
0.25 mf, 100 volt tubular condenser  
Trimmer, part of variable condenser  
0.002 mf, 600 volt tubular condenser  
Multiple dry electrolytic condenser  
C24—15 mf, 350 volt. C25—20 mf, 25 volt  
T—dynamic speaker  
Tone control switch

**VOLTAGE ANALYSIS**  
Voltage from transformer center tap to ground—85 volts (negative).  
Voltage across resistor R10 and R11—15 volts (negative).  
Always use as weak a test signal as possible when aligning the receiver.  
An output transformer should be used across the voice coil or output transformer for observing maximum response.

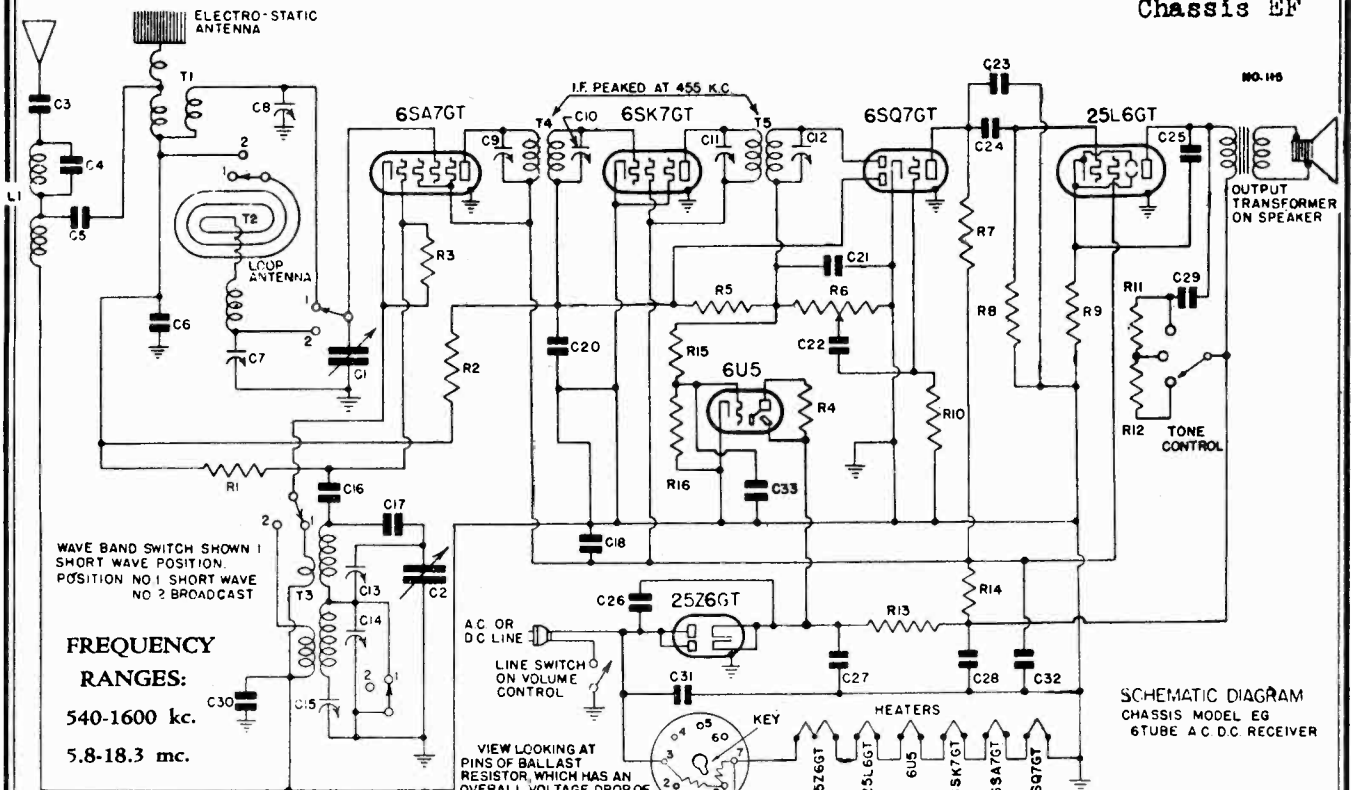
**Location of Coils and Trimmer Adjustments**  
The first i-f transformer is mounted on top of the chassis deck behind the variable condenser. The trimmers are accessible through holes in the top of the can.  
The second i-f transformer is mounted underneath the chassis. The trimmers are accessible through holes in the back of the chassis.  
The trimmers for the antenna and oscillator coils are located on the variable condenser. The trimmer on the front section is for the oscillator coil.  
The oscillator coil is located underneath the chassis. The loop antenna acts as the antenna coil.

**Production Changes**  
1. ED chassis bearing serial numbers below 38137730 use:  
(a) 8DT-365—Oscillator coil  
(b) 6SC-438—Variable condenser  
(c) 6GC-430—Dual trimmer strip in place of trimmers on variable condenser  
(d) 2NC-231A—Adjustable series padding condenser  
(e) 8DD-116—Dial face  
(f) 8DW-272—Loop antenna

2. ED chassis which use wet second electrolytic, C17, part No. 35C-303 or 35C-329 may use dry electrolytic 7AC-444 for replacement.

EMERSON RADIO & PHONOGRAPH CORP.

MODEL EG-355  
Chassis EG  
MODEL EF-363  
Chassis EF



WAVE BAND SWITCH SHOWN IN SHORT WAVE POSITION.  
POSITION NO. 1 SHORT WAVE  
NO. 2 BROADCAST

**FREQUENCY RANGES:**  
540-1600 kc.  
5.8-18.3 mc.

VIEW LOOKING AT PINS OF BALLAST RESISTOR WHICH HAS AN OVERALL VOLTAGE DROP OF 42 VOLTS AT 3 AMP. VOLTAGE DROP ACROSS PILOT LIGHT IS 4 VOLTS

SCHEMATIC DIAGRAM  
CHASSIS MODEL EG  
6TUBE A.C. D.C. RECEIVER

**MODEL: EG-355**

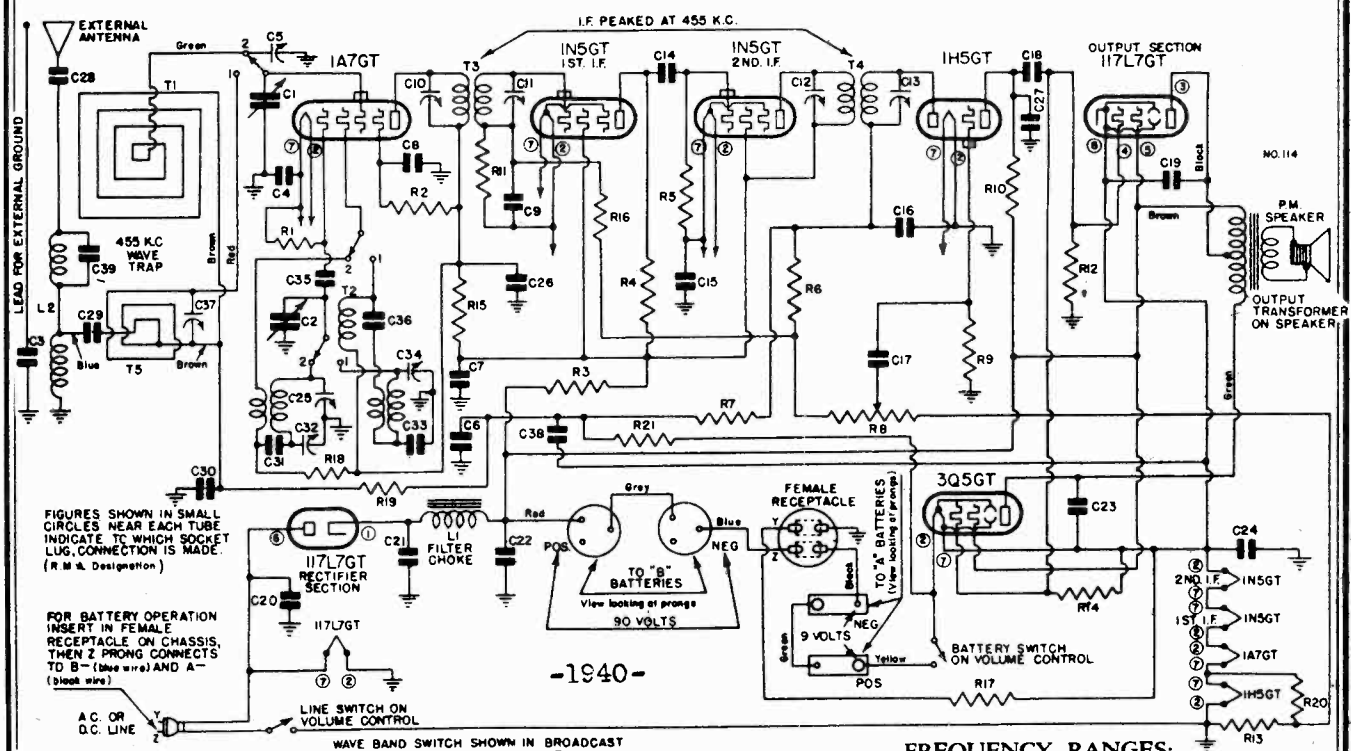
CHASSIS MODEL: EG

TYPE: Two-band superheterodyne.

VOLTAGE RATING: 105-125 volts.

POWER SUPPLY: a.c. or d.c.

POWER CONSUMPTION: 45 watts.



FIGURES SHOWN IN SMALL CIRCLES NEAR EACH TUBE INDICATE TO WHICH SOCKET LUG CONNECTION IS MADE. (R.M.A. Designation)

FOR BATTERY OPERATION INSERT IN FEMALE RECEPTACLE ON CHASSIS, THEN 2 PRONG CONNECTS TO B- (blue wire) AND A- (black wire)

-1940-

**MODEL: EF-363**

CHASSIS MODEL: EF

Two-band Universal (Battery, A.C.-D.C.) Superheterodyne.

**FREQUENCY RANGES:**

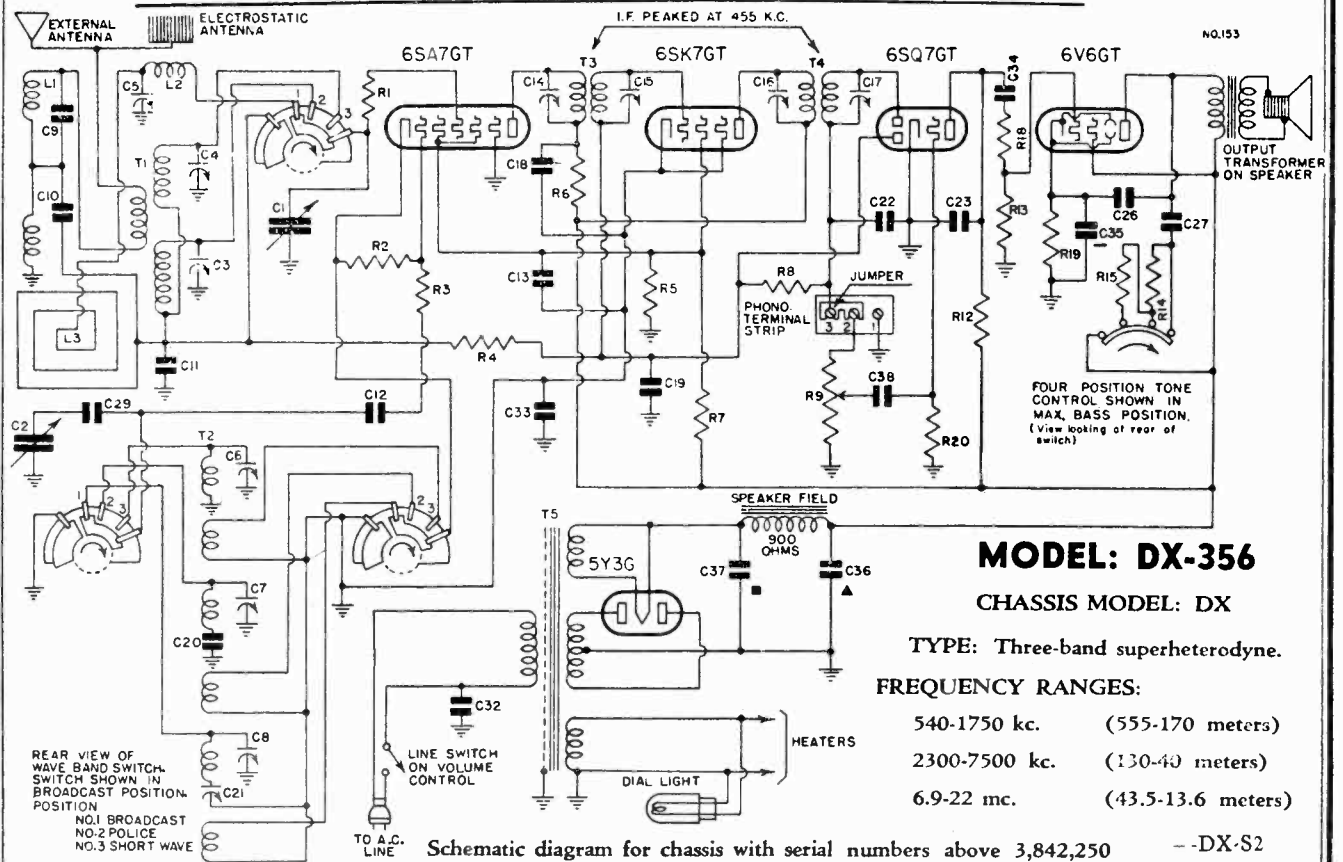
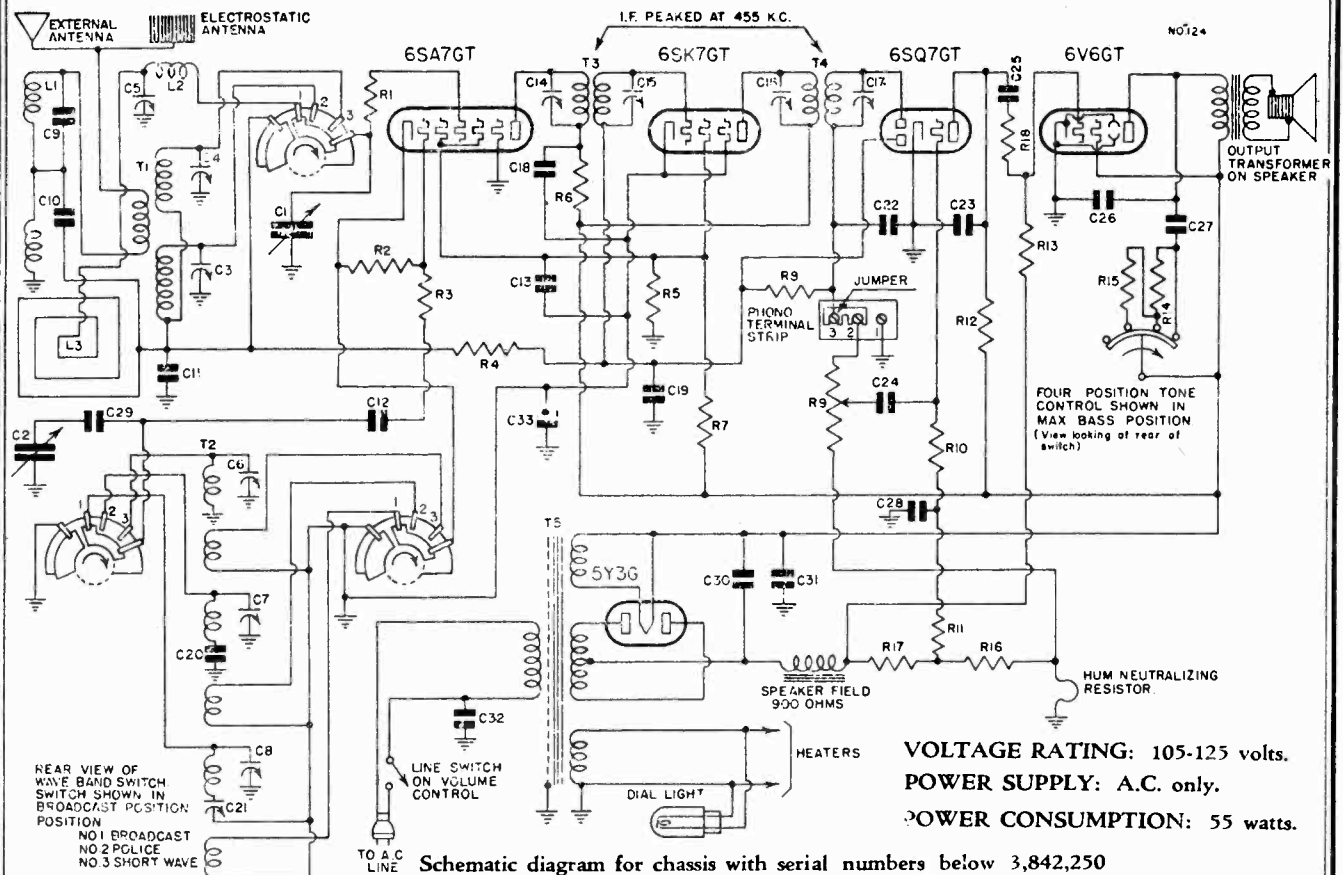
540-1600 kc.

5.8-18.3 mc.



EMERSON RADIO & PHONOGRAPH CORP.

MODEL DX-356  
Chassis DX





MODEL DX-356  
Chassis DX

EMERSON RADIO & PHONOGRAPH CORP.

PARTS LIST

- L1, C9 Antenna choke and 455 kc fixed wave-trap.....
- L2 Broadcast antenna loading coil.....
- L3 Broadcast loop antenna assembly.....
- T1 Police and short-wave antenna coil.....
- T2 Three-band oscillator coil.....
- T3 Double-tuned 455 kc first i-f transformer.....
- T4 Double-tuned 455 kc second i-f transformer.....
- T5 Power transformer.....
- R1, R3 100 ohm 1/4 watt carbon resistor.....
- R2 20,000 ohm 1/4 watt carbon resistor.....
- R4 100,000 ohm 1/4 watt carbon resistor.....
- R5 40,000 ohm 1/4 watt carbon resistor.....
- R6 1000 ohm 1/4 watt carbon resistor.....
- R7 15,000 ohm 3 watt carbon resistor.....
- R8, R10 2 megohm 1/4 watt carbon resistor.....
- R9 Volume control, .25 megohm with line switch.....
- R11, R13 .5 megohm 1/4 watt carbon resistor.....
- R12 .25 megohm 1/4 watt carbon resistor.....
- R14 2500 ohm 1/4 watt carbon resistor.....
- R15 5000 ohm 1/4 watt carbon resistor.....
- R16 23 ohm 1/2 watt wire-wound resistor.....
- R17 180 ohm 1 watt wire-wound resistor.....
- R18 50,000 ohm 1/4 watt carbon resistor.....
- R19 240 ohm 1 watt wire-wound resistor.....
- R20 10 megohm 1/4 watt carbon resistor.....
- C1, C2 Two-gang variable condenser.....
- C3, C4, C5 Tripple trimmer strip for antenna circuits.....
- C6, C7, C8 Trimmers, part of oscillator coil.....
- C9 .001 mf condenser, part of 455 kc wave-trap.....
- C10, C33 .01 mf, 400 volt tubular condenser.....
- C11 .0025 mf, mica condenser.....
- C12 .00011 mf, mica condenser.....
- C13 .01 mf, 400 volt tubular condenser.....
- C14, C15 } Trimmers, part of i-f transformers.....
- C16, C17 }.....
- C18, C25, C27 } .05 mf, 400 volt tubular condenser.....
- C19 .05 mf, 200 volt tubular condenser.....
- C20 .0022 mf, mica condenser.....
- C21 Single adjustable padding condenser. Range: 150-300 umf.....
- C22, C23 .00022 mf, mica condenser.....
- C24, C26 .0006 mf, 600 volt tubular condenser.....
- C28 .025 mf, 100 volt tubular condenser.....
- C29 .002 mf, mica condenser.....
- C30 16 mf, 400 volt dry electrolytic condenser.....
- C31 16 mf, 400 volt dry electrolytic condenser.....
- C32 .01 mf, 400 volt molded condenser.....
- C34 .02 mf, 400 volt tubular condenser.....
- C35, C36 } Multiple dry electrolytic condenser:  
C35—20 mf, 25 volt; C36—15 mf, 350 volt;  
C37—15 mf, 400 volt.....
- C38 .002 mf, 600 volt tubular condenser.....
- 8DS-486 8" dynamic speaker.....
- 7XS-511 Wave-band switch.....
- 8GS-485A Tone-control switch.....

The adjustable padding condenser for the broadcast band is mounted on the top of the chassis, with the screw adjustment accessible in the top of the chassis. The police and short-wave bands have fixed padders, C20 and C29 on the schematic. When replacing these fixed padders be careful to use a condenser which has a capacity within 2% of the specified value, otherwise the short-wave coils may not track.

ADJUSTMENTS

An oscillator with frequencies of 455, 600, 1600, 6500 and 20,000 kc should be used.

An output meter should be used across the voice coil or speaker output transformer for observing maximum response.

Use a dummy antenna for aligning the police and short-wave bands. A .0001 mf condenser in series with a 400 ohm carbon resistor may be used for the police band dummy antenna. For the short-wave band a 400 ohm carbon resistor may be used.

Always use as weak a test signal as possible during alignment.

The set's oscillator is higher in frequency than the signal on all three bands, so images should be observed on the low frequency side of the signals.

Always choose the minimum capacity peak on oscillator trimmers and maximum capacity peaks on antenna trimmers. The last motion in adjusting trimmers should always be a tightening one, not a loosening one.

Never leave the trimmer with the outside plate so loose that there is no tension on the screw. Either bend the plate up or remove the screw entirely. Loose screws are a sure source of noise, drifting, and microphonism.

In aligning antenna trimmers on the high frequency signals there is always a tendency for the oscillator to drift, due to interlocking. To compensate for this always keep tuning the variable condenser as the trimmers are being adjusted.

I-f Alignment

Rotate the wave-band switch to the broadcast (clockwise) position. Set the variable condenser at the minimum capacity position and feed 455 kc through a .02 mf paper condenser, to the grid of the 6SA7 tube. The input may be fed to the stator lug of the front condenser section. Adjust the four i-f trimmers for maximum response.

Broadcast Alignment

Rotate the wave-band switch to the broadcast (clockwise) position. Set the dial pointer at 160 and feed 1600 kc from the signal generator into a loop of wire about 12 inches in diameter. Hold this radiating loop about 12 inches from and parallel to the receiver loop antenna and advance the output of the generator until a deflection is obtained on the output meter. Adjust first the oscillator coil trimmer then the antenna trimmer for maximum response. Reset the pointer at 60, feed 1600 kc and rock the variable condenser while adjusting the series padder for maximum response. Return to 1600 kc and check alignment. If readjustment is necessary return to 600 and repeat entire procedure.

Police Alignment

Set the wave-band switch at the police band (central) position and the pointer at 6.5. Feed 6500 kc to the antenna (using a 400 ohm dummy antenna) and adjust the oscillator trimmer for maximum response. Then adjust the antenna trimmer for maximum response. The police band padder is fixed and therefore requires no adjustment.

Short-Wave Alignment

Set the wave-band switch at the short-wave (counter-clockwise) position. Move the pointer to 20 and feed 20,000 kc to the antenna (using a 400 ohm dummy antenna) and adjust the short-wave oscillator trimmer for maximum response. If two peaks are obtained choose the minimum capacity peak. Then adjust the antenna coil trimmer for maximum response. If two peaks are obtained choose the maximum capacity peak.

The color coding of the i-f transformers is as follows:  
Grid—green Plate—blue  
B plus—red Grid return—black

The color coding of the power transformer is as follows:  
Primary—two black leads  
High-voltage secondary—two red leads  
High-voltage secondary center tap—red and yellow lead  
6.3 volt secondary—two green leads  
5 volt secondary—two yellow leads.

CHASSIS DX

DX-356

TYPE OF TUBES:

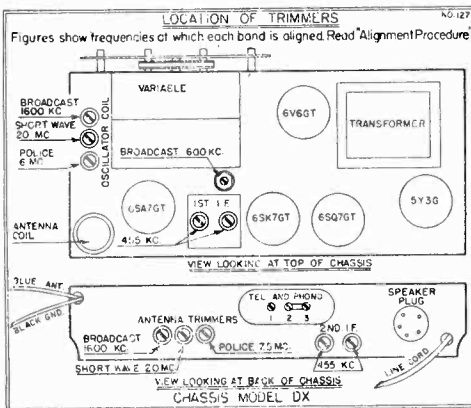
- 1—6SA7GT, pentagrid converter
- 1—6SK7GT, i-f amplifier
- 1—6SQ7GT, diode detector, audio amplifier and a.v.c.
- 1—6V6GT, power output
- 1—5Y3G, full-wave rectifier.

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground (chassis) with the volume control turned on full and no signal. Line voltage for these readings was 117 volts, 60 cycles, a.c. All readings except B plus at rectifier, heaters, and cathode voltages were taken on 250 volt scale.

- Voltage across resistors R16 and R17—15 volts (negative).
- Chassis bearing serial numbers above 3,842,250 should measure 12 volts.
- Voltage from power transformer center tap to ground (red and yellow lead)—87 volts (negative).

PRODUCTION CHANGE

1. Chassis bearing serial numbers below 3,842,250 use second i-f transformer, part number 8AT-55A.



The outlet marked "Television" at rear of the chassis may be used with any "Television Attachment" which is designed to feed audio frequencies to a separate amplifier. Detailed instruction for such a connection is given with any "Television Attachment."

VOLTAGE ANALYSIS

Tube	Plate	Screen	Cathode	Fil.
6SA7GT	250	85	0	6.3 ac.
6K7GT	250	85	0	6.3 ac.
6SQ7GT	125	—	0	6.3 ac.
6V6GT	235	250	0	6.3 ac.



MODEL DV-364  
Chassis DV  
MODEL DZ-371  
Chassis DZ

EMERSON RADIO & PHONOGRAPH CORP.

MODEL EV-384  
Chassis EV

Chassis DV and EV

Recording Adjustments

The following adjustments should be carefully noted. Experience the recording arm to locate the controls indicated and to become familiar with their use. In all cases, it is unnecessary to move either the height or pressure adjustment unless a recording blank other than the type furnished by Emerson is used or the cutting needle shows great wear or has been replaced.

Two adjustments are provided on the recorder arm: arm height and needle pressure.

Recorder Arm Height

The height of the recorder arm can be varied by means of the slotted screw which is located on the bracket just beneath the cutting arm. In order to make this adjustment, it is necessary to insert a cutting needle, and with the motor turned OFF and a record blank on the turntable, place the recorder arm in the cutting position. Now lift the cutting arm, turn the height adjusting screw and lower the arm to the record. When properly adjusted, the needle screw should be approximately centered in the slot at the front of the arm, when the needle is resting on the record. Tighten the lock nut to prevent the screw from moving. See figure at right.

Cutting the Record

1. The illustration above indicates the correct position of the cutting needle in the cutting arm. It is important to note that the flat portion of the needle must be parallel to the front end of the cutting arm and that it faces toward the rear. Be sure the needle is tightened as firmly as possible.

Note: The two cutting arm pivot screws (item P—see back page) should be screwed down firmly. If they should become loose the recording may be cut unevenly.

Chassis DZ only

Recording Adjustments

The following adjustments should be carefully noted. Experience the recording arm to locate the controls indicated and to become familiar with their use. In general, it is unnecessary to move either the height or pressure adjustment unless a recording blank other than the type furnished by Emerson is used or the cutting needle shows great wear or has been replaced.

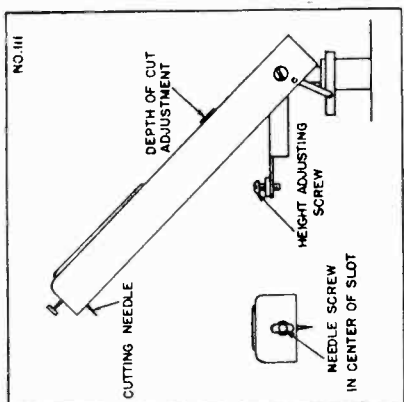
Recorder Arm Height

Two adjustments are provided on the recorder arm: arm height and needle pressure.

The height of the recorder arm can be varied by means of the slotted screw head which is on the top of the arm and toward the back, approximately flush with the surface. In order to make this adjustment, it is necessary to insert a cutting needle, and with the motor turned OFF and a record blank on the turntable, place the recorder arm in the cutting position. Now raise or lower the recorder arm by means of the above mentioned adjustment until the needle screw is approximately "centered" in the slot at the front end of the recorder arm.

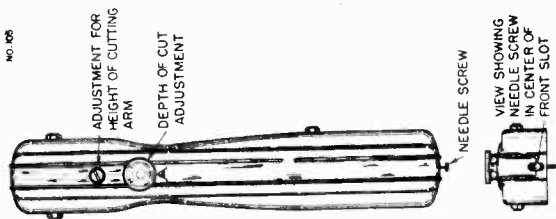
Pressure Adjustment

The pressure on the cutting needle is controlled by the chrome-plated knob on the top of the recorder arm. This knob has engraved upon it the letters "L, M, and H" indicating Light, Medium and Heavy pressures and provides an easy means of compensating for different types of needles, or blanks, or for the wearing of a cutting needle after it is used. In general, the machine is properly set at the factory so that it will cut the average record correctly. Any adjustment of this knob is dependent upon the factors discussed under "Recording Technique." Once the proper adjustment of this knob has been determined, its position should be permanently marked with ink or by scratching a thin line with a sharp instrument. Thus, if by accident, the knob should be turned off adjustment, it may be reset to the proper position without repeating a trial recording.



3. Place a recording blank on the turntable so that the recording arm is in the cutting position. This is necessary to prevent the blank from slipping during recording.

4. Start the motor and allow the turntable to come up to speed.



Models DV-364, DZ-371, EV-384  
OPERATING THE RECORDING MECHANISM  
Chassis DV, DZ, EV

General Recording Instructions

In the "Radio Recording" position, recordings can be made of any program which can be tuned in with sufficient clarity and volume. If the station is too weak or if man-made or atmospheric static is strong the noise level on the recording will be sufficient to make the results quite unsatisfactory.

While the radio program is being recorded it can be heard faintly from the loudspeaker. This arrangement is made so that the operator can select any part of a program for recording by listening to the loudspeaker.

When the phono-radio-recorder switch is in the "Microphone Recording" position records can be made only by means of the microphone furnished with the unit. The microphone may be mounted by plugging into the receptacle mounted on the inside of the cabinet wall near the loop antenna. It is of great importance that an external ground be connected to the chassis if microphone recordings are to be made, otherwise hum pickup may make the recordings unusable.

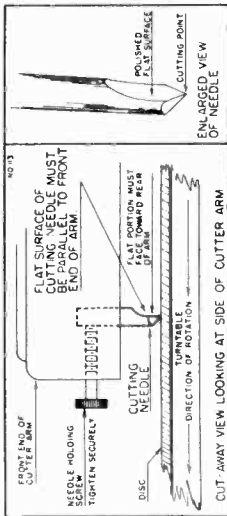
When the phono-radio-recorder knob indicates "Radio + Microphone Recording" the microphone may be used to inject local speech or music into the radio program being recorded. Since the recording level for radio may be controlled by the volume control, the microphone recording level should be adjusted.

caused by moving the microphone stand closer to or farther from the person speaking. The proper level can be set by first adjusting the volume control for radio recording level. Then without changing the volume control setting switch over to microphone recording position where the distance of the speaker from the microphone should be determined for proper cutting level. Switching back to Radio-Microphone Recording now allows the combined sounds to be recorded at their proper levels.

Recording Level

The "Electron Ray" indicator on the tuning panel is furnished to indicate the "level" at which the record is cut. It will be noticed that when the selector switch is in the recording position the indicator will flicker open and partly closed. The volume control should slowly be increased until the indicator just closes on the loudest passages of music or voice being recorded. The two fluorescent portions of the indicator should never overlap.

If a recording is being made using the microphone, the speaker should first read or speak a few lines in the tone of voice and at the distance from the microphone that he will use during recording. This will enable the operator to preset the volume control so that the first few words will not be recorded either too loudly or too softly.



Cutting the Record

1. The illustration above indicates the correct position of the cutting needle in the cutting arm. It is important to note that the flat portion of the needle is parallel to the front end of the cutting arm and that it faces toward the rear. Be sure the needle is tightened as firmly as possible.

2. Turn the tone control switch to the type of recording desired. Be sure the tone control switch is in the treble position, clockwise.

3. Place a recording blank on the turntable so that the retractable driving pin in the turntable engages the blank. This is necessary to prevent the blank from slipping during recording.

4. Start the motor and allow the turntable to come up to speed.

5. Raise the recording arm from its rest position and move it inward toward the record, placing the cutting needle approximately 1/4 inch from the outer edge of the blank.

A lead screw underneath the sub-panel will then drive the cutter arm slowly across the blank and the needle will cut a continuously spiral groove until such a time as the operator will stop the turntable. During the time that the needle is recording, a fine thread will be cut from the record itself and this thread will pile up toward the center of the blank. Remove this thread continually with a "soft" brush so that the operator does not fatigue it around the cutting needle, nor slow up the turntable by touching it with his hands since either one will make for poor recording.

Be sure to turn the motor off before attempting to remove the recorded blank. The recorded blank may be placed back at any time after the recorder arm has been returned to the rest position.

CAUTION: Never stall the turntable by hand; this turntable is weighted for use in recording and it will acquire an appreciable time to come to rest.

## RECORDER ADJUSTMENTS

Make no adjustments unless repeated tests show that adjustment is absolutely necessary

## 1. FUNCTION OF MANUAL CONTROL BUTTON AND RELATIVE PARTS.

When Manual Control Button (Item 84, Fig. 4) is moved to the Manual Play-Back recording position, it moves the Manual Control Slide (Item 102, Fig. 1) which in turn moves Clutch Lock Slide (Item 103, Fig. 1) into a position which prevents Engagement Clutch Cam Assembly (Item 79, Fig. 2) from rotating. When Engagement Clutch Cam Assembly is in the above mentioned position and is not free to rotate, the Changer will not go into its changing cycle.

Also when the Manual Control Button is in the above mentioned position, the Manual Control Slide has moved the Locator Lock Slide (Item 106, Fig. 1) into a position where it engages the Tone Arm Locator & Bushing Assembly (Item 12, Fig. 1) and prevents same from bearing against Tone Arm Lever Assembly (Item 19, Fig. 1) allowing the Tone Arm to swing freely without hindrance and without setting Changer into its changing cycle. When the Manual Control is in the automatic position the Changer will function normally as an automatic record changer.

## 2. POSSIBLE MECHANICAL CAUSES OF POOR RECORDINGS.

(a) Threads from record cuttings getting down onto Rubber Idler Drive Wheel (Item 83, Fig. 4) and between drive wheel and motor pulley. This will cause very bad speed variation of the turntable and, of course, will result in very inferior recording. Cuttings may also wrap around motor shaft and cause motor to slow down or stop.

To remove the record cuttings, the turntable should be lifted by applying an even lifting force at opposite edges of the turntable while the turntable spindle is gently tapped downward on its top end, and the record cuttings then removed. The Rubber Idler Drive Wheel should be taken off; this can be accomplished by unsnapping the small snap cotter ring and slipping Rubber Idler Drive Wheel off its shaft, after which all record cuttings can be removed.

NOTE: It is very important that no grease or oil be gotten on the surface of the Rubber Idler Drive Wheel.

(b) Tight Pivot Bearings: Check Cartridge Pivot Screw (Item 108, Fig. 4) for binding. Also Recording Arm Pivot Screw (Item 107, Fig. 4) and Traverse Arm Pivot Screws (Item 101, Fig. 2). These bearings should all be free, but have no looseness or play.

If the Pivot Screw (Item 108, Fig. 4) of the Cutter Cartridge is tight, the Cutter Cartridge cannot follow a slight up and down variation of the record or turntable. A record cut in this manner will, when played back, have a high scratch level, rough cutting and a tendency for the needle to jump from one groove to another.

(c) Damaged Rubber Idler Drive Wheel (Item 83, Fig. 4). Rubber Idler Drive Wheel may have become damaged by:

1. Allowing oil or grease to come in contact with same.
2. By allowing turntable to drop and cut into the outside surface of the Rubber Idler Drive Wheel.
3. Stopping the turntable by hand while the motor is running will cause a flat spot on the surface of the Rubber Idler Drive Wheel.

NOTE: If the Rubber Idler Drive Wheel has been damaged in any of the above mentioned ways, it should be replaced with a new one.

(d) Vibration Reaching The Recorder While A Blank Is Being Recorded: It is very important the floor or the surface upon which the Recorder rests remain quiet as any vibration such as people walking across the floor or shaking of the instrument in which the Recorder is mounted will seriously effect the quality of the finished recording.

(e) Recorder Not Level: It is very important that the Recorder is standing level. This can be checked by placing a small level on the turntable and checking same in two positions at right angles to each other and then leveling Instrument in which Recorder is mounted.

(f) Bent Or Damaged Turntable Spindle: If the Turntable Spindle (Item 59, Fig. 4) has been bent in shipment, or by someone exerting a heavy pressure on one side, it should be replaced with a new one. A bent Turntable Spindle will cause the surface of the Turntable to move up and down while it is turning and, of course, will seriously effect the quality of both recording and play-back.

NOTE: When removing the Turntable an even upward lifting force should be applied at opposite edges of the Turntable while Turntable Spindle is gently tapped downward on its top end.

(g) Record Cutting Causing A Bind Between Turntable Spindle (Item 59, Fig. 4) And Its Bearing: It is very important that all record cuttings are removed from Turntable Spindle and its bearing.

(h) Tension On Rubber Idler Wheel (Item 83, Fig. 4) Too Great: If the tension on the Rubber Idler Drive Wheel is too great, this will result in a "wow" or a rumble in the recording. To decrease the tension on Rubber Idler Drive Wheel, loosen the screw holding the lug which is located beneath the Rubber Idler Drive Wheel and turn it slightly in a clockwise direction. This will reduce the spring tension on the Rubber Idler Drive Wheel. When the spring tension is correct, the spring will be approximately at right angles to the lug.

(i) Tension On Rubber Idler Drive Wheel (Item 83, Fig. 4) Too Weak: This will cause very bad speed variation. Turntable will slow down and then speed up as audio current of varying intensity reaches the cutter cartridge.



MODEL DZ-371  
Chassis DZ

EMERSON RADIO & PHONOGRAPH CORP.

RECORD CHANGER  
ADJUSTMENTS

The following is detailed information for adjusting the Record Changer Mechanism. Do not make any adjustments before reading the instructions carefully.

1. PICKUP DOES NOT INDEX PROPERLY ON TEN-INCH OR TWELVE-INCH RECORDS.

(a) Adjustment for correct indexing of 10-inch records:  
1. Swing tone arm outward until tone arm lever assembly (Item 19, Fig. 1) latches with tone arm latch lever (Item 18, Fig. 1) which is held to tone arm shaft (Item 77, Fig. 1) by two set-screws.

2. Make sure these set-screws are tight and that there is a slight play between the tone arm lever assembly and the panel (Item 5, Fig. 1). This will give proper clearance at ball race assembly (Item 74, Fig. 3).

The tone arm lever assembly (Item 19, Fig. 1) is held against tone arm latch lever (Item 18, Fig. 1) by the tension of tone arm locator lever spring (Item 16, Fig. 1).

3. Next loosen the clamping screw in the Swivel Bracket Assembly (Item 46, Fig. 3).

4. Now move tone arm until its outside edge is 1/8" from the outside edge of the panel (Item 5, Fig. 1) and retighten screw securely.

2. RECORD CHANGER DOES NOT GO INTO ITS CHANGING CYCLE AT END OF RECORD.

(a) Worn or Damaged Stop Groove: If the stop groove in the record is worn out or damaged, discard such a record.

(b) Cut-off Adjustment May Be Incorrect: The Record Changer should go into its changing cycle when the needle enters the stem groove and has traveled to within a distance of 1/8" from the center of the turntable shaft.

If the Record Changer does not go into its changing cycle when the needle has reached the above mentioned distance, the Tone Arm Trip Lever Shoe (Item 23, Fig. 1) should be moved toward the outside edge of the panel. To do this, it is necessary to loosen the thumb nut (Item 22, Fig. 1) and then retighten after adjustment has been made.

If the Record Changer goes into its changing cycle before the needle has reached a distance of 1/8" from the center of the turntable, the Tone Arm Trip Lever Shoe should be moved inward toward the center of the Record Changer.

3. RECORD CHANGER DOES NOT GO INTO ITS CHANGING CYCLE WHEN SWITCH KNOB IS TURNED ON.

When the switch is turned to "ON" the Record Changer should start its changing cycle. If it does not, the following points should be checked.

1. Make sure motor is running.
2. Check Trip Rod (Item 32, Fig. 1), to make sure it releases Trip Lever Assembly (Item 20, Fig. 1) from Engagement Clutch Cam Assembly (Item 79, Fig. 2) when Switch Knob is being turned on. If Trip Lever Assembly is not released, Trip Rod should be shortened by bending until Trip Lever clears Engagement Clutch Cam Assembly, when Switch Knob is turned.
3. Make sure that Clutch Reset Pawl (Item 40, Fig. 2) clears Drive Link Assembly (Item 31, Fig. 1).

7. TONE ARM ADJUSTMENTS FOR 10" RECORDS.

1. Turn both knobs until the arrows marked "10" are pointing toward the center of the turntable.

2. Place a 10" record on the turntable and start Record Changer.

3. Note where needle contacts record. Correct contacting is about 1/8" from the outside edge of record. If contacting of needle is not correct as mentioned, loosen the screw which holds Tone Arm Locator Shoe 10" (Item 15, Fig. 1) and slide shoe in or out as required, then tighten screw.

8. TONE ARM HEIGHT ADJUSTMENTS.

Set the Record Changer for 10" records, turn Switch to "ON" and allow Record Changer to go through a changing cycle with no record on the turntable. The clearance between Turntable and the bottom surface of the Tone Arm should be approximately 1/8". Usually this clearance can be obtained by adjusting the Tone Arm Adjustment Screw (Item 70, Fig. 3). It is well to check the following points before making any adjustment.

Check clearance between Roller (Item 51, Fig. 3) and Selector Crank Shaft Assembly (Item 7, Fig. 1). There should be approximately 1/32" clearance at this point. If the clearance is greater, it would be due to the pressure on the Spring Washer (Item 50, Fig. 3) being too great. This will prevent the Tone Arm Lifter Reset Spring (Item 82, Fig. 3) from returning the Tone Arm Lifter Link Assembly (Item 81, Fig. 2) sufficiently. To relieve the pressure on the Spring Washer, lower the Selector Shaft Collar (Item 6, Fig. 1) slightly.

9. TONE ARM LOWERS ON RECORD TOO SUDDENLY.

If the Tone Arm lowers too suddenly, the Spring Washer (Item 50, Fig. 3) which is located between the Tone Arm Lifter Link Assembly (Item 81, Fig. 2) and Selector Shaft Crank Assembly Post (Item 7, Fig. 1) is not under sufficient pressure. The set-screws in the Selector Shaft Collar (Item 6, Fig. 1) should be loosened and the Selector Shaft Collar pressed upward slightly and set-screws tightened.

10. LUBRICATION.

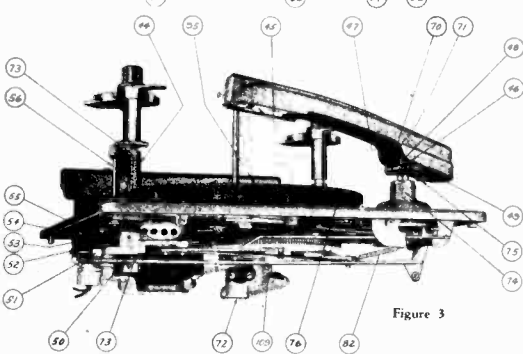
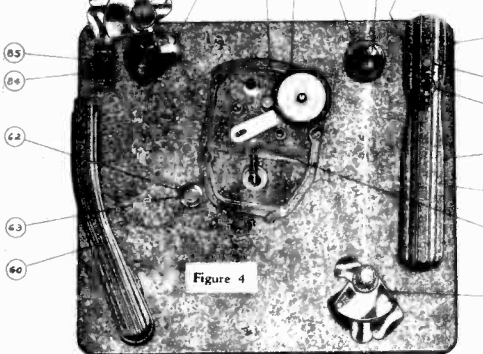
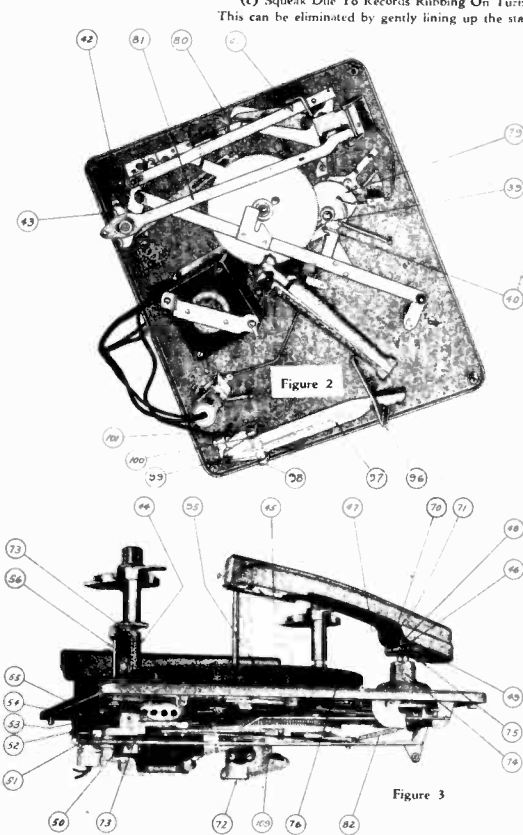
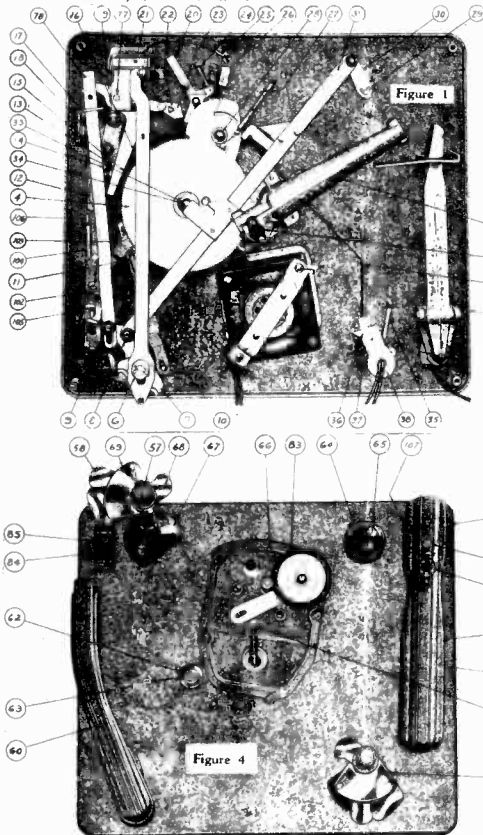
(a) Motor: The motor is equipped with oil-less bearing and requires no lubrication.

(b) Turntable Spindle Bearings: Are lubricated at the factory and do not require any lubrication for one year. After one year they should be oiled with 1 or 2 drops of a light grade oil.

The top bearing can be oiled by lifting off turntable. Make sure when replacing turntable to see that pin in Turntable Spindle slips into slot on bottom surface of turntable hub and also care should be taken not to injure Rubber Idler Drive Wheel.

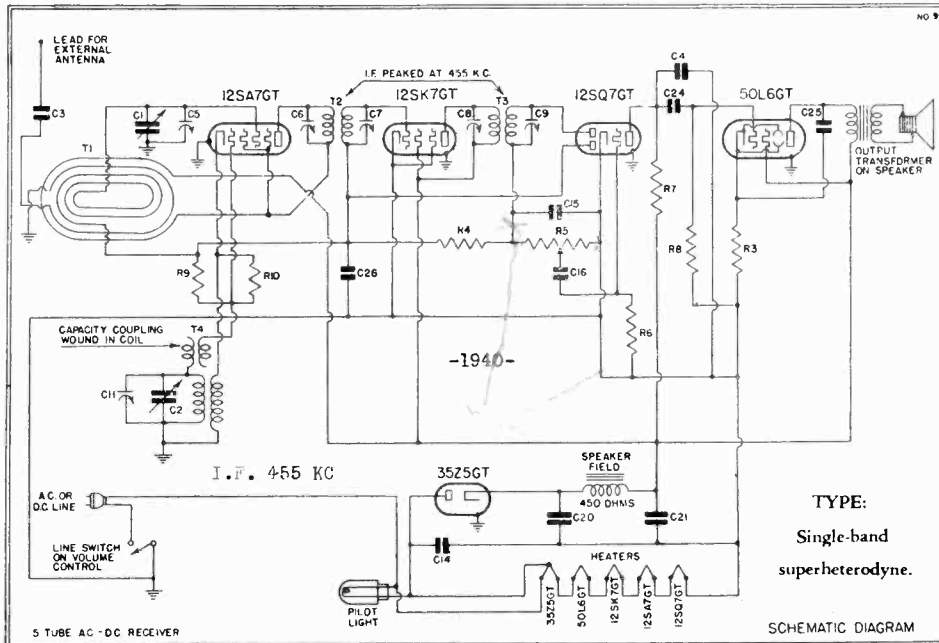
Never, under any circumstance, allow oil to come in contact with Rubber Idler Drive Wheel.

(c) Squeak Due To Records Rubbing On Turntable Spindle: This can be eliminated by gently lining up the stack of records.



**MODELS EP-367, EP-375, EP-381, EMERSON RADIO & PHONOGRAPH CORP. EP-405, EP-406, Chassis EP**

**MODELS EL-360, EL-361, EL-362. EL-373 Chassis EL**



**MODELS: EL-360, EL-361, EL-362 and EL-373**

CHASSIS MODEL: EL

**MODELS: EP-367, EP-375, EP-381, EP-405, EP-406**

CHASSIS MODEL: EP

POWER SUPPLY: A.C. or D.C.

POWER CONSUMPTION: 30 watts.

VOLTAGE RATING: 105-125 volts.

If replacements are made or the wiring disturbed in the r-f section of the circuit, the receiver should be carefully re-aligned.

**TYPE OF TUBES:**

- 1—12SA7GT, pentagrid oscillator-modulator
- 1—12SK7GT, first i-f amplifier
- 1—12SQ7GT, diode detector, a-f amplifier, a.v.c.
- 1—50L6GT, beam power output
- 1—35Z5GT, half-wave rectifier.

Readings should be taken with a 1000 ohm-per-volt meter. Voltages listed below are from point indicated to B minus (line switch) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, a.c. All readings except heaters and cathodes were taken on 250 volt scale. Measurements made with 117.5 volts a.c. will be lower than those given below.

Tube	Plate	Screen	Cathode	FIL
12SA7GT	88	88	0	12
12SK7GT	88	88	0	12
12SQ7GT	30	—	0	12
50L6GT	82	88	5.6	50

**Location of Coils and Trimmer Adjustments**

The first i-f transformer is mounted on top of the chassis deck to the left of the speaker. The trimmers are accessible through holes in the top of the can.

The second i-f transformer is mounted on top of the chassis to the right of the speaker. The trimmers are accessible through holes in the top of the can.

The trimmers for the antenna and oscillator coils are located on the variable condenser. In Model EL the trimmer on the front section is for the antenna coil (loop). In Model EP the trimmer on the rear section is for the antenna coil (loop). The oscillator coil is located directly beneath the speaker.

**I-f Alignment**

Swing the variable condenser to the minimum capacity position. Feed 455 kc to the grid of the 12SA7GT tube through a .01 mf condenser and adjust the four i-f trimmers for maximum response. The grid of the 12SA7GT tube may be reached by clipping the input lead to the stator lug of the antenna section.

**R-f Alignment**

Set the dial pointer at 140. Feed 1400 kc from the signal generator into a loop of wire about one foot in diameter. Hold this radiating loop about 12 inches away from and parallel to the receiver loop antenna. Advance the input to the loop until a satisfactory deflection is obtained on the output meter. Adjust first the oscillator trimmer then the antenna trimmer for maximum response. If the loop antenna has been replaced it may be necessary to retrace the loop inductance. With the dial set at 60 feed 600 kc to the antenna lead. A portion of the outside may be swung to either side of the center to give maximum response. Repeat the trimmer alignment at 140.

**VOLTAGE ANALYSIS**

- Voltage at 35Z5 cathode—120 volts.
- Voltage across speaker field—32 volts.
- Voltage across pilot light—4.5 volts.

color coding of the i-f transformer leads  
 Grid—green  
 Grid return—black  
 Plate—blue  
 B plus—red

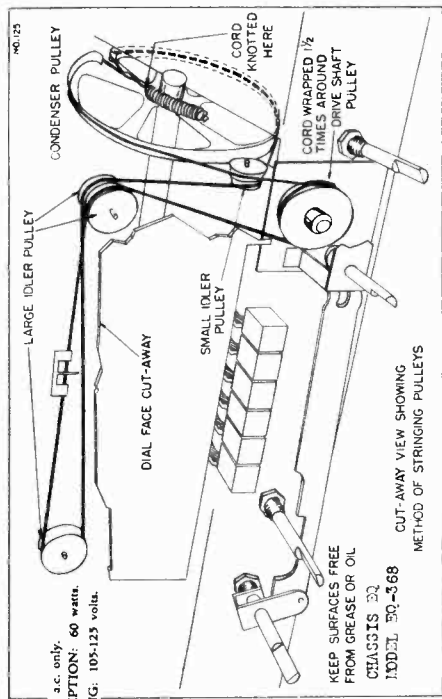
- T1 Loop antenna assembly (see prod. ch. No. 2)
- T4 Oscillator coil (EL).
- T4 Oscillator coil (EP).
- T2 Double-tuned 455 kc first i-f transformer (EL).....
- T2 Double-tuned 455 kc first i-f transformer (EP).....
- T3 Double-tuned 455 kc second i-f transformer (EL)
- T3 Double-tuned 455 kc second i-f transformer (EP)
- R2, R9 15 megohm 1/4 watt carbon resistor.....
- R3 140 ohm 1/4 watt wire-wound resistor.
- R4 3 megohm 1/4 watt carbon resistor.....
- R5 Volume control .5 megohm with line switch (EL)
- R5 Volume control .5 megohm with line switch (EP)
- R7, R8 500,000 ohm 1/4 watt carbon resistor.
- R10 20,000 ohm 1/4 watt carbon resistor.....
- C1, C2 Two-gang variable condenser (EL).....
- C1, C2 Two-gang variable condenser (EP).
- C3, C16 0.002 mf, 600 volt tubular condenser.....
- C4 0.0004 mf, 600 volt tubular or mica condenser.
- C15 0.00022 mf mica condenser.....
- C5, C11 Trimmers, part of variable condenser.
- C6, C7, C8, C9 Trimmers, part of i-f transformers.
- C14 0.05 mf, 400 volt tubular condenser.
- C24 0.02 mf, 400 volt tubular condenser.
- C20, C21 Dual-20 mf, 150 volt dry electrolytic condenser (EL)
- C20, C21 Dual 20 mf, 150 volt dry electrolytic condenser (EP)
- C25 0.01 mf, 400 volt tubular condenser.
- C26 0.1 mf, 200 volt tubular condenser.
- 8LS-493 4" dynamic speaker (EL) (see prod. ch. No. 1)
- 6WS-403C 4" dynamic speaker (EP).

**PRODUCTION CHANGES**

1. Chassis using speakers 6JS-368 or 6WS-403 may use 8LS-493 for replacement.
2. a. EP chassis bearing serial number above 4,133,831 use 8PW-324 loop antenna.
- b. Model EP-405 uses 8PW-332 loop antenna.

FREQUENCY RANGE: 540-1600 kc.

MODELS EQ-368, EMERSON RADIO & PHONOGRAPH CORP.  
EQ-410  
Chassis EQ



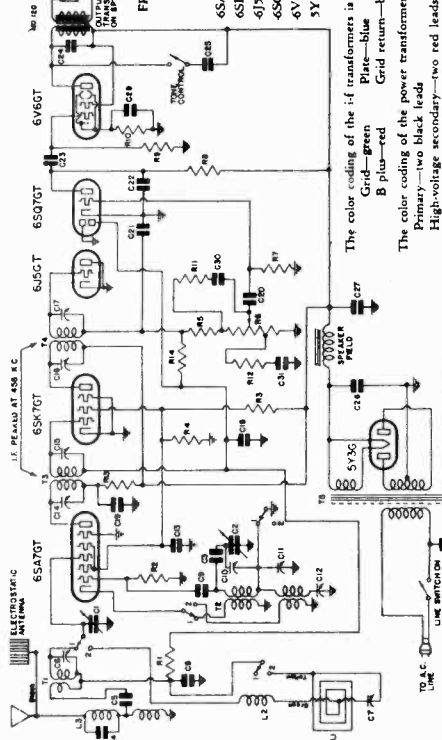
POWER SUPPLY: a.c. only.  
POWER CONSUMPTION: 60 watts.  
VOLTAGE RATING: 105-125 volts.

FREQUENCY RANGES:  
540-1650 kc.  
5.7-18.3 mc.

6SA7GT, oscillator-modulator  
6SK7GT, i.f. amplifier  
6J5GT, diode detector, a.v.c.  
6SQ7GT, audio amplifier  
6V6GT, power output  
5Y3G, full-wave rectifier.

The color coding of the i.f. transformers is as follows:

Grid—green Plate—black  
B plus—red Grid return—black  
The color coding of the power transformer is as follows:  
Primary—two black leads  
High-voltage secondary—center tap—red and yellow lead  
6.3 volt secondary—two green leads  
5 volt secondary—two yellow leads.



- 0.001 mf mica condenser—Part of L3  
0.01 mf, 400 volt tubular condenser.  
Trimmer, part of T1  
C7  
Trimmer, part of L1  
0.003 mf mica condenser.  
0.00011 mf mica condenser.  
Dual oscillator trimming condenser.  
Single adjustable padding condenser  
0.1 mf, 400 volt tubular condenser  
C14, C15 }  
C16, C17 }  
C18 }  
0.05 mf, 200 volt tubular condenser.  
C20 }  
0.002 mf, 600 volt tubular or mica condenser  
C21, C22 }  
0.02 mf, 400 volt tubular condenser  
C23, C25 }  
0.005 mf, 400 volt tubular condenser  
C24, C31 }  
Multiple dry electrolytic condensers.  
C26, C27, }  
C28, 20 mf—25 volt  
C29, 0.01 mf, 400 volt molded condenser  
C30 }  
0.00005 mf mica condenser  
C3 }  
0.002 mf mica condenser.
- Resistors:  
T1 Short-wave antenna coil.  
T2 Two-band oscillator coil.  
T3 Double-tuned 455 kc first i.f. transformer.  
T4 Double-tuned 455 kc second i.f. transformer  
T5 Power transformer  
L1 Broadcast loop antenna  
L2 Broadcast antenna loading coil.  
L3 Antenna choke and 455 kc wave-trap  
R1 100,000 ohm 1/4 watt carbon resistor  
R2 20,000 ohm 1/4 watt carbon resistor.  
R3 15,000 ohm 3/4 watt carbon resistor.  
R4 40,000 ohm 1/4 watt carbon resistor  
R5 25,000 ohm 1/4 watt carbon resistor.  
R6 Volume control 5 megohm with line switch  
R7 10 megohm 1/4 watt carbon resistor  
R8 250,000 ohm 1/4 watt carbon resistor  
R9, R11 500,000 ohm 1/4 watt carbon resistor  
R10 240 ohm 1 watt wire-wound resistor  
R12 10,000 ohm 1/4 watt carbon resistor.  
R13 1000 ohm 1/4 watt carbon resistor.  
R14 2 megohm 1/4 watt carbon resistor.  
C1, C2 Six-button tuning unit with two-gang variable condenser

VOLTAGE ANALYSIS

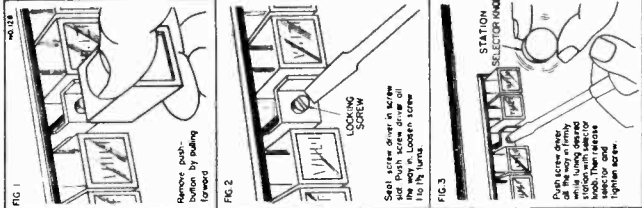
Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground (chassis) with the volume control turned on full and no signal. Line voltage for these readings was 117 volts, 60 cycles, a.c. All readings except B plus at rectifier, heaters, and cathode voltages were taken on 300 volt scale.

Tube	Plate	Screen	Cathode	Fil.
6SA7GT	232	85	0	6.3 a.c.
6SK7GT	260	85	0	6.3 a.c.
6J5GT	0	—	0	6.3 a.c.
6SQ7GT	110	—	0	6.3 a.c.
6V6GT	245	260	14	6.3 a.c.

EQ-410  
MODEL: EQ-368  
CHASSIS MODEL: EQ  
Voltage at 5Y3G filament to ground—330 volts.  
Voltage across speaker field—70 volts.

PREADJUSTMENT OF PUSHBUTTONS FOR AUTOMATIC TUNING

- Rotate the wave-band selector knob to the 600 kc position, clockwise. Select six nearby stations desired for automatic tuning. Choose one of these stations and adjust the wave-band selector knob to be adjusted for it. Follow the procedure outlined below.
  - Grasp the button firmly and remove it from its shaft by pulling straight out. See Fig. 1.
  - Insert a screw driver into the slot of the locking screw. Press in and loosen the screw 1 to 1 1/2 turns. See Fig. 2.
  - With the screw driver wedged in the screw slot, press the screw in as far as possible. Hold it in place with the other hand while the selector knob is turned in the other direction by rotating the selector knob. See Fig. 3.
  - Release the selector knob and tighten screw firmly.
  - Check the adjustment by turning well past the station, using the selector knob, and then pushing the selector knob back to the station. The station should come back in again clearly and with maximum volume.



Location of Coils and Trimmer Adjustments

The first i.f. transformer is the shortest and second i.f. transformer is the longest. The trimmer for both are accessible through holes in the tops of the cans.  
The short-wave antenna coil is mounted just to the left of the variable condenser in front of the 6SA7GT tube. Its trimmer is mounted on the coil. The loop acts as the broadcast antenna coil. The trimmer is accessible through a hole in the top of the chassis.  
The oscillator coil for both bands is located beneath the chassis. Trimmers for both oscillators are mounted on a dial strip on the front center wall of the chassis. The left-hand trimmer is for short-wave and the right-hand trimmer for broadcast.

I-f Alignment

Rotate the wave-band switch to the broadcast (clockwise) position. Set the variable condenser at the minimum capacity position and feed 455 kc, through a 0.02 mf paper condenser, to the grid of the 6SK7 tube. Adjust the four i.f. trimmers for maximum response. (The trimmer of the 6SA7GT is located in the center of the antenna (center) section of the variable condenser.)

Short-Wave Alignment

(Slot-wave alignment should precede broadcast alignment.) Set the wave-band switch at the short-wave (counterclockwise) position. Feed 600 kc to the antenna (using a standard dummy antenna) and adjust the broadcast-band series peaking trimmer for maximum response. Then adjust the oscillator coil trimmer for maximum response, then adjust the loop trimmer for maximum response. Reset the pointer at 60, feed 600 kc and rock the variable condenser while adjusting the series peaking trimmer for maximum response. Return to 1000 kc and repeat alignment procedure. (The broadcast trimmer is located on top of the chassis to the left of the variable condenser.)

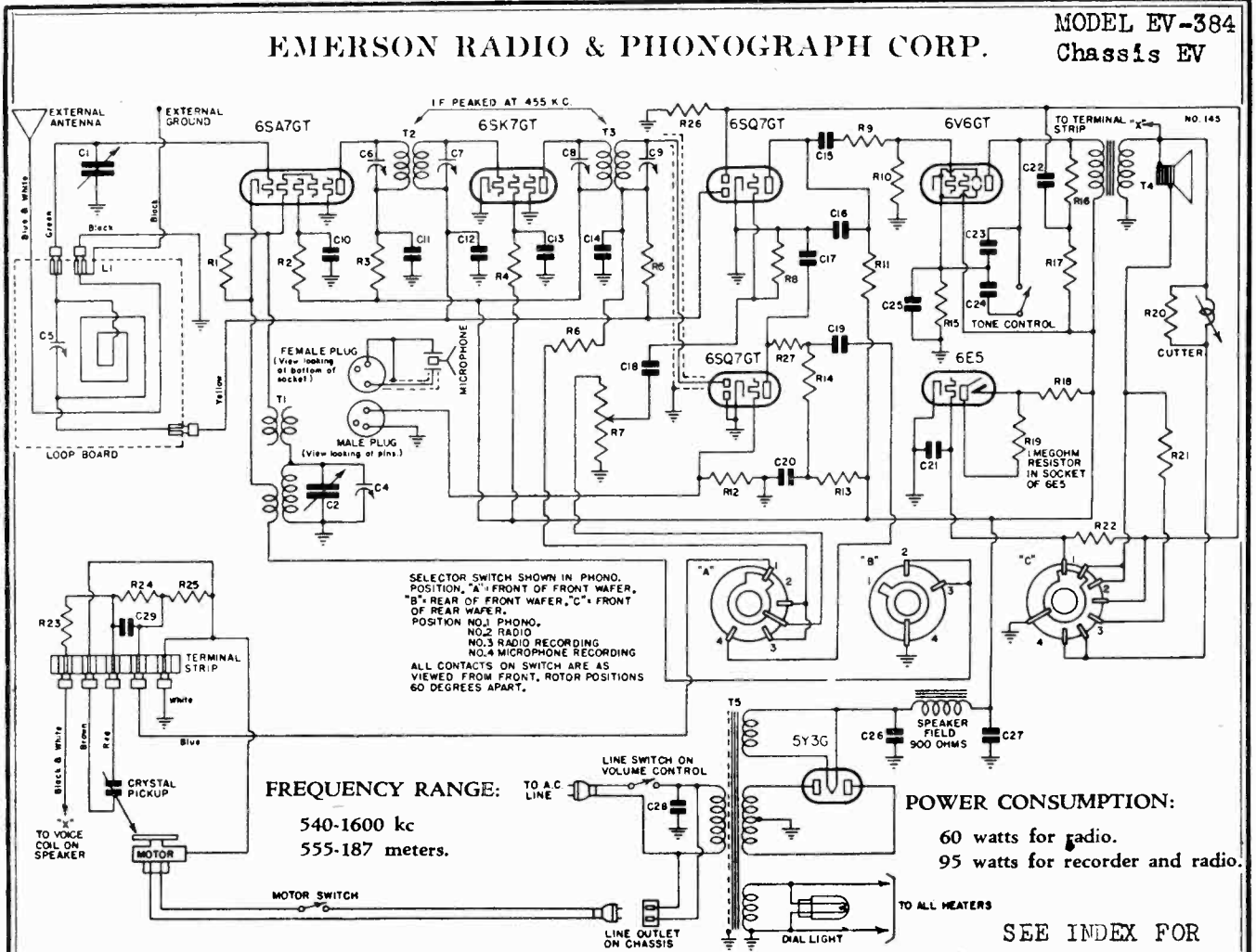
Broadcast Alignment

Set the wave-band switch at the broadcast (clockwise) position, and the pointer at 60. Feed 600 kc to the antenna (using a standard dummy antenna) and adjust the broadcast-band series peaking trimmer for maximum response. Then adjust the oscillator coil trimmer for maximum response, then adjust the loop trimmer for maximum response. Reset the pointer at 60, feed 600 kc and rock the variable condenser while adjusting the series peaking trimmer for maximum response. Return to 1000 kc and repeat alignment procedure. (The broadcast trimmer is located on top of the chassis to the left of the variable condenser.)

The adjustable padding condenser for the broadcast band is mounted on the top of the chassis near the short-wave antenna coil. The short-wave band has a fixed paddler, C3 on schematic. When replacing this fixed paddler be careful to use a condenser which has a capacity within 2% of the specified value, otherwise the short-wave coils may not track.

EMERSON RADIO & PHONOGRAPH CORP.

MODEL EV-384  
Chassis EV



FREQUENCY RANGE:  
540-1600 kc  
555-187 meters.

POWER CONSUMPTION:  
60 watts for radio.  
95 watts for recorder and radio.

SEE INDEX FOR  
PHONO RECORDER DATA.

TYPE: Portable single-band superheterodyne and phonograph recorder.

The color coding of the i-f transformers is as follows:

TYPE OF TUBES:

- 1—6SA7GT, oscillator-modulator
  - 1—6SK7GT, i-f amplifier
  - †1—6SQ7GT, diode detector, microphone preamplifier and a.v.c.
  - 1—6SQ7GT, audio amplifier
  - 1—6V6GT, beam power output
  - 1—5Y3G, full-wave rectifier
- In addition, a 6E5 electron ray recording level indicator is used.

- Grid—green
- Plate—blue
- B plus—red
- Grid return—black

The color coding of the power transformer is as follows:  
Primary—two black leads  
High-voltage secondary—two red leads  
High-voltage secondary center tap—red and yellow lead  
6.3 volt secondary—two green leads  
5 volt secondary—two yellow leads.

A ground is necessary if the microphone is to be used for recording. Use the conventional method of grounding to a water pipe or steam radiator. Connect the ground to the flexible black lead emerging from the motor board.

VOLTAGE ANALYSIS

Voltage at 5Y3G filament to ground—325 volts.  
Voltage across speaker field—70 volts.

POWER SUPPLY: a.c. only. 60 cycle.

\*Actual operating voltages cannot be measured because of high resistance in circuit. VOLTAGE RATING: 105-125 volts.  
†This tube is located in corner of chassis.

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground (chassis) with the volume control turned on full and no signal. Line voltage for these readings was 117 volts, 60 cycles, a.c. All readings except B plus at rectifier, heaters, and cathode voltages were taken on 300 volt scale.

Tube	Plate	Screen	Cathode	Fil.
6SA7GT	252	80	0	6.3 a.c.
6SK7GT	255	67	0	6.3 a.c.
6SQ7GT	100	—	0	6.3 a.c.
†6SQ7GT	*48	—	0	6.3 a.c.
6V6GT	247	255	12	6.3 a.c.

MODEL: EV-384

CHASSIS MODEL: EV

-EV-S1

MODEL EV-384

Chassis EV

MODELS ER-369, ER-370

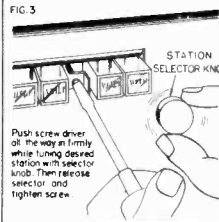
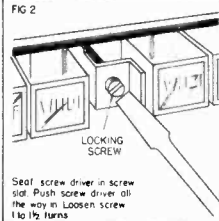
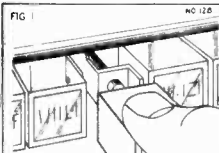
Chassis ER

EMERSON RADIO & PHONOGRAPH CORP.

MODELS: ER-369 and ER-370 CHASSIS MODEL: ER I-f Alignment

PREADJUSTMENT OF PUSHBUTTONS FOR

AUTOMATIC TUNING



Rotate the wave-band switch to the broadcast (clockwise) position. Set the variable condenser at the minimum capacity position and feed 455 kc, through a 0.02 mf paper condenser, to the grid of the 6SA7 tube. Clip input to stator lug of middle variable condenser section. Adjust the four i-f trimmers for maximum response.

1. Grasp the button firmly and remove it from its shaft by pulling straight out. See Fig. 1.

2. Insert a screwdriver into the slot of the locking screw. Press in and loosen the screw 1 to 1 1/2 turns. See Fig. 2.

3. With the screwdriver seated in the screw slot, press the screw in as far as possible. Hold it in firmly with one hand and tune in the desired station with the other hand by pressing in and rotating the selector knob. See Fig. 3.

4. Release the selector knob and tighten screw firmly.

5. Check the adjustment by turning well past the station, using the selector knob, and then pushing in the button shaft. The station should come back in again clearly and with maximum volume.

After the adjustment is tested, check to see that the locking screw is tightened firmly. Replace the button on its shaft.

Rotate the wave-band switch to the broadcast (clockwise) position. Set the variable condenser at the minimum capacity position and feed 455 kc, through a 0.02 mf paper condenser, to the grid of the 6SA7 tube. Clip input to stator lug of middle variable condenser section. Adjust the four i-f trimmers for maximum response.

Broadcast Alignment

Set the wave-band switch at the broadcast (clockwise) position, and the pointer at 60. Feed 600 kc to the antenna (using a standard dummy antenna) and adjust the broadcast-band series padder for maximum response. Move the pointer to 160, feed 1600 kc and adjust the oscillator coil trimmer for maximum response, then adjust the antenna coil trimmer for maximum response. Reset the pointer at 60, feed 600 kc and rock the variable condenser while adjusting the series padder for maximum response. Return to 1600 and check alignment. If readjustment is necessary return to 600 and repeat entire procedure.

Police Alignment

Set the wave-band switch at the police band (central) position and the pointer at 7.0. Feed 7000 kc to the antenna (using the dummy described above). Adjust the oscillator trimmer for maximum response. Then adjust the antenna trimmer for maximum response.

Short-Wave Alignment

Set the wave-band switch at the short-wave (counter-clockwise) position. Move the pointer to 20 and feed 20,000 kc to the antenna (using a 400 ohm dummy antenna) and adjust the short-wave oscillator trimmer for maximum response. If two peaks are obtained choose the minimum capacity peak. Then adjust the antenna coil trimmer for maximum response. If two peaks are obtained choose the maximum capacity peak.

Use a dummy antenna for aligning any of the three bands. A .0002 mf condenser may be used for broadcast band dummy antenna, a .0001 mf condenser in series with a 400 ohm carbon resistor for the police band dummy antenna and a 400 ohm non-inductive resistor for the short-wave band dummy antenna.

The adjustable padding condenser for the broadcast band is located on the top of the chassis near the 6SQ7 tube. The short-wave and police padders are fixed mica condensers. When replacing, be careful to use a condenser which has a capacity within 2% of the specified value, otherwise the coils may not track.

MODEL: EV-384 CHASSIS MODEL: EV

T1	Oscillator coil
T2	Double-tuned 455 kc first i-f transformer
T3	Double-tuned 455 kc second i-f transformer
T4	Output transformer
T5	Power transformer
L1	Loop antenna assembly
R1	20,000 ohm 1/4 watt carbon resistor
R2	20,000 ohm 2 watt carbon resistor
R3	1000 1/4 watt carbon resistor
R4	100,000 ohm 1/4 watt carbon resistor
R5, R24	3 megohm 1/4 watt carbon resistor
R6, R9, R17	50,000 ohm 1/4 watt carbon resistor
R7	Volume control 5 megohm with line switch
R8, R12	10 megohm 1/4 watt carbon resistor
R10, R26	500,000 ohm 1/4 watt carbon resistor
R11	200,000 ohm 1/4 watt carbon resistor
R13, R14, R25, R27	250,000 ohm 1/4 watt carbon resistor
R15	240 ohm 1 watt wire-wound resistor
R16	560,000 ohm 1/4 watt carbon resistor
R18	20,000 ohm 1 watt carbon resistor
R19	1 megohm resistor in 6E5 socket
R20	23 ohm 1/2 watt wire-wound resistor
R21	45 ohm 1/2 watt wire-wound resistor
R22	1 megohm 1/4 watt carbon resistor
R23	2 megohm 1/4 watt carbon resistor
R24	3 megohm 1/4 watt carbon resistor
C1, C2	Two-gang variable condenser
C4	Oscillator trimmer, on variable condenser
C5	Antenna trimmer, part of loop assembly
C6, C7, C8, C9	Trimmers, part of i-f transformers
C10, C13, C22	0.05 mf, 400 volt tubular condenser
C11	0.1 mf, 400 volt tubular condenser
C12	0.05 mf, 200 volt tubular condenser
C14	0.00011 mf, mica condenser
C15	0.02 mf, 400 volt tubular condenser
C16	0.00006 mf, mica condenser
C17	0.00022 mf, mica condenser
C18	0.002 mf, 600 volt tubular condenser
C19	0.01 mf, 400 volt tubular condenser
C20	0.5 mf, 400 volt tubular condenser
C21	0.25 mf, 100 volt tubular condenser
C23	0.005 mf, 1000 volt tubular condenser
C24	0.035 mf, 1000 volt tubular condenser
C25, C26, C27	Multiple dry electrolytic condenser
C28	C28—20 mf, 25 volt;
C29	C26—15 mf, 450 volt; C27—15 mf, 350 volt.
C30	0.01 mf, 400 volt molded condenser
C31	0.000026 mf mica condenser

Location of Coils and Trimmer Adjustments

The first i-f transformer is mounted on top of the chassis deck behind the variable condenser. The trimmers are accessible through holes in the top of the can.

The second i-f transformer is mounted beneath the chassis. The trimmers are accessible through holes in the rear of the chassis.

The oscillator coil is mounted underneath the chassis. The oscillator trimming condenser is located on the front section of the variable condenser.

The trimmer for the loop winding is mounted on the loop board. It is accessible through a hole in the rear of the cabinet and should be trimmed when the chassis is mounted in its position.

I-f Alignment

Set the variable condenser at the minimum capacity position and feed 455 kc, through a 0.02 mf paper condenser, to the grid of the 6SA7GT tube. Adjust the four i-f trimmers for maximum response.

Note: The grid of the 6SA7 tube is connected to the stator lug of the rear variable condenser section. Connection may be made with a test clip.

R-f Alignment (LOOP ALIGNMENT)

Set the dial pointer at 150. Set the signal generator at 1500 kc and feed its output into a loop of wire about 12 inches in diameter. Hold this radiating loop about 12 inches from and parallel to the receiver loop antenna. Advance the output of the signal generator until deflection is obtained on the output meter. Adjust first the oscillator trimmer (on front section of variable condenser) then the antenna trimmer (located on the loop board) for maximum response.

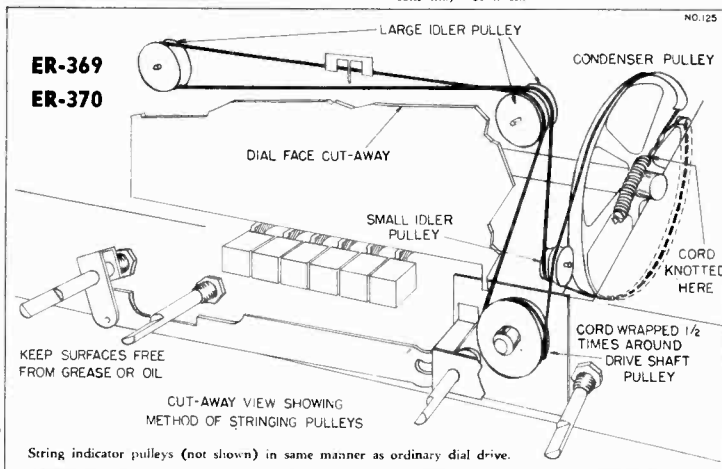
If the loop antenna has been replaced it may be necessary to adjust the loop inductance as follows: Align at 150. Set the pointer at 60 and feed 600 kc to the antenna lead. A portion of the outside turn of the loop may be swung to either side of the center to give maximum response. Realign at 150.

Radio

With the selector switch in "Radio" position the receiver can be used as any ordinary radio. The electron ray indicator near the top of the panel is a level indicator for recording and is not intended for use as a tuning indicator.

Phonograph Operation

With the selector switch in the "Phonograph" position the receiver may be used as to reproduce records up to 12". Never use the cutting needle in the reproducing pick-up since this will immediately ruin the records.



T1	Police and short-wave antenna coil	C1, C2	Two-gang variable condenser (complete with 6 push button assembly)
T2	Three-band oscillator coil	C7	0.01 mf, 400 volt tubular condenser
T3	Double-tuned 455 kc first i-f transformer	C8	0.001 mf mica condenser (part of L1)
T4	Double-tuned 455 kc second i-f transformer	C3, C13	0.003 mf mica condenser
L1	Power transformer	C4, C5	Dual trimmer strip
L2	Antenna choke and 455 kc wave-trap	C6	Loop antenna trimming condenser
L3	Broadcast antenna loading coil	C9	0.002 mf mica condenser
R1	20,000 ohm 1/4 watt carbon resistor	C10, C11, C12	Trimmer, part of oscillator coil
R2	50 ohm 1/4 watt carbon resistor	C14	Single adjustable padding condenser
R3	40,000 ohm 1/4 watt carbon resistor	C15, C24, C30	Range: 400-700 mmf
R4	100,000 ohm 1/4 watt carbon resistor	C16, C23	0.00011 mf mica condenser
R5, R13	15,000 ohm 3 watt carbon resistor	C17, C18, C19, C20	0.1 mf, 400 volt tubular condenser
R6	2 megohm 1/4 watt carbon resistor	C21, C34, C35	Trimmers, part of i-f transformers
R7	2 megohm 1/4 watt carbon resistor	C22, C41	0.05 mf, 400 volt tubular condenser
R8, R16, R18	250,000 ohm 1/4 watt carbon resistor	C25	0.00006 mf mica condenser
R9	20,000 ohm 1 watt carbon resistor	C26, C28	0.02 mf, 400 volt tubular condenser
R10	1 megohm 1/4 watt carbon resistor (in 6U5 socket)	C27, C29, C32, C36	0.002 mf, 600 volt tubular condenser
R11	Volume control 2.5 megohm with line switch tapped at 4 meg, and 50,000 ohms	C31, C33	0.005 mf, 400 volt tubular condenser
R12	15,000 ohm 1/4 watt carbon resistor	C37, C38, C39	Triple 15 mf dry electrolytic condenser
R14	50,000 ohm 1/4 watt carbon resistor	C40	C37—250 volt; C38 and C39—400 volt
R15	15 megohms 1/4 watt carbon resistor	C24	0.01 mf, 400 volt molded condenser
R17, R19, R20	500,000 ohm 1/4 watt carbon resistor	R24	3 megohm 1/4 watt carbon resistor
R21	25,000 ohm 1/4 watt carbon resistor	R25	2 megohm 1/4 watt carbon resistor
R22	1,000 ohm 1 watt carbon resistor	R26	1,000 ohm 1/4 watt carbon resistor
R23	3 megohm 1/4 watt carbon resistor	C42	0.0005 mf mica condenser

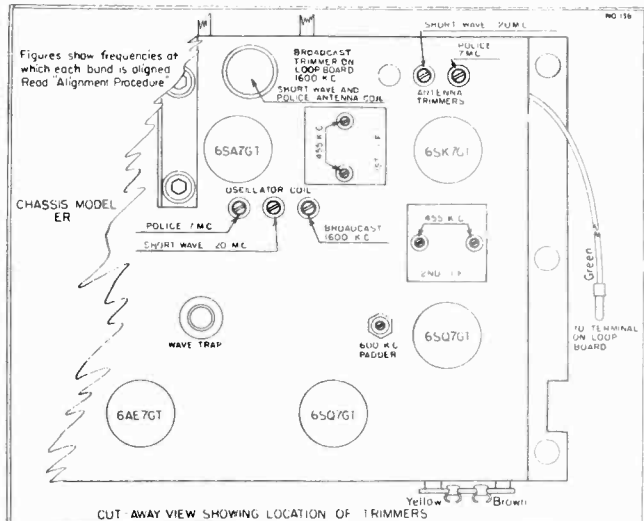
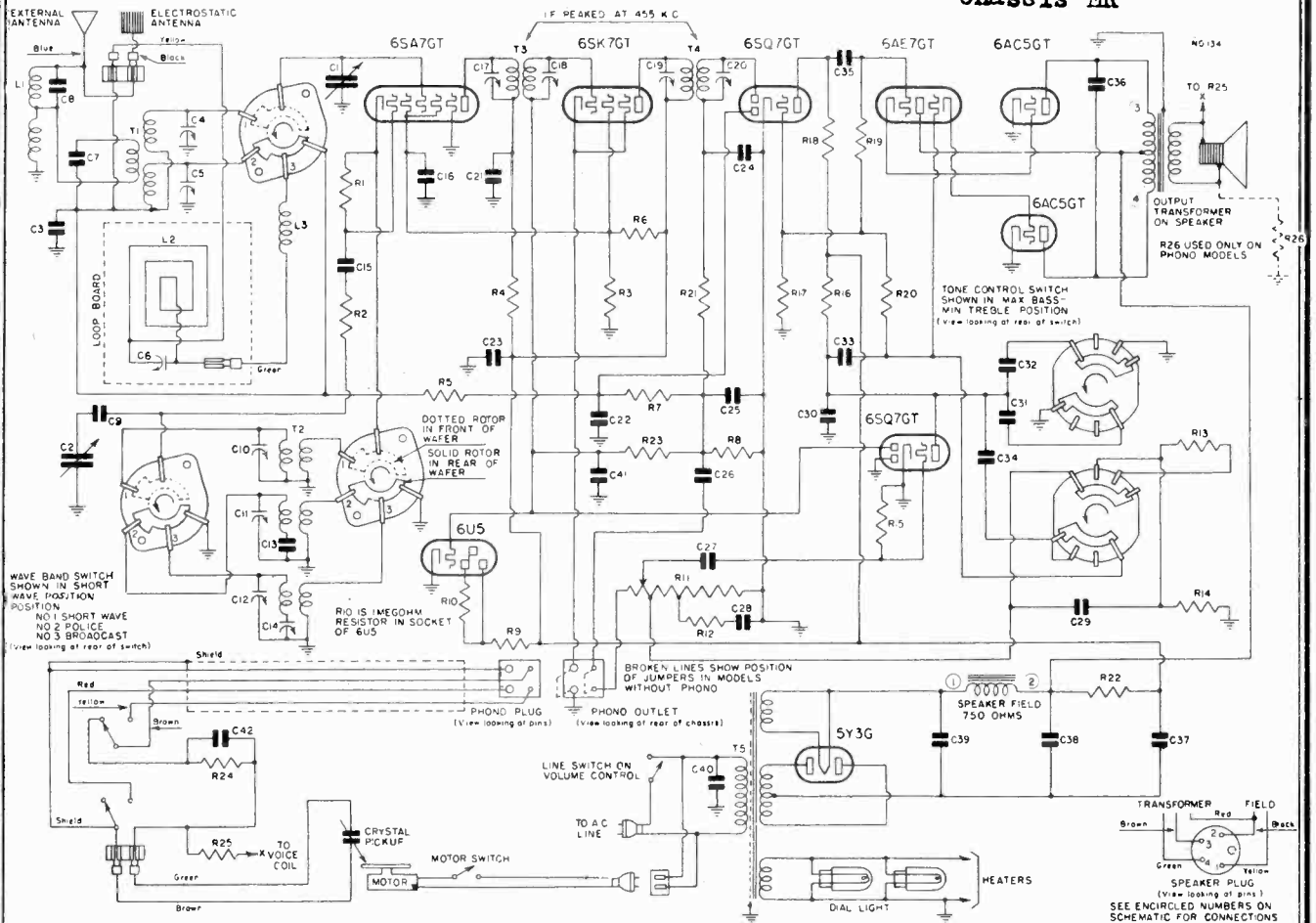


EMERSON RADIO & PHONOGRAPH CORP.

MODELS

ER-369, ER-370

Chassis ER



VOLTAGE RATING: 105-125 volts.  
 POWER SUPPLY: A.C. only.  
 POWER CONSUMPTION: 85 watts for receiver.  
 120 watts for combination.  
 FREQUENCY RANGES: 540-1630 kc.  
 2.3-7.5 mc.  
 6.9-22.3 mc.

- 6SA7GT, oscillator-modulator
- 6SK7GT, i-f amplifier
- 6SQ7GT, diode detector, audio amplifier and a.v.c.
- 6SQ7GT, audio amplifier
- 6AE7GT, audio amplifier
- 6AC5G, power output
- 6U5 electron-ray tuning indicator.
- 5Y3G, full-wave rectifier.

VOLTAGE ANALYSIS

Voltage at 5Y3 filament to ground—345 volts.  
 Voltage drop across speaker field—90 volts.  
 \*Same voltage for each tube.  
 \*Same voltage for both cathodes.

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground (chassis) with the volume control turned on full and no signal. Line voltage for these readings was 117 volts, 60 cycles, a.c. All readings except B plus at rectifier, heaters, and cathode voltages were taken on 300 volt scale.

**MODELS: ER-369  
 and ER-370**  
 CHASSIS MODEL: ER  
 —ER-51 —ER-52

Tube	Plate	Screen	Cathode	Fil.
6SA7GT	235	72	0	6.3
6SK7GT	235	72	0	6.3
+6SQ7GT	75	—	0	6.3
*6AE7GT	255	—	12	6.3
*+6AC5GT	245	—	0	6.3

EMERSON RADIO & PHONOGRAPH CORP.

**RECORD CHANGER ADJUSTMENTS**  
**PICKUP DRIVE NOT INDEX PROPERLY ON TEN-OR TWELVE-INCH RECORDS.**

1. The lugs on the Muting Switch may have been bent together.
2. The lugs on the Muting Switch may have been bent together.
3. Pickup carriage in Tone Arm may have been damaged or may be defective.
4. Adjustment for correct indexing of 10-inch records:  
 1. Swing tone arm outward until tone arm lever assembly (Item 19, Fig. 1) latches with tone arm latch lever (Item 18, Fig. 1) which is held to tone arm shaft (Item 77, Fig. 1) by two set-screws.  
 2. Make sure these set-screws are tight and that there is a slight play between the tone arm lever assembly and the panel (Item 5, Fig. 1). This will give proper clearance at ball race assembly (Item 74, Fig. 3).  
 The tone arm lever assembly (Item 19, Fig. 1) is held against tone arm latch lever (Item 18, Fig. 1) by the tension of tone arm locator lever spring (Item 16, Fig. 1).  
 3. Next loosen the clamping screw in the Swivel Bracket Assembly (Item 46, Fig. 5).
4. Now move tone arm (Item 60, Fig. 4) until its outside edge is  $\frac{1}{8}$ " from the outside edge of the panel (Item 5, Fig. 1) and retighten screw securely.

**RECORD CHANGER DOES NOT GO INTO ITS CHANGING CYCLE AT END OF RECORD.**

1. Worn or Damaged Stop Groove: If the stop groove in the record is worn out or damaged, discard such a record.
2. Curloff Adjustment May Be Incorrect: The Record Changer should go into its changing cycle when the needle enters the stop groove and has traveled to within a distance of  $\frac{1}{16}$ " from the center of the turntable start.

If the Record Changer does not go into its changing cycle when the needle has reached the above mentioned distance, the Tone Arm Trip Lever Shoe (Item 21, Fig. 1) should be moved inward toward the center of the Record Changer.

**RECORD CHANGER DOES NOT GO INTO ITS CHANGING CYCLE WHEN SWITCH KNOB IS TURNED ON.**

1. Make sure the Clutch Rest Post (Item 40, Fig. 2) clears Drive Link Assembly (Item 31, Fig. 1).
2. Check Trip Rod (Item 32, Fig. 1) to make sure it releases Trip Lever Assembly (Item 20, Fig. 2) from Engagement Clutch Cam Assembly (Item 79, Fig. 2) when Switch Knob is being turned on. If Trip Lever Assembly is not released, the Engagement Clutch Cam Assembly, when Switch Knob is turned on, may be due to causes listed below:
3. Make sure the Clutch Rest Post (Item 40, Fig. 2) clears Drive Link Assembly (Item 31, Fig. 1).
4. RECORD CHANGER CONTINUES TO REPEAT ITS CHANGING CYCLE WITHOUT PLAYING RECORDS:  
 (a) Trip Lever Assembly (Item 20, Fig. 2) does not latch Engagement Clutch Cam Assembly (Item 79, Fig. 2) which may be due to causes listed below:  
 1. Trip Rod (Item 32, Fig. 1) may be bent so that it is too short, holding Trip Lever Assembly from contacting Engagement Clutch Cam Assembly.  
 2. Springs (Item 24 or 35, Fig. 1) may be disconnected.  
 3. NO SOUND WHEN NEEDLE IS ON MOVING RECORD.  
 1. Muting Switch (Item 36, Fig. 1) may be out of adjustment. The contacts of this switch should be open whenever its long blade is not resting on the shoe of the Engagement Clutch Cam Assembly (Item 79, Fig. 2). If the contacts remain closed when the long blade is not resting on the shoe of the Engagement Clutch Cam Assembly, they may be bent until there is a separation of approximately  $\frac{1}{32}$ ". Switch should be checked to make sure contacts are closed when long blade is resting on the shoe of the Engagement Clutch Cam Assembly.

**TONE ARM ADJUSTMENTS FOR 12" RECORDS.**

1. Turn both Control Knobs until the screws marked "12" are pointing toward the center of the turntable.
2. Place a 12" record on the turntable.
3. Start Record Changer and note where needle contacts record. Correct contact is about  $\frac{1}{8}$ " from the outside edge of the record.
4. Set Rod (Item 56, Fig. 3) is operated by Selector Arm (Item 61, Fig. 4). The 12" Set Link (Item 10, Fig. 1) operates as a stop when Record Changer is set for 12" records. When the selector arm is in the 12" position, the Set Link (Item 10, Fig. 1) will hold the Tone Arm in its correct position to play a 12" record.

If, at this point, the position of Tone Arm is incorrect, loosen the screw which holds the Tone Arm Locator Shoe 12" (Item 14, Fig. 1) and move in either direction as required and tighten screw.

**TONE ARM ADJUSTMENTS FOR 10" RECORDS.**

1. Turn both knobs until the arrows marked "10" are pointing toward the center of the turntable.
2. Place a 10" record on the turntable and start Record Changer.

3. Note where needle contacts record. Correct contact is about  $\frac{1}{8}$ " from the outside edge of the record. If the needle is not correct as mentioned, loosen the screw which holds the Tone Arm Locator Shoe 10" (Item 15, Fig. 1) and slide shoe in or out as required, then tighten screw.

**TONE ARM HEIGHT ADJUSTMENTS.**

Set the Record Changer for 10" records, turn Switch to "ON" and allow Record Changer to go through a changing cycle with no record on the turntable. The clearance between the tone arm and the record surface should be approximately  $\frac{1}{32}$ ". Usually this clearance can be obtained by adjusting the Tone Arm Adjustment Screw (Item 70, Fig. 3). If it will not check the following points before making any adjustment:  
 1. Check clearance between Roller (Item 51, Fig. 3) and Selector Arm Shaft Assembly (Item 7, Fig. 1). There should be approximately  $\frac{1}{32}$ " clearance at this point. If the clearance is greater, it would be due to the pressure on the Spring Washer (Item 52, Fig. 3) which is too tight. Loosen the Spring Washer (Item 52, Fig. 3) by turning the Tone Arm Lifter Link Assembly (Item 81, Fig. 2) from retaining the Tone Arm Lifter Link Assembly (Item 81, Fig. 2) sufficiently. To relieve the pressure on the Spring Washer, lower the Selector Shaft Collar (Item 6, Fig. 1) slightly.

**TONE ARM LOWERS ON RECORD TOO SUDDENLY.**

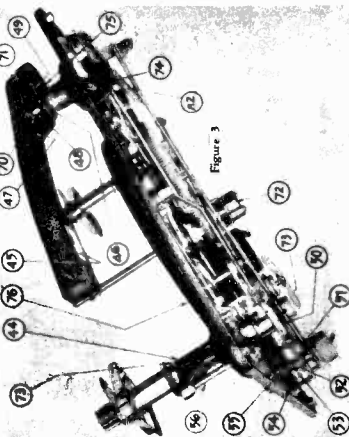
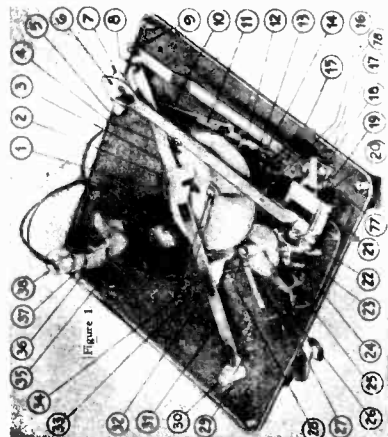
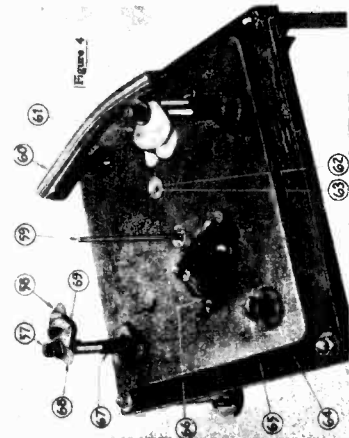
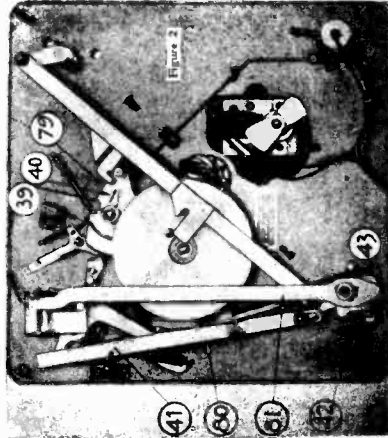
If the Tone Arm lowers too suddenly, the Spring Washer (Item 50, Fig. 3) which is located between the Tone Arm Lifter Link Assembly (Item 81, Fig. 2) and Selector Shaft Collar (Item 6, Fig. 1) may be too tight. The set-screws in the Selector Shaft Collar (Item 6, Fig. 1) should be loosened and the Selector Shaft Collar pressed upward slightly and set-screws tightened.

**LUBRICATION.**

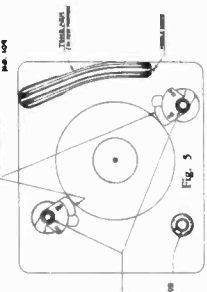
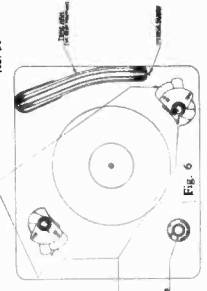
- (a) Motor: The motor is equipped with oilless bearing and requires no lubrication.
- (b) Turntable Spindle Bearings: Are lubricated at the factory. The bearings should be oiled with 1 or 2 drops of a light grade oil. The top bearing can be oiled by lifting off turntable. Make sure when replacing turntable to see that pins in Turntable Spindle dips into slot on bottom surface of turntable hub and also case should be taken not to injure Rubber Idler Drive Wheel.
- (c) Squeak Due To Records Rubbing On Turntable Spindle: This can be eliminated by greasing lining up the stack of records.

**Automatic Phonograph Operation**

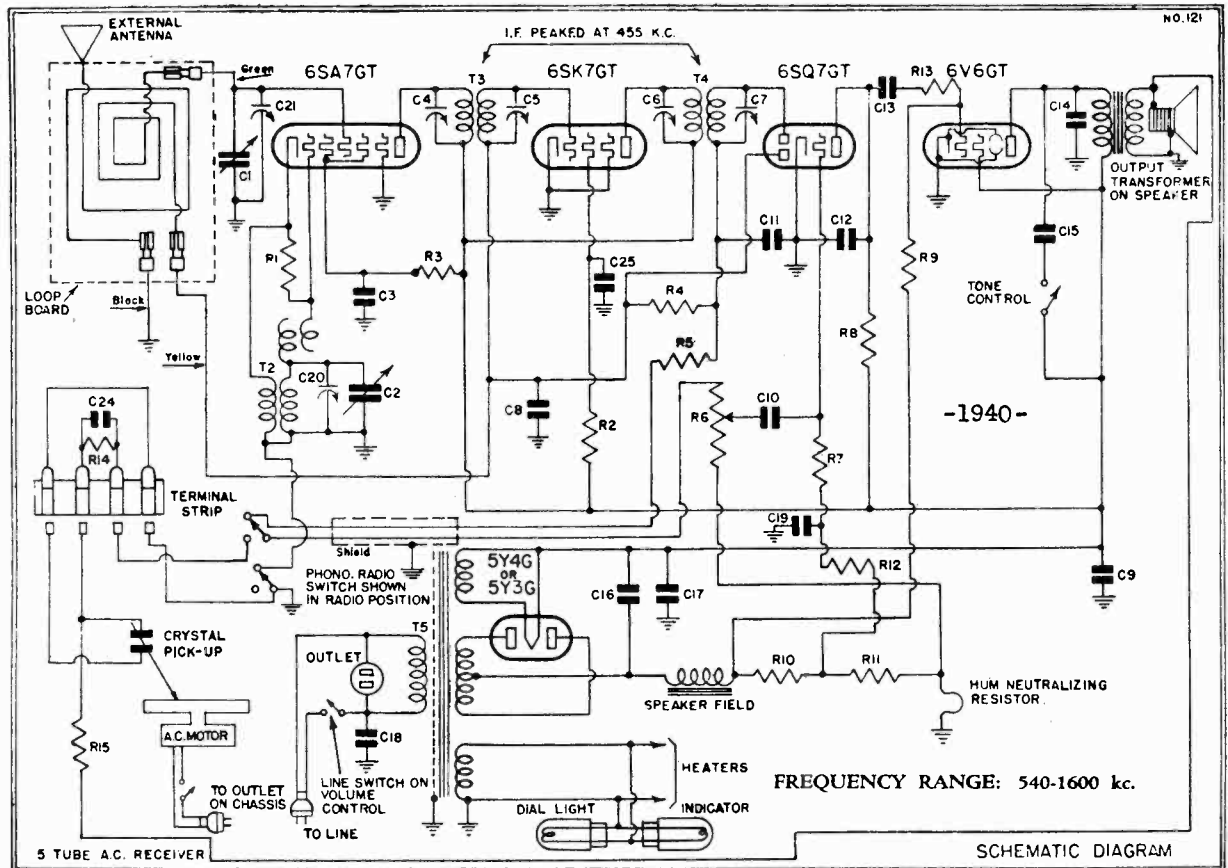
1. Turn the radio on in the regular manner and then rotate the radio-phonograph switch to the phonograph position, counter-clockwise.
2. The selector arms on the record holder posts are fixed to record holder. The posts for 10" records lift the posts and rotate until the 10" arrows on the arms point to the center of the



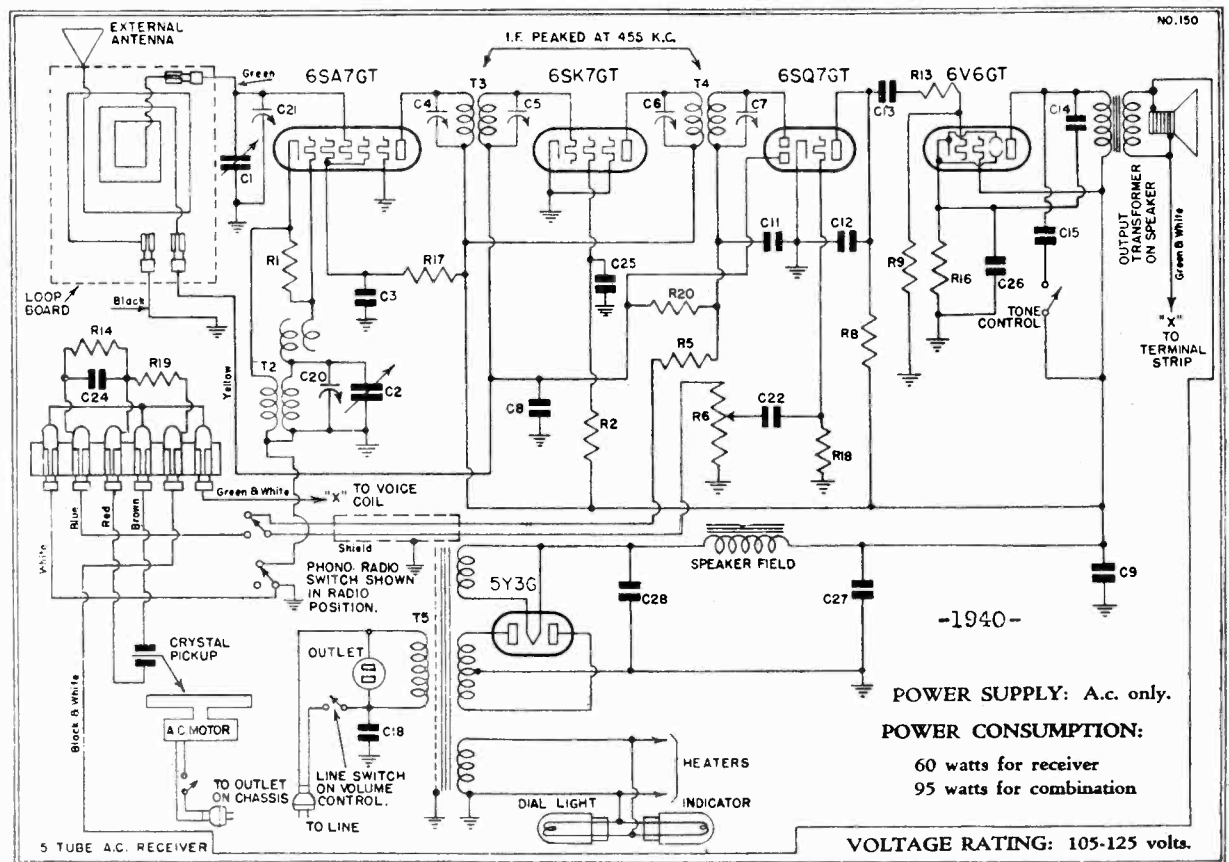
6. The first record should drop into place and the tone arm should swing into place on the record. If it does not, push the switch knob down once.
7. Push the switch knob down once.
8. This volume should be adjusted to the desired level by means of the regular receiver volume control.
9. During operation, the cabinet lid should be closed to eliminate mechanical noises due to needle vibration.
10. The whole series of records will now play without further attention, and the last record will repeat until the turntable switch is turned off. Allow the record-changer to change to the next record. When the record-changer has changed to the pickup, swing the arm to the right beyond the edge of the record and lower it.
11. Grasp each post by its knob and rotate until the record holder is over the turntable. (See Fig. 6). The record may then be removed.



EMERSON RADIO & PHONOGRAPH CORP. MODELS ES-374, ES-397 Chassis ES



SCHEMATIC DIAGRAM No. 1



SCHEMATIC DIAGRAM No. 2

**MODELS**  
**ES-374, ES-397** **EMERSON RADIO & PHONOGRAPH CORP.**  
**Chassis ES**

T1	Loop antenna assembly.....
T2	Oscillator coil.....
T3	Double-tuned 455 kc first i-f transformer.....
T4	Double-tuned 455 kc second i-f transformer.....
T5	Power transformer.....
P1	20,000 ohm 3/4 watt carbon resistor.....
R2	20,000 ohm 3 watt carbon resistor (see prod. change no. 1a).....
R3	100,000 ohm 1/2 watt carbon resistor.....
R4	3 megohm 3/4 watt carbon resistor.....
R5	25,000 ohm 3/4 watt carbon resistor.....
R6	Volume control, .25 megohm with line switch.....
R7, R14, R15	2 megohm 3/4 watt carbon resistor.....
R8	250,000 ohm 1/4 watt carbon resistor.....
R9, R12	500,000 ohm 3/4 watt carbon resistor (see prod. change no. 1b).....
R10	180 ohm 1 watt wire-wound resistor (see prod. change no. 1a).....
R11	25 ohm 3/4 watt wire-wound resistor (see prod. change no. 1a).....
R13	50,000 ohm 1/4 watt carbon resistor.....
R16	240 ohm 1 watt wire-wound resistor.....
R17	20,000 ohm 2 watt carbon resistor.....
R18	15 megohm 1/4 watt carbon resistor.....
C1, C2	Two-gang variable condenser (see prod. change no. 1a).....
C3, C25	0.05 mf, 400 volt tubular condenser.....
C4, C5, C6, C7	Trimmers, part of i-f transformers.....
C8	0.05 mf, 200 volt tubular condenser.....
C9	0.1 mf, 400 volt tubular condenser.....
C10	0.006 mf, 600 volt tubular condenser (see prod. change no. 1c).....
C11, C12	0.0002 mf, 600 volt tubular or mica condenser.....
C14	0.005 mf, 1000 volt tubular condenser.....
C13, C15	0.02 mf, 400 volt tubular condenser.....
C16	16 mf, 450 volt dry electrolytic condenser.....
C17	16 mf, 400 volt dry electrolytic condenser.....
C18	0.01 mf, 400 volt tubular condenser.....
C19	0.25 mf, 100 volt tubular condenser (see prod. change no. 1c).....
C20	Trimmer, part of loop antenna assembly, no. 1c.....
C21	Trimmer, part of variable condenser.....
C23	0.002 mf, 600 volt tubular condenser.....
C24	0.00006 mf mica condenser.....
C26, C27, C28	Multiple dry electrolytic condenser.....
	C26—20 mf, 25 volt; C27—15 mf, 350 volt; C28—16 mf, 400 volt (see prod. change no. 1e)
TTS-111V	Phono-radio switch.....
3ES-256J	Tone control switch.....
8SS-519	12" dynamic speaker.....

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground (chassis) with the volume control turned on full and no signal. Line voltage for these readings was 117 volts, 60 cycles, a.c. All readings except B plus at rectifier, heaters, and cathode voltages were taken on 300 volt scale.

**VOLTAGE ANALYSIS**

Tube	Plate	Screen	Cathode	Fil.
6SA7	255	100	0	6.3 a.c.
6SK7	255	85	0	6.3 a.c.
6SQ7GT	110	—	0	6.3 a.c.
6V6	245	255	*12	6.3 a.c.

In chassis below 3,923,600 \*6V6 cathode voltage is zero on chassis below 3,923,600. In chassis above 3,923,600: Voltage from power transformer center tap to ground—85 volts (negative). Voltage across field—70 volts  
 Voltage across resistors R10 and R11—15 volts (negative). Voltage at 5Y3 filament to ground—325

**PRODUCTION CHANGES**

- 1 For chassis bearing serial numbers above 3,923,600
  - (a) This part is not used. (refer to schematic diagram no. 2)
  - (b) Resistor R12—5 megohm is not used.
  - (c) Condenser C10—.006 mf; C19—.25 mf; are not used.
  - (d) This variable condenser is used. Chassis below 3,923,600 use 85C-507.
  - (e) This electrolytic is used. Chassis below 3,923,600 use: C16—7AC-443—16 mf, 450 volt; C17—7AC-444—16 mf, 400 volt

**MODELS: ES-374 and ES-397**

**CHASSIS MODEL: ES**

**TYPE OF TUBES:**

- 1—6SA7GT, oscillator-modulator
  - 1—6SK7GT, i-f amplifier
  - 1—6SQ7GT, diode detector, audio amplifier and a.v.c.
  - 1—6V6GT, power output
  - 1—5Y3G, full-wave rectifier.
- Chassis below 3,923,600 use 5Y3G or 5Y4G

**I-f Alignment**

Swing the variable condenser to the minimum capacity position. Feed 455 kc to the grid of the 6SA7 tube through a .01 mf condenser and adjust the four i-f trimmers for maximum response.

Note: The grid of the 6SA7 tube is connected to the motor lug of the rear variable condenser section.

**R-f Alignment**

Set the dial pointer at 150. Set the signal generator at 1500 kc and feed its output into a loop of wire about 12 inches in diameter. Hold this radiating loop about 12 inches from and parallel to the receiver loop antenna. Advance the output of the signal generator until deflection is obtained on the output meter. Adjust first the oscillator trimmer (on front section of variable condenser) then the antenna trimmer (on rear section of variable condenser) for maximum response.

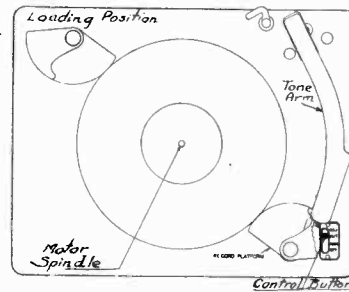
If the loop antenna has been replaced it may be necessary to adjust the loop inductance as follows: Align at 150. Set the pointer at 60 and feed 600 kc to the antenna lead. A portion of the outside turn of the loop may be swung to either side of the center to give maximum response. Realign at 150.

**4. TONE ARM LIFT**

This record changer is designed so that the pickup will start at the proper position on the top record of twelve 10-inch records on the turntable. This is based upon the use of a needle which is inserted with approximately 5/16" protruding from the underside of the tone arm. Adjustment for this is readily available by lifting the tone arm to its maximum position. Turning the hexagon headed screw thus exposed on the underside of the tone arm makes the adjustment. Turning the screw to the left or counter-clockwise raises the operating position of the tone arm and turning the screw to the right, or clockwise, lowers its position.

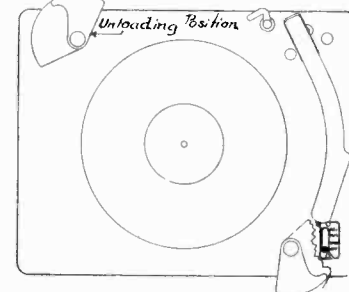
Refer to the diagram at the right and become familiar with the parts to be handled during automatic phonograph operation. To play any series of records proceed as follows:

1. Turn the radio on in the regular manner and then rotate the radio-phonograph switch to the phonograph position, counter-clockwise.
2. The record holder posts are free to rotate when the posts are lifted. Turn both posts until they snap into a locked position.
3. Insert a needle all the way in the tone arm, fastening it securely by means of the small set screw provided. It is important, once a needle has been removed from the tone arm, that it never be reinserted in the tone arm.
4. Load the records over the motor spindle so that they rest on top of the record platforms. Up to twelve 10-inch records or ten 12-inch records may be used at one loading. It is not necessary to place a record on the turntable.
5. Move the Control Button to "Rej" (reject) position and release. The turntable should start to revolve.
6. The first record should drop into place and the tone arm should swing into place on the record.
7. To reject a record at any time, all that is necessary is to push the control button to "Rej."
8. The volume should be adjusted to the desired level by means of the regular receiver volume control.
9. During operation, the cabinet lid should be closed to eliminate mechanical noises due to needle vibrations.
10. The whole series of records will now play without further attention, and the last record will repeat until the turntable switch is turned off. Allow the record-changing mechanism to complete its cycles before the switch is turned off. Then lift the pickup, swing the arm to the right beyond the edge of the record and lower it.
11. Lift each post and rotate until the record platforms are clear of the turntable. The records may then be removed.



**Manual Operation**

First lift the record holder posts upward and turn them so that no portion of them overhangs the Record Turntable. Place the record over the Motor Spindle. Push the Control Button to the first or Manual position and place the Tone Arm in the Starting Groove. When the record has been played thru, return the Tone Arm to its rest position and the Control Button to its "Off" position.



**SPECIAL PRECAUTIONS**

The following precautions are of the utmost importance and should be carefully observed:

1. Do not handle or move manually the pickup or any part of the mechanism while it is going through the record-changing operation.
2. Do not use force in handling the mechanism at any time.
3. Off-standard thickness or warped records should not be used for automatic operation.
4. Do not leave records on record holder posts except when needed for immediate operation, as they will warp and sag if left in this manner for a long period of time. Records can be straightened, however, by placing them on a flat surface and resting heavy flat articles, such as books, over them.
5. Never leave tone arm with needle resting on a record or on the turntable. When finished playing, be sure that the turntable has stopped and the pickup is in the rest position.
6. For playing ten or more records at one set-up, as with this changer, no attempt should be made to use ordinary steel or fibre points, since continued use of worn points will be likely to ruin both quality of reproduction and the records as well.
7. This instrument is not recommended for playing 10-inch and 12-inch records in mixed sequence. If the user desires this service he must be positive that all records are perfectly flat and free from warp.

**Location of Coils and Trimmer Adjustments**

The first i-f transformer is mounted on top of the chassis deck behind the variable condenser. The trimmers are accessible through holes in the top of the can.

The second i-f transformer is mounted underneath the chassis. The trimmers are accessible through holes in the rear of the chassis.

The oscillator coil is mounted underneath the chassis. The oscillator trimmer is located on the front variable condenser section.

The loop antenna acts as the antenna coil. Its trimmer is mounted on the loop board.

**FOR AUTOMATIC RECORD CHANGER ADJUSTMENTS**  
**Automatic Record Changer** **SEE INDEX**

This record changer is provided with two trip mechanisms so that automatic changing can be secured from records with the conventional Eccentric Center Groove or with records lacking the Eccentric Center Groove, but which are recorded sufficiently near the center so that the Positive Trip comes into operation.

**1. THE RATCHET TRIP**

The Ratchet Trip requires no adjustment, as its range of operation is greater than that of any standard records.

**2. THE POSITIVE TRIP**

The Positive Trip can be adjusted to operate at a definite point from the center spindle in the following manner: Remove the button covering the hole on the left side of the pick-up arm. Using a small screw-driver rotate the screw-head appearing thru this hole. (Caution: This screw can be rotated only one-half turn or 180 degrees. Therefore, slight adjustments are all that should be required.) A slight turn to the right or in a clockwise direction makes the trip operative earlier in the playing cycle or farther from the center of the record. Turning this screw slightly to the left or in a counter-clockwise direction causes the positive trip to set later in the playing cycle or nearer to the center of the record. The exact adjustment can be determined only by playing a record with its last groove located at the desired distance from its center.

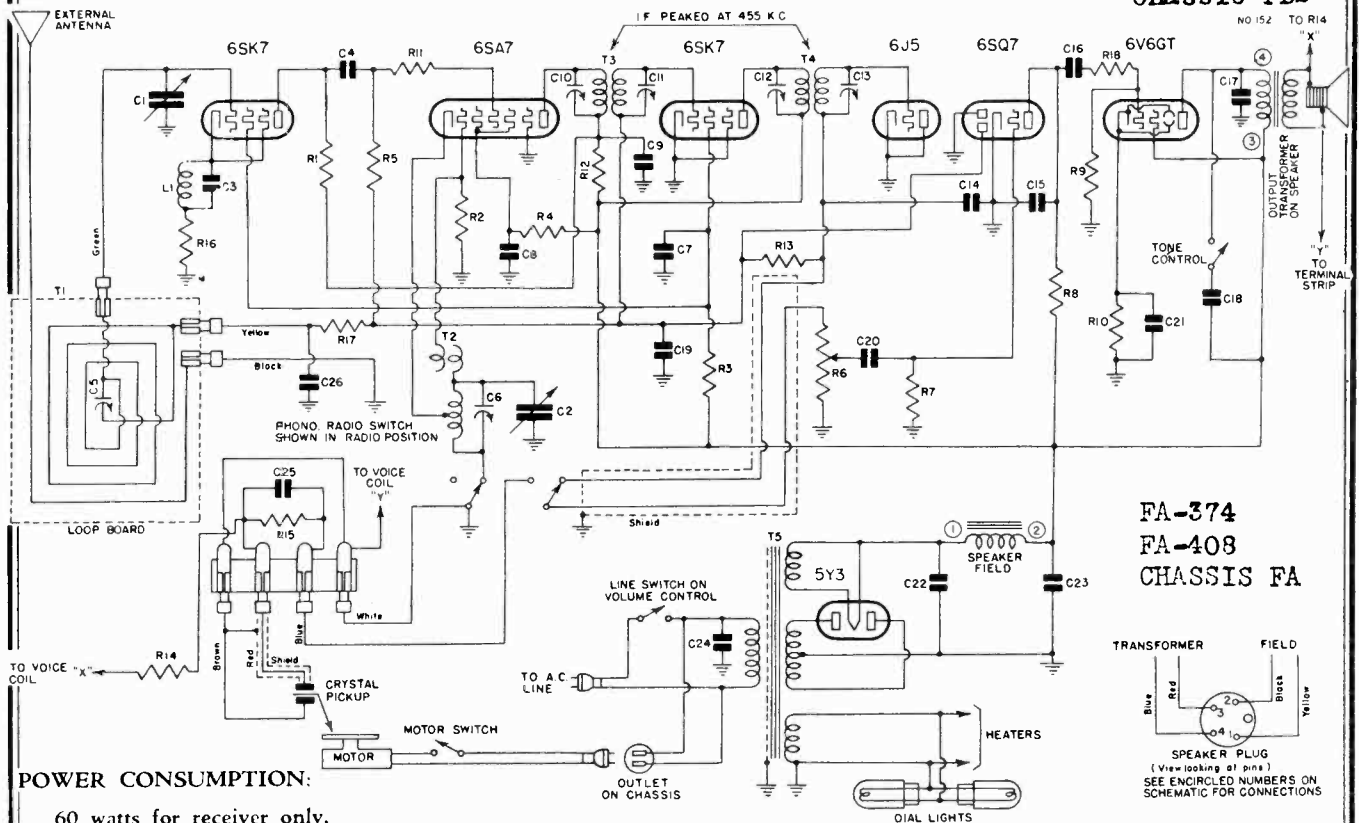
**3. TONE ARM DROP POINT**

This record changer is provided with an adjustment controlling the position at which the Tone Arm is dropped on the outer edge of the record. This adjustment has a constant relationship for 10- or 12-inch records. Therefore, one adjustment on either diameter of record is sufficient. To make this adjustment, remove the button on the right side of the pick-up arm and with a small screw-driver, rotate the exposed screw-head slightly. (Caution: This screw also can be rotated only one-half turn or 180 degrees. Therefore, slight adjustments are all that should be required.) Turning to the right or in a clockwise direction causes the needle to drop farther from the edge of the record. Turning to the left or counter-clockwise direction causes the needle to drop nearer the edge of the record. The proper position for the needle to drop is approximately 1/8" from the edge of the record and in the blank space at this point; that is, in the space at the edge of the record where there are no grooves.

EMERSON RADIO & PHONOGRAPH CORP.

MODELS FA-374, FA-408  
Chassis FA

MODEL FB2-374  
Chassis FB2



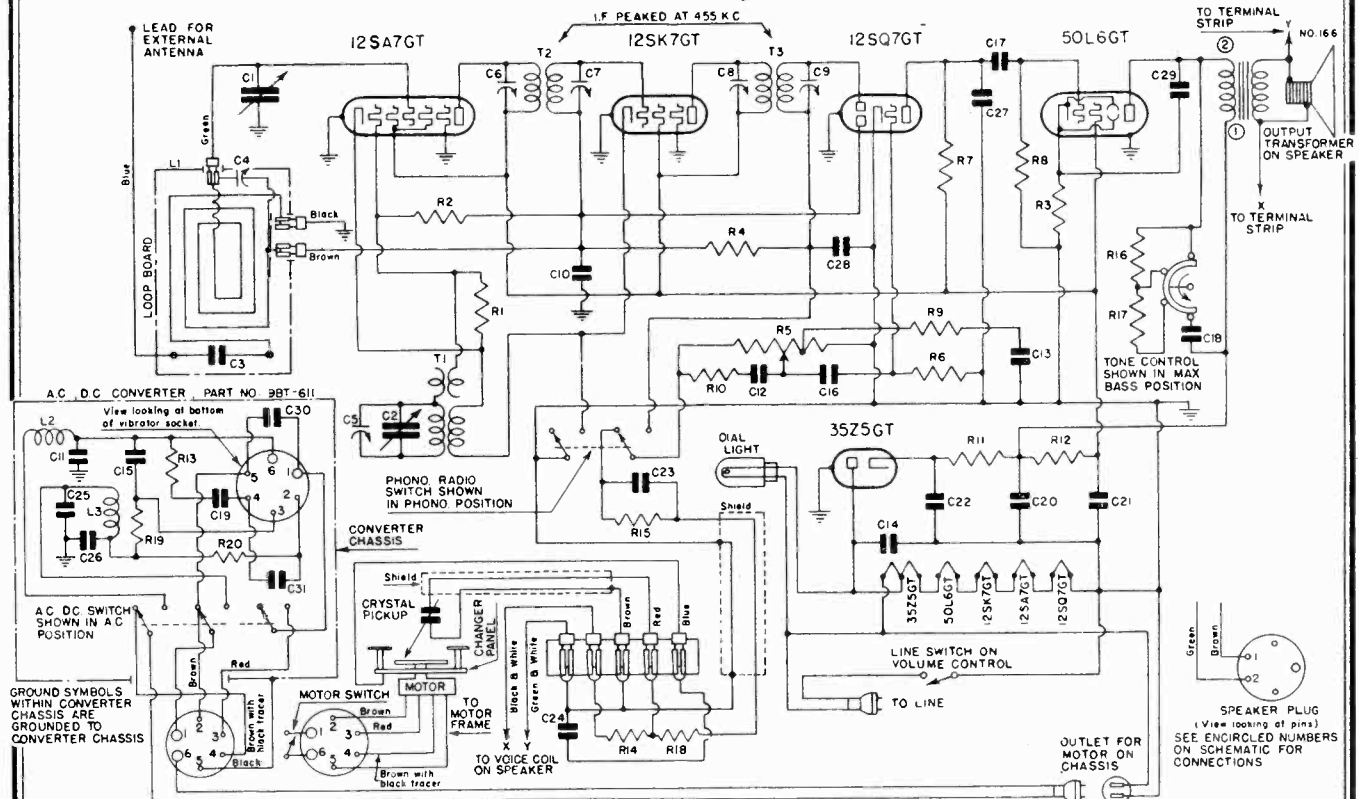
POWER CONSUMPTION:

60 watts for receiver only.  
95 watts for combination.

VOLTAGE RATING: 105-125 volts.

FOR RECORD-CHANGER DATA, SEE INDEX

FREQUENCY RANGE: 540-1600 kc.



MODEL: FB2-374

CHASSIS MODEL: FB2

VOLTAGE RATING: 105-125 volts.

FREQUENCY RANGE: 540-1630 kc.



MODEL FB2-374

Chassis FB2  
MODELS FA-374, FA-408  
Chassis FA

EMERSON RADIO & PHONOGRAPH CORP.

MODELS FA-374, FA-408  
CHASSIS MODEL FA

Location of Coils and Trimmer Adjustments

The first i-f transformer is mounted on top of the chassis back behind the variable condenser. The trimmers are accessible through holes in the top of the can.

The second i-f transformer is mounted underneath the rear of the chassis. The trimmers are accessible through holes in the rear of the chassis.

The oscillator coil is mounted underneath the chassis. The oscillator trimmer is located on the front variable condenser section.

The loop antenna acts as the antenna coil. Its trimmer is mounted on the loop board.

I-f Alignment

Swing the variable condenser to the minimum capacity position. Feed 455 kc to the grid of the 6SA7 tube through a .01 mf condenser and adjust the four i-f trimmers for maximum response.

R-f Alignment

Set the dial pointer at 150. Set the signal generator at 1500 kc and feed its output into a loop of wire about 12 inches in diameter. Hold this radiating loop about 12 inches from and parallel to the receiver loop antenna. Advance the output of the signal generator until deflection is obtained on the output meter. Adjust first the oscillator trimmer (on front section of variable condenser) then the antenna trimmer (on rear section of variable condenser) for maximum response.

If the loop antenna has been replaced, it may be necessary to adjust the loop inductance as follows. Align at 150. Set the pointer at 60 and feed 600 kc to the antenna lead. A portion of the outside turn of the loop may be swung to either side of the center to give maximum response. Realign at 150.

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground (chassis) with the volume control turned on full and no signal. Line voltage for these readings was 117 volts, 60 cycles, a.c. All readings except B plus at rectifier, heaters, and cathode voltages were taken on 250 volt scale.

Tube	Plate	Screen	Cathode	Heater
6SK7GT	184	80	1.25	6.3
6SA7GT	249	74	0	6.3
6SK7GT	254	80	0	6.3
6SQ7GT	67	—	0	6.3
6V6GT	240	25.5	13	6.3

The color coding of the i-f transformers is as follows:  
Grid—green  
B plus—red  
Grid return—black

The color coding of the power transformer is as follows:  
Primary—two black leads  
High-voltage secondary—two red leads  
High-voltage secondary center tap—red and yellow lead  
6.3 volt secondary—two green leads  
5 volt secondary—two yellow leads.

MODEL: FB2-374

Location of Coils and Trimmer Adjustments

The first i-f transformer is mounted on top of the chassis back behind the variable condenser. The trimmers are accessible through holes in the top of the can.

The second i-f transformer is mounted on top of the chassis between the variable condenser and the speaker. The trimmers are accessible through holes in the top of the can.

The oscillator coil is mounted on the loop assembly. The oscillator trimmer is mounted on the front section of the variable condenser.

The loop antenna acts as the antenna coil. The oscillator coil is located underneath the chassis. The antenna coil is at the antenna coil.

I-f Alignment

Swing the variable condenser to the minimum capacity position. Feed 455 kc to the grid of the 12SA7 tube through a .01 mf condenser and adjust the four i-f trimmers for maximum response.

R-f Alignment

Set the dial pointer at 150. Set the signal generator at 1500 kc and feed its output into a loop of wire about 12 inches from and parallel to the receiver loop antenna. Advance the output of the signal generator until deflection is obtained on the output meter. Adjust first the oscillator trimmer (on front section of variable condenser) then the antenna trimmer (on the loop assembly) for maximum response.

If the loop antenna has been replaced, it may be necessary to adjust the loop inductance as follows. Align at 150. Set the pointer at 60 and feed 600 kc to the antenna lead. A portion of the outside turn of the loop may be swung to either side of the center to give maximum response. Realign at 150.

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (line switch) with the volume control turned on full and no signal. Line voltage for these readings was 117 volts, 60 cycles, a.c. All readings except heaters and cathodes were taken on 250 volt scale. Measurements made with 117.5 volts d.c. will be lower than those given below.

Tube	Plate	Screen	Cathode	Fil.
12SA7GT	85	85	0	12
12SK7GT	85	85	0	12
12SQ7GT	25	—	0	12
50L6GT	98	85	5.0	30

The color coding of the i-f transformers is as follows:  
Grid—green  
B plus—red  
Grid return—black

The color coding of the power transformer is as follows:  
Primary—two black leads  
High-voltage secondary—two red leads  
High-voltage secondary center tap—red and yellow lead  
6.3 volt secondary—two green leads  
5 volt secondary—two yellow leads.

CHASSIS MODEL: FB2

Location of Coils and Trimmer Adjustments

The first i-f transformer is mounted on top of the chassis back behind the variable condenser. The trimmers are accessible through holes in the top of the can.

The second i-f transformer is mounted on top of the chassis between the variable condenser and the speaker. The trimmers are accessible through holes in the top of the can.

The oscillator coil is mounted on the loop assembly. The oscillator trimmer is mounted on the front section of the variable condenser.

The loop antenna acts as the antenna coil. The oscillator coil is located underneath the chassis. The antenna coil is at the antenna coil.

I-f Alignment

Swing the variable condenser to the minimum capacity position. Feed 455 kc to the grid of the 12SA7 tube through a .01 mf condenser and adjust the four i-f trimmers for maximum response.

R-f Alignment

Set the dial pointer at 150. Set the signal generator at 1500 kc and feed its output into a loop of wire about 12 inches from and parallel to the receiver loop antenna. Advance the output of the signal generator until deflection is obtained on the output meter. Adjust first the oscillator trimmer (on front section of variable condenser) then the antenna trimmer (on the loop assembly) for maximum response.

If the loop antenna has been replaced, it may be necessary to adjust the loop inductance as follows. Align at 150. Set the pointer at 60 and feed 600 kc to the antenna lead. A portion of the outside turn of the loop may be swung to either side of the center to give maximum response. Realign at 150.

POWER SUPPLY:

A.c. or d.c. Caution—This combination is equipped with an a.c.-d.c. switch for the motor. Before plugging the cord into the wall outlet, the switch should be in the "a.c." position corresponding to the house supply. The set was shipped with the switch in the D.C. position. The switch is the red lever located on the small chassis which is to the right of the speaker when viewed from the rear. To change position of switch, remove locking screw from red switch lever, throw switch to desired position and replace locking screw.

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (line switch) with the volume control turned on full and no signal. Line voltage for these readings was 117 volts, 60 cycles, a.c. All readings except heaters and cathodes were taken on 250 volt scale. Measurements made with 117.5 volts d.c. will be lower than those given below.

Tube	Plate	Screen	Cathode	Fil.
12SA7GT	85	85	0	12
12SK7GT	85	85	0	12
12SQ7GT	25	—	0	12
50L6GT	98	85	5.0	30

The color coding of the i-f transformers is as follows:  
Grid—green  
B plus—red  
Grid return—black

The color coding of the power transformer is as follows:  
Primary—two black leads  
High-voltage secondary—two red leads  
High-voltage secondary center tap—red and yellow lead  
6.3 volt secondary—two green leads  
5 volt secondary—two yellow leads.

TYPE OF TUBES:

- 1—12SA7GT, pentagrid oscillator-modulator
- 1—12SK7GT, diode detector, a-f amplifier, a.v.c.
- 1—12SQ7GT, beam power output
- 1—35Z5GT, half-wave rectifier.

DIAL CORD REPLACEMENT

Use a turn and a half of cord, part number 7BZ-867A. Draw the cord snugly around the condenser pulley and knot it with no slack, near the north in the pulley, after which the spring may be hooked to condenser pulley. The dial frame should be against the fibre washer when finally assembled.

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (line switch) with the volume control turned on full and no signal. Line voltage for these readings was 117 volts, 60 cycles, a.c. All readings except heaters and cathodes were taken on 250 volt scale. Measurements made with 117.5 volts d.c. will be lower than those given below.

Tube	Plate	Screen	Cathode	Fil.
12SA7GT	85	85	0	12
12SK7GT	85	85	0	12
12SQ7GT	25	—	0	12
50L6GT	98	85	5.0	30

The color coding of the i-f transformers is as follows:  
Grid—green  
B plus—red  
Grid return—black

The color coding of the power transformer is as follows:  
Primary—two black leads  
High-voltage secondary—two red leads  
High-voltage secondary center tap—red and yellow lead  
6.3 volt secondary—two green leads  
5 volt secondary—two yellow leads.

POWER CONSUMPTION:

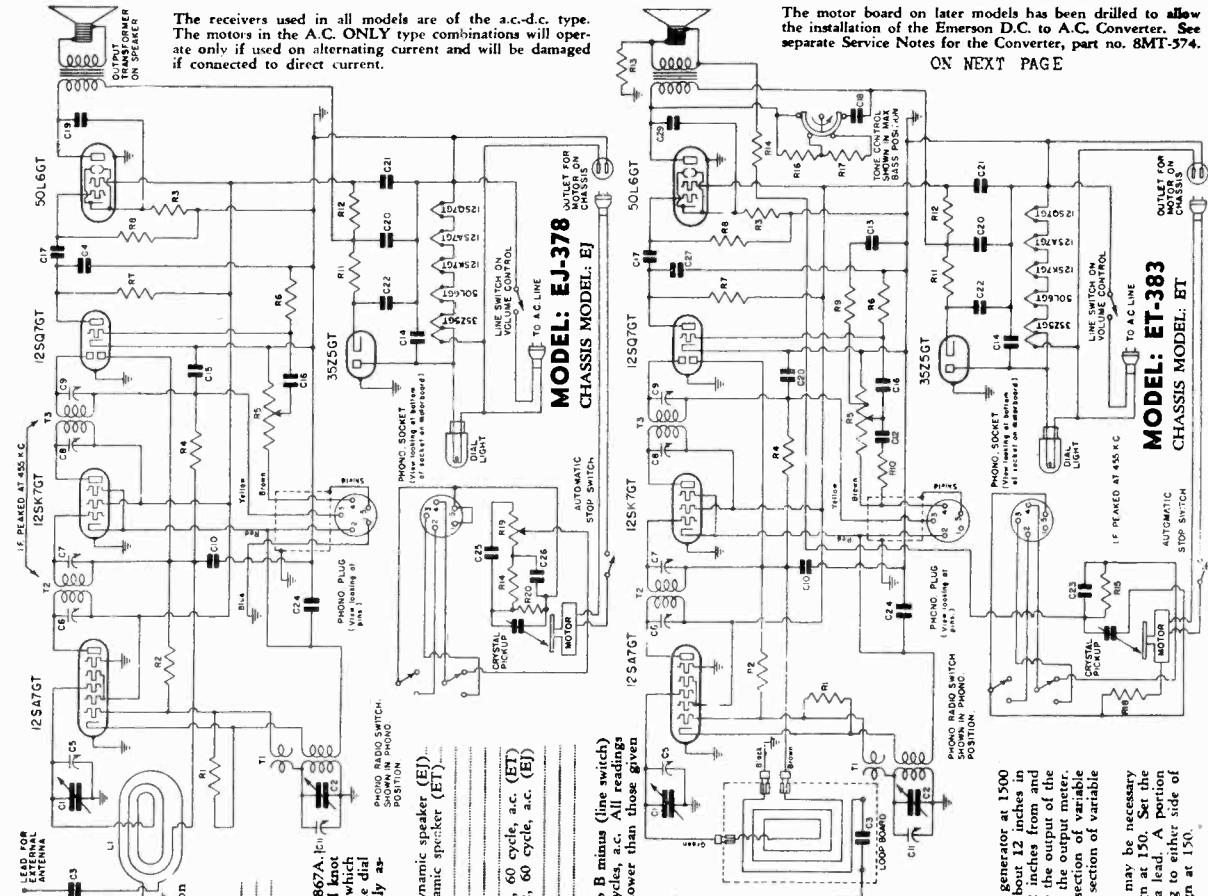
30 watts for receiver.  
20 watts for phono motor.

—FB2-51

—FA-51

EMERSON RADIO & PHONOGRAPH CORP.

MODEL EJ-378  
Chassis EJ  
MODEL ET-383  
Chassis ET



The receivers used in all models are of the a.c.-d.c. type. The motors in the A.C. ONLY type combinations will operate only if used on alternating current and will be damaged if connected to direct current.

The motor board on later models has been drilled to allow the installation of the Emerson D.C. to A.C. Converter. See separate Service Notes for the Converter, part no. 8MT-574. ON NEXT PAGE

FREQUENCY RANGE: 540-1630 kc.  
VOLTAGE RATING: 105-125 volts.  
POWER CONSUMPTION:  
30 watts for receiver.  
20 watts for a.c. motor.  
POWER SUPPLY:  
A.c. or d.c. (for receivers using Emerson to A.C. Converter on phono motors)  
D.C. A.c. only (for models so designated).

**DIAL CORD REPLACEMENT**  
Use a turn and a half of cord, part number 7BZ-867A. Join the cord snugly around the condenser pulley and knot it, with no slack, near the notch in the pulley, after which the spring may be hooked to the cord and pulley. The dial cord should bear against the fibre washer when finally assembled.

- 81S-522 6 1/2" permanent magnet dynamic speaker (EJ)
- 85S-487 8" permanent magnet dynamic speaker (ET)
- 85S-485 Tone control switch
- 6X5-432 Phono-radio switch
- 6V5-445 Phono-radio switch
- 6V5-445 Rubber needle cup
- 8TPM-68 Rim drive motor, 117 volt, 60 cycle, a.c. (ET)
- 8CPM-64F Rim drive motor, 117 volt, 60 cycle, a.c. (EJ)
- 1XC-418B Crystal pick-up (ET)
- 4XC-418A Crystal pick-up (EJ)
- 8JS-523 Automatic stop switch

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (line switch) with the volume control turned on full and no signal. Line voltages for these readings are 117.5 volts, 60 cycles, a.c. All readings except heaters and cathodes were taken on 250 volt scale. Measurements made with 117.5 volts d.c. will be lower than those given.

Tube	Plate	Screen	Cathode	File
12SA7GT	85	85	0	12
12SK7GT	85	85	0	12
12SQ7GT	25	—	0	12
50L6GT	98	85	3.0	50

**Location of Coils and Trimmer Adjustments**

The first i-f transformer is mounted on top of the chassis deck to the right of the variable condenser. The trimmers are accessible through holes in the top of the can.  
The second i-f transformer is mounted on top of the chassis between the variable condenser and the speaker. The trimmers are accessible through holes in the top of the can.  
The trimmers for the antenna and oscillator coils are located on the variable condenser. The trimmer on the front section is for the oscillator coil.  
The oscillator coil is located underneath the chassis. The loop antenna acts as the antenna coil.

**R-f Alignment**

Set the dial pointer at 1500 kc and feed its output into a loop of wire about 12 inches in diameter. Hold this radiating loop about 12 inches from and parallel to the receiver loop antenna. Advance the output of the signal generator until deflection is obtained on the output meter. Adjust first the oscillator trimmer (on front section of variable condenser) then the antenna trimmer (on rear section of variable condenser) for maximum response.  
If the loop antenna has been replaced it may be necessary to adjust the loop inductance as follows. Align at 150. Set the pointer at 60 and feed 600 kc to the antenna lead. A portion of the outside turn of the loop may be swung to either side of the center to give maximum response. Realign at 150.

**I-f Alignment**

Swing the variable condenser to the minimum capacity position. Feed 455 kc to the grid of the 12SA7 tube through a .01 i-f condenser and adjust the four i-f trimmers for maximum response.

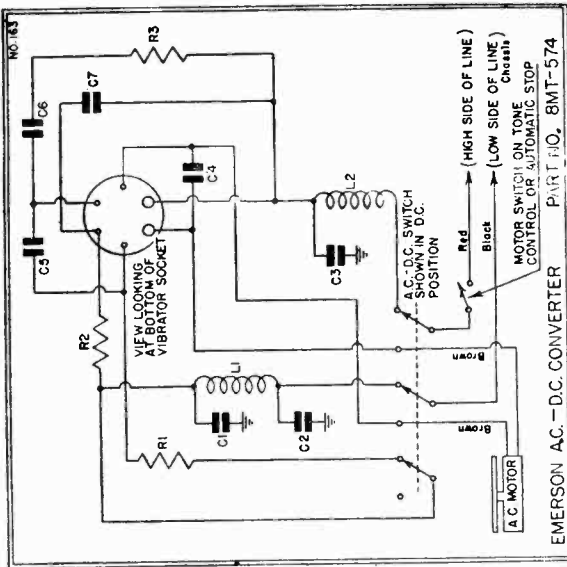
Note: The grid of the 12SA7 tube is connected to the lower stator lug of the rear variable condenser section. Connection may be made with a test clip to the upper stator lug. This lug is easily identified by the connection of the green lead to the loop.

**TYPE OF TUBES:**

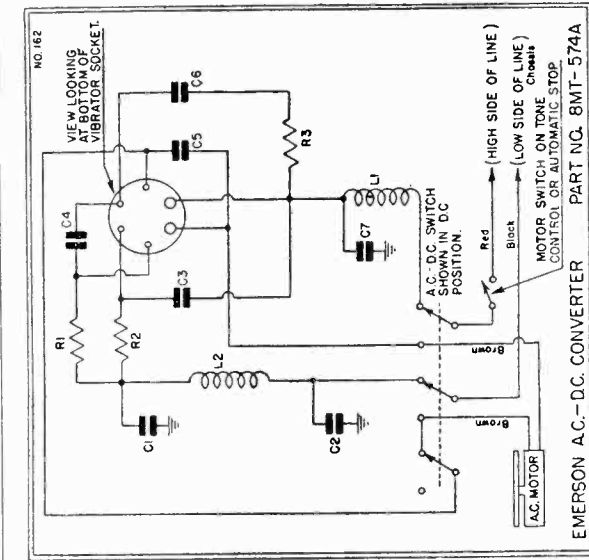
- 12SA7GT, pentagrid oscillator-modulator
- 12SK7GT, first i-f amplifier
- 50L6GT, diode detector, a.f. amplifier, beam power output a.v.c.
- 35Z5GT, half-wave rectifier.

MODEL 8MT-574  
Converter

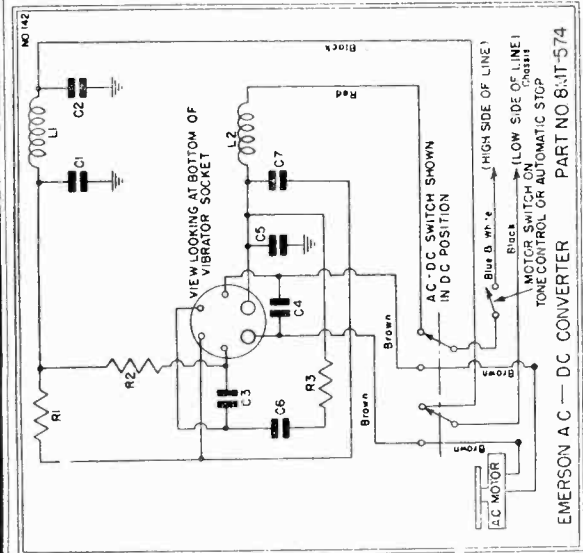
EMERSON RADIO & PHONOGRAPH CORP.



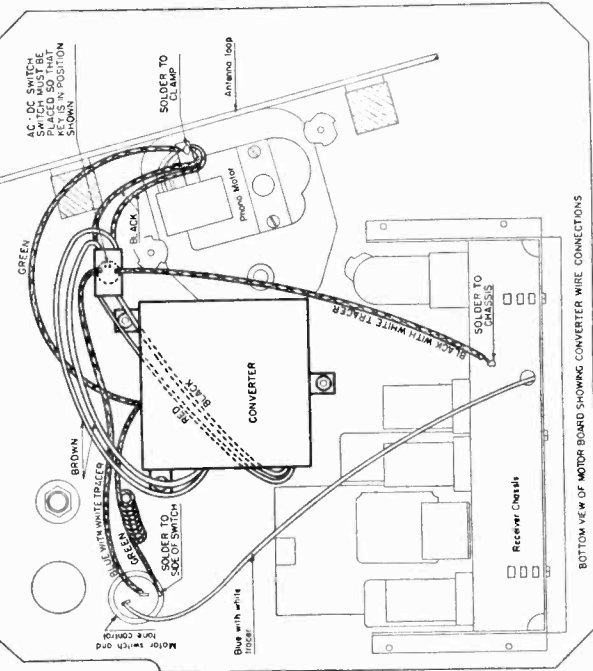
EMERSON AC-D.C. CONVERTER PART NO. 8MT-574  
Schematic for converter having AC-DC switch mounted on unit



EMERSON AC-D.C. CONVERTER PART NO. 8MT-574A  
Schematic for latest series converter having A.C.-D.C. switch mounted on unit



EMERSON AC-D.C. CONVERTER PART NO. 8MT-574  
Schematic for converter having separate AC-DC toggle switch



Cut showing installation on EM-345 and EM-346 motorboards.

- (For converters with a.c.-d.c. switch mounted on converter chassis.)
- Disconnect two black motor leads; one from the motor switch and one from the chassis.
  - Solder each of the two black motor leads to the brown leads emerging from the converter.
  - Solder the red lead to the motor switch.
  - Solder the black wire to the receiver chassis.
  - Solder one green lead to the clamp on the phono motor's grounding; the other green lead to some point in the ground circuit will reduce vibrator hash.
  - Unit is shipped with a.c.-d.c. switch on converter in d.c. position.

The converter should not be turned on when phono-radio switch is in the radio position, as the vibrator noise will make the receiver unusable.

At no time should the a.c.-d.c. switch be thrown to the a.c. position when the line switch is plugged into a d.c. outlet.

**IMPORTANT:** Do not plug receiver into house outlet until having first ascertained that this supply is d.c. If house supply is a.c., remove lever-switch clamp and push switch to a.c. position. Always see that switch is in position corresponding to house supply (a.c. or d.c.). Replace clamp over switch after any change in switch position.

- L1, L2 Line r-f filter choke...
  - R1 25 ohm 5 watt metal-clad resistor...
  - R2 2,200 ohm 2 watt wire-wound resistor.
  - R3 220 ohm 1 watt wire-wound resistor...
  - C1 0.1 mf, 400 volt tubular condenser.....
  - C2 0.01 mf, 400 volt tubular condenser.....
  - C3, C6 0.1 mf, 200 volt tubular condenser.....
  - C4 3 mf, 200 volt paper condenser.....
  - C5 0.05 mf, 400 volt tubular condenser
  - C7 0.5 mf, 200 volt "A" condenser.
- A.C.-D.C. toggle switch (used on early models)  
A.C.-D.C. water switch (used on late models).  
Vibrator 117 volt, d.c. to a.c.

**TYPE:** Synchronous vibrator.  
**INPUT VOLTAGE:** 105-125 volts.  
**INPUT CURRENT:** D.C. only.  
**OUTPUT VOLTAGE:** 105-125 volts.  
**OUTPUT CURRENT:** A.C. only.  
**CAPACITY:** 20 watts (maximum).

EMERSON RADIO & PHONOGRAPH CORP.

MODELS DU-379,

DU-380

Chassis DU

TYPE: Single-band (battery operated) superheterodyne.

The color coding of the i-f transformer leads is as follows:

- Grid—green
- Grid return—black
- Plate—blue
- B plus—red

The color coding of the battery cable is as follows:

- Red—B plus, 90 volts
- Blue—B minus.

If replacements are made in the r-f section of the circuit, the receiver should be carefully re-aligned.

The receiver has a self-contained antenna and does not require additional antenna or ground connection. Model DU-379 has the loop antenna contained in the shoulder strap. If it is not worn around the shoulder it is important that the strap be stretched out into a loop of about the same width as the cabinet.

When Model DU-379 is worn about the shoulders, the correct position of the antenna may be found by the wearer turning through a quarter circle as mentioned below.

The self-contained loop antenna in Model DU-380 operates at maximum efficiency when its position is at right angles to the broadcasting source. It is important, therefore, once the station is tuned in, rotate the cabinet back and forth through a quarter of a circle (90 degrees), leaving it at the position where the station is received with maximum volume.

I-f Alignment

DU-379, DU-380

Swing variable condenser to minimum capacity position.

Feed 455 kc to the grid of the 1R5 tube through a 0.01 mf condenser. Adjust the three i-f trimmer core screws for maximum response. (Clip the i-f input to the stator lug of the upper variable condenser section.)

R-f Alignment

Set the dial pointer at 130. Set the signal generator at 1500 kc and feed its output into a loop of wire about one foot in diameter. Hold this radiating loop about one foot away from and parallel to the receiver loop antenna. Advance the output of the generator until deflection is obtained on the output meter. Adjust first the oscillator trimmer (on lower section of variable condenser) then the antenna trimmer (on upper section of variable condenser) for maximum response.

battery snap fasteners.

4. Place the "B" battery into the cabinet as shown in diagram. Slide the two "pull-tabs" over the flashlight cells and then push the cells into the two compartments shown in the diagram with the brass center-contacts at the top.

5. Replace the back panel of the cabinet and fasten it in place with the screw.

MODEL: DU-379 and DU-380

CHASSIS MODEL: DU

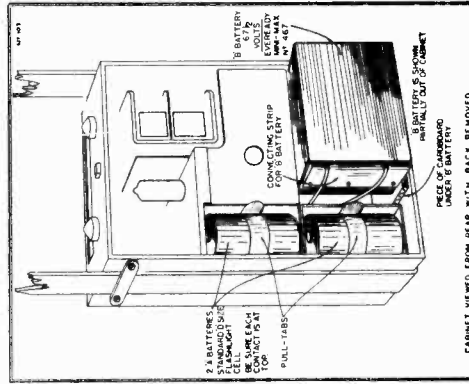
Location of Coils and Trimmer Adjustments

DU-379, DU-380

The first i-f transformer is located in the bottom outer edge of the chassis behind the lower flashlight cell. The brass screws which protrude from either end of the can are the core adjustment for tuning the transformer. The second i-f transformer is located between the 1T4 and 1S5 tubes. The single trimming core screw extends from the end of the can.

The oscillator coil is located inside the chassis, beside the variable condenser. Trimmer for the oscillator is located on the lower section of the variable condenser.

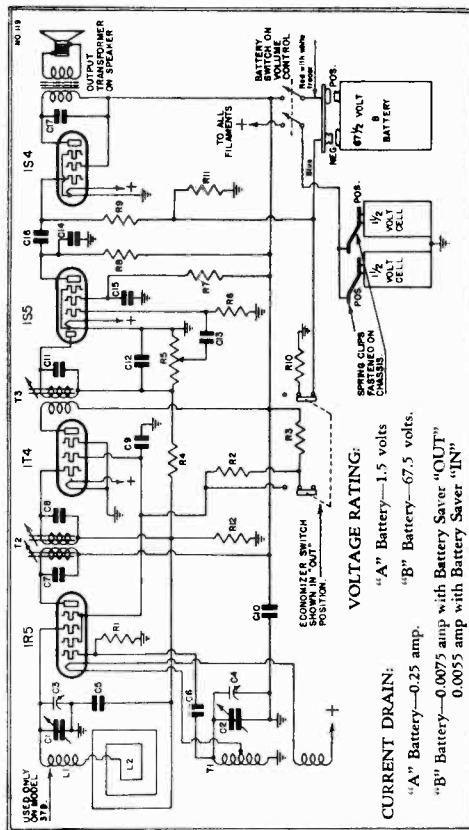
The loop antenna acts as the antenna coil. Trimmer for the loop is located on the upper section of the variable condenser.



BATTERY INSTALLATION

To install and connect the batteries in this cabinet observe the following procedure:

1. Remove the back panel of the cabinet by taking out the screw.
2. Examine the battery cable coming from the receiver and identify the fasteners on the terminal strip.
3. With the "B" battery out of the cabinet, snap the two fasteners on the terminal strip into the two "B"



- L1 Iron core loading coil (379)
- L2 Shoulder strap loop assembly (379)
- L3 Loop antenna (380)
- T1 Oscillator coil
- T2 Iron core double-tuned 455 kc first i-f transformer
- T3 Iron core single-tuned 455 kc second i-f transformer
- R1 100,000 ohm 1/4 watt carbon resistor
- R2 5,000 ohm 1/4 watt carbon resistor
- R3 10,000 ohm 1/4 watt carbon resistor
- R4, R12 5 megohm 1/4 watt carbon resistor
- R5 Volume control 1.5 megohm with double pole battery saver switch
- R6 10 megohm 1/4 watt carbon resistor
- R7, R9 3 megohm 1/4 watt carbon resistor
- R8 1 megohm 1/4 watt carbon resistor
- R10 2200 ohm 1/4 watt carbon resistor
- R11 1800 ohm 1/4 watt carbon resistor
- C1, C2 Trimmers, part of variable condenser
- C3, C4 Trimmers, part of variable condenser
- C5, C9, C15 0.02 mf, 200 volt tubular condenser
- C6, C12, C14 0.00011 mf mica condenser
- C7, C8, C11 Fixed trimming condensers, contained inside i-f cans
- C10 10 mf, 100 volt dry electrolytic condenser
- C13 0.002 mf, 600 volt tubular condenser
- C16, C17 0.001 mf, 600 volt tubular condenser

**VOLTAGE ANALYSIS**  
 1. On all models, except early ones, R12 is removed.  
 Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed are from point indicated to chassis with volume control turned on full and no signal. The battery voltages for these readings were: "A" 1.5 volts, "B" 67.5 volts. All readings except filaments were taken on the 250 volt scale, with battery saver "out."  
 Bias for the 1S4 tube is obtained across the resistor R11. The voltage drop across this resistor should be 7.5 volts with battery saver "out" or 9.4 volts with battery saver "in."  
 \*The operating voltage of this tube cannot be measured because of the high resistor in the circuit.

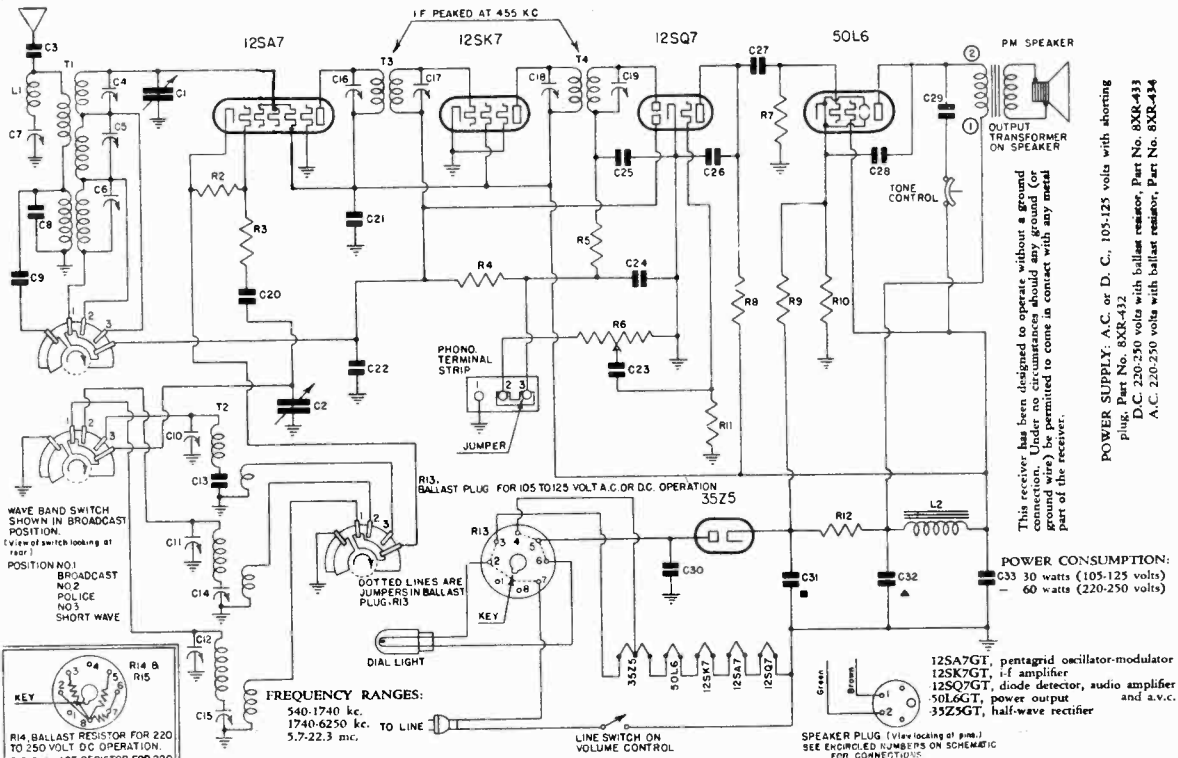
Tube	Plate	Screen	File
1R5	57	60	57
1T4	57	60	1,5
1S5	95	93	1,5
1S4	55	60	1,5

BATTERY COMPLEMENT

The cabinet is designed to house the complete set of batteries. The battery complement should be as follows:  
 Type Battery Number Required  
 1 1/2 volt "A" Standard "D" size (1 1/4" diameter) flashlight cell 2  
 67 1/2 volt "B" Eveready "Mini-max" No. 467 1

**MODEL EX-386**  
**Chassis EX**

**EMERSON RADIO & PHONOGRAPH CORP.**



This receiver has been designed to operate without a ground connection. Under no circumstances should any ground (or ground wire) be permitted to come in contact with any metal part of the receiver.

**POWER SUPPLY:** A.C. or D.C., 105-125 volts with shoring plug, Part No. 8XR-432  
D.C. 220-250 volts with ballast resistor, Part No. 8XR-433  
A.C. 220-250 volts with ballast resistor, Part No. 8XR-434

**POWER CONSUMPTION:**  
C33 30 watts (105-125 volts)  
60 watts (220-250 volts)

- L1 Adjustable 455 kc wave-trap
- L2 Filter choke
- T1 Three-band antenna coil
- T2 Three-band oscillator coil
- T3 Double-tuned 455 kc first i-f transformer
- T4 Double-tuned 455 kc second i-f transformer
- R2 20,000 ohm 1/4 watt carbon resistor
- R3 50 ohm 1/4 watt carbon resistor
- R4 3 megohm 1/4 watt carbon resistor
- R5 5000 ohm 1/4 watt carbon resistor
- R6 Volume control .5 megohm with line switch
- R7 500,000 ohm 1/4 watt carbon resistor
- R8 250,000 ohm 1/4 watt carbon resistor
- R9 20,000 ohm 1 watt carbon resistor
- R10 140 ohm 1 watt wire-wound resistor
- R11 15 megohm 1/4 watt carbon resistor
- R12 75 ohm 1 watt wire-wound resistor
- R13 Shorting plug for 105-125 volt a.c. or d.c. operation
- R14 Ballast resistor for 220-250 volt d.c. operation
- R15 Ballast resistor for 220-250 volt a.c. operation
- C1, C2 Two-gang variable condenser
- C3 0.01 mf, 400 volt tubular condenser
- C4, C5, C6 Trimmers, part of antenna coil assembly
- C7 Trimmer, part of 455 kc wave-trap
- C13 0.0034 mf, mica condenser
- C14 Single adjustable padding condenser (Range: 750-1500 mmf.)
- C15 Single adjustable padding condenser (Range: 300-600 mmf.)
- C16, C17 Trimmers, part of first i-f transformer
- C18, C19 Trimmers, part of second i-f transformer
- C20, C25 0.00011 mf, mica condenser
- C21 0.1 mf, 200 volt tubular condenser
- C22, C29 0.05 mf, 200 volt tubular condenser
- C23 0.002 mf, 600 volt tubular condenser
- C24 0.0006 mf, mica condenser
- C25 0.00011 mf, mica condenser
- C26 0.00022 mf, mica condenser
- C27 0.02 mf, 400 volt tubular condenser
- C28 0.024 mf, 400 volt tubular condenser
- C30 0.05 mf, 400 volt tubular condenser
- C31, C32, C33 Three section dry electrolytic condenser. C31, C32—40 mf, 150 volt C33—20 mf, 150 volt

An electrical phonograph pick-up may be connected to this receiver for playing records. Connections to the receiver may be made at the "phono" terminal strip which is located on the rear wall of the receiver chassis.

Remove the link connecting two of the terminals on the phono strip. The switch should be wired to the pick-up and terminal strip so that in the phonograph position the switch should short terminals 1 and 3 and at the same time connect the high side of the pick-up to a lead from terminal 2. (The ground side of the pick-up may be permanently wired to terminal 1.) When the switch is in the radio position terminals 2 and 3 should be shorted together and the pick-up disconnected from terminal 2.

**ADJUSTMENTS**

The adjustable padding condensers for the broadcast and police bands are mounted on the top of the chassis with the screw adjustment accessible through holes in the top of the chassis. The short-wave band has a fixed paddler, C13 on schematic. When replacing this fixed paddler be careful to use a condenser which has a capacity within 2% of the specified value, otherwise the short-wave coils may not track.

The set's oscillator is higher in frequency than the signal on all three bands, so images should be observed on the low frequency side of the signals.

Use a dummy antenna for aligning any of the three bands. A .0002 mf condenser may be used for broadcast dummy antenna, a .0001 mf condenser for the police band dummy antenna and a 400 ohm non-inductive resistor for the short-wave band dummy antenna.

Always choose the minimum capacity peak on oscillator trimmers and maximum capacity peaks on antenna trimmers. The last motion in adjusting trimmers should always be a tightening one, not a loosening one.

In aligning antenna trimmers on the high frequency signals there is always a tendency for the oscillator to drift, due to interlocking. To compensate for this always keep tuning the variable condenser as the trimmers are being adjusted.

**I-f Alignment**

Rotate the wave-band switch to the broadcast (clockwise) position. Set the variable condenser at the minimum capacity position and feed 455 kc through a 0.02 mf paper condenser to the grid of the 12SA7 tube. Adjust the four i-f trimmers for maximum response. Feed 455 kc to the antenna (using a standard dummy antenna) and adjust the 455 kc wave-trap for minimum response.

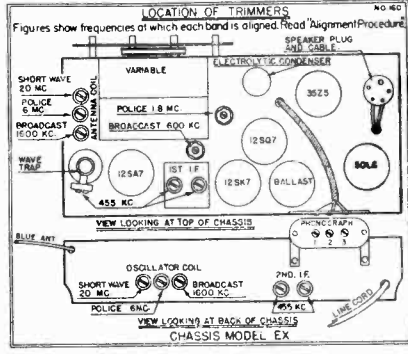
**VOLTAGE ANALYSIS**

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to B minus (line switch) with the volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c. All readings except heaters and cathodes were taken on 250 volt scale. Measurements made with 117.5 volts d.c. will be lower than those given below.

Voltage at 35Z5 cathode—115 volts.

Tube	Plate	Screen	Cathode	Fil.
12SA7GT	100	100	0	12
12SK7GT	100	100	0	12
12SQ7GT	45	—	0	12
50L6GT	97	100	6.2	50

**MODEL: EX-386** —EX—S1  
CHASSIS MODEL: EX



**Broadcast Alignment**

Set the wave-band switch at the broadcast (clockwise) position, and the pointer at 60. Feed 600 kc to the antenna (using a standard dummy antenna) and adjust the broadcast-band series paddler for maximum response. Move the pointer to 160, feed 1600 kc and adjust the oscillator coil trimmer for maximum response, then adjust the antenna coil trimmer for maximum response. Reset the pointer at 60, feed 600 kc and rock the variable condenser while adjusting the series paddler for maximum response. Return to 1600 and check alignment. If readjustment is necessary return to 600 and repeat entire procedure. (The broadcast paddler is located beneath the chassis to the left of the variable condenser.)

**Police Alignment**

Set the wave-band switch at the police band (central) position and the pointer at 1.8. Feed 1800 kc to the antenna (using a .0001 mf dummy antenna) and adjust the police band series paddler for maximum response. Move the pointer to 6.0, feed 6000 kc and adjust the oscillator trimmer for maximum response. Then adjust the antenna trimmer for maximum response. Return the pointer to 1.8, feed 1800 kc to the antenna and rock the variable condensers while readjusting the series paddler for maximum response. Return to 6000 kc and check alignment. If readjustment is necessary return to 1800 kc and repeat entire procedure. The police band paddler is located beneath the chassis behind the variable condenser.)

**Short-Wave Alignment**

Set the wave-band switch at the short-wave (counter-clockwise) position. Move the pointer to 20 and feed 20,000 kc to the antenna (using a 400 ohm dummy antenna) and adjust the short-wave oscillator trimmer for maximum response. If two peaks are obtained choose the minimum capacity peak. Then adjust the antenna coil trimmer for maximum response. If two peaks are obtained choose the maximum capacity peak.

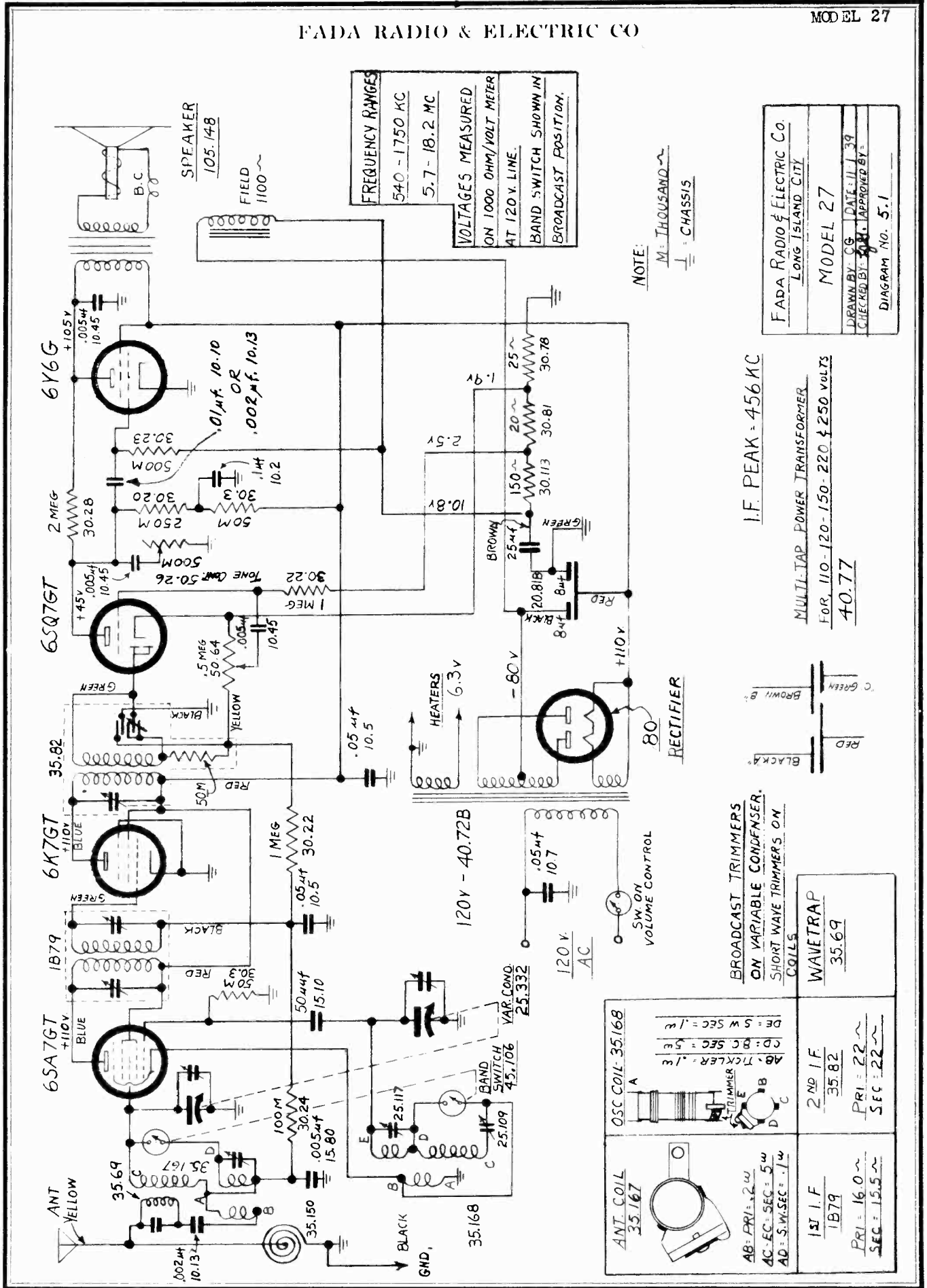






FADA RADIO & ELECTRIC CO

MODEL 27



FREQUENCY RANGES  
 540 - 1750 KC  
 5.7 - 18.2 MC

VOLTAGES MEASURED  
 ON 1000 OHM/VOLT METER  
 AT 120 V. LINE.  
 BAND SWITCH SHOWN IN  
 BROADCAST POSITION.

NOTE:  
 M = THOUSAND ~  
 J = CHASSIS

FADA RADIO & ELECTRIC CO.  
 LONG ISLAND CITY

MODEL 27

DRAWN BY: CG DATE: JUL 39  
 CHECKED BY: J.B. APPROVED BY: J.B.

DIAGRAM NO. 5.1

I.F. PEAK = 456 KC

MULTI-TAP POWER TRANSFORMER  
 FOR 110-120-150-220 VOLTS  
 40.77

BROADCAST TRIMMERS  
 ON VARIABLE CONDENSER.  
 SHORT WAVE TRIMMERS ON  
 COILS

ANT. COIL 35.167	OSC. COIL - 35.168	1ST I.F. 1B79 PRI = 16.0 ~ SEC = 15.5 ~	2ND I.F. 35.82 PRI = 22 ~ SEC = 22 ~
AB - PRI = 2.0 AC - EC - SEC = 5 W AD = S.W. SEC = .1 W	DE = 5 W SEC = .1 W CD = BC SEC = .5 W AB - TCKER = .1 C	WAVETRIP 35.69	





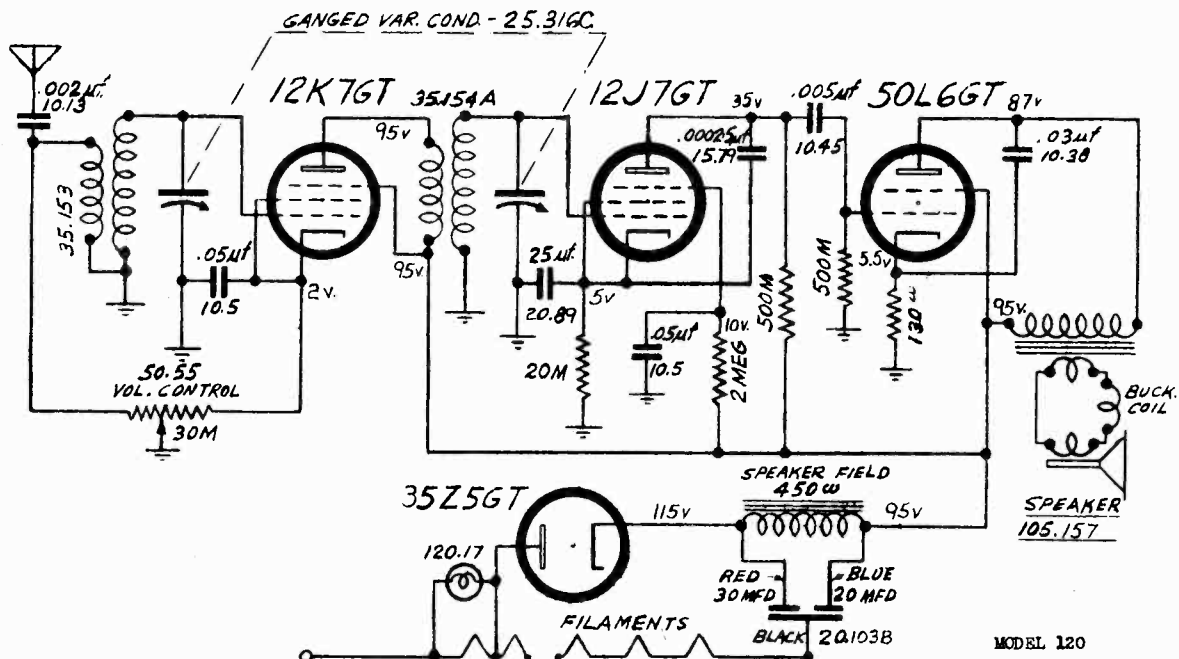






MODEL 120  
MODEL 137

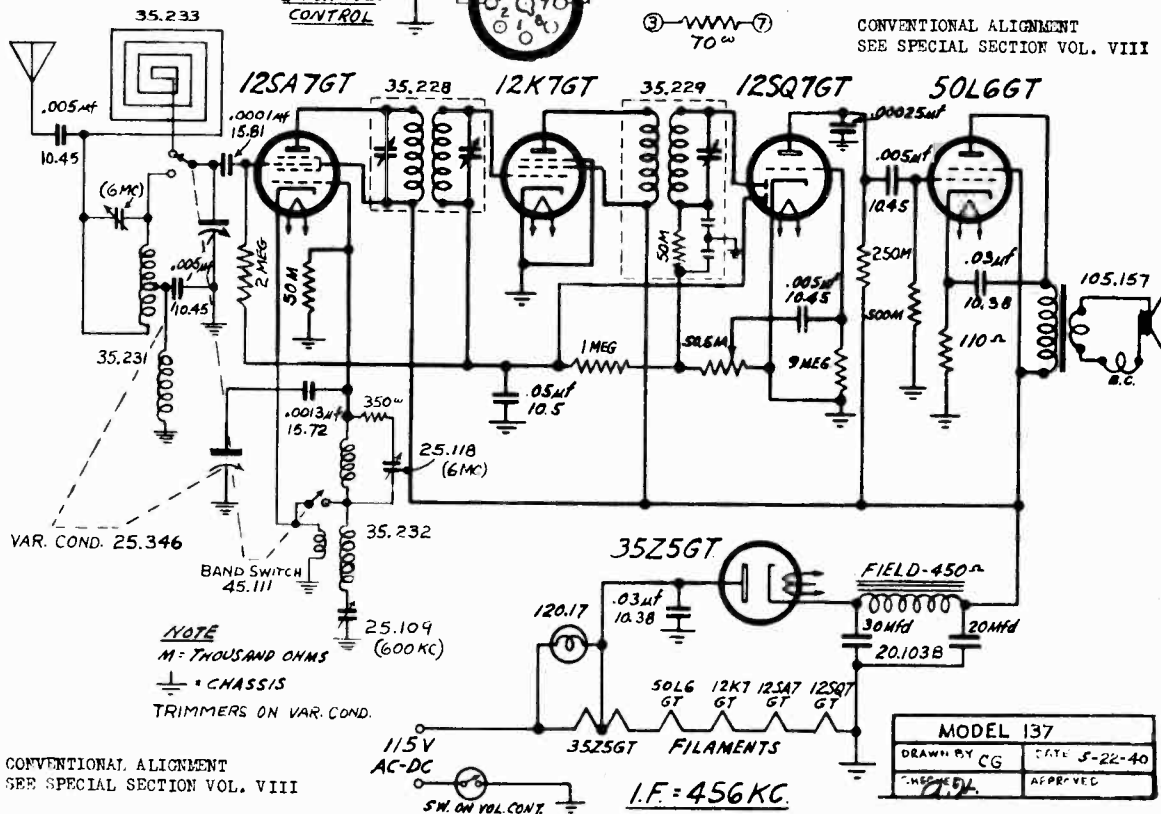
FADA RADIO & ELECTRIC CO



MODEL 120

-1940-

CONVENTIONAL ALIGNMENT  
SEE SPECIAL SECTION VOL. VIII



MODEL 137	
DRAWN BY CG	DATE 5-22-40
HECKED BY	APPROVED

CONVENTIONAL ALIGNMENT  
SEE SPECIAL SECTION VOL. VIII

NOTE  
M = THOUSAND OHMS  
⊥ = CHASSIS  
TRIMMERS ON VAR. COND.

I.F. = 456 KC.







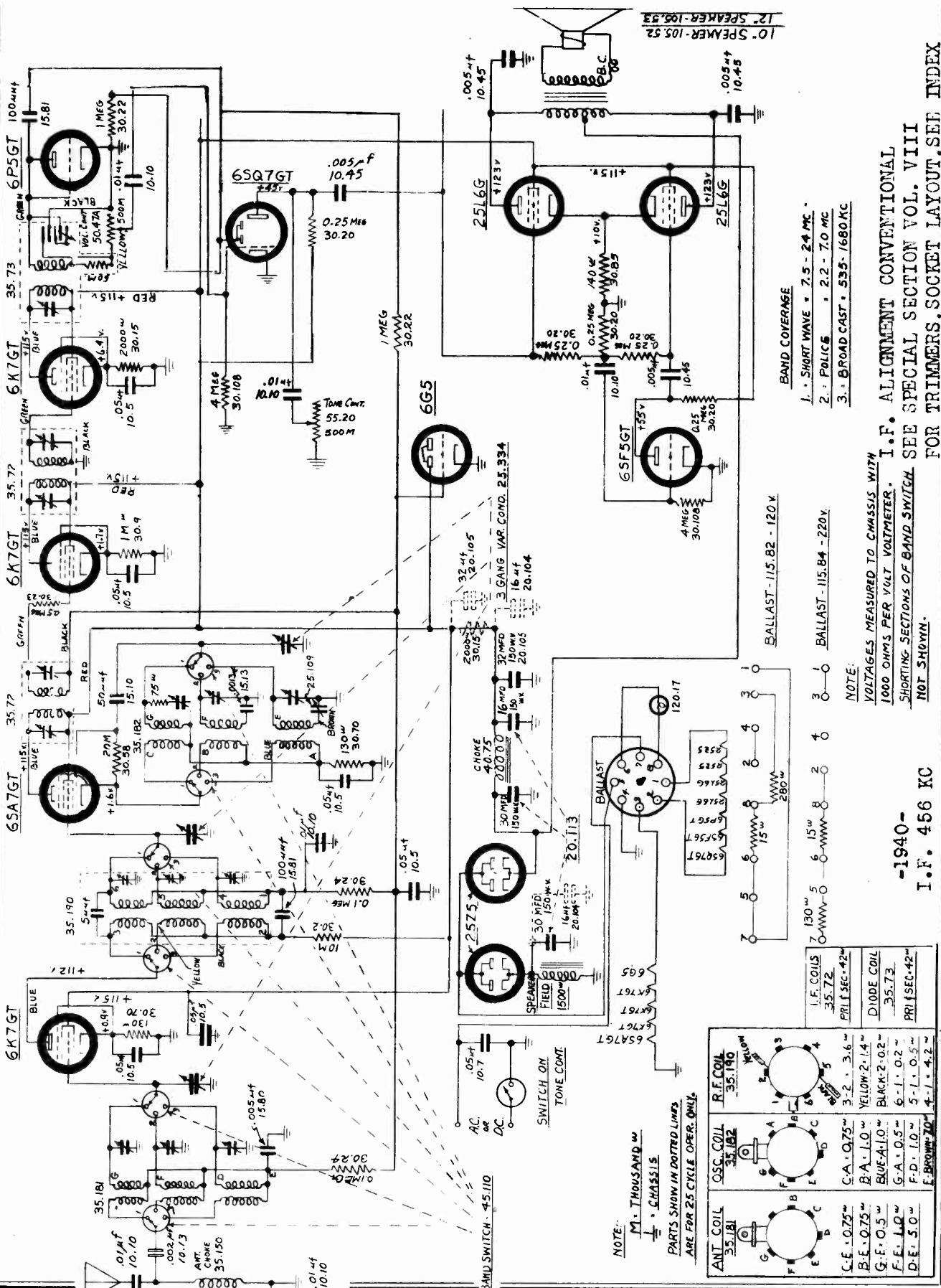






MODEL 913

FADA RADIO & ELECTRIC CO



- BAND COVERAGE**
1. SHORT WAVE - 7.5 - 24 MC.
  2. P.B.C.'S - 2.2 - 7.0 MC
  3. BROAD CAST - 535 - 1680 KC

BALLAST - 115-82 - 120 V

- NOTE:**  
VOLTAGES MEASURED TO CHASSIS WITH 1000 OHMS PER VOLT VOLTMETER.
- SHORTING SECTIONS OF BAND SWITCH SEE SPECIAL SECTION VOL. VIII FOR TRIMMERS, SOCKET LAYOUT, SEE INDEX

-1940-  
I.F. 456 KC

ANT. COIL 35.181	OSC. COIL 35.182	R.F. COIL 35.190
C.E. 0.75 <sup>w</sup>	C.A. 0.75 <sup>w</sup>	3-2-1-3.6 <sup>w</sup>
B.E. 0.75 <sup>w</sup>	B.A. 1.0 <sup>w</sup>	YELLOW-2.14 <sup>w</sup>
G.E. 0.5 <sup>w</sup>	BLUE-A-1.0 <sup>w</sup>	BLACK-2.02 <sup>w</sup>
F.E. 1.0 <sup>w</sup>	G.A. 0.5 <sup>w</sup>	6-1-1.02 <sup>w</sup>
D.E. 5.0 <sup>w</sup>	F.D. 1.0 <sup>w</sup>	5-1-0.5 <sup>w</sup>
	F. BROWN-7.0 <sup>w</sup>	4-1-4.2 <sup>w</sup>

**NOTE:**  
M. = THOUSAND W  
- = CHASSIS  
PARTS SHOWN IN DOTTED LINES  
ARE FOR 25 CYCLE OPER. ONLY





**Automatic Record  
Changer****AC. Unit - Part No. 125.10****FADA RADIO & ELECTRIC CO****Automatic Record Changer****AC.-DC. Unit - Part No. 125.11**

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 when using a mixture of the two sizes.

**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. One adjustment is provided for the main lever. Rotate the turntable until the changer is out-of-cycle; and adjust rubber bumper bracket (A) so that the roller clears the nose of the cam plate by 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 4-11/16 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 5-11/16 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 motor board, otherwise incorrect landing may occur with 10 inch records.

**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 bear-

**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 .058 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 .055—.061 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 tone arm is at maximum distance outward from turntable; lift record upward until it is in contact with both separating knives, then loosen screws "H" and shift record shelves so that the curved inner edges of the shelves are uniformly spaced at least 1/16 inch from record edge. 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 motor board. 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.

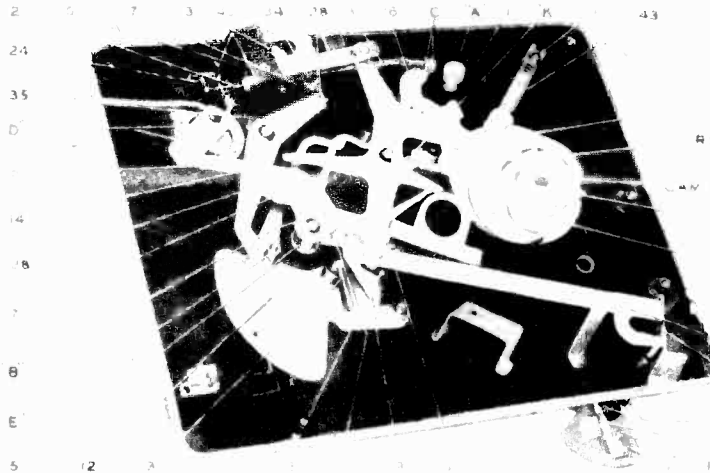
**Lubrication.**—Petrolatum or petroleum jelly should be applied to cam, main gear, spindle pinion gear, and gears of record posts.

Light machine oil should be used in the tone arm vertical bearing, record post bearings, and all other bearings of various levers on underside of motor board.

Apply a few drops of light machine oil to the motor spindle bearing and oil hole adjacent to the spindle bearing. 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, or rubber spindle cap.

- ing; 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 (65° F).
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. Needle lands in 10 inch position on 12 inch record or misses record when playing both types mixed—Increase tension of pickup locating lever spring "34."
12. On AC.-DC. Models only - Spindle loosens from motor. - To tighten: Remove turntable, hold governor of motor and tighten spindle.



**NOTE: Numbers refer to parts—letters refer to adjustments**

FARNSWORTH TELEV. & RADIO CORP.

MODELS

BT20, BT22, BT61

BT63, BT66

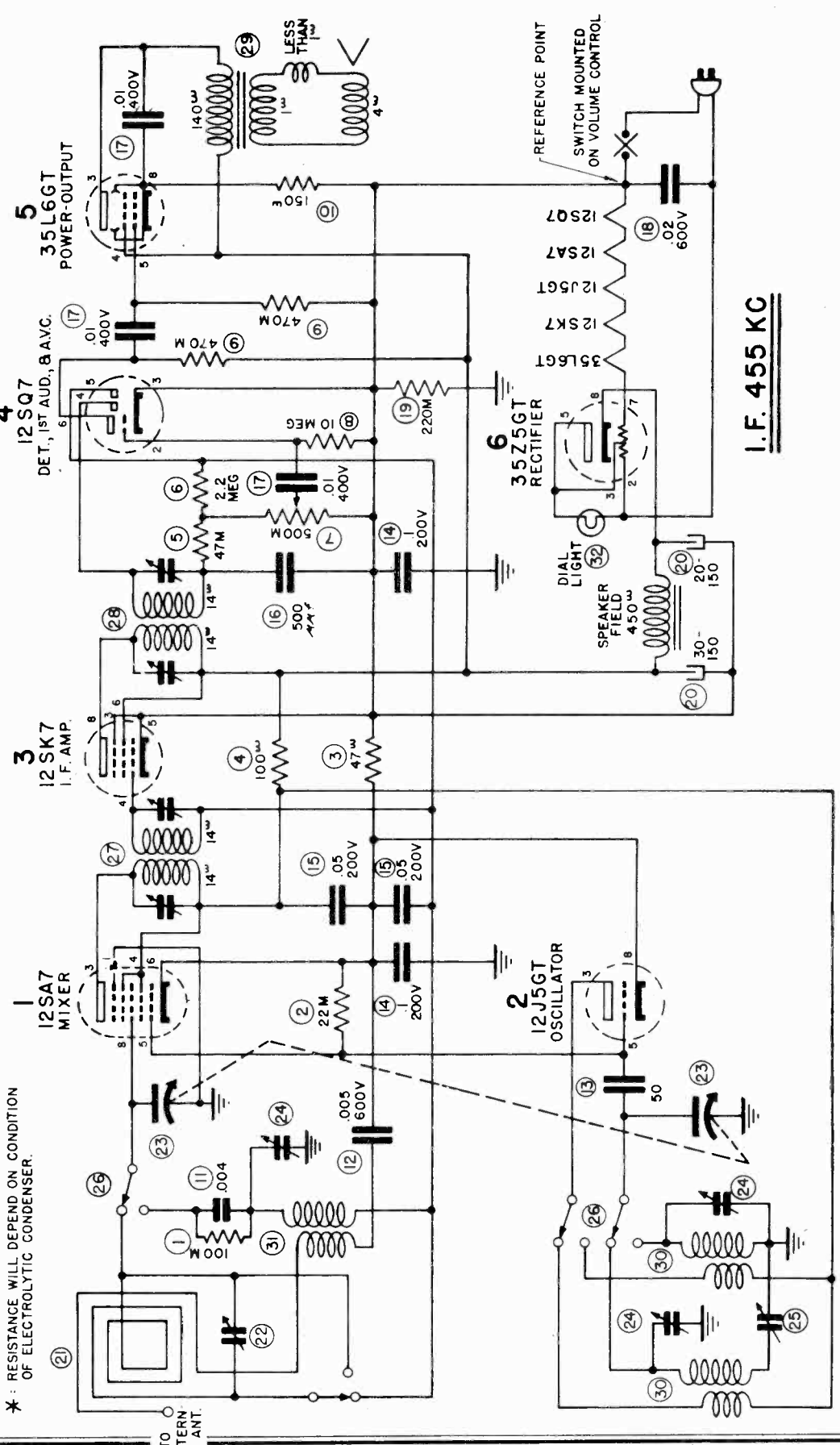
VOLTAGE	RESISTANCE	VOLTAGE	RESISTANCE	VOLTAGE	RESISTANCE	VOLTAGE	RESISTANCE
1. 0	1. 220M	1. 0	1. 220M	1. 0	1. 220M	1. 0	1. 220M
2. 25 AC	2. 24 $\omega$	2. 39 AC	2. 38 $\omega$	2. -2 †	2. 10 MEG	2. 53 AC	2. 50 $\omega$
3. 93	3. INF *	3. 95	3. 0	3. 0	3. 0	3. 90	3. INF *
4. 95	4. INF *	4. .6	4. 47 $\omega$	4. 0	4. .5 MEG	4. 95	4. INF *
5. -6 †	5. 22M	5. 0	5. 2.7 MEG	5. 0	5. 2.7 MEG	5. 0	5. 470M
6. .6	6. 47 $\omega$	6. .6	6. 95	6. 0	6. 0	6. 0	6. 0
7. 12 AC	7. 12 $\omega$	7. 25 AC	7. 24 $\omega$	7. 0	7. 0	7. 90 AC	7. 90 $\omega$
8. 0	8. 2.7 MEG	8. 0	8. 47 $\omega$	8. 12 AC	8. 12 $\omega$	8. 5 V	8. 125

† : VOLTAGE READING WILL VARY WITH SENSITIVITY OF METER.

\* : RESISTANCE WILL DEPEND ON CONDITION OF ELECTROLYTIC CONDENSER.

BOTTOM VIEW OF SOCKETS

PIN 3 OF TUBE #4 IS REFERENCE POINT FOR VOLTAGE & RESISTANCE.



I.F. 455 KC

BT63, BT66

FARNSWORTH TELEV. & RADIO CORP.

MODELS BT52, BT53, BT54

BT55, BT56

MODELS BT20, BT22, BT61

GRID OF 12SA7 PLATE 12SA7 15 GAIN  
 PLATE OF 12SA7 GRID 12SK7 1.3 GAIN  
 GRID OF 12SK7 PLATE 12SK7 60 GAIN  
 PLATE OF 12SQ7 DIODE 12SQ7 40% LOSS  
 GRID OF 12SQ7 PLATE OF 12SQ7 30 VOLTAGE GAIN  
 GRID OF 50L6GT 5 POWER GAIN

OSCILLATOR VOLTAGE 1500 KC. - 6  
 OSCILLATOR VOLTAGE 600 KC. - 7

VOLTAGE LOSS IN OUTPUT TRANSFORMER - 98% LOSS  
 ALL VALUES ABOVE ARE APPROXIMATE

BT-52  
 BT-53  
 BT-54  
 BT-55  
 BT-56

12SA7  
 12SK7  
 12SQ7  
 50L6GT

WHEN ALIGNING THE SHORT WAVE OSCILLATOR TIGHTEN THE ADJUSTING SCREW FOR MAXIMUM CAPACITY AND THEN LOOSEN IT UNTIL THE FIRST PEAK IS REACHED. DO NOT USE THE SIGNAL HEARD AT THE LOWER CAPACITY SETTING AS IN THIS RECEIVER THE OSCILLATOR WORKS AT A FREQUENCY LOWER THAN THE ONE THE R.F. IS TUNED TO. IF THE LOOP IS TUNED TO 18MC THE OSCILLATOR IS TUNED TO 17,545KC THAT IS SIGNAL FREQUENCY MINUS I.F. FREQUENCY, INSTEAD OF SIGNAL FREQUENCY PLUS I.F. FREQUENCY, OR 18,455KC AS IS CUSTOMARY.

GRID OF 12SA7 PLATE 12SA7 12 GAIN  
 PLATE OF 12SA7 GRID 12SK7 SLIGHT LOSS  
 GRID OF 12SK7 PLATE 12SK7 60 GAIN  
 PLATE OF 12SK7 DIODE 12SQ7 25% LOSS  
 GRID OF 12SQ7 PLATE 12SQ7 30 VOLTAGE GAIN  
 GRID OF 35L6GT PLATE 35L6GT 5 POWER GAIN

OSCILLATOR VOLTAGE 1500 KC  
 OSCILLATOR VOLTAGE 600 KC

VOLTAGE LOSS IN OUTPUT TRANSFORMER 98%.

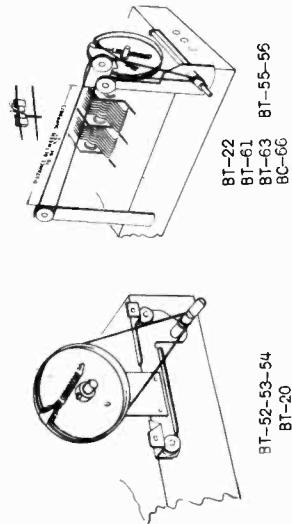
BT-20  
 BT-22  
 BT-61  
 BT-63  
 BT-66

12SA7  
 12SK7  
 12SQ7  
 35L6GT

STEPS	CONNECT HIGH SIDE OF GENERATOR TO SET VOLUME CONTROL AT MAXIMUM	SET GENERATOR AT 455 KC.	SET GANG AT A QUIET POINT	ADJUST THE FOLLOWING	LOCATED	TO OBTAIN
1.	ANTENNA LEAD WITH 250 MMF. IN SERIES	455 KC.	A QUIET POINT	2ND I. F. TRANSFORMER	SEE FIG. TOP OF CHASSIS	
3.				1ST. I. F. TRIMMERS	SEE FIG. END OF CHASSIS	
4.		1730 KC.	MINIMUM CAPACITY	OSCILLATOR TRIMMER	TOP OF GANG CONDENSER	
5.		1400 KC.	1400 KC.	ANTENNA TRIMMER	SEE FIG. REAR GANG	
6.		600 KC.	600 KC.	END PLATES OF GANG		
7.	RECHECK ALL ABOVE ADJUSTMENTS					

TO OBTAIN MAXIMUM OUTPUT

STRINGING DIAGRAM



TABULATION FOR ALIGNMENT

STEPS	DUMMY ANTENNA	SET GENERATOR AT 455 KC	SET GANG AT MINIMUM	ADJUST 2ND I.F. TRIMMERS	LOCATED	TO OBTAIN
1	SET VOLUME CONTROL FOR MAXIMUM OUTPUT.	455 KC	MINIMUM	2ND I.F. TRIMMERS	TOP OF I.F. TRANS.	
2	250 MMFD	455 KC	MINIMUM	1ST I.F. TRIMMERS	NEAREST FRONT OF CHASSIS	
3		1720 KC		B.C. OSC. TRIMMER	ON LOOP ANTENNA	
4		1500 KC	STRONGEST SIG. & ROCK GANG	B.C. R.F. TRIMMER	TOP OF CHASSIS	
5		600 KC		600 KC. PAD	MIDDLE OF THREE	
6	CHECK	1000 KC			REAR OF THREE	
7		16 MC	MINIMUM	S.W. OSC. TRIMMER		
8	400 OHMS	18.1 MC		S.W. R.F. TRIMMER		
9		16 MC				

TO OBTAIN MAXIMUM OUTPUT

\* THESE TRIMMERS ARE ON A STRIP OF THREE AT THE RIGHT HAND END OF THE CHASSIS

PUSH BUTTON SET UP  
 (ON BT-22 - BT-61 - BT-63 - BC-66)

WHEN THE PUSH BUTTONS ARE LIFTED A SCREW IS EXPOSED. THIS SCREW SHOULD BE LOOSENED BY ONE OR TWO TURNS BY A SCREWDRIVER. TUNE IN THE DESIRED STATION MANUALLY, THEN FIRMLY PRESS THE BUTTON UNTIL IT HITS THE STOP, MAKING CERTAIN THE GANG SETTING DOES NOT CHANGE. AGAIN LIFT THE PUSH BUTTON AND TIGHTEN THE SCREW. MANUALLY DETUNE THE SET, PRESS THE BUTTON JUST SET UP. IF THE ADJUSTMENT WAS PROPERLY MADE PROCEED WITH THE REMAINING BUTTONS.

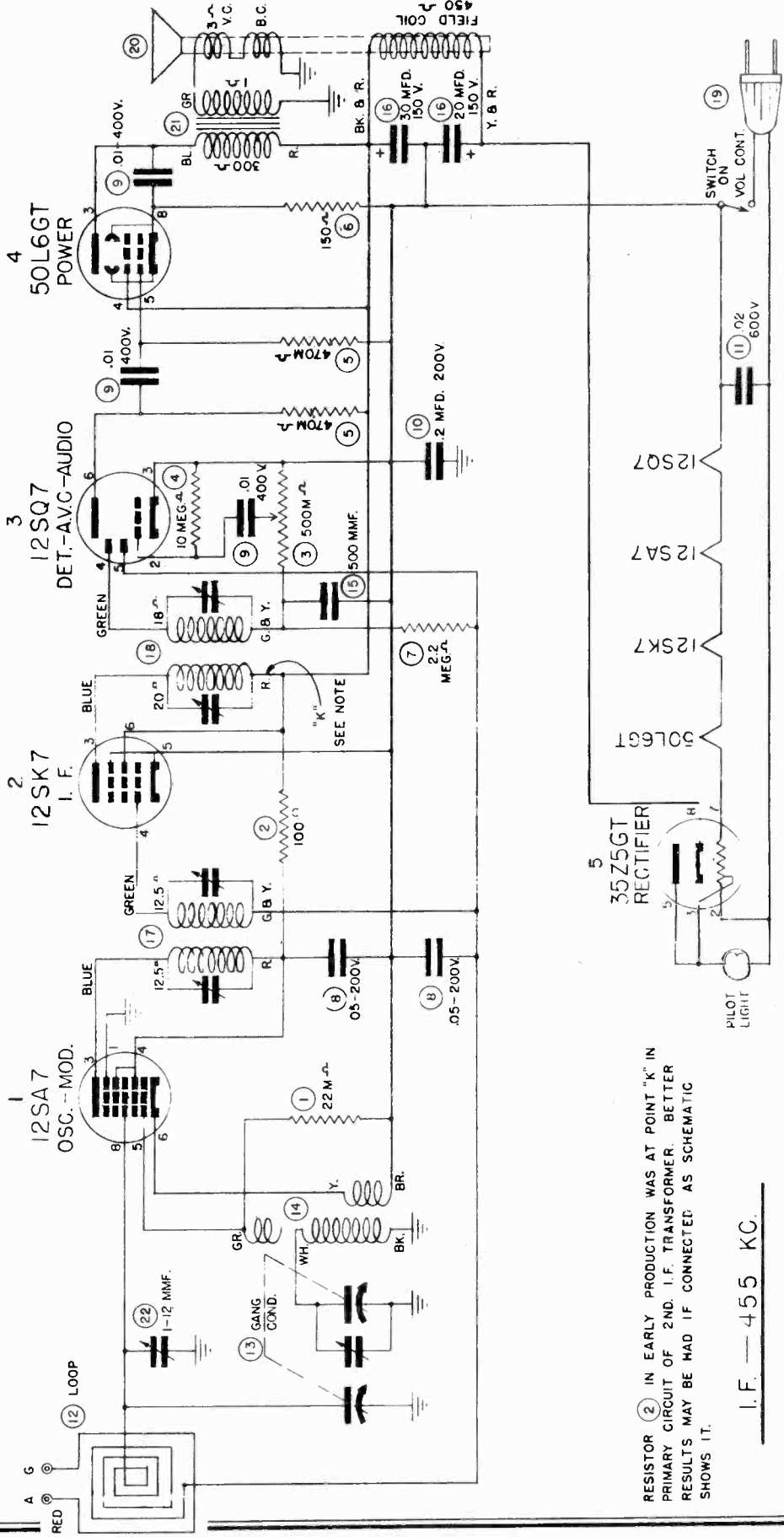
FARNSWORTH TELEV. & RADIO CORP. BT55, BT58  
 MODELS BT52, BT53, BT54

1	2	3	4	5
<b>VOLTAGE</b>	<b>VOLTAGE</b>	<b>VOLTAGE</b>	<b>VOLTAGE</b>	<b>VOLTAGE</b>
1. 0 D.C.	1. 0	1. 0	1. 0	1. 125 A.C.
2. 27 A.C.	2. 0.75	2. INF.	2. 41 A.C.	2. 100
3. +85	3. 0	3. INF.	3. +75	3. 119 A.C.
4. -85	4. -3.5	4. 4.50M	4. +85	4. INF.
5. -8.5	5. 0	5. 2.5 MEG.	5. 0	5. 125
6. 0	6. +85	6. INF.	6. 0	6. 0
7. 13 A.C.	7. 41 A.C.	7. 0	7. 90 A.C.	7. 75
8. -75	8. +85	8. 15	8. +120	8. INF.
<b>RESISTANCE</b>	<b>RESISTANCE</b>	<b>RESISTANCE</b>	<b>RESISTANCE</b>	<b>RESISTANCE</b>
1. INF.	1. 0	1. INF.	1. INF.	1. INF.
2. 25	2. 0.75	2. INF.	2. 45	2. 100
3. INF.	3. 0	3. INF.	3. INF.	3. 100
4. INF.	4. -3.5	4. 4.50M	4. INF.	4. INF.
5. 25M	5. 0	5. 2.5 MEG.	5. 550M	5. 125
6. 0	6. +85	6. INF.	6. 0	6. 0
7. 15	7. 41 A.C.	7. 0	7. 75	7. 75
8. INF.	8. +85	8. 15	8. 150	8. INF.

LINE VOLTAGE 125 V. A.C.

BOTTOM VIEW OF SOCKETS

\* REFERENCE POINT FOR A.C. & D.C. VOLTAGES AND RESISTANCE. MEASURE VOLTAGES WITH VOLTMETER HAVING RESISTANCE OF INFINITY OHMS PER VOLT.



RESISTOR (2) IN EARLY PRODUCTION WAS AT POINT "K" IN PRIMARY CIRCUIT OF 2ND. I.F. TRANSFORMER. BETTER RESULTS MAY BE HAD IF CONNECTED AS SCHEMATIC SHOWS IT.

I.F. — 455 KC.

SCHEMATIC - BT-52, BT-53, BT-54, BT-55 & BT-56

MODELS BT41, BC45 FARNSWORTH TELEV. & RADIO CORP.

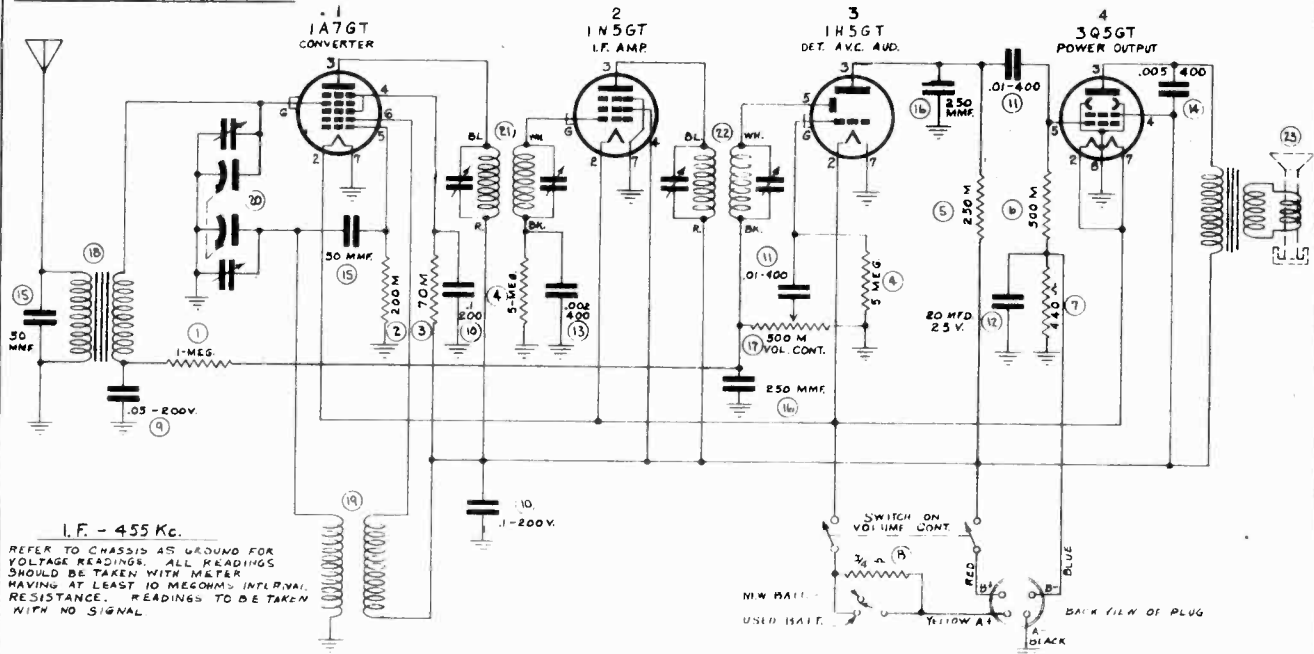
VOLTAGE	RESISTANCE
1.0	1.0
2.14	2.1B
3.00	3. INF.
4.85	4. INF.
5.3	5. 200M
6.80	6. INF.
7.0	7.0
8.0	8.0
CAP. 0	CAP. 0

VOLTAGE	RESISTANCE
1. OPEN	1. OPEN
2. 1.4	2. 1B
3. 00	3. INF.
4. 85	4. INF.
5. 83	5. INF.
6. OPEN	6. OPEN
7. 0	7. 0
8. -5	8. 00M
CAP. 0	CAP. 5 MEGS.

VOLTAGE	RESISTANCE
1.0	1.0
2.14	2.1B
3.46	3. INF.
4. OPEN	4. 500M
5.0	5. OPEN
6. OPEN	6. 0
7.0	7.0
8.0	8.0
CAP. 0	CAP. 5 MEGS.

VOLTAGE	RESISTANCE
1.0	1.0
2.14	2.1B
3.83	3. INF.
4.80	4. INF.
5.0	5. 300M
6.0	6.0
7.14	7.1B
8.0	8.0

BOTTOM VIEW OF SOCKETS



I.F. - 455 Kc.

REFER TO CHASSIS AS GROUND FOR VOLTAGE READINGS. ALL READINGS SHOULD BE TAKEN WITH METER HAVING AT LEAST 10 MEGOHMS INTERNAL RESISTANCE. READINGS TO BE TAKEN WITH NO SIGNAL

TO PROPERLY ALIGN THIS RECEIVER, A SIGNAL GENERATOR CALIBRATED AT 455 Kc., 1400 Kc., AND 1730 Kc., IS REQUIRED. THE OSCILLATOR TRIMMER IS NEAREST THE FRONT PANEL AND THE LOOP TRIMMER IS DIRECTLY BEHIND IT.

ANY COMBINATION OF ONE 1 1/2 VOLT "A" BATTERY AND TWO 45 VOLT "B" BATTERIES THAT WILL FIT IN THE RECEIVER CASE WILL BE SATISFACTORY. BATTERY DRAIN IS .2 AMP., AT 1 1/2 VOLTS AND 9 MA., AT 90 VOLTS.

TABULATION FOR ALIGNMENT

STEPS	USE IN SERIES WITH GENERATOR	SET GENERATOR AT	SET GANG AT	ADJUST	LOCATED	TO OBTAIN
1.	.02 MFD. TO CHASSIS CONNECT HIGH SIDE OF GENERATOR TO GRID CAP OF 1A7G TUBE.	455 Kc.	QUIET POINT	2ND I.F. TRIMMERS 1st I.F. TRIMMERS	TOP OF I.F. TRANS	MAXIMUM OUTPUT
2.	250 M.M.F.	1730 Kc.	1730 Kc.	OSCILLATOR TRIMMER*	SEE NOTE BELOW	
3.	250 M.M.F.	1400 Kc.	1400 Kc. & ROCK GANG	LOOP TRIMMER*		

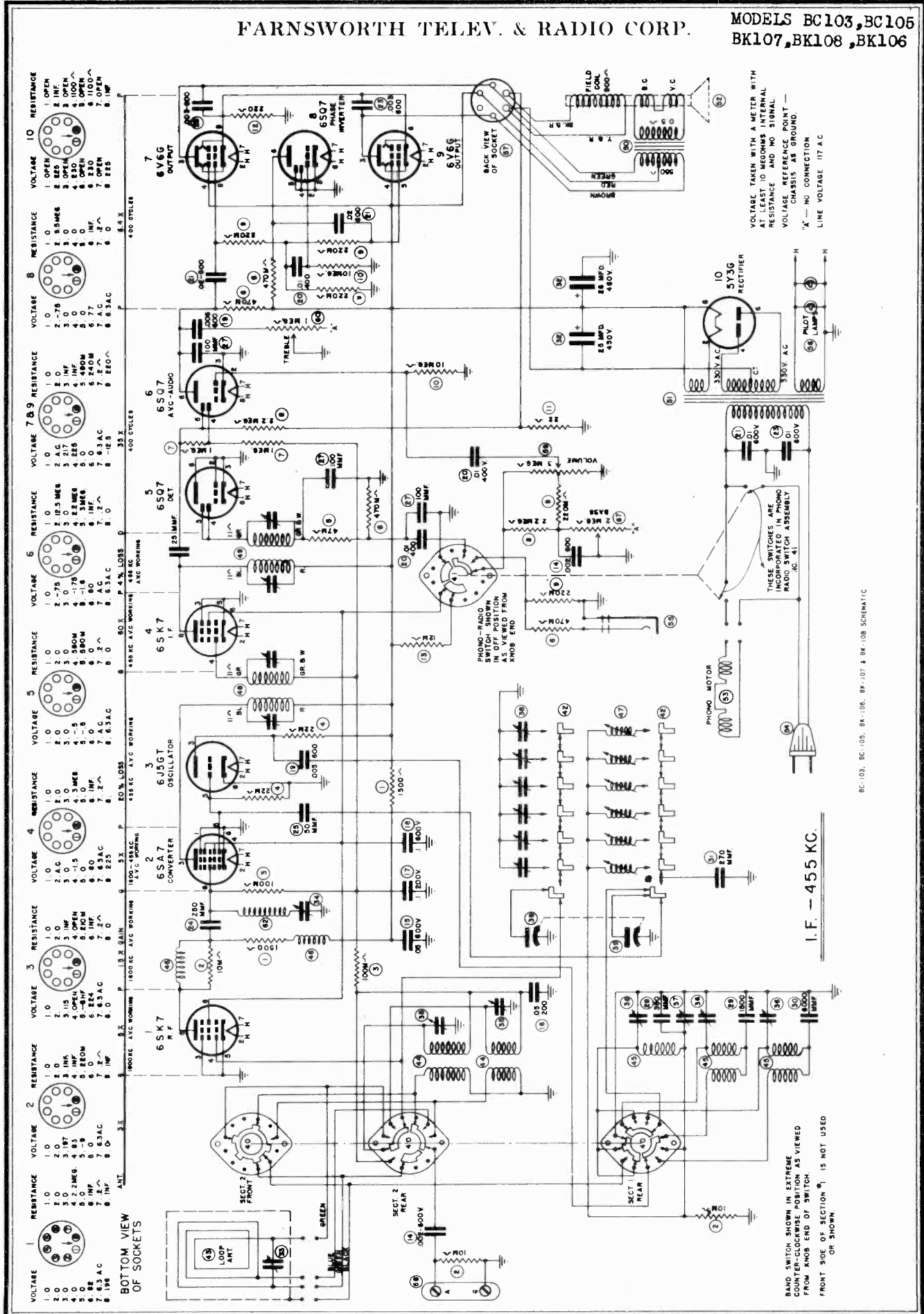
\* SEE PRECEDING PARAGRAPH FOR LOCATION OF TRIMMERS.

\*\* LOOP TO CONSIST OF FIVE TO TEN TURNS OF INSULATED WIRE WOUND ON A THREE TO FOUR INCH FORM TO BE CLOSELY COUPLED TO THE LOOP ANTENNA IN THE RECEIVER.



FARNSWORTH TELEV. & RADIO CORP.

MODELS BC103, BC105  
BK107, BK108, BK106



RESISTANCE	VOLTAGE	RESISTANCE	VOLTAGE	RESISTANCE	VOLTAGE	RESISTANCE	VOLTAGE	RESISTANCE	VOLTAGE	RESISTANCE	VOLTAGE
1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0

BC-103, BC-105, BK-106, BF-107 & BK-108 SCHEMATIC

I.F. - 455 KC.

VOLTAGE TAKEN WITH A METER WITH AT LEAST 10 MEGOHMS INTERNAL RESISTANCE AND NO SIGNAL REFERENCE POINT - CHASSIS AS GROUND.

"A" - NO CONNECTION.

LINE VOLTAGE 117 AC

BAND SWITCH SHOWN IN EXTREME COUNTER-CLOCKWISE POSITION AS VIEWED FROM KNOB END OF SWITCH.

FRONT SIDE OF SECTION 9 IS NOT USED OR SHOWN.

MODELS BC103, BC105  
BK107, BK108, BK106

FARNSWORTH TELEV. & RADIO CORP.

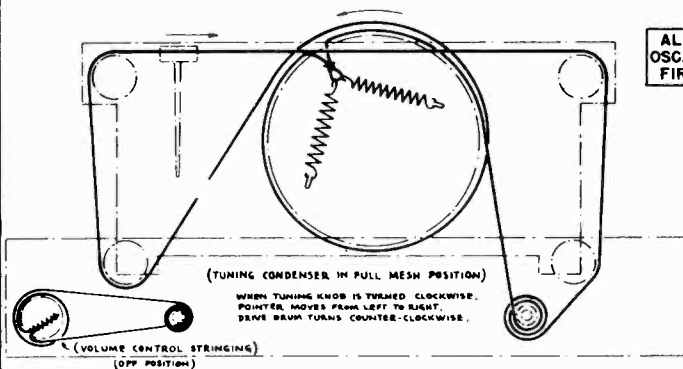
PUSH BUTTON SET UP

TO PREVENT THE BUTTONS FROM BEING SET UP ON THE WRONG STATIONS A SIGNAL GENERATOR SHOULD BE USED.

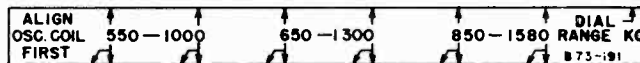
THE BUTTON TO THE EXTREME RIGHT IS THE MANUAL TUNING BUTTON.

ADJUST THE LOWER SCREW (SEE FIG.) FIRST AS THIS IS THE OSCILLATOR; THEN ADJUST THE UPPER SCREW FOR MAXIMUM OUTPUT.

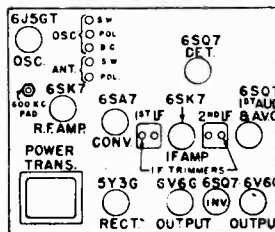
STRINGING DIAGRAM



BUTTON LAYOUT



OSCILLATOR TRIMMERS — BOTTOM ROW



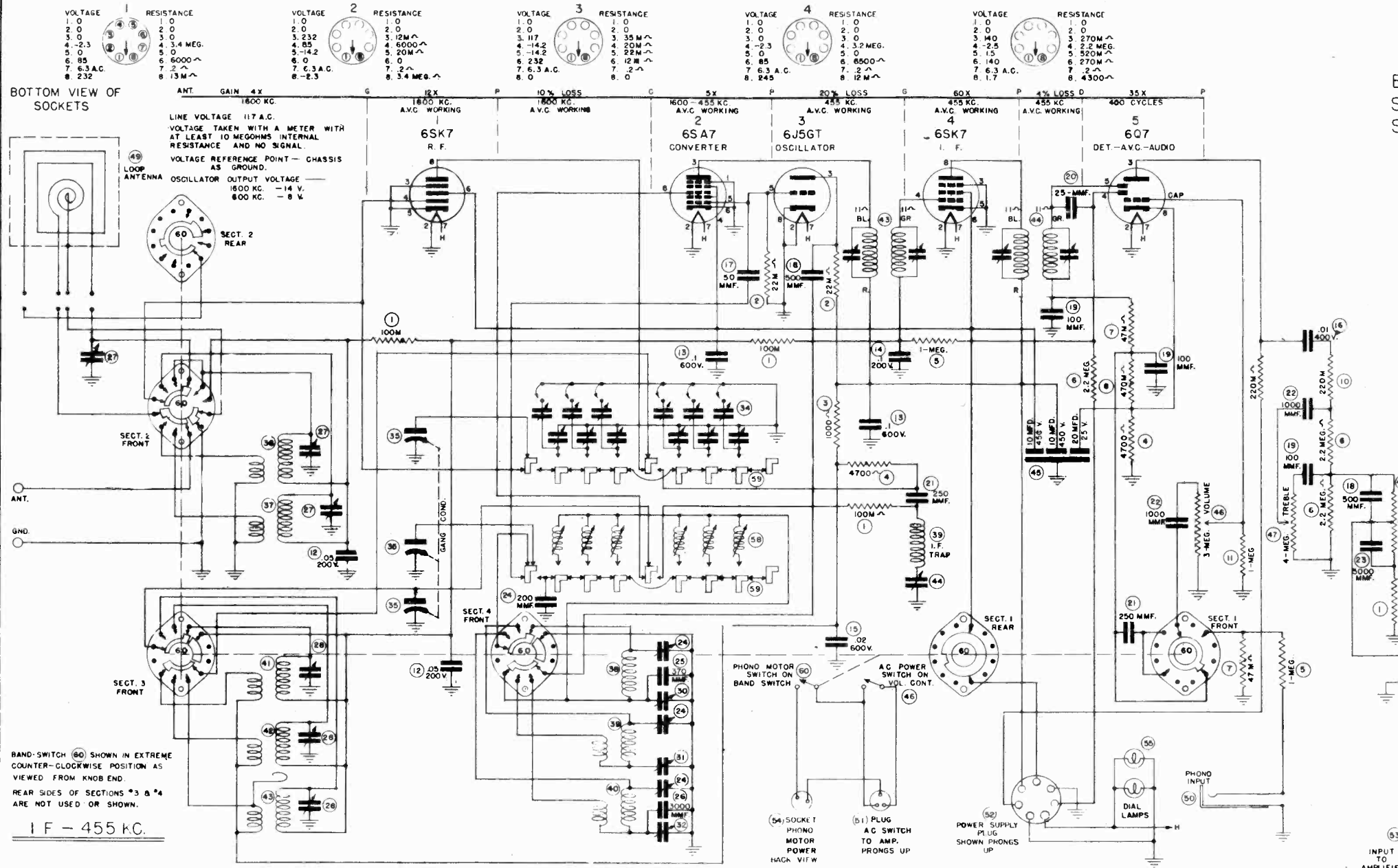
STEPS	IN SERIES WITH ANTENNA	SET GENERATOR AT	SET GANG AT	ADJUST	LOCATED	TO OBTAIN	
1.	SET VOLUME AND TONE CONTROLS AT MAXIMUM						
2.	250 MMFD.	455 Kc.	NOTE A	2ND I.F. TRIMMERS	TOP OF I.F. TRANS.	MAX. OUTPUT	
3.				1ST I.F. TRIMMERS			
4.				WAVE TRAP TRIMMER	REAR OF CHASSIS		MIN. OUTPUT
5.				1600 Kc.	Osc. B.C. TRIMMER		
6.		1500 Kc.	NOTE B	R.F. B.C. TRIMMER	ON LOOP	SEE FIG.	
7.		600 Kc.	600 Kc. PAD				
8.		RECHECK 1500 Kc.					
9.	400 OHMS	5.4	NOTE A	Osc. POLICE TRIMMER*	MAXIMUM OUTPUT		
10.		5 Mc.	NOTE B	R.F. POLICE TRIMMER**			
11.	CHECK 1.8 Mc.						
12.	400 OHMS	18.1 Mc.	NOTE A	Osc. S.W. TRIMMER*			
13.		16 Mc.	NOTE B	R.F.S.W. TRIMMER**			
14.	CHECK 6 AND 10 Mc.						

NOTE A. SET GANG AT MINIMUM.  
NOTE B. STRONGEST SIGNAL AND ROCK GANG.

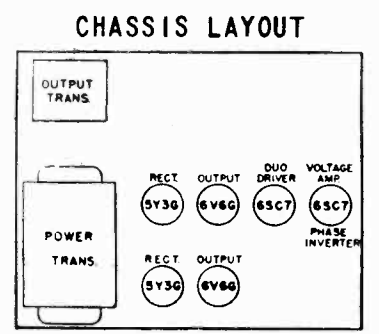
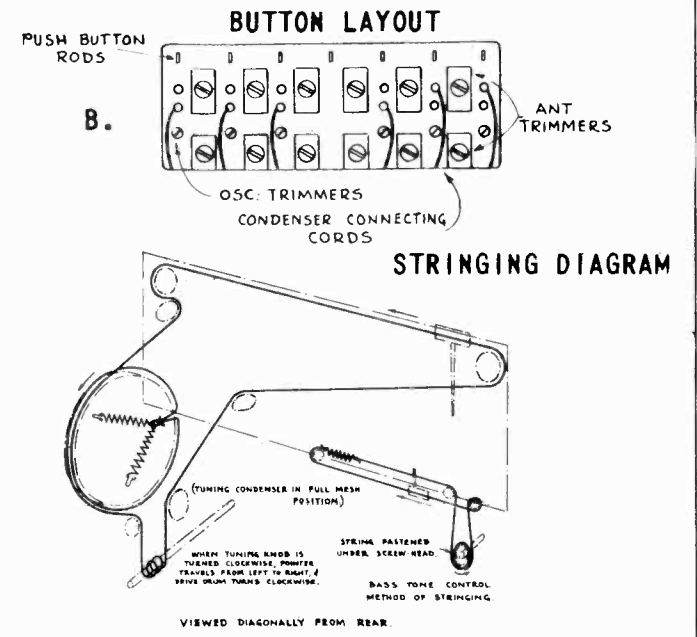
\* TIGHTEN OSCILLATOR TRIMMER SCREW FOR MAXIMUM CAPACITY, THEN UNSCREW UNTIL SECOND PEAK IS SECURED.

\*\* TIGHTEN R.F. TRIMMER SCREW FOR MAXIMUM CAPACITY, THEN UNSCREW UNTIL FIRST PEAK IS SECURED.

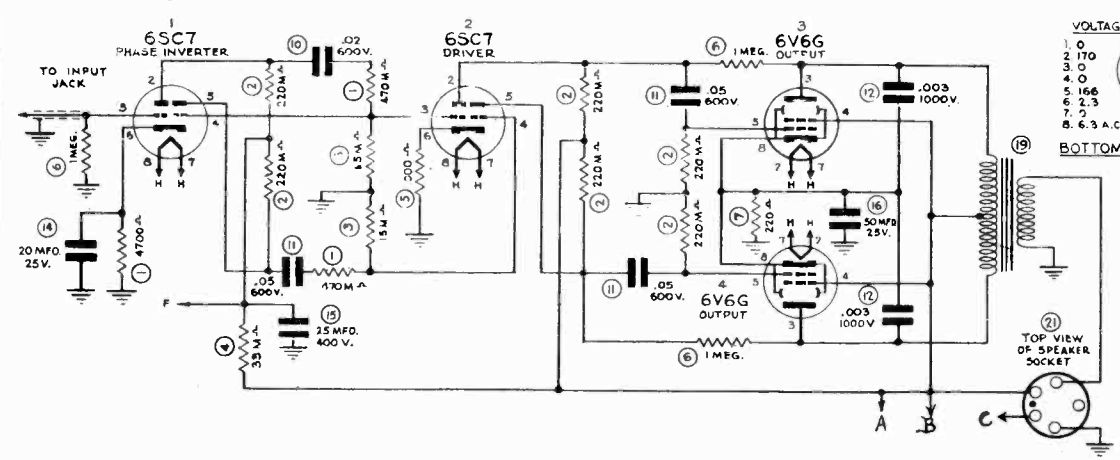
FARNSWORTH TELEV. & RADIO CORP.



BROADCAST BAND 540 - 1600 K.C.  
SPECIAL SERVICE BAND 1.6 - 5.4 Mc.  
SHORT WAVE BAND 5.4 - 18



BAND-SWITCH (80) SHOWN IN EXTREME COUNTER-CLOCKWISE POSITION AS VIEWED FROM KNOB END.  
REAR SIDES OF SECTIONS \*3 & \*4 ARE NOT USED OR SHOWN.  
I F - 455 KC.

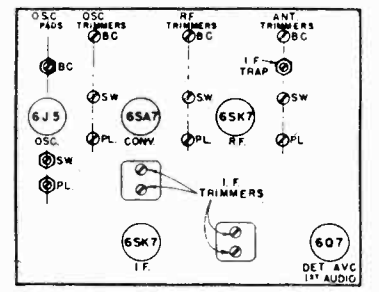
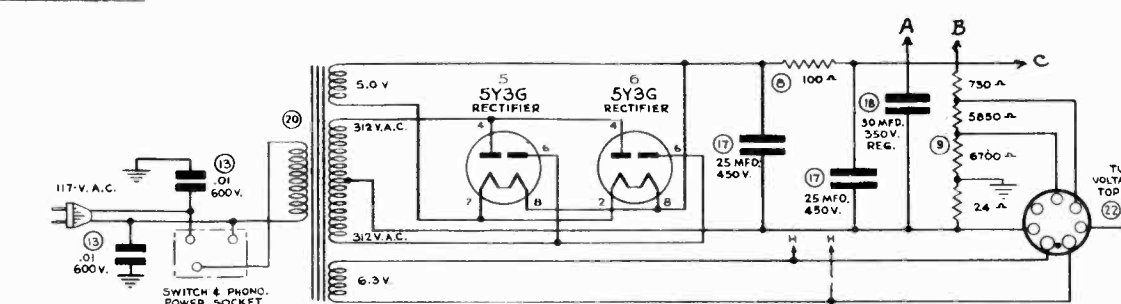


**VOLTAGE RESISTANCE**

1.0	1.0	1.0	1.0	1.0	1.0
2.170	2.350M $\wedge$	2.130	2.2	2.2	2.2
3.0	3.15M $\wedge$	3.0	3.15M $\wedge$	3.0	3.15M $\wedge$
4.0	4.500M $\wedge$	4.0	4.15M $\wedge$	4.250	4.14M $\wedge$
5.166	5.130	5.270M $\wedge$	5.0	5.0	5.0
6.2.3	6.470M $\wedge$	6.14	6.1000 $\wedge$	6.0PFN	6.312 A.C.
7.2	7.2 A.C.	7.0	7.2 A.C.	7.2 A.C.	7.0PFN
8.6.3 A.C.	8.2 A.C.	8.6.3 A.C.	8.2	8.270 A.C.	8.333

**RESISTANCE**

1.0	1.0	1.0	1.0	1.0	1.0
2.170	2.350M $\wedge$	2.130	2.2	2.2	2.2
3.0	3.15M $\wedge$	3.0	3.15M $\wedge$	3.0	3.15M $\wedge$
4.0	4.500M $\wedge$	4.0	4.15M $\wedge$	4.250	4.14M $\wedge$
5.166	5.130	5.270M $\wedge$	5.0	5.0	5.0
6.2.3	6.470M $\wedge$	6.14	6.1000 $\wedge$	6.0PFN	6.312 A.C.
7.2	7.2 A.C.	7.0	7.2 A.C.	7.2 A.C.	7.0PFN
8.6.3 A.C.	8.2 A.C.	8.6.3 A.C.	8.2	8.270 A.C.	8.333



FARNSWORTH TELEV. & RADIO CORP.

MODELS BK110, BK112 BK111

**PUSH BUTTON SET UP**

1. If the station you select for one of the buttons falls between 1500 to 1000 kilocycles be sure that the pin jack is in the upper strip.
2. Adjust the brass screw at the side of the lower trimmer until the wanted station is heard most clearly.
3. Adjust the lower trimmer screw for maximum volume.
4. Press Manual button making certain the station is still tuned in; check this reception against the reception on the button just set up. If it is the same proceed with the next station on the list.
5. If the station you desire to pick up falls between 1000 and 550 kilocycles, you must remove the pin jack and place in the hole provided at the bottom edge of the upper trimmer (see figure 1).
6. Turn the lower trimmer screw back until the screw is off the trimmer plates.
7. Adjust the brass screw until the wanted station is heard most clearly.
8. Then adjust the upper trimmer until maximum volume is secured; if maximum volume cannot be had and the upper trimmer screw is down tight you must finish tuning with the lower trimmer screw.

**ALIGNMENT INSTRUCTIONS**

An output meter and a signal generator are required for proper alignment of these sets. The oscillator should be calibrated at the following points, 455 Kc, 600 Kc, 900 Kc, 1400 Kc, 2.0 Mc, 5 Mc, 5.5 Mc, 6 Mc, 10 Mc, 16 Mc, and 18.0 Mc. Always keep the output of the signal generator as low as possible to prevent A.V.C. action and false settings. Connect the high side of the generator to the antenna terminal and the low side of it to the ground terminal making certain jumper on terminal strip is disconnected. Before aligning tighten wave trap trimmer screw.

**TABULATION FOR ALIGNMENT**

Steps	In Series With Antenna	Set Generator At	Set Gang At	Adjust	Located	To Obtain
1.	SET VOLUME AND TONE CONTROLS AT MAXIMUM					
2.				2nd I.F. Trimmers	Top of I.F. Trans.	Max. Output
3.		455 Kc.	Note A	1st I.F. Trimmers		
4.				Wave Trap Trimmer	See Fig.	Min. Output
5.	250 mmfd.	1600 Kc.		OSC. B.C. Trimmer		
6.		1400 Kc.	Note B	R.F. B.C. Trimmer		
7.		600 Kc.		Ant. B.C. Trimmer		
8.	recheck 1400 Kc.					
9.		5.5	Note A	600 Kc. Pad.	See Fig.	
10.	400 Ohms	5 Mc.	Note B	Osc. Police Trimmer*		
11.		2 Mc.	Note B	R.F. Police Trimmer**		
12.	Recheck 5 Mc.					
13.		18 Mc.	Note A	Ant. Police Trimmer**		
14.	400 Ohms	16 Mc.	Note B	OSC. S.W. Trimmer*		
15.		6 Mc.	Note B	R. F. S.W. Trimmer**		
16.	Recheck 16 Mc.					

\*Tighten oscillator trimmer screw for maximum capacity, then unscrew until second peak is secured.  
 \*\*Tighten R.F. Trimmer screw for maximum capacity, then unscrew until first peak is secured.

NOTE A. Set gang at minimum.  
 NOTE B. Strongest signal and rock gang.

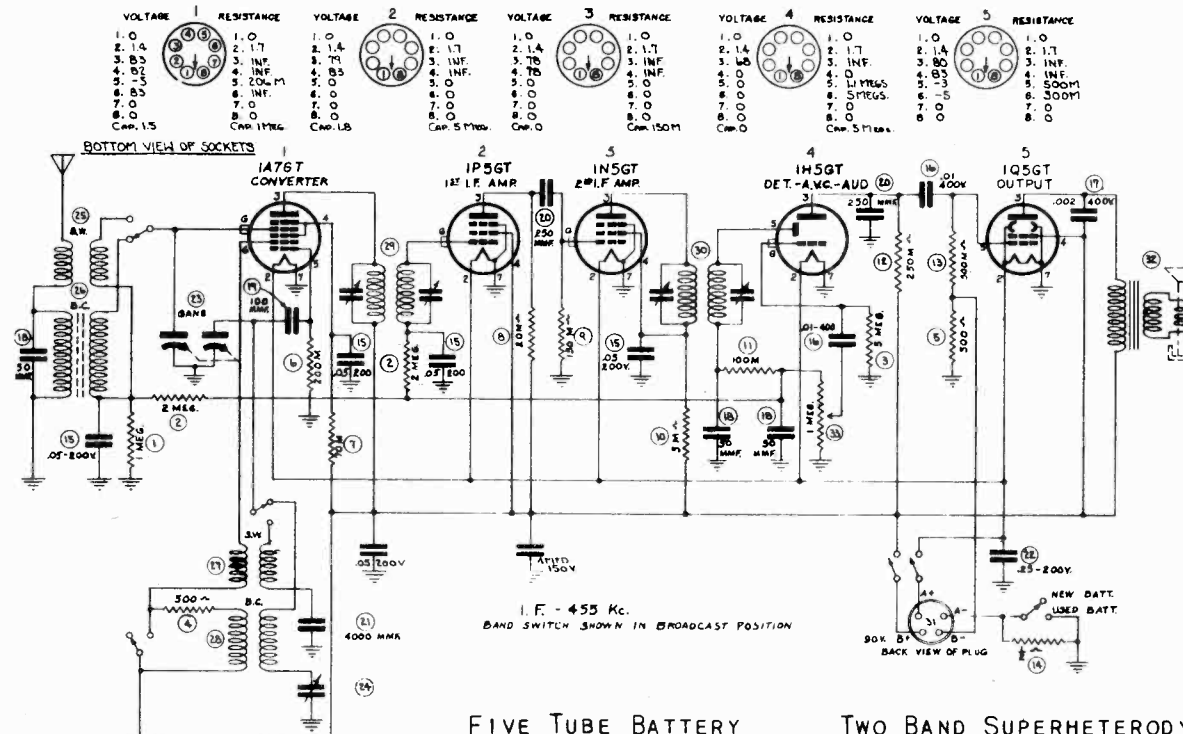
WATTS AT 117 VOLTS A.C. 106  
 VOLTAGE A. C. 105-125

**TUBE COMPLEMENT**

TUBE	FUNCTION	MODELS	CHASSIS
6SK7	R. F. AMPLIFIER	BK-110	C-32
6SA7	CONVERTER	BK-111	C-73
6J5	OSCILLATOR	BK-112	C-32
6SK7	I. F. AMPLIFIER		
6Q7	DET. A.V.C. 1st AUDIO		
6SC7	PHASE INVERTER		
6SC7	DUO DRIVER		
2 - 6V6	OUTPUT		
2 - 5Y3G	RECTIFIERS		

MODEL BT57

FARNSWORTH TELEV. & RADIO CORP



FIVE TUBE BATTERY  
 BROADCAST BAND  
 SHORTWAVE BAND

TWO BAND SUPERHETERODYNE  
 540 Kc. - 1600 Kc.  
 6 Mc. - 18.3 Mc.

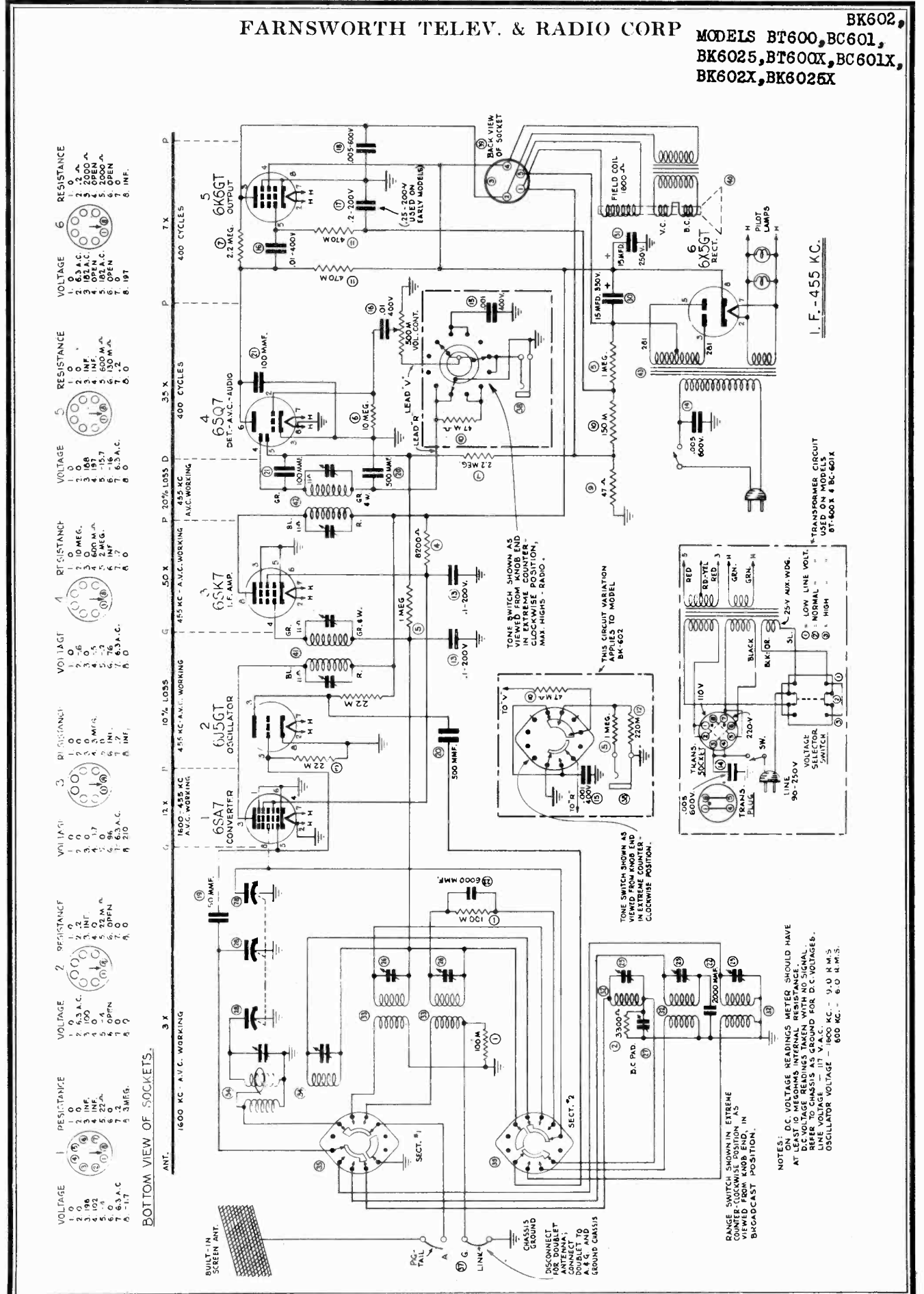
**TABULATION FOR ALIGNMENT**

STEPS	USE IN SERIES WITH ANTENNA	SET GENERATOR AT	SET GANG AT	ADJUST	LOCATED	TO OBTAIN
1.	SET VOLUME CONTROL AT MAXIMUM					
2.				2ND I.F. TRIMMERS	TOP 2ND I.F. TRAN.	
3.		455 Kc.	NOTE A	1st I.F. TRIMMERS	TOP 1st I.F. TRAN.	
4.	250 MMFD.	1600 Kc.		B.C.R.F. TRIMMER	RIGHT FRONT OF CHASSIS	
5.		1500 Kc.		B.C.R.F. TRIMMER		
6.		600 Kc.	NOTE B	B.C.	SIDE OF CHASSIS	
7.	RECHECK 1600 Kc.					
8.		18.1 Mc.	NOTE A	S.W. Osc. TRIMMER	LEFT FRONT OF CHASSIS	
9.	400 OHMS	16 Mc.	NOTE B	S.W.R.F. TRIMMER		
10.	CHECK SIGNAL AT 6 Mc. AND 10 Mc.					

NOTE A. Set Gang at Minimum.  
 NOTE B. Strongest Signal and Rock Gang.

FARNSWORTH TELEV. & RADIO CORP

BK602,  
 MODELS BT600, BC601,  
 BK6025, BT600X, BC601X,  
 BK602X, BK6025X



**1. RESISTANCE**

VOLTAGE	1. 0	2. 6.3 A.C.	3. 100	4. 0	5. 27 A.	6. 0	7. 0	8. -17
RESISTANCE	1. 0	2. 0	3. 10 MEG.	4. 0	5. 2 MEG.	6. 0	7. 0	8. INF.

**2. RESISTANCE**

VOLTAGE	1. 0	2. 6.3 A.C.	3. 100	4. 0	5. 27 A.	6. 0	7. 0	8. -17
RESISTANCE	1. 0	2. 0	3. 10 MEG.	4. 0	5. 2 MEG.	6. 0	7. 0	8. INF.

**3. RESISTANCE**

VOLTAGE	1. 0	2. 6.3 A.C.	3. 100	4. 0	5. 27 A.	6. 0	7. 0	8. -17
RESISTANCE	1. 0	2. 0	3. 10 MEG.	4. 0	5. 2 MEG.	6. 0	7. 0	8. INF.

**4. RESISTANCE**

VOLTAGE	1. 0	2. 6.3 A.C.	3. 100	4. 0	5. 27 A.	6. 0	7. 0	8. -17
RESISTANCE	1. 0	2. 0	3. 10 MEG.	4. 0	5. 2 MEG.	6. 0	7. 0	8. INF.

**5. RESISTANCE**

VOLTAGE	1. 0	2. 6.3 A.C.	3. 100	4. 0	5. 27 A.	6. 0	7. 0	8. -17
RESISTANCE	1. 0	2. 0	3. 10 MEG.	4. 0	5. 2 MEG.	6. 0	7. 0	8. INF.

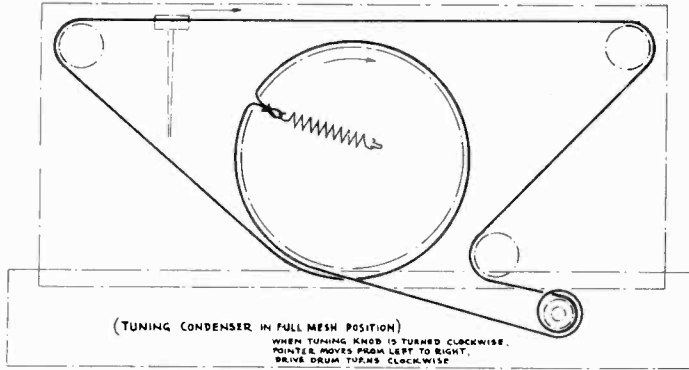
**6. RESISTANCE**

VOLTAGE	1. 0	2. 6.3 A.C.	3. 100	4. 0	5. 27 A.	6. 0	7. 0	8. -17
RESISTANCE	1. 0	2. 0	3. 10 MEG.	4. 0	5. 2 MEG.	6. 0	7. 0	8. INF.

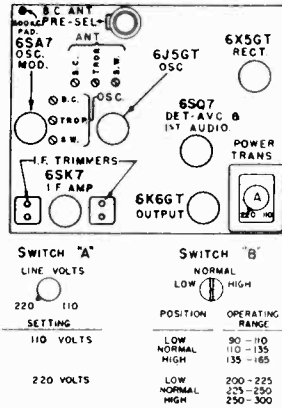


MODELS BT600, BC601,  
BK6025, BT600X, BC601X,  
BK602X, BK6025X BK602,

STRINGING DIAGRAM



CHASSIS LAYOUT



TABULATION FOR ALIGNMENT

STEPS	IN SERIES WITH ANTENNA	SET GENERATOR AT	SET GANG AT	ADJUST	LOCATED	TO OBTAIN	
1.	SET VOLUME AND TONE CONTROLS AT MAXIMUM						
2.	B.C. 250 MMFD.	455 Kc.	NOTE A	2ND I.F. TRIMMERS	TOP OF I.F. TRANS.	MAX. OUTPUT	
3.				1ST I.F. TRIMMERS			
4.							
5.				1900 Kc.		Osc. B.C. TRIMMER	SEE FIG.
6.	1500 Kc.	NOTE B	R.F. B.C. TRIMMER PRESELECTOR TRIMMER				
7.	600 Kc.		600 Kc. PAD				
8.	RFCHECK 1500 Kc.						
9.	TROPICAL BAND 400 OHMS	7.0	NOTE A	Osc. POLICE TRIMMER*	SEE FIG.	MAXIMUM OUTPUT	
10.		6.0	NOTE B	R.F. POLICE TRIMMER**			
11.	CHECK 2.2 Mc.						
12.	S.W. 400 OHMS	22.0 Mc.	NOTE A	Osc. S.W. TRIMMER*			SEE FIG.
13.		18.0 Mc.	NOTE B	R.F.S.W. TRIMMER**			
14.	CHECK 6 AND 10 Mc.		NOTE A. SET GANG AT MINIMUM. NOTE B. STRONGEST SIGNAL AND ROCK GANG.				

\* TIGHTEN OSCILLATOR TRIMMER SCREW FOR MAXIMUM CAPACITY, THEN UNSCREW UNTIL SECOND PEAK IS SECURED.

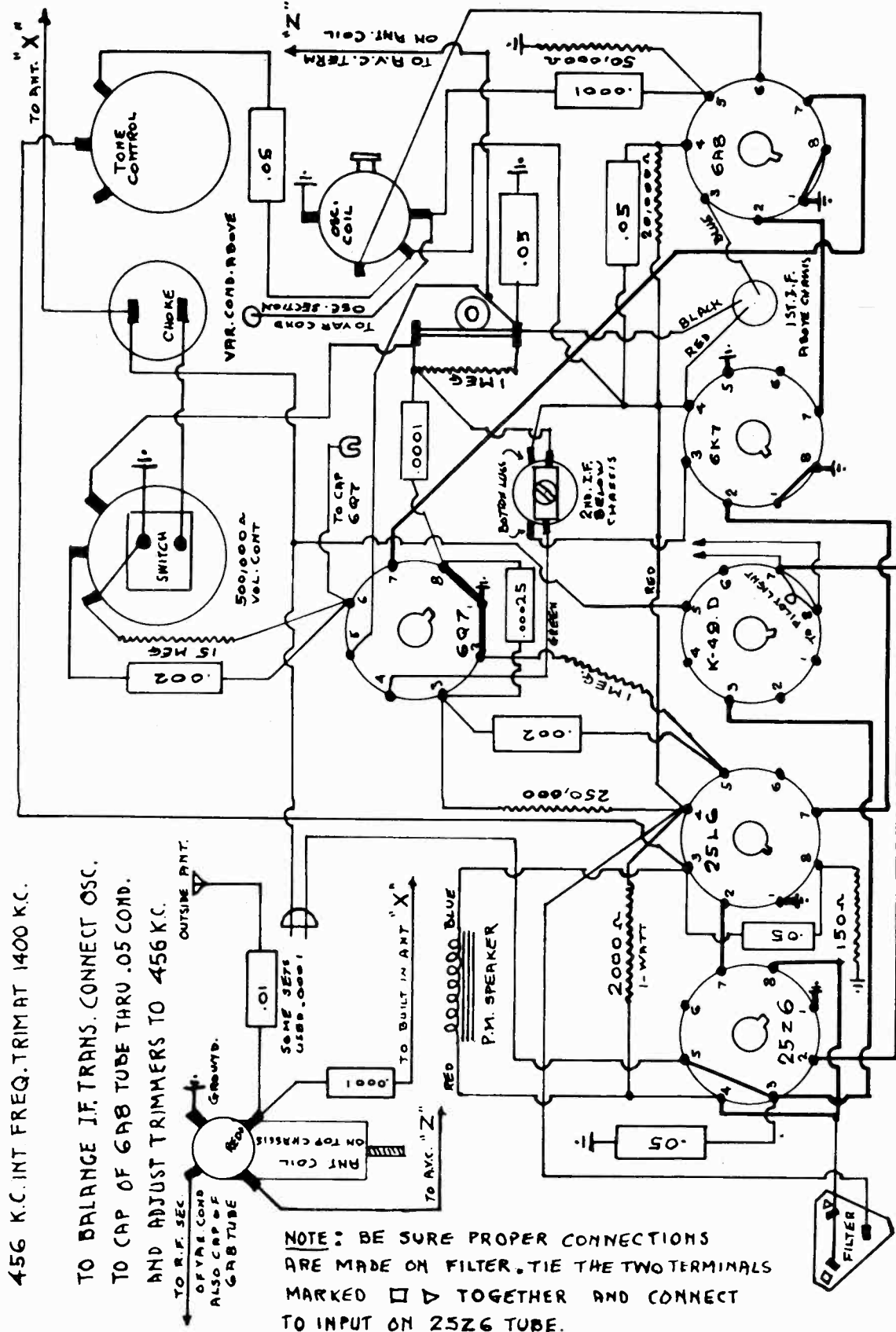
\*\* TIGHTEN R.F. TRIMMER SCREW FOR MAXIMUM CAPACITY, THEN UNSCREW UNTIL FIRST PEAK IS SECURED.



MODEL 6141ABT

FERGUSON RADIO, INC.

MODEL 6141 ABT CHAMPION RADIO



456 K.C. INT FREQ. TRIM AT 1400 K.C.

TO BALANCE I.F. TRANS. CONNECT OSC. TO CAP OF 6A8 TUBE THRU .05 COMP. AND ADJUST TRIMMERS TO 456 K.C.

TO R.F. SEC OF VAR. COND. ALSO CAP OF 6A8 TUBE

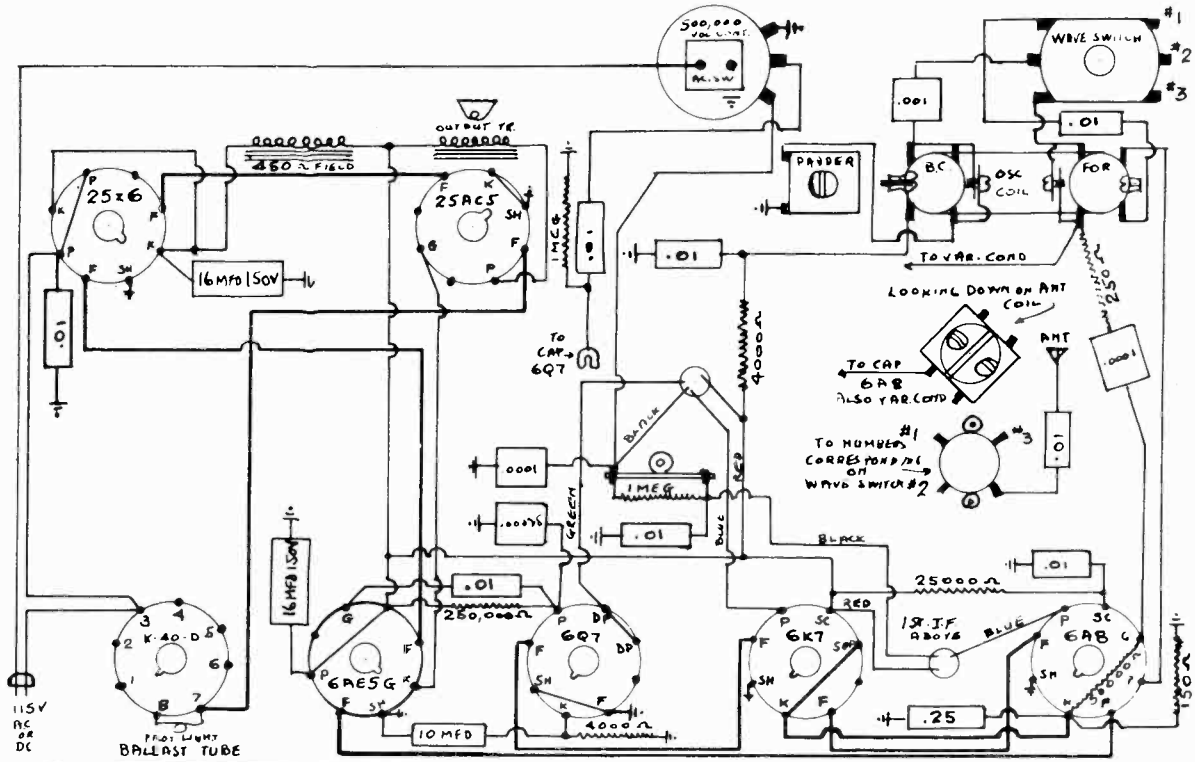
NOTE: BE SURE PROPER CONNECTIONS ARE MADE ON FILTER. TIE THE TWO TERMINALS MARKED □ ▽ TOGETHER AND CONNECT TO INPUT ON 25Z6 TUBE.

FERGUSON RADIO, INC.

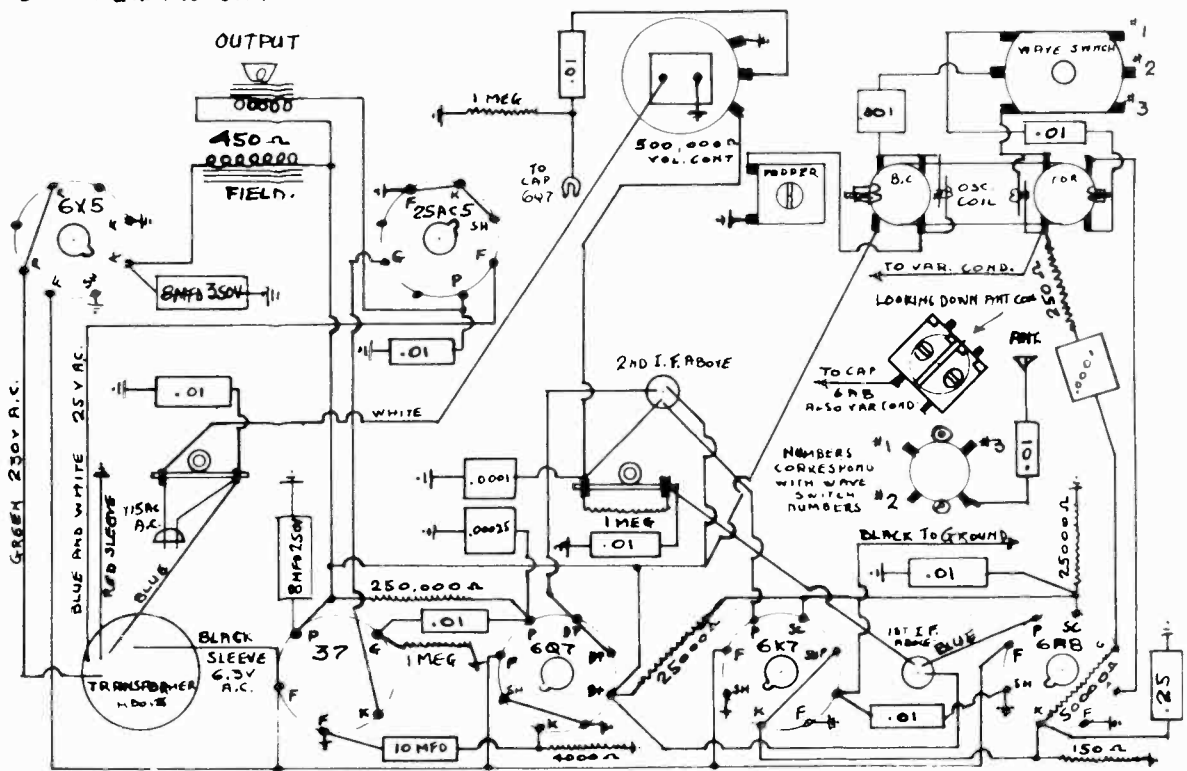
MODEL 7339-A  
MODEL 7339-T

MODEL 7339-A CHAMPION RADIO  
DO NOT GROUND CHASSIS. 456 K.C. 3 BAND AC-D.C.

ANT. COIL ABOVE.

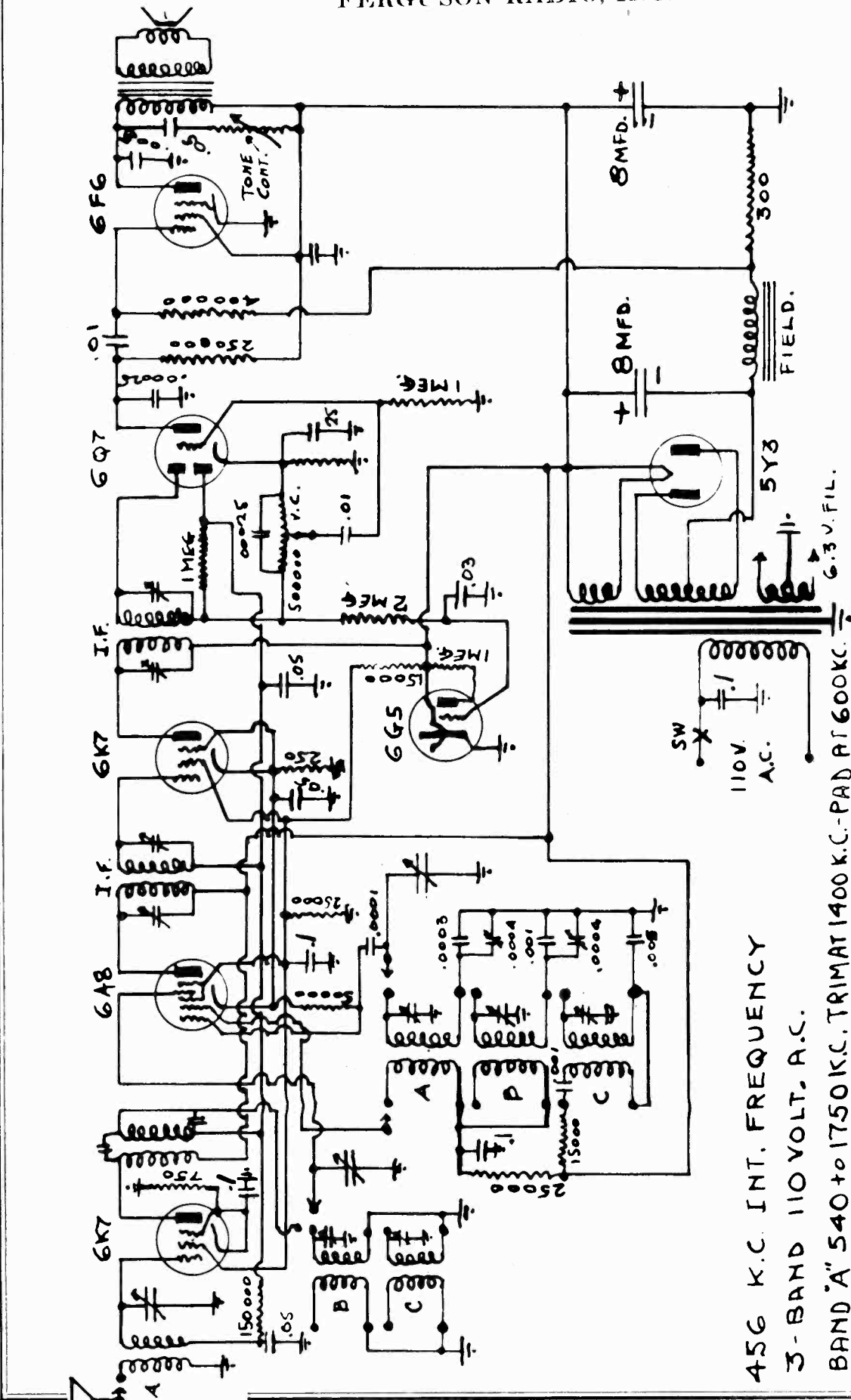


MODEL 7339-T CHAMPION RADIO. AC ONLY. 3 BAND 456 K.C. P.D. AT 600 K.C. TRIM AT 400 KHZ. 13M.  
DO NOT GROUND CHASSIS. ANT. COIL ABOVE.



MODEL 7340TK

FERGUSON RADIO, INC.



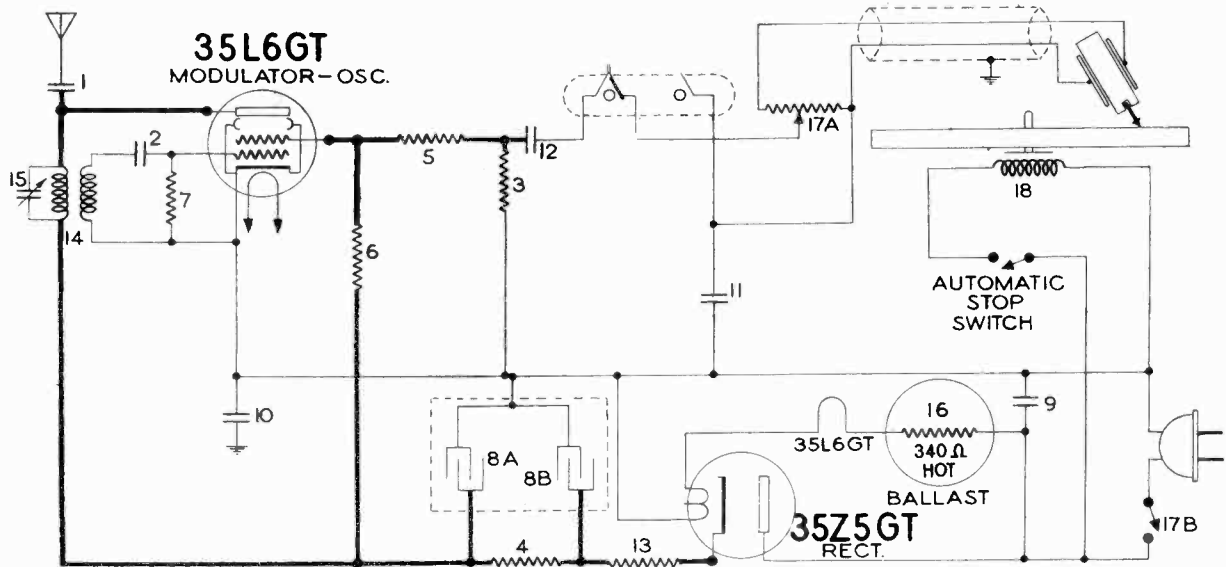
456 K.C. INT. FREQUENCY  
 3-BAND 110 VOLT, A.C.  
 BAND "A" 540 to 1750 K.C. TRIMAT 1400 K.C.-PAD AT 600 K.C.  
 BAND "B" 1750 K.C. TO 5800 K.C.  
 BAND "C" 5.8 M.C. TO 18 M.C.

MODEL 7340TK.



FIRESTONE TIRE & RUBBER CO.

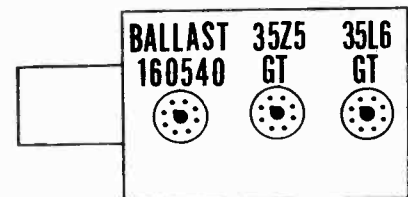
MODEL S-7401-7



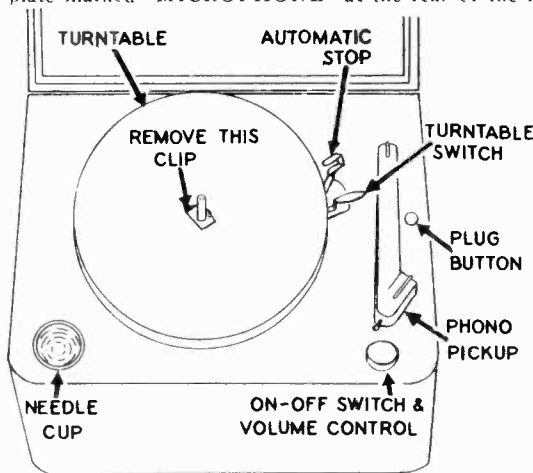
MICROPHONE CONNECTIONS

Provisions have been made so that a high impedance microphone may be connected to the record player. This will permit any sound picked up by the microphone to be heard through the radio receiver. The microphone cable should be equipped with standard 1/8" plugs which should be inserted into the holes in the plate marked "MICROPHONE" at the rear of the record player.

TUBE LOCATIONS



REAR OF CHASSIS



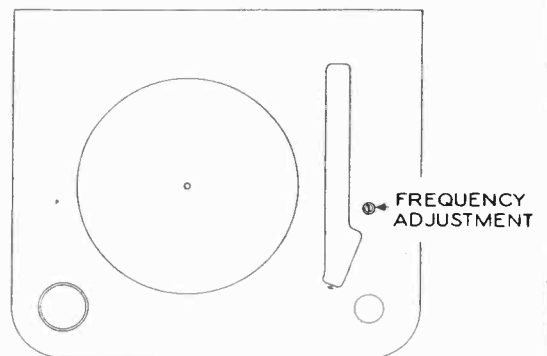
ELECTRICAL PARTS

Diagram Number	Part Number	Description	List Price
1	83539	Condenser—mica, 260 mmfd.	\$0.20
2	83783	Condenser—mica, 110 mmfd.	.20
3	110559	Resistor—carbon 470,000 ohms 1/4 watt.	.12
4	110569	Resistor—carbon 10,000 ohms 1/4 watt.	.12
5	110578	Resistor—carbon 68,000 ohms 1/4 watt.	.12
6	110580	Resistor—carbon 3.3 meg. 1/4 watt.	.12
7	116051	Resistor—insulated 33,000 ohms 1/4 watt.	.15
8A-8B	116470	Condenser—electrolytic 20-20 mfd. 150 volt.	.95
9-10	116625	Condenser—1 mfd. 600 volt.	.25
11-12	116819	Condenser—.05 mfd. 600 volt.	.20
13	118823	Resistor—1000 ohms 1 watt Wire Wound.	.15
14	160499	Coil—oscillator	.26
15	160501	Condenser—tuning	.22
16	160540	Ballast tube	.60
17A-17B	160576	Volume control—250,000 ohms with switch.	1.45
18	160603	Motor—less turntable	5.65

ALL D.C. VOLTAGES MEASURED TO B—(K on 35L6GT)

TUBE	FUNCTION	H	K	G	S	P
35L6GT	Oscillator Modulator	34 V. A.C.	0	—1	Note A	140
35Z5GT	Rectifier	34 V. A.C.	150	—	—	117 V. A.C.

NOTE A: Voltage on the screen of the 35L6GT cannot be measured with the ordinary voltmeter because of the high resistance of resistor No. 6. Use a voltmeter of at least 1000 ohms per volt.

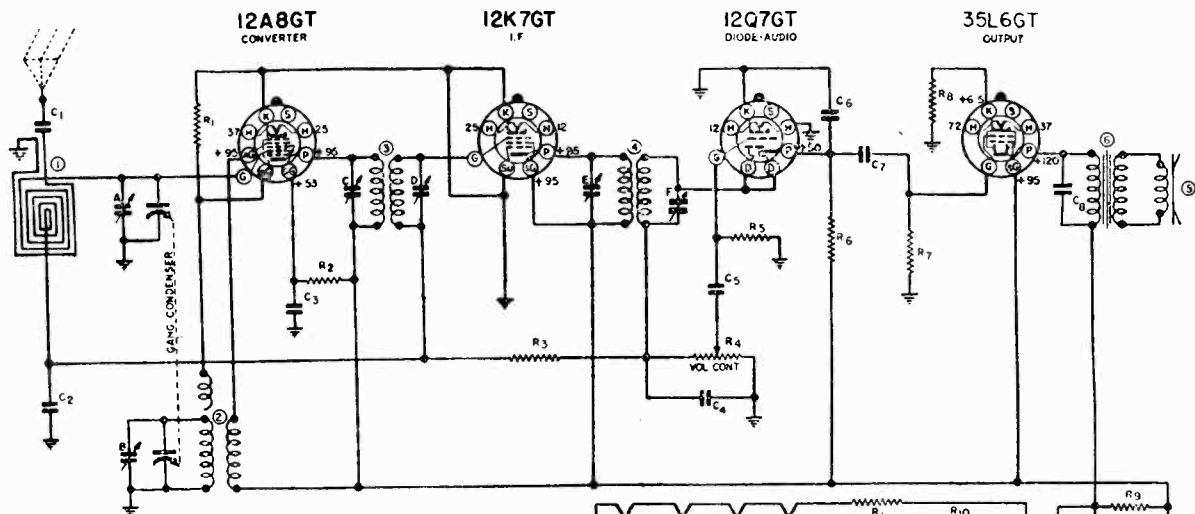


Set the receiver to be used with this record player, to some frequency between 540 and 750 KC which is clear and free from interfering stations. Remove the plug near the volume control on top of the record player. Using an insulated screwdriver turn the screw, located beneath this plug, until the signal from the record player is heard in the receiver. This will be heard as a reduction in noise as the signal comes in tune with the receiver. If a record is being played, the music or sound from it may be tuned in. If it is desired to change the frequency, set the receiver to the new frequency and turn the screw until the signal is heard. The fact that stations which are entirely absent during the day may be present at night with strong signals, should be kept in mind in choosing the frequency to be used. Always choose a frequency which is free from strong interference at all times, day or night.

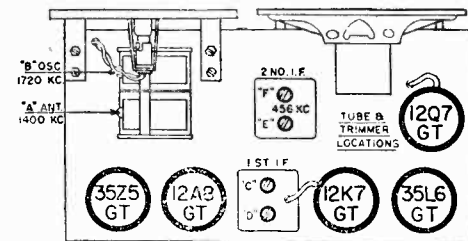
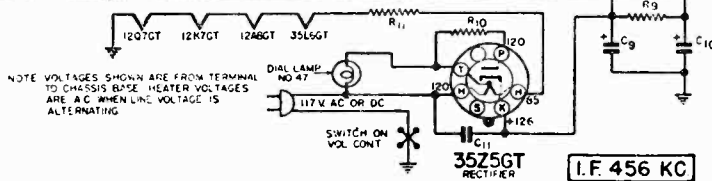
When the record player is located at some distance from the receiver, or under conditions when the signal from it is too weak, the coil of wire from the record player should be uncoiled enough to give a satisfactory signal. Under no conditions should more wire be uncoiled than is necessary for a reasonably strong signal in the receiver.

MODEL S-7403-5

FIRESTONE TIRE & RUBBER CO.



DIAG. NO.	PART NO.	DESCRIPTION	DIAG. NO.	PART NO.	DESCRIPTION
R1	N-1263	50,000 OHM 5W 20%	1	N-3041	ANTENNA COIL LOOP
R2	N-1259	5,000 OHM 5W 20%	2	N-1452	OSCILLATOR COIL
R3	N-1262	1 MEGOHM 5W 20%	3	N-3043	1ST I.F. TRANSFORMER
R4	N-3042	5 MEGOHM VOL. CONT.	4	N-3044	2ND I.F. TRANSFORMER
R5	N-1263	10 MEGOHM 5W 20%	5	N-3039	5" SPEAKER
R6	N-1377	200,000 OHM 5W 20%	6	N-3040	OUTPUT TRANSFORMER
R7	N-1264	100,000 OHM 5W 20%			
R8	N-4515	250 OHM 5W 10%			
R9	N-1237	2,000 OHM 5W 20%			
R10	N-1742	25 OHM 5W 20%			
R11	N-1616	50 OHM 2W 10%			
				N-3046	2 GANG CONDENSER
C1	N-1344	0.1 MFD. 400V.			
C2	N-1345	0.5 MFD. 200V.			
C3	N-1345	0.5 MFD. 200V.			
C4	N-1374	100 MMFD.			
C5	N-1344	0.1 MFD. 400V.			
C6	N-1447	0.005 MFD. 400V.			
C7	N-1343	0.1 MFD. 400V.			
C8	N-1375	0.2 MFD. 400V.			
C9	N-205	15 MFD. 50V. ELECTRO.			
C10	N-205	20 MFD. 150V. ELECTRO.			
C11	N-1346	0.5 MFD. 400V.			



I.F. 456 KC

5 TUBE AC-DC

SUPERMETROPHONE

SINGLE BAND

DESIGN L.T.C. APPROX. 1940

MARCH 18, 1940

KH

Voltages shown on the circuit diagram are from socket terminals to chassis base. In measuring voltages use a voltmeter having a resistance of at least 1000 ohms per volt. Allowances should be made for variations in line voltage.

## TUNING RANGE

This receiver is designed to operate over the standard broadcast band which extends from 535 to 1720 Kilocycles and includes the popular 1712 KC police channel.

## ALIGNMENT PROCEDURE

**GENERAL DATA.** The alignment of this receiver requires the use of a test oscillator that will cover the frequencies of 456, 600, 1400 and 1720 KC and an output meter to be connected across the primary or secondary of the output transformer. If possible, all alignments should be made with the volume control on maximum and the test oscillator output as low as possible to prevent the AVC from operating and giving false readings.

**CORRECT ALIGNMENT PROCEDURE.** The intermediate frequency (I.F.) stages should be aligned properly as the first step. After the I.F. transformers have been properly adjusted and peaked, the broadcast band should be adjusted.

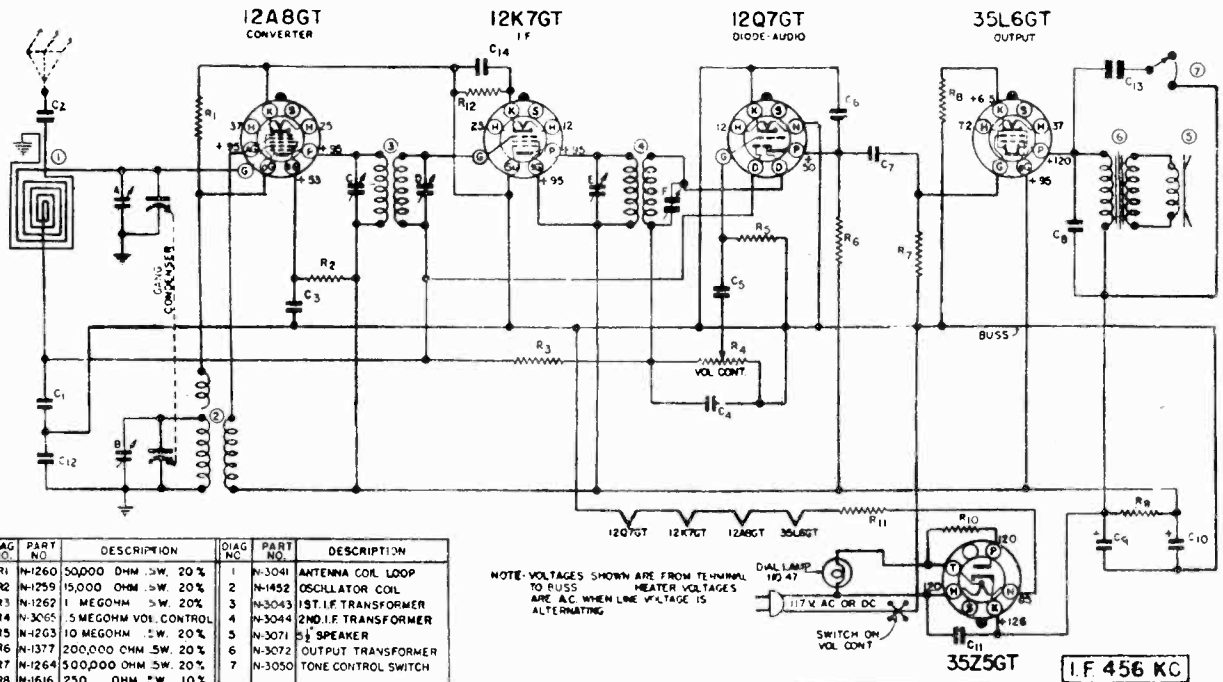
**I. F. ALIGNMENT.** With the gang condenser set at minimum, adjust the test oscillator to 456 KC and connect the output to the grid of the first detector tube (12A8GT) through a .05 or .1 mfd. condenser. The ground on the test oscillator should be connected to the chassis ground. Align all four I.F. trimmers to peak or maximum reading on the output meter.

**BROADCAST BAND ALIGNMENT.** Remove chassis, shield, and loop antenna from cabinet and set them up on the bench so that they occupy exactly the same respective positions on the bench as they did in the cabinet. Care should be taken to have no iron or other metal near the loop. Do not make this set up on a metal bench.

Connect the test oscillator to the antenna of the set through a 200 mmfd. (.0002) condenser. With the gang condenser set at minimum capacity, set the test oscillator at 1720 KC, and adjust the oscillator (or 1720 KC trimmer) on gang condenser. Next—set the test oscillator at 1400 KC, and tune in the signal on the gang condenser. Adjust the antenna trimmer (or 1400 KC trimmer) for maximum signal. Next set the test oscillator at 600 KC, and tune in signal on condenser to check alignment of coils.

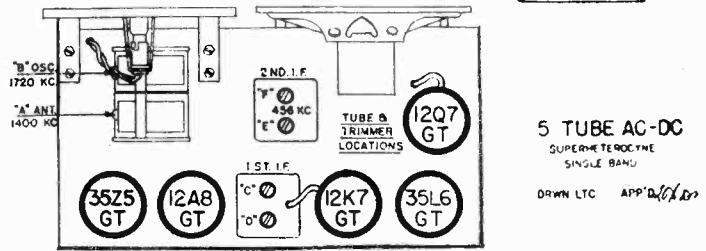
FIRESTONE TIRE & RUBBER CO.

MODEL S-7403-3



DIAG. NO.	PART NO.	DESCRIPTION	DIAG. NO.	PART NO.	DESCRIPTION
R1	N-1260	50,000 OHM 5W. 20%	1	N-3041	ANTENNA COIL LOOP
R2	N-1259	15,000 OHM 5W. 20%	2	N-1452	OSCILLATOR COIL
R3	N-1262	1 MEGOHM 5W. 20%	3	N-3043	1ST. I.F. TRANSFORMER
R4	N-3065	5 MEGOHM VOL. CONTROL	4	N-3044	2ND. I.F. TRANSFORMER
R5	N-1263	10 MEGOHM 5W. 20%	5	N-3071	5" SPEAKER
R6	N-1377	200,000 OHM 5W. 20%	6	N-3072	OUTPUT TRANSFORMER
R7	N-1264	500,000 OHM 5W. 20%	7	N-3050	1.5" TONE CONTROL SWITCH
R8	N-1616	250 OHM 2W. 10%			
R9	N-1257	2000 OHM 5W. 20%			
R10	N-1742	25 OHM 2W. 20%			
R11	N-1618	80 OHM 2W. 10%			
R12	N-2487	200 OHM 2W. 20%			
C1	N-1345	.05 MFD. 200V.			
C2	N-1344	.01 MFD. 400V.			
C3	N-1345	.05 MFD. 200V.			
C4	N-1374	100 MMFD.			
C5	N-1344	.01 MFD. 400V.			
C6	N-1447	.0005 MFD. 400V.			
C7	N-1344	.01 MFD. 400V.			
C8	N-1376	.02 MFD. 400V.			
C9	N-3114	40 MFD. 150V.			
C10	N-3114	25 MFD. 150V. ELECTRO.			
C11	N-1346	.05 MFD. 400V.			
C12	N-3080	.22 MFD. 200V.			
C13	N-1346	.05 MFD. 400V.			
			C14	N-1351	1 MFD. 200V.

NOTE: VOLTAGES SHOWN ARE FROM TERMINAL TO BUSS HEATER VOLTAGES ARE AC WHEN LINE VOLTAGE IS ALTERNATING



5 TUBE AC-DC SUPERHETERODYNE SINGLE BAND

DRWN LTC APP'D [Signature]

Voltages shown on the circuit diagram are from socket terminals to chassis base. In measuring voltages use a voltmeter having a resistance of at least 1000 ohms per volt. Allowances should be made for variations in line voltage.

### TUNING RANGE

This receiver is designed to operate over the standard broadcast band which extends from 535 to 1720 Kilocycles and includes the popular 1712 KC police channel.

### ALIGNMENT PROCEDURE

**GENERAL DATA.** The alignment of this receiver requires the use of a test oscillator that will cover the frequencies of 456, 600, 1400 and 1720 KC and an output meter to be connected across the primary or secondary of the output transformer. If possible, all alignments should be made with the volume control on maximum and the test oscillator output as low as possible to prevent the AVC from operating and giving false readings.

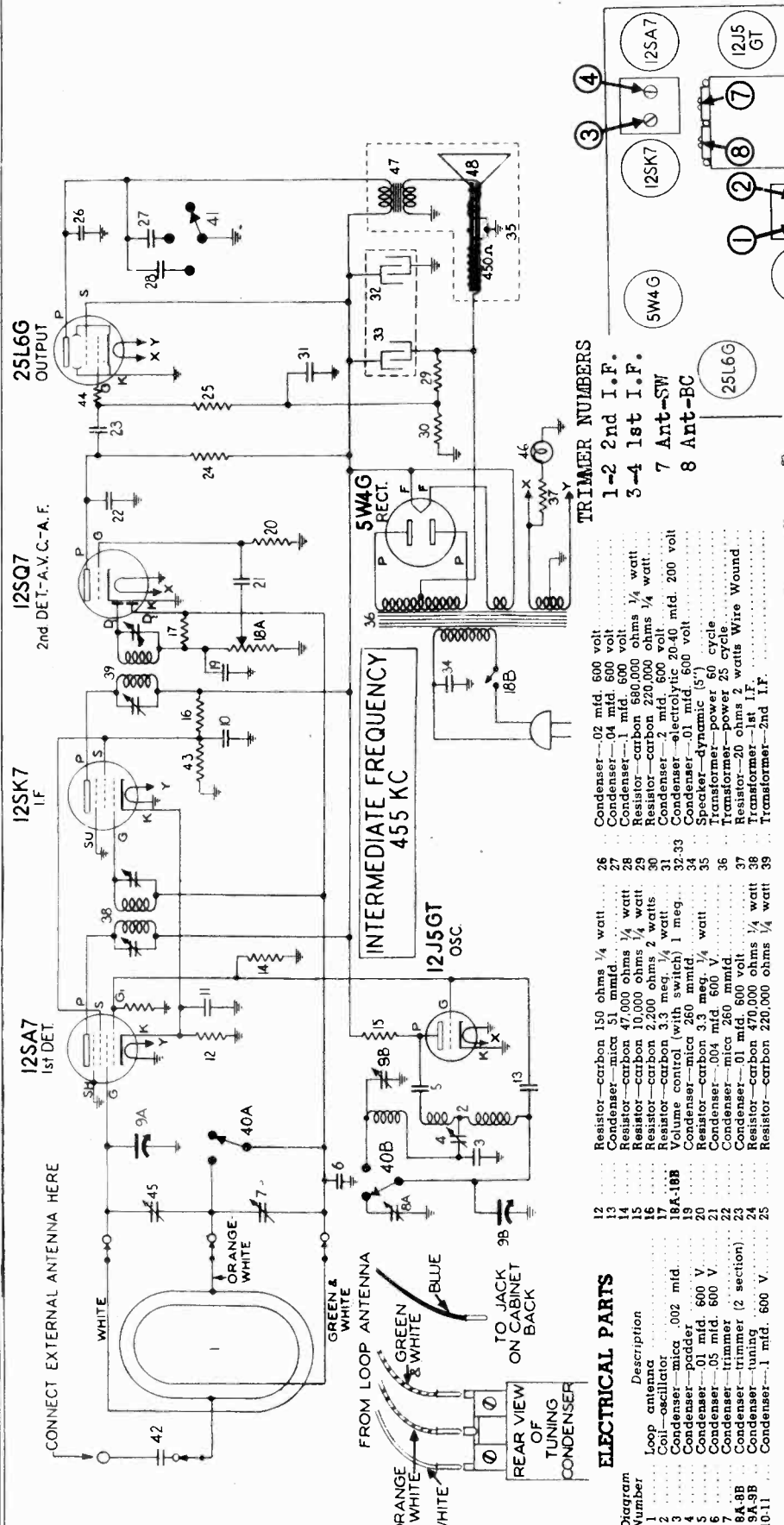
**CORRECT ALIGNMENT PROCEDURE.** The intermediate frequency (I.F.) stages should be aligned properly as the first step. After the I.F. transformers have been properly adjusted and peaked, the broadcast band should be adjusted.

**I. F. ALIGNMENT.** With the gang condenser set at minimum, adjust the test oscillator to 456 KC and connect the output to the grid of the first detector tube (12A8GT) through a .05 or .1 mfd. condenser. The ground on the test oscillator should be connected to

the chassis ground. Align all four I.F. trimmers to peak or maximum reading on the output meter.

**BROADCAST BAND ALIGNMENT.** Remove chassis, shield, and loop antenna from cabinet and set them up on the bench so that they occupy exactly the same respective positions on the bench as they did in the cabinet. Care should be taken to have no iron or other metal near the loop. Do not make this set up on a metal bench.

Connect the test oscillator to the antenna of the set through a 200 mmfd. (.0002) condenser. With the gang condenser set at minimum capacity, set the test oscillator at 1720 KC, and adjust the oscillator (or 1720 KC trimmer) on gang condenser. Next—set the test oscillator at 1400 KC, and tune in the signal on the gang condenser. Adjust the antenna trimmer (or 1400 KC trimmer) for maximum signal. Next set the test oscillator at 600 KC, and tune in signal on condenser to check alignment of coils.



**ELECTRICAL PARTS**

Diagram Number	Description
1	Loop antenna
2	Condenser—mica .002 mid.
3	Condenser—paper .002 mid.
4	Condenser—.05 mid. 600 V.
5	Condenser—.05 mid. 600 V.
6	Condenser—trimmer (2 section)
7	8A-8B
8	9A-9B
10-11	Condenser—.1 mid. 600 V.
12	Resistor—carbon 150 ohms 1/4 watt
13	Condenser—mica .51 mid. 600 volt
14	Resistor—carbon 47,000 ohms 1/4 watt
15	Resistor—carbon 10,000 ohms 1/4 watt
16	Resistor—carbon 2,200 ohms 2 watts
17	Resistor—carbon with med. 1/4 watt
18A-18B	Condenser—mica .260 mid. 600 volt
19	Resistor—carbon 3.3 meg 1/4 watt
20	Condenser—.004 mid. 600 V.
21	Condenser—.004 mid. 600 V.
22	Condenser—.01 mid. 600 volt
23	Condenser—trimmer (2 section)
24	Resistor—carbon 470,000 ohms 1/4 watt
25	Resistor—carbon 220,000 ohms 1/4 watt
26	Resistor—carbon 150 ohms 1/4 watt
27	Condenser—.04 mid. 600 volt
28	Condenser—.1 mid. 600 volt
29	Resistor—carbon 220,000 ohms 1/4 watt
30	Resistor—carbon 220,000 ohms 1/4 watt
31	Condenser—electrolytic 20-40 mid. 200 volt
32-33	Condenser—.01 mid. 600 volt
34	Speaker—dynamic (5")
35	Transformer—power 60 cycle
36	Transformer—power 25 cycle
37	Resistor—20 ohms 2 watts Wire Wound
38	Transformer—1st I.F.
39	Transformer—2nd I.F.

**SOCKET VOLTAGES—ALL D.C. POTENTIAL MEASURED TO CHASSIS**  
DIAL TUNED TO 540 K.C.  
NO SIGNAL CONDITION

TUBE FUNCTION	H	K	G	G <sub>1</sub>	S	SU	P	D <sub>1</sub>	D <sub>2</sub>
12SA7 1st DET.	12.0 A.C.	1.9	0	-5	73		120		
12J5GT OSC.	12.0 A.C.	0	-5		73	0	85		
12SK7 I.F.	12.0 A.C.	1.9	0		73	0	120		
12SQ7 2nd DET. A.V.C.-A.F.	12.0 A.C.	0	0				NOTE B	0	0
25L6G OUTPUT	25.0 A.C.	0	NOTE A				110		
5W4G RECTIFIER	5.0 A.C.						150 V.A.C. to C.T.		

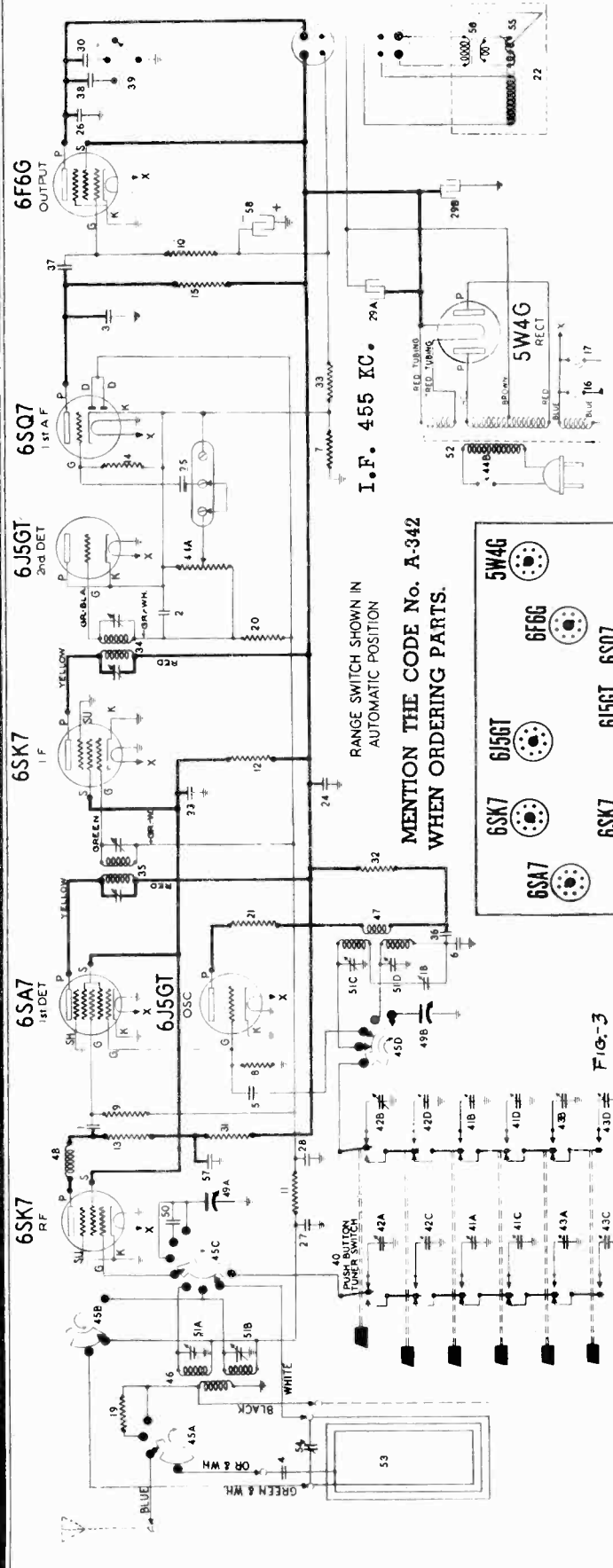
**NOTE A:** The 25L6G grid bias is —8.5 volts measured across resistor No. 30.  
**NOTE B:** Due to the high resistance of No. 24, only a small voltage will be measured here.  
Use a high resistance voltmeter of at least 1000 ohms per volt.

**TRIMMER NUMBERS**  
1-2 2nd I.F.  
3-4 1st I.F.  
7 Ant-SW  
8 Ant-BC

**TRIM OSC-SW-6 MC**  
" OSC-BC-1500 KC  
" ANT-SW-6 MC  
" ANT-BC-1500 KC

Adjust ANT trimmers and OSC padder after replacing set in cabinet. Use 50 mmf condenser as dummy antenna, connected to blue wire- or lay RF lead of signal generator near the loop.

FIRESTONE TIRE & RUBBER CO.



I.F. 455 KC.

RANGE SWITCH SHOWN IN AUTOMATIC POSITION

MENTION THE CODE NO. A-342 WHEN ORDERING PARTS.

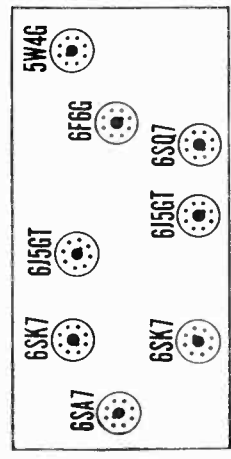


Diagram Number	Part Number	Description	List Price
1-2-3	83539	Condenser—mica 250 mmd.	\$0.20
4	83783	Condenser—mica 110 mmd.	15
5	85061	Condenser—mica 30 mmd.	35
6	118574	Resistor—carbon 100,000 ohms 1/2 watt	12
7	118574	Resistor—carbon 100,000 ohms 1/4 watt	12
8	118574	Resistor—carbon 100,000 ohms 1/4 watt	12
9	118574	Resistor—carbon 100,000 ohms 1/4 watt	12
10-11	118574	Resistor—carbon 100,000 ohms 1/4 watt	12
12	118574	Resistor—carbon 100,000 ohms 1/4 watt	12
13	118574	Resistor—carbon 100,000 ohms 1/4 watt	12
14	118574	Resistor—carbon 100,000 ohms 1/4 watt	12
15	118574	Resistor—carbon 100,000 ohms 1/4 watt	12
16-17	118574	Resistor—carbon 100,000 ohms 1/4 watt	12
18	118574	Resistor—carbon 100,000 ohms 1/4 watt	12
19	118574	Resistor—carbon 100,000 ohms 1/4 watt	12
20	118574	Resistor—carbon 100,000 ohms 1/4 watt	12
21	118574	Resistor—carbon 100,000 ohms 1/4 watt	12
22	118574	Resistor—carbon 100,000 ohms 1/4 watt	12
23-24	118574	Resistor—carbon 100,000 ohms 1/4 watt	12
25-26	118574	Resistor—carbon 100,000 ohms 1/4 watt	12
27-28	118574	Resistor—carbon 100,000 ohms 1/4 watt	12
29A, 29B	118574	Resistor—carbon 100,000 ohms 1/4 watt	12
30	118574	Resistor—carbon 100,000 ohms 1/4 watt	12
31-32	118574	Resistor—carbon 100,000 ohms 1/4 watt	12
33	118574	Resistor—carbon 100,000 ohms 1/4 watt	12
34	118574	Resistor—carbon 100,000 ohms 1/4 watt	12
35	118574	Resistor—carbon 100,000 ohms 1/4 watt	12
36-37-38	118574	Resistor—carbon 100,000 ohms 1/4 watt	12
39	118574	Resistor—carbon 100,000 ohms 1/4 watt	12
40	118574	Resistor—carbon 100,000 ohms 1/4 watt	12
41A to 41D	118574	Resistor—carbon 100,000 ohms 1/4 watt	12
42A to 42D	118574	Resistor—carbon 100,000 ohms 1/4 watt	12
43A to 43D	118574	Resistor—carbon 100,000 ohms 1/4 watt	12
44A, 44B	118574	Resistor—carbon 100,000 ohms 1/4 watt	12
45A to 45D	118574	Resistor—carbon 100,000 ohms 1/4 watt	12
46	118574	Resistor—carbon 100,000 ohms 1/4 watt	12
47	118574	Resistor—carbon 100,000 ohms 1/4 watt	12
48	118574	Resistor—carbon 100,000 ohms 1/4 watt	12

Diagram Number	Part Number	Description	List Price
49A to 49B	119812	Gang condenser	2.65
50	119815	Condenser—mica 370 mmd.	24
51A to 51D	119819	Condenser—trimmer (4 section)	60

Rear of Chassis

SOCKET VOLTAGES—ALL D.C. POTENTIAL MEASURED TO CHASSIS  
NO SIGNAL CONDITION  
DIAL TUNED TO 540 K.C.

TUBE	FUNCTION	H	K	G	G <sub>1</sub>	S	SU	P	D <sub>1</sub>	D <sub>2</sub>
6SK7	R.F.	6.0 A.C.	0	Note A	—	93	0	125		
6SA7	1st Det.	6.0 A.C.	0	Note A	—	93		235		
6J5GT	Osc.	6.0 A.C.	0	—	—	155		155		
6SK7	I.F.	6.0 A.C.	0	Note A	—	93		235		
6J5GT	2nd Det - A.V.C.	6.0 A.C.	2.8	Note A	—			—		
6SQ7	1st A.F.	6.0 A.C.	2.8	Note A	—			55	Note A	Note A
6F6G	Output	6.0 A.C.	0	Note B	—	235		215		
5W4G	Rectifier	5.0 A.C.								Plates 350 V.A.C. to C.T.

NOTE A: This voltage to ground is —2.8 volts measured across resistor No. 7.  
NOTE B: The bias for this grid is —16 volts measured across resistor No. 33 and No. 7.  
Use a high resistance voltmeter of at least 1000 ohms per volt.

FOR ALIGNMENT, TRIMMERS, P.B. DATA - SEE INDEX



FIRESTONE TIRE & RUBBER CO.

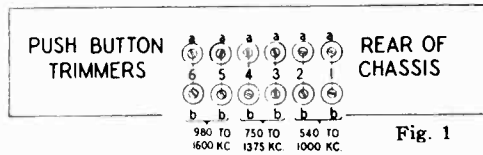
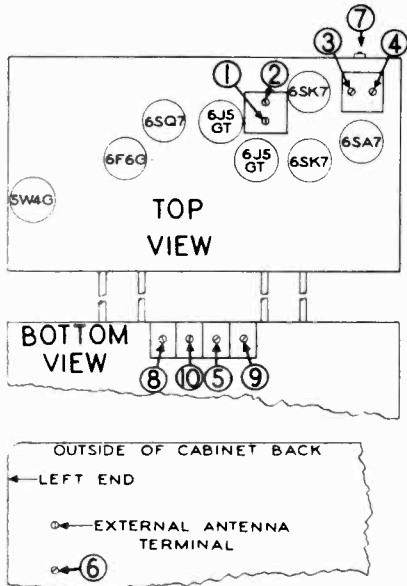


Fig. 1



TO SET UP THE BUTTONS FOR AUTOMATIC TUNING:

1. Turn the set on and allow it to operate at least fifteen minutes before attempting to set up the buttons.
2. Make a list of the frequencies of six nearby stations to which you wish to set up the buttons. Be sure to select the most powerful nearby stations, since weak signals will not give as satisfactory results. Also be sure to select stations that fall well within the frequency range of the buttons as shown in Fig. 1.
3. With the Band Switch in the "AM" Position tune in the station to be set up. Then turn the range switch to Automatic Position "AUT." Position and push in the button to be set up, being sure to select a button with the proper frequency range (see Fig. 1).
4. At the back of the chassis, as viewed from the rear of the radio, will be found 12 holes numbered in pairs to correspond to the numbers of the buttons. See Fig. 1. Adjust the "a" screw with the number corresponding to the number of the button you have pushed in, until the same station is again heard. Tune accurately, adjusting for deepest tone.
5. Now adjust the "b" screw (located below the "a" screw) until maximum output is obtained. Make a final adjustment on the "a" screw, always tuning for deepest tone.
6. The set-up is now complete for this button.

The remaining buttons may be set up in the same way.

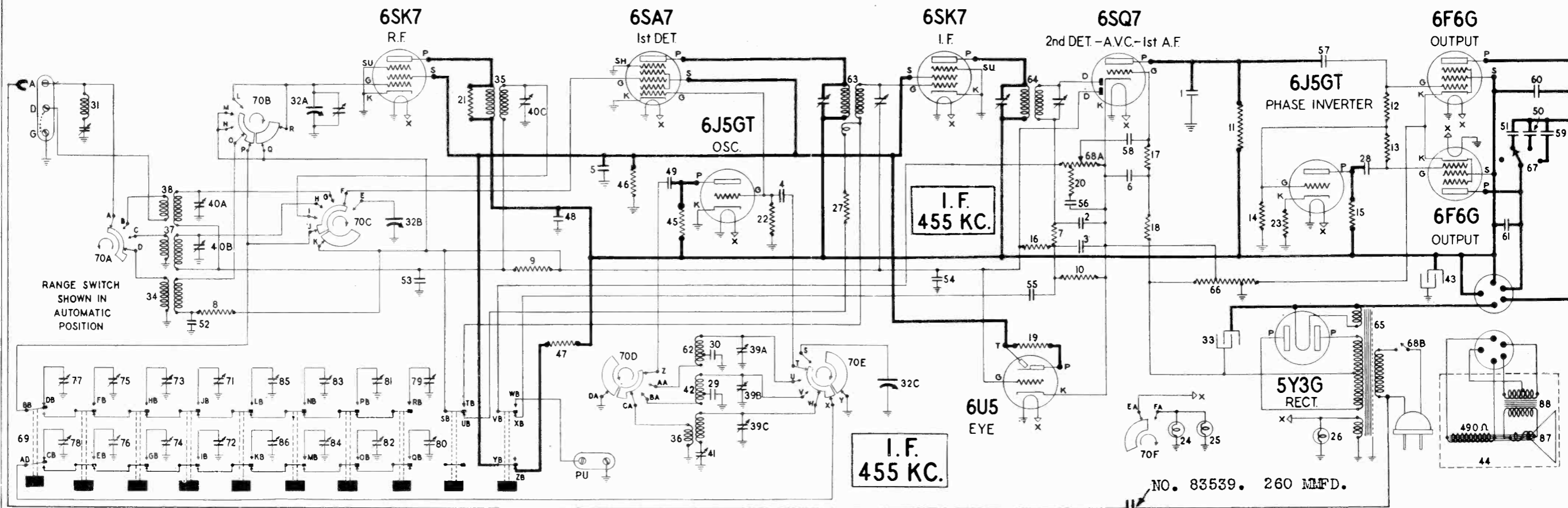
1. Connect the output meter across the voice coil or from the plate of the 6F6G output tube to ground through a .1 mfd. condenser. (The more sensitive type should be connected across the voice coil.)
2. Connect the ground lead of the signal generator to the receiver chassis.
3. Turn the volume control to the maximum volume position and keep it in this position throughout the alignment procedure.
4. Check the pointer to see that it is correctly set. Connect the loop antenna as shown in Fig. 3.

ALIGNMENT PROCEDURE

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Band Switch Position	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
1 MFD Condenser	Lug on Rear Section of Gang Cond.	455 KC	Broadcast	Any Point Where It Does Not Affect the Signal	1-2	2nd I.F.	Adjust for Maximum Output. Then Repeat Adjustment.
					3-4	1st I.F.	
200 MMFD. Mica Condenser	External Ant. Terminal	1500 KC	Broadcast	1500 KC	5	Broadcast Oscillator (Shunt)	Adjust for Maximum Output.
200 MMFD. Mica Condenser	External Ant. Terminal	1500 KC	Broadcast	Tune to 1500 KC Generator Signal	6*	Broadcast Antenna	Adjust for Maximum Output.
200 MMFD. Mica Condenser	External Ant. Terminal	600 KC	Broadcast	Tune to 600 KC Generator Signal	7*	Broadcast Oscillator (Series)	Adjust for Maximum Output. Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.
400 OHM Carbon Resistor	External Ant. Terminal	2.5 MC	Intermediate	Tune to 2.5 MC Generator Signal	8	Intermediate Antenna	Adjust for Maximum Output.
400 OHM Carbon Resistor	External Ant. Terminal	16 MC	Foreign	16 MC	9	Foreign Oscillator	Adjust for Maximum Output. Check to see if Proper Peak was Obtained by Tuning in Image at Approx. 15.1 MC. If Image does not appear. Realign at 16 MC. with Trimmer Screw farther out. Recheck Image.
400 OHM Carbon Resistor	External Ant. Terminal	16 MC	Foreign	Tune to 16 MC Generator Signal	10	Foreign Antenna	Adjust for Maximum Output. Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.

When making these adjustments the loop must be in the same relative position to the chassis as when in the cabinet. Using a weak radiated signal, repeat adjustment 6 after set is in cabinet.

FIRESTONE TIRE & RUBBER CO.



ELECTRICAL PARTS

Diagram Number	Part Number	Description	List Price	Diagram Number	Part Number	Description	List Price
1	83539	Condenser—mica, 260 mmfd.	\$0.20	40A-40B-40C	113320	Condenser—trimmer—3 section	\$0.54
2-3	83783	Condenser—mica, 110 mmfd.	.20	41	113346	Condenser—padding	.38
4	85061	Condenser—mica, 51 mmfd.	.15	42	113412	Coil—oscillator (police)	1.20
5	88682	Condenser—paper, .1 mfd., 400 volt.	.25	43	114972	Condenser—electrolytic, 16 mfd., 450 volt.	.78
6	89421	Condenser—paper, .1 mfd., 200 volt.	.25	44	R-115070	Speaker—dynamic, 12"	10.50
7	110552	Resistor—carbon, 47,000 ohms, 1/4 watt.	.12	45	116055	Resistor—carbon, 22,000 ohm, 1/2 watt.	.12
8-9-10-11	110553	Resistor—carbon, 220,000 ohms, 1/4 watt.	.12	46	116085	Resistor—10,000 ohms, 2 watt.	.20
12-13-14-15	110554	Resistor—carbon, 1 megohm, 1/4 watt.	.12	47	116093	Resistor—10,000 ohms, 5 watt.	.38
16-17-18-19	110555	Resistor—carbon, 22,000 ohms, 1/4 watt.	.12	48	116625	Condenser—.1 mfd., 600 volt.	.25
20	110565	Resistor—carbon, 2,200 ohms, 1/4 watt.	.12	49-50	116640	Condenser—.01 mfd., 600 volt.	.15
21	110573	Resistor—carbon, 2,200 ohms, 1/4 watt.	.12	51	116647	Condenser—.004 mfd., 600 volt.	.15
22	110578	Resistor—carbon, 68,000 ohms, 1/4 watt.	.12	52-53-54	116819	Condenser—.05 mfd., 600 volt.	.15
23	110586	Resistor—carbon, 2,200 ohms, 1/4 watt.	.12	55-56-57-58	116893	Condenser—.02 mfd., 600 volt.	.15
24-25-26	110629	Lamp—6.3 volt—25 amps.	.15	59	116984	Condenser—.04 mfd., 600 volt.	.20
27	110975	Resistor—33 ohms, 1/2 watt (10%), W.W.	.12	60-61	117022	Condenser 0.002 mfd.—600 volt.	.15
28	111252	Condenser—paper, .05 mfd., 400 volt.	.13	62	113607	Coil—short wave oscillator	.52
29	112426	Condenser—mica, 1650 mmfd. (3%)	.30	63	117616	Transformer—1st I.F.	1.50
30	112427	Condenser—mica, 4050 mmfd. (3%)	.40	64	117618	Transformer—2nd I.F.	1.50
31	112796	Coil—wave trap (with trimmer)	.50	65	117633	Transformer—power	9.00
32A-32B-32C	113216	Condenser—Gang	6.50	66	117669	Resistor—bias strip	.52
33	113261	Condenser—electrolytic, 30 mfd., 450 volt.	1.40	67	117677	Switch—tone control	.80
34	113295	Coil—antenna (B.C.)	1.20	68A-68B	117885	Volume control (400,000 ohms) with switch	1.00
35	113296	Coil—R.F. (B.C.)	1.30	69	117686	Push button switch	3.90
36	113297	Coil—oscillator (B.C.)	.48	70A to 70F	117692	Range switch	5.00
37	113298	Coil—antenna (police)	.50	71 to 78	117726	Condenser—trimmer gang (high frequency section)	3.90
38	113301	Coil—antenna (S.W.)	.52	79 to 86	117727	Condenser—trimmer gang (low frequency section)	3.90
39A-39B-39C	113319	Condenser—trimmer—3 section	.54	87	R-117789	Cone & Voice Coil for R-115070 speaker	3.00
				88	R-117790	Output transformer for R-115070	1.95

ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE

SOCKET VOLTAGES—ALL D.C. VOLTAGES MEASURED TO CHASSIS

TUBE	FUNCTION	H	K	G	G <sub>1</sub>	S	SU	P	D <sub>1</sub>	D <sub>2</sub>
6SK7	R.F.	6.0 A.C.	0	Note A		95	0	285		
6SA7	1st Det.	6.0 A.C.	0	Note A	—8	95		285		
6J5GT	Oscillator	6.0 A.C.	0	—8				104		
6SK7	I.F.	6.0 A.C.	0	Note A		95	0	285		
6SQ7	2nd Det., A.V.C., A.F.	6.0 A.C.	—3	Note B				175	Note A	Note A
6J5GT	Phase Inverter	6.0 A.C.	2	0				41		
6F6G	Output	6.0 A.C.	20	0		285		270		
6F6G	Output	6.0 A.C.	20	0		285		270		
6U5	Tuning Eye	6.0 A.C.	—3	Note A					T=95 Volts*	
5Y3G	Rectifier	5.0 A.C.							Plates 375 V. A.C.	

NOTE A: Due to the high resistance of resistors No. 16, No. 7, No. 8, and No. 9, only very slight deflections of the voltmeter will be obtained.

NOTE B: Voltage is —5 volts measured at resistor No. 66.

\*Voltages measured at end of tuning eye cable.

Use a high resistance voltmeter of at least 1000 ohms per volt.

**ALIGNMENT PROCEDURE**

FOR ALIGNMENT: An output meter and an accurately calibrated signal generator are required.

1. Connect the output meter across the voice coil or across the plates of the 6F6G output tubes depending on the type of meter. (The more sensitive type should be connected across the voice coil.)
2. Connect the ground lead of the signal generator to the receiver chassis or to the "G" terminal at the back of the chassis. NOTE: The "G" and "D" terminals on this terminal strip must be connected together.
3. Turn the volume control to the maximum volume position and keep it in this position throughout the alignment procedure.
4. Push in the "Selectivity" button and keep it pushed in. Check the pointer to see that it is correctly set.

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Band Switch Position	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD Condenser	Lug on Middle Section of Gang Cond.	455 KC	Broadcast	Any Point Where it Does Not Affect the Signal	1-2	2nd I.F.	Adjust for Maximum Output. Then Repeat Adjustment.
					3-4	1st I.F.	
400 OHM Carbon Resistor	"A" Terminal	455 KC	Broadcast	Any Point Where it Does Not Affect the Signal	5	Wave Trap	Adjust for Minimum Output, Using a Strong Generator Signal.
400 OHM Carbon Resistor	"A" Terminal	1500 KC	Broadcast	1500 KC	6	Broadcast Oscillator (Shunt)	Adjust for Maximum Output.
400 OHM Carbon Resistor	"A" Terminal	1500 KC	Broadcast	Tune to 1500 KC Generator Signal	7	Broadcast Detector	Adjust for Maximum Output.
					8	Broadcast Antenna	
400 OHM Carbon Resistor	"A" Terminal	600 KC	Broadcast	Tune to 600 KC Generator Signal	9	Broadcast Oscillator (Series)	Adjust for Maximum Output. Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.
400 OHM Carbon Resistor	"A" Terminal	6 MC	Intermediate	6 MC	10	Intermediate Oscillator	Adjust for Maximum Output. Check to see if Proper Peak was Obtained by Tuning in Image at Approx. 5.1 MC. If Image does not appear, Realign at 6MC. with Trimmer Screw farther out. Recheck Image.
400 OHM Carbon Resistor	"A" Terminal	6 MC	Intermediate	Tune to 6 MC Generator Signal	11	Intermediate Antenna	Adjust for Maximum Output.
400 OHM Carbon Resistor	"A" Terminal	20 MC	Foreign	20 MC	12	Foreign Oscillator	Adjust for Maximum Output. Check to see if Proper Peak was Obtained by Tuning in Image at Approx. 19.1 MC. If image does not appear, Realign at 20MC. with Trimmer Screw farther out. Recheck image.
400 OHM Carbon Resistor	"A" Terminal	20 MC	Foreign	Tune to 20 MC Generator Signal	13	Foreign Antenna	Adjust for Maximum Output. Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.

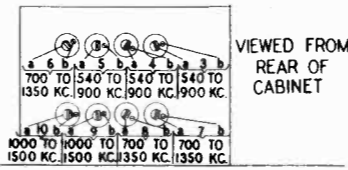
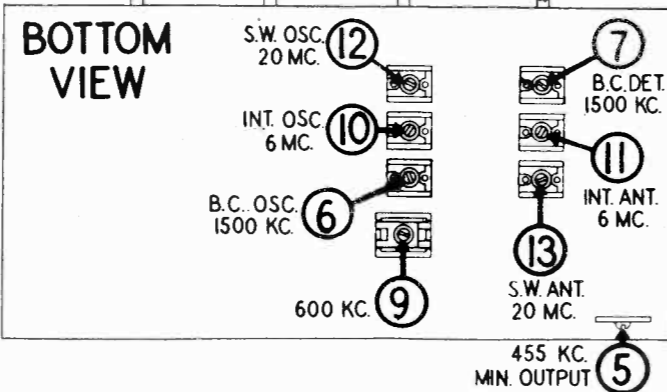
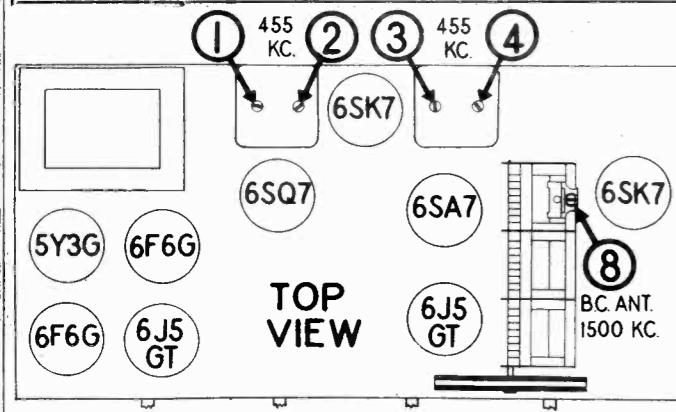
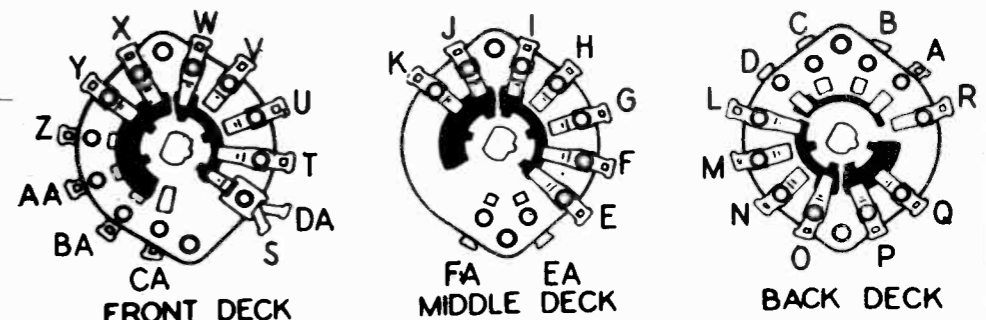


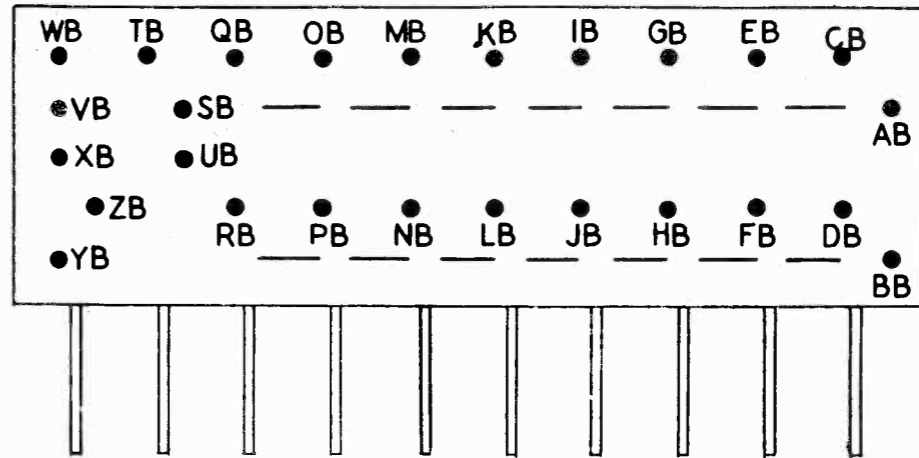
Fig. 1

FOR PUSH BUTTON DATA SEE INDEX.

FRONT VIEW OF RANGE SWITCH DECKS.



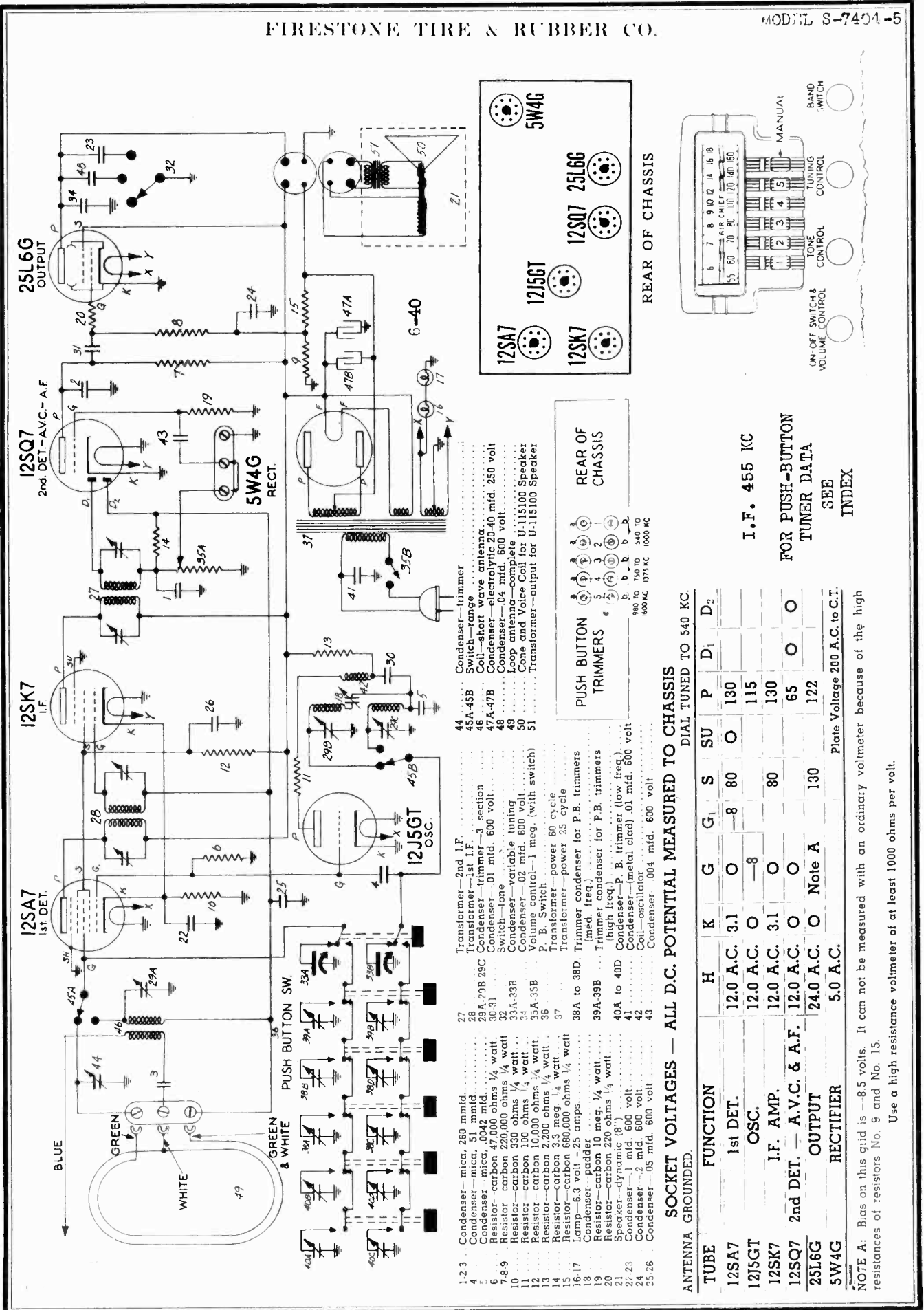
PUSH-BUTTON TUNER SWITCH



LETTERS ON TERMINALS OF SWITCHES SHOWN ABOVE CORRESPOND TO SIMILARLY LETTERED TERMINALS ON THE SWITCHES SHOWN IN THE CIRCUIT DIAGRAM.

**MISCELLANEOUS PARTS**

Part No.	Description	List Price	Part No.	Description	List Price
114043	Band Indicator slide & strip	\$0.36	117662	Pointer assembly	\$0.32
113442	Bracket—for tuning eye	.16	112762	Pulley—dial cord drive	.04
114032	Bracket and pulley assembly—right hand	.34	114047	Pulley—on band indicator shaft	.34
114034	Bracket and pulley assembly—left hand	.34	113887	Push button	.04
117703	Cable & socket for tuning eye	1.00	113463	Rubber bushing—chassis mtg.	.03
114955	Clamp for dial cord	.01	83624	Screw—self tapping 8x1/4	.01
114042	Clamp for dial scale	.10	85040	Screw—No. 6 Hex. Hd.	Per C
112798	Clip for mtg. wave trap coil	.01	85827	Set screw—8-32 sq. head	.02
110808	Clip—for tuning eye support	.14	111116	Screw—No. 5x5/8; mechanism mtg.	.02
114031	Collar—for band switch shaft	.10	112874	Screw—No. 10x1 1/8 chassis mtg.	.01
85321	Connector—for antenna strip	.01	114914	Screw—special head for mtg. escutcheon	.15
113178	Cord—dial	.30	117661	Shaft—auxiliary range switch shaft	.28
116948	Cord—dial drive (supplied in 6 ft. lengths)	.18	114084	Slide and strip assembly for tone indicator	.36
117057	Cord—drive (supplied in 2 foot lengths)	.15	114117	Socket—dial lamp	.18
111973	Cushion—rubber rest for back of chassis	.06	85427	Socket—octal base (standard)	.15
117740	Dial scale	1.00	113025	Socket—octal base (with special ground)	.15
113338	Drum—dial drive	.54	117704	Socket—for speaker 5 prong	.13
114052	Escutcheon—dial	2.00	111090	Spacer—steel, mechanism mtg. to chassis	.02
113890	Escutcheon—eye	.10	113177	Spring—dial cord tension	.09
114053	Escutcheon—push button	.60	114046	Spring—for band indicator drive	.05
113347	Gear—on range switch shaft	.20	114041	Tabs—station call letters	.36
113207	Gear—pinion on auxiliary range switch shaft	.25	85066	Terminal strip—G.D.A.	.20
117087	Knob for tuning or volume	.12	117664	Tuning shaft	.32
117687	Light shield	.05	110829	Washer—flat steel, for mtg. chassis	.01
			116530	Washer (paper) for back of knobs	.005



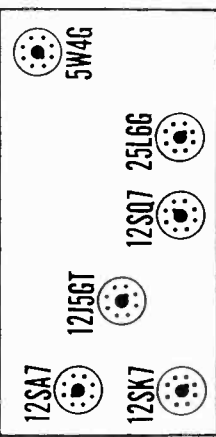
- 1-2 3 Condenser—mica, 250 mmfd.
- 4 Condenser—mica, .0042 mid.
- 5 Resistor—carbon 47,000 ohms 1/4 watt.
- 6 Resistor—carbon 220,000 ohms 1/4 watt.
- 7-8 9 Resistor—carbon 100 ohms 1/4 watt.
- 10 Resistor—carbon 10,000 ohms 1/4 watt.
- 11 Resistor—carbon 2,200 ohms 1/4 watt.
- 12 Resistor—carbon 3.3 meg 1/4 watt.
- 13 Resistor—carbon 680,000 ohms 1/4 watt.
- 14 Lamp—6.3 volt—25 amps.
- 15 Condenser—padder
- 16-17 Resistor—carbon 10 meg. 1/4 watt.
- 18 Resistor—carbon 220 ohms 1/4 watt.
- 19 Speaker—dynamic (8")
- 20 Resistor—dynamic (8")
- 21-23 Condenser—1 mid. 600 volt.
- 24 Condenser—2 mid. 600 volt.
- 25-26 Condenser—.05 mid. 600 volt.
- 27 Transformer—2nd I.F.
- 28 Transformer—1st I.F.
- 29A, 29B 29C Trimmer—3 section
- 30 Switch—tone
- 31 Condenser—.01 mid. 600 volt.
- 32 33A, 33B Condenser—variable tuning
- 34 Condenser—.02 mid. 600 volt.
- 35A, 35B Volume control—1 meg. (with switch)
- 36 P. B. Switch
- 37 Transformer—power 60 cycle
- 38A to 38D Trimmer—power for P.B. trimmers (med. freq.)
- 39A, 39B Trimmer—power for P.B. trimmers (high freq.)
- 40A to 40D Condenser—P. B. trimmer (low freq.)
- 41 Condenser—(metal clad) .01 mid. 600 volt
- 42 Coil—oscillator
- 43 Condenser .004 mid. 600 volt
- 44 Condenser—trimmer
- 45A-45B Switch—range
- 46 Coil—high-imp. antenna
- 47A-47B Condenser—electrolytic 20-40 mfd. 250 volt
- 48 Condenser—.04 mid. 600 volt.
- 49 Loop antenna—complete
- 50 Cone and Voice Coil for U-115100 Speaker
- 51 Transformer—output for U-115100 Speaker

SOCKET VOLTAGES — ALL D.C. POTENTIAL MEASURED TO CHASSIS DIAL TUNED TO 540 KC.

TUBE	FUNCTION	H	K	G	G <sub>1</sub>	S	SU	P	D <sub>1</sub>	D <sub>2</sub>
12SA7	1st DET.	12.0 A.C.	3.1	O	8	O	130	O	130	
12J5GT	OSC.	12.0 A.C.	O	8			115			
12SK7	I.F. AMP.	12.0 A.C.	3.1	O	80		130			
12SQ7	2nd DET. — A.V.C. & A.F.	12.0 A.C.	O	O			65	O	O	
25L6G	OUTPUT	24.0 A.C.	O	Note A	130		122			
5W4G	RECTIFIER	5.0 A.C.								Plate Voltage 200 A.C. to C.T.

NOTE A: Bias on this grid is —8.5 volts. It can not be measured with an ordinary voltmeter because of the high resistances of resistors No. 9 and No. 15.

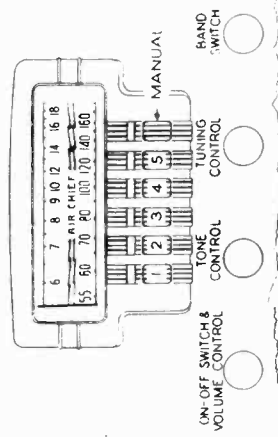
Use a high resistance voltmeter of at least 1000 ohms per volt.



REAR OF CHASSIS



REAR OF CHASSIS



I.F. 455 KC

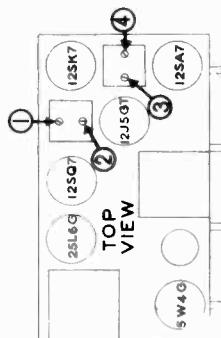
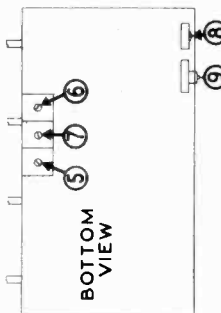
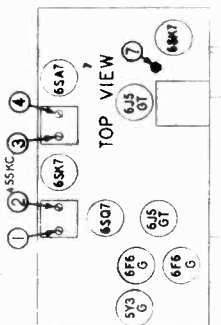
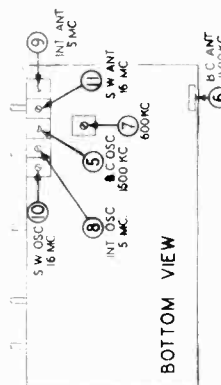
FOR PUSH-BUTTON  
TUNER DATA  
SEE  
INDEX

MODEL S-7404-5  
S-7404-6  
S-7406-6

FIRESTONE TIRE & RUBBER CO.

S-7404-6  
ALIGNMENT EQUIPMENT & PROCEDURE

1. Connect the output meter across the voice coil or from plate to plate of the 6F6G output tubes through a .1 mfd. condenser. (The more sensitive type should be connected across the voice coil.)
2. Connect the ground lead of the signal generator to the receiver chassis and plug black wire lead from chassis into the inside clip on loop drum top.
3. Turn the volume control to the maximum position and keep it in this position throughout the alignment procedure.
4. Push in the "Manual" button and keep it pushed in. Check the pointer to see that it is correctly set to 540 KC. with gang in full mesh.
5. The loop must be connected as indicated in circuit diagram at all times.



Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Band Switch Position	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD Condenser	Lug on Front Section of Gang Cond.	455 KC	Broadcast	Any Point Where It Does Not Affect the Signal	1-2 3-4	2nd I.F. 1st I.F.	Adjust for Maximum Output. Then repeat Adjustment.
200 MMFD Mica Condenser	Clip on Loop Drum	1500 KC	Broadcast	1500 KC	5	Broadcast Oscillator (Shunt)	Adjust for Maximum Output.
200 MMFD Mica Condenser	Clip on Loop Drum	1500 KC	Broadcast	Tune to 1500 KC Generator Signal	6	Broadcast Antenna	Adjust for Maximum Output.
200 MMFD Mica Condenser	Clip on Loop Drum	600 KC	Broadcast	Tune to 600 KC Generator Signal	7	Broadcast Oscillator (Series)	Adjust for Maximum Output Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.
400 OHM Carbon Resistor	Clip on Loop Drum	5 MC	Intermediate	5 MC	8	Intermediate Oscillator	Adjust for Maximum Output. Check to see if Proper Peak was Obtained by Tuning in Image at Approx. 4.1 MC. If Image does not appear, Realign at 5 MC. with Trimmer Screw farther out. Recheck Image.
400 OHM Carbon Resistor	Clip on Loop Drum	5 MC	Intermediate	Tune to 5 MC Generator Signal	9	Intermediate Antenna	Adjust for Maximum Output.
400 OHM Carbon Resistor	Clip on Loop Drum	16 MC	Foreign	16 MC	10	Foreign Oscillator	Adjust for Maximum Output. Check to see if Proper Peak was Obtained by Tuning in Image at Approx. 15.1 MC. If Image does not appear, Realign at 16 MC. with Trimmer Screw farther out. Recheck Image.
400 OHM Carbon Resistor	Clip on Loop Drum	16 MC	Foreign	Tune to 16 MC Generator Signal	11	Foreign Antenna	Adjust for Maximum Output. Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.

NOTE: Realign trimmer No. 6 after set in cabinet by placing range switch in broadcast position, and adjusting for maximum output on a weak signal at approximately 1500 KC.

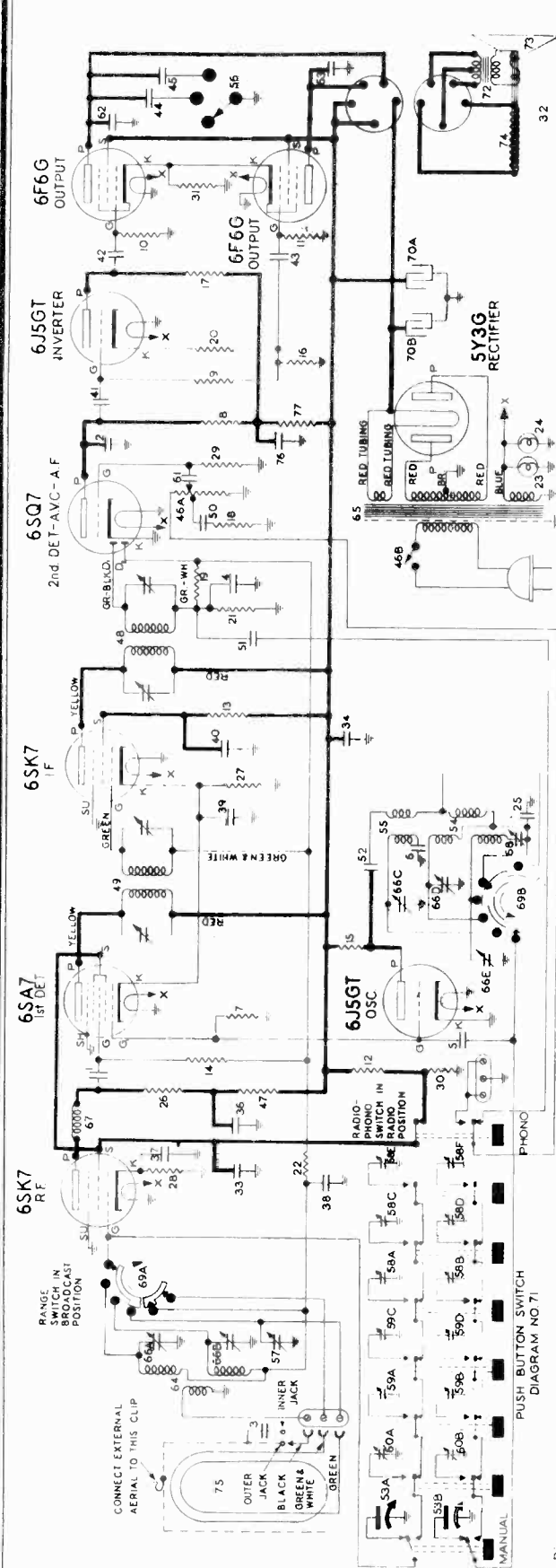
S-7404-5 S-7406-6

ALIGNMENT EQUIPMENT & PROCEDURE

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Band Switch Position	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD Condenser	Rear Lug of Gang Condenser	455 KC	Broadcast	Any Point Where It Does Not Affect The Signal	1-2 3-4	2nd I. F. 1st I. F.	Adjust for maximum output. Then repeat adjustment.
400 OHM Carbon Resistor	External Antenna Terminal Blue Wire	16 MC	Foreign	16 MC	5	Foreign Oscillator (Shunt)	Adjust for maximum output. Check to see if proper peak was obtained by tuning in image at approx. 15.1 MC. If image does not appear realign at 16 MC. with trimmer screw farther out. Recheck image.
400 OHM Carbon Resistor	External Antenna Terminal Blue Wire	16 MC	Foreign	Tune to 16 MC Generator Signal	6	Foreign Antenna	Adjust for maximum output. Try to increase output by detuning trimmer and returning receiver dial until maximum output is obtained.
200 MMFD Mica Condenser	External Antenna Terminal Blue Wire	1500 KC	Broadcast	1500 KC	7	Broadcast Oscillator (Shunt)	Adjust for maximum output.
200 MMFD Mica Condenser	External Antenna Terminal Blue Wire	1500 KC	Broadcast	Tune To 1500 KC Generator Signal	8*	Broadcast Antenna	Adjust for maximum output.
200 MMFD Mica Condenser	External Antenna Terminal Blue Wire	600 KC	Broadcast	Tune To 600 KC Generator Signal	9*	Broadcast Oscillator (Series Pad)	Adjust for maximum output. Try to increase output by detuning trimmer and returning receiver dial until maximum output is obtained.

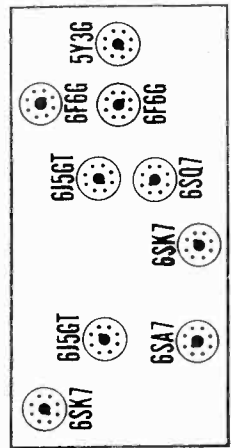
NOTE: These adjustments should be made with the set in the cabinet. Use a weak radiated signal at 1500 KC.





- Diagram:
- 1 Condenser—mica 260 mmfd.
  - 2 Condenser—mica 110 mmfd.
  - 3 Condenser—mica 51 mmfd.
  - 4 Condenser—mica .0042 mfd.
  - 5 Resistor—carbon 47,000 ohms 1/4 watt
  - 6 Resistor—carbon 220,000 ohms 1/4 watt
  - 7 Resistor—carbon 470,000 ohms 1/4 watt
  - 8 Resistor—carbon 15,000 ohms 2 watts
  - 9 Resistor—carbon 100,000 ohms 1/4 watt
  - 10 Resistor—carbon 22,000 ohms 1/4 watt
  - 11 Resistor—carbon 2.2 meg 1/4 watt
  - 12 Resistor—carbon 22,000 ohms 1/4 watt
  - 13 Resistor—carbon 220,000 ohms 1/4 watt
  - 14 Resistor—carbon 20,000 ohms 1/4 watt
  - 15 Resistor—carbon 20,000 ohms 1/4 watt
  - 16 Resistor—carbon 20,000 ohms 1/4 watt
  - 17 Resistor—carbon 20,000 ohms 1/4 watt
  - 18 Resistor—carbon 20,000 ohms 1/4 watt
  - 19 Resistor—carbon 20,000 ohms 1/4 watt
  - 20 Resistor—carbon 20,000 ohms 1/4 watt
  - 21 Resistor—carbon 20,000 ohms 1/4 watt
  - 22 Resistor—carbon 20,000 ohms 1/4 watt
  - 23 Resistor—carbon 20,000 ohms 1/4 watt
  - 24 Resistor—carbon 20,000 ohms 1/4 watt
  - 25 Resistor—carbon 20,000 ohms 1/4 watt
  - 26 Resistor—carbon 20,000 ohms 1/4 watt
  - 27 Resistor—carbon 20,000 ohms 1/4 watt
  - 28 Resistor—insulated 470 ohms 1/4 watt
  - 29 Resistor—carbon 10 meg 1/4 watt
  - 30 Resistor—carbon 20,000 ohms 1 watt
  - 31 Resistor—wire wound 360 ohms 2 watts
  - 32 Speaker—12" 1 mid. 600 volt
  - 33 Resistor—05 mid. 600 volt
  - 34 Resistor—07 mid. 600 volt
  - 35 Resistor—07 mid. 600 volt
  - 36 Resistor—07 mid. 600 volt
  - 37 Resistor—07 mid. 600 volt
  - 38 Resistor—07 mid. 600 volt
  - 39 Resistor—07 mid. 600 volt
  - 40 Resistor—07 mid. 600 volt
  - 41 Resistor—07 mid. 600 volt
  - 42 Resistor—07 mid. 600 volt
  - 43 Resistor—07 mid. 600 volt
  - 44 Resistor—07 mid. 600 volt
  - 45 Resistor—07 mid. 600 volt
  - 46 Resistor—07 mid. 600 volt
  - 47 Resistor—07 mid. 600 volt
  - 48 Resistor—07 mid. 600 volt
  - 49 Resistor—07 mid. 600 volt
  - 50 Resistor—07 mid. 600 volt
  - 51 Resistor—07 mid. 600 volt
  - 52 Resistor—07 mid. 600 volt
  - 53 Resistor—07 mid. 600 volt
  - 54 Resistor—07 mid. 600 volt
  - 55 Resistor—07 mid. 600 volt
  - 56 Switch—tone
  - 57 Condenser—trimmer for loop
  - 58 Resistor—trimmer for P.B. trimmer (low freq.)
  - 59 Resistor—trimmer for P.B. trimmer (med. freq.)
  - 60 Resistor—trimmer for P.B. trimmer (high freq.)
  - 61 Resistor—004 mid. 600 volt
  - 62 Resistor—004 mid. 600 volt
  - 63 Resistor—004 mid. 600 volt
  - 64 Resistor—004 mid. 600 volt
  - 65 Resistor—004 mid. 600 volt
  - 66 Resistor—004 mid. 600 volt
  - 67 Resistor—004 mid. 600 volt
  - 68 Resistor—004 mid. 600 volt
  - 69 Resistor—004 mid. 600 volt
  - 70 Resistor—004 mid. 600 volt
  - 71 Resistor—004 mid. 600 volt
  - 72 Resistor—004 mid. 600 volt
  - 73 Resistor—004 mid. 600 volt

**TUBE LOCATIONS**



REAR OF CHASSIS

FOR ALIGNMENT PROCEDURE  
AND PUSH-BUTTON TUNER DATA  
SEE INDEX

NOTE: MENTION CODE No. A-344  
WHEN ORDERING PARTS.

**SOCKET VOLTAGES—ALL D.C. POTENTIAL MEASURED TO CHASSIS**  
DIAL TUNED TO 540 K.C.

TUBE	FUNCTION	H	K	G	G	S	SU	P	D <sub>1</sub>	D <sub>2</sub>
6SK7	R.F.	6.0 A.C.	3.5	0	0	90	0	175		
6SA7	1st Det.	6.0 A.C.	3.1	0	-5	90	0	255		
6J5GT	Osc.	6.0 A.C.	0	-5	0	85	0	255		
6SK7	I.F.	6.0 A.C.	3.1	0	0	85	0	255		
6SQ7	2nd Det. - A.V.C. Audio	6.0 A.C.	0	0	0	85	0	85	0	0
6J5GT	Inverter	6.0 A.C.	4.5	Note A				190		
6F6G	Output	6.0 A.C.	19.5	0				248		
6F6G	Output	6.0 A.C.	19.5	0				248		
5Y3G	Rectifier	5.0 A.C.								Plates 370 V.A.C to C.T.

NOTE A: Bias for the 6J5GT inverter grid is approximately 0.5 volt measured across Resistor No. 20.

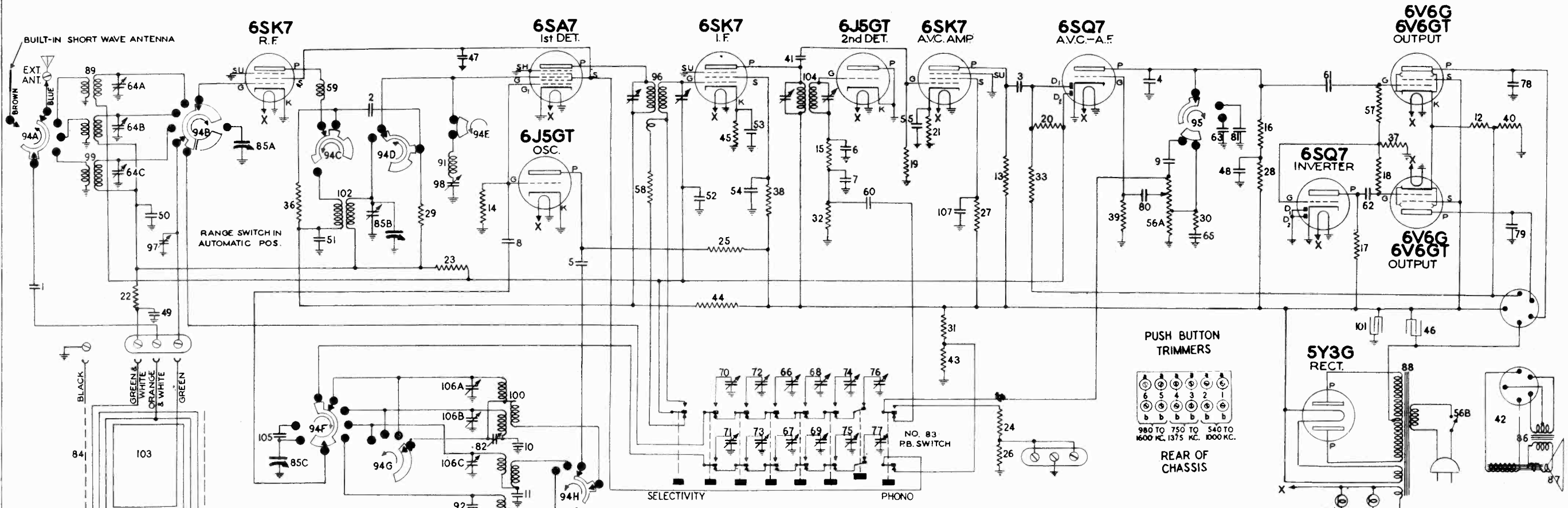
Use a high resistance voltmeter of at least 1000 ohms per volt.





FIRESTONE TIRE & RUBBER CO.

MODEL S-7404-7



ELECTRICAL PARTS

Diagram Number	Description
1-2-3-4	Condenser mica 260 mmfd.
5-6-7	Condenser mica 110 mmfd.
8	Condenser mica 51 mmfd.
9	Condenser mica 510 mmfd.
10	Condenser .00144 mfd. mica
11	Condenser mica .00255 mfd.
12	Resistor wire wound 200 ohms 2 watts
13	Resistor carbon 15,000 ohms 1 watt
14-15	Resistor carbon 47,000 ohms 1/4 watt
16-17-18	Resistor carbon 220,000 ohms 1/4 watt
19-20	Resistor carbon 1 megohm 1/4 watt
21	Resistor carbon 4700 ohms 1/4 watt
22-23-24	Resistor carbon 470,000 ohms 1/4 watt
25	Resistor carbon 22,000 ohms 1/2 watt
26-27-28	Resistor carbon 100,000 ohms 1/4 watt
29-30	Resistor carbon 68,000 ohms 1/4 watt
31	Resistor carbon 18,000 ohms 2 watts
32-33	Resistor carbon 330,000 ohms 1/4 watt
34-35	Dial light 6.3 volt
36	Resistor carbon 3,300 ohms 1/4 watt
37	Resistor carbon 220,000 ohms 1/4 watt
38	Resistor carbon 150,000 ohms 1/4 watt
39	Resistor carbon 10 meg. 1/4 watt
40	Resistor wire wound 110 ohms 1/2 watt
41	Condenser mica 15 mmfd.
42	Speaker dynamic 12 inch
43	Resistor carbon 27,000 ohms 1 watt
44	Resistor carbon 1500 ohms 1/2 watt
45	Not used in most sets, K goes to ground.
46	Condenser electrolytic 16 mfd. 450 volt
47	Condenser .1 mfd. 600 volt
48	Condenser .2 mfd. 600 volt
49 to 55	Condenser .05 mfd. 600 volt.
56A to 56B	Volume control—1 meg. (with switch)
57	Resistor carbon 180,000 ohms 1/4 watt.
58	Resistor insulated 12 ohms 1/4 watt.
59	Coil compensating
60 to 63	Condenser .01 mfd. 600 volt
64A to 64E	Condenser trimmer (4 section)
65	Condenser .02 mfd. 600 volt
66 to 69	Condenser P. B. trimmer (med. freq.)
70 to 73	Condenser P. B. trimmer (high freq.)
74 to 77	Condenser P. B. trimmer (low freq.)
78 to 81	Condenser .004 mfd. 600 volt
82	Condenser padder
83	Switch—push button
84	Loop antenna shield
85A-B-C	Condenser—variable tuning
86	Transformer—output for M-115116 speaker
87	Cone & voice coil for M-115116 speaker
88	Transformer—power—60 cycle
89	Transformer—power 25 cycle
90	Coil—antenna (Band spread)
91	Coil—oscillator (Band spread)
92	Wave trap coil
93	Condenser—mica .0001 mfd. (low drift)
94A to 94H	Condenser—compensating .0001 mfd.
95	Switch—range
96	Switch—tone control
97-98	Transformer—1st I. F.
99	Condenser trimmer
100	Coil—Police & Short Wave antenna
101	Oscillator coil with trimmers
102	Condenser electrolytic 30 mfd. 450 volt
103	Coil—Broadcast R. F.
104	Loop antenna complete
105	Transformer—2nd I. F.
106A to 106C	Condenser—low drift—75 mmfd.
107	Condenser—trimmer (3 section)
107	Condenser—.05 mfd.. 600 volt

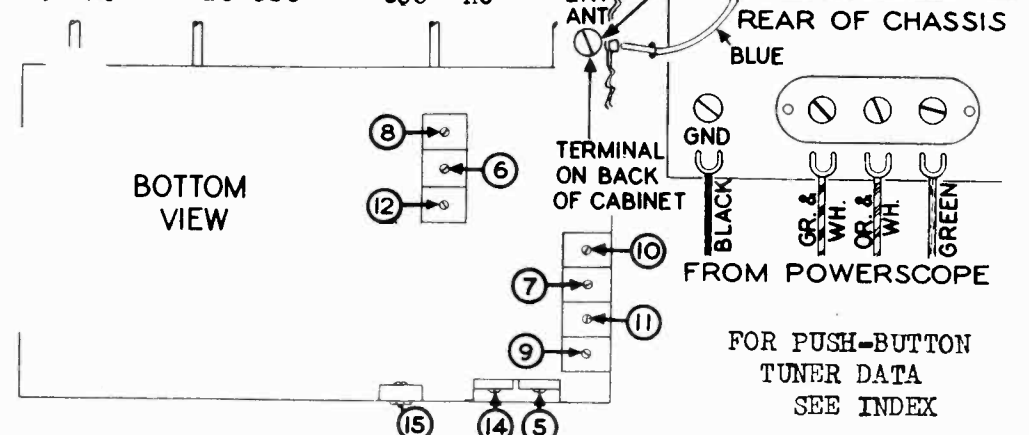
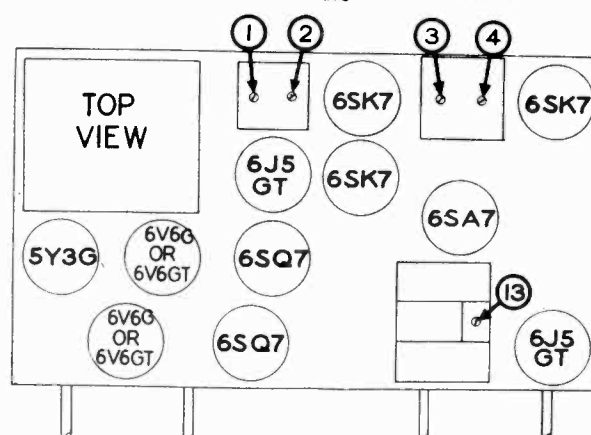
SOCKET VOLTAGES—ALL D.C. POTENTIAL MEASURED TO CHASSIS  
NO SIGNAL CONDITION DIAL TUNED TO 540 KC

TUBE	FUNCTION	H	K	G	G <sub>1</sub>	S	SU	P	D <sub>1</sub>	D <sub>2</sub>
6SK7	R.F.	6.0 A.C.	0	Note A		85	0	235		
6SA7	1st Det.	6.0 A.C.	0	Note A	-10	85	0	250		
6J5GT	Osc.	6.0 A.C.	0	-10			0	137		
6SK7	I.F.	6.0 A.C.	0	Note A		70	0	260		
6J5GT	2nd Det.	6.0 A.C.	0	0				0		
6SK7	A.V.C. Amp.	6.0 A.C.	15	0		140		230		
6SQ7	A.F.—A.V.C.	6.0 A.C.	0	0				80	Note A	Note A
6SQ7	Inverter	6.0 A.C.	0	0				70	0	0
6V6G or 6V6GT	Output	6.0 A.C.	12			260		252		
6V6G or 6V6GT	Output	6.0 A.C.	12			260		252		
5Y3G	Rectifier	5.0 A.C.								

Plates 370 V.A.C. to C.T.

TRIMMERS

TRIMMERS	ALIGN AT	8 S.W. Osc	9 S.W. Ant	10 B.S. Osc	11 B.S. Ant
1-2 2nd I.F.	455 KC	16 MC	12 BC Osc	1400 KC	
3-4 1st I.F.	455 KC	16 MC	13 BC Det	1400 KC	
5 Wave Trap	455 KC	9.5 MC	14 BC Ant	1400 KC	
6 P.B. Osc	5 MC	9.5 MC	15 BC Osc	600 KC	
7 P.B. Ant	5 MC				



Note  
Mention Code  
No. 347 when  
ordering parts

USE A VOLTMETER OF AT LEAST 1000 OHMS PER VOLT.  
NOTE A: Bias is -3.7 volts at these points, measured across resistor No. 40.

FIRESTONE TIRE & RUBBER CO.

FIRESTONE PAGE 12-17

MODEL S-7406-7

PARTS

1 1 mfd., 600 V  
 2 2.2 Megs., 1/2 W  
 3 .005 mfd., 600 V  
 4 .05 mfd., 200 V  
 5 .01 mfd., 400 V  
 6 .05 mfd., 500 V  
 7 .1 mfd., 200 V  
 8 .002 mfd., 600 V  
 9 .01 mfd., 600 V  
 10 .01 mfd., Mica  
 11 100 mmf., Mica  
 12 22 Ohm., 1/2 W  
 13 50 mmf., Mica  
 14 10 mmf., Mica  
 15 250 mmf., Mica  
 16 1500 mmf., Mica  
 17 6000 mmf., Mica  
 18 350 mmf., Silver 3%  
 19 270 mmf., Silver 8%  
 20 25 mfd., 450 V  
 21 25 mfd., 450 V  
 22 22 M Ohm., 1/2 W  
 23 12 M Ohm., 2 W  
 24 100 M Ohm., 1/2 W  
 25 2200 Ohm., 1/2 W  
 26 47 M Ohm.,  
 27 470 M Ohm.,

28 220 M Ohm.,  
 29 1 Meg. Ohm.,  
 30 3.3 Meg. Ohm., Volume Control  
 31 10 Meg. Ohm., 1/2 Watt  
 32 220 Ohm., 2 Watt  
 33 1500 Ohm., 1/2 Watt  
 34 4700 Ohm., 1/2 Watt  
 35 10 M Ohm., 1/2 Watt  
 36 2.2 Meg. Ohm., Tone Control  
 37 Loop Assembly  
 38 Band Switch Assembly  
 39 Tuning Condenser Gang  
 40 Wave Trap Trimmer  
 41 Short Wave Trimmer  
 42 Broadcast Padder  
 43 Trimmer Strip Assembly  
 44 Antenna Coil Assembly  
 45 Oscillator Coil Assembly  
 46 Mixer Coil Assembly, Short W  
 47 Push Button Tuner Switch  
 48 Push Button Trimmer Strip

49 Button Oscillator Coil-Strip  
 57 Wave Trap Coil Assem  
 53 Phono Motor  
 61 Mixer Coil Assembly, Broadcast  
 54 Cone and Voice Coil Assembly  
 56 Output Transformer .02 mfd., 600 Volts

FOR SWITCH DATA, PUSH-BUTTON TUNER

ALIGNMENT, VOLTAGES-SEE INDEX.

VIEWED FROM REAR OF CABINET

BACK VIEW OF RANGE SWITCH DECKS.

PUSH-BUTTON TUNER SWITCH

LETTERS ON TERMINALS OF SWITCHES SHOWN ABOVE CORRESPOND TO SIMILARLY LETTERED TERMINALS ON THE SWITCHES SHOWN IN THE CIRCUIT DIAGRAM.

PAGE 12-18 FIRESTONE

FIRESTONE TIRE & RUBBER CO.

MODEL S-7406-7

STRINGING DIAGRAM

FOR CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOL. VIII

ALIGN POLICE BAND  
 OSC- 5.4 MC  
 ANT- 5 MC  
 SHORT WAVE  
 OSC- 18.1 MC  
 ANT- 16 MC

SOCKET VOLTAGES--ALL D.C. VOLTAGES MEASURED TO CHASSIS ANTENNA GROUNDED

TUBE	FUNCTION	H	K	G	S	P	D <sub>1</sub>	D <sub>2</sub>
6SK7	R.F.	6.3 A.C.	0	Note A	100	180		
6SA7	Mixer	6.3 A.C.	0	Note A	100	245		
6J5GT	Oscillator	6.3 A.C.	0	Note A	100	115		
6SK7	I. F.	6.3 A.C.	+3			245		Note A Note A
6SQ7	Det.	6.3 A.C.	0					Note A Note A
6SQ7	A.V.C.	6.3 A.C.	0					
6SQ7	1st Audio	6.3 A.C.	0					
6SQ7	Inverter	6.3 A.C.	0					
6V6G	Audio	6.3 A.C.	15		245		62	
6V6G	Audio	6.3 A.C.	15		245		62	
5Y3	Rect.	5 A.C.						230 A.C.

NOTE A: Due to the high resistance in the circuit, only very slight deflections of the voltmeter will be obtained.

©John F. Rider, Publisher

©John F. Rider, Publisher

www.americanradiohistory.com