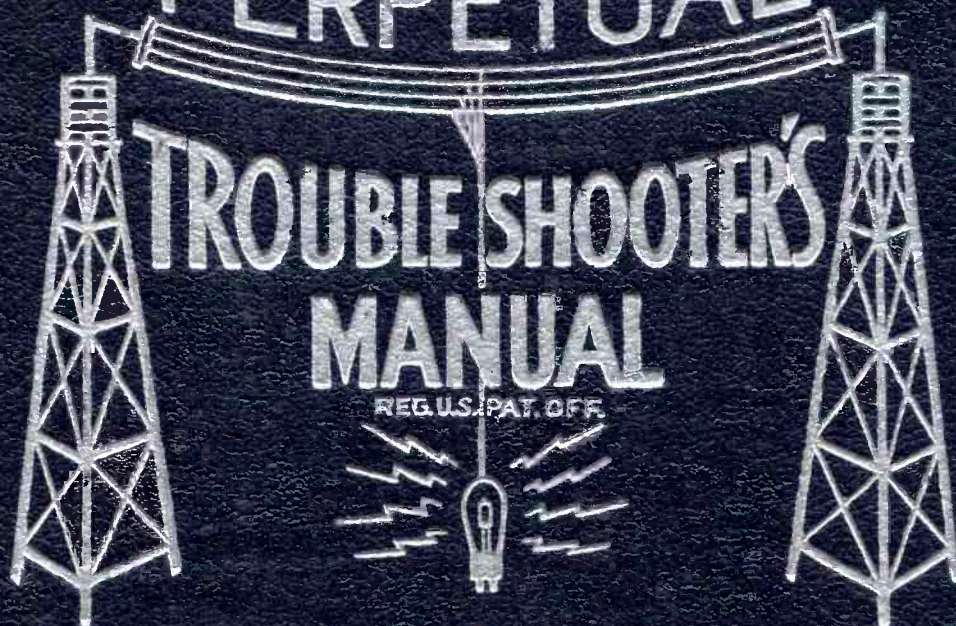


VOLUME VIII

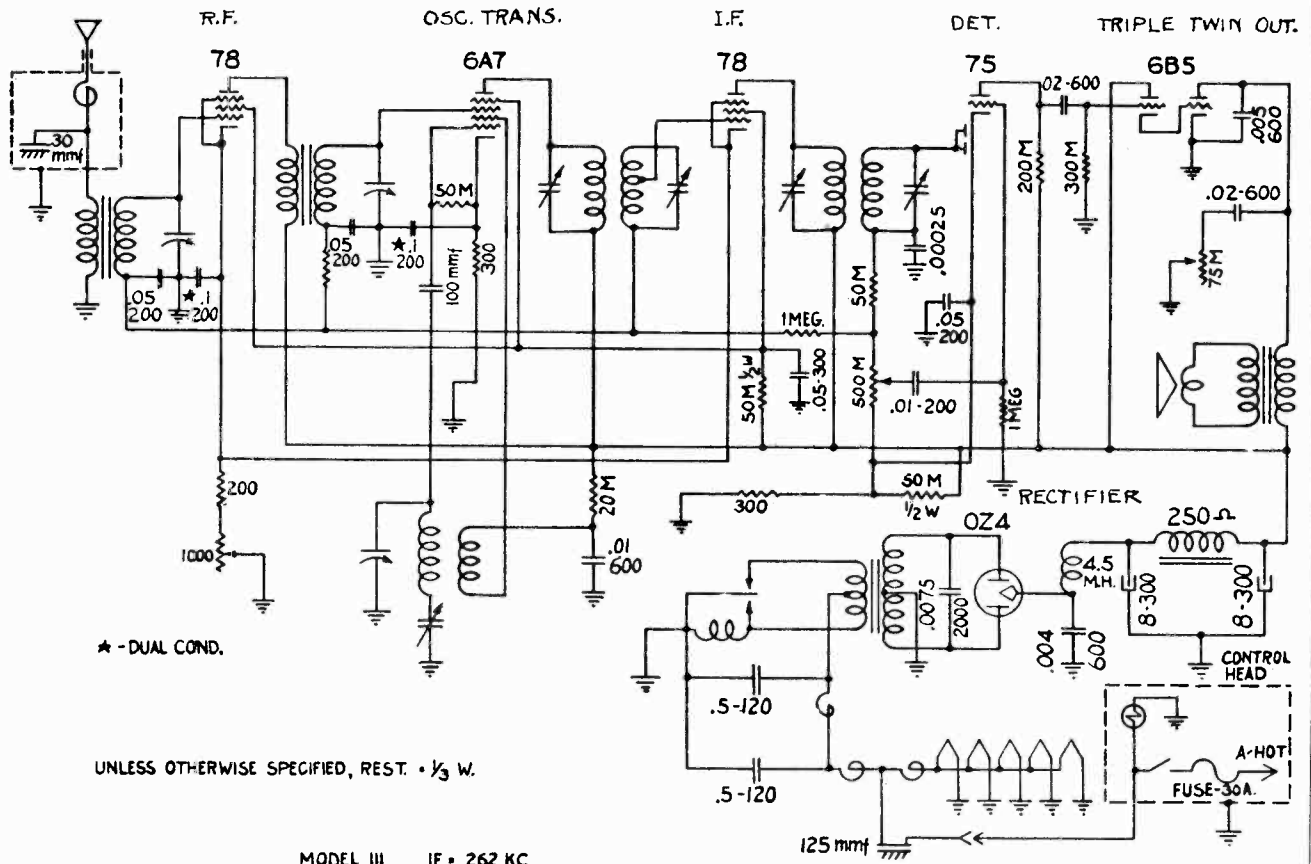
PERPETUAL



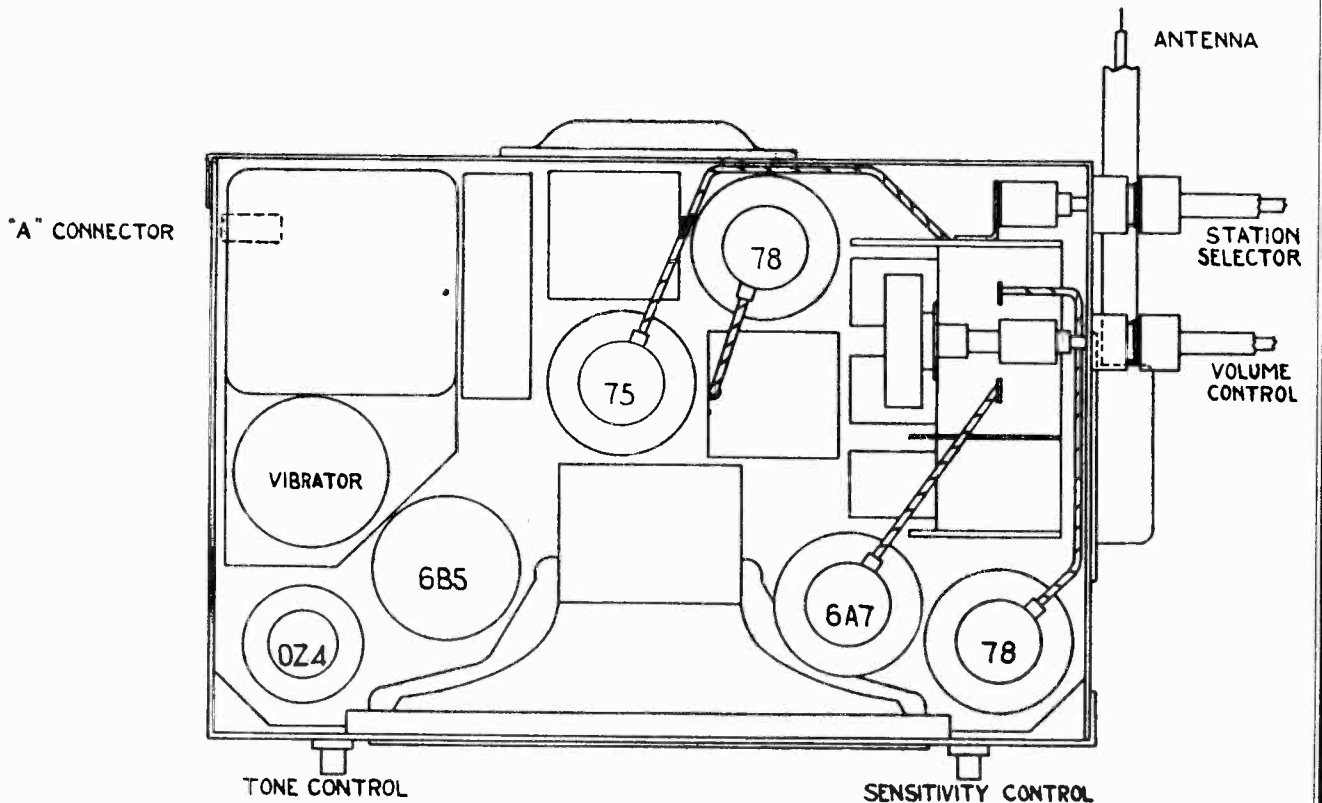
JOHN F. RIDER

DETROLA RADIO CORP.

MODEL 111
Schematic
Socket



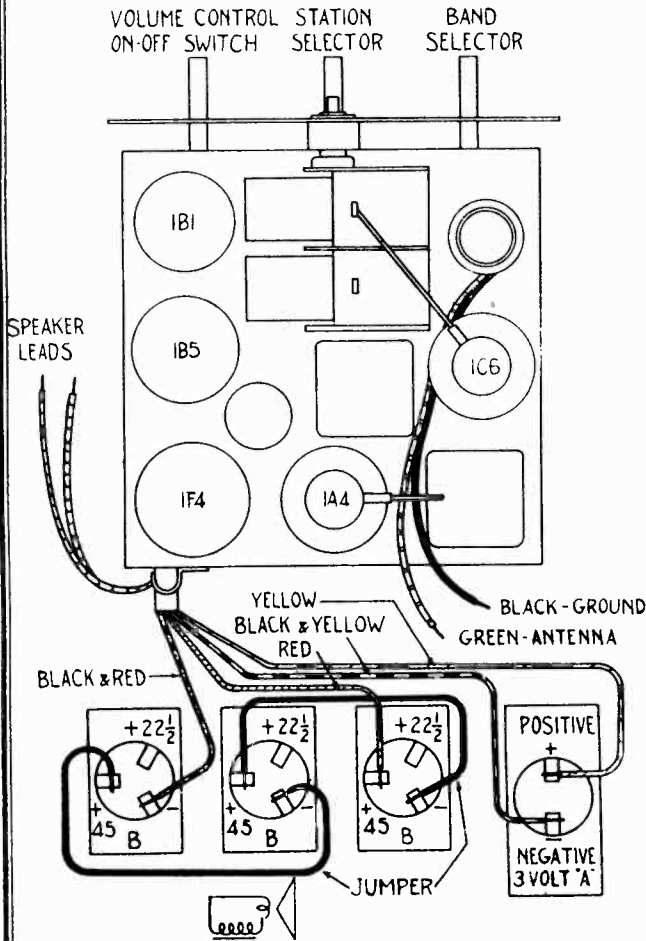
MODEL 111 IF = 262 KC



MODEL 117B
Schematic, Socket

DETROLA RADIO CORP.

Alignment, Parts



Batteries required for operation of this receiver are:

- 1— 3 Volt-dry "A" pack.
- 3—45 Volt Standard "B" batteries.

No "C" batteries are necessary.

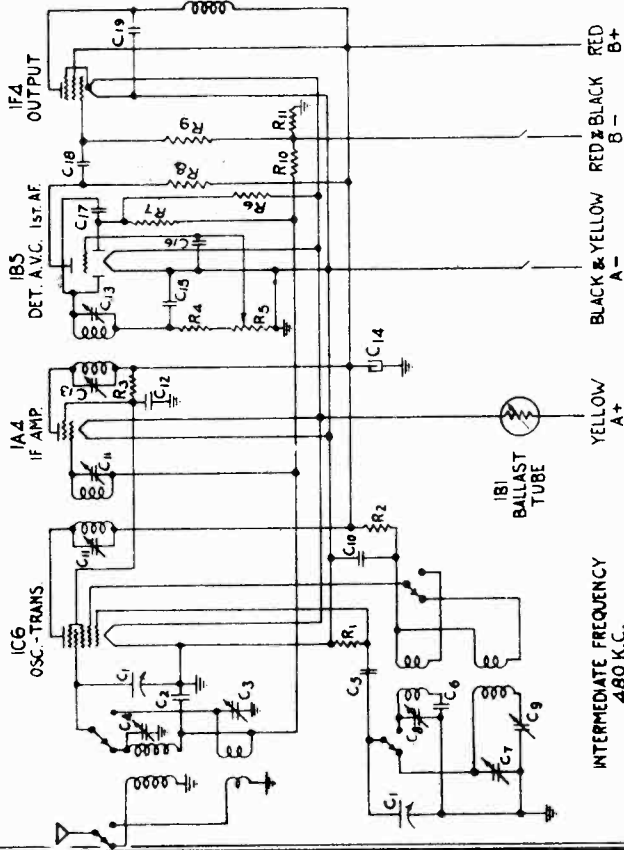
DO NOT USE A 6 VOLT BATTERY.

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.

IF. Connect signal generator ground to receiver ground. Using .1 mfd condenser in series with "high" side of generator, apply 480 KC signal to grid of 1A4 and adjust second IF transformer: same for first IF transformer, applying signal to grid of 1C6.

RF. Using 200 mmf condenser in series with generator, feed 1725 KC signal to antenna lead and adjust BC oscillator trimmer (located center under base). Set generator to 1400 KC. tune receiver and adjust BC antenna trimmer (located on coil on top of base). Set generator to 600 KC. tune receiver and adjust BC oscillator padder (located between variable and 1B1 tube). The tuning condenser should be rocked back and forth through the signal while padder is being adjusted to obtain perfect alignment.

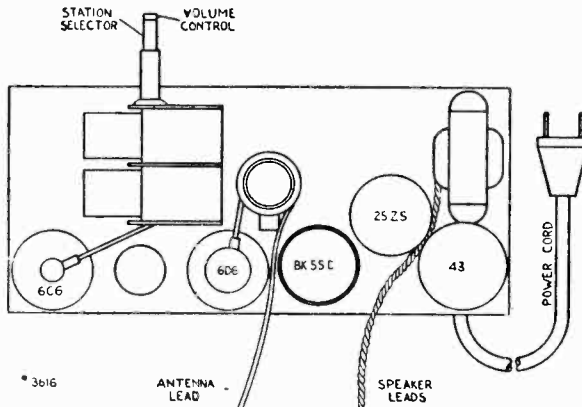
Using 400 ohm resistor in series with generator, set band selector in SW (right) position, and feed 15600 KC signal to antenna lead and adjust SW oscillator trimmer (on coil back of band selector switch); screw trimmer down tight and unscrew to SECOND peak. Set generator to 15000 KC and adjust SW antenna trimmer (on coil back of tuning control); screw trimmer down tight and unscrew to FIRST peak, rocking tuning control back and forth through signal while adjusting screw. Above procedure for alignment at 15000 KC should be followed exactly to insure proper tracking. A "dead spot" at about 12000 KC will result if oscillator and antenna circuits are not set in proper relation to each other.



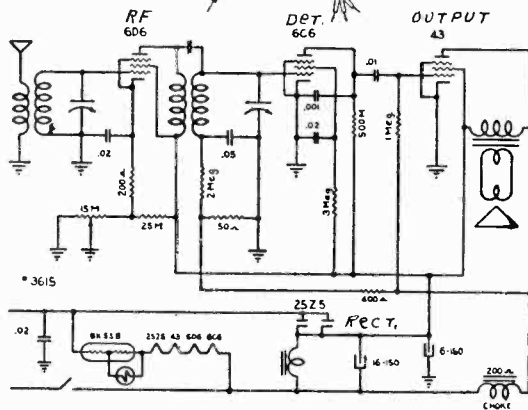
Symbol	Part No.	Description
R1, R4	631	50M 1/3 watt
R2	617	20M 1/3 watt
R3	621	25M 1/3 watt
R5	2699	500M volume control with DPST switch
R6, R7	2599	1 meg ± 10% 1/3 watt
R8	602	250M 1/3 watt
R9	624	1 meg 1/3 watt
R10	2693	2 meg ± 10% 1/3 watt
R11	2946	400 ohms ± 10% 1/2 watt
C1, C12	2664	350 mmf variable
C3, C7	572	.1 200V
C4, C8	1611	3-35 Trimmer
C5	2597	1-10 Trimmer
C6	2780	50 mmf Mica
C9	2694	.005 ± 5%
C10	2560	Variable padder
C11, C13	2385	.02 200V
C14, C16	2698	16 MF electrolytic
C15, C16	1286	250 mmf Mica
C17	581	005 600V
C18	2695	.003 600V
C19		
1408		Pointer screw
2364		Dial glass
2365		Dial glass retainer
1151		Escutcheon screw
2707		First IF transformer
2942		Second IF transformer
2685		Broadcast antenna coil
2686		Broadcast oscillator coil
2761		Short wave oscillator coil
2762		Short wave antenna coil
2696		Band selector switch
833		4-prong socket
789		6-prong socket
1489		5-prong socket
2949		PM dynamic speaker
2378		Pointer

DETROLA RADIO CORP.

MODEL 130
 MODEL 134X
 MODEL 141A
 MODEL 157A
 Schematics
 Sockets

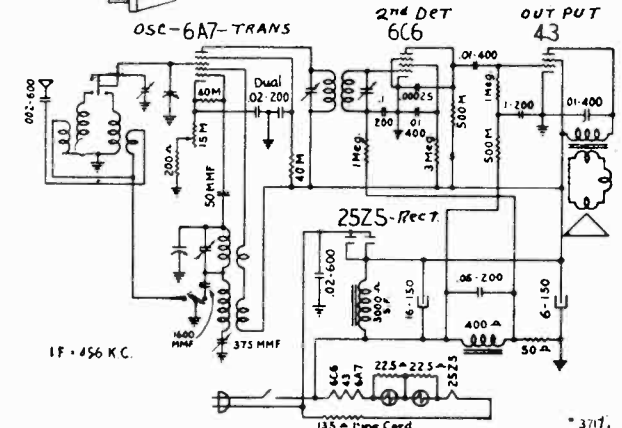
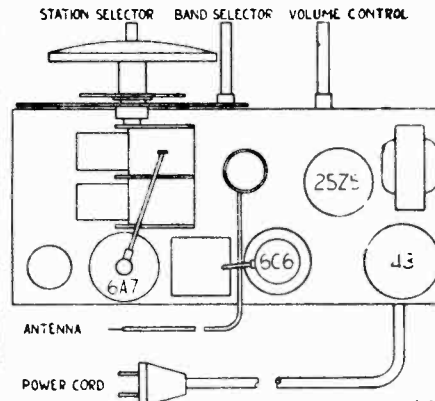


* 3616

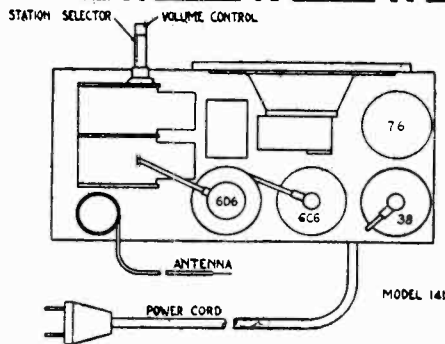


* 3615

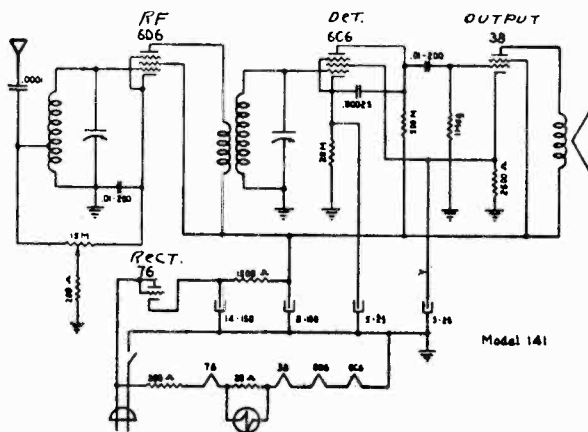
MODEL 130



MODEL 134-X

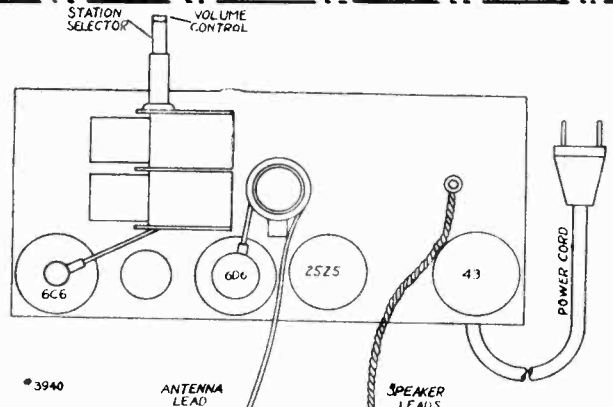


MODEL 141

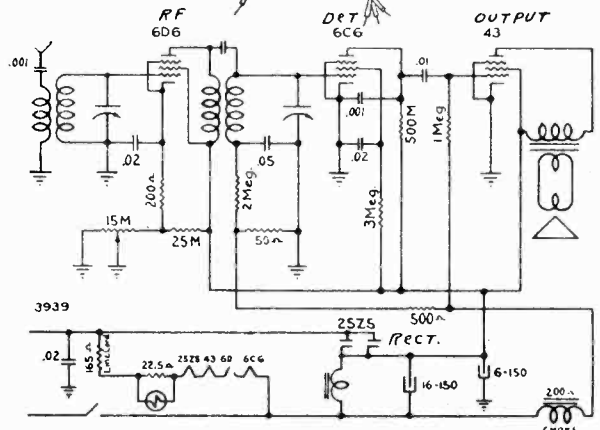


Model 141

MODEL 141-A



* 3940

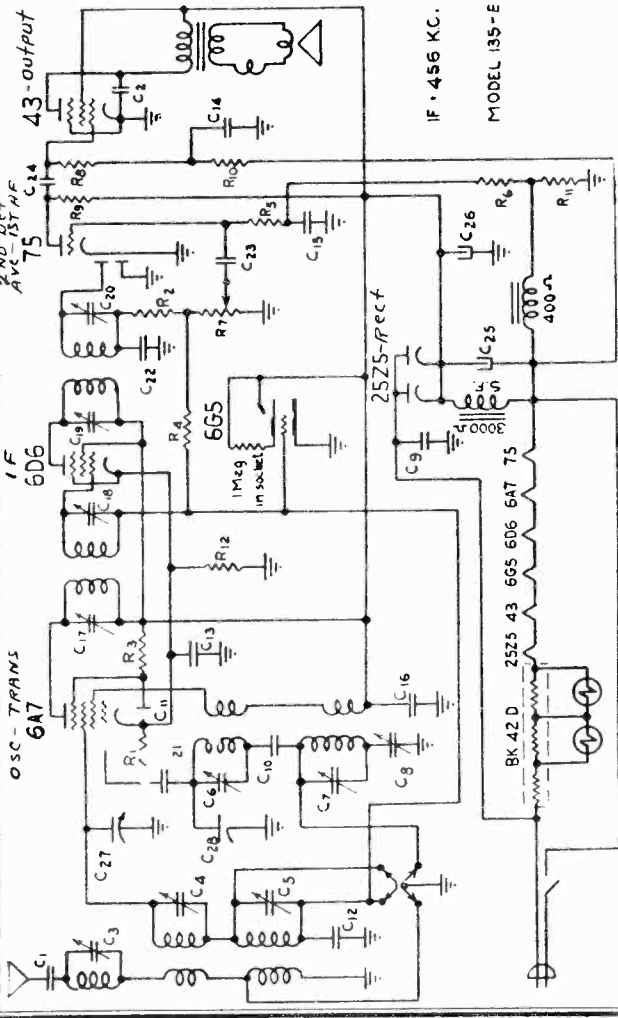
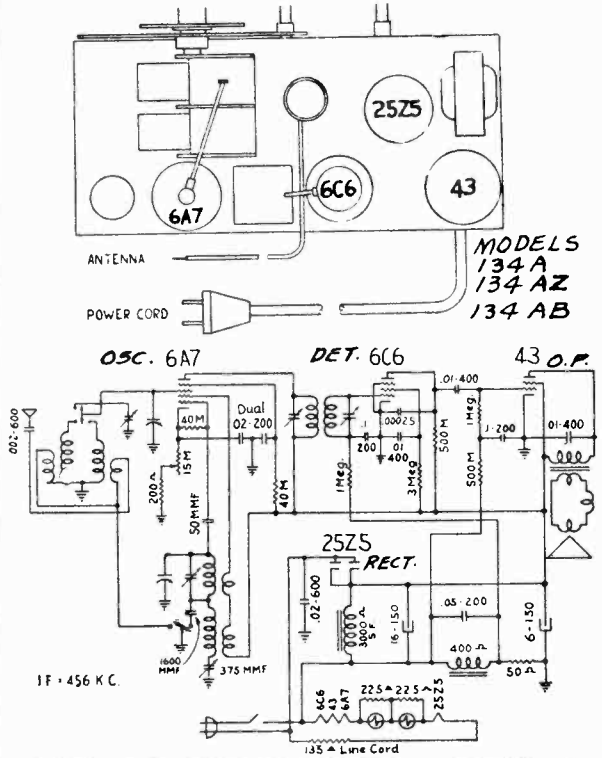


MODEL 157-A

MODELS 134A, 134AZ, 134AB
MODELS 135, 135E

DETROLA RADIO CORP.

Schematics, Sockets

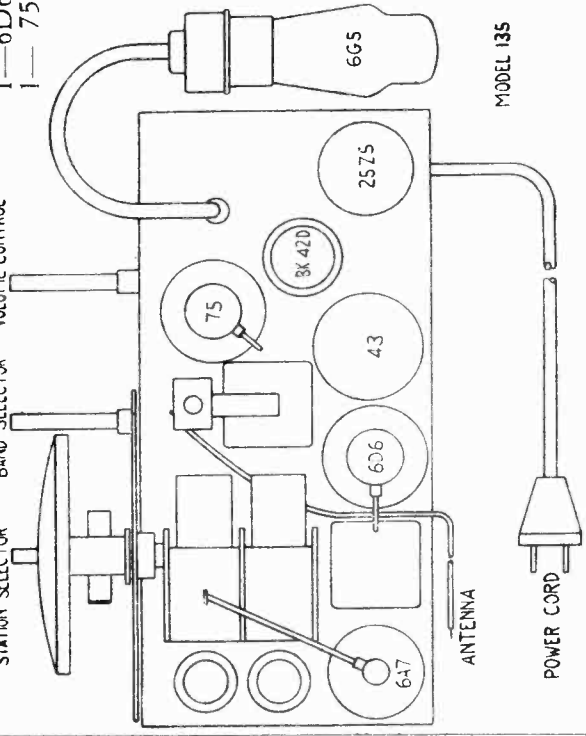


MODEL 135 same as MODEL 135-E but without tuning eye.
Tubes required are:
1—6A7 Oscillator-Translator
1—6D6 Intermediate Frequency Amplifier
1—75 Detector-Automatic Volume Control First Audio

1—43 Power Output Rectifier
1—25Z5 Tuning Indicator
1—6G5 Tuning Indicator
1—BK-42-D Voltage Regulator

PARTS LIST — MODEL 135

- C1, C2 .005 - 600 v.
- C3 180 mmf. trimmer
- C4, C5, C6, C7, 1 - 10 mmf. trimmer
- C8 350 mmf. padder
- C9 .02 - 600
- C10 1150 mmf. mica
- C11, C12 .05 - 200
- C13, C14, C15, C16 1 - 200 v.
- C17, C18, C19, C20 100 - 125 trimmer
- C21 50 mmf. mica
- C22 250 mmf. mica
- C23, C24 .01 - 600 v.
- C25 16 mfd. 150 v.
- C26 24 mfd. 150 v.
- C27, C28 variable air
- R1, R2, 50M 1/3 w.
- R3 20M 1/3 w.
- R4, R5, R6 1 meg. 1/3 w.
- R7 500M volume control and switch
- R8 500M 1/3 w.
- R9 200M 1/3 w.
- R10 300M 1/3 w.
- R11 20 ohms. 1/2 w.
- R12 100 ohms. 1/3 w.



DETROLA RADIO CORP.

MODELS 136, 149, 149E
Schematic, Socket
Trimmers, Alignment

I. F. Alignment

The I.F. frequency of this receiver is 456 K.C. For realignment, use the following procedure.

It is necessary to use an accurately calibrated signal generator. Couple the signal generator to the grid of the 6A7 tube with a tenth microfarad condenser in series with the "high" lead of the signal generator. Connect the ground side of the signal generator to the chassis. Set the signal generator to 456 K.C. Be sure the wave switch of the set is in the broadcast position and the volume control set at maximum. Attenuate the signal generator so that the signal is just audible in the speaker. If an output meter is used, it should be connected across the voice coil terminals of the speaker. Use 1/2 volt as standard output.

Adjust the 2nd I.F. transformer first. Each screw should be adjusted for maximum output. After number two I.F. has been adjusted, number one I.F. should be adjusted for maximum output. After both transformers have been adjusted, it is necessary to recheck No. 2 transformer and then recheck No. 1.

See TUBE LAYOUT for location of I.F. and R.F. trimmers and padder.

R. F. Alignment

To align the broadcast band, proceed as follows: First, connect the ground side of the signal generator to the chassis. Connect the high side of the signal generator with a .00025 condenser, in series, to the antenna lead of the set. Make sure the band switch of the set is in the broadcast position. Set the

volume control to maximum. Turn the station selector to the highest frequency (as far as it will go). Set the signal generator to 1720 K.C. Adjust the oscillator trimmer until the signal is heard. After the oscillator has been set at 1720 K.C., turn the station selector to 1400 K.C. Set the signal generator to 1400 K.C. When the signal is heard, adjust the first detector trimmer for maximum output.

When the set has been adjusted at 1400 K.C., turn the station selector dial to 600 K.C. Set the signal generator to 600 K.C. When the signal is heard, adjust the padder condenser by rocking the selector back and forth. While adjusting the padder screw, it is necessary to move the selector so that the signal may be kept in tune while adjusting the padder screw. This procedure should be followed until maximum output is obtained.

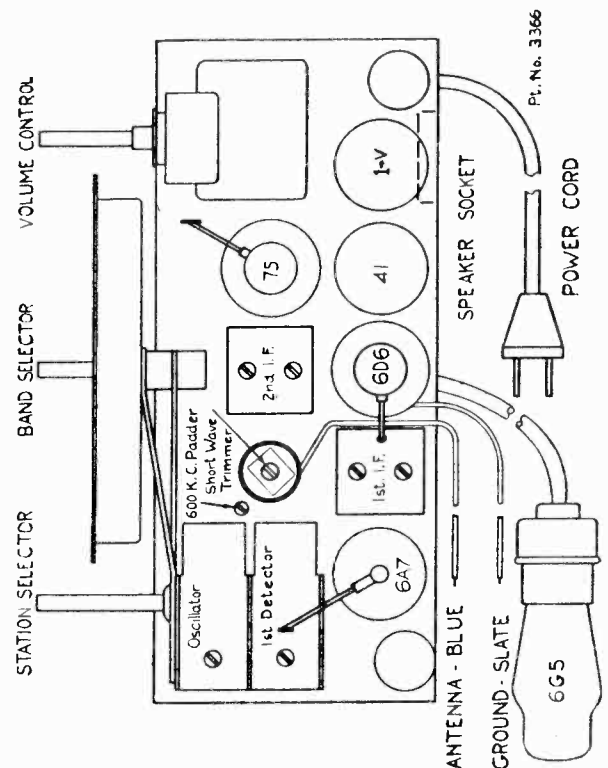
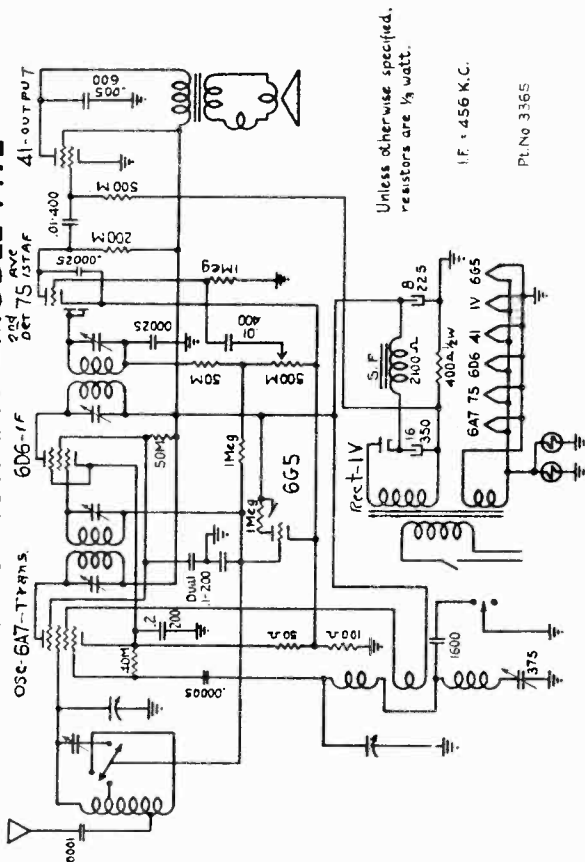
The foregoing procedure should be repeated. That is, the set is to be rechecked at 1720, 1400 and 600 K.C.

When aligning the R.F., use the same output standard as was used on the I.F. alignment.

Short Wave Alignment

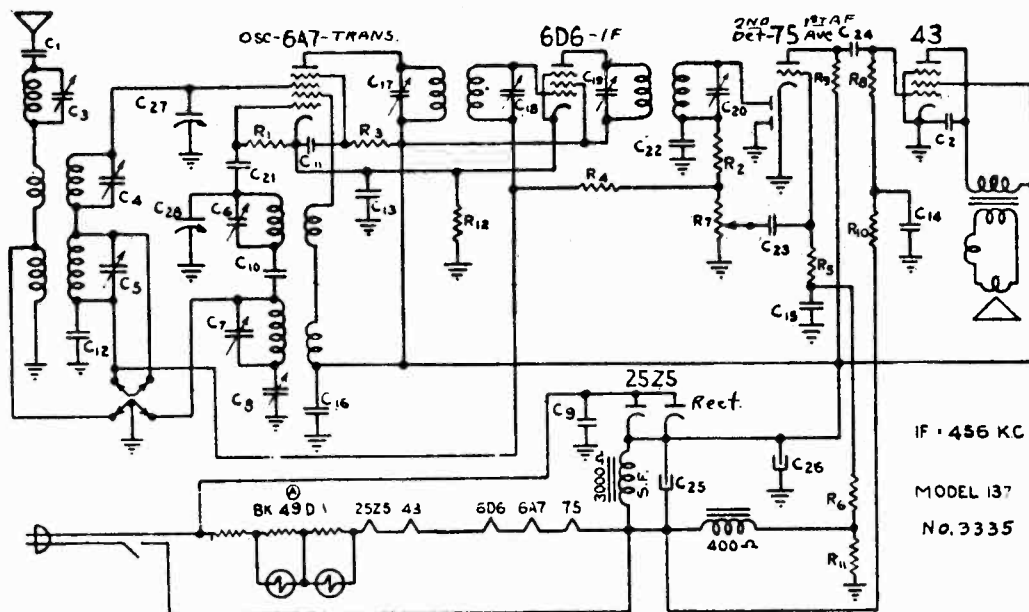
Turn the band selector switch of the set to short wave. Set the signal generator to 6000 K.C. Connect a 400 ohm resistor in series with the .00025 condenser. Tune the set until the signal is heard. If two signals are heard, always align to the highest frequency heard on the receiver. Adjust the small trimmer on the antenna coil for maximum output.

MODELS 136 & 149 are the same except that the 6G5 Tuning Tube is not used. **CIRCUIT DIAGRAM — MODEL 149E**



MODEL 137
Schematic, Socket
Parts

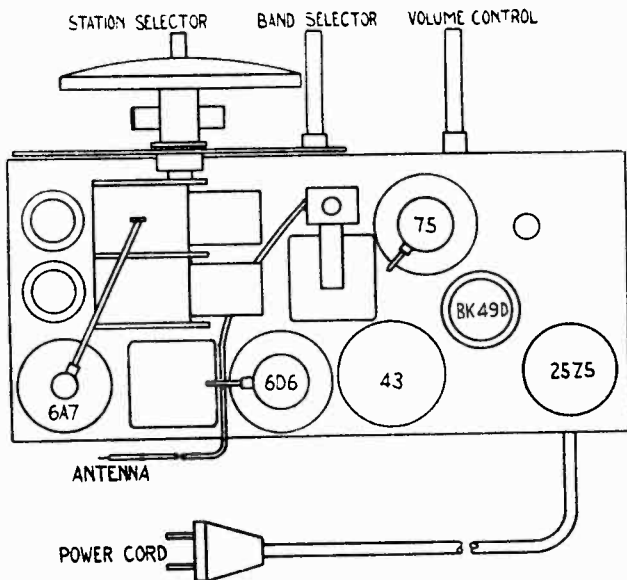
DETROLA RADIO CORP.



IF - 456 KC
MODEL 137
No. 3335

PARTS LIST — MODEL 137

- | | | |
|--|---|--------------------------------------|
| C1, C2 .005 - 600 v. | C17, C18, C19, C20
100 - 125 trimmer | R4, R5, R6 1 meg. 1/3 w. |
| C3 180 mmf. trimmer | C21 50 mmf. mica | R7 500M volume control
and switch |
| C4, C5, C6, C7, 1 - 10 mmf.
trimmer | C22 250 mmf. mica | R8 500M 1/3 w. |
| C8 350 mmf. padder | C23, C24 .01 - 600 v. | R9 200M 1/3 w. |
| C9 .02 - 600 | C25 16 mfd. 150 v. | R10 300M 1/3 w. |
| C10 1150 mmf. mica | C26 24 mfd. 150 v. | R11 20 ohms. 1/2 w. |
| C11, C12 .05 - 200 | C27, C28 variable air | R12 100 ohms. 1/3 w. |
| C13, C14, C15, C16
.1 - 200 v. | R1, R2, 50M 1/3 w. | |
| | R3 20M 1/3 w. | |



Tubes required are:

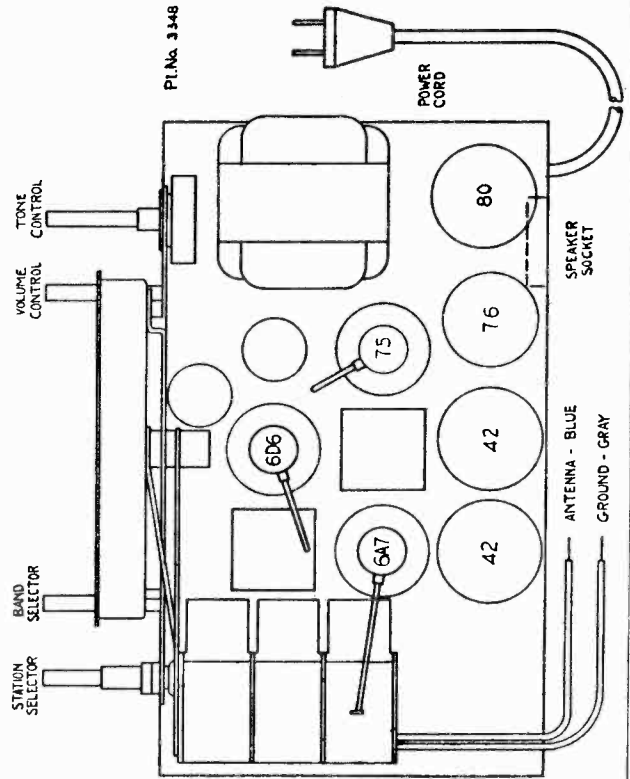
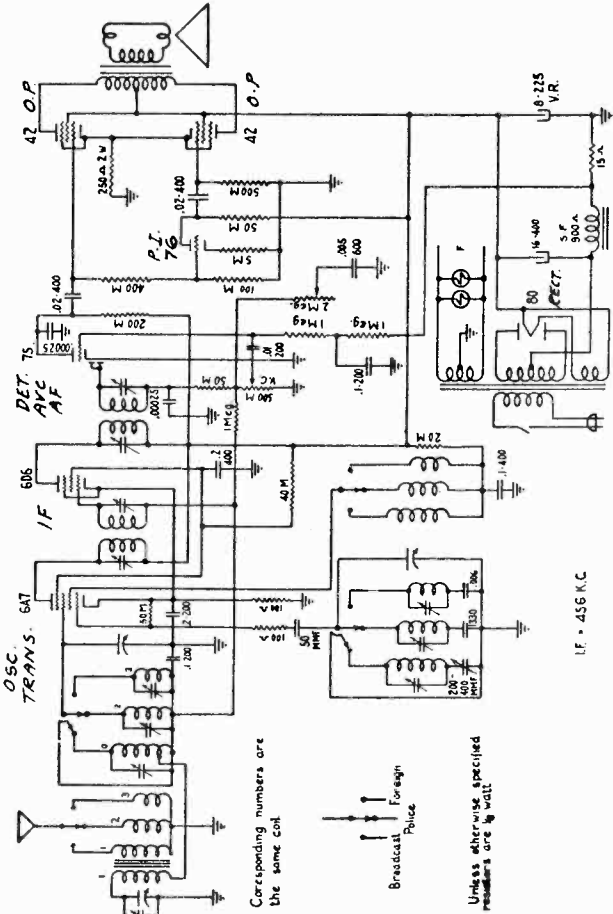
- 1—6A7 Oscillator-Translator
- 1—6D6 Intermediate Frequency Amplifier
- 1—75 Detector-Automatic Volume Control
First Audio
- 1—43 Power Output
- 1—25Z5 Rectifier
- 1—BK-42-D Voltage Regulator

NO GROUND IS NECESSARY—Under no condition should a ground wire be attached to this receiver.

DETROLA RADIO CORP.

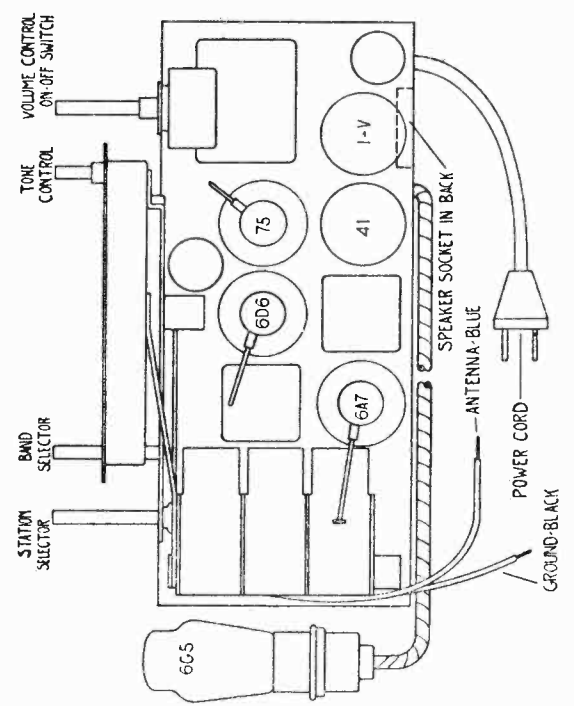
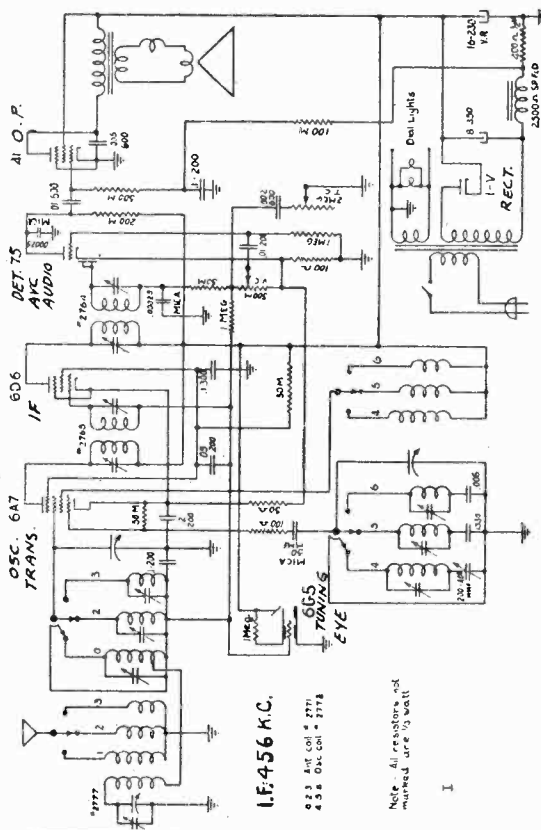
MODELS 139, 139E
MODELS 147A-B-CR
Schematics, Sockets

CIRCUIT DIAGRAM MODEL 147 A-B-CR



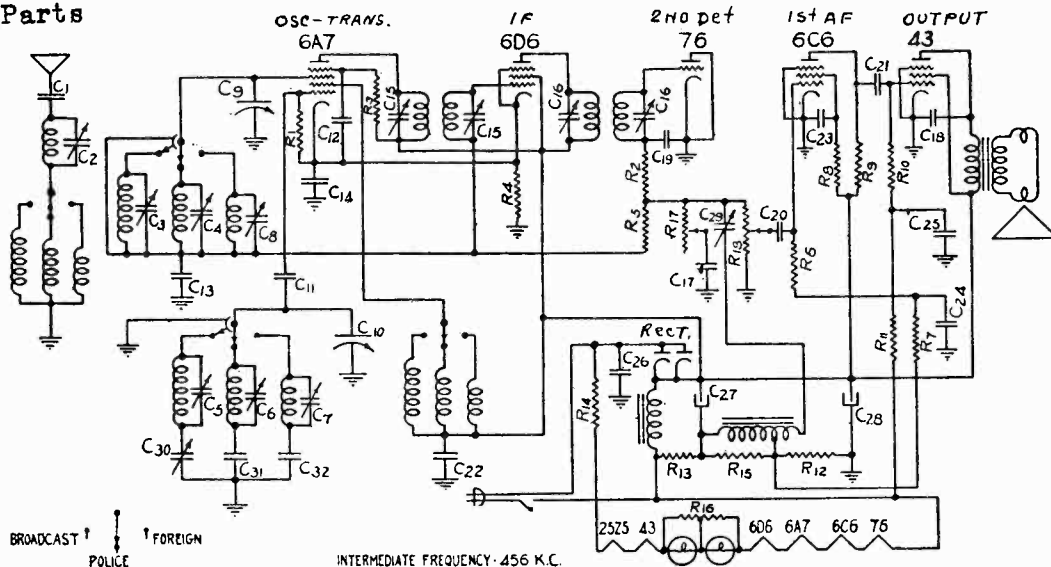
CIRCUIT DIAGRAM—MODEL 139E

MODEL 139 is the same except that 6G5 Tuning Indicator is not used.



MODEL 140
Schematic
Socket, Parts

DETROLA RADIO CORP.



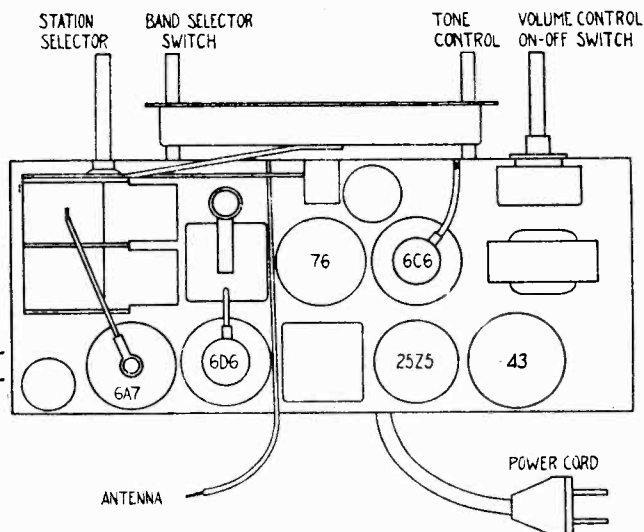
PARTS LIST — MODEL 140

- | | | |
|---|--|----------------------------|
| C1 .005 600 v. | C20 .01 200 v. | R1, R2 50M ohms |
| C2 180 mmf. trimmer | C21 .01 400 v. | R3 20M ohms |
| C3, C4, C5, C6, C7,
1 to 10 mmf. trimmer | C22, C23, C24 .1 200 v. | R4 200 ohms |
| C8 3 to 35 mmf. trimmer | C25 .2 200 v. | R5, R6, R7, R8 1 megohm |
| C9, C-10 350 mmf. air
variable | C26 .02 600 v. | R9 250M ohms |
| C11 50 mmf. mica | C27 16 mfd. 150 v. wet
electrolytic | R10 500M ohms |
| C12, C13, .05-200 v. | C28 24 mfd. 150 v. wet
electrolytic | R11 300M ohms |
| C14 .2 200 | C29 3 to 35 mmf. trimmer | R12, R13 35 ohms |
| C15, C16 120 mmf.
trimmer | C30 220 to 550 mmf.
padder | R14 100 ohms line cord |
| C17, C18 .003 600 v. | C31 1330 mmf. padder | R15 10M ohms |
| C19 250 mmf. mica | C32 3850 mmf. padder | R16 45 ohms center tapped |
| | | R17 2 megohms tone control |
| | | R18 500M ohms vol. control |

Tubes required are:

- 1—6A7 Oscillator-Translator
- 1—6D6 Intermediate Frequency Amplifier
- 1—76 Detector-Automatic Volume Control
- 1—6C6 First Audio
- 1—43 Power Output
- 1—25Z5 Rectifier

NO GROUND IS NECESSARY—Under no condition should a ground wire be attached to this receiver.



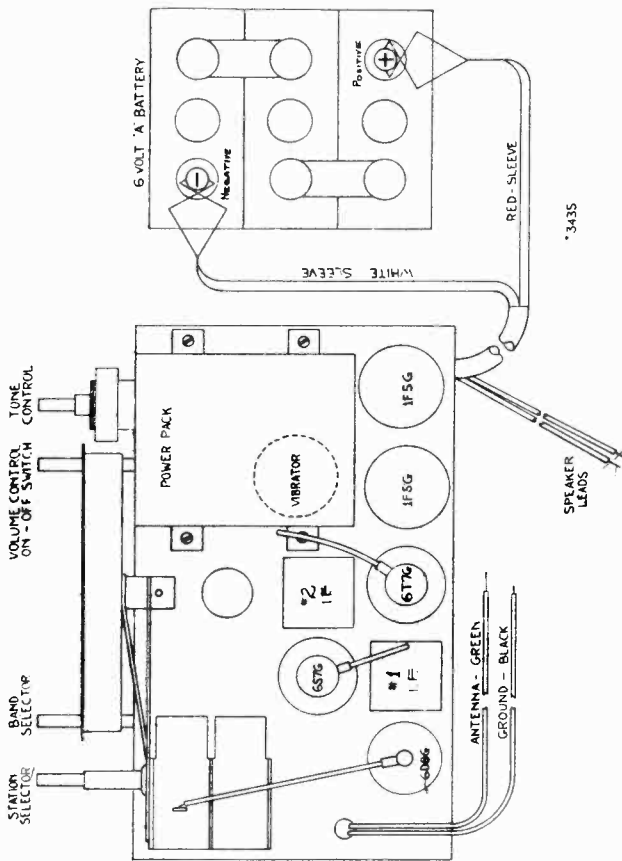
Alignment, Parts, Trimmers

DETROLA RADIO CORP.

MODELS 144B, 144C
Schematic, Socket

Tubes required are:
 1—6D8G Oscillator-Translator.
 1—6S7G Intermediate frequency amplifier.
 1—6T7G Detector—automatic volume control—
 first audio amplifier.
 2—1F5G Power output.

TUBE LAYOUT and CONNECTION DIAGRAM



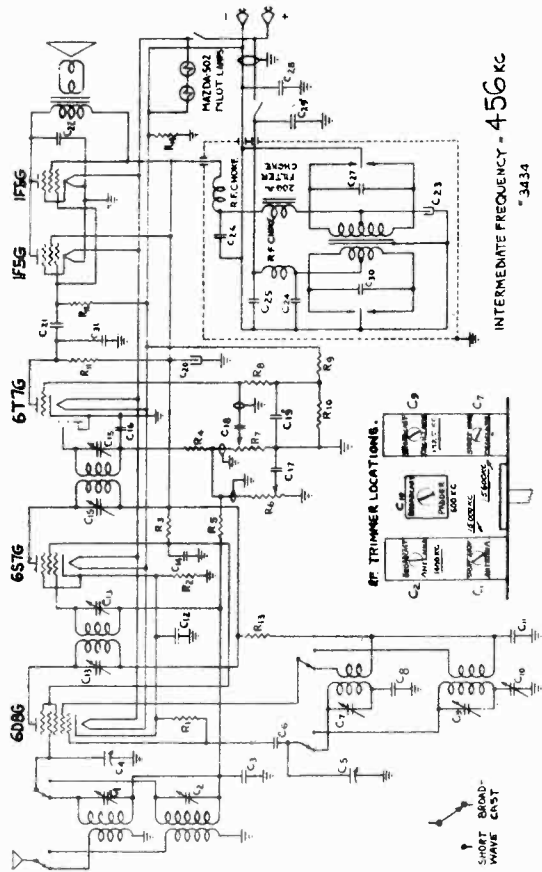
ALIGNMENT PROCEDURE

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.

IF. Connect generator ground to receiver ground. Using 1 mfd condenser in series with "high" side of generator, apply 456 kc signal to grid of 6S7G and adjust second IF transformer: same for first IF, applying signal to grid of 6D8G. (See above diagram for location of tubes and transformers.)

RF. (See circuit diagram for location of trimmers.) Using 200 mmf condenser in series with generator, feed 1725 kc signal to antenna lead and adjust oscillator top frequency. Set generator at 1400 kc. tune receiver to signal and adjust oscillator top frequency trimmer. Set generator to 600 kc. tune receiver and adjust antenna trimmer. The tuning condenser should be rocked back and forth through the signal while the paddler is being adjusted in order to obtain perfect alignment.

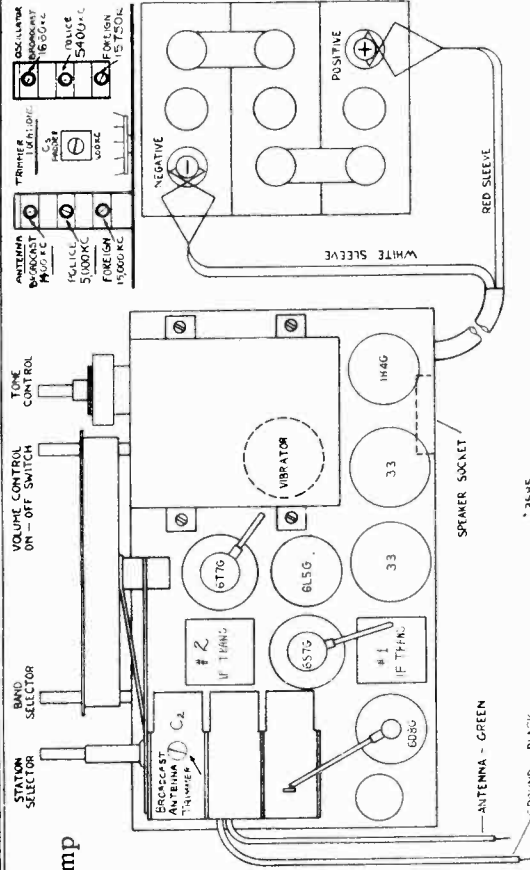
Using 400 ohm resistor in series with generator, set band selector in short wave (right) position, feed 15,600 kc signal to antenna and adjust oscillator trimmer—screw trimmer down tight and unscrew to SECOND peak. Set generator to 15,000 kc. tune receiver and adjust antenna trimmer—screw trimmer down tight and unscrew to FIRST peak, rocking the condenser back and forth through the signal while the adjustment is being made. Above procedure for alignment at 15,000 kc must be followed exactly to insure proper tracking. A "dead spot" at about 12,000 kc will result if antenna and oscillator are not set in proper relation to each other.



Symbol	Part No.	Description	Symbol	Part No.	Description
C1	1611	3-35 Trimmer	R7	3418	500 M VC with DPST Switch
C2, 7, 9	2597	1-10 Trimmer	R9	2693	2 Meg 1/3 W
C3, 12, 19	572	1 200V	R11	599	150 M 1/3 W
C4, 5	2871	350 mmf Variable	R12	615	500 M 1/3 W
C6	2780	50 mmf Mica	R13	614	5 M 1/3 W
C8	2694	.005 ± 5%	R14	3433	15 Ohms ± 5/8 1w
C10	2560	350 mmf Padder		3412	No. 1 IF Trans.
C11, 18	568	.01 400V		3413	No. 2 IF Trans.
C13, 15		IF Trimmers		3415	Power Transformer
C14, 28, 29	580	05 200V		3416	Filter Choke
C16, 31	1286	250 mmf Mica		3570	Band Selector Switch
C17	581	005 400V		3419	Antenna Coil
C20	2594	24 mf 150V		3420	Oscillator Coil
C21	576	.02 400V		3421	Vibrator
C22	3190	.001 Mica		2378	Pointer
C23	3417	8 mf 200V		1408	Pointer Screw
C24, 25, 30	3003	5 160V		2163	Drive Cable
C26	824	.002 600V		3268	8 Prong Socket
C27	3432	.015 1200V		2165	7 Prong Socket
R1, 4	631	50 M 1/3 W		1489	5 Prong Socket
R2	3004	150 Ohms		3426	Pilot Lamp
R3	609	15 M 1/3 W		3431	Battery Connector
R5, 8, 10	624	1 Meg 1/3 W		3436	PM Dynamic Speaker
R6	3571	2 Meg TC			

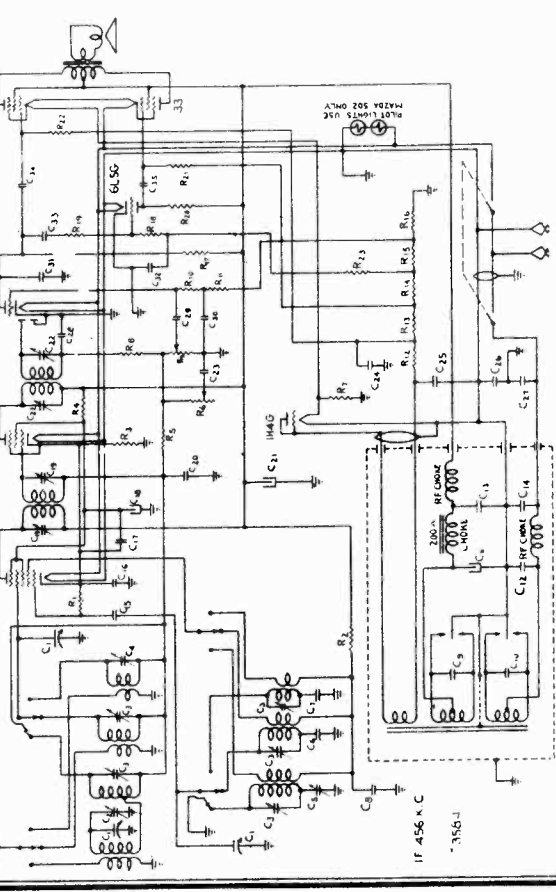
MODELS 145B, 145CR
Schematic, Socket
Trimmers, Alignment, Parts

DETROLA RADIO CORP.



Symbol	Part No.	Description	Symbol	Part No.	Description
C1	2872	350 MMF Variable	R9	3418	500M VC with DPST Switch
C2,3	2597	1-10 trimmer	R12	2688	60M 1/3 w + 10%
C4	1611	3-35 trimmer	R13, 16	3581	3M 1/3 w + 10%
C5	2560	360 MMF padder	R17	602	250M 1/3 w
C6	2741	1330 MMF padder	R18	3582	75M 1/3 w + 10%
C7	2793	.006 + 5%	R19	2599	1 Meg. + 10%
C8, 17	565	.01 200V	R20	603	100M 1/3 w
C9	3579	.01 1600V	R21, 22	615	500M 1/3 w
C10, 12, 14	3003	5 160V		3412	#1 IF transformer
C11	3575	8 MF 250WV		3465-1	#2 IF transformer
C13	563	.05 400V		3573	Power transformer
C15	2780	50 MMF mica		3416	Filter choke
C16	2792	.2 200V		2724	Band switch
C18	3574	8 MF 150WV		2771	Antenna coil
C19, 22		IF trimmers		2772	Oscillator coil
C20, 30, 32	572	.1 200V		L-1020	Choke coil
C21	3574	16 MF 200 WV		2845	B.C. Antenna coil
C23	581	.005 600V		3421	Vibrator
C24	566	5 200V		2378	Pointer
C25	579	.25 200V		1408	Pointer screw
C26, 27	680	.05 200V		2163	Drive cable
C28	1286	250 MMF mica		3268	8 Prong socket
C29, 33, 34, 35	576	.02 400V		2165	7 Prong socket
C31	1285	100 MMF mica		2221	6 Prong socket
R1	631	50M 1/3 w		1489	5 Prong socket
R2	617	20M 1/3 w		833	4 Prong socket
R3	2689	100 ohms + 10%		3426	Pilot lamp
R4	609	15M 1/3 w		3431	Battery connector
R5, 10, 11, 23	624	1 Meg.		3586	8" PM Dynamic speaker
R6	3571	2 Meg. TC			
R7	3580	10 ohms + 5%			
R8	631	50M 1/3 w			

6T7G Detector—automatic volume cont
6L5G first audio amplifier
1H4G Bias rectifier



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.

IF. Connect generator ground to received ground. Using .1 mfd condenser in series with "high" side of generator, apply 456 kc signal to grid of 6S7G and adjust second IF transformer: same for first IF, applying signal to grid of 6D8G. (See above diagram for location of tubes and transformers.)

RF. (See above diagram for location of trimmers.) Using 200 mmf condenser in series with the generator, feed 1660 kc to antenna lead and adjust broadcast oscillator trimmer for top frequency. Set generator to 1400 kc, tune receiver and adjust the two antenna trimmers. Set generator to 600 kc, tune receiver to signal and adjust padder. The tuning condenser should be rocked back and forth through the signal while the padder is being set in order to secure perfect alignment.

Using 400 ohm resistor in series with generator, set band selector in center position. set generator to 5400 kc and adjust oscillator trimmer for top frequency. Set generator to 5000 kc, tune receiver to signal and adjust antenna trimmer.

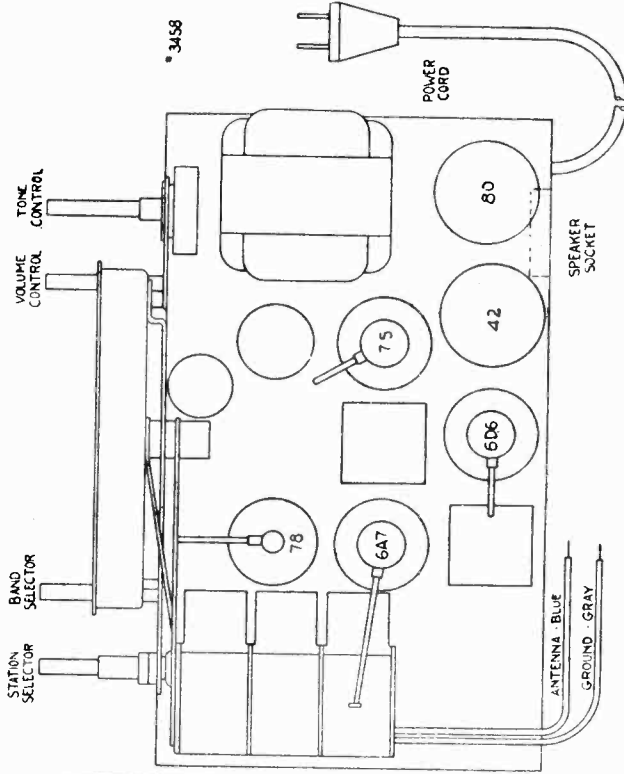
Turn band selector to extreme clockwise position. Using 400 ohm resistor in series with generator, set oscillator top frequency for 15,750 kc—screw trimmer down tight, then unscrew to second peak. Set generator to 15,000 kc, tune receiver to signal and adjust antenna trimmer—Screw trimmer down tight, 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 15,000 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.

Schematics, Sockets

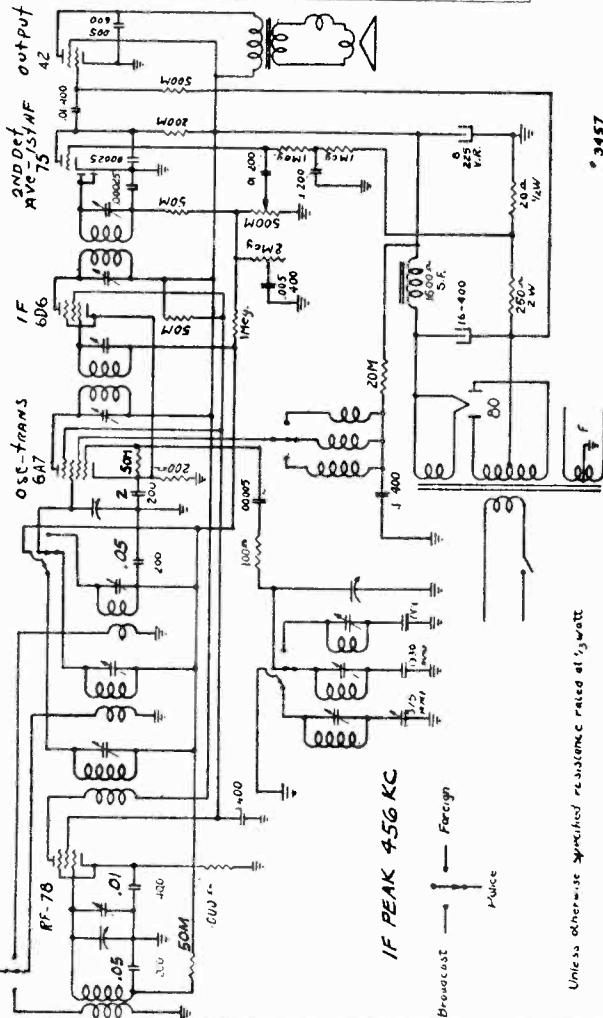
DETROLA RADIO CORP.

MODEL 146
MODEL 158A
MODEL 162

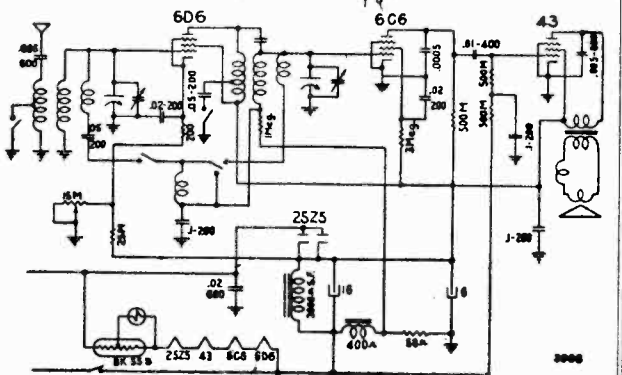
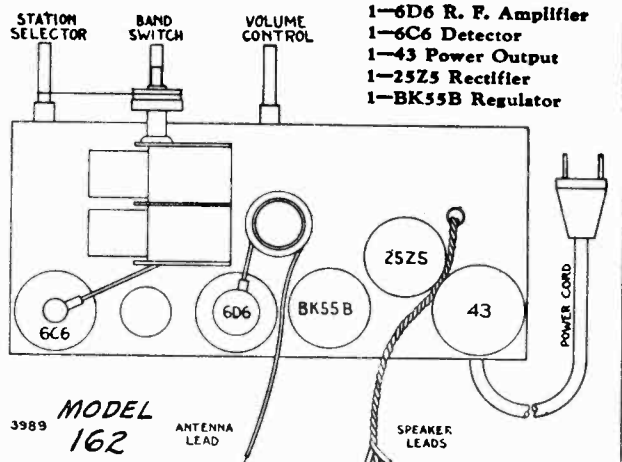
TUBE LAYOUT MODEL 146



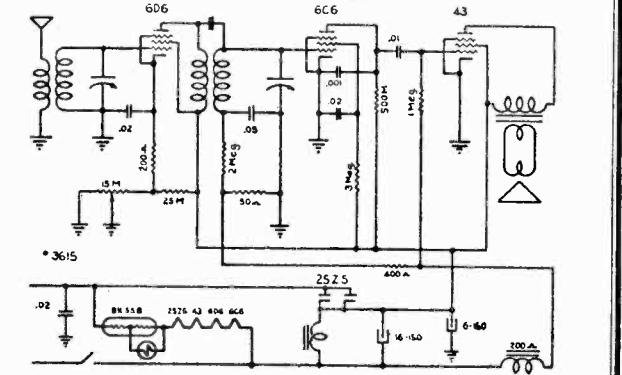
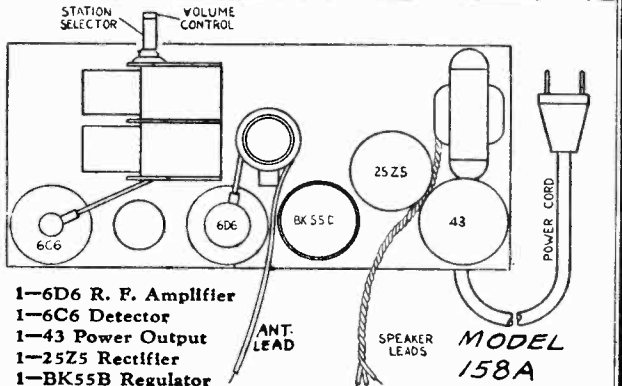
CIRCUIT DIAGRAM MODEL 146



Unless otherwise specified resistance is in ohms



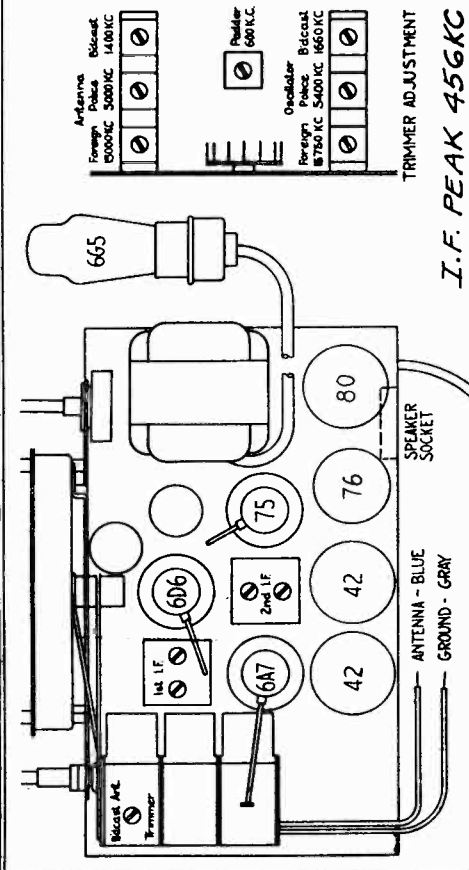
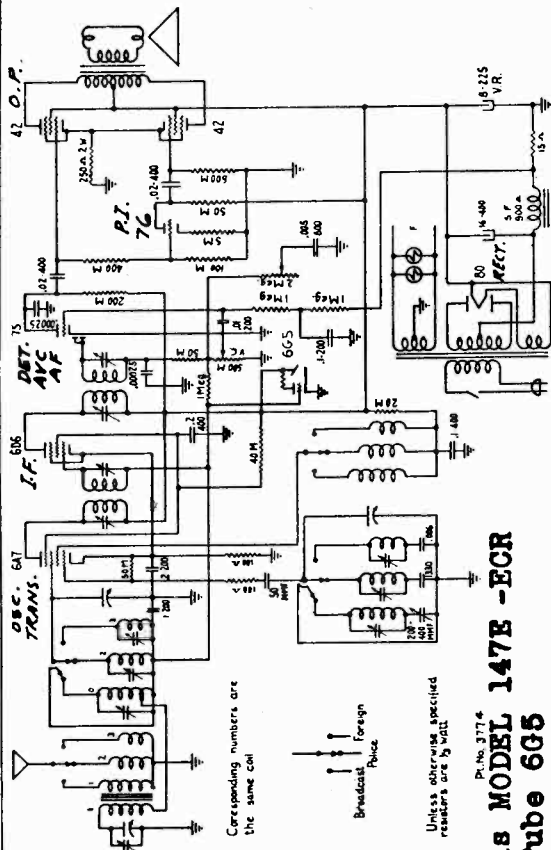
ALIGN AT 1500 KC



ALIGN AT 1500 KC

DETROLA RADIO CORP.

MODELS 147, 147E, 147ECR
Schematic, Socket, Parts
Alignment, Trimmers



I.F. PEAK 456KC
MODEL 147-the same as MODEL 147E -ECR except that Tuning Tube 605 is not used.

I. F. Alignment

The I.F. frequency of this receiver is 456 K.C. For alignment, use the following procedure.
It is necessary to use an accurately calibrated signal generator. Couple the signal generator to the grid of the 6A7 tube with a tenth microfarad condenser in series with the "high" lead of the signal generator. Connect the ground side of the signal generator to the chassis. Set the signal generator to 456 K.C. Be sure the wave switch of the set is in the broadcast position and the volume control set at maximum. Attenuate the signal generator so that the signal is just audible in the speaker. If an output meter is used, it should be connected across the voice coil terminals of the speaker. Use 1/2 volt as standard output.

Adjust the 2nd I.F. transformer first. Each screw should be adjusted for maximum output. After number two I.F. has been adjusted, number one I.F. should be adjusted for maximum output. After both transformers have been adjusted, it is necessary to recheck No. 2 transformer and then recheck No. 1.

See TUBE LAYOUT for location of I.F. and R.F. trimmers and paddler.
RF. (See above diagram for location of trimmers.) Using 200 mmf condenser in series with the generator, feed 1660 kc to antenna lead and adjust broadcast oscillator trimmer for top frequency. Set generator to 1400 kc, tune receiver and adjust the two antenna trimmers. Set generator to 600 kc, tune receiver to signal and adjust paddler. The tuning condenser should be rocked back and forth through the signal while the paddler is being set in order to secure perfect alignment.

Using 400 ohm resistor in series with generator, set band selector in center position, set generator to 5400 kc and adjust oscillator trimmer for top frequency. Set generator to 5000 kc, tune receiver to signal and adjust antenna trimmer.

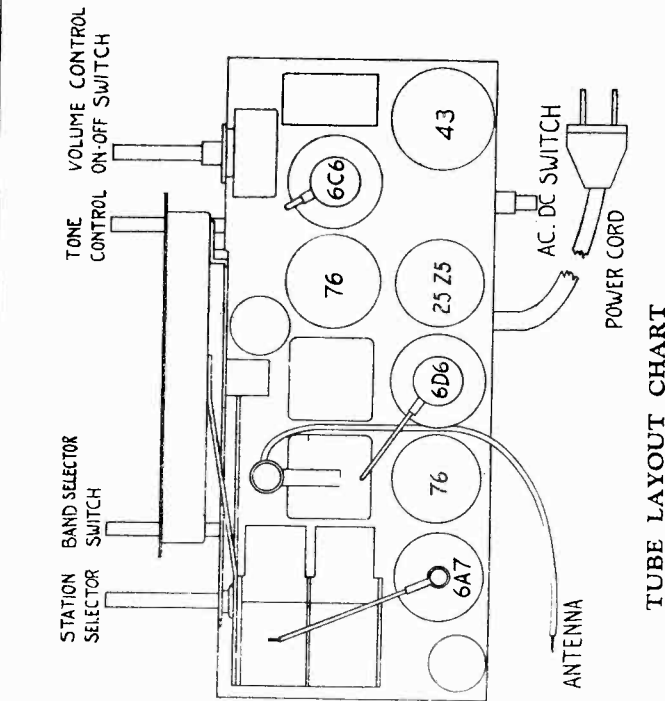
Turn band selector to extreme clockwise position. Using 400 ohm resistor in series with generator, set oscillator top frequency for 15,750 kc—screw trimmer down tight, then unscrew to second peak. Set generator to 15,000 kc, tune receiver to signal and adjust antenna trimmer—Screw trimmer down tight, then unscrew to first peak, rocking the tuning condenser back and forth through the signal while the adjustment is being

Part No.	Req.	Description	Part No.	Req.	Description
2163	1	Cable, Drive, Approx. 20"	3353	1	Resistor, 2 W., 250 Ohm
3351	1	Cond. 8 MF., 225 V. Reg.	2689	2	Resistor, 1/3 W., 100 Ohm
3774		Schematic Diagram	2883	1	Resistor, 1/3 W., 5 M.
3775	1	Tube Sticker	2882	1	Resistor, 1/3 W., 15 Ohm
2560	1	Condenser, Padder	2881	1	Resistor, 1/3 W., 400 M.
2597	4	Condenser, Trimmer, 1-10	2880	1	Resistor, 1/3 W., 100 M.
1611	1	Condenser, Trimmer, 5-35	636	1	Resistor, 1/3 W., 40 M.
3157	1	Condenser, Trimmer	2724	1	Switch, Band
1286	1	Condenser, Mica, .00025	2837	1	Coil, Antenna
2780	1	Condenser, Mica, .00005	2772	1	Coil, Oscillator
2741	1	Variable Condenser	2845	1	Coil, B. C. Antenna
2872	1	Variable Condenser	3343	1	Transformer, Power
576	2	Condenser, .02, 400 V., Paper	3344	1	Transformer, 1st I. F.
572	2	Condenser, .1, 200 V., Paper	3345	1	Transformer, 2nd I. F.
565	1	Condenser, .01, 200 V., Paper	3375	1	Cond. Elec. 16 MF., 400 V
581	1	Cond., .005, 600 V., Paper	2908	1	Spring, Drive Cable
2792	1	Condenser, .2, 200 V., Paper	3374	1	Indicator
2793	1	Cond., .006, 600 V., Paper	2378	1	Pointer
3352	1	Condenser, .2, 400 V., Paper	2726	1	Control, Vol. & Switch
575	1	Condenser, .1, 400 V., Paper	2737	1	Control, Tone
624	2	Resistor, 1/3 W., 1 Meg.	1732	1	A. C. Cord
2731	1	Resistor, 1/3 W., 500 M.	3778	1	Book, Instruction
2730	1	Resistor, 1/3 W., 200 M.	2897	1	Escutcheon Tuning Tube
631	2	Resistor, 1/3 W., 50 M.	2981	1	Tuning Tube Cable
617	1	Resistor, 1/3 W., 20 M.	3710	1	Speaker, 8"
			3377	1	Escutcheon

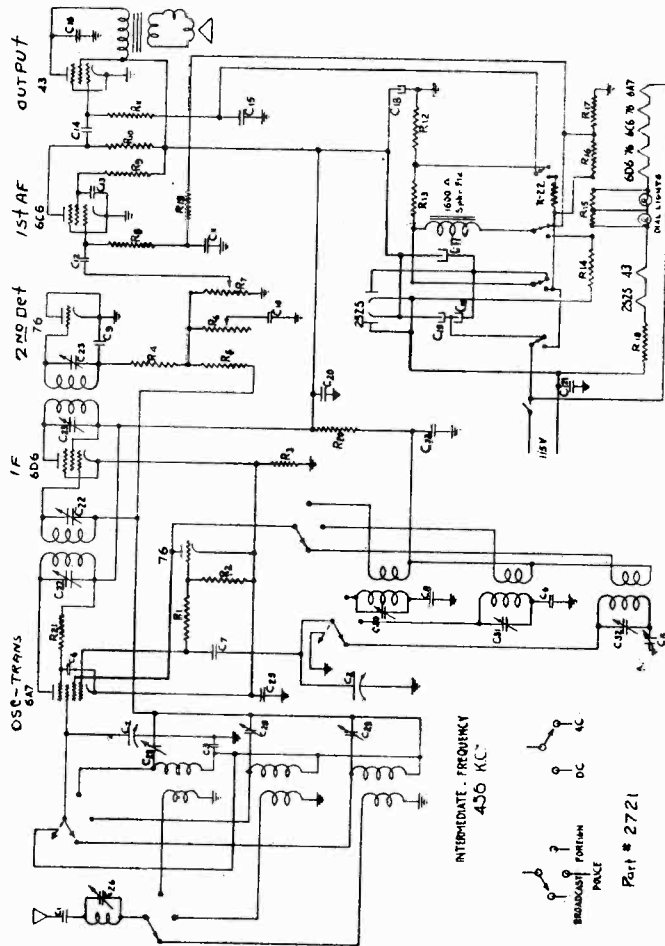
made. Above procedure for alignment at 15,000 kc must be followed exactly to insure proper tracking. A dead spot at about 12,000 kc will result if antenna and oscillator circuits are not set in proper relation to each other.

DETROLA RADIO CORP.

MODEL 148
Schematic, Socket
Parts



TUBE LAYOUT CHART



PARTS LIST - - MODEL 148

- C1 .005 600 v.
- C2 .00035 variable air
- C3 .05 200 v.
- C4 .05 200 v.
- C5 350 mmf. variable mica
- C6 1330 mmf.
- C7 50 mmf. mica
- C8 3850 mmf.
- C9 250 mmf. mica
- C10 .01 200 v.
- C11 .1 200 v.
- C12 .01 400 v.
- C13 .1 200 v.
- C14 .01 400 v.
- C15 .25 200 v.
- C16 .005 600 v.
- C17 8 mfd. 250 w.v. wet el.
- C18 24 mfd. 150 w.v. wet el.
- C19 8/8 mfd. 175 p.v. dry
- C20 .1 200 v.
- C21 .02 600 v.
- C22 120 mmf. trimmer
- C23 120 mmf. trimmer
- C24 .02 200 v.
- C25 .05 200 v.
- C26 180 mmf. trimmer
- C27 5 to 35 mmf. trimmer
- C28, C29, C30, C31, C32, 1 to 10 mmf. trimmer
- R1 200 ohms, 1/3 watt
- R2 50M ohms, 1/3 watt
- R3 200 ohms, 1/3 watt
- R4 50M ohms, 1/3 watt
- R5 1 meg., 1/3 watt
- R6 2 meg. tone control
- R7 500M ohms, vol. con. and line switch
- R8 1 meg., 1/3 watt
- R9 1 meg., 1/3 watt
- R10 250M ohms, 1/3 watt
- R11 500M ohms, 1/3 watt
- R12 200M ohms, 1/3 watt
- R13 500M ohms, 1/3 watt
- R14 1200 ohms, 3 watt
- R15 45 ohms, center tapped
- R16 370 ohms, 1 watt
- R17 35 ohms, 1/3 watt
- R18 82 ohms, line cord
- R19 1 meg., 1/3 watt
- R20 5M ohms, 1/3 watt
- R21 20M ohms, 1/3 watt
- R22 500M ohms, 1/3 watt

NO GROUND IS NECESSARY—Under no condition should a ground wire be attached to this receiver.

Tubes and Connections

Tubes required are:

- 1—6A7 Translocator.
- 1—76 Oscillator.
- 1—6D6 Intermediate frequency amplifier.
- 1—76 Detector-Automatic volume control.
- 1—6C6 First audio.
- 1—43 Power output.
- 1—25Z5 Rectifier. Voltage Doubler.

MODEL 150
Schematic, Socket
Notes

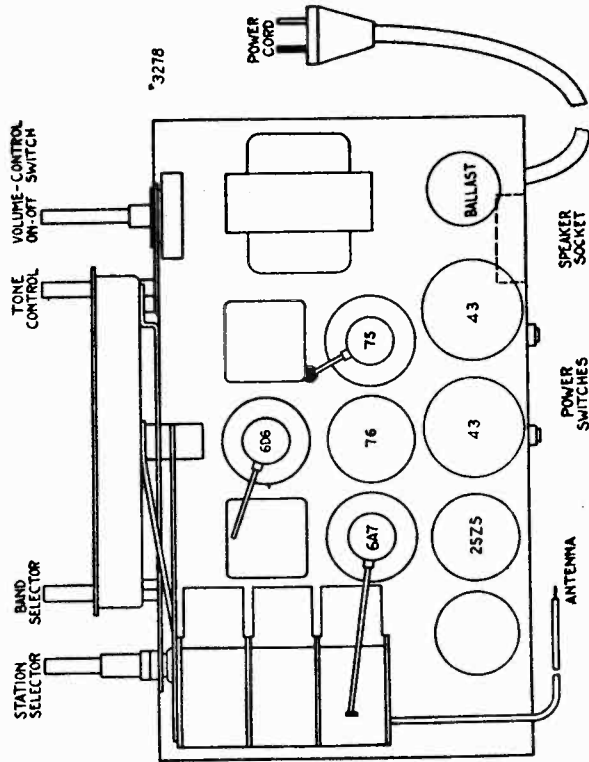
DETROLA RADIO CORP.

Tubes required are:

- 1—6A7 Oscillator Translator
- 1—6D6 I. F. Amplifier

- 1—75 Detector A. V. C. Audio Amplifier
- 1—76 Phase Inverter
- 2—43 Output
- 1—25Z5 Rectifier

TUBE LAYOUT



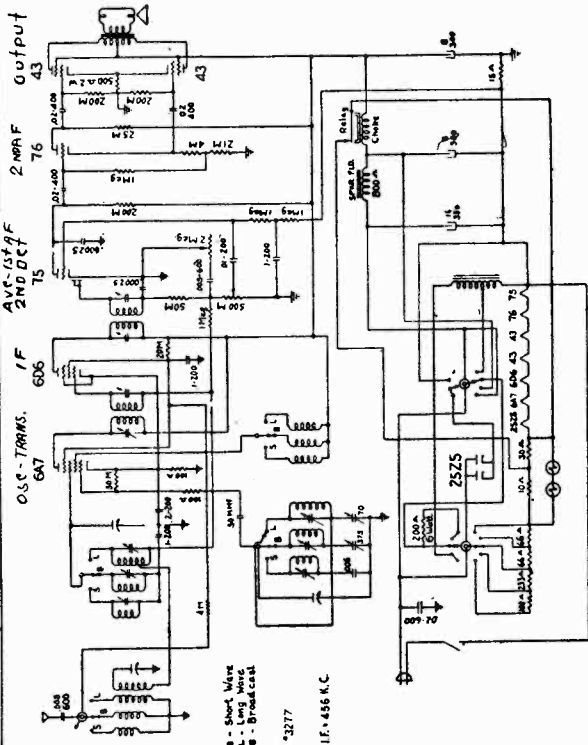
Do not attach a ground to this receiver.

FOR DIRECT CURRENT ONLY

Voltage of Mains	Set Switch to position marked	
	Set Switch B	Set Switch A
100 to 120	110	DC 100 to 150
120 to 140	130	DC 100 to 150
140 to 160	150	DC 150 to 250
210 to 230	220	DC 150 to 250
240 to 260	250	DC 150 to 250

FOR ALTERNATING CURRENT ONLY

100 to 120	110	AC 100 to 130
120 to 130	130	AC 100 to 130
140 to 160	150	AC 130 to 250
210 to 230	220	AC 130 to 250
240 to 260	250	AC 130 to 250



WARNING: READ THESE INSTRUCTIONS
BEFORE CONNECTING THIS RECEIVER
TO THE ELECTRIC MAINS

This receiver may be adjusted to operate on any current, either direct or alternating of any frequency from 25 cycles to 150 cycles, and at any voltage from 100 volts to 260 volts. The adjustments of the receiver to any voltage or current is accomplished by means of two switches located on the rear panel of the receiver.

Before connecting the receiver to the electric mains, ascertain from your power company the voltage of the mains in your home, and whether it is alternating current or direct current.

When this information has been obtained, the following procedure should be used to set the electrical circuits of the receiver to the line voltage in your home:

Below is a table of main voltage, for both direct and alternating currents. Opposite each main voltage in the table, is a designation of the proper setting for each switch. There is a plate on the rear of the chassis that is graduated in the main voltage settings. The switches are adjustable by means of a screw driver. The slot in the switches is also used as an indicator which should point to graduation to be used.

Each switch must be set according to the table. They must not be changed on the set while it is connected to the mains.

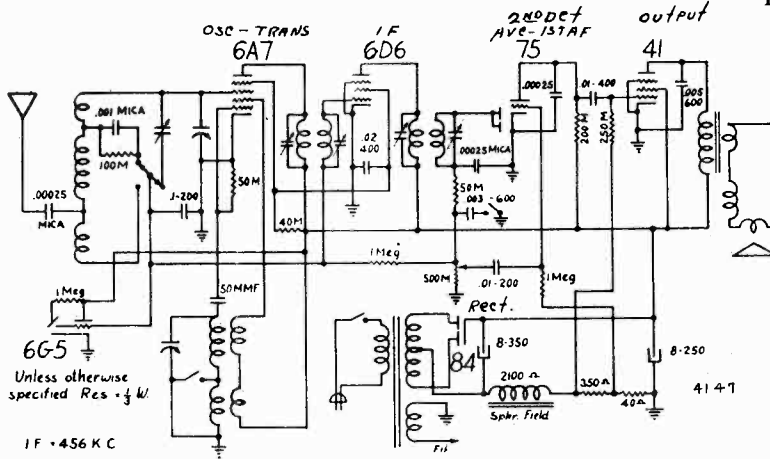
Unless these instructions are properly carried out serious harm to the electrical parts in the receiver will result.

DETROLA RADIO CORP.

MODEL 154E
Schematic, Socket
Trimmers, Alignment
Parts

Tubes required are:

- 1—6A7 Oscillator-Translator
- 1—6D6 I. F. Amplifier
- 1—75 Detector-A.V.C., Audio Amplifier
- 1—41 Output
- 1—84 Rectifier
- 1—6G5 Tuning Eye



Part No.	Req.	Description	Part No.	Req.	Description
3873	1	Transformer—Power	624	1	Resistor— $\frac{1}{3}$ W—1 Meg.
3356	1	Transformer—1st I.F.	602	1	Resistor— $\frac{1}{3}$ W—250M
3465	2	Transformer—2nd I.F.	2730	1	Resistor— $\frac{1}{3}$ W—200M
3874	1	Coil—Antenna	603	1	Resistor— $\frac{1}{3}$ W—100M
3875	1	Coil—Oscillator	631	1	Resistor— $\frac{1}{3}$ W—50M
3876	1	Condenser—Variable	636	1	Resistor— $\frac{1}{3}$ W—40M
3877	1	Condenser—Dry Elec.	3893	1	Resistor— $\frac{1}{3}$ W—350 oms
3878	1	Speaker	3402	1	Resistor—1W—40 ohms Flexohm
4147		Schematic Diagram	4145	1	Indicator
4148		Tube Sticker	3889	1	Gasket—Glass
530	2	Bulbs—Pilot Light	3890	1	Glass
2163	1	Drive Cable	3891	1	Pointer
2908	1	Spring—Drive Cable	565	1	Condenser—Paper .01-200V
2597	1	Condenser—Trimmer	568	1	Condenser—Paper .01-400V
1286	2	Condenser—Mica .00025	576	1	Condenser—Paper .02-400V
3190	1	Condenser—Mica .001	572	1	Condenser—Paper .1-200V
3066	1	Switch—Band	581	1	Condenser—Paper .005-600V
3883	1	Control—Tone—Switch	2695	1	Condenser—Paper .003-600V
3361	1	Control—Volume and Switch			

R. F. Alignment

First, connect the ground side of the signal generator to the chassis. Connect the high side of the signal generator with a .00025 condenser in series, to the antenna lead of the set. Make sure the band switch of the set is in the broadcast position. Set the volume control to maximum. Turn the station selector to the highest frequency (as far as it will go). Set the signal generator to 1720 K.C. Adjust the oscillator trimmer until the signal is heard. After the oscillator has been set at 1720 K.C., turn the station selector to 1400 K.C. Set the signal generator to 1400 K.C. When the signal is heard, adjust the first detector trimmer for maximum output.

When aligning the R.F., use the same output standard as was used on the I.F. alignment.

Short Wave Alignment

Turn the band selector switch of the set to short wave. Set the signal generator to 6000 K.C. Connect a 400 ohm resistor in series with the .00025 condenser. Tune the set until the signal is heard. If two signals are heard, always align to the highest frequency heard on the receiver. Adjust the small trimmer on the antenna coil for maximum output.

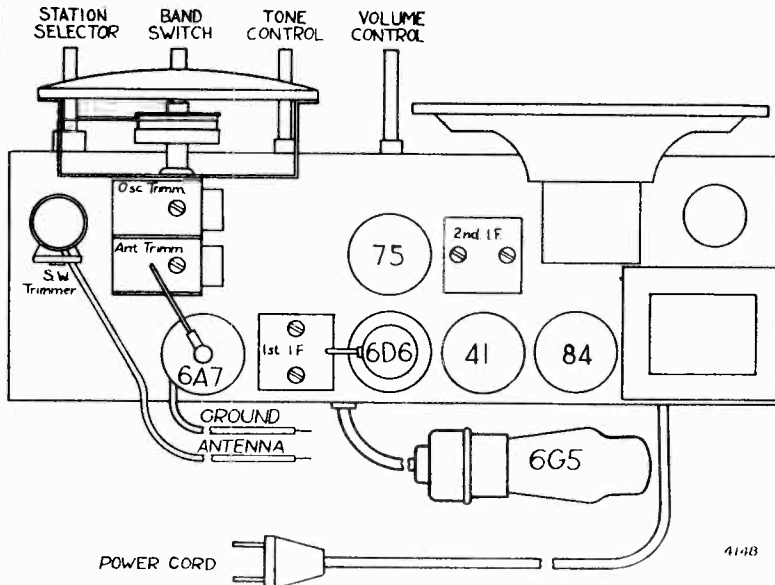
I. F. Alignment

The I.F. frequency of this receiver is 456 K.C. For realignment, use the following procedure.

It is necessary to use an accurately calibrated signal generator. Couple the signal generator to the grid of the 6A7 tube with a tenth microfarad condenser in series with the "high" lead of the signal generator. Connect the ground side of the signal generator to the chassis. Set the signal generator to 456 K.C. Be sure the wave switch of the set is in the broadcast position and the volume control set at maximum. Attenuate the signal generator so that the signal is just audible in the speaker. If an output meter is used, it should be connected across the voice coil terminals of the speaker. Use $\frac{1}{2}$ volt as standard output.

Adjust the 2nd I.F. transformer first. Each screw should be adjusted for maximum output. After number two I.F. has been adjusted, number one I.F. should be adjusted for maximum output. After both transformers have been adjusted, it is necessary to recheck No. 2 transformer and then recheck No. 1.

See TUBE LAYOUT for location of I.F. and R.F. trimmers and paddr.



MODEL 155X

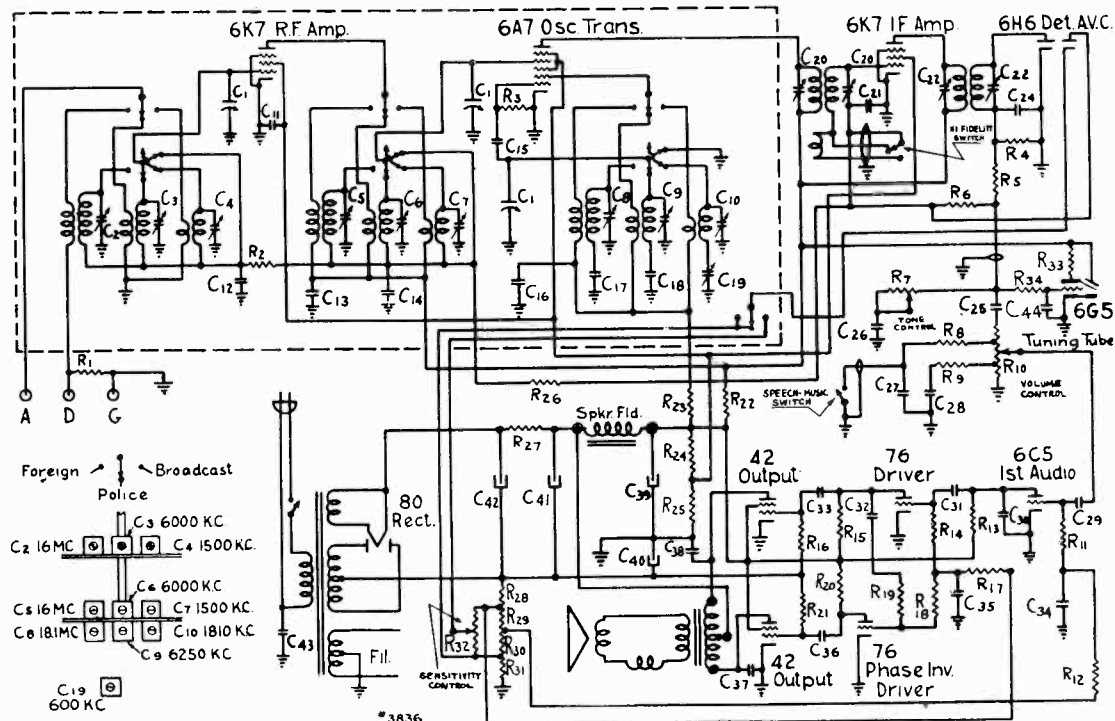
Schematic, Parts

DETROLA RADIO CORP.

Tubes

- Tubes required are:
- 1—6K7 Radio frequency amplifier
- 1—6A7 Oscillator—translator
- 1—6K7 Intermediate frequency amplifier
- 1—6H6 Detector—automatic volume control
- 1—6C5 First audio amplifier

- 1—6G5 Cathode ray tuning tube (on models equipped with "eye" tuning indicator)
- 1—76 Driver
- 1—76 Driver-phase inverter
- 2—42 Power output
- 1—80 Rectifier



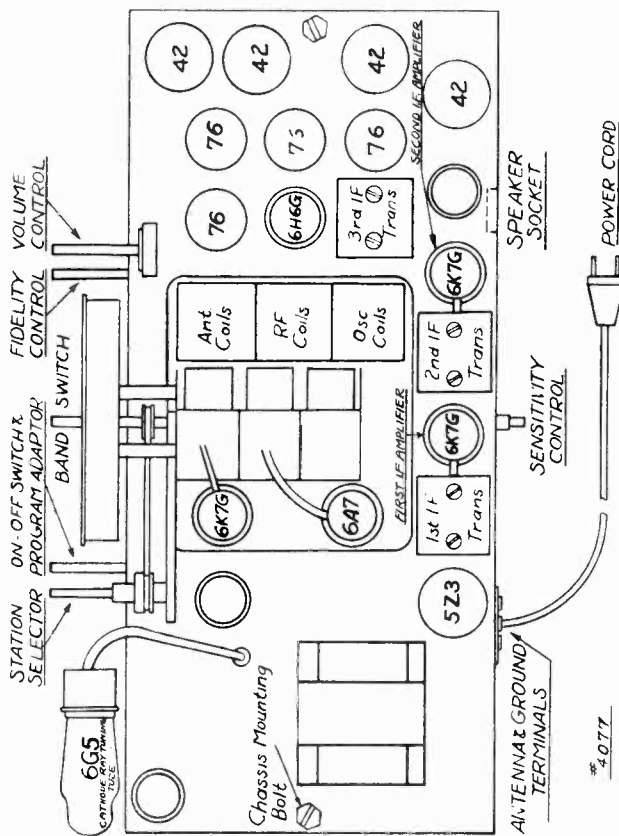
IF PEAK 456 KC

Symbol	Part No.	Description	Symbol	Part No.	Description
C1	3814	9-400 mmf Variable	R9,23	617	20 M 1/3 W.
C2,3,4	3822	2-35 triple trimmer	R10	3800	3 meg volume control
C5,6,7	3822	2-35 triple trimmer	R11,12	624	1 meg 1/3 W.
C8,9,10	3822	2-35 triple trimmer	R18	2688	60 M 1/3 W. 10%
C11,21,34	572	.1—200 V.	R19	2731	500 M 1/3 W. 10%
C12,14	580	.05 200 V.	R22	2421	1 M 1/3 W.
C13	575	.1 400 V.	R24	3805	7 M 3.5 W.
C15,24	2780	50 mmf mica	R25	3805	8 M 1.5 W.
C16	568	.01 400 V.	R27	3809	100 ohms 2 W. 10%
C17	2694	.005 5% tolerance	R28	3806	120 ohms 1.5 W. 10%
C18	2741	1330 mmf 5% tolerance	R29	3808	50 ohms .75 W. 10%
C19	2560	350 mmf variable padder	R30	3807	35 ohms .5 W. 10%
C20,22		IF Trimmers	R31	3870	15 ohms .5 W. 10%
C25,28	2385	.02 200 V.	R32	3801	2 M Variable
C26	2695	.003 600 V.		3796	Power transformer
C27	824	.002 600 V.		3797	No. 1 IF transformer
C29	576	.02 400 V.		3798	No. 2 IF transformer
C30	1286	250 mmf mica		2981	Tuning tube cable
C31,33,36	2600	.02 600 V.		3838	12" Speaker
C32	563	.05 400 V.		2898	Tuning tube clamp
C35	579	.25 200 V.		3815	RF coil
C37,38	3138	.001 800 V.		3943	Oscillator coil
C39	3113	16 MF regulating		3817	Antenna coil
C40	3136	20 MF 25 V.		3825	Planetary drive
C41	3112	16 MF 450 V.		3826	Drive belt
C42	3111	16 MF 500 V.		3198	Idler pulley
C43	3135	.003 800 V.		3199	Idler spring
R1,5,15,20,26	603	100 M 1/3 W.		3831	Minute pointer
R2,3,13	631	50 M 1/3 W.		3832	Tuning pointer
R4,14,16,21	615	500 M 1/3 W.		3802	On-off switch
R6	2693	2 meg 1/3 W.		3818	RF and Antenna switch
R7	3799	2 meg tone control		3819	Oscillator switch
R8,17	2568	300 M 1/3 W.			

DETROLA RADIO CORP.

MODEL 155X
MODEL 163
Sockets, Trimmers
Alignment

MODEL 163



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

Be sure that the fidelity control is NOT in the HIGH FIDELITY position. It will not be possible to properly align the receiver unless this control is turned part way toward its "bass" position.

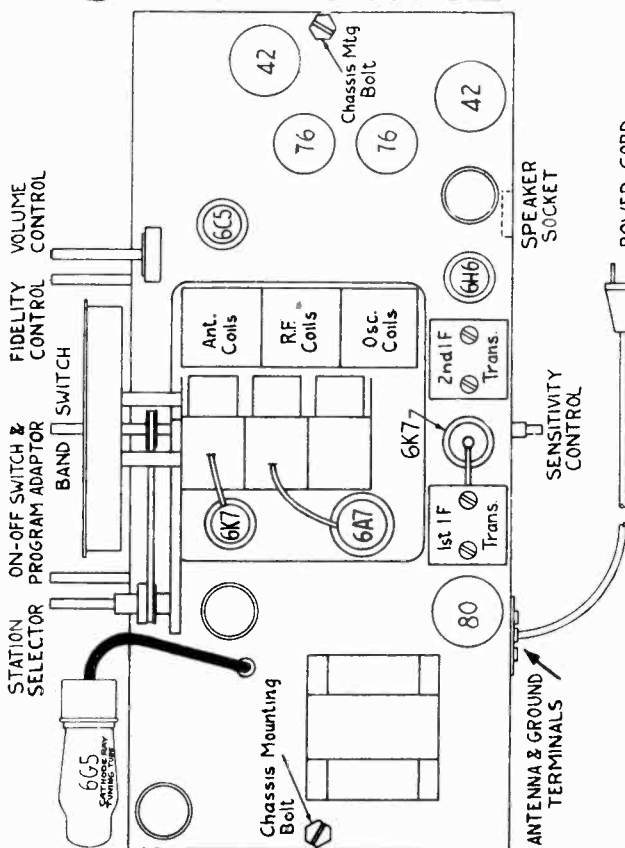
IF. Connect the generator ground to receiver chassis. Using .1 mfd. condenser in series with high side of generator, apply 456 kc. signal to grid of 6K7G second IF amplifier and align transformer No. 3. Repeat for transformer No. 2, applying signal to grid of 6K7G first IF amplifier. Repeat for transformer No. 1, applying signal to grid of 6A7 transformer. (See above diagram for location of tubes and transformers.)

RF. (See circuit diagram for location of trimmers.) Using a 200 mmf. condenser in series with the high side of the generator, turn band selector switch all the way to the left, tuning condenser to minimum capacity, feed 1810 kc. signal to antenna terminal and adjust broadcast oscillator trimmer for top frequency. Set generator frequency at some point around 1500-1600 kc. and adjust broadcast antenna and RF trimmers. 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.

A 400 ohm resistor must be used in series with the generator as a "dummy" antenna for proper alignment of the two short wave bands. Set the band selector switch in the center position, adjust the oscillator top frequency for 6250 kc., then align the antenna and RF trimmers at about 6000 kc. With the band selector in the extreme right position, adjust the top frequency of the high frequency to 18,100 kc., and align the antenna and RF trimmers at about 16,000 kc. In order to make sure that the top end of the last band is set properly, it is best to screw the oscillator trimmer down tight, then unscrew to the second peak. The antenna and RF trimmers should be screwed down tight, then unscrew to the first peak. This procedure must be followed in order that the oscillator and RF circuits will be set in the correct relation to each other, otherwise a "dead" spot at a lower frequency will result, and the dial calibration will not be correct. Usually, it is best to rock the tuning condenser back and forth slightly while making these adjustments at high frequencies.

MODEL 155X

TUBE LAYOUT and CONNECTION DIAGRAM



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

Be sure that the fidelity control is NOT in the HIGH FIDELITY position. It will not be possible to properly align the receiver unless this control is turned part way toward its "bass" position.

IF. Connect the generator ground to receiver chassis. Using .1 mfd. condenser in series with high side of the generator, apply 456 kc. signal to the grid of the 6K7 IF amplifier tube and align second IF transformer trimmers. Repeat for first IF transformer, applying signal to grid of the 6A7 tube. (See above diagram for location of tubes and transformers.)

RF. (See circuit diagram for location of trimmers.) Using a 200 mmf. condenser in series with the high side of the generator, turn band selector switch all the way to the left, tuning condenser to minimum capacity, feed 1810 kc. signal to antenna terminal and adjust broadcast oscillator trimmer for top frequency. Set generator frequency at some point around 1500-1600 kc. and adjust broadcast antenna and RF trimmers. 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.

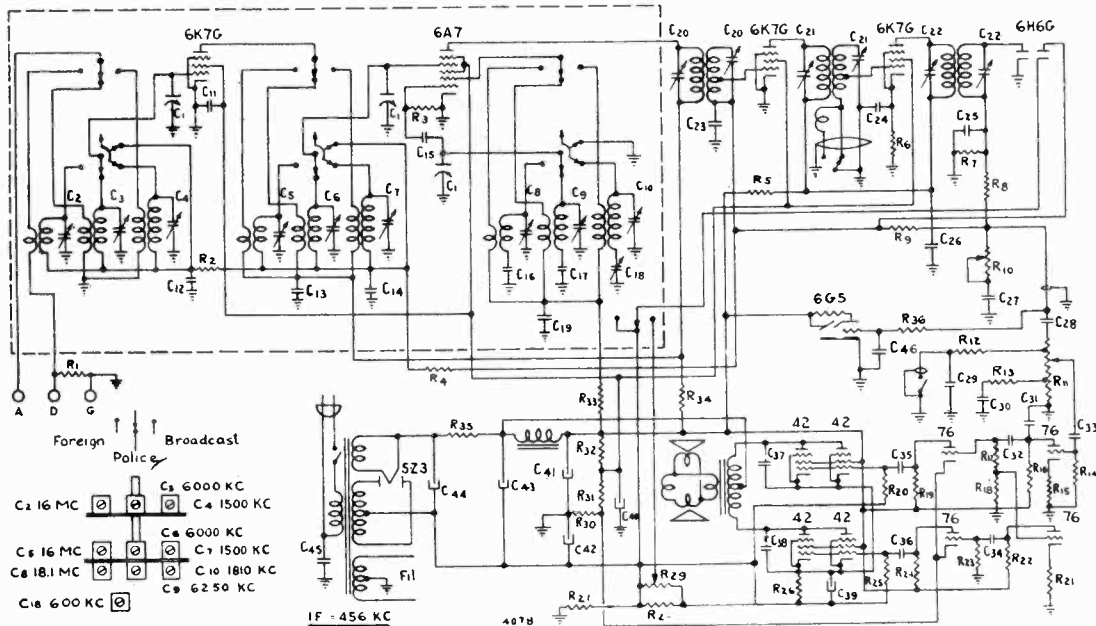
A 400 ohm resistor must be used in series with the generator as a "dummy" antenna for proper alignment of the two short wave bands. Set the band selector switch in the center position, adjust the oscillator top frequency for 6250 kc., then align the antenna and RF trimmers at about 6000 kc. With the band selector in the extreme right position, adjust the top frequency of the high frequency to 18,100 kc., and align the antenna and RF trimmers at about 16,000 kc. In order to make sure that the top end of the last band is set properly, it is best to screw the oscillator trimmer down tight, then unscrew to the second peak. The antenna and RF trimmers should be screwed down tight, then unscrew to the first peak. This procedure must be followed in order that the oscillator and RF circuits will be set in the correct relation to each other, otherwise a "dead" spot at a lower frequency will result, and the dial calibration will not be correct. Usually, it is best to rock the tuning condenser back and forth slightly while making these adjustments at high frequencies.

MODEL 163
Schematic
Parts

DETROLA RADIO CORP.

Tubes

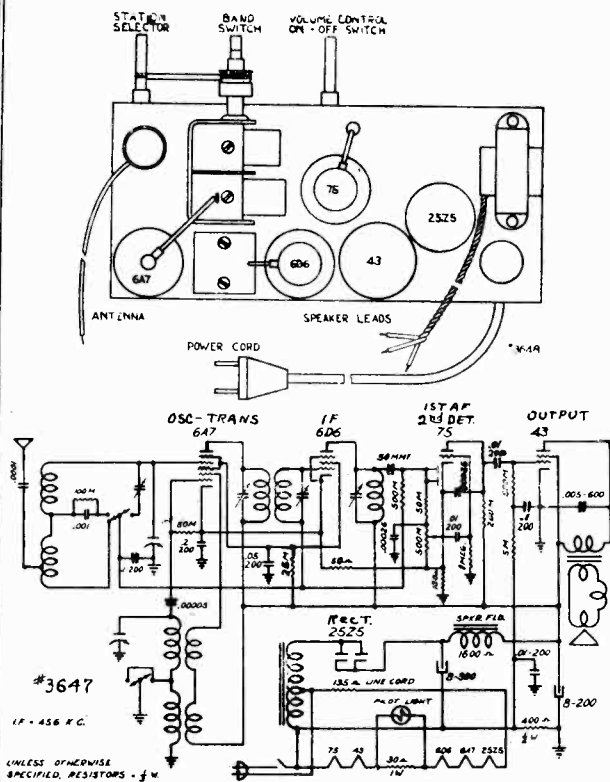
- | | |
|--|----------------------------|
| Tubes required are: | 1—76 First Audio Amplifier |
| 1—6K7G Radio frequency Amplifier | 1—76 Phase Inverter |
| 1—6A7 Oscillator—Translator | 2—76 Drivers |
| 2—6K7G Intermediate frequency Amplifiers | 4—42 Power Output |
| 1—6H6G Detector—AVC—Bias control | 1—5Z3 Rectifier |
| 1—6G5 Cathode ray tuning tube (on models equipped with "eye" tuning indicator) | |



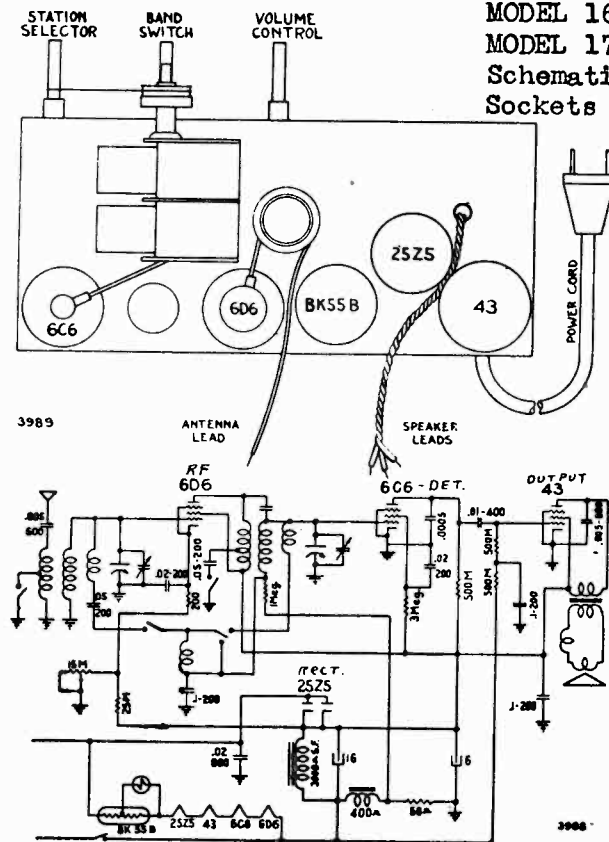
Symbol	Part No.	Description	Symbol	Part No.	Description
C1	3814	9-400 mmf variable	R12,20,25	2568	300 M 1/3 W.
C2,3,4	3822	2-35 triple trimmer	R13,33	617	20 M 1/3 W.
C5,6,7	3822	2-35 triple trimmer	R14	624	1 meg 1/3 W.
C8,9,10	3822	2-35 triple trimmer	R15,21	614	5 M 1/3 W.
C11,23	572	.1 200V.	R17	2731	500 M 10% 1/3 W.
C12,14,46	580	.05 200V.	R18	2880	100 M 10% 1/3 W.
C13	575	.1 400V.	R26	4068	300 ohm 10% 3/4 W. flex.
C15,25	2780	50 mmf mica	R27	3808	50 ohm 10% 3/4 W. flex.
C16	2694	.005 5% tolerance	R28	4069	200 ohm 10% 2 W. flex.
C17	2741	1330 mmf 5% tolerance	R29	3801	2 M variable
C18	2560	350 mmf variable padder	R30	639	750 ohm 1/3 W.
C19,24	568	.01 400V.	R31	3805	8 M 1.5 W.
C20,21,22		IF trimmers	R32	3805	7 M 3.5 W.
C26		.05 400V.	R35	4070	100 ohm 10% 3 W. flex
C27	2695	.003 600V.	4058		Power transformer
C28,33	576	.02 200V.	4061		No. 1 IF transformer
C29	824	.002 600V.	4060		No. 2 IF transformer
C30	4072	.03 200V.	3968		No. 3 IF transformer
C31	1286	250 mmf mica	2981		Tuning tube cable
C32,34,35,36	2600	.02 600V.	4082		12" Dynamic speaker
C37,38	3138	.001 800V.	4079		12" P.M. speaker
C39,42	4071	20 MF 35 WV.	2898		Tuning tube clamp
C40	3079	8 MF 150V.	3815		RF coil
C41	4062	30 MF 275V. Reg.	3943		Oscillator coil
C43	3112	16 MF 450V.	3817		Antenna coil
C44	3111	16 MF 500V.	3825		Planetary drive
C45	3135	.003 800V.	3826		Drive belt
R1,4,8,16,19,22,24	603	100 M 1/3 W.	3198		Idler pulley
R2,3	631	50 M 1/3 W.	3199		Idler spring
R5,6,34	2421	1 M 1/3 W.	3831		Minute pointer
R7,23	615	500 M 1/3 W.	3832		Tuning pointer
R9	2693	2 meg 1/3 W.	3802		On-off switch
R10	3799	2 meg tone control	3818		RF and antenna switch
R11	3800	3 meg volume control	3819		Oscillator switch

DETROLA RADIO CORP.

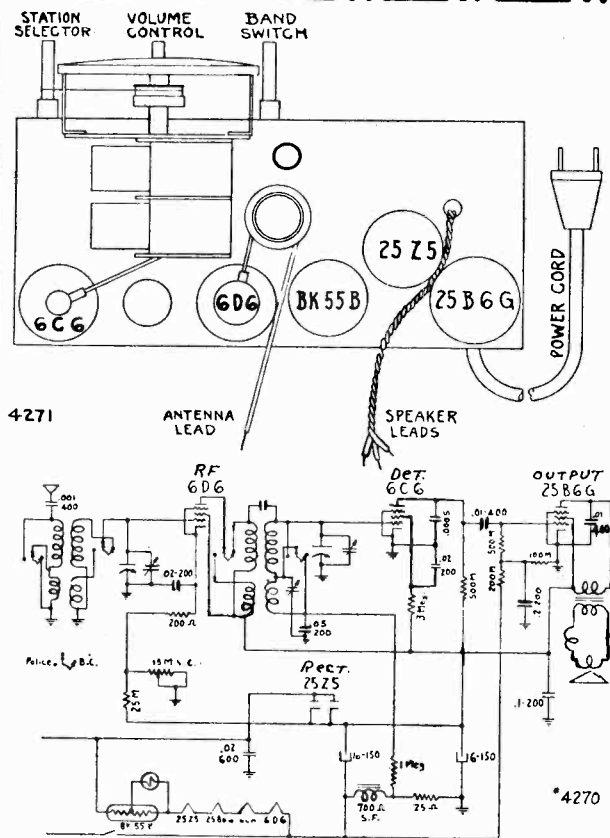
MODEL 159
 MODEL 162A
 MODEL 168
 MODEL 172
 Schematics
 Sockets



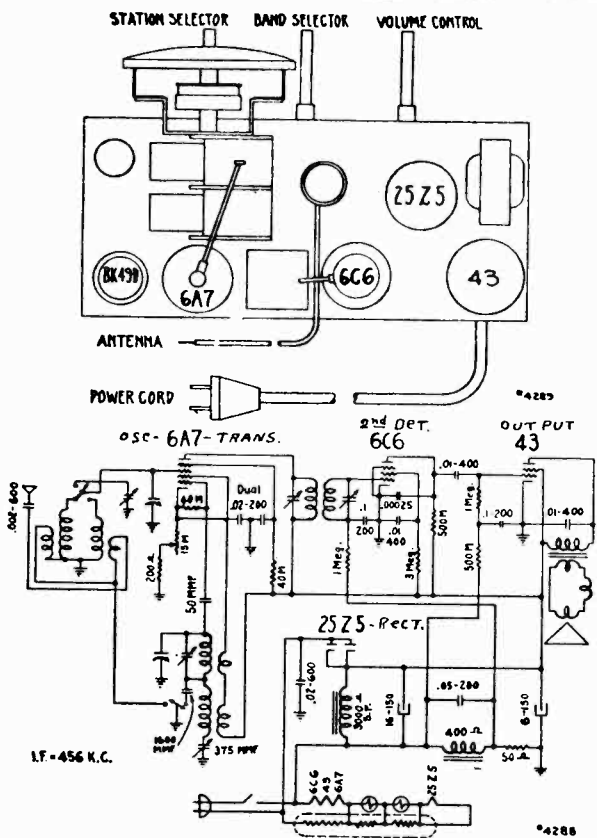
MODEL 159



MODEL 162-A



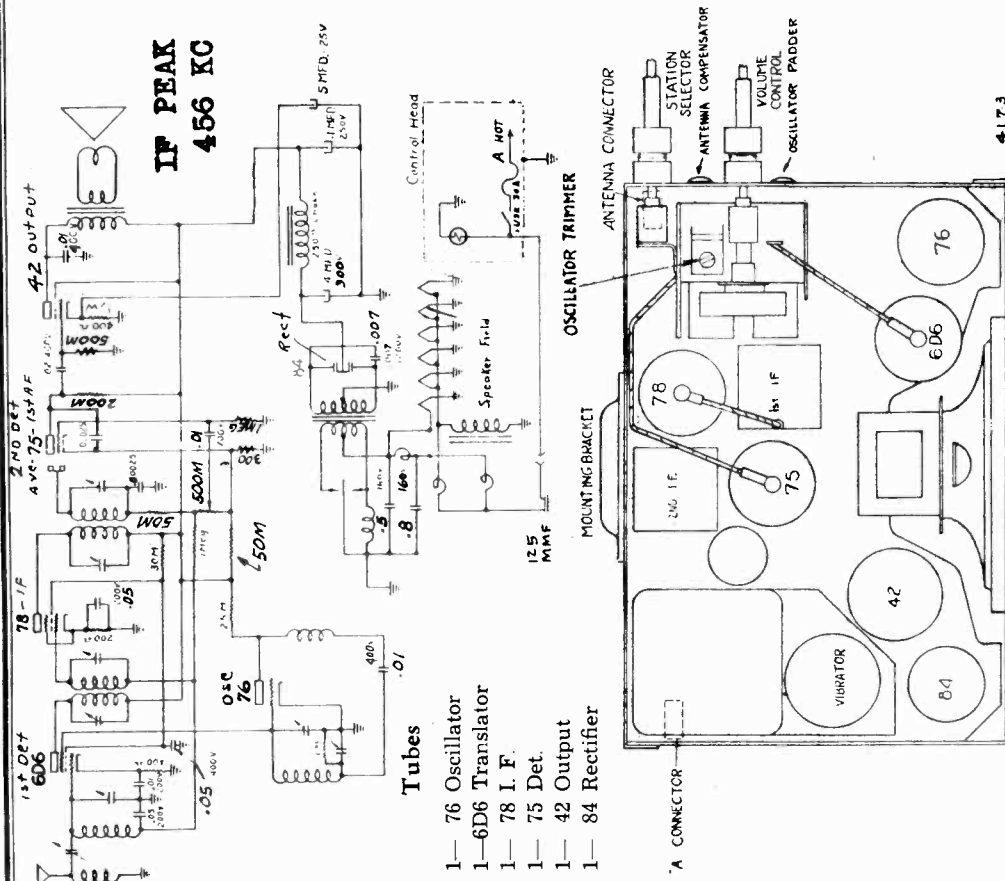
MODEL 168



MODEL 172

MODEL 166
Schematic, Socket
Trimmers, Alignment, Parts

DETROLA RADIO CORP.



- Tubes**
- 1— 76 Oscillator
 - 1— 6D6 Transformer
 - 1— 78 I. F.
 - 1— 75 Det.
 - 1— 42 Output
 - 1— 84 Rectifier

I. F. Alignment

The I.F. frequency of this receiver is 456 K.C. For realignment, use the following procedure.

It is necessary to use an accurately calibrated signal generator. Couple the signal generator to the grid of the 6A7 tube with a tenth microfarad condenser in series with the "high" lead of the signal generator. Connect the ground side of the signal generator to the chassis. Set the signal generator to 456 K.C. Be sure the volume control is set at maximum. Attenuate the signal generator so that the signal is just audible in the speaker. If an output meter is used, it should be connected across the voice coil terminals of the speaker. Use ½ volt as standard output.

Adjust the 2nd I.F. transformer first. Each screw should be adjusted for maximum output. After number two I.F. has been adjusted, number one I.F. should be adjusted for maximum output. After both transformers have been adjusted, it is necessary to recheck No. 2 transformer and then recheck No. 1.

R. F. Alignment

To align the broadcast band, proceed as follows:

First, connect the ground side of the signal generator to the chassis. Connect the high side of the signal generator with a .00025 condenser, in series, to the antenna lead of the set. Set the volume control to maximum. Turn the station selector to the highest frequency (as far as it will go). Set the signal generator to 1570 K.C. Adjust the oscillator trimmer until the signal is heard. After the oscillator has been set at 1570 K.C., turn the station selector to 1400 K.C. Set the signal generator to 1400 K.C. When the signal is heard, adjust the antenna trimmer for maximum output.

When the set has been adjusted at 1400 K.C., turn the station selector dial to 600 K.C. Set the signal generator to 600 K.C. When the signal is heard, adjust the padder condenser by rocking the selector back and forth. While adjusting the padder screw, it is necessary to move the selector so that the signal may be kept in tune while adjusting the padder screw. This procedure should be followed until maximum output is obtained.

The foregoing procedure should be repeated. That is, the set is to be rechecked at 1570, 1400 and 600 K.C.

When aligning the R.F., use the same output standard as was used on the I.F. alignment.

No. Req.	Description	No. Req.	Description
624	1 Resistor—1 Meg.—1/3 W.	3298	1 Speaker
615	1 Resistor—500 M.—1/3 W.	3299	1 Grille Screen
2730	1 Resistor—200 M.—1/3 W.	4156	1 Grille Cloth
631	1 Resistor—50 M.—1/3 W.	4157	1 Condenser—Variable
621	1 Resistor—25 M.—1/3 W.	4169	1 Condenser—Ant. Trimmer
2692	1 Resistor—300 ohm—1/3 W.	4170	1 Condenser—Osc. Padder
2268	1 Resistor—200 ohm—1/3 W.	4167	1 Antenna Cable
2572	1 Resistor—400 ohm—1/3 W.	4187	1 Steering Post Control Head
629	1 Resistor—50 M.—1/2 W.	1286	1 Condenser—.00025 Mica
2784	1 Resistor—400 ohm—1/2 W.	3002	1 Condenser—.0075-1200 V.

Buffer	
3583	Resistor—30 M.—1/3 W.
3012	1 Transformer—Vibrator
3052	1 Cover—Transformer
3042	1 Adapter—Variable Condenser
2293	1 Choke—Iron Core
4158	1 Coil—Antenna
4159	1 Coil—Oscillator
3000	1 Vibrator—With Ground Ring
2860	1 Transformer—1st I.F.
2916	1 Transformer—2nd I.F.
4165	1 Condenser—Dry Elec.
3061	2 Cables Control. Includes Casting Tips and Flex. Shafts
580	3 Condenser—.05—200 V. Paper
565	2 Condenser—.01—200 V. Paper
2601	2 Condenser—.01—600 V. Paper
2600	1 Condenser—.02—600 V. Paper
4171	1 Condenser—.2—160 V. N.I.—Paper
3003	1 Condenser—.5—160 V. N.I.—Paper

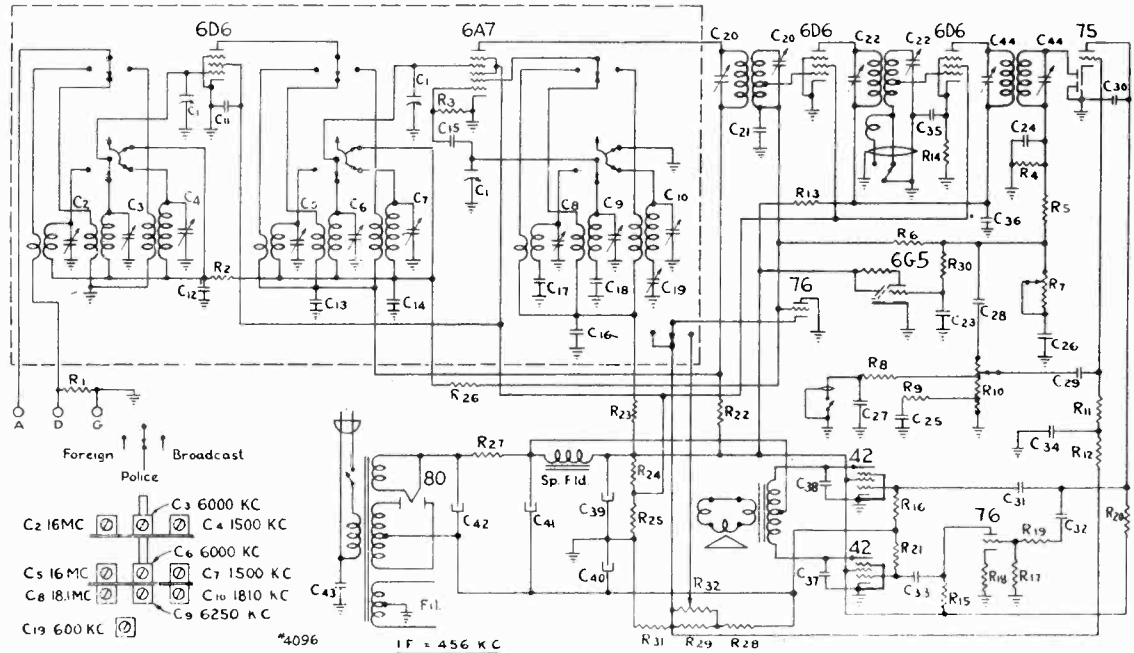
DETROLA RADIO CORP.

MODEL 165
Schematic, Parts
Trimmers

Tubes

- Tubes required are:
 1—6D6 Radio Frequency Amplifier
 1—6A7 Oscillator-translator
 2—6D6 Intermediate Frequency Amplifiers
 1—76 Automatic Bias Control
 1—75 Detector AVC—First Audio Amplifier

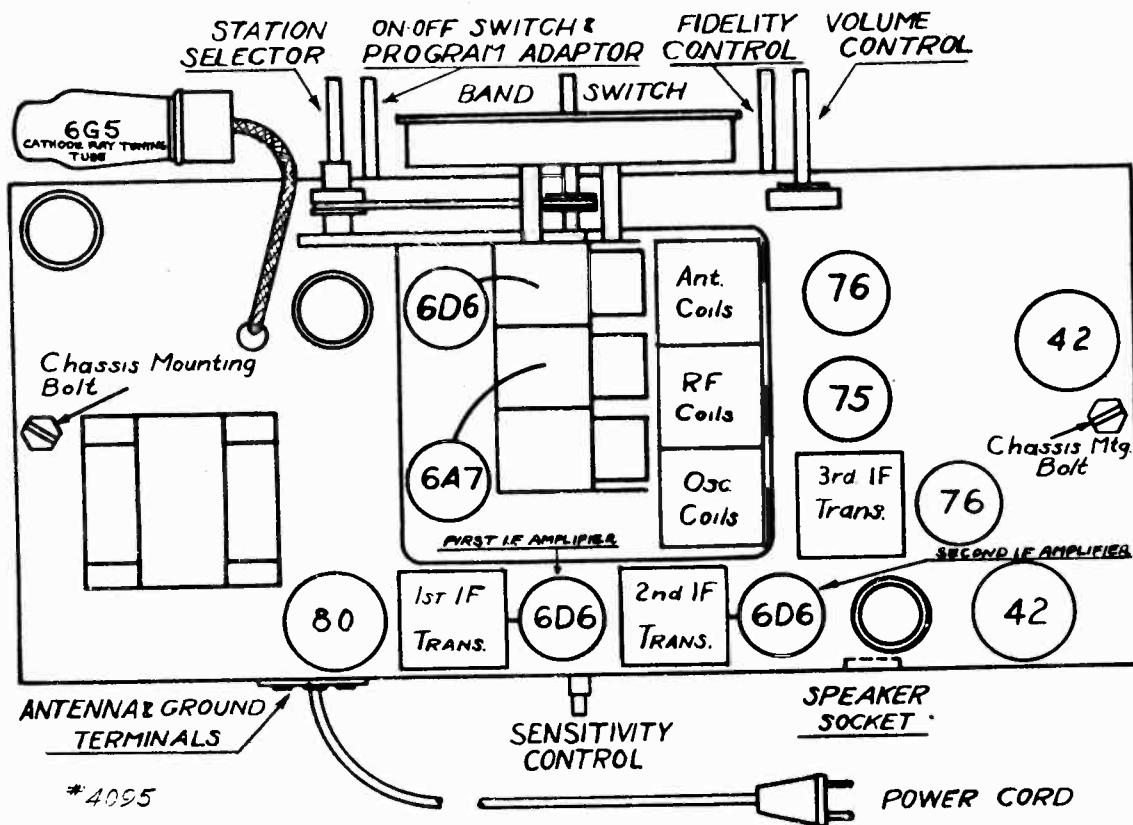
- 1—76 Driver—Phase Inverter
 2—42 Power Output
 1—80 Rectifier
 1—6G5 Cathode Ray Tuning Tube (on models equipped with "eye" tuning indicator)



Symbol	Part No.	Description	Symbol	Part No.	Description
C1	3814	9-400 mmf variable	R11.12	624	1 meg 1/3 W.
C2,3,4	3822	2-35 triple trimmer	R13,14,22	2421	1 M 1/3 W.
C5,6,7	3822	2-35 triple trimmer	R17	2880	100 M 1/3 W. 10%
C8,9,10	3822	2-35 triple trimmer	R18	614	5 M 1/3 W.
C11,21,34	572	.1-200 V.	R19	2731	500 M 1/3 W. 10%
C12,14,23	580	.05-200 V.	R20	598	200 M 1/3 W.
C13	575	.1-400 V.	R24	3805	7 M 3.5 W.
C15,24	2780	50 mmf mica	R25	3805	8 M 1.5 W.
C16,35	568	.01-400 V.	R27	3809	100 ohms 2 W. 10%
C17	2694	.005 5% tolerance	R28	3806	120 ohms 1.5 W. 10%
C18	2741	1330 mmf 5% tolerance	R29	4111	85 ohms 1.0 W. 10%
C19	2560	350 mmf variable padder	R30	2106	3 meg 1/3 W.
C20,22,44		IF Trimmer	R31	3870	15 ohms .5 W. 10%
C25	4072	.03-200 V.	R32	3801	2 M variable
C26	2695	.003-600 V.	3796		Power transformer
C27	824	.002-600 V.	4061		No. 1 IF transformer
C28,29	576	.02-400 V.	4060		No. 2 IF transformer
C30	1286	250 mmf mica	3968		No. 3 IF transformer
C31,33	2600	.02-600 V.	2981		Tuning tube cable
C32,36	563	.05-400 V.	3838		12" Speaker
C37,38	3138	.001-800 V.	2898		Tuning tube clamp
C39	3113	16 MF regulating	3815		RF coil
C40	3136	20 MF 25 V.	3943		Oscillator coil
C41	3112	16 MF 450 V.	3817		Antenna coil
C42	3111	16 MF 500 V.	3826		Drive belt
C43	3135	.003-800 V.	3198		Idler pulley
R1,5,15,26	603	100 M 1/3 W.	3199		Idler spring
R2,3	631	50 M 1/3 W.	3831		Minute pointer
R4,16,21	615	500 M 1/3 W.	4113		Tuning pointer
R6	2693	2 meg 1/3 W.	3802		On-off switch
R7	3799	2 meg tone control	3818		RF and Antenna switch
R8	2558	300 M 1/3 W.	3819		Oscillator switch
R9,23	617	20 M 1/3 W.	3825		Planetary drive
R10	3800	3 meg volume control			

MODEL 165
Socket
Alignment

DETROLA RADIO CORP.



Tubes must be in proper position and connected as shown.

ALINEMENT PROCEDURE

Warning! This information is to be used by a *Competent Service Man only* and not by an untrained person.

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

Be sure that the fidelity control is NOT in the HIGH FIDELITY position. It will not be possible to properly aline the receiver unless this control is turned part way toward its "bass" position.

IF. Connect the generator ground to receiver chassis. Using .1 mfd condenser in series with high side of generator, apply 456 kc signal to grid of 6D6 second IF amplifier and aline transformer No. 3. Repeat for transformer No. 2, applying signal to grid of 6D6 first IF amplifier. Repeat for transformer No. 1, applying signal to grid of 6A7 translator. (See above diagram for location of tubes and transformers.)

RF. (See circuit diagram for location of trimmers.) Using a 200 mmf. condenser in series with the high side of the generator, turn band selector switch all the way to the left, tuning condenser to minimum capacity, feed 1810 kc. signal to antenna terminal and adjust broadcast oscillator trimmer for top frequency. Set generator frequency at some point around 1500-1600 kc., and adjust broadcast antenna and RF trimmers. Set generator for 600 kc., tune receiver to signal and adjust the padder. The tuning condenser should be rocked back and forth through the signal while varying the padder in order to assure perfect alinement.

A 400 ohm resistor must be used in series with the generator as a "dummy" antenna for proper alinement of the two short wave bands. Set the band selector switch in the center position, adjust the oscillator top frequency for 6250 kc., then aline the antenna and RF trimmers at about 6000 kc. With the band selector in the extreme right position, adjust the top frequency of the high frequency to 18,100 kc., and aline the antenna and RF trimmers at about 16,000 kc. In order to make sure that the top end of the last band is set properly, it is best to screw the oscillator trimmer down tight, then unscrew to the second peak. The antenna and RF trimmers should be screwed down tight, then unscrewed to the first peak. This procedure must be followed in order that the oscillator and RF circuits will be set in the correct relation to each other, otherwise a "dead" spot at a lower frequency will result, and the dial calibration will not be correct. Usually, it is best to rock the tuning condenser back and forth slightly while making these adjustments at high frequencies.

DETROLA RADIO CORP.

MODEL 167

Schematic, Socket Trimmers, Alignment, Parts

ALIGNMENT PROCEDURE—WARNING! This information is to be used by a COMPETENT SERVICE MAN ONLY and not by an untrained person.

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

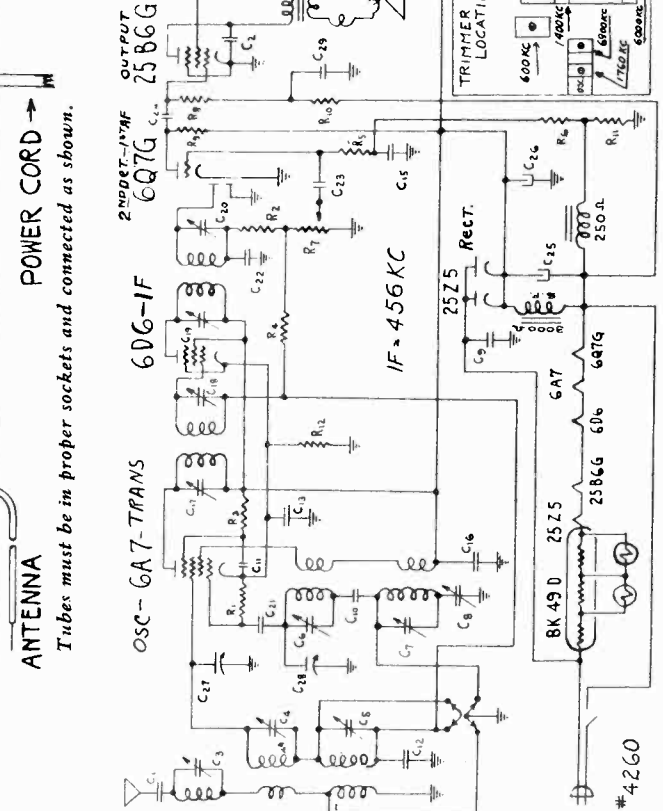
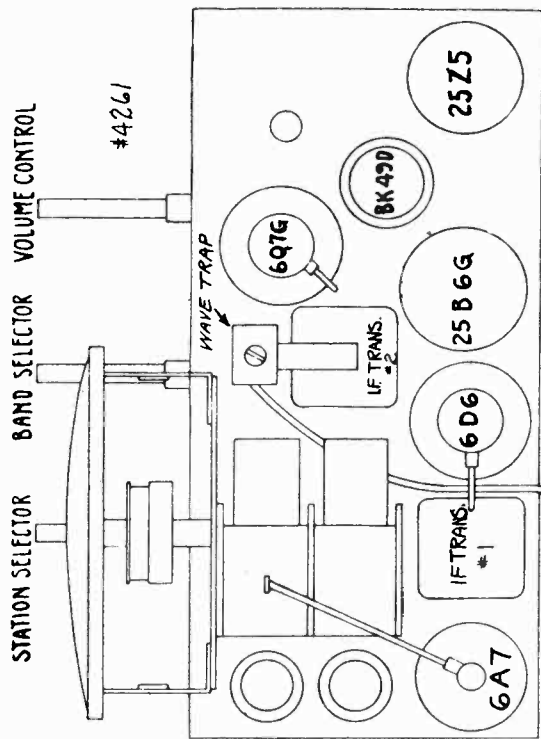
I.F.: Connect the generator ground to receiver chassis. Using .1 mfd. condenser in series with high side of generator, apply 456 kc. signal to grid of 6D6 I.F. amplifier tube, and a line transformer No. 2. Connect generator to grid of 6A7 tube and a line transformer No. 1.

SHORT WAVE: A 400 ohm resistor must be used in a series with the generator as a "dummy" antenna for proper alignment of the short wave band. Set the band selector switch in the right hand position, adjust the oscillator top frequency to 6900 kc. then a line antenna trimmer at about 6000 kc.

BROADCAST: Using a 100 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 456 kc. signal to the antenna and adjust wave trap trimmer for minimum response. With the tuning condenser at minimum capacity feed 1760 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.

Antenna: This receiver requires very little antenna for proper operation, provided the installation is made correctly. The average length of antenna, including lead-in should be about fifty feet. In locations near powerful broadcast stations, this length should be shortened to thirty-five feet. In more favorable locations, seventy-five feet may be used. Regardless of length, the antenna and lead-in should be spaced well away from the roof, sides of building, trees, power lines, etc. Indoor antennae will give good broadcast reception except in steel frame buildings. However, foreign reception will not be satisfactory unless a good, well insulated, outdoor antenna is used.

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



Symbol	Part. No.	Description	Symbol	Part. No.	Description
C1, C2	DR381	.005-.600 V.	C29	DR579	.25-.200 V.
C3	DR2559	180 mmf. Tr.	R1-2	DR631	50M 1/3 W.
C4-5-6-7	DR2597	1-10 mmf. Tr.	R3	DR617	20M 1/3 W.
C8	DR2560	350 mmf. Pad	R4-5-6	DR624	1 Meg. 1/3 W.
C9	DR2469	0.2-.600 V.	R7	DR4255	500M V. C.
C10	DR2469	1150 mmf. 5/4	R8	DR615	500M 1/3 W.
C11-12	DR580	.05-.200 V.	R9	DR2730	200M 1/3 W.
C13-15-16	DR572	1-200 V.	R10	DR602	250M 1/3 W.
C17 to 20		I.F. Trimmers	R11	DR2965	20 Ohms 1/3 W.
C21	DR2780	50 mmf. Mica	R12	DR2689	100 Ohms 1/3 W.
C22	DR1286	250 mmf. Mica		DR4254	Band Switch
C23-24	DR2698	.01-.600 V.		DR2976	Antenna Coil
C25	DR2594	16 mfd. X150 V.		DR2977	Oscillator Coil
C26	DR2594	24 mfd. X150 V.		DR2972	1st I.F. Trans.
C27-28	DR4251	+10 mmf. Var.		DR2969	2nd I.F. Trans.

MODEL 169
Schematic, Socket
Trimmers, Alignment, Parts

DETROLA RADIO CORP.

ALINEMENT PROCEDURE

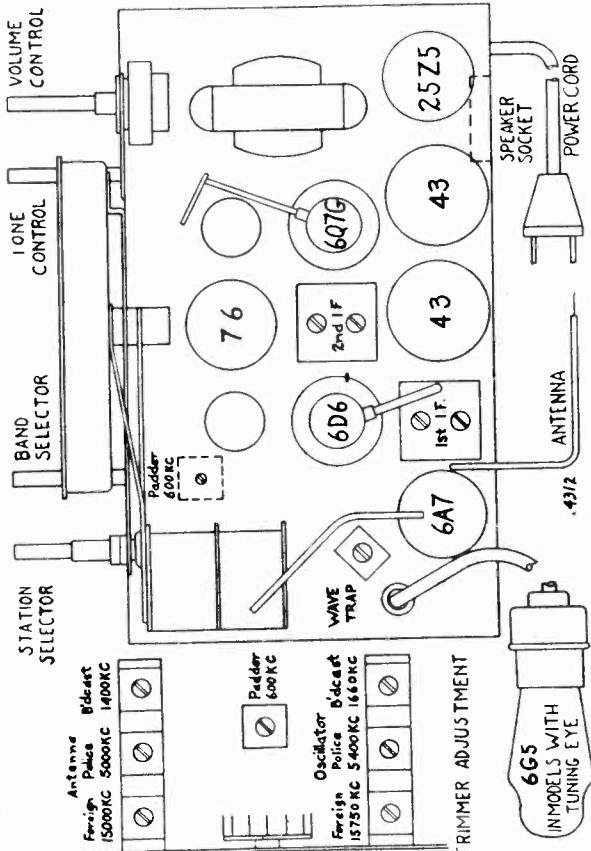
Connect a high impedance AC voltmeter across loud-speaker terminals. Volume control should be set a few degrees back of maximum volume position. Use a weak signal from generator, strong signals tend to cause improper adjustments. Using 1 mfd. condenser in I.F.: Connect the generator ground to receiver chassis. Using 6D6 I.F. amplifier series with high side of generator, apply 456 kc. signal to grid of 6A7 tube and a line tube, and aine transformer No. 2. Connect generator to grid of 6A7 tube and aine transformer No. 1.

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

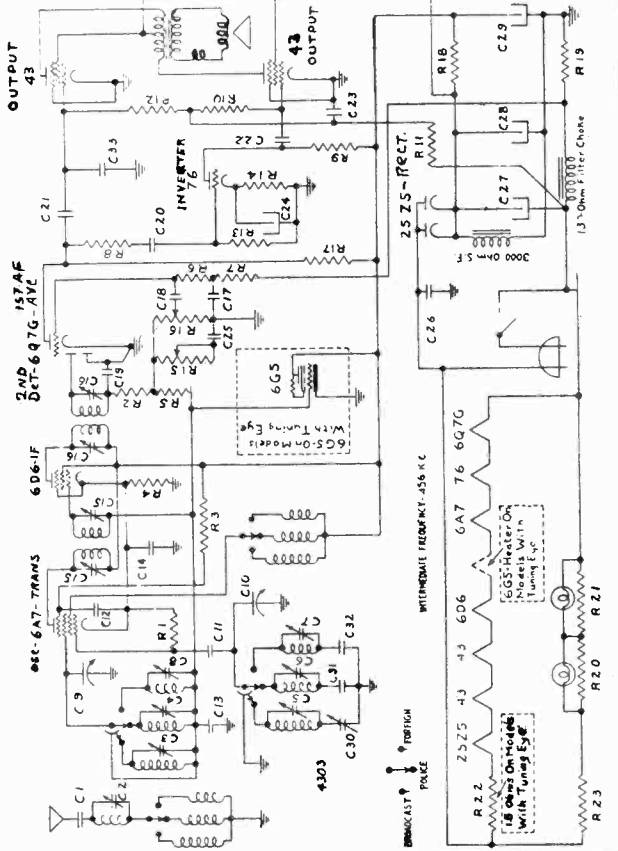
Using a 200 MMF. condenser in series with the high side of the generator, turn band selector switch to left hand position and the tuning condenser to about 600 kc. Feed a 456 kc. signal to the antenna and adjust wave trap trimmer for minimum response. With the tuning condenser at minimum capacity feed 1660 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 5400 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 15,750 kc—screw trimmer down tight then unscrew to second peak. Set generator to 15,000 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 15,000 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.	Models
C-1	3137	.001-400 V.	R-10, 12	500 M-1/3 W.-10%
C-2	2559	180 MMF Trimmer	R-11	300 M-1/3 W.-10%
C-3, 4, 5,	2597	1-10 MMF Trimmer	R-13	100 M-1/3 W.-10%
C-6, 7	1611	3-35 MMF Trimmer	R-15	2 Meg. Tone Control
C-8	2871	350 MMF Variable	R-16	500 M Volume Control
C-9, 10	2780	50 MMF Mica	R-17	200 M-1/3 W.-10%
C-11, 13	580	.05-200 V.	R-18	500 OHM-1 W.-10%
C-12, 13	572	1-200 V.	R-19	100 OHM-.5 W.
C-14, 17	2445	IF Trimmer	R-20, 21	32 OHM 3 W.
C-15, 16	576	02-400 V.	R-22	15 OHM—On Eye
C-18, 20,	1286	250 MMF Mica		35 OHM—4 W—
C-21, 22	566	5-200 V.		Wire Wound
C-19	581	.005-600 V.	R-23	300 OHM Line Cord
C-23	2600	.02-600 V.		Antenna Coil
C-25	4297	20 MF-150 V.		Band Switch
C-26	4298	4 MF-18 V.		Oscillator Coil
C-27	4298	30 MF-150 V.		1st IF Transformer
C-28	2560	220-550 MMF Padder		2nd IF Transformer
C-29	2741	10 MF-150 V.		Filter Choke
C-30	2740	3850 MMF 5%		5 Prong Socket
C-31	631	50 M-1/3 W.		6 Prong Socket
C-32	4302	20 M-1/3 W, 10%		7 Prong Socket
R-1, 2	2689	100 OHM-1/3 W.		7 Prong Octal Socket
R-3, 14	624	1 Meg.-1/3 W.		Pilot Lamp
R-4	2599	1 Meg.-1/3 W.-10%		Pointer
R-5, 6, 7	4300	250 M-1/3 W.-10%		Pointer Screw
R-8				Tuning Eye Cable
R-9				Speaker—10"
				Speaker—8"



Tubes must be in proper position and connected as shown.



DEWALD RADIO

MODELS 200, 202M
Electrocall
Connections, Data

SERVICE NOTES

MODEL 200 ELECTROCALL.

Failure to Function:

- A. Defective tube (loose screen grid Cap.)
- B. Open resistor line cord.
- C. Defective filter condenser:-

If unit does not operate and voltages check O.K., suggest adding 8 mfd. 200 V condenser in parallel with filter in unit. If unit operates, replace filter condenser.
- D. Defective "Talk-Listen" switch:-

Remove set from cabinet - loosen set screws and remove lever arm - open retainer washer on shaft - remove rotor of switch - clean contacts with Carbona - bend rotor arms to increase tension - assemble switch making certain lever arm is in original position.
- E. Open 1700 ohm resistor or discolored:

Replace both resistor and seven prong tube (seven prong tube has developed internal short).
- F. Reverse Line plug if connected to Direct Current.

Failure of Pilot Light:

- A. Pilot lamp burned out or making poor contact.
- B. Defective tube or open line cord.
- C. Pilot lamp socket opened, shorted, or grounded.
- D. Open 25 ohm wire wound resistor.

Excess Hum:

- A. Defective 6 prong tube.
- B. Defective Filter Condenser:-

To check -- connect 8 mfd. 200 volt condenser in parallel with filter in unit. If hum ceases, replace filter condenser.

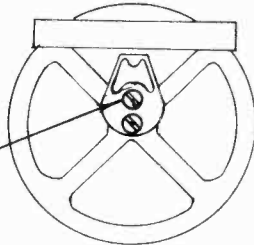
Weak Response:

- A. Check second section of filter cond.
- B. Check speaker adjustment.
- C. Check tubes.

Speaker Rattles or Poor Quality:

This may be remedied by adjusting screw as indicated, also check for loose pilot lamp or bracket.

ADJUST THIS SCREW ONLY (NEAREST MAGNET)



If Unit "A" rattles when speaking into Unit "B" - recheck adjustments on both speakers as it may be either the microphone unit or speaker.

If voice is audible through "A" when speaking into "B" but not vice-versa, then "A's" unit is defective.



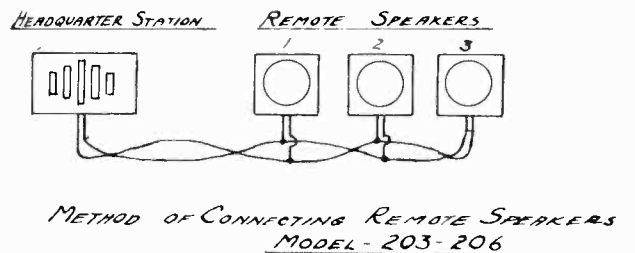
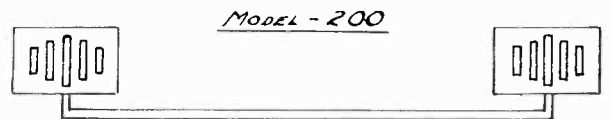
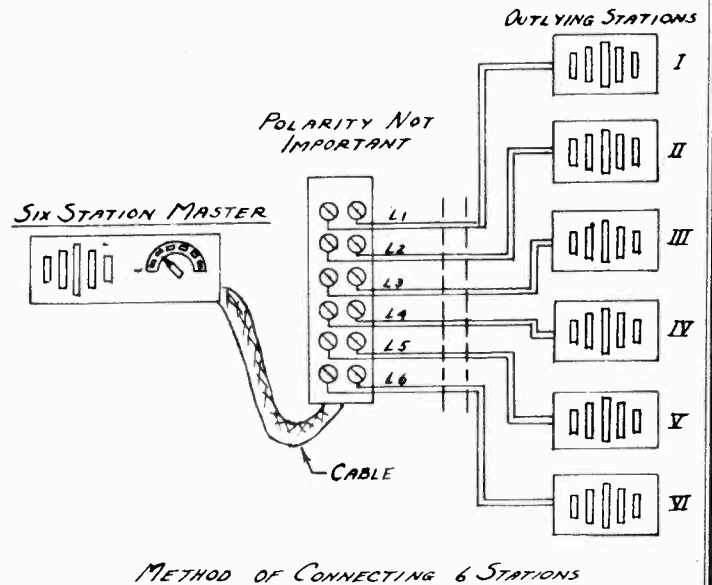
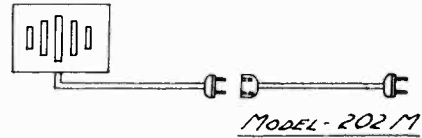
If units howl or squeal due to close proximity, insert 10,000 ohm resistor in series with one side of the cable, as illustrated.

Voltages - taken with 1000 ohm per Volt meter:

- Across 1700 ohm resistor 12 to 16 Volts
- Across 3500 ohm resistor 1/2 to 1 Volt
- Across B plus to B minus 125 to 150 Volts.

DO NOT SHORTEN LINE CORD UNDER ANY CONDITIONS.

Connect conventional extension cord, should it be necessary to extend length of line cord furnished with units.



F-109

MODELS 200A, 202A, 202M, 203A
Schematic, Installation, Notes

DEWALD RADIO

GENERAL INSTRUCTIONS

202-M MASTER UNIT

TO TALK:

This device is of a multiple system type, designed to operate on 25-60 cycles A.C. or D.C. 110-120 volts.

The master station may select and hold two way conversation with any one remote station and yet may not be overheard by any other station. Any remote station may also call the master and not be overheard by other stations.

INSTALLATION:

After locating the units the cables should be run in the most convenient manner. These cables carry no power, but care should be taken that they do not come in contact with electrical or telephone lines. It is also advisable not to run them parallel. (If they have to be run parallel, keep them as far apart as possible.)

TO OPERATE:

Snap middle switch to "ON" position and wait from ten to twenty seconds for tubes to heat. When operating instrument from direct supply line, it may be necessary to reverse the current plug at the calling stations if instrument at other end of line fails to respond and vice versa.

CALLING SIGNAL:

Turn Station Selector Switch to station desired, press "Call Listen" lever down and pull out.

Press "Talk-Listen" switch down. This switch must be held down all the while when talking. Each instrument is normally in a position to receive calls regardless of whether the switch is turned on or off. It is only necessary to turn on the instrument when calling.

TO RECEIVE CALLS:

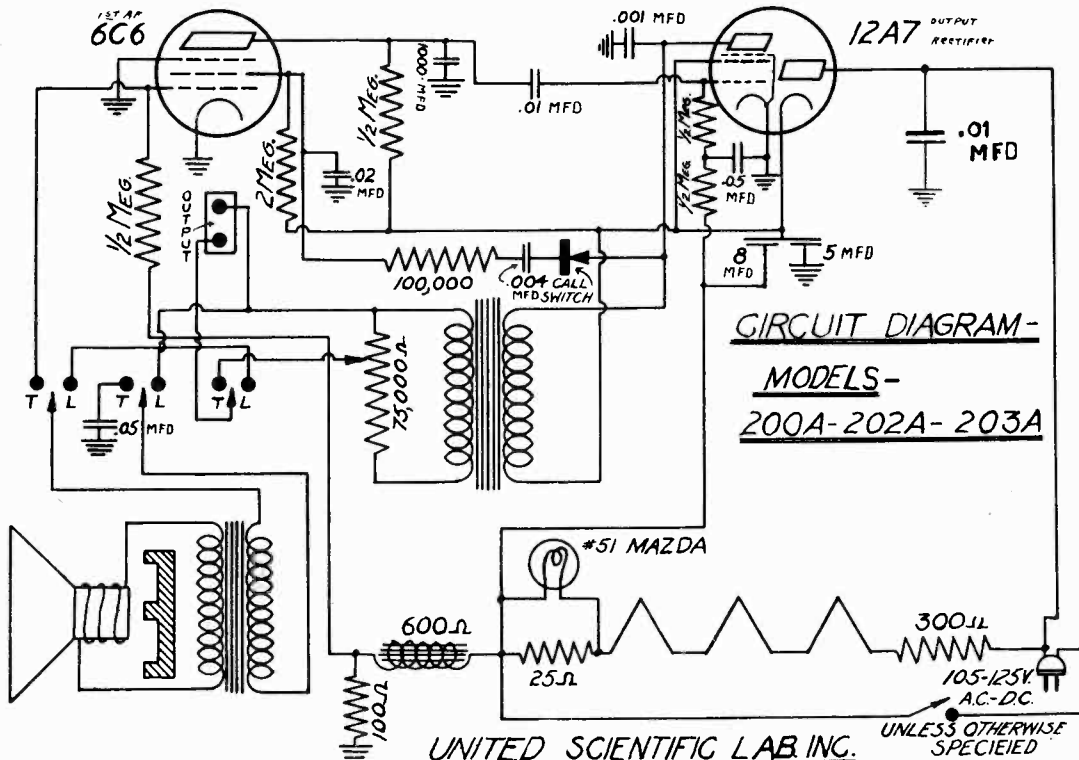
To signal master station from individual outlying station, most convenient practice is to adapt a call system corresponding with the numerals on the master terminal board. That is, if the outlying station is attached to #5 on terminal board, then this station should depress the "Talk-Listen" key five times, when desiring to converse through the master unit.

It is advisable to set station selector switch to a neutral position, which is indicated by the small arrow head between station numerals, when master instrument is not in use.

When operating Electrocall, the user should talk about an arm's length away from the grill and in an ordinary conversational tone. Talking loudly into the grill will result in greater amplification at the receiving end.

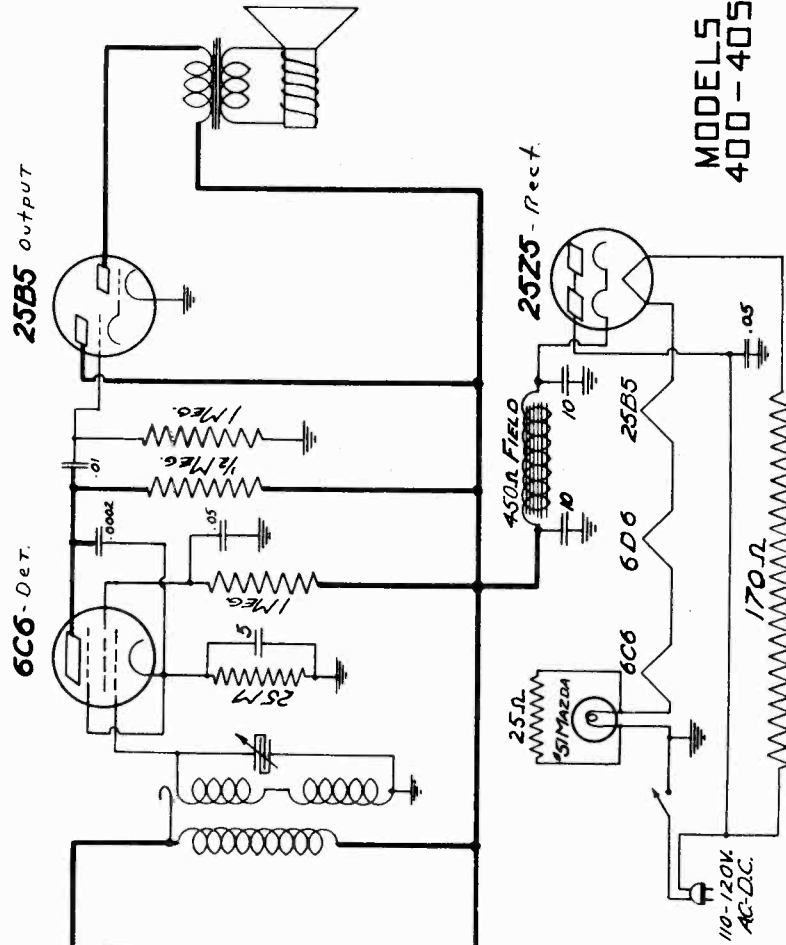
Both units must be turned "ON" when holding two way conversation. When continuous service is desired, it is necessary to keep all units turned "ON"

The tubes used for the Electrocall are especially designed for this system and can only be obtained directly from the manufacturer or through any Electrocall distributor. These tubes carry our regular ninety day guarantee.



DEWALD RADIO

MODELS 400, 405
Schematic, Notes



PRICES SUBJECT TO CHANGE
WITHOUT NOTICE

MODELS
400-405

This receiver is a 4 tube T.R.F. and designed to operate on 110-120 volts - 400 cycles, alternating current or direct current unless otherwise specified on rear of chassis.

RANGE: The tuning range of this receiver is from 540 to 1750 kilocycles. This range covers all of the standard American broadcast stations and some Police Calls.

ANTENNA: Unwind reel of brown wire and place same along the base-board. In shielded buildings, it is advisable to hang the wire out of the window or connect it to an outside antenna. No ground is necessary with this receiver.

TUBES: 1-606, 1-6C6, 1-25Z5, 1-25B5.

CONTROLS: The upper control is the station selector knob. The lower one is the On-Off Switch and the volume control.

IMPORTANT: DO NOT CONNECT A GROUND WIRE TO THE CHASSIS. DO NOT CHANGE THE LENGTH OF THE LINE CORD.

DEWALD LIST PRICES OF REPLACEMENT PARTS.

Part No.	part	PRICE	Part No.	Part	PRICE
1443	Antenna Coil	\$.50	8793	Selector Knob	\$.20
1444	Detector Coil	.50	8777	Volume Control Knob	.10
2374	Variable Cond.	2.00	9837	Telephone Dial	.25
5198	Electrolytic Cond.	1.15	5051	Scale	.35
7221	Volume Control	1.00	8787	Knob	.15
	Speaker	4.00			

ALIGN AT 1750 KC

MOEEL-405

FOLLOW THE SAME INSTRUCTIONS AS FOR MODEL 400.

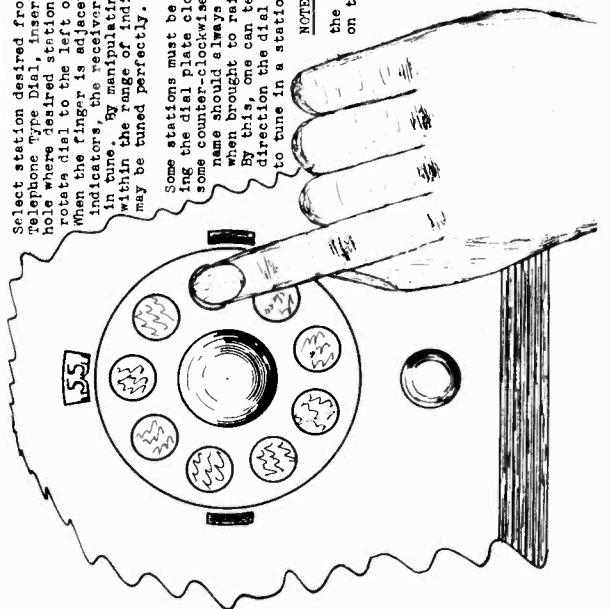
TELEPHONE DIAL

TELEPHONE DIAL OPERATION

Select station desired from those seen on Telephone Type Dial. Insert finger into hole where desired station appears, and rotate dial to the left or to the right. When the finger is adjacent to raised indicators, the receiver is approximately in tune. By manipulating the finger within the range of indicator, station may be tuned perfectly.

Some stations must be tuned by turning the dial plate clockwise, and some counter-clockwise. The station name should always appear upright when brought to raised indicators. By this, one can tell which direction the dial should be turned to tune in a station.

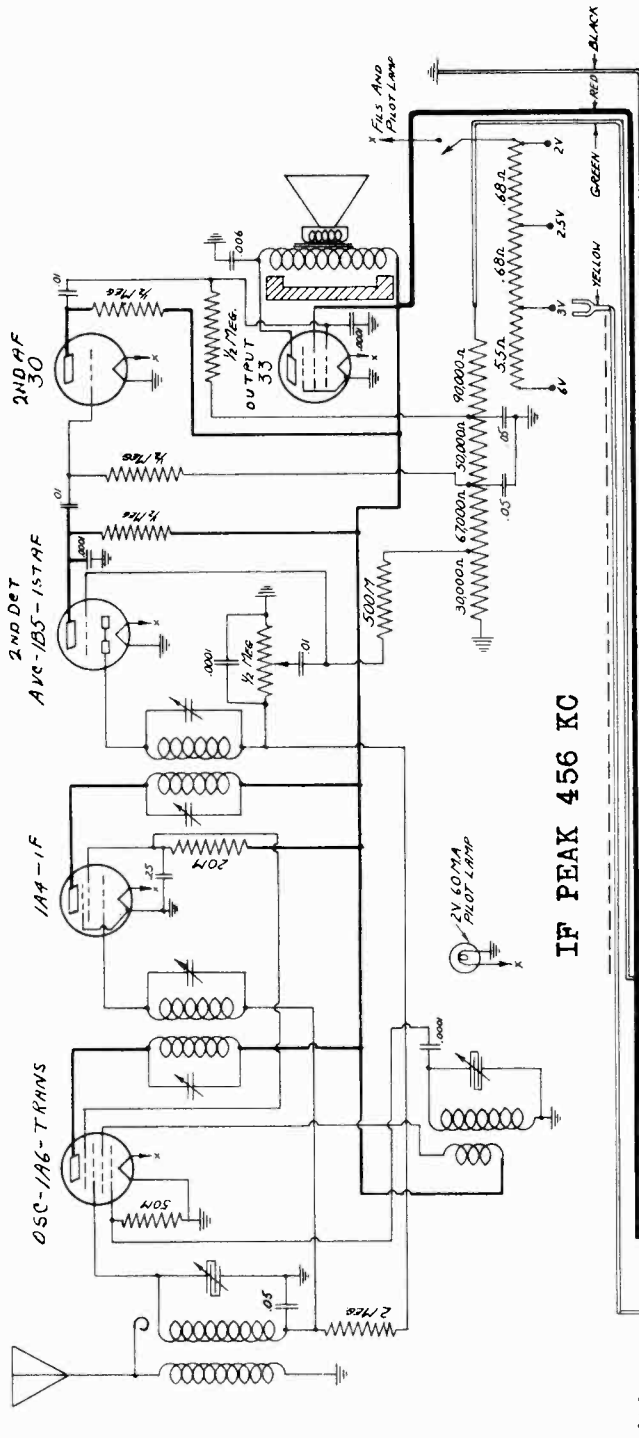
NOTE: If one prefers to use the knob the kilocycle scale on top is used.



MODEL 522
Schematic
Notes
Alignment

DEWALD RADIO

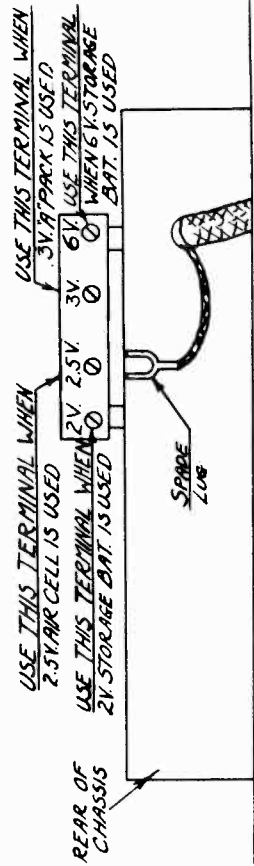
MODEL-522
72716



FOR SERVICING TO CALIBRATE:
Set service oscillator to 456 K.C. and connect "HOT" lead to grid of 1A6 tube ground stator of rear (oscillator) section of variable condenser. Turn volume control for maximum output and peak intermediate frequency trimmers for maximum gain.
Remove short from variable condenser. Remove service oscillator lead from grid of 1A6 tube and connect same to red lead on rear of set. Adjust service oscillator and the receiver to 1500 K.C. and peak trimmers on variable condenser for maximum gain. All the other frequencies are automatically calibrated when receiver is peaked at 1500 K.C. due to the construction of the cut section of variable condenser.

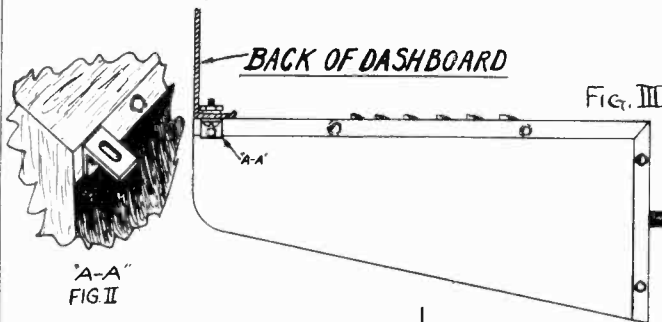
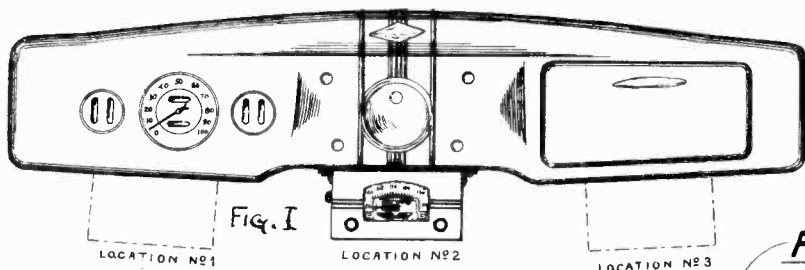
BATTERY SUPPLY: This receiver is designed to operate from a 2-volt storage battery, 2.5 volt "air cell" battery, 3-volt "A" pack or a 6-volt storage battery.

IMPORTANT:
1. Before operating this receiver, make certain that the spade lug which is attached to the yellow lead extending through rear of chassis is fastened to the proper terminal on the battery terminal strip. See Sketch.
2. See circuit drawing for battery connections.
3. Be certain all battery wires and plugs are properly connected.



DEWALD RADIO

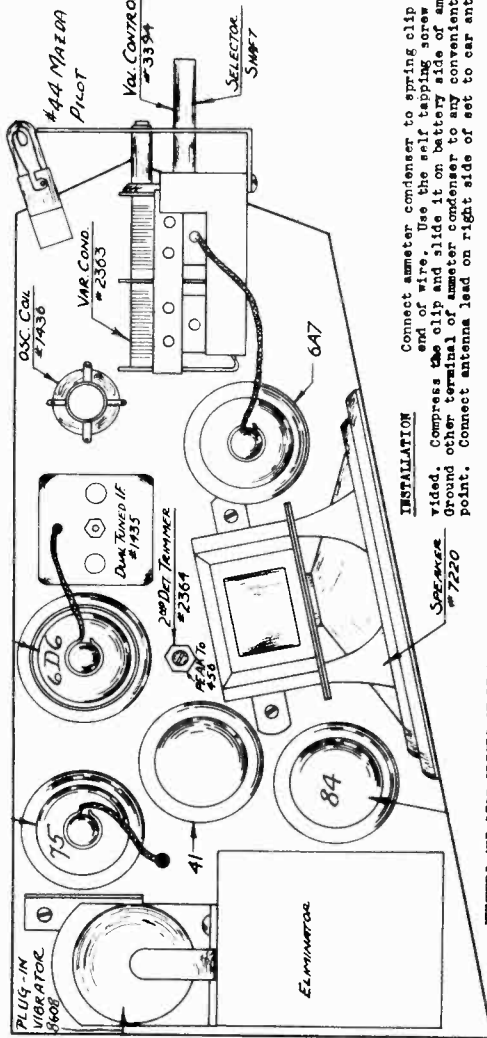
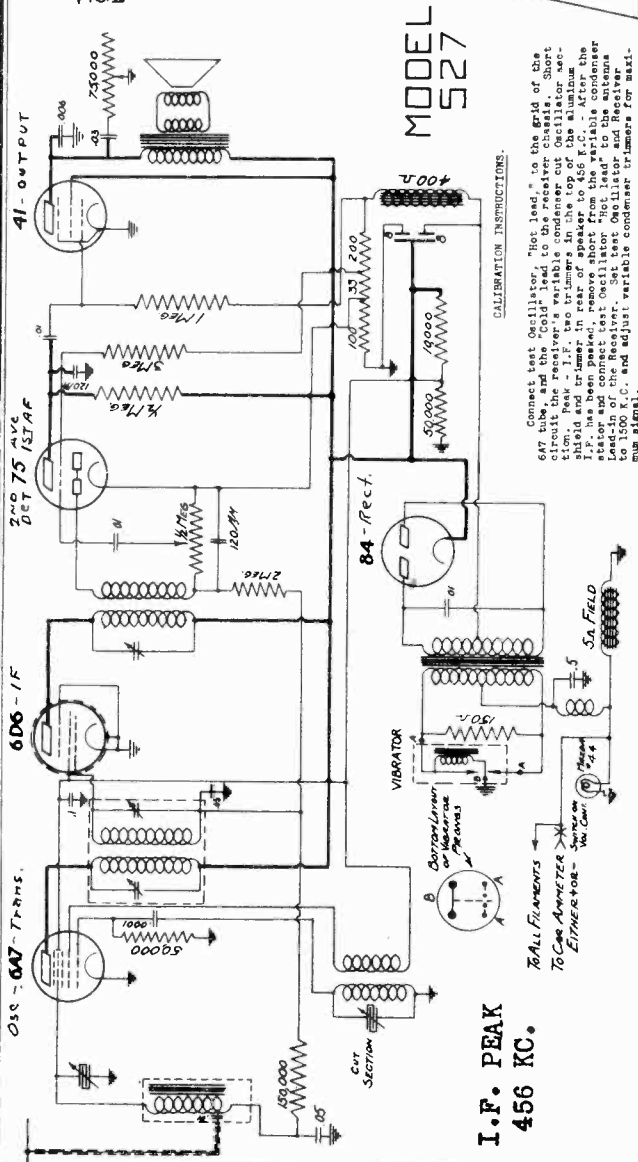
MODEL 527
Schematic
Socket, Chassis
Installation, Notes



FIRE BOARD
LOCATING STOPNUT
MOUNTING WASHER
MOUNTING NUT
MOUNTING STUD

METHOD OF MOUNTING MODEL NO. 527 UNDER THE DASHBOARD OF CAR
DOTTED LINE OF RECEIVER ON DASH SHOWS OTHER LOCATIONS THAN CENTER

- Screw the short threaded section of mounting bolt into mounting hole in rear of receiver and the long threaded section through the fire board. Note the arrangement of nuts and washers. (Fig. III)
- Fasten mounting brackets with the two 10-32 screws supplied (See Fig. III).
- Install distributor suppressor in Distributor ignition head.



- INSTALLATION**
- Connect ammeter condenser to spring clip at end of wire. Use the self tapping screw provided. Compress the clip and slide it on battery side of ammeter. Ground other terminal of ammeter condenser to any convenient point. Connect antenna lead on right side of set to car antenna.
 - Assemble mounting brackets to receiver.
 - Determine location of 3/4" hole in the fire board. (See Figure I.) Spot and drill two 3/4" holes in the fire board in the location of the dash-board to correspond with the two holes in the mounting brackets.
 - Drill a 1/4" hole in fire board to line up with tapped hole in rear of receiver. (See Figure III)

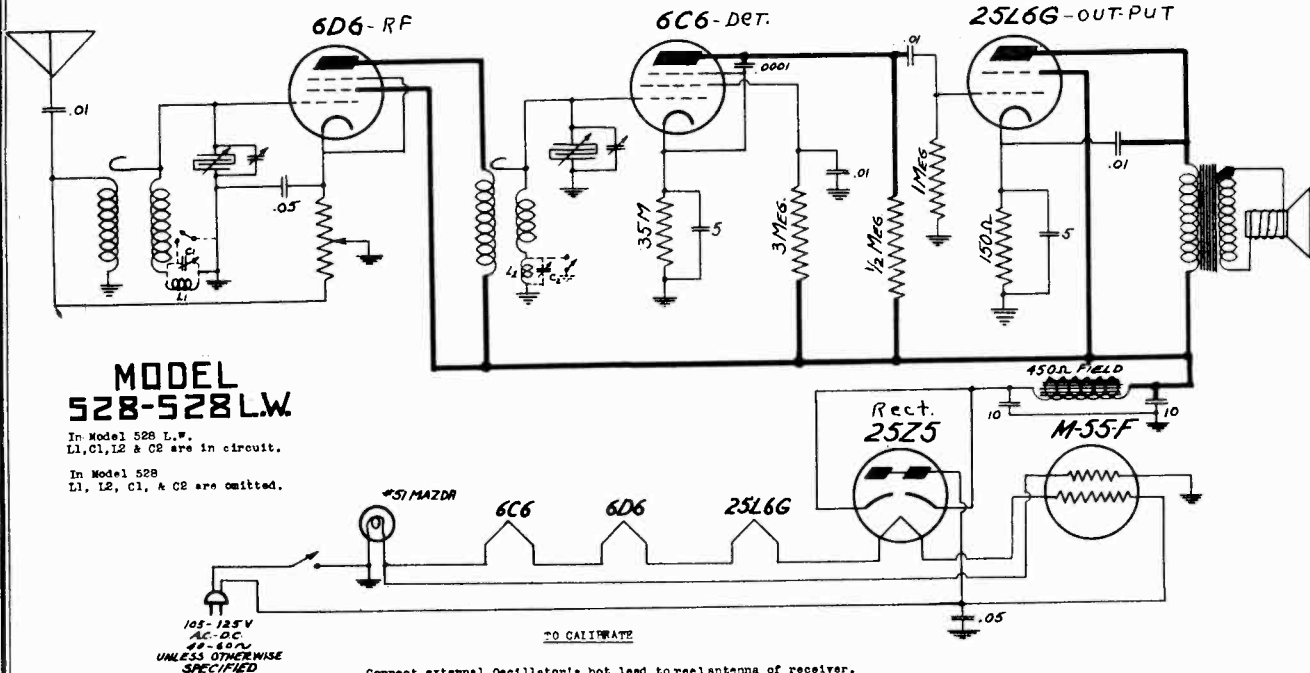
NUMBERS AND LIST PRICES OF REPLACEMENT PARTS

Part No.	Part	LIST	Part No.	Part	LIST
1379	2nd Det. I.P.	\$.95	2362	Electrolytic Cond.	\$1.25
1434	Antenna Coil	.90	3362	Volume Control	.85
1435	Auto-tuned I.P.	1.25	3390	Tone Control	.75
1436	1" Choke	.85	3109	Antenna Cable	.50
1437	"A" Choke	.75	7220	Battery Cable	.25
1438	"B" Choke	.75	7220	Speaker	4.50
1431	Power Transformer	3.00	8608	Vibrator	5.00
2365	2 Gang Variable Cond.	2.25			

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

MODELS 528, 528LW
MODEL 1200
Schematics

DEWALD RADIO

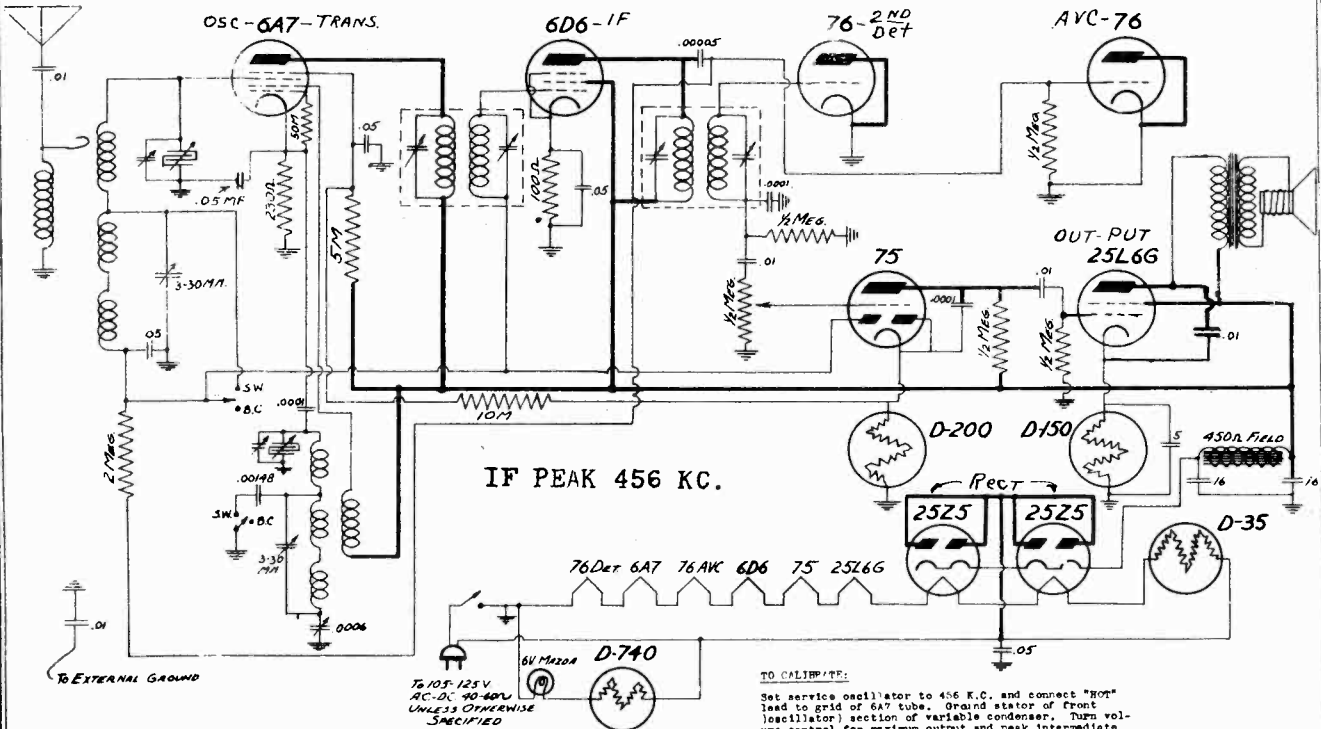


MODEL 528-528LW

In Model 528 L.W.
L1, C1, L2 & C2 are in circuit.

In Model 528
L1, L2, C1, & C2 are omitted.

Connect external Oscillator's hot lead to reel antenna of receiver.
Connect oscillator cold lead in series with a $\frac{1}{4}$ or $.1$ μ PD condenser to receiver chassis. Set oscillator at 1500KC and peak Variable Condenser trimmers for Maximum signal with condenser set approximately where 1500 comes in on scale.



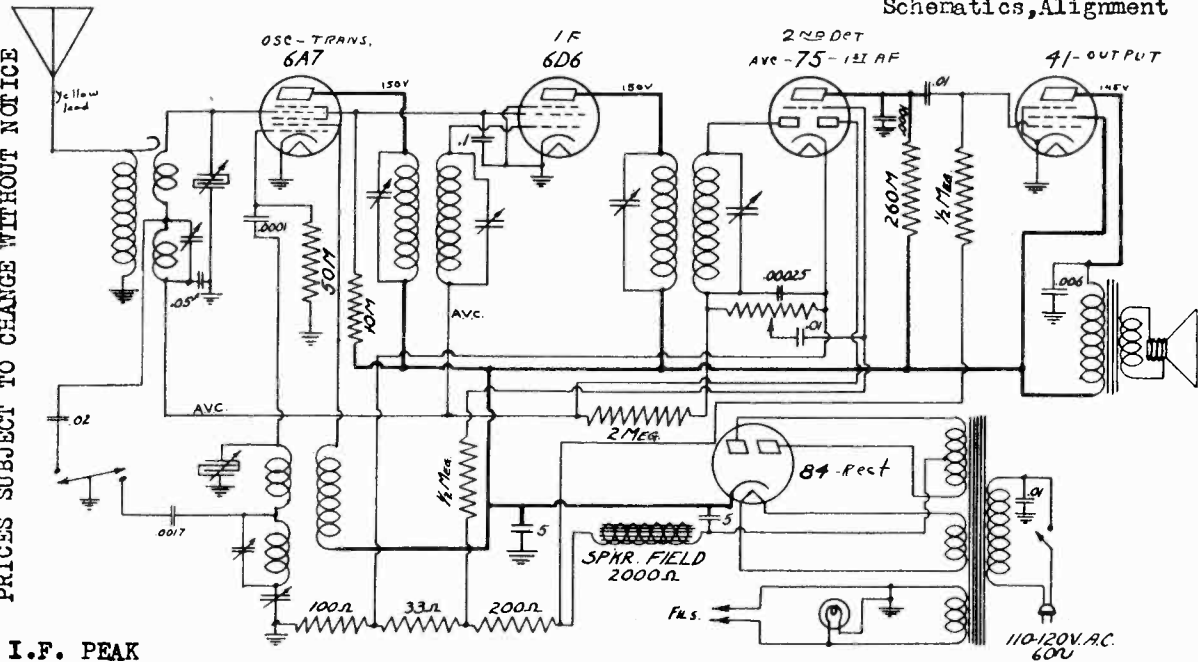
MODEL 1200

TO CALIBRATE:
Set service oscillator to 456 K.C. and connect "HOT" lead to grid of 6A7 tube. Ground stator of front (oscillator) section of variable condenser. Turn volume control for maximum output and peak intermediate frequency trimmers for maximum gain. Turn wave band switch knob toward right. Adjust service oscillator and receiver to 7 megacycles and peak variable condenser trimmers for maximum gain. Turn wave band switch toward left and adjust oscillator (service) and receiver to 1500 K.C. Peak both trimmers underneath chassis for maximum gain. Then adjust service oscillator and receiver to 600 K.C. and "rock" the variable condenser and adjust the paddler (near front of chassis on top) at the same time for maximum gain.

DEWALD RADIO

MODELS 529, 529LW
MODELS 629, 629LW, 703, 703LW
Schematics, Alignment

PRICES SUBJECT TO CHANGE WITHOUT NOTICE



I.F. PEAK
456 KC.

These receivers are dual wave superheterodynes with automatic volume control. The 529 covers the following ranges: 1650-550 K.C. and 7-2.4 M.C. The 529-LW covers the following ranges: 1650-550 K.C. and 340-150 K.C.

MODEL-529
529 LW.

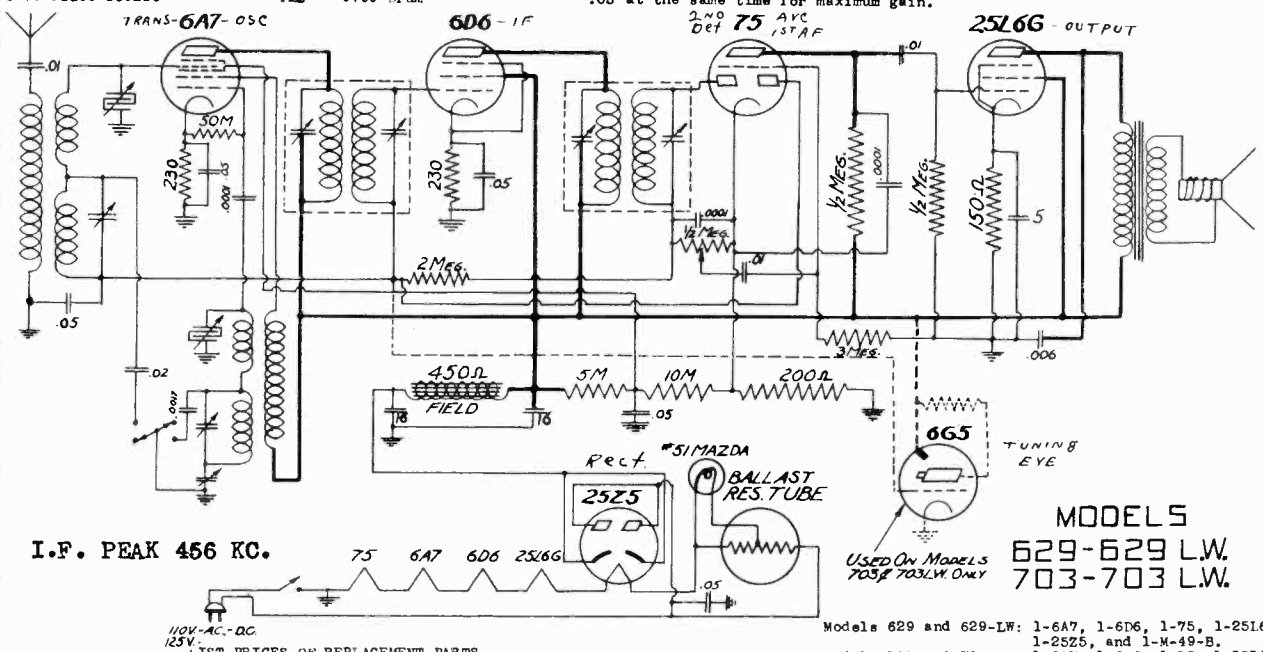
LONG WAVE OPERATION

The Model 529-LW has a long-wave band in place of the Sh.Wave band. Follow same instructions for tuning as for the Sh.Wave band operation.

LIST PRICES OF REPLACEMENT PARTS.

1440 Power Transformer	\$2.50	3382 comb. bias resistor	.35
1423A 1st dual I.P.	1.25	7212 Speaker	4.00
1424A 2nd "	1.25	8660 Comb. vol. control	1.00
1438 Ant. coil	.70	8662 knobs	.10
1439 Osc. coil	.65	6041 Scales	.10
2369 2 gang var. cond.	2.00	9823 Pointer	.10
2372 Electrolytic cond.	1.10	9818 Shaft	.10
8779 Pilot socket	.10	9799 Drum	.05

TO CALIBRATE: Set service oscillator to 456 K.C. and connect "HOT" lead to grid of 6A7 tube. Ground stator of front (oscillator) section of variable condenser. Turn volume control for maximum output and peak intermediate frequency trimmers for maximum gain. Turn wave band switch toward left. Adjust service oscillator and receiver to 7 megacycles and peak variable condenser trimmers for maximum gain. Turn wave band switch toward right and adjust service oscillator and receiver to 1500 K.C. Peak the trimmer next to the variable condenser and the one underneath chassis for maximum gain. Then adjust service oscillator and receiver to 600 K.C. and "rock" the variable condenser and adjust the padder (near front of chassis) at the same time for maximum gain.



I.F. PEAK 456 KC.

MODELS
629-629 LW.
703-703 LW.

LIST PRICES OF REPLACEMENT PARTS

1438 Antenna coil	* .70	8662 knobs	\$.10
1439 Oscillator Coil	.65	8627A Wave Band Switch	.35
1423A Dual tuned I.P.	1.25	8660 Comb. volume control	1.00
1424A 2nd det. coil	1.25	6041 Scale	1.10
2369 Variable condenser	2.00	9823 Pointer	.10
2376 Comb. electrolytic	1.00	9818 Shaft	.10
7222 Speaker	4.00	9799 Drum	.05

These receivers are dual wave superheterodynes with the automatic volume control feature. The frequency ranges are as follows:

Models 629 and 703 - 1650-550 K.C. and 7-2.4 M.C.
Models 629-LW and 703-LW - 1650-550 K.C. and 340-150 K.C.

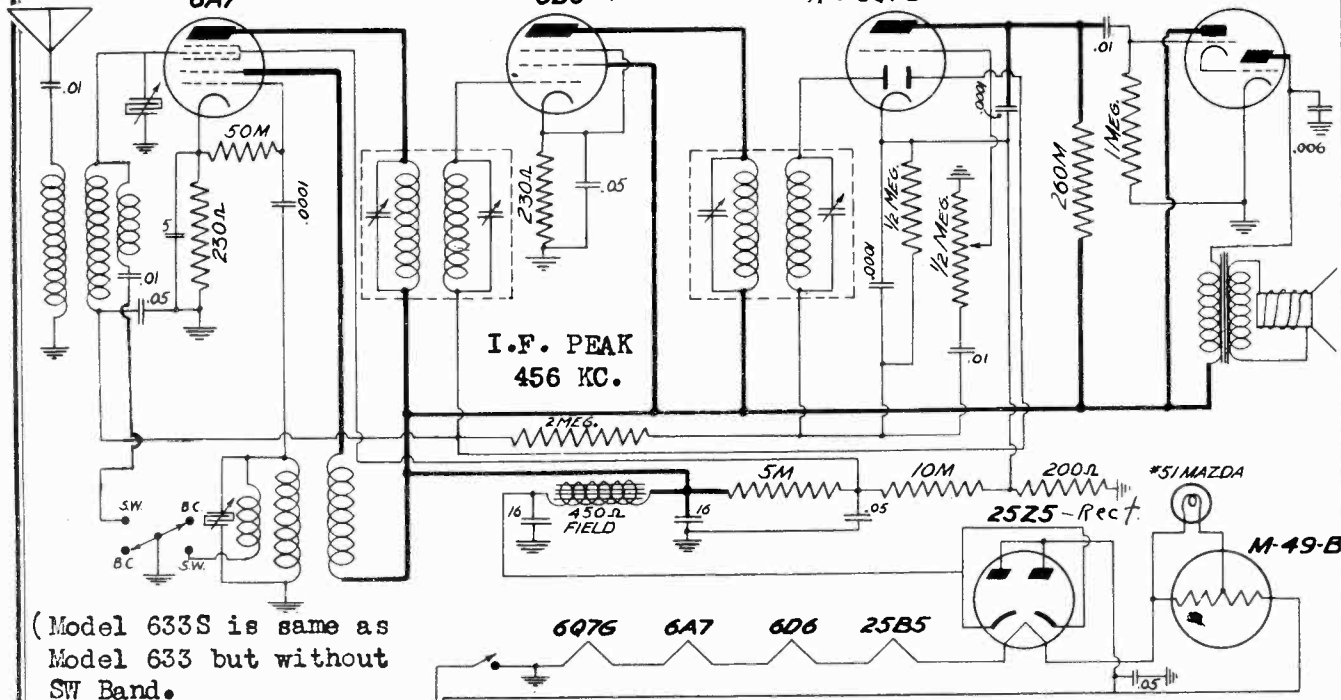
TO CALIBRATE: Set service oscillator to 456 K.C. and connect "HOT" lead to grid of 6A7 tube. Ground stator of front (oscillator) section of variable condenser. Turn volume control for maximum output and peak intermediate frequency trimmers for maximum gain. Turn wave band switch toward left. Adjust service oscillator and receiver to 7 megacycles and peak variable condenser trimmers for maximum gain. Turn wave band switch toward right and adjust oscillator (service) and receiver to 1500 K.C. Peak both trimmers underneath chassis for maximum gain. Then adjust service oscillator and receiver to 600 K.C. and "rock" the variable condenser and adjust the padder (near front of chassis) at the same time for maximum gain.

MODELS 633, 633LW, 633S
MODELS 635, 635LW
Schematics, Alignment
OSC-TRANS

DEWALD RADIO

MODEL 633, 633LW, 633S 2ND DET
6D6-1F AVC-6Q7G-AF

OUTPUT
25B5



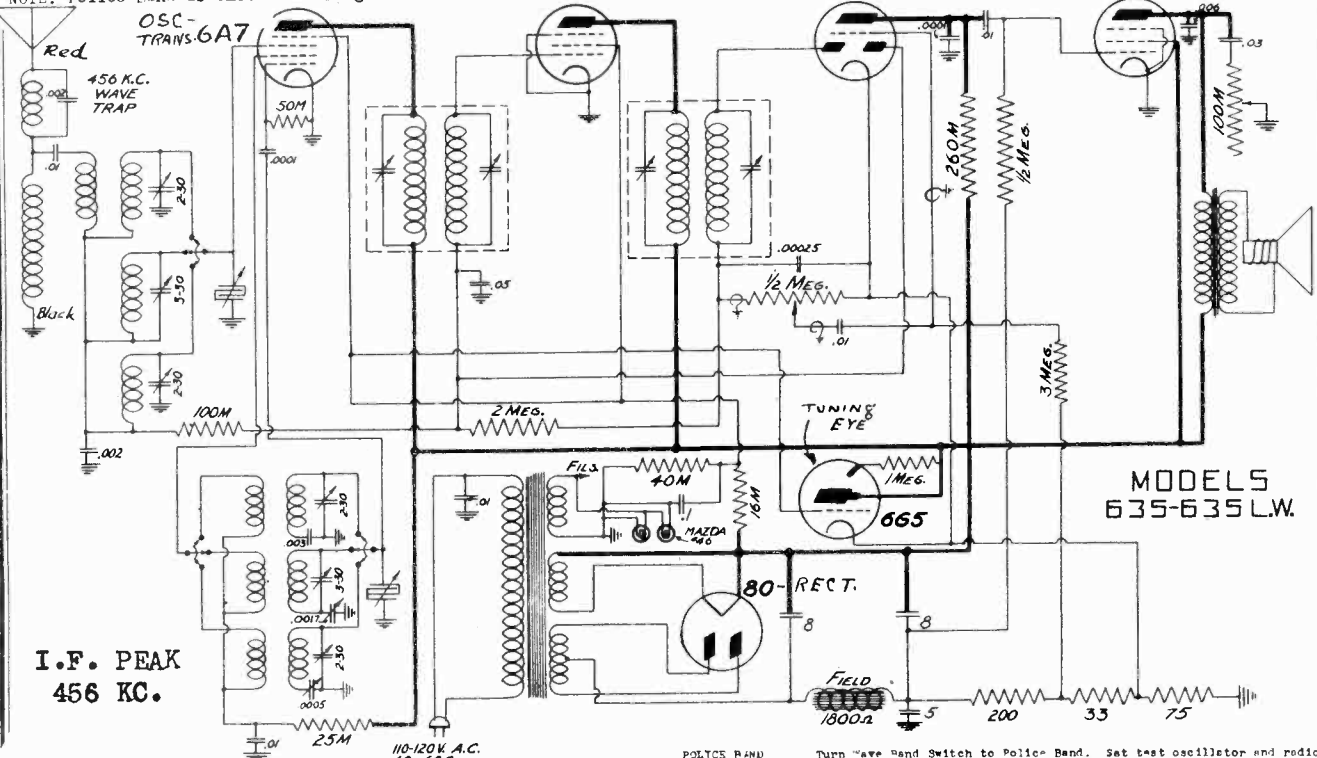
(Model 633S is same as Model 633 but without SW Band.)

The Model 635 has the following ranges:
 650-1700 K.C. (550-175 meters)
 1700-4800 K.C. (175-62 meters)
 5.7-16 M.C. (18-52 meters)

The Model 635LW has the following additional range:
 330-150 K.C. (900-2000 meters)

NOTE: Police Band is omitted in Long Wave receiver.

TO CALIBRATE: Set Service Oscillator to 456 K.C. and connect "HOT" lead to grid of 6A7. Ground stator of rear (oscillator) section of variable condenser. Turn Volume Control for maximum output and peak intermediate frequency trimmers for maximum gain. Remove Variable Condenser short. Adjust service oscillator and receiver to 1500 K.C. and peak variable condenser trimmers for maximum gain.



I.F. PEAK
456 KC.

MODELS
635-635LW.

I. F. ALIGNMENT: Intermediate frequency peaked at 456 K.C. Connect test oscillator to grid of 6A7 and chassis. Short circuit stator of front section of variable condenser during this operation. Then peak I.F. trimmers for maximum signal.

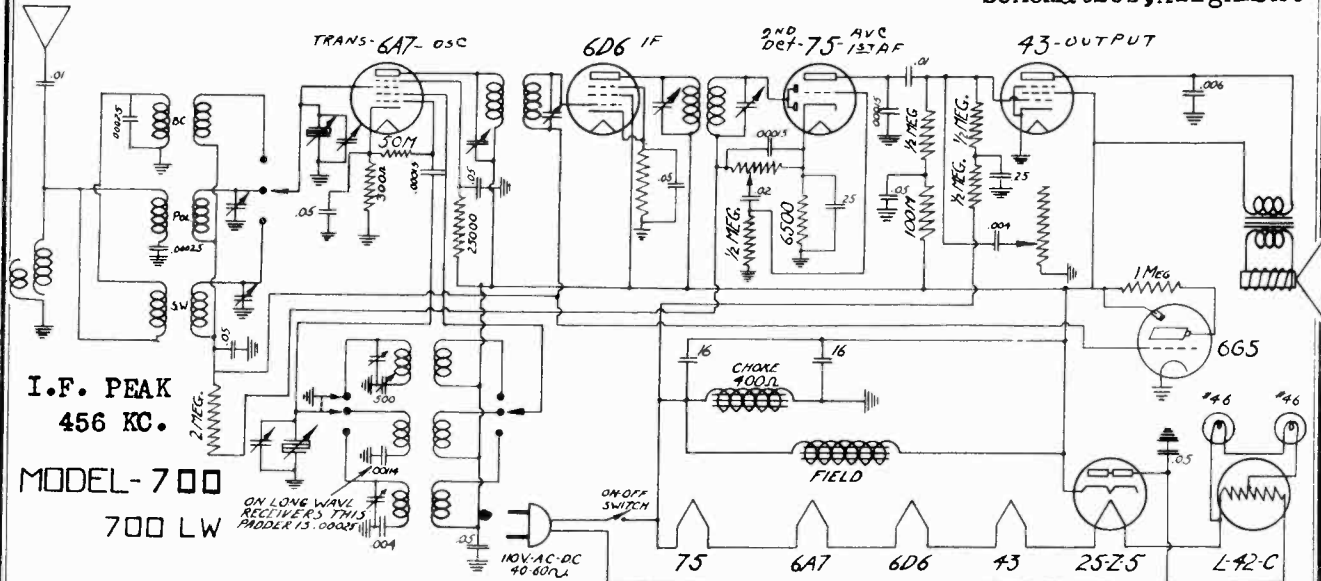
S. P. ALIGNMENT: Remove short from stator of variable condenser. Turn Wave Band Switch to Broadcast. Connect test oscillator to antenna and chassis. Set test oscillator and radio dial to 1500 K.C. and peak two trimmers underneath chassis, (toward rear) for maximum signal. Set test oscillator at 600 K.C. and adjust radder condenser (nut side) in front of chassis for maximum signal. During this operation, the variable condenser must be rocked. Readjust 1500 K.C.

POLICE BAND ALIGNMENT: Turn Wave Band Switch to Police Band. Set test oscillator and radio dial to 4000 K.C. and peak two trimmers on coil on top of chassis. Set test oscillator and radio to 3700 K.C. and adjust peifer (screw side) for maximum signal. The variable condenser must be rocked during the operation. If receiver has long waves instead of police band, calibrate same trimming condenser as on Police Band, but set oscillator and receiver at 300 K.C. for alignment.

SHORT WAVE ALIGNMENT: Turn wave band switch to short wave. Set test oscillator and radio dial to 15 Megacycles and peak trimmers on bottom of chassis (toward front) for maximum signal. Low frequency setting is automatically taken care of by short wave coils which are carefully matched for this setting by a fixed calibrated radder.

DEWALD RADIO

MODELS 700, 700LW
 MODELS 700A, 700A-LW
 Schematics, Alignment

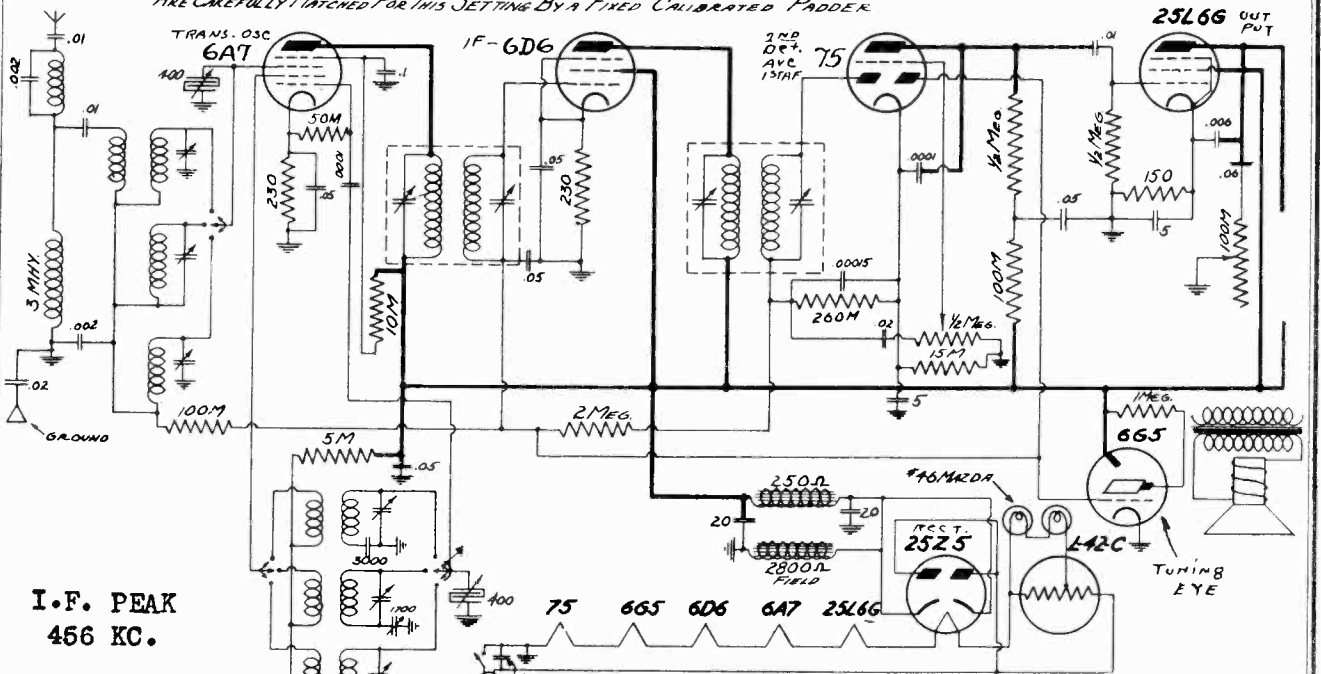


I.F. ALIGNMENT - INTERMEDIATE FREQUENCY PEAKED AT 456 KC. CONNECT TEST OSCILLATOR TO GRID OF 6A7 AND CHASSIS. SHORT CIRCUIT STATOR OF FRONT SECTION OF VARIABLE CONDENSER DURING THIS OPERATION. THEN PEAK I.F. TRIMMER FOR MAXIMUM SIGNAL.

R.F. ALIGNMENT - REMOVE SHORT FROM STATOR OF VARIABLE CONDENSER. TURN WAVE BAND SWITCH TO BROADCAST. CONNECT TEST OSCILLATOR TO ANTENNA AND CHASSIS. SET TEST OSCILLATOR AND RADIO DIAL TO 1500 KC. AND PEAK VAR. COND. TRIMMERS FOR MAXIMUM SIGNAL. SET TEST OSCIL. AT 600 KC. AND ADJUST PADDER CONDENSER IN FRONT OF CHASSIS FOR MAX. SIGNAL. DURING THIS OPERATION THE VAR. COND. MUST BE KEPT REAR - 1500 KC.

POLICE BAND ALIGNMENT - TURN WAVE BAND SWITCH TO POLICE BAND. SET TEST OSC. AND RADIO DIAL TO 4000 KC. AND PEAK 2 TRIMMERS NEAR FRONT OF CHASSIS FOR MAX. SIG. THE LOW FREQ. SETTING IS AUTOMATICALLY ADJUSTED BY A FIXED CALIBRATED PADDER. IF RECEIVER HAS LONG WAVES INSTEAD OF POLICE BAND CALIBRATE SAME TRIMMING COND. AS ON P.C. BAND BUT SET OSCILLATOR AND RECEIVER AT 300 KC. FOR ALIGNMENT.

SHORT WAVE ALIGNMENT - TURN W.B. SWITCH TO SHORT WAVE. SET TEST OSC. AND RADIO DIAL TO 15 Mc. CYCLES AND PEAK TRIMMERS NEAR CENTER OF CHASSIS FOR MAX. SIG. LOW FREQ. SETTING IS AUTOMATICALLY TAKEN CARE OF BY SHORT WAVE COILS WHICH ARE CAREFULLY MATCHED FOR THIS SETTING BY A FIXED CALIBRATED PADDER.



I. F. ALIGNMENT - Intermediate frequency peaked at 456 K. C. Connect test oscillator to grid of 6A7 and chassis. Short circuit stator of front section of variable condenser during this operation. Then peak I.F. trimmer for maximum signal.

R. F. ALIGNMENT - Remove short from stator of variable condenser. Turn Wave Band Switch to Broadcast. Connect test oscillator to antenna and chassis. Set test oscillator and radio dial to 1500 K.C. and peak two trimmers underneath chassis, (toward rear) for maximum signal. Set test oscillator at 600 K.C. and adjust padder condenser (nut side) in front of chassis for maximum signal. During this operation, the variable condenser must be rocked. Readjust 1500 K. C.

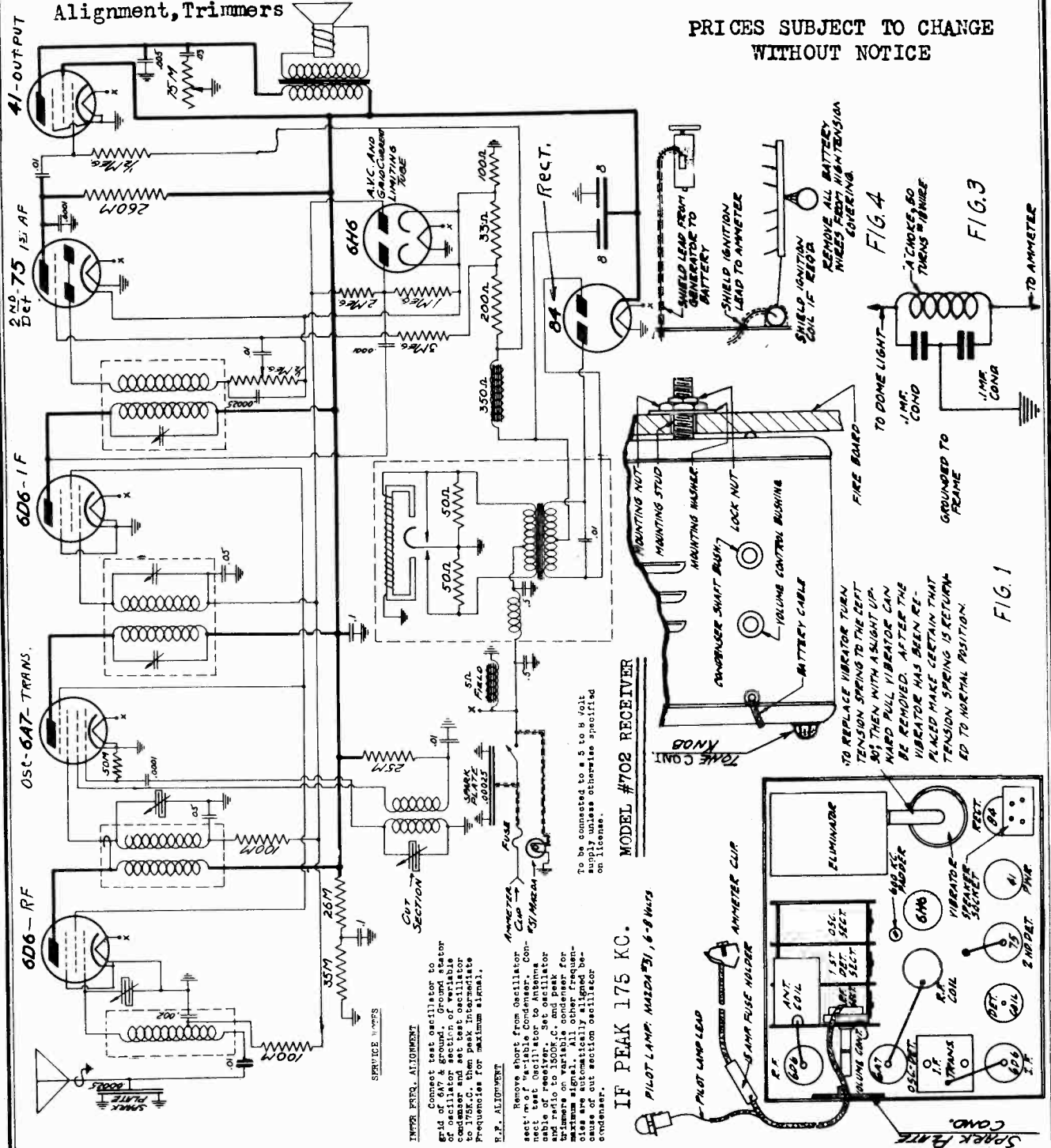
POLICE BAND ALIGNMENT - Turn Wave Band Switch to Police Band. Set test oscillator and radio dial to 400 K.C. and peak two trimmers on coil on top of chassis. Set test oscillator and radio to 1200 K.C. and adjust padder (screw side) for maximum signal. The variable condenser must be rocked during the operation. If receiver has long waves instead of police band, calibrate same trimming condenser as on Police Band, but set oscillator and receiver at 300 K.C. for alignment.

SHORT WAVE ALIGNMENT - Turn Wave band switch to short wave. Set test oscillator and radio dial to 15 Mc. cycles and peak trimmers on bottom of chassis, (toward front) for maximum signal. Low frequency setting is automatically taken care of by short wave coils which are carefully matched for this setting by a fixed calibrated padder.

MODEL 702
Schematic, Socket, Parts
Alignment, Trimmers

DEWALD RADIO

PRICES SUBJECT TO CHANGE
WITHOUT NOTICE



To be connected to a 5 to 6 volt supply unless otherwise specified on license.

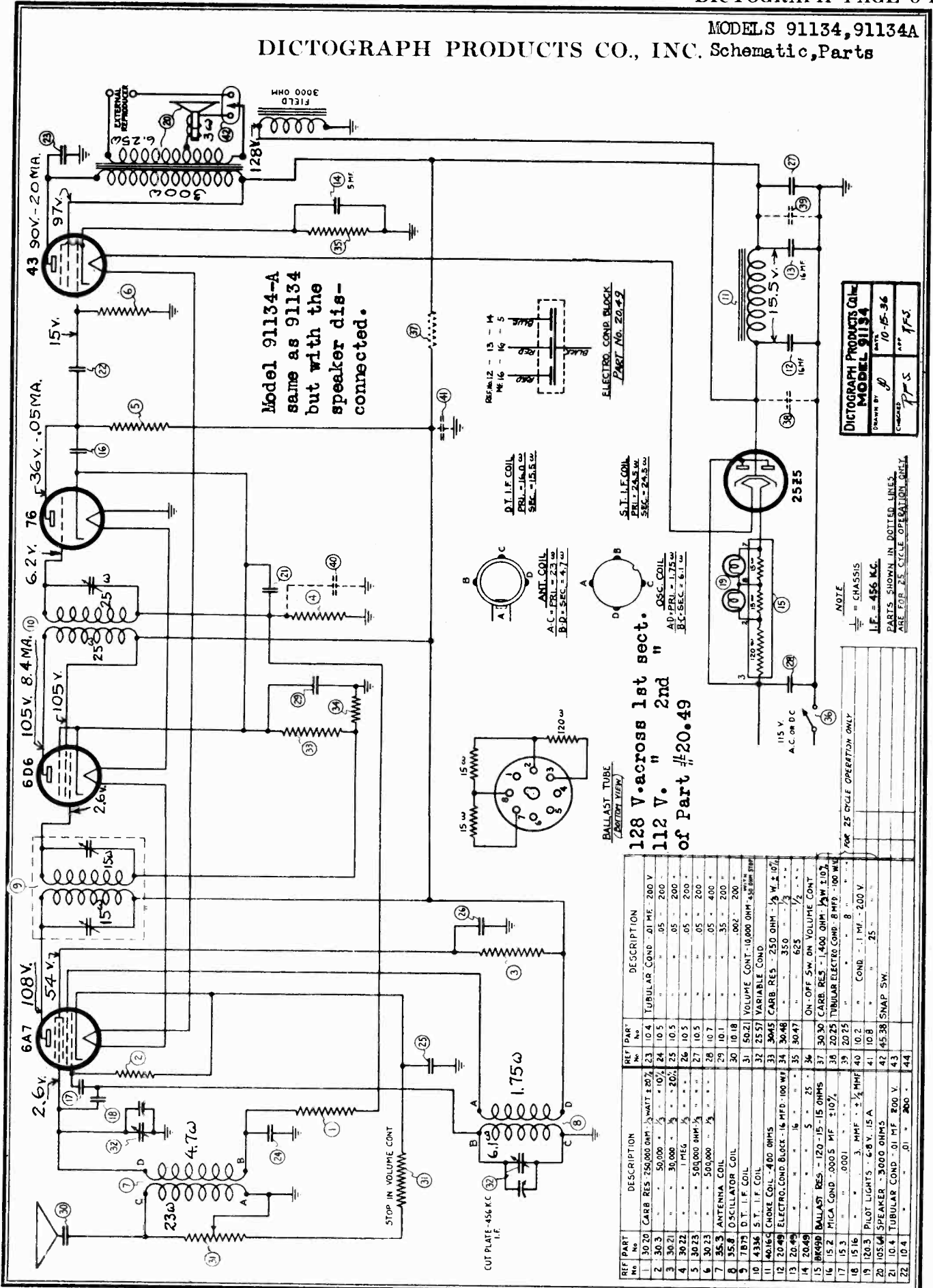
MODEL #702 RECEIVER

IF PEAK 175 KC.

NUMBERS AND LIST PRICES OF REPLACEMENT PARTS

1431A.....Power Transformer.....	\$ 3.00	3407.....Volume Control.....	1.10
1432A.....A Choke.....	.30	5077B.....Antenna Cable.....	.85
1433.....B Choke.....	.95	5094.....Combination A Cable.....	.50
1488.....Antenna Coil.....	.90	7194.....Speaker.....	5.50
1308D.....1st Detector Coil.....	.95	3608.....Vibrator.....	5.00
1309A.....Dual I.F. Transformer.....	1.50	8399.....Fuse Retainer.....	.20
1310.....2nd Detector Coil.....	1.30	8400.....15 Ampere Fuse.....	.05
1454.....Oscillator Coil.....	.75	8777.....Knob.....	.20
2317.....3 Gang Variable Condenser.....	4.50	8792.....Remote Control.....	5.75
2362.....Dual 8 Electrolytic Condenser.....	2.05	9850.....Cable and Sheath.....	1.50
2390.....Spark Plate Condenser (Chassis).....	.25	9517.....Mounting Stud.....	.05
2391.....Spark Plate Condenser (Can).....	.25	7/16 Hexagon Nut.....	.05
3390A.....Tone Control.....	.80	Pilot Lamps.....	.10

MODELS 91134, 91134A
 DICTOGRAPH PRODUCTS CO., INC. Schematic, Parts



Model 91134-A
 same as 91134
 but with the
 speaker dis-
 connected.

128 V. across 1st sect.
 112 V. " 2nd " of Part #20.49

DICTOGRAPH PRODUCTS CO.
 MODEL 91134
 DRAWN BY [Signature]
 CHECKED [Signature]
 DATE 10-15-36
 APP. J.F.S.

NOTE
 * CHASSIS I.F. = 455 KC.
 PARTS SHOWN IN DOTTED LINES ARE FOR 25 CYCLE OPERATION ONLY.

REF PART No	DESCRIPTION	REF PART No	DESCRIPTION
1 30.10	CARB RES 750,000 OHM ± 20%	23 10.4	TUBULAR COND. .01 MF. 200 V
2 30.3	" 50,000 " " 10%	24 10.5	" .05 " 200 "
3 30.21	" 30,000 " " 20%	25 10.5	" .05 " 200 "
4 30.22	" 1 MEG "	26 10.5	" .05 " 200 "
5 30.23	" 500,000 OHM ± 1/2 "	27 10.5	" .05 " 200 "
6 30.23	" 500,000 " "	28 10.7	" .05 " 400 "
7 35.5	ANTENNA COIL	29 10.1	" .35 " 200 "
8 35.8	OSCILLATOR COIL	30 10.18	" .002 " 200 "
9 7B7	D.T. I.F. COIL	31 50.21	VOLUME CONT. 10,000 OHM 550 OHM IMP
10 4336	S.T. I.F. COIL	32 2557	VARIABLE COND.
11 40.16C	CHOKER COIL - 400 OHMS	33 30M5	CARB. RES. 250 OHM - 1/2 W. ± 10%
12 20.49	ELECTRO. COND. BLOCK - 16 MFD. 100 WT	34 30.48	" 350 " 1/2 "
13 20.49	" " " " " " " "	35 30.47	" 625 " 1/2 "
14 20.49	" " " " " " " "	36	ON-OFF SW. ON VOLUME CONT
15 8K490	BALLAST RES. - 120-15-15 OHMS	37 30.50	CARB. RES. - 1,400 OHM 1/2 W ± 10%
16 15.2	MICA COND. - 500 P F ± 10%	38 20.25	TUBULAR ELECTRO. COND. 8 MFD. 100 W
17 15.3	" .001 " "	39 20.25	" " " " " " " "
18 15.16	" 3. MHF ± 1/2 MHF	40 10.2	" COND. - 1 MF. 200 V
19 120.3	PILOT LIGHTS - 6.8 V. 15 A	41 10.8	" " " " " " " "
20 105.4	SPEAKER - 3000 OHMS	42 45.38	SNAP SW.
21 10.4	TUBULAR COND. - 0.1 MF. 200 V	43	" " " " " " " "
22 10.4	" " " " " " " "	44	" " " " " " " "

MODELS 91134, 91134A
MODELS 91168, 91175

DICTOGRAPH PRODUCTS CO., INC.

Socket, Trimmers
Alignment

This receiver is equipped with an automatic overload control which necessitates setting the manual volume control of the receiver to its maximum position to insure accuracy in alignment. To control the signal output of the receiver it will be necessary to use the attenuator control of the signal generator. Connect the low potential side of the signal generator to the metal chassis through a .1 mfd. (400 volt) condenser for the following adjustments.

ADJUSTMENT OF I.F. CONDENSERS

(a) - Remove the control grid lead of the 6A7 tube and insert a 50,000 ohm (carbon type 1/3 watt) resistor in series with same. Then connect the high potential lead of the signal generator through a .001 mfd. condenser (paper tubular 400 volt type), directly to the control grid of the 6A7 tube.

(b) - Turn the rotor plates of the ganged variable condenser where no broadcast station carrier is heard (approximately 1000 KC). If this is not possible connect a .1 mfd. condenser (paper tubular) from the oscillator stator section (see sketch) of the ganged variable condenser to chassis.

(c) - Place an output meter (copper oxide type) across the mystic ear terminals with the speaker control switch in a clockwise position so that variations in signal output can be noted.

(d) - Place the signal generator in operation, adjust the carrier frequency to 456 KC and regulate the attenuator control of the signal generator so that the output signal is low enough to insure accuracy in adjusting the I.F. condenser.

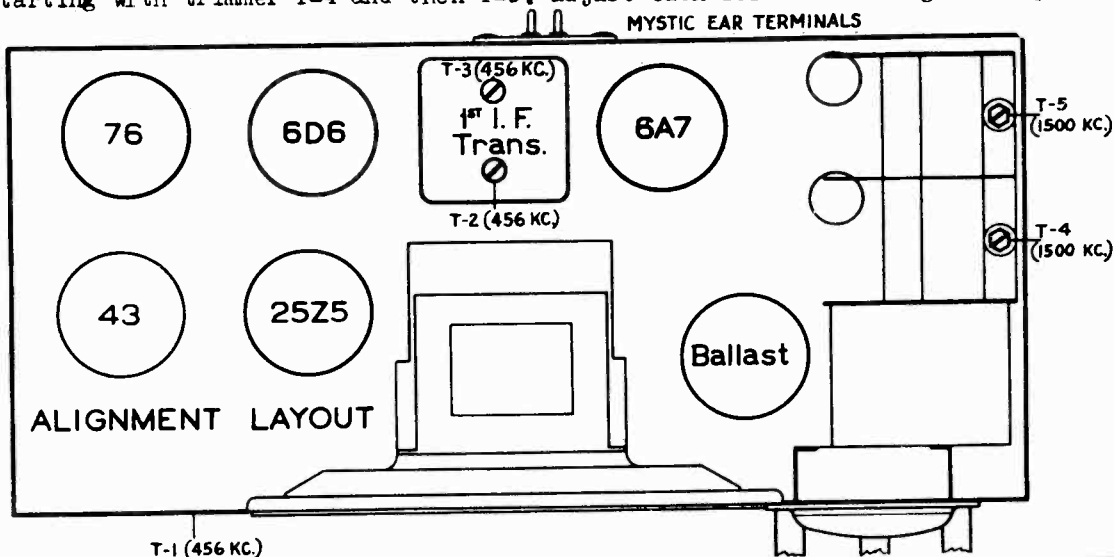
(e) - Adjust trimmers T-1, T-2 and T-3 (see alignment layout) to resonance as indicated by the greatest swing on the output meter.

ADJUSTMENT OF THE GANGED VARIABLE CONDENSERS

(a) - Remove the signal generator connection from the control grid of the 6A7 tube and replace the control grid lead. Then connect the antenna wire of the receiver to the high potential lead of the signal generator through a 200 mmfd. condenser (mica type).

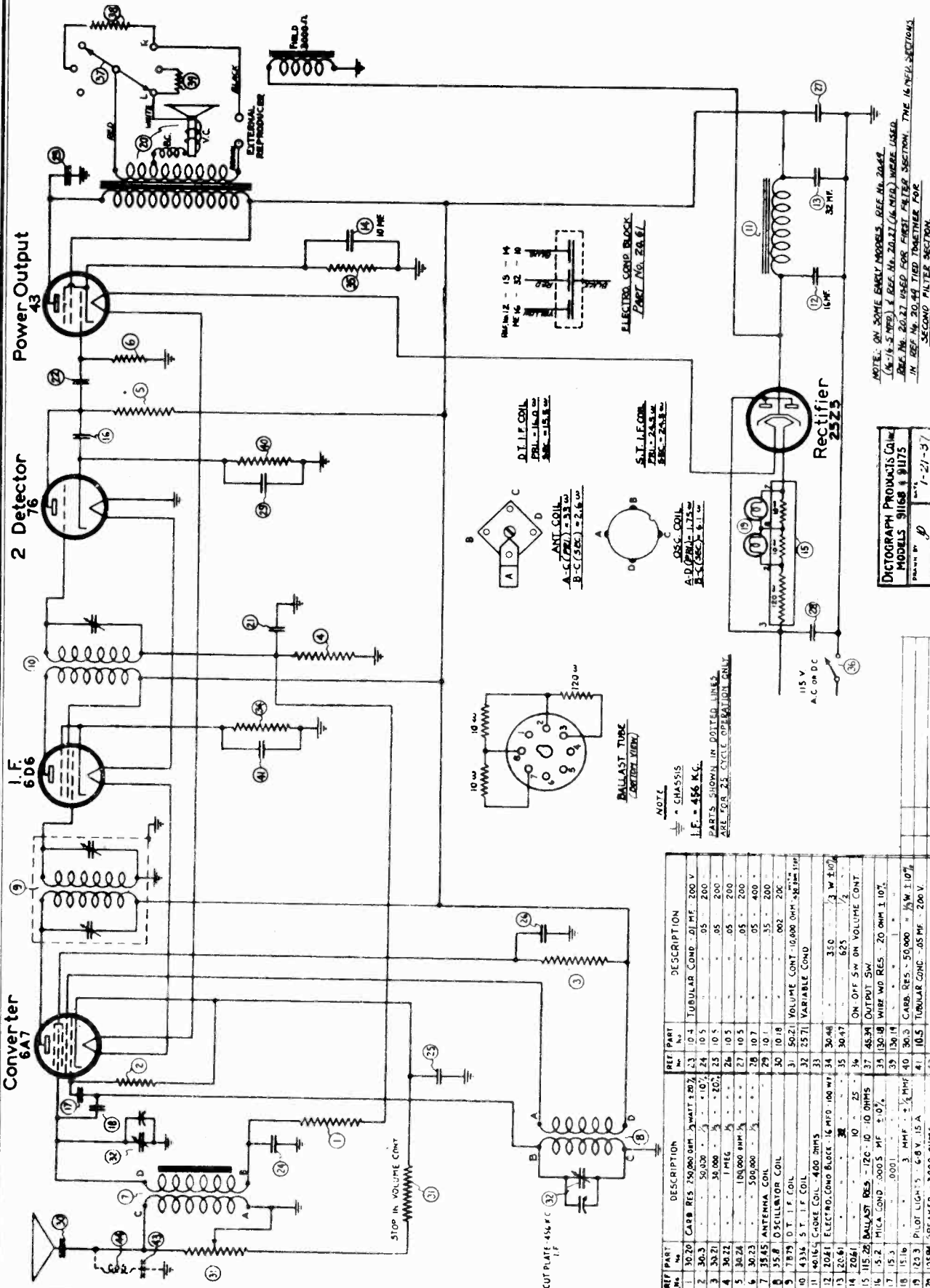
(b) - Set the dial pointer directly at the last long line at the right hand side of the dial with the ganged variable condenser fully meshed. Then rotate the receiver dial to 1,500 KC.

(c) - Adjust the carrier frequency of the signal generator to 1,500 KC and, starting with trimmer T-4 and then T-5, adjust each for maximum signal output.



DICTOGRAPH PRODUCTS CO., INC. Schematic, Parts

MODELS 91168, 91175

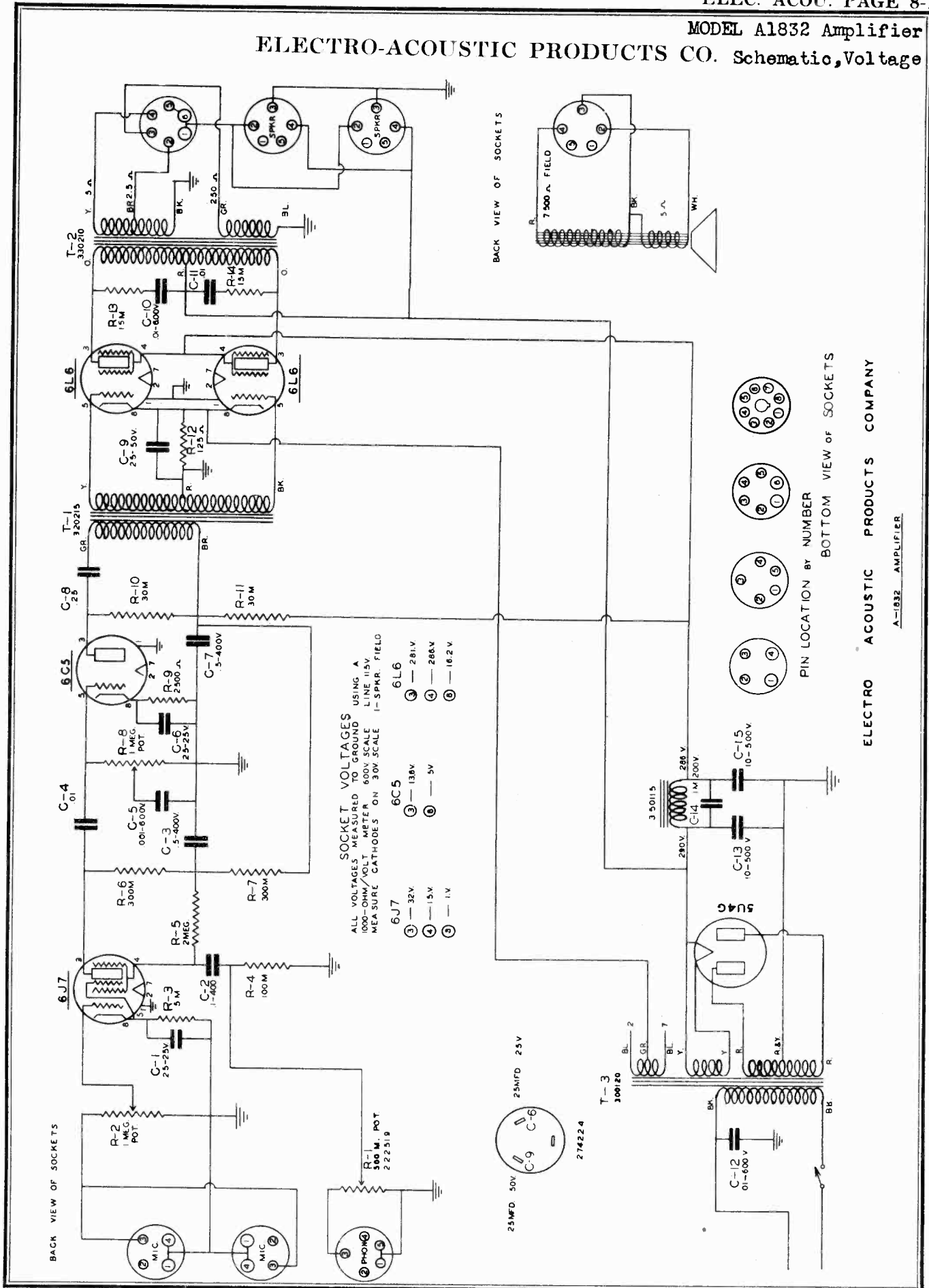


NOTE: ON SOME EARLY MODELS, REF. NO. 2044 (1/2" 5 WIRE) & REF. NO. 2022 (1/2" 10 WIRE) WERE USED. REF. NO. 2022 USED FOR FIRST FILTER SECTION, THE 16-NEEL SECTIONS IN REF. NO. 2044 TIED TOGETHER FOR SECOND FILTER SECTION.

DICTOGRAPH PRODUCTS CO. INC. MODELS 91168 & 91175
 PART NO. 8
 DATE 7-27-37
 CHECKED F.M.S.
 APP. A.P.S.

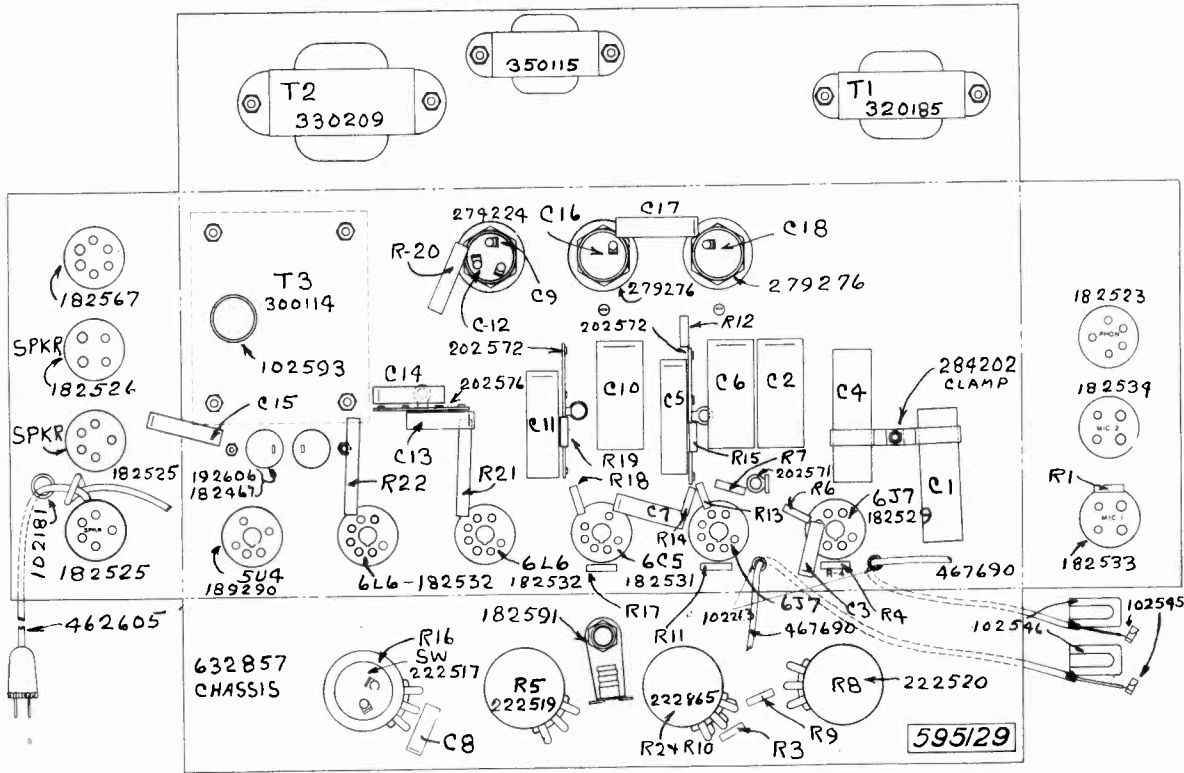
REF. PART No.	DESCRIPTION	REF. PART No.	DESCRIPTION
1	30.10 CARB. RES. 750,000 OHM 5WATT 2.7%	23	10.4 TUBULAR COND. .01 MF. 200 V.
2	30.3 50,000 1/2" 10"	24	10.5
3	30.21 30,000 1/2" 20"	25	10.5
4	30.22 1 MEG. 1/2" 26"	26	10.5
5	30.23 100,000 PH. 1/2" 27"	27	10.5
6	30.23 500,000 1/2" 28"	28	10.7
7	33.45 ANTENNA COIL	29	10.1
8	35.8 OSCILLATOR COIL	30	10.18
9	1879 D.T. I.F. COIL	31	50.21 VOLUME CONT. 10,000 OHM 50 MM TIP
10	4334 S.T. I.F. COIL	32	25.71 VARIABLE COND.
11	4014 CHOKE COIL - 400 OHMS	33	35.0 3 W 2.0"
12	2021 ELECTRO. COND. BLOCK - 16 PH. 100 MF. 34	30.46	625
13	2061	35	30.47
14	2061	36	ON OFF SW ON VOLUME CONT.
15	115.26 BALLAST RES. - 120-10 10 OHMS	37	48.34 OUTPUT SW
16	5.2 MICA COND. .0005 MF. 10"	38	130.18 WIRE W/ RES. 20 OHM 1 10"
17	15.3	39	130.14
18	15.16 3 MHF. 1/2" 30"	40	30.3 CARB. RES. - 50,000 1/2" 10"
19	123.3 PILOT LIGHT - 6.0 V. 15 A	41	10.5 TUBULAR COND. .05 MF. 200 V.
20	105.8 SPEAKER 3,000 OHMS	42	
21	10.4 TUBULAR COND. .01 MF. 200 V.	43	25.50 TRIMMING COND. 150 MHF.
22	10.4	44	46.97 VALVE TRAP COIL

ELECTRO-ACOUSTIC PRODUCTS CO. Schematic, Voltage
 MODEL A1832 Amplifier

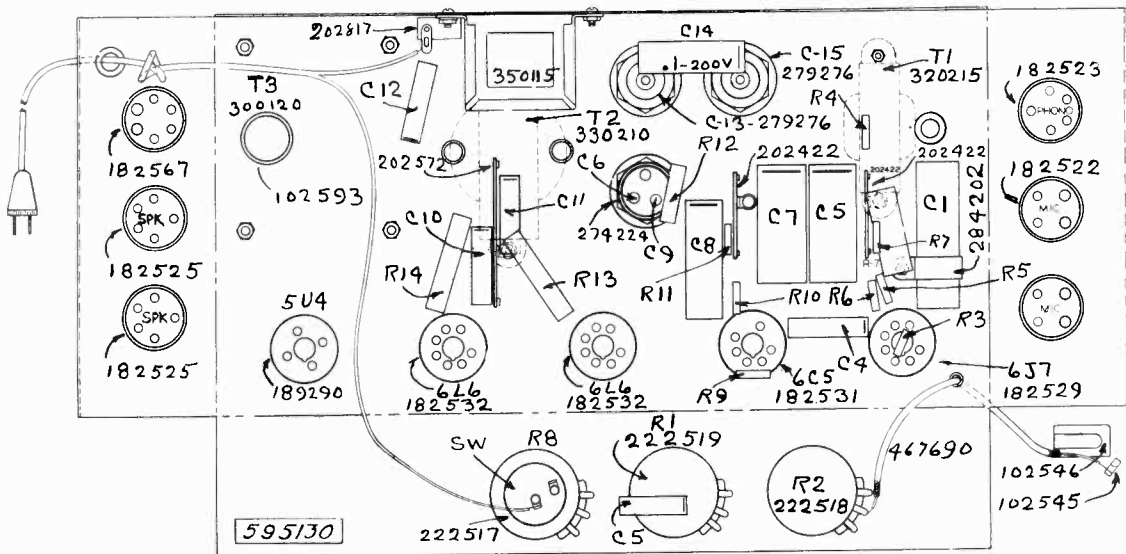


MODEL A1832 Amplifier
MODEL A2023 Amplifier
Chassis Layouts

ELECTRO-ACOUSTIC PRODUCTS CO.



CHASSIS LAYOUT - MODEL A2023



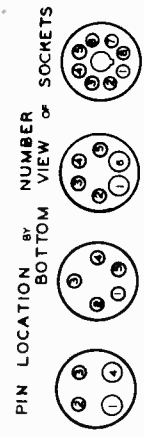
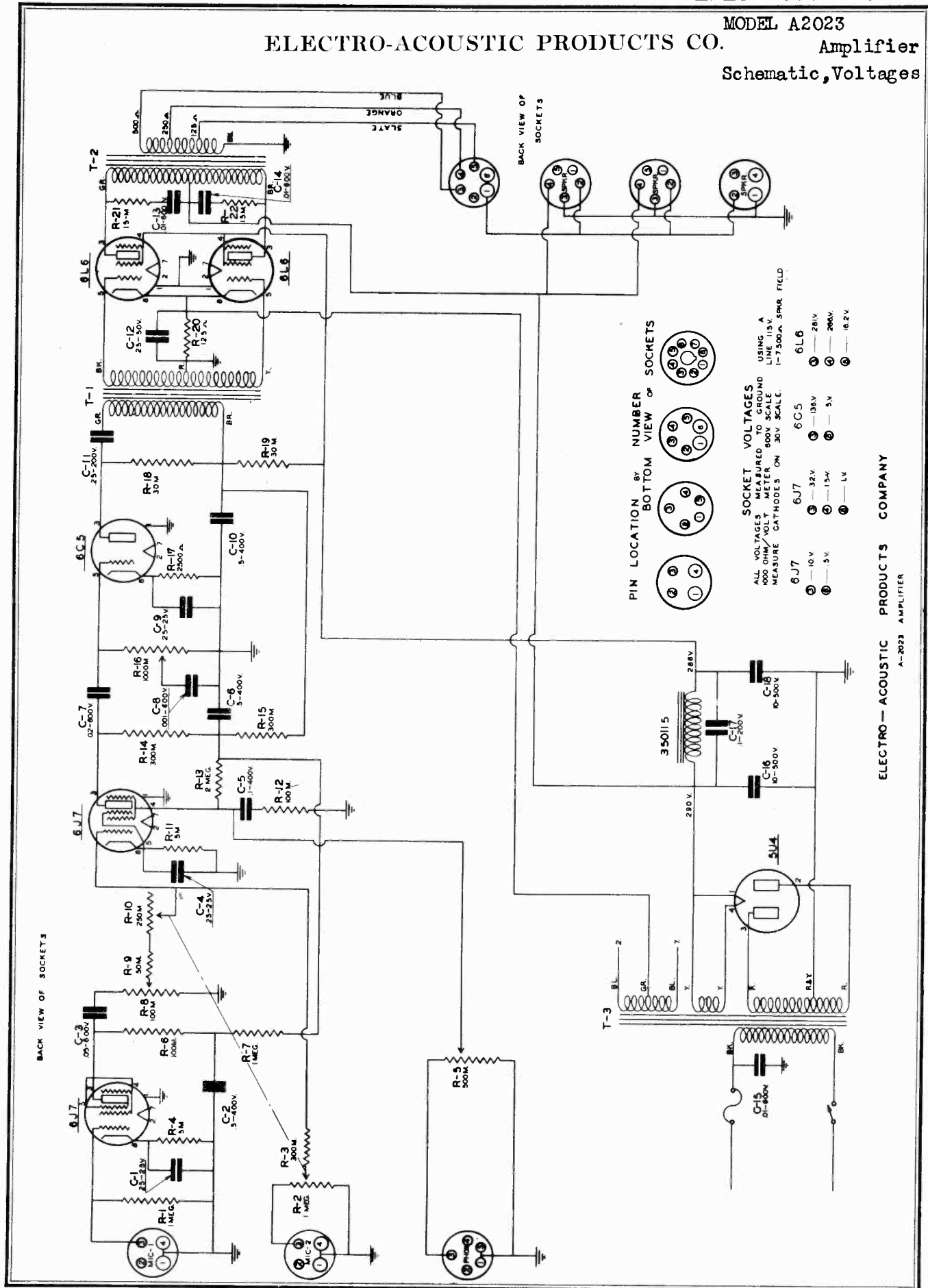
CHASSIS LAYOUT - MODEL 1832

ELECTRO-ACOUSTIC PRODUCTS CO.

MODEL A2023

Amplifier

Schematic, Voltages



SOCKET VOLTAGES
ALL VOLTAGES MEASURED TO GROUND
1000 OHM TAP, 900V SCALE
MEASURE CATHODES ON 30V SCALE.

6J7	6J7	6C5	6L6
1 - 10V	3 - 32V	3 - 136V	3 - 28V
2 - 5V	4 - 15V	4 - 5V	4 - 200V
5 - LV	5 - LV	5 - LV	5 - 10.2V

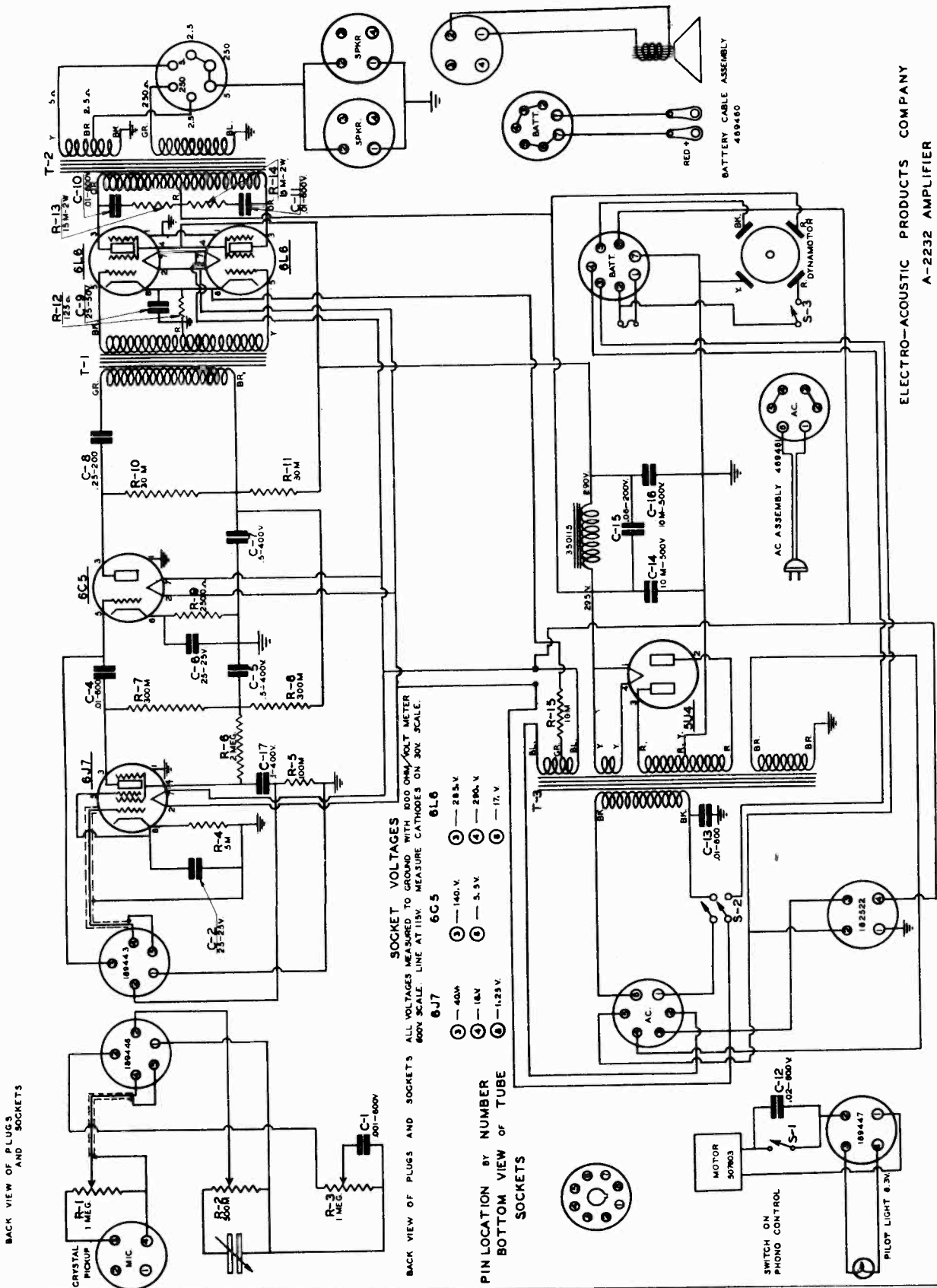
ELECTRO-ACOUSTIC PRODUCTS COMPANY
A-2023 AMPLIFIER

MODEL A2232 Amplifier

Schematic, Voltage

ELECTRO-ACOUSTIC PRODUCTS CO.

ELECTRO-ACOUSTIC PRODUCTS COMPANY
A-2232 AMPLIFIER

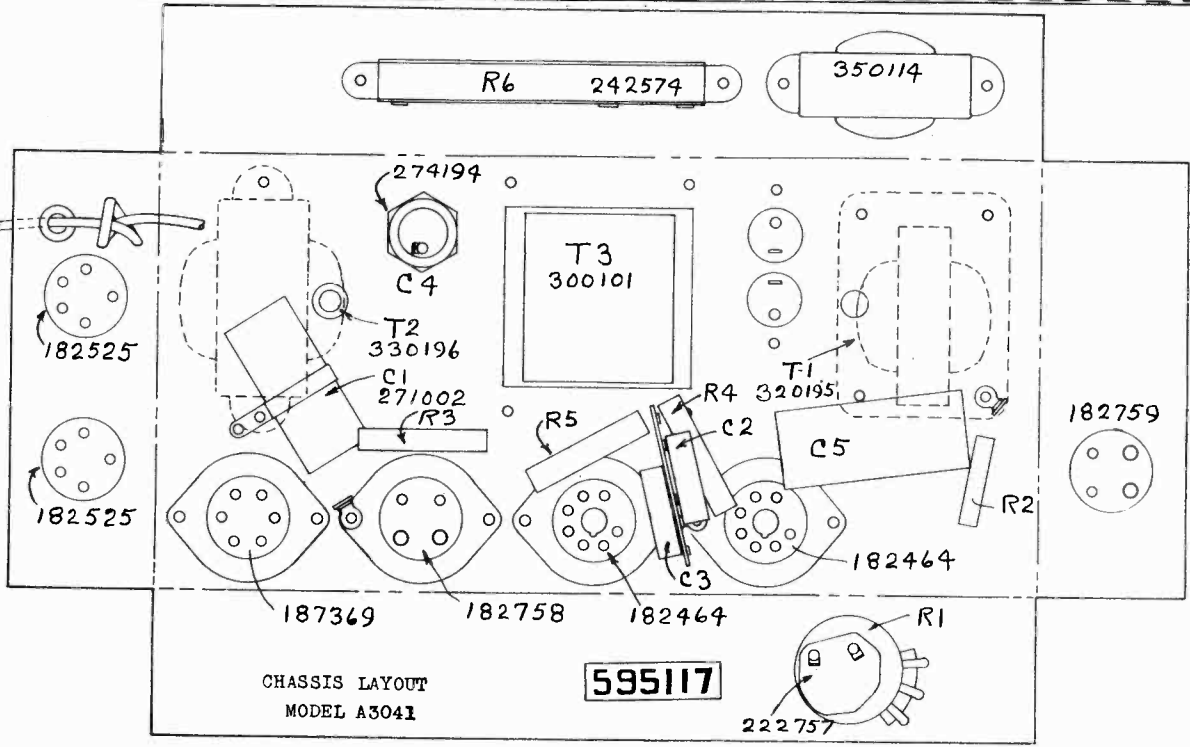
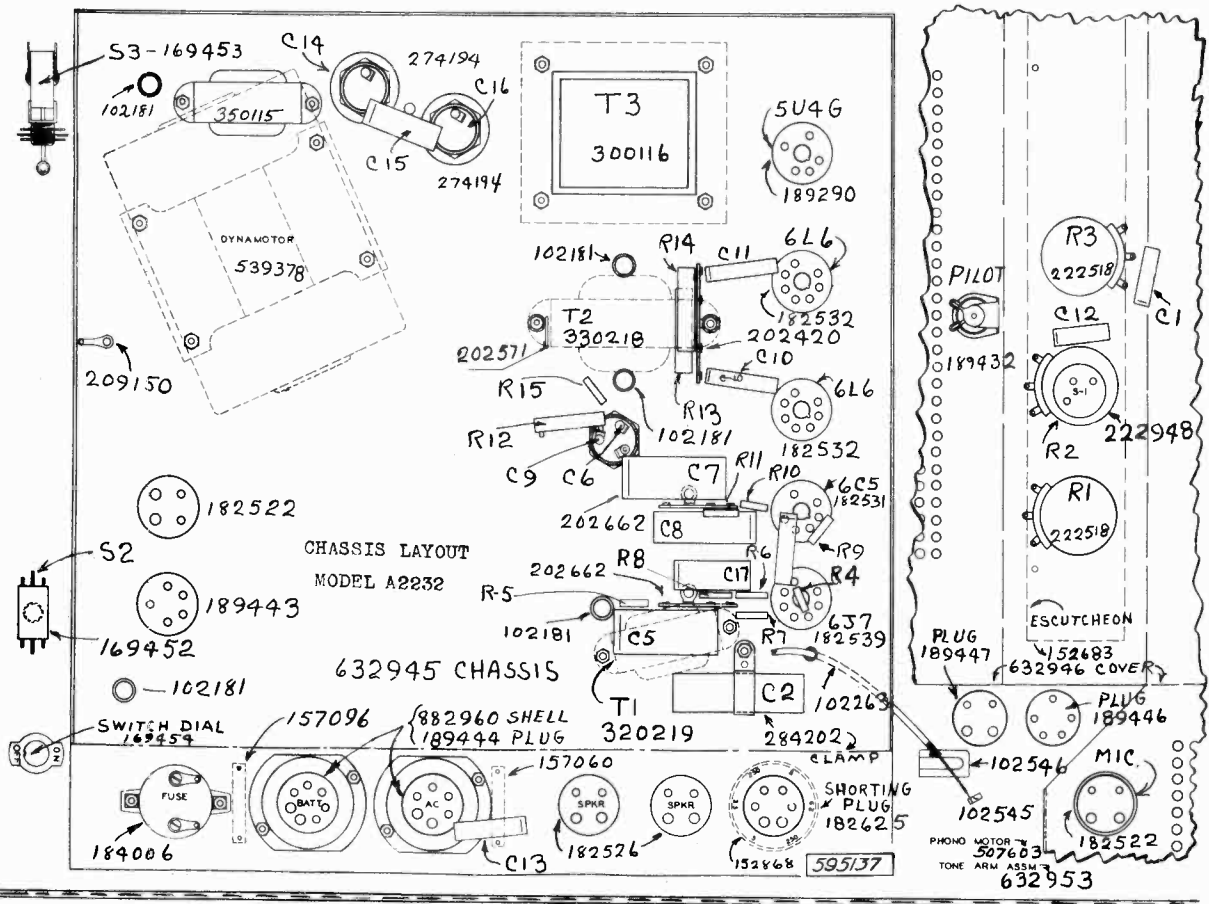


SOCKET VOLTAGES
ALL VOLTAGES MEASURED TO GROUND WITH 800 OHM VOLT METER
600V SCALE. LINE AT 115V. MEASURE CATHODES ON 30V SCALE.

6J7	① — 40V	② — 140V	③ — 285V
6C5	① — 5.5V	② — 5.5V	③ — 280V
	④ — 1.25V	⑤ — 17.1V	

ELECTRO-ACOUSTIC PRODUCTS

MODEL A2232 Amplifier
 MODEL A3041 Amplifier
 Chassis Layouts

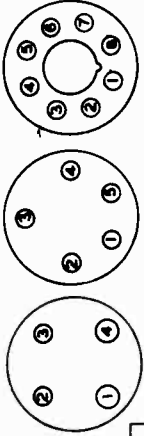
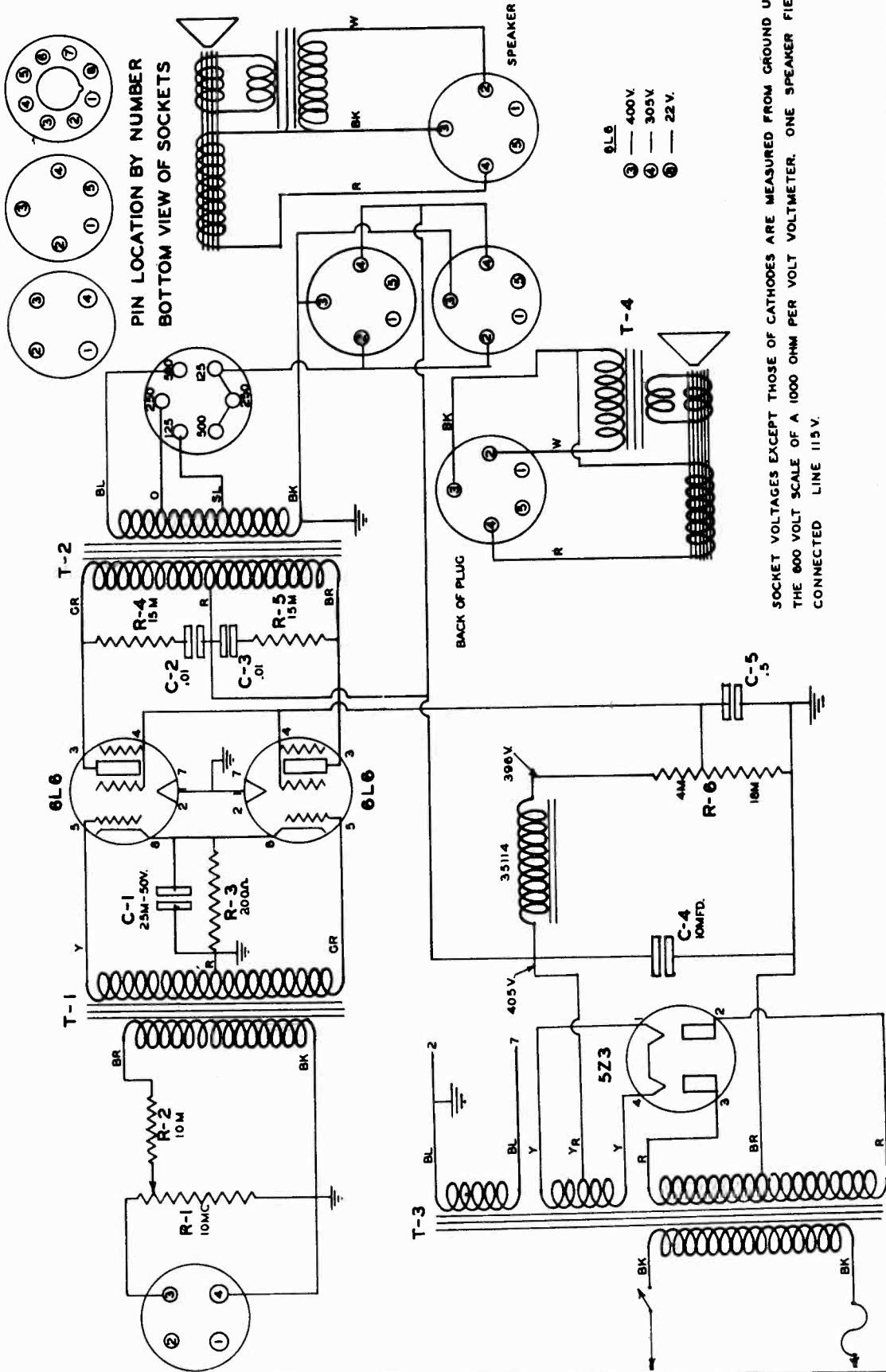


MODEL A3041 Amplifier
Schematic, Voltage

ELECTRO-ACOUSTIC PRODUCTS CO.

ELECTRO ACOUSTIC PRODUCTS COMPANY

A-3041 AMPLIFIER



- 6L6
 ③ — 400V
 ④ — 305V
 ⑤ — 22V

SOCKET VOLTAGES EXCEPT THOSE OF CATHODES ARE MEASURED FROM GROUND USING THE 600 VOLT SCALE OF A 1000 OHM PER VOLT VOLTMETER. ONE SPEAKER FIELD CONNECTED LINE 115 V.

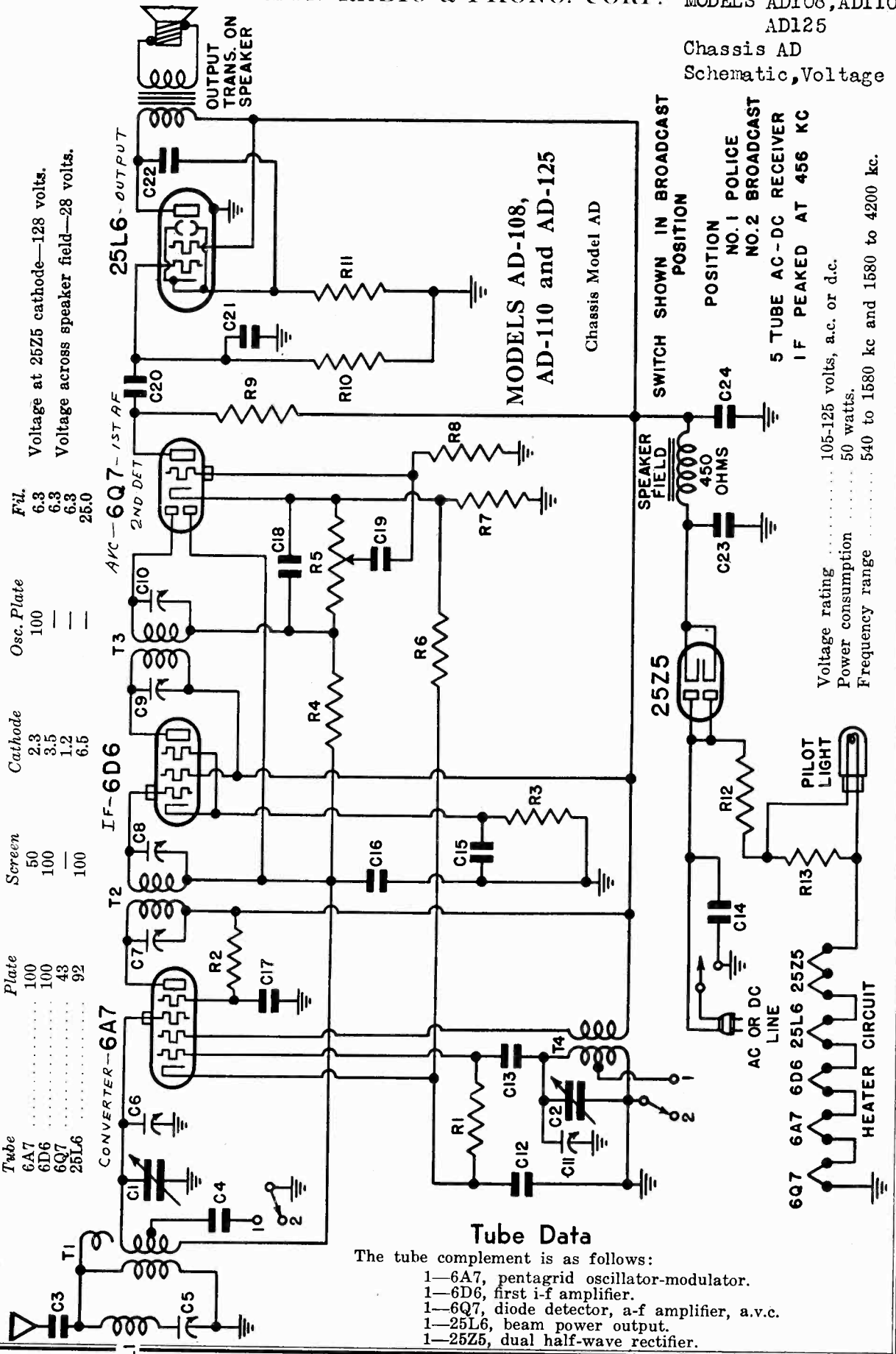
Chassis AD
Schematic, Voltage

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 117.5 volts, 60 cycles, a.c.

Tube	Plate	Screen	Cathode	Osc. Plate	Fil.
6A7	100	50	2.3	100	6.3
6D6	100	100	3.5	—	6.3
6Q7	43	—	1.2	—	6.3
25L6	92	100	6.5	—	25.0

Voltage at 25Z5 cathode—128 volts.
Voltage across speaker field—28 volts.



Tube Data

- The tube complement is as follows:
- 1—6A7, pentagrid oscillator-modulator.
 - 1—6D6, first i-f amplifier.
 - 1—6Q7, diode detector, a-f amplifier, a.v.c.
 - 1—25L6, beam power output.
 - 1—25Z5, dual half-wave rectifier.

SWITCH SHOWN IN BROADCAST POSITION
NO. 1 POLICE
NO. 2 BROADCAST
5 TUBE AC-DC RECEIVER
IF PEAKED AT 456 KC

Voltage rating 105-125 volts, a.c. or d.c.
Power consumption 50 watts.
Frequency range 540 to 1580 kc and 1580 to 4200 kc.

MODELS AD108, AD110
AD125

EMERSON RADIO & PHONO. CORP.

Chassis AD
Alignment, Notes, Parts

REPLACEMENT PARTS

Line Price as
Effective 1-1-37
(Subject to change without notice)

Part No.	DESCRIPTION	PRICE
4DT-343	456 kc adjustable wave-trap	.80
3RT-318	Two-band antenna coil	.85
3RT-320B	456 kc first i-f transformer	1.10
4DT-362	456 kc second i-f transformer	1.10
3RT-319A	Two-band oscillator coil	.80
4DC-344	Two-gang variable condenser	2.95
3HC-274	0.002 mf, 600 volt tubular condenser	.20
AA-C-114	0.001 mf, mica condenser	.20
	Trimmer, part of 456 kc wave-trap	
	Trimmer, part of variable condenser	
	Trimmer, part of i-f coil assembly	
	0.1 mf, 200 volt tubular condenser	.20
	0.00005 mf mica condenser	.20
	0.1 mf, 400 volt molded paper condenser	.20
	0.05 mf, 200 volt tubular condenser	.20
	0.0002 mf mica condenser	.20
	0.01 mf, 200 volt tubular condenser	.20
	0.02 mf, 400 volt tubular condenser	.20
	0.04 mf, 400 volt tubular condenser	.20
	Dual 16 mf, 150 volt tubular dry electrolytic condenser	1.50
	30,000 ohm 1/4 watt carbon resistor	.16
	410 ohm 1/4 watt carbon resistor	.16
	2 megohm 1/4 watt carbon resistor	.16
	Volume control with line switch—500,000 ohm	1.20
	240 ohm 1/2 watt wire-wound resistor	.16
	250,000 ohm 1/4 watt carbon resistor	.16
	500,000 ohm 1/4 watt carbon resistor	.16
	140 ohm, 1/2 watt wire-wound resistor	.16
	145 ohm, 1/2 watt resistor wire in line cord	.16
	40 ohm wire-wound metal clad resistor	.30
	5" dynamic speaker	4.85
	Wave-band switch	.35
	Pilot light 6.3 volt, .25 amp., Mazda No. 46	.20
	Line cord with built-in resistor wire—R12	.50

DIAL ASSEMBLY CONSISTS OF:

ZDR-48A	Dial scale and bracket	.90
2DD-21B	Pyralin drive disc	.30
2DD-21E	Dial crystal	.15
2DD-21F	Dial pointer	.10
	Vernier friction drive	.50

*Item number locates the article on the schematic diagram.
†These trimmer condensers are part of the variable condenser and can not be supplied separately.
‡These trimmer condensers are part of the coil assemblies and can not be supplied separately.

ADJUSTMENTS

An oscillator with frequencies of 456 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.

Location of Coils and Trimmer Adjustments

The first i-f transformer is mounted on top of the chassis deck beside the speaker. The trimmers are accessible through holes in the top of the can.
The second i-f transformer is mounted underneath the chassis in the right hand front corner. The trimmers are accessible through holes in the top of the chassis directly in front of the first i-f transformer.
The trimmers for the antenna and oscillator coils are located on the variable condenser. The trimmer on the front section is for the antenna coil.
The 456 kc wave-trap is mounted on the metal strip at the rear of the chassis directly behind the variable condenser. The trimmer for the 456 kc wave-trap is mounted on the coil and is accessible from the bottom of the chassis.

I-f and Wave-trap Alignment

Rotate the wave-band switch (located at the rear of the chassis) to the broadcast position, clockwise, and swing the variable condenser to the minimum capacity position. Feed 456 kc to the grid-cap of the 6A7 tube and adjust the i-f trimmers for maximum response. Feed 456 kc through a dummy antenna (a .0002 mf condenser may be used as a substitute) to the antenna lead and adjust the wave-trap trimmer for minimum response. (See General Notes, paragraph No. 7.)

R-f Alignment

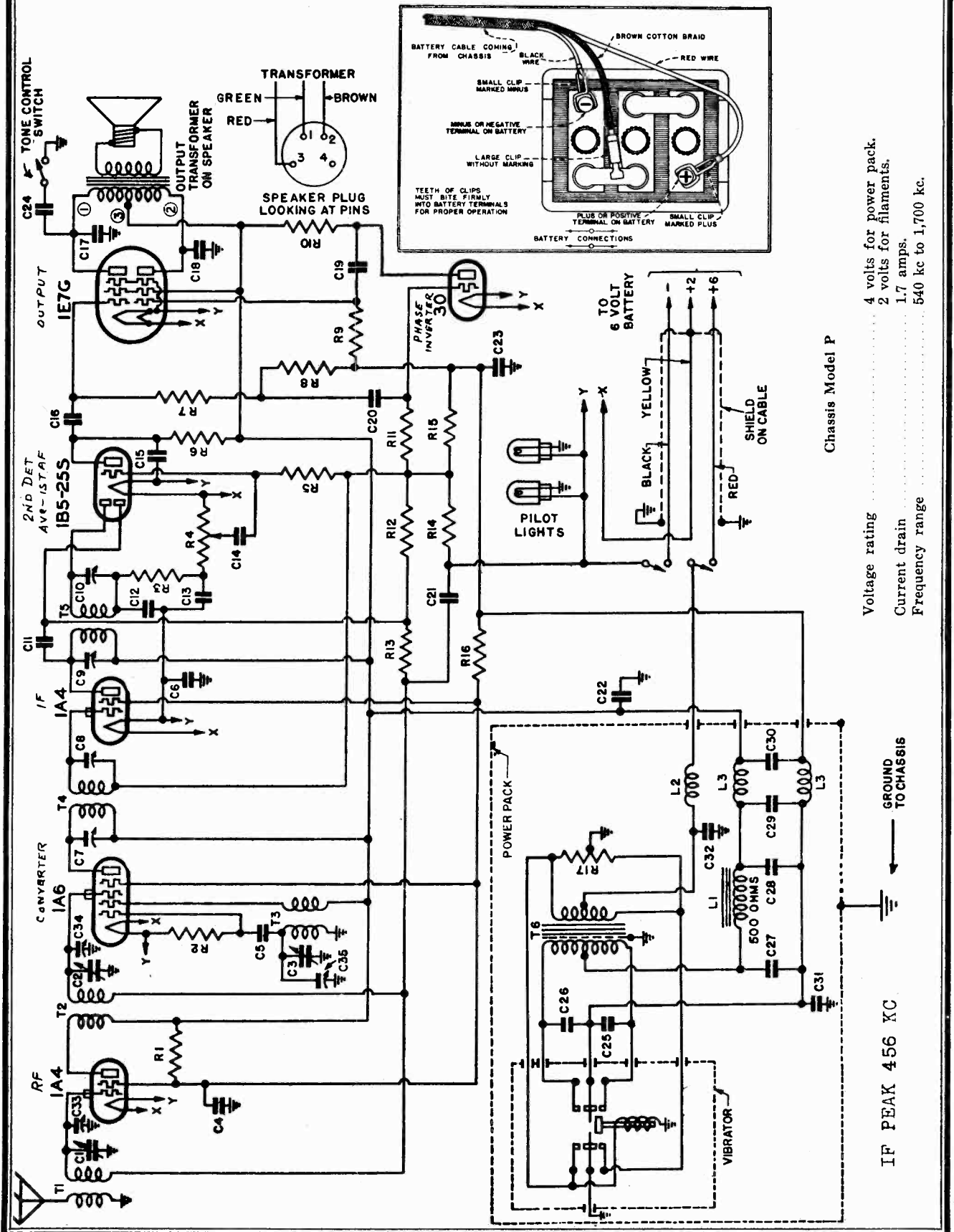
With the wave-band switch in the broadcast position, clockwise, set the dial pointer at 140. Feed 1400 kc through a standard dummy antenna (a .0002 mf condenser may be used as a substitute) to the antenna lead and adjust first the oscillator trimmer (on rear section of variable condenser) then the antenna trimmer (on front section of variable condenser) for maximum response. The police band is self-tracking and does not require any adjustment.

GENERAL NOTES

- If replacements are made or the wiring disturbed in the r-f section of the circuit, the receiver should be carefully realigned.
- One side of the power line is directly grounded to the chassis base. Under no circumstances, therefore, should a ground wire be permitted to come in contact with any metal part of the receiver.
- The filament dropping resistor (R-12—see schematic) is a resistance wire in the special line cord. The cord will, therefore, become warm under normal operating conditions. To insure good heat radiation stretch out the line cord to its full length. Do not attempt to shorten it by cutting.
- In operating the receiver on d.c. it may be necessary to reverse the line plug for correct polarity.
- The color coding of the i-f transformer leads is as follows:
Grid—green
Grid return—black
Plate—blue
B plus—red.
- In congested areas where the installation of a large antenna is not desirable we recommend the use of the Emerson Flexible Mast Antenna, Model W-82. Instructions for the installation of this compact and efficient antenna are supplied with each kit.
Where the Flexible Mast is installed permanently, it is urgently recommended that the receiver antenna wire be cut. Leave just enough of this wire to reach from the receiver to the window strip connector.
- The wave-trap in the receiver has been adjusted for maximum signal rejection at 456 kc. If, however, persistent interference is experienced from some particular telegraphic station, readjust the wave-trap trimmer until the response from the interfering station is at a minimum.

EMERSON RADIO & PHONO. CORP.

MODELS P117, P135
Chassis P
Schematic, Connections



MODELS P117, P135
Chassis P
Voltage, Alignment
Notes, Parts

EMERSON RADIO & PHONO. CORP.

VOLTAGE ANALYSIS

Readings should be taken with a 1,000 ohms-per-volt meter. Voltages listed below are from point indicated to chassis with volume control turned on full and no signal. Battery voltage for these readings was 6.1 volts.

Tube	Sec. Plate	Volts
1A4	137	58
1A6	137	53
1A4	137	53
1A4	137	53
1B5/255	95	80
1E7G	135	137

Volume across filaments—2 volts.

To check the bias of the 1E7G tube, measure the voltage from the filament terminal, closest to the screen, of the 30 tube to the negative side of the 20 mf tubular electrolytic condenser. This reading should be 7.5 volts. To check the bias of the other tubes, measure the voltage from the filament terminal, closest to the screen, of the 30 tube to the grid cap of the 1A4 i-f tube. This reading should be 3 volts.

REPLACEMENT PARTS LIST

Low Price as of Aug. 15, 1935

PRICE

DESCRIPTION

PART NO.

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

ITEM	DESCRIPTION	PRICE
T1	Antenna coil	.85
T2	R-f interstage coil	.75
T3	1A4 i-f tube	1.30
T4	3HT-287A 456 kc second i-f transformer	1.35
T5	3HT-288A 456 kc second i-f transformer	1.35
T6	Power transformer	2.00

L1	Iron-core filter choke (500 ohms)	1.20*
L2	Layer-wound "A" choke	.65
L3	Dual r-f choke assembly (170 microhenries each section)	1.50
R1	20,000 ohm, 1/4 watt carbon resistor	.16
R2	50,000 ohm, 1/4 watt carbon resistor	.16
R3	Volume control (250,000 ohms)	.75
R4	50,000 ohm, 1/4 watt carbon resistor	.16
R5	10,000 ohm, 1/4 watt carbon resistor	.16
R6	30,000 ohm, 1/4 watt carbon resistor	.16
R7	30,000 ohm, 1/4 watt carbon resistor	.16
R8	250,000 ohm, 1/4 watt carbon resistor	.16
R9	1 megohm, 1/4 watt carbon resistor	.16
R10	150 ohm, 1/2 watt wire-wound resistor	.16
R11	200 ohm, 1/2 watt wire-wound resistor	.16
R12	40,000 ohm, 1/4 watt carbon resistor	.16
R13	200 ohm wire-wound center-tapped resistor	.16
R14	3PC-304	4.15
R15	Three-gang variable condenser	.20
R16	0.0001 mf mica condenser	.20
R17	0.9 mf, 200 volt tubular condenser	.50

Trim. Trimmers, part of 3HT-287A, first i-f transformer assembly. (Trimmers can not be supplied separately.)

Trim. Trimmers, part of 3HT-288A, second i-f transformer assembly. (Trimmers can not be supplied separately.)

C1	0.00025 mf mica condenser	.20
C2	0.02 mf, 200 volt tubular condenser	.20
C3	0.02 mf, 400 volt tubular condenser	.20
C4	0.002 mf, 600 volt tubular condenser	.20
C5	20 mf, 25 volt tubular dry electrolytic condenser	.80
C6	0.25 mf, 200 volt tubular condenser	.20
C7	0.01 mf, 500 volt tubular condenser	.20
C8	0.013 mf, 300 volt tubular condenser	.80
C9	0.1 mf, 200 volt tubular condenser	.20
C10	0.1 mf, 400 volt tubular condenser	.20
C11	0.5 mf, 200 volt tubular condenser	.60
C12	6 1/4 permanent magnet dynamic speaker (for Model P-117)	8.25
C13	16 permanent magnet dynamic speaker (for Model P-135)	11.50
C14	Tone control switch	.75
C15	Power switch	.75
C16	Battery cable	1.85
C17	Pilot light 2.5 volt, 0.5 amp Mazda No. 41	.20
C18	Dial face	.75
C19	Dial drive belt	.20
C20	Dial drive shaft and pulley	.10
C21	Idler pulley	.08
C22	Idler pulley	.08
C23	Condenser shaft pulley	.10
C24	Condenser shaft pulley	.10
C25	Dial pointer	.10
C26	Escutcheon with crystal	1.05
C27	Escutcheon	1.05

Trim. Trimmers, part of 3HT-287A, first i-f transformer assembly. (Trimmers can not be supplied separately.)

Trim. Trimmers, part of 3HT-288A, second i-f transformer assembly. (Trimmers can not be supplied separately.)

Trim. Trimmers, part of 3HT-287A, first i-f transformer assembly. (Trimmers can not be supplied separately.)

Trim. Trimmers, part of 3HT-288A, second i-f transformer assembly. (Trimmers can not be supplied separately.)

Trim. Trimmers, part of 3HT-287A, first i-f transformer assembly. (Trimmers can not be supplied separately.)

Trim. Trimmers, part of 3HT-288A, second i-f transformer assembly. (Trimmers can not be supplied separately.)

Trim. Trimmers, part of 3HT-287A, first i-f transformer assembly. (Trimmers can not be supplied separately.)

Trim. Trimmers, part of 3HT-288A, second i-f transformer assembly. (Trimmers can not be supplied separately.)

Six-Tube Battery - Operated Superheterodyne
MODELS P117 and P135
ADJUSTMENTS

An oscillator with frequencies of 456 kc and 1500 kc should be used.

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

Location of I-f Transformers and Trimmers

The first i-f transformer, part number 3HT-287A is in an oblong coil can located on the top of the chassis to the right of the variable condenser. The two trimmers for this i-f are accessible through holes in the top of the coil can.

The second i-f transformer, part number 3HT-288A, is in an oblong coil can located on the top of the chassis directly behind the first i-f tube. The two trimmers for this i-f are accessible through holes in the top of the coil can.

The oscillator, antenna, and r-f trimmers are located on the top of the variable condenser. The oscillator trimmer is on the rear section of the variable condenser, the antenna trimmer is on the front section of the variable condenser and the r-f trimmer is on the center section of the variable condenser.

Alignment Procedure

1. Rotate the variable condenser to the minimum capacity position.
2. Feed 456 kc to the grid cap of the 1A6 tube.
3. Adjust the four i-f trimmers, repeating for maximum response.
4. Set dial pointer to 1500 and feed 1500 kc to the antenna lead through a standard broadcast dummy antenna (a .0002 mf mica condenser may be used as a substitute).
5. Adjust the oscillator trimmer (on rear section of variable condenser) for maximum response.
6. Adjust the r-f trimmer (on center section of variable condenser) for maximum response.
7. Adjust the antenna trimmer (on front section of variable condenser) for maximum response.

GENERAL NOTES

1. The large, oblong metal box on the top of the chassis deck contains the power pack. The function of this power pack is to convert the 4 volt direct current from the storage battery into 140 volt direct current. The vibrator used is of the synchronous type.
2. The illustration on the right indicates the correct battery connections. The test leads clips are attached to the ends of two small clips marked plus and should be attached to the positive terminal of the battery. The small clip without marking should be attached to the negative side of the battery.

Note that the battery is made up of three cells. The large battery clip should be attached to the positive side of the same cell to which the negative clip is attached. It is important that these battery connections be made correctly. Before turning the receiver on check the connections with the illustration.

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

Grid—green
Grid return—black
B plus—red

4. With few exceptions the color coding of the general wiring is as follows:

Plate—blue
B plus—red
Screen—brown
A plus—yellow
A minus—yellow

5. The color coding of the leads of the power pack is as follows:

A plus—yellow
A minus—yellow
Emerson All-Wave Antenna is especially designed for high efficiency and reduction of noise on all frequency ranges. Complete instructions for the installation of this antenna are supplied with each kit.

Common neg.—black.
Common neg.—black.

Common neg.—black.
Common neg.—black.

Tube Data

The tube complement is as follows:

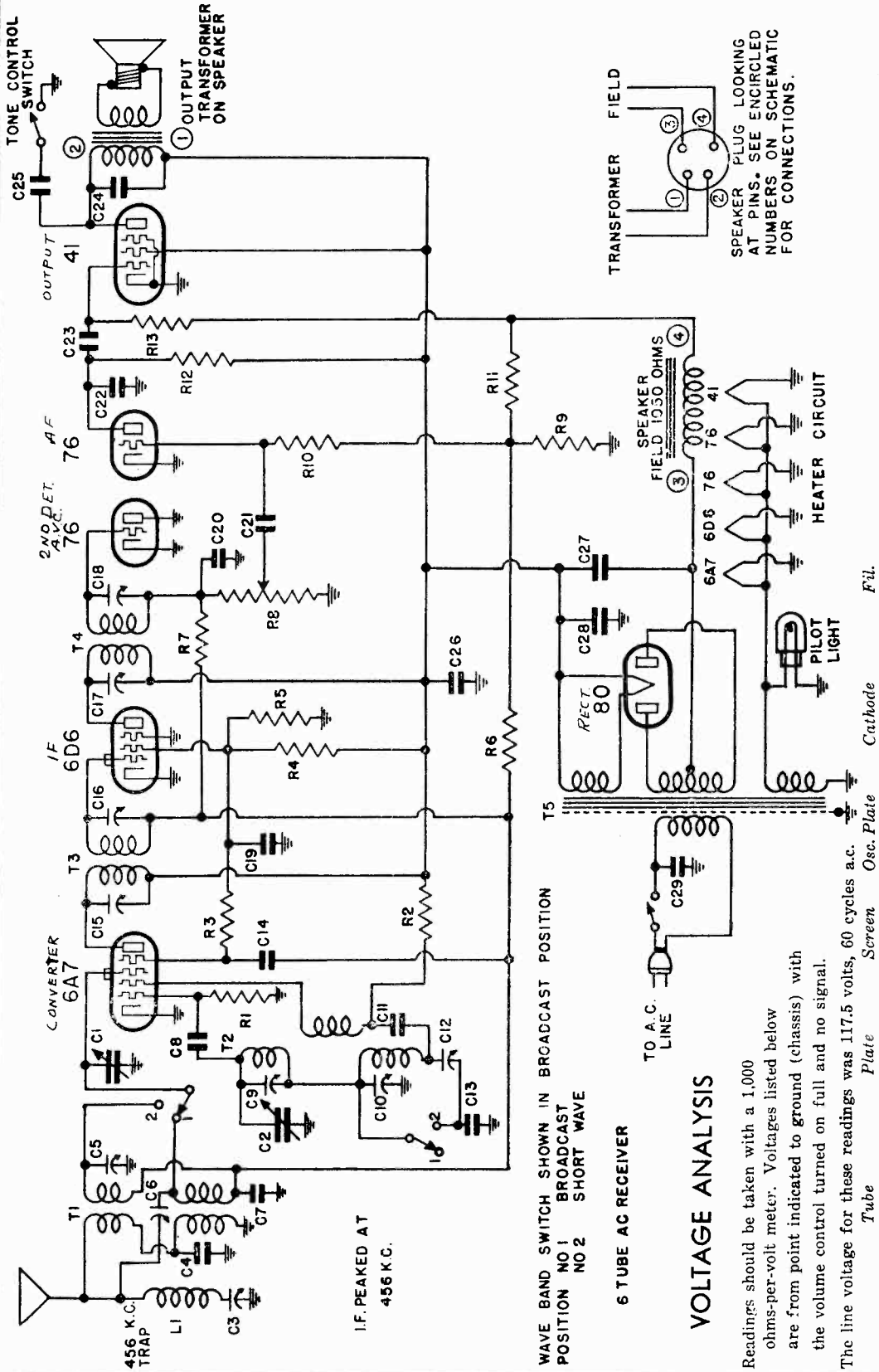
- 1—1A4, r-f amplifier
- 1—1A6, oscillator-modulator
- 1—1B5/255, 2nd detector, a.v.c., a-f amplifier
- 1—30, phase inverter
- 1—1E7G, push-pull pentode output.

*Item number locates the article on the schematic diagram.

EMERSON RADIO & PHONO. CORP.

MODELS Z117, Z122, Z133
Z141, Z150, Z159
Z160 Z135

Chassis Z
Schematic, Voltage



I.F. PEAKED AT
456 K.C.

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

6 TUBE AC RECEIVER

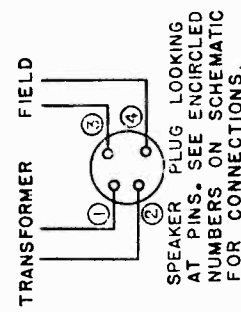
VOLTAGE ANALYSIS

Readings should be taken with a 1,000 ohms-per-volt meter. Voltages listed below are from point indicated to ground (chassis) with the volume control turned on full and no signal.

The line voltage for these readings was 117.5 volts, 60 cycles a.c.

Tube	Plate	Screen	Osc. Plate	Cathode	Fil.
6A7 osc.-mod.	244	62	118	0	6.3 a.c.
6D6 i-f amp.	244	85	—	0	6.3 a.c.
76 detector a.v.c.	0	—	—	0	6.3 a.c.
76 a-f amp.	85	—	—	0	6.3 a.c.
41 output	226	244	—	0	6.3 a.c.

Voltage across speaker field—65.
Voltage at 80 filament to B minus (center-tap of high-voltage winding on power transformer)—325.
The grid bias for all the tubes is developed across the resistors R9 and R11 (see schematic). The total voltage measured across R9 and R11 should be 15 volts, and is the bias for the 41 tube. The voltage measured across R9 should be 5 volts. To check the bias on the 6A7 and 6D6 tubes, measure the values of resistors R6, R7 and R8 (see schematic).



Chassis Model Z
Listed by Underwriters' Laboratories

Voltage rating 105-125 volts, 60 cycle a.c.
Power consumption 55 watts
Frequency ranges 540 to 1730 kc and 5.6 to 18 megacycles

MODELS Z117, Z122, Z133
Z141, Z150, Z159
Z160 Z135 EMERSON RADIO & PHONO. CORP.

Chassis Z
Alignment, Changes, Notes
Parts

Tube Data

The tube complement is as follows:
1—6A7, pentagrid oscillator-modulator.
1—6T6, i-f amplifier.
1—7B, diode detector and a.v.c. (behind second i-f transformer).
1—41, pentode power output.
1—80, full-wave rectifier.

REPLACEMENT PARTS

Item	Part No.	DESCRIPTION	Price
T1	3CT-289A	Two-band antenna coil and 456 kc wave trap	1.80
T2	3CT-290A	Wave-band oscillator coil	1.50
T3	3CT-291A	456 kc second i-f transformer	1.85
T4	2N1-241	456 kc first i-f transformer	4.45
T5	3ZT-345	Power transformer	1.15
T6	3ZB-357	40,000 ohm, 1/2 watt carbon resistor	.16
T7	3ZB-358	40,000 ohm, 1/2 watt carbon resistor	.16
T8	LH-95	10,000 ohm, 1/2 watt carbon resistor	.16
T9	BB-12	25,000 ohm, 1/2 watt carbon resistor	.16
T10	3ZB-359	40,000 ohm, 1/2 watt carbon resistor	.16
T11	3ZB-360	40,000 ohm, 1/2 watt carbon resistor	.16
T12	HR-42	2 megohm, 1/2 watt carbon resistor	1.05
T13	3ZR-288	Volume control with line switch—500,000 ohms	1.05
T14	3ZB-370	90 ohm, 1/2 watt wire-wound resistor	.16
T15	3ZB-371	210 ohm, 1/2 watt wire-wound resistor	.16
T16	3ZR-289	100,000 ohm, 1/2 watt carbon resistor	.16
T17	KB-54	500,000 ohm, 1/2 watt carbon resistor	.16
T18	KB-55	100,000 ohm, 1/2 watt carbon resistor	.16
T19	3ZC-284	Trimmer, part of antenna coil	3.65
T20	AA-C-106A	0.00005 mf mica condenser	.20
T21	OC-5	0.05 mf, 200 volt tubular condenser	.20
T22	OC-6	0.01 mf, 400 volt tubular condenser	.20
T23	OC-7	Single adjustable padding condenser. Range: 300 to 600 mmf	.40
T24	OC-8	0.042 mf mica condenser	.20
T25	3EC-287	Trimmer, part of second i-f transformer	.20
T26	AC-7A	0.00025 mf mica condenser	.20
T27	HC-34	0.005 mf, 600 volt tubular condenser	.20
T28	LC-35	0.02 mf, 400 volt tubular condenser	.20
T29	ZC-115	0.005 mf, 1000 volt tubular condenser	.20
T30	ZC-116	0.015 mf, 1000 volt tubular condenser	.20
T31	ZC-117	0.015 mf, 1000 volt tubular condenser	.20
T32	2N1-246	16 mf, 450 volt wet electrolytic condenser	1.30
T33	2N1-247	16 mf, 405 volt wet electrolytic condenser	1.30
T34	3LC-297A	0.01 mf, 400 volt molded type paper condenser	.30
T35	3ZB-361	Wave-band switch	.60
T36	2N8-122	8" dynamic speaker	6.00
T37	3B8-181	8" dynamic speaker	6.00
T38	3ZB-362	10" dynamic speaker	8.25
T39	XL-9	Pilot light 6.3 volt, .25 amp, Mazda No. 46	.70
T40	3ZB-363	Dial face	.10
T41	3ZB-364	Dial drive shaft and pulley	.10
T42	3ZB-365	Idle pulley	.06
T43	3ZB-366	Idle pulley spring	.10
T44	3ZB-367	Diaphragm shaft pulley	.10
T45	3ZB-368	Diaphragm	1.10
T46	3ZB-369	Euclytheon with crystal	1.05

PRODUCTION CHANGES

Early Model Z-150 receivers differed from the schematic diagram as follows:
a. C27 is a 12 mf, 450 volt dry electrolytic condenser.
b. C28 is a 24 mf, 400 volt dry electrolytic condenser.
c. Filter between 6T6 plus and the plate resistor (R12) of the 7B a-f amplifier.
d. A 5 mf, 160 volt dry electrolytic condenser is connected from the screen-grid of the 6D6 i-f amplifier to ground.

Later Model Z-150 receivers differ from the schematic diagram as follows:
a. C27 is a 12 mf, 450 volt dry electrolytic condenser.
b. C28 is a 24 mf, 400 volt dry electrolytic condenser.
c. A 25 mf, 200 volt condenser is connected from the screen-grid of the 6D6 i-f amplifier to ground.

In receivers bearing serial numbers below 1072-4533, the color coding of this transformer is as follows:
a. The primary—two black leads
b. The secondary—two green leads
c. High voltage secondary—two black leads
d. High voltage secondary—two yellow leads

*Item number locates the article on the schematic diagram.
†See production changes.
‡These trimmer condensers are part of the coil assemblies and can not be supplied separately.

Six-Tube, A.C., Dual-Wave Superheterodyne
MODELS Z117, Z122, Z133, Z135, Z141, Z150, Z159, and Z160
ADJUSTMENTS

An oscillator with frequencies of 456, 600, 1600 and 16,000 kc should be used. An output meter should be used across the voice coil or output transformer for observing maximum response. If the results at all disturbed, both the broadcast and short-wave bands must be realigned. The sets oscillator is higher in frequency than the signal, so images should be observed on the low frequency side of the signal.

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 on the plate up or remove the screw on any trimmer so loose that there is no tension on the screw. Either bend the plate or always use a test signal as possible during alignment.

Location of Coils and Trimmer Adjustments

The two i-f transformers are located on top of the chassis deck. The second i-f is the one directly behind the variable condenser. The four trimmers, two for each transformer, are accessible through holes in the tops of the cans. The adjustable padding condenser for the broadcast band is mounted underneath the chassis (in the corner near the 6A7 tube) with the screw adjustment accessible through a hole in the front of the chassis. The antenna coils for the broadcast and short-wave bands and the 456 kc wave trap are wound on one form and mounted underneath the chassis deck. The antenna trimmer is mounted on the front of the chassis in the short-wave antenna trimmer. The central trimmer is the broadcast antenna trimmer. The trimmer nearest the rear of the chassis is the 456 kc wave trap.

The oscillator coils for the broadcast and short-wave bands are wound on one form and mounted underneath the chassis deck near the variable condenser. The broadcast antenna trimmer is mounted on the top of the chassis in the front of the chassis for the short-wave oscillator coil and the trimmer farthest from the front in for the broadcast oscillator coil.

I-f and Wave-trap Alignment

Rotate the wave-band switch to the broadcast (clockwise) position. Set the variable condenser at the minimum capacity position and tune the 456 kc wave trap to the broadcast signal. The id cap of the 6A7 tube (do not remove the standard dummy antenna (a 0.0002 mica condenser may be substituted) and adjust the wave-trap trimmer (farthest from front on left side of the chassis) for minimum response. (See General Notes.)

Short-Wave Alignment (Alignment of the short-wave band should precede broadcast alignment)

Use a 400 ohm dummy antenna (a 400 ohm non-inductive resistor in series with the test oscillator antenna lead) when aligning the short-wave coils. Rotate the wave-band switch to the short-wave (counter-clockwise) position, and set the dial pointer exactly at 16 megacycles. Feed 16,000 kc to the antenna and adjust the short-wave oscillator trimmer (nearest the front ends of the antenna trimmers) for maximum response. Adjust the broadcast antenna trimmer (farthest from front on left side of the chassis) for maximum response. Be very careful to choose the minimum capacity peak on the oscillator trimmer.

Broadcast Alignment

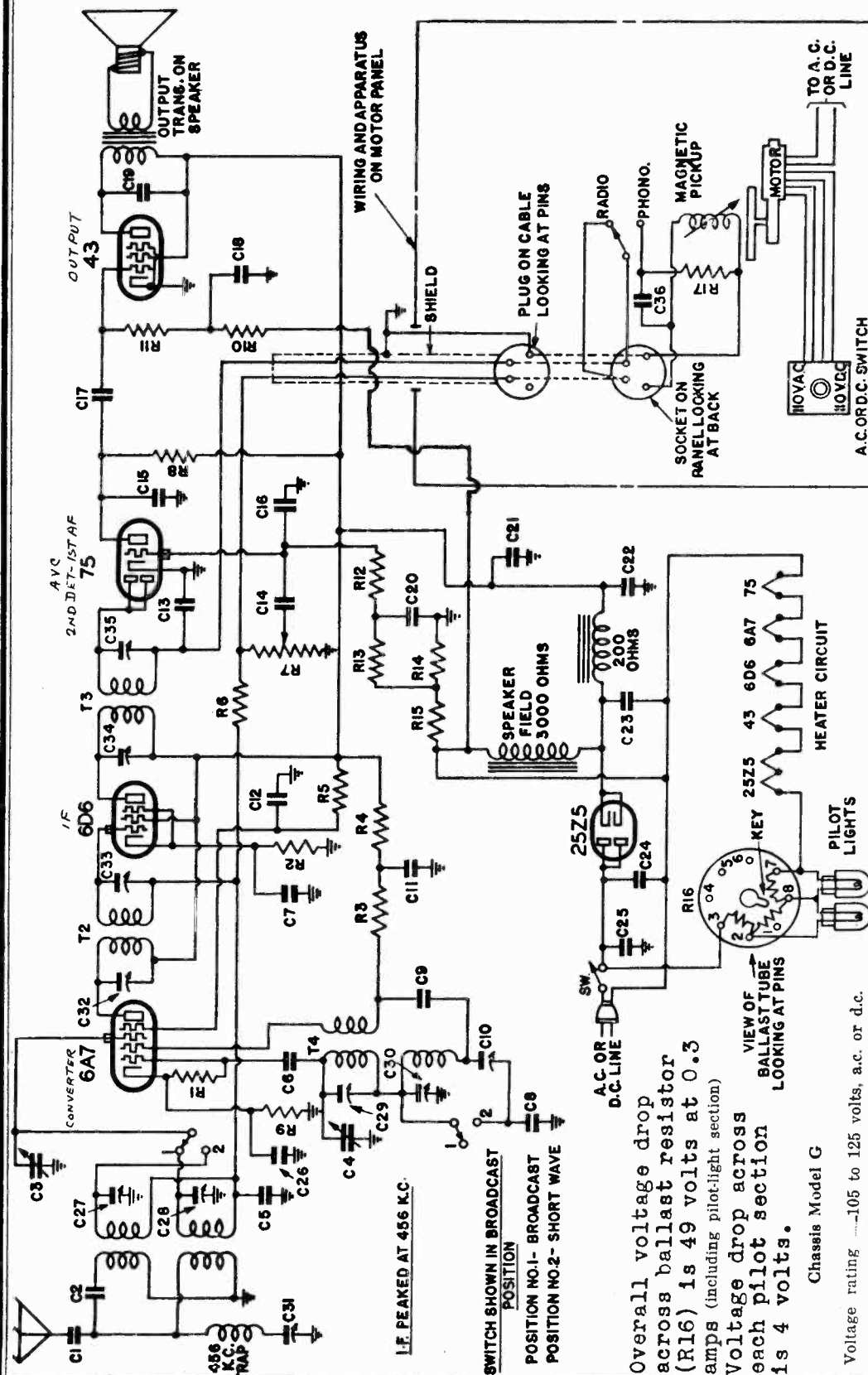
Use a standard dummy antenna in aligning the broadcast coils. (A .0002 condenser may be substituted.) Rotate the wave-band switch to the broadcast (clockwise) position. Set the dial pointer at 60 and feed 600 kc. Adjust the broadcast series padder (in corner near 6A7 tube) for maximum response. Rotate the variable condenser to maximum response and then adjust the broadcast antenna trimmer (central trimmer at left side of chassis). Return pointer to 60, feed 600 kc and readjust the broadcast series padder, rotating the variable condenser (rotate the variable condenser shaft back and forth through a small arc) for maximum response.

GENERAL NOTES

- The wave-trap in the receiver has been adjusted for maximum signal rejection at 456 kc. If, however, persistent interference from the interfering station is at a minimum.
- The receiver should never be turned on with either the speaker plug or the 41 tube out of their sockets, since the rapid rise in rectifier voltage would damage the electrolytic condensers.
- The pilot light may be replaced by slipping the push-on socket off the dial and unscrewing the bulb. It is not necessary to remove either the dial or the chassis from cabinet.
- In replacing chassis in cabinet do not tighten mounting screws so much that chassis will not float freely, and do not cabinet front panel. If these precautions are not observed the receiver may become microphonic.
- The color coding of the 3ZT-345 power transformer leads is as follows: (See production changes for color coding of power transformer previously used.)
Primary—two black leads
Secondary—two green leads
High voltage sec.—two red and yellow leads
High voltage sec.—two yellow leads
- An efficient antenna system is necessary to enable a full realization of the merits of the receiver. The Emerson All-Wave Antenna is especially designed for high efficiency and low noise on all frequency ranges. Complete instructions for the installation of this antenna are supplied with each kit.

EMERSON RADIO & PHONO. CORP.

MODEL G127
Chassis G
Schematic, Voltage



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 117.5 volts, 60 cycles, a.c.

Tube	Plate	Screen	Cathode	Osc. Plate	Fil.
6A7	100.0	42	2.0	60	6.3 a.c.
6D6	100.0	100	2.0	—	6.3 a.c.
75	89.5	0	0	—	6.3 a.c.
43	87.0	100	0	—	25 a.c.

Voltage at 25Z5 cathode—110 volts.

Overall voltage drop across ballast resistor (R16) is 49 volts at 0.3 amps (including pilot-light section)
Voltage drop across each pilot tube section is 4 volts.

Chassis Model G

- Voltage rating ...105 to 125 volts, a.c. or d.c.
- Current drain ...0.42 amperes for receiver and 0.2 amperes for motor.
- Frequency ranges ...540 to 1625 kc, ...5.6 to 18.0 megacycles.

MODEL G127

Chassis G
Alignment, Notes
Changes, Parts

EMERSON RADIO & PHONO. CORP.

Tube Data

The tube complement is as follows:
 1-6A7, pentagrid oscillator/modulator
 1-4D6, first i-f amplifier
 1-6X7, detector, amplifier, automatic volume control
 1-43, neonode power output
 1-25Z5, dual half-wave rectifier
 1-3CR-241, ballast tube (R-16 on schematic).

REPLACEMENT PARTS

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

Part No.	DESCRIPTION	PRICE
3CT-289	Two-band antenna coil	\$2.40
3CT-274	456 kc first i-f transformer	1.60
3CT-276	456 kc second i-f transformer	1.50
3CT-277	Two-band oscillator coil	1.35
3CT-297	Two-band antenna coil	.90
KR-53	50,000 ohm 1/4 watt carbon resistor	.16
AAR-119	300 ohm 1/4 watt wire-wound resistor	.18
KR-56	10,000 ohm 1/4 watt carbon resistor	.16
KR-58	300 ohm 1/4 watt wire-wound resistor	.18
KR-57	1 megohm 1/4 watt carbon resistor	.16
2NR-214C	Volume control with line switch—250,000 ohms	1.20
KR-55	250,000 ohm 1/4 watt carbon resistor	.18
KR-54	500,000 ohm 1/4 watt carbon resistor	.18
3CR-242	20 ohm 1/2 watt wire-wound resistor	.18
3CR-241	20 ohm 1 watt metallized resistor	.16
KR-54	100,000 ohm 1/4 watt carbon resistor	.16
KR-54	100,000 ohm 1/4 watt carbon resistor	.16
AAC-114	0.00005 mica condenser (part of 3CT-289 antenna coil assembly)	.20
3CC-276	Low-gain variable condenser	3.95
3CC-277	Low-gain variable condenser	3.95
AAC-106A	0.00005 mica condenser	.20
AC-6	0.1 mf, 200 volt tubular condenser	.20
3EC-267	0.0042 mf mica condenser	.20
CCC-127	0.01 mf, 200 volt tubular condenser	.20
ZNC-231	Single adjustable padding condenser, range: 300 to 600 mmf	1.50
AC-7A	0.00022 mf mica condenser	.20
AC-7A	0.00022 mf mica condenser	.20
LC-56	0.02 mf, 400 volt tubular condenser	.20
TYC-177	0.01 mf, 600 volt tubular condenser	.20
3CC-287	0.01 mf, 600 volt electrolytic condenser	.20
3CC-287A	0.01 mf, 400 volt electrolytic condenser	.20
EEC-132	0.1 mf, 400 volt tubular condenser	.20
TTS-111J	Trimmer part of 3CT-289 antenna coil assembly. (Trimmers can not be supplied separately.)	.60
3CS-171	Trimmer part of 3CT-274 first i-f transformer. (Trimmers can not be supplied separately.)	.60
3CZ-356	Trimmer part of 3CT-275 second i-f transformer. (Trimmers can not be supplied separately.)	.60
3CZ-386A	Wave-hand switch	5.25
3CZ-387	6 1/2" dynamic speaker	7.75
3CZ-390	Dial light, 6.3 volt, 25 amp. Mazda No. 46	.10
3CZ-341	Dial drive belt	.10
3PZ-353	Dial drive shaft and pulley	.10
3CZ-341	Dial pulley	.10
3CZ-341	Dial pulley spring	.10
3CZ-341	Condenser shaft, pulley	.10
3CZ-341	Dial pointer	.10
3CZ-341	Penacohor with crystal	1.05
3CZ-341	Magnetic pickup (high impedance type)	19.60
3CZ-429A	Magnetic pickup (high impedance type) with pickup rest, part no. 3CZ-442	14.96
3CZ-502	Phono-radio switch	.60
3CZ-502	Phono-radio switch	.60
3GPM-1	Ac-dc. phonograph motor complete with accessories	45.00

*When number locates the article on the schematic diagram.

PRODUCTION CHANGES

- Early receivers differed from the schematic diagram as follows:
- A 50,000 ohm resistor, bypassed with a 0.1 mf, 200 volt condenser, was used in the plate circuit of the 75 tube as an R-C filter.
 - The rotor of C38 was returned to ground instead of the coil, as shown on the schematic.
 - R11 and R12 were 250,000 ohm carbon resistors.
 - The resistor in the grid circuit of the 6A7 tube was 150 ohm, 1/2 watt wire-wound resistor, and C7 was 0.15 mf, 200 volt condenser.
 - C1 was an 0.01 mf, 200 volt condenser.

Combination Phonograph and
A.C.-D.C. Dual-Wave Superheterodyne
SIX TUBES, INCLUDING BALLAST TUBE

Model G-127
RECEIVER ADJUSTMENTS

An oscillator with frequencies of 466, 600, 1426 and 15,000 kc should be used.
 In addition an output meter should be used across the voice coil or output transformer for observing maximum response.

Location of Coils and Trimmer Adjustments

The broadcast antenna coil, the short-wave antenna coil and the 456 kc wave trap are one assembly mounted underneath the chassis deck to the right of the variable condenser. The trimmers for these coils are accessible through the chassis wall. The 6A7 tube is located in the rear chassis wall. The trimmer for the 6A7 tube is accessible through two holes in the rear chassis wall. The broadcast antenna coil and the trimmer farthest from the chassis front is for the 456 kc wave trap.
 The broadcast oscillator and short-wave coils are wound on one tubing and mounted on the inside of the rear chassis wall. The trimmers for these coils are accessible through two holes in the rear chassis wall. The broadcast antenna coil and the trimmer farthest from the chassis front is for the 456 kc wave trap.
 The two i-f transformers are in oblong coil cans located on the top of the chassis. The first i-f transformer is the one behind the variable condenser. The trimmers for these transformers are accessible through holes in the tops of the cans.
 The broadcast series padding condenser is located on the rear wall of the chassis below the 6A7 tube.

I-f Transformer and Wave-Trap Adjustment

Turn the switch clockwise to the broadcast position and rotate the variable condenser to the minimum capacity position. Feed 456 kc to the grid cap of the 6A7 tube and adjust the trimmer (central screw beside variable condenser) for maximum response. Return pointer to 60, feed 600 kc and readjust the series padding condenser for minimum response.

Short-Wave Alignment

Use a dummy antenna (400 ohm resistor) when aligning the short-wave coils.
 Rotate the wave-hand switch to the broadcast position, clockwise, and set the dial pointer to 15 megacycles.
 Feed the wave-hand switch the dummy antenna and adjust the short-wave oscillator trimmer (left-hand screw on rear chassis wall) for maximum response and then adjust the short-wave antenna trimmer (front screw beside variable condenser) for maximum response. The variable condenser should be rotated while adjusting the antenna trimmer. (Rotate variable condenser rotor shaft back and forth through a small arc.)

Broadcast Alignment

Rotate the wave-hand switch to the broadcast position, clockwise, and set the dial pointer at 60. Feed 600 kc through a standard dummy antenna (a .0022 mf condenser may be used as a standard dummy antenna).
 Adjust the broadcast antenna trimmer (right-hand screw on rear chassis wall) for maximum response and then adjust the broadcast antenna trimmer (central screw beside variable condenser) for maximum response. Return pointer to 60, feed 600 kc and readjust the series padding condenser rotating the variable condenser for maximum response.

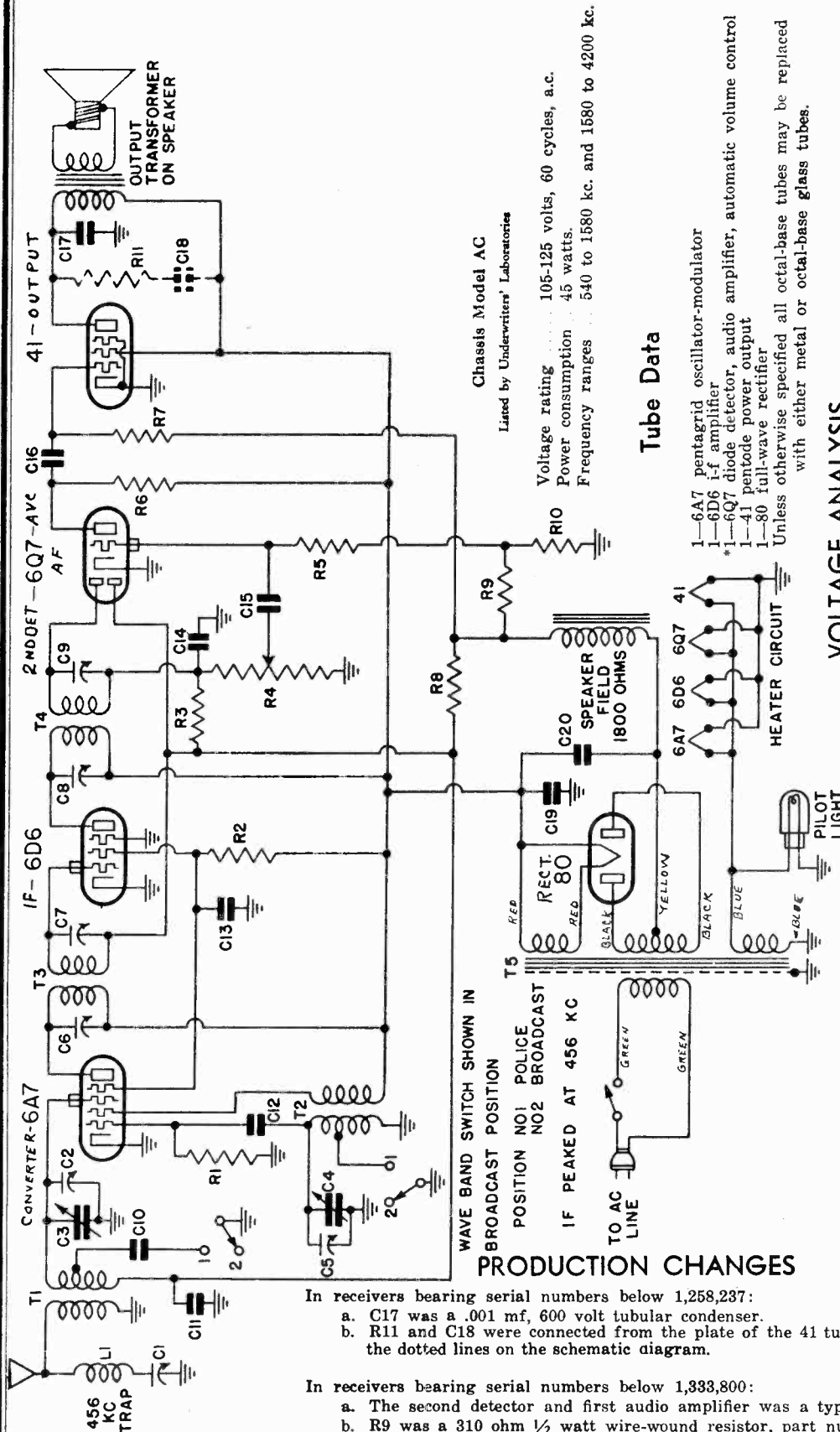
GENERAL INSTRUCTIONS

The set's oscillator is higher in frequency than the signal, 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.
 Always use as weak a test signal as possible during alignment.
 Never leave a 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.

GENERAL NOTES

- If replacements are made or the wiring disturbed in the r-f portion of the circuit, the receiver should be carefully realigned.
- One side of the power line is directly grounded to the chassis base. Under no circumstances, therefore, should a ground wire be permitted to come in contact with any metal part of the receiver.
- The filament dropping resistor (R16 on schematic) is in a special metal tube at the rear of the chassis. This tube will become quite hot under normal operating conditions. For voltage drop specifications, see below.
- When operating the receiver on a.c. it may be necessary to reverse the line plug to obtain the correct polarity.
- The two i-f transformers are held to the chassis by snap-on fasteners. To remove an i-f, unsolder all the leads under the chassis, punch together the prongs of the snap-on fastener and lift the i-f can from the chassis.
- The color coding of the i-f transformer leads is as follows:
 Plate—blue
 Grid return—black
 B plus—red
- The phonograph motor has been adjusted at the factory to turn at a speed of 78 r.p.m. The speed may be checked by work when the neon bulb is lighted from a 60 cycle a.c. supply).
- An ac-dc. switch is provided to switch the motor for a.c. or d.c. power supply. It is important that this switch be in the proper position for the power supply available.

EMERSON RADIO & PHONO. CORP. MODELS AC130, AC149, AC168
 Chassis AC
 Schematic, Voltage, Changes



Chassis Model AC
 Listed by Underwriters' Laboratories

Voltage rating 105-125 volts, 60 cycles, a.c.
 Power consumption 45 watts.
 Frequency ranges 540 to 1580 kc. and 1580 to 4200 kc.

Tube Data

- 1-6A7 pentagrid oscillator-modulator
 - 1-6D6 i-f amplifier
 - *1-6Q7 diode detector, audio amplifier, automatic volume control
 - 1-41 pentode power output
 - 1-80 full-wave rectifier
- Unless otherwise specified all octal-base tubes may be replaced with either metal or octal-base glass tubes.

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 117.5 volts, 60 cycles, a.c.

Tube	Plate	Screen	Cathode	Osc. Plate	Fil.
6A7	182	70	0	182	6.3
6D6	182	70	0	—	6.3
6Q7	87	182	0	—	6.3
41	165	—	0	—	6.3

Voltage across speaker field—70.
 Voltage from B minus to chassis—80.
 B plus at 80 tube filament—262.

*See production changes on next page.

PRODUCTION CHANGES

- In receivers bearing serial numbers below 1,258,237:
- a. C17 was a .001 mf, 600 volt tubular condenser.
 - b. R11 and C18 were connected from the plate of the 41 tube to B plus as shown by the dotted lines on the schematic diagram.
- In receivers bearing serial numbers below 1,333,800:
- a. The second detector and first audio amplifier was a type 75.
 - b. R9 was a 310 ohm 1/2 watt wire-wound resistor, part number 3RR-276.
 - c. R10 was a 23 ohm 1/2 watt wire-wound resistor, part number 3RR-266.

5 TUBE AC RECEIVER
 MODELS AC-130,
 AC-149,
 AC-168

MODELS AC130, AC149, AC168

Chassis AC

EMERSON RADIO & PHONO. CORP.

Alignment, Notes, Parts

GENERAL NOTES

- The wave-trap in the receiver has been adjusted for maximum signal rejection at 456 kc. If, however, persistent interference is experienced from some particular telegraphic station, readjust the wave-trap trimmer until the response from the interfering station is at a minimum.
- The receiver should never be turned on with the 41 tube out of its socket since the rapid rise in rectifier voltage would damage the electrolytic condensers.
- The two i-f transformers are held to the chassis by snap-on fasteners. To remove an i-f, unsolder all the leads under the chassis, pinch together the prongs of the snap-on fastener and lift the i-f can from the chassis.
- The color coding of the leads of the i-f transformers, is as follows:
 Grid—green Plate—blue
 Grid return—black B plus—red
- The color coding of the power transformer leads is as follows:
 Primary—two green leads 6.3 v. sec.—two heavy blue leads
 High voltage sec.—two black leads 5 v. sec.—two heavy red leads
 High voltage sec. center tap—yellow
- With a few exceptions, the color coding of the general wiring is as follows:
 Plate—blue A.v.c. and cathode—white or yellow
 B plus—red Grid—green
 Screen—brown Filament and ground—black
- An efficient antenna system is necessary to enable a full realization of the merits of the receiver. For reduction of noise and achievement of high efficiency on all frequency ranges the Emerson All-Wave High-Fidelity Antenna, Model W-78, and the Emerson All-Wave Antenna System, Model W-89, are recommended. Instructions for the installation of these antennas are supplied with each kit.
 In congested areas where the installation of a large antenna is not desirable we recommend the use of the Emerson Flexible Mast Antenna, Model W-82. Instructions for the installation of this compact and efficient antenna are supplied with each kit.

ADJUSTMENTS

An oscillator with frequencies of 456 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.

Location of Coils and Trimmer Adjustments

The two i-f transformers are located on top of the chassis deck. The first i-f transformer is the one directly behind the variable condenser. The trimmers for the two i-f transformers are available through holes in the tops of the cans.

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

The 456 kc wave-trap is mounted on the front chassis wall beneath the variable condenser. The trimmer for the 456 kc wave-trap is mounted on the coil and is accessible from the bottom of the chassis.

I-f and Wave-Trap Alignment

Rotate the wave-band switch to the broadcast (clockwise) position. Set the variable condenser at the minimum capacity position and feed 456 kc, through a 0.02 mf paper condenser, to the grid cap of the 6A7 tube (do not remove the grid clip from the tube). Adjust the four i-f trimmers for maximum response. Feed 456 kc to the antenna through a standard dummy antenna (a .0002 mf condenser may be used as a substitute) and adjust the wave-trap trimmer for minimum response. (See General Notes.)

R-f Alignment

With the wave-band switch in the broadcast position, clockwise, set the dial pointer at 140. Feed 1400 kc through a standard dummy antenna (a .0002 mf condenser may be used as a substitute) to the antenna lead and adjust first the oscillator trimmer (on rear section of variable condenser) then the antenna trimmer (on front section of variable condenser) for maximum response. The police band is self-tracking and does not require any adjustment.

REPLACEMENT PARTS LIST

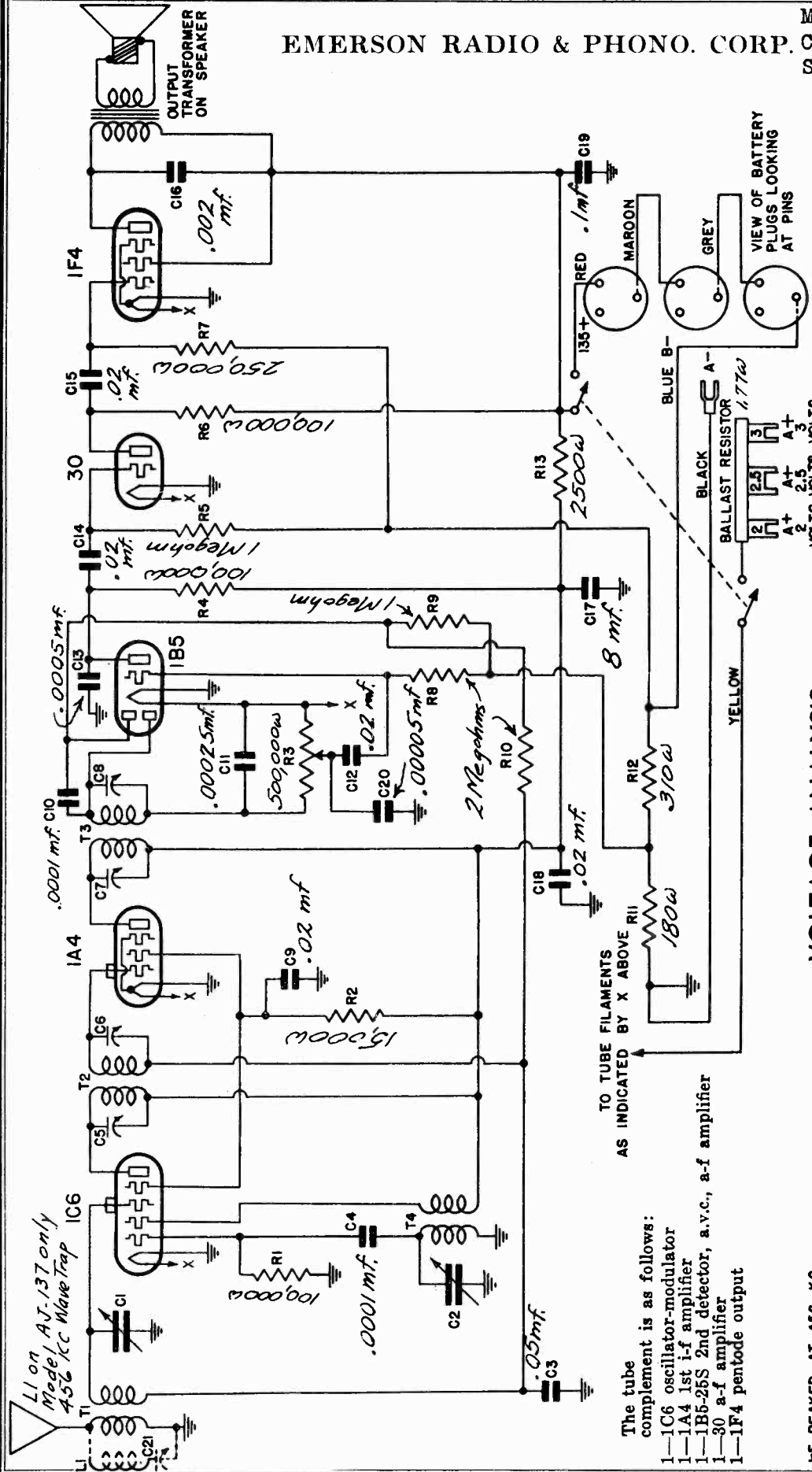
*Item	Part No.	DESCRIPTION	PRICE
L1	MMT-149A	456 kc wave-trap	.60
T1	8RT-324	Two-band antenna coil	.85
T2	8RT-319A	Two-band oscillator coil	.80
T3	8RT-320B	456 kc first i-f transformer	1.10
T4	8RT-321B	456 kc second i-f transformer	1.10
T5	8RT-322A	Power transformer	3.80
R1	KR-53U	50,000 ohm 1/4 watt carbon resistor	.16
R2	3LR-265U	40,000 ohm 1/2 watt carbon resistor	.16
R3	HR-42U	2 megohm 1/4 watt carbon resistor	.16
R4	3FR-265B	Volume control with switch—250,000 ohms	1.00
R5	3RR-274U	5 megohm 1/4 watt carbon resistor	.16
R6	KR-56	250,000 ohm 1/4 watt carbon resistor	.16
R7	KR-56U	500,000 ohm 1/4 watt carbon resistor	.16
R8	3RR-275U	10 megohm 1/4 watt carbon resistor	.16
R9	4CR-321	290 ohm 1/2 watt wire-wound resistor	.16
R10	4CR-320	36 ohm 1/2 watt wire-wound resistor	.16
R11	LR-65U	10,000 ohm 1/4 watt carbon resistor	.16
+C1		Trimmer, part of 456 kc wave-trap assembly.	
+C2, C5		Trimmer, part of variable condenser.	
+C3, C4	4CC-350A	Two-gang variable condenser	2.60
+C6, C7		Trimmer, part of first i-f transformer.	
+C8, C9		Trimmer, part of second i-f transformer.	
C10	AAC-114	0.001 mf mica condenser	.20
C11, C18			
C18	BC-12	0.05 mf, 200 volt tubular condenser	.20
C12	AAC-106A	0.00005 mf mica condenser	.20
C14	IC-47A	0.0005 mf mica condenser	.20
C15, C17	HC-34	0.006 mf, 600 volt tubular condenser	.20
C16	KC-58	0.01 mf, 400 volt tubular condenser	.20
C19, C20	3RC-318A	Dual 5 mf, 300 volt dry electrolytic condenser	1.00
	3RS-231	Wave-band switch	.85
	4CS-269	5 1/2" dynamic speaker	4.75
	XL-9	Pilot light, 6.3 volt, .25 amp., Mazda No. 46	.20
	4LZ-582	Dial face	.70
	8CZ-386	Drive belt for dial assembly	.10
	8CZ-337B	Drive shaft and pulley for dial assembly	.10
	8CZ-389	Idler pulley for dial assembly	.05
	8CZ-340	Idler spring for dial assembly	.05
	8CZ-341	Condenser shaft pulley	.10
	4MZ-588	Dial pointer	.25
	3FZ-351	Escutcheon with crystal (for Models AC-130 and AC-168)	1.05
	3FZ-398A	Dial crystal (for Model AC-149)	.50
	3FZ-399	Clip for dial crystal (for Model AC-149)	.01

NOTE: The Model AC-149 should be aligned with the chassis bottom plate in place.

†These trimmers are part of coil assemblies and can not be supplied separately.
 ‡These trimmers are part of variable condenser and can not be supplied separately.

When ordering replacement parts specify part numbers.
 *Item number locates the article on the schematic diagram.

EMERSON RADIO & PHONO. CORP. Models AJ130, AJ137, AJ149
Schematic, Voltage



The tube complement is as follows:
 1-1C6 oscillator-modulator
 1-1A4 1st i-f amplifier
 1-1B5-25S 2nd detector, a.v.c., a-f amplifier
 1-30 a-f amplifier
 1-1F4 pentode output

IF PEAKED AT 456 KC.

VOLTAGE ANALYSIS

Readings should be taken with a 1,000 ohms-per-volt meter. The voltages listed below are from point indicated. A minus with volume control turned on full and no signal. The battery voltages for these readings were as follows: "A" battery 3 volts, "B" battery 135 volts.

Tube	Plate	Screen	Osc. Plate	Fil.
1C6	105	105	57	2.0
1A4	105	57	—	2.0
1B5-25S	75	—	—	2.0
30	90	—	—	2.0
1F4	127	135	—	2.0

5 TUBE BATTERY RECEIVER

MODELS AJ130, AJ137, AJ149

Chassis AJ

Alignment, Notes

EMERSON RADIO & PHONO. CORP.

MODELS AJ-130, AJ-137, and AJ-149

CHASSIS MODEL AJ

Current drain "A" battery—42 amps.
 "B" battery—.016 amps. with no signal
 Frequency range 540 to 1730 kc.

GENERAL NOTES

1. The battery complement should be as follows:

Portable (Small Batteries)

Type	No. Req.	Eveready Part No.	Burgess Part No.	Ray-o-vac Part No.
1½ volt "A"	2	7111	4FA	6 Railroad
45 volt "B"	3	762 (plug-in type)	5308 (plug-in type)	5303 (plug-in type)

Home (Heavy Duty Batteries)

3 volt "A"	1	X-125	20F2	P9403
45 volt "B"	3	385 (plug-in type)	22308 (plug-in type)	P9303 (plug-in type)

The batteries indicated above for portable use are chosen for size so that the entire complement can be housed by the portable cabinet. In general, it will be found that the "B" batteries will last somewhat longer than the "A" batteries.

- The receiver is designed for an "A" supply of 2 to 3 volts. If a 2 volt storage battery is used, its positive terminal should be connected to the terminal marked "2" on the metal clad ballast resistor. If a 2½ volt air-cell battery is used, it should be connected to the terminal marked "2.5". A 3 volt supply should be connected to the terminal marked "3".
- The i-f transformers are of the snap-on type. To remove, unsolder all leads under the chassis, pinch together the prongs of the snap-on fastener and lift out.
- The color coding of the i-f transformer leads is as follows:
 Grid—green
 Grid return—black
 Plate—blue
 B plus—red
- An efficient antenna system is necessary to enable a full realization of the merits of the receiver. For reduction of noise and achievement of high efficiency on all frequency ranges the Emerson All-Wave High-Fidelity Antenna, Model W-78, and the Emerson All-Wave Antenna System, Model W-89, are recommended. Instructions for the installation of these antennas are supplied with each kit.

ADJUSTMENTS

An oscillator with frequencies of 456 and 1600 kc should be used.

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

If the circuit is at all disturbed, the receivers must be realigned.

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

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

Never leave a 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.

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

Location of Coils and Trimmer Adjustments

The two i-f transformers are located on top of the chassis deck. The first i-f is the one directly behind the variable condenser. The four trimmers, two for each transformer, are accessible through holes in the tops of the cans.

The antenna and oscillator trimmers are located on the right hand side of the variable condenser. The rear trimmer is the oscillator trimmer.

On portable model AJ-137, the 456 kc wave-trap is located below the chassis deck, directly underneath the variable condenser. Its trimmer is accessible through a hole in the bottom plate.

Alignment Procedure

- Rotate the variable condenser to the minimum capacity position.
- Feed 456 kc to the grid cap of the 1C6 tube.
- Adjust the four i-f trimmers, repeating for maximum response.
- If the receiver is portable model AJ-137, feed 456 kc to the antenna through a standard dummy antenna (a .0002 mf mica condenser may be substituted) and adjust the wave-trap trimmer for minimum response.
- Set dial pointer to 1600 and feed 1600 kc to the antenna lead through a standard broadcast dummy antenna (a .0002 mf mica condenser may be used as a substitute).
- Adjust the oscillator trimmer (on rear section of variable condenser) for maximum response.
- Adjust the r-f trimmer (on front section of variable condenser) for maximum response.

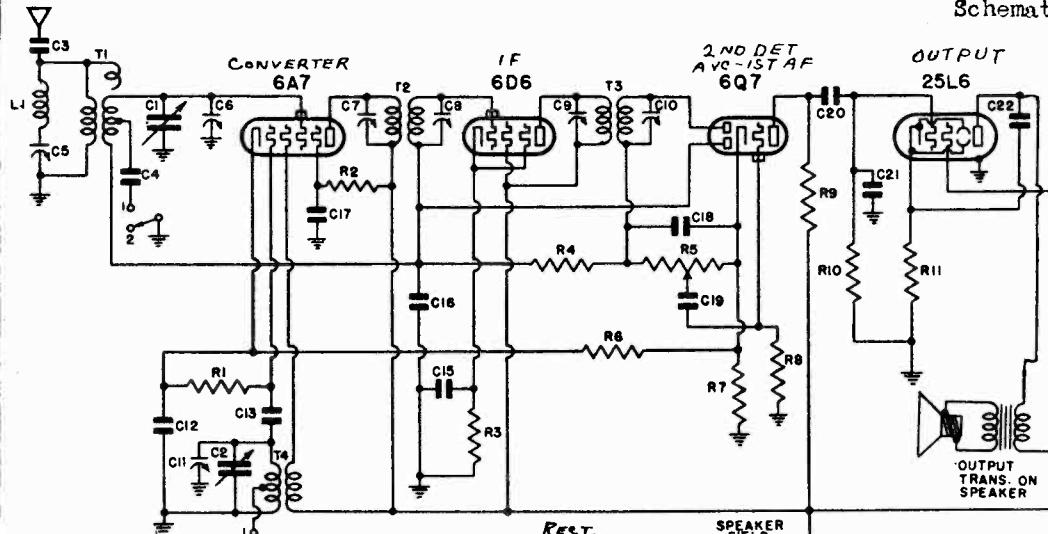
MODELS AL130,AL132
AL149,AL168

EMERSON RADIO & PHONO. CORP.

MODELS ALLW130,ALLW132,
ALLW149,ALLW168

Chassis AL

Chassis ALLW
Schematics, Voltage



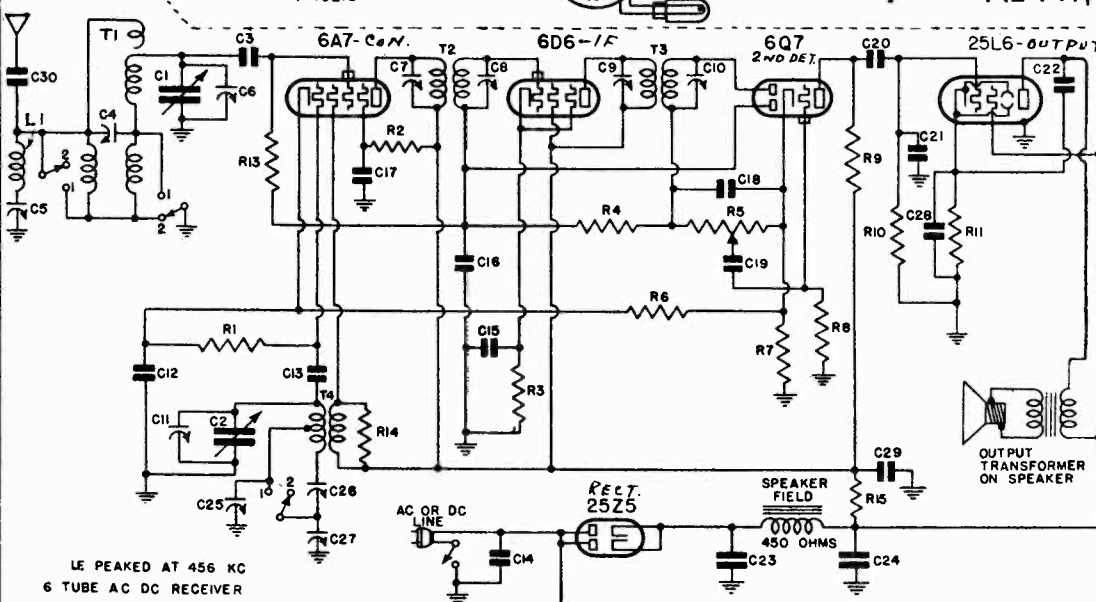
SWITCH SHOWN IN BROADCAST POSITION
NO 1 POLICE
NO 2 BROADCAST
LF PEAKED AT 456 KC
6 TUBE AC DC RECEIVER
CHASSIS MODEL AL

VIEW LOOKING AT PINS OF BALLAST TUBE R12, WHICH HAS AN OVERALL VOLTAGE DROP OF 49V. AT 3 AMP. VOLTAGE DROP ACROSS PILOT LIGHT IS 4 VOLTS

Tube Data

- The tube complement is as follows:
- 1-6A7 pentagrid oscillator-modulator.
 - 1-6D6 first i-f amplifier.
 - 1-6Q7 diode detector, a-f amplifier, a.v.c.
 - 1-25L6 beam power output.
 - 1-25Z5 dual half-wave rectifier.
 - 1-2UR-224 ballast tube (R12 on schematic).
- NOTE: Metal tubes may be replaced with equivalent octal-base glass tubes.

MODELS AL-130, AL-132,
AL-149, AL-168



LF PEAKED AT 456 KC
6 TUBE AC DC RECEIVER
CHASSIS MODEL ALLW

VIEW LOOKING AT PINS OF BALLAST TUBE R12, WHICH HAS AN OVERALL VOLTAGE DROP OF 49V. AT 3 AMP. VOLTAGE DROP ACROSS PILOT LIGHT IS 4 VOLTS

Chassis Model AL

Chassis Model ALLW

- and
- Voltage rating 105 to 125 volts, a.c. or d.c.
 - Power consumption 43 watts.
 - Frequency ranges Model AL: 540 to 1580 kc and 1580 to 4200 kc. Model ALLW: 135 to 360 kc and 580 to 1660 kc.

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 117.5 volts, 60 cycles, a.c.

Tube	Plate	Screen	Cathode	Osc. Plate	Fil.
6A7	100	50	2.3	100	6.3
6D6	100	100	3.5	—	6.3
6Q7	43	0	1.2	—	6.3
25L6	92	100	6.5	—	25.0

- Voltage at 25Z5 cathode—130 volts.
- Voltage across speaker field—28 volts.
- Voltage drop across ballast tube (pins Nos. 3, 7)—49 volts.
- Voltage drop across pilot light section (pins Nos. 8 and 7)—4 volts.

MODELS ALLW-130, ALLW-132,
ALLW-149, ALLW-168

MODELS AL130,AL132
AL149,AL168

EMERSON RADIO & PHONO. CORP.

MODELS ALLW130,ALLW132
ALLW149,ALLW168

Chassis AL

Alignment,Parts,Notes

(on rear section of gang) for maximum response. Return pointer to 60, feed 600 kc and readjust padding condenser while rocking variable condenser.

Long-Wave Alignment for Model ALLW

1. If replacements are made or the wiring disturbed in the r-f portion of the circuit, the receiver should be carefully realigned of the power line is directly connected to the chassis base. Under no circumstances, therefore, should a ground wire be permitted to come in contact with any metal part of the receiver.
2. The filament dropping resistor (R12 on schematic) is in a special metal tube at the rear of the chassis. This tube will become quite hot under normal operating conditions. For voltage drop specifications, see the correct polarity.
3. The wave-band switch is mounted on the chassis by snap-on fasteners. To remove an i-f, unsolder all the leads under the chassis, pinch together the prongs of the snap-on fastener and lift the i-f can from the chassis.
4. The color coding of the i-f transformer leads is as follows:
Grid-green
Grid-blue
B plus-blue
5. The receiver is shipped with an attached antenna wire. In some locations near powerful local stations the addition of a very large antenna may be detrimental to reception, because of the resulting interference. The Emerson Flexible Mast Antenna, Model W-32, has been especially designed for Emerson receivers, featuring compact construction and portability while at the same time providing the maximum possible length of antenna wire.
6. The Emerson Flexible Mast is installed permanently. It is urgently recommended that the receiver antenna wire be cut. Leave just enough of this wire to reach from the receiver to the window strip connector. Instructions for the installation of this compact and efficient outside antenna are supplied with each kit.
7. The wave-band switch is mounted on the chassis by snap-on fasteners. To remove an i-f, unsolder all the leads under the chassis, pinch together the prongs of the snap-on fastener and lift the i-f can from the chassis.
8. The wave-band switch is mounted on the chassis by snap-on fasteners. To remove an i-f, unsolder all the leads under the chassis, pinch together the prongs of the snap-on fastener and lift the i-f can from the chassis.

ADJUSTMENTS

An oscillator with frequencies of 172, 345, 456, 600 and 1400 kc should be used. If the output meter should be used across the voice coil or output transformer for observing maximum response. If the circuit is at all disturbed, both the broadcast and long-wave bands must be realigned. When the set's oscillator is higher in frequency than the signal, so images should be observed on the low frequency side of the signal. The last motion in adjusting trimmers should always be a tightening one, not a loosening one. Never leave a 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. Always use a clean, sharp screwdriver. Always use a clean, sharp screwdriver. Always use a clean, sharp screwdriver. Always use a clean, sharp screwdriver.

CHASSIS MODEL AL

Location of Coil and Trimmer Adjustments on the Model AL
The two i-f transformers are in oblong coil cans located on top of the chassis deck. The first i-f transformer is the one behind the variable condenser. The trimmers for these transformers are accessible through holes in the tops of the cans. The 456 kc wave-trap is mounted on the right side of the front chassis wall. Its trimmer is accessible through a hole in the bottom plate. The antenna coils for the broadcast and police bands are wound on one form and are mounted on the rear wall of the chassis deck near the variable condenser. The trimmer for the broadcast antenna and oscillator coils are located on the front sections of the antenna coil. Turn the switch clockwise to the broadcast position and rotate the variable condenser to the minimum capacity position. Feed 456 kc to the grid cap of the 6AT tube and adjust the four trimmers for maximum response. Feed 400 kc to the antenna and adjust the wave-trap trimmer for minimum response.

CHASSIS MODEL ALLW

Location of Coils and Trimmer Adjustments on the Model ALLW
The two i-f transformers are in oblong coil cans located on top of the chassis deck. The first i-f transformer is the one behind the variable condenser. The trimmers for these transformers are accessible through holes in the tops of the cans. The 456 kc wave-trap is mounted on the right side of the front chassis wall. Its trimmer is accessible through a hole in the bottom plate. The antenna coils for the broadcast and police bands are wound on one form and are mounted on the rear wall of the chassis deck near the variable condenser. The trimmer for the broadcast antenna and oscillator coils are located on the front sections of the antenna coil. Turn the switch clockwise to the broadcast position and rotate the variable condenser to the minimum capacity position. Feed 456 kc to the grid cap of the 6AT tube and adjust the four trimmers for maximum response. Feed 400 kc to the antenna and adjust the wave-trap trimmer for minimum response.

CHASSIS MODEL ALLW

Location of Coils and Trimmer Adjustments on the Model ALLW
The two i-f transformers are in oblong coil cans located on top of the chassis deck. The first i-f transformer is the one behind the variable condenser. The trimmers for these transformers are accessible through holes in the tops of the cans. The 456 kc wave-trap is mounted on the right side of the front chassis wall. Its trimmer is accessible through a hole in the bottom plate. The antenna coils for the broadcast and police bands are wound on one form and are mounted on the rear wall of the chassis deck near the variable condenser. The trimmer for the broadcast antenna and oscillator coils are located on the front sections of the antenna coil. Turn the switch clockwise to the broadcast position and rotate the variable condenser to the minimum capacity position. Feed 456 kc to the grid cap of the 6AT tube and adjust the four trimmers for maximum response. Feed 400 kc to the antenna and adjust the wave-trap trimmer for minimum response.

CHASSIS MODEL ALLW

Location of Coils and Trimmer Adjustments on the Model ALLW
The two i-f transformers are in oblong coil cans located on top of the chassis deck. The first i-f transformer is the one behind the variable condenser. The trimmers for these transformers are accessible through holes in the tops of the cans. The 456 kc wave-trap is mounted on the right side of the front chassis wall. Its trimmer is accessible through a hole in the bottom plate. The antenna coils for the broadcast and police bands are wound on one form and are mounted on the rear wall of the chassis deck near the variable condenser. The trimmer for the broadcast antenna and oscillator coils are located on the front sections of the antenna coil. Turn the switch clockwise to the broadcast position and rotate the variable condenser to the minimum capacity position. Feed 456 kc to the grid cap of the 6AT tube and adjust the four trimmers for maximum response. Feed 400 kc to the antenna and adjust the wave-trap trimmer for minimum response.

REPLACEMENT PARTS LIST

Part No.	DESCRIPTION	PRICE
3RT-384	Two-band antenna coil	.85
3RT-385	Two-band antenna coil	.85
3RT-386	456 kc second i-f transformer	1.10
3RT-387	Two-band oscillator coil	.80
3RT-388	Two-band oscillator coil	.80
4DT-346	456 kc wave trap	.80
456 kc wave trap	part of antenna coil assembly	
60,000 ohm 1/2 watt carbon resistor		.16
30,000 ohm 1/2 watt carbon resistor		.16
410 ohm 1/2 watt wire wound resistor		.16
100,000 ohm 1/2 watt carbon resistor		.16
Volume control with line switch—600,000 ohms		1.05
240 ohm 1/2 watt wire-wound resistor		.16
250,000 ohm 1/2 watt carbon resistor		.16
500,000 ohm 1/2 watt carbon resistor		.16
100,000 ohm 1/2 watt carbon resistor		.16
Plug-in type ballast resistor		.80
1 megohm 1/2 watt carbon resistor		.16
10,000 ohm 1/2 watt carbon resistor		.16
100,000 ohm 1/2 watt carbon resistor		.16
Two-gang variable condenser		2.60
100,000 ohm 1/2 watt carbon resistor		2.60
0.0025 mf 600 volt tubular condenser		.20
0.0005 mf mica condenser		.20
0.001 mf mica condenser		.20
0.0001 mf mica condenser		.20
0.1 mf, 400 volt molded condenser		.20
0.02 mf, 200 volt tubular condenser		.20
0.02 mf, 200 volt tubular condenser		.20
0.0002 mf mica condenser		.20
0.01 mf, 200 volt mica condenser		.20
0.02 mf, 400 volt tubular condenser		.20
20 mf, 150 volt tubular condenser		.20
20 mf, 150 volt tubular condenser		.20
Dual padding condenser		.26
C26—100 to 200 mmf		
5 mf, 25 volt dry electrolytic condenser		.90
Wave-band switch for ALLW chassis		.85
Wave-band switch for ALLW chassis		.85
5 1/2" dynamic speaker		4.90
Dial face (for AL chassis)		.70
Dial face (for ALLW chassis)		.70
Dial drive belt		.10
Dial drive shaft and pulley		.10
Idle pulley		.05
Idle pulley spring		.05
Cable pulley		.25
Cable pulley spring		.25
Dial pointer		.10
Escutcheon with crystal (for Models AL-130, AL-168, ALLW-130 and ALLW-168)		1.05
Dial for Models AL-132, AL-169, ALLW-132 and ALLW-169		.50
Clip for dial crystal (for Models AL-132, AL-169, ALLW-132 and ALLW-169)		.01

When ordering replacement parts specify part numbers.

*Item number locates the article on the schematic diagram.

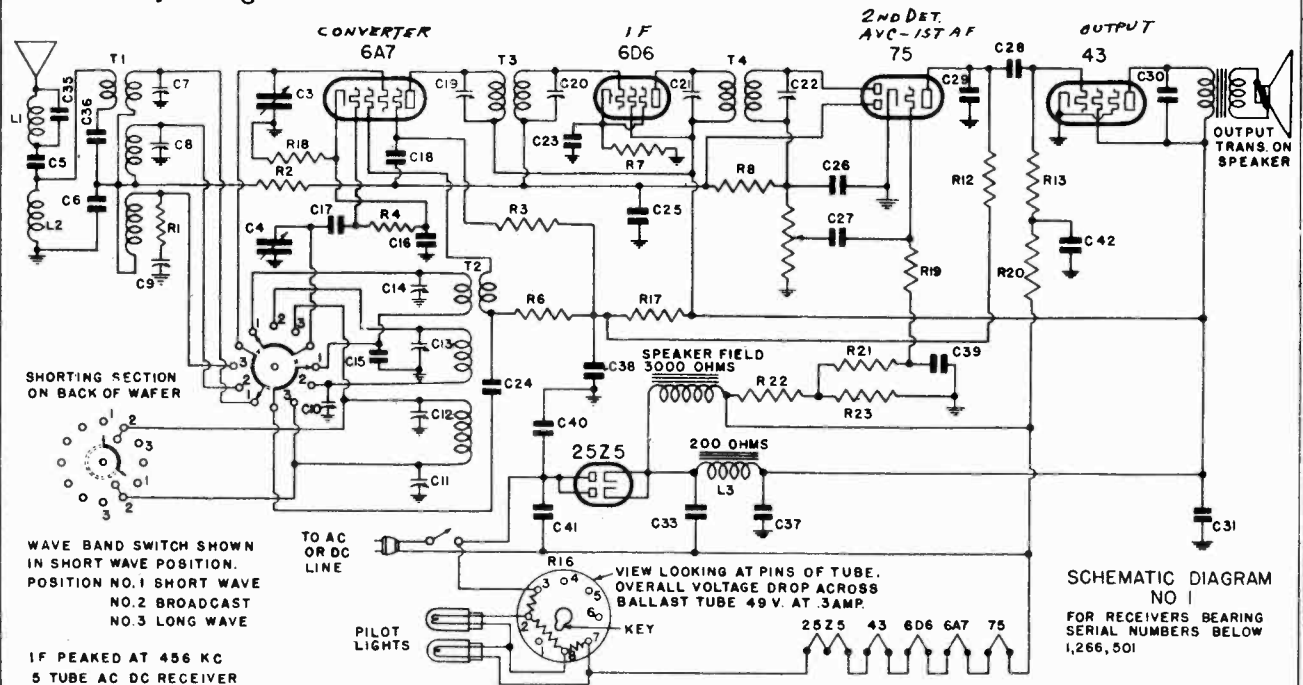
†These trimmers are part of coil assemblies and can not be supplied separately.

‡These trimmers are part of variable condenser and can not be supplied separately.

Below and Above
Serial 1266501
Schematics, Voltages

EMERSON RADIO & PHONO. CORP.

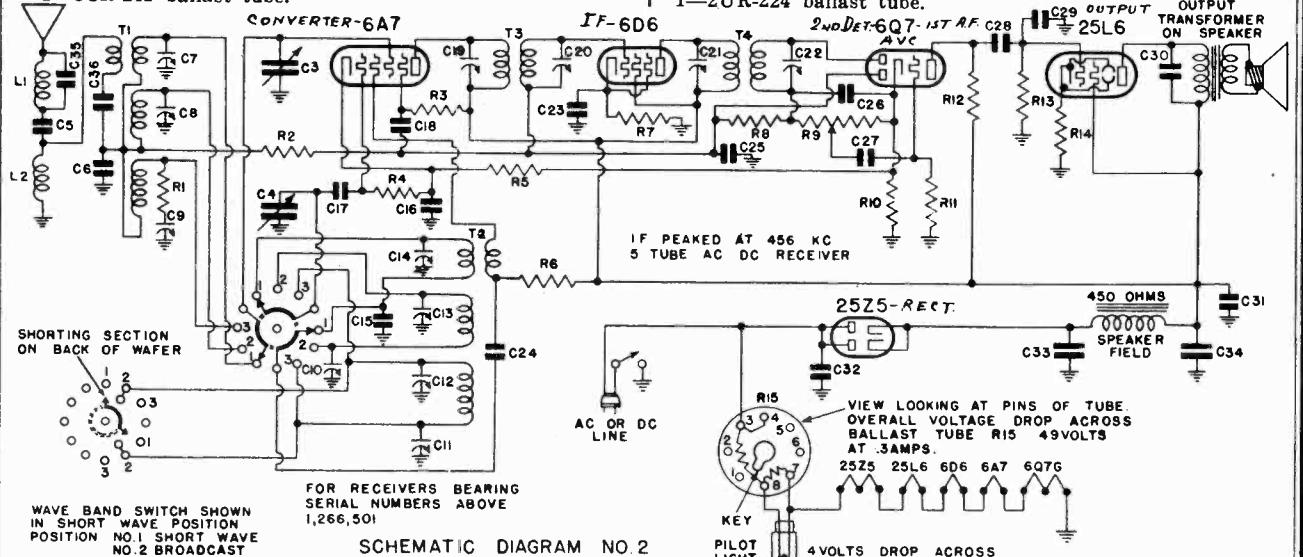
MODEL AA131
Chassis AA



IF PEAKED AT 456 KC
5 TUBE AC DC RECEIVER

The tube complement for receivers bearing serial numbers below 1,266,501 is as follows:
1—6A7 pentagrid oscillator-modulator
1—6D6 first i-f amplifier
1—75 diode detector, a.v.c., audio amplifier
1—43 pentode power output
1—25Z5 dual half-wave rectifier
1—3CR-241 ballast tube.

The tube complement for receivers bearing serial numbers above 1,266,501 is as follows:
1—6A7 pentagrid oscillator-modulator
1—6D6 first i-f amplifier
1—6Q7 diode detector, a.v.c., audio amplifier
1—25L6 beam power output
1—25Z5 dual half-wave rectifier
1—2UR-224 ballast tube.



IF PEAKED AT 456 KC
5 TUBE AC DC RECEIVER

FOR RECEIVERS BEARING SERIAL NUMBERS ABOVE 1,266,501

SCHEMATIC DIAGRAM NO 2

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 117.5 volts, 60 cycles, a.c.

The following are voltages for receivers bearing serial numbers below 1,266,501:

Tube	Plate	Screen	Cathode	Osc. Plate	Fil.
6A7	96	35	0.6	57	6.3
6D6	96	78	2	—	6.3
75	35	—	0	—	6.3
43	85	96	0	—	24

Voltage across speaker field—125
Voltage across filter choke—11.1

The bias for the 75 and 43 is developed across resistors R22 and R23 (see schematic diagram). The voltage across R22 is 11 volts and the voltage across R23 is 1 volt.

The voltage drop across the ballast resistor (R16—see schematic) is 49 volts between pins 3 and 7.

The following are voltages for receivers bearing serial numbers above 1,266,501:

Tube	Plate	Screen	Cathode	Osc. Plate	Fil.
6A7	100	42	1.6	75	6.3
6D6	100	100	3.6	—	6.3
6Q7	36	—	0.8	—	6.3
25L6	95	100	6.7	—	24

Voltage across speaker field—27.5

The voltage drop across the ballast resistor (R15—see schematic) is 49 volts between pins 3 and 7.

MODEL AA131
Chassis AA
Below and Above
Serial 1266501
Alignment, Notes, Parts

EMERSON RADIO & PHONO. CORP.

REPLACEMENT PARTS LIST

NOTE: Schematic No. 1 applies to receivers bearing serial numbers below 1,246,501. Schematic No. 2 applies to receivers bearing serial numbers above 1,246,501.

Part No.	Description	Price
22T-268A	466 kc wave-trap	.75
22T-269	I-F choke	.56
22T-270	I-F choke	.56
22T-271	Three-band antenna coil	2.00
22T-272	Three-band oscillator coil	1.90
22T-273	Double-tuned 466 kc first I-F transformer	1.50
22T-274	Double-tuned 466 kc second I-F transformer	1.35
22T-275	3000-ohm 1/2 watt carbon resistor	1.16
22T-276	250,000 ohm 1/4 watt carbon resistor	.16
22T-277	60,000 ohm 1/4 watt carbon resistor	.16
22T-278	100,000 ohm 1/4 watt carbon resistor	.16
22T-279	100,000 ohm 1/4 watt wire-wound resistor	.16
22T-280	20,000 ohm 1/2 watt wire-wound resistor	.16
22T-281	410 ohm 1/2 watt wire-wound resistor	.16
22T-282	1 megohm 1/4 watt carbon resistor	.16
22T-283	Volume control with on-off switch—250,000 ohms	1.20
22T-284	100,000 ohm 1/4 watt wire-wound resistor	.16
22T-285	500,000 ohm 1/4 watt wire-wound resistor	.16
22T-286	140 ohm 1/2 watt wire-wound resistor	.16
22T-287	Plug-in type ballast resistor	.80
22T-288	Plug-in type ballast resistor	.80
22T-289	500 ohm 1/2 watt carbon resistor	.16
22T-290	25,000 ohm 1/4 watt carbon resistor	.16
22T-291	230 ohm 1/2 watt wire-wound resistor	.16
22T-292	20 ohm 1/2 watt wire-wound resistor	.16
22T-293	100 ohm 1/2 watt wire-wound resistor	.16
22T-294	Two-gang variable condenser	3.66
22T-295	Two-gang variable condenser	3.90
22T-296	0.02 mf, 200 volt tubular condenser	.20
22T-297	0.0025 mf mica condenser	.30
22T-298	Trimmer, part of antenna coil assembly	.65
22T-299	Dual adjustable padding condenser: C10-250 to 500 mmf, C11-100 to 200 mmf.	.30
22T-300	Trimmer, part of oscillator coil assembly	.20
22T-301	0.0024 mf mica condenser	.20
22T-302	0.1 mf, 500 volt tubular condenser	.20
22T-303	0.00495 mf mica condenser	.20
22T-304	0.01 mf, 400 volt tubular condenser	.20
22T-305	Trimmer, part of I-F coil assembly	.20
22T-306	0.05 mf, 200 volt tubular condenser	.20
22T-307	0.02 mf, 400 volt tubular condenser	.20
22T-308	0.015 mf, 500 volt tubular condenser	.20
22T-309	0.05 mf, 400 volt molded paper condenser	.20
22T-310	40 mf, 150 volt wet electrolytic condenser	.90
22T-311	40015 mf mica condenser—top assembly	1.05
22T-312	4 mf, 150 volt tubular dry electrolytic condenser	.20
22T-313	Wave-band switch	1.10
22T-314	6 1/2" dynamic speaker for receivers using 201L6 output tube	5.25
22T-315	6 1/2" dynamic speaker for Mazda No. 46	2.20
22T-316	Pilot light, 6.5 volt, 25 amp, Mazda No. 46	.75
22T-317	Dial face	.10
22T-318	Dial drive belt	.10
22T-319	Dial drive shaft and pulley	.05
22T-320	Idle pulley spring	.10
22T-321	Condenser shaft, pulley	.10
22T-322	Dial pointer (screw-on type)	.10
22T-323	Dial pointer (push-on type)	.25
22T-324	Eucytecon with crystals	1.06

When ordering replacement parts specify part numbers.

*Item number locates the article on the schematic diagram.
†These trimmers are part of the coil assembly and can not be supplied separately.
‡When ordering pointer specify if screw-on or push-on type.

MODEL AA - 131
Chassis Model AA

Voltage rating 105-125 volts, a.c. or d.c.
Power consumption 150 to 375 kc, 540 to 1600 kc, 5.7 to 17.5 mc.
Frequency range

GENERAL NOTES

- If replacements are made or the wiring disturbed in the r-f portion of the circuit, the receiver should be carefully re-aligned.
- One side of the power line is directly grounded to the chassis base. Under no circumstances, therefore, should a ground wire be permitted to come in contact with any metal part of the receiver.
- The filament dropping resistor is in a special metal tube at the rear of the chassis. This tube will become quite hot under normal operating conditions. For voltage drop specifications, see below.
- The power supply for this receiver may be either a.c. or d.c. The standard line voltage rating is 105 to 125 volts. When operating the receiver on d.c. it may be necessary to reverse the line plug to obtain the correct polarity.
- The tap of the transformer are held to the chassis by snap-on fasteners. To remove an I-F unloader, all the leads under the chassis pinch together the prongs of the snap-on fastener and lift the I-F can from the chassis.
- The color coding of the I-F transformer leads is as follows:
Grid—green
Grid return—black
B plus—red
E plus—blue
- An efficient antenna system is necessary to enable a full realization of the merits of the receiver. For reductions of coil size and minimum frequency trimmer, the Emerson All-Wave Antenna System, Model W-89, are recommended. Instructions for the installation of these antennas are supplied with each kit.
In congested areas where the installation of a large antenna is not desirable we recommend the use of the Emerson Flexible Mast Antenna, Model W-82. Instructions for the installation of this compact and efficient antenna are supplied with each kit.

ADJUSTMENTS

An oscillator with frequencies of 160, 360, 486, 600, 1500 and 15,000 kc should be used.
An output meter should be used across the voice coil or output transformer for observing maximum response.
Use a standard dummy antenna when aligning either the long-wave or medium-wave bands. A .0002 mf condenser may be used as a substitute. When aligning the short-wave band use a 400 ohm dummy antenna (a 400 ohm resistor in series with antenna lead).
If the antenna oscillator is higher in frequency than the signal, so images should be observed on the low frequency side of the 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.
Never leave a 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.
Always use as weak a test signal as possible during alignment.

Location of Coils and Trimmers

The antenna coils for the three bands are wound on one form and mounted underneath the chassis deck in the right of the chassis. The long-wave antenna coil is accessible through three holes in the top of the chassis. The trimmer farthest from the front of the chassis is for the long-wave antenna coil, and the central trimmer is for the short-wave antenna coil. The oscillator coils for the three bands are wound on one form and mounted on the inside of the rear chassis wall. The trimmers for these coils are accessible through holes in the rear chassis wall. The trimmer farthest from the end of the chassis is for the long-wave antenna coil, and the trimmer nearest the end of the chassis is for the medium-wave oscillator coil. The two I-F transformers are in oblong coil cans located on the top of the chassis. The first I-F transformer is the one behind the variable condenser. The trimmers for these transformers are accessible through holes in the tops of the cans.
The series padding condensers for the long-wave and medium-wave bands are located on the rear chassis wall below the 6A7 tube.

I-F Alignment

Reset the wave-band switch to the medium-wave (central) position and set the variable condenser to minimum. Feed 466 kc to the grid cap of the 6A7 tube through a .02 mf paper condenser, (do not remove the grid clip from the tube). Adjust the four I-F trimmers for maximum response.

Long-Wave Alignment

With the wave-band switch at long-wave (clockwise) position set the dial pointer at 15 and feed 150 kc to antenna. Adjust the long-wave series padder (next to dual paper) for maximum response. Then adjust the long-wave antenna trimmer for maximum response. Reset pointer to 15, feed 150 kc and rock (rotate back and forth through a small arc) the variable condenser while adjusting long-wave series padder for maximum response. Reset pointer to 35, feed 350 kc and check alignment. If readjustment is necessary return to 150 kc and repeat entire procedure.

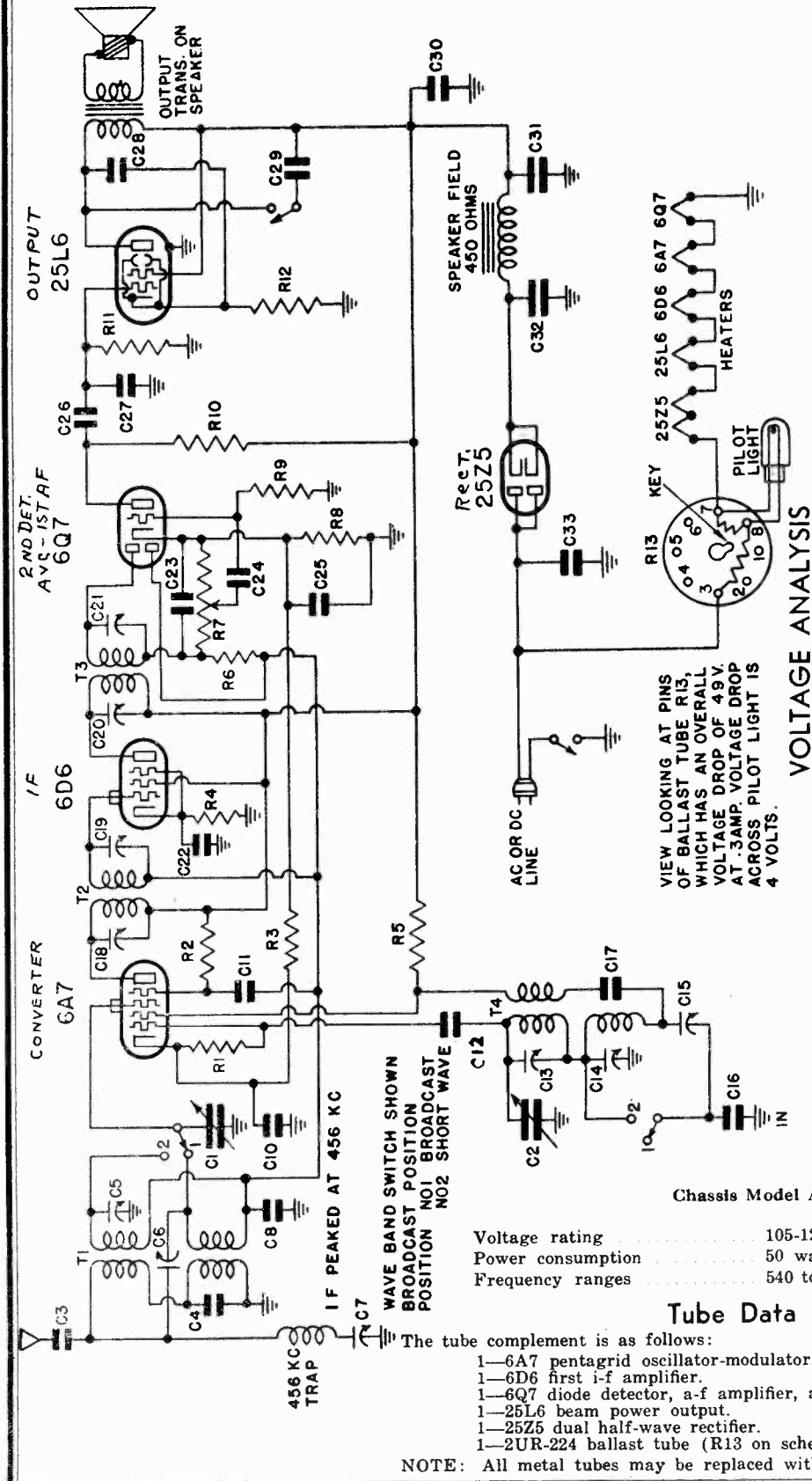
Medium-Wave Alignment

Set switch at medium-wave (central) position and dial pointer at 60. Feed 600 kc to antenna and adjust medium-wave series padder (next to dual paper) for maximum response. Move pointer to 150, feed 1500 kc and adjust medium-wave oscillator trimmer and then the medium-wave antenna trimmer for maximum response. Reset pointer to 60, feed 600 kc and rock variable condenser while readjusting medium-wave series padder for maximum response. Reset pointer to 150, feed 1500 kc and check alignment. If readjustment is necessary return to 600 and repeat entire procedure.

Short-Wave Alignment

Set wave-band switch at short-wave (counter-clockwise) position. Set pointer at 15, feed 15 megacycles to antenna and adjust short-wave oscillator trimmer and then short-wave antenna trimmer for maximum response.

EMERSON RADIO & PHONO. CORP. MODELS AM-131, AM-169, AM-187
 Chassis AM
 Schematic, Voltage, Changes



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 117.5 volts, 60 cycles, a.c.

Tube	Plate	Screen	Cathode	Osc. Plate	Fil.
6A7	96	45	2.3	74	6.3
6D6	96	96	4.5	—	6.3
6Q7	40	—	1.0	—	6.3
25L6	92	100	6.2	—	25.0

Voltage at 25Z5 cathode—125 volts.
 Voltage across speaker field—29 volts.
 Voltage drop across ballast tube (pins Nos. 3, 7)—49 volts.
 Voltage drop across pilot light section (pins Nos. 8, 7)—4 volts.
 In receivers bearing serial numbers below 1,184,290:

PRODUCTION CHANGES

The variable condenser was part number 8CC-275. The dial pointer was part number 4MZ-590.

SIX TUBES, INCLUDING BALLAST TUBE MODELS AM-131, AM-169 and AM-187

Chassis Model AM

Voltage rating 105-125 volts, a.c. or d.c.
 Power consumption 50 watts.
 Frequency ranges 540 to 1,730 kc, and 5.6 to 18.0 megacycles.

Tube Data

The tube complement is as follows:
 1—6A7 pentagrid oscillator-modulator.
 1—6D6 first i-f amplifier.
 1—6Q7 diode detector, a-f amplifier, a.v.s.
 1—25L6 beam power output.
 1—25Z5 dual half-wave rectifier.
 1—2UR-224 ballast tube (R13 on schematic).

NOTE: All metal tubes may be replaced with equivalent octal base glass tubes.

MODELS AM131, AM169, AM187

Chassis AM

EMERSON RADIO & PHONO. CORP.

Alignment, Notes, Parts

GENERAL NOTES

1. If replacements are made or the wiring disturbed in the r-f portion of the circuit, the receiver should be carefully re-aligned.
2. One side of the power line is directly grounded to the chassis base. Under no circumstances, therefore, should a ground wire be permitted to come in contact with any metal part of the receiver.
3. The filament winding is connected to the chassis base. For voltage drop specifications, see below.
4. When operating the receiver on d.c. it may be necessary to reverse the line plug to obtain the correct polarity.
5. The two i-f transformers are held to the chassis by snap-on fasteners. To remove an i-f, unsolder all the leads under the chassis, pinch together the prongs of the snap-on fastener and lift the i-f can from the chassis.
6. The color coding of the i-f transformer leads is as follows:
 Plate—blue
 B plus—red
 Grid—green
 Return—black
7. An efficient antenna system is necessary to enable a full realization of the merits of the receiver. For reduction of noise and achievement of high efficiency on all frequency ranges the Emerson All-Wave High Fidelity Antenna, Model W-78, and the Emerson Antenna System, Model W-85, are recommended. Instructions for the installation of these antennas are supplied with each kit.
 In congested areas where the installation of a large antenna is not desirable we recommend the use of the Emerson Flexible Mast Antenna, Model W-82. Instructions for the installation of this compact and efficient antenna are supplied with each kit.
8. The wave-trap in the receiver has been adjusted for maximum signal rejection at 456 kc. If, however, persistent interference is experienced from some particular telegraphic station, readjust the wave-trap trimmer until the response from the interfering station is at a minimum.

ADJUSTMENTS

An oscillator with frequencies of 456, 600, 1425 and 15,000 kc should be used.
 In addition an output meter should be used across the voice coil or output transformer for observing maximum response.
 The oscillator is higher in frequency than the signal, 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.
 Always use a trimmer with the outside plate as loose as possible during alignment.
 Never leave a 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.

Location of Coils and Trimmer Adjustments

The broadcast antenna coil, the short-wave antenna coil and the 456 kc wave trap are one assembly mounted underneath the chassis deck to the right of the variable condenser. The trimmers for these coils are accessible through three holes in the top of the chassis. The trimmer closest to the front of the chassis is for the short-wave antenna coil. The central trimmer is for the broadcast antenna coil and the trimmer farthest from the chassis front is for the 456 kc wave trap.
 The broadcast oscillator and short-wave oscillator coils are wound on one form and mounted on the inside of the rear chassis wall. The trimmers for these coils are accessible through two holes in the rear chassis wall. The left hand trimmer (looking at the rear wall) is for the short-wave oscillator coil and the right-hand trimmer is for the broadcast oscillator coil.
 The two i-f transformers are in oblong coil cans located on the top of the chassis. The first i-f transformer is the one on the left and the variable condenser. The trimmers for these transformers are accessible through holes in the tops of the cans.
 The broadcast series padding condenser is located on the rear wall of the chassis below the 6A7 tube.

I-f Transformer and Wave-Trap Alignment

Turn the switch clockwise to the broadcast position and rotate the variable condenser to the minimum capacity position. Feed 456 kc to the grid cap of the 6X7 tube and adjust the i-f trimmer for minimum response. Feed 456 kc to the antenna and adjust the wave-trap trimmer. (rear screw beside variable condenser) for minimum response.

Short-Wave Alignment

Use a dummy antenna (400 ohm resistor) when aligning the short-wave coils.
 Rotate the wave-band switch counter-clockwise to the short-wave position and set the dial pointer to 15 megacycles. Feed 15 megacycles through the dummy antenna and adjust the short-wave oscillator trimmer (left-hand screw on rear chassis wall) for maximum response and then adjust the short-wave antenna trimmer (front screw beside variable condenser) for maximum response. The variable condenser should be rotated while adjusting the antenna trimmer. (Rotate variable condenser rotor shaft back and forth through a small arc.)

Broadcast Alignment

Rotate the wave-band switch to the broadcast position, clockwise, and set the dial pointer at 60. Feed 600 kc through a standard dummy antenna (a .0002 mf condenser may be used as a substitute).
 Adjust the broadcast series padding condenser (on rear chassis wall, below 6A7 tube) for maximum response. Move pointer to 142.5 (feed 1425 kc and adjust the broadcast oscillator trimmer (right-hand screw on rear chassis wall) for maximum response and then adjust the broadcast antenna trimmer (central screw beside variable condenser) for maximum response. Return pointer to 60, feed 600 kc and readjust the series padding condenser (rotating the variable condenser for maximum response).

REPLACEMENT PARTS LIST

Part No.	DESCRIPTION	Price
9CT-289A	Two-hand antenna coil	\$1.80
9CT-277	456 kc first i-f transformer	1.50
9CT-275	456 kc second i-f transformer	1.35
9CT-280A	Two-band oscillator coil	1.35
KR-63	50,000 ohm 1/4 watt carbon resistor	.16
ZR-196	30,000 ohm 1/4 watt carbon resistor	.16
9CR-245	10,000 ohm 1/4 watt carbon resistor	.16
9CR-246	410 ohm 1/4 watt wire-wound resistor	.16
LR-65	10,000 ohm 1/4 watt carbon resistor	.16
KR-57	1 megohm 1/4 watt carbon resistor	.16
2NR-211C	Volume control with line switch—250,000 ohms	1.20
9CR-244	250,000 ohm 1/2 watt wire-wound resistor	.16
9CR-243	250,000 ohm 1/2 watt carbon resistor	.16
KR-66	500,000 ohm 1/4 watt carbon resistor	.16
9PR-293	140 ohm 1/2 watt wire-wound resistor	.80
2UR-224	Plug in type ballast resistor	.35
3CC-275A	Two-gang variable condenser (see production changes)	3.00
AAC-114	0.00025 mf mica condenser	.20
AAC-104A	Trimmer, part of antenna coil assembly	.20
BC-12	0.05 mf, 200 volt tubular condenser	.20
AC-5	0.1 mf, 200 volt tubular condenser	.20
KC-59	0.006 mf, 400 volt tubular condenser	.40
2RC-221	Trimmer, part of oscillator coil assembly	.20
9CC-127	Single adjustable padding condenser. Range: 300 to 600 mmf	.40
9CC-127	0.044 mf, 200 volt tubular condenser	.20
9CC-127	0.017 mf, 200 volt tubular condenser	.20
AC-7A	Trimmer, part of first i-f transformer	.20
FC-29	0.0025 mf mica condenser	.20
9CC-337	0.02 mf, 200 volt tubular condenser	.20
9CC-281	40 mf, 150 volt wet electrolytic condenser	.90
ECC-132	20 mf, 150 volt wet electrolytic condenser	.90
9S-246	0.1 mf, 400 volt tubular condenser	.20
9S-111G	Tone control switch	.50
9S-244	Wave-band switch	5.25
XL-9	Pilot light, 6.3 volt, .25 amp., Mazda No. 46	.70
9CZ-614	Dial face	.10
9CZ-386A	Dial drive belt	.10
9CZ-387	Drive shaft and pulley	.06
9CZ-389	Idle pulley	.06
9CZ-341	Idle spring shaft, pulley	.10
4MZ-538	Dial pointer (see production changes)	.25
9CZ-360	Escutcheon with crystal (for Models AM-131 and AM-169)	1.05
4MZ-544	Dial crystal (for Model AM-187)	.50

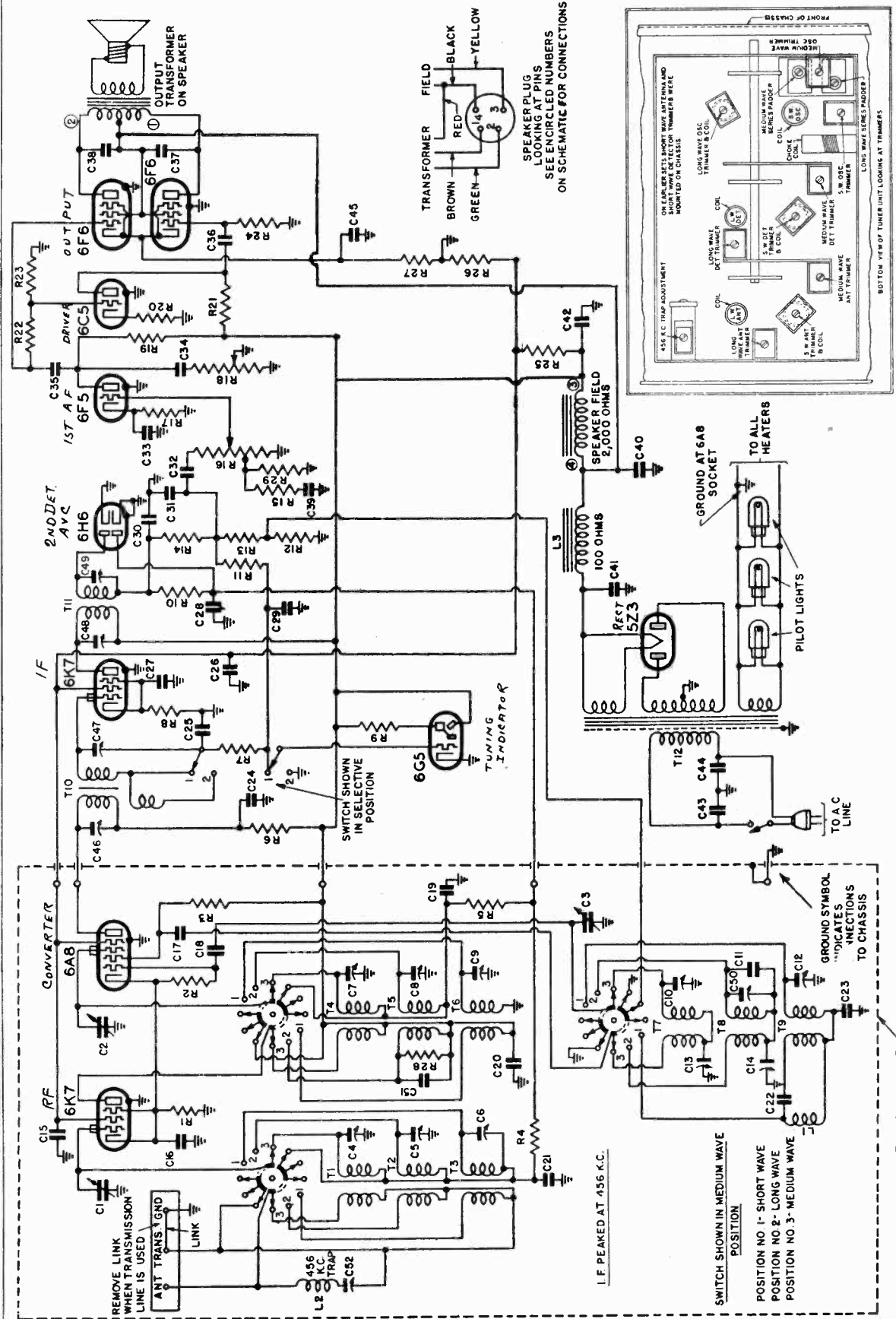
When ordering replacement parts specify part numbers.

*Item number locates the article on the schematic diagram.
 †These trimmers cannot be supplied separately.

Chassis DLW
Schematic, Trimmers

EMERSON RADIO & PHONO. CORP.

MODELS D134LW, D136LW, D138LW
D139LW, D140LW, D142LW
D146LW



105-125 volts a.c. (unless otherwise specified)
1.1 amps a.c. (at 117.6 volts)
140 to 375 kc, 540 to 1800 kc and 5.5 to 18.0 megacycles

MODELS D134LW, D136LW, D138LW, D139LW, D140LW, D142LW, D146LW

EMERSON RADIO & PHONO. CORP.

Chassis DLW Alignment, Voltage Notes, Changes, Parts

Ten-Tube, A.C., Long, Medium and Short-Wave Superheterodyne

MODELS D134LW, D136LW, D138LW, D139LW, D140LW, D142LW and D146LW Chassis Model DLW

VOLTAGE ANALYSIS table with columns for component, voltage, and filament current.

Readings should be taken with a 1000 ohm-per-volt meter. Voltages listed below are from point indicated to ground.

REPLACEMENT PARTS LIST

REPLACEMENT PARTS LIST table with columns for Part No., Description, and Price.

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

When number locates the article on the schematic diagram... PRODUCTION CHANGES

ADJUSTMENTS The receiver was carefully aligned and checked at the factory by means of an oscillograph, and it is strongly recommended that servicemen use one for realignment.

Tube Data

- The tube complement is as follows: 1-6AK5 Pentagrid modulator-oscillator (on tuner unit) 1-6K7-14 amplifier 1-6BE Diode detector and automatic volume control 1-6C5 Phase inverter (audio) 1-6F6 Push-pull pentode output 1-6E8 Electron ray tuning indicator 1-6Z5 Full-wave rectifier.

Checking High-Fidelity Operation On the oscillograph screen the peak of the selectivity curve (1-f response curve with fidelity-selectivity switch in "on" position) should be checked for its position on the response curve with fidelity-selectivity switch in "off" position (center, clockwise). In other words the central vertical axis of the high-fidelity curve.

Alignment

Set the wave-band switch at the medium-wave (clockwise) position and the variable condenser at the minimum capacity position. Feed 400 kc to the grid cap of the 6E8 tube through the antenna terminal and adjust the 400 kc wave-trap for minimum response. (See General Notes) Set the antenna terminal and adjust the 400 kc wave-trap for minimum response. (See General Notes) Both pointers on the dial should coincide vertically at 890 kc. For adjustment, the gold pointer may be adjusted around its shaft. With the wave-band switch at the long-wave position, set the antenna terminal and adjust the 400 kc wave-trap for minimum response. Move pointer to 150, feed 1600 kc to the antenna and adjust the oscillator trimmer for maximum response, then adjust detector and antenna trimmers. Reset the pointer to 90, feed 800 kc to the antenna and adjust the variable condenser for the 600 kc check alignment. If readjustment is necessary, return to 900 and repeat entire procedure.

GENERAL INSTRUCTIONS

Use as weak a test signal as possible during alignment. The signal on all three bands. Images, therefore, should be observed on the low-frequency side of the signal. Always choose the minimum capacity peak on oscillator trimmer and maximum capacity peak on antenna and 1-f trimmers. The last motion in adjusting the antenna trimmer should be made with the antenna terminal and microphone up or remove the screw entirely. Loose screws are a source of noise, frequency drift and microphonism. In aligning antenna trimmers on this set the antenna terminal variable condenser as you align.

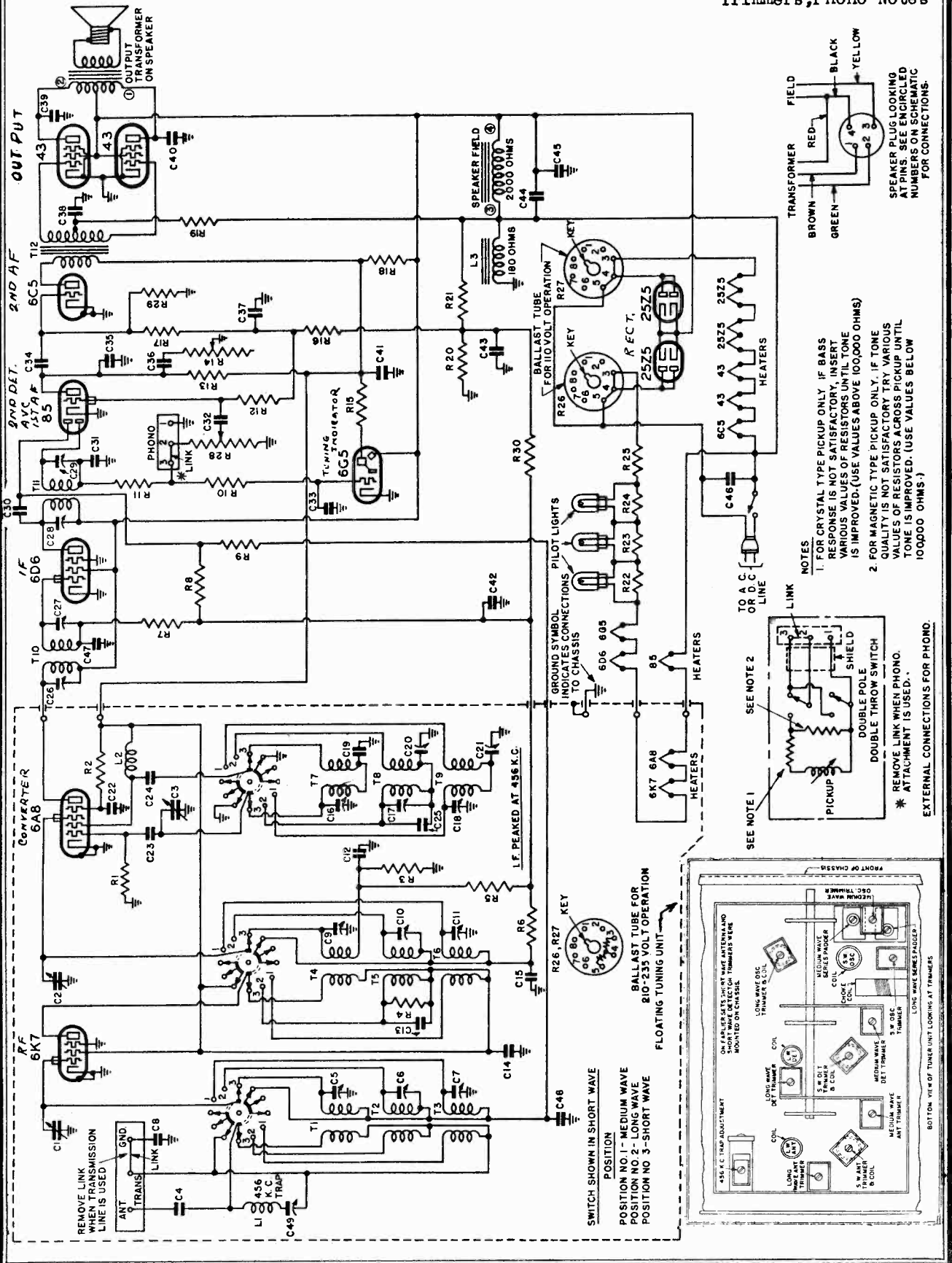
GENERAL NOTES

- 1. The wave-trap in the receiver has been adjusted for maximum signal rejection at 400 kc. If, however, persistent interference is experienced during operation, the wave-trap trimmer may be readjusted until the minimum capacity peak on the dial is at its minimum. A jack is provided at the rear of the chassis for a phonograph attachment. The pickup to be used should be of the high impedance type. A separate potentiometer type volume control is required, the overall resistance to be determined by the type of pickup used. The potentiometer should be connected to the terminals at the top of the control. A lead from the center terminal should be plugged into the hole in the phone jack nearest the center of the chassis. A lead from the center terminal of the volume control should be plugged into the other hole in the jack (right side of jack). The potentiometer should be connected to the terminals at the top of the control. The potentiometer should be connected to the extreme counter-clockwise (low) position when operating phonograph. Since the phone jack is of the shorting type signals cannot be received by the set when the leads are plugged into the jack. The leads should be removed before attempting to receive broadcast stations with either the speaker plug or the 6F6 tubes out of their sockets, since the rapid rise in receiver voltage would damage the electrolytic condensers. 4. Pilot lights may be replaced by slipping the push-on sockets off the dial and unscrewing the bulbs. It is not necessary to remove either the dial or chassis cover when replacing the pilot lights. The pilot lights should be replaced with the cabinet front panel. If these precautions are not observed the receiver may become microphonic. 6. The two black leads are as follows: High voltage sec.—two red leads High voltage sec.—two heavy yellow leads High voltage center tap—red and yellow lead High voltage secondary center tap—red and yellow lead The dial on all the complete type receivers, and in the speaker compartment on the table type receivers. On the table type receivers to remove the speaker cable is as follows: Black—filament Blue—ground Green—grid

An efficient antenna system (aerial) is necessary to enable a full realization of the merits of the receiver. The antenna should be installed in accordance with the instructions for the antenna and location of noise on all three frequency ranges. Complete instructions for the installation of this antenna are supplied with each kit.

EMERSON RADIO & PHONO. CORP

MODELS M134, M136, M139
M140, M142, M146
Chassis M
Schematic
M138
Trimmers, Phono Notes



MODELS M134, M136
M138, M139
M140, M142
M146

EMERSON RADIO & PHONO. CORP.

Chassis M
Alignment, Voltage
Changes, Notes, Parts

A.C. - D.C., Long, Medium and Short-Wave
Superheterodyne

12 Tubes Including Ballast Tubes
MODELS M-134, M-136, M-138, M-139, M-140, M-142, and M-146
Chassis Model M

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohm load below any from point indicated to ground, with no signal, volume control turned on full, and variable condenser at maximum capacity position. The line voltage for these readings was as indicated in the headings below.

Line voltage—215 volts, 60 cycles, a.c.
Line voltage—175 volts, 60 cycles, a.c.

Tube	Chassis Point	Screen	Grid	Plate	Fil.
6K7	85	85	7.5	7.5	7
6A8	100	100	85	100	7
6A9	125	125	125	125	7
6B6	130	130	130	130	7
6C6	25	25	7.5	7.5	7
43	90	100	—	—	28
44	100	100	—	—	28

Volume from 2525 cathode to chassis—100 volts.
Voltage across choke (soldering lug on electrolytic in corner of chassis)—20 volts.
Filament voltage of 6B6 (red lead to black lead)—7 volts.
Target voltage of 6B6 (red lead to chassis)—125 volts.

REPLACEMENT PARTS

Item	Part No.	Description	Price
L1	257-283	456 kc wave-trap	\$.60
L2	3AT-283	500,000 ohm 1/4 watt carbon resistor	.20
L3	3AT-300	Iron-core filter choke	2.00
L4	3AT-287	Short-wave antenna coil	.70
L5	3AT-288	Short-wave detector coil	.70
L6	3AT-289	Long-wave antenna coil	1.06
L7	3AT-301	Long-wave antenna coil	1.06
L8	3AT-302	Long-wave detector coil	1.06
L9	3AT-303	Long-wave oscillator coil	1.06
L10	3AT-291	Medium-wave antenna coil	.95
L11	3AT-292	Medium-wave detector coil	.95
L12	3AT-293	Medium-wave oscillator coil	.75
L13	3AT-294	456 kc first i-f transformer	2.00
L14	3AT-295	456 kc second i-f transformer	2.00
L15	3AT-296	Audio input transformer	2.55
R1	KR-53	50,000 ohm 1/4 watt carbon resistor	.18
R2	KR-54	20,000 ohm 1/4 watt carbon resistor	.18
R3	KR-55	1 megohm 1/4 watt carbon resistor	.18
R4	GR-85	2,000 ohm 1/4 watt carbon resistor	.16
R5	GR-86	500,000 ohm 1/4 watt carbon resistor	.16
R6	KR-56	250,000 ohm 1/4 watt carbon resistor	.18
R7	KR-57	100,000 ohm 1/4 watt carbon resistor	.18
R8	KR-58	100,000 ohm 1/4 watt carbon resistor	.18
R9	3MR-262	1,000 ohm 1/4 watt wire-wound resistor	.18
R10	IR-131	25,000 ohm 1/4 watt carbon resistor	.18
R11	OR-78	30,000 ohm 1/4 watt carbon resistor	.18
R12	ZR-196	Wire-wound metal clad filament resistor	.60
R13	3MR-254	R25—40 ohms; R26—40 ohms; R27—195 ohms.	.40
R14	3MR-255	Ballast tube for 105-125 volt operation	1.00
R15	3MR-256	Ballast tube for 140-150 volt operation	1.00
R16	3MR-257	Volume control—100,000 ohms	.40
R17	3MR-258	Three-gang variable condenser	7.40
R18	3MR-259	0.001 mf mica condenser	.16
R19	3AC-278	1.5 to 12 mmf tummer condenser (see Production Changes)	.20
R20	KC-68	0.01 mf, 400 volt tubular condenser	.20
R21	BC-12	0.05 mf, 200 volt tubular condenser	.20
R22	EC-24A	0.05 mf, 200 volt tubular condenser	.20
R23	CC-7	0.05 mf, 200 volt tubular condenser	.20
R24	NC-158	Trimmer, part of long-wave oscillator strap	.20
R25	XXC-87	0.0038 mf mica condenser	.48
R26	3MC-298	Dual adjustable padding condenser	.60
R27	AAC-106A	0.00005 mf mica condenser	.30
R28	IIC-188A	Trimmer, part of first i-f transformer.	.50
R29	AC-7A	0.00025 mf mica condenser	.20
R30	LC-64	0.05 mf, 400 volt tubular condenser	.20
R31	HC-113	0.015 mf, 400 volt tubular condenser	.20
R32	3AC-256	5 mf, 50 volt tubular dry electrolytic condenser	.40
R33	TTG-177	0.01 mf, 600 volt tubular condenser	.20
R34	3MC-296	50 mf, 150 volt wet electrolytic condenser	.85
R35	3MC-297	50 mf, 150 volt wet electrolytic condenser	1.20
R36	3MC-291	0.1 mf, 400 volt a.c. tubular condenser	1.30
R37	3MC-293	Trimmer, part of wave-trap assembly.	.30

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

PRODUCTION CHANGES

C5 and C9 trimmers were supplied separately and later incorporated as part of the short-wave antenna and detector coil. In later receivers trimmers C6 and C10 have their rotors returned to "round and not to a.v.c.", as shown on the schematic.

*Item number locates the article on the schematic diagram. †These trimmers are part of coil assemblies and can not be supplied separately.

ADJUSTMENTS

An oscillator with frequencies of 150, 345, 456, 600, 1600 and 16000 kc should be used. An output meter should be used across the voice coil or speaker output transformer for observing maximum response. Use standard dummy antenna for aligning any of the three bands. A .0002 mf condenser may be used for the medium wave band and a 400 ohm resistor for the short-wave dummy antenna.

TUBE DATA

The tube complement is as follows:
1—6A8—R-F amplifier (on tuner unit)
1—6A9—R-F amplifier (on tuner unit)
1—6B6—R-F amplifier (on tuner unit)
1—6C6—Second detector, a.v.c., and a-f amplifier
2—43—Pilot lights
2—44—Pilot lights
1—656—Electron Ray tuning indicator
2—625—Half-wave rectifiers for 105-125 volt operation
2—648—Ballast tubes for 105-125 volt operation
2—3MR-253—Ballast tubes for 140-150 volt operation

Alignment
Set the wave-band switch at the medium-wave (clockwise) position and the variable condenser at the minimum capacity position. Feed 456 kc to the grid cap of the 6A8 tube. Adjust the trimmer carefully for maximum response. Feed 1600 kc to the grid cap of the 6A9 tube. Adjust the trimmer for maximum response. Return to the antenna terminal and adjust the 456 kc wave-trap for minimum response. (See General Notes.)

Medium-Wave Alignment
Both pointers on the dial should coincide vertically at 890 kc. For adjustment, the gold pointer may be slipped until the tip of the wave-band switch at the medium-wave (clockwise) position, set the pointer at 60, feed 600 response. Move pointer to 160, feed 1600 kc to the antenna and adjust the oscillator trimmer for maximum response. Adjust detector and antenna trimmers. Reset the pointer to 60, feed 600 kc to the antenna and rock the variable condenser to the densest back and forth through a small arc while resetting the oscillator pad for maximum response. Return to 1600 kc alignment. If readjustment is necessary, return to 600 and repeat entire procedure.

Long-Wave Alignment
Set the wave-band switch at the long-wave (counter) position and the pointer to 150. Feed 150 kc through a standard dummy antenna to the antenna terminal and adjust the long-wave series pad for maximum response. Move the pointer to 345, feed 345 kc and adjust the long-wave oscillator trimmer, then the r-f trimmer and then the antenna trimmer for maximum response. Return to 150 kc and readjust the long-wave series pad for maximum response. Return to 345 kc alignment. If readjustment is necessary, return to 150 and check the alignment. Repeat the entire procedure until no appreciable re-adjustment is required.

Short-Wave Alignment
Set the wave-band switch at the short-wave (counter-clockwise) position. Move pointer to 16, feed 16000 kc to antenna (using a 400 ohm dummy antenna) and adjust the short-wave oscillator for maximum response. If two peaks are obtained choose minimum capacity peak. Then adjust the detector and antenna trimmers for maximum response. If two peaks are obtained choose the maximum capacity peak.

GENERAL INSTRUCTIONS

The set's oscillator is higher in frequency than the signal on all three bands. Images, therefore, should be observed on the low-frequency side of the signal. Peak an oscillator trimmer and maximum capacity peaks on antenna and r-f trimmers. The last motion in adjusting trimmers should always be tightening on the screw. Either bend the plate up or remove the screw entirely. Loose screws are a source of noise, frequency drift and microphonism.

When the set is to be stored, disconnect the antenna and ground terminals. Disconnect the variable condenser as well as the oscillator to drift, due to interlocking. To compensate for this always keep returning the variable condenser to you align.

GENERAL NOTES

- An electrical photograph 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. A double-pole double-throw-switch is necessary in addition to the photograph pick-up and motor. The receiver volume control may be used to control the pick-up and terminal strip so connecting two of the terminals on the phono strip. The pick-up switch should be wired to the pick-up and terminal strip so connecting two of the terminals on the phono strip. The pick-up side of the pick-up may be permanently wired to terminal 1. When the switch is in the radio position terminal 2 (The ground terminal) must be connected to terminal 1. When the switch is in the phono position terminal 2 must be connected to terminal 1. The pick-up must be replaced across terminals 2 and 3. (See schematic diagram.)
- The receiver should never be turned on with the speaker plug out of its socket, since the rapid rise in rectifier voltage will damage the speaker.
- Pilot lights may be replaced by slipping the push-on sockets off the dial and unscrewing the bulbs. It is not necessary to remove either the dial or chassis from cabinet.
- In replacing chassis in cabinet do not tighten mounting screws so much that chassis will not float freely, and do not tighten chassis in cabinet so that the push-on sockets will not float freely on the chassis.
- One side of the power line is connected to the chassis through the filter chokes L3 (see schematic). Under no condition, therefore, should a ground wire be allowed to come in contact with any metal part of the receiver.
- When the set is to be stored, disconnect the antenna and ground terminals. Disconnect the variable condenser as well as the oscillator to drift, due to interlocking. To compensate for this always keep returning the variable condenser to you align.

Black—filament
Green—grid
Blue—cathode
Red—largest

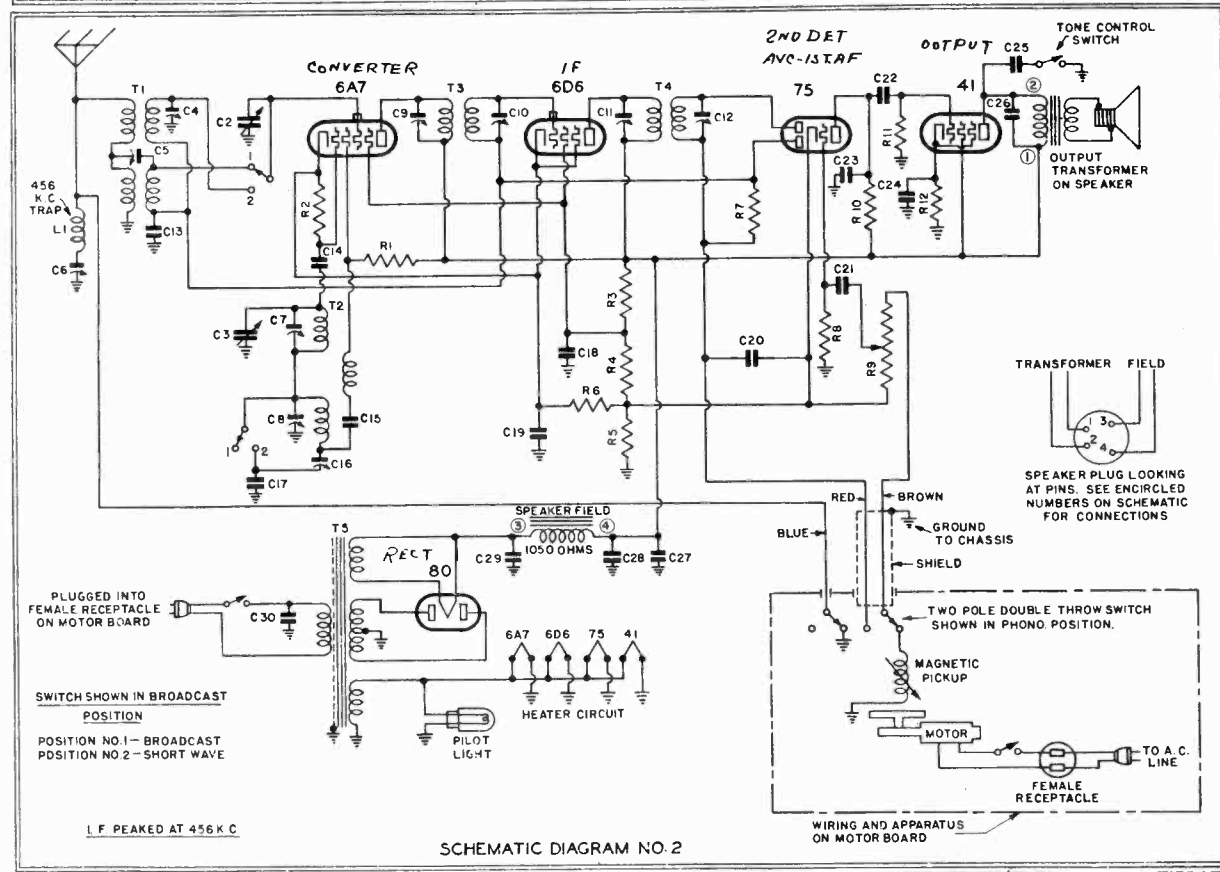
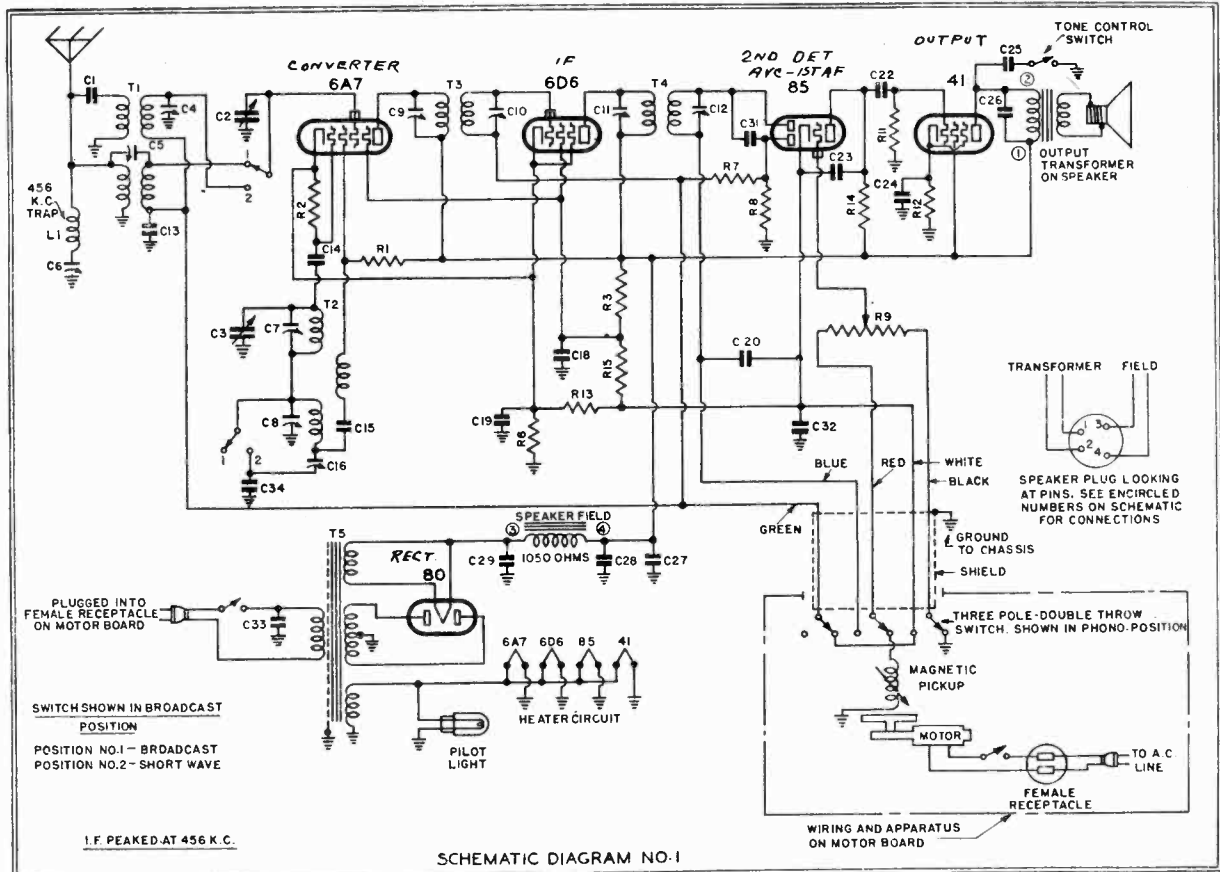
An efficient antenna system is necessary to enable a full realization of the merits of this receiver. The Emerson Alignment instructions for the installation of an efficient antenna system are included with the receiver. The receiver is designed for maximum efficiency and is equipped with an antenna system which is supplied with 0.7 amp. of current. The receiver is designed for maximum signal rejection at 456 kc. If, however, persistent interference is experienced from some particular telegraph station, readjust the wave-trap trimmer until the response is satisfactory. The receiver for 105-125 volt operation may be easily converted for 210-250 volt operation by substituting ballast tubes part no. 3MR-253 for ballast tubes part no. 3MR-251.

Voltage rating	Part no.
105-125 volts, a.c. or d.c. (with ballast tubes)	3MR-249
140-150 volts, a.c. (with ballast tubes)	3MR-250
Current drain	0.7 amp.
Frequency ranges	140 to 375 kc, 540 to 1800 kc, 5.5 to 18.0 megacycles.

Below and Above Ser. 895962
Schematics,

EMERSON RADIO & PHONO. CORP.

MODEL L143
Chassis L



MODEL L143

Chassis L

EMERSON RADIO & PHONO. CORP.

Below and Above #895962

Alignment, Voltage, Parts

Notes, Changes

Combination Phonograph and Five-Tube, A.C., Dual-Wave Superheterodyne

MODEL L143 Chassis Model L

Voltage rating 105 to 125 volts, a.c. Current drain 0.5 amp for receiver, 540 to 1750 kc, 2200 to 7500 kc.

Tube Data

The tube complement is as follows: 1-6A7, oscillator-modulator; 1-4F6, I.F. amplifier; 1-41, power output; 1-80, full-wave rectifier.

VOLTAGE ANALYSIS

Table with columns: Tube, Plate, Screen, Cathode, O.C. Plate, F.I.L. and rows for various tubes like 6A7, 4F6, 41, 80.

REPLACEMENT PARTS LIST

Large table with columns: Schematic No. 1, Schematic No. 2, Item, Part No., Description, List Price, and Price.

*Item number locates the article on the schematic diagram. †Items condensers are part of coil assemblies and will not be supplied separately. ‡See Production Changes, paragraph 3.

PRODUCTION CHANGES

- 1. Schematic No. 1 applies to receivers bearing serial numbers below 895,962. 2. Schematic No. 2 applies to receivers bearing serial numbers above 895,962. 3. The two primaries of the antenna coil, T1, were in parallel from 361,900 to 361,900. a. The two primaries of the antenna coil, T1, were in parallel from 361,900 to 361,900. b. C17 was an 0.00155 mf mica condenser.

ADJUSTMENTS

An oscillator with frequencies of 456, 600, 1600, and 6000 kc should be used. An output meter should be used across the voice coil or output transformer for observing maximum response. If the circuit is at all disturbed, both the broadcast and short-wave bands must be realigned.

Location of Coils and Trimmer Adjustments

The two I-F transformers are located on top of the chassis deck. The second I-F is one directly behind the variable condenser. The four trimmers, two for each transformer, are accessible through holes in the top of the chassis. The 456 kc wave trap is located on top of the chassis deck between the 6A7 tube and the first I-F transformer. The 6A7 tube) with the screw adjustment accessible through a hole in the top of the chassis (in the corner near the chassis deck directly behind the adjustable padding condenser. The trimmers for these coils are also accessible through holes in the top of the chassis. The trimmer nearest the front of the chassis is the short-wave antenna trimmer. The trimmer farthest from the front of the chassis is for the broadcast antenna trimmer. The trimmer nearest the front of the chassis is for the short-wave oscillator coil and the trimmer farthest from the front is for the broadcast oscillator coil.

I-F and Wave-trap Alignment

Align the I-F transformer with the broadcast position, clockwise. Set the variable condenser at the minimum capacity position and adjust the antenna lead and the wave-trap trimmer (mounted on wave-trap) for minimum response. (See paragraph 7 under General Notes)

Short-wave Alignment (Alignment of the short-wave band should precede broadcast alignment)

Use a 400 ohm dummy antenna (a 400 ohm resistor in series with the test oscillator antenna lead) in aligning the short-wave coils. Rotate the wave-trap trimmer (counter-clockwise) and the dial pointer assembly (clockwise) for maximum response and then adjust the antenna trimmer (left side of top of chassis, closest to front). Be very careful to choose the minimum capacity peak on the oscillator trimmer. (See General Instructions below.)

Broadcast Alignment

Use a standard dummy antenna in aligning the broadcast coils. (A .0002 condenser may be used as a substitute.) Rotate the wave-band switch to the broadcast position, clockwise. Set the dial pointer at 600 and feed 600 kc. Adjust the broadcast antenna trimmer (farthest from front outside the variable condenser) for maximum response. Return pointer to 600, feed 600 kc and readjust the broadcast series padder, making the variable condenser (rotate the variable condenser shaft back and forth through a small arc) for maximum response.

GENERAL INSTRUCTIONS

The set's oscillator is higher in frequency than the signal, 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. Never let the minimum capacity peak on the outside plate go loose that there is no tension on the screw. Either bend the plate up or remove the screw entirely. Always use as weak a test signal as possible during alignment.

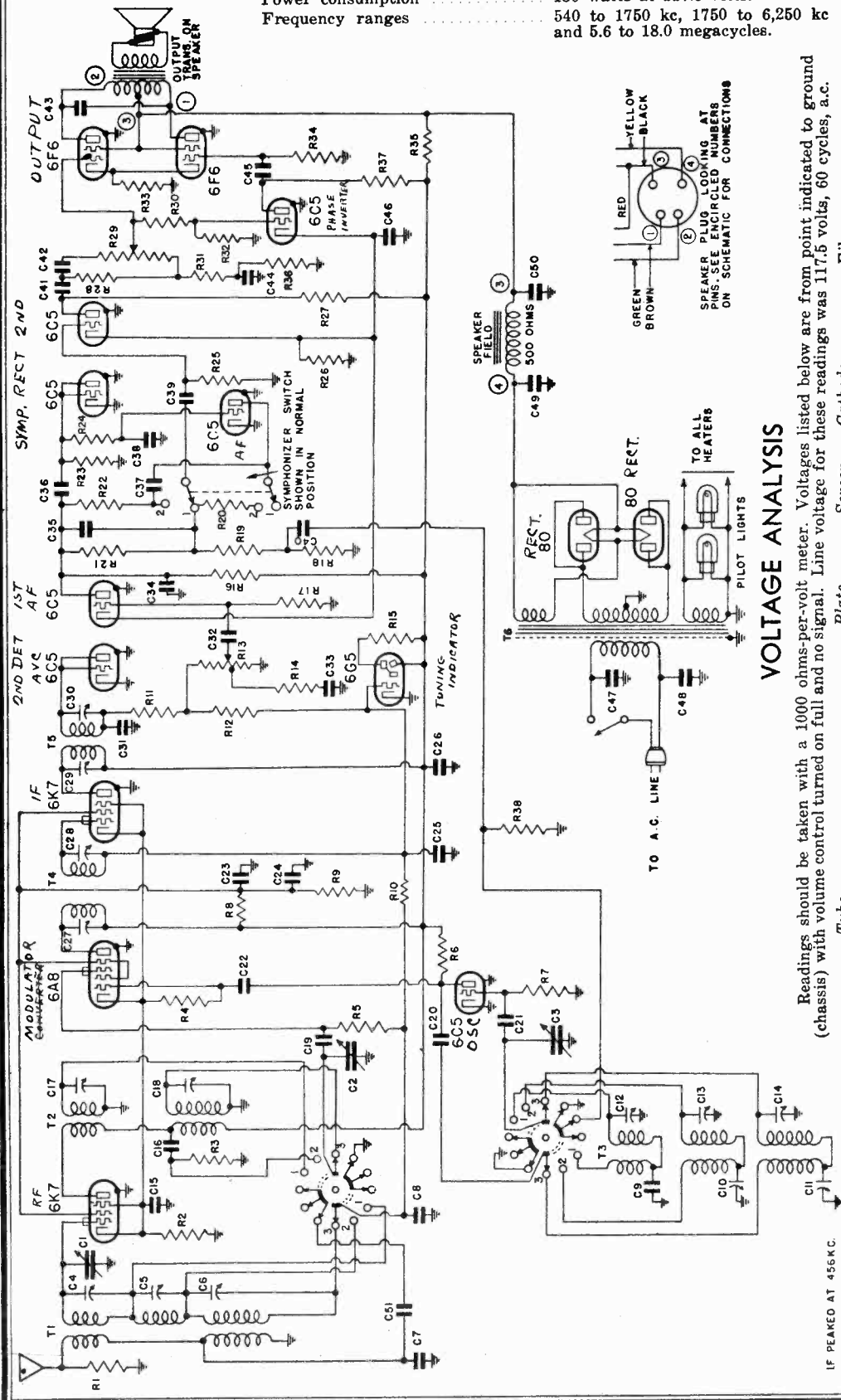
GENERAL NOTES

- 1. The receiver should never be turned on with either the speaker plug or the 41 tube out of its respective socket, since the rapid rise in rectifier voltage will damage the electrolytic condenser. 2. When replacing the chassis in the cabinet take precautions to keep any part of the dial and condenser assembly from touching the cabinet, otherwise micropneumism will result. 3. The color coding of the transformers is as follows: Grid return—black; B plus—red; Plate—blue; B minus—red. 4. 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. 5. The adjustable padding condenser for the broadcast band is mounted underneath the chassis (in the corner near the band has a fixed padder, C17 on schematic). When replacing this fixed padder be careful to use a condenser which has a capacity within 2% of the specified value, otherwise the short-wave coils may not track. 6. With a few exceptions, the color coding of the general wiring is as follows: Cathode—white or yellow; Filament—brown; Screen—brown; B plus—red; B minus—red; Plate—blue; Fil and ground—black. 7. The wave-trap in the receiver has been adjusted for maximum signal rejection at 456 kc. If, however, persistent interference is experienced from some particular telegraph station the wave-trap trimmer may be readjusted until the response from the interfering station is at a minimum. 8. The antenna lead is a standard 1/4 wave antenna lead. Complete instructions for full realization of the merits of the receiver. The Emerson All-Wave Antenna is especially designed for high efficiency and reduction of noise on both frequency ranges. Complete instructions for the installation of this antenna are supplied with each kit. 9. The phonograph motor has been adjusted at the factory to turn at a speed of 78 r.p.m. The speed may be checked by counting the turntable's revolutions by using a stroboscopic disk and a neon light. (The stroboscopic method will only give an approximate reading of the speed.) To check the speed of the motor, remove the turntable and turn the speed adjusting screw (located near the turntable shaft). A clockwise rotation of the screw decreases the speed. The speed should be checked with the pick-up and record in playing position. Phonograph motors, part No. 31P-M-2, have the speed adjustment brought out to an indicator arm and excitation. The speed of this motor is adjusted by shifting the indicator arm to the right or left.

EMERSON RADIO & PHONO. CORP.

MODEL X146
Chassis X
Schematic, Voltage

Voltage rating 105-125 volts, 60 cycles, a.c.
Power consumption 130 watts at 117.5 volts.
Frequency ranges 540 to 1750 kc, 1750 to 6,250 kc
and 5.6 to 18.0 megacycles.



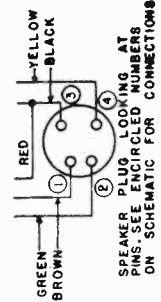
VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground (chassis) with volume control turned on full and no signal. Line voltage for these readings was 117.5 volts, 60 cycles, a.c.

Tube	Plate	Screen	Cathode	File
6K7 r-f amplifier	240	90	2	6.8 a.c.
6A8 modulator	240	90	2	6.3 a.c.
6C5 oscillator	80	—	—	6.3 a.c.
6K7 i-f amplifier	240	90	2	6.3 a.c.
6C5 diode detector	125	—	—	6.3 a.c.
6C5 1st a-f amplifier	140	—	—	6.8 a.c.
6C5 2nd a-f amplifier	140	—	—	6.8 a.c.
6C5 phase inverter	280	300	18	6.3 a.c.
6F6 output	280	300	18	6.3 a.c.
6C5 symphonizer rectifier	40	—	—	6.3 a.c.
6C5 symphonizer amplifier	40	—	—	6.3 a.c.
Voltage across speaker field—75				
Voltage at 80 filament—375				

Chassis Model X

WAVE BAND SWITCH SHOWN IN
BROADCAST POSITION
POSITION NO. 1 SHORT WAVE
POSITION NO. 2 POLICE
POSITION NO. 3 BROADCAST



MODEL XL16
Chassis X
Alignment, Notes
Parts

EMERSON RADIO & PHONO. CORP.

TUBE DATA

- The tube complement is as follows:
- 1-8K7—i-f amplifier (opposite front section of variable condenser)
 - 1-8K9—i-f amplifier (opposite rear section of variable condenser)
 - 1-6C9—Oscillator (behind variable condenser)
 - 1-6K7—i-f amplifier (between i-f transformers)
 - 1-6C5—Diode detector, a.v.c. (left side of chassis nearest front)
 - 1-6C6—Diode detector, a.v.c. (right side of chassis nearest front)
 - 1-6C8—Symphonizer amplifier (left side of chassis fourth from front)
 - 1-6C8—Symphonizer amplifier (right side of chassis fourth from front)
 - 2-6F6—Periodic power output (two large tubes at rear)
 - 1-6C6—Second i-f amplifier (behind 6A8 tube)
 - 2-80—Rectifiers (beside power transformer).

REPLACEMENT PARTS

Item	Part No.	Description	List Price Subject to change without notice.
T1	3XT-335	Three-band antenna coil	\$2.00
T2	3XT-335	Three-band interstage coil	1.50
T3	3AT-269	456 kc first i-f transformer	1.95
T4	3AT-269	456 kc second i-f transformer	1.90
T5	3AT-261	Power transformer	1.90
T6	3XT-338	50.0 ohm, 1/2 watt carbon resistor	6.80
T7	3XT-270	50.0 ohm, 1/4 watt carbon resistor	1.16
T8	LR-61	200,000 ohm, 1/4 watt carbon resistor	1.16
T9	LR-61	200,000 ohm, 1/4 watt carbon resistor	1.16
R1	KR-57	1 megohm, 1/2 watt carbon resistor	1.16
R2	KR-57	1 megohm, 1/2 watt carbon resistor	1.16
R3	R10, R11, R12, R13, R14, R15, R16, R17, R18, R19	50,000 ohm, 1/4 watt carbon resistor	1.16
R4	R20, R26	10,000 ohm, 2 watt carbon resistor	2.28
R5	R21, R22, R23, R24, R25	12,000 ohm, 2 watt carbon resistor	2.28
R6	R26, R27	2 megohm, 1/2 watt carbon resistor	1.16
R7	R28, R29	5 megohm, 1/2 watt carbon resistor	1.16
R8	R30, R31, R32, R33, R34	15,000 ohm, 1/2 watt carbon resistor	1.16
R9	R35	75,000 ohm, 1/2 watt carbon resistor	1.16
R10	R36	3 megohm, 1/2 watt carbon resistor	1.16
R11	R37	5 megohm, 1/2 watt carbon resistor	1.16
R12	R38	500,000 ohm, 1/2 watt carbon resistor	1.16
R13	R39	35,000 ohm, 1/4 watt carbon resistor	1.16
R14	R40	15,000 ohm, 2 watt wire-wound resistor	1.16
R15	R41	25,000 ohm, 1/4 watt carbon resistor	1.16
R16	R42	Three-gang variable condenser with gear train for dial	7.00
R17	R43	0.00001 part of antenna coil	20
R18	R44	0.005 mf, 200 volt tubular condenser	20
R19	R45	0.0033 mf mica condenser	35
R20	R46	Dual adjustable padding condenser	95
R21	R47	Trimmer part of oscillator coil C11—300 to 600 mmf	20
R22	R48	0.25 mf, 200 volt tubular condenser	20
R23	R49	0.01 mf, 400 volt tubular condenser	20
R24	R50	0.0001 mf mica condenser	20
R25	R51	4 mf, 150 volt tubular dry electrolytic condenser	1.06
R26	R52	0.02 mf, 200 volt tubular condenser	20
R27	R53	0.1 mf, 400 volt tubular condenser	20
R28	R54	Trimmer part of second i-f transformer	20
R29	R55	0.0005 part of second i-f transformer	20
R30	R56	0.5 mf, 400 volt tubular condenser	35
R31	R57	0.02 mf, 200 volt tubular condenser	20
R32	R58	0.012 mf, 400 volt tubular condenser	20
R33	R59	0.012 mf, 400 volt tubular condenser	20
R34	R60	0.05 mf, 400 volt tubular condenser	20
R35	R61	5 mf, 25 volt tubular dry electrolytic condenser	30
R36	R62	0.01 mf, 400 volt moulded type paper condenser	20
R37	R63	30 mf, 400 volt wet electrolytic condenser	1.46

*Item number locates the article on the schematic diagram.
†These trimmer condensers are part of the coil assemblies and can not be supplied separately.

ADJUSTMENTS

An oscillator with frequencies of 455, 600, 1600, 1800, 6000 and 18,000 kc should be used. An output meter should be used across the voice coil or speaker output transformer for observing maximum response.

Use a standard dummy antenna for aligning any of the three bands. A .00022 mf condenser may be used for broadcast band, and the 400 ohm non-inductive resistor for the short-wave band dummy antenna.

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 trimmer.

Align the trimmer by adjusting trimmer capacity peak and maximum capacity peaks on antenna trimmer.

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

Align the trimmer by adjusting trimmer capacity peak and maximum capacity peaks on antenna trimmer. To drift, due to interlocking. To compensate for this always keep tuning the variable condenser as the trimmers are being adjusted.

Location of Coils and Trimmer Adjustments

The i-f transformers are located on the left-hand side of the top of the chassis. The first i-f transformer is the one nearest the rear of the chassis. The four trimmers for the i-f adjustment are available through holes in the tops of the cans.

The antenna coils for the three bands are wound on one form located on the front wall of the chassis with the trimmer on the top. The gold pointer is for the broadcast band, the right-hand trimmer for the short-wave band and the central trimmer is for the broadcast band, the right-hand trimmer for the variable condenser. The trimmer is accessible through holes in the top of the chassis. The trimmer closer to the variable condenser is for the broadcast band. The trimmer farthest from the variable condenser is for the broadcast band. The trimmer closest to the variable condenser is for the broadcast band, the trimmer farthest from the variable condenser is for the broadcast band and the central trimmer is for the broadcast band.

The antenna coils are wound on one form and mounted directly behind the i-f interstage coils. The trimmer for the broadcast band is mounted underneath the chassis near the ceiling. The trimmer for the short-wave band is mounted underneath the chassis near the ceiling. The trimmer for the broadcast band is mounted underneath the chassis near the ceiling. The trimmer for the broadcast band is mounted underneath the chassis near the ceiling. The trimmer for the broadcast band is mounted underneath the chassis near the ceiling.

The adjusting screws are available through holes in the top of the chassis. The padder nearest the front of chassis is for the broadcast band. The padder for the short-wave band is a .00383 fixed mica condenser. If this condenser is to be replaced use a constant mica condenser (about 2%) of that specified.

Feed 455 kc to the grid cap of the 6A8 tube through a variable condenser at the minimum capacity position. Feed 456 kc to the grid cap of the 6A8 tube through a .02 mf condenser and adjust the four i-f trimmers for maximum response. (Do not remove the grid clip from the tube.)

The three bands should be aligned in the following order: Short-wave band first, police-band second, and broadcast-band last.

Short-Wave Alignment

Both pointers on the dial should coincide vertically at 890 kc. (For adjustment the gold pointer may be slipped around on its shaft.)

Set the wave-band switch at the short-wave (counter-clockwise) position. Move the dial pointer to 18 and feed 18,000 kc to the antenna coil and adjust the short-wave oscillator trimmer for maximum response. If two peaks are obtained choose the minimum capacity peak.

Trimmers for maximum response. If two peaks are obtained choose the maximum capacity peak.

Police Alignment

Set the wave-band switch at the police-band (central) position and the dial pointer at 1.8. Feed 1,800 kc to the antenna coil and adjust the police-band trimmer for maximum response. Then adjust the trimmer for maximum response. Note the interstage coil on this band has no trimmer adjustment. Return the dial pointer to 1.8, feed 1,800 kc to the antenna and rock the variable condenser while readjusting the series padder for maximum response. Return to 6,000 kc and check alignment. If readjustment is necessary return to 1,800 kc and repeat entire procedure.

Broadcast Alignment

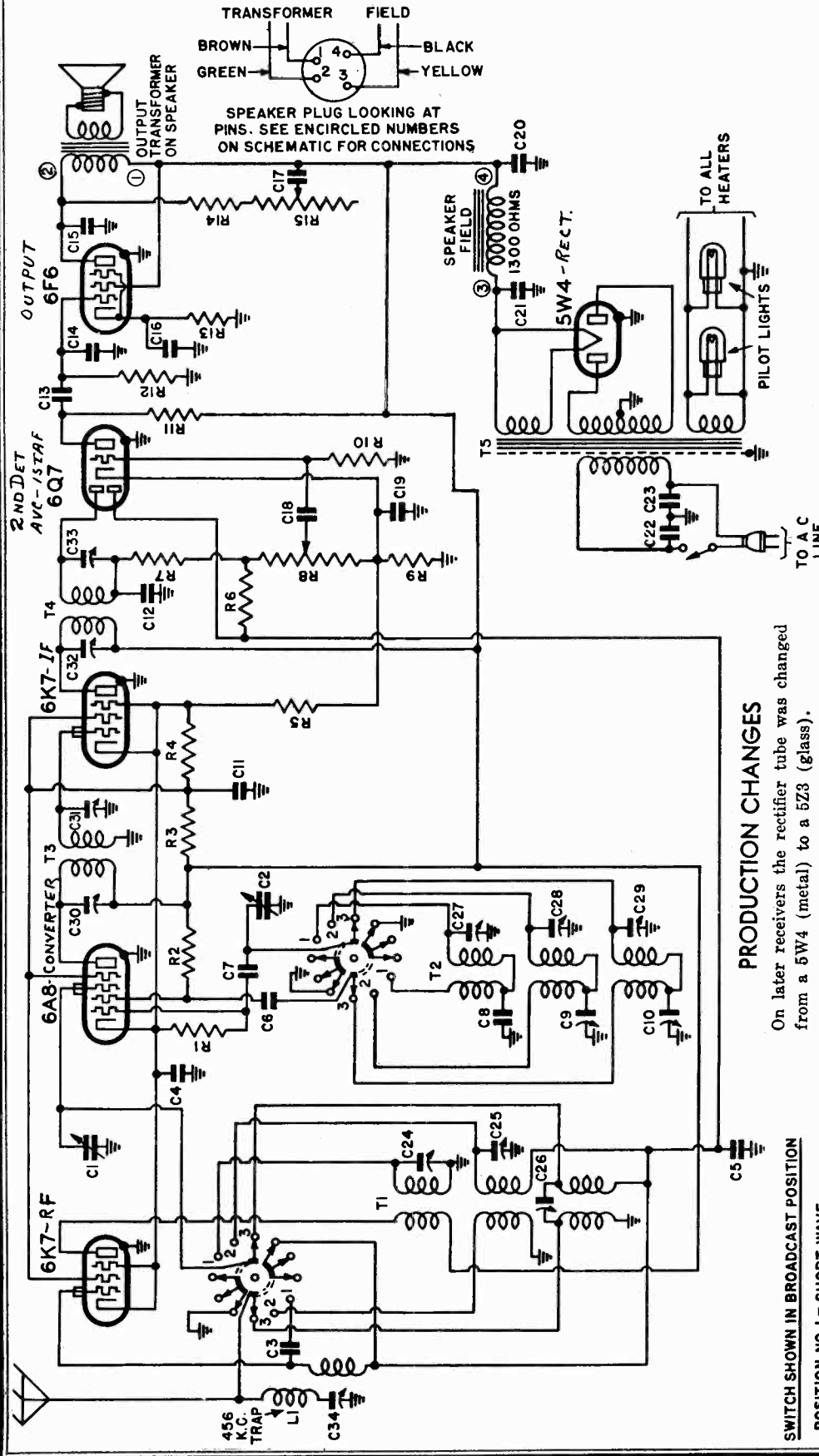
Set the wave-band switch at the broadcast (clockwise) position, and the dial pointer at 60. Feed 600 kc to the antenna coil and adjust the broadcast-band series padder for maximum response. Move the dial pointer to 1,600, feed 1,600 kc and adjust the oscillator coil for maximum response. Return the dial pointer to 60, feed 600 kc and rock the variable condenser while adjusting the series padder for maximum response. Return to 1,600 kc and check alignment. If readjustment is necessary return to 600 and repeat entire procedure.

GENERAL NOTES

- The receiver should never be turned on with either the speaker plug or the 6F6 tubes out of their sockets, since the rapid rise in rectifier voltage would damage the electrolytic condensers.
- Plot lights may be replaced by slipping the push-on sockets off the dial and unscrewing the bulbs. It is not necessary to remove either the dial or chassis from cabinet.
- In replacing chassis in cabinet do not tighten mounting screws so much that chassis will not float freely, and do not allow any part of the dial assembly to touch the cabinet. Do not push control knobs on so far that they touch the cabinet front panel. If these precautions are not observed the receiver may become microphonic.
- The color coding of the power transformer leads is as follows:
Primary—two black leads
High voltage sec.—two red leads
High voltage-secondary center tap—red and yellow lead
Shield—cathode
Sed—target
- The tuning indicator (6G5 tube) is mounted in the cabinet above the dial. The color coding of the tuning indicator tube cable is as follows:
Black—filament
Green—grid
Red—target
- An efficient antenna system is necessary to enable a full realization of the merits of the receiver. The Emerson All-Wave Antenna is especially designed for high efficiency and reduction of noise on all frequency ranges. Complete instructions for the installation of this antenna are supplied with each kit.

EMERSON RADIO & PHONO. CORP.

MODELS S147, S151
Chassis S
Schematic, Voltage
Changes



IF PEAKED AT 456 K. C.

PRODUCTION CHANGES

On later receivers the rectifier tube was changed from a 5W4 (metal) to a 5Z3 (glass).

VOLTAGE ANALYSIS

Readings should be taken with a 1000 ohms-per-volt meter. Voltages listed below are from point indicated to ground, with no signal. Line voltage for these readings was 117.5 volts, 60 cycles.

Tube	Plate	Screen	Control Grid	Osc. Plate	Fil.
6K7-R-f amp.	230	90	2.8	—	6.3 a.c.
6A8-Osc.-mod.	230	90	2.8	140	6.3 a.c.
6K7-I-f amp.	230	—	2.8	—	6.3 a.c.
6Q7-2nd det.	118	—	1.4	—	6.3 a.c.
6F6-Output	215	230	14	—	6.3 a.c.

Voltage across speaker field—80 volts.
Voltage from 5W4 filament to ground—310 volts.

SWITCH SHOWN IN BROADCAST POSITION
POSITION NO. 1 - SHORT WAVE
POSITION NO. 2 - POLICE
POSITION NO. 3 - BROADCAST

Chassis Model S

Voltage rating 105-125 volts a.c.
Current drain 0.55 amps.
Frequency ranges 550 to 1750 kc.,
1750 to 5500 kc.,
5.7 to 18.0 megacycles.

EMERSON RADIO & PHONO. CORP.

MODELS S147, S151
Chassis S
Alignment, Notes
Parts

Tube Data

- The tube complement is as follows:
1-6K7-R-f amplifier (Right-hand front corner)
1-6X4-rectifier tube (Between l-f transformers)
1-607-Second detector, a.v.c., a-f amplifier
1-6Y6-Pentode output
1-6W4-Full-wave rectifier

REPLACEMENT PARTS LIST PRICES SUBJECT TO CHANGE WITHOUT NOTICE

Table with columns: Part No., Description, Price. Includes items like 2PT-285 456 kc wave-trap, 38T-306 Antenna choke coil, 38T-304 Three-band oscillator coil, etc.

WHEN ORDERING REPLACEMENT PARTS SPECIFY PART NUMBERS.

*When number locates the article on the schematic diagram.
†These trimmers are part of the coil assemblies and can not be supplied separately.

ADJUSTMENTS

An oscillator with frequencies of 456, 600, 1600, 1800, 6000 and 15000 kc should be used.
An output meter should be used across the voice coil or speaker output transformer for observing maximum response.

Location of Coils and Trimmers

The l-f transformers are in oblong coil cans located on the top of the chassis. The four trimmers, two for each transformer, are available through holes in the tops of the cans. The trimmer for the wave-trap is available through a hole in the top of the chassis deck at the rear, near the rectifier tube.

l-f and Wave-trap Alignment

Set the wave-band switch at the broadcast (clockwise) position and the variable condenser at the minimum capacity position. Set the antenna and speaker dummy antenna at 1600 kc. Adjust the four l-f trimmers carefully for maximum response.

Broadcast Alignment

With the wave-band switch at the broadcast (clockwise) position, set the pointer at 60, feed 600 kc through the antenna (using a standard dummy antenna), and adjust the broadcast series padder for maximum response.

Short-Wave Alignment

Set the wave-band switch at the short-wave (counter-clockwise) position. Move pointer to 15, feed 16000 kc to antenna (using a 400 ohm dummy antenna), and adjust the short-wave oscillator for maximum response.

GENERAL INSTRUCTIONS

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. Images, therefore, should be observed on the low-frequency side of the signal.

GENERAL NOTES

- 1. The wave-trap in the receiver has been adjusted for maximum signal rejection at 456 kc. If, however, persistent interference is experienced from some particular telegraphic station, readjust the wave-trap trimmer until the response from the interfering station is at a minimum.
2. The receiver should never be turned on with either the speaker plug or the 6F5 tube out of their sockets, since the rapid rise in rectifier voltage would damage the electrolytic condensers.
3. Pilot lights may be replaced by slipping the push-on sockets off the dial and unscrewing the bulbs. It is not necessary to remove either the dial or chassis from cabinet.
4. In replacing chassis in cabinet do not tighten mounting screws so much that chassis will not float freely, and do not allow any part of the dial assembly to touch the cabinet. Do not push control knobs on so far that they touch the cabinet front panel. If these precautions are not observed the receiver may become microphonic.
5. The color coding of the power transformer leads is as follows:
Primary—two green leads
High voltage sec.—two black leads
High voltage sec. center tap—yellow
6. An efficient antenna system (aerial) is necessary to enable a full realization of the merits of the receiver. The Emerson All-Wave Antenna is especially designed for high efficiency and reduction of noise on all three frequency ranges. Complete instructions for the installation of this antenna are supplied with each set.

MODEL AG151
Chassis AG
Alignment, Notes
Parts

EMERSON RADIO & PHONO. CORP.

REPLACEMENT PARTS

Part No.	DESCRIPTION	PRICE
3PT-283	Adjustable 456 kc wave-trap	.60
3ET-299	R-f choke wound on wooden dowel	.40
3AT-257	Short-wave antenna coil	1.06
3MT-301	Long-wave antenna coil	.96
3AT-251	Broadcast antenna coil	.85
3MT-302	Long-wave detector coil	1.05
3AT-252	Broadcast detector coil	.95
3MT-303	Long-wave oscillator coil	.60
3AT-253	Broadcast oscillator coil	.55
3MT-304	Double-tuned 456 kc r-f transformer	2.75
3AT-254	Double-tuned 456 kc second i-f transformer	1.90
3MT-305	410 ohm 1/2 watt wire-wound molded resistor	.16
3CR-295		
FR-53	50,000 ohm 1/4 watt carbon resistor	.16
FR-54	510,000 ohm 1/4 watt carbon resistor	.16
LR-286	20,000 ohm 1/4 watt carbon resistor	.16
LR-60	25,000 ohm 1/4 watt carbon resistor	.16
KR-57	1 megohm 1/4 watt carbon resistor	.16
GR-56	2,000 ohm 1/4 watt carbon resistor	.16
XR-56	500,000 ohm 1/4 watt carbon resistor	.16
OR-78	150,000 ohm 1/4 watt carbon resistor	.16
OR-79	250,000 ohm 1/4 watt carbon resistor	.16
4GR-300	75,000 ohm 1/4 watt carbon resistor	.16
PR-79	1,000 ohm 1/4 watt carbon resistor	.16
MR-251	Tone control—100,000 ohms	.80
IR-181	1,000 ohm 1/2 watt wire-wound molded resistor	.16
PR-252	Volume control—250,000 ohms	.75
LR-54	5,000 ohm 1/4 watt carbon resistor	.16
LR-64	5,000 ohm 1/4 watt carbon resistor	.16
3MR-254	315 ohm wire-wound tapped resistor	.60
3MZ-419	R26—40 ohms; R28—40 ohms; R29—195 ohms	.40
3MR-253	Ballast tube for 105-125 volt operation	1.10
3AC-276	Ballast tube for 210-250 volt operation	7.40
BC-12	Three-gang variable condenser	.90
KC-38	0.05 mf, 200 volt roll type condenser	.20
AAC-114	0.01 mf, 400 volt roll type condenser	.30
	0.001 mf mica condenser	
	Trimmer, part of 456 kc wave-trap	
3AC-278	Mica trimmer, range—1/2 to 12 mmf	.15
EC-24A	0.0001 mf mica condenser	.20
AC-6	0.1 mf, 200 volt roll type condenser	.20
NNC-188	0.05 mf, 200 volt roll type condenser	.20
AAC-106A	Trimmer, part of oscillator coil	.90
XXC-197	0.00035 mf mica condenser	.45
3MC-295	0.00388 mf mica condenser	.60
	Dual adjustable padding condenser	
	Trimmer, part of 456 kc wave-trap	
	Trimmer, part of 456 kc second i-f transformer	
	0.00025 mf mica condenser	
AC-7A	0.05 mf, 400 volt roll type condenser	.20
3MC-292	80 mf, 150 volt wet electrolytic condenser	1.80
3MC-291	50 mf, 150 volt wet electrolytic condenser	1.45
3MC-290	50 mf, 200 volt wet electrolytic condenser	1.45
3MC-289	0.1 mf, 400 volt a.c. roll type condenser	.30
3MC-288	0.1 mf, 400 volt a.c. roll type condenser	.30
KVC-145	80 dynamic speaker	1.95
4CS-240	80 dynamic speaker	2.25
3BS-226	Wave-band switch	.55
3LD-41	On-off switch	.20
3M7-422	Pilot light, 6.3 volt, 25 amp, Mazda No. 46	1.20
3A7-369	Trimmer assembly with band-indicator mechanism	1.50
3A7-370	Dial face	.50
3A7-370	Idle pulley spring	.05

*Item number locates the article on the schematic diagram.
†These trimmers cannot be supplied separately.

GENERAL NOTES

1. 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. A double-pole, double throw-switch is necessary in addition to the phonograph pick-up and motor. The receiver volume control may be turned to minimum. Connect the link between the two of the terminals on the phono and the pick-up. The phono should be plugged into the pick-up terminal and the other terminal should be plugged into the "phono" terminal. The ground 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 terminal 2 and 3 should be shorted together and the pick-up disconnected from terminal 2. A matching input transformer must be connected in series with the pick-up. (See Note 3.) The phono plug should be permanently disconnected, the small connector must be pushed up into the top of the plug. (See Note 3.)
2. The receiver should never be turned on with the speaker plug out of its socket, since the rapid rise in rectifier voltage would damage the electrolytic condenser.
3. Pilot lights may be replaced by slipping the push-on sockets off of its socket, and unscrewing the bulbs. It is not necessary to remove either the dial chassis or the front panel to change the bulbs. The receiver should be turned off and the chassis disconnected from the power line before attempting to change the bulbs. Do not push control knobs on or so far that they touch the cabinet front panel. If these precautions are not observed the receiver may become microphonic.
4. One side of the power line is connected to the chassis. Under no condition, therefore, should a ground wire be allowed to come in contact with any internal part of the receiver.
5. The receiver should be kept in a dry place to insure full realization of the merits of the receiver. For reduction of noise and achievement of high efficiency on all frequency ranges the Emerson All-Wave High Fidelity Antenna, Model W-78, or the Emerson All-Wave Antenna System, Model W-39, are recommended. Complete instructions for the installation of these antennas are supplied with each kit.
6. The wave-trap in the set has been adjusted for maximum signal rejection at 456 kc. If, however, persistent interference is being received from a nearby telegraphic station, readjust the wave-trap trimmer until the response from the interfering station is at a minimum.
7. The receiver for 105-125 volt operation may be easily converted for 210-250 volt operation by substituting ballast tubes part no 3MR-253 for ballast tubes part no. 3MR-254.

ADJUSTMENTS

- An oscillator with frequencies of 150, 345, 455, 600, 1600 and 16000 kc should be used.
- Use standard dummy antenna for aligning any of the three bands. A .0002 mf condenser may be used for the medium-wave band and the long-wave band dummy antenna and a 400 ohm non-inductive resistor for the short-wave dummy antenna.
- Always use as weak a test signal as possible when aligning the receiver.
- Set the set oscillator to the frequency of the signal.
- Always choose the minimum capacity peak on oscillator trimmer and maximum capacity peaks on antenna and r-f trimmers. The last motion in adjusting trimmers should always be a tightening one.
- Never leave a 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 source of noise, frequency drift and microphonism.
- In aligning the receiver, the following points should be observed:
- 1—Align the antenna trimmer with the variable condenser as you align.

MODEL AG-151

Chassis Model AG
Voltage rating 105-125 volts, a.c. or d.c.
210-250 volts, a.c. or d.c. (with ballast tubes part no. 3MR-419)

- Current drain 0.7 amps.
Frequency ranges 140 to 375 kc, 540 to 1800 kc, 5.5 to 18.0 megacycles.

TUBE DATA

- 1-6K7—R-f amplifier (on tuner unit)
- 1-6A8—Pentagrid modulator-oscillator (on tuner unit)
- 1-6D8—I-f amplifier
- 1-6C6—A-f amplifier
- 1-6E6—A-f amplifier
- 2-251F—Push-pull pentode output
- 2-252F—Half-wave rectifiers
- 2-3MR-419—Ballast tubes for 105-125 volt operation
- 2-3MR-253—Ballast tubes for 210-250 volt operation

Both pointers on the dial should coincide vertically at 890 kc. For adjustment, the gold pointer may be slipped around its shaft. With the wave-band switch at the medium-wave (clockwise) position, set the pointer at 60, feed 600 kc through the antenna (using a standard dummy antenna), and adjust the medium-wave series paddler for maximum response. Move pointer to 1600, feed 600 kc to the antenna and adjust the oscillator trimmer for maximum response, then return the pointer to 890 kc. Repeat the above procedure for the long-wave and short-wave bands. Repeat the above procedure (rotate the condenser back and forth through a small arc) while readjusting the oscillator trimmer for maximum response. Return to 1600 and check alignment. If readjustment is necessary, return to 600 and repeat entire procedure.

Long-Wave Alignment

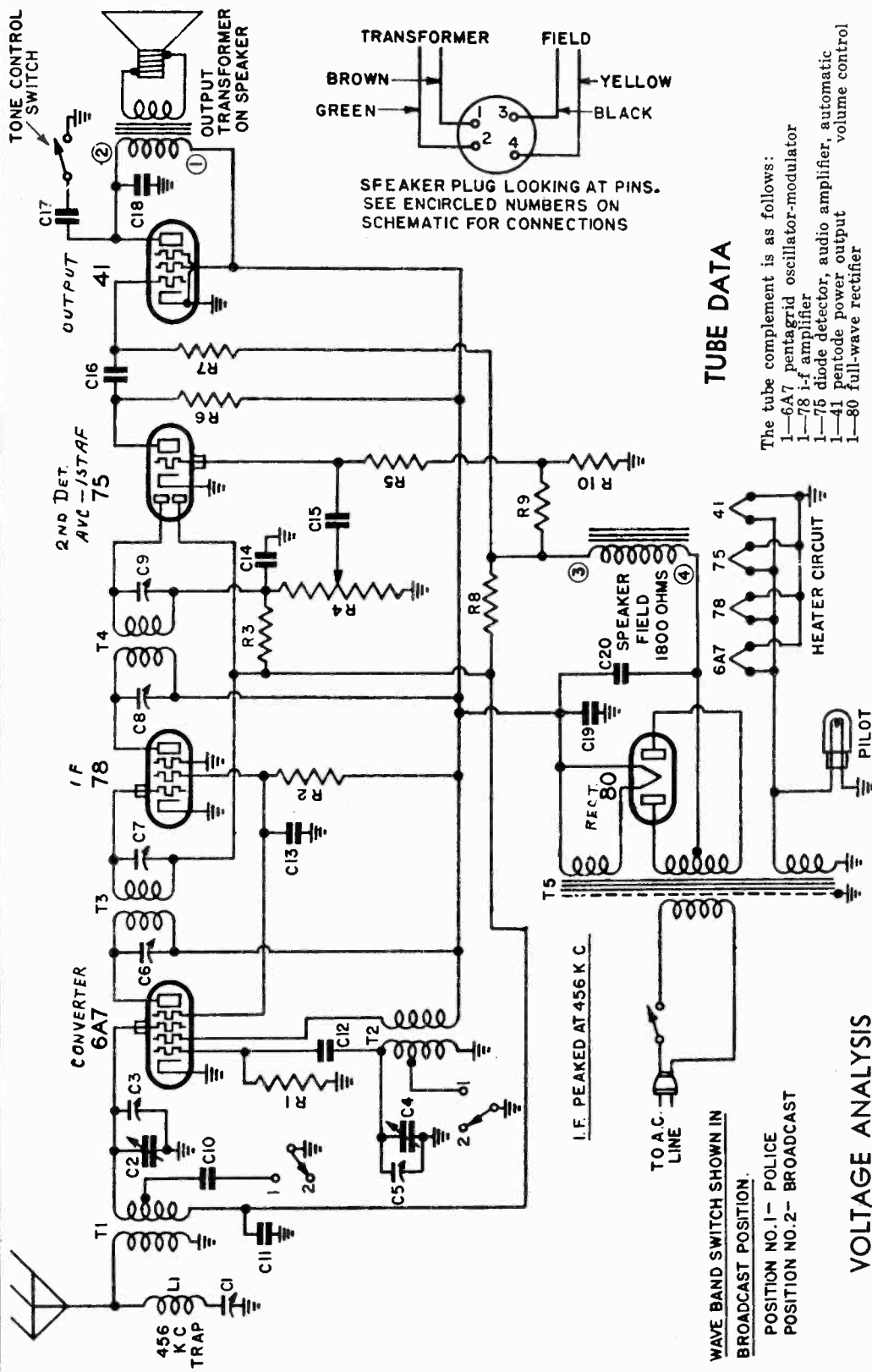
Set the wave-band switch at the long-wave (central) position and the pointer to 150. Feed 150 kc through a standard dummy antenna to the antenna terminal and adjust the long-wave series paddler for maximum response. Move the pointer to 345, feed 345 kc and adjust the long-wave oscillator trimmer, then the r-f trimmer and then the antenna trimmer for maximum response. Return to 150 kc and re-adjust the long-wave series paddler for maximum response. Return to 345 kc and readjust the antenna trimmer. Return again to 150 and check the alignment. Repeat the entire procedure until all three bands are in alignment. Readjustment is required.

Short-Wave Alignment

Set the wave-band switch at the short-wave (counter-clockwise) position. Move pointer to 16, feed 16000 kc to antenna terminal and adjust the antenna trimmer for maximum response. Then adjust the antenna trimmer for two peaks. The peaks are obtained choose the maximum capacity peak.

EMERSON RADIO & PHONO. CORP.

MODELS R152, R153, R156
R158
Chassis R
Schematic, Voltage



TUBE DATA

The tube complement is as follows:
 1-6A7 pentagrid oscillator-modulator
 1-78 i-f amplifier
 1-75 diode detector, audio amplifier, automatic volume control
 1-41 pentode power output
 1-80 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 117.5 volts, 60 cycles, a.c.

Tube	Plate	Screen	Cathode	Osc. Plate	Fil.
6A7	182	70	0	182	6.3
78	182	70	0	—	6.3
75	87	—	0	—	6.3
41	165	182	0	—	6.3

Voltage across speaker field—70.
 Voltage from B minus to chassis—80.

VOLTAGE ANALYSIS

Chassis Model R

Listed by Underwriters Laboratories

Voltage rating 105-125 volts a.c.
 Power consumption 45 watts
 Frequency ranges 540 to 1580 kc.
 and 1580 to 4200 kc.

B plus at 80 filament—262.

MODELS R152, R153
R156, R158
EMERSON RADIO & PHONO. CORP.
Chassis R
Alignment, Changes
Notes, Parts

REPLACEMENT PARTS

Part No.	DESCRIPTION	Part No.	PRICE
MMT-149A	456 kc wave-trap		.60
3RT-318	Two-band antenna coil		.85
3RT-319A	Two-band oscillator coil		.80
3RT-320	456 kc first i-f transformer		1.10
3RT-321	456 kc second i-f transformer		1.10
3RT-322	Power transformer		3.20
KR-63U	50,000 ohm 1/4 watt carbon resistor		.16
3LR-265U	40,000 ohm 1/4 watt carbon resistor		.16
NNR-220U	3 megohm 1/4 watt carbon resistor		.16
3FR-256A	Volume control with switch—500,000 ohms		1.00
3RR-274U	5 megohm 1/4 watt carbon resistor		.16
KR-55U	250,000 ohm 1/4 watt carbon resistor		.16
KR-56U	500,000 ohm 1/4 watt carbon resistor		.16
3RR-275U	10 megohm 1/4 watt carbon resistor		.16
3RR-276	310 ohm 1/2 watt wire-wound resistor		.16
3RR-266	23 ohm 1/2 watt wire-wound resistor		.16
3RC-317	Trimmer, part of 486 kc wave-trap assembly.		2.40
	Two-gang variable condenser		
	Trimmers, part of variable condenser.		
	Trimmers, part of first i-f transformer assembly.		
	Trimmers, part of second i-f transformer assembly.		
AAC-114	0.001 mf mica condenser		.20
BC-12	0.05 mf, 200 volt tubular condenser		.20
AAC-106A	0.0005 mf mica condenser		.20
IC-47A	0.0005 mf mica condenser		.20
HC-84	0.006 mf, 600 volt tubular condenser		.20
KC-58	0.01 mf, 400 volt tubular condenser		.20
QQC-173	0.015 mf, 600 volt tubular condenser		.20
3RC-318	Dual 5 mf, 300 volt dry electrolytic condenser		1.00
3RS-230	5" dynamic speaker		4.55
3RS-248A	6" dynamic speaker		4.85
3RS-231	Wave-band switch		.35
2TS-145F	Tone control switch		.05
3RM-270	Pointer shaft bearing plate		.20
3RM-269	Dial plate		.20
XL-9	Pointer light, 6.3 volt, .25 amp., Mazda No. 46		.10
3RB-38	Pilot light socket		.10
3RZ-477	Dial face		.75
3RZ-478	Condenser pulley		.15
3RZ-479	Pointer pulley		.15
3RZ-480	Drive cord spring		.02
3FZ-353	Dial pointer		.10
3CZ-350	Bronze escutcheon with crystal		1.05
3CZ-350A	Brass escutcheon with crystal		1.05

See Price List
Effective Dec. 3rd, 1936
(Subject to change without notice)

ADJUSTMENTS

An oscillator with frequencies of 456 and 1400 kc is required.

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

Location of Coils and Trimmer Adjustments

The two i-f transformers are located on top of the chassis deck. The first i-f transformer is the one directly behind the 6A7 tube. The trimmers for the two i-f transformers are available through holes in the tops of the cans.

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

The 456 kc wave-trap is mounted on the rear chassis wall directly beneath the wave-band switch. The trimmers for the 456 kc wave-trap is mounted on the coil and is accessible from the bottom of the chassis.

I-f and Wave-Trap Alignment

Rotate the wave-band switch (located on the rear wall of the chassis) to the broadcast position, clockwise, and swing the variable condenser to the maximum capacity position. Feed 456 kc to the grid-cap of the 6A7 tube and adjust the four i-f trimmers for maximum response. Feed 456 kc through a dummy antenna (a .0002 mf condenser may be used as a substitute) to the antenna lead and adjust the wave-trap trimmer for minimum response. (See General Notes, paragraph No. 1.)

Broadcast Alignment

With the wave-band switch in the broadcast position, clockwise, set the dial pointer at 140. Feed 1400 kc. through a standard dummy antenna (a .0002 mf condenser may be used as a substitute) to the antenna lead and adjust first the oscillator trimmer (on rear section of variable condenser) then the antenna trimmer (on front section of variable condenser) for maximum response. The police band is self-tracking and does not require any adjustment.

GENERAL NOTES

- The wave-trap in the receiver has been adjusted for maximum signal rejection at 456 kc. If, however, persistent interference is experienced from some particular telegraphic station, readjust the wave-trap trimmer until the response from the interfering station is at a minimum.
- The receiver should never be turned on with either the speaker plug or the 41 tube out of their sockets, since the rapid rise in rectifier voltage would damage the electrolytic condensers.
- The pilot light may be replaced by removing the snap-on socket from the dial and unscrewing the bulb. It is not necessary to remove either the dial or chassis from the cabinet.
- The color coding of the leads 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 leads is as follows:
Primary—two green leads
High voltage sec.—two black leads
High voltage sec. center tap—yellow
5 v. sec.—two heavy red leads
6.3 v. sec.—two heavy blue leads
- With a few exceptions, the color coding of the general wiring is as follows:
Aerial and cathode—white or yellow
Grid—green
Filament and ground—black
Plate—blue
B plus—red
Screen—brown
- An efficient antenna system (aerial) is necessary to enable a full realization of the merits of the receiver. The Emerson All-Wave Antenna is especially designed for high efficiency and reduction of noise on all three frequency ranges. Complete instructions for the installation of this antenna are supplied with each kit.

PRODUCTION CHANGES

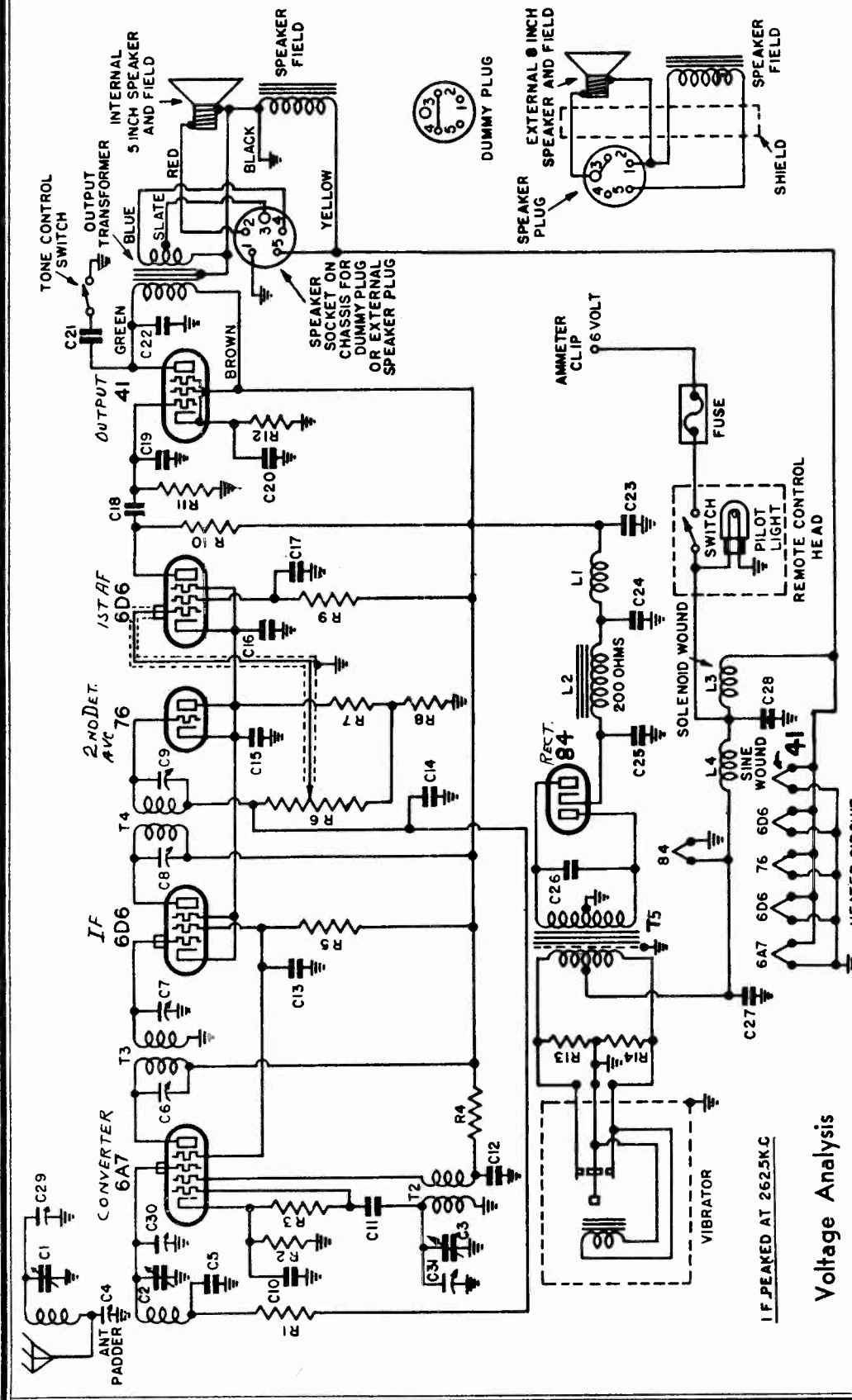
On early receivers the oscillator coil was part number 3RT-319. When replacing this coil with the new coil, part number 3RT-319A, it will be necessary to remove the short length of shielding over the white lead (lead from wave-band switch to tap on coil).

When ordering replacement parts specify part numbers.

*Item number locates the article on the schematic diagram.
†These trimmers are part of coil assemblies and can not be supplied separately.
‡These trimmers are part of variable condenser and can not be supplied separately.

EMERSON RADIO & PHONO. CORP.

MODEL U154
Chassis U
Schematic, Voltage



Voltage Analysis

All voltages should be measured with a 1000 ohms-per-volt meter. Voltages measured from the point indicated to ground (chassis) with no signal and volume control turned on full. Readings taken with battery voltage of 6.3 volts. Voltage across heaters—6.0. Voltage across speaker field—6.0.

Tube	Plate	Screen	Cathode	Osc. Plate
6A7	230	60	5.1	155
6D6 i-f (in corner)	230	60	3.4	—
76	3.4	—	3.4	—
6D6 a-f	20	20	3.4	—
41	235	230	14.5	—

Voltage rating . . . 6.3 volts
(6 volt storage battery).
Current drain . . . 6.1 amps.
Frequency range 540 to 1530 kc.

MODEL U154
Chassis U
Alignment, Notes
Parts

EMERSON RADIO & PHONO. CORP.

Tube Data

The tube complement is as follows:

- 1-6A7 pentagrid oscillator-modulator
- 1-6D6 i-f amplifier (in corner of chassis)
- 1-76 diode detector, a.v.c.
- 1-6D6 a-f amplifier
- 1-41 power output pentode
- 1-84 full-wave thermionic rectifier
- 1 primary type vibrator.

The function of the vibrator is to convert the direct current from the battery into alternating current to actuate the power transformer. The stepped-up voltage is then rectified into direct current by the 84 tube for use as plate supply.

REPLACEMENT PARTS

ITEM	PART NO.	DESCRIPTION
T1	3UT-331	Preselector coil
T2	3UT-325	Oscillator coil
T3	3UT-332	262 kc first i-f transformer
T4	3UT-333	262 kc second i-f transformer
T5	3UT-334	Power transformer
L1	00T-166	1 millihenry r-f choke
L2	3VT-229	Iron-core filter choke
L3	00T-187B	"A" choke solenoid
L4	3VT-328	"A" choke sine wound
R1	HR-42	2 megohm 1/4 watt carbon resistor
R2	3UR-282	860 ohm 1/2 watt wire-wound resistor
R3	3VR-272	60,000 ohm 1/4 watt carbon resistor
R4	LR-60	20,000 ohm 1/4 watt carbon resistor
R5	LLR-154	75,000 ohm 1/4 watt carbon resistor
R6	3VR-267	Volume control—1 megohm
R7	3DR-289	250 ohm 1/2 watt wire-wound resistor
R8	3UR-273	750 ohm 1/2 watt wire-wound resistor
R9	KR-57	1 megohm 1/4 watt carbon resistor
R10	LLR-152	150,000 ohm 1/4 watt carbon resistor
R11	KR-56	500,000 ohm 1/4 watt carbon resistor
R12	3VR-271	510 ohm 1/2 watt wire-wound resistor
R13, R14	3VR-270	90 ohm 1/2 watt wire-wound resistor
C1, C2, C3	3VC-319	Three-gang variable condenser
TC4	FC-29	Padder condenser part of 3UT-331 preselector coil assembly
C6, C10		0.02 mf, 200 volt tubular condenser
TC8, C7		Trimmer part of 3UT-332 first i-f coil assembly
		Trimmer part of 3UT-333 second i-f coil assembly
C11, C12		0.00025 mf mica condenser
C14, C19, C28	AC-7A	0.05 mf, 200 volt tubular condenser
C13, C15, C17	BC-12	5 mf, 25 volt dry electrolytic condenser
C16	IC-43A	0.02 mf, 400 volt tubular condenser
C18	LC-65	Dry electrolytic condenser block
C20, C24, C25	3VC-320A	C20, 20 mf—35 volt. C24, 8 mf—350 volt. C25, 8 mf—350 volt.
C21	3DC-272	0.015 mf, 600 volt tubular condenser with mounting strap
C22	3VC-324	0.003 mf, 600 volt tubular condenser
C23	EEC-132	0.1 mf, 400 volt tubular condenser
C26	3UC-225	0.0075 mf, 2000 volt condenser
C27	3VC-222	0.5, mf, 50 volt tubular condenser
	00C-164	Special 0.5 mf ammeter condenser
	00C-165	Special 0.5 mf generator condenser
	3US-235	b dynamic speaker
	3VS-247	b dynamic speaker
	00S-108A	Tone control switch
	00W-53A	Shielded antenna lead
	00Z-165	Distributor suppressor
	3VZ-10	Non-synchronous vibrator
	3VZ-540	Tuning control cable
	3VZ-541	Volume control cable
TC29, C30, C31		Trimmer, part of variable condenser

*Item number locates the article on the schematic diagram.

†These trimmer condensers are part of coil assemblies and cannot be supplied separately.

‡These trimmer condensers cannot be supplied separately.

ALIGNMENT PROCEDURE

The receiver was carefully adjusted and tested at the factory, and should reach the customer in perfect condition. Under no circumstances should these adjustments be disturbed unless it is absolutely necessary, as in the repairing of a damaged set. This should be done by an experienced auto radio service man only.

I-f Alignment

To align the intermediate frequency transformers, use a good modulated oscillator set for 262.5 kc. Rotate the variable condenser to the minimum capacity position, turn the volume control on full and rotate the antenna to the chassis.

Connect the test oscillator lead, through a paper condenser (.02 mf or larger) to the grid cap of the 6A7 tube. Do not remove the grid clip from the tube. Connect an output meter across the primary of the speaker transformer or across the voice coil. Using the *smallest output* from the test oscillator that will give a definite reading on the meter, adjust the two i-f transformers for maximum response. Use a non-metallic screw driver if possible.

Radio Frequency and Oscillator Alignment

Connect the test oscillator lead through a standard dummy antenna (a .0002 mf condenser may be substituted) to the antenna connector of the receiver. Rotate the variable condenser to the minimum capacity position. Feed 1530 kc and adjust the oscillator trimmer (center) on the variable condenser for maximum response. Set the test oscillator to some frequency near 1400 kc and swing the variable until this signal is heard. Adjust the two r-f trimmers (front and rear) on the variable condenser for maximum response. Set the test oscillator for 600 kc and swing the variable until this signal is heard. Adjust the antenna padder (on chassis wall below the variable condenser) for maximum response. Reset the test oscillator to some frequency near 1400 kc and readjust the two r-f trimmers for maximum response. Reduce the output of the test oscillator and repeat this adjustment.

NOTE: The antenna padder should be readjusted when the receiver is installed in the car. (See paragraph (g) under installation instructions.)

Suppression of Ignition Interference

If, when the receiver is in operation, and the motor is running, the ignition interference is excessive the following suggestions should help to reduce it to a satisfactory level.

- By-pass dome light wire at instrument panel with a 1/2 mf condenser.
- By-pass the low tension lead to the ignition coil with a 1/2 mf condenser.
- Shield high tension lead from coil and ground to fire wall.
- Shield low tension leads to ignition coil.
- Try grounding antenna shield at various points, and also try leaving shield ungrounded, except at point where it is automatically grounded at receiver by means of the metal connector. Move all adjacent wiring slightly, and note if it may be coupling to the battery lead to receiver.
- Bond steering column to fire wall.
- Try bonding exhaust pipe, particularly if interference is increased with passengers in car.
- Bond metal cables or pipes coming through fire wall, connecting them to the fire wall. If car has wooden floor boards, place a screen underneath floor mat and note if interference is decreased, particularly with passengers in car.
- Check antenna wiring, making sure it is shielded completely.
- Try bonding windshield wiper pipe.
- Check ignition system for defects.
- When condensers are used for by-passing ignition interference, their leads should be as short as possible, since often a condenser with leads a fraction of an inch long will be very effective in places where the same condenser with longer leads would be useless.

NOTE: It is recommended that the charging rate of the car generator be increased slightly to compensate for the added drain of the receiver.

General Notes

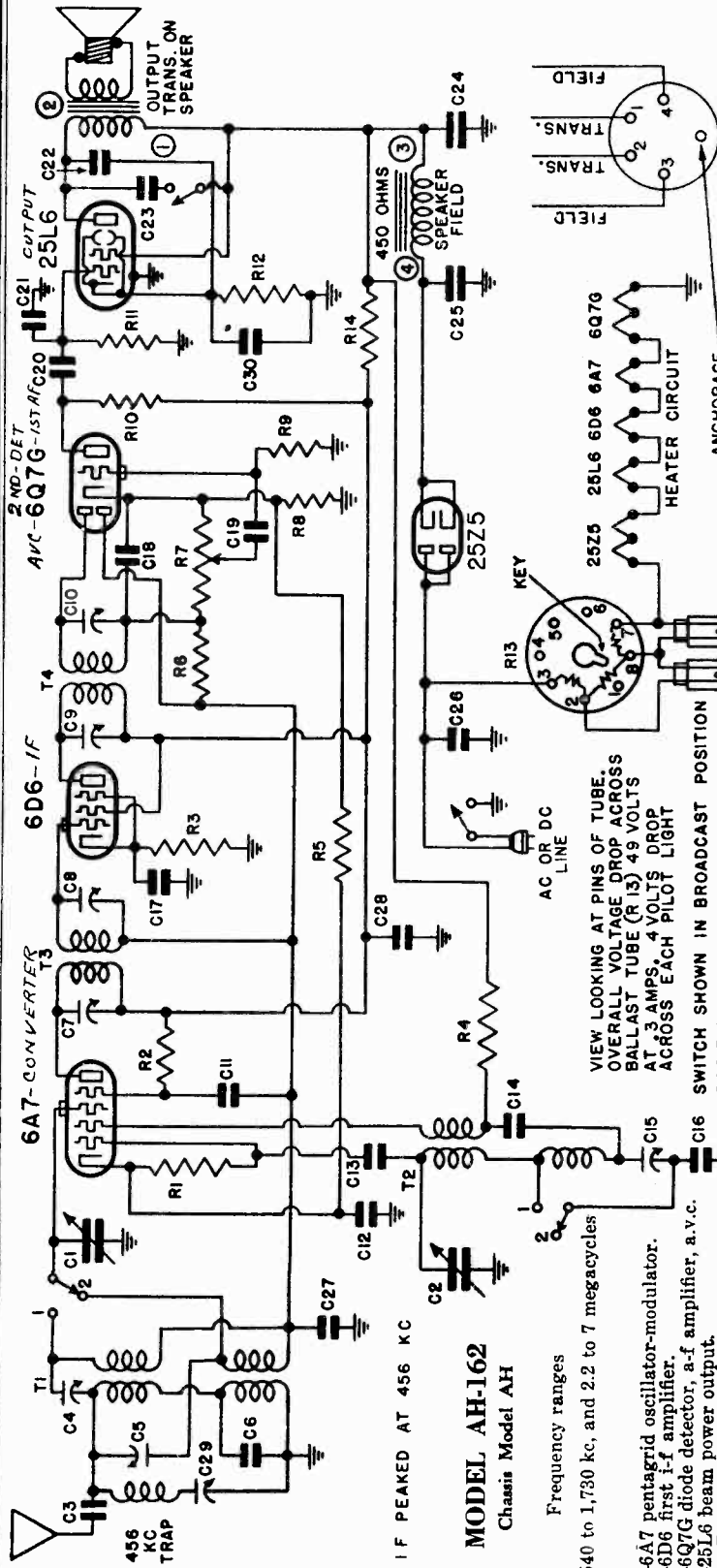
1. To remove the chassis from the case it will be necessary to unsolder the speaker leads.
2. It should be noted that one side of the speaker field is grounded to the speaker frame.
3. A 10 ampere fuse is located in a small tubular holder in the battery lead. The fuse is intended to protect the receiver and in no case should one larger than 10 amperes be used.

EMERSON RADIO & PHONO. CORP.

MODEL AH162
Chassis AH
Schematic, Changes
Parts

PRODUCTION CHANGES

In receivers bearing serial numbers below 1, 102, 142, C11 was an .01 mf, 400 volt tubular condenser.
In receivers bearing serial numbers below 1, 149, 148, C22 was connected from plate to B plus.



ITEM	PART NO.	PRICE
T1	4HT-360	Two-band antenna coil with 456 kc wave trap... \$1.70
T2	4HT-361	Two-band oscillator coil... 1.10
T3	4ET-350A	Double-tuned 456 kc first i-f transformer... 1.15
T4	4ET-351A	Double-tuned 456 kc second i-f transformer... 1.15
R1	KR-54	100,000 ohm 1/4 watt carbon resistor... .16
R2	ZZR-196	30,000 ohm 1/4 watt carbon resistor... .16
R3	3CR-296	410 ohm 1/2 watt wire-wound molded resistor... .16
R4	LR-65	10,000 ohm 1/4 watt carbon resistor... .16
R5	3RR-276	310 ohm 1/4 watt wire-wound molded resistor... .16
R6	HR-42	2 megohm 1/4 watt carbon resistor... .16
R7	3ZR-288	Volume control with line switch—500,000 ohms... 1.06
R8, R14	3CR-294	240 ohm 1/2 watt wire-wound molded resistor... .16
R9	KR-57	1 megohm 1/4 watt carbon resistor... .16
R10	KR-56	250,000 ohm 1/4 watt carbon resistor... .16
R11	KR-55	500,000 ohm 1/4 watt carbon resistor... .16
R12	3FR-293	140 ohm 1/2 watt wire-wound molded resistor... .16
R13	3CR-241	Plug-in ballast resistor... .80
C1, C2	4HC-343	Two-gang variable condenser... 3.95
C3, C11	3HC-274	0.002 mf, 600 volt tubular condenser... .20
+C4, C5	C29	Trimmer, part of antenna coil assembly
C6	11C-138A	0.000025 mf mica condenser... .20
+C7, C8		Trimmer, part of first i-f transformer.
+C9, C10		Trimmer, part of second i-f transformer.
C14	KC-58	0.01 mf, 400 volt tubular condenser... .20
C12, C28	AC-6	0.1 mf, 200 volt tubular condenser... .20
C13	AAC-108A	0.00005 mf mica condenser... .20
C15	2NC-291	Single adjustable padding condenser range—300 to 600 mmf... .30
C16	3LC-327	0.0018 mf mica condenser... .20
C17, C19	FC-29	0.02 mf, 200 volt tubular condenser... .20
C18, C21	LC-65	0.02 mf, 400 volt tubular condenser... .20
C20	AC-7A	0.00025 mf mica condenser... .20
C22	QC-C-173	0.015 mf, 600 volt tubular condenser... .20
C23	EC-23	0.03 mf, 400 volt tubular condenser... .20
C24, C26	4HC-348	Dual 20 mf, 150 volt, dry electrolytic condenser in cardboard... 1.50
C25	3EC-326A	0.05 mf, 400 volt molded type paper condenser... .20
C27	BC-12	0.05 mf, 200 volt tubular condenser... .20
C30	IC-43A	5 mf, 25 volt tubular dry electrolytic condenser... .60
C31	TTS-111K	Wave-band switch... 5.15
C32	4HS-262	5 1/2" dynamic speaker... .50
C33	3ES-256	Tone control switch... .15
C34	XL-9	Pilot light, 6.3 volt, 25 amp., Mazda No. 46... 1.15
C35	4HZ-561	Dial face... .10
C36	3LZ-403	Drive belt for dial assembly... .15
C37	3CZ-337	Drive shaft and pulley for dial assembly... .10
C38	3CZ-339	Idle pulley for dial assembly... .05
C39	4HZ-562	Idle spring for dial assembly... .05
C40	3CZ-341	Condenser shaft pulley... .10
C41	3SZ-436	Dial pointer... .10
C42	3SZ-438A	Escutcheon with crystal... 1.85

VIEW LOOKING AT PINS OF TUBE.
OVERALL VOLTAGE DROP ACROSS
BALLAST TUBE (R 13) 49 VOLTS
AT 3 AMPS, 4 VOLTS DROP
ACROSS EACH PILOT LIGHT

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

Frequency ranges
540 to 1,730 kc, and 2.2 to 7 megacycles

6A7 converter
6D6-IF
6Q7G-1st AF
2ND-DET
AVC
OUTPUT TRANS. ON SPEAKER
SPEAKER PLUG LOOKING AT PINS. SEE ENCIRCLED NUMBERS ON SCHEMATIC FOR CONNECTIONS
ANCHORAGE HOLE
HEATER CIRCUIT
PILOT LIGHTS
AC OR DC LINE
KEY
SPEAKER FIELD

MODEL AH162

Chassis AH

Voltage, Alignment

Notes

EMERSON RADIO & PHONO. CORP.

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 117.5 volts, 60 cycles, a.c.

Tube	Plate	Screen	Cathode	Osc. Plate	Fil.
6A7	100	55	2.0	77	6.3
6D6	100	100	3.3	—	6.3
6Q7G	38	—	1.0	—	6.3
25L6	96	103	6.7	—	25.0

Voltage at 25Z5 cathode—130 volts.

Voltage across speaker field—28 volts.

Voltage drop across ballast tube (pins Nos. 3, 7)—49 volts.

Voltage drop across each pilot light section (pins Nos. 2, 8 and Nos. 8, 7)—4 volts

- If replacements are made or the wiring disturbed in the r-f portion of the circuit, the receiver should be carefully re-aligned.
- One side of the power line is directly grounded to the chassis base. Under no circumstances, therefore, should a ground wire be permitted to come in contact with any metal part of the receiver.
- The filament dropping resistor (R13 on schematic) is in a special metal tube at the rear of the chassis. This tube will become quite hot under normal operating conditions. For voltage drop specifications, see below.
- When operating the receiver on d.c. it may be necessary to reverse the line plug to obtain the correct polarity.
- The color coding of the i-f transformer leads is as follows:

Grid—green

Grid return—black

Plate—blue

B plus—red

- An efficient antenna system is necessary to enable a full realization of the merits of the receiver. For reduction of noise and achievement of high efficiency on all frequency ranges the Emerson All-Wave High-Fidelity Antenna, Model W-78, and the Emerson All-Wave Antenna System, Model W-89, are recommended. Instructions for the installation of these antennas are supplied with each kit.

In congested areas where the installation of a large antenna is not desirable we recommend the use of the Emerson Flexible Mast Antenna, Model W-82. Instructions for the installation of this compact and efficient antenna are supplied with each kit.

- The wave-trap in the receiver has been adjusted for maximum signal rejection at 456 kc. If, however, persistent interference is experienced from some particular telegraphic station, readjust the wave-trap trimmer until the response from the interfering station is at a minimum.

An oscillator with frequencies of 456, 600, 1600 and 6,000 kc should be used.

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

If the circuit is at all disturbed, both the broadcast and short-wave bands must be realigned.

The set's oscillator is higher in frequency than the signal, 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 a 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.

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

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

Location of Coils and Trimmer Adjustments

The two i-f transformers are located on top of the chassis deck. The second i-f is the one directly behind the variable condenser. The four trimmers, two for each transformer, are accessible through holes in the tops of the cans.

The adjustable padding condenser for the broadcast band is mounted underneath the chassis (in the corner near the 6A7 tube) with the screw adjustment accessible through a hole in the top of the chassis.

The antenna coils for the broadcast and short-wave bands and the 456 kc wave trap are wound on one form and mounted underneath the chassis deck directly behind the adjustable padding condenser. The trimmers for these coils are accessible through holes in the top of the chassis. The trimmer nearest the front of the chassis is the short-wave antenna trimmer. The central trimmer is the broadcast antenna trimmer. The trimmer nearest the rear of the chassis is the 456 kc wave trap.

The oscillator coils for the broadcast and short-wave bands are wound on one form and mounted underneath the chassis deck near the variable condenser. The trimmers for these coils are accessible through holes in the top of the chassis. The trimmer nearest the front of the chassis is for the short-wave oscillator coil and the trimmer farthest from the front is for the broadcast oscillator coil.

I-f and Wave-trap Alignment

Rotate the wave-band switch to the broadcast (clockwise) position. Set the variable condenser at the minimum capacity position and feed 456 kc, through a 0.02 mf paper condenser, to the grid cap of the 6A7 tube (do not remove the grid clip from the tube). Adjust the four i-f trimmers for maximum response. Feed 456 kc to the antenna through a standard dummy antenna and adjust the wave-trap trimmer for *minimum* response. (See General Notes.)

Short-Wave Alignment (Alignment of the short-wave band should precede broadcast alignment)

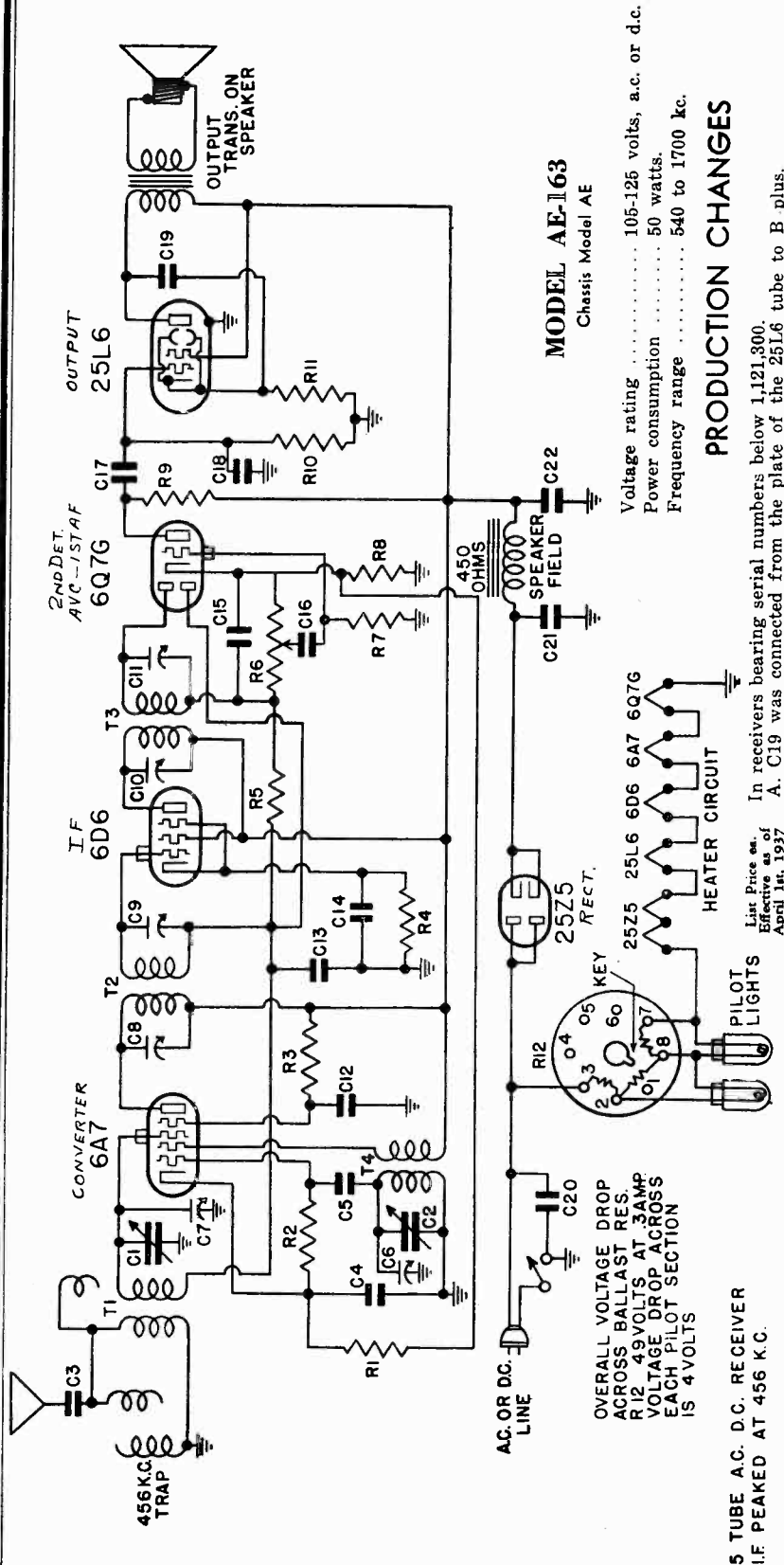
Rotate the wave-band switch to the short-wave (counter-clockwise) position, and set the dial pointer exactly at 6 megacycles. Feed 6,000 kc to the antenna and adjust the short-wave oscillator trimmer for maximum response, and then adjust the short-wave antenna trimmer for maximum response. Be very careful to choose the minimum capacity peak on the oscillator trimmer.

Broadcast Alignment

Rotate the wave-band switch to the broadcast position (clockwise) and set the dial pointer at 60. Feed 600 kc through a standard dummy antenna. Adjust the broadcast series padding condenser for maximum response. Move pointer to 160, feed 1600 kc and adjust the broadcast oscillator trimmer for maximum response and then adjust the broadcast antenna trimmer for maximum response. Return pointer to 60, feed 600 kc and readjust the series padding condenser rocking the variable condenser for maximum response.

EMERSON RADIO & PHONO. CORP.

MODEL AE163
 Chassis AE
 Schematic, Change
 Parts



MODEL AE-163
 Chassis Model AE

Voltage rating 105-126 volts, a.c. or d.c.
 Power consumption 50 watts.
 Frequency range 540 to 1700 kc.

PRODUCTION CHANGES

In receivers bearing serial numbers below 1,121,300.
 A. C19 was connected from the plate of the 25L6 tube to B plus.

*ITEM	PART No.	DESCRIPTION	PRICE
T1	3FT-280	Antenna coil with 456 kc wave trap	\$.10
T2	4ET-350	456 kc first i-f transformer	1.15
T3	4ET-351	456 kc second i-f transformer	1.15
T4	3FT-281	Oscillator coil	.50
R1	3RR-276	310 ohm 1/2 watt wire-wound molded resistor	.16
R2	KR-53	50,000 ohm 1/4 watt carbon resistor	.16
R3	ZZR-196	30,000 ohm 1/4 watt carbon resistor	.16
R4	3CR-295	410 ohm 1/2 watt wire-wound molded resistor	.16
R5, R7	HR-42	2 megohm 1/4 watt carbon resistor	.16
R6	ZZR-190A	Volume control—500,000 ohms	1.10
R8	3CR-294	240 ohm 1/2 watt wire-wound molded resistor	.16
R9	KR-55	250,000 ohm 1/4 watt carbon resistor	.16
R10	KR-56	500,000 ohm 1/4 watt carbon resistor	.16
R11	3FR-293	140 ohm 1/2 watt wire-wound molded resistor	.16
R12	3CR-241	Plug-in type ballast resistor	.80
C1, C2	4EC-340	Two-gang variable condenser	3.05
C3	3HC-274	0.002 mf 600 volt tubular condenser	.20
C4, C12	AC-6	0.1 mf 200 volt tubular condenser	.05
C5, C13, C18	NC-70A	0.0002 mf mica condenser	.10
†C6, C7	—	Trimmer, part of variable condenser	1.05
†C8, C9	—	Trimmer, part of first i-f transformer
†C10, C11	—	Trimmer, part of second i-f transformer
C14	BC-12	0.05 mf 200 volt tubular condenser	.20
C15	FC-29	0.02 mf 200 volt tubular condenser	.20
C16	CCC-127	0.01 mf 200 volt tubular condenser	.20
C17, C19	LC-65	0.02 mf 400 volt tubular condenser	.20
C20	2VC-242A	0.1 mf 400 volt molded type paper condenser	.90
C21, C22	3CC-261	20 mf 150 volt wet electrolytic condenser	5.00
—	4ES-258	5 1/2" dynamic speaker	20
—	XL-9	Pilot light, 6.3 volt, .25 amp, Mazda No. 46	.30
—	4EZ-531	Dial face	.15
—	4EZ-533	Dial drive belt	.10
—	4EZ-553	Dial drive shaft bushing	.10
—	3JZ-375	Dial drive shaft pulley	.10
—	3CZ-339	Idle pulley	.05
—	3SZ-457	Idle pulley spring	.05
—	3CZ-341	Condenser shaft pulley	.10
—	3FZ-353	Dial pointer	.10
—	3CZ-350B	Escutcheon with crystal	1.05

5 TUBE A.C. D.C. RECEIVER
 I.F. PEAKED AT 456 K.C.

OVERALL VOLTAGE DROP
 ACROSS BALLAST RES.
 R12 49 VOLTS AT 3 AMP
 VOLTAGE DROP ACROSS
 EACH PILOT SECTION
 IS 4 VOLTS

List Price as of
 April 1st, 1937
 (Subject to change without notice)

MODEL AE163

Chassis AE

Voltage, Alignment

Notes

EMERSON RADIO & PHONO. CORP.

GENERAL NOTES

1. If replacements are made or the wiring distributed in the r-f section of the circuit, the receiver should be carefully re-aligned.
2. One side of the power line is directly grounded to the chassis base. Under no circumstances, therefore, should a ground wire be permitted to come in contact with any metal part of the receiver.
3. The filament dropping resistor (R12—see schematic) is in a special metal tube at back of the chassis. This tube will, therefore, become quite hot under normal operating conditions. For voltage drop see below.
4. When operating the receiver on d.c. it may be necessary to reverse the line plug for correct polarity.
5. The color coding of the i-f transformer leads is as follows:

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

Tube Data

The tube complement is as follows:

- 1—6A7 pentagrid oscillator-modulator.
- 1—6D6 first i-f amplifier.
- 1—6Q7G diode detector, audio amplifier, automatic volume control.
- 1—25L6 pentode power output.
- 1—25Z5 dual half-wave rectifier.
- 1—3CR-241 ballast tube.

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 117.5 volts, 60 cycles, a.c.

Tube	Plate	Screen	Osc. Plate	Cathode	Fil.
6A7	100	50	100	2.4	6.3
6D6	100	100	—	3.8	6.3
6Q7G	45	—	—	1.1	6.3
25L6	95	100	—	6.4	25.0

Voltage across speaker field—30 volts.

Overall voltage drop across ballast tube, (See R12, schematic)—49 volts at .3 amps.

Voltage drop across the pilot light section of ballast tube—4 volts, a.c.

ADJUSTMENTS

An oscillator with frequencies of 456 kc and 1500 kc should be used.

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.

Location of I-f Transformers and Trimmers

The first i-f transformer, part number 4ET-350, is in an oblong coil can located on the top of the chassis directly behind the 6A7 tube. The two trimmers for this i-f are accessible through holes in the top of the coil can.

The second i-f transformer, part number 4ET-351 is in an oblong coil can located on top of the chassis directly behind the speaker. The two trimmers for this i-f are accessible through holes in the top of the coil can.

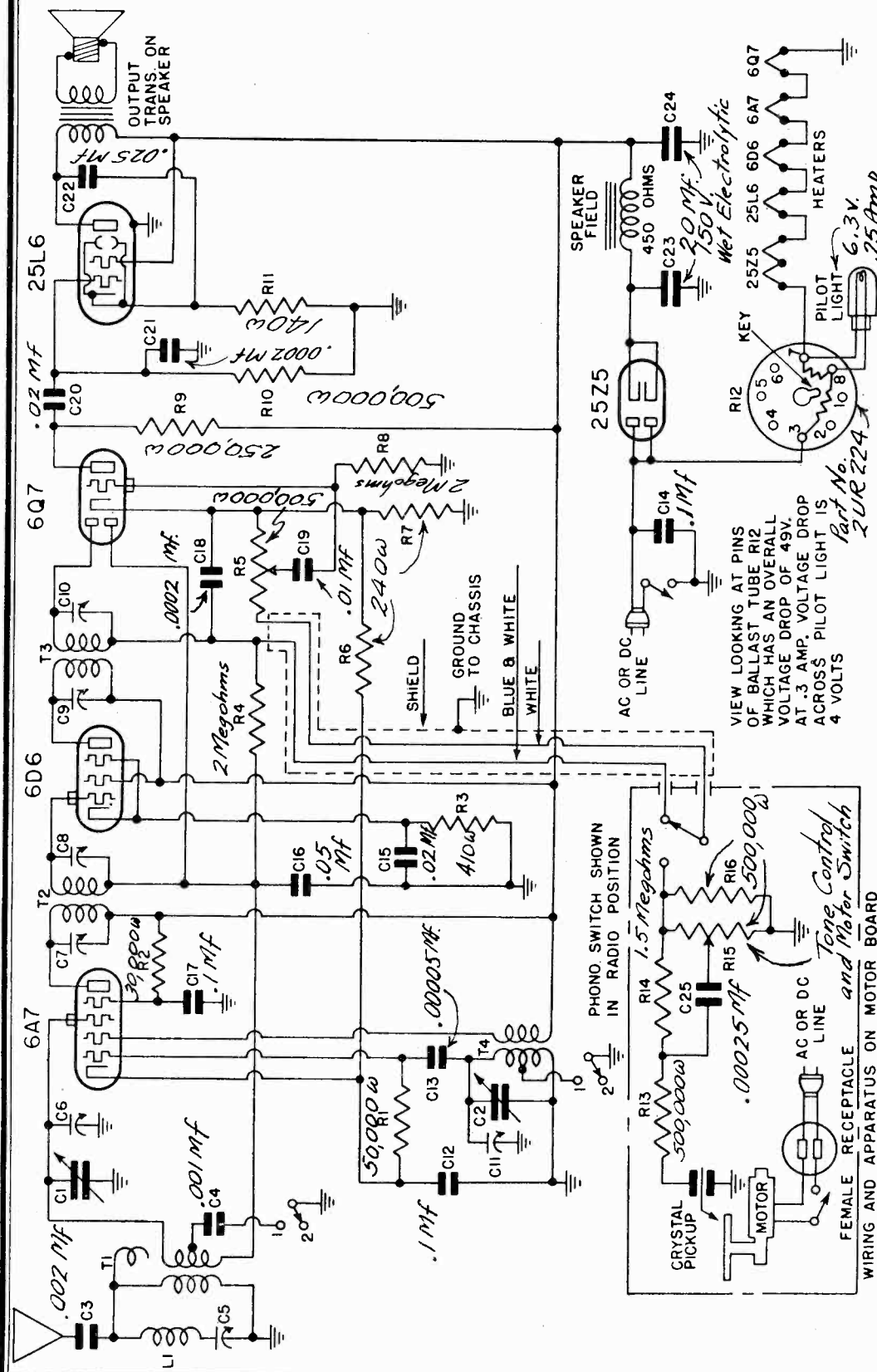
The oscillator and antenna trimmers are located on the variable condenser. The oscillator trimmer is on the rear section of the variable condenser and the antenna trimmer is on the front section of the variable condenser.

Alignment Procedure

1. Rotate the variable condenser to the minimum capacity position.
2. Feed 456 kc to the grid cap of the 6A7 tube, through a .02 mf paper condenser.
3. Adjust the i-f trimmers, repeating for maximum response.
4. Set the dial pointer to 1500 and feed 1500 kc to the antenna lead through a standard dummy antenna. (A .0001 mf mica condenser may be used as a substitute.)
5. Adjust the oscillator trimmer (on rear section of variable condenser) for maximum response.
6. Adjust the antenna trimmer (on front section of variable condenser) for maximum response.

EMERSON RADIO & PHONO. CORP.

MODEL AL164
Chassis AL
Schematic, Voltage



IF PEAKED AT 456 KC
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 117.5 volts, 60 cycles, a.c.

WAVE BAND SWITCH POSITION	SHOWN IN BROADCAST POSITION	NO. 1 POLICE	NO. 2 BROADCAST	Tube	Plate	Screen	Cathode	Osc. Plate	Fil.
1-6A7	pentagrid oscillator-modulator.	100	50	6A7	100	50	2.3	100	6.3
1-6D6	first i-f amplifier.	100	100	6D6	100	100	3.5	100	6.3
1-6Q7	beam power output.	43	100	6Q7	92	100	1.2	100	6.3
1-25L6	dual half-wave rectifier.	92	100	25L6	92	100	6.5	100	25.0

Voltage at 25Z5 cathode—130 volts.
Voltage across speaker field—28 volts.
Voltage drop across ballast tube (pins Nos. 3, 7)—49 volts.
Voltage drop across pilot light section (pins Nos. 8 and 7)—4 volts.

WIRING AND APPARATUS ON MOTOR BOARD

VIEW LOOKING AT PINS OF BALLAST TUBE R12 WHICH HAS AN OVERALL VOLTAGE DROP OF 49V. AT .3 AMP. VOLTAGE DROP ACROSS PILOT LIGHT IS 4 VOLTS

MODEL AL164
Chassis AL
Notes, Alignment

EMERSON RADIO & PHONO. CORP.

Model AL-164

CHASSIS MODEL AL

Voltage rating	105 to 125 volts a.c. or d.c.
Power consumption	43 watts for receiver and 26 watts for motor
Frequency range	540 to 1580 kc (See paragraph 11 in General Notes below).

GENERAL NOTES

1. If replacements are made or the wiring disturbed in the r-f portion of the circuit, the receiver should be carefully re-aligned.
2. One side of the power line is directly grounded to the chassis base. Under no circumstances, therefore, should a ground wire be permitted to come in contact with any metal part of the receiver.
3. The filament dropping resistor (R12 on schematic) is in a special metal tube at the rear of the chassis. This tube will become quite hot under normal operating conditions. For voltage drop specifications, see below.
4. When operating the receiver on d.c. it may be necessary to reverse the line plug to obtain the correct polarity.
5. The two i-f transformers are held to the chassis by snap-on fasteners. To remove an i-f, unsolder its leads under the chassis, pinch together the prongs of the snap-on fastener and lift the i-f can from the chassis.
6. The color coding of the i-f transformer leads is as follows:

Grid—green	Plate—blue
Grid return—black	B plus—red
7. The receiver is shipped with an attached antenna wire. In some locations near powerful local stations the addition of a very large antenna may be detrimental to reception, because of the resulting interference. The Emerson Flexible Mast Antenna, Model W-82, has been especially designed for Emerson receivers, featuring compactness and portability while at the same time retaining a high efficiency from the standpoint of performance. Since it functions as an outside antenna the Flexible Mast will substantially improve the receiver performance. Where the Flexible Mast is installed permanently, it is urgently recommended that the receiver antenna wire be cut. Leave just enough of this wire to reach from the receiver to the window strip connector. Instructions for the installation of this compact and efficient outside antenna are supplied with each kit.
8. The wave-trap in the receiver has been adjusted for maximum signal rejection at 456 kc. If, however, persistent interference is experienced from some particular telegraphic station, readjust the wave-trap trimmer until the response from the interfering station is at a minimum.
9. The phonograph motor has been adjusted at the factory, to turn at a speed of 78 r.p.m. The speed may be checked by counting the turns per minute or by using a stroboscope disc and a neon light (the stroboscope method will only work when the neon bulb is lighted from a 60 cycle a.c. supply).
10. An a.c.-d.c. switch is provided to switch the motor for a.c. or d.c. power supply. It is important that this switch be in the proper position for the power supply available.
11. The receiver in this combination is designed to cover two frequency ranges, but since it is represented as a single band receiver only, the short-wave band, although available, may be ignored.

ADJUSTMENTS

An oscillator with frequencies of 456, 600 and 1400 kc should be used.

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

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

The last motion in adjusting trimmers should always be a tightening one, not a loosening one.

Never leave a 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.

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

Use a .0001 mf mica condenser as a dummy antenna during alignment.

Location of Coils and Trimmer Adjustments

The two i-f transformers are in oblong coil cans located on top of the chassis deck. The first i-f transformer is the one behind the variable condenser. The trimmers for these transformers are accessible through holes in the tops of the cans.

The 456 kc wave-trap is mounted on the right side of the front chassis wall. Its trimmer is accessible at the bottom of the chassis.

The antenna coils for the broadcast and police bands are wound on one form and are mounted underneath the chassis deck below the variable condenser.

The oscillator coils for the broadcast and police bands are wound on one form and are mounted on the rear wall of the chassis deck near the variable condenser.

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

I-f Transformer and Wave-Trap Alignment

Turn the switch clockwise to the broadcast position and rotate the variable condenser to the minimum capacity position. Feed 456 kc to the grid cap of the 6A7 tube and adjust the four i-f trimmers for maximum response. Feed 456 kc to the antenna and adjust the wave-trap trimmer for *minimum* response.

R-f Alignment

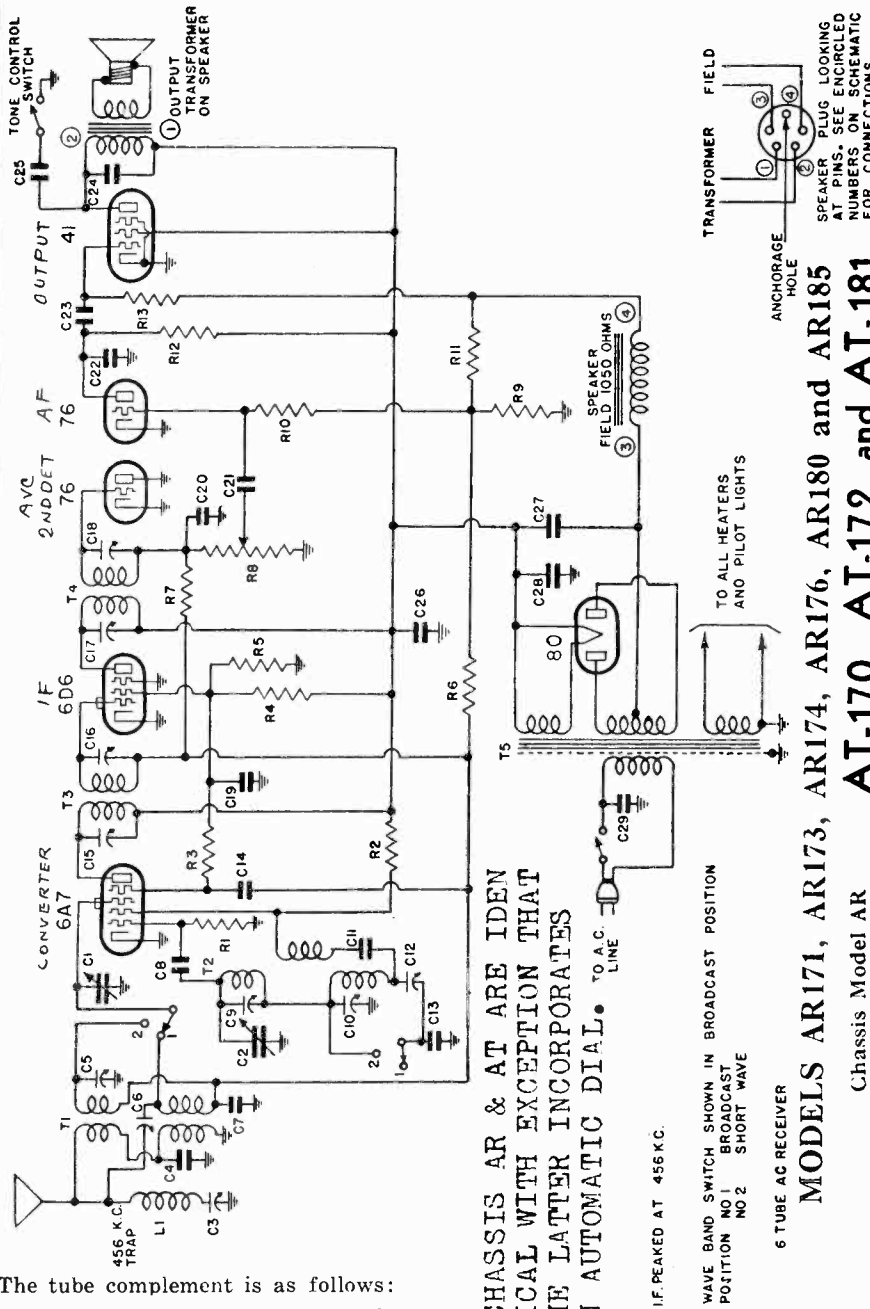
With the wave-band switch in the broadcast position, clockwise, set the dial pointer at 140. Feed 1400 kc through a .0001 mf condenser to the antenna lead and adjust first the oscillator trimmer on rear section of variable condenser) then the antenna trimmer (on front section of variable condenser) for maximum response. The police band is self-tracking and does not require any adjustment.

MODELS AT170, AT172
AT181
Chassis AT

EMERSON RADIO & PHONO. CORP.

MODELS AR171, AR173
AR174, AR176
AR180, AR185

Chassis AR
Schematic, Changes
Voltage



CHASSIS AR & AT ARE IDENTICAL WITH EXCEPTION THAT THE LATTER INCORPORATES AN AUTOMATIC DIAL.

The tube complement is as follows:

- 1—6A7, pentagrid oscillator-modulator.
- 1—6D6, i-f amplifier.
- 1—76, diode detector and a.v.c. (behind second i-f transformer).
- 1—76, audio amplifier.
- 1—41, pentode power output.
- 1—80, full-wave rectifier.

Voltage rating 105-125 volts, 60 cycle a.c.
Power consumption 55 watts
Frequency ranges 540 to 1730 kc and 5.6 to 18 megacycles

PRODUCTION CHANGES

Model AR-174 receivers differ from the schematic diagram as follows:

- a. C27 is a 12 mf, 450 volt dry electrolytic condenser, part no. 3LC-314.
- b. C28 is a 24 mf, 400 volt dry electrolytic condenser, part no. 3ZC-341.
- c. A .25 mf, 200 volt condenser is connected from the screen-grid of the 6D6 i-f amplifier to ground.

In receivers bearing serial numbers below 1,200,100:

- a. C1 and C2 was a two-gang variable condenser, part no. 4HC-343B and the dial face used with this condenser was part no. 4RZ-580.

**MODELS AR171, AR173, AR174, AR176, AR180 and AR185
AT-170, AT-172 and AT-181**
Chassis Model AR

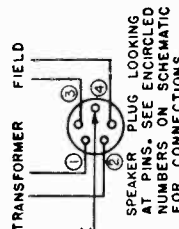
VOLTAGE ANALYSIS

Readings should be taken with a 1,000 ohms-per-volt meter. Voltages listed below are from point indicated to ground (chassis) with the volume control turned on full and no signal. The line voltage for these readings was 117.5 volts, 60 cycles a.c.

Tube	Plate	Screen	Osc. Plate	Cathode	Fil.
6A7 osc.-mod.	244	62	118	0	6.3 a.c.
6D6 i-f amp.	244	85	—	0	6.3 a.c.
76 detector a.v.c.	0	—	—	0	6.3 a.c.
76 a-f amp.	85	—	—	0	6.3 a.c.
41 output	226	244	—	0	6.3 a.c.

Voltage across speaker field—65.

Voltage at 80 filament to B minus (center-tap of high-voltage winding on power transformer)—325. The grid bias for all the tubes is developed across the resistors R9 and R11 (see schematic). The total voltage measured across R9 and R11 should be 15 volts, and is the bias for the 41 tube. The voltage measured across R9 should be 5 volts. To check the bias on the 6A7 and 6D6 tubes, measure the values of resistors R6, R7 and R8 (see schematic).



MODELS AT170, AT172
AT181

Chassis AT
EMERSON RADIO & PHONO. CORP Automatic Dial Details

CHASSIS AR - SEE INDEX FOR SCHEMATIC
Models AT-170, AT-172 and AT-181

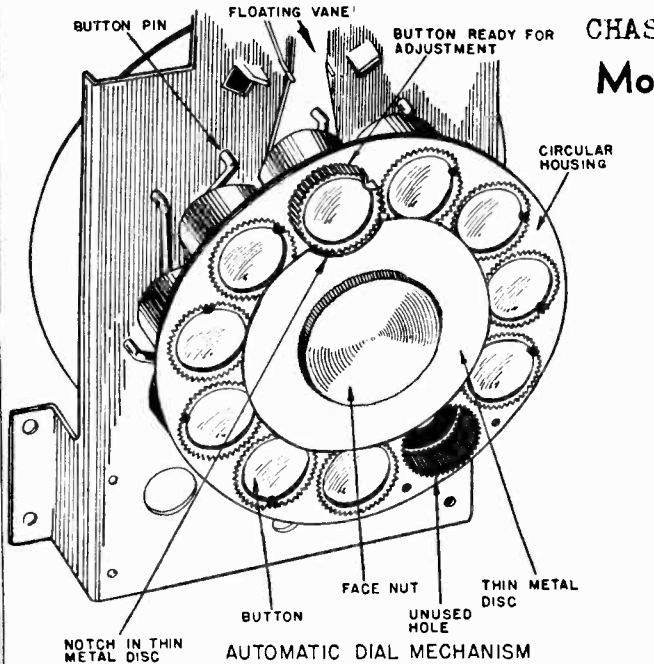


FIGURE 2

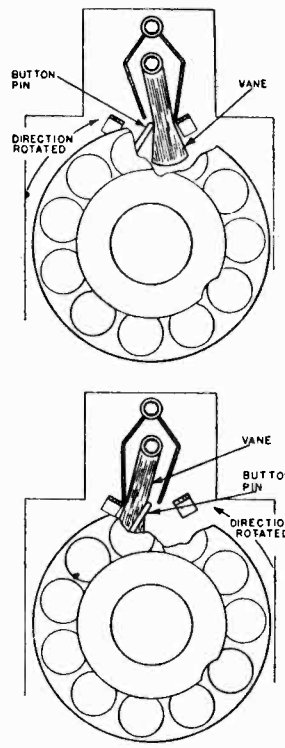


FIGURE 5

SHOWING TIP OF PIN HITTING VANE FROM EITHER SIDE WHEN STATION IS TUNED IN

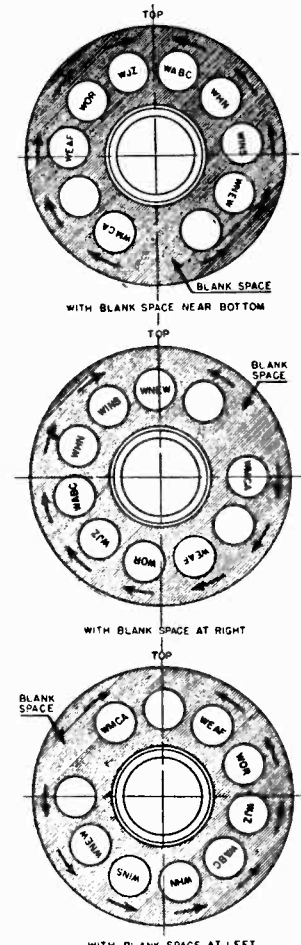


FIGURE 1

ARROWS INDICATE DIRECTION DIAL IS TO BE TURNED FOR ANY PARTICULAR BUTTON

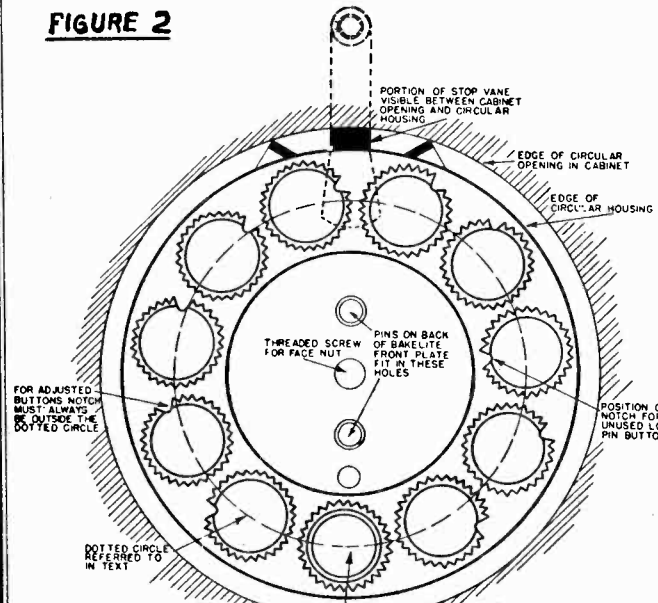
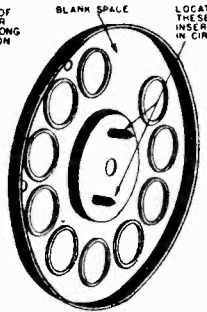


FIGURE 3

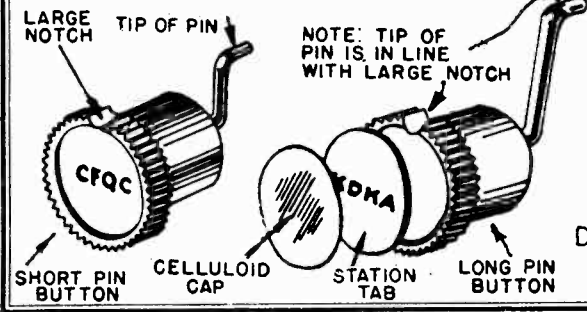


FRONT OF DIAL WITH METAL DISC REMOVED



REAR VIEW OF BAKELITE FRONT PLATE

FIGURE 7



DETAILS OF BUTTONS

FIGURE 4

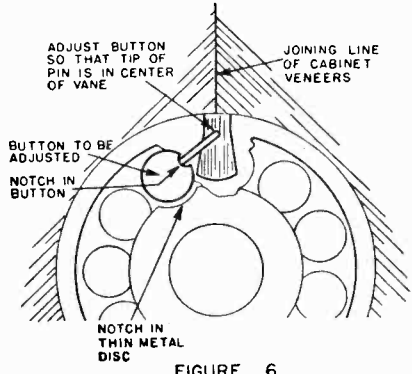


FIGURE 6

EMERSON RADIO & PHONO. CORP.

MODELS AT170, AT172
AT181
Chassis AT
Automatic Dial Notes

AUTOMATIC DIAL

Models AT-170, AT-172 and AT-181

CHASSIS AR - SEE INDEX FOR SCHEMATIC

Automatic Dial Tuning

Insert the line plug into the electric outlet. Turn the receiver on by rotating the volume control knob clockwise until the switch is heard to click. Wait about a minute for the tubes to warm up.

Be sure the wave-band switch is in the broadcast position, clockwise.

(Complete information relative to the pre-setting of the Automatic Dial appears on pages 5 to 7 inclusive in this booklet.)

Tuning with the Automatic Dial is very similar to dialing a telephone except that only one turn of the dial is necessary. Merely push in the button bearing the call letters of the desired station, and, keeping the button pressed in firmly, rotate the dial until it stops with the button near the top. The button may then be released. This procedure automatically tunes in the desired station.

The illustrations, Fig. 1, indicate the proper rotation of the dial for a particular button. Note that the button must always stop near the top of the disc. If the button for the desired station is already at the top, rotate the dial in either direction about a quarter turn and then push the button in and rotate the dial back again until it stops with this button near the top.

Broadcast Reception

Broadcast stations may be tuned in the regular manner by means of the station selector knob on the front of the cabinet.

STATION PRE-SETTING OF AUTOMATIC DIAL

The bakelite front plate for the dial will be found in the knob envelope. This plate is to be assembled after following the procedure described below. Eight cards of station call letter tabs for the buttons are in a separate envelope packed with the receiver.

The illustrations at the right, Fig. 2 and Fig. 3, show the major parts of the automatic dial. Ten buttons are supplied with each dial. Note that there are eleven button holes in the circular housing. One of these button holes is not to be used. (See Fig. 3). Each of the buttons may be set for a particular station. The stations chosen should be the popular local broadcast stations. The dial cannot be used for automatic tuning of short-wave stations. Each button is adjustable in that it can be rotated in its hole in the housing. This rotation is the means of adjustment for any particular station.

First turn the receiver on. The adjustments should be made with the receiver warmed up. Of the possible ten selected local stations choose five of the more desirable and determine their frequencies. Station frequencies will usually be found listed in newspapers. The station with the lowest frequency of the first five chosen should be adjusted first. Compare the frequency of this station with the frequency markings on the tab inserts in the buttons. The station frequency will be between the frequency limits marked on one of the buttons and that button should be adjusted for that particular station. The following procedure should be observed in adjusting the buttons:

1. Do not remove the thin metal disc which holds the buttons in the housing until this entire procedure is completely finished. Merely loosen the face nut slightly and rotate the disc until its semi-circular notch falls below the first button to be adjusted. See Fig. 2. (When rotating this disc it is necessary to successively hold each button in place with a finger as the notch in the disc moves past these buttons.) Tighten the face nut again to prevent the disc from falling off. Take out this button and remove the celluloid cap and tab insert by prying with a sharp instrument at the large notch on the side of the button.

Tune in the desired station by means of the selector knob on the front of the cabinet.

3. The large notch on the side of the button will indicate the position of the stop pin on the back of the button, see Fig. 4. The tip portion of the stop pin in this drawing is the part that stops against the floating vane. This tip portion in stopping against the vane is the action that locates the station once the button is adjusted, see Fig. 5. The vane is visible between the edge of the button housing and the edge of the hole in the cabinet, see Fig. 3.

4. With the station tuned in and without moving the circular housing partially insert the button, lining up the tip portion of the stop pin by eye with the center of the floating vane, and then push the button in, engaging the teeth. See Fig. 6. The center joint of the veneer on the cabinet may be used to assist in this lining up since the joint is approximately at the center of the floating vane.

Hold the button in and rotate the thin metal disc a small fraction of a turn, just enough so that it holds the button in place.

It is important that when the stop pin is lined up it is either horizontal or pointing at some angle away from the hub of the housing. This precaution may be observed by locating the large notch of the button (which is in line with the tip of the stop pin) outside the dotted circle through the buttons as shown in Fig. 3.

5. To check if the button has been properly adjusted rotate the entire housing first in clockwise direction so that the button stop pin is clear of the floating vane. Push the button all the way in with a finger and rotate the housing so that the pin travels toward and stops against the floating vane. The desired station should then be heard. Repeat this procedure on the counter-clockwise side of the vane. The station should again be heard.

6. If the station tunes in perfectly on each side of the vane no further adjustment is necessary. If it does not tune in perfectly, further adjustment should be made by carefully pulling out the button and rotating it one notch in the housing in the direction which will bring in the station more accurately. Check the tuning again by following the procedure outlined in paragraph No. 5. Find the station call letters for this button on one of the cards supplied. Remove the tab from the card and insert in the button by pressing in firmly. Replace the clear celluloid cap over the call letter tab, snapping it firmly in place.

7. Adjust four buttons for the other four selected stations following the procedure outlined above. In adjusting these buttons care should be taken, when rotating the thin metal disc, to keep the other buttons from falling.

8. The remaining buttons, five in number, may be adjusted for any other local stations easily obtainable, or left in reserve for future settings.

9. After the buttons are all adjusted the thin metal disc should be removed carefully by unscrewing the face nut and replaced by the bakelite front plate. *Be very careful in removing the thin metal disc that the buttons do not spring out from the housing.* The cabinet should be tilted or placed on its back, when placing the bakelite plate on the dial, to make sure that the buttons do not fall out.

Check carefully the drawings in Fig. 3 and Fig. 7 for aligning the bakelite front plate with the circular housing.

The plate must fit in easily and snugly. Care should be taken not to damage the locating pins on the back of the front plate.

The following additional precautions must be observed when adjusting the buttons:

The long pin buttons, when adjusted, should have the long length of the pin nearly horizontal. If these long pins, after the button is adjusted, interfere with any other part of the mechanism when the housing is rotated the buttons cannot be used in these holes.

If no special use is found for the two long pin buttons it is preferable to insert these in unused holes with the pins pointing directly toward the hub of the housing.

When loosening the thin metal disc be sure the face nut is unscrewed only enough to allow the disc to turn. During adjustments check this nut frequently to make sure it is in no danger of falling off. It cannot be emphasized too strongly that the utmost care must be taken to prevent this metal disc or the bakelite front plate from falling off and allowing the adjusted buttons to spring out from the housing. When making adjustments, rotate the thin metal disc very carefully to be sure that the adjusted buttons do not fall out of the housing past the notch in the disc.

After replacing the thin metal disc with the bakelite plate, the disc should not be discarded but should be reserved for future use in resetting buttons or in the event the receiver is reshipped. The receiver should never be transported with the bakelite plate assembled.

Note:—Two of the ten buttons supplied with the dial have long pins. In rare cases a particular station cannot be reached with a short pin button. The two long pin buttons are available for this purpose.

MODELS AR171, AR173
AR174, AR176
AR180, AR185

EMERSON RADIO & PHONO. CORP.

MODELS AT170, AT172
AT181
Chassis AT

Chassis AR
Alignment, Notes, Parts

Use a standard dummy antenna in aligning the broadcast coils. (A .0002 condenser may be substituted.) Rotate the wave-band switch to the broadcast tubes for maximum response. Move the dial pointer to 60 and feed 600 kc. Adjust the broadcast series paddler (in front of the variable condenser) for maximum response and then adjust the broadcast antenna trimmer (central trimmer at left side of chassis). Return pointer to 60, feed 600 kc and readjust the broadcast series paddler, rocking the variable condenser (rotate the variable condenser shaft back and forth through a small arc) for maximum response.

REPLACEMENT PARTS

Part No.	DESCRIPTION	PRICE
3CT-289A	Two-band antenna coil and 456 kc wave-trap	\$1.90
3CT-290A	456 kc first i-f transformer	1.35
3CT-291	456 kc second i-f transformer	1.60
3ZT-345	Power transformer	1.95
KR-53	50,000 ohm, 1/4 watt carbon resistor	4.18
3BR-247	40,000 ohm, 1/4 watt carbon resistor	.16
LR-66	20,000 ohm, 1/4 watt carbon resistor	.16
3R-265	40,000 ohm, 1/2 watt carbon resistor	.16
NRB-220	3 megohm, 1/4 watt carbon resistor	.16
3VR-288	Volume control with line switch—500,000 ohms	1.06
3VR-270	50 ohm, 1/2 watt carbon resistor	.16
3RR-274	210 ohm, 1 watt wire-wound resistor	.16
3R-346	100,000 ohm, 1/4 watt carbon resistor	.16
KR-56	500,000 ohm, 1/4 watt carbon resistor	.16
4HC-348A	Two-gang variable condenser	3.66
AAC-106A	Trimmer, part of antenna coil	.20
BC-12	0.05 mf, 200 volt tubular condenser	.20
KC-58	Trimmer, part of oscillator coil	.20
2NC-231	0.01 mf, 400 volt tubular condenser	.35
3EC-267	Single adjustable padding condenser. Range: 300 to 600 mmf	.40
AC-7A	Trimmer, part of second i-f transformer	.20
HC-34	0.0025 mf mica condenser	.20
IC-47	0.006 mf, 600 volt tubular condenser	.20
LC-45	0.02 mf, 400 volt tubular condenser	.20
ZC-115	0.05 mf, 1000 volt tubular condenser	.20
3R-190	0.1 mf, 400 volt tubular condenser	.20
3FC-192	0.1 mf, 400 volt wet electrolytic condenser	1.20
2NC-246	16 mf, 450 volt wet electrolytic condenser	1.20
2NC-247	0.01 mf, 400 volt wet electrolytic condenser	.35
2TS-145E	Tone control switch	.60
4TS-270	6 1/2" dynamic speaker	5.25
4TS-281	10" dynamic speaker	8.60
XT-9	Pilot light 6.3 volt, .25 amp., Mazda No. 46	1.20
4AFZ-596	Dial face	.15
3RZ-403	Dial drive belt	.10
3CT-383	Dial drive shaft and pulley	.06
3CT-384	Idle pulley	.06
4HZ-562	Idle pulley spring	.25
3CZ-341	Condenser shaft pulley	.25
4RZ-592	Dial pointer	.25
4RZ-595	Escutcheon with crystal	1.95

Broadcast Alignment

The receiver should never be turned on with either the speaker plug or the 41 tube out of its respective socket, since the rapid rise in rectifier voltage will cause the cabinet to take precautions to keep any part of the dial and condenser assembly from touching the cabinet, otherwise microphonism will result.

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

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

The adjustable padding condenser (two yellow leads) is mounted underneath the chassis (in the corner near the wave band switch) to the broadcast tubes for maximum response. Move the dial pointer to 160 and feed 1600 kc. Adjust the broadcast series paddler (in front of the variable condenser) for maximum response and then adjust the broadcast antenna trimmer (central trimmer at left side of chassis). Return pointer to 60, feed 600 kc and readjust the broadcast series paddler, rocking the variable condenser (rotate the variable condenser shaft back and forth through a small arc) for maximum response.

GENERAL NOTES

- The receiver should never be turned on with either the speaker plug or the 41 tube out of its respective socket, since the rapid rise in rectifier voltage will cause the cabinet to take precautions to keep any part of the dial and condenser assembly from touching the cabinet, otherwise microphonism will result.
- The color coding of the i-f transformers is as follows:
Grid—green
B plus—red
Plate—blue
Grid—blue
Plate—blue
- The color coding of the power transformer is as follows:
High-voltage secondary—two red leads
High-voltage secondary center tap—red and yellow lead
6.3 volt secondary—two green leads
- The adjustable padding condenser (two yellow leads) is mounted underneath the chassis (in the corner near the wave band switch) to the broadcast tubes for maximum response. Move the dial pointer to 160 and feed 1600 kc. Adjust the broadcast series paddler (in front of the variable condenser) for maximum response and then adjust the broadcast antenna trimmer (central trimmer at left side of chassis). Return pointer to 60, feed 600 kc and readjust the broadcast series paddler, rocking the variable condenser (rotate the variable condenser shaft back and forth through a small arc) for maximum response.

ADJUSTMENTS

An oscillator with frequencies of 456, 600, 1600 and 16,000 kc should be used.
An output meter should be used across the voice coil or output transformer for observing maximum response.
If the circuit is at all disturbed, both the broadcast and short-wave bands must be realigned.
The set's oscillator is higher in frequency than the signal, 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 a 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.
Always use as weak a test signal as possible during alignment.

Location of Coils and Trimmer Adjustments

The two i-f transformers are located on top of the chassis deck. The second i-f is the one directly behind the variable condenser. The four trimmers, two for each transformer, are accessible through holes in the tops of the cans.
The adjustable padding condenser for the broadcast band is located underneath the chassis (in the corner near the 6A7 tube) with the screw adjustment accessible through the front of the chassis.
The antenna coils for the broadcast and short-wave bands and the 456 kc wave trap are wound on one form and mounted underneath the chassis deck near the variable condenser. The trimmers for these coils are accessible through holes in the chassis deck near the variable condenser. The trimmer nearest the front of the chassis is the short-wave antenna trimmer. The trimmer nearest the rear of the chassis is the broadcast antenna trimmer. The trimmer nearest the rear of the chassis is the 456 kc wave trap.
The oscillator coils for the broadcast and short-wave bands are wound on one form and mounted underneath the chassis deck near the variable condenser. The trimmers for these coils are accessible through holes in the top of the chassis. The trimmer nearest the front of the chassis is for the short-wave oscillator coil and the trimmer farthest from the front is for the broadcast oscillator coil.

I-f and Wave-trap Alignment

Rotate the wave-band switch to the broadcast (clockwise) position. Set the variable condenser at the minimum capacity position and feed 456 kc. Rotate the 0.02 mf mica condenser, to the grid cap of the 6A7 tube (do not remove the grid clip from the tube) to the four i-f trimmers for maximum response. Feed 456 kc to the antenna through a standard dummy antenna (a 0.0002 mica condenser may be substituted) and adjust the wave-trap trimmer (farthest from front on left side of the chassis) for minimum response. (See General Notes.)

Short-Wave Alignment (Alignment of the short-wave band should precede broadcast alignment)

Use a 400 ohm dummy antenna (a 400 ohm non-inductive resistor in series with the test oscillator antenna lead) when aligning the short-wave coils. Rotate the wave-band switch to the short-wave (counter-clockwise) position, and set the dial pointer exactly at 16 megacycles. Feed the antenna through the antenna trimmer and adjust the short-wave oscillator trimmer (nearest the front, beside the variable condenser) for maximum response, and then adjust the short-wave antenna trimmer (nearest the front, beside the variable condenser) for maximum response. Be very careful to choose the minimum capacity peak on the oscillator trimmer.

When ordering replacement parts specify part numbers.

*Item number locates the article on the schematic diagram.
†See production changes.
‡These trimmer condensers are part of the coil assemblies and can not be supplied separately.

MODELS AF171, AF173, AF176
 AF179, AF180, AF185 EMERSON RADIO & PHONO. CORP.

Chassis AF
 Alignment, Notes

ADJUSTMENTS

An oscillator with frequencies of 456, 600, 1600 and 15,000 kc should be used.
 An output meter should be used across the voice coil or output transformer for observing maximum response.
 If the circuit is at all disturbed, both the broadcast and short-wave bands must be realigned.
 The set's oscillator is higher in frequency than the signal, 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 a 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.
 Always use as weak a test signal as possible during alignment.
 Use a standard dummy antenna for aligning either of the bands. A .0002 mf condenser may be used for the broadcast band dummy antenna and a 400 ohm non-inductive resistor for the short-wave dummy antenna.

Location of Coils and Trimmer Adjustments

The three i-f transformers are in oblong coil cans located on top of the chassis deck.
 The first i-f transformer, part number 4ET-350B, is located to the left of the variable condenser.
 The second i-f transformer, part number 4ET-350B, is located behind the variable condenser.
 The third i-f transformer, part number 4FT-382, is located to the right of the variable condenser. The trimmers, two for each transformer, are accessible through holes in the top of the cans.
 The broadcast series padder is located underneath the chassis (in the corner near the 1C6 tube). The screw adjustment is accessible through a hole in the top of the chassis.
 The antenna coil for the two bands is wound on one coil form and mounted underneath the chassis to the right of the variable condenser. The trimmers are accessible through holes in the top of the chassis. The trimmer nearest the front of the chassis is for the short-wave antenna coil.
 The r-f interstage coils for the two bands are wound on one form and mounted underneath the chassis to the left of the first i-f transformer. The trimmers are accessible through holes in the top of the chassis. The trimmer nearest the front of the chassis is for the short-wave interstage coil.
 The oscillator coils for the two bands are wound on one coil form and mounted underneath the chassis to the left of the variable condenser. The trimmers are accessible through holes in the top of the chassis. The trimmer nearest the front of the chassis is for the short-wave oscillator coil.

I-f Alignment

Rotate the wave-band switch to the broadcast (clockwise) position. Set the variable condenser at the minimum capacity position and feed 456 kc through a 0.02 mf paper condenser, to the grid cap of the 1C6 tube (do not remove the grid clip from the tube). Adjust the six i-f trimmers for maximum response.

Short-Wave Alignment (Short-wave alignment should precede broadcast alignment.)

Set the wave-band switch at the short-wave (counter-clockwise) position. Move pointer to 15, feed 15,000 kc to antenna (using a 400 ohm dummy antenna) and adjust the short-wave oscillator for maximum response. If two peaks are obtained choose minimum capacity peak. Then adjust the interstage and antenna trimmers for maximum response. If two peaks are obtained choose the maximum capacity peak.

Broadcast Alignment

With the wave-band switch at the broadcast (clockwise) position, set the pointer at 600, feed 600 kc through the antenna (using a standard dummy antenna), and adjust the broadcast series padder for maximum response. Move pointer to 1600, feed 1600 kc to the antenna and adjust the oscillator trimmer for maximum response, then adjust interstage and antenna trimmers. Reset the pointer to 600, feed 600 kc to antenna and rock the variable condenser (rotate the condenser back and forth through a small arc) while resetting the oscillator padder for maximum response. Return to 1600 and check alignment. If readjustment is necessary, return to 600 and repeat entire procedure.

- The battery complement should be as follows:

Type	No. Required	Eveready Part No.	Burgess Part No.	Ray-o-vac Part No.
3 volt "A"	1	X-125 or A-600	20F2	P9403
45 volt "B"	3	385 (plug-in type)	22308 (plug-in type)	P9303 (plug-in type)

- The receiver is designed for an "A" supply of 2 to 3 volts. A 2 volt storage battery may be used, in which case the 1E1 (ballast) tube, in the chassis becomes unnecessary and may be eliminated as follows:

If it is definitely known that a 2 volt storage battery will always be used it is permissible and advisable to short-circuit the two heavy prongs on the 1E1 tube by connecting them with a short piece of bare wire. Be sure that the two small prongs on the tube are free of this bare wire.

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

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

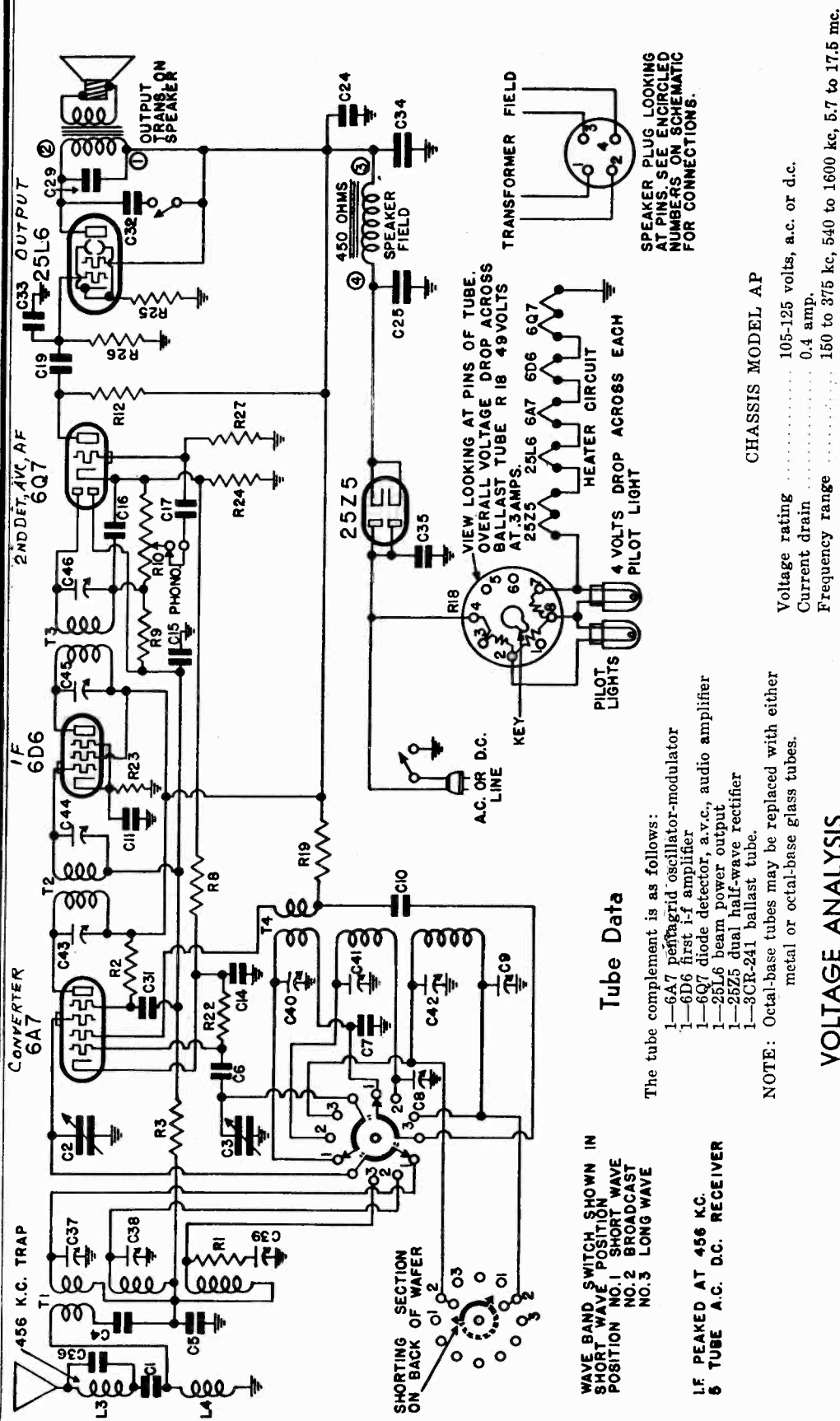
- Note that all leads in the battery cable are color coded. The two "A" leads are tagged with small metal markers giving the polarity. The battery cable is equipped with three plugs for "B" battery connections. These plugs are all alike and may be inserted in any order in the sockets of the three "B" batteries. The color coding of the battery cable is as follows:

Red	B plus 135
Brown	B plus 67.5
Blue	B neg.
Yellow	A plus 3
Black	A neg.

- If replacements are made in the r-f section of the circuit, the receiver should be carefully re-aligned.
- Be very careful not to remove any of the tubes from their sockets with the power switch turned on, as the rapid rise in filament voltage will damage the remainder of the tubes.

EMERSON RADIO & PHONO. CORP

MODELS AP171, AP173, AP174
 AP176, AP180, AP185
 Chassis AP
 Schematic, Voltage



SPEAKER PLUG LOOKING AT PINS. SEE ENCIRCLED NUMBERS ON SCHEMATIC FOR CONNECTIONS.

VIEW LOOKING AT PINS OF TUBE. OVERALL VOLTAGE DROP ACROSS BALLAST TUBE R 18 49 VOLTS AT 3 AMPS.

HEATER CIRCUIT
 25L6 6A7 6D6 6Q7
 25Z5
 4 VOLTS PILOT LIGHT

Tube Data

The tube complement is as follows:
 1—6A7 pentagrid oscillator-modulator
 1—6D6 first i-f amplifier
 1—6Q7 diode detector, a.v.c., audio amplifier
 1—25L6 beam power output
 1—25Z5 dual half-wave rectifier
 1—3CR-241 ballast tube.

NOTE: Octal-base tubes may be replaced with either metal or octal-base glass tubes.

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 117.5 volts, 60 cycles, a.c.

Tube	Plate	Screen	Cathode	Osc. Plate	Fil.
6A7	110	84	2.4	67	6.3
6D6	110	110	4.2	—	6.3
6Q7	46	—	1.2	—	6.3
25L6	100	110	7.0	—	25
25Z5	—	—	135.0	—	25

Voltage across speaker field—25 volts.
 The overall voltage drop across the resistors in the ballast tube is 49 volts.
 The voltage drop across each pilot light section is 4 volts.

CHASSIS MODEL AP

Voltage rating 105-125 volts, a.c. or d.c.
 Current drain 0.4 amp.
 Frequency range 150 to 375 kc, 540 to 1600 kc, 5.7 to 17.5 mc.

MODELS AP-171, AP-173, AP-174,
 AP-176, AP-180 and AP-185

MODELS AP171, AP173 AP174, AP176 AP180, AP185

EMERSON RADIO & PHONO. CORP. Chassis AP Alignment, Notes, Parts

GENERAL NOTES

- 1. If replacements are made or the wiring disturbed in the r-f section of the circuit, the receiver should be carefully re-aligned.
2. One side of the power line is directly grounded to the chassis base. Under no circumstances, therefore, should a ground lead be permitted to come in contact with any metal part of the receiver.
3. When operating the receiver on d.c., it may be necessary to reverse the line plug for correct polarity.
4. When replacing the chassis in the cabinet take precautions to keep any part of the dial and condenser assembly from touching the cabinet, otherwise microphonism will result.
5. The color coding of the i-f transformers is as follows:
Grid return-black
Plate-blue
B plus-green
B plus-red

6. An electrical phonograph pick-up may be connected to this receiver for playing records. Connections to this receiver may be made at the "phono" jack which is located on the rear wall of the phonograph pick-up. The two pick-up lead wires should be connected to the terminals of this volume control. A lead from one of the outside terminals of the volume control should be plugged into the phono jack. The leads to be plugged in the phono jack should be fitted with tips. The plug into the other hole in the phono jack. The leads to be plugged in the jack should be fitted with tips. The volume control in the receiver should be turned down to the zero volume position when operating the phonograph pick-up. A matching input transformer must be used. The impedance of the transformer is of the low impedance type. In this case the volume control is of the variable type. It is important that the phonograph leads be removed from the jack when it is desired to operate the receiver for ordinary radio reception.
7. An efficient antenna system is necessary to enable a full realization of the merits of the receiver. For reduction of noise and achievement of high efficiency, the Emerson All-Wave High-Fidelity Antenna, Model W-89, is recommended. Instructions for the installation of these antennas are supplied with each kit.
8. The Emerson All-Wave Antenna System, Model W-89, are recommended. Instructions for the installation of these antennas are supplied with each kit.
9. In congested areas where the installation of a large antenna is not desirable we recommend the use of the Emerson Flexible Mast Antenna, Model W-92. Instructions for the installation of this compact and efficient antenna are supplied with each kit.

ADJUSTMENTS

An oscillator with frequencies of 150, 350, 450, 600, 1500 and 16,000 kc should be used.
An output meter should be used across the voice coil or output transformer for observing maximum response.
Use a standard dummy antenna when aligning either the long-wave or medium-wave bands. A .0002 ohm resistor may be used as a substitute. When aligning the short-wave band use a 400 ohm dummy antenna (a 400 ohm resistor in series with antenna lead).
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.
Always use as weak a test signal as possible during alignment.
Never leave a trimmer with its outside plate so loose that there is no tension on the screw. Either bend the plate up or remove the screw entirely.

Location of Coils and Trimmers

The two i-f transformers are located on top of the chassis deck. The second i-f transformer is the one directly behind the variable condenser. The four trimmers, two for each transformer, are accessible through holes in the tops of the cans.
The dual adjustable padding condenser is mounted on the left side of the front chassis wall.
The antenna coils for the three bands are wound on one form and mounted underneath the chassis deck directly behind the adjustable padding condenser. The trimmers for these coils are accessible through holes in the top of the chassis. The trimmer nearest the front of the chassis is the medium-wave antenna trimmer. The central trimmer is the short-wave antenna trimmer. The trimmer farthest from the front of the chassis is the long-wave antenna trimmer.
The oscillator coils for the three bands are wound on one form and mounted underneath the chassis deck near the variable condenser. The trimmers for these coils are accessible through holes in the top of the chassis. The trimmer nearest the front of the chassis is the medium-wave oscillator trimmer. The central trimmer is the long-wave oscillator trimmer. The trimmer farthest from the front of the chassis is the long-wave oscillator trimmer.

I-f Alignment

Rotate the wave-band switch to the medium-wave (central) position and set the variable condenser to minimum. Feed 466 kc to the grid cap of the 6A7 tube. Adjust the four i-f trimmers for maximum response.

Long-Wave Alignment

With the wave-band switch at long-wave (clockwise) position set the dial pointer at 150 and feed 150 kc to antenna. Adjust the long-wave series paddler (hex nut on dial paddler) for maximum response. Move pointer to 350 and feed 350 kc to antenna. Adjust the long-wave oscillator trimmer then the long-wave antenna trimmer for maximum response. Reset pointer to 150, feed 150 kc and rock (rotate back and forth through small range) the variable condenser while adjusting long-wave series paddler for maximum response. Repeat procedure for 350, feed 350 kc and then alignment. If readjustment is necessary return to 150 kc and repeat entire procedure.

Medium-Wave Alignment

Set switch at medium-wave (central) position and dial pointer at 600. Feed 600 kc to antenna and adjust medium-wave series paddler (slotted screw on dial paddler) for maximum response. Move pointer to 1500, feed 1500 kc and adjust medium-wave oscillator trimmer and then the medium-wave antenna trimmer for maximum response. Reset dial pointer to 600 kc and rock (rotate back and forth through small range) the variable condenser while adjusting long-wave series paddler for maximum response. Repeat procedure for 1500, feed 1500 kc and then alignment. If readjustment is necessary return to 600 and repeat entire procedure.

Short-Wave Alignment

Set wave-band switch at short-wave (counter-clockwise) position. Set pointer at 15, feed 15 megacycles to antenna and adjust short-wave oscillator trimmer and then short-wave antenna trimmer for maximum response.

REPLACEMENT PARTS LIST

Table with columns: #item, Part No., DESCRIPTION, List Price, and Additive Price. Includes items like 456 kc wave-trap, R-f choke, antenna coils, transformers, resistors, capacitors, and various trimmers.

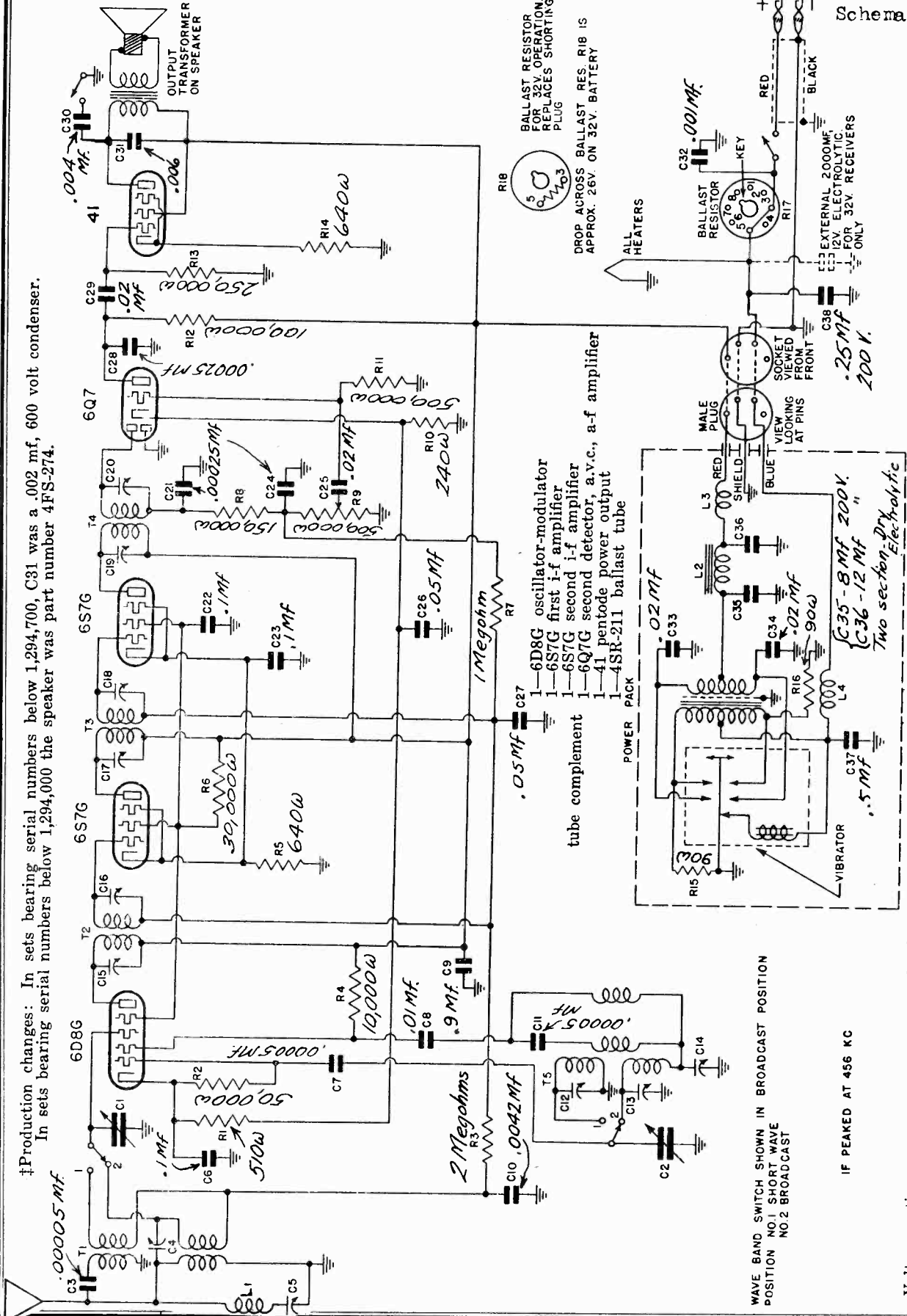
When ordering replacement parts specify part numbers.

*Item number locates the article on the schematic diagram. †These condensers are part of coil assemblies and cannot be supplied separately.

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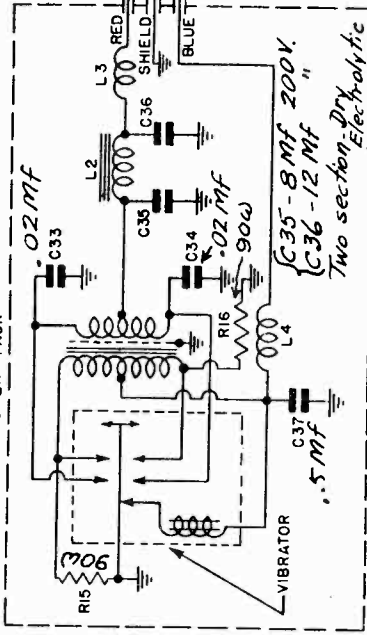
MODEL AS179
Chassis AS
Schematic

Production changes: In sets bearing serial numbers below 1,294,700, C81 was a .002 mf, 600 volt condenser.
In sets bearing serial numbers below 1,294,000 the speaker was part number 4FS-274.



RIB
BALLAST RESISTOR FOR 32V OPERATION REPLACES SHORTING PLUG
DROP ACROSS BALLAST RES. RIB IS APPROX. 26V. ON 32V. BATTERY

POWER PACK
tube complement
1-6D8G oscillator-modulator
1-6S7G first i-f amplifier
1-6S7G second i-f amplifier
1-6Q7G second detector, a.v.c., a-f amplifier
1-4SR-211 pentode power output
1-4SR-211 ballast tube



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

IF PEAKED AT 456 KC

Voltage rating 6 volts d.c. (6 volt storage battery)
Current drain 2.65 amps
Frequency range 540 to 1730 kc and 5.75 to 18.3 mc.

6 TUBE BATTERY RECEIVER

MODEL AS179

Chassis AS

Alignment, Notes, Voltage

EMERSON RADIO & PHONO. CORP.

ADJUSTMENTS

An oscillator with frequencies of 456, 600, 1600 and 15,000 kc should be used.

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

If the circuit is at all disturbed, both the broadcast and short-wave bands must be realigned.

Never leave a 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.

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

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

Location of Coils and Trimmer Adjustments

The first i-f transformer, part number 4ET-350C, is located on top of the chassis to the left of the variable condenser.

The second i-f transformer, part number 4ET-350A is located on top of the chassis behind the variable condenser.

The third i-f transformer, part number 4FT-382B, is located on top of the chassis to the right of the variable condenser.

The trimmer condensers, two for each transformer, are accessible through holes in the top of the cans.

The adjustable padding condenser for the broadcast band is mounted underneath the chassis (in the corner near the 6D8G tube) with the screw adjustment accessible through a hole in the front of the chassis.

The antenna coils for the broadcast and short-wave bands and the 456 kc wave-trap are wound on one form and mounted underneath the chassis deck directly behind the adjustable padding condenser. The trimmers for these coils are accessible through holes in the top of the chassis. The trimmer nearest the front of the chassis is the broadcast antenna trimmer. The central trimmer is the short-wave antenna trimmer. The trimmer nearest the rear of the chassis is the 456 kc wave-trap.

The oscillator coils for the broadcast and short-wave bands are wound on one form and mounted underneath the chassis deck near the variable condenser. The trimmers for these coils are accessible through holes in the top of the chassis. The trimmer nearest the front of the chassis is for the short-wave oscillator coil and the trimmer farthest from the front is for the broadcast oscillator coil.

I-f and Wave-trap Alignment

Rotate the wave-band switch to the broadcast (clockwise) position. Set the variable condenser at the minimum capacity position and feed 456 kc through a 0.02 mf paper condenser to the grid cap of the 6D8G tube (do not remove the grid clip from the tube). Adjust the six i-f trimmers for maximum response. Feed 456 kc to the antenna through a standard dummy antenna and adjust the wave-trap trimmer for *minimum* response. (See General Notes.)

Broadcast Alignment

Rotate the wave-band switch to the broadcast position (clockwise) and set the dial pointer at 600. Feed 600 kc through a standard dummy antenna. Adjust the broadcast series padding condenser for maximum response. Move pointer to 1600, feed 1600 kc and adjust the broadcast oscillator trimmer for maximum response and then adjust the broadcast antenna trimmer for maximum response. Return pointer to 600, feed 600 kc and readjust the series padding condenser, rocking the variable condenser for maximum response.

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

Short-Wave Alignment

Rotate the wave-band switch to the short-wave (counter-clockwise) position, and set the dial pointer exactly at 15 megacycles. Feed 15,000 kc to the antenna through a 400 ohm non-inductive resistor and adjust the short-wave oscillator trimmer for maximum response, and then adjust the short-wave antenna trimmer for maximum response. Be very careful to choose the maximum capacity peak on the oscillator trimmer.

The set's oscillator is lower in frequency than the signal (on the short-wave band only), so images should be observed on the high frequency side of the signal.

1. The large, oblong metal box behind the speaker contains the power pack. The function of this power pack is to convert the 6 volt direct current from the storage battery into 150 volt direct current. The vibrator used is of the synchronous type.
2. The wave-trap in the receiver has been adjusted for maximum signal rejection at 456 kc. If, however, persistent interference is experienced from some particular telegraphic station, readjust the wave-trap trimmer until the response from the interfering station is at a minimum.
3. Particular care should be taken in connecting the battery to the receiver. The heavy battery cable emerging from the rear of the receiver terminates in two separate leads with clips attached. Note that the clip at the end of the red rubber covered lead is marked with a plus sign (+). This clip should be attached to the *positive* terminal of the six-volt storage battery. The other clip, on the braid covered lead should be attached to the *negative* terminal of the storage battery. It is important to observe the proper polarity in connecting the battery. Reversed connections with the receiver turned on will result in serious damage to the receiver.
4. Make certain that all battery connections make good contact, otherwise the receiver may be noisy. The positive terminal of an unmarked battery may be distinguished by a deposit of green corrosion, which usually collects on this terminal. On most batteries the positive terminal is larger than the negative terminal.
5. The color coding of the leads of the i-f transformers is as follows:

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

6. With few exceptions the color coding of the general wiring is as follows:

Plate—blue	Cathode—white or yellow
B plus—red	Grid—green
Screen—brown	Filament and ground—black

7. The color coding of the leads of the power pack is as follows:
- | | | |
|-------------|------------|--------------------|
| A plus—blue | B plus—red | Common neg.—shield |
|-------------|------------|--------------------|

The receiver may be quickly and easily adapted for operation from a 32 volt power supply. A complete kit, Model W-95, containing the additional parts required for this conversion may be purchased through Emerson dealers. Complete instructions for attaching these additional parts are supplied with each kit.

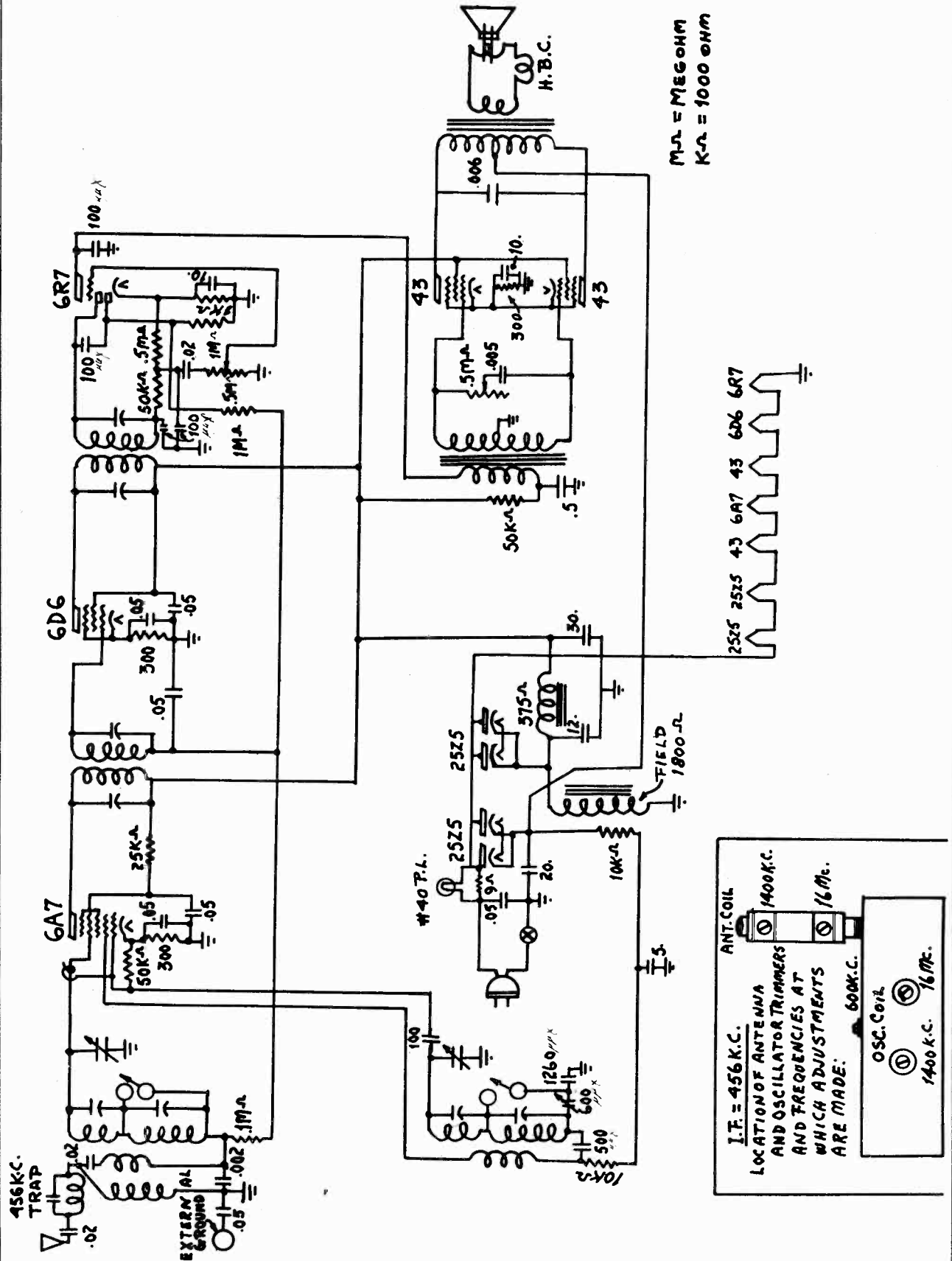
Readings should be taken with a 1,000 ohms-per-volt meter. Voltages listed below are from point indicated to chassis with volume control turned on full and no signal. Battery voltage for these readings was 6.1 volts.

Tube	Plate	Screen	Cathode	Osc. Plate
6D8G osc.-mod.	150	60	4	120
6S7G 1st i-f	150	60	4	—
6S7G 2nd i-f	150	60	4	—
6Q7G 2nd detector	95	—	1.4	—
41 output	145	150	10.5	—

VOLTAGE ANALYSIS

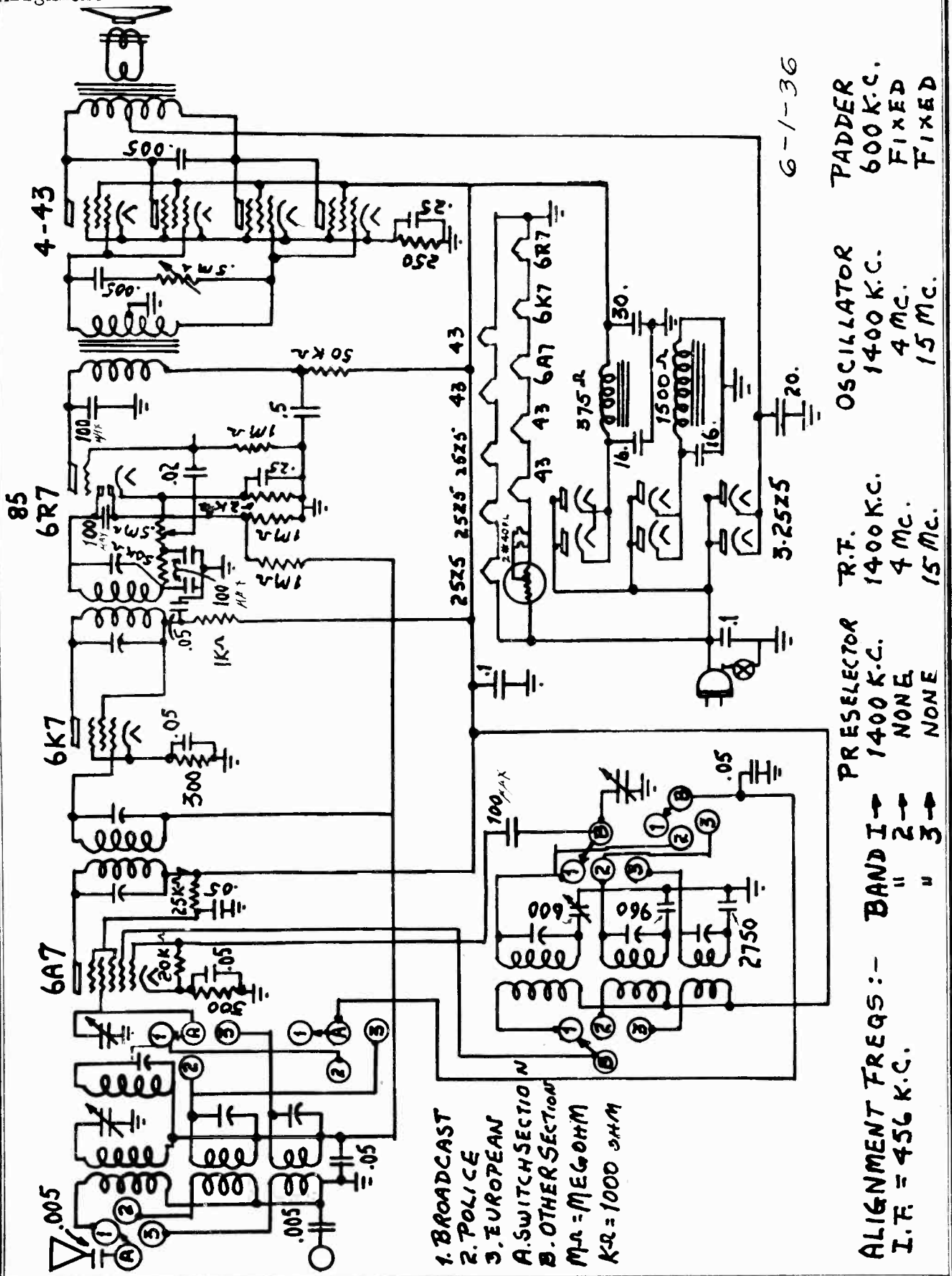
ESPEY MFG. CO., INC.

MODEL 675
Schematic, Trimmers
Alignment



MODEL 5111
Schematic
Alignment

ESPEY MFG. CO., INC.



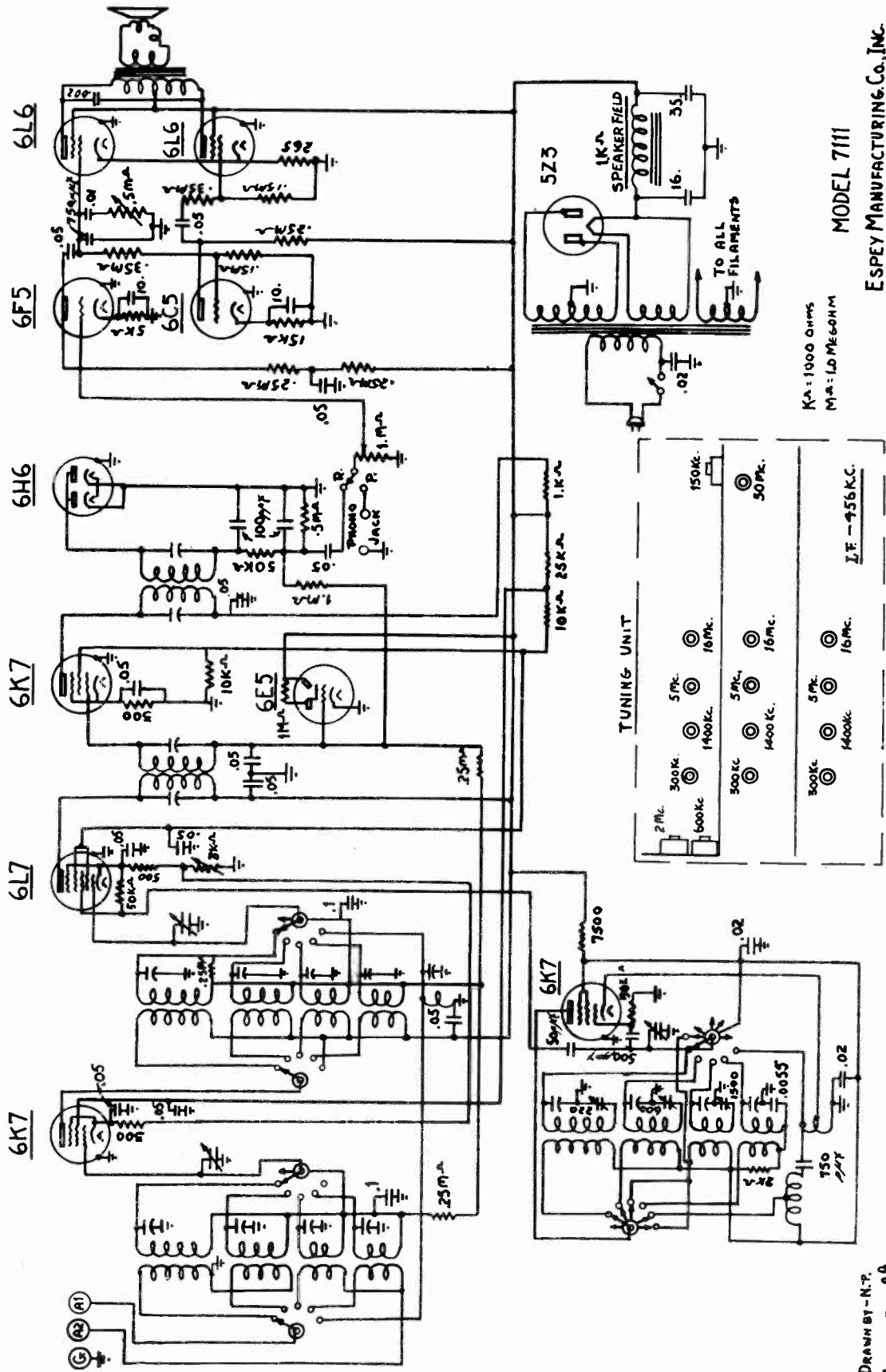
1. BROADCAST
2. POLICE
3. EUROPEAN
A. SWITCH SECTION
B. OTHER SECTION
M.A. = MEGOHM
K.O. = 1000 OHM

ALIGNMENT FREQS.:- BAND I → 1400 K.C.
" " → NONE
" " → NONE
PRESELECTOR R.F. 1400 K.C.
4 Mc.
15 Mc.
OSCILLATOR 1400 K.C.
4 Mc.
15 Mc.
PADDER 600 K.C.
FIXED
FIXED

6-1-36

ESPEY MFG. CO., INC.

MODEL 7111
Schematic
Trimmers, Alignment



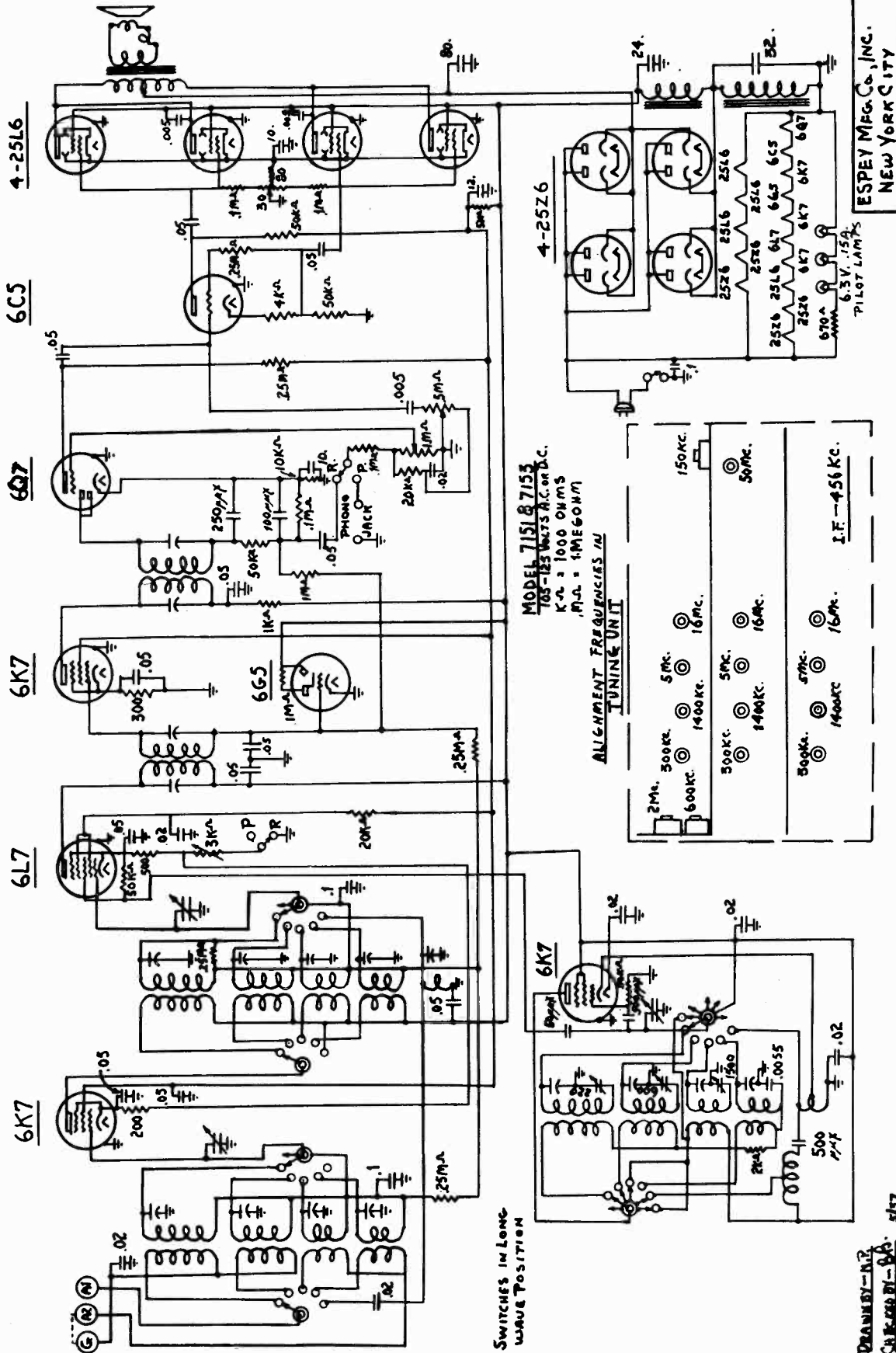
MODEL 7111
ESPEY MANUFACTURING CO., INC.
NEW YORK CITY

K_A = 1900 OHMS
M_A = 1.0 MEGOHM

DRAWN BY - N.P.
CHECKED BY - 88.

MODELS 7151, 7153
Schematic, Trimmers
Alignment

ESPEY MFG. CO., INC.



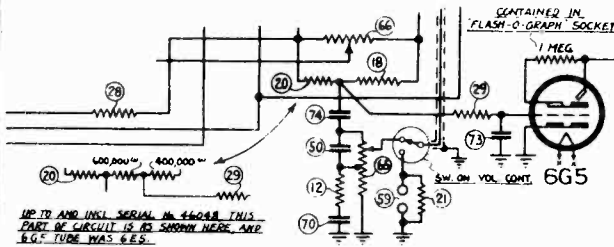
ESPEY MFG. CO., INC.
NEW YORK CITY

SWITCHES IN LOW
WAVE POSITION

DRANBY-112
S.A. 500 BT-100
4/57

FADA RADIO & ELECTRIC CO

MODEL 211(Late)
Alignment, Changes
Socket, Trimmers



The Schematic of the EARLY model on page 7-3 is the same as the latest model with the exception, Ref.No.54 was .00093 Mf, changed to .0007 MF, MICA, the latter value shunted by Ref.No. 89, Padding Condenser of 110 to 250 MMF.

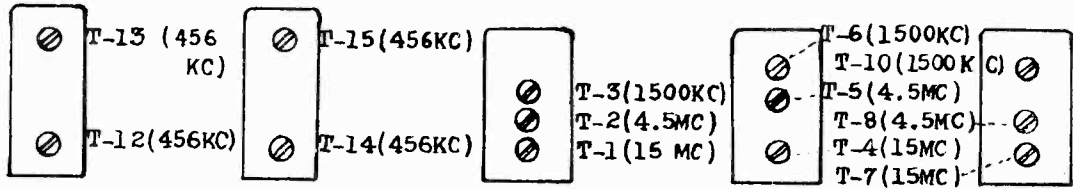
The changes in the Flash-o-graph circuit is given in the insert to the left.

FLASH-O-GRAPH CIRCUIT CHANGES

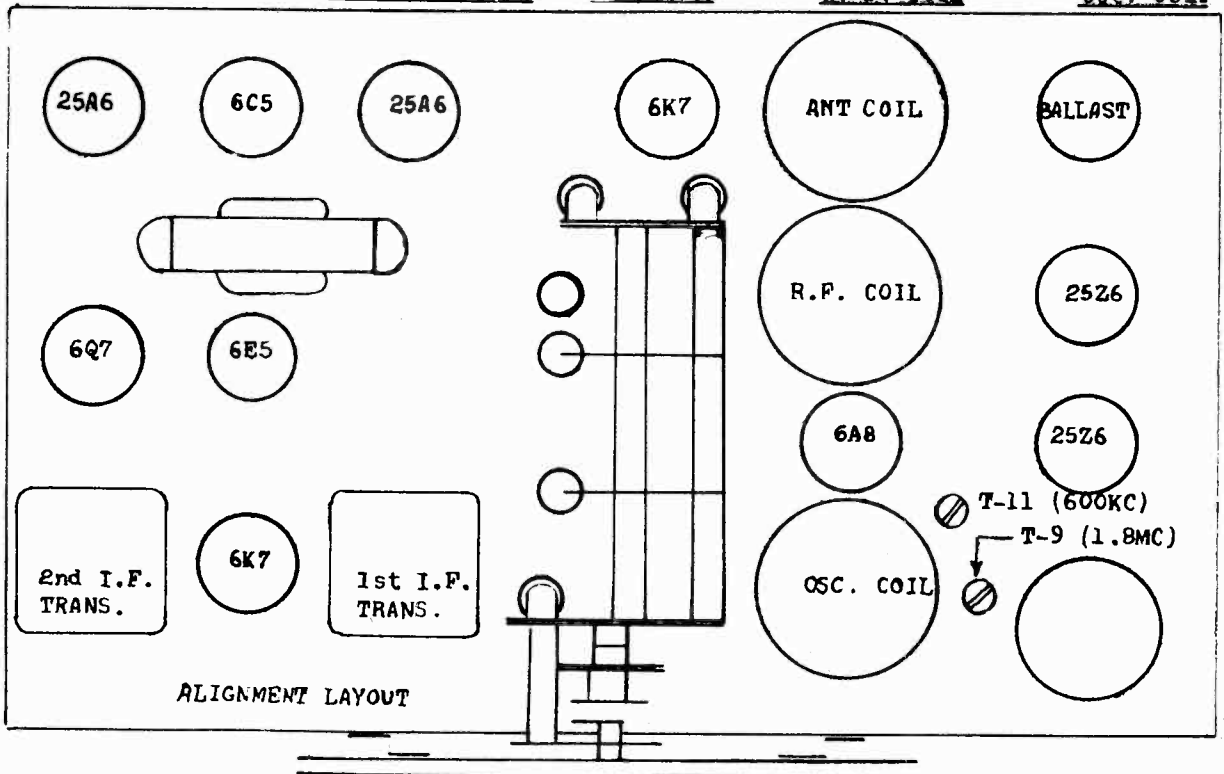
ALIGNMENT TABLE

WAVE BAND	DIAL FRE.	GEN. FRE.	IMAGE FRE.	DUMMY ANTENNA	GENERATOR CON. TO	ADJUST TRIMMER
BC	---	456KC	- -	.001 MF 50 M	CG of IF	T15, T14
BC	- -	456KC	- -	Same	CG of 6A8	T13, T12
A	15 MC	15 MC	15.9MC	400	"Y" Ant.	T7, T4, T1
A	6 MC	6 MC	- -	Same	Same	Chk. Sen.
B	4.5MC	4.5MC	- -	Same	Same	T8, T5, T2
B	1.8MC	1.8MC	- -	Same	Same	T9 (Rock V.C.)
C	1500KC	1500KC	- -	200 MMF	Same	T10, T6, T3
C	600KC	600KC	- -	Same	Same	T11 (Rock VC)

All adjustments made with selectivity control in the "S" Position



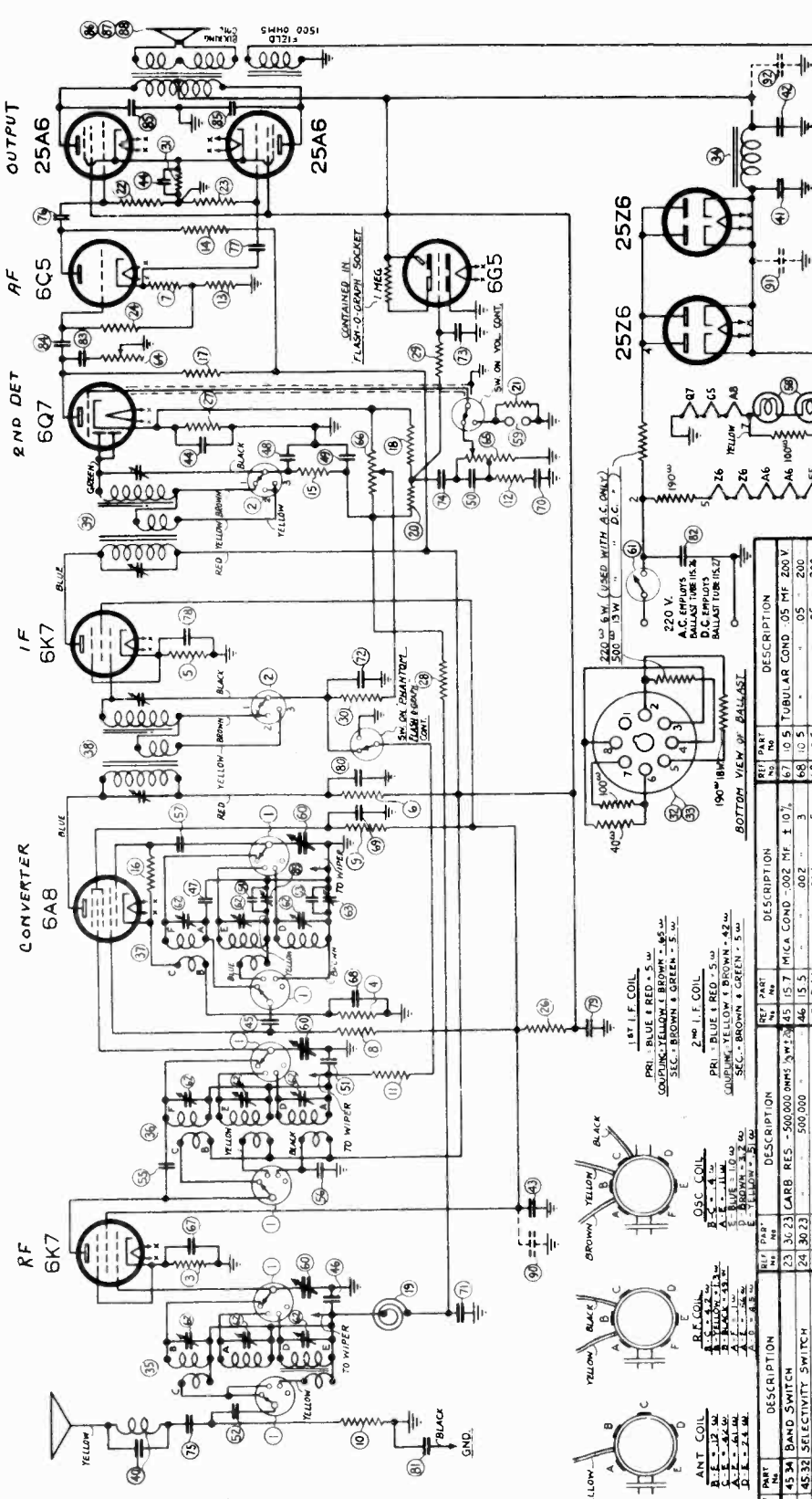
1st I.F. Trans. 2nd I.F. Trans. Ant. Coil R. F. Coil Osc. Coil



ALIGNMENT LAYOUT

MODEL 211(220V)
Schematic, Parts

FADA RADIO & ELECTRIC CO.



I. F. - 456 KC

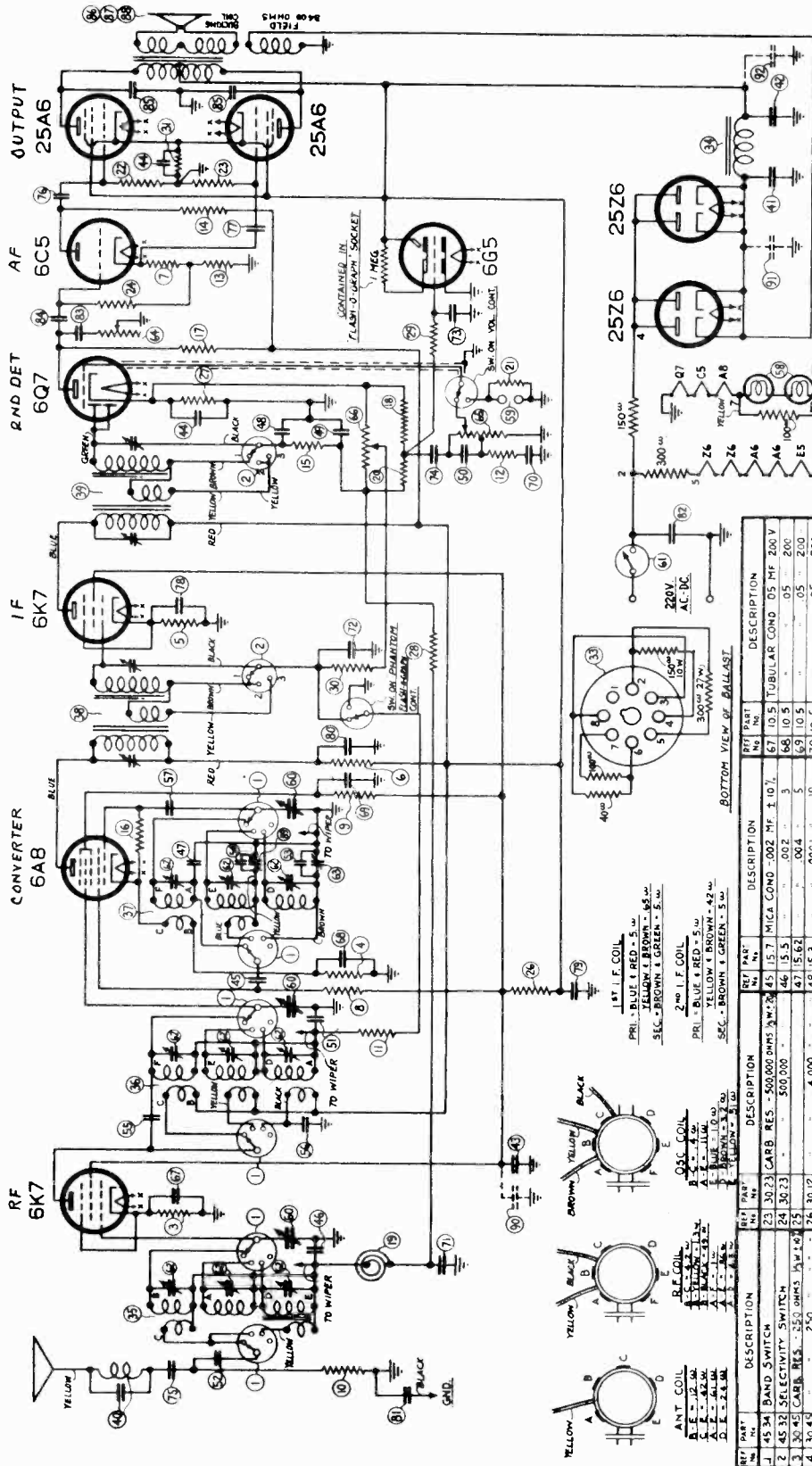
NOTE:
- BAND SW. SHOWN IN 3rd POSITION.
- SELECTIVITY SW. - SHARP.
- 6G5 (6) ELECTRON CONTROL (M.F. 100 W.V. FOR 25-CYCLE OPERATION ONLY).
- CHASSIS 2

FADA RADIO & ELECTRIC CO. LONG ISLAND CITY, N. Y.	
220V-MODEL 211	
REVISED BY	11-12-36
APPROVED BY	P.F.S.

REF. PART No.	DESCRIPTION	REF. PART No.	DESCRIPTION
1 45 34	BAND SWITCH	45 15 7	MICA COND. .05 MF 200 V.
2 45 32	SELECTIVITY SWITCH	46 15 5	TUBULAR COND. .05 MF 200 V.
3 30 45	CARB. RES. - 250 OHMS 1/2 W. 10% TOL.	47 15 6 2	5
4 30 45	250	48 15 3	.0001
5 30 63	300	49 15 3	.0001
6 30 36	1000	50 15 3	.0001
7 30 15	2000	51 15 5	.0025
8 30 1	5000	52 15 2	.0025
9 30 2	10000	53 15 2	.0025
10 30 31	100000	54 15 2	.0025
11 30 31	100000	55 15 2	.0025
12 30 58	20000	56 15 10	35
13 30 59	20000	57 15 10	50
14 30 10	50000	58 20 3	PILOT L.T.'S. 4-B.V. 15 A.
15 30 26	50000	59 20 1	PHONO JACK
16 30 84	1000000	60 25 1	VARIABLE COND.
17 30 84	1000000	61 61	ON-OFF SW. ON TONE CONT.
18 30 6	1500000	62 10 10	83
19 30 16	CHOK. COIL - 2.3 MH	63 25 49	PAIDING COND. - 70 M.H.F.
20 30 20	CARB. RES. 250000 OHMS 1/2 W. 10% TOL.	64 55 11	TONE CONTROL - 1/2 M.H.F.
21 30 23	500000	65 50 35	VOLUME - 1 MEG TAPPED & 500000
22 30 25	500000	66 10 10	25
		67 10 10	25
		68 10 10	25
		69 10 10	25
		70 10 10	25
		71 10 10	25
		72 10 10	25
		73 10 10	25
		74 10 10	25
		75 10 10	25
		76 10 10	25
		77 10 10	25
		78 10 10	25
		79 10 10	25
		80 10 10	25
		81 10 10	25
		82 10 10	25
		83 10 10	25
		84 10 10	25
		85 10 10	25
		86 10 10	25
		87 10 10	25
		88 10 10	25
		89 10 10	25
		90 10 10	25
		91 25 6 4	PAIDING COND. - 110 - 250 MHF

FADA RADIO & ELECTRIC CO.

MODEL 211B(220V)
Schematic, Parts



I. F. - 456 KC.

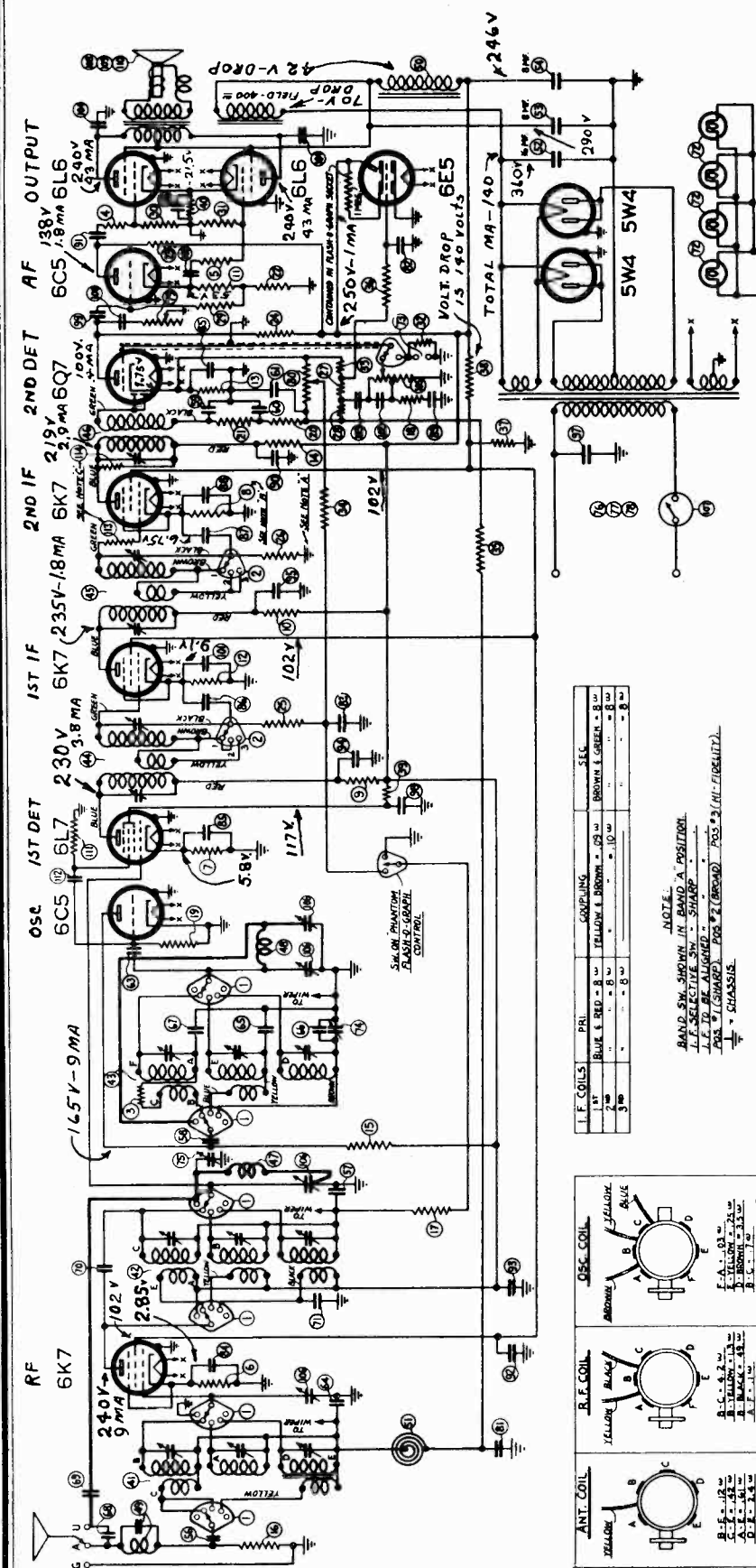
NOTE:
BAND SW SHOWN IN S.W. POSITION.
SELECTIVITY SW. - SHARP.
I. F. TO BE ALIGNED
POS. 1 (SHARP) POS. 2 (BROAD) POS. 3 (HI-FIDELITY)
ELECTRO COND. - 5 MF 175 W.V. (FOR 2.5 CYCLE OPERATION ONLY)
CHAS 515 (CMT. NO. 20-50)

REF. PART NO.	DESCRIPTION	REF. PART NO.	DESCRIPTION	REF. PART NO.	DESCRIPTION
1	45 34 BAND SWITCH	21	30 23 CARB. RES. 500,000 OHMS 1/2 W.	67	10 5 TUBULAR COND. 05 MF 200 V.
2	45 32 SELECTIVITY SWITCH	24	30 13 CARB. RES. 300,000 -	68	10 5 TUBULAR COND. 05 MF 200 V.
3	30 24 CARB. RES. 250,000 OHMS 1/2 W.	25	30 15 CARB. RES. 4,000 -	69	10 5 TUBULAR COND. 05 MF 200 V.
4	30 24 CARB. RES. 250,000 OHMS 1/2 W.	26	30 12 CARB. RES. 4,000 -	70	10 5 TUBULAR COND. 05 MF 200 V.
5	30 43 CARB. RES. 250,000 OHMS 1/2 W.	27	30 15 CARB. RES. 4,000 -	71	10 26 TUBULAR COND. 02 MF 200 V.
6	30 43 CARB. RES. 250,000 OHMS 1/2 W.	28	30 15 CARB. RES. 4,000 -	72	10 26 TUBULAR COND. 02 MF 200 V.
7	30 15 CARB. RES. 2,000,000 -	29	30 15 CARB. RES. 4,000 -	73	10 26 TUBULAR COND. 02 MF 200 V.
8	30 15 CARB. RES. 2,000,000 -	30	30 15 CARB. RES. 4,000 -	74	10 26 TUBULAR COND. 02 MF 200 V.
9	30 2 CARB. RES. 50,000 -	31	30 28 CARB. RES. 2,000,000 -	75	10 4 TUBULAR COND. 01 MF 200 V.
10	30 2 CARB. RES. 50,000 -	32	30 43 CARB. RES. 250,000 OHMS 1/2 W.	76	10 2 TUBULAR COND. 01 MF 200 V.
11	30 31 CARB. RES. 10,000 -	33	10 18 BALLAST RES. 40-100 OHMS 1/2 W.	77	10 2 TUBULAR COND. 01 MF 200 V.
12	30 31 CARB. RES. 10,000 -	34	40 34 BALLAST RES. 40-100 OHMS 1/2 W.	78	10 2 TUBULAR COND. 01 MF 200 V.
13	30 31 CARB. RES. 10,000 -	35	35 15 ANTENNA	79	10 2 TUBULAR COND. 01 MF 200 V.
14	30 31 CARB. RES. 10,000 -	36	35 15 ANTENNA	80	10 2 TUBULAR COND. 01 MF 200 V.
15	30 24 CARB. RES. 50,000 -	37	35 17 OSCILLATOR	81	10 2 TUBULAR COND. 01 MF 200 V.
16	30 24 CARB. RES. 50,000 -	38	35 9 TUNING	82	10 3 PHONO JACK
17	30 24 CARB. RES. 50,000 -	39	35 9 TUNING	83	10 3 PHONO JACK
18	30 6 CHOKE COIL - 100,000 -	40	35 6 WAVE TRAP	84	10 10 VARIABLE COND.
19	32 16 CHOKE COIL - 2.3 MH	41	20 54 ELECTRO COND. 32 MF 175 W.V.	85	10 10 VARIABLE COND.
20	30 20 CARB. RES. 250,000 OHMS 1/2 W.	42	20 54 ELECTRO COND. 32 MF 175 W.V.	86	10 17 DIAL
21	30 23 CARB. RES. 500,000 OHMS 1/2 W.	43	20 55 ELECTRO COND. 70 MF	87	10 55 SPEAKER 3400 OHMS (MOR. 211 B)
22	30 23 CARB. RES. 500,000 OHMS 1/2 W.	44	10 10 DIAL	88	10 57 PHANTOM FLASH-O-GRAPH
		45	20 44 DIAL	89	25 64 PADDING COND. 10 - 250 P.P.T.

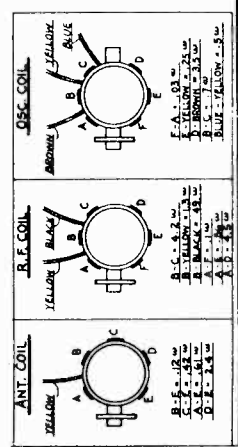
FADA RADIO & ELECTRIC CO.
LONG ISLAND CITY, N. Y.
220 V. MODEL 211 B
PRINTED IN U.S.A.
DATE 10-15-36
APPROVED BY J.F.S.

MODEL 212
Schematic
Voltage, Parts

FADA RADIO & ELECTRIC CO



I. F. COILS		PRI. COUPLING		SEC.	
1st	Blue & Red - 8 Ω	Yellow & Brown - 0.5 Ω	Brown & Green - 8 Ω	B - 8 Ω	B - 8 Ω
2nd	"	"	"	"	"
3rd	"	"	"	"	"



NOTE:
BAND SW. SHOWN IN BAND A POSITION.
I. F. SELECTIVE SW. - SHARP.
I. F. TO BE ALIGNED - SHARP.
PUSH UP (SHARP) FOR 2 (BROAD) POS. - 2 (ALTERNATELY).
↑ = CHASSIS.

FOR ALIGNMENT, SEE INDEX

I. F. - 456 KC.

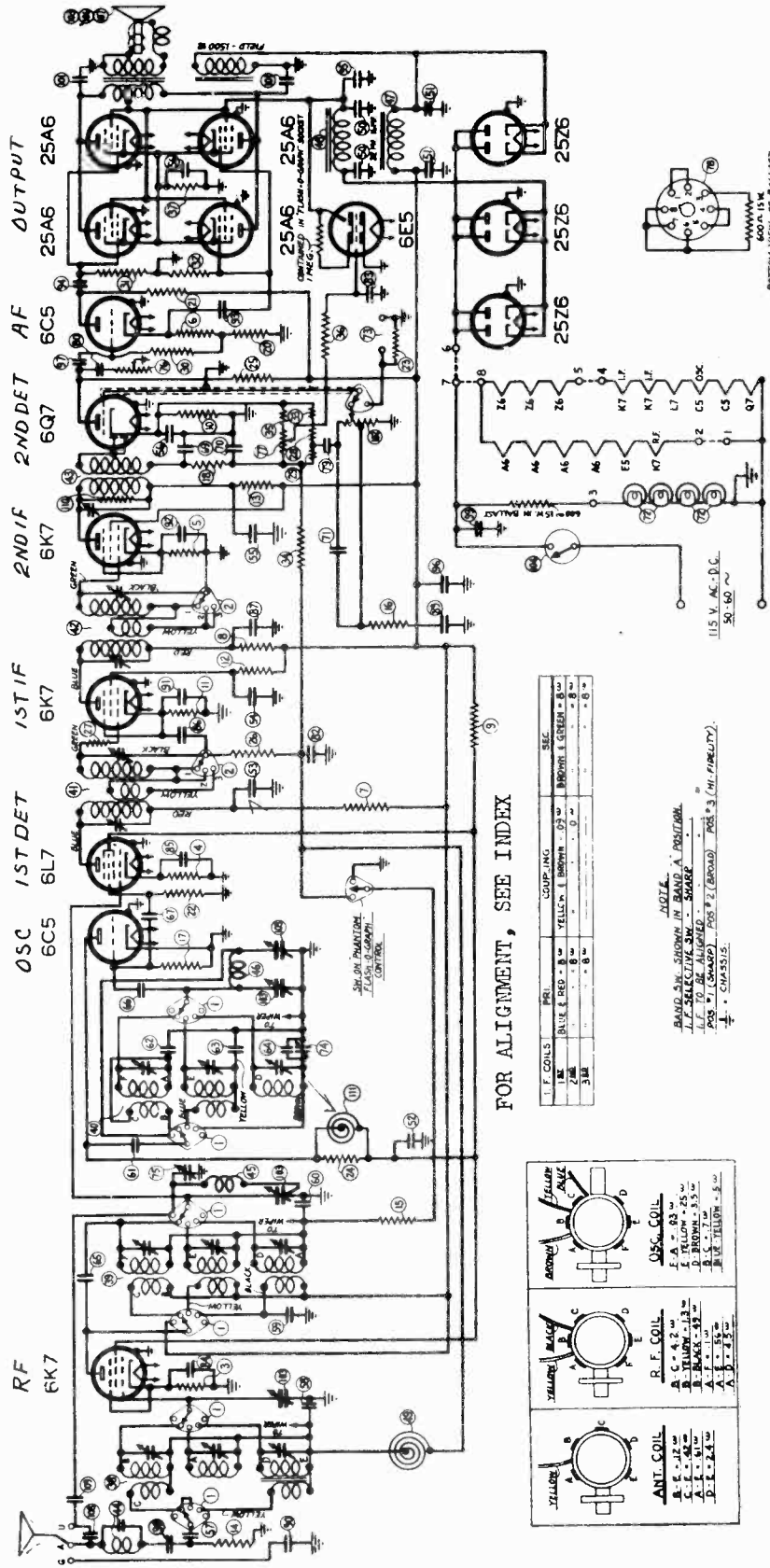
FIELD OUTPUT coil
400 Ω 800 Ω
400 Ω 500 Ω
400 Ω 400 Ω 1/2

FADA RADIO & ELECTRIC CO
CINCINNATI, OHIO
MODEL 212
DESIGNED BY
F. J. S.
APPROVED BY
F. J. S.

REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION
1	45.54	BAND SW.	73	125.1	PHONO JACK
2	45.324	SELECTIVITY SW.	74	25.40	PADDING COND. - 140 MHF.
3	30.78	CARB. RES. - 25 OHMS 1/10"	75	25.43	"
4	30.70	"	76	40.03	POWER TRANS. - 115 V. 50-60 MA.
5	30.70	"	77	40.50	"
6	30.45	"	78	40.51	"
7	30.71	"	79	55.13	TR. CONTROL - 2% MEC.
8	30.68	"	80	50.24	PUSH ON SWITCH CONTROL - 1 MEG.
9	30.64	"	81	10.28	TUBULAR COND. - 02 MHF. 200 V.
10	30.57	"	82	10.28	"
11	30.57	"	83	10.28	"
12	30.1	"	84	10.28	"
13	30.4	"	85	10.3	"
14	30.3	"	86	10.5	"
15	30.3	"	87	10.5	"
16	30.3	"	88	10.5	"
17	30.3	"	89	10.5	"
18	30.3	"	90	10.5	"
19	30.1	"	91	10.9	"
20	30.1	"	92	10.9	"
21	30.35	"	93	10.9	"
22	30.55	"	94	10.7	"
23	30.10	"	95	10.7	"
24	30.53	"	96	10.7	"
			97	10.7	TUBULAR COND. - 05 MHF. 400 V.
			98	10.10	"
			99	10.10	"
			100	10.10	"
			101	10.2	"
			102	10.2	"
			103	10.2	"
			104	10.2	"
			105	10.2	"
			106	10.2	"
			107	45.37	VOLUME CONTROL - 1 MHF. 200 V.
			108	45.49	ON-OFF SW. (LINE)
			109	105.50	"
			110	105.51	"
			111	30.3	CARB. RES. - 50,000 OHMS 1/10"
			112	15.10	MICA COND. - 50 MHF. 10 V.
			113	30.20	CARB. RES. - 250,000 OHMS 1/10"
			114	30.20	"
			115	30.20	"
			116	30.20	"
			117	30.20	"
			118	30.20	"
			119	30.20	"
			120	30.20	"
			121	20.3	PILOT L.T.S. - 6-B.V. 15A
			122	30.53	"

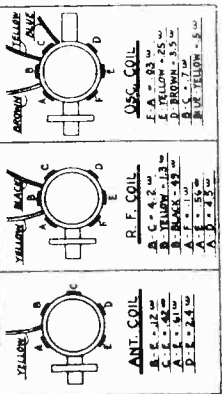
MODEL 216(3rd Prod.)
Schematic, Parts

FADA RADIO & ELECTRIC CO.

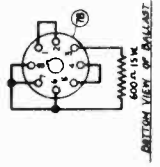


FOR ALIGNMENT, SEE INDEX

L.F. COILS	PREL.	COUPLING	SEC.
1M	BLUE & RED	8	BROWN & GREEN
2M	8	8	8
3M	8	8	8



NOTE:
BAND SW. SHOWN IN BAND A POSITION.
L.F. TO BE ADJUSTED - BARGE.
POS. W/ (SWAMP) POS. 2 (BROAD) POS. 3 (HI. FIDELITY).
L.F. CHASSIS.



REF. PART NO.	DESCRIPTION	QTY. REQ.	REF. PART NO.	DESCRIPTION	QTY. REQ.
37	10.10 TUBULAR COND. - 01 MF 400V	1	73	125.1 PHONO JACK	1
38	10.10 TUBULAR COND. - 01 MF 400V	1	74	25.40 PADDING COND. - 140 MHF.	1
39	10.10 TUBULAR COND. - 01 MF 400V	1	75	25.40 PADDING COND. - 140 MHF.	1
40	10.10 TUBULAR COND. - 01 MF 400V	1	76	25.40 PADDING COND. - 140 MHF.	1
41	10.10 TUBULAR COND. - 01 MF 400V	1	77	25.40 PADDING COND. - 140 MHF.	1
42	10.10 TUBULAR COND. - 01 MF 400V	1	78	15.19 FLASH GRAPH. CONTROL - 1 MEG.	1
43	10.10 TUBULAR COND. - 01 MF 400V	1	79	10.4 BALLAST RES. - 600Ω 15W	1
44	10.10 TUBULAR COND. - 01 MF 400V	1	80	10.4 TUBULAR COND. - 01 MF 200V	1
45	10.10 TUBULAR COND. - 01 MF 400V	1	81	10.4 TUBULAR COND. - 01 MF 200V	1
46	10.10 TUBULAR COND. - 01 MF 400V	1	82	10.24 MICRA COND. - 0005 MF 1.0V	3
47	10.10 TUBULAR COND. - 01 MF 400V	1	83	10.24 MICRA COND. - 0005 MF 1.0V	3
48	10.10 TUBULAR COND. - 01 MF 400V	1	84	10.24 MICRA COND. - 0005 MF 1.0V	3
49	10.10 TUBULAR COND. - 01 MF 400V	1	85	10.24 MICRA COND. - 0005 MF 1.0V	3
50	10.10 TUBULAR COND. - 01 MF 400V	1	86	10.24 MICRA COND. - 0005 MF 1.0V	3
51	10.10 TUBULAR COND. - 01 MF 400V	1	87	10.24 MICRA COND. - 0005 MF 1.0V	3
52	10.10 TUBULAR COND. - 01 MF 400V	1	88	10.24 MICRA COND. - 0005 MF 1.0V	3
53	10.10 TUBULAR COND. - 01 MF 400V	1	89	10.24 MICRA COND. - 0005 MF 1.0V	3
54	10.10 TUBULAR COND. - 01 MF 400V	1	90	10.24 MICRA COND. - 0005 MF 1.0V	3
55	10.10 TUBULAR COND. - 01 MF 400V	1	91	10.24 MICRA COND. - 0005 MF 1.0V	3
56	10.10 TUBULAR COND. - 01 MF 400V	1	92	10.24 MICRA COND. - 0005 MF 1.0V	3
57	10.10 TUBULAR COND. - 01 MF 400V	1	93	10.24 MICRA COND. - 0005 MF 1.0V	3
58	10.10 TUBULAR COND. - 01 MF 400V	1	94	10.24 MICRA COND. - 0005 MF 1.0V	3
59	10.10 TUBULAR COND. - 01 MF 400V	1	95	10.24 MICRA COND. - 0005 MF 1.0V	3
60	10.10 TUBULAR COND. - 01 MF 400V	1	96	10.24 MICRA COND. - 0005 MF 1.0V	3
61	10.10 TUBULAR COND. - 01 MF 400V	1	97	10.24 MICRA COND. - 0005 MF 1.0V	3
62	10.10 TUBULAR COND. - 01 MF 400V	1	98	10.24 MICRA COND. - 0005 MF 1.0V	3
63	10.10 TUBULAR COND. - 01 MF 400V	1	99	10.24 MICRA COND. - 0005 MF 1.0V	3
64	10.10 TUBULAR COND. - 01 MF 400V	1	100	10.24 MICRA COND. - 0005 MF 1.0V	3
65	10.10 TUBULAR COND. - 01 MF 400V	1	101	10.24 MICRA COND. - 0005 MF 1.0V	3
66	10.10 TUBULAR COND. - 01 MF 400V	1	102	10.24 MICRA COND. - 0005 MF 1.0V	3
67	10.10 TUBULAR COND. - 01 MF 400V	1	103	10.24 MICRA COND. - 0005 MF 1.0V	3
68	10.10 TUBULAR COND. - 01 MF 400V	1	104	10.24 MICRA COND. - 0005 MF 1.0V	3
69	10.10 TUBULAR COND. - 01 MF 400V	1	105	10.24 MICRA COND. - 0005 MF 1.0V	3
70	10.10 TUBULAR COND. - 01 MF 400V	1	106	10.24 MICRA COND. - 0005 MF 1.0V	3

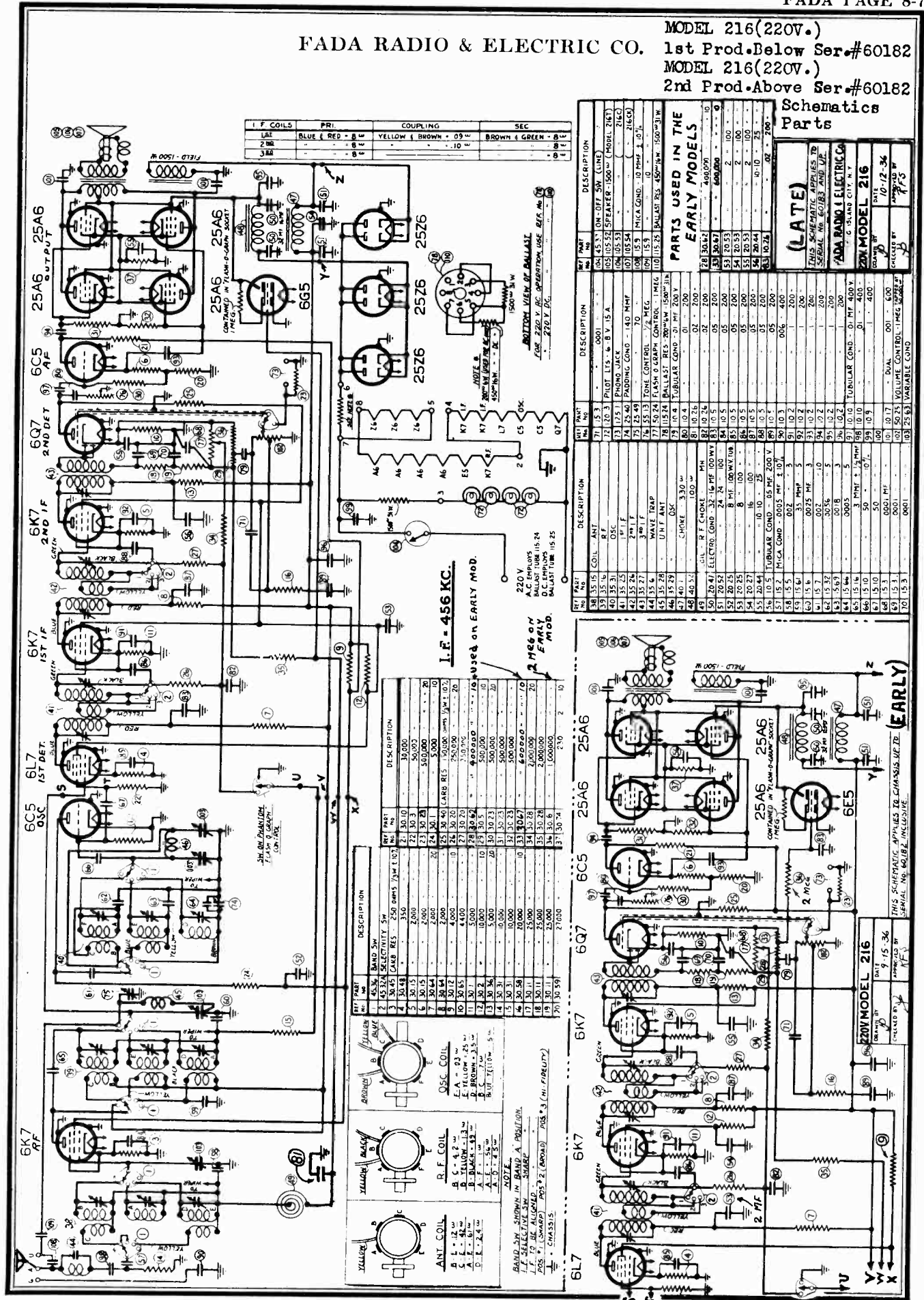
I.F. - 456 KC.
3RD PRODUCTION
FADA RADIO ELECTRIC CO.
LONG ISLAND CITY, N.Y.
MODEL 216
DATE: 2-9-37
DRAWN BY: [Signature]
CHECKED BY: [Signature]

SEE OTHER SIDE FOR ENERGY MODELS

FADA RADIO & ELECTRIC CO.

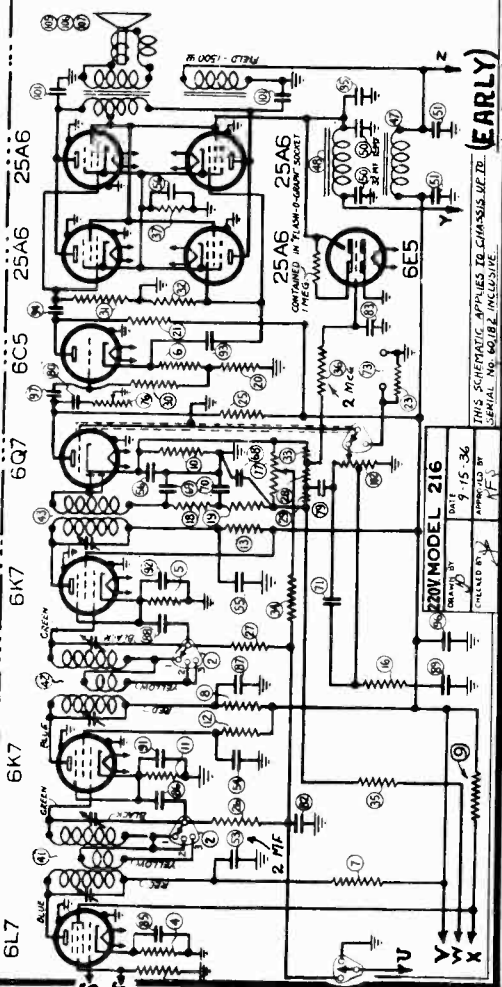
MODEL 216(220V.)
1st Prod. Below Ser.#60182
MODEL 216(220V.)
2nd Prod. Above Ser.#60182

Schematics
Parts

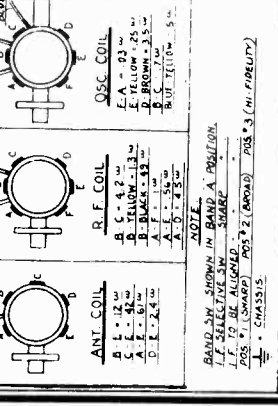


1 F COILS	PRI	COUPLING	SEC
1A1	BLUE & RED - B 4"	YELLOW & BROWN - .09"	BROWN & GREEN - B 1"
2B	- B 4"	- .10"	- B 1"
3B	- B 4"	- .10"	- B 1"

RT PART NO	DESCRIPTION	RT PART NO	DESCRIPTION
38 35 15	COIL ANT	71 15 3	0001
39 35 16	R.F	72 10 3	PHONO JACK
40 35 17	1A1	73 10 5	PHONO JACK
41 35 18	1A1	74 25 40	PADDING COND - 140 MMF
42 35 24	2M IF	75 25 40	2M IF
43 35 27	3M IF	76 25 40	3M IF
44 35 6	WAVE TRAP	77 25 40	3M IF
45 35 28	UHF ANT	78 10 5	500K COND
46 35 29	UHF ANT	79 10 4	TUBULAR COND - 01 MF 200 V
47 40 1	CHOKER 3.30 M	80 10 4	TUBULAR COND - 01 MF 200 V
48 40 5	CHOKER 1.00 M	81 10 4	TUBULAR COND - 01 MF 200 V
49 35 19	1A1	82 10 4	PHONO JACK
50 35 20	1A1	83 10 5	ELECTRO COND - 50 MF 200 V
51 35 21	1A1	84 10 5	ELECTRO COND - 50 MF 200 V
52 35 22	1A1	85 10 5	ELECTRO COND - 50 MF 200 V
53 35 23	1A1	86 10 5	ELECTRO COND - 50 MF 200 V
54 20 27	1A1	87 10 5	ELECTRO COND - 50 MF 200 V
55 20 28	1A1	88 10 5	ELECTRO COND - 50 MF 200 V
56 10 5	TUBULAR COND - 05 MF 200 V	89 10 3	0001
57 10 5	TUBULAR COND - 05 MF 200 V	90 10 3	0001
58 10 5	TUBULAR COND - 05 MF 200 V	91 10 2	0001
59 10 5	TUBULAR COND - 05 MF 200 V	92 10 2	0001
60 10 5	TUBULAR COND - 05 MF 200 V	93 10 2	0001
61 10 5	TUBULAR COND - 05 MF 200 V	94 10 2	0001
62 10 5	TUBULAR COND - 05 MF 200 V	95 10 2	0001
63 15 6	35 MMF	96 10 3	0001
64 15 7	35 MMF	97 10 3	0001
65 15 8	35 MMF	98 10 3	0001
66 15 9	35 MMF	99 10 3	0001
67 15 10	35 MMF	100 10 3	0001
68 15 11	35 MMF	101 10 3	0001
69 15 12	35 MMF	102 10 3	0001
70 15 13	35 MMF	103 25 3	VARIABLE COND



RT PART NO	DESCRIPTION	RT PART NO	DESCRIPTION
1	ANT. COIL	10	OSC. COIL
2	1A1	11	1A1
3	1A1	12	1A1
4	1A1	13	1A1
5	1A1	14	1A1
6	1A1	15	1A1
7	1A1	16	1A1
8	1A1	17	1A1
9	1A1	18	1A1
10	1A1	19	1A1
11	1A1	20	1A1
12	1A1	21	1A1
13	1A1	22	1A1
14	1A1	23	1A1
15	1A1	24	1A1
16	1A1	25	1A1
17	1A1	26	1A1
18	1A1	27	1A1
19	1A1	28	1A1
20	1A1	29	1A1
21	1A1	30	1A1
22	1A1	31	1A1
23	1A1	32	1A1
24	1A1	33	1A1
25	1A1	34	1A1
26	1A1	35	1A1
27	1A1	36	1A1
28	1A1	37	1A1
29	1A1	38	1A1
30	1A1	39	1A1
31	1A1	40	1A1
32	1A1	41	1A1
33	1A1	42	1A1
34	1A1	43	1A1
35	1A1	44	1A1
36	1A1	45	1A1
37	1A1	46	1A1
38	1A1	47	1A1
39	1A1	48	1A1
40	1A1	49	1A1
41	1A1	50	1A1
42	1A1	51	1A1
43	1A1	52	1A1
44	1A1	53	1A1
45	1A1	54	1A1
46	1A1	55	1A1
47	1A1	56	1A1
48	1A1	57	1A1
49	1A1	58	1A1
50	1A1	59	1A1
51	1A1	60	1A1
52	1A1	61	1A1
53	1A1	62	1A1
54	1A1	63	1A1
55	1A1	64	1A1
56	1A1	65	1A1
57	1A1	66	1A1
58	1A1	67	1A1
59	1A1	68	1A1
60	1A1	69	1A1
61	1A1	70	1A1
62	1A1	71	1A1
63	1A1	72	1A1
64	1A1	73	1A1
65	1A1	74	1A1
66	1A1	75	1A1
67	1A1	76	1A1
68	1A1	77	1A1
69	1A1	78	1A1
70	1A1	79	1A1
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73	1A1	82	1A1
74	1A1	83	1A1
75	1A1	84	1A1
76	1A1	85	1A1
77	1A1	86	1A1
78	1A1	87	1A1
79	1A1	88	1A1
80	1A1	89	1A1
81	1A1	90	1A1
82	1A1	91	1A1
83	1A1	92	1A1
84	1A1	93	1A1
85	1A1	94	1A1
86	1A1	95	1A1
87	1A1	96	1A1
88	1A1	97	1A1
89	1A1	98	1A1
90	1A1	99	1A1
91	1A1	100	1A1



MODEL 212
 MODEL 216, All Prod. FADA RADIO & ELECTRIC CO
 MODEL 216(220V)
 Alignment, Socket
 Trimmers

MODELS 216 and 216 (220 Volt) ALIGNMENT TABLE

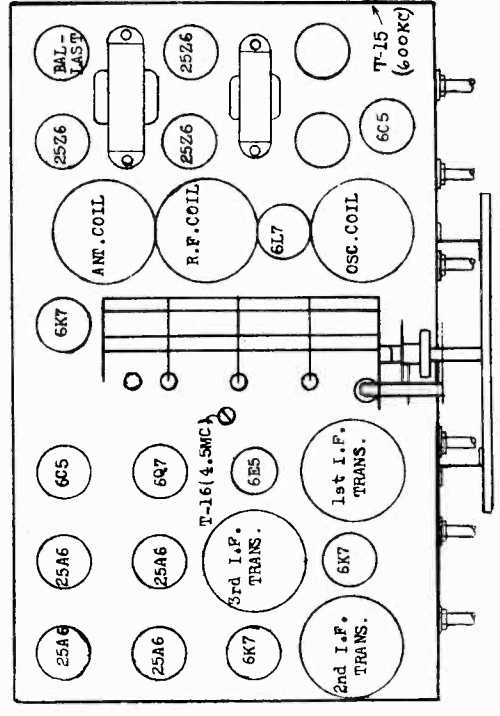
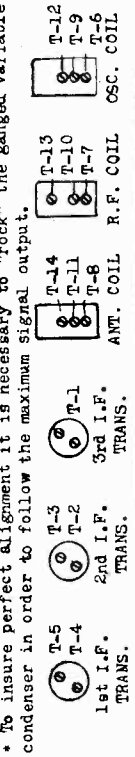
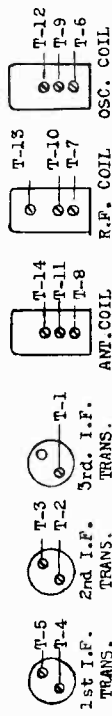
Wave Band	Dial Frequency	Generator Frequency	Image Frequency	Dummy Antenna	Generator connected to	Adjust Trimmer No.
C	1000 KC	456 KC	---	.001 MF & 50M	1st IF Tube control grid	T1, T2, T3
C	1000 KC	456 KC	---	.001 MF & 50M	6L7 Tube control grid	T4 and T5
A	15 MC	15 MC	15.9 MC	400 Ohm Res.	"A" Antenna Post	T6, T7, T8
A	6 MC	6 MC	---	400 Ohm Res.	"A" Antenna Post	Check
B	4.5 MC	4.5 MC	3.6 MC	400 Ohm Res.	"A" Antenna Post	Sensitivity T9, T10, T11
B	1.8 MC	1.8 MC	---	400 Ohm Res.	"A" Antenna Post	Check
C	1500 KC	1500 KC	---	200 MF Cond.	"A" Ant. Post	Sensitivity T12, T13, T14
C	600 KC	600 KC	---	200 MF Cond.	"A" Ant. Post	T15 (Rock)
U	45 MC	45 MC	45.9 MC	400 Ohm Res.	"U" Ant. Post	T16
U	20 MC	20 MC	---	400 Ohm Res.	"U" Ant. Post	Check

* To insure perfect alignment it is necessary to "rock" the ganged variable condenser in order to follow the maximum signal output.

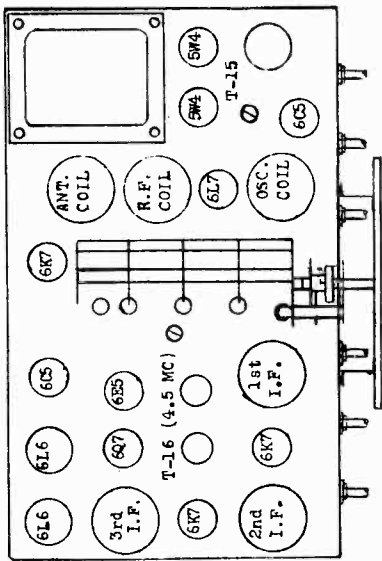
MODEL 212 ALIGNMENT TABLE

Wave Band	Dial Frequency	Generator Frequency	Image Frequency	Dummy Antenna	Generator Connected to	Adjust Trimmer
C	1000 KC	456 KC	---	.001 mfd. 50,000 ohms	1st I.F. tube control grid	T-1, T-2, T-3
C	1000 KC	456 KC	---	.001 mfd. 50,000 ohms	6L7 tube control grid	T-4, T-5
A	15 MC	15 MC	15.9 MC	400 ohm resistor	"A" antenna post	T-6, T-7, T-8
A	6 MC	6 MC	---	400 ohm resistor	"A" antenna post	Check Sensitivity
B	4.5 MC	4.5 MC	3.6 MC	400 ohm resistor	"A" antenna post	T-9, T-10, T-11
B	1.8 MC	1.8 MC	---	400 ohm resistor	"A" antenna post	Check Sensitivity
C	1500 KC	1500 KC	---	200 mfd. condenser	"A" antenna post	T-12, T-13, T-14
C	600 KC	600 KC	---	200 mfd. condenser	"A" antenna post	T-15*
U	45 MC	45 MC	45.9 MC	400 ohm resistor	"U" antenna post	T-16
U	20 MC	20 MC	---	400 ohm resistor	"U" antenna post	Check Sensitivity

* To insure perfect alignment it is necessary to "rock" the ganged variable condenser in order to follow the maximum signal output.



ALIGNMENT LAYOUT

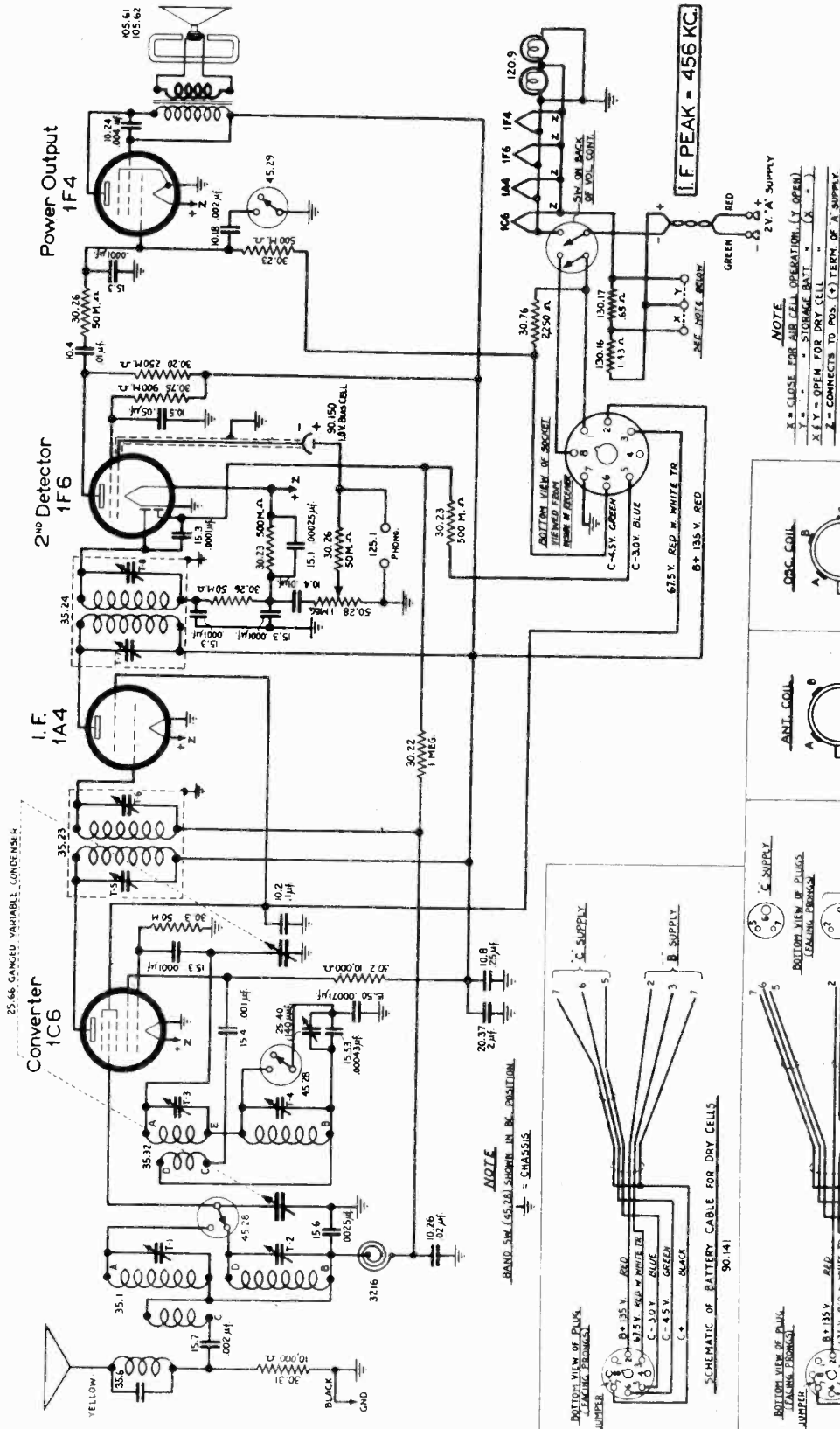


ALIGNMENT LAYOUT

FADA RADIO & ELECTRIC CO

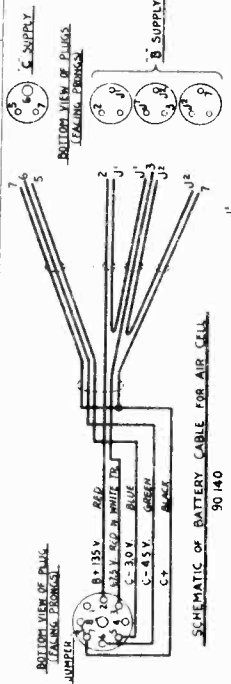
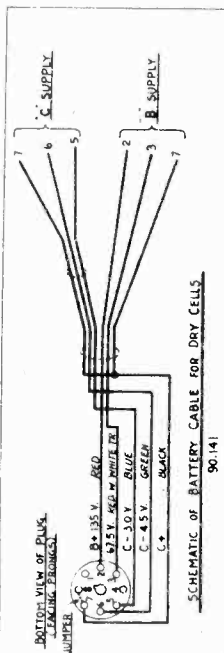
MODEL 242
Schematic

FOR ALIGNMENT, SEE INDEX



NOTE
 X = CLOSE FOR AIR CELL OPERATION (X OPEN)
 Y = STORAGE BATT.
 Z = OPEN FOR DRY CELL
 A = CONNECTS TO POS. (*) TERM. OF A SUPPLY

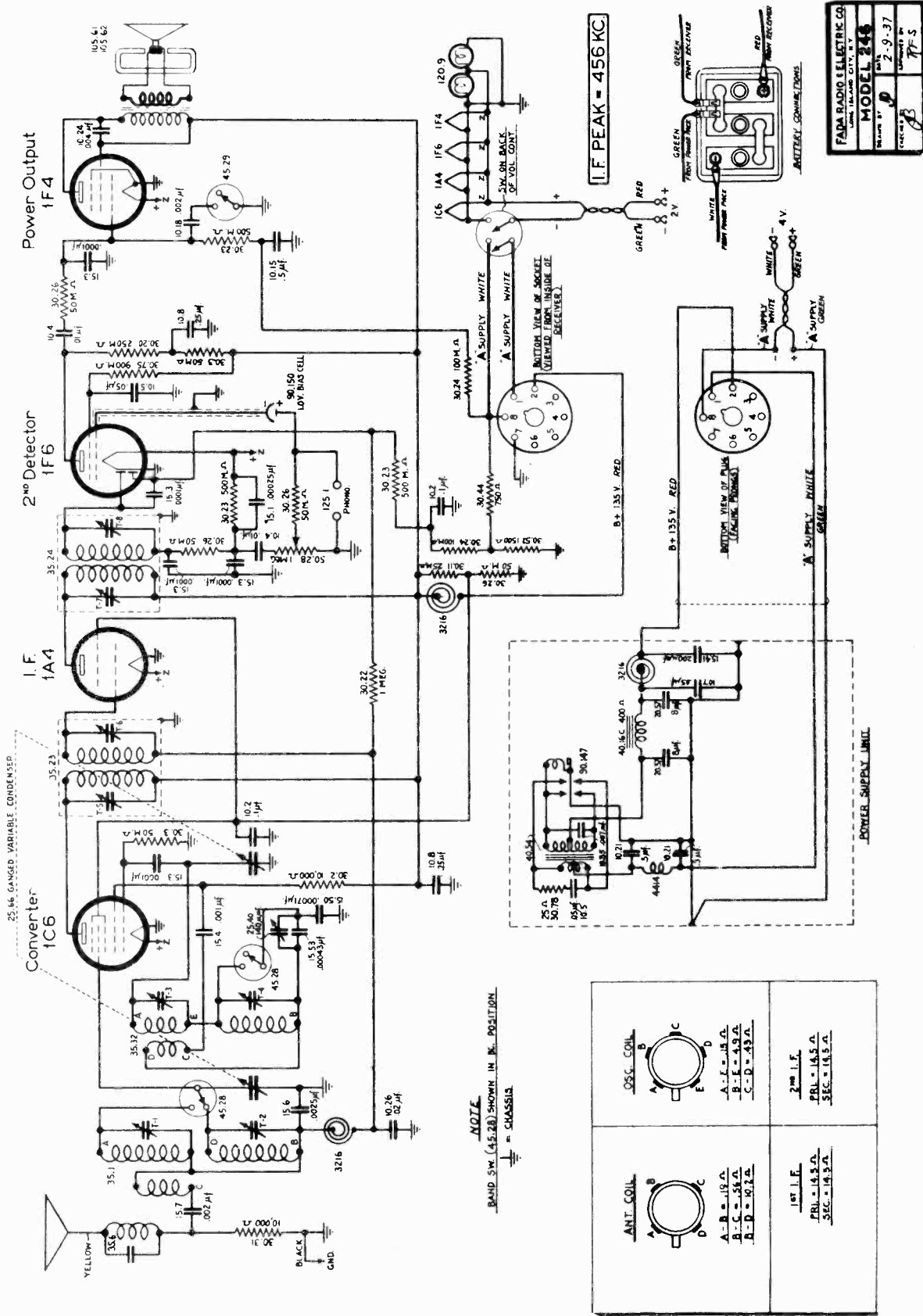
1 st I.F.	2 nd I.F.
PERI. = 14.3 µ	PERI. = 14.5 µ
SEC. = 14.3 µ	SEC. = 14.5 µ



FADA RADIO & ELECTRIC CO.
 CHICAGO, ILL. U.S.A.
MODEL 242
 DATE: 2-9-37
 DRAWN BY: RJS

MODEL 246
Schematic

FADA RADIO & ELECTRIC CO.



FADA RADIO & ELECTRIC CO.	
LANSING, MICHIGAN	
MODEL 246	
REVISED BY	DATE
PPS	2-9-37
PPS	PPS

<p>ANT. COIL</p> <p>A - B = 15 Ω B - C = 58 Ω C - D = 10.2 Ω</p>	<p>OSC. COIL</p> <p>A - E = 18 Ω B - E = 4.9 Ω C - D = 4.3 Ω</p>
<p>1st I.F.</p> <p>FRL = 14.5 Ω SEC = 14.3 Ω</p>	<p>2nd I.F.</p> <p>FRL = 14.5 Ω SEC = 14.3 Ω</p>

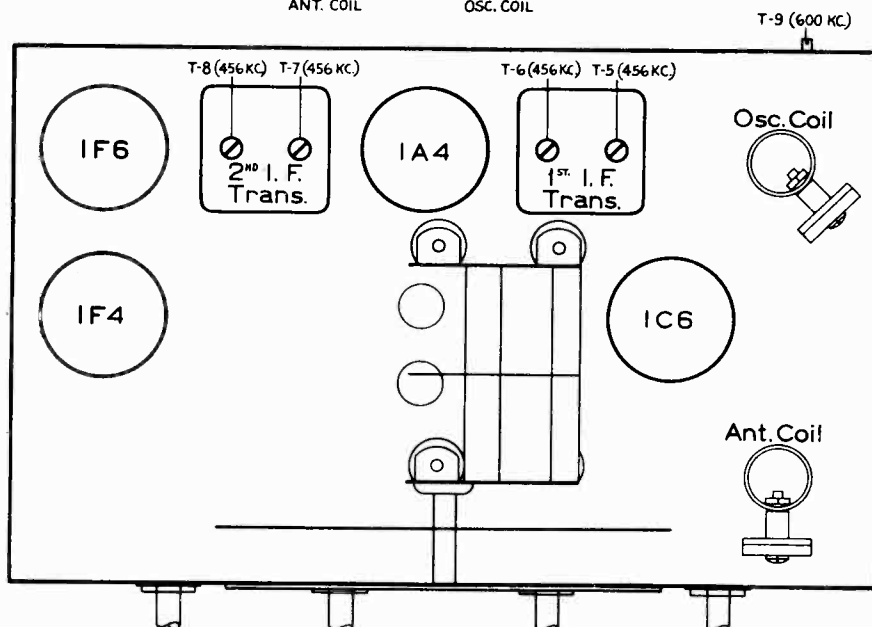
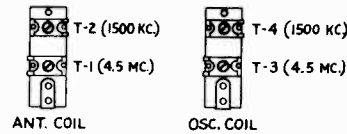
FADA RADIO & ELECTRIC CO.

MODEL 242
 MODEL 246
 Alignment
 Socket, Trimmers

ALIGNMENT TABLE

WAVE BAND	DIAL FREQUENCY	GENERATOR FREQUENCY	IMAGE FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTED TO	ADJUST TRIMMER
B.C.	1000 KC	456 KC	---	.001 mfd. 50,000 ohms	Control grid of 1A4 tube	T-8, T-7
B.C.	1000 KC	456 KC	---	.001 mfd. 50,000 ohms	Control grid of 1C6 tube	T-6, T-5
S.W.	4.5 MC	4.5 MC	3.6 MC	400 ohm resistor	Yellow antenna lead	T-3, T-1
S.W.	1.8 MC	1.8 MC	---	400 ohm resistor	Yellow antenna lead	Check Sensitivity
B.C.	1500 KC	1500 KC	---	200 mmfd. condenser	Yellow antenna lead	T-4, T-2
B.C.	600 KC	600 KC	---	200 mmfd. condenser	Yellow antenna lead	T-9*

*To insure perfect alignment it is necessary to "rock" the ganged variable condenser in order to follow the maximum signal output.

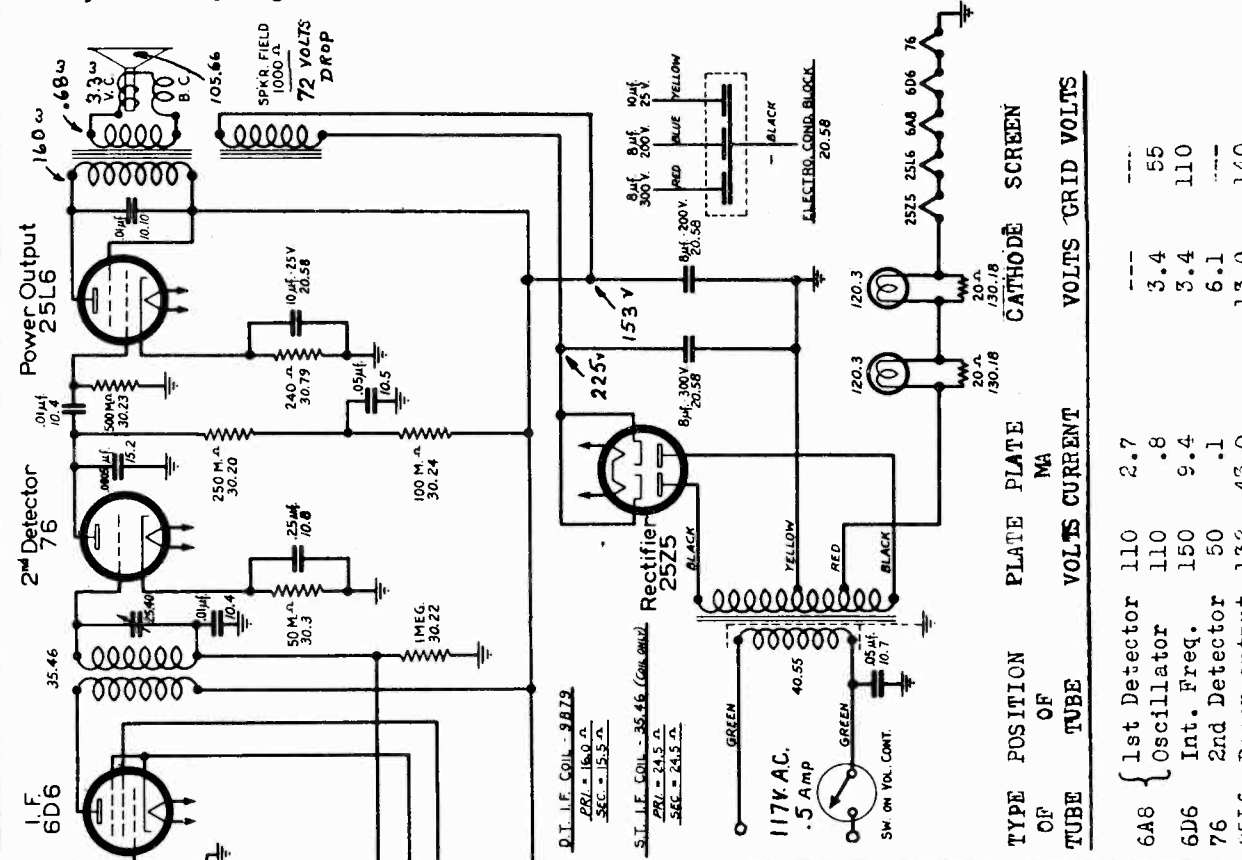


ALIGNMENT LAYOUT

MODEL 254

Schematic, Voltage
Socket, Trimmers, Alignment

FADA RADIO & ELECTRIC CO



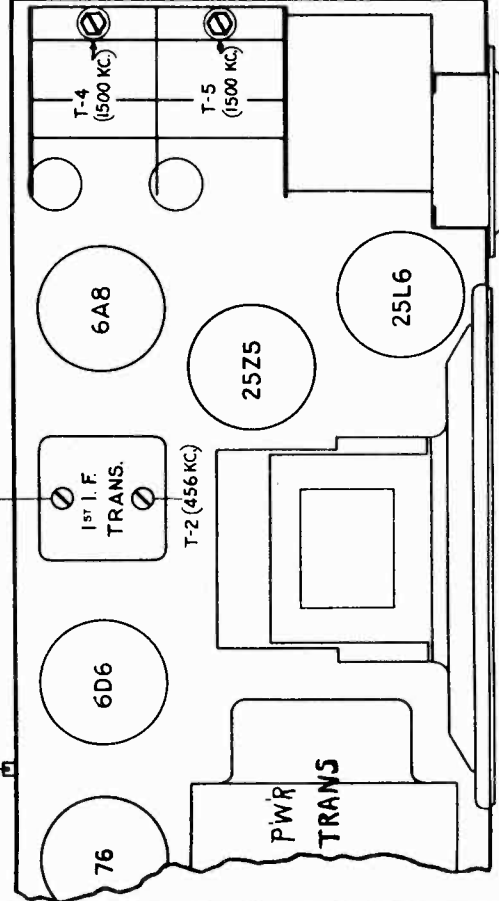
I.F. Alignment, place 50000 ohm resistance in series with CG of 6A8, Signal Gen. connected to the CG of 6A8 thru .001 MF cond., adjust 456 KC. For 1500 KC RF adjustment, Signal Generator is connected to ANT post thru 200 MWF Cond. Adjust T-4 trimmer first, then T-5 Trimmer to max. peak.

I.F. PEAK = 456 KC.

NOTE: A. (OPTIONAL WAVE TRAP EQUIPMENT)

FADA RADIO & ELECTRIC CO
CINCINNATI, OHIO, U.S.A.

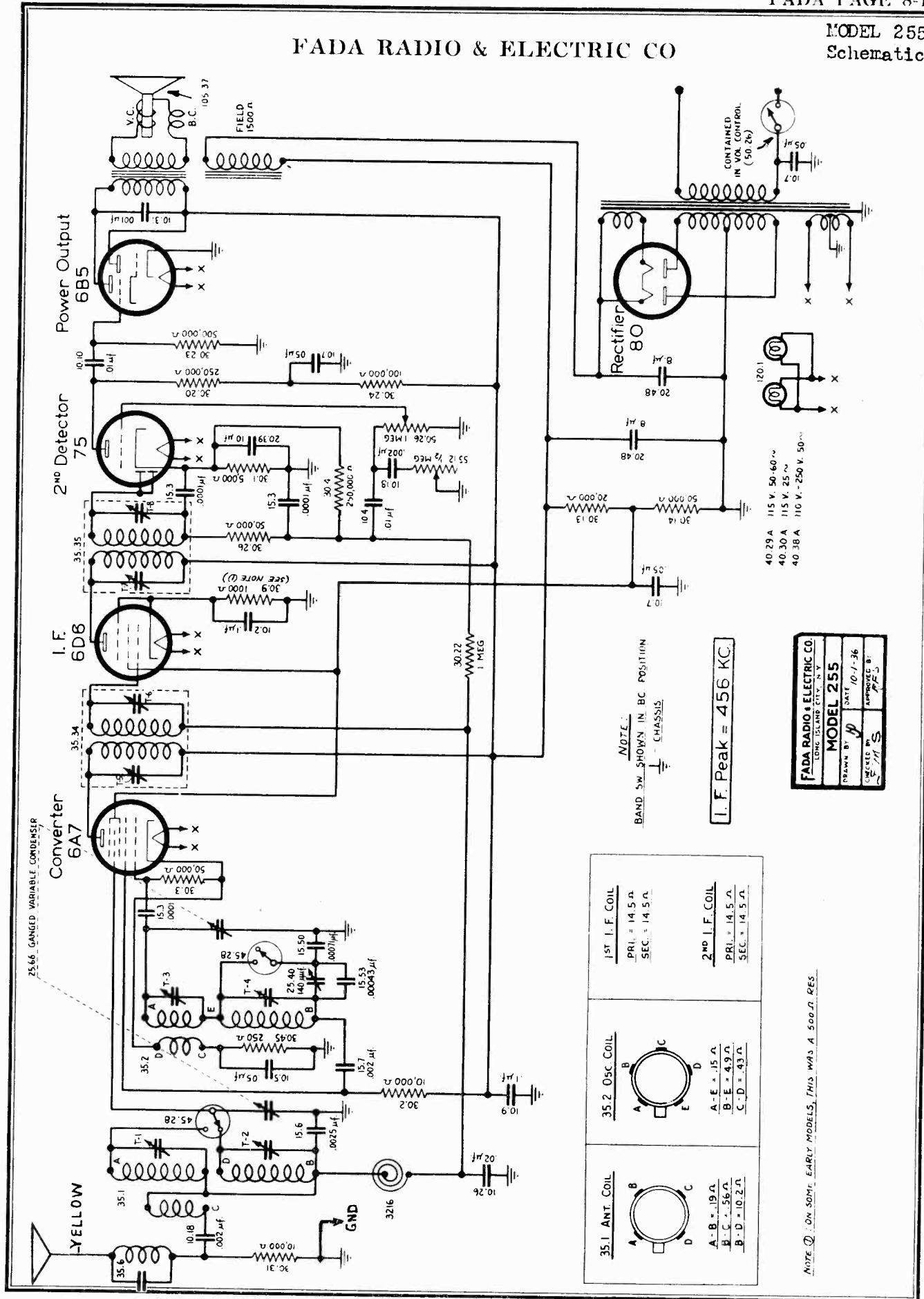
MODEL 254
PARTS LIST
REVISED BY
CHECKED BY F.M.S. 7-4-37



ALIGNMENT LAYOUT

FADA RADIO & ELECTRIC CO

MODEL 255
Schematic



35.1 ANT. COIL A-B = 19 Ω B-C = 56 Ω B-D = 10.2 Ω	35.2 OSC. COIL A-E = 15 Ω B-E = 4.9 Ω C-D = 43 Ω	1ST I.F. COIL PRI. = 14.5 Ω SEC. = 14.5 Ω	2ND I.F. COIL PRI. = 14.5 Ω SEC. = 14.5 Ω
---	--	--	--

NOTE:
BAND SW SHOWN IN BC POSITION
CHASSIS

I.F. Peak = 456 KC.

40.29 A 115 V. 50-60 ~
 40.30 A 115 V. 25 ~
 40.38 A 110 V.-250 V. 50 ~

FADA RADIO & ELECTRIC CO.
 LONG ISLAND CITY, N. Y.

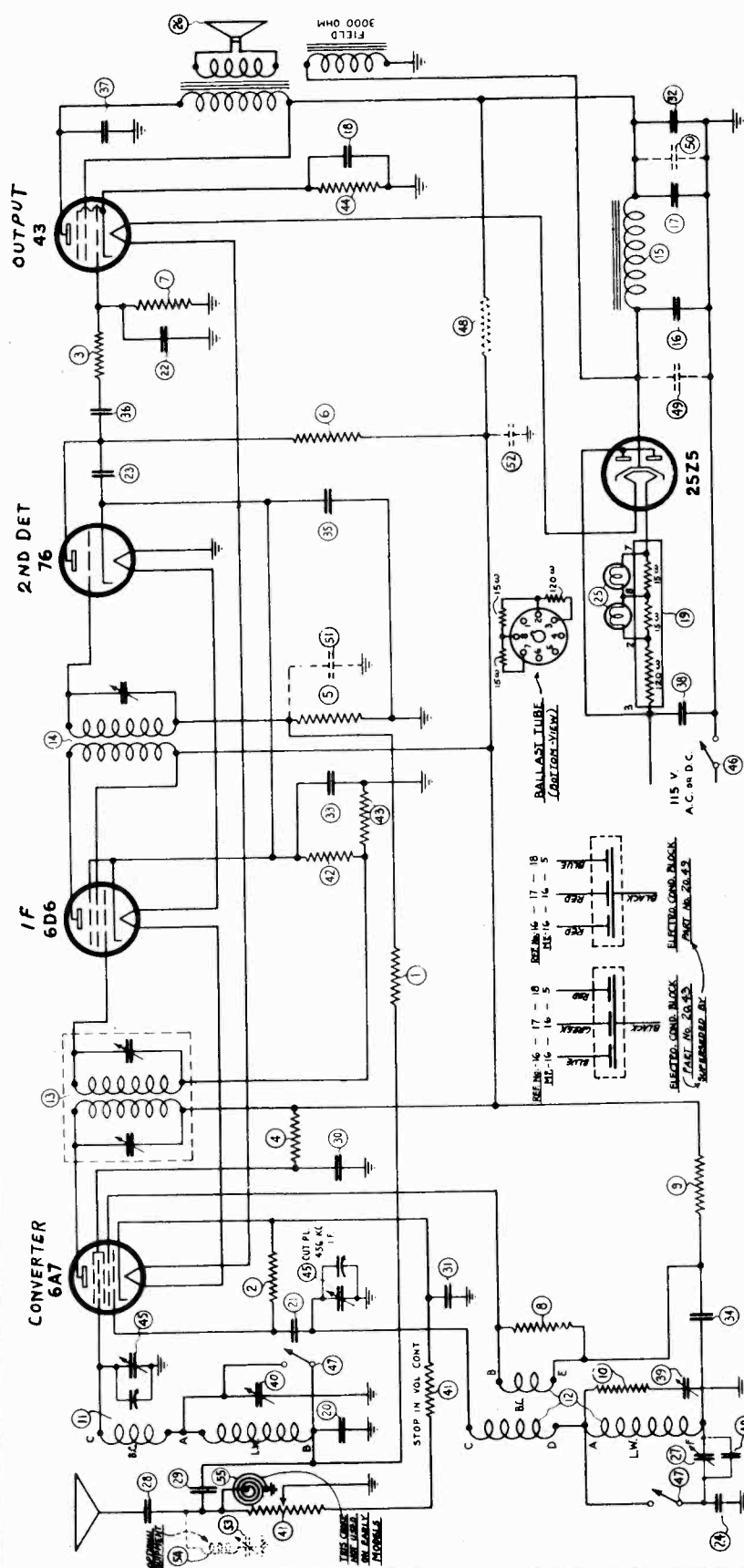
MODEL 255
DRAWN BY: [Signature]
DATE: 10-1-36
CHECKED BY: [Signature]
APPROVED BY: [Signature]

NOTE: ON SOME EARLY MODELS, THIS WAS A 500-Ω RES.

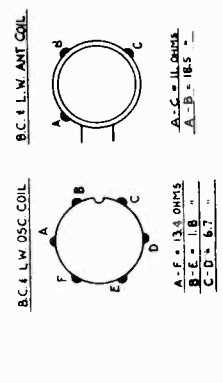
MODEL 261
Schematic
Parts

FADA RADIO & ELECTRIC CO

FADA RADIO & ELECTRIC CO LONG ISLAND CITY, N.Y.	
DESIGN BY	MODEL 261
DATE	8-7-36
CHECKED BY	PFS



L.F. = 456 K.C.



NOTE:
BAND SW. SWITCH IN L.W. PKC.
BANDS: 500, 1000, 1500, 2000, 2500, 3000, 3500, 4000, 4500, 5000, 5500, 6000, 6500, 7000, 7500, 8000, 8500, 9000, 9500, 10000, 10500, 11000, 11500, 12000, 12500, 13000, 13500, 14000, 14500, 15000, 15500, 16000, 16500, 17000, 17500, 18000, 18500, 19000, 19500, 20000, 20500, 21000, 21500, 22000, 22500, 23000, 23500, 24000, 24500, 25000, 25500, 26000, 26500, 27000, 27500, 28000, 28500, 29000, 29500, 30000, 30500, 31000, 31500, 32000, 32500, 33000, 33500, 34000, 34500, 35000, 35500, 36000, 36500, 37000, 37500, 38000, 38500, 39000, 39500, 40000, 40500, 41000, 41500, 42000, 42500, 43000, 43500, 44000, 44500, 45000, 45500, 46000, 46500, 47000, 47500, 48000, 48500, 49000, 49500, 50000, 50500, 51000, 51500, 52000, 52500, 53000, 53500, 54000, 54500, 55000, 55500, 56000, 56500, 57000, 57500, 58000, 58500, 59000, 59500, 60000, 60500, 61000, 61500, 62000, 62500, 63000, 63500, 64000, 64500, 65000, 65500, 66000, 66500, 67000, 67500, 68000, 68500, 69000, 69500, 70000, 70500, 71000, 71500, 72000, 72500, 73000, 73500, 74000, 74500, 75000, 75500, 76000, 76500, 77000, 77500, 78000, 78500, 79000, 79500, 80000, 80500, 81000, 81500, 82000, 82500, 83000, 83500, 84000, 84500, 85000, 85500, 86000, 86500, 87000, 87500, 88000, 88500, 89000, 89500, 90000, 90500, 91000, 91500, 92000, 92500, 93000, 93500, 94000, 94500, 95000, 95500, 96000, 96500, 97000, 97500, 98000, 98500, 99000, 99500, 100000.

REF. PART NO.	DESCRIPTION	REF. PART NO.	DESCRIPTION	REF. PART NO.	DESCRIPTION
1	30.00 CARB. RES. - 250,000 OHMS 1/2 W. 20%	45	25.57 VARIABLE COND.	46	ON-OFF SW. ON VOLUME CONT.
2	30.3 CARB. RES. - 50,000 OHMS 1/2 W. 10%	46	ON-OFF SW. ON VOLUME CONT.	47	45.31 BAND SWITCH
3	30.3 CARB. RES. - 50,000 OHMS 1/2 W. 10%	48	30.30 CARB. RES. - 1400 OHMS 1/2 W. 10%	49	20.25 TUBULAR ELECTRO. COND. - 8 MF. - .005 MV.
4	50.21 1 MEG. - 20% 2W 0521	49	20.25 TUBULAR ELECTRO. COND. - 8 MF. - .005 MV.	50	20.25 TUBULAR ELECTRO. COND. - 8 MF. - .005 MV.
5	50.22 1 MEG. - 20% 2W 0522	51	10.2 COND. - 1 MF. - 200 V.	51	10.2 COND. - 1 MF. - 200 V.
6	30.23 500,000 OHMS 1/2 W. 20%	52	10.8 TRIMMING COND. - 150 MMF.	52	10.8 TRIMMING COND. - 150 MMF.
7	30.23 500,000 OHMS 1/2 W. 20%	53	25.50 TRIMMING COND. - 150 MMF.	53	25.50 TRIMMING COND. - 150 MMF.
8	30.1 5,000 OHMS 1/2 W. 20%	54	4697 WAVE TRAP COIL	54	4697 WAVE TRAP COIL
9	30.1 5,000 OHMS 1/2 W. 20%	55	3216 CHOKE COIL - 2.3 MH.	55	3216 CHOKE COIL - 2.3 MH.
10	30.42 500 OHMS 1/2 W. 20%				
11	3514 B.C. L.W. ANTENNA COIL				
12	4575 B.C. L.W. OSCILLATOR				
13	7879 D.T. I.F. COIL				
14	4376 S.T. I.F. COIL				
15	4016 CHOKE COIL - 4.00 OHMS				
16	20.49 ELECTRO. COND. BLOCK - 6 MF. 0.005 MV.				
17	20.49 ELECTRO. COND. BLOCK - 6 MF. 0.005 MV.				
18	20.49 ELECTRO. COND. BLOCK - 6 MF. 0.005 MV.				
19	20.49 ELECTRO. COND. BLOCK - 6 MF. 0.005 MV.				
20	15.3 MICHA. COND. - 130-16 1/2 OHMS				
21	15.3 MICHA. COND. - 130-16 1/2 OHMS				
22	15.3 MICHA. COND. - 130-16 1/2 OHMS				
23	15.3 MICHA. COND. - 130-16 1/2 OHMS				
24	15.3 MICHA. COND. - 130-16 1/2 OHMS				
25	15.3 MICHA. COND. - 130-16 1/2 OHMS				
26	15.3 MICHA. COND. - 130-16 1/2 OHMS				
27	15.3 MICHA. COND. - 130-16 1/2 OHMS				
28	15.3 MICHA. COND. - 130-16 1/2 OHMS				
29	15.3 MICHA. COND. - 130-16 1/2 OHMS				
30	15.3 MICHA. COND. - 130-16 1/2 OHMS				
31	15.3 MICHA. COND. - 130-16 1/2 OHMS				
32	15.3 MICHA. COND. - 130-16 1/2 OHMS				
33	15.3 MICHA. COND. - 130-16 1/2 OHMS				
34	15.3 MICHA. COND. - 130-16 1/2 OHMS				
35	15.3 MICHA. COND. - 130-16 1/2 OHMS				
36	15.3 MICHA. COND. - 130-16 1/2 OHMS				
37	15.3 MICHA. COND. - 130-16 1/2 OHMS				
38	15.3 MICHA. COND. - 130-16 1/2 OHMS				
39	15.3 MICHA. COND. - 130-16 1/2 OHMS				
40	15.3 MICHA. COND. - 130-16 1/2 OHMS				
41	15.3 MICHA. COND. - 130-16 1/2 OHMS				
42	15.3 MICHA. COND. - 130-16 1/2 OHMS				
43	15.3 MICHA. COND. - 130-16 1/2 OHMS				
44	15.3 MICHA. COND. - 130-16 1/2 OHMS				
45	15.3 MICHA. COND. - 130-16 1/2 OHMS				
46	15.3 MICHA. COND. - 130-16 1/2 OHMS				
47	15.3 MICHA. COND. - 130-16 1/2 OHMS				
48	15.3 MICHA. COND. - 130-16 1/2 OHMS				
49	15.3 MICHA. COND. - 130-16 1/2 OHMS				
50	15.3 MICHA. COND. - 130-16 1/2 OHMS				
51	15.3 MICHA. COND. - 130-16 1/2 OHMS				
52	15.3 MICHA. COND. - 130-16 1/2 OHMS				
53	15.3 MICHA. COND. - 130-16 1/2 OHMS				
54	15.3 MICHA. COND. - 130-16 1/2 OHMS				
55	15.3 MICHA. COND. - 130-16 1/2 OHMS				

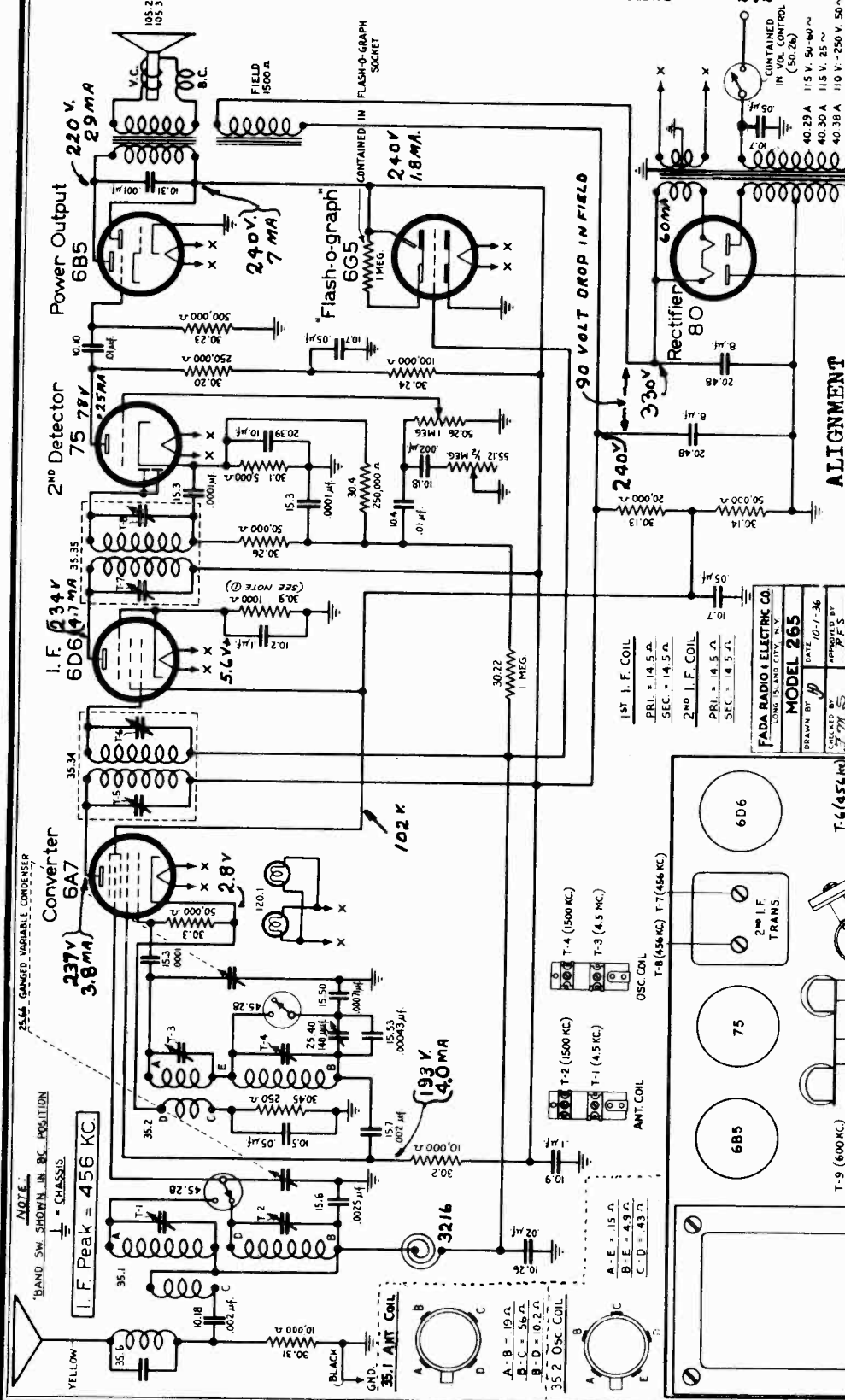
FADA RADIO & ELECTRIC CO

MODEL 265
Schematic, Socket
Trimmers, Alignment
Voltage

SPEAKER D.C. RESISTANCE VALUES

PART NO.-FIELD COIL-AUDIO TRANS. PRI.-AUDIO TRANS. SEC.-V.C.

105.27 - 1500 * (COLO) - 650 ohms * - .4 ohms * * - 1.8
105.37 - 1500 * " - 400 ohms * - .58 ohms * * - 2.2

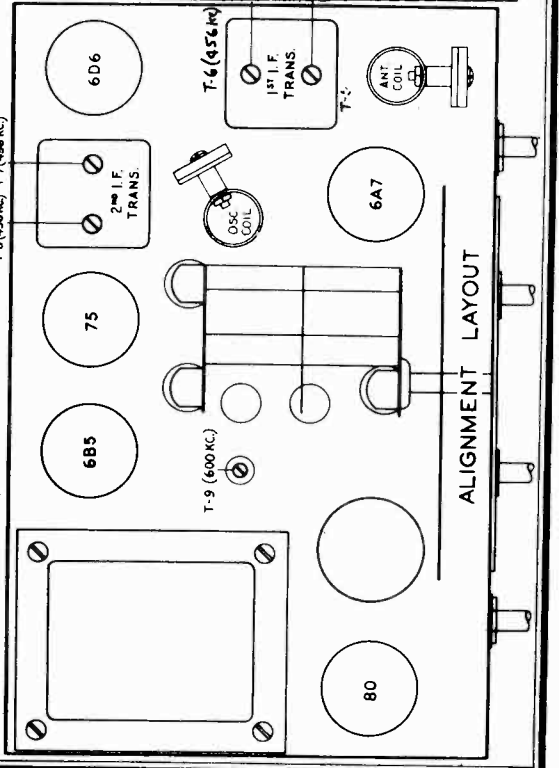


Wave Band	Dial Fre.	Gen. Fre.	Image Fre.	Dummy Ant.	Connect Gen. To-	Adj. Trim.
BC	1000 KC	456 KC	-	001 & 50M	CG of 6D6	T8, T7
BC	1000 KC	456 KC	-	same	CG of 6A7	T6, T5
SW	4.5 MC	3.6 MC	-	400 Ohm	Yel. Ant.	T3, T1
SW	1.8 MC	1.8 MC	-	same	Same	Check Sensi.
BC	1500 KC	1500 KC	-	200 MFD	Same	T4, T2
BC	600 KC	600 KC	-	Same	Same	T9*

ALIGNMENT

FADA RADIO & ELECTRIC CO.
LONG BEACH, CALIF. U.S.A.
MODEL 265
DRAWN BY [Signature]
DATE 10-1-36
CHECKED BY [Signature]
APPROVED BY [Signature]

1st I.F. COIL
PRI. = 14.5 μ
SEC. = 14.5 μ
2nd I.F. COIL
PRI. = 14.5 μ
SEC. = 14.5 μ

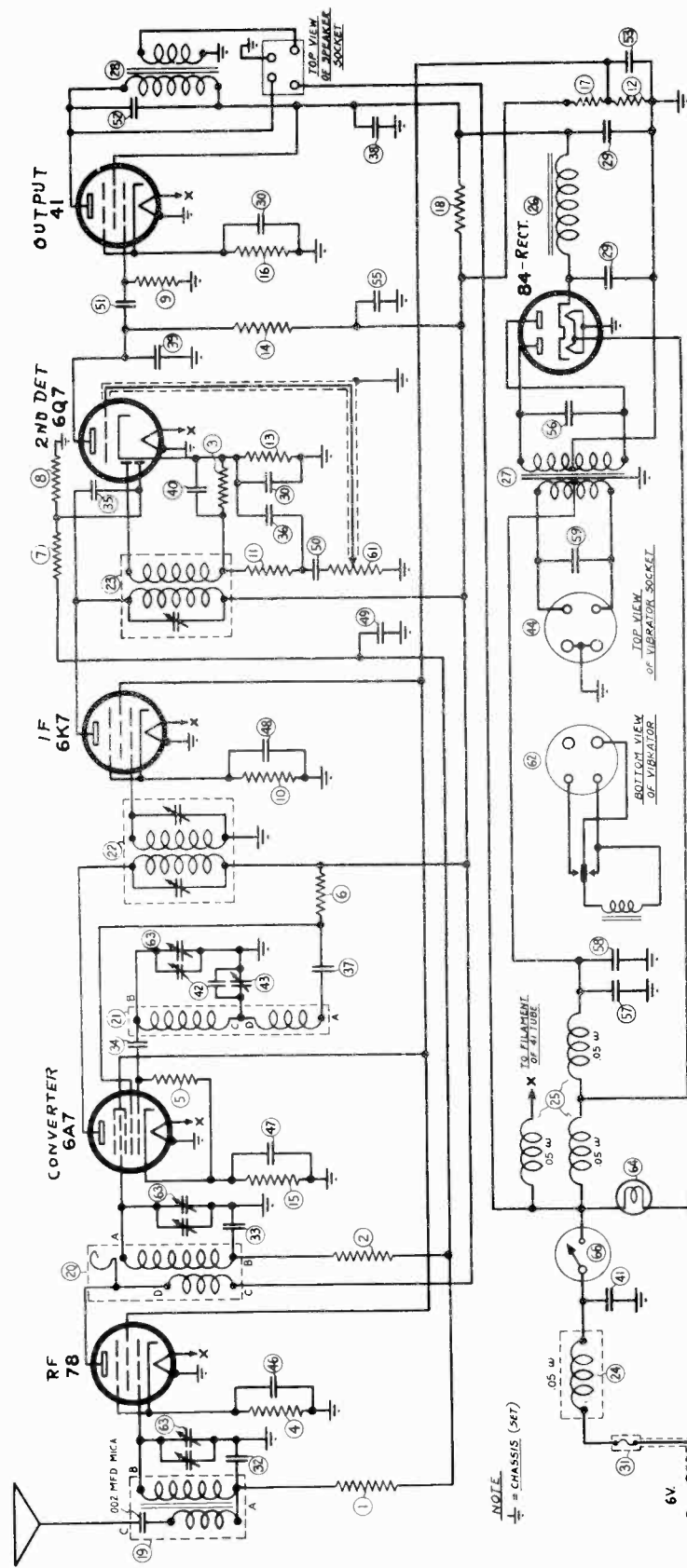


* Rock variable gang condenser for padder adjustment

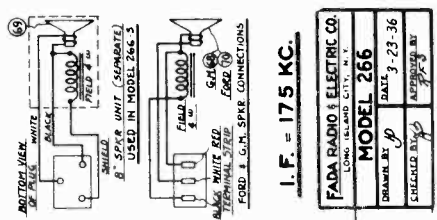
NOTE: BAND SW SHOWN IN BC POSITION
= CHASSIS
I.F. Peak = 456 KC

MODEL 266
Schematic
Parts

FADA RADIO & ELECTRIC CO

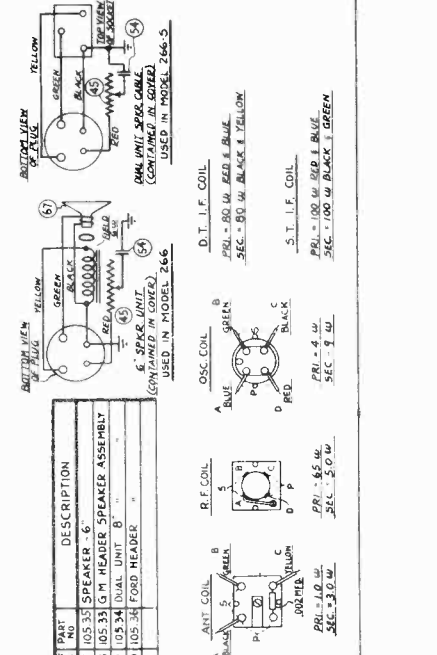


NOTE:
1/2" = CHASSIS (467)



I. F. = 175 KC.

FADA RADIO & ELECTRIC CO. LONG ISLAND CITY, N. Y.	
MODEL 266	DATE 3-23-36
DRAWN BY J.P.	APPROVED BY J.P.
SCHEDULED BY	

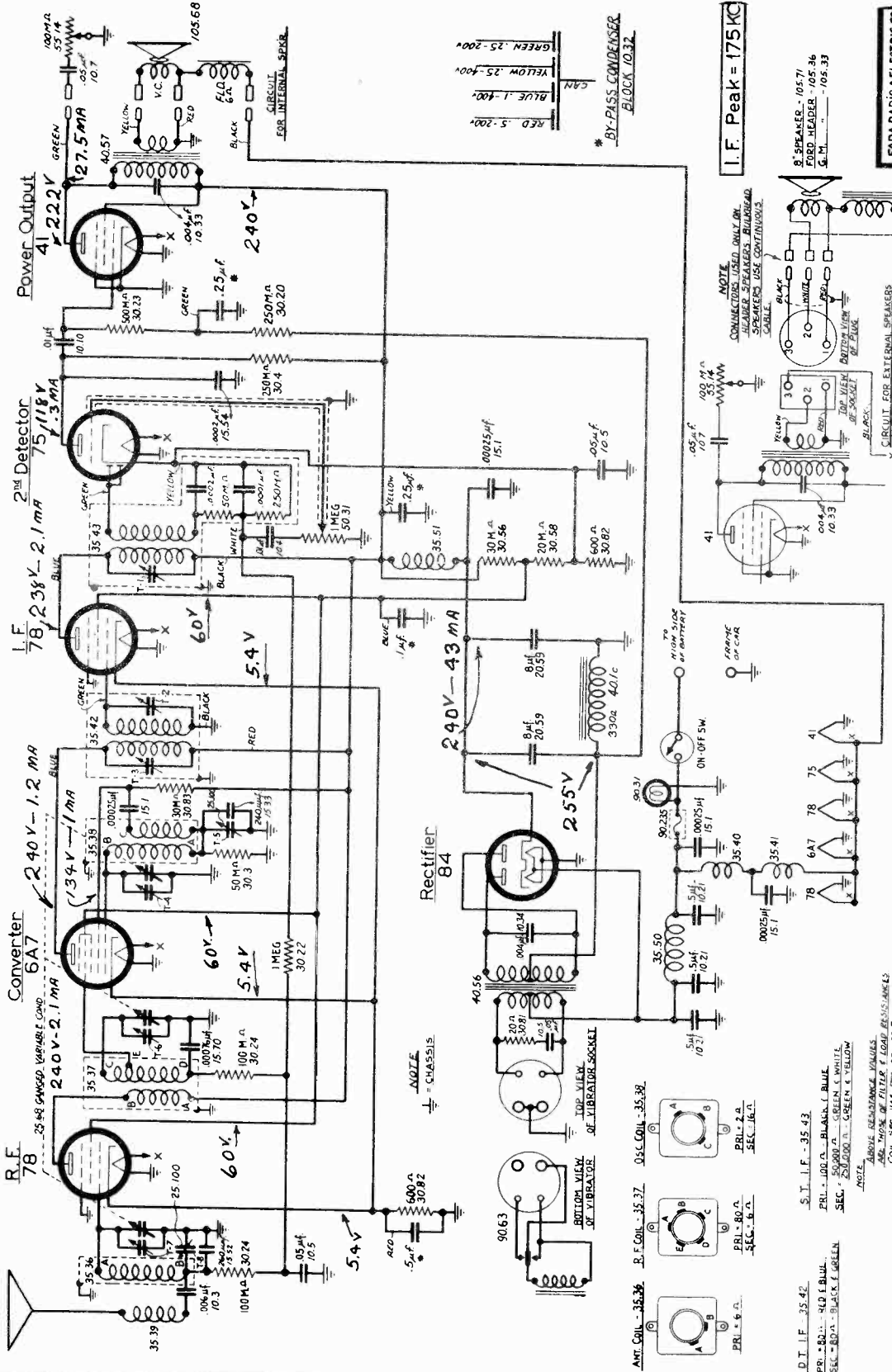


REF. PART NO.	DESCRIPTION	REF. PART NO.	DESCRIPTION	REF. PART NO.	DESCRIPTION
1	30.20 CARB. RES. 250,000 OHMS	23	4423 S.T. I.F. COIL	45	55.4 TONE CONT. 100,000 OHMS
2	30.20 " 250,000 "	24	4424 SHIELDED CHOKE COIL (1.5 MH)	46	10.5 TUBULAR COND. .05 MFD 200V
3	30.20 " 250,000 "	25	4414 P.F. CHOKE COIL	47	10.5 " .05 " 200 "
4	30.15 " 2,000 "	26	40.1 AUDIO	48	10.5 " .05 " 200 "
5	30.3 " 50,000 "	27	40.45 POWER TRANS. 6V	49	10.5 " .05 " 200 "
6	30.11 " 250,000 "	28	40.22 OUTPUT	50	10.4 " .01 " 200 "
7	30.23 " 500,000 "	29	20.42 ELECTRO. COND. (2MVA) 8 MFD 350V	51	10.10 " .01 " 400 "
8	30.23 " 500,000 "	30	20.30 FUSE 10 A	52	10.3 " .006 " 400 "
9	30.23 " 500,000 "	31	90.13 MICA COND. .00275 "	53	10.7 " .05 " 400 "
10	30.52 " 1,500 "	32	15.5 " "	54	10.7 " .05 " 400 "
11	30.26 " 50,000 "	33	15.20 " "	55	10.14 " .25 " 2000 "
12	30.12 " 50,000 "	34	15.3 " "	56	10.29 " .001 " 10 "
13	30.12 " 50,000 "	35	15.3 " "	57	10.21 " .001 " 5 " 120 "
14	30.35 " 200,000 "	36	15.3 " "	58	10.21 " .001 " 5 " 120 "
15	30.9 " 1,000 "	37	15.4 " "	59	10.21 " .001 " 5 " 120 "
16	30.47 " 665 "	38	15.4 " "	60	50.8 VOL. CONT. 1 MEG.
17	30.13 " 20,000 "	39	15.54 " "	61	50.63 VIBRATOR
18	30.25 " 5,000 "	40	15.2 " "	62	25.56 VARIABLE COND.
19	35.4 ANT. COIL (IRON CORE)	41	15.10 " "	63	90.31 PILOT LIGHT - MAZDA #51
20	35.5 R.F. COIL	42	15.37 " "	64	90.31 PILOT LIGHT - MAZDA #51
21	4422 OSC. COIL	43	25.40 PADDING COND. .140 MME	65	
22	717 D.T. I.F. COIL	44	65.20 VIBRATOR SOCKET	66	ON OFF SW. ON VOL. CONT.

FADA RADIO & ELECTRIC CO

MODELS 267, 267SD, 267SG
267SF Motoset

Schematic
Voltage

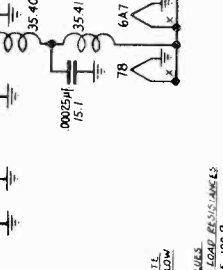
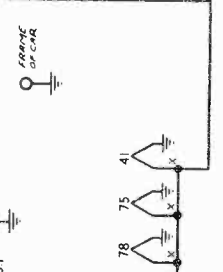
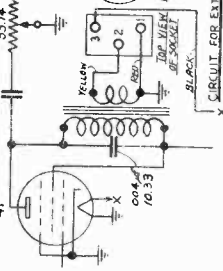


I.F. Peak = 175 KC

FADA RADIO & ELECTRIC CO	
LONG ISLAND CITY, N.Y.	
MODEL 267	
DRAWN BY	HP
CHECKED BY	J.B.
DATE	2-10-37
REVISIONS	

NOTE: CONDUCTORS USED ONLY IN SPEAKER SPEAKERS BILLBOARD. SPEAKERS USE CONTINUOUS CABLES.

NOTE: SPEAKERS - 105.71 ZODD HEADER - 105.36 W.C.H. - 105.33



NOTE: ABOVE RESISTANCE VALUES ARE THOSE OF FILTER & LOAD RESISTANCES. COIL SIZE HAS RES. OF 100 Ω.

D.T. I.F. - 35.42
 P.R.I. - 80 Ω - BLACK & BLUE
 S.E.C. - 250,000 Ω - GREEN & YELLOW

S.T. I.F. - 35.43
 P.R.I. - 100 Ω - BLACK & BLUE
 S.E.C. - 250,000 Ω - GREEN & YELLOW

NOTE: ABOVE RESISTANCE VALUES ARE THOSE OF FILTER & LOAD RESISTANCES. COIL SIZE HAS RES. OF 100 Ω.

MODELS 267, 267SD
267SG, 267SF
Motostat
Socket, Trimmers
Alignment, Parts

FADA RADIO & ELECTRIC CO

PRICES SUBJECT TO CHANGE
WITHOUT NOTICE

MODEL 267 SF is a two unit speaker for installation behind the radio employing the same receiver header panel in 1936-37 Ford Cars. unit as above, but a separate

SEPARATE SPEAKERS: Model 267 MOTOSET is also available for use with separate speakers instead of the standard 6 1/2 inch speaker supplied with the standard set. These combinations are available as follows:

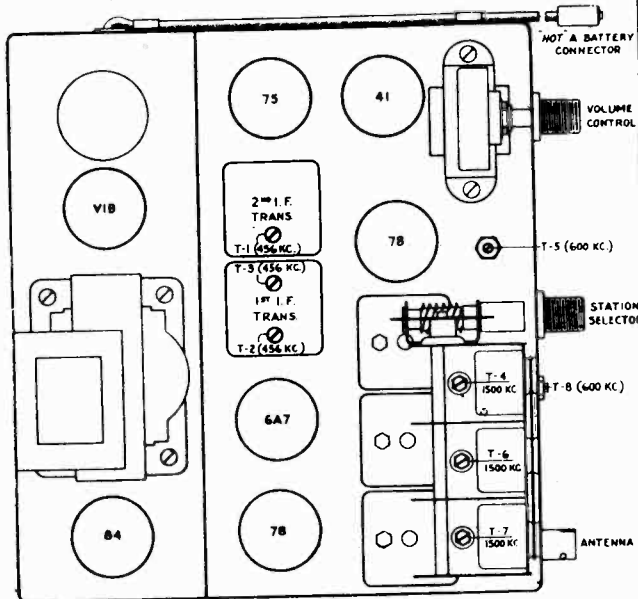
MODEL 267 SD is a two unit receiver in which the speaker is an 8 inch dynamic in a large housing of its own. This housing mounts on the bulkhead by a single large bolt, and plugs into the receptacle provided for this purpose on the side of the case, near the front.

MODEL 267 SG is a two unit receiver similar to 267 SF, with header speaker for installation in 1936 General Motor Cars.

ALIGNMENT TABLE

Dial Frequency	Generator Frequency	Dummy Antenna	Generator Connected To	Adjust Trimmer
1,000 KC	175 KC	.001 mfd. 50,000 ohms	Control grid of 6A7 tube	T-1, T-2 T-3
1,500 KC	1,500 KC	200 mmfd. condenser	Antenna lead socket	T-4, T-6, T-8
600 KC	600 KC	200 mmfd. condenser	Antenna lead socket	T-5* T-8

*To insure perfect alignment, it is necessary to "rock" the ganged variable condenser in order to follow the maximum signal output.



ALIGNMENT LAYOUT

PARTS PRICE LIST

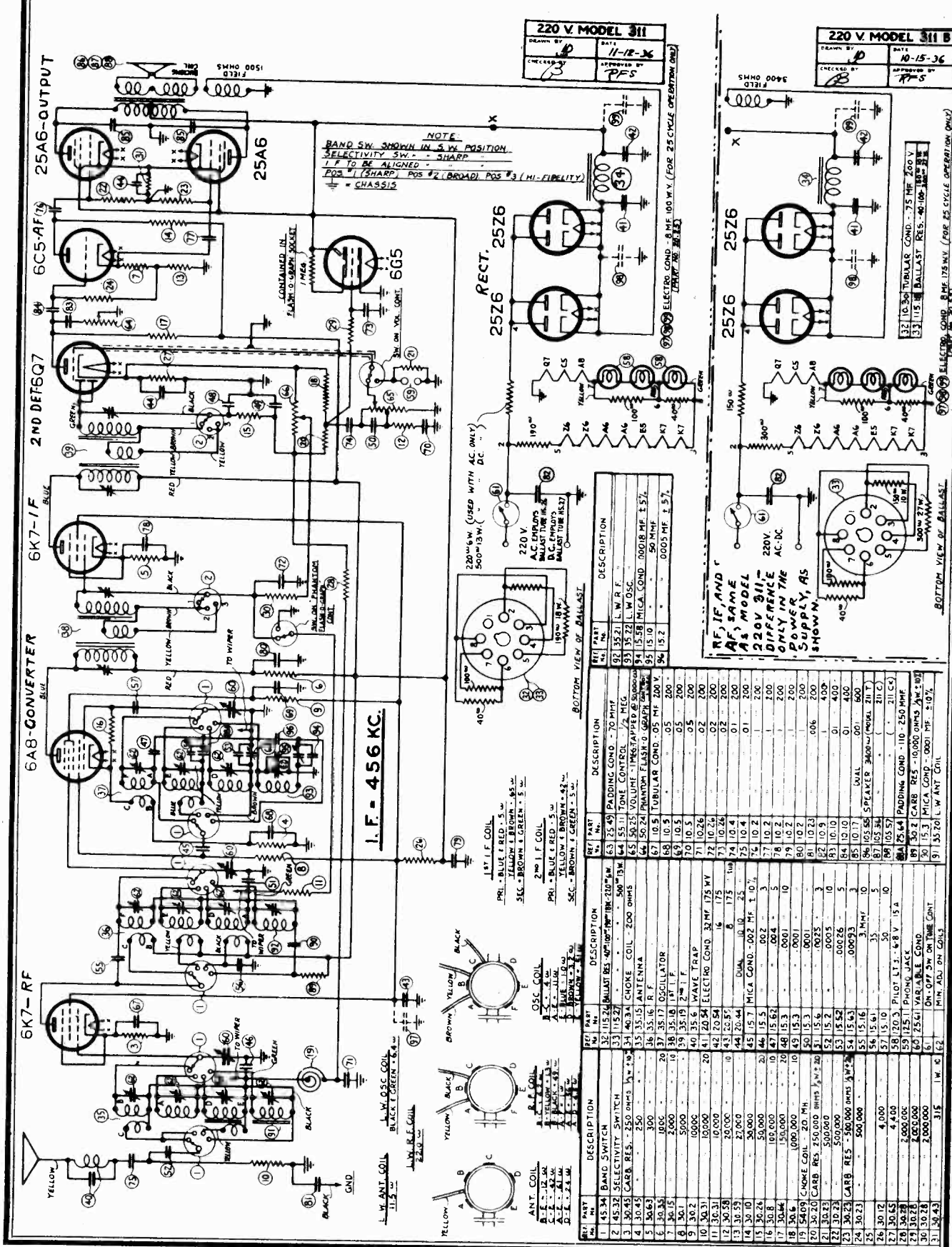
PART NO.	DESCRIPTION	LIST PRICE
10.3	Capacitor - tubular - (.006 mfd. - 400 Volts)	.20
10.4	Capacitor - tubular - (.01 mfd. - 200 Volts)	.20
10.5	Capacitor - tubular - (.05 mfd. - 200 Volts)	.20
10.7	Capacitor - tubular - (.05 mfd. - 400 Volts)	.20
10.10	Capacitor - tubular - (.01 mfd. - 400 Volts)	.20
10.21	Capacitor - tubular - (.5 mfd. - 120 Volts)	.40
10.22	Capacitor - generator - (.5 mfd. - 120 Volts)	.50
10.32	Capacitor - block - (.25 mfd. 400 V., 1 mfd. 400 V.) (.5 mfd. 200 V., .25 mfd. 200 V.)	1.05
10.33	Capacitor - tubular - (.004 mfd. - 400 Volts)	.20
10.34	Capacitor - tubular - (.004 mfd. - 1,600 Volts)	.25
15.1	Capacitor - mica - (.00025 mfd. - 10%)	.25
15.33	Capacitor - mica - (.00024 mfd. - 5%)	.25
15.52	Capacitor - mica - (.00026 mfd. - 5%)	.25
15.54	Capacitor - mica - (.0002 mfd. - 10%)	.25
15.70	Capacitor - mica - (.00076 mfd. - 3%)	.25
20.59	Capacitor - electrolytic (Dual 8 mfd. 350 W. V.)	1.55
25.63	Capacitor - variable gang	4.10
25.100	Capacitor - padder	.30
30.3	Resistor - carbon - (50,000 ohms 1/3 W 10%)	.20
30.4	Resistor - carbon - (250,000 ohms 1/3 W 10%)	.20
30.20	Resistor - carbon - (250,000 ohms 1/3 W 20%)	.20
30.22	Resistor - carbon - (1,000,000 ohms 1/3 W 20%)	.20
30.23	Resistor - carbon - (500,000 ohms 1/3 W 20%)	.20
30.24	Resistor - carbon - (100,000 ohms 1/3 W 20%)	.20
30.27	Resistor - distributor suppressor - (15,000 ohms)	.35
30.56	Resistor - carbon - (30,000 ohms 1 W 10%)	.25
30.58	Resistor - carbon - (20,000 ohms 1/3 W 10%)	.20
30.81	Resistor - carbon - (20 ohms 1/3 W 10%)	.20
30.82	Resistor - carbon - (600 ohms 1/3 W 10%)	.20
30.83	Resistor - carbon - (30,000 ohms 1/3 W 20%)	.20
30.87	Resistor - carbon - (650 ohms 1/3 W 10%)	.20
35.36	Coil - antenna	.80
35.37	Coil R. F.	1.15
35.38	Coil - oscillator	.75
35.39	Spark filter choke	.25
35.40	R. F. Choke Coil	.50
35.41	R. F. Choke Coil	.25
35.42	1st I. F. Transformer	1.30

PARTS PRICE LIST

PART NO.	DESCRIPTION	LIST PRICE
35.43	2nd I. F. Transformer	1.50
35.50	"A" Choke	.50
35.51	R. F. Choke	.50
40.1C	Choke coil - filter (330 ohm)	.75
40.56	Power transformer	3.50
40.57	Output transformer	1.30
50.31	Volume control - (1 meg.)	.85
55.14	Tone control - (100,000 ohm)	.65
65.2	Socket - (6A7)	.15
65.4	Socket - (75)	.15
65.17	Socket - (78)	.15
65.18	Socket - (41)	.15
65.19	Socket - (84)	.10
65.46	Socket - (vibrator)	.10
65.61	Socket - (external speaker)	.12
75.119	Remote control cable - (station selector)	1.25
75.120	Remote control cable - (volume control)	1.25
75.122	Volume control unit - (with switch)	2.75
75.123	Tuning control unit	2.60
80.11	Tube shield - (two sections)	.09
80.13	Tube shield base	.04
80.14	Tube shield retaining ring	.02
80.16	Tube shield cap	.04
90.2	Cup washer	.05
90.3	Rubber grommet - (Dia. 11/16" Hole 13/32")	.05
90.15	Antenna cable	.60
90.18	Mounting bolt - (5/16" - 18 Thd. x 3/2" L.)	.20
90.31	Pilot light - (6 volt)	.04
90.54	Grid cap	.07
90.63	Vibrator	3.50
90.107	Washer - (7/8" x 1/16" x 11/32" Hole)	Net .01
90.108	Lockwasher - (11/16" O. D. x 3/32")	Net .01
90.110	Hex nut - (5/16" - 18 Thd.)	Net .02
90.153	Speaker cable	.35
90.160	Grounding clips - (per doz.)	.10
90.159	Vibrator grounding cup	.15
90.235	Fuse - 15 Amp.	.10
105.68	Speaker - (Model 267)	5.95
140.14	Knob - (tone control)	.10

FADA RADIO & ELECTRIC CO

MODELS 311(220V), 311B(220V) Schematics, Parts



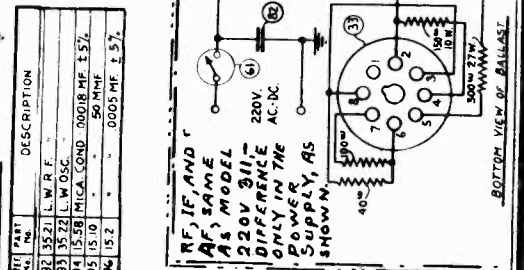
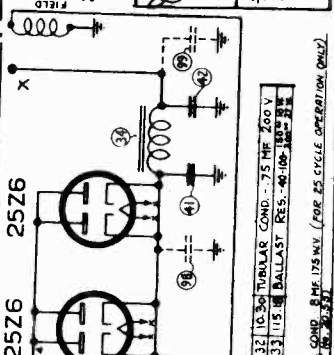
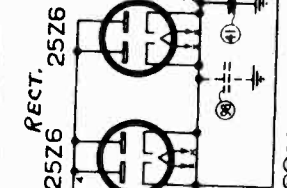
220 V. MODEL 311

DRAWN BY: P
 CHECKED BY: B
 DATE: 11-12-36
 APPROVED BY: PFS

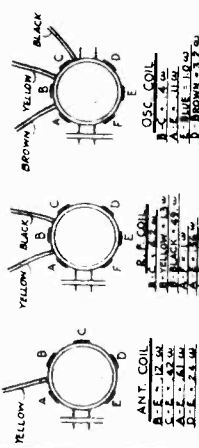
220 V. MODEL 311 B

DRAWN BY: P
 CHECKED BY: B
 DATE: 10-15-36
 APPROVED BY: PFS

NOTE:
 BAND SW. SHOWN IN 'S' POSITION.
 SELECTIVITY SW. - SHARP.
 I.F. TO BE ALIGNED
 POS #1 (SHARP POS #2 BROAD POS #3 HI-FIDELITY)
 # = CHASSIS



REF. PART NO.	DESCRIPTION	REF. PART NO.	DESCRIPTION
63	25.49 PADDING COND. - 70 MHF	92	35.21 L.W. R.F.
64	55.11 TONE CONTROL 1/2 MIC	93	35.22 L.W. OSC.
65	50.25 VOLUME - INSTANTANEOUS	94	15.58 MICA COND. 0.0018 MF. 1.57.
66	50.24 PHANTOM FLASH-D. COOPER	95	15.10 50 MHF
67	10.5 R.F.	96	15.2 0.005 MF. 1.57.
68	10.5 OSCILLATOR		
69	35.10 1st I.F.		
70	10.5 2nd I.F.		
71	10.26 WAVE TRAP		
72	10.26 ELECTRO COND. 37 MHF 175 WV		
73	10.26		
74	10.4 DUAL		
75	10.4 MICA COND. .002 MF. 1.07.		
76	10.2		
77	10.2		
78	10.2		
79	10.2		
80	10.2		
81	10.23		
82	10.9		
83	10.10		
84	10.10		
85	10.17 DUAL		
86	10.58 SPEAKER 2400 OHMS (INDIAL ZIT)		
87	10.57		
88	10.57		
89	30.2 CARB. RES. 10,000 OHMS 1/2W		
90	15.3 MICA COND. .001 MF. ±0.7.		
91	35.20 L.W. ANT. COIL		

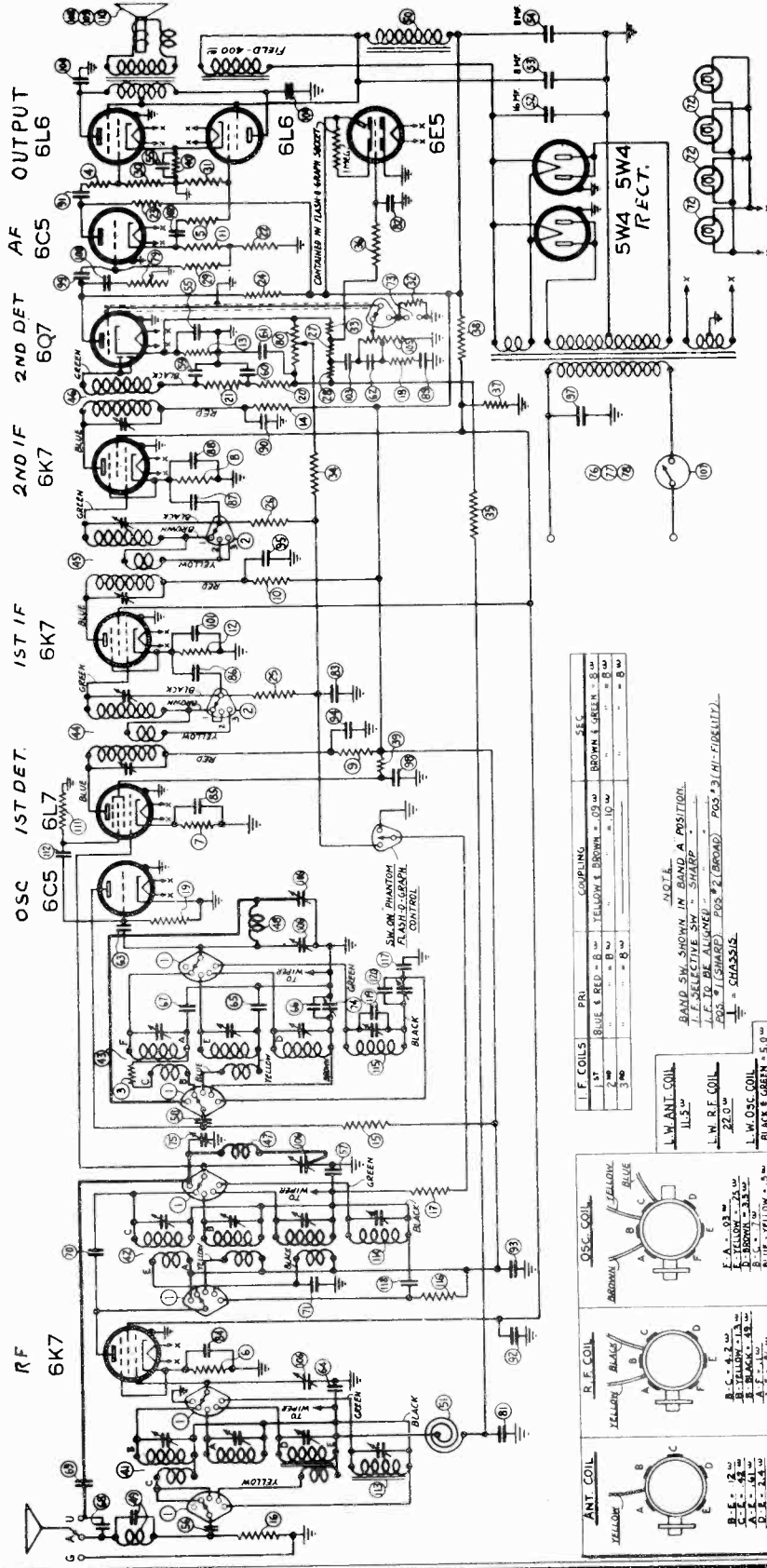


MODEL 312
Schematic
Parts

FADA RADIO & ELECTRIC CO

I.F. - 456 KC.

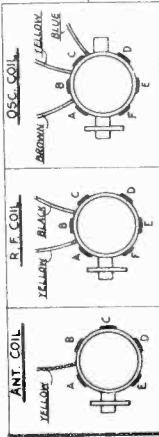
FADA RADIO & ELECTRIC CO
LONG ISLAND CITY, N. Y.
MODEL 312
DESIGNED BY J.P.
CHECKED BY J.M.S.
APPROVED BY J.P.S.



I.F. COILS

PRN	COUPLING	SEC.
1-3	YELLOW & BROWN - .05 μ	BROWN & GREEN - 8 μ
4	BROWN & RED - 8 μ	BROWN & GREEN - 10 μ
5	BROWN & RED - 8 μ	BROWN & GREEN - 10 μ

NOTE:
BAND SW. SHOWN IN BAND A POSITION.
I.F. SELECTIVE SW. - SHARP
POS. 2 (SHARP) POS. 3 (BROAD) POS. 4 (HI-FIDELITY)
= CHASSIS.

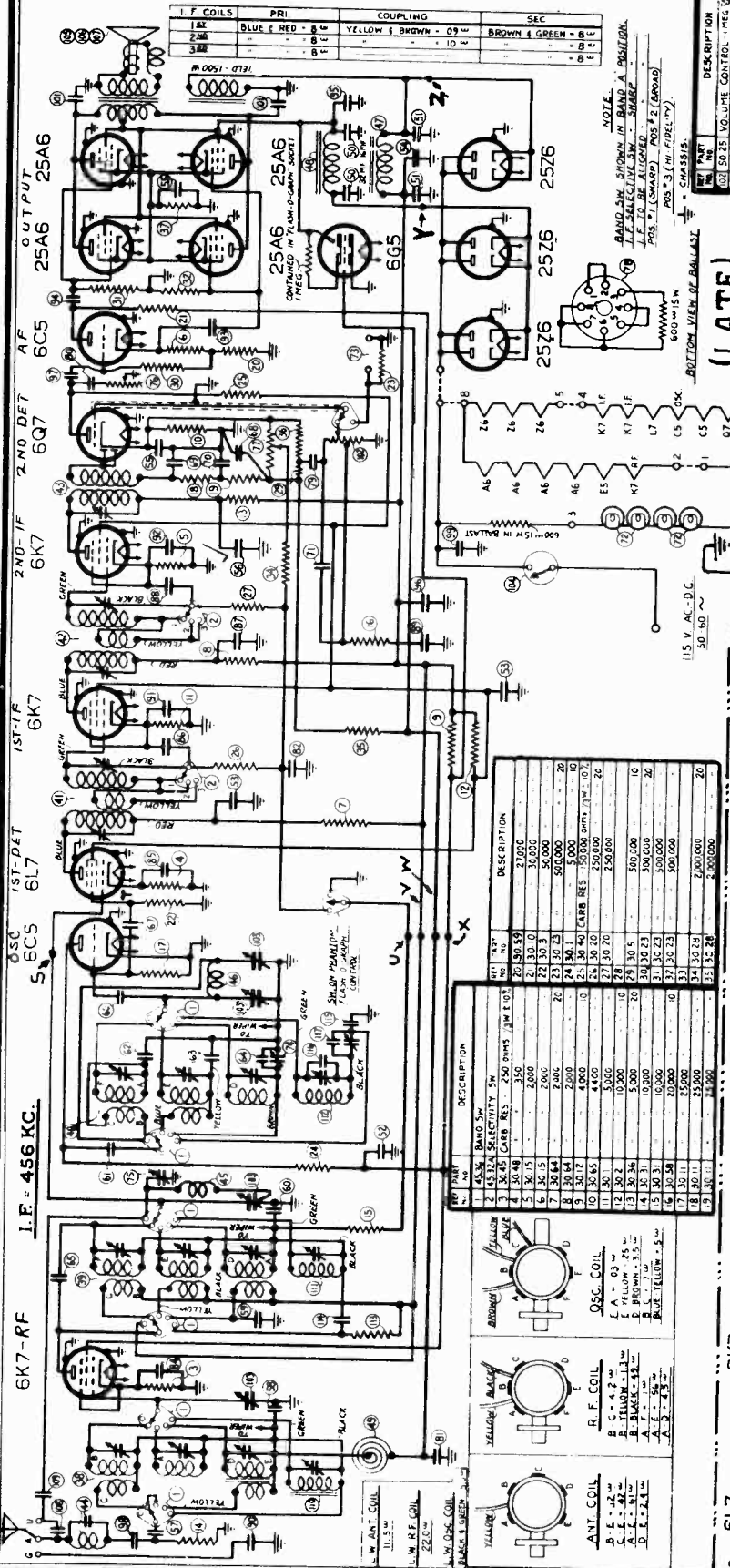


REF. PART NO.	DESCRIPTION	REF. PART NO.	DESCRIPTION	REF. PART NO.	DESCRIPTION
1	25 SW BAND SW	73	725 I PHONO JACK	101	TUBULAR COND. .05 MF 400 V
2	45 SW SELECTIVE SW	74	25-40 PADDING COND.	102	01 400
3	30-70 CARB. RES.	75	25-40 R.F. CHOKES	103	01 400
4	30-70 CARB. RES.	76	20-50 ELECTRO. COND.	104	01 400
5	30-70 CARB. RES.	77	40-50 POWER TRANS.	105	01 200
6	30-70 CARB. RES.	78	40-50 DUAL	106	01 200
7	30-70 CARB. RES.	79	55-13 TONE CONTROL	107	01 200
8	30-70 CARB. RES.	80	50-24 FLASH O. GRAPH. CONTROL	108	01 200
9	30-70 CARB. RES.	81	10-26 FLASH O. GRAPH. CONTROL	109	01 200
10	30-70 CARB. RES.	82	2-26 TUBULAR COND.	110	01 200
11	30-70 CARB. RES.	83	2-26 TUBULAR COND.	111	01 200
12	30-70 CARB. RES.	84	10-53 MICA COND.	112	01 200
13	30-70 CARB. RES.	85	10-53 MICA COND.	113	01 200
14	30-70 CARB. RES.	86	10-53 MICA COND.	114	01 200
15	30-70 CARB. RES.	87	10-53 MICA COND.	115	01 200
16	30-70 CARB. RES.	88	10-53 MICA COND.	116	01 200
17	30-70 CARB. RES.	89	10-53 MICA COND.	117	01 200
18	30-70 CARB. RES.	90	10-53 MICA COND.	118	01 200
19	30-70 CARB. RES.	91	10-53 MICA COND.	119	01 200
20	30-70 CARB. RES.	92	10-53 MICA COND.	120	01 200
21	30-70 CARB. RES.	93	10-53 MICA COND.	121	01 200
22	30-70 CARB. RES.	94	10-53 MICA COND.	122	01 200
23	30-70 CARB. RES.	95	10-53 MICA COND.	123	01 200
24	30-70 CARB. RES.	96	10-53 MICA COND.	124	01 200

MODEL 316 Late
Above Ser #60183
Schematics, Parts

FADA RADIO & ELECTRIC CO

MODEL 316 Early
Below Ser #60183

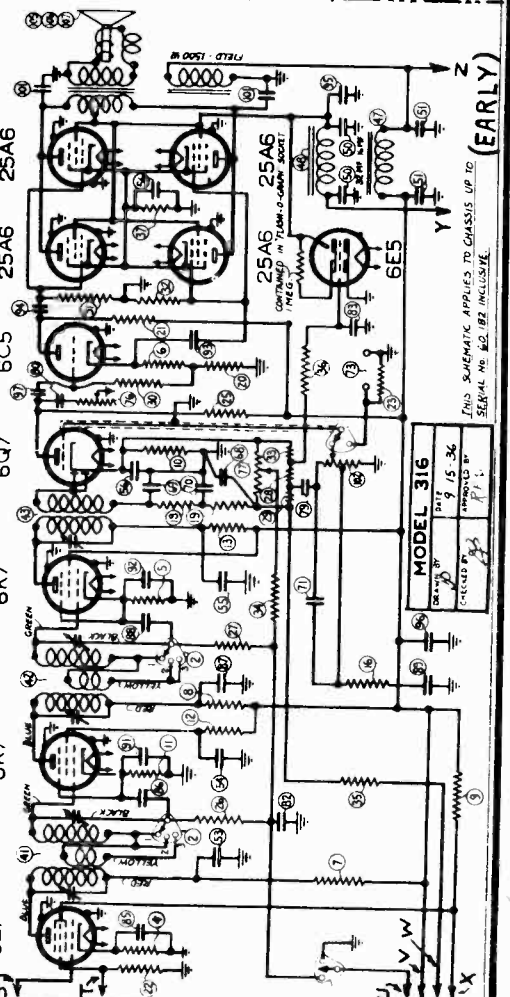


1 F. COILS	PRI	COUPLING	SEC
1A	BLUE & RED - 8	YELLOW & BROWN - 9	BROWN & GREEN - 10
2A
3A

NOTE:
BANDPASS SHOWN IN BAND A POSITION.
I.F. TO BE TUNED TO SHARP
POS. 7 (SWAMP) POS. 2 (AROUND)
POS. 3 (HI FIDELITY)
CHASSIS.

REF. NO.	DESCRIPTION
01	50.15 VOLUME CONTROL - 1 MEG. VARIABLE COND.
02	25.63 VARIABLE COND.
03	45.37 ON-OFF SW. (LINE)
04	105.52 SPEAKER 150W (MODEL 216T)
05	105.53 " " " " " " " "
06	105.54 " " " " " " " "
07	105.55 " " " " " " " "
08	15.9 MIC. COND. 10 MHF. X 10 P.
09	32.60 L. W. ANT. COIL
10	32.61 " " " " " " " "
11	32.62 " " " " " " " "
12	32.63 " " " " " " " "
13	32.64 " " " " " " " "
14	32.65 " " " " " " " "
15	32.66 " " " " " " " "
16	32.67 " " " " " " " "
17	32.68 " " " " " " " "
18	32.69 " " " " " " " "
19	32.70 " " " " " " " "
20	32.71 " " " " " " " "
21	32.72 " " " " " " " "
22	32.73 " " " " " " " "
23	32.74 " " " " " " " "
24	32.75 " " " " " " " "
25	32.76 " " " " " " " "
26	32.77 " " " " " " " "
27	32.78 " " " " " " " "
28	32.79 " " " " " " " "
29	32.80 " " " " " " " "
30	32.81 " " " " " " " "
31	32.82 " " " " " " " "
32	32.83 " " " " " " " "
33	32.84 " " " " " " " "
34	32.85 " " " " " " " "
35	32.86 " " " " " " " "
36	32.87 " " " " " " " "
37	32.88 " " " " " " " "
38	32.89 " " " " " " " "
39	32.90 " " " " " " " "
40	32.91 " " " " " " " "
41	32.92 " " " " " " " "
42	32.93 " " " " " " " "
43	32.94 " " " " " " " "
44	32.95 " " " " " " " "
45	32.96 " " " " " " " "
46	32.97 " " " " " " " "
47	32.98 " " " " " " " "
48	32.99 " " " " " " " "
49	32.00 " " " " " " " "

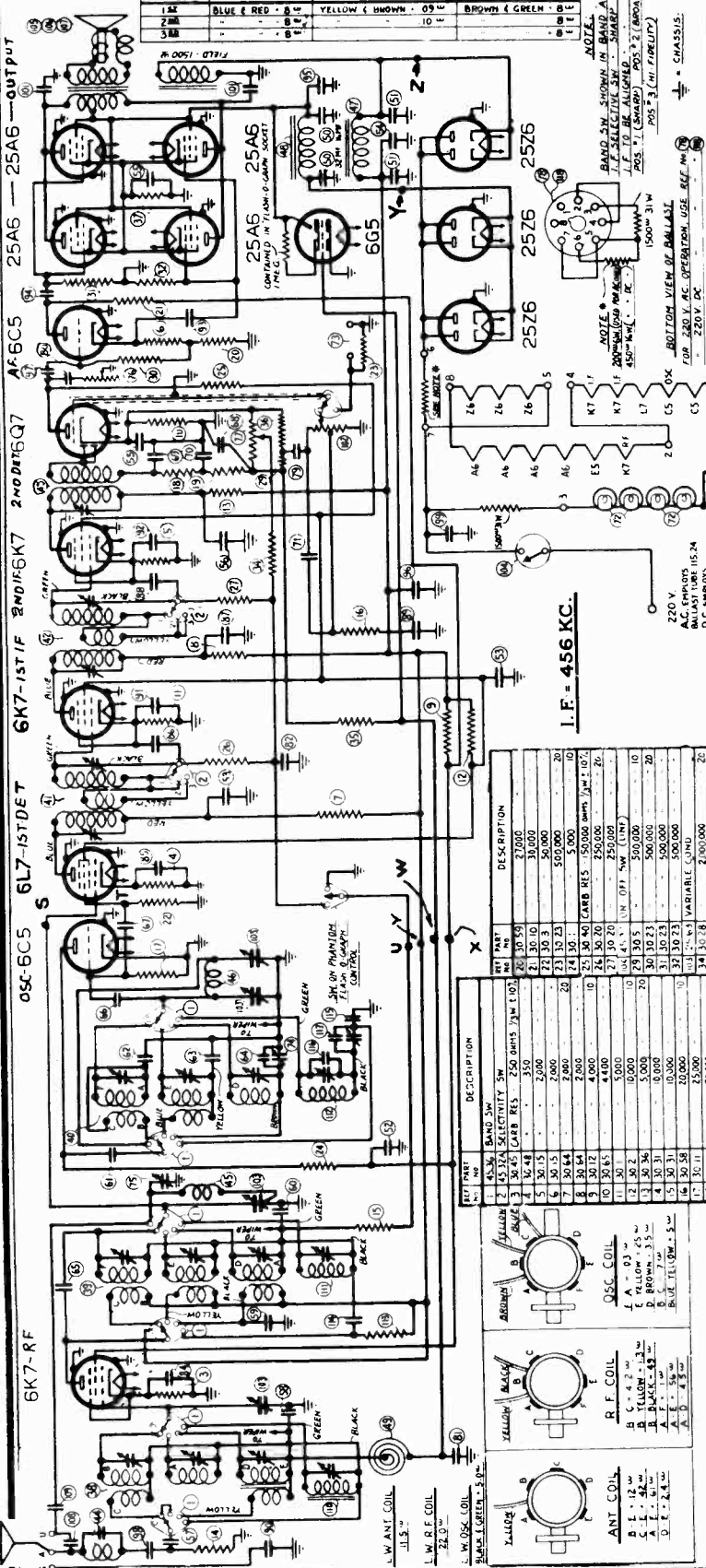
REF. PART NO.	DESCRIPTION	QTY.
01	200000	2
02	230	2
03	ANT	2
04	COIL - ANT	2
05	OSC	2
06	1" I.F.	2
07	3" I.F.	2
08	WAVE TRAP	2
09	U.F. ANT	2
10	OSC	2
11	CHOKE 300 W	2
12	50.15 COIL - R.F. CHOKER 20 MH	2
13	25.63 ELECTRO. COND. - 32. MF. 100V	2
14	45.37	2
15	105.52	2
16	105.53	2
17	105.54	2
18	105.55	2
19	15.9	2
20	32.60	2
21	32.61	2
22	32.62	2
23	32.63	2
24	32.64	2
25	32.65	2
26	32.66	2
27	32.67	2
28	32.68	2
29	32.69	2
30	32.70	2
31	32.71	2
32	32.72	2
33	32.73	2
34	32.74	2
35	32.75	2
36	32.76	2
37	32.77	2
38	32.78	2
39	32.79	2
40	32.80	2
41	32.81	2
42	32.82	2
43	32.83	2
44	32.84	2
45	32.85	2
46	32.86	2
47	32.87	2
48	32.88	2
49	32.89	2
50	32.90	2



REF. PART NO.	DESCRIPTION	QTY.
01	200000	2
02	230	2
03	ANT	2
04	COIL - ANT	2
05	OSC	2
06	1" I.F.	2
07	3" I.F.	2
08	WAVE TRAP	2
09	U.F. ANT	2
10	OSC	2
11	CHOKE 300 W	2
12	50.15 COIL - R.F. CHOKER 20 MH	2
13	25.63 ELECTRO. COND. - 32. MF. 100V	2
14	45.37	2
15	105.52	2
16	105.53	2
17	105.54	2
18	105.55	2
19	15.9	2
20	32.60	2
21	32.61	2
22	32.62	2
23	32.63	2
24	32.64	2
25	32.65	2
26	32.66	2
27	32.67	2
28	32.68	2
29	32.69	2
30	32.70	2
31	32.71	2
32	32.72	2
33	32.73	2
34	32.74	2
35	32.75	2
36	32.76	2
37	32.77	2
38	32.78	2
39	32.79	2
40	32.80	2
41	32.81	2
42	32.82	2
43	32.83	2
44	32.84	2
45	32.85	2
46	32.86	2
47	32.87	2
48	32.88	2
49	32.89	2
50	32.90	2

FADA RADIO & ELECTRIC CO

MODEL 316(220V)
Early, Below Ser. #60183
MODEL 316(220V)
Late, Above Ser. #60183
Schematics, Parts

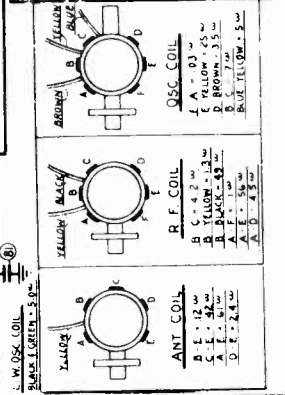


I. F. = 456 KC.

1. F. COILS	PRI	COUPLING	SEC
1	BLUE & RED	YELLOW & BROWN	BROWN & GREEN
2	2	10	10
3	3	10	10

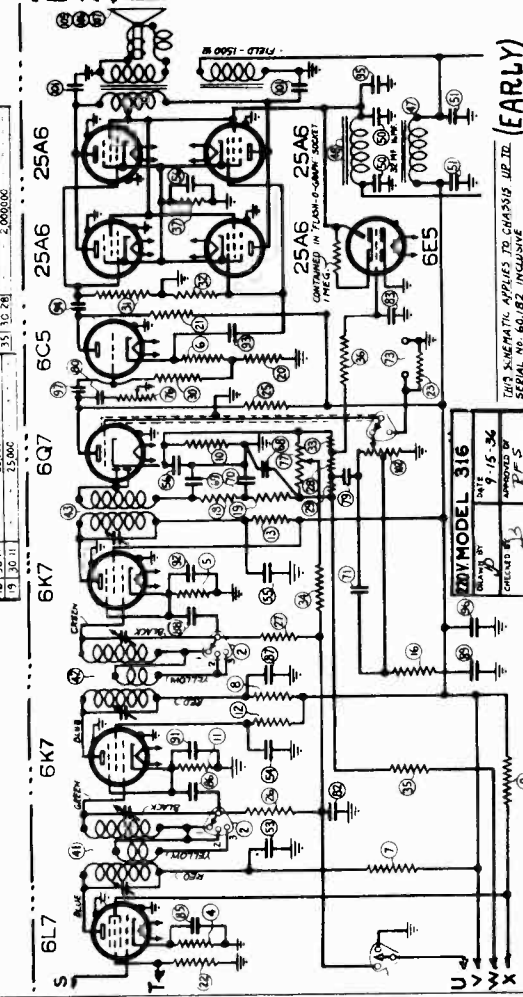
RT PART NO.	DESCRIPTION
1	ANT. COIL
2	R. F. COIL
3	OSC. COIL
4	6K7
5	6L7
6	6S5
7	6K7
8	6Q7
9	25A6
10	25B6
11	6G5
12	25Z6

RT PART NO.	DESCRIPTION
13	27000
14	30000
15	35000
16	40000
17	45000
18	50000
19	55000
20	60000
21	65000
22	70000
23	75000
24	80000
25	85000
26	90000
27	95000
28	100000
29	105000
30	110000
31	115000
32	120000
33	125000
34	130000
35	135000
36	140000
37	145000
38	150000
39	155000
40	160000
41	165000
42	170000
43	175000
44	180000
45	185000
46	190000
47	195000
48	200000
49	205000
50	210000
51	215000
52	220000



RT PART NO.	DESCRIPTION
53	220 V. AC. SUPPLY
54	250 OHM RES.
55	500 OHM RES.
56	1000 OHM RES.
57	2000 OHM RES.
58	5000 OHM RES.
59	10000 OHM RES.
60	20000 OHM RES.
61	50000 OHM RES.
62	100000 OHM RES.
63	200000 OHM RES.
64	500000 OHM RES.
65	1000000 OHM RES.
66	2000000 OHM RES.
67	5000000 OHM RES.
68	10000000 OHM RES.
69	20000000 OHM RES.
70	50000000 OHM RES.
71	100000000 OHM RES.
72	200000000 OHM RES.
73	500000000 OHM RES.
74	1000000000 OHM RES.
75	2000000000 OHM RES.
76	5000000000 OHM RES.
77	10000000000 OHM RES.
78	20000000000 OHM RES.
79	50000000000 OHM RES.
80	100000000000 OHM RES.
81	200000000000 OHM RES.
82	500000000000 OHM RES.
83	1000000000000 OHM RES.
84	2000000000000 OHM RES.
85	5000000000000 OHM RES.
86	10000000000000 OHM RES.
87	20000000000000 OHM RES.
88	50000000000000 OHM RES.
89	100000000000000 OHM RES.
90	200000000000000 OHM RES.
91	500000000000000 OHM RES.
92	1000000000000000 OHM RES.
93	2000000000000000 OHM RES.
94	5000000000000000 OHM RES.
95	10000000000000000 OHM RES.
96	20000000000000000 OHM RES.
97	50000000000000000 OHM RES.
98	100000000000000000 OHM RES.
99	200000000000000000 OHM RES.
100	500000000000000000 OHM RES.

RT PART NO.	DESCRIPTION
101	1000000
102	2000000
103	5000000
104	10000000
105	20000000
106	50000000
107	100000000
108	200000000
109	500000000
110	1000000000
111	2000000000
112	5000000000
113	10000000000
114	20000000000
115	50000000000
116	100000000000
117	200000000000
118	500000000000
119	1000000000000
120	2000000000000
121	5000000000000
122	10000000000000
123	20000000000000
124	50000000000000
125	100000000000000
126	200000000000000
127	500000000000000
128	1000000000000000
129	2000000000000000
130	5000000000000000
131	10000000000000000
132	20000000000000000
133	50000000000000000
134	100000000000000000
135	200000000000000000
136	500000000000000000
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139	5000000000000000000
140	10000000000000000000
141	20000000000000000000
142	50000000000000000000
143	100000000000000000000
144	200000000000000000000
145	500000000000000000000
146	1000000000000000000000
147	2000000000000000000000
148	5000000000000000000000
149	10000000000000000000000
150	20000000000000000000000

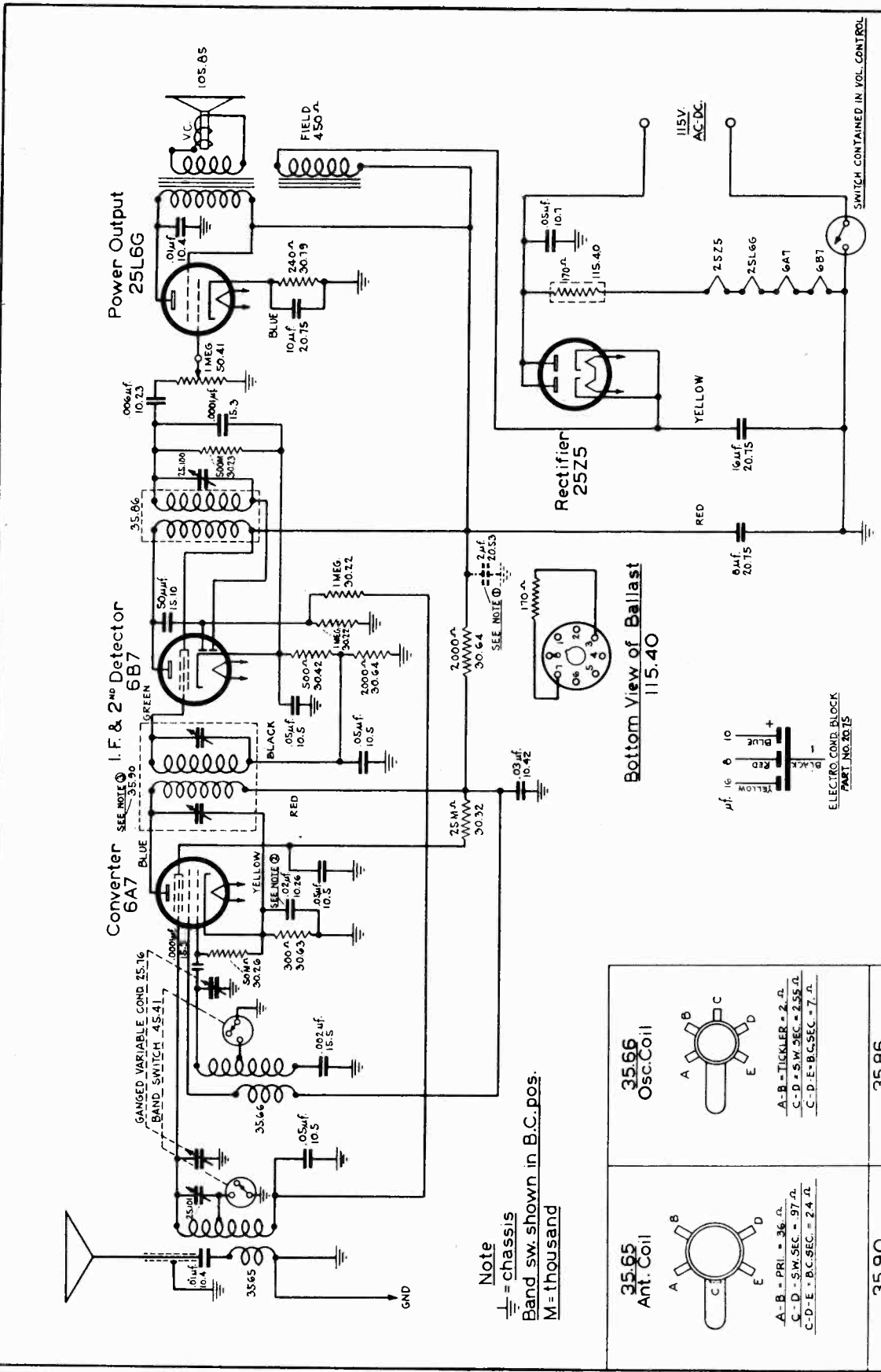


THIS SCHEMATIC APPLIES TO CHASSIS UP TO SERIAL NO. 60182 INCLUSIVE (EARLY)

THIS SCHEMATIC APPLIES TO CHASSIS UP TO SERIAL NO. 60183 AND UP (LATE)

FADA RADIO & ELECTRIC CO


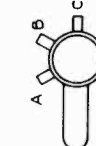
MODEL 350
Schematic, Changes



FADA RADIO & ELECTRIC CO
LONG ISLAND CITY, N.Y.
MODEL 350
DRAWN BY *J.P.* DATE 8-31-37
CHECKED BY *R.H.F.* 9/6/37

I.F. Peak = 456 KC.

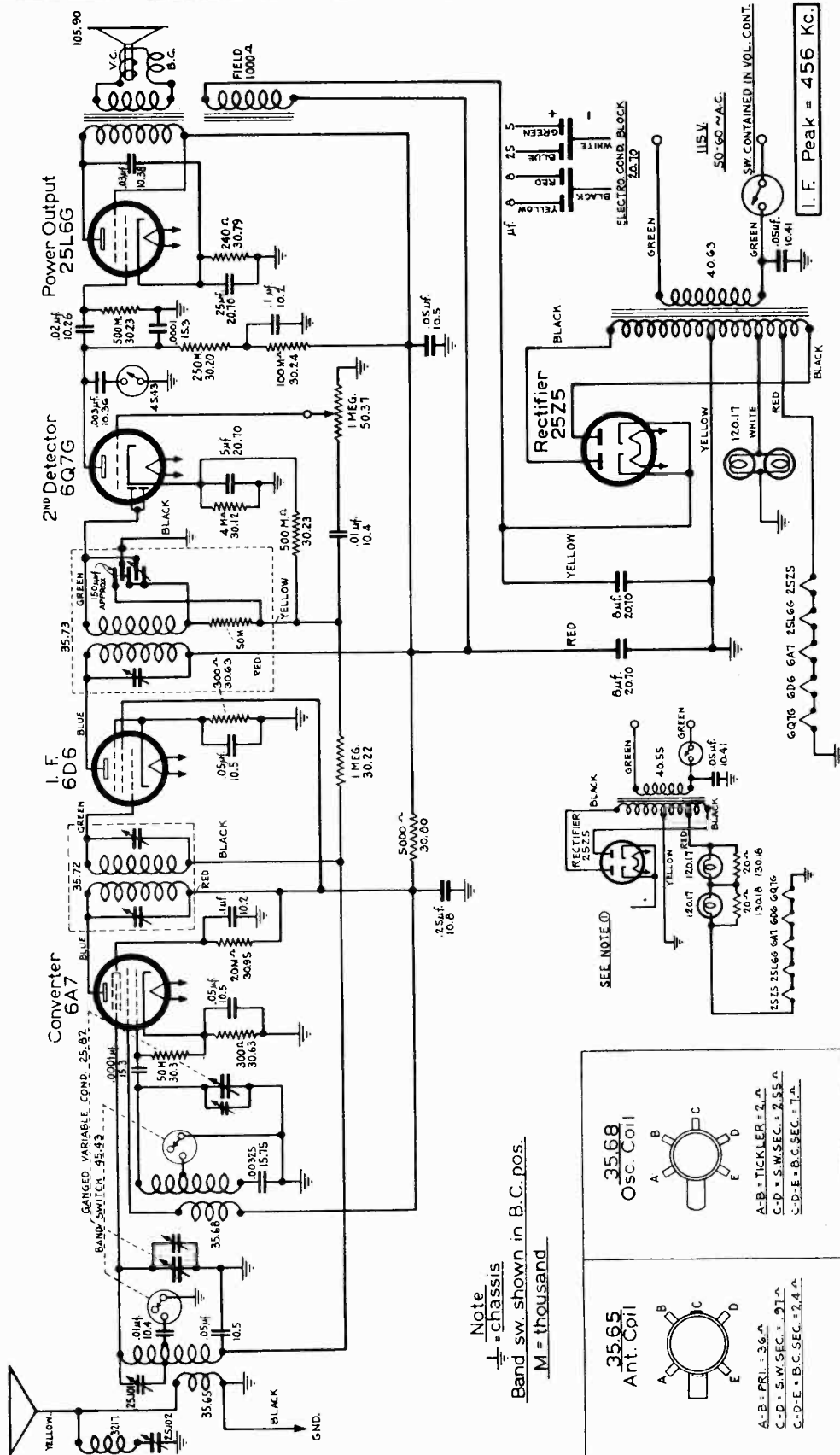
Note
⊥ = chassis
Band sw. shown in B.C. pos.
M = thousand

<p>35.65 Ant. Coil</p>  <p>A-B = PRI. = 36 Ω C-D = S.W. SEC. = 97 Ω C-D-E = B.C. SEC. = 24 Ω</p>	<p>35.66 Osc. Coil</p>  <p>A-B = TICKLER = 2 Ω C-D = S.W. SEC. = 255 Ω C-D-E = B.C. SEC. = 7 Ω</p>
<p>35.90 1st I.F.</p> <p>PRI. f SEC. = 11 Ω</p>	<p>35.86 2nd I.F.</p> <p>PRI. f SEC. = 10 Ω</p>

NOTE: (1) 2μF ELECTROLYTIC, PART NO. 20.53 IS USED ON EARLY MODELS IN CONNECTION WITH PART NO. 20.63
(2) 0.02μF ELECTROLYTIC CONDENSER, PART NO. 10.42 IS USED IN PLACE OF .02μF PART NO. 10.26
NOTE: (3) ON EARLY MODELS, I.F. TRANS. PART NO. 35.44 IS USED IN PLACE OF PART NO. 35.90

MODEL 351
Schematic

FADA RADIO & ELECTRIC CO



Note
 = chassis
 Band sw. shown in B.C. pos.
 M = thousand

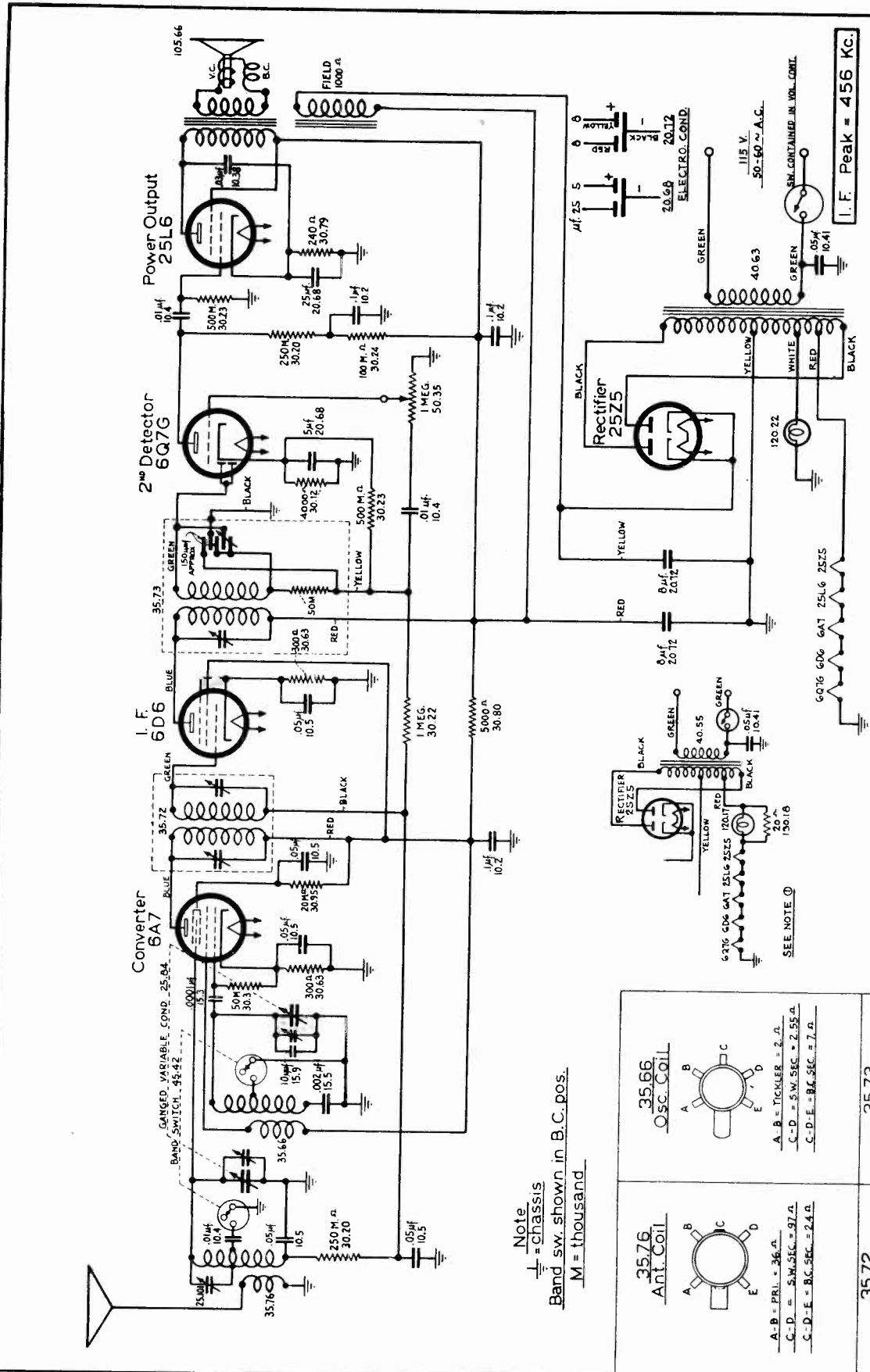
<p>35.65 Ant. Coil</p> <p>A-B = PRI. = 3.6μ C-D = S.W. SEC. = .21μ C-D-E = B.C. SEC. = 7.4μ</p>	<p>35.68 OSC. COIL</p> <p>A-B = TICKLER = 2.0μ C-D = S.W. SEC. = 7.55μ C-D-E = B.C. SEC. = 7.4μ</p>
<p>35.72 1st I.F.</p> <p>PRI. & SEC. = 2.0μ</p>	<p>35.73 2nd I.F.</p> <p>PRI. & SEC. = 2.0μ</p>

NOTE: POWER TRANSFORMER AND CIRCUIT USED IN EARLY MODELS.

FADA RADIO & ELECTRIC CO
 LONG ISLAND CITY, N. Y.
MODEL 351
 DRAWN BY: [Signature]
 CHECKED BY: [Signature]
 DATE: 8-31-37
 APPROVED BY: [Signature]

FADA RADIO & ELECTRIC CORP.

MODEL 354
Schematic



FADA RADIO & ELECTRIC CO.
LONG ISLAND CITY, N. Y.
MODEL 354
DRAWN BY: J. D.
CHECKED BY: P. H. F.
DATE: 8-31-37
APPROVED BY: F. H.

I. F. Peak = 456 Kc.

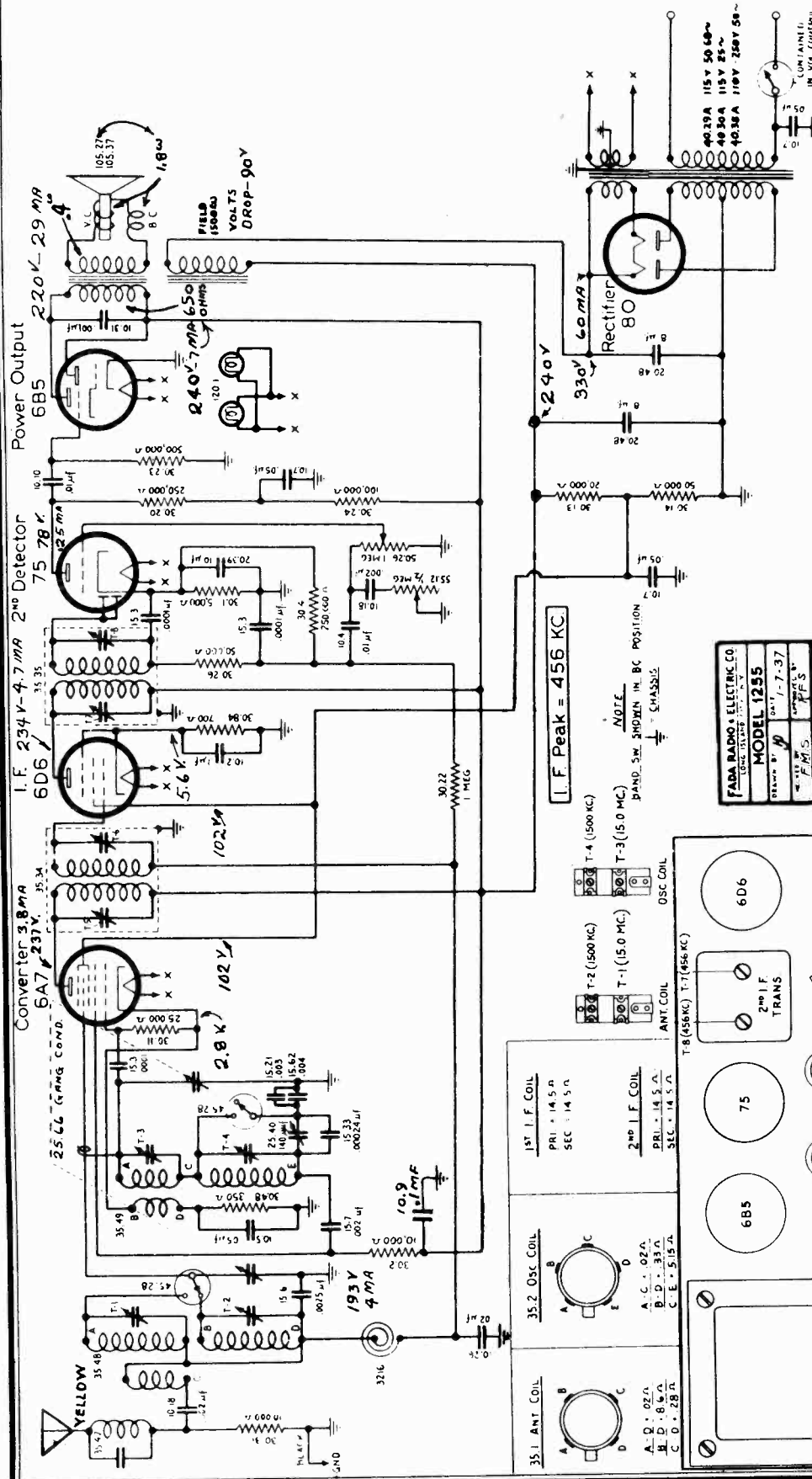
Note
⊥ = chassis
Band sw. shown in B.C. pos.
M = thousand

<p>3576 Ant. Coil</p> <p>A - B = PRI. = 36.Ω C - D = S.W. SEC. = 97.Ω C - D - E = B.C. SEC. = 2.4.Ω</p>	<p>3566 Osc. Coil</p> <p>A - B = TICKLER = 2.Ω C - D = S.W. SEC. = 2.55.Ω C - D - E = B.C. SEC. = 7.Ω</p>
<p>3572 1st I. F.</p> <p>PRI. & SEC. = 28.Ω</p>	<p>3573 2nd I. F.</p> <p>PRI. & SEC. = 28.Ω</p>

NOTE: POWER TRANSFORMER AND CIRCUIT USED IN EARLY MODELS

MODEL 1255
Schematic, Socket
Alignment, Trimmers

FADA RADIO & ELECTRIC CO



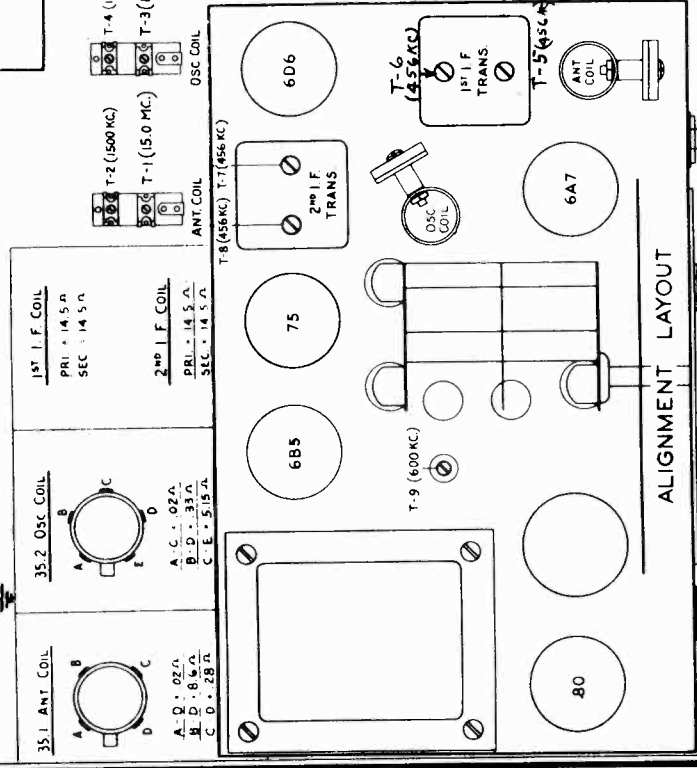
ALIGNMENT TABLE

Wave BAND	Dial Fre.	Gen. Fre.	Image Fre.	Dum. ANT	Gen. Con. to CG of 6D6	Adj. Trim.
BC	1000 KC	456 KC	- - -	.001 MF & 50MΩ	CG of 6A7	T8, T7
BC	1000 KC	456 KC	- - -	Same	CG of 6A7	T6, T5
SW	15.0 MC	15.0 MC	15.9 MC	400 Ω	"Y" Ant.	T3, T1
SW	6.0 MC	6.0 MC	- - -	Same	Same	Chk. Sen
BC	1500 KC	1500 KC	- - -	200MMF	Same	T4, T2
BC	1600 KC	600 KC	- - -	Same	Same	T9 *

* Rock during adjustment. (Check sensitivity at 6 MC)

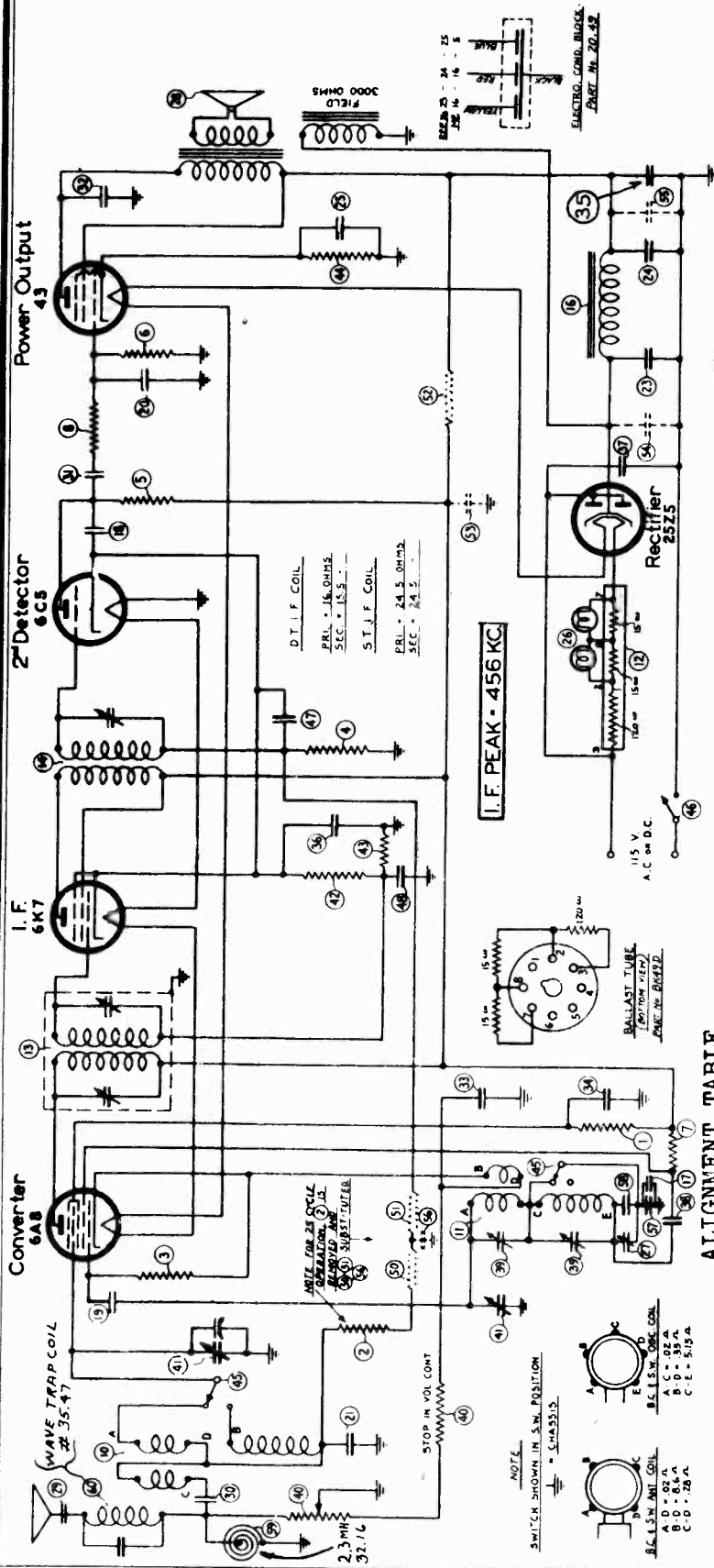
FADA RADIO & ELECTRIC CO
 MODEL 1255
 MADE IN U.S.A.
 SERIAL NO. 1-7-37
 PARTS LIST

I.F. Peak = 456 KC
 NOTE: BAND SW SHOWN IN BC POSITION
 CHASSIS

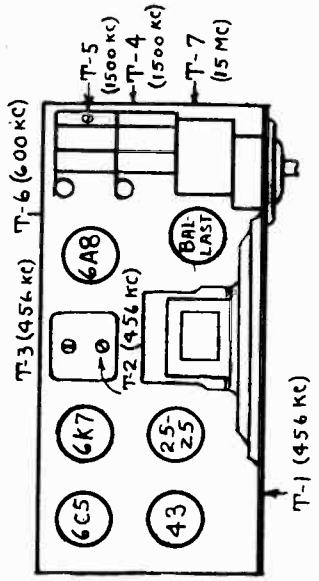


FADA RADIO & ELECTRIC CO

MODEL 1262
Schematic, Socket
Trimmers, Alignment
Parts



NOTE
SEE NOS. 50, 51, 52, 53, 54, 55, 56
FOR 25 CYCLE OPERATION ONLY
AND ARE SHOWN IN DOTTED LINES.



FADA RADIO & ELECTRIC CO LONG ISLAND CITY, N.Y.	
MODEL	MODEL 1262
DATE	1-7-37
DESIGNED BY	F.M.S.

ALIGNMENT LAYOUT

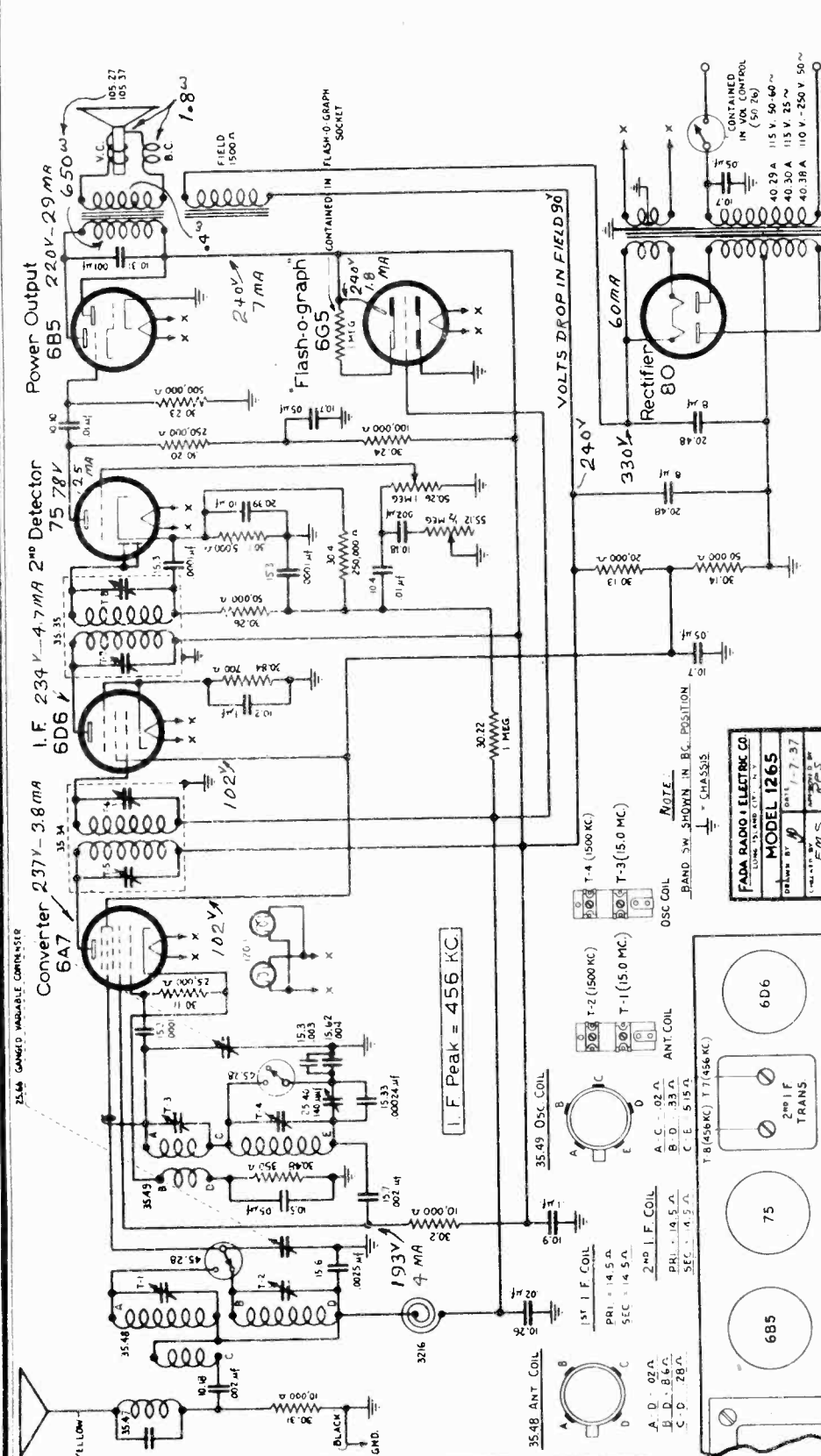
WAVE BAND	Dial Fre.	Gen. Fre.	Image Fre.	Dum. Ant.	Gen. Ant.	Adj. Con. to	Trim.
BC	1000KC	456 KC	- - -	.001 MF & 50MΩ	CG of 6A8	T1, T2, T3	
BC	1500KC	1500KC	- - -	200 MΩ	Ant. lead	T4, T5	
BC	600KC	600KC	- - -	Same	Same	T6*	
SW	15 MC	15MC	15.9MC	400 Ω	Same	T7	

* Rock variable condenser during alignment.

REF. NO.	PART NO.	DESCRIPTION	REF. PART NO.	DESCRIPTION
1	10.1	CARB. RES. 30,000 OHMS 1/4 W 221	43	30-44
2	10.2	CARB. RES. 30,000 OHMS 1/4 W 221	44	30-47
3	30.1	40 MΩ CROKE COIL 400 OHMS	45	45-3
4	30.2	1 MΩ CROKE COIL .003 MFD 5% E 57	46	45-3
5	30.3	1 MΩ CROKE COIL .003 MFD 5% E 57	47	10-4
6	30.4	500,000	48	10-8
7	30.5	500,000	49	10-8
8	30.6	500,000	50	30-24
9	30.7	500,000	51	30-24
10	30.8	500,000	52	30-30
11	30.9	500,000	53	20-25
12	30.10	500,000	54	20-25
13	30.11	500,000	55	20-25
14	30.12	500,000	56	20-25
15	30.13	500,000	57	15-5
16	30.14	500,000	58	105-2
17	30.15	500,000	59	105-2
18	30.16	500,000	60	105-2
19	30.17	500,000	61	105-2
20	30.18	500,000	62	105-2
21	30.19	500,000	63	105-2
22	30.20	500,000	64	105-2
23	30.21	500,000	65	105-2
24	30.22	500,000	66	105-2
25	30.23	500,000	67	105-2
26	30.24	500,000	68	105-2
27	30.25	500,000	69	105-2
28	30.26	500,000	70	105-2
29	30.27	500,000	71	105-2
30	30.28	500,000	72	105-2
31	30.29	500,000	73	105-2
32	30.30	500,000	74	105-2
33	30.31	500,000	75	105-2
34	30.32	500,000	76	105-2
35	30.33	500,000	77	105-2
36	30.34	500,000	78	105-2
37	30.35	500,000	79	105-2
38	30.36	500,000	80	105-2
39	30.37	500,000	81	105-2
40	30.38	500,000	82	105-2
41	30.39	500,000	83	105-2
42	30.40	500,000	84	105-2
43	30.41	500,000	85	105-2
44	30.42	500,000	86	105-2
45	30.43	500,000	87	105-2
46	30.44	500,000	88	105-2
47	30.45	500,000	89	105-2
48	30.46	500,000	90	105-2
49	30.47	500,000	91	105-2
50	30.48	500,000	92	105-2
51	30.49	500,000	93	105-2
52	30.50	500,000	94	105-2
53	30.51	500,000	95	105-2
54	30.52	500,000	96	105-2
55	30.53	500,000	97	105-2
56	30.54	500,000	98	105-2
57	30.55	500,000	99	105-2
58	30.56	500,000	100	105-2

MODEL 1265
Schematic, Socket
Trimmers, Alignment
Voltage

FADA RADIO & ELECTRIC CO

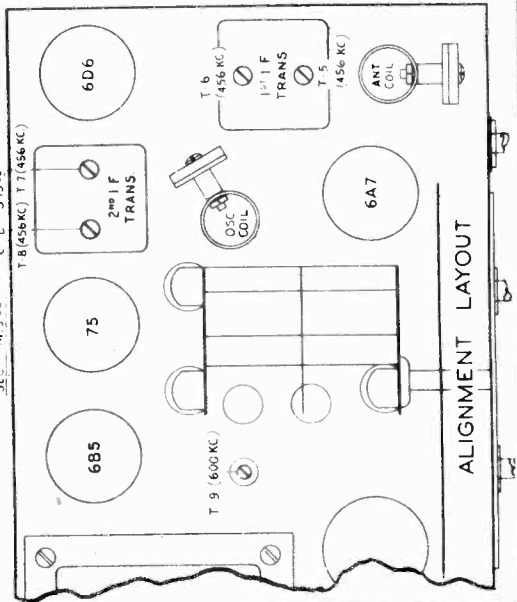


ALIGNMENT TABLE

WAVE BAND	DIAL Fre.	Gen. Fre.	Image Fre.	Dummy Antenna	Generator Con. to-	Adjust Trimmer
BC	1000KC	456KC	-	.001 MF & 50M ω	CG of 6D6	T8, T7
BC	1000KC	456KC	-	Same	CG of 6A7	T6, T5
SW	15.0MC	15 MC	15.9MC	400 ω	"Y" Ant.Ld.	T3, T1
SW	6 MC	6 MC	-	Same	Same	Chk.Sen.
BC	1500KC	1500KC	-	.002 MF	Same	T4, T2
BC	600KC	600KC	-	Same	Same	*T9(Rock)

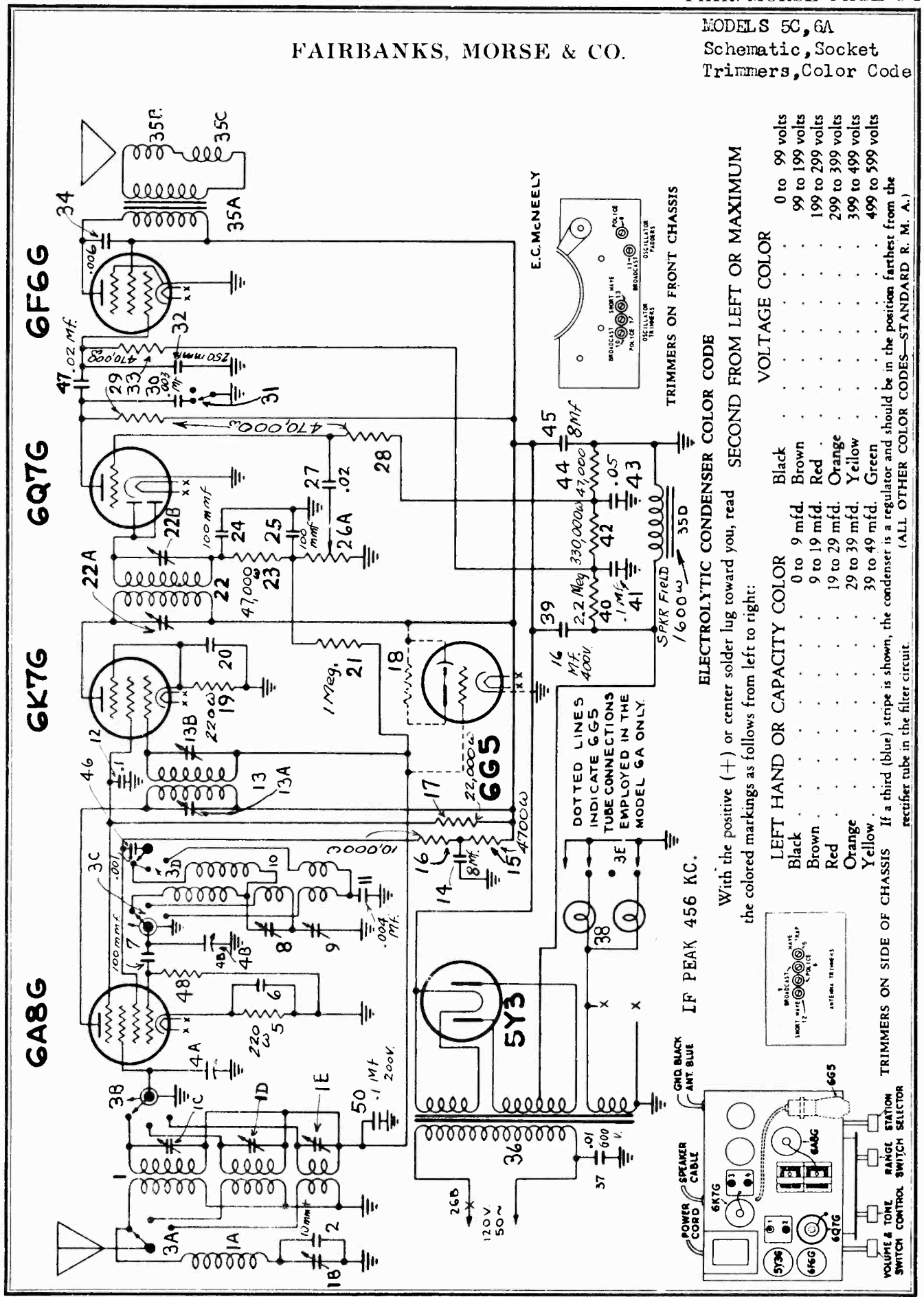
* Rock variable condenser during adjustment.

FADA RADIO & ELECTRIC CO
LONDON, ENGLAND
MODEL 1265
PRINTED IN U.S.A.
F.M.S.



FAIRBANKS, MORSE & CO.

MODEL S 5C, 6A
Schematic, Socket
Trimmers, Color Code



ELECTROLYTIC CONDENSER COLOR CODE

With the positive (+) or center solder lug toward you, read SECOND FROM LEFT OR MAXIMUM the colored markings as follows from left to right:

LEFT HAND OR CAPACITY COLOR		VOLTAGE COLOR	
Black	0 to 9 mfd.	Black	0 to 99 volts
Brown	9 to 19 mfd.	Brown	99 to 199 volts
Red	19 to 29 mfd.	Red	199 to 299 volts
Orange	29 to 39 mfd.	Orange	299 to 399 volts
Yellow	39 to 49 mfd.	Yellow	399 to 499 volts
		Green	499 to 599 volts

TRIMMERS ON SIDE OF CHASSIS If a third (blue) stripe is shown, the condenser is a regulator and should be in the position farthest from the rectifier tube in the filter circuit. (ALL OTHER COLOR CODES—STANDARD R. M. A.)

MODELS 5C, 6A
Alignment, Voltage
Resistance

FAIRBANKS, MORSE & CO.

ALIGNMENT

The models 5C and 6A are AC operated, superheterodyne chassis with automatic volume control. These receivers operate on three bands—broadcast, police-amateur, and short wave, Figure 4. The 6A has the tuning eye, Figures 3 and 4; the 5C does not. Otherwise, the two chassis are identical.

Alignment procedure is given below in chart form, Figures 1 and 2. Make adjustments in the order given. The output meter may be any

low range AC voltmeter, preferably about 0-15 volts. It should be connected from the plate of the 6F6G tube to ground with a .1 mfd. condenser in series with one of the leads. When the hand tends to go off scale, reduce the input from the signal generator and keep the volume control at maximum. If too strong a signal is fed to the receiver and the volume control is used to keep the output meter hand on scale, the A. V. C. will operate and inaccurate alignment will result.

No.	Connect Generator To	Signal Generator Frequency	Dummy	Range Switch	Dial Setting	Stage	Trimmer No.	AFC Switch	Peak For	Special Instructions
1	6A8G Grid	456 KC	.1 mfd. Condenser	Broadcast	530 KC	2nd IF	1		Max.	
2	6A8G Grid	456 KC	.1 mfd. Condenser	Broadcast	530 KC	2nd IF	2		Max.	
3	6A8G Grid	456 KC	.1 mfd. Condenser	Broadcast	530 KC	1st IF	3		Max.	
4	6A8G Grid	456 KC	.1 mfd. Condenser	Broadcast	530 KC	1st IF	4		Max.	
5	Antenna	456 KC*	400 ohm Resistor	Broadcast	530 KC	Wave Trap	5		Min.	*Raise input until signal is heard.
6	Antenna	5.4 MC	400 ohm Resistor	Police Amateur	5.4 MC	Police Osc.	6		Max.	
7	Antenna	5.4 MC	400 ohm Resistor	Police Amateur	5.4 MC	Police Det.	7		Max.	
8	Antenna	1.8 MC	400 ohm Resistor	Police Amateur	1.8 MC	Police Osc.	8		*Max.	*While rocking — Repeat 6, 7 and 8 until no change is noted.
9	Antenna	1500 KC	200 mmfd. Condenser	Broadcast	1500 KC	B. C. Osc.	9		Max.	
10	Antenna	1500 KC	200 mmfd. Condenser	Broadcast	1500 KC	B. C. Det.	10		Max.	
11	Antenna	600 KC	200 mmfd. Condenser	Broadcast	600 KC	B. C. Osc.	11		*Max.	*While rocking — Repeat 9, 10 and 11 until no change is noted.
12	Antenna	18 MC	400 ohm Resistor	Short Wave	18 MC	S. W. Osc.	12		Max.	
13	Antenna	18 MC	400 ohm Resistor	Short Wave	18 MC	S. W. Det.	13		Max.	
14	Antenna	6 MC	400 ohm Resistor	Short Wave	6 MC		*			*Check calibration at 6 MC—Padder is fixed.

FIGURE 2
ALIGNMENT CHART

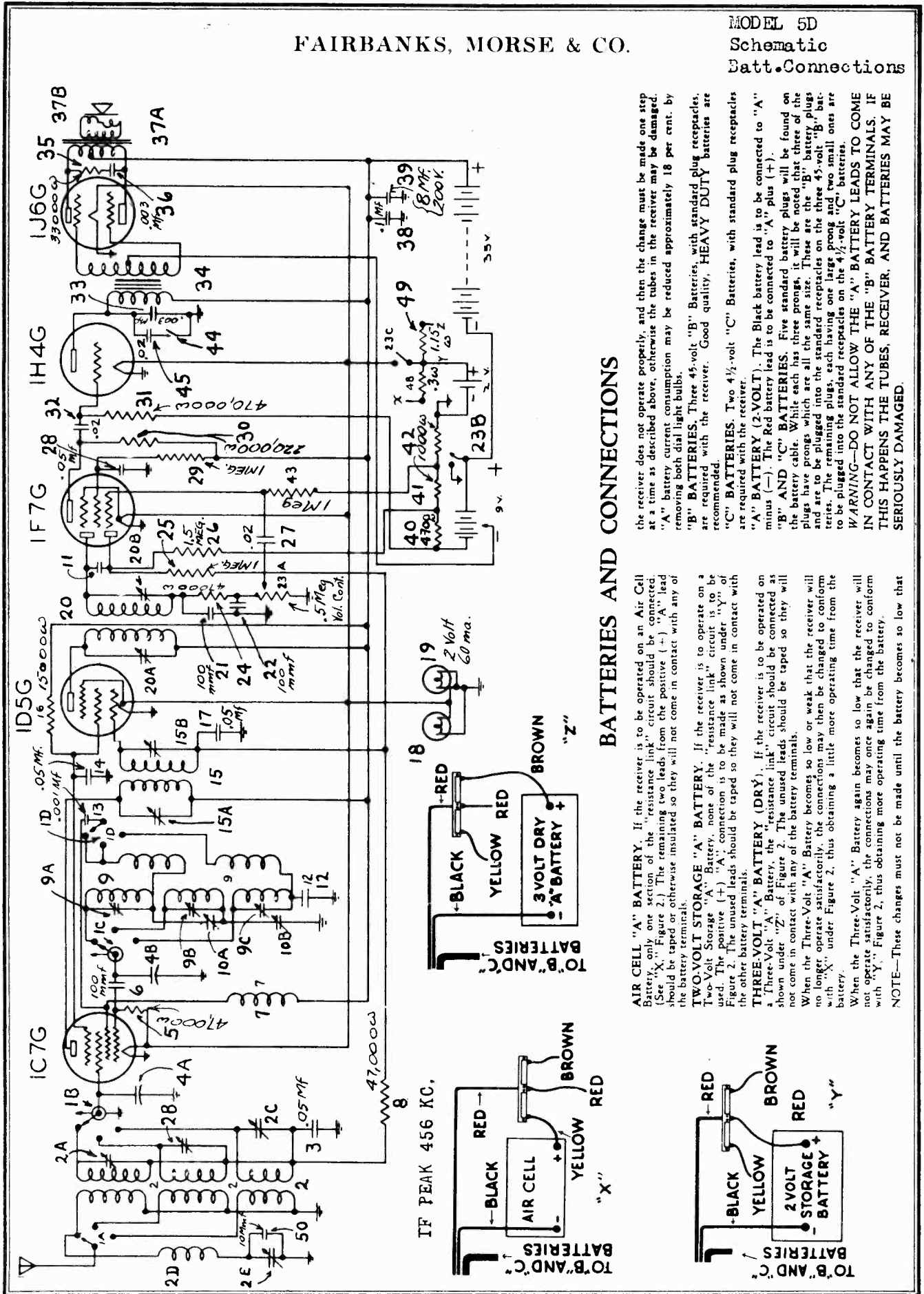
OHMS	VOLTS	6A8G	VOLTS	OHMS	OHMS	VOLTS	6F6G	VOLTS	OHMS	OHMS	VOLTS	6K7G	VOLTS	OHMS		
INF.	210		18.2 ^{**}	35M	INF.	255		.10	750M	INF.	108		2.15 [®]	210		
INF.	255		.13 [®]	125MEG	INF.	235		6.3	.5	INF.	253		.13 [®]	125MEG		
.5	6.3		0	0	0	0		0	0	0	0		6.3	.5	2.15 [®]	210
0	0		2.95 [®]	220	0	0		0	0	0	0		0	0	2.15 [®]	210
OHMS	VOLTS	6Q7G	VOLTS	OHMS	OHMS	VOLTS	6G5	VOLTS	OHMS	OHMS	VOLTS	5Y3G	VOLTS	OHMS		
500M	.05 [®]		.05 [®]	500M	125MEG	0	<p>NOT USED ON MODEL 5C</p>	255	INF.	1650	138		138	1650		
INF.	83		.13 [®]	500M	68	0		0	INF.	255	INF.		255	255	INF.	
0	0		6.3	.5	.5	6.3		0	0	0	0		0	0	255	INF.
0	0		0	0	0	0		0	0	0	0		0	0	0	0

*CONNECTED TO TARGET THRU 1 MEGOHM RESISTOR ** 30 VOLT SCALE ® 3 VOLT SCALE

VOLTAGE AND RESISTANCE ANALYSIS CHART

FAIRBANKS, MORSE & CO.

MODEL 5D
Schematic
Batt. Connections



BATTERIES AND CONNECTIONS

the receiver does not operate properly, and then the change must be made one step at a time as described above, otherwise the tubes in the receiver may be damaged. "A" battery current consumption may be reduced approximately 18 per cent. by removing both dial light bulbs.

"B" BATTERIES. Three 45-volt "B" Batteries, with standard plug receptacles, are required with the receiver. Good quality, HEAVY DUTY batteries are recommended.

"C" BATTERIES. Two 4 1/2-volt "C" Batteries, with standard plug receptacles are required with the receiver.

"A" BATTERY (2-VOLT). The Black battery lead is to be connected to "A" minus (-). The Red battery lead is to be connected to "A" plus (+).

"B" AND "C" BATTERIES. Five standard battery plugs will be found on the battery cable. While each has three prongs, it will be noted that three of the plugs have prongs which are all the same size. These are the "B" battery plugs and are to be plugged into the standard receptacles on the three 45-volt "B" batteries. The remaining plugs, each having one large prong and two small ones are to be plugged into the standard receptacles on the 4 1/2-volt "C" batteries.

WARNING—DO NOT ALLOW THE "A" BATTERY LEADS TO COME IN CONTACT WITH ANY OF THE "B" BATTERY TERMINALS. IF THIS HAPPENS THE TUBES, RECEIVER, AND BATTERIES MAY BE SERIOUSLY DAMAGED.

AIR CELL "A" BATTERY. If the receiver is to be operated on an Air Cell Battery, only one section of the "resistance link" circuit should be connected. (See "X," Figure 2.) The remaining two leads from the positive (+) "A" lead should be taped or otherwise insulated so they will not come in contact with any of the battery terminals.

TWO-VOLT STORAGE "A" BATTERY. If the receiver is to operate on a Two-Volt Storage "A" Battery, none of the "resistance link" circuit is to be used. The positive (+) "A" connection is to be made as shown under "Y" of Figure 2. The unused leads should be taped so they will not come in contact with the other battery terminals.

THREE-VOLT "A" BATTERY (DRY). If the receiver is to be operated on a Three-Volt "A" Battery, the "resistance link" circuit should be connected as shown under "Z" of Figure 2. The unused leads should be taped so they will not come in contact with any of the battery terminals.

When the Three-Volt "A" Battery becomes so low or weak that the receiver will no longer operate satisfactorily, the connections may then be changed to conform with "X" under Figure 2, thus obtaining a little more operating time from the battery.

When the Three-Volt "A" Battery again becomes so low that the receiver will not operate satisfactorily, the connections may once again be changed to conform with "Y," Figure 2, thus obtaining more operating time from the battery.

NOTE—These changes must not be made until the battery becomes so low that

MODEL 5D

Alignment, Socket Trimmers

FAIRBANKS, MORSE & CO.

The model 5D is a battery operated superheterodyne with automatic volume control. It receives signals on three bands—broadcast, police-amateur, and short wave.

Alignment procedure is given below in chart form, figures 1 and 2. Make adjustments in the order given. The output meter may be any low range AC voltmeter, preferably about 0-15 volts. It should be connected across the two plates of the 1J6G tube

with a .1 mfd. condenser in series with one of the leads. Set the volume at maximum during the alignment and as the meter hand tends to go off scale, decrease the output from the signal generator. If too strong a signal is fed to the receiver and the volume control is used to keep the output meter hand on scale, the AVC will operate and inaccurate alignment will result.

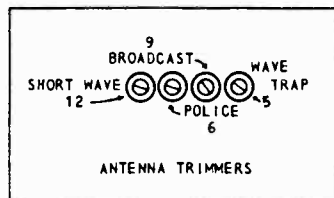
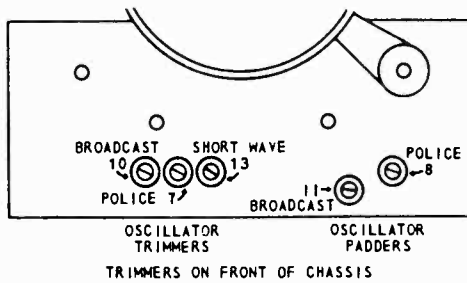
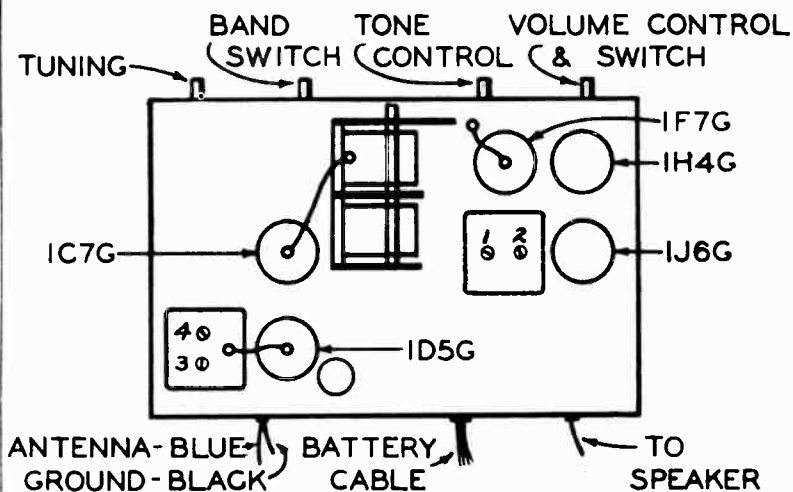


Figure 4

TOP, FRONT AND END VIEWS OF THE 5D CHASSIS SHOWING LOCATION OF TRIMMERS, CONTROLS AND COMPONENT PARTS

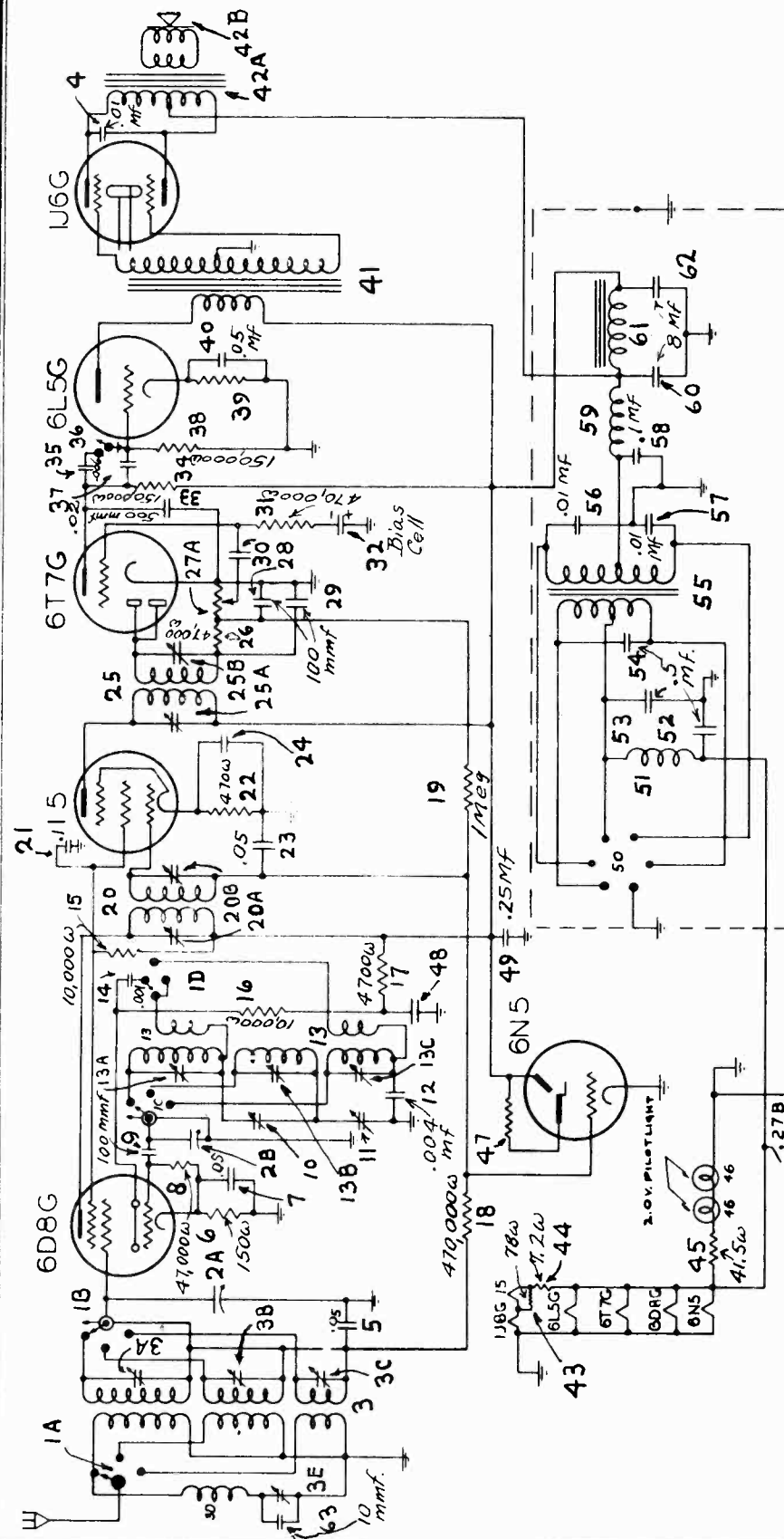
No.	Connect Generator To	Signal Generator Frequency	Dummy	Range Switch	Dial Setting	Stage	Trimmer No.	AFC Switch	Peak For	Special Instructions
1	6A8G Grid	456 KC	.1 mfd. Condenser	Broadcast	530 KC	2nd IF	1		Max.	
2	6A8G Grid	456 KC	.1 mfd. Condenser	Broadcast	530 KC	2nd IF	2		Max.	
3	6A8G Grid	456 KC	.1 mfd. Condenser	Broadcast	530 KC	1st IF	3		Max.	
4	6A8G Grid	456 KC	.1 mfd. Condenser	Broadcast	530 KC	1st IF	4		Max.	
5	Antenna	456 KC*	400 ohm Resistor	Broadcast	530 KC	Wave Trap	5		Min.	*Raise input until signal is heard.
6	Antenna	5.4 MC	400 ohm Resistor	Police Amateur	5.4 MC	Police Osc.	6		Max.	
7	Antenna	5.4 MC	400 ohm Resistor	Police Amateur	5.4 MC	Police Det.	7		Max.	
8	Antenna	1.8 MC	400 ohm Resistor	Police Amateur	1.8 MC	Police Osc.	8		*Max.	*While rocking — Repeat 6, 7 and 8 until no change is noted.
9	Antenna	1500 KC	200 mmf. Condenser	Broadcast	1500 KC	B. C. Osc.	9		Max.	
10	Antenna	1500 KC	200 mmf. Condenser	Broadcast	1500 KC	B. C. Det.	10		Max.	
11	Antenna	600 KC	200 mmf. Condenser	Broadcast	600 KC	B. C. Osc.	11		*Max.	*While rocking — Repeat 9, 10 and 11 until no change is noted.
12	Antenna	18 MC	400 ohm Resistor	Short Wave	18 MC	S. W. Osc.	12		Max.	
13	Antenna	18 MC	400 ohm Resistor	Short Wave	18 MC	S. W. Det.	13		Max.	
14	Antenna	6 MC	400 ohm Resistor	Short Wave	6 MC	S. W. Pad.	*			*Check calibration at 6 MC—Padder is fixed.

Figure 5

ALIGNMENT PROCEDURE CHART

FAIRBANKS, MORSE & CO.

MODEL 6C
Schematic, Socket
Trimmers



ELECTROLYTIC CONDENSER COLOR CODE

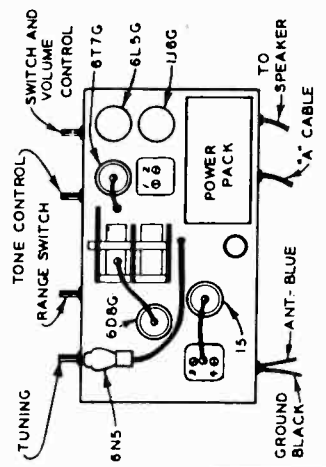
(All Other Color Codes Standard R. M. A.)

With the positive (+) or center solder lug toward you, read the colored markings as follows from left to right.

LEFT HAND OR CAPACITY COLOR	SECOND FROM LEFT OR MAXIMUM VOLTAGE COLOR
Black	0 to 99 volts
Brown	0 to 9 mfd.
Brown	99 to 199 volts
Red	9 to 19 mfd.
Red	199 to 299 volts
Orange	19 to 29 mfd.
Orange	299 to 399 volts
Yellow	29 to 39 mfd.
Yellow	399 to 499 volts
Green	39 to 49 mfd.

If a third (blue) stripe is shown, the condenser is a regulator and should be in the position farthest from the rectifier tube in the filter circuit.

IF PEAK 456 KC.



MODEL 6C

Alignment, Voltage Resistance

FAIRBANKS, MORSE & CO.

The model 6C is a six-volt battery operated superhetrodyne with automatic volume control and tuning eye. It receives signals on three bands—broadcast, police-amateur, and short wave.

Alignment procedure is given below in chart form, figures 1 and 2. Make adjustments in the order given. The output meter may be any low range AC voltmeter, preferably about 0-15 volts. It should be connected across the two plates of the

1J6G tube with a .1 mfd. condenser in series with one of the leads. Set the volume at maximum during the alignment and as the meter hand tends to go off scale, decrease the output from the signal generator. If too strong a signal is fed to the receiver and the volume control is used to keep the output meter hand on scale, the AVC will operate and inaccurate alignment will result.

Figure 1

TOP VIEW, FRONT VIEW AND END VIEW OF THE CHASSIS SHOWING THE LOCATION OF TRIMMERS, CONTROLS, TUBES AND COMPONENT PARTS

No.	Connect Generator To	Signal Generator Frequency	Dummy	Range Switch	Dial Setting	Stage	Trimmer No.	AFC Switch	Peak For	Special Instructions
1	6A8G Grid	456 KC	.1 mfd. Condenser	Broadcast	530 KC	2nd IF	1		Max.	
2	6A8G Grid	456 KC	.1 mfd. Condenser	Broadcast	530 KC	2nd IF	2		Max.	
3	6A8G Grid	456 KC	.1 mfd. Condenser	Broadcast	530 KC	1st IF	3		Max.	
4	6A8G Grid	456 KC	.1 mfd. Condenser	Broadcast	530 KC	1st IF	4		Max.	
5	Antenna	456 KC*	400 ohm Resistor	Broadcast	530 KC	Wave Trap	5		Min.	*Raise input until signal is heard.
6	Antenna	5.4 MC	400 ohm Resistor	Police Amateur	5.4 MC	Police Osc.	6		Max.	
7	Antenna	5.4 MC	400 ohm Resistor	Police Amateur	5.4 MC	Police Det.	7		Max.	
8	Antenna	1.8 MC	400 ohm Resistor	Police Amateur	1.8 MC	Police Osc.	8		*Max.	*While rocking. Repeat 6, 7 and 8 until no change is noted.
9	Antenna	1500 KC	200 mmf. Condenser	Broadcast	1500 KC	B. C. Osc.	9		Max.	
10	Antenna	1500 KC	200 mmf. Condenser	Broadcast	1500 KC	B. C. Det.	10		Max.	
11	Antenna	600 KC	200 mmf. Condenser	Broadcast	600 KC	B. C. Osc.	11		*Max.	*While rocking. Repeat 9, 10 and 11 until no change is noted.
12	Antenna	18 MC	400 ohm Resistor	Short Wave	18 MC	S. W. Osc.	12		Max.	
13	Antenna	18 MC	400 ohm Resistor	Short Wave	18 MC	S. W. Det.	13		Max.	
14	Antenna	6 MC	400 ohm Resistor	Short Wave	6 MC		*			*Check calibration at 6 MC. Padder is fixed.

Figure 2

ALIGNMENT PROCEDURE CHART

OHMS	VOLTS	6D8G	VOLTS	OHMS	OHMS	VOLTS	15	VOLTS	OHMS	OHMS	VOLTS	6T7G	VOLTS	OHMS
INF.	83		-.62*	41M				83	INF.	450M	-.15*		-.15*	450M
INF.	125		85	INF.				.05*	1MEG	INF.	58		.3*	350M
0	0		6.3	1.5	INF.	127		1.25	450	0	0		6.3	1.5
			1.37*	135	1.5	2.2		4.1	2.5	0	0		0	0
OHMS	VOLTS	6L5G	VOLTS	OHMS	OHMS	VOLTS	6N5	VOLTS	OHMS	OHMS	VOLTS	1J6G	VOLTS	OHMS
			0	130M	1MEG	0		126	INF.	240	0		0	260
INF.	225		0	0				0	0	INF.	136		136	INF.
1.5	6.3		4.2	1100	1.5	6.3		0	0					

* 3 VOLT SCALE

* CONNECTED TO TARGET (T) THRU 1 MEGOHM. RESISTOR IN SOCKET

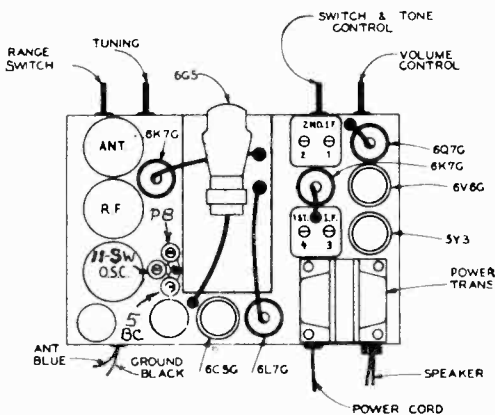
Figure 5

VOLTAGE AND RESISTANCE ANALYSIS CHART

MODEL 8A

Alignment, Voltage
Resistance, Socket
Trimmers

FAIRBANKS, MORSE & CO.



No.	Connect Generator To	Signal Generator Frequency	Dummy	Range Switch	Dial Setting	Stage	Trimmer No.	AFC Switch	Peak For	Special Instructions
1	6L7G Grid	456 KC	1 mfd. Condenser	Broadcast	550 KC	2nd IF	1		Max.	
2	6L7G Grid	456 KC	1 mfd. Condenser	Broadcast	550 KC	2nd IF	2		Max.	
3	6L7G Grid	456 KC	1 mfd. Condenser	Broadcast	550 KC	1st IF	3		Max.	
4	6L7G Grid	456 KC	1 mfd. Condenser	Broadcast	550 KC	1st IF	4		Max.	
5	Antenna Lead	1500 KC	200 mmf. Condenser	Broadcast	1500 KC	BC Osc.	5		Max.	
6	Antenna Lead	1500 KC	200 mmf. Condenser	Broadcast	1500 KC	BC Det.	6		Max.	
7	Antenna Lead	1500 KC	200 mmf. Condenser	Broadcast	1500 KC	BC Ant.	7		Max.	Check calibration at 600 KC
8	Antenna Lead	5.4 MC	400 ohm Resistor	Police	5.4 MC	Police Osc.	8		Max.	
9	Antenna Lead	5.4 MC	400 ohm Resistor	Police	5.4 MC	Police Det.	9		Max.	
10	Antenna Lead	5.4 MC	400 ohm Resistor	Police	5.4 MC	Police Ant.	10		Max.	Check calibration at 1.8 MC
11	Antenna Lead	18 MC	400 ohm Resistor	Short Wave	18 MC	S.W. Osc.	11		Max.	Check for image at 17.1 MC. It should not be as strong as the signal at 18 MC
12	Antenna Lead	18 MC	400 ohm Resistor	Short Wave	18 MC	S.W. Det.	12		Max.	Check calibration at 6 MC
13	Antenna Lead	18 MC	400 ohm Resistor	Short Wave	18 MC	S.W. Ant.	13		Max.	

When aligning the police and short wave bands, care must be taken to see that the trimmers are set on the proper frequency and not on the image. The signal from the oscillator beating with the incoming signal in the mixer tube produces two 456 kilocycle heterodynes, one equal to the oscillator frequency minus the frequency of the incoming signal, and the other equal to the incoming signal minus the oscillator. The former is the one to which the RF and antenna trimmers must be tuned if the receiver is to work correctly over the entire band. The image falls 912 kilocycles below the fundamental signal, so at 18 megacycles the image should be heard at 18 megacycles minus .912 megacycle or 17.1 megacycles approximately.

After setting the oscillator trimmer, increase the input from the signal generator and make sure that the image comes in at the proper point. When you can hear one signal at the frequency to which your generator is set, and one at about 1 megacycle below it, you are ready to finish the alignment. Go back to the fundamental frequency and start peaking the RF trimmer, rocking the tuning condenser slightly as you do so. When you reach a peak, compare the strength of the fundamental signal and the image. If the image is the stronger, you have the wrong peak on the RF trimmer. Find the other peak and again compare the two signals. You will probably find it necessary to increase the generator input greatly in order even to hear the image when you have found the right peak. The antenna trimmer may be peaked in the same manner.

Extreme howling or motorboating on the short wave bands or dead spots near the high frequency end of the dial are good indications that the RF trimmer is improperly aligned and may easily be corrected by resetting it as described above.

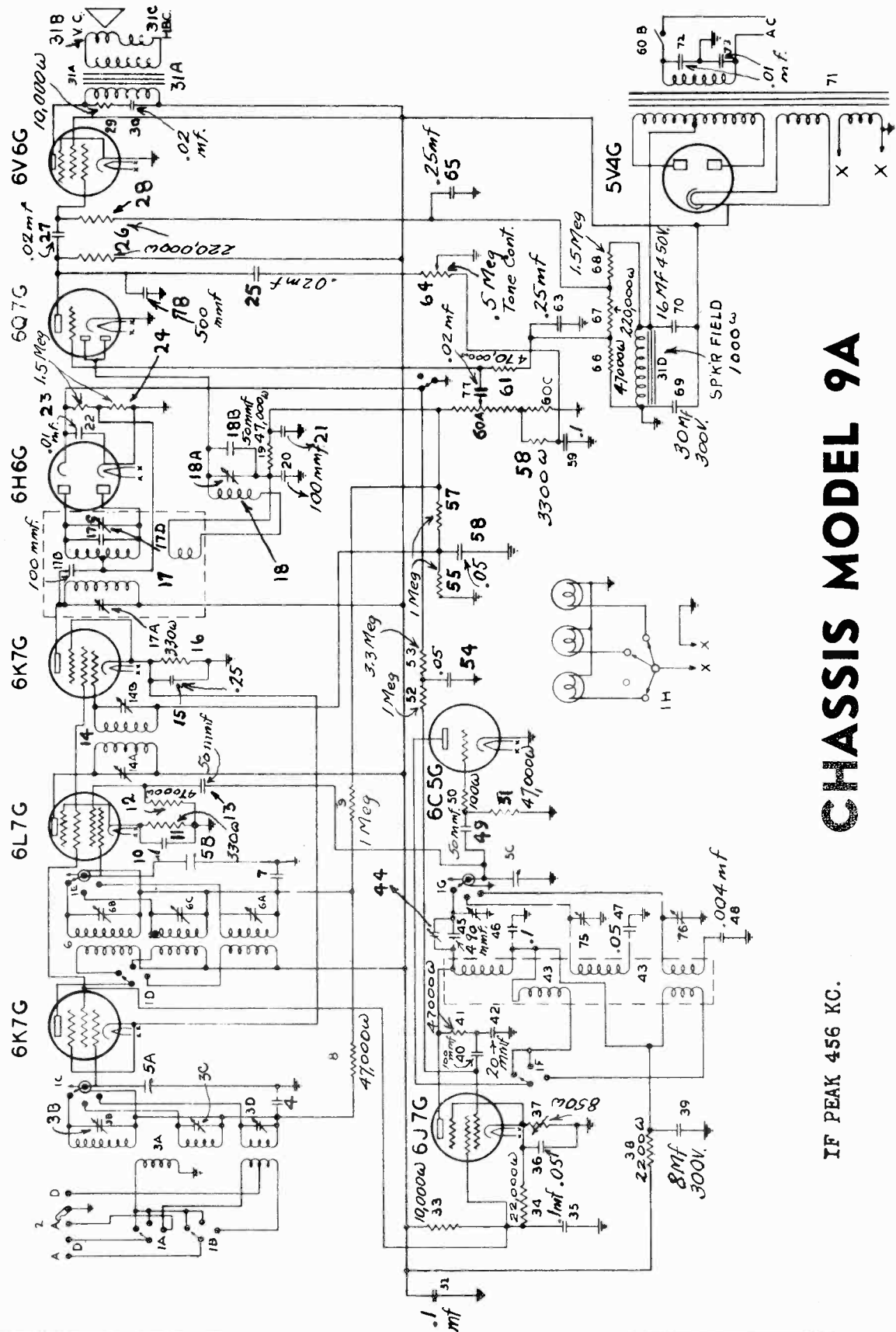
OHMS VOLTS	5Y3G	6V6G	6L7G	6G5G	6K7G	6V6G	5Y3
1000	95	245	105	26.0	42M		
INF.	245	240	240	245	INF		
0	0	0	0	0	0		
0	0	0	0	0	0		
OHMS VOLTS	6K7G	6L7G	6G5G	6G5			
INF.	107	105	105	245			
INF.	240	240	240	0			
0	0	0	0	65			
0	0	0	0	0			
OHMS VOLTS	6K7G	6L7G	6G5G	6G5			
INF.	105	105	105	245			
INF.	238	240	240	0			
0	0	0	0	0			
0	0	0	0	0			

CONNECTED TO TARGET THRU
1 MEGOHM RESISTOR

* 3 VOLT SCALE
** 30 VOLT SCALE

FAIRBANKS, MORSE & CO.

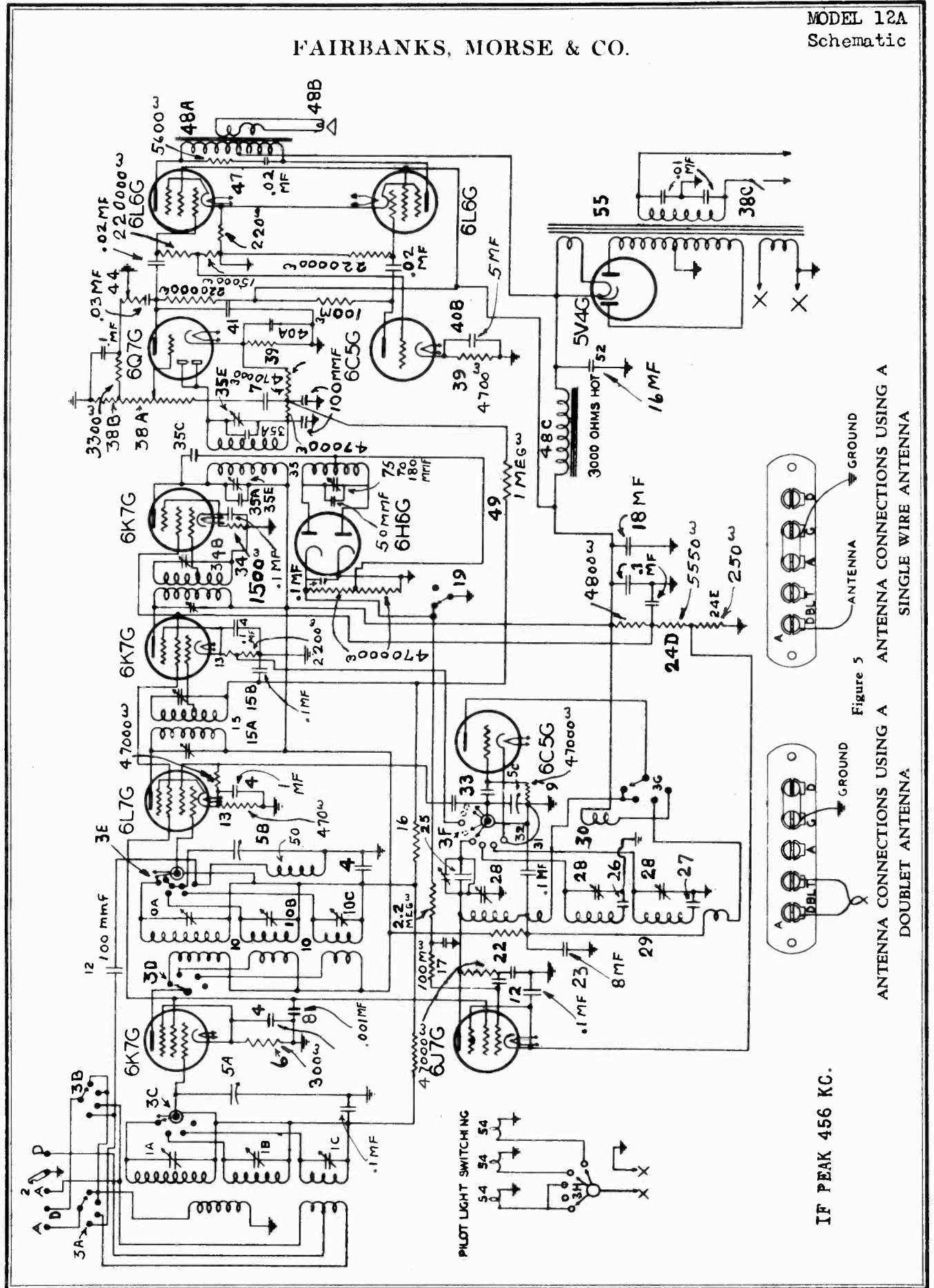
MODEL 9A
Schematic



CHASSIS MODEL 9A

IF PEAK 456 KC.

FAIRBANKS, MORSE & CO.



IF PEAK 456 KC.

ANTENNA CONNECTIONS USING A DOUBLET ANTENNA

ANTENNA CONNECTIONS USING A SINGLE WIRE ANTENNA

Figure 5

MODEL 12A
Socket, Trimmers
Voltage, Resistance, Data

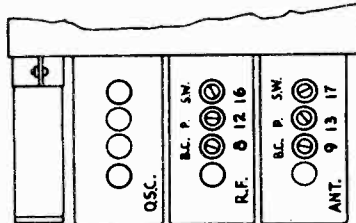
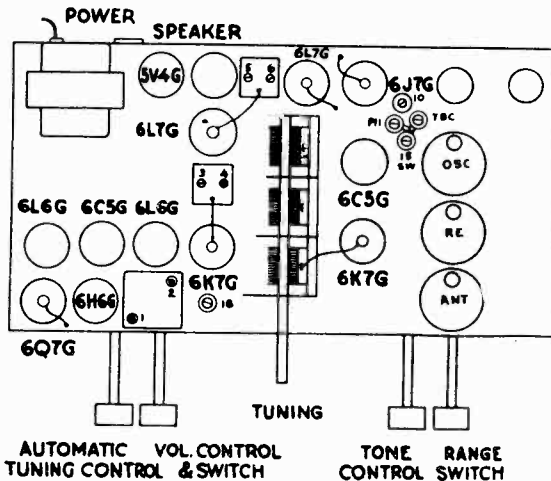
FAIRBANKS, MORSE & CO.

The Model 12A is an AC operated superheterodyne with automatic volume control, signal-lite band indication, automatic dial and automatic frequency control. It receives signals on four bands—broadcast, police-amateur, short wave and ultra-short wave.

Alignment procedure is given in the following pages in chart form. Make adjustments in the order given. The output meter may be any low range AC voltmeter, preferably about 0-15 volts. It should be connected across the plates of the 6L6G tubes with a .1 mfd. condenser in series with one of the leads. The volume control should be set at maximum during the alignment, and as the meter hand tends to go off scale, the output from the signal generator should be decreased. If too strong a signal is fed to the receiver and the volume control is used to keep the hand on scale, the A.V.C. will operate and inaccurate alignment will result.

When aligning the police and short wave bands, care must be taken to see that the trimmers are set on the proper frequency and not on the image. The signal from the oscillator beating with the incoming signal in the mixer tube produces two 456 kilocycle heterodynes, one equal to the oscillator frequency minus the frequency of the incoming signal and the other equal to the incoming signal minus the oscillator. The former is the one to which the RF and antenna trimmers must be tuned if the receiver is to work correctly over the entire band. The image falls 912 kilocycles below the fundamental signal, so at 18 megacycles the signal should be heard at 18 minus .912 or 17.1 megacycles approximately.

After setting the oscillator trimmer, increase the input from the signal generator and make sure that the image comes in at the proper point. When one signal can be heard at the frequency to which the generator is set and one at about one megacycle below it the alignment is ready to be finished. Go back to the fundamental frequency and start peaking the RF trimmer, rocking the tuning condenser slightly at the same time. When a peak has been reached, compare the strength of the fundamental signal and the image. If the image is the stronger, the RF trimmer is at the wrong peak. Find the other peak and again compare the two signals. It will probably be necessary to increase the generator input greatly in order even to hear the image when the right peak has been found.



OHMS	VOLTS	6K7G	VOLTS	OHMS	OHMS	VOLTS	6L7G	VOLTS	OHMS	OHMS	VOLTS	6J7G	VOLTS	OHMS	
5,700	100	RF	3.7*	320	5,700	100	.35*	42,500	5,700	100	4.8*	250			
10,500	235		0	INF.	10,000	232	0	INF.	13,500	192	0	INF.	0	0	
0	6.3		0	0	0	0	6.3	0	0	6.3	0	0	0	0	
0	0		3.7*	320	0	0	5.2*	500	0	0	4.8*	250			
OHMS	VOLTS	6C5G	VOLTS	OHMS	OHMS	VOLTS	6K7G	VOLTS	OHMS	OHMS	VOLTS	6K7G	VOLTS	OHMS	
		OSC	.05**	41,500	5,700	100	1ST IF	8.3*	2,900	5,700	100	2ND IF	3.2*	1,500	
13,500	200		0	0	10,500	232		0	INF.	10,500	232		0	7.50	
0	6.3		0	0	0	6.3		0	0	0	6.3		0	0	0
0	0		0	0	0	0		8.3*	2,900	0	0		3.2*	1,500	
OHMS	VOLTS	6H6G	VOLTS	OHMS	OHMS	VOLTS	6C5G	VOLTS	OHMS	OHMS	VOLTS	6Q7G	VOLTS	OHMS	
0	0		.13**	230M			PHASE INVERTER	0	190M	500M	0		0	500M	
230M	.13**		0	0	13,000	108		0	0	190M	110		0	500M	
0	6.3		0	0	0	6.3		0	0	0	6.3		0	0	0
0	0	0	0	0	0	4.8*		225	0	0	1.15**	4,500			
OHMS	VOLTS	6L6G	VOLTS	OHMS	OHMS	VOLTS	6L6G	VOLTS	OHMS	OHMS	VOLTS	5V4G	VOLTS	OHMS	
10,500	215		0	190M	10,500	215		0	190M	55	AC			58	
13,000	395		0	0	13,000	395		6.3	0	13,500	405				
0	6.3		0	0	0	0		18.7*	225	0	0		405	13,000	

*3 VOLT SCALE

VOLTAGE AND RESISTANCE ANALYSIS CHART

**30 VOLT SCALE

FAIRBANKS, MORSE & CO.

MODEL 9A,12A
Automatic Dial Notes
MODEL 12A
Alignment

THE AUTOMATIC DIAL

Since the Model 12AC6 is to be delivered to the customer with the dial set up for the locality in which he lives, it is important that the serviceman be thoroughly familiar with the proper set-up procedure so that he can perform the operation accurately and in a small amount of time.

It would be practically impossible to design a mechanical tuning device for a receiver as selective as the 12A which would automatically tune stations to the exact point of resonance every time without the operator's having to watch some sort of resonance indicator. For that reason automatic frequency control (true AFC tuning) has been incorporated into this model. The automatic frequency control makes up for the slight mechanical tolerances necessary in a device such as the automatic dial by shifting the oscillator to the exact frequency of the station to which the dial is tuned. It will be noted that stations can be "pulled" into resonance with the dial as much as 10 kilocycles away from the point where they would come in with the automatic tuning switch in the "out" position, and for that reason accurate setting of the dial might seem unimportant. It must be remembered, however, that the sensitivity of the receiver is best at the point where the stations come in without A.F.C. and that A.F.C. shifts only the oscillator frequency, not the RF and detector stages. Therefore, accurate setting of the dial is important if good reception is to be obtained on all the stations.

First, throw the automatic tuning switch to the "OUT" position. Then, by means of the outer tuning knob, tune in a station to which a button is to be assigned. Now, place a finger on the button nearest the "click" point (the mid-point at the bottom) and move it over to the "click" point until the dial locks. Care must be taken at this point that in depressing the button without its pyralin covering the metal plunger in the center is not pushed to a point where the dial will not lock. If this difficulty is experienced, try depressing the button with the nail of the forefinger against its outer edge.

After the dial has clicked into place and seems to be locking properly,

release the button taking care not to move the dial. Now, with a pencil or screw driver held in the left hand push the metal plunger at the center of the button in as far as it will go. With the right hand retune the station carefully and then release the metal plunger. It may not come all the way out at first and a slight back and forth motion of the vernier knob may be necessary before it snaps out to its original position. Be sure that the plunger is back into place before the station tab is placed in the button.

To check the setting before putting in the station tab, rotate the dial until the button which was just set is somewhere near the top of the dial. Throw the automatic tuning switch to the "IN" position and use the button to tune in the station just as is described under "Automatic Tuning" in the Operating Instructions. Observe the same precautions as were mentioned before in regard to the metal plunger or the setting will have to be made all over again. With the station still tuned in, throw the automatic tuning switch to the "OUT" position and note the amount of detuning which occurs. If the station is detuned more than 3 or 4 kilocycles or to a point where the side bands are just barely audible, there is a closer setting possible and the button should be reset. When the dial seems to be tuning in the station properly, put in the proper station tab and place one of the pyralin discs over it. The tab should be placed so as to read right side up when the button is at the "click" point. This gives a uniform appearance to the dial when the buttons have all been set. In case any of the buttons are not used, put in one of the blank tabs supplied and a pyralin disc.

Set the remainder of the buttons in exactly the same manner, making sure each time that the switch is in the "OUT" position before an adjustment is started.

When the dial setting has been completed, replace the sheets of station tabs in their envelope and put the envelope, together with the one containing the pyralin discs, into the back of the cabinet beside the chassis so that they will be available later should the customer desire to have the dial set for other stations.

ALIGNMENT PROCEDURE CHART

No.	Connect Generator To	Signal Generator Frequency	Dummy Antenna	Range Switch	Dial Setting	Stage	Trimmer No.	APC Switch	Peak For	Special Instructions
1	6L7G Grid	456 KC	.1 Mfd. Condenser	Broadcast	550 KC	Disc.	1	Out	Max.	***See foot note below.
2	6L7G Grid	456 KC	.1 Mfd. Condenser	Broadcast	550 KC	Disc.	2	Out	Max.	***See foot note below.
3	6L7G Grid	456 KC	.1 Mfd. Condenser	Broadcast	550 KC	Disc.	18	Out	Min.	***See foot note below.
4	6L7G Grid	456 KC	.1 Mfd. Condenser	Broadcast	550 KC	2nd IF	3	Out	Max.	
5	6L7G Grid	456 KC	.1 Mfd. Condenser	Broadcast	550 KC	2nd IF	4	Out	Max.	
6	6L7G Grid	456 KC	.1 Mfd. Condenser	Broadcast	550 KC	1st IF	5	Out	Max.	
7	6L7G Grid	456 KC	.1 Mfd. Condenser	Broadcast	550 KC	1st IF	6	Out	Max.	
8	Antenna	1500 KC	200 Mmf. Condenser	Broadcast	1500 KC	B.C. Osc.	7	Out	Max.	
9	Antenna	1500 KC	200 Mmf. Condenser	Broadcast	1500 KC	B.C. R.F.	8	Out	Max.	
10	Antenna	1500 KC	200 Mmf. Condenser	Broadcast	1500 KC	B.C. Ant.	9	Out	Max.	
11	Antenna	600 KC	200 Mmf. Condenser	Broadcast	600 KC	B.C. Pad.	10	Out	*Max.	*While rocking. Repeat 8, 9, 10, and 11 until no change is noted.
12	Antenna	5.4 MC	400 Ohm Resistor	Police Amateur	5.4 MC	Police Osc.	11	Out	Max.	
13	Antenna	5.4 MC	400 Ohm Resistor	Police Amateur	5.4 MC	Police R.F.	12	Out	Max.	
14	Antenna	5.4 MC	400 Ohm Resistor	Police Amateur	5.4 MC	Police Ant.	13	Out	Max.	
15	Antenna	1.8 MC	400 Ohm Resistor	Police Amateur	1.8 MC	Police Pad.	*	Out		*Check calibration at 1.8 MC. Padder is fixed.
16	Antenna	18 MC	400 Ohm Resistor	Short Wave	18 MC	S.W. Osc.	15	Out	Max.	
17	Antenna	18 MC	400 Ohm Resistor	Short Wave	18 MC	S.W. R.F.	16	Out	Max.	
18	Antenna	18 MC	400 Ohm Resistor	Short Wave	18 MC	S.W. Ant.	17	Out	Max.	
19	Antenna	6 MC	400 Ohm Resistor	Short Wave	6 MC	S.W. Pad.	*	Out		*Check calibration at 6.0 MC. Padder is fixed.
20	Antenna	60 MC	400 Ohm Resistor	Ultra S.W.	60 MC		**	Out		**See foot note below.
21	Antenna	30 MC	400 Ohm Resistor	Ultra S.W.	30 MC		**	Out		**See foot note below.

**No adjustment is required on this band. If signal is not received on or near dial setting, check the oscillator tube, switch contacts, the fixed padding condenser and the coils.
***To check the setting of the discriminator, tune in a fairly weak station near 1000 kilocycles with the automatic tuning switch in the "OUT" position. Peak the station carefully and then throw the switch to the "IN" position. If throwing the switch detunes the station, repeat it carefully using trimmer number 18. A further check may be made by tuning to either side of the station with the switch out until only the side bands are audible and then throwing the switch in. The station should come into resonance as the switch is thrown in. Failure to do so indicates that the adjustment just described has not been careful enough and that it should be made over again.

MODEL 1206
 Chassis 120
 Socket, Trimmers
 Voltage, Resistance

FAIRBANKS. MORSE & CO.

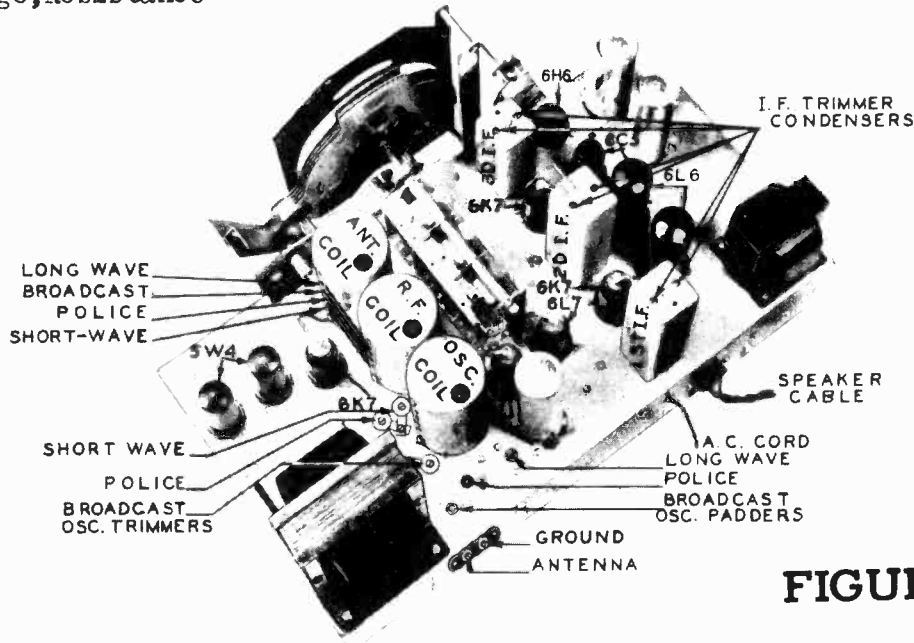


FIGURE 4

OHMS	VOLTS	6K7 TUBE	VOLTS	OHMS
50M	105		3	300
60M	245		0	2 MEG
.2	6.3		0	0
0	0		3	300
OHMS	VOLTS	6K7 TUBE	VOLTS	OHMS
50M	105		3.5	300
60M	245		0	1 MEG
.2	6.3		0	0
0	0		3.5	300
OHMS	VOLTS	6C5 TUBE	VOLTS	OHMS
60M	245		.05	500M
.2	6.3		0	0
0	0		18	1M
OHMS	VOLTS	5H4 TUBE	VOLTS	OHMS
45	A.C.		A.C.	45
60M	420			
0	0		420	60M

OHMS	VOLTS	6L7 TUBE	VOLTS	OHMS
50M	105		-6.5	50M
60M	245		0	2 MEG
.2	6.3		0	0
0	0		4	500
OHMS	VOLTS	6K7 TUBE	VOLTS	OHMS
50M	105		2.5	300
60M	245		0	8
.2	6.3		0	0
0	0		2.5	300
OHMS	VOLTS	6L6 TUBE	VOLTS	OHMS
60M	245		0	750
60M	355		0	0
.2	6.3		17.5	200
0	0			
OHMS	VOLTS	5H4 TUBE	VOLTS	OHMS
45	A.C.		A.C.	45
60M	420			
0	0		420	60M

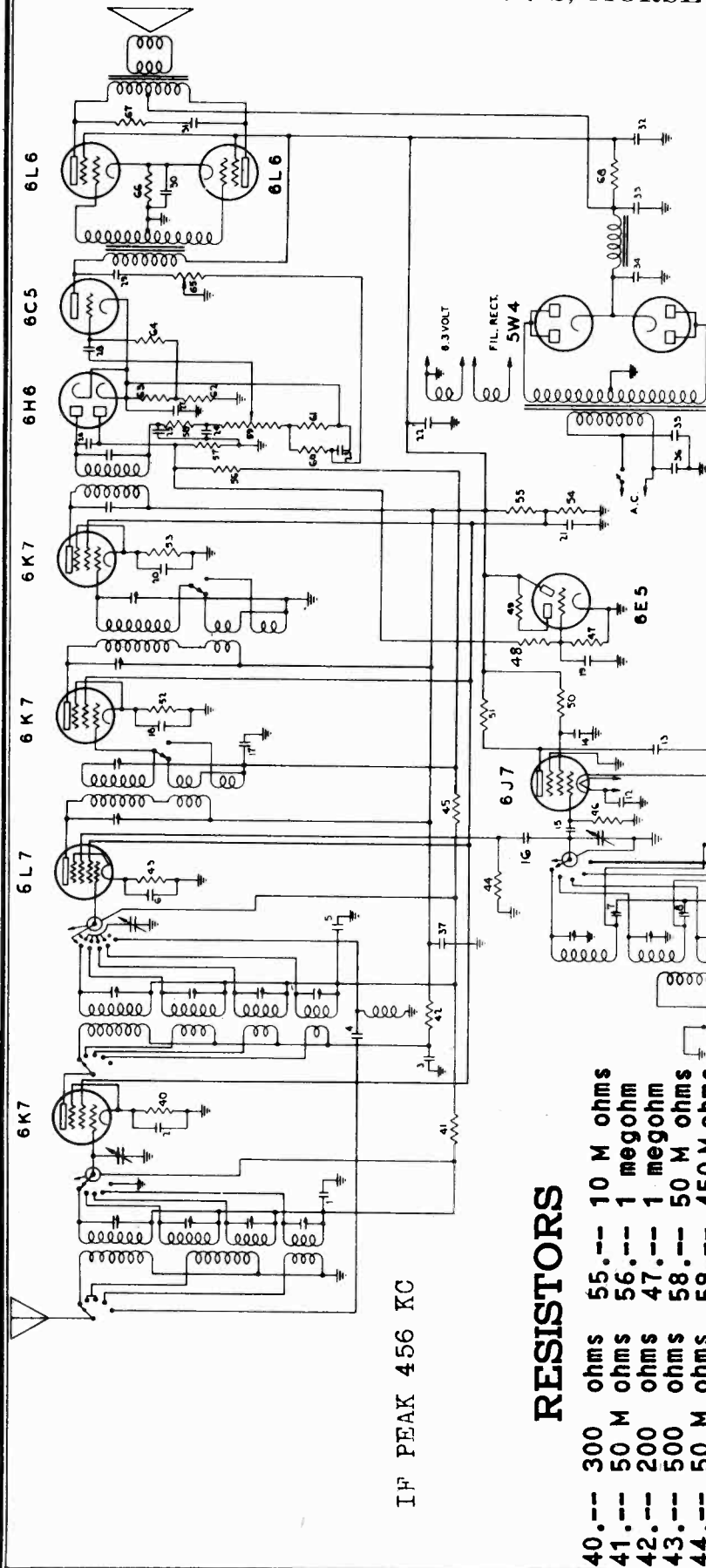
OHMS	VOLTS	6J7 TUBE	VOLTS	OHMS
65M	240		0	0
70M	155		22.5	50M
0	0		6.3	.2
0	0		0	.5
OHMS	VOLTS	6N6 TUBE	VOLTS	OHMS
1000	18		10	300M
250M	0		0	0
.2	6.3		0	0
0	0		18	1000
OHMS	VOLTS	6L6 TUBE	VOLTS	OHMS
60M	245		0	750
60M	355		0	0
.2	6.3		17.5	200
0	0			
OHMS	VOLTS	6E5 TUBE	VOLTS	OHMS
1 MEG	0		245	60M
2 MEG	2.5		0	0
.2	6.3		0	0

FIGURE 6
 VOLTAGE AND RESISTANCE TABLE

The voltage and resistance charts in this manual give detailed information regarding the resistance from various points to various other points in the chassis. The measured voltage from the various tube socket contacts to ground is also given. When these charts are followed faithfully, little difficulty should be experienced in finding almost any fault that may develop.

FAIRBANKS, MORSE & CO.

MODEL 12C6
Chassis 120
Schematic



IF PEAK 456 KC

RESISTORS

- 40.--- 300 ohms
- 41.--- 50 M ohms
- 42.--- 200 ohms
- 43.--- 500 ohms
- 44.--- 50 M ohms
- 45.--- 50 M ohms
- 46.--- 50 M ohms
- 47.--- 2 megohms
- 48.--- 2 megohms
- 49.--- 1 megohm
- 50.--- 2 M ohms
- 51.--- 10 M ohms
- 52.--- 300 ohms
- 53.--- 300 ohms
- 54.--- 50 M ohms
- 55.--- 10 M ohms
- 56.--- 1 megohm
- 47.--- 1 megohm
- 58.--- 50 M ohms
- 59.--- 450 M ohms
- 60.--- 3 M ohms
- 61.--- 50 M ohms
- 62.--- 5 M ohms
- 63.--- 5 M ohms
- 64.--- 500 M ohms
- 65.--- 500 M ohms
- 66.--- 200 ohms
- 67.--- 10 M ohms
- 68.--- 2 M ohms

CONDENSERS

- 11.--- 200 mmfd.
- 12.--- 500 mmfd.
- 13.--- 1000 mmfd.
- 14.--- 500 mmfd.
- 15.--- 100 mmfd.
- 16.--- 50 mmfd.
- 17.--- .05 mfd.
- 18.--- .05 mfd.
- 19.--- .1 mfd.
- 20.--- .05 mfd.
- 21.--- .1 mfd.
- 22.--- .1 mfd.
- 23.--- .1 mfd.
- 24.--- 100 mmfd.
- 25.--- 100 mmfd.
- 26.--- 25 mmfd.
- 27.--- 10 mfd.
- 28.--- .01 mfd.
- 29.--- .03 mfd.
- 30.--- .1 mfd.
- 31.--- .02 mfd.
- 32.--- 30 mfd.
- 33.--- 8 mfd.
- 34.--- 16 mfd.
- 35.--- .01 mfd.
- 36.--- .01 mfd.
- 37.--- .1 mfd.
- 1.--- .05 mfd.
- 2.--- .05 mfd.
- 3.--- .1 mfd.
- 4.--- 100 mmfd.
- 5.--- .05 mfd.
- 6.--- .05 mfd.
- 7.--- 220 mmfd.
- 8.--- 750 mmfd.
- 9.--- 1800 mmfd.
- 10.--- 4000 mmfd.

MODEL 12C6
Chassis 120
Alignment

FAIRBANKS, MORSE & CO.

THE OSCILLATOR CIRCUIT

The oscillator circuit is unconventional in that the tickler coils are in the cathode circuit of the 6J7 oscillator tube, this is done to obtain sufficient band coverage with the additional capacity of the 6L7 tube inductor grid across the tune circuits and also to accommodate the receiver to operation up to 70 megacycles. One tickler serves for both the Broadcast and Police-Amateur bands and the second tickler serves the short wave band, being switched in and out by the range switch.

The tuned circuit coil for the Ultra Short Wave band consists of three pieces of heavy bus wire. The cathode taps into this circuit and causes oscillation at the high frequency end of the band. In addition, on this band, a small coil which is inductively coupled to the bus wire coil is switched into the plate circuit and causes the tube to oscillate at the low frequency end of the band.

On the other bands, the plate of the oscillator tube is by-passed to ground through the padding condensers of the oscillator tuned circuits and assists the oscillator at the low frequency end of each band. The patent on this circuit was issued to MacNabb.

INTERMEDIATE FREQUENCY ALIGNMENT

With the range switch on the broadcast position, the fidelity switch on "Sharp" (clockwise) and the gang condenser closed (maximum capacity), supply a 456 kilocycle signal, stage by stage, to the intermediate frequency amplifier, beginning with the grid of the second intermediate frequency tube. To accomplish this, a .1 Mfd. condenser should be connected between the signal generator supply lead and the second intermediate frequency tube.

The trimmers of the third intermediate frequency transformer should be adjusted for maximum output with minimum input from the signal generator. Then the signal generator lead should be moved to the first intermediate frequency tube and the trimmers of the second intermediate transformer should be adjusted. The next step is to supply the signal to the grid of the first detector tube and adjust the trimmers of the first intermediate frequency transformer. This method of procedure is essential because of the extreme selectivity of the receiver. After each stage has been aligned, it is well to go back over all adjustments to make sure they are accurate.

The next step in the intermediate frequency alignment is to supply a very strong (about 1000 microvolt) signal to the grid of the first detector tube through the .1 Mfd. condenser. CAUTION: Before the signal is applied to the receiver, the volume control should be retarded to zero. After the signal is applied to the receiver, the volume control should be advanced slowly and carefully until a suitable indication appears on the output meter.

The fidelity switch should be turned to the high fidelity or Third Dimension position. Symmetrical double humps should appear, one on each side of where the sharp resonance point appeared on the "Sharp" position (see Figure 5), when the signal generator is tuned approximately 8 kilocycles on each side of the resonance point. The two humps must be of equal amplitude. If this is not the case, the trimmers of the third intermediate frequency transformer must be adjusted until a condition of equal amplitude is obtained. This may be found to be a very difficult adjustment unless an oscillograph is used.



FIGURE 5

USE OF THE OSCILLOGRAPH

A signal generator with a sweep circuit must be employed in making this check. The output of the signal generator should be fed to the grid of the first detector tube in the receiver. The grid clip must be removed from the tube, but, since the first detector is one of the A.V.C. controlled tubes, it is necessary to complete the grid circuit. To accomplish this, connect a large resistor (about 50,000 or 100,000 ohms) between the grid clip and the grid cap of the tube. The low side of the signal generator should be connected to the chassis ground.

The "vertical" binding posts of the oscillograph should be connected to the audio output of the second detector. The high side connection from the "vertical" plates should be made to the point of juncture between resistors 58 and 59. The low side connection may be made to ground. Thus, the audio voltage is applied to the "vertical" plates of the oscillograph.

With the receiver operating on the "Sharp" position, the intermediate frequency amplifier resonance curve will appear on the screen. When the receiver is switched to the "3RD DIMENSION" position, symmetrical double humps, approaching a wide flat top resonance curve, should appear in place of the "Sharp" resonance curve (see Figure 5). Each side of the curve should be of equal amplitude. If this is not the case, the trimmers of the third intermediate frequency transformer should be adjusted until the proper curve is obtained. The adjustment of one trimmer, in addition to effecting its own side of the curve, will reflect in the other side and, for this reason, great care must be exercised in making these adjustments.

RADIO FREQUENCY ALIGNMENT

The parallel or high frequency trimmer condensers for each coil are housed in the same can with the coil, with the exception of the oscillator trimmers, these are air dielectric condensers and are mounted on the chassis. These trimmers are used for aligning the high frequency end of each band. The location of the various trimmers is shown on Figure 4. It is essential that the bands be aligned in the order they appear in the following instructions. In other words, the police band alignment must be completed before the broadcast band alignment is started because of the interlocking effect of the padding condensers on these bands.

Adjustable series padding condensers are used for tracking the oscillator at the low frequency end of each band. The padding condensers may be adjusted from the top of the chassis, through the holes indicated in Figure 4. Since a fixed mica padding condenser is employed on the short wave band, no adjustment is necessary. While making padding condenser adjustments, the gang condenser should be rotated back and forth across the signal to insure adjustment to the peak of greatest intensity.

POLICE BAND

With the band selector switch on the police position and the fidelity switch on the "Sharp" position, supply a 5 megacycle signal from the signal generator to the antenna of the receiver, using a 400 ohm carbon resistor in series with the signal generator lead. Tune the receiver to 5 megacycles and then adjust the oscillator, radio frequency and antenna stage police band trimmers for maximum output with minimum input from the signal generator. WARNING: Care must be exercised to avoid aligning the receiver to the image frequency as outlined under "Short Wave Band".

Supply a 1.8 megacycle signal to the receiver and tune the receiver to 1.8 megacycles. Adjust the police band oscillator padding condenser (see Figure 4), for the signal of greatest intensity, rocking the gang condenser back and forth across the signal while making adjustment. Check at 5 megacycles and then at 1.8 megacycles to correct for any frequency change.

BROADCAST BAND

With the band selector switch on the broadcast position, supply a 1500 kilocycle signal from the signal generator to the receiver, using a standard dummy antenna or a 200 Mmfd. condenser in series between the signal generator and the antenna post of the receiver to serve as the dummy antenna. Make certain that the fidelity switch is on the "Sharp" position.

Tune the receiver to 1500 kilocycles and adjust the radio frequency, antenna and oscillator stage broadcast band trimmers for maximum output with minimum input from the signal generator.

Supply a 600 kilocycle signal to the receiver through the same connections. Tune the receiver to 600 kilocycles. Adjust the broadcast band oscillator padding condenser (see Figure 4), for the peak of greatest intensity while rocking the tuning condenser back and forth across the signal. Recheck at 1500 kilocycles and then at 600 kilocycles and make any frequency corrections that appear necessary.

LONG WAVE BAND

With the band selector switch on the long wave position, supply a 350 kilocycle signal from the signal generator to the antenna of the receiver, using a standard dummy antenna or a 200 Mmfd. condenser in series with the lead. Make sure the fidelity switch is on the "Sharp" position. Tune the receiver to 350 kilocycles and adjust the oscillator, radio frequency and antenna stage trimmers for maximum output with minimum input from the signal generator.

NOTE - The Long Wave oscillator trimmer is accessible through a hole in the chassis bottom shield plate.

Supply a 175 kilocycle signal to the receiver through the same connections used in the previous adjustment. Tune the receiver to 175 kilocycles. Adjust the long wave oscillator padding condenser for the peak of greatest intensity while rocking the tuning condenser back and forth across the signal. Readjust at 350 kilocycles and then at 175 kilocycles as many times as may be necessary to obtain satisfactory tracking.

SHORT WAVE BAND

Turn the band selector switch to the short wave position. Supply an 18 megacycle signal from the signal generator through a 400 ohm carbon resistor (dummy antenna) to the antenna post of the receiver. Tune the receiver to 18 megacycles on the dial. Adjust the short wave band oscillator trimmer condenser for maximum output with minimum input from the signal generator, then adjust the short wave band antenna and same time rocking the tuning condenser for maximum output, at the same time rocking the tuning condenser back and forth across the signal to insure the peak of greatest intensity. The 6 megacycle signal should be received near 6 megacycles on the dial. If the signal is not received check the oscillator tube, switch connections, the fixed padding condenser and the coils. No adjustment is required at this point. Check the calibration and, if necessary, readjust all three stages.

WARNING: The image signal should be received at approximately 17 megacycles after the above adjustments have been made. If it cannot be located, the oscillator has probably been aligned to the image frequency and the oscillator trimmer must be backed out until the proper signal comes in at 18 megacycles and the somewhat weaker image is received at approximately 17 megacycles. If this readjustment is necessary, it will also be necessary to again align all three trimmers for maximum output.

ULTRA SHORT WAVE BAND

No adjustment is required on this band. If signals are not properly received check the oscillator tube, switch contacts, fixed condenser and the coils.

POWER TRANSFORMERS

Lead Color	Voltage
Black	115 Volts Primary
Yellow	6.3 Volt Filament
Green	5.0 Volt Filament
Red	High Voltage Sec.
Red & White	High Voltage C.T.

COLOR CODES

I. F. TRANSFORMERS

FIRST

Plate	Blue
"B" Plus	Red
Grid (Top)	Green
Grid Return (A.V.C.)	Black-White
Switch Lead	Brown-White
Switch Lead (Sharp)	Brown
Switch Lead (3rd.0im)	Black

SECOND

Plate	Blue
"B" Plus	Red
Grid (Top)	Green
Grid Return (Ground)	Black-White
Switch Lead	Brown-White
Switch Lead (Sharp)	Brown
Switch Lead (3rd.0im)	Black

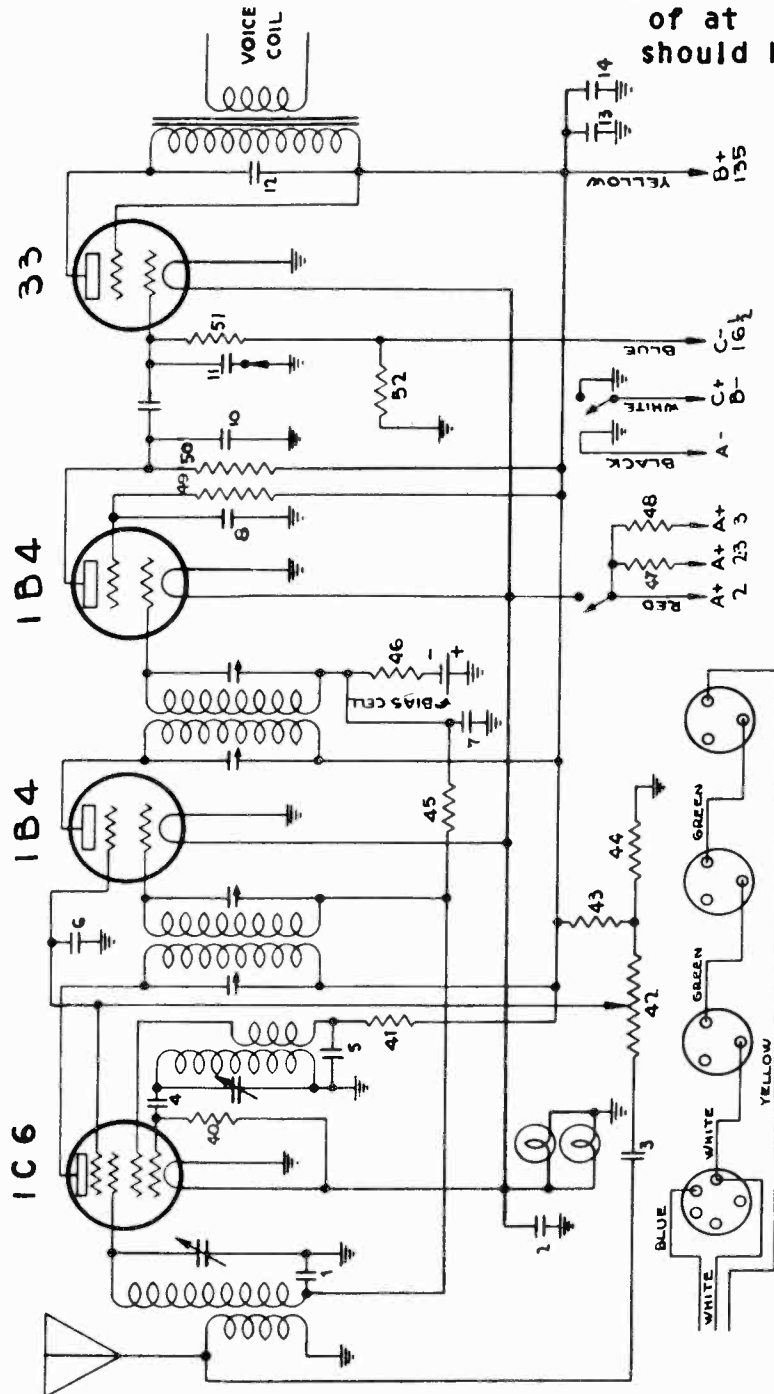
THIRD

Plate	Blue
"B" Plus	Red
Grid	Green
Grid Return	Black-White

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MODELS 42CIB, 42TOB
Chassis 42
Schematic, Notes

The model 42 chassis employs a type 1C6 pentagrid converter. The incoming signal is supplied to this tube through a preselector coil arrangement. This tube serves the dual function of first detector and oscillator. A type 1B4 is employed as the intermediate frequency amplifier. This tube and the two intermediate frequency transformers are responsible for most of the selectivity and gain in the receiver. A type 1B4 tube performs the dual function of detector and first audio amplifier. The output of the second type 1B4 tube is resistance coupled to a type 33 tube in the power output stage. A storage battery having a capacity of at least 135 ampere hours should be used with the receiver.



IF PEAK 456 KC

RESISTORS

1 - .1 MFD	8 - .05 MFD	40 - 50M Ohms	47 - .4 Ohms
2 - .5 MFD	9 - .02 MFD	41 - 25M Ohms	48 - 1.2 Ohms
3 - .05 MFD	10 - .0005 MFD	42 - 400M Ohms	49 - 2 Meg.
4 - .001 MFD	11 - .006 MFD	43 - 25M Ohms	50 - 250M Ohms
5 - .1 MFD	12 - .006 MFD	44 - 50M Ohms	51 - 500M Ohms
6 - .1 MFD	13 - .25 MFD	45 - 100M Ohms	52 - 20M Ohms
7 - .1 MFD	14 - 8. MFD	46 - 250M Ohms	

CONDENSERS

MODELS 42CIB, 42TOB

Chassis 42

Socket, Trimmers, Notes

Alignment, Batt. Conn.

FAIRBANKS, MORSE & CO.

BATTERIES

This receiver has been designed to operate equally well on an Air Cell "A" Battery or a Two Volt Storage Battery as the "A" supply.

A three volt dry battery may be used with the receiver but the life of such a battery is usually not as long as that of the other types.

AIR CELL "A" BATTERY

If the receiver is to be operated on an air cell battery only one section of the "resistance link" circuit should be connected (See "X" Figure 3). The remaining two leads from the positive (+) "A" lead should be taped or otherwise insulated so they will not come in contact with any of the other battery terminals.

TWO VOLT STORAGE "A" BATTERY

If the receiver is to be operated on a Two Volt Storage "A" Battery, none of the "resistance link" circuit is to be used. The Positive (+) "A" connections are to be made as shown under "Y" of Figure 3. The unused leads should be taped so they will not come in contact with the other battery terminals.

THREE VOLT "A" BATTERY

If the receiver is to be operated on a Three Volt "A" Battery the "resistance link" circuit should be connected as shown under "Z" of Figure 3. The unused leads should be taped so they will not come in contact with any of the battery terminals.

When the Three Volt "A" Battery becomes so low or weak that the receiver will no longer operate satisfactorily, the connections may then be changed to conform with "X" under Figure 3, thus obtaining a little more operating time from the battery.

When the Three Volt "A" Battery again becomes so low that the receiver will not operate satisfactorily, the connections may once more be changed, to conform with "Y" of Figure 3, thus again obtaining more operating time from the battery.

NOTE - These changes must not be made until the battery becomes so low that the receiver does not operate properly, and then the change must be made one step at a time as described above otherwise the tubes in the receiver may be damaged.

"B" BATTERIES

Three 45 volt "B" batteries, with standard plug receptacles, are required with the receiver. Good quality, HEAVY DUTY batteries are recommended.

"C" BATTERIES

1 1/2 volts of "C" battery are required on the receiver. This voltage may be obtained from a standard 2 1/2 volt battery, with a standard plug receptacle, with a 1 1/2 volt tap.

BATTERY CABLE CONNECTIONS

"A" BATTERY

The Black battery lead is to be connected to "A" minus (-). The Red battery lead is to be connected to "A" plus (+). See Figure 3.

"B" AND "C" BATTERIES

Four Standard Battery Plugs will be found on the battery cable, three of these are identical to each other and are to be plugged into the Standard Receptacles on the three "B" batteries. The remaining plug, the one with the different terminal arrangement, should be plugged into the "C" battery.

WARNING - DO NOT ALLOW THE "A" BATTERY LEADS TO COME IN CONTACT WITH ANY OF THE "B" BATTERY TERMINALS. IF THIS HAPPENS, THE TUBES, RECEIVER AND BATTERIES MAY BE SERIOUSLY DAMAGED.

SUGGESTED SERVICE PROCEDURE

If the receiver does not operate properly, first test all batteries and then test all tubes in a reliable tube tester or, better still, replace the tubes in the receiver, one by one, with tubes known to be good. Most difficulties will be found in or centered around defective tubes, or batteries. If, after replacing any defective tubes, or batteries, the receiver is still inoperative, remove the chassis from the cabinet and conduct a careful resistance analysis using the resistance values shown on the schematic diagram as a guide. This will usually reveal the source of the difficulty.

ALIGNMENT PROCEDURE

To insure obtaining the performance the model 42 chassis is capable of delivering, it is essential that it be aligned perfectly. For this reason, it is urged that the following instructions be studied carefully before any alignment adjustments are attempted.

Proper adjustment of the various tuned circuits will be possible only through the use of an accurate and reliable signal generator employed in conjunction with an output meter, which may be connected from plate to ground on the output tube. A fixed condenser (.1 Mfd.) should be connected in series with the output meter.

NOTE - All adjustments should be made with the volume control "full on". Any desired variation in signal strength should be obtained by adjusting the output of the signal generator.

INTERMEDIATE FREQUENCY

- 1.- Turn the gang condenser to maximum capacity (fully meshed).
- 2.- Set the dial pointer at 530 kilocycles and then tighten the set screw.
- 3.- Supply a 456 kilocycle signal from the signal generator to the grid of the type 1CG first detector tube through a .1 Mfd. condenser connected in series with the signal generator lead.
- 4.- Adjust the radio frequency trimmer ("B", Figure 1) for maximum output with minimum input from the signal generator.

- 4.- Adjust the four trimmers of the two intermediate frequency transformers (see Figure 1) for maximum output with minimum input from the service oscillator.

RADIO FREQUENCY ALIGNMENT

The parallel or high frequency trimmer condensers for each stage located on the gang condenser (see Figure 1)

- 1.- Tune the receiver to 1500 kilocycles.
- 2.- Supply a 1500 kilocycle signal from the signal generator to the antenna lead of the receiver through a standard dummy antenna or a 200 Mfd. (.0002 Mfd.) condenser, connected in series with the signal generator lead.
- 3.- Adjust the oscillator stage trimmer condenser ("A" Figure 1) for maximum output with minimum input from the signal generator.

FIRST I. F. TRANSFORMER	COLOR CODES	SECOND I. F. TRANSFORMER	
Plate	Blue	Plate	Blue
"B" Plus	Red	"B" Plus	Red
Grid Return	Black	Diode Return	Black
Grid (Top)	Green	Diodes	Green

STANDARD RMA

RESISTOR AND CONDENSER COLOR CODE

0	Black	5	Green
1	Brown	6	Blue
2	Red	7	Purple
3	Orange	8	Grey
4	Yellow	9	White

POWER TRANSFORMERS

Lead Color	Voltage
Black	115V. Primary
Green	6.3V. Filament
Yellow	5.0V. Filament
Red	High Voltage Sec.
Red and White	High Voltage C.T.

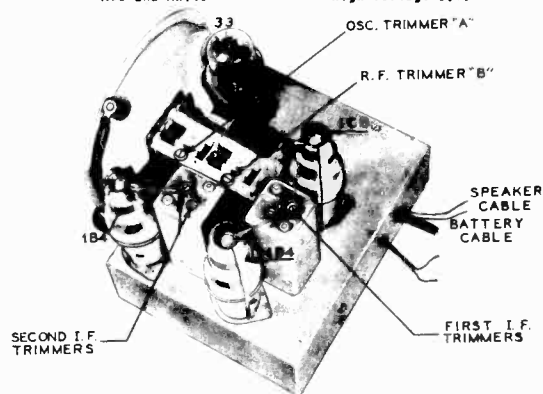


FIGURE 1
TOP VIEW

DIAGRAM X

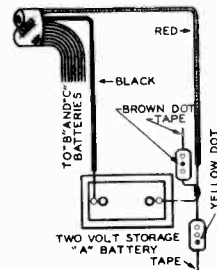
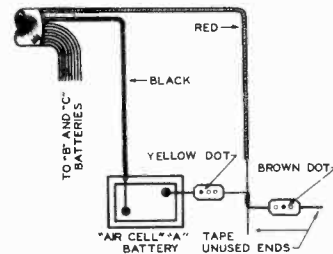


DIAGRAM Y

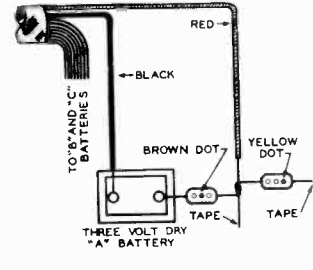


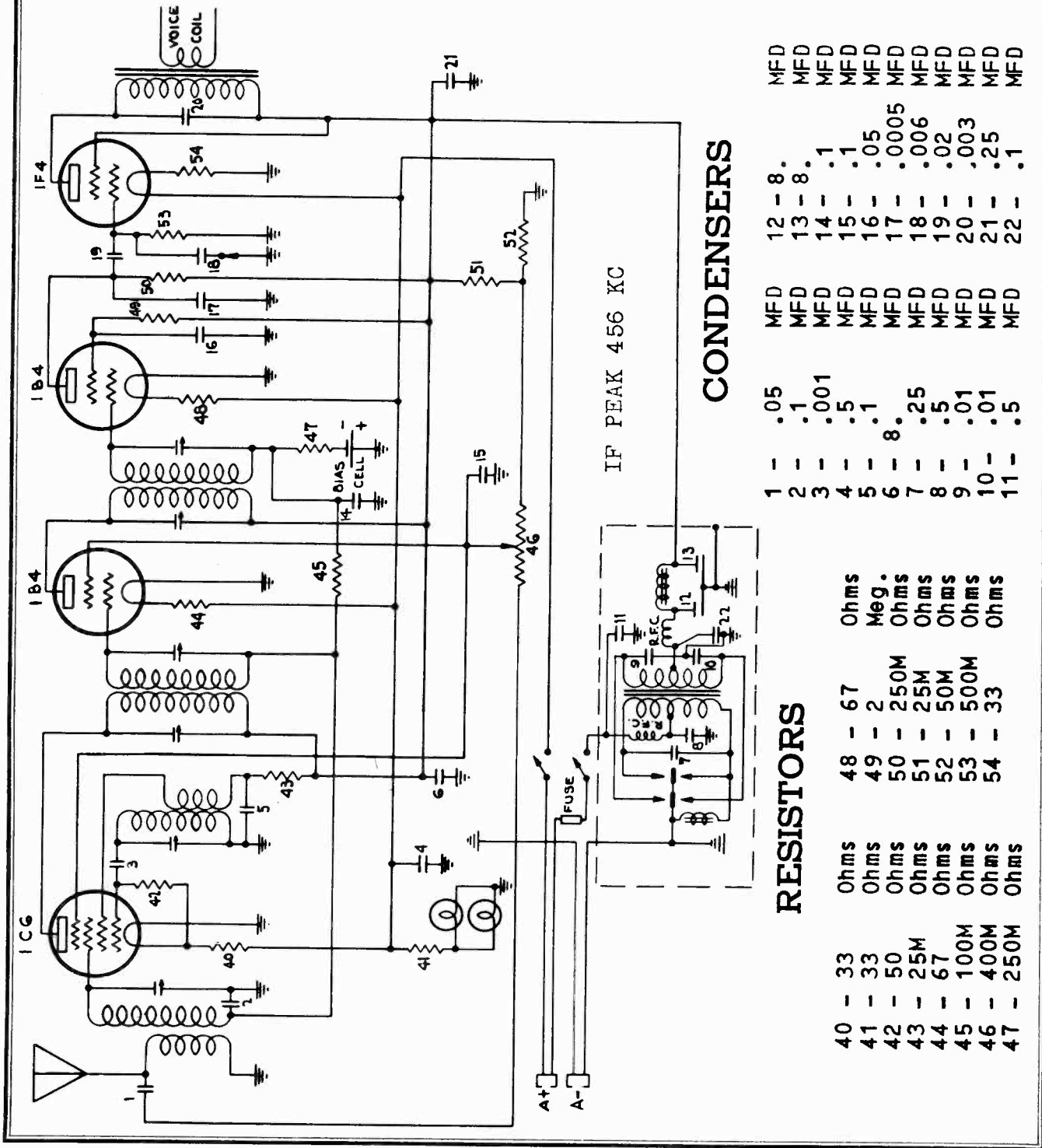
DIAGRAM Z

FIGURE 3
BATTERY CABLE CONNECTIONS

FAIRBANKS, MORSE & CO.

MODELS 43CIB, 43TIB
Chassis 43
Schematic, Notes

The model 43 chassis employs a type 1C6 pentagrid converter. The incoming signal is supplied to this tube through a preselector coil arrangement. This tube serves the dual function of first detector and oscillator. A type 1B4 tube is employed as the intermediate frequency amplifier. This tube and the two intermediate frequency transformers are responsible for most of the selectivity and gain in the receiver. A type 1B4 tube performs the dual function of detector and first audio amplifier. The output of the second type 1B4 tube is resistance coupled to a type 1F4 tube in the power output stage.



CONDENSERS

1	.05	MFD	12	8.	MFD
2	.1	MFD	13	8.	MFD
3	.001	MFD	14	.1	MFD
4	.5	MFD	15	.1	MFD
5	.1	MFD	16	.05	MFD
6	8.	MFD	17	.0005	MFD
7	.25	MFD	18	.006	MFD
8	.5	MFD	19	.02	MFD
9	.01	MFD	20	.003	MFD
10	.01	MFD	21	.25	MFD
11	.5	MFD	22	.1	MFD

RESISTORS

40	33	Ohms	48	67	Ohms
41	33	Ohms	49	2	Meg.
42	50	Ohms	50	250M	Ohms
43	25M	Ohms	51	25M	Ohms
44	67	Ohms	52	50M	Ohms
45	100M	Ohms	53	500M	Ohms
46	400M	Ohms	54	33	Ohms
47	250M	Ohms			

MODELS 43CIB, 43TIB
Chassis 43

FAIRBANKS, MORSE & CO.

Alignment, Voltage
Socket, Trimmers
Resistance

- Supply a 1500 kilocycle signal from the signal generator to the antenna lead of the receiver through a standard dummy antenna or a 200 Mfd. (.0002 Mfd.) condenser, connected in series with the signal generator lead.
- Adjust the oscillator stage trimmer condenser ("A" Figure 1) for maximum output with minimum input from the signal generator.
- Adjust the radio frequency trimmer ("B" Figure 1) for maximum output with minimum input from the signal generator.

COLOR CODES

POWER TRANSFORMERS

Lead Color	Voltage
Black	115 Volts Primary
Green	6.3 Volts Filament
Yellow	5.0 Volts Filament
Red	High Voltage Sec.
Red and White	High Voltage C.T.

FIRST I.F. TRANSFORMER

Plate	Blue
"B" Plus	Red
Grid Return	Black
Grid (Top)	Green

SECOND I.F. TRANSFORMER

Plate	Blue
"B" Plus	Red
Diode Return	Black
Diodes	Green

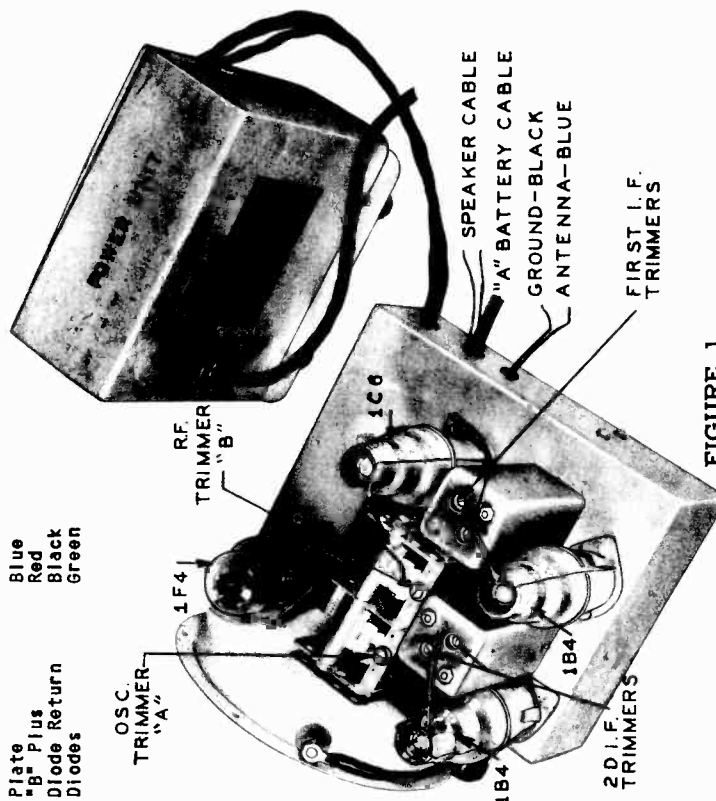


FIGURE 1
TOP VIEW OF THE MODEL 43 CHASSIS

ALIGNMENT PROCEDURE

To insure obtaining the performance the model 43 chassis is capable of delivering, it is essential that it be aligned perfectly. For this reason, it is urged that the following instructions be studied carefully before any alignment adjustments are attempted.

Proper adjustment of the various tuned circuits will be possible only through the use of an accurate and reliable signal generator employed in conjunction with an output meter, which may be connected from plate to ground on the output tube. A fixed condenser (.1 Mfd.) should be connected in series with the output meter.

NOTE - All Adjustments should be made with the volume control "full on". Any desired variation in signal strength should be obtained by adjusting the output of the signal generator.

INTERMEDIATE FREQUENCY ALIGNMENT

- Turn the gang condenser to maximum capacity (fully meshed).
- Set the dial pointer at 530 kilocycles and then tighten the set screw.
- Supply a 456 kilocycle signal from the signal generator to the grid of the type 1C6 first detector tube through a .1 Mfd. condenser connected in series with the signal generator lead.
- Adjust the four trimmers of the two intermediate frequency transformers (see Figure 1) for maximum output with minimum input from the service oscillator.

RADIO FREQUENCY ALIGNMENT

The parallel or high frequency trimmer condensers for each stage are located on the gang condenser (see Figure 1).

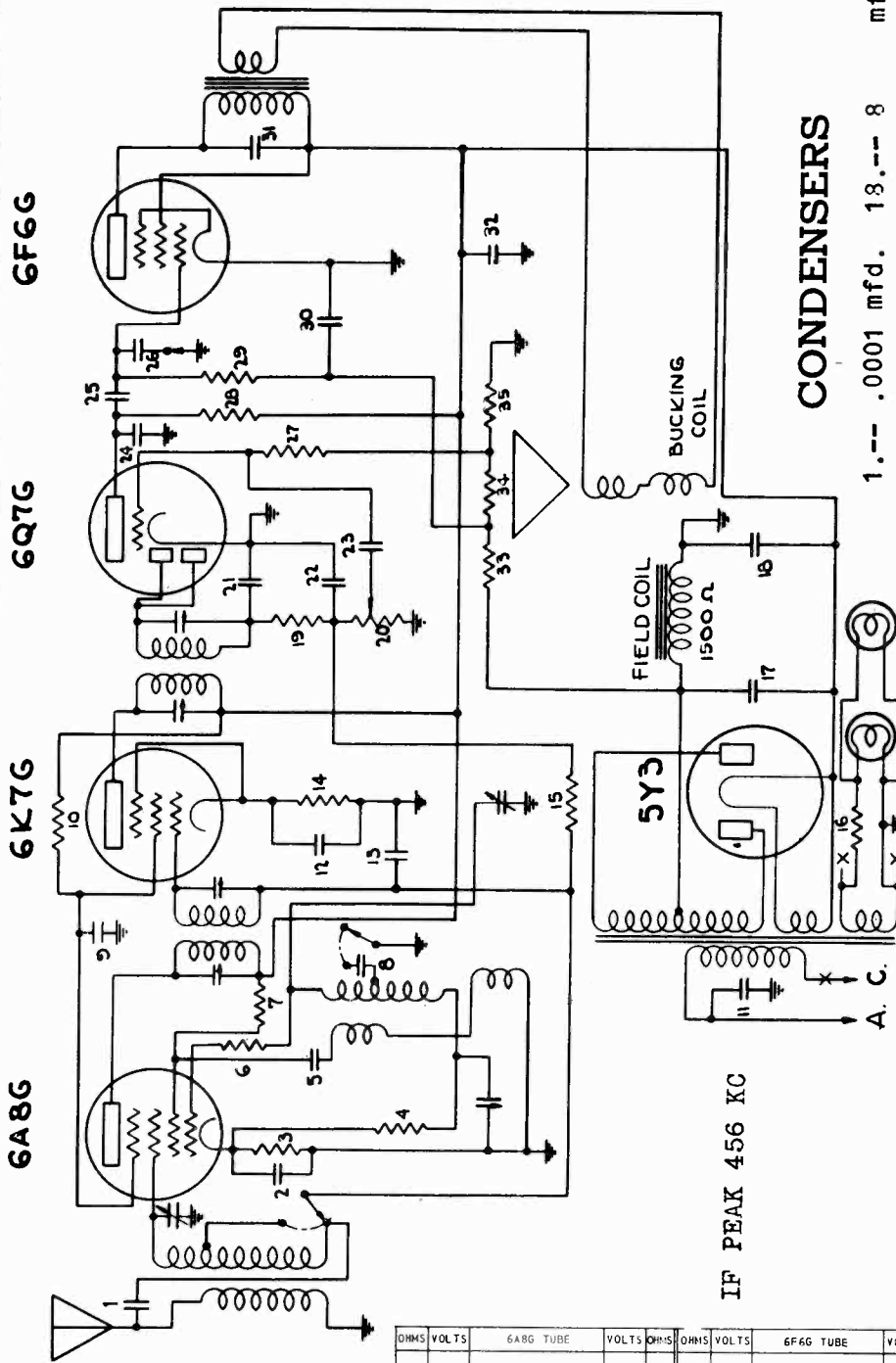
- Tune the receiver to 1500 kilocycles.

OHMS VOLTS	1B4 TUBE	VOLTS OHMS	OHMS VOLTS	1B4 TUBE	VOLTS OHMS
75M 137		50 50M 300M	55		15 2MEG.
72 2		0 300M	72 2		0 200M
		0 0			0 0
		0 0			0 0
OHMS VOLTS	1C6 TUBE	VOLTS OHMS	OHMS VOLTS	1F4 TUBE	VOLTS OHMS
100M 65		-0.6 40M			0 500M
80M 140		0 300M	75M 135		140 75M
40 2		50 55M	0 8 6		4 34
		0 0			
		0 0			

FIGURE 5
VOLTAGE AND RESISTANCE TABLE

FAIRBANKS, MORSE & CO.

MODEL 57T0
Chassis 57
Schematic, Voltage
Resistance



CONDENSERS

- 1.-- .0001 mfd. 18.-- 8 mf
- 2.-- .05 mfd. 21.-- .0001 mf
- 5.-- .001 mfd. 22.-- .0001 mf
- 8.-- .003 mfd. 23.-- .02 mf
- 9.-- .1 mfd. 24.-- .0001 mf
- 11.-- .01 mfd. 25.-- .02 mf
- 12.-- .1 mfd. 26.-- .006 mf
- 13.-- .1 mfd. 30.-- .25 mf
- 16.-- .6 mfd. 31.-- .006 mf
- 17.-- 8 mfd. 32.-- .1 mf

RESISTORS

- 3.-- 300 ohms 14.-- 300 ohms 28.-- 500 M ohms
- 4.-- 20 M ohms 15.-- 1 megohm 29.-- 500 M ohms
- 6.-- 150 ohms 19.-- 50 M ohms 33.-- 2 megohms
- 7.-- 10 M ohms 20.-- 500 M ohms 34.-- 400 M ohms
- 10.-- 20 M ohms 27.-- 500 M ohms 35.-- 50 M ohms

**FIGURE 5
VOLTAGE AND
RESISTANCE TABLE**

OHMS	VOLTS	6A8G TUBE	VOLTS	OHMS	OHMS	VOLTS	6F6G TUBE	VOLTS	OHMS	OHMS	VOLTS	5Y3 TUBE	VOLTS	OHMS		
1NF.	106		.5	23M	1NF.	218		-.5	1MEG	1900	-.95					
1NF.	218		150	1NF.	208	6.3		.5	1NF.	222						
0	0		6.3	.5	0	0		0	0	0	0					
0	0		4.2	300	0	0		0	0	0	0				222	1NF.
500Ω	.15							1MEG	106		2.5	300				
500Ω	76							1MEG	218		0	1MEG				
0	0							6.3	.5		6.3	300				
0	0							0	0		2.5	300				

MODEL 57T0
Alignment, Trimmers
Socket, Notes

Chassis 57

FAIRBANKS, MORSE & CO.

COLOR CODES

FIRST

SECOND

I. F. TRANSFORMER

I. F. TRANSFORMER

Plate Blue
"B" Plus Red
Grid Return Black
Grid (Top) Green

Plate Blue
"B" Plus Red
Diode Return Black
Diodes Green

RESISTOR AND CONDENSER COLOR CODE

0 Black 2 Red 4 Yellow 6 Blue 8 Grey
1 Brown 3 Orange 5 Green 7 Purple 9 White

RESISTORS

The BODY COLOR represents the FIRST FIGURE of the resistance value
The END COLOR represents the SECOND FIGURE of the resistance value
The DOT COLOR represents the NUMBER OF CIPHERS following the First two Figures

4.- The 6 megacycle signal should be received near 6 megacycles on the dial. If this is not the case, check the oscillator tube, switch connections, the fixed padding condenser (C-4) and coils. No adjustment is necessary on this band.

5.- Repeat 1, 2, 3 and 4 at 3.6 megacycles.

THE ANTENNA

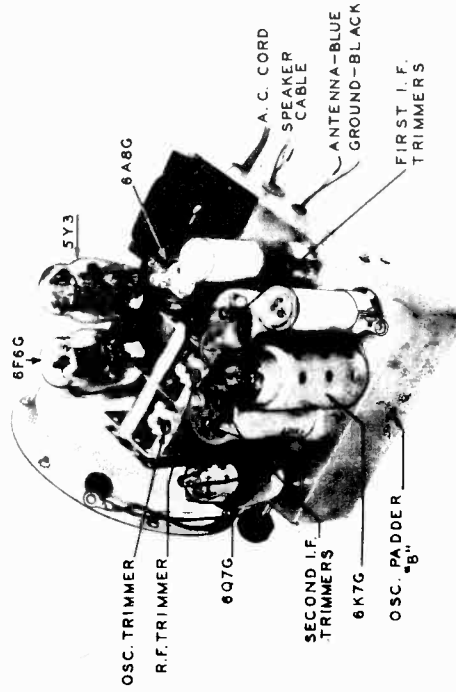
A good outside antenna is recommended for best results. An inside antenna will usually give satisfactory results on local broadcast stations, but it cannot be relied upon for distant and short wave reception.

The most satisfactory antenna for any installation will vary, depending largely upon local structural details and sources of interference. It should be kept as far as possible from buildings, trees and other obstructions. The antenna should not run parallel to nearby power lines and should not run near a tin roof or any metallic structure. The length of the antenna has much to do with the volume of the receiver. As the length of the antenna is increased, the volume on distant stations will be increased.

The most suitable antenna for use in large cities or congested radio districts where interference is a serious problem, is the doublet. In small centers of population, where interference is not serious, a single wire antenna having a total length of from 75 to 100 feet, erected as high as possible, with a good insulator at each end, will prove satisfactory. The lead-in should go to the receiver by the most direct route and should be kept away, as far as possible, from obstructions. Such an antenna will have less directional properties and less tendency to pick up power line interference than a low antenna with a long horizontal lead.

POWER TRANSFORMER

Lead Color	Voltage
Black	115 Volt Primary
Green	6.3 Volt Filament
Yellow	5.0 Volt Filament
Red	High Voltage Sec.
Red & White	High Voltage C.T.



INTERMEDIATE FREQUENCY ALIGNMENT

- 1.- Turn the gang condenser to maximum capacity (fully meshed).
- 2.- Set the band selector switch on the "Broadcast" position.
- 3.- Supply a 456 kilocycle signal from the signal generator to the antenna lead of the receiver through a .1 Mfd. condenser connected in series with the signal generator lead.
- 4.- Adjust the four trimmers of the two intermediate frequency transformers (see Figure 1) for maximum output with minimum input from the service oscillator.

RADIO FREQUENCY ALIGNMENT

The parallel or high frequency trimmer condensers for the broadcast band are on the gang condenser. These trimmers are used for aligning the high frequency end of the broadcast band. The location of the trimmers is shown in Figure 1.

The oscillator adjustable series padding condenser is used for tracking the oscillator at the low frequency end of the broadcast band. The padding condenser may be adjusted from the side of the chassis through the hole indicated in Figure 1. While making padding condenser adjustments, the gang condenser should be rotated back and forth across the signal to insure adjustment to the peak of greatest intensity.

DIAL ADJUSTMENT

Before making any radio frequency alignment adjustments, close the variable tuning condenser (Maximum capacity), place the dial pointer at 540 kilocycles (gang condenser still closed), and then proceed with the following adjustments.

BROADCAST BAND

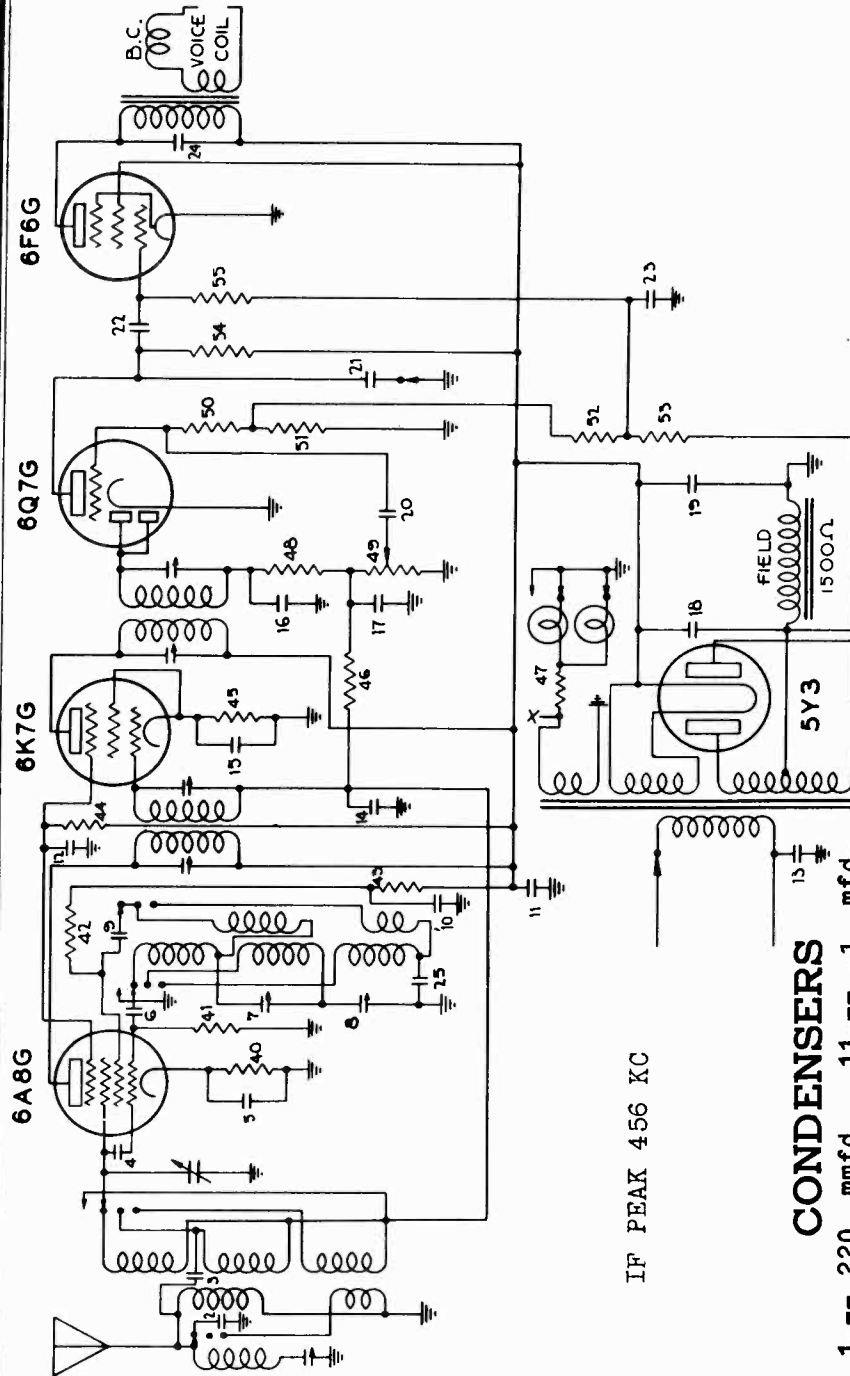
- 1.- Turn the band selector switch to the broadcast (Counter-Clockwise) position.
- 2.- Tune the receiver to 1500 kilocycles.
- 3.- Supply a 1500 kilocycle signal from the signal generator to the antenna lead of the receiver through a standard dummy antenna or a 200 Mmfd. (.0002 Mfd.) condenser, connected in series with the signal generator lead.
- 4.- Adjust the trimmer condensers on the gang condenser (Figure 1) for maximum output with minimum input from the signal generator.
- 5.- Tune the receiver to 600 kilocycles.
- 6.- Supply a 600 kilocycle signal to the antenna of the receiver through the same connections as previously used.
- 7.- Adjust the broadcast band oscillator padding condenser "B" (side of chassis, see Figure 1) for maximum output with minimum input from the signal generator, at the same time locking the tuning condenser back and forth across the signal to insure the peak of greatest intensity.
- 8.- Check at 1500 kilocycles and then at 600 kilocycles. Make any adjustments that are necessary to obtain satisfactory calibration.

SHORT WAVE BAND

- 1.- Turn the band selector switch to the short wave position (clockwise).
- 2.- Tune the receiver to 6 megacycles.
- 3.- Supply a 6 megacycle signal from the signal generator to the antenna lead of the receiver through a 400 ohm carbon resistor (dummy antenna), connected in series with the signal generator lead.

FAIRBANKS, MORSE & CO.

MODELS 58T1, 58T2
Chassis 58
Schematic, Voltage
Resistance



RESISTORS

- 40.--- 300 ohms
- 41.--- 35 M ohms
- 42.--- 10 M ohms
- 43.--- 5 M ohms
- 44.--- 25 M ohms
- 45.--- 300 ohms
- 46.--- 1 megohm
- 47.--- .4 ohms
- 48.--- 50 M ohms
- 49.--- 500 M ohms
- 50.--- 500 M ohms
- 51.--- 50 M ohms
- 52.--- 400 M ohms
- 53.--- 2 megohms
- 54.--- 500 M ohms
- 55.--- 500 M ohms

CONDENSERS

- 1.--- 220 mmfd.
- 2.--- .0001 mfd.
- 3.--- 6.5 mmfd.
- 4.--- 1.2 mmfd.
- 5.--- .05 mfd.
- 6.--- .0001 mfd.
- 7.--- 800 mmfd.
- 8.--- 1600 mmfd.
- 9.--- .001 mfd.
- 10.--- 8
- 11.--- .1 mfd.
- 12.--- .1 mfd.
- 13.--- .01 mfd.
- 14.--- .1 mfd.
- 15.--- .25 mfd.
- 16.--- .0001 mfd.
- 17.--- .0001 mfd.
- 18.--- 8 mfd.
- 19.--- 8 mfd.
- 20.--- .02 mfd.
- 21.--- .006 mfd.
- 22.--- .02 mfd.
- 23.--- .25 mfd.
- 24.--- .006 mfd.
- 25.--- .004 mfd.

IF PEAK 456 KC

FIGURE 5
VOLTAGE AND
RESISTANCE TABLE

OHMS	VOLTS	6A8G TUBE	VOLTS	OHMS	OHMS	VOLTS	6F6G TUBE	VOLTS	OHMS	OHMS	VOLTS	5Y3 TUBE	VOLTS	OHMS
INF.	100		-11	40M	INF.	248		-.3	1 MEG	1800	-100			
INF.	242		155	1 MEG.	INF.	235		6.3	.5	INF.	248		-100	1800
0	0		6.3	.5	0	0		0	0	0	0		248	INF.
0	0		3.6	300	0	0		0	0	0	0		0	0
OHMS	VOLTS	6Q7G TUBE	VOLTS	OHMS	OHMS	VOLTS	6K7G TUBE	VOLTS	OHMS	OHMS	VOLTS	OHMS		
500M	-.1							INF.	100	2.2	300			
INF.	90		-.1	500M	INF.	245		0	1 MEG.					
0	0		6.3	.5	0	0		6.3	.5					
0	0		0	0	0	0		2.2	300					

MODELS 58T1, 58T2
 Chassis 58
 Alignment, Trimmers
 Socket, Notes

FAIRBANKS, MORSE & CO.

INTERMEDIATE FREQUENCY ALIGNMENT

- 1.- Turn the gang condenser to maximum capacity (full meshed). With the Range Switch on the Broadcast position.
- 2.- Supply a 456 kilocycle signal from the signal generator to the grid of the first detector tube (6A8G) through a .1 Mfd. condenser connected in series with the signal generator lead.
- 3.- Adjust the four trimmers of the two intermediate frequency transformers (see Figure 1) for maximum output with minimum input from the service oscillator.

RADIO FREQUENCY ALIGNMENT

The parallel or high frequency trimmer condensers for each coil are housed in the same shield can with the coil. These trimmers are used for aligning the high frequency end of each band. The location of the various trimmers is shown in Figure 1.

The oscillator, adjustable, series padding condensers are used for tracking the oscillator at the low frequency end of each band. The padding condenser may be adjusted from the top of the chassis through the holes indicated in Figure 1. Since a fixed mica padding condenser is employed on the short wave band, no adjustment is necessary. While making padding condenser adjustments, the gang condenser should be rotated back and forth across the signal to insure adjustment to the peak of greatest intensity.

DIAL ADJUSTMENT

Before making any radio frequency alignment adjustments, close the variable tuning condenser (maximum capacity), loosen the screw that secures the dial pointer, place the pointer in a horizontal position (gang condenser still closed) and then tighten the screw.

NOTE - The three bands must be aligned in the following order: First, police; second, broadcast; third, short wave.

POLICE BAND

- 1.- Turn the band selector switch to the police band (center) position.
- 2.- Tune the receiver to 6 megacycles.
- 3.- Supply a 6 megacycle signal from the signal generator to the antenna lead of the receiver through a 400 ohm carbon resistor (dummy antenna), connected in series with the signal generator lead.
- 4.- Adjust the police band oscillator trimmer condenser (Figure 1) for maximum output with minimum input from the signal generator, then adjust the police band antenna stage trimmer for maximum output, at the same time rocking the tuning condenser back and forth across the signal to insure the peak of greatest intensity.
- 5.- Tune the receiver to 2.4 megacycles.
- 6.- Supply a 2.4 megacycle signal to the receiver through the same connections used on the previous adjustment.
- 7.- Adjust the police band oscillator padding condenser (top of chassis, see Figure 1) for maximum output with minimum input from the signal generator, at the same time rocking the tuning condenser back and forth across the signal to insure the peak of greatest intensity.
- 8.- Check at 6 megacycles and then at 2.4 megacycles and make any adjustments that are necessary to obtain satisfactory calibration.

BROADCAST BAND

- 1.- Turn the band selector switch to the broadcast (counter-clockwise) position.
- 2.- Tune the receiver to 1500 kilocycles.
- 3.- Supply a 1500 kilocycle signal from the signal generator to the antenna lead of the receiver through a standard dummy antenna or a 200 Mmfd. (.0002 Mfd.) condenser, connected in series with the signal generator lead.
- 4.- Adjust the broadcast band oscillator trimmer condenser (Figure 1) for maximum output with minimum input from the signal generator. Then adjust the broadcast band antenna stage trimmer for maximum output.
- 5.- Tune the receiver to 600 kilocycles.
- 6.- Supply a 600 kilocycle signal to the antenna of the receiver through the same connections as previously used.
- 7.- Adjust the broadcast band oscillator padding condenser (top of chassis, see Figure 1) for maximum output with minimum input from the signal generator, at the same time rocking the tuning condenser back and forth across the signal to insure the peak of greatest intensity.
- 8.- Check at 1500 kilocycles and then at 600 kilocycles. Make any adjustments that are necessary to obtain satisfactory calibration.
- 9.- Supply a 456 kilocycle signal to the antenna of the receiver through the dummy antenna with the gang condenser at 600 kilocycles.
- 10.- Adjust the wave trap trimmer "A" (see Figure 1) for minimum output.

SHORT WAVE BAND

- 1.- Turn the band selector switch to the short wave (clockwise) position.
- 2.- Tune the receiver to 20 megacycles.
- 3.- Supply a 20 megacycle signal from the signal generator to the antenna lead of the receiver through a 400 ohm carbon resistor (dummy antenna), connected in series with the signal generator lead.

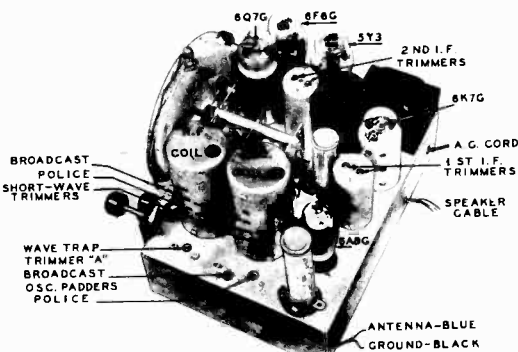
- 4.- Adjust the short wave band oscillator trimmer condenser (Figure 1) for maximum output with minimum input from the signal generator. Then adjust the short wave band antenna stage trimmer for maximum output, at the same time rocking the tuning condenser back and forth across the signal to insure the peak of greatest intensity.
- 5.- The 8 megacycle signal should be received near 8 megacycles on the dial. If this is not the case, check the oscillator tube, switch connections, the fixed padding condenser and the coils. No adjustment is necessary at this point.

WARNING - The image signal should be received at approximately 19 megacycles on the dial. If not, the oscillator has been aligned to the image frequency and the oscillator trimmer condenser must be backed out until the correct signal is received at 20 megacycles and the image at approximately 19 megacycles. If readjustment is found necessary, the antenna stage trimmer should also be checked again.

ANTENNA AND GROUND CONNECTIONS

The BLUE wire on the receiver is to be connected to the antenna. The BLACK wire on the receiver is to be connected to the ground. When a FAIRBANKS-MORSE ANTENNA is used, the BLUE wire from the receiver is to be connected to the red wire on the antenna set coupler and the BLACK wire from the receiver is to be connected to the black wire on the antenna set coupler and to a good ground.

The most suitable antenna for use in large cities or congested radio districts, where interference is a serious problem, is the doublet. In small centers of population, where interference is not serious, a single wire antenna having a total length of from 75 to 100 feet, erected as high as possible, with a good insulator at each end, will prove satisfactory. The lead-in should go to the receiver by the most direct route and should be kept away, as far as possible, from obstructions. Such an antenna will have less directional properties and less tendency to pick up power line interference than a low antenna with a long horizontal lead.



COLOR CODES

FIRST I. F. TRANSFORMER		SECOND I. F. TRANSFORMER	
Plate	Blue	Plate	Blue
"B" Plus	Red	"B" Plus	Red
Grid Return	Black	Diode Return	Black
Grid (Top)	Green	Diodes	Green

RESISTOR AND CONDENSER COLOR CODE

0 Black	2 Red	4 Yellow	6 Blue	8 Grey
1 Brown	3 Orange	5 Green	7 Purple	9 White

POWER TRANSFORMER

Lead Color	Voltage
Black	115 Volt Primary
Green	6.3 Volt Filament
Yellow	5.0 Volt Filament
Red	High Voltage Sec.
Red & White	High Voltage C.T.

RESISTORS

The BODY COLOR represents the FIRST FIGURE of the resistance value. The END COLOR represents the SECOND FIGURE of the resistance value. The DOT COLOR represents the NUMBER OF CIPHERS following the First two figures.

MICA CONDENSERS

(Capacity in Micro-Microfarads)

The FIRST DOT on the condenser represents the FIRST FIGURE of the capacity. The SECOND DOT on the condenser represents the SECOND FIGURE of the capacity. The THIRD DOT on the condenser represents the NUMBER OF CIPHERS following the first two figures. The colors on the condensers should be read from left to right with the condenser in an upright position.

FAIRBANKS, MORSE & CO.

MODEL 68T6
Chassis 68
Schematic

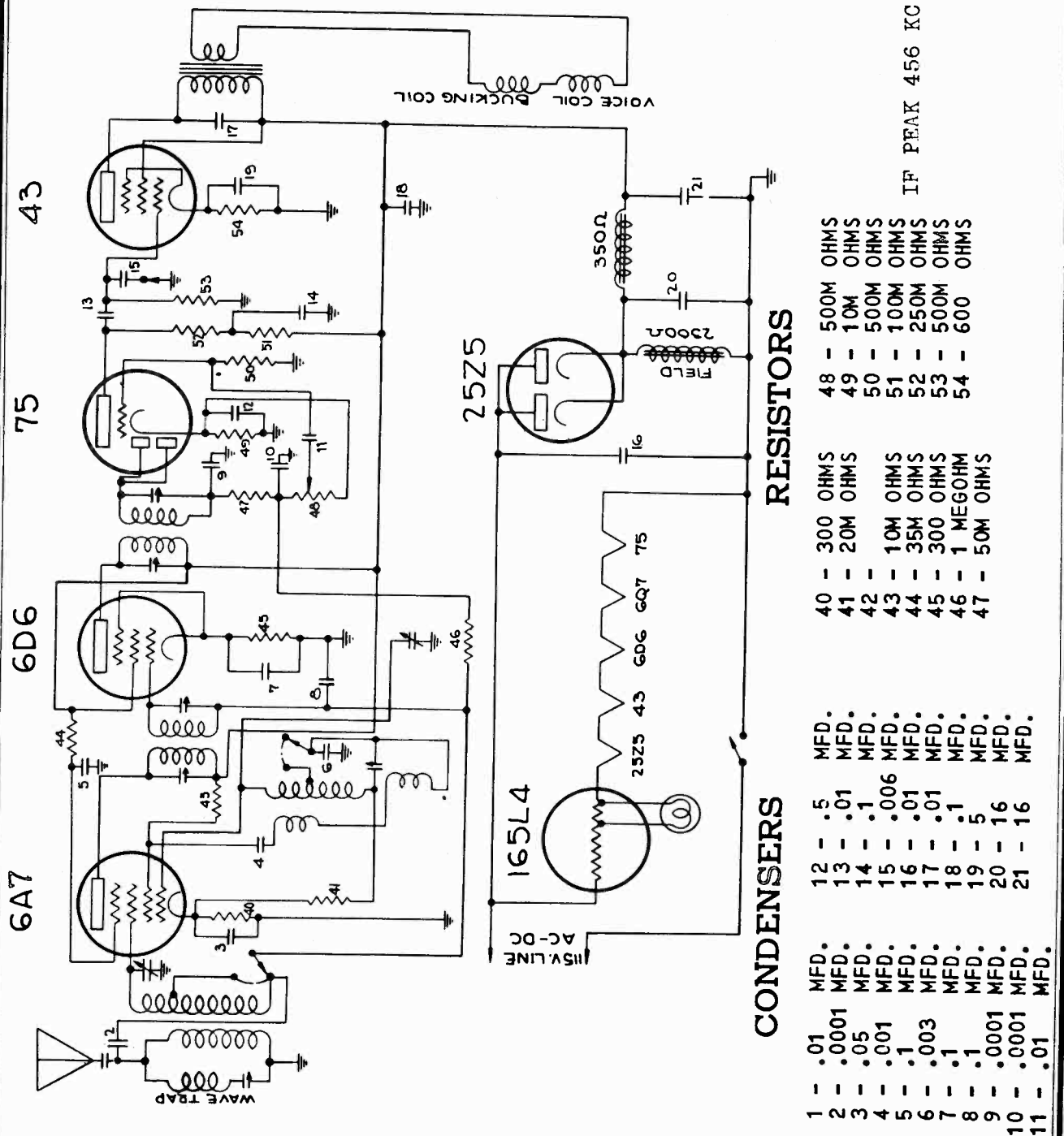
COLOR CODES

FIRST I. F. TRANSFORMER

Plate. Blue
"B" Plus Red
Grid Return. Black
Grid (Top) Green

SECOND I. F. TRANSFORMER

Plate. Blue
"B" Plus Red
Diode Return Black
Diodes Green



RESISTORS

- 40 - 300 OHMS
- 41 - 20M OHMS
- 42 - 10M OHMS
- 43 - 35M OHMS
- 44 - 300 OHMS
- 45 - 1 MEGOHM
- 46 - 50M OHMS
- 47 - 50M OHMS
- 48 - 500M OHMS
- 49 - 10M OHMS
- 50 - 500M OHMS
- 51 - 100M OHMS
- 52 - 250M OHMS
- 53 - 500M OHMS
- 54 - 600 OHMS

CONDENSERS

- 1 - .01 MFD.
- 2 - .0001 MFD.
- 3 - .05 MFD.
- 4 - .001 MFD.
- 5 - .1 MFD.
- 6 - .003 MFD.
- 7 - .1 MFD.
- 8 - .1 MFD.
- 9 - .0001 MFD.
- 10 - .0001 MFD.
- 11 - .01 MFD.
- 12 - .5 MFD.
- 13 - .01 MFD.
- 14 - .1 MFD.
- 15 - .006 MFD.
- 16 - .01 MFD.
- 17 - .01 MFD.
- 18 - .1 MFD.
- 19 - .5 MFD.
- 20 - 16 MFD.
- 21 - 16 MFD.

IF PEAK 456 KC

MODEL 68T6
 Chassis 68
 Socket, Trimmers
 Alignment

FAIRBANKS, MORSE & CO.

DIAL ADJUSTMENT

Before making any radio frequency alignment adjustments, close the variable tuning condenser (Maximum capacity), place the dial pointer at 540 kilocycles (gang condenser still closed), and then proceed with the following adjustments.

BROADCAST BAND

1. Turn the band selector switch to the broadcast (Counter-Clockwise) position.
2. Tune the receiver to 1500 kilocycles.
3. Supply a 1500 kilocycle signal from the signal generator to the antenna lead of the receiver, through a standard dummy antenna or a 200 Mmfd. (.0002 Mfd.) condenser, connected in series with the signal generator lead.
4. Adjust the trimmer condensers on the gang condenser (Figure 1) for maximum output with minimum input from the signal generator.
5. Tune the receiver to 600 kilocycles.
6. Supply a 600 kilocycle signal to the antenna of the receiver through the same connections as previously used.

7. Adjust the broadcast band oscillator padding condenser (top of chassis, see Figure 1) for maximum output with minimum input from the signal generator, at the same time rocking the tuning condenser back and forth across the signal to insure the peak of greatest intensity.
8. Check at 1500 kilocycles and then at 600 kilocycles. Make any adjustments that are necessary to obtain satisfactory calibration.
9. Supply a 456 kilocycle signal to the antenna of the receiver through the dummy antenna with the gang condenser at 600 kilocycles.
10. Adjust the wave trap trimmer (see Figure 1) for minimum output.

SHORT WAVE BAND

1. Turn the band selector switch to the short wave position (clockwise).
2. Tune the receiver to 6 megacycles.
3. Supply a 6 Megacycle signal from the signal generator to the antenna lead of the receiver through a 400 ohm carbon resistor (dummy antenna), connected in series with the signal generator lead.
4. The 6 megacycle signal should be received near 6 megacycles on the dial. If this is not the case, check the oscillator tube, switch connections, the fixed padding condenser (C-6) and coils. No adjustment is necessary on this band.
5. Repeat 1, 2, 3, and 4 at 3.6 megacycles.

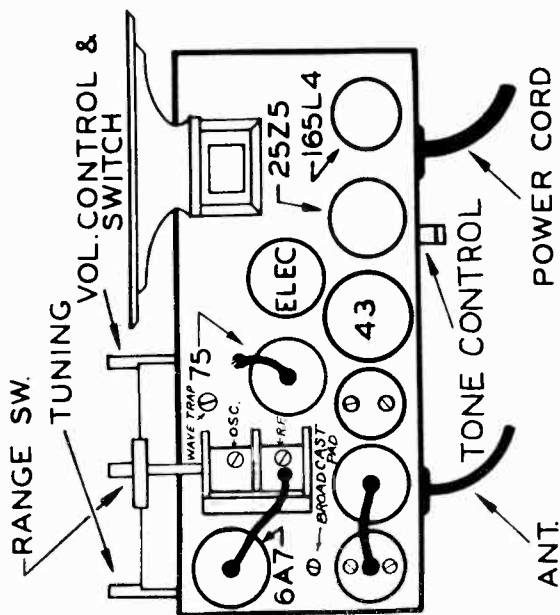


FIGURE 1
 TOP VIEW OF THE MODEL 68 CHASSIS

INTERMEDIATE FREQUENCY ALIGNMENT

1. Turn the gang condenser to maximum capacity (fully meshed.)
2. Set the band selector switch on the "Broadcast" position.
3. Supply a 456 kilocycle signal from the signal generator to the antenna lead of the receiver through a .1 Mfd. condenser connected in series with the signal generator lead.
4. Adjust the four trimmers of the two intermediate frequency transformers (see Figure 1) for maximum output with minimum input from the service oscillator.

RADIO FREQUENCY ALIGNMENT

The parallel or high frequency trimmer condensers for the broadcast band are on the gang condenser. These trimmers are used for aligning the high frequency end of the broadcast band. The location of the trimmers is shown in Figure 1.

The oscillator adjustable series padding condenser is used for tracking the oscillator at the low frequency end of the broadcast band. The padding condenser may be adjusted from the top of the chassis through the hole indicated in Figure 1. While making padding condenser adjustments, the gang condenser should be rotated back and forth across the signal to insure adjustment to the peak of greatest intensity.

FAIRBANKS, MORSE & CO.

MODEL 68T6
Chassis 68
Model 69T7
Chassis 69
Voltage,
Resistance

Upper
Voltage
Readings
A. C.

Lower
Voltage
Readings
D. C.

OHMS		VOLTS		6D6		VOLTS		OHMS		VOLTS		43		VOLTS		OHMS		VOLTS		2525		VOLTS		OHMS	
2700	108	96				0	1 Meg.	3.5	300	2700	108	96		0	500M	25		124	107		124	107	25		
	108	96				3.5	300	2.4		3M	98	97		15	600	170		115	115		115	115	170		
	10.2	17.5				12.6	7.8			23	43	43		17.5	10.2	34		43	43		66	66	23		
OHMS		VOLTS		6A7		VOLTS		OHMS		VOLTS		75		VOLTS		OHMS		VOLTS		165L4		VOLTS		OHMS	
12.5M	85	75				0	1ME6							0	500M										
	50	46				22.5M	500M	0						0	500M										
	2700	108	96			1.6	300	400M	36	2.8				4	33	8500									
	7.8	12.6	12.6			6.4	4.2	4	6.3	6.3				0	170										

FIGURE 5

VOLTAGE AND RESISTANCE TABLE MODEL 68

OHMS		VOLTS		6D6		VOLTS		OHMS		VOLTS		43		VOLTS		OHMS		VOLTS		2525		VOLTS		OHMS	
2500	95	95				0	500M	3	300	2500	95	95		-.45	1ME6	2500	95	95		95	2500				
	95	95				3.8		3	300	3000	87	77		0	0	590	98AC	95		96AC	95	590			
	450	29AC	2.1			2.9AC	450	450M	35AC	25				29AC	450M	450	54AC	50		35AC	25	450			
OHMS		VOLTS		6A7		VOLTS		OHMS		VOLTS		76		VOLTS		OHMS		VOLTS		165L4		VOLTS		OHMS	
7500	95	95				0	6.8							0	0										
	5300	44	45			1.75	50M							0	0										
	2500	95	95			1.75	150	250M	48	50				1	100M										
	450	29AC	1.6			30AC	17.5	450	32.5AC	15				30AC	9	450	590	98AC	95		54AC	50	450		

FIGURE 5

VOLTAGE AND RESISTANCE TABLE MODEL 69

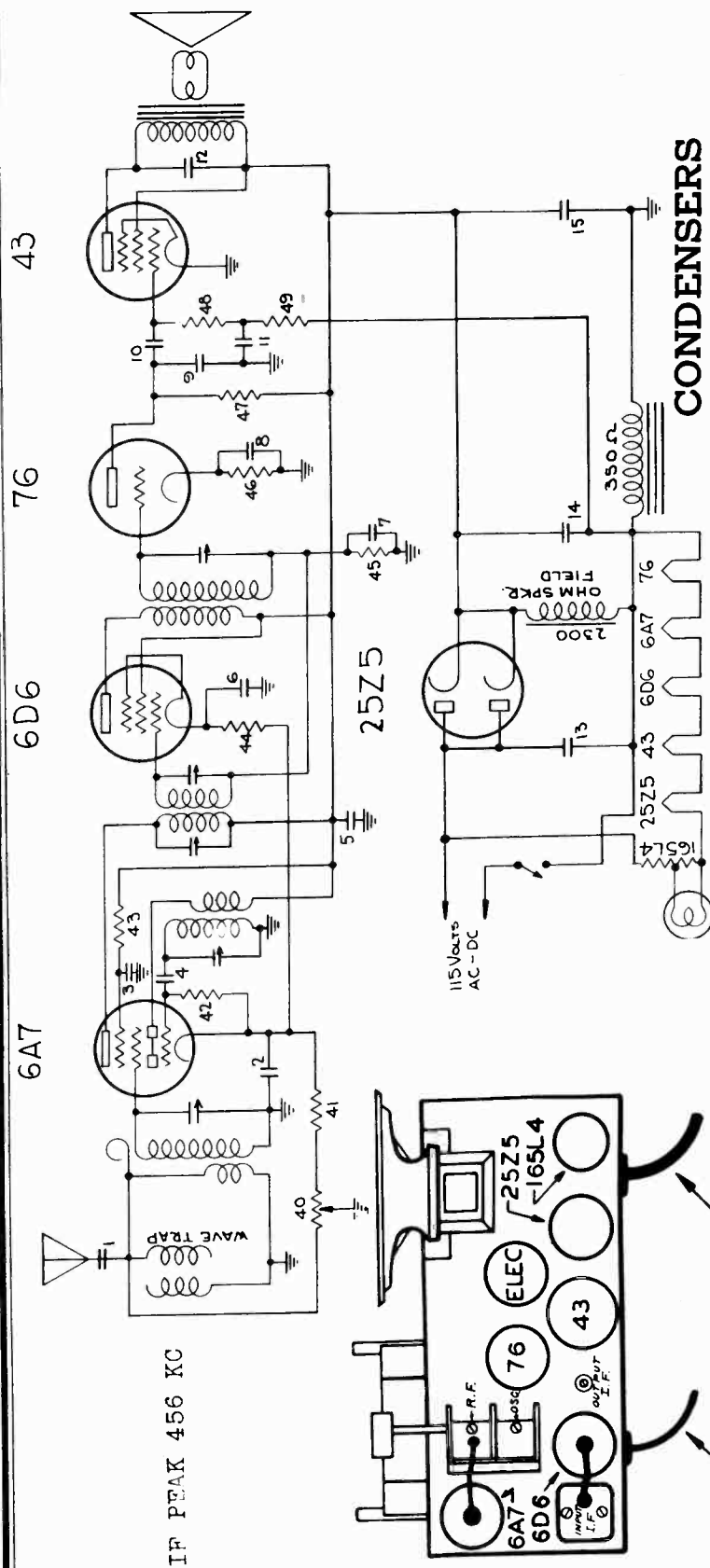
NOTE - The upper voltage readings shown indicate the voltage from each respective prong to ground with the receiver connected to an A.C. (Alternating Current) power line.

The lower voltage readings were taken with the receiver connected to a D.C. (Direct Current) power line.

These Voltage readings may vary with the fluctuation in line voltage.

MODEL 69T7
 Chassis 69
 Schematic, Socket
 Trimmers, Alignment

FAIRBANKS, MORSE & CO.



CONDENSERS

1	-.01	MFD.
2	-.05	MFD.
3	-.05	MFD.
4	-.0001	MFD.
5	-.25	MFD.
6	-.05	MFD.
7	-.1	MFD.
8	-.1	MFD.
9	-.0005	MFD.
10	-.01	MFD.
11	-.25	MFD.
12	-.006	MFD.
13	-.01	MFD.
14	-.16	MFD.
15	-.8	MFD.

RESISTORS

40	- 5M	OHMS
41	- 150	OHMS
42	- 50M	OHMS
43	- 35M	OHMS
44	- 150	OHMS
45	- 500M	OHMS
46	- 100M	OHMS
47	- 250M	OHMS
48	- 500M	OHMS
49	- 500M	OHMS

INTERMEDIATE FREQUENCY ALIGNMENT:—Supply a 456 KC signal from the sig. gen. to the antenna lead thru a .1 mfd. cond. in series with the signal gen.
 Adjust the three trimmers for maximum output with minimum input from the osc.

RADIO FREQUENCY ALIGNMENT: With min. cap. of var. cond. set dial at 540 KC.
 Tune the receiver at 1500 KC. — Supply a 1500 signal from sig. gen. to antenna thru 200 mmfd. cond., connected in series with sig. gen. lead. Adj. trimmers for max. OP.

Tune receiver to 600 KC — Supply 600 KC to ant. thru the same connection as above.
 Low freq. of band does not employ an osc. padding cond. but is tracked by means of a split section of gang cond. The wave trap requires no adjustment.

COLOR CODES
FIRST

I. F. TRANSFORMER

Plate	Blue
"B" Plus	Red
Grid Return	Black
Grid (Top)	Green

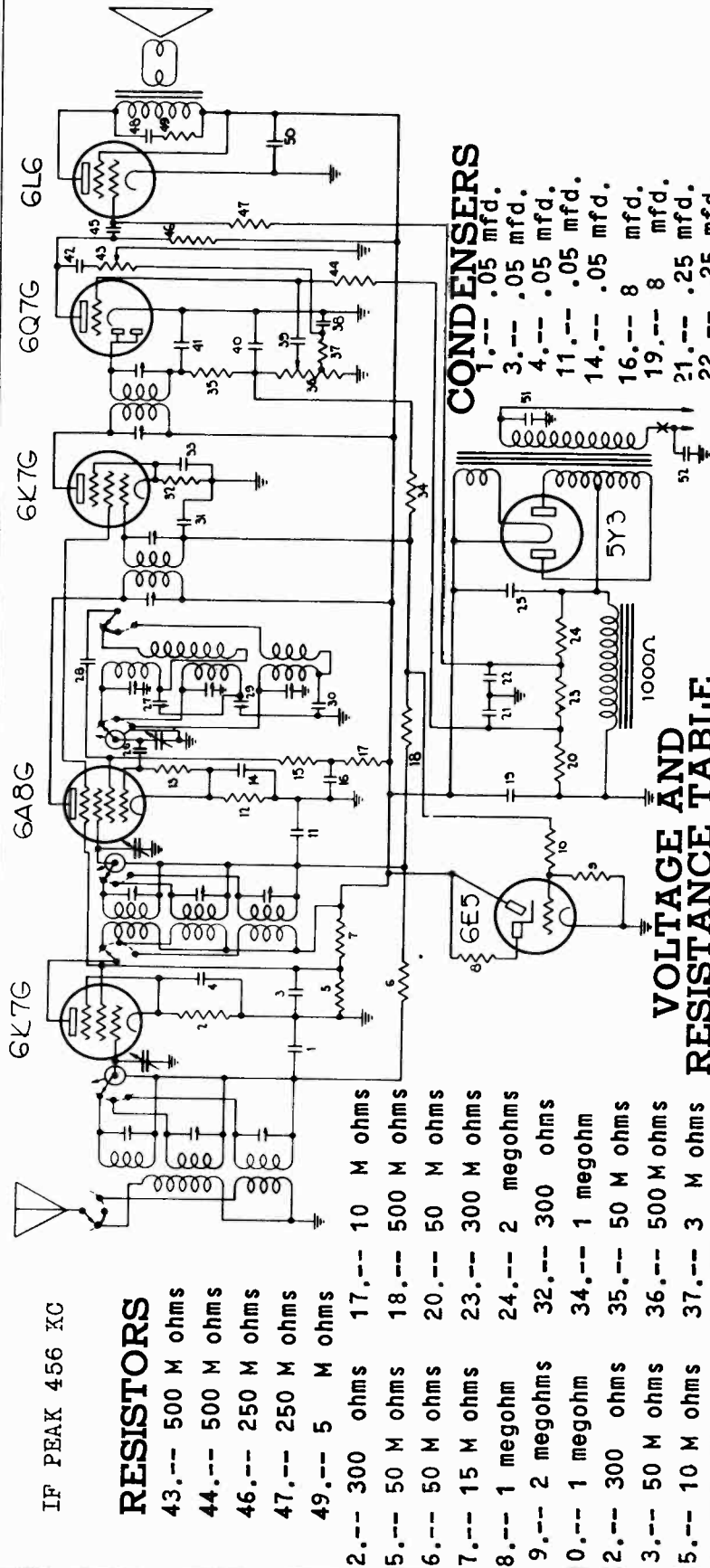
SECOND

I. F. TRANSFORMER

Plate	Blue
"B" Plus	Red
Grid Return	Black
Grid	Green

FAIRBANKS, MORSE & CO.

MODELS 72C2, 72C3, 72T3
Chassis 72
Schematic, Voltage
Resistance



RESISTORS

- 43.--- 500 M ohms
- 44.--- 500 M ohms
- 46.--- 250 M ohms
- 47.--- 250 M ohms
- 49.--- 5 M ohms

- 2.--- 300 ohms
- 5.--- 50 M ohms
- 6.--- 50 M ohms
- 7.--- 15 M ohms
- 8.--- 1 megohm
- 9.--- 2 megohms
- 10.--- 1 megohm
- 12.--- 300 ohms
- 13.--- 50 M ohms
- 15.--- 10 M ohms
- 17.--- 10 M ohms
- 18.--- 500 M ohms
- 20.--- 50 M ohms
- 23.--- 300 M ohms
- 24.--- 2 megohms
- 32.--- 300 ohms
- 34.--- 1 megohm
- 35.--- 50 M ohms
- 36.--- 500 M ohms
- 37.--- 3 M ohms

CONDENSERS

- 1.--- .05 mfd.
- 3.--- .05 mfd.
- 4.--- .05 mfd.
- 11.--- .05 mfd.
- 14.--- .05 mfd.
- 16.--- 8 mfd.
- 19.--- 8 mfd.
- 21.--- .25 mfd.
- 22.--- .25 mfd.
- 38.--- .1 mfd.
- 39.--- .01 mfd.
- 40.--- 100 M mfd.
- 41.--- 100 M mfd.
- 42.--- .03 mfd.
- 48.--- .02 mfd.
- 45.--- .01 mfd.
- 50.--- .1 mfd.
- 51.--- .01 mfd.

VOLTAGE AND RESISTANCE TABLE

OHMS	VOLTS	6A8G TUBE	OHMS	VOLTS	6K7G TUBE	OHMS	VOLTS	6K7G TUBE	OHMS	VOLTS	6E5 TUBE	OHMS	VOLTS	6E5 TUBE	OHMS	VOLTS	6E5 TUBE
50M	85		50M	85		50M	85		50M	85	6E5	1 MEG	-1		195	65M	
65M	195		65M	195		55M	195		55M	195		2 MEG	5		0	0	
.5	6.3		.5	6.3		0	0		0	0		.5	6.3		0	0	
0	0		0	0		0	0		0	0		0	0		0	0	
0	0		300	2		300	1.75		300	1.75		0	0		0	0	
500M	-2		500M	-2		500M	-25		500M	-25		500M	195		0	0	
300M	95		300M	95		65M	185		65M	185		65M	185		0	0	
.5	6.3		.5	6.3		.5	6.3		.5	6.3		.5	6.3		0	0	
0	0		0	0		0	0		0	0		0	0		0	0	

MODELS 72C2, 72C3, 72T3
Chassis 72

FAIRBANKS, MORSE & CO.

Alignment, Socket
Trimmers, Data

INTERMEDIATE FREQUENCY ALIGNMENT

- 1.- Turn the gang condenser to maximum capacity (fully meshed). With the range switch on the broadcast position.
- 2.- Supply a 456 kilocycle signal from the signal generator to the grid of the first detector tube (6A8G) through a .1 Mfd. condenser connected in series with the signal generator lead.
- 3.- Adjust the four trimmers of the two intermediate frequency transformers (see Figure 1) for maximum output with minimum input from the service oscillator.

RADIO FREQUENCY ALIGNMENT

The parallel or high frequency trimmer condensers for each coil are housed in the same shield can with the coil except the oscillator trimmers, these are air dielectric condensers and are mounted on the chassis. These trimmers are used for aligning the high frequency end of each band. The location of the various trimmers is shown in Figure 1.

The oscillator, adjustable, series padding condensers are used for tracking the oscillator at the low frequency end of each band. The padding condensers may be adjusted from the top of the chassis through the holes indicated in Figure 1. Since a fixed mica padding condenser is employed on the short wave band, no adjustment is necessary. While making padding condenser adjustments, the gang condenser should be rotated back and forth across the signal to insure adjustment to the peak of greatest intensity.

DIAL ADJUSTMENT

Before making any radio frequency alignment adjustments, close the variable tuning condenser (maximum capacity), loosen the screw that secures the dial pointer, place the pointer in a horizontal position (gang condenser still closed) and then tighten the screw.

POLICE BAND

- 1.- Turn the band selector switch to the police band (center) position.
- 2.- Tune the receiver to 6 megacycles.
- 3.- Supply a 6 megacycle signal from the signal generator to the antenna lead of the receiver through a 400 ohm carbon resistor (dummy antenna), connected in series with the signal generator lead.
- 4.- Adjust the police band oscillator trimmer condenser (Figure 1) for maximum output with minimum input from the signal generator, then adjust the police band radio frequency and antenna stage trimmers for maximum output.
- 5.- Tune the receiver to 2.5 megacycles.
- 6.- Supply a 2.5 megacycle signal to the receiver through the same connections used on the previous adjustment.
- 7.- Adjust the police band oscillator padding condenser (top of chassis, see Figure 1) for maximum output with minimum input from the signal generator, at the same time rocking the tuning condenser back and forth across the signal to insure the peak of greatest intensity.
- 8.- Check at 6 megacycles and then at 2.5 megacycles and make any adjustments that are necessary to obtain satisfactory calibration.

BROADCAST BAND

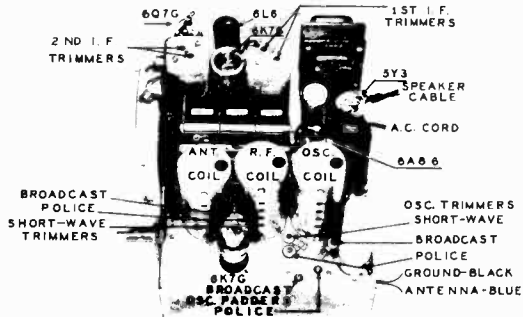
- 1.- Turn the band selector switch to the broadcast (counter-clockwise) position.
- 2.- Tune the receiver to 1500 kilocycles.
- 3.- Supply a 1500 kilocycle signal from the signal generator to the antenna lead of the receiver through a standard dummy antenna or a 200 Mfd. (.0002 Mfd.) condenser, connected in series with the signal generator lead.
- 4.- Adjust the broadcast band oscillator trimmer condenser (Figure 1) for maximum output with minimum input from the signal generator. Then adjust the broadcast band radio frequency and antenna stage trimmers for maximum output.
- 5.- Tune the receiver to 600 kilocycles.
- 6.- Supply a 600 kilocycle signal to the antenna of the receiver through the same connections as previously used.
- 7.- Adjust the broadcast band oscillator padding condenser (top of the chassis, see Figure 1) for maximum output with minimum input from the signal generator, at the same time rocking the tuning condenser back and forth across the signal to insure the peak of greatest intensity.
- 8.- Check at 1500 kilocycles and then at 600 kilocycles. Make any adjustments that are necessary to obtain satisfactory calibration.

SHORT WAVE BAND

- 1.- Turn the band selector switch to the short wave (clockwise) position.
- 2.- Tune the receiver to 20 megacycles.
- 3.- Supply a 20 megacycle signal from the signal generator to the antenna lead of the receiver through a 400 ohm carbon resistor (dummy antenna), connected in series with the signal generator lead.
- 4.- Adjust the short wave band oscillator trimmer condenser (Figure 1) for maximum output with minimum input from the signal generator. Then adjust the short wave band antenna and radio frequency stage trimmers for maximum output, at the same time rocking the tuning condenser back and forth across the signal to insure the peak of greatest intensity.
- 5.- The 8 megacycle signal should be received near 8 megacycles on the dial. If this is not the case check the oscillator tube, switch connections, the fixed padding condenser and the coils. No adjustment is required at this point.

WARNING

The image signal should be received at approximately 19 megacycles on the dial. If not, the oscillator has been aligned to the image frequency and the oscillator trimmer condenser must be backed out until the correct signal is received at 20 megacycles and the image at approximately 19 megacycles. If readjustment is found necessary, the antenna and radio frequency stage trimmers should also be checked again.



COLOR CODES

FIRST	SECOND
I. F. TRANSFORMER	I. F. TRANSFORMER
Plate Blue	Plate Blue
"B" Plus Red	"B" Plus Red
Grid Return Black	Diode Return Black
Grid (Top) Green	Diodes Green

STANDARD RMA

RESISTOR AND CONDENSER COLOR CODE

0 Black	2 Red	4 Yellow	6 Blue	8 Grey
1 Brown	3 Orange	5 Green	7 Purple	9 White

RESISTORS

The BODY COLOR represents the FIRST FIGURE of the resistance value
The END COLOR represents the SECOND FIGURE of the resistance value
The DOT COLOR represents the NUMBER OF CIPHERS following the first two figures

MICA CONDENSERS

(Capacity in Micro-Microfarads)

The FIRST DOT on the condenser represents the FIRST FIGURE of the capacity
The SECOND DOT on the condenser represents the SECOND FIGURE of the capacity
The THIRD DOT on the condenser represents the NUMBER OF CIPHERS following the first two figures.
The colors on the condensers should be read from left to right with the condenser in an upright position.

POWER TRANSFORMER

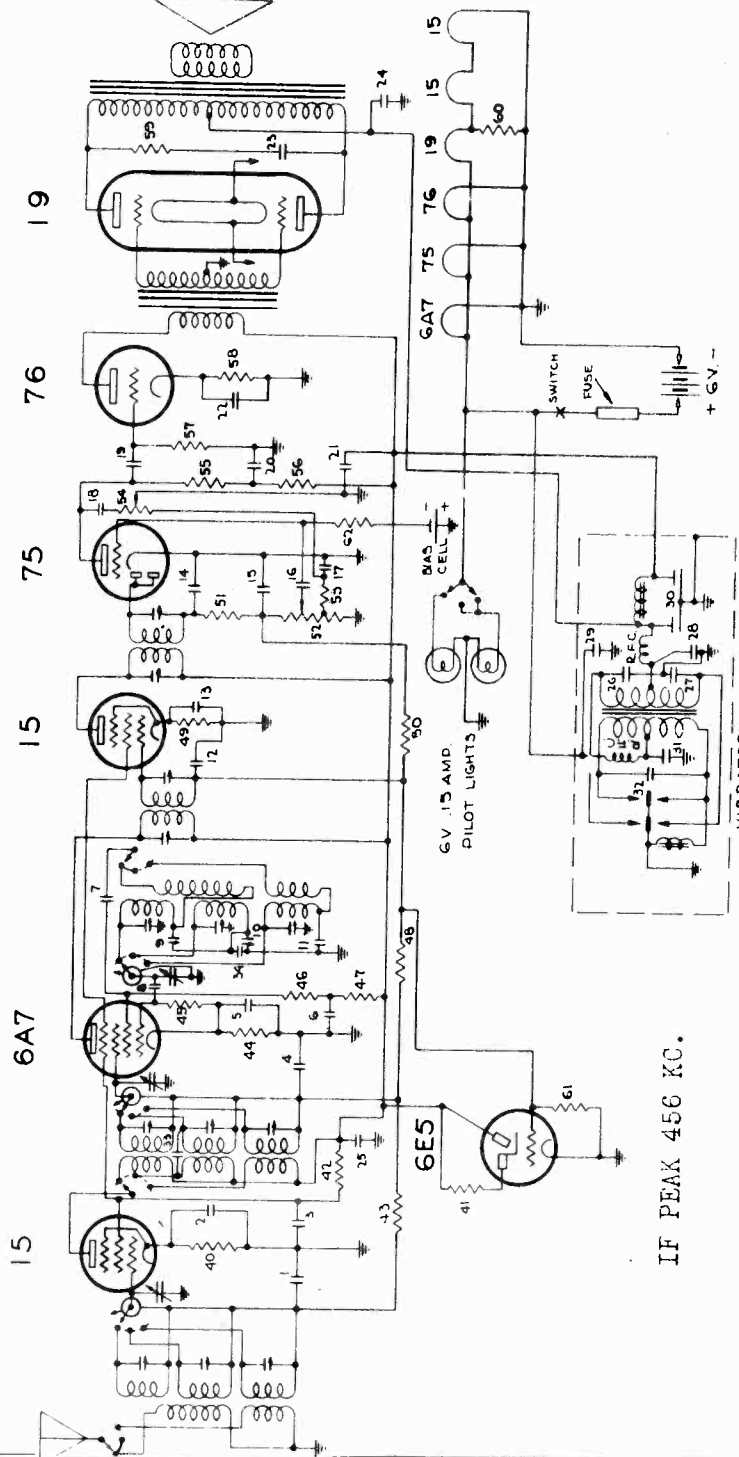
Lead Color	Voltage
Black	115 Volt Primary
Green	6.3 Volt Filament
Yellow	5.0 Volt Filament
Red	High Voltage Sec.
Red & White	High Voltage C.T.

FAIRBANKS, MORSE & CO.

MODELS 73C3B, 73T3B
Chassis 73
Schematic, Voltage
Resistance

OHMS	VOLTS	VOLTS	OHMS	OHMS	VOLTS	VOLTS	OHMS
300M	150	70	500M	0	100	0	1-MEG.
0	2	0	450	0	70	-1.2	50M
			0	4	150	0	200
			500M		0		500M
500M	-0.5	-0.5	750M	300M	45	5	1-M
750M	55	0	0	0	0	6	3.5
0	0	6	3.5				

OHMS	VOLTS	VOLTS	OHMS
0	70	0	1-MEG.
		.9	
100	150	2	
	4		
250	0	0	250
200M	155	155	200M
3.5	6	4	100



IF PEAK 456 KC.

RESISTORS

40 - 500 ohms	50 - 1 megohm
41 - 1 megohm	51 - 50M ohms
42 - 25M ohms	52 - 500M ohms
43 - 50 ohms	53 - 3M ohms
44 - 150 ohms	54 - 500M ohms
45 - 50M ohms	55 - 250M ohms
46 - 10M ohms	56 - 250M ohms
47 - 10M ohms	57 - 500M ohms
48 - 500M ohms	58 - 1M ohms
49 - 500 ohms	59 - 10M ohms
60 - 100 ohms	
61 - 2 megohms	
62 - 500M ohms	

CONDENSERS

11 - .004 mfd	21 - .25 mfd
12 - .05 mfd	22 - 10 mfd
13 - .05 mfd	23 - .01 mfd
14 - .0001 mfd	24 - .25 mfd
15 - .0001 mfd	25 - .1 mfd
16 - .01 mfd	26 - .01 mfd
17 - .1 mfd	27 - .01 mfd
18 - .03 mmfd	28 - .1 mfd
19 - .01 mfd	29 - .05 mfd
20 - .1 mfd	30 - Dual 8 mfd
31 - .5 mfd	
32 - .25 mfd	
33 - 10 mfd	
34 - 300 mmfd	

MODELS 73C3B, 73T3B

Chassis 73

Socket, Trimmers

Alignment, Data

FAIRBANKS, MORSE & CO.

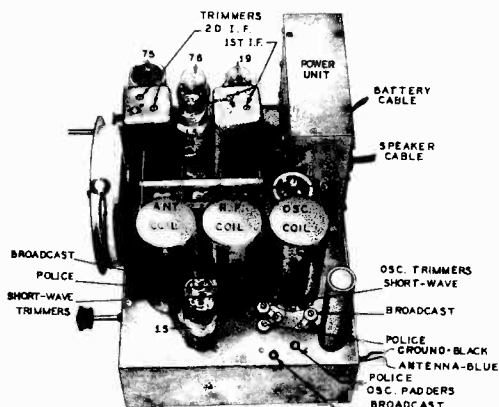


FIGURE 3
TOP VIEW OF THE MODEL 73 CHASSIS

INTERMEDIATE FREQUENCY ALIGNMENT

- 1.- Turn the gang condenser to maximum capacity (fully meshed). Set the band selector switch on the broadcast position.
- 2.- Supply a 456 kilocycle signal from the signal generator to the grid of the first detector tube (6A7) through a .1 Mfd. condenser connected in series with the signal generator lead.
- 3.- Adjust the four trimmers of the two intermediate frequency transformers (see Figure 3) for maximum output with minimum input from the service oscillator.

RADIO FREQUENCY ALIGNMENT

The parallel or high frequency trimmer condensers for each coil are housed in the same shield can with the coil except the oscillator trimmers, these are air dielectric condensers and are mounted on the chassis. These trimmers are used for aligning the high frequency end of each band. The location of the various trimmers is shown in Figure 3.

The oscillator, adjustable, series padding condensers are used for tracking the oscillator at the low frequency end of each band. The padding condensers may be adjusted from the top of the chassis through the holes indicated in Figure 3. Since a fixed mica padding condenser is employed on the short wave band, no adjustment is necessary. While making padding condenser adjustments, the gang condenser should be rotated back and forth across the signal to insure adjustment to the peak of greatest intensity.

DIAL ADJUSTMENT

Before making any radio frequency alignment adjustments, close the variable tuning condenser (maximum capacity), loosen the screw that secures the dial pointer, place the pointer in a horizontal position (gang condenser still closed) and then tighten the screw.

POLICE BAND

- 1.- Turn the band selector switch to the police band (center) position.
- 2.- Tune the receiver to 6 megacycles.
- 3.- Supply a 6 megacycle signal from the signal generator to the antenna lead of the receiver through a 400 ohm carbon resistor (dummy antenna), connected in series with the signal generator lead.
- 4.- Adjust the police band oscillator trimmer condenser (Figure 3) for maximum output with minimum input from the signal generator, then adjust the police band radio frequency and antenna stage trimmers for maximum output.
- 5.- Tune the receiver to 2.5 megacycles.
- 6.- Supply a 2.5 megacycle signal to the receiver through the same connections used on the previous adjustment.
- 7.- Adjust the police band oscillator padding condenser (top of chassis, see Figure 3) for maximum output with minimum input from the signal generator, at the same time rocking the tuning condenser back and forth across the signal to insure the peak of greatest intensity.
- 8.- Check at 6 megacycles and then at 2.5 megacycles and make any adjustments that are necessary to obtain satisfactory calibration.

BROADCAST BAND

- 1.- Turn the band selector switch to the broadcast (counter-clockwise) position.
- 2.- Tune the receiver to 1500 kilocycles.
- 3.- Supply a 1500 kilocycle signal from the signal generator to the antenna lead of the receiver through a standard dummy antenna or a 200 Mfd. (.0002 Mfd.) condenser, connected in series with the signal generator lead.

- 4.- Adjust the broadcast band oscillator trimmer condenser (Figure 3) for maximum output with minimum input from the signal generator. Then adjust the broadcast band radio frequency and antenna stage trimmers for maximum output.
- 5.- Tune the receiver to 600 kilocycles.
- 6.- Supply a 600 kilocycle signal to the antenna of the receiver through the same connections as previously used.
- 7.- Adjust the broadcast band oscillator padding condenser (top of chassis, see Figure 3) for maximum output with minimum input from the signal generator, at the same time rocking the tuning condenser back and forth across the signal to insure the peak of greatest intensity.
- 8.- Check at 1500 kilocycles and then at 600 kilocycles. Make any adjustments that are necessary to obtain satisfactory calibration.

SHORT WAVE BAND

- 1.- Turn the band selector switch to the short wave (clockwise) position.
- 2.- Tune the receiver to 20 megacycles.
- 3.- Supply a 20 megacycle signal from the signal generator to the antenna lead of the receiver through a 400 ohm carbon resistor (dummy antenna), connected in series with the signal generator lead.
- 4.- Adjust the short wave band oscillator trimmer condenser (Figure 3) for maximum output with minimum input from the signal generator. Then adjust the short wave band antenna and radio frequency stage trimmers for maximum output, at the same time rocking the tuning condenser back and forth across the signal to insure the peak of greatest intensity.
- 5.- The 8 megacycle signal should be received near 8 megacycles on the dial. If not, the oscillator has been aligned to the image frequency and the oscillator trimmer condenser must be backed out until the correct signal is received at 20 megacycles and the image at approximately 19 megacycles. If readjustment is found necessary, the antenna and radio frequency stage trimmers should also be checked again.

WARNING

The image signal should be received at approximately 19 megacycles on the dial. If not, the oscillator has been aligned to the image frequency and the oscillator trimmer condenser must be backed out until the correct signal is received at 20 megacycles and the image at approximately 19 megacycles. If readjustment is found necessary, the antenna and radio frequency stage trimmers should also be checked again.

SUGGESTED SERVICE PROCEDURE

If the receiver does not operate properly, test all tubes in a reliable tube tester or, better still, replace the tubes in the receiver, one by one, with tubes known to be good. Care must be exercised to see that the switch is turned off before any tubes are removed from the receiver, since some of them are two volt tubes, while others are six volt tubes, their filaments being connected in a series parallel arrangement. If, after replacing any defective tubes, the receiver is still inoperative, remove the chassis from the cabinet and conduct a careful resistance and voltage analysis.

The voltage and resistance charts in this manual give detailed information regarding the resistance from various points to various other points in the chassis. The measured voltage from the various tube socket contacts to ground is also given. When these charts are followed faithfully, little difficulty should be experienced in finding almost any fault that may develop.

NOTE - All adjustments should be made with the volume control "full on". Any desired variation in signal strength should be obtained by adjusting the output of the signal generator.

FUSE

In case of difficulty, the fuse located in a metal cartridge near the end of the positive (red) battery lead should be checked. A 15 ampere fuse, FAIRBANKS-MORSE part number 5605, should be used for replacement purposes.

BATTERY

A storage battery having a capacity of at least 135 ampere hours should be used with the receiver. The storage battery should be located as far from the chassis of the receiver as the battery cables will permit. Attach the long, red lead from the receiver to the positive (+) side of the storage battery. Attach the long, black lead from the receiver to the negative (-) side of the battery.

POWER TRANSFORMERS

Lead Color	Voltage
Black	115V. Primary
Green	6.3V. Filament
Yellow	5.0V. Filament
Red	High Voltage Sec.
Red and White	High Voltage C.T.

FIRST

I. F. TRANSFORMER

Plate	Blue
"B" Plus	Red
Grid Return	Black
Grid (Top)	Green

COLOR CODES

SECOND

I. F. TRANSFORMER

Plate	Blue
"B" Plus	Red
Diode Return	Black
Diodes	Green

Schematic, Voltage Resistance

FAIRBANKS, MORSE & CO.

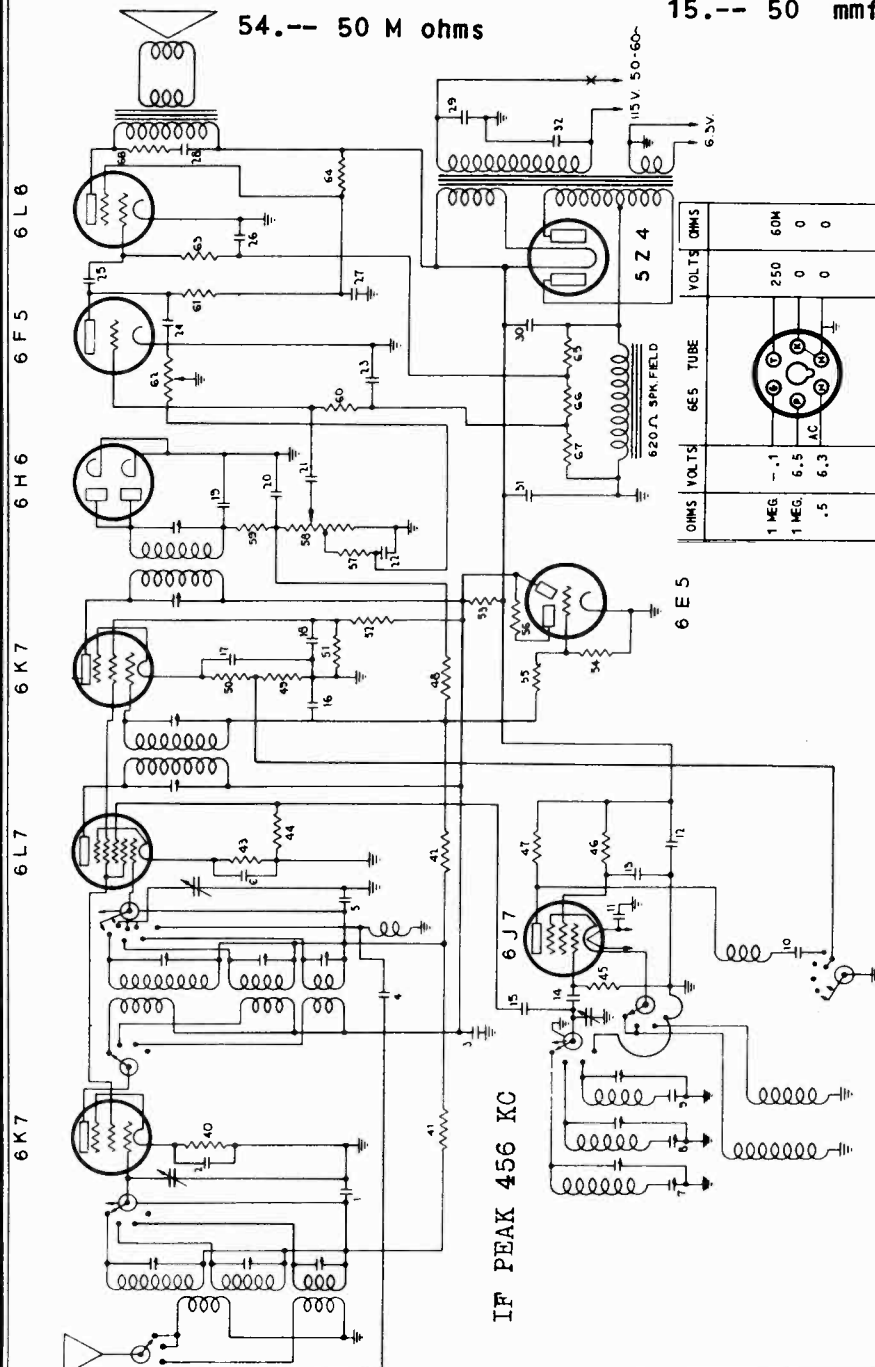
MODELS 91C4, 91C5, 91T4
Chassis 91

RESISTORS

CONDENSERS

- 40.--- 300 M ohms
- 41.--- 50 M ohms
- 42.--- 500 M ohms
- 43.--- 500 ohms
- 44.--- 50 M ohms
- 45.--- 50 M ohms
- 46.--- 2 M ohms
- 47.--- 10 M ohms
- 48.--- 1 megohm
- 49.--- 2 M ohms
- 50.--- 300 ohms
- 51.--- 50 M ohms
- 52.--- 500 M ohms
- 53.--- 500 ohms
- 54.--- 50 M ohms
- 55.--- 1 megohm
- 56.--- 1 megohm
- 57.--- 3 M ohms
- 58.--- 500 M ohms
- 59.--- 50 M ohms
- 60.--- 500 M ohms
- 61.--- 250 M ohms
- 62.--- 500 M ohms
- 63.--- 250 M ohms
- 64.--- 10 M ohms
- 65.--- 2 megohms
- 66.--- 400 M ohms
- 67.--- 40 M ohms
- 68.--- 5 M ohms

- 1.--- .05 mfd.
- 2.--- .05 mfd.
- 3.--- .1 mfd.
- 4.--- 100 mfd.
- 5.--- .05 mfd.
- 6.--- .05 mfd.
- 7.--- 750 mmfd.
- 8.--- 1800 mmfd.
- 9.--- .004 mfd.
- 10.--- 200 mmfd.
- 11.--- 500 mmfd.
- 12.--- .1 mfd.
- 13.--- 500 mmfd.
- 14.--- 100 mmfd.
- 15.--- 50 mmfd.
- 16.--- .05 mfd.
- 17.--- .05 mfd.
- 18.--- .1 mfd.
- 19.--- 100 mmfd.
- 20.--- 100 mmfd.
- 21.--- .01 mfd.
- 22.--- .1 mfd.
- 23.--- .25 mfd.
- 24.--- .03 mfd.
- 25.--- .01 mfd.
- 26.--- .25 mfd.
- 27.--- 4 mfd.
- 28.--- .02 mfd.
- 29.--- .01 mfd.
- 30.--- 16 mfd.
- 31.--- 30 mfd.
- 32.--- .01 mfd.



6K7 TUBE		6L7 TUBE		6K7 TUBE		6E5 TUBE		6H6 TUBE		6F5 TUBE		6L6 TUBE		5Z4 TUBE	
OHMS	VOLTS	OHMS	VOLTS	OHMS	VOLTS	OHMS	VOLTS	OHMS	VOLTS	OHMS	VOLTS	OHMS	VOLTS	OHMS	VOLTS
50M	130	3.6	0	50M	300	0	0	0	0	0	0	660	-90	660	-90
60M	250	0	2 MEG.	2 MEG.	175	-2.2	50M	265	275	6.3	0	60M	310	60M	310
.5	6.3	0	0	0	0	AC	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	3.6	300	5.5	500	0	1	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	8.5	2300	-35	500M	0	500M	120	0	0	0	0	0	0	0
0	0	0	1 MEG.	0	0	0	0	0	0	0	0	0	0	0	0
0	0	6.3	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	8.5	2300	0	0	0	0	0	0	0	0	0	0	0	0

MODELS 91C4, 91C5, 91T4

Chassis 91

Socket, Trimmers

Alignment, Data

FAIRBANKS, MORSE & CO.

NOTE - All adjustments should be made with the volume control "full on". Any desired variation in signal strength should be obtained by adjusting the output of the signal generator.

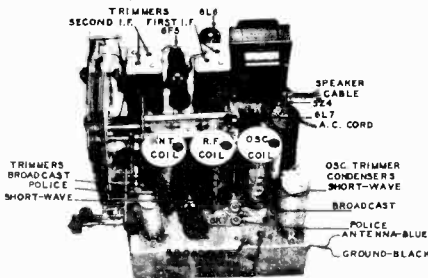


FIGURE 4
TOP VIEW OF THE MODEL 91 CHASSIS

INTERMEDIATE FREQUENCY ALIGNMENT

- 1.- Turn the gang condenser to maximum capacity (fully meshed). Band switch on broadcast position.
- 2.- Supply a 456 kilocycle signal from the signal generator to the grid of the first detector tube through a .1 Mfd. condenser connected in series with the signal generator lead.
- 3.- Adjust the four trimmers of the two intermediate frequency transformers (see Figure 4) for maximum output with minimum input from the service oscillator.

RADIO FREQUENCY ALIGNMENT

The parallel or high frequency trimmer condensers for each coil are housed in the same shield can with the coil, with the exception of the oscillator trimmers, these are air dielectric condensers and are mounted on the chassis. These trimmers are used for aligning the high frequency end of each band. The location of the various trimmers is shown in Figure 4.

The oscillator, adjustable, series padding condensers are used for tracking the oscillator at the low frequency end of each band. The padding condensers may be adjusted from the top of the chassis through the holes indicated in Figure 4. Since a fixed mica padding condenser is employed on the short wave band, no adjustment is necessary. While making padding condenser adjustments, the gang condenser should be rotated back and forth across the signal to insure adjustment to the peak of greatest intensity.

BROADCAST BAND

- 1.- Turn the band selector switch to the broadcast (clockwise) position.
- 2.- Tune the receiver to 1500 kilocycles.
- 3.- Supply a 1500 kilocycle signal from the signal generator to the antenna lead of the receiver through a standard dummy antenna or a 200 Mmfd. (.0002 Mfd.) condenser, connected in series with the signal generator lead.
- 4.- Adjust the broadcast band oscillator trimmer condenser (Figure 4) for maximum output with minimum input from the signal generator. Then adjust the broadcast band radio frequency and antenna stage trimmers for maximum output.
- 5.- Tune the receiver to 600 kilocycles.
- 6.- Supply a 600 kilocycle signal to the antenna of the receiver through the same connections as previously used.
- 7.- Adjust the broadcast band oscillator padding condenser (top of chassis, see Figure 4) for maximum output with minimum input from the signal generator, at the same time rocking the tuning condenser back and forth across the signal to insure the peak of greatest intensity.
- 8.- Check at 1500 kilocycles and then at 600 kilocycles. Make any adjustments that are necessary to obtain satisfactory calibration.

POLICE BAND

- 1.- Turn the band selector switch to the police band (center) position.
- 2.- Tune the receiver to 5.4 megacycles.
- 3.- Supply a 5.4 megacycle signal from the signal generator to the antenna lead of the receiver through a 400 ohm carbon resistor (dummy antenna), connected in series with the signal generator lead.
- 4.- Adjust the police band oscillator trimmer condenser (Figure 4) for maximum output with minimum input from the signal generator, then adjust the police band radio frequency and antenna stage trimmers for maximum output.
- 5.- Tune the receiver to 1.8 megacycles.
- 6.- Supply a 1.8 megacycle signal to the receiver through the same connections used on the previous adjustment.

- 7.- Adjust the police band oscillator padding condenser (top of chassis, see Figure 4) for maximum output with minimum input from the signal generator, at the same time rocking the tuning condenser back and forth across the signal to insure the peak of greatest intensity.

- 8.- Check at 5.4 megacycles and then at 1.8 megacycles and make any adjustments that are necessary to obtain satisfactory calibration.

SHORT WAVE BAND

- 1.- Turn the band selector switch to the shortwave (clockwise) position.
- 2.- Tune the receiver to 18 megacycles.
- 3.- Supply an 18 megacycle signal from the signal generator to the antenna lead of the receiver through a 400 ohm carbon resistor (dummy antenna), connected in series with the signal generator lead.
- 4.- Adjust the short wave band oscillator trimmer condenser (in Figure 4) for maximum output with minimum input from the signal generator. Then adjust the short wave band antenna and radio frequency stage trimmers for maximum output, at the same time rocking the tuning condenser back and forth across the signal to insure the peak of greatest intensity.
- 5.- The 6 megacycle signal should be received near 6 megacycles on the dial. If the signal is not received check the oscillator tube, switch connections, the fixed padding condenser and the coils. No adjustment is required at this point.
- 6.- Check and, if necessary, readjust all three stages for maximum output with minimum input from the signal generator.

WARNING

The image signal should be received at approximately 17 megacycles on the dial. If not, the oscillator has been aligned to the image frequency and the oscillator trimmer condenser must be backed out until the correct signal is received at 18 megacycles and the image at approximately 17 megacycles. If readjustment is found necessary, the antenna and radio frequency stage trimmers should also be checked again.

ULTRA SHORT WAVE BAND

No adjustment is required on this band. If signals are not properly received check the oscillator tube, switch contacts, the fixed padding condenser, and the coils.

COLOR CODES

FIRST	SECOND
I. F. TRANSFORMER	I. F. TRANSFORMER
Plate Blue	Plate Blue
"B" Plus Red	"B" Plus Red
Grid Return Black	Diode Return Black
Grid (Top) Green	Diodes Green

STANDARD RMA

RESISTOR AND CONDENSER COLOR CODE

0 Black	2 Red	4 Yellow	6 Blue	8 Grey
1 Brown	3 Orange	5 Green	7 Purple	9 White

RESISTORS

The BODY COLOR represents the FIRST FIGURE of the resistance value
The END COLOR represents the SECOND FIGURE of the resistance value
The DOT COLOR represents the NUMBER OF CIPHERS following the First two figures

MICA CONDENSERS

(Capacity in Micro-Microfarads)

The FIRST DOT on the condenser represents the FIRST FIGURE of the capacity
The SECOND DOT on the condenser represents the SECOND FIGURE of the capacity
The THIRD DOT on the condenser represents the NUMBER OF CIPHERS following the first two figures.
The colors on the condensers should be read from left to right with the condenser in an upright position.

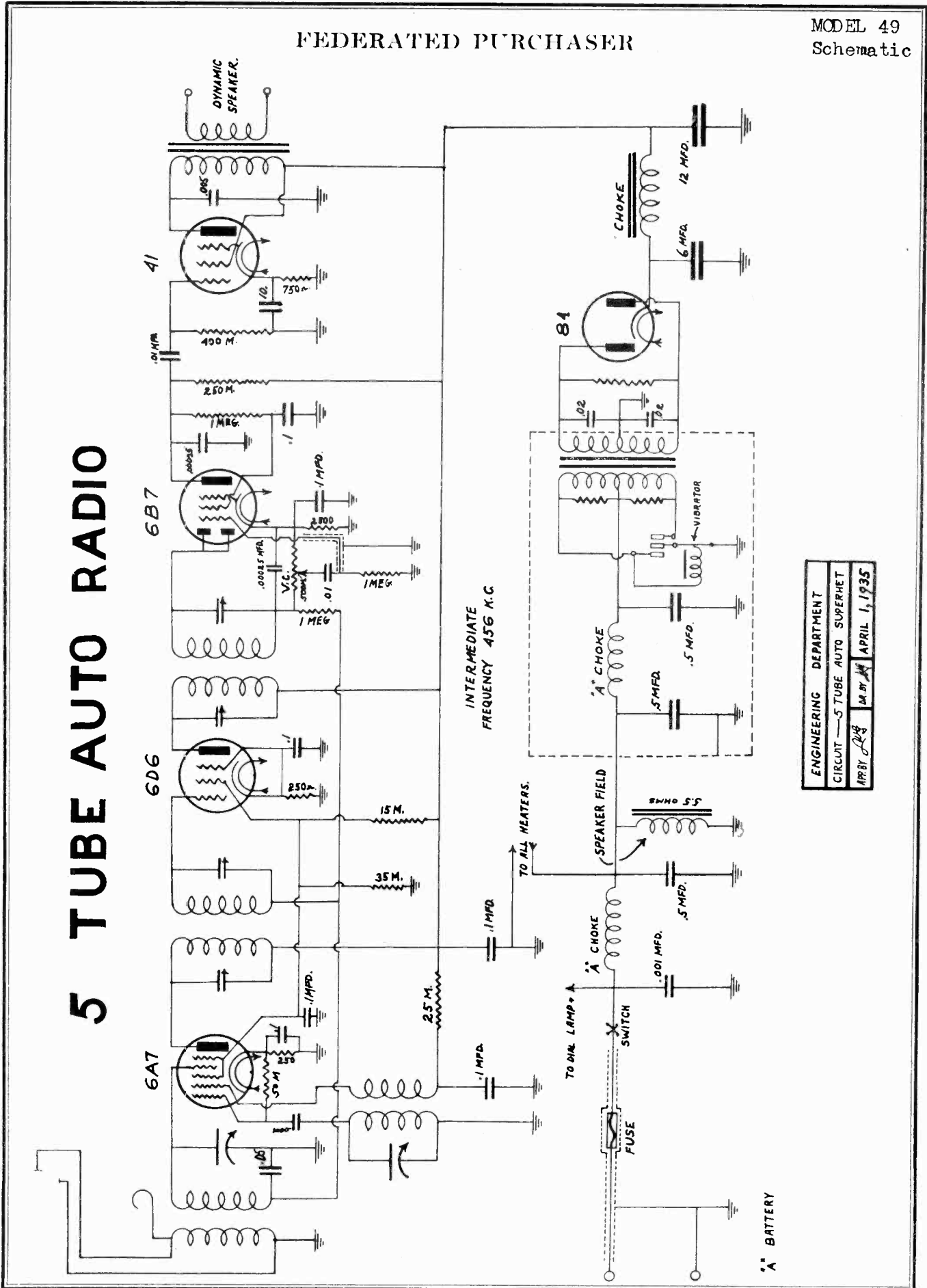
POWER TRANSFORMER

Lead Color	Voltage
Black	115 Volt Primary
Green	6.3 Volt Filament
Yellow	5.0 Volt Filament
Red	High Voltage Sec.
Red & White	High Voltage C.T.

FEDERATED PURCHASER

MODEL 49
Schematic

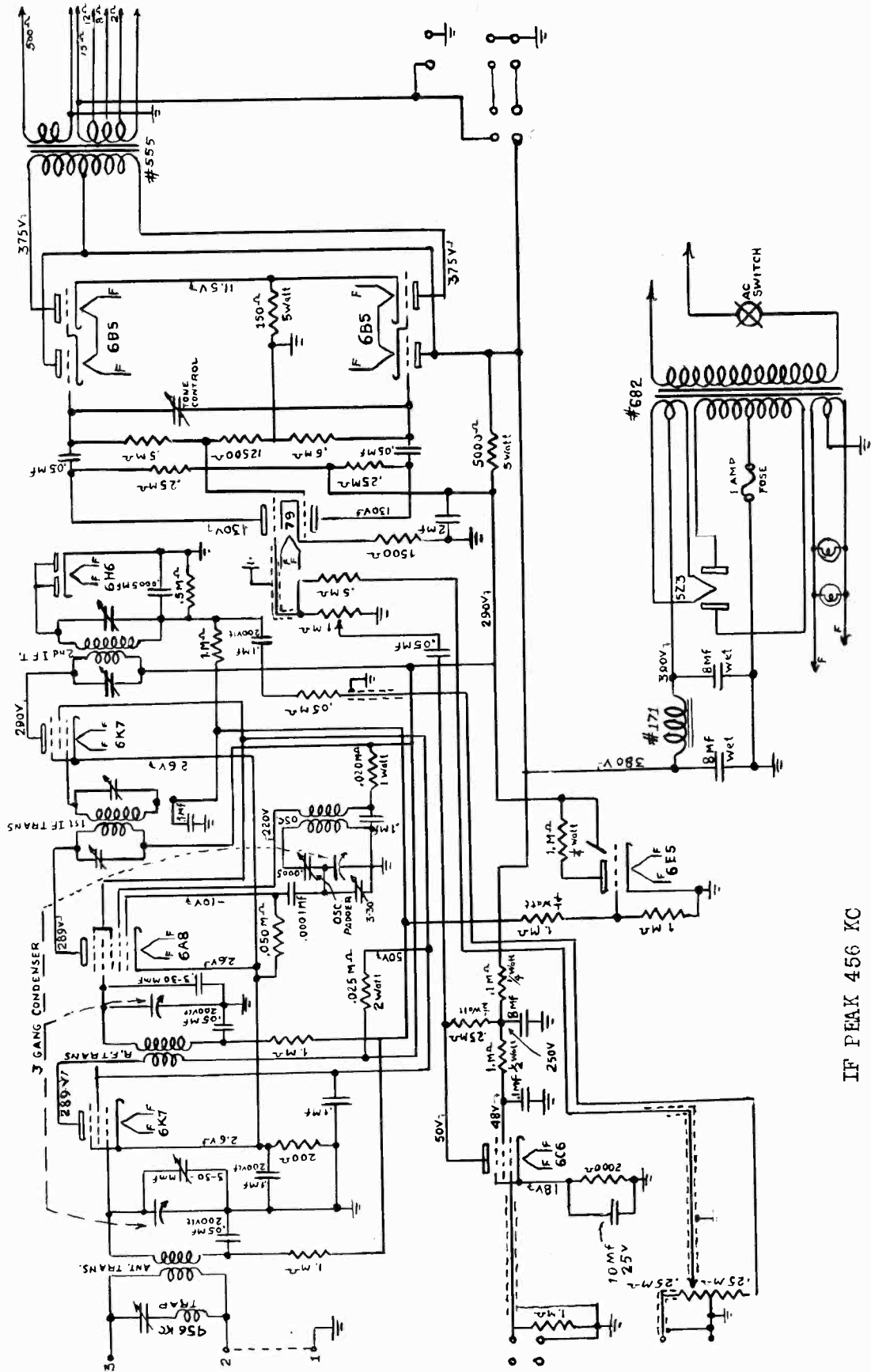
5 TUBE AUTO RADIO



ENGINEERING DEPARTMENT
CIRCUIT — 5 TUBE AUTO SUPERHET
APR BY <i>LS</i> M. BY <i>AM</i> APRIL 1, 1935

MODEL 1940
Schematic

FEDERATED PURCHASER



IF PEAK 456 KC

FIRESTONE

MODEL 7405-1
Schematic, Socket
Notes, Parts

MODEL 7405-1
4 Tube - AC-DC - Receiver
(Airchief)

4-Tube AC-DC Receiver
For Use on 110-115 Volts AC or DC Current Only

This receiver is a four-tube tuned-radio-frequency type which operates on either AC or DC current. It will provide very satisfactory entertainment for those who desire a small set.

First, carefully remove all packing material from the set and around the tubes. See that all tubes are pushed down tightly in the sockets, all grid caps on top of tubes properly connected, and tube shields in place. Test by means of a lamp that there is power at the receptacle you have chosen for your radio, and be sure that the voltage is 110 volts. Connect attachment cord to outlet.

SUPPLY VOLTAGE

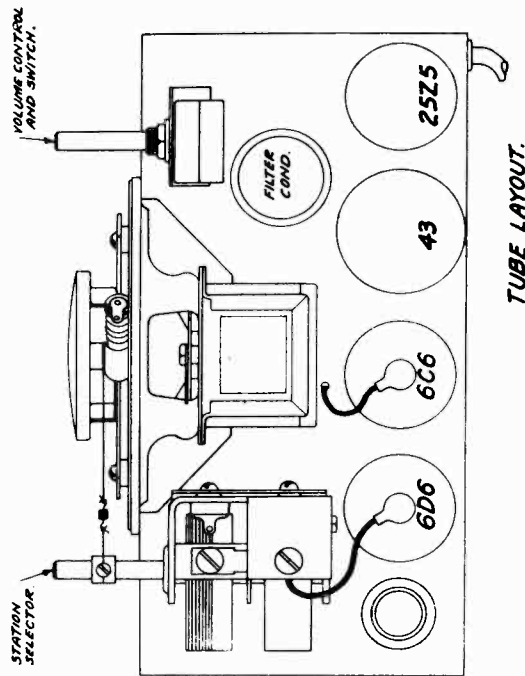
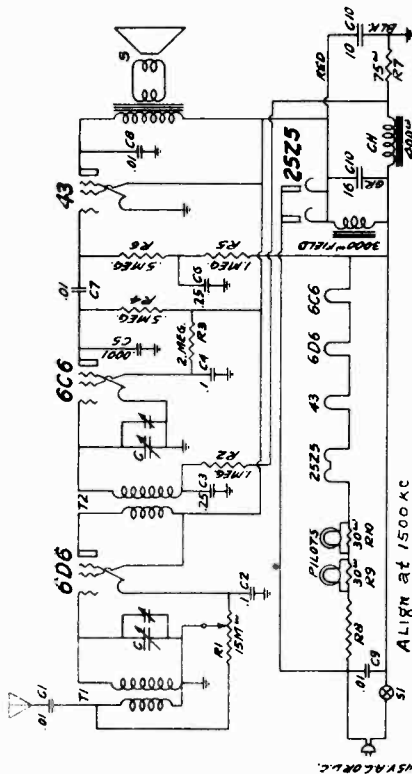
This receiver operates from any 110 volt light socket of any frequency AC or straight DC. When operating on a DC socket, the plug may have to be reversed in the socket to obtain the correct polarity, as it will work only in one position on DC current, but in either position on AC current.

ANTENNA

A 20-foot coil of antenna wire is supplied connected to the receiver. This is usually sufficient for most locations if it is unrolled and laid on the floor or thrown out of window. However, in some buildings of steel construction it may be necessary to use an outside antenna to obtain satisfactory results. Connect it to end of the antenna supplied.

GROUND

No ground connection is necessary. There is no provision made for its use on this set.



REPLACEMENT PARTS LIST

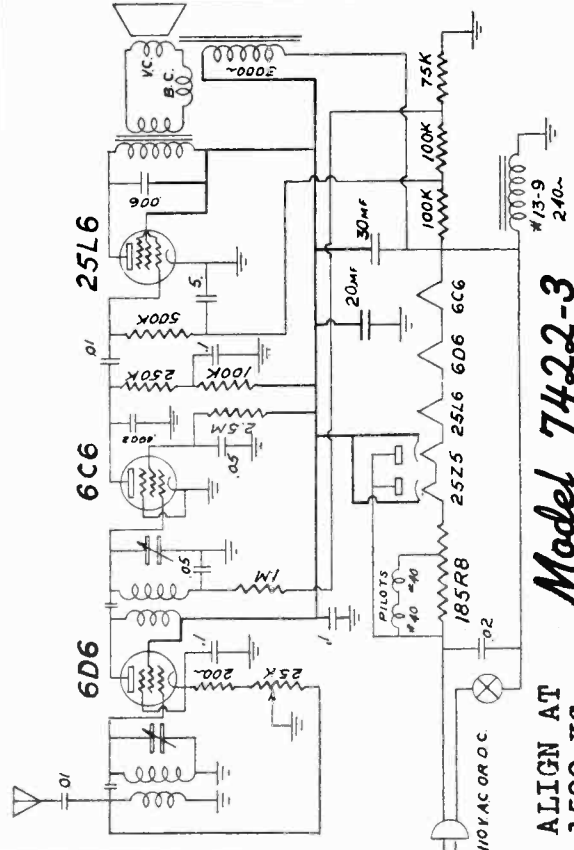
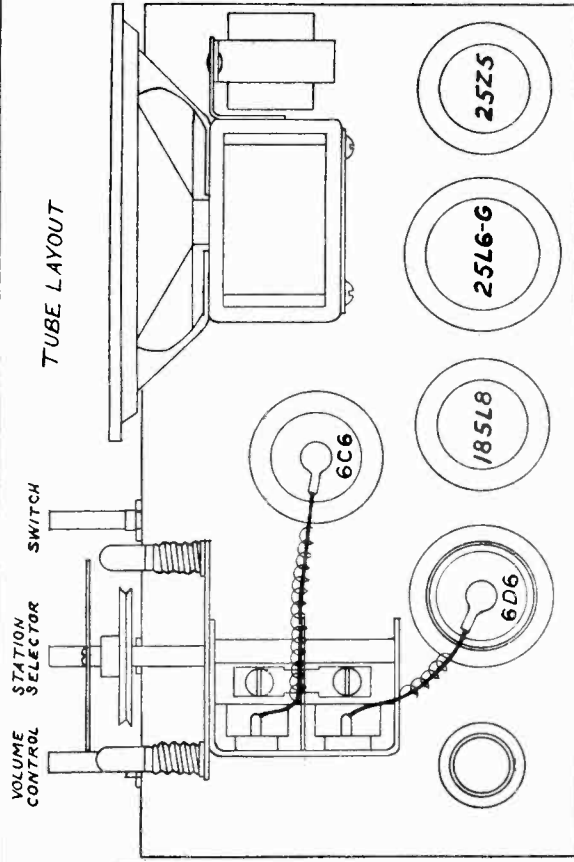
Part #	Description	Letter	Unit Price
3508-A	Antenna Coil	T1	.65
3804-A	R.F. Coil	T2	.65
3003-A	Loud Speaker	B	4.25
5201-C	Choke	CH	.75
5206-A	Tuning Condenser	C	2.06
	Mica Condenser .0001 Mf.	C5	.16
	Tubular Condenser .01 Mf. 200 V.	C1, C7, C8, C9	.10
	" " " 1 Mf. 200 V.	C2, C4	.10
	" " " .25 Mf. 250 V.	CH, C6	.10
4906-A	Filter Condenser 16 & 10 Mf.	C10	1.50
4108-A	Volume Control & Switch	R1, R11	1.06
	Carbon Resistor 1. meg., 1/2 watt	R2, R5	.10
	" " " 2. meg., 1/2 watt	R3	.10
	" " " .5 meg., 1/2 watt	R4, R6	.10
	" " " 75 Ω 1/2 watt	R7	.10
6652-A	Armored Resistor .30 Ω , 3W	R9, R10	.25
4454-A	Resistance Cord	R8	.75
4451-F	Pilot Bulb		.16
4501-D	Antenna Cord		.20

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

TUBE LAYOUT.

MODEL 7422-3
Schematic, Socket
Notes, Parts

FIRESTONE



ALIGN AT
1500 KC

Model 7422-3
"AIR CHIEF"

GENERAL INFORMATION This is a 5-tube tuned radio frequency receiver and operates from either an alternating or a direct current lighting circuit having the usual 110-115 volt terminal potential.

After taking the set out of its carton, be sure that all packing material has been removed. The line cord is un-wound and later inserted in the nearest receptacle. First, however, be sure that the line voltage is of the value mentioned above.

ANTENNA A 20-foot coil of antenna wire is supplied attached to the receiver. This is usually sufficient for most locations if it is unrolled and laid on the floor or dropped out the window. Inside a steel constructed building it may be necessary to erect an outside antenna either up to the roof or on top of it. In localities where signal strengths are low as in rural districts, an outside antenna is always advisable with any radio receiver.

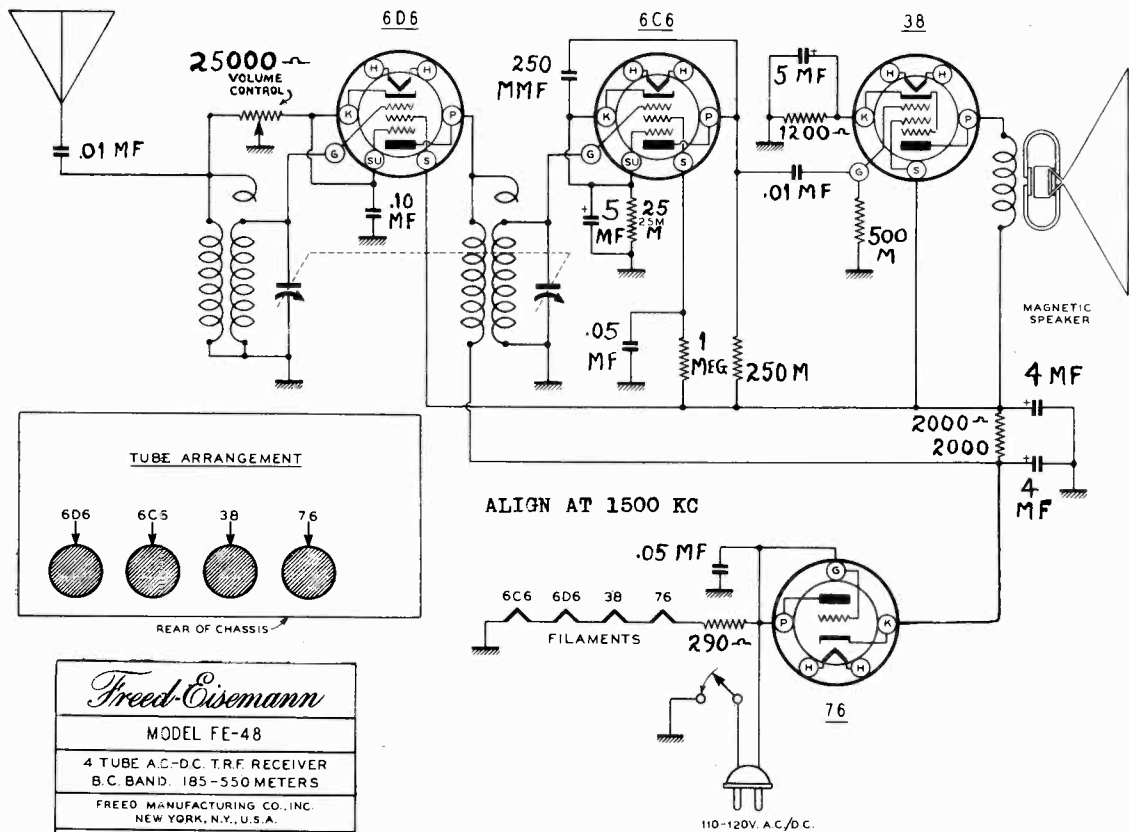
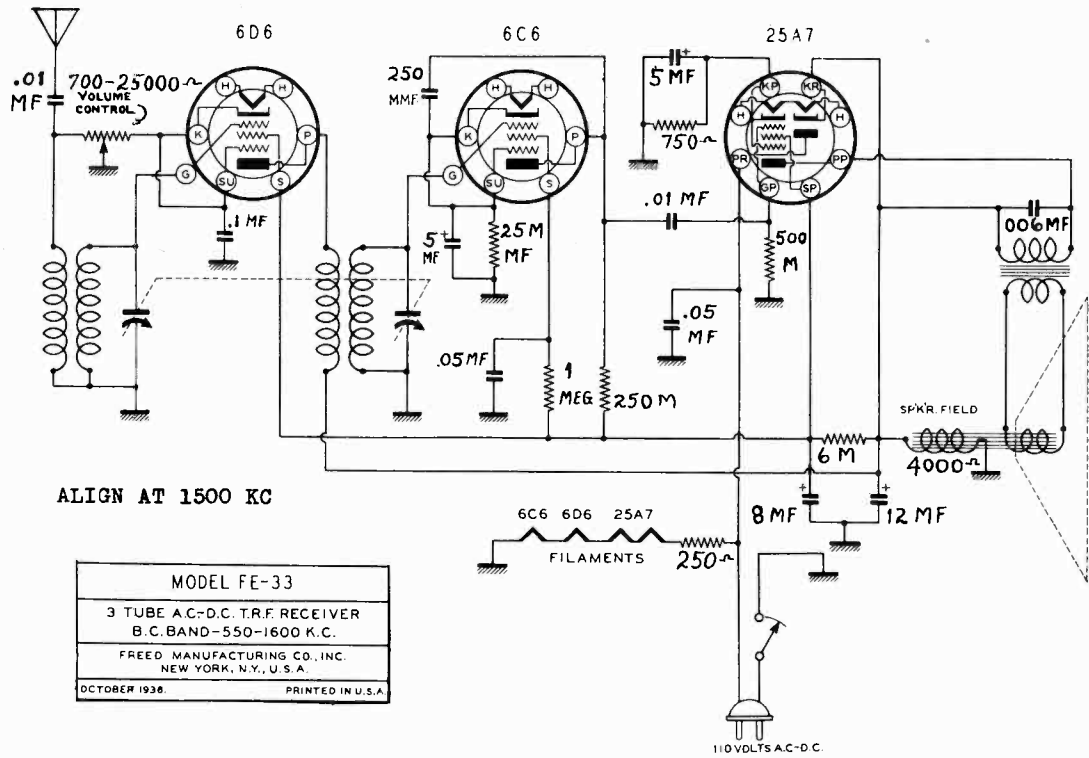
GROUND No ground is needed as set is grounded to the supply circuit internally.
PRICES SUBJECT TO CHANGE WITHOUT NOTICE

REPLACEMENT PARTS LIST

Part No.	Description	Price
5-39	Volume Control	.75
6-3	.01 mfd. 400V condenser	.15
6-7	.02 mfd. 400V condenser	.15
6-12	.05 mfd. 200V condenser	.15
6-21	.006 mfd. 400V condenser	.15
6-24	.1 mfd. 200V condenser	.15
7-27	Electrolytic condenser	1.50
8-29-B	.0002 mfd. mica condenser	.10
10-39	Variable Tuning Condenser	2.15
13-9	Filter Choke	.85
14-18	Switch	.40
15-76	An.enna coil	.65
15-77	R. F. coil	.65
19-F-5	Dial Scale	.50
19-G-13	Dial indicator	.15
34-2	Antenna cord	.20
43-60	Speaker	3.90
46-36	Control Knobs	.10
44-52	Cabinet	6.50
	Resistors 1/4 watt	.10

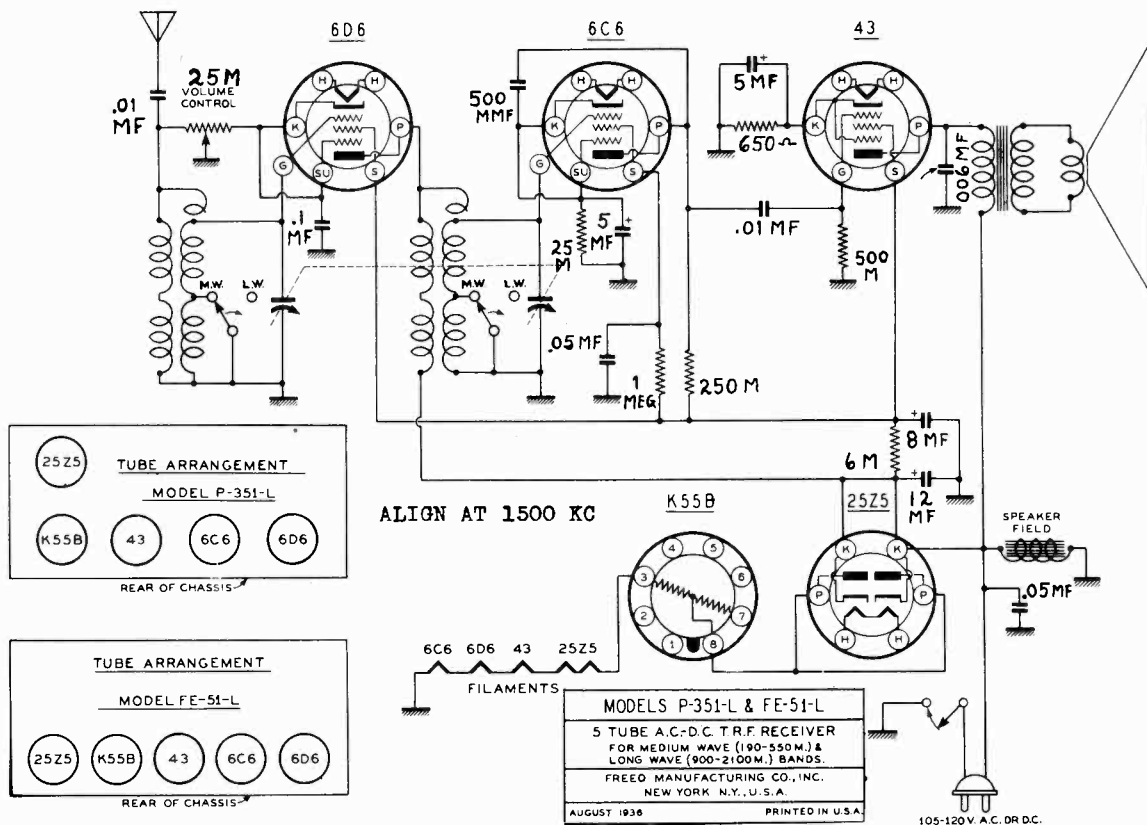
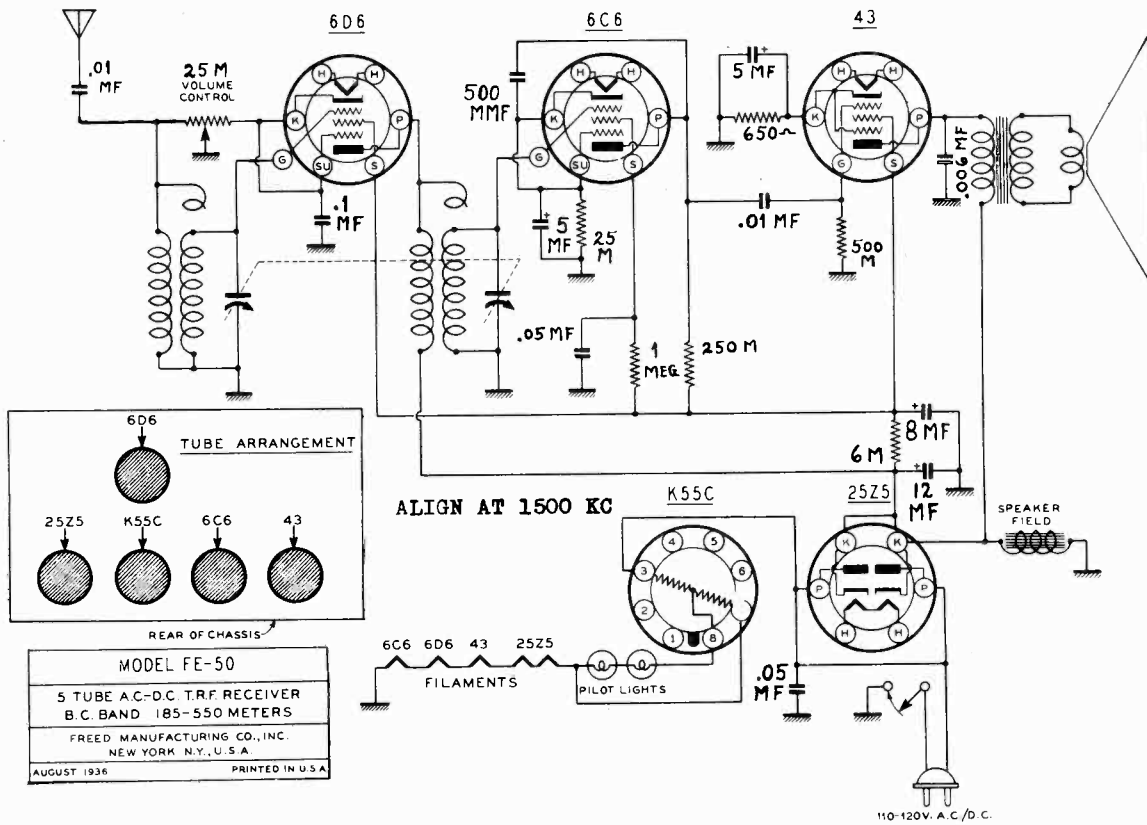
FREED MFG. CO., INC.

MODEL FE33
MODEL FE48
Schematics



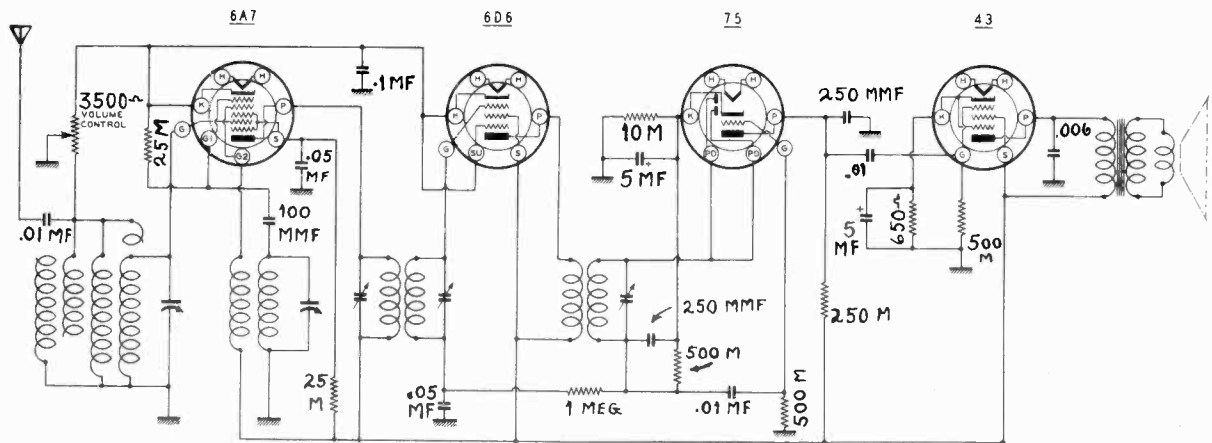
MODEL FE50
 MODELS FE51L, P351L
 Schematics, Sockets

FREED MFG. CO., INC.



MODEL FE60
MODEL FE62
Schematics
Socket

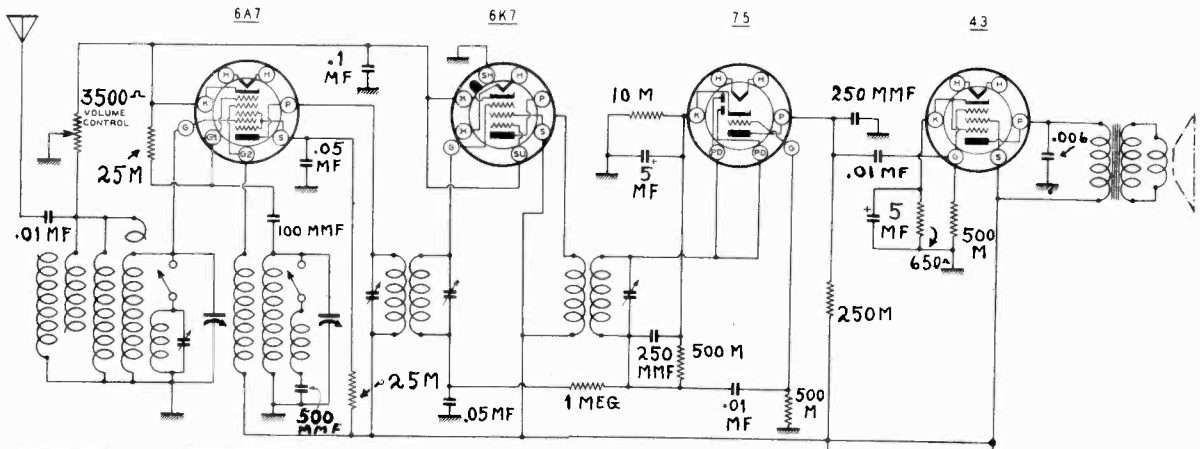
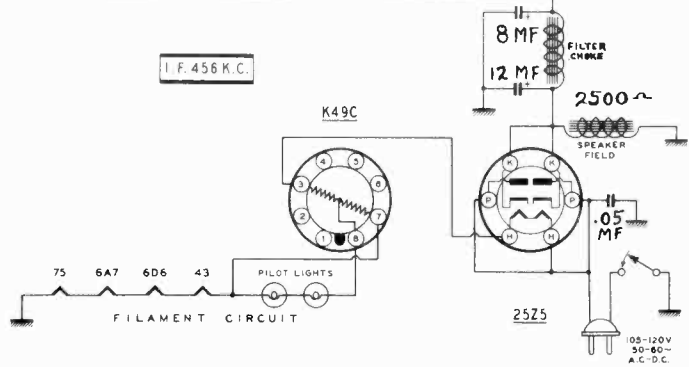
FREED MFG. CO., INC.



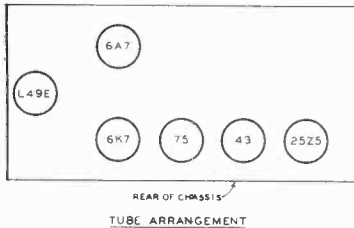
TUBE SOCKETS SHOWN

FOTOM VIEW

<i>Freed-Cosmorn Radio</i>	
MODELS	FE-60
3 TUBE A.C.-D.C. SUPERHETERODYNE B.C. BAND (163-550M)	
FREED MANUFACTURING CO., INC. NEW YORK, N.Y. U.S.A.	
AUGUST 1934	PRINTED IN U.S.A.



TUBE SOCKETS SHOWN
BOTTOM VIEW



<i>Freed-Cosmorn Radio</i>	
MODELS	FE-62
6 TUBE A.C.-D.C. SUPERHETERODYNE 2 BANDS (550-1600 K.C. & 1600-3700 K.C.)	
FREED MANUFACTURING CO., INC. NEW YORK, N.Y. U.S.A.	
AUGUST 1934	PRINTED IN U.S.A.

