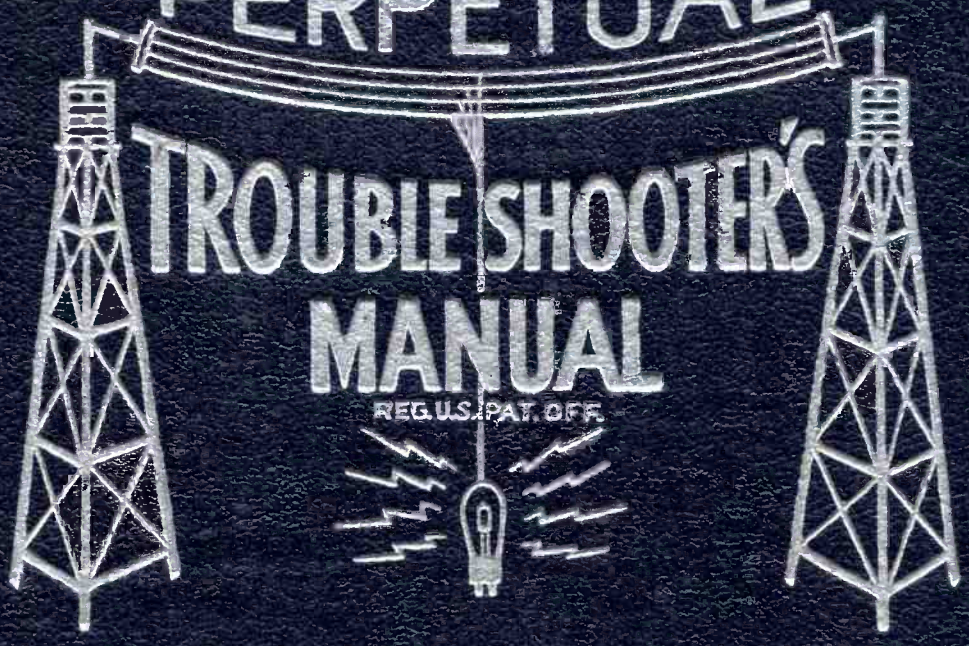
VOLUME VIII

PERPETUAL TROUBLE SHOOTER'S MANUAL

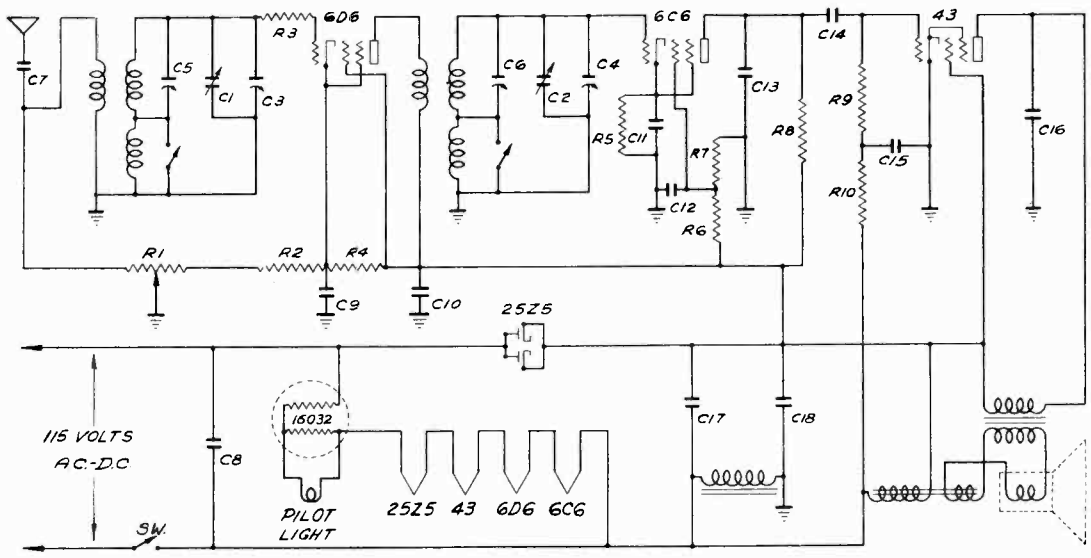
REG. U.S. PAT. OFF.



JOHN F. RIDER

MAJESTIC RADIO & TELEV. CO.

MODEL 50
Schematic, Socket
Trimmers, Voltage
Alignment, Parts



ALIGNMENT PROCEDURE—Correct alignment is of extreme importance. Your receiver is properly aligned at the factory and realignment should not be attempted by the service technician until all other causes of faulty operation are corrected.

In order to properly realign the receiver, the following equipment is necessary.

1. A signal generator which will provide an accurately calibrated signal at any frequency from 540 to 4000 kilocycles. The generator should have a modulated and adjustable signal output.
2. An output audio voltmeter to be connected across the moving coil of the speaker. This meter should be capable of providing a readable deflection for output levels of ½ volt, to avoid the effects of overload.
3. One screw driver; one .25 Mfd. 600 volt condenser; one 100 Mmfd. mica condenser.

BROADCAST BAND 540 TO 1550 KILOCYCLES

1. Connect output meter across loud speaker voice coil.
2. Connect ground or low potential terminal of signal generator to receiver chassis through a .25 Mfd. 600 volt condenser.
3. Connect antenna or high potential terminal of signal generator through a 100 Mmfd mica condenser to antenna lead from the receiver.
4. Adjust signal generator to 1400 kilocycles and 5000 microvolts output.
5. Adjust receiver range indicator to broadcast or "B" band and pointer to 1400 kilocycles.
6. Adjust trimmers C3 and C4 until maximum output is obtained and reduce volume level with volume control to approximately 0 5 volt. Repeat until C3 and C4 cannot be adjusted to give greater output.
7. Turn volume control to clockwise or most sensitive position; reduce output from signal generator; retune receiver and check sensitivity.
8. Check sensitivity at 1000 kilocycles and 550 kilocycles.

POLICE BAND 1550 to 4000 KILOCYCLES

1. Adjust signal generator to 4000 kilocycles.
2. Adjust receiver range indicator to police or "P" band and pointer to 4000 kilocycles.
3. Turn receiver volume control to maximum or extreme clockwise position, and increase signal generator output until a signal is heard.
4. Adjust trimmers C5 and C6 until maximum output is obtained and reduce output from signal generator until receiver output is approximately 0.5 volt. Repeat until C5 and C6 cannot be adjusted to give greater output.
5. Check sensitivity at 2400 kilocycles and 1600 kilocycles.
6. Sensitivity at 1600 kilocycles may be adjusted by moving position of lead from wave switch to chassis.

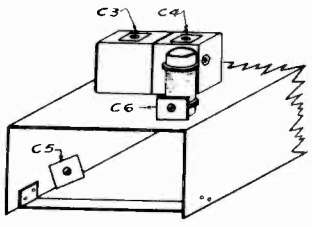


Fig. 2 Location of Trimmers

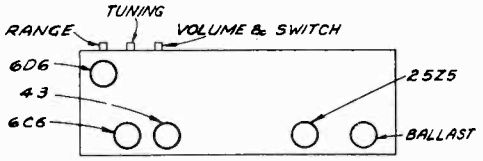


Fig. 1 Tuning Controls and Tube Position

Schematic Location	Part No.	Description
C1 C2	B-16986	Condenser Variable Gang
C3 C4		Condenser Trimmers, part of Variable Gang
C5 C6	A17003	Condenser Trimmer 3-25 Mmfd. bakelite base
C7	15767	Condenser Tubular .001 Mfd. 400 volts
C8	15757	Condenser Tubular .1 Mfd. 400 volts
C9 C12	15752	Condenser Tubular .05 Mfd. 200 volts
C10	15757	Condenser Tubular .1 Mfd. 400 volts
C11	15751	Condenser Tubular .25 Mfd. 200 volts
C13	15928	Condenser Mica 250 Mmfd. +—20% type O
C14 C16	15754	Condenser Tubular .01 Mfd. 400 volt
C15	15775	Condenser Tubular .5 Mfd. 200 volts
C17	B-16973	Condenser Wet Electrolytic 30 Mfd. 150 volts
C18	B-17042	Condenser Wet Electrolytic 25 Mfd. 150 volts
R1	B-16970	Control volume and line switch 50,000 ohms
R2	15569	Resistor Carbon 300 +— 20% ¼ watt
R3	15570	Resistor Carbon 2,000 +—20% ¼ watt
R4	15515	Resistor Carbon 100,000 +—¼ watt
R5	15531	Resistor Carbon 10,000 +—20% ¼ watt
R6	15568	Resistor Carbon 35,000 +—10% ¼ watt
R7	15567	Resistor Carbon 15,000 +—10% ¼ watt
R8	15512	Resistor Carbon 250,000 +—20% ¼ watt
R9	15528	Resistor Carbon 400,000 +—20% ¼ watt
R10	15515	Resistor Carbon 100,000 +—20% ¼ watt
	15089	Bulb Pilot Light, Mazda No. 44
	16032	Ballast Tube
	B-16969	Ballast Tube Socket
	17057	Antenna Coil Assembly
	17058	Interstage Coil Assembly
	16994	Antenna Hank
	A-16971	Wave Switch
	C-16972	Filter Choke
	C-16985	Speaker
	B-16471	Line Cord
	A-17020	Spring, part of Dial Drive Assembly
	6001	String, Dial Drive
	A-16983	Socket, Pilot Light
	A-16997	Dial Glass
	A-17040	Dial Pointer
	A-17027	Wood Spacer, Dial Assembly
	A-17002	Purple Dial Backing
	A-2100	Fibre Washer, Dial Assembly
	1145	Dial Pointer Screw
	A-16988	Fish Paper Insulation, Electrolytic Condenser
		Knob (volume, band switch and tune)
	A-1954	Washer, Felt (small)
	A-17137	Escutcheon

VOLTAGE CHART

Position	Tube	Ef	Ek	Eg Screen	Ep Suppressor	Ep Pentode
R. F. Amplifier	6D6	6.3	3.2	103	3.2	103
Detector	6C6	6.3	1.8	28 Note "C"	1.8 Note "D"	35 Note "C"
Power Output	43	25	Note "A"	103	.....	96
Rectifier	25Z5	25		.....	.....	103
Ballast	16032	Note "B"		.....	.....	.....

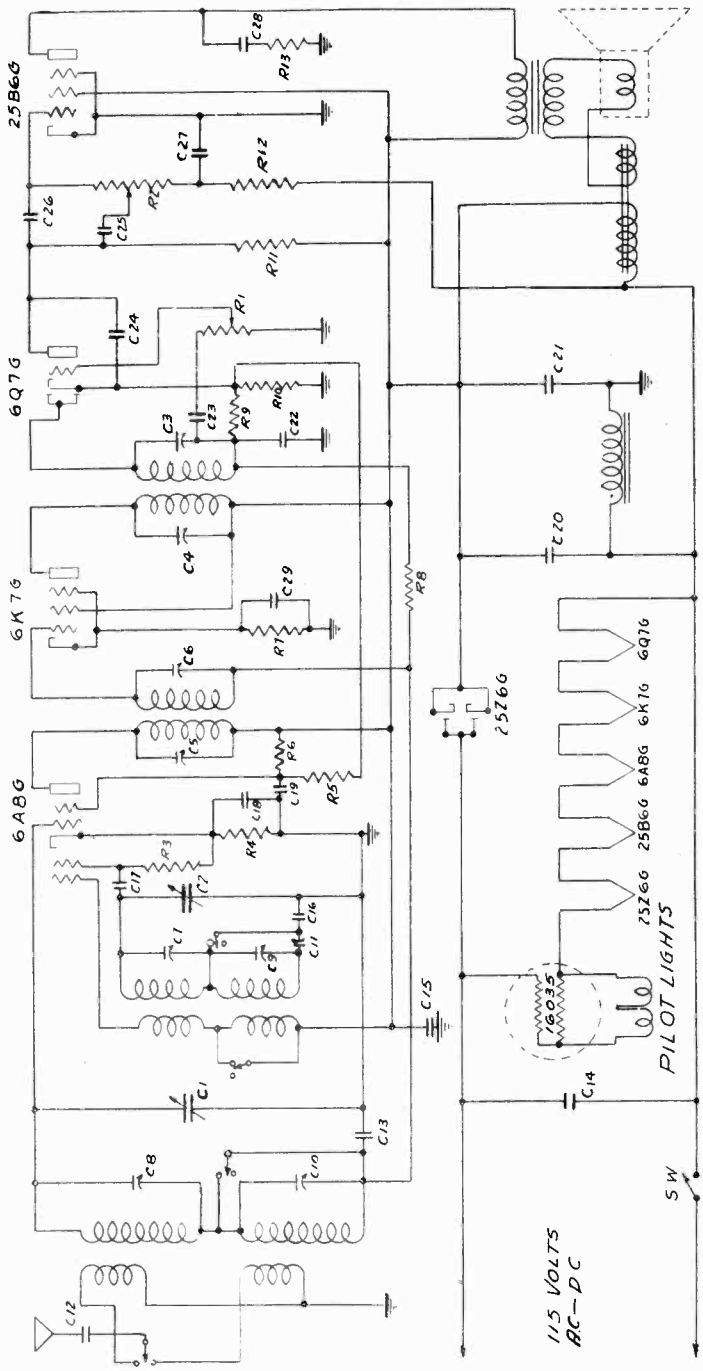
All above voltages to chassis with 115 volt 60 cycle line. Cathode, screen, suppressor and pentode voltages when operating from 115 volt d.c. line will be 10 percent lower.
Note "A"—Output pentode bias should be measured across filter choke at 14 volts.
Note "B"—Pins 3 to 7 should measure 50 volts a.c.
Note "C"—Measured with 250,000 ohm voltmeter.
Note "D" Measured with 25,000 ohm voltmeter.

MODEL 60
Schematic, Voltage
Parts

MAJESTIC RADIO & TELEV. CO.

VOLTAGE CHART					
TUBE	FUNCTION	Ef	Ep	E SCREEN	E BIAS
6A8G	Converter	6	106	53	2.3†
6K7G	I. F Amplifier	6	106	106	4.6†
6Q7G	Detector and 1st audio amplifier	6	53*		1.1
25B6G	Power Output Tube	25	99	106	
25Z6G	Rectifier	25			
Ballast	Voltage Equalizer	45			

Line voltage—115 volts A.C.
B supply voltage, B+ to chassis (ground)—106 volts.
B supply voltage, B+ to B— (line)—121 volts
Voltage across filter choke (in negative lead) chassis ground to B——16.5 volts Note this is the bias voltage for the 25B6G output tube.
* This reading taken with 1000 ohm voltmeter on 250 volt scale. True plate voltage is nearer 60 volts.
† Deduct the bias voltage of the 6Q7G from these values for the net bias.
Voltage across pilot lights approximately 4.8 volts each.
These voltages will be about 10% lower for 115 volts D.C. power supply.



REPLACEMENTS PARTS LIST IF PEAK 456KC

Please Specify Receiver Serial No. When Ordering Parts.

Schematic Location	Part No.	Description
C1 C2	C-17004	Condenser Variable Gang
C11	A-16472	Condenser Variable Padder
C12 C25	15759	Condenser Tubular .006 Mfd. 600 volt
C13 C15	15761	Condenser Tubular .1 Mfd. 200 volt
C14	15757	Condenser Tubular .1 Mfd. 400 volt
C16	15942	Condenser Mica Padder 1710 Mmfd. 5%
C17	15929	Condenser Mica 50 Mmfd. 20%
C18 C19 C29	15752	Condenser Tubular .05 Mfd 200 volt
C20	B-17041-3	Condenser Electrolytic 40 Mfd. 150 volt 1½" can
C21	B-17197	Condenser Electrolytic 40 Mfd. 150 volt 1⅝" can
C22	15028	Condenser Mica 250 Mmfd. (located inside 2nd I. F can)
C23 C26	15760	Condenser Tubular .02 Mfd. 400 volt
C24	15928	Condenser Mica 250 Mmfd.
C27	15775	Condenser Tubular .5 Mfd. 200 volt
C28	15764	Condenser Tubular .03 Mfd. 400 volt
R1	B-17010	Volume control 1,000,000 ohms
R2	B-17047	Tone control 300,000 with on-off line switch
R3	15511	Resistor Carbon 50,000 ohms ¼ watt +— 20%
R4	15571	Resistor Carbon 500 ohms ¼ watt +—10%
R5	15557	Resistor Carbon 20,000 ohms ¼ watt +—10%
R6	15575	Resistor Carbon 12,500 ohms ¼ watt +—10%
R7	15519	Resistor Carbon 700 ohms ¼ watt +—10%
R8	15517	Resistor Carbon 1,000,000 ohms ¼ watt +—20%
R9	15520	Resistor Carbon 500,000 ohms
R10	15537	Resistor Carbon 400 ohms
R11	15504	Resistor Carbon 150,000 ohms
R12	15512	Resistor Carbon 250,000 ohms
R13	15577	Resistor Carbon 7,500 ohms
	15089	Pilot Light Bulb Mazda No. 44
	A-16983	Pilot Light Socket bayonet base
	A-17095	Dial Drive Belt
	A-17020	Dial Drive Belt Spring
	A-17136	Dial Backing
	B-17098	Dial Glass
	17009	Complete Dial and Drive Assembly
	17142	Antenna Transformer Assembly
	17143	Oscillator Transformer Assembly
	17144	1st I. F. transformer Assembly
	B-17007-2	2nd I. F. transformer Assembly
	16994	Antenna Hank
	A-17013	Wave Change Switch
	C-17008-3	Filter Choke
	C-17001	Speaker
	B-16471	Line Cord
	16988	Fish Paper Insulation for Electrolytic Condenser
	A-16598	Knob (Vol. Control, Tuning, Tone Control and Band Switch)
	A-1954	Knob Washers (felt)
	17382	Escutcheon with indicator lens
	16036	Ballast Tube

MODEL 60
MODEL 620
Socket
Trimmers
Alignment

MAJESTIC RADIO & TELEV. CO.

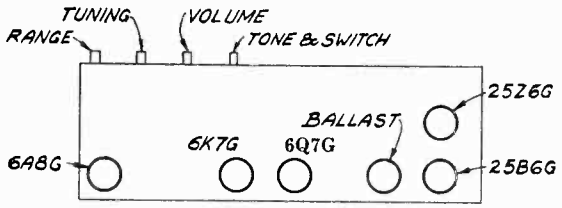
POWER LINE VOLTAGE

The model 620 is designed to operate on 110-115 volts, 50-60 cycles a.c. Serious damage may result if the set is connected to a power supply other than that shown above.

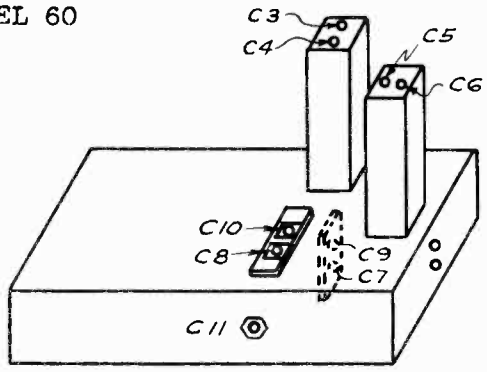
POWER LINE VOLTAGE—The model 60 is designed to operate on 105 to 125 volts, 50-60 cycles a.c. or d.c. Serious damage may result if the set is connected to a power supply other than that shown above. If there is any doubt in your mind, do not plug the set in until you first determine the voltage and cycles from your power supply company.

IF THE RECEIVER IS CONNECTED TO A D.C. SUPPLY FOR TWO MINUTES AND NO SIGNAL IS HEARD, REVERSE THE LINE PLUG.

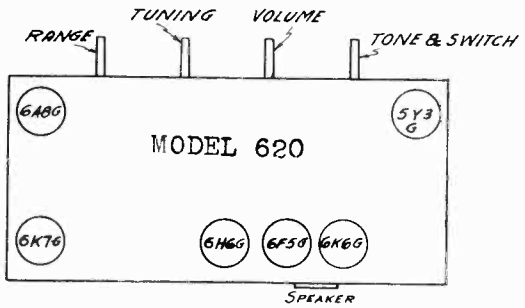
DIAL LIGHTS—There are two No. 44 Mazda bayonet base dial lights in your receiver. It is not considered advisable to operate the receiver when either of the dial lights are defective as this may injure the ballast tube.



MODEL 60



MODEL 620



In order to properly realign the receiver, the following equipment is necessary.

1. A signal generator which will provide an accurately calibrated signal at any frequency from 400 to 7500 kilocycles. The generator should have a modulated and adjustable signal output.

2. An output audio voltmeter to be connected across the moving coil of the speaker. This meter should be of providing a readable deflection for output levels of ½ volt, to avoid the effects of overload.

3. One screw driver; one .25 Mfd. 600 volts condenser; one 200 Mmfd. mica condenser and one 400 ohm resistor.

I. F. SYSTEM

Apply 456 k.c. signal to the grid of 6A8G tube through a tubular condenser on the order of .1 Mfd. Make certain that the wave change switch is in the broadcast position fully counter-clockwise. Turn variable condenser until it is engaged completely.

Referring to figure two which is the trimming diagram: adjust the I. F. capacities in the following order for maximum signal; C6, C5, C3, and C4. Of course to begin with, a very strong signal may be necessary on the input to "find" the preliminary adjustments. As alignment is approached, it is advisable to reduce the generator signal to minimum satisfactory value to prevent the possibility of misalignment due to A.V.C. action When the I. F. system has been adjusted, it will be found advisable to once again readjust C4. In order to derive a symetrical tuning curve, it will be found highly advisable to make all adjustments approach the resonance condition by starting at too high a capacity on the trimmer and working to a smaller value to give maximum output. In other words, having all trimmers down tight, unscrew them and bring the adjustment to a point of resonance. This should be done twice with C4. The general idea being to adjust C4 until the capacity has passed through resonance and has become to small. This is merely to indicate the maximum reading position. Return the capacity to an excess value again and gradually reduce it until it reaches its maximum tuning point.

SHORT WAVE BAND

In all cases the ground side of the generator should be connected to the ground on the chassis of the receiver through a .1 Mfd. or larger tubular paper condenser Apply a 7.2 m.c. signal through a 400 ohm resistance dummy antenna to the terminal strip where the antenna hank connects. Turn the wave change switch in the clockwise direction. Turn the variable condenser until it is completely disengaged. Unscrew trimmer C7 to a minimum capacity. Slowly turn the screw so that trimmer capacity increases until the signal is heard. Adjust C8 until the response is maximum. It may be necessary here to "rock" the variable condenser slightly with the adjustment of C8. The short wave antenna circuit range is now set. Adjust variable condenser until the dial indicator points to 6 m.c. Turn trimmer C7 until signal comes in and reaches maximum. This means that the two circuits are absolutely aligned at this point. Inasmuch as a fixed padder is utilized and comes accurately matched, the two circuits should remain correctly aligned over entire band. It is considered advisable to check this at 4.25 m.c. and 2.4 m.c. These are the three tracking frequencies.

BROADCAST BAND

Shift wave change switch to broadcast position. Replace the 400 ohms dummy antenna with a 200 Mmfd. mica condenser. Apply signal to same input. (Caution—Applying the signal from the generator to the set through the antenna hank may cause serious misalignment.) Apply a 600 k.c. signal. Rotate variable condenser until dial scale pointer indicates 600 k.c. Adjust padder screw C11 until signal is approximately maximum. Disengage variable condenser. Apply 1750 k.c. signal. Turn trimmer C9 to max. sig. Adjust trimmer C10 for max sig. Turn variable condenser until dial indicator reads 1500 k.c. Adjust C9 until signal is maximum at this point. Shift variable condenser to 600 k.c. Apply this frequency on the generator. Note the direction in which this frequency has shifted on the dial scale. Accordingly this will determine whether C11 should be increased or decreased to effect a meeting of the oscillator circuit with th antenna circuit by the usual "rocking" process. Reurn again to 1500 k.c. on both generator and dial scale of the receiver; if necessary make a slight adjustment of C9 until signal is maximum at this point.

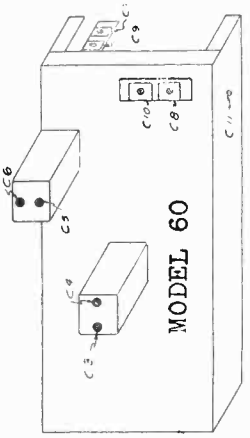


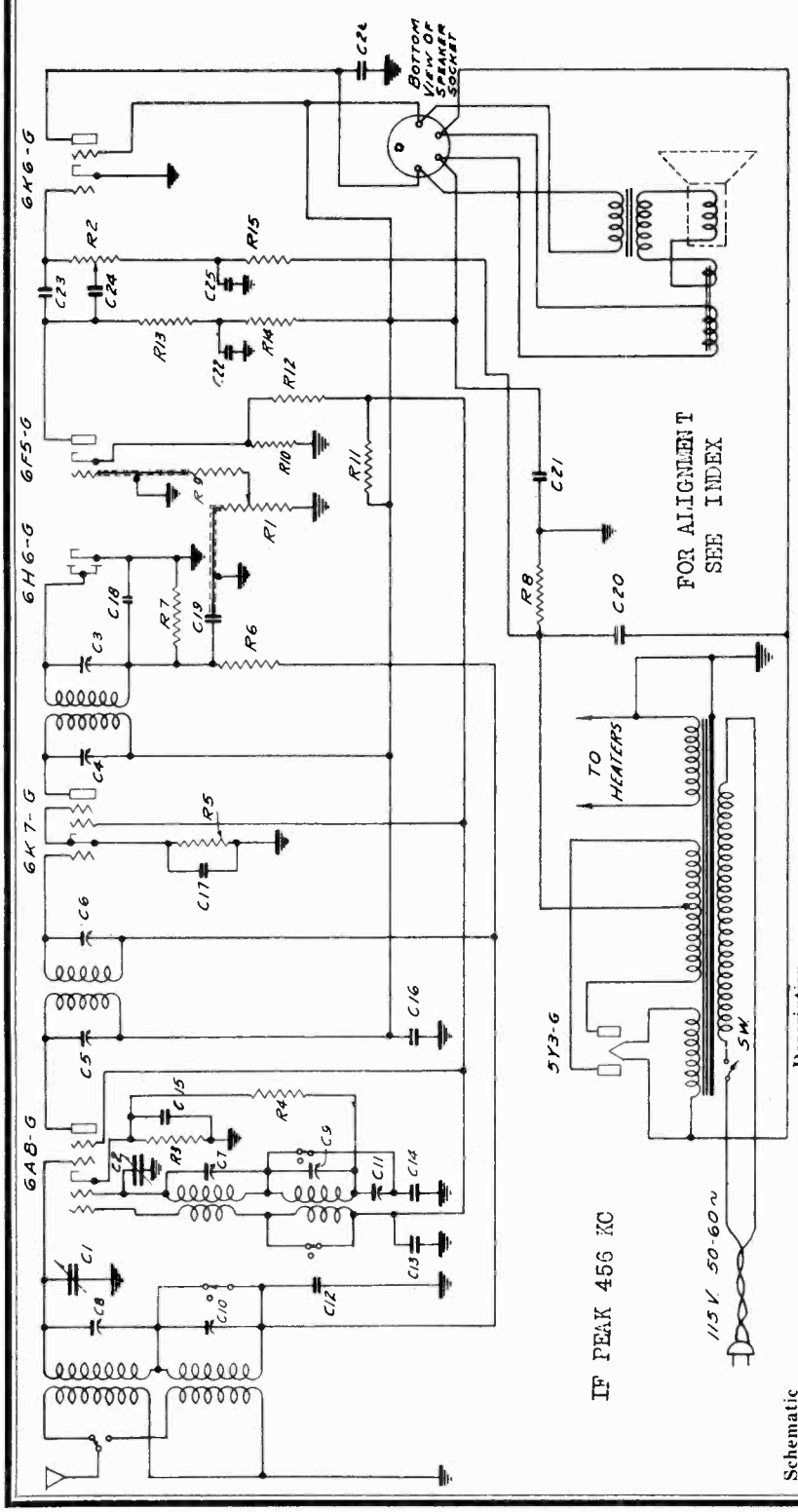
Fig. 2 Location of Trimmers

MODEL 620
Schematic, Voltage
Parts

MAJESTIC RADIO & TELEV. CO.

VOLTAGE CHART						
TUBE	FUNCTION	Ef	Ep	E SCREEN	E BIAS	E OSC. PLATE
6A8G	Converter	6.3	210	115	4.7	115
6K7G	I. F. Amplifier	6.3	210	115	3.8	
6H6G	Detector—AVC	6.3				
6F5G	Audio Amplifier	6.3	125*		1.5	
6K6G	Power Output	6.3	200	210	14.5	
5Y3G	Rectifier	5.0				

Line voltage—115 volts—60 cycle AC.
All d. c. voltages measured to chassis.
* Measured with 250,000 ohm voltmeter.
Volts across speaker field—100 d. c.



Schematic Location	Part No.	Description
	15089	Bulb Pilot Light (Edgelight)
C1 C2	C-17004	Condenser Variable Gang
C11	A-16472	Condenser Variable Padder
C8 C10	A-17589	Condenser Trimmer (antenna coil)
C7 C9	A-17590	Condenser Trimmer (oscillator coil)
C5 C6	B-17560	Condenser 1st I. F. Trimmer (part of I. F. assembly)
C3 C4	B-17561	Condenser 2nd I. F. Trimmer (part of I. F. assembly)
C15 C17 C25	15752	Condenser Tubular .05 Mfd. 200 V.
C13 C22	15756	Condenser Tubular .05 Mfd. 400 V.
C16	15757	Condenser Tubular .1 Mfd. 400 V.
C12	15761	Condenser Tubular .1 Mfd. 200 V.
C24	15759	Condenser Tubular .006 Mfd. 600 V.
C19 C23	15760	Condenser Tubular .02 Mfd. 400 V.
C26	15771	Condenser Tubular .004 Mfd. 600 V.
C14	15942	Condenser Mica 1710 Mmfd. 5% type W
C20	B-16466	Condenser Wet Electrolytic 16 Mfd. 350 volts
C21	B-16467-2	Condenser Wet Electrolytic 8 Mfd. 250 volts
R1	B-17015	Control Volume 1,000,000 ohms
R2	B-17047	Control Tone 300,000 ohms
R4 R14	15511	Resistor Carbon 50,000 +—20% ¼ watt
R9 R13	15516	Resistor Carbon 100,000 +—20% ¼ watt
R6	15517	Resistor Carbon 1 meg. +—20% ¼ watt
R7	15529	Resistor Carbon 500,000 +—20% ¼ watt
R15	15523	Resistor Carbon 200,000 +—20% ¼ watt
R5	15571	Resistor Carbon 500 +—10% ¼ watt
R8	15584	Resistor Carbon 250 +—10% 1 watt
R12	15586	Resistor Carbon 15,000 +—10% 1 watt
R11	15587	Resistor Carbon 5,000 +—10% 2 watt
R3	15588	Resistor Carbon 350 +—10% ¼ watt
R10	15589	Resistor Carbon 220 +—10% ¼ watt
	A-16829	Socket Speaker
	A-17562	Socket Pilot Light
	A-17095	Dial Drive Belt
	A-17606	Dial Backing
	B-17591	Dial Glass
	17597	Complete Dial and Drive Assembly
	17583	Antenna Coil Assembly
	17584	Oscillator Coil Assembly
	17567	1st I. F. Transformer Assembly
	B-17561	2nd I. F. Transformer Assembly
	A-17013	Wave Change Switch
	C-17580	Speaker 8"
	B-16471	Attachment Cord
	A-16598	Knob
	A-1954	Washer Felt
	17382	Escutcheon with Indicator Lens
	C-16575-6	Transformer Power 110 volts 50-60 cycle

MAJESTIC RADIO & TELEV. CO.

MODELS 65,66,650
MODELS 75,76,750
MODELS 85,86,850
Trimmers,Voltage
Alignment

VOLTAGE CHART

POSITION	TUBE	Ef	Ek	Eg SCREEN	Eg SUPPRESSOR	Ep TRIODE	Ep PENTODE
Converter	6 A8-G	6.3	3.0	90.0		150.0	220.0
I. F. Amplifier	6 K7-G	6.3	3.0	90.0	Connected to gr'd.		220.0
Detector—AVC	6 Q7-G	6.3	2.0			195.0	
Power Output	6 K6-G	6.3	16.0	220.0	Connected to Cathode in Tube		208.0
Rectifier	5 Y3	5.0					

MODELS 65 - 66 - 650

VOLTAGE CHART

POSITION	TUBE	Ef	Ek	Eg SCREEN	Eg SUPPRESSOR	Ep TRIODE	Ep PENTODE
Oscillator	6 C5G	6.3				150.0	
Converter	6 L7G	6.3	3.0	90.0			230.0
I. F. Amplifier	6 K7G	6.3	3.0	90.0			230.0
Detector—AVC	6 Q7G	6.3	2.0			110.0	
Power Output	6 F6G	6.3	14.5	230.0			215.0
Rectifier	5 Y3	5.0					

MODELS 75-76-750

VOLTAGE CHART

POSITION	TUBE	Ef	Ek	Eg SCREEN	Eg SUPPRESSOR	Ep TRIODE	Ep PENTODE
Converter	6 A8-G	6.3	3.0	110.0			225.0
I. F. Amplifier	6 K7-G	6.3	3.0	110.0			230.0
Detector—AVC	6 Q7-G	6.3	2.0			95.0	
Phase Inverter	6 C5G	6.3	7.0			150.0	
Power Output	6 F6G	6.3	14.0	230.0			225
Power Output	6 F6G	6.3	14.0	230.0			225
Rectifier	5 Y3	5.0					

MODELS 85-86-850

Fig. 2 Location of Trimmers

Fig. 2 Location of Trimmers
MODELS 85-86-950

MODELS 65-66-650; 75-76-750; 85-86-850

ALIGNMENT PROCEDURE

Correct alignment is of extreme importance in all-wave receivers. The receivers are properly aligned at the factory with precision equipment and realignment should not be attempted by the service technician until all other causes of faulty operation are corrected.

In order to properly realign the receiver the following equipment is necessary.

1. A signal generator which will provide an accurately calibrated signal at any frequency from 456 kilocycles to 18 megacycles. The generator should have adjustable signal output.
2. An output audio voltmeter of the low voltage type to be connected across the moving coil of the speaker. This should be capable of providing a readable deflection for relatively low output levels to avoid the effects of overload.
3. An insulated or non-metallic screw driver for the adjustment of trimmers.

I F ALIGNMENT 456 KC

1. Connect the output meter (low scale) across the loud speaker voice coil. Turn the wave band switch to broadcast position. Turn the volume control to its maximum position.
2. Connect the test oscillator ground to chassis and the "hot" lead from the test oscillator to the grid of the converter tube through a series .1 Mfd. condenser. Set test oscillator to 456 KC.

Models 85 and 86 have a two point selectivity or high fidelity control associated with the tone control. This adjustment should be set for highest selectivity during alignment. Highest selectivity is obtained when the switch at the end of the tone control action is in its left or counterclockwise position.

Model 850 has this same control as a separate adjustment (second knob from the left). This adjustment should also be in its left hand or counterclockwise position during alignment.

3. Adjust I F alignment screws of second I F transformer adjacent to power tube to maximum output, reducing output of test oscillator to keep the meter reading on scale as alignment proceeds.
4. Adjust alignment of first I F transformer. (directly behind tuning condenser) to maximum output as described above.
5. Readjust these trimmers for accurate alignment. Always use the lowest possible output from the test oscillator to preclude the possibility of automatic volume control action confusing proper adjustment.
6. Connect "hot" lead of test oscillator to receiver antenna lead in series with 200 Mmfd. condenser, and tune receiver to 550 kilocycles.
7. Adjust C-37 for minimum receiver output.

NOTE: Since coils are used in series it is absolutely necessary to align the high frequency bands first, in the order indicated.

FOREIGN BAND 5.7 TO 18.5 MEGACYCLES

1. With test oscillator connected to the antenna and ground terminals through a 400 ohm resistor set oscillator at 16 megacycles.
2. Set the dial scale to 16 megacycles and adjust the oscillator trimmer condenser (C 4) to a resonance using the counterclockwise or low capacity point.
3. Adjust input circuit trimmer (C 5) to maximum response, rocking the gang condenser back and forth a degree or two to obtain proper maximum.

POLICE OR MIDDLE BAND 1.75 TO 5.8 MEGACYCLES

1. With the test oscillator connected as above set the oscillator and dial to 5.5 megacycles.
2. Adjust oscillator trimmer condenser (C 6) for maximum response using the counterclockwise or low capacity point.
3. Adjust input circuit trimmer (C 7) to maximum response rocking the gang condenser as described above.

BROADCAST BAND 535 TO 1800 KC

1. With test oscillator connected to antenna and ground through a 200Mfd. condenser set oscillator and receiver dial to 1600 kilocycles.
2. Adjust broadcast oscillator trimmer (C 8) to obtain maximum response.
3. Adjust antenna circuit trimmer (C 9) for maximum output.
4. Adjust preselector trimmer (C 10) for maximum output.
5. Set test oscillator and dial to 600 kilocycles and tune in the signal, then adjust broadcast band padding condenser (C 11) for maximum output. This padder is mounted on the aluminum coil deck near the panel and is adjusted through a hole provided in the back of the chassis pan. Rock the condenser back and forth a degree or two in order to obtain proper maximum.
6. Repeat the 1600 KC adjustments described above for greater accuracy.

MODELS 65,66,650
MODELS 75,76,750
MODELS 85,86,850
Socket Layouts

MAJESTIC RADIO & TELEV. CO.

MODEL 1050
Socket,Trimmers
Voltage,Alignment

ALIGNMENT PROCEDURE

Correct alignment is of extreme importance in all-wave receivers. The receivers are properly aligned at the factory with precision equipment and realignment should not be attempted by the service technician until all other causes of faulty operation are corrected.

In order to properly realign the receiver the following equipment is necessary:

1. A signal generator which will provide an accurately calibrated signal at any frequency from 456 kilocycles to 18 megacycles. The generator should have adjustable signal output.
2. An output audio voltmeter of the low voltage type to be connected across the moving coil of the speaker. This should be capable of providing a readable deflection for relatively low output levels to avoid the effects of overload.
3. An insulated or non-metallic screw driver for the adjustment of trimmers.

I F ALIGNMENT 456 KC

1. Connect the output meter (low scale) across the loud speaker voice coil. Turn the wave band switch to broadcast position. Turn the volume control to its maximum position.
2. Connect the test oscillator ground to chassis and the "hot" lead from the test oscillator to the grid of the 6L7 converter tube through a series .1 Mfd. condenser. Set test oscillator to 456 KC.
3. Turn selectivity control (second from the left) to its high selectivity position. This is the left hand or counter-clockwise position.
4. Adjust I. F. alignment screws C17 and C18 of the output transformer to maximum output reducing output of test oscillator to keep meter reading on scale as alignment proceeds.
5. Adjust alignment screws, C15 and C16, of input transformer to maximum output as described above.
6. Readjust all four alignment screws to insure accurate alignment. Always use the lowest possible output from the test oscillator to preclude the possibility of automatic volume control action confusing proper adjustment.
7. Connect "hot" lead of test oscillator to receiver antenna lead in series with 250 Mmfd. condenser and tune receiver to 550 kilocycles.
8. Adjust C-46 for minimum receiver output.

R. F. ALIGNMENT BROADCAST BAND

1. With test oscillator connected to the antenna post through .00025 Mfd. set signal generator to 1600 KC.
2. Set travelite indicator to end of scale (beyond 550 KC calibration) with gang condenser fully meshed at maximum capacitance.
3. Set dial to 1600 KC. Adjust broadcast oscillator trimming condenser. C9, for maximum output meter reading.
4. Adjust detector input trimmer. C14, to a maximum.
5. Adjust antenna stage trimmer. C6, to a maximum.
6. Set test oscillator to 600 KC and tune in the signal, then adjust broadcast oscillator padder. C10, for maximum output. Rock the main tuning adjustment back and forth a degree or two in order to obtain proper maximum.
7. Repeat adjustments described under 3, 4, and 5 for greater accuracy.

POLICE OR SECOND BAND

1. Turn the wave switch to second or police band. Leave oscillator connected as above but with the output set to 5000 KC and the .00025 Mfd. condenser replaced by a 400 ohm resistor. Set dial scale to 5 MC on the second band. Adjust oscillator trimming condenser C8 for maximum output, observing as before that the proper point occurs at the minimum or counter-clockwise position of the screw as two points are found.
2. Adjust detector input trimming condenser, C13, to maximum, while rocking the tuning condenser slightly for maximum response.
3. Adjust antenna stage trimmer. C5, for maximum output.
4. Set test oscillator to 2000 KC and tune in the signal. Adjust oscillator padding condenser, C11, for maximum output, while rocking the tuning condenser as described above.
5. Repeat operations 1, 2 and 3 to assure precise alignment.

FOREIGN OR THIRD BAND

1. With the test oscillator connected the same as above and set to 16000 KC (16MC) set the dial to 16MC on the third band.
2. Adjust oscillator trimming condenser, C7, for maximum response. Use lower capacity or counter-clockwise response point.
3. Adjust detector input trimmer, C12, to maximum, rocking tuning adjustment.
4. Adjust antenna trimmer, C4, for maximum response.

ULTRA HIGH FREQUENCY OR INSIDE BAND

This band was adjusted at the factory and will not require further adjustment.

Fig. 2 Location of Trimmers

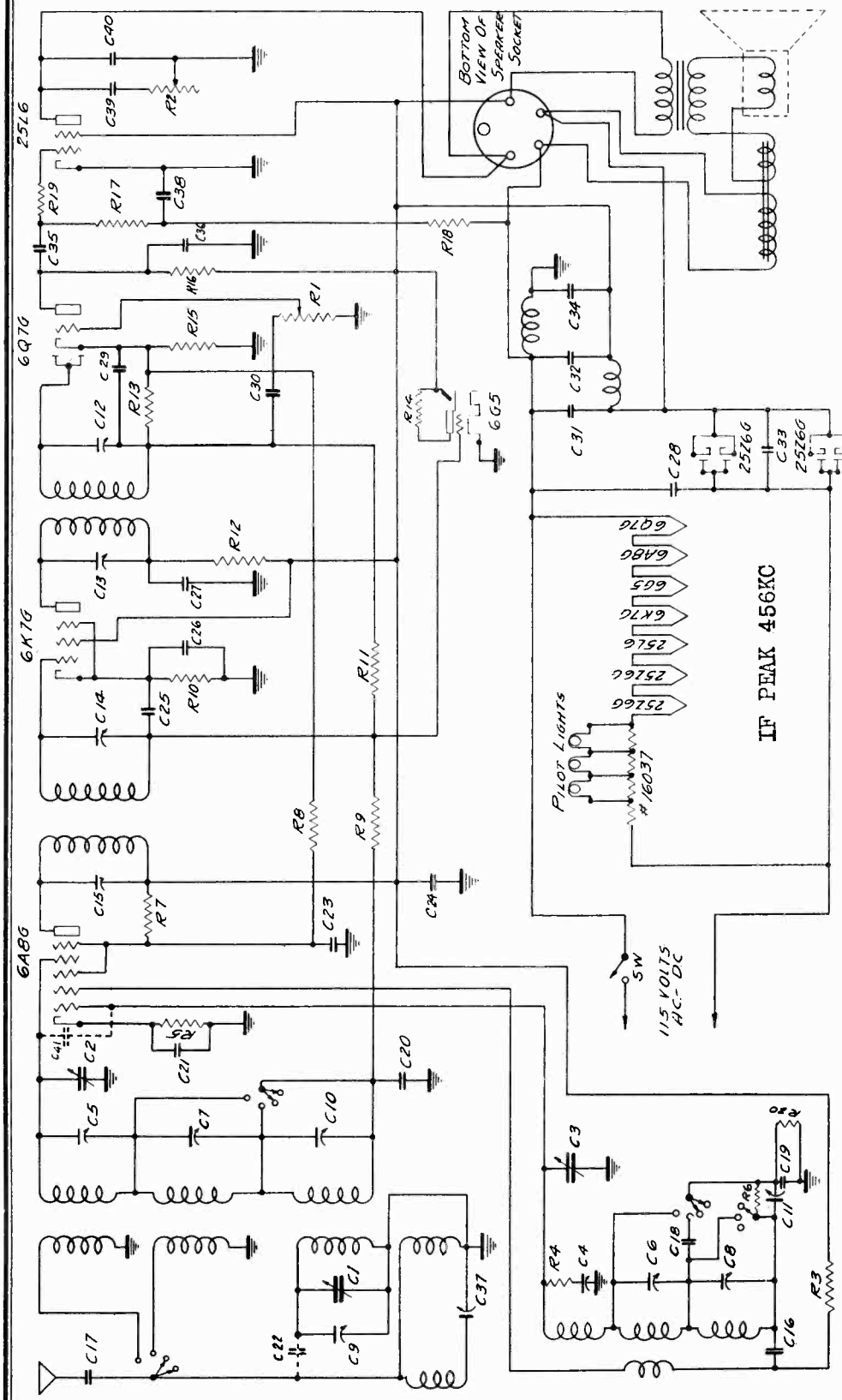
VOLTAGE CHART							
Position	Tube	Ef	Ek	Eg Screen	Eg Suppressor	Ip Triode	Ep Pentode
R. F. Amplifier	6 K7G	6.3	4	90.0	Connected to Cathode		235
Converter	6 L7G	6.3	4	90.0	Connected to Cathode	110	235
Oscillator	6 C5G	6.3					
I. F. Amplifier	6 K7G	6.3	4	90.0	Connected to Cathode	105	235
Detector A.V.C.	6 Q7G	6.3	1.1			212	
Driver	6 F6G	6.3	16.5	connected to plate	Connected to Cathode in tube		
Power Output	6 F6G	6.3	18.5	235	Connected to Cathode in tube		335
Power Output	6 F6G	6.3	18.5	235	Connected to Cathode in tube		335
Rectifier	5 Z3	5.0	340				

MODEL 1050

MODEL 1050

MAJESTIC RADIO & TELEV. CO.

MODEL 800
Schematic
Voltage



VOLTAGE CHART

POSITION	TUBE	Ef	Ek	Eg SCREEN	Ep SUPPRESSOR	Ep OSC.	Ep PENTODE
Converter	6A8G	6.3	2.4	54.0		85	110
I. F. Amplifier	6K7G	6.3	3.8	110.0	3.8		104
Det. AVC	6Q7G	6.3	.95				57 "C"
Power Output	25L6	25	"B"	110.0			103
Rectifier	(2) 25L6G	25					110
Tuning Eye	6G5	6.3	"O"				110
Ballast	A-16037	"A"					

All voltage shown on chart measured to chassis, with receiver connected to 117 volt 60 cycle line. Cathode, screen, suppressor and plate voltages when operating from 117 volt D. C. line will be 10 percent lower.
"A" Pin No. 3 to No. 7—17.0 volts a.c.
"B" 8 volts measured across 2nd filter choke
"C" Measured with 250,000 voltmeter.

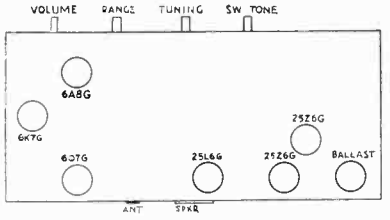
REPLACEMENT PARTS MODEL 800

State serial number of receiver when ordering parts.

Schematic Location	Part No.	Description
	16885	Bulb Pilot Light (Edgelight)
	16589	Bulb Pilot Light (Travelite)
C1 C2 C3	B-16461-3	Condenser Variable Gang
C4 C6 C8	A-16473	Condenser Trimmer 3-30 Mmfd. triple strip bakelite
C5 C9	A-16474	Condenser Trimmer 3-30 Mmfd. ceramic base
C10	A-17486	Condenser Trimmer 1½-10 Mmfd. bakelite base
C7	A-15246-2	Condenser Trimmer 3-30 Mmfd. bakelite base
C11	A-16472	Condenser Variable Padder 340-960 Mmfd.
C16	15930	Condenser Mica 2000 Mmfd. +—20% Type W
C17	15767	Condenser Tubular .001 Mfd. 600 volts
C18	15932	Condenser Mica 1750 Mmfd. +—5% Type W
C19	15931	Condenser Mica 4300 Mmfd. +—5% Type W
C20 C24 C25	15752	Condenser Tubular .05 Mfd. 200 volts
C26 C27	15752	Condenser Tubular .05 Mfd. 200 volts
C21 C23	15761	Condenser Tubular .1 Mfd. 200 volts
C28 C39	15757	Condenser Tubular .1 Mfd. 400 volts
C29	15928	Condenser Mica 250 Mmfd. +—20% Type O
C30 C35	15772	Condenser Tubular .02 Mfd. 200 volts
C31	B-17041-3	Condenser Wet Electrolytic 40 Mfd. 150 volts
C32	B-17197	Condenser Wet Electrolytic 40 Mfd. 150 volts
C33	15754	Condenser Tubular .01 Mfd. 400 volts
C34	B-17042	Condenser Wet Electrolytic 25 Mfd. 150 volts
C36	15918	Condenser Mica 100 Mmfd. +—20% Type O
C37	B-16786	Condenser Padder 20-55 Mmfd.
C38	15751	Condenser Tubular .25 Mfd. 200 volts
C40	15760	Condenser Tubular .02 Mfd. 400 volts
R1	B-17411	Control Volume (1 megohm)
R2	A-17408	Control Tone and line switch (15,000 ohms)
R3	15531	Resistor Carbon 10,000 +—20% ¼ watt
R4	3320	No. 38 D. C. C. Manganin wire 2 ohms
R5 R10	15533	Resistor Carbon 600 ohms +—10% ¼ watt
R6 R20	15529	Resistor Carbon 25,000 ohms +—20% ¼ watt
R7	15575	Resistor Carbon 12,500 ohms +—10% ¼ watt
R8	15557	Resistor Carbon 20,000 ohms +—10% ¼ watt
R9 R19	15515	Resistor Carbon 100,000 ohms +—20% ¼ watt
R11	15517	Resistor Carbon 1 megohm +—20% ¼ watt
R12	15542	Resistor Carbon 1,000 ohms +—20% ¼ watt
R13 R14	15520	Resistor Carbon 500,000 ohms +—20% ¼ watt
R15	15537	Resistor Carbon 400 ohms +—10% ¼ watt
R16	15504	Resistor Carbon 150,000 ohms +—20% ¼ watt
R17	15549	Resistor Carbon 300,000 ohms +—20% ¼ watt
R18	15523	Resistor Carbon 200,000 ohms +—20% ¼ watt
	17499	Coil and mounting assembly (oscillator, antenna and wave switch)
	17501	Preselector coil assembly
	17502	Wave trap assembly
	17436	Drive and Indicator assembly (complete)
	B-17298	Dial Glass
	B-17199	Dial Glass Backing
	17549	Escutcheon with indicator lenses
	A-16598	Knob (tone and volume)
	A-16597	Knob (tune and band switch)
	A-16829	Socket Speaker
	B-17413	Socket 6G5 with leads
	A-17514	Socket pilot light edgelight R. H.
	A-17515	Socket pilot light edgelight L. H.
	17446	Socket pilot light travelite
	C-17495	Speaker
	17505	Transformer 1st I. F.
	B-17317	Transformer 2nd I. F.
	C-17423	Choke Filter
	A-1954	Washer Felt (large)
	A-1955	Washer Felt (small)
	17525	Balance Wheel
	A-16037	Ballast Tube
	17440	Universal Joint
	17453	Band Pulley
	A-5706	Travel light
	A-17133	Dial Glass Clip
	A-17203	Belt Drive
	A-17383	Pilot Light Shield

POWER LINE VOLTAGE

The model 800 is designed to operate on 105 to 125 volts, 50-60 cycles a.c. or d.c. Serious damage may result if the set is connected to a power supply other than that shown above. If there is any doubt in your mind, do not plug in the set until you first determine the voltage and cycles from your power supply company.



ALIGNMENT PROCEDURE

Correct alignment is of extreme importance in all wave receivers. The receivers are properly aligned at the factory with precision equipment and realignment should not be attempted by the service technician until all other causes of faulty operation are corrected.

In order to properly realign the receiver the following equipment is necessary:

1. A signal generator which will provide an accurately calibrated signal at any frequency from 456 kilocycles to 18 megacycles. The generator should have adjustable signal output.

2. An output audio voltmeter of the low voltage type to be connected across the moving coil of the speaker. This should be capable of providing a readable deflection for relatively low output levels to avoid the effects of overload.

3. An insulated or non-metallic screw driver for the adjustment of trimmers.

I. F. ALIGNMENT 456 KC

1. Connect the output meter (low scale) across the loud speaker voice coil. Turn the wave band switch to broadcast position. Turn the volume control to its maximum position.

2. Connect the test oscillator ground to chassis in series with .25 Mfd. 600 volt condenser, and the "hot" lead from the test oscillator to the grid of the 6A8G converter tube through a series .1 Mfd. condenser. Set test oscillator to 456 KC.

3. Adjust I. F. alignment screws of second I. F. transformer (at rear corner of chassis) to maximum output, reducing output of test oscillator to keep the meter reading on scale as alignment proceeds.

4. Adjust alignment of first I. F. transformer (rear front corner of chassis) to maximum output as described above.

5. Readjust these trimmers for accurate alignment. Always use the lowest possible output from the test oscillator to preclude the possibility of automatic volume control action confusing proper adjustment.

6. Connect "hot" lead of test oscillator to receiver antenna lead in series with 200 Mmfd. condenser.

7. Adjust C37 for minimum output, increasing test oscillator output until a signal is heard when C37 is adjusted for minimum output.

NOTE: Since coils are used in series it is absolutely necessary to align the high frequency bands first in the order indicated.

FOREIGN BAND 5.7 TO 18.5 MC

1. With test oscillator connected to the receiver antenna lead through a 400 ohm resistor, set oscillator at 16 megacycles.

2. Set the dial scale to 16 megacycles and adjust the oscillator trimmer condenser (C4) to a resonance using the counter-clockwise or low capacity point.

3. Adjust input circuit trimmer (C5) to maximum response, rocking the gang condenser back and forth a degree or two to obtain proper maximum.

POLICE OR MIDDLE BAND 1.75 TO 5.8 MC

1. With the test oscillator connected as above set the oscillator and dial to 5.5 megacycles.

2. Adjust oscillator trimmer condenser (C6) for maximum response using the counter-clockwise or low capacity point.

3. Adjust input circuit trimmer (C7) to maximum response rocking the gang condenser as described above.

BROADCAST BAND 535 TO 1800 KC

1. With test oscillator connected to receiver antenna lead through a 200 Mmfd. condenser, set oscillator and receiver dial to 1600 kilocycles.

2. Adjust broadcast oscillator trimmer (C8) to obtain maximum response.

3. Adjust antenna circuit trimmer (C9) for maximum output.

4. Adjust preselector trimmer (C10) for maximum output.

5. Set test oscillator and dial to 600 kilocycles and tune in the signal, then adjust broadcast band padding condenser (C11) for maximum output. This padder is mounted on the aluminum coil deck near the panel and is adjusted through a hole provided in the back of the chassis pan. Rock the condenser back and forth a degree or two in order to obtain proper maximum.

6. Repeat the 1600 kilocycle adjustments described above for greater accuracy.

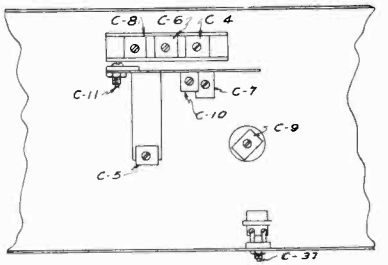
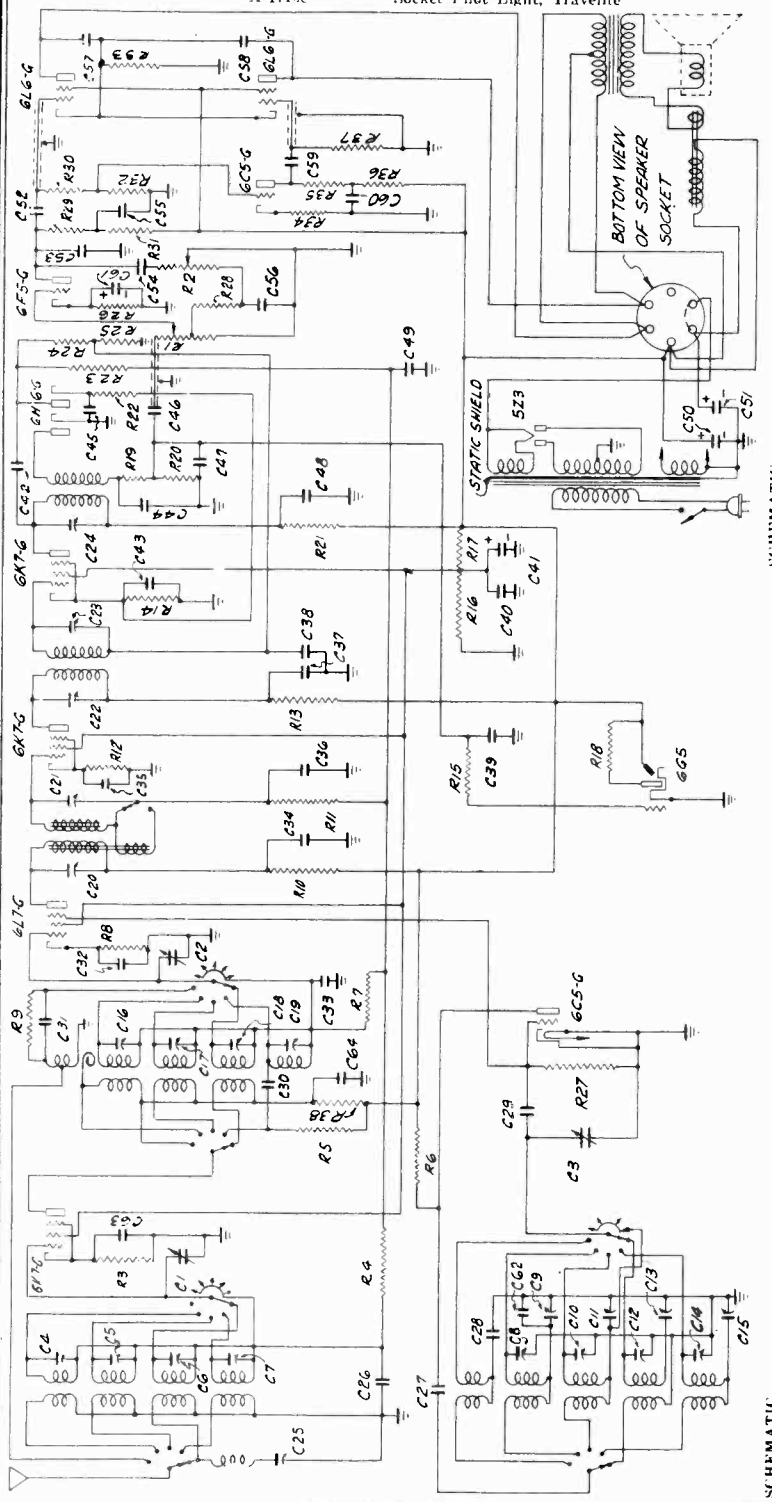


Fig. 2 Location of Trimmers

MAJESTIC RADIO & TELEV. CO.

MODEL 1250
Schematic
Parts

15248	Socket Speaker
B-16637-2	Socket 6G5 with leads
C-16581-2	Speaker 15"
B-16610-2	Transformer 1st I. F.
B-16611-3	Transformer 2nd I. F.
B-16612-3	Transformer 3rd I. F.
C-16578-4	Transformer Power 110 v. 50-60 cycle
A-16701	Trap Wave
A-1954	Washer Felt (large)
A-1955	Washer Felt (small)
17304	Drive and Indicator Assembly
17303	Dial Glass
17161	Dial Glass Backing
17384	Escutcheon No. 4 with Indicator Lens
A-17114	Socket Pilot Light, Edgelight R. H.
A-17115	Socket Pilot Light, Edgelight L. H.
A-17168	Socket Pilot Light, Travelite



IF PEAK 456KC

SCHEMATIC LOCATION	PART. NO.	DESCRIPTION
	15089	Bulb Pilot Light (edgelight)
	16589	Bulb Pilot Light Frosted (Travelite)
	C-16543-2	Condenser Variable Gang
C1 C2 C3	A-16552	Condenser Trimmer 3-30 Mmfd. (triple strip)
C4 C5 C6	A-16667-2	Condenser Trimmer 3-30 Mmfd. (bakelite base)
C7 C14 C19	A-16552	Condenser Trimmer 3-30 Mmfd. (triple strip)
C16 C17 C18	A-16552	Condenser Trimmer 3-30 Mmfd. (triple strip)
C8 C10 C12	B-16603	Condenser Padder 400-700 Mmfd.
C13	B-16604	Condenser Padder 1000-3000 Mmfd.
C9	B-16605	Condenser Padder 600-1800 Mmfd.
C11	B-16606	Condenser Padder 100-300 Mmfd.
C25	B-16746	Condenser Padder 20-55 Mmfd.
C20 C21	B-16610-2	Condenser Trimmer (part of 1st I. F. assembly)
C22 C23	B-16611-3	Condenser Trimmer (part of 2nd I. F. assembly)
C24	B-16612-3	Condenser Trimmer (part of 3rd I. F. assembly)
C50 C51	B-16613-2	Condenser Dry Electrolytic Dual 12 Mfd. 350 V.
C41 C61	B-16614-3	Condenser Tubular Dry Electrolytic Dual 8-10 Mfd. 200-12 V.
C44 C47	15914	Condenser Mica 100 Mmfd. 20% Type O
C29	15919	Condenser Mica 50 Mmfd. 10% Type O
C58	15928	Condenser Mica 250 Mmfd. 20% Type O
C42	15929	Condenser Mica 50 Mmfd. 20% Type O
C62	15932	Condenser Mica 17500 Mmfd. 5% Type W
C54	15933	Condenser Mica 4000 Mmfd. 20% Type W
C28 C31	15935	Condenser Mica 680 Mmfd. 20% Type W
C30	15938	Condenser Mica 10 Mmfd. 20% Type G
C26 C33 C49	15752	Condenser Tubular .05 Mfd. 200 volts
C63 C32 C35 C43	15752	Condenser Tubular .05 Mfd. 200 volts
C45 C38 C36	15752	Condenser Tubular .05 Mfd. 200 volts
C46 C57 C58	15753	Condenser Tubular .002 Mfd. 600 volts
C34 C64	15756	Condenser Tubular .05 Mfd. 400 volts
C40 C48 C37	15757	Condenser Tubular .1 Mfd. 100 volts
C55 C60 C52 C59	15760	Condenser Tubular .02 Mfd. 400 volts

SCHEMATIC LOCATION	PART. NO.	DESCRIPTION
C39	15763	Condenser Tubular .01 Mfd. 200 volts
C56	15772	Condenser Tubular .02 Mfd. 200 volts
C27	15774	Condenser Tubular .002 Mfd. 400 volts
R1	B-16565-2	Control Volume with 110 switch
R2	B-16566-2	Control Tone
	A-16541-2	Control High Fidelity
	16890	Coil Antenna in Shield
	16891	Coil Detector in Shield
	16892	Coil Oscillator in Shield
	A-16596	Knob (tune and high fidelity)
	A-16658	Knob (volume and tone)
	A-16597	Knob (band switch)
R28 R19	15510	Resistor Carbon 20,000 +—20% ¼ watt
R35 R5	15511	Resistor Carbon 50,000 +—20% ¼ watt
R25 R29	15512	Resistor Carbon 250,000 +—20% ¼ watt
R16	15560	Resistor Carbon 25,000 +—10% ½ watt
R7 R4 R31 R36 R11	15515	Resistor Carbon 100,000 +—20% ½ watt
R23 R15	15517	Resistor Carbon 1 meg. +—20% ½ watt
R9 R20 R24	15520	Resistor Carbon 500,000 +—20% ¼ watt
R22	15531	Resistor Carbon 10,000 +—20% ¼ watt
R3 R8	15533	Resistor Carbon 600 +—10% ½ watt
R27	15552	Resistor Carbon 30,000 +—20% ½ watt
R32	15557	Resistor Carbon 20,000 +—10% ½ watt
R6	15614	Resistor Carbon 25,000 +—20% ½ watt
R30	15561	Resistor Carbon 150,000 +—10% ½ watt
R10 R13 R21 R38	15534	Resistor Carbon 1,500 +—20% ¼ watt
R26	15565	Resistor Carbon 4,000 +—10% ¼ watt
R37	15605	Resistor Carbon 100,000 +—10% ¼ watt
R34	15611	Resistor Carbon 3,000 +—10% ¼ watt
R17	15618	Resistor Carbon 20,000 +—10% 2 watt
R14	15566	Resistor Carbon 2,000 +—10% ½ watt
R12	15576	Resistor Carbon 5000-2 +—10% ½ watt
R33	A-16785	Resistor Candohm 220 ohm 3 watt

MODEL 1250
Socket, Trimmers
Voltage, Alignment

MAJESTIC RADIO & TELEV. CO.

I. F. ALIGNMENT 456 KC

1. Connect the output meter (low scale) across the loud speaker voice coil. Turn the wave band switch to extreme clockwise position (broadcast band). Turn the volume control to maximum position. Rotate the hi-fidelity switch to the counter-clockwise position and the volume control to the "treble" or clockwise position.
2. Connect the test oscillator ground to chassis and the "hot" lead from the oscillator to the grid of the 6L7 converter tube through a series .1 mfd. condenser. Set test oscillator to 456.0 KC.
3. Adjust I. F. alignment screw of 3rd I. F. assembly, at rear of chassis, to maximum output, reducing output of test oscillator to keep meter reading on scale as alignment proceeds.
4. Adjust I. F. alignment screws of 2nd I. F. transformer adjacent to 3rd I. F. transformer, for maximum output as described above.
5. Adjust alignment screws of 1st I. F. transformer, near front of chassis, for maximum output as described above.
6. Re-adjust alignment screws of all three transformers to make sure of accurate alignment. Always use lowest possible output of test oscillator to preclude the possibility of the automatic volume control action confusing correct alignment.

WAVE TRAP ADJUSTMENT

1. With test oscillator still set at 456.0 KC remove series condenser from grid of 6L7 converter tube and substitute a 200 mmfd. condenser in its place.
2. Connect test oscillator lead to antenna post of receiver.
3. Keep variable condenser at maximum capacity position with wave band switch in broadcast position.
4. Raise output of test oscillator until a half scale meter deflection is obtained.
5. Adjust trimmer No. C-25 (located on chassis) until the meter reading is at the minimum deflection (toward zero).

BROADCAST BAND—535-1720 KC

1. Set test oscillator to 1600 KC. Connect oscillator to receive through a 200 mmfd. condenser.
2. Rotate wave band switch to full clockwise direction.
3. Set dial scale to 1600 KC, and adjust trimmer C-19 to a resonance.
4. Adjust trimmer C-18 for maximum response.
5. Adjust trimmer C-6 for maximum response.
6. Set test oscillator to 600 KC.
7. Set dial scale to 600 KC and adjust padding condenser C-13 for maximum response "rocking" gang condenser while adjustment is made, to obtain proper resonance.
8. Repeat the adjustments at 1600 KC to obtain greater accuracy.

WEATHER BAND—140-410 KC

1. Set test oscillator to 400 KC. Use 200 mmfd. condenser in series with oscillator lead.
2. Rotate wave band switch one position in counter-clockwise direction.
3. Set dial scale to 400 KC and adjust trimmer C-14 to a resonance.
4. Adjust trimmer C-19 to a mixmum response.
5. Adjust trimmer C-7 to a maximum response.
6. Set test oscillator to 160 KC.
7. Set dial scale to 160 KC and adjust padding condenser C-15 to maximum response, "rocking" gang condenser while adjustment is made, to obtain proper resonance.

POLICE BAND—1.7-5.8 Megacycles

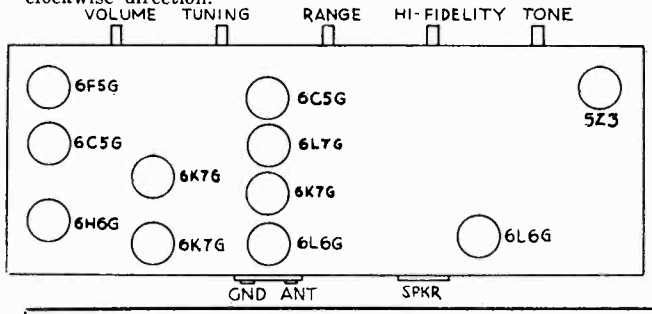
1. Set test oscillator to 5.5 megacycles, (400 ohm resistor in series with oscillator lead).
2. Rotate wave band switch counter-clockwise one position.
3. Set dial scale to 5.5 megacycles, and adjust C-10 to a resonance. The resonance obtained with the trimmer in the low capacity direction, being the correct one.
4. Adjust trimmer C-17 to a maximum response, "rocking" gang condenser while adjustment is made, to obtain proper resonance.
5. Adjust trimmer C-5 to a maximum response, "rocking" gang condenser while adjustment is made, to obtain proper resonance.
6. Set test oscillator to 2.0 megacycles.
7. Set dial scale to 2.0 megacycles, and adjust padding condenser C-11 for maximum response, "rocking" gang condenser while adjustment is made, to obtain proper resonance.
8. Repeat the adjustments at 5.5 megacycles to obtain greater accuracy.

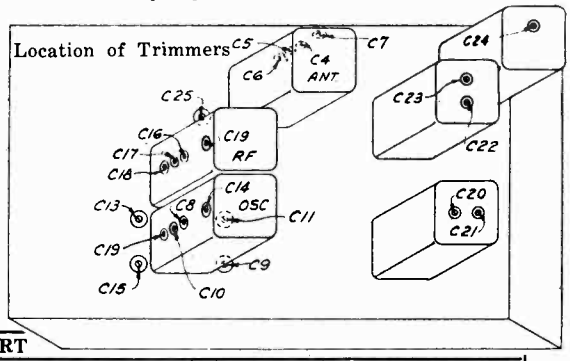
FOREIGN BAND—5.6-18.0 Megacycles

1. With test oscillator connected to the antenna and ground terminals through a 400 ohm resistor, set oscillator at 16.0 megacycles.
2. Rotate the wave band switch to the 4th position in the counter-clockwise position. Set dial scale to 16.0 megacycles.
3. Adjust oscillator trimmer C-8 to a resonance. There will possibly be two resonant points noticed. The one obtained with the trimmer out in the minimum capacity direction, is the correct one.
4. Adjust trimmer C-16 to maximum response, "rocking" the gang condenser back and forth a degree or two to obtain proper resonance.
5. Adjust trimmer C-4 to maximum response, "rocking" gang condenser while trimming to obtain proper resonance.
6. Set test oscillator to 6.0 megacycles.
7. Set dial scale to 6.0 megacycles, and adjust padding condenser C-9 until a maximum response is obtained, "rocking" the gang condenser while adjustment is made to obtain proper resonance.
8. Return to 16.0 megacycles and check adjustment of C-8, C-16, and C-4 to make certain that the adjustment of C-9 has not disturbed their adjustments.

ULTRA HIGH FREQUENCY BAND 16.5-42.0 Megacycles

The alignment of this band is fixed at the factory and does not have any adjustments to be made in the field.





VOLTAGE CHART

Position	Tube	Ef	Ek	Eg Screen	Eg Suppressor	Ep Triode	Ep Pentode
R. F. Amplifier	6 K7G	6.3	3.5	85.0	Tied to Cathode		278.0
1st I. F. Amplifier	6 K7G	6.3	5.0	85.0	Tied to Cathode		275.0
Converter	6 L7G	6.3	3.5				275.0
Oscillator	6 C5G	6.3				100.0	
2nd I. F. Amplifier	6 K7G	6.3	5.0	85.0	Tied to Cathode		275.0
Detector A.V.C.	6 H6G	6.3	2.5				
1st Audio	6 F5G	6.3	1.5			200.0	
Phase Inverter	6 C5G	6.3	3.5			75.0	
Audio Output	6 L6G	6.3	22.0	280.0			275.0
Audio Output	6 L6G	6.3	22.0	280.0			275.0
Rectifier	5 Z3	5.0					

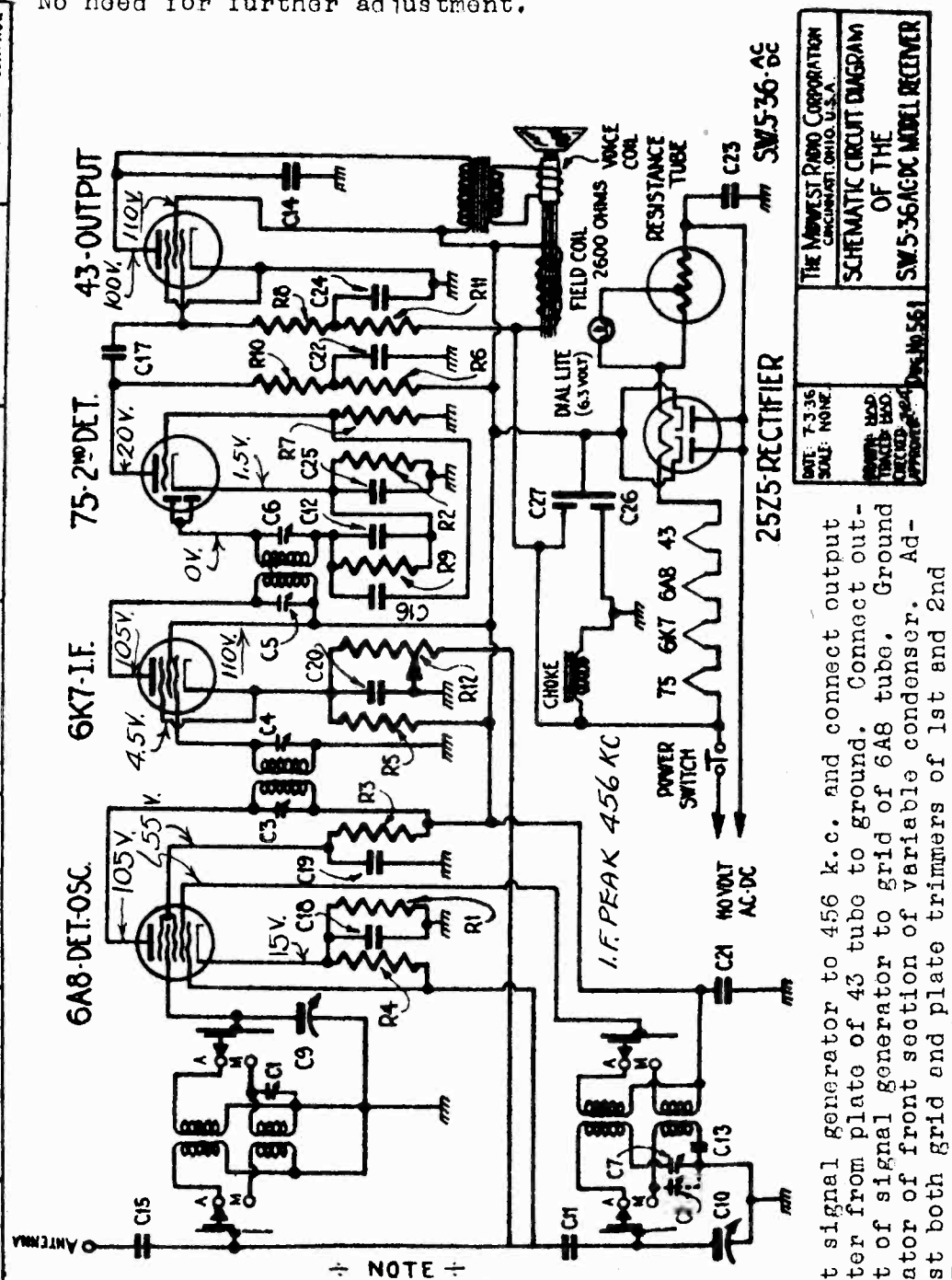
MODEL SW5-36 AC-DC
Schematic, Alignment
Voltage

MID-WEST RADIO CORP.

(2) Connect signal generator to antenna post on set through a standard dummy antenna. Remove short circuit from condonser. Set generator and dial to 1500 k.c. and peak bariable condensers for maximum output on meter. For low frequency adjustment set dial at 600 k.c. and peak padding condenser on front of chassis. Short wave calibration is automatically taken care of by fixed calibrated trimmers and padders. No need for further adjustment.

RESISTORS					
R1	240 OHMS	R7	100,000 OHMS		
R2	6,500 OHMS	R8	250,000 OHMS		
R3	25,000 OHMS	R9	500,000 OHMS		
R4	50,000 OHMS	R10	" "		
R5	" "	R11	" "		
R6	67,000 OHMS	R12	VOLUME CONTROL		

CONDENSERS							
C1	I.F. TRIMMER	C7	PADDER	C13	.0028 MFD. MICA	C19	.05 MFD. PAPER
C2	"	C8	"	C14	.006 MFD. "	C20	" "
C3	I.F. TRIMMER	C9	TUNING CONDENSER	C15	.02 MFD. PAPER	C21	" "
C4	"	C10	"	C16	" "	C22	.1 MFD. 200V.
C5	" "	C11	100 MMFD. MICA	C17	" "	C23	.1 MFD. 400V.
C6	" "	C12	350 MMFD. "	C18	.05 MFD. "	C24	.25 MFD. PAPER
				C25	5 MFD. (ELECTROLYTIC)		
				C26	12 MFD. (ELECTROLYTIC)		
				C27	20 MFD. (ELECTROLYTIC)		

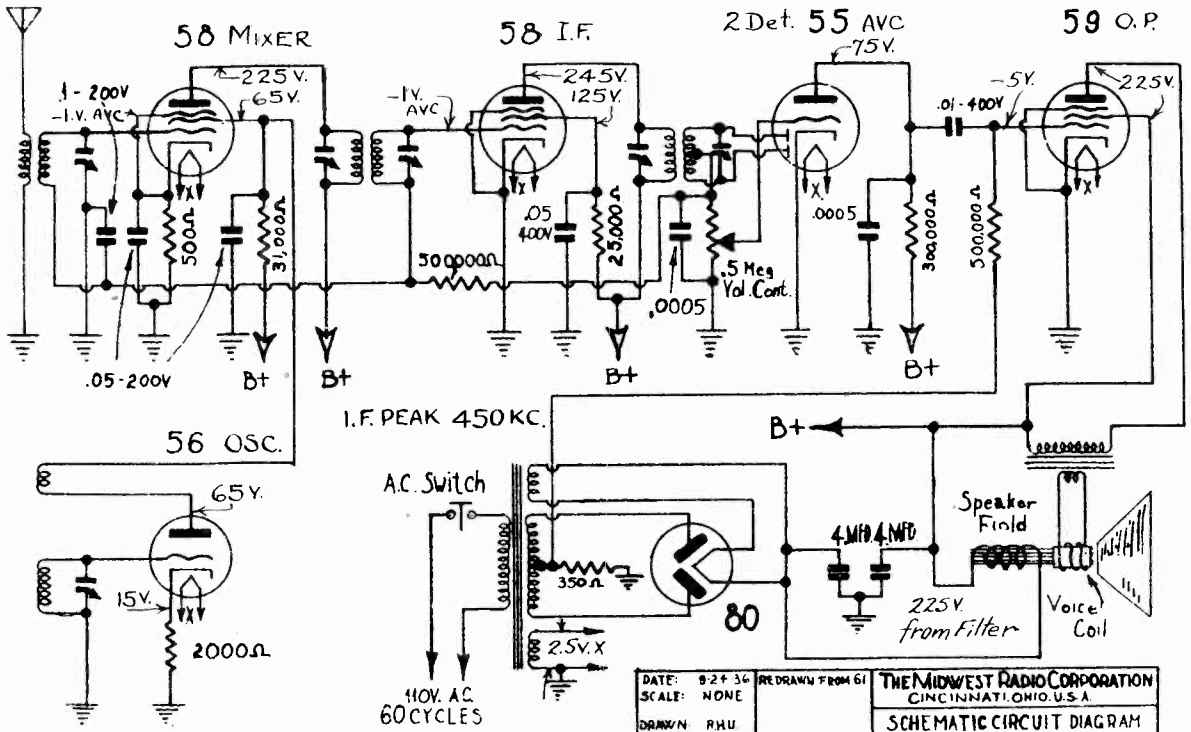


+ NOTE +
On Long Wave Model use Trimmers C1 & C2. Also replace C13 with Padder C8. & M Band coils are replaced with E Band coils.

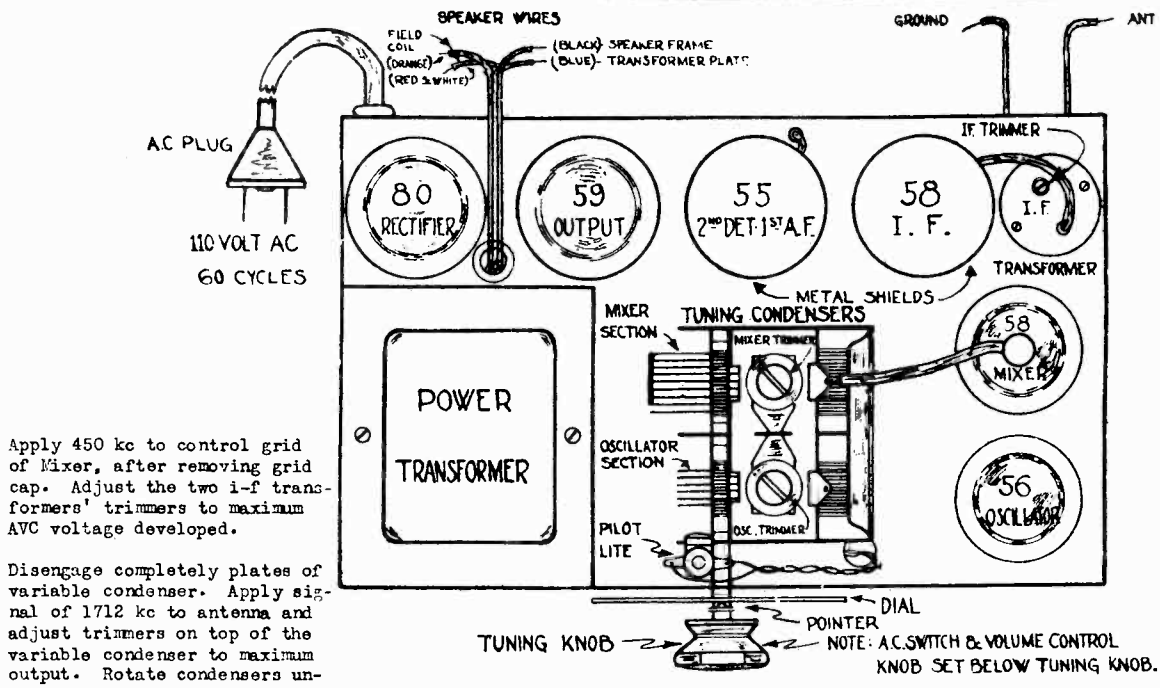
(1) Set signal generator to 456 k.c. and connect output meter from plate of 43 tube to ground. Connect output of signal generator to grid of 6A8 tube. Ground stator of front section of variable condenser. Adjust both grid and plate trimmers of 1st and 2nd I.F. transformers for maximum gain on output meter.

MODEL 6-33
Schematic, Socket
Voltage, Alignment

MID-WEST RADIO CORP.



DATE: 8-24-36 SCALE: NONE	REDRAWN FROM 61	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO, U.S.A.	
DRAWN: R.H.U. TRACED: R.H.U. CHECKED: H.A.D. APPROVED:	DRG. No. 613	SCHEMATIC CIRCUIT DIAGRAM OF THE 6-33 MODEL RECEIVER	



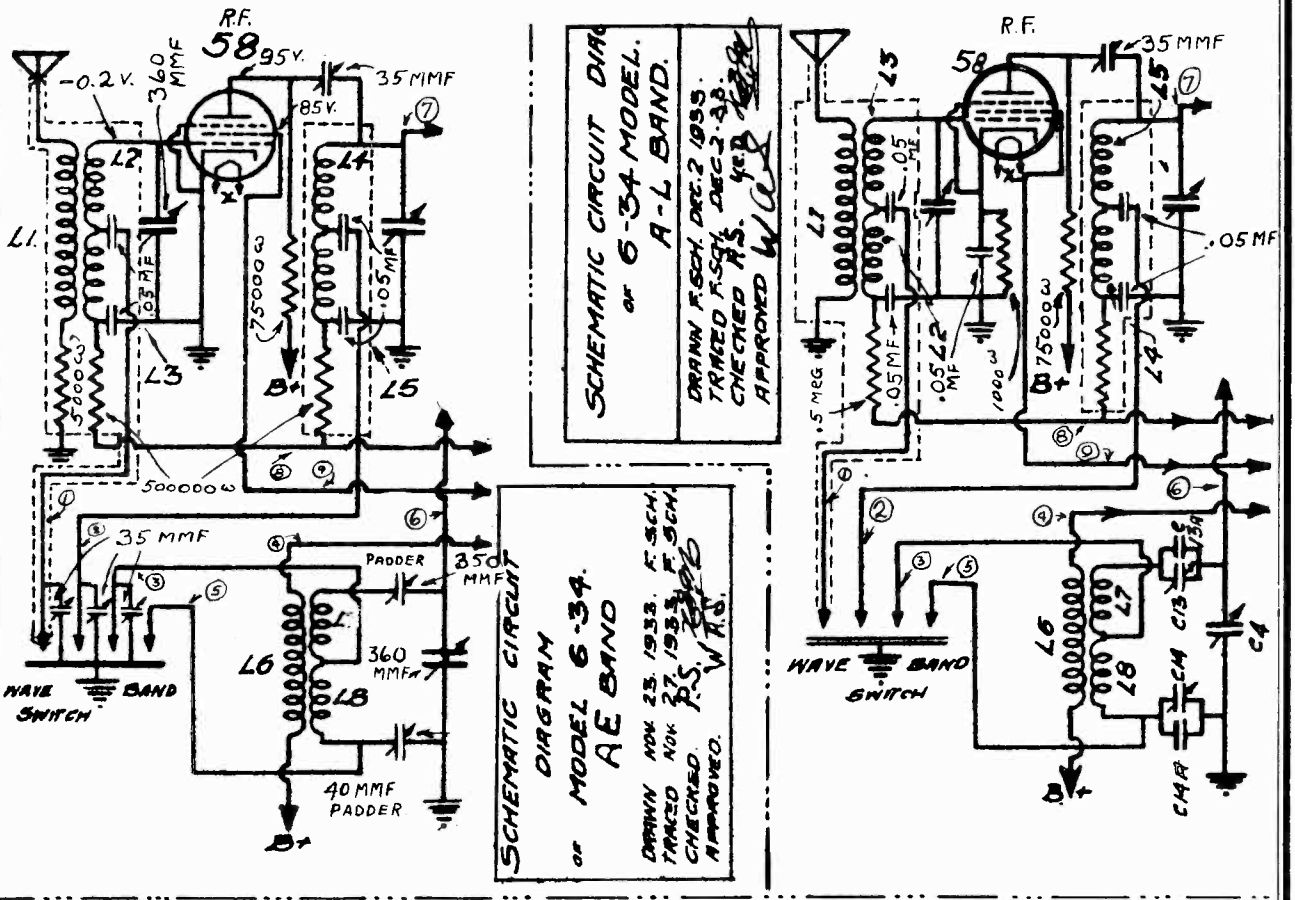
Apply 450 kc to control grid of Mixer, after removing grid cap. Adjust the two i-f transformers' trimmers to maximum AVC voltage developed.

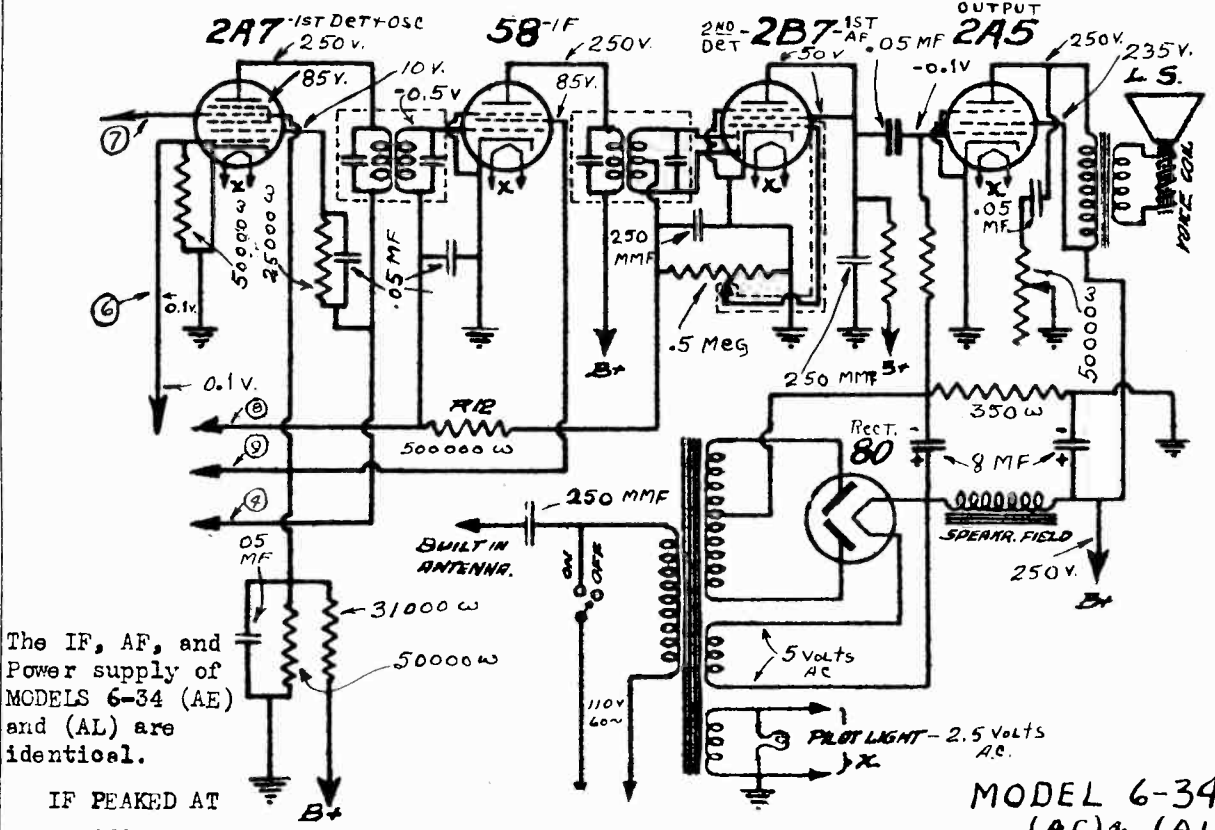
Disengage completely plates of variable condenser. Apply signal of 1712 kc to antenna and adjust trimmers on top of the variable condenser to maximum output. Rotate condensers until one section of the split plates are engaged and bend plates for maximun output. Be sure to change oscillator frequency with each move to a new section.

DATE: 10-18-35 SCALE: FULL		THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO.
DRAWN: H.A.D. TRACED: H.A.D. CHECKED: APPROVED:	DRAWING No. A-120	CHASSIS LAYOUT SHOWING LOCATION OF TUBES & PARTS FOR 6-33 MODEL.

MODEL 6-34 (A-E)
MODEL 6-34 (A-L)
Schematics, Voltage

MID-WEST RADIO CORP.





The IF, AF, and Power supply of MODELS 6-34 (AE) and (AL) are identical.

IF PEAKED AT 450 KC

MODEL 6-34 (AE) AND (AL)

MODEL 6-34 (A-E)
MODEL 6-34 (A-L)
Socket, Trimmers
Alignment

MID-WEST RADIO CORP.

INSTRUCTIONS FOR REBALANCING 6 TUBE 1934 MODEL DUAL WAVE RECEIVER. MODEL AE AND AL

Remove the control grid cap of the 2A7 tube (mixer) and apply a modulated signal of 450 K.C. to the control grid of the 2A7 tube. Trimm the first and second I.F. Transformers for maximum AVC voltage developed. Be sure during the alignment procedure to keep the signal input down as low as possible or double peaking of stations will result. There are two adjustments on each of the I.F. transformers.

To align the R.F. and Osc. and Mixer circuits on the AL Model --

Turn the wave band switch to the A position (all switch contacts open), turn the variable condenser until the plates are entirely engaged. Apply a signal of 530 K.C. to the antenna connection of the receiver and adjust the A band padder until the oscillator signal is received at maximum. Apply signal of 1600 K.C. to the antenna connection of the receiver and turn the variable condenser until the plates are disengaged and trimm the trimmers on the variable condenser until maximum signal is obtained. Adjust the Osc., Mixer and R.F., in order named.

To adjust the L band, apply a signal of 1600 K.C. to the antenna connection of the receiver and adjust the L band padder until maximum signal is obtained.

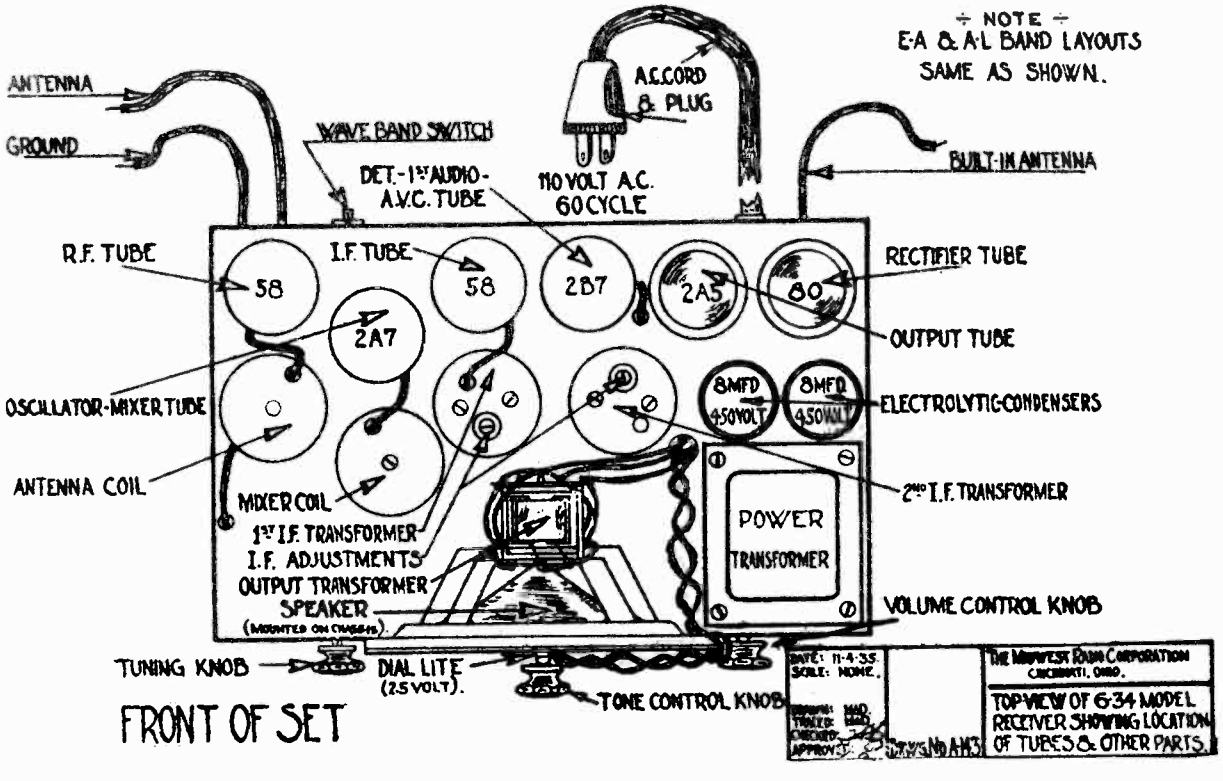
To align the R.F., Osc, and Mixer circuits of the AE model --

Turn the wave band switch to the A position (all contacts closed). Apply a signal of 530 K.C. to the antenna connection of the receiver and adjust the A band padder until maximum signal is received. Condensers being fully engaged or closed. Rotate condensers to the position where the plates are entirely disengagod. Apply a signal of 1600 K.C. to the antenna connection of the receiver and trimm the adjustments on the variable condensor until maximum output is received.

Turn the wave change switch to the E position (all contacts open). Apply a signal of 150 K.C. to the antenna connection of the receiver, and adjust the E band padder until maximum signal is received. Rotate the variable condonsor being closed for this operation.

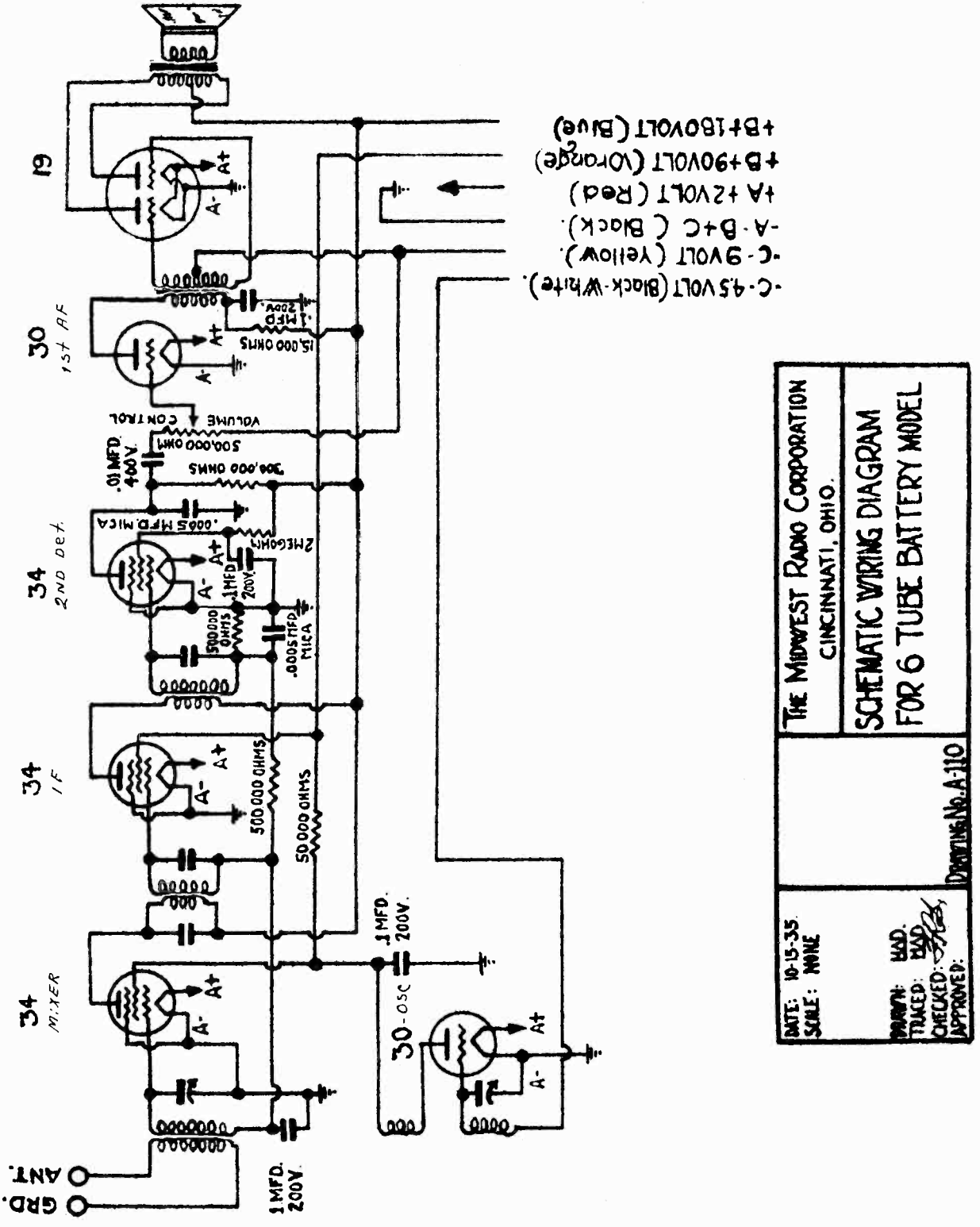
Turn the variable condensors to the position whoro the plates are entirely disongaged and apply a signal of 370 K.C. to the antonna connection of the receiver and adjust the trimmers on switch until maximum signal is received. This completes the procoduro of rebalancing the receiver.

Be sure to always koop the signal imput as low as possible whon aligning a receiver.



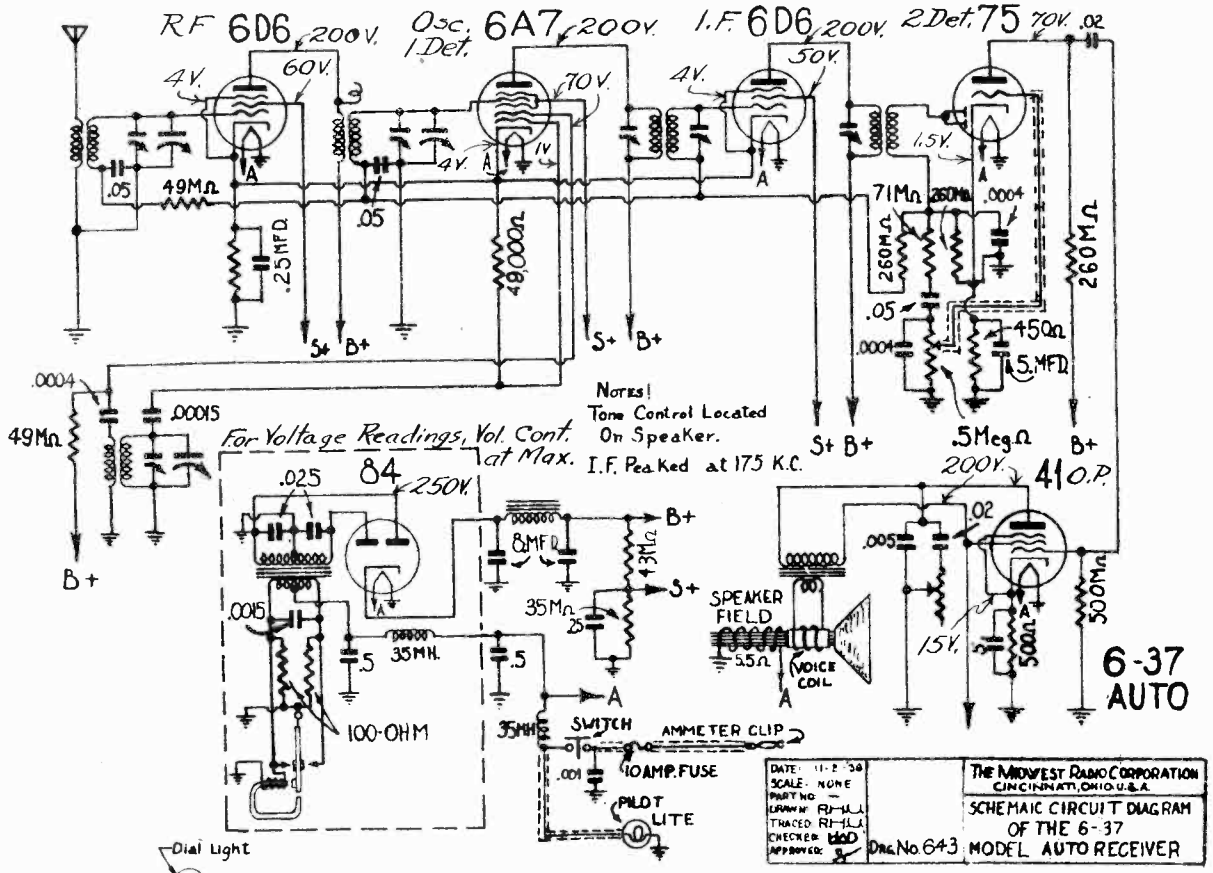
MODEL 6-Tube Batt.
Schematic

MID-WEST RADIO CORP.

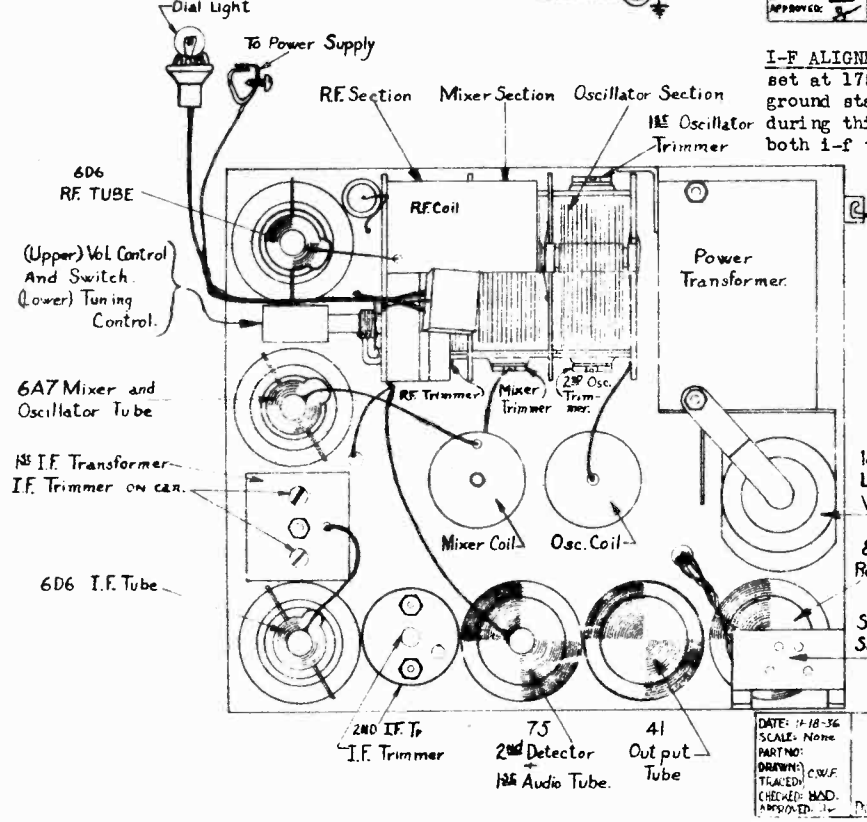


MODEL 6-37 Auto
Schematic, Voltage
Socket, Trimmers
Alignment

MID-WEST RADIO CORP.



DATE: 11-2-36 SCALE: NONE PART NO: — DRAWN: RJHLL TRACED: RJHLL CHECKED: HAD APPROVED:	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO U.S.A.
Dwg. No. 643	SCHEMAIC CIRCUIT DIAGRAM OF THE 6-37 MODEL AUTO RECEIVER



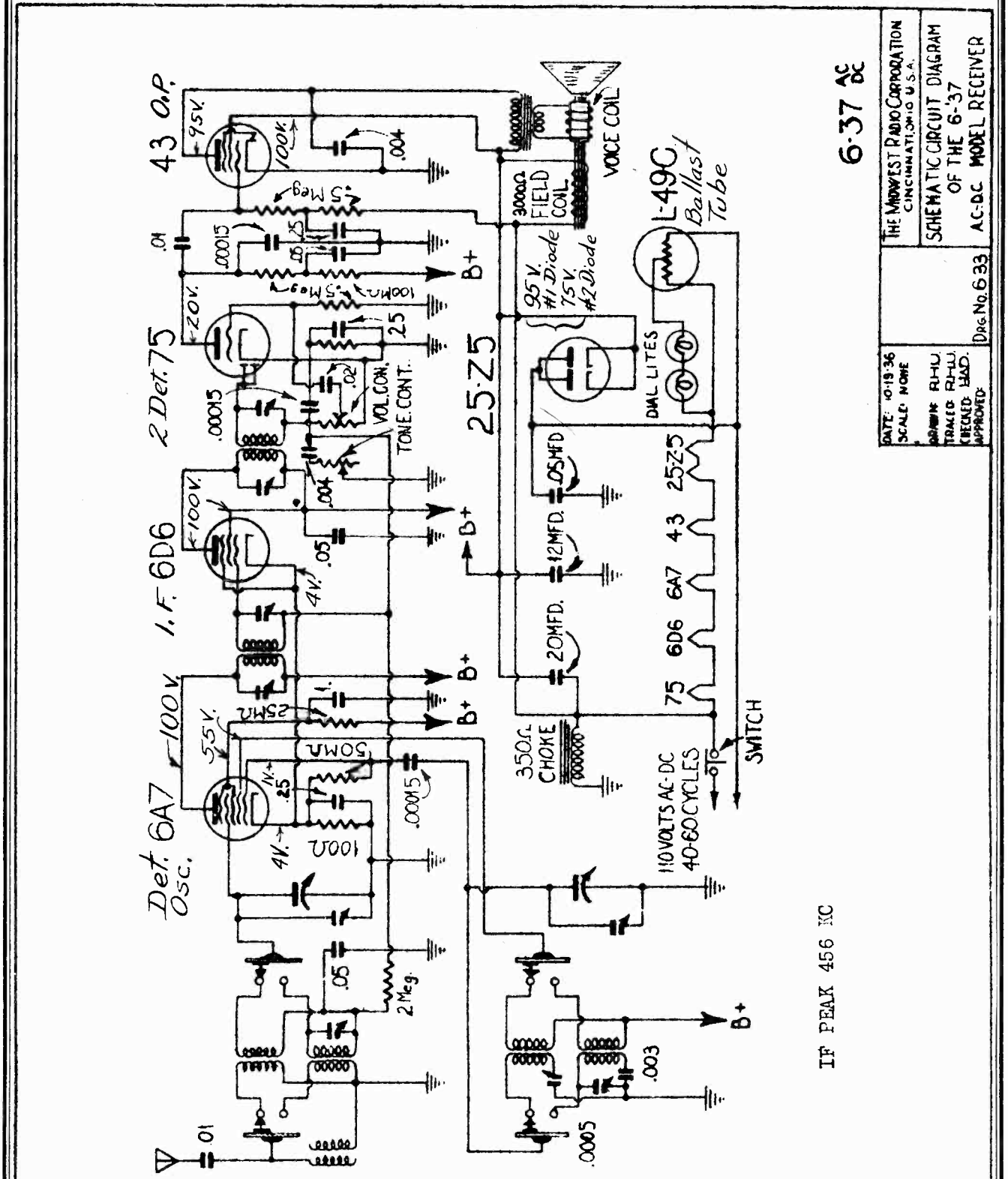
I-F ALIGNMENT: Connect signal generator set at 175 kc, to grid of 6A7 tube and ground stator of oscillator condenser during this operation. Peak trimmers of both i-f transformers for maximum.

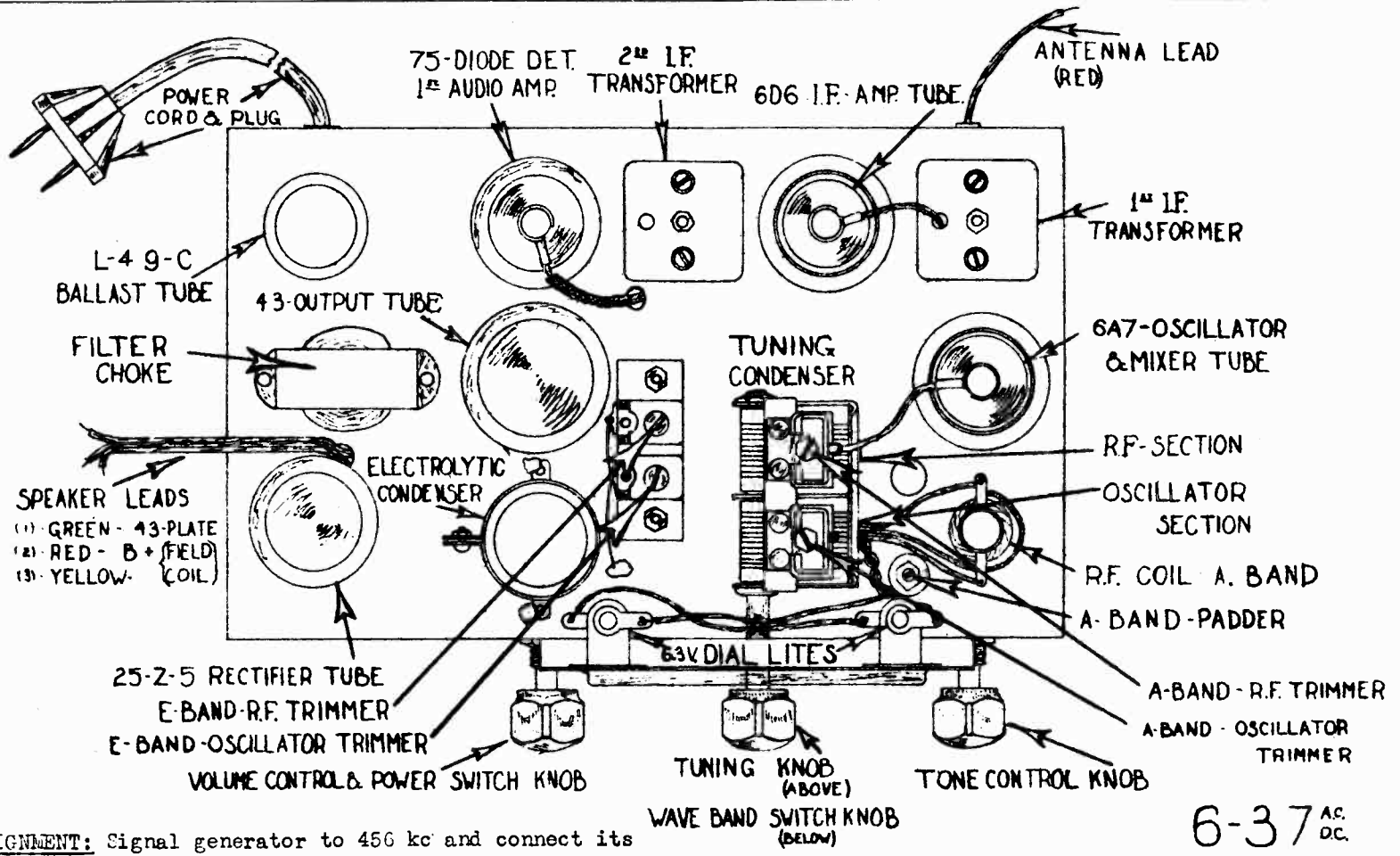
R-F ALIGNMENT: Connect signal generator to antenna post of set through a standard dummy antenna. Remove ground from oscillator condenser. Set dial and signal generator to 1500 kc and align trimmers on variable condensers for maximum output. All other frequencies will be aligned automatically because of cut section oscillator condenser.

DATE: 11-18-36 SCALE: None PART NO: DRAWN: C.W.F. TRACED: CHECKED: HAD. APPROVED:	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO U.S.A.
Dwg. No. 670	TUBE & TRIMMER LOCATION ON THE 6-37 AUTO RECEIVER

MODEL 6-37 AC-DC
Schematic, Voltage

MID-WEST RADIO CORP.





6-37 A.C. D.C.

I-F ALIGNMENT: Signal generator to 456 kc and connect its output to grid of 6A7 tube. Short-circuit front section of variable condenser. Adjust trimmers of both i-f transformers for maximum.

R-F ALIGNMENT: Broadcast Band-- Remove short circuit from condenser. Connect signal generator, set at 1500 kc, to antenna post of receiver through standard dummy antenna. Set dial to 1500 kc and peak variable condenser trimmers for maximum. Set signal generator and dial to 600 kc and adjust padder for maximum output. Readjust 1500-kc alignment.

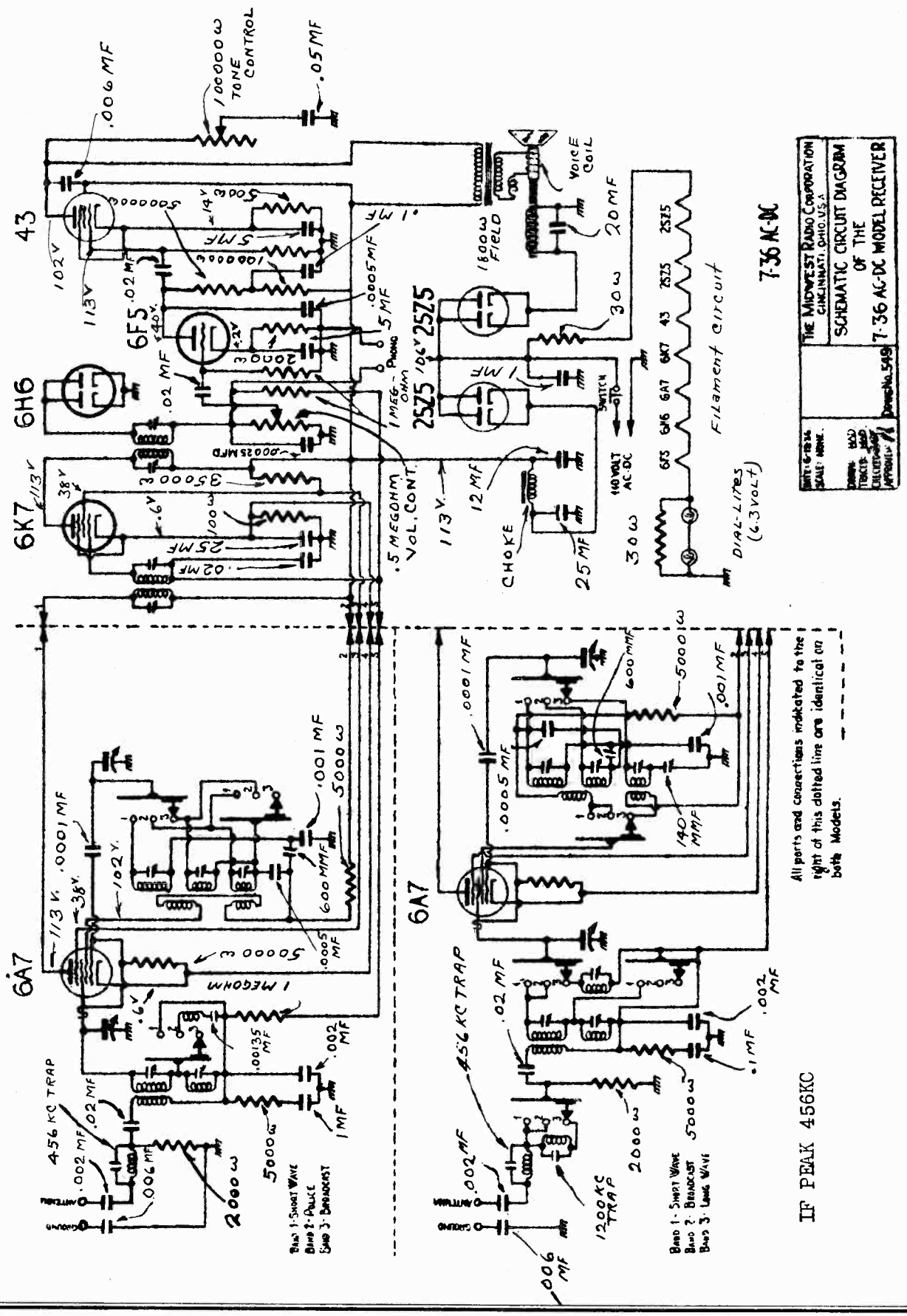
Short-wave Alignment-- Set signal generator and dial to 15 mc and peak trimmers for maximum output. Low-frequency setting is automatically cared for by fixed calibrated padder.

DATE: 11-11-38 SCALE: NONE DRAWN: FH-LU TRACED: FH-LU CHECKED: HOD APPROVED:	Drg. No. 658	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO. U.S.A. TOP VIEW OF MODEL 6-37 A.C. D.C. SHOWING LOCATION OF TUBES, TRIMMERS, AND OTHER PARTS

MID-WEST RADIO CORP.

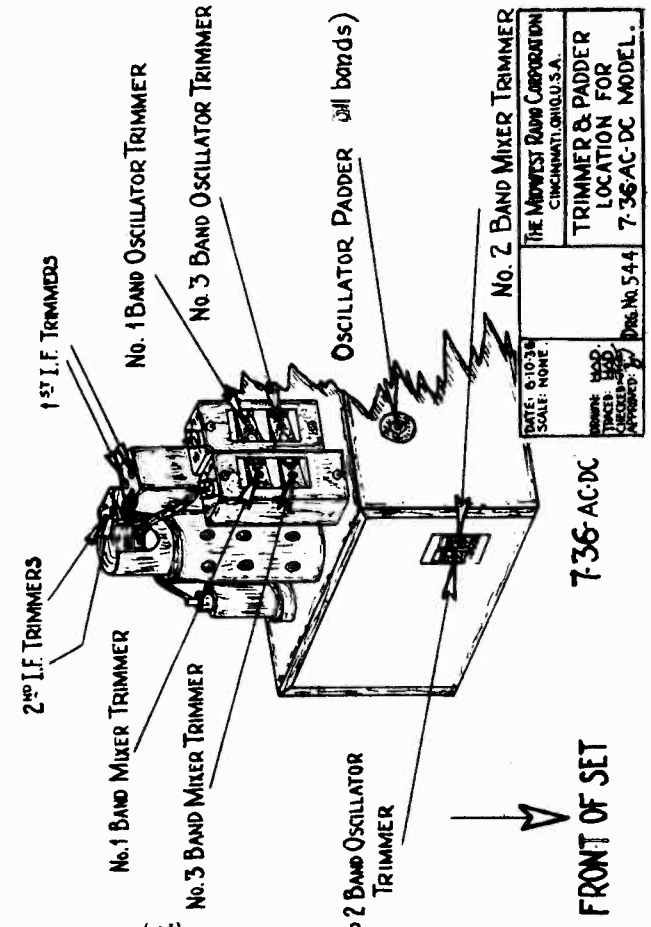
MODEL 7-36 AC-DC
Schematic, Voltage

MID-WEST RADIO CORP.



MODEL 7-36 AC-DC
Socket, Trimmers
Alignment

MIDWEST RADIO CORP.



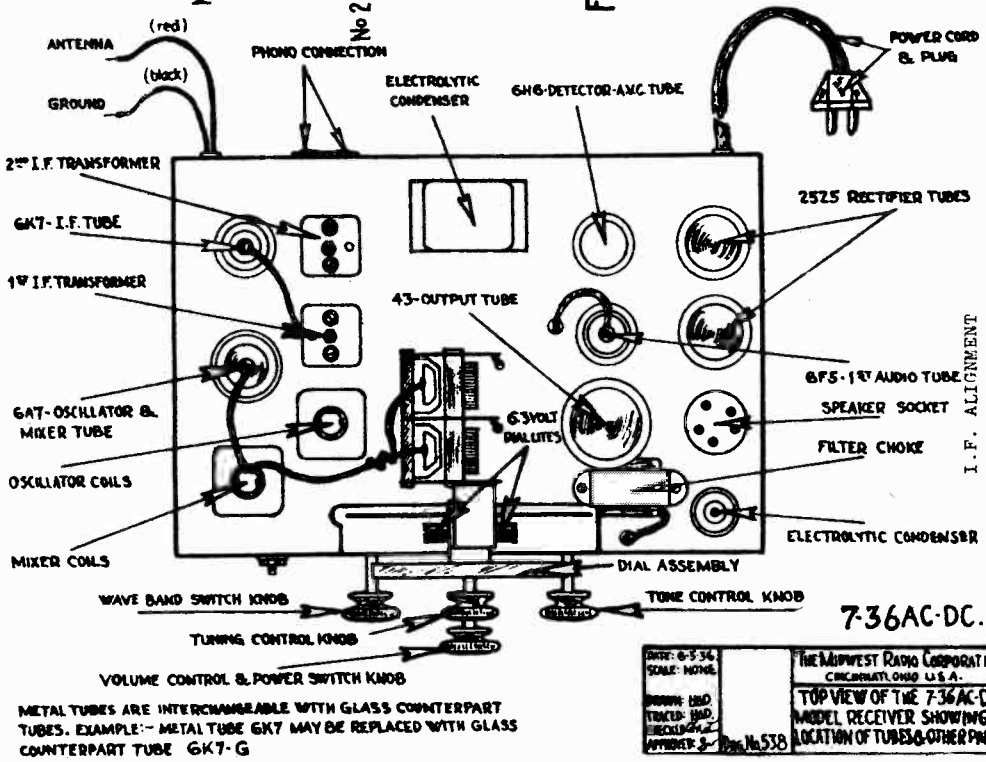
R.F. ALIGNMENT

(2) Band #1 Alignment :- The short circuit is removed from oscillator condenser and the signal generator is connected to the antenna post of the receiver through a standard dummy antenna. The receiver and signal generator are set at 16 m.c. The oscillator trimmer is adjusted so as to bring in the signal at this setting The antenna trimmer is adjusted for maximum output.

(3) Band #2 Alignment: - With the signal generator still connected to antenna post of receiver, set generator and receiver dial at 1400 k.c. Adjust oscillator trimmer so that signal comes in at this setting. The Antenna and R.F. trimmers are adjusted for maximum output. The signal generator is set at 600 k.c. and the padder is adjusted so that the signal comes in at this point on the dial. After making this adjustment the 1400 k.c. adjustment should then be rechecked.

(4) Band #3 Alignment: - With the receiver and signal generator both set at 325 k.c., the oscillator trimmer is adjusted so that this signal agrees with the dial. Antenna trimmer is then adjusted for maximum output.

Note: To assure more accurate trimmer setting always use lowest possible test oscillator output consistent with readable output meter scale deflection.



METAL TUBES ARE INTERCHANGEABLE WITH GLASS COUNTERPART TUBES. EXAMPLE:- METAL TUBE 6K7 MAY BE REPLACED WITH GLASS COUNTERPART TUBE 6K7-G

I.F. ALIGNMENT

Set signal generator to 1456 k.c. Connect output meter from plate of 43 output tube to ground. Connect output of signal generator to grid cap of 6A7 tube. The front section of the tuning condenser if short circuited and the volume control is turned to max-position. The I.F. trimmers are then adjusted for maximum gain on output meter.

Note: To assure more accurate trimmer setting always use lowest possible test oscillator output consistent with readable output meter scale deflection.

MODEL 7-36 Batt.
Schematic, Voltage

MID-WEST RADIO CORP.

CONDENSERS

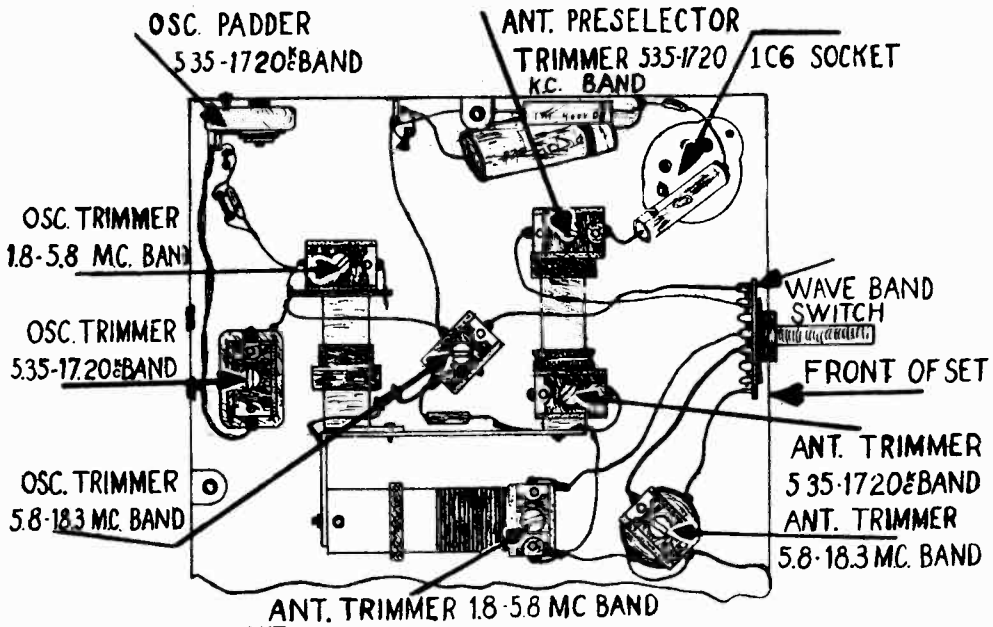
C1	50MMFD TRIMER	C11	600 - MMFD-PADDER	C21	.004 MFD.	C31	.1 MFD - 400V.
C2	" "	C12	6 MMFD	C22	.02 MFD 1200V.	C32	" "
C3	" "	C13	.00025 MFD.	C23	.03 MFD 600V.	C33	" "
C4	" "	C14	.0005 MFD.	C24	.05 MFD 200V.	C34	" "
C5	" "	C15	" "	C25	.05 MFD 400V.	C35	.5 MFD - 200V.
C6	" "	C16	.002 MFD - 600V.	C26	.1 MFD 200V.	C36	.5 MFD - 400V.
C7	" "	C17	" "	C27	" "	C37	1. MFD - 400V.
C8	TUNING COND.	C18	" "	C28	" "	C38-8 MFD-	DRY ELECT.
C9	" "	C19	.0021 MFD.	C29	" "	C39	20 MFD. "
C10	" "	C20	.0027 MFD.	C30	.1 MFD. 400V		

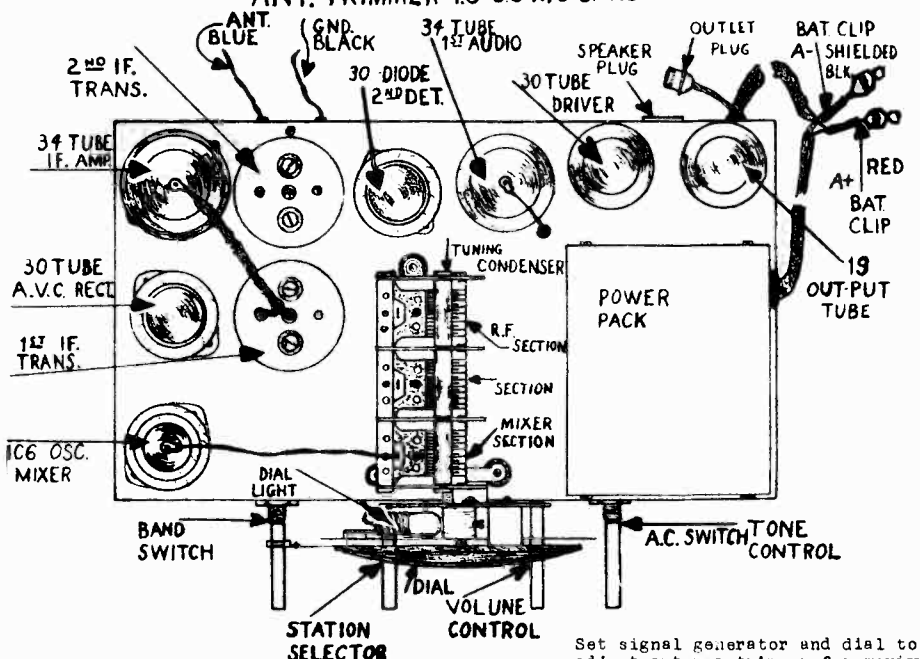
RESISTORS

R1	16.7 OHM - ½ WATT	R11	500000 OHM ½ WATT		
R2	333 OHM - "	R12	" "		
R3	5,000 OHM "	R13	1. MEGOHM "		
R4	" "	R14	" "		
R5	15,000 OHM "	R15	" "		
R6	25,000 OHM "	R16	7.7 OHM .5 WATT		
R7	50,000 OHM "	R17	10 OHM "		
R8	100,000 OHM "	R18	15,000 OHM "		
R9	250,000 OHM "	R19	50M. OHM TONE CONT		
R10	" "	R20	500 OHM VOL. CONT		

MODEL 7-36 Batt.
Socket, Trimmers
Alignment

MID-WEST RADIO CORP.





(1) Connect output of signal generator to the control grid of the 1C6 tube through a .02 mfd. condenser. Leave the grid cap connected to the grid terminal of the tube and connect the ground side of the signal generator to the receiver ground. Set signal generator to 465 k.c. and connect output meter between plates of the 19 output tube. Adjust grid and plate trimmer screws of 1st and 2nd I. F. transformers for maximum gain.

(2) Connect output of signal generator to antenna post of receiver through a standard dummy antenna.

(a) Place band selector switch for operation on the 5.8 to 18.3 m.c. band. Tune the receiver dial and the signal generator to exactly 18.3 m.c. Adjust the 18.3 m.c. oscillator trimmer for maximum gain. Care must be taken that the fundamental peak and not the image peak is used for aligning the receiver at this frequency.

(b) Place band selector switch for operation on the 1.8 to 5.8 m.c. band. Set the signal generator and dial to a frequency of 5.8 m.c. Adjust 5.8 m.c. oscillator trimmer for maximum output. Adjust antenna trimmer for maximum output.

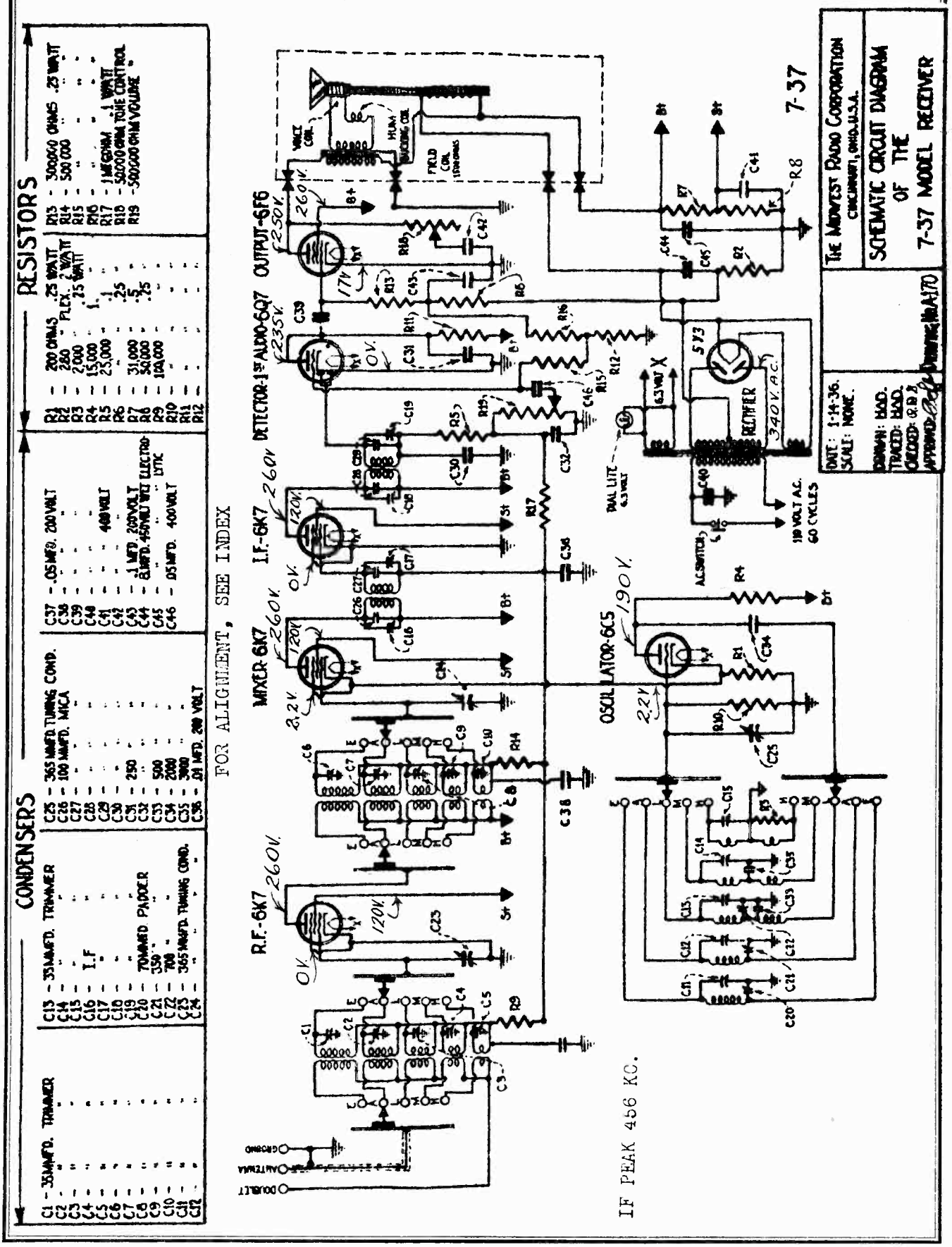
(c) Place band selector switch for operating on the 5.35 17.20 k.c. band. Set signal generator and dial to 17.20 k.c. and adjust oscillator trimmer for maximum output. Adjust 1400 k.c. R. F. and antenna trimmers for maximum output. Set signal generator and dial to 600 k.c. and adjust oscillator padder for maximum output.

Set signal generator and dial to 16 m.c. and adjust antenna trimmer for maximum output.

It will be necessary to recheck the 17.20 k.c. setting after this alignment.

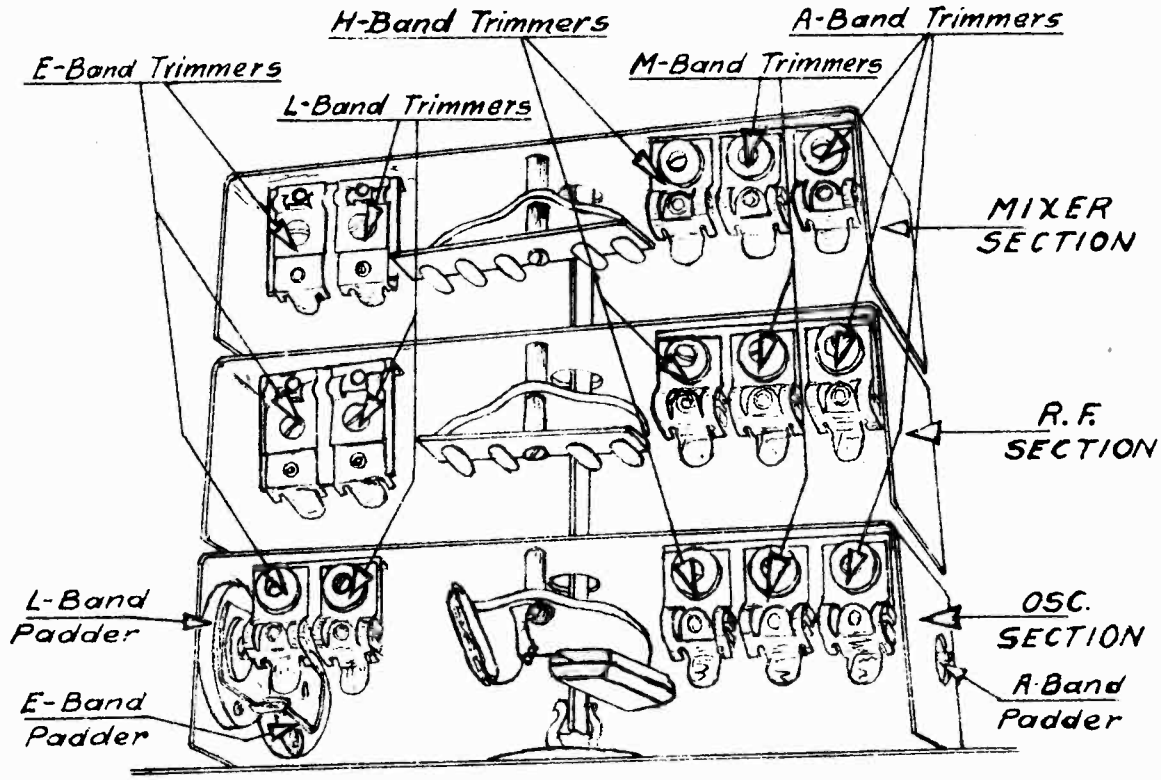
MODEL 7-37 AC
Schematic, Voltage

MID-WEST RADIO CORP.



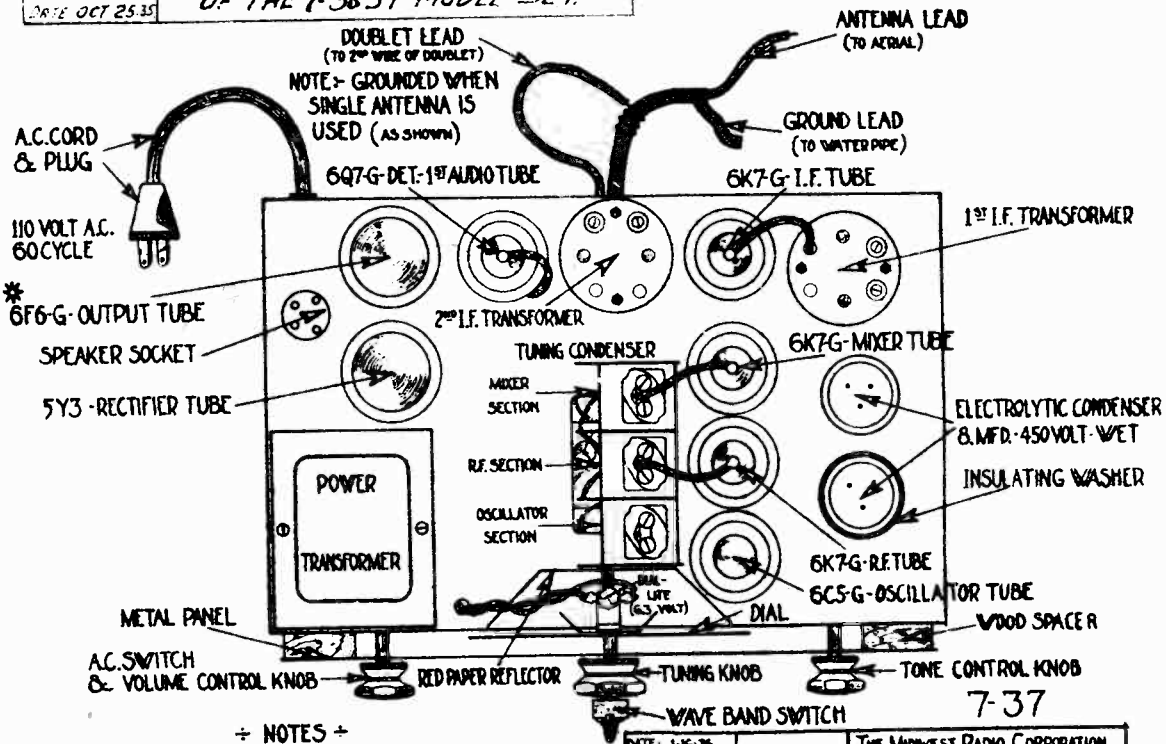
MODEL 7-37 AC
Socket, Trimmers

MID-WEST RADIO CORP.



Drawn F.S.H. Checked R.D.C. Approved [illegible] DATE OCT 25-35	THE MIDWEST RADIO CORP. CINCINNATI, OHIO.
	PADDER AND TRIMMER LOCATIONS OF THE 7-36-37 MODEL SET.

FRONT OF SET



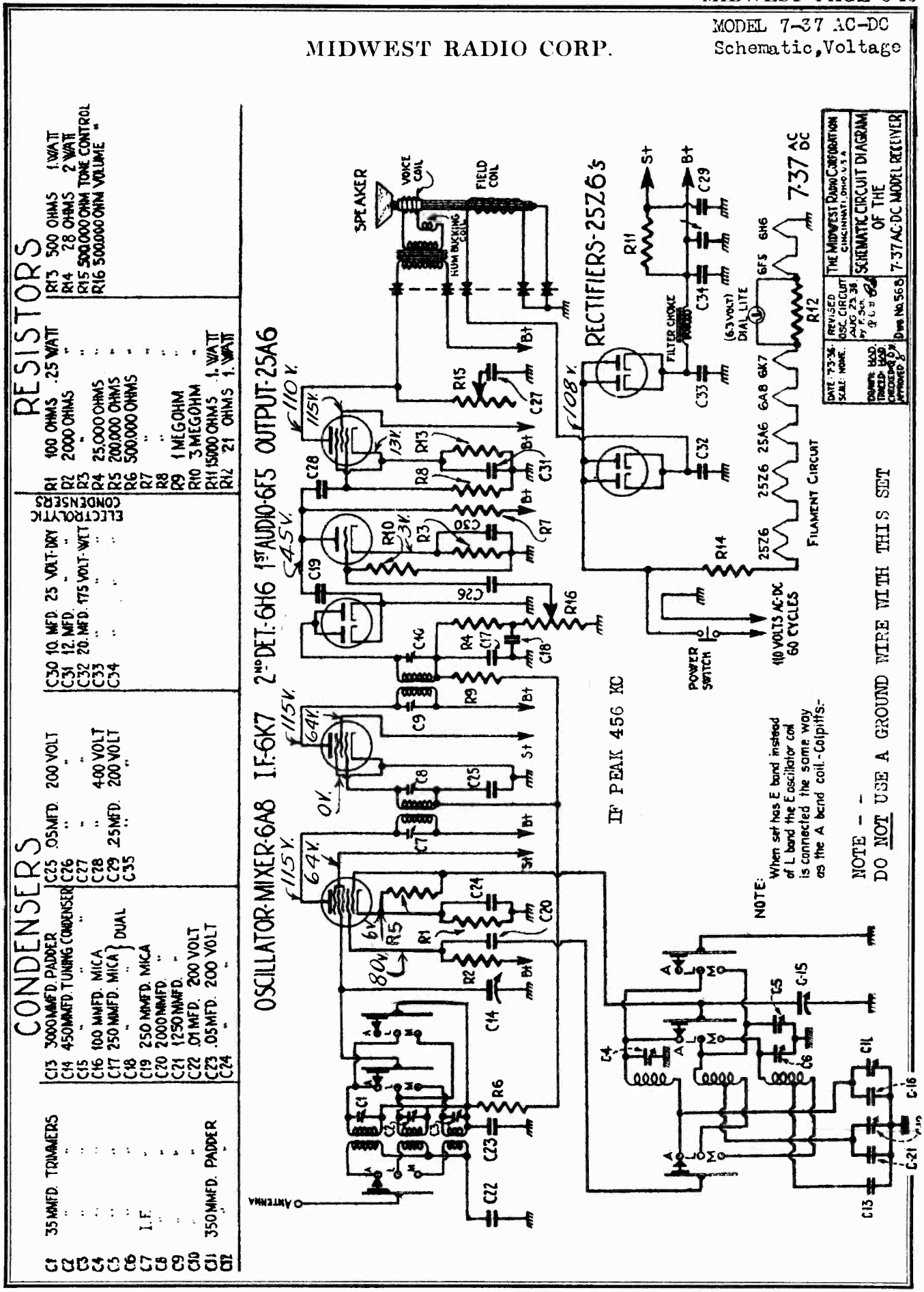
÷ NOTES ÷

* This chassis is shown with glass-counterpart tube. Metal; metal-glass or glass-counterpart tubes may be used. For example the Output tube shown is a glass-counterpart tube numbered 6F6-G, A Metal-glass tube would be numbered 6F6-MG and a Metal tube would be numbered 6F6.
Wood spacers and metal panel used in console models only.

DATE: 1-14-36. SCALE: NONE. DRAWN: H.O.D. TRACED: H.O.D. CHECKED: [illegible] APPROVED: [illegible] Drawing No. A-174	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO. U.S.A.
	TOP VIEW OF THE 7-37 MODEL RECEIVER SHOWING LOCATION OF TUBES & OTHER PARTS.

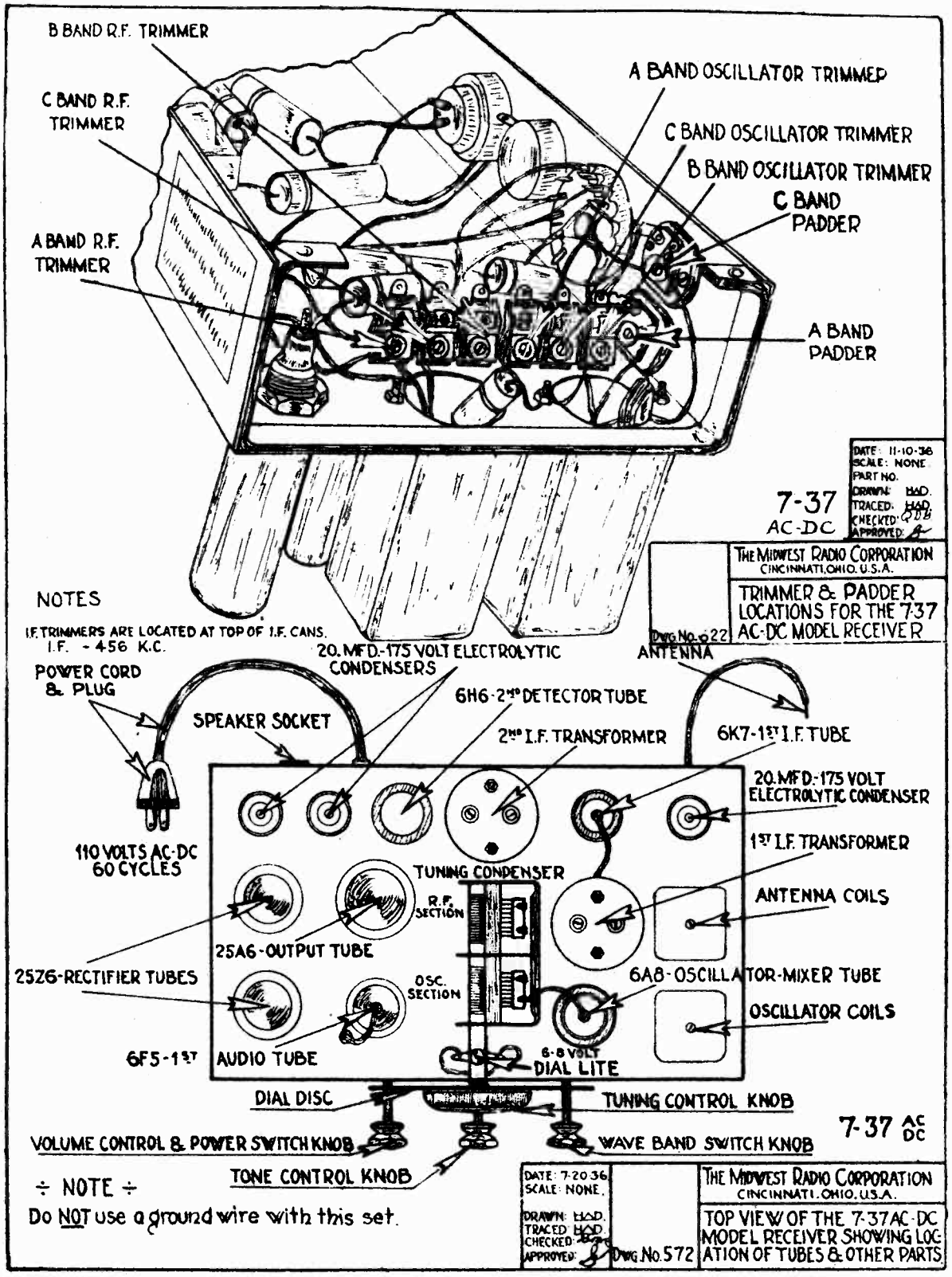
MIDWEST RADIO CORP.

MODEL 7-37 AC-DC
Schematic, Voltage



MODEL 7-37 AC-DC
Socket, Trimmers

MID-WEST RADIO CORP.



MID-WEST RADIO CORP.

MODELS 7-35, 7-36
MODEL 7-37 AC-DC
Alignment

INSTRUCTIONS FOR ALIGNING THE MIDWEST 7-TUBE 1935-36 MODEL RECEIVERS

(1) Set the signal generator to 456 k.c. and connect it from the mixer grid to ground.

(2) Remove the oscillator tube from the receiver.

(3) Connect the output meter from the plate of the output tube to positive B +

(4) Using a moderately weak signal approximately 40 microvolts, align the two I.F. Transformers to maximum output.

(5) Keep decreasing the oscillator input and realigning for maximum gain.

This completes the alignment of the I.F. amplifier.

Insert the oscillator tube. Connect the signal generator and mixer grid lead between antenna and ground.

(1) Set the wave change switch to the "E" Band.

(2) Set the signal generator to 325 k.c.

(3) Adjust the "E" oscillator trimmer to maximum gain, then adjust the "E" Band R.F. and the "E" Band mixer trimmers for maximum gain.

(4) Reset the signal generator to 135 k.c. and rotate the receiver dial to 135 k.c.

(5) Adjust the "E" Band padder for maximum signal.

(6) Repeat the adjustment of trimmers and padders until the adjustment of one does not effect the adjustment of the other.

This completes the alignment of the "E" Band.

(1) Set the wave change switch to the "A" Band.

(2) Set the signal generator to 1490 k.c.

(3) Adjust the "A" oscillator trimmer to maximum gain, then adjust the "A" Band R.F. and the "A" Band mixer trimmers for maximum gain.

(4) Reset the signal generator to 550 k.c. and rotate the receiver dial to 550 k.c.

(5) Adjust the "A" Band padder for maximum signal.

(6) Repeat the adjustment of trimmers and padders until the adjustment of one does not effect the adjustment of the other.

This completes the alignment of the "A" Band.

(1) Set the wave change switch to the "L" Band.

(2) Set the signal generator to 3.8 megacycles.

(3) Adjust the "L" oscillator trimmer to maximum gain, then adjust the "L" Band R.F. and the "L" Band mixer trimmers for maximum gain.

(4) Reset the signal generator to 1.6 megacycles and rotate the receiver dial to 1.6 megacycles.

(5) Adjust the "L" Band padder for maximum signal.

(6) Repeat the adjustment of trimmers and padders until the adjustment of one does not effect the adjustment of the other.

This completes the alignment of the "L" Band.

(1) Set the wave change switch to the "M" Band.

(2) Set the signal generator to 11.5 megacycles.

(3) Adjust the "M" oscillator trimmer to maximum gain, then adjust the "M" Band R.F. and the "M" Band mixer trimmers for maximum gain.

This completes the alignment of the "M" Band.

(1) Set the wave change switch to the "H" Band.

(2) Set the signal generator to 28 megacycles.

(3) Adjust the "H" Band oscillator trimmer to maximum gain, then adjust the "H" Band R.F. and the "H" band mixer trimmers for maximum gain.

This completes the alignment of the "H" Band.

INSTRUCTIONS FOR ALIGNING THE MIDWEST 7-37 AC-DC RECEIVER

(1) Set the signal generator to 456 k.c. and connect it from the mixer grid to ground.

(2) Be sure that set is not tuned to a station.

(3) Connect the output meter from the plate of the output tube to positive B.

(4) Using a moderately weak signal approximately 60 micro-volts, align the two I.F. transformers to maximum gain.

(5) Keep decreasing the oscillator input and realigning for maximum gain.

This completes the alignment of the I.F. amplifier.

Connect the signal generator between antenna and ground. Connect mixer grid lead to grid of mixer tube.

(1) Set the wave change switch to the "A" band.

(2) Set the signal generator to 1490 k.c.

(3) Adjust the "A" oscillator trimmer to maximum gain, then adjust "A" band mixer trimmer for maximum gain.

(4) Reset the signal generator to 550 k.c. and rotate the receiver dial to 550 k.c.

(5) Adjust the "A" band padder for maximum signal.

(6) Repeat the adjustment of trimmers and padders until the adjustment of one does not effect the adjustment of the other.

This completes the alignment of the "A" band.

(1) Set the wave change switch to the "B" band.

(2) Set the signal generator to 12 mc.

(3) Adjust the "B" oscillator trimmer to maximum gain, then adjust the "B" band mixer for maximum gain.

This completes the alignment of the "B" band.

Short Wave Receiver

(1) Set the wave change switch to the "C" band.

(2) Set the signal generator to 4 m.c. Set dial at 75.

(3) Adjust the "C" oscillator trimmer to maximum gain, then adjust the "C" band mixer trimmers for maximum gain.

(4) Reset the signal generator to 2 m.c. and rotate the receiver dial to 16.

(5) Adjust the "C" band padder for maximum signal.

(6) Repeat the adjustment of trimmers and padders until the adjustment of one does not effect the adjustment of the other.

This completes the alignment of the "C" band s.w.

Long Wave Receiver

(1) Set the wave change switch to the "C" band.

(2) Set the signal generator to 325 k.c.

(3) Adjust the "C" oscillator trimmer to maximum gain, then adjust the "C" band mixer trimmers for maximum gain.

(4) Reset the signal generator to 150 k.c. and rotate the receiver dial to 150 k.c.

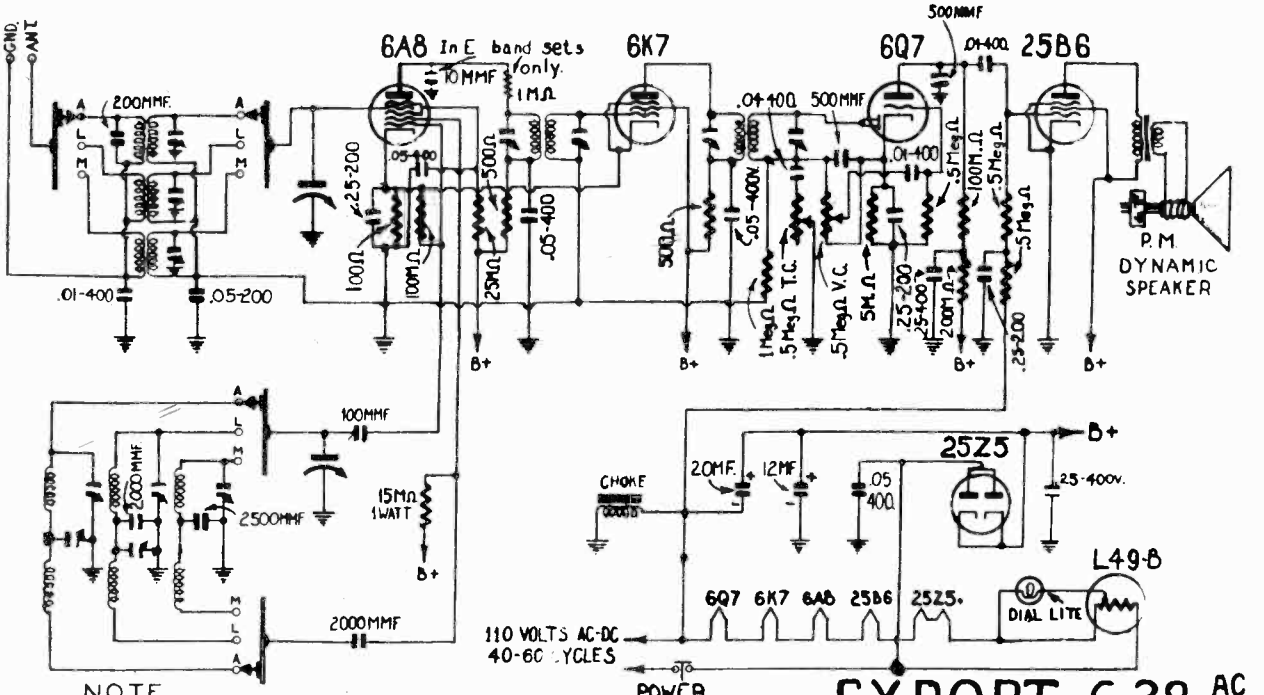
(5) Adjust the "C" band padder for maximum signal.

(6) Repeat the adjustment of trimmers and padders until the adjustment of one does not effect the adjustment of the other.

This completes the alignment of the "C" band l.w.

MODEL 6-38 AC-DC
(Export)
Schematic, Socket

MID-WEST RADIO CORP.



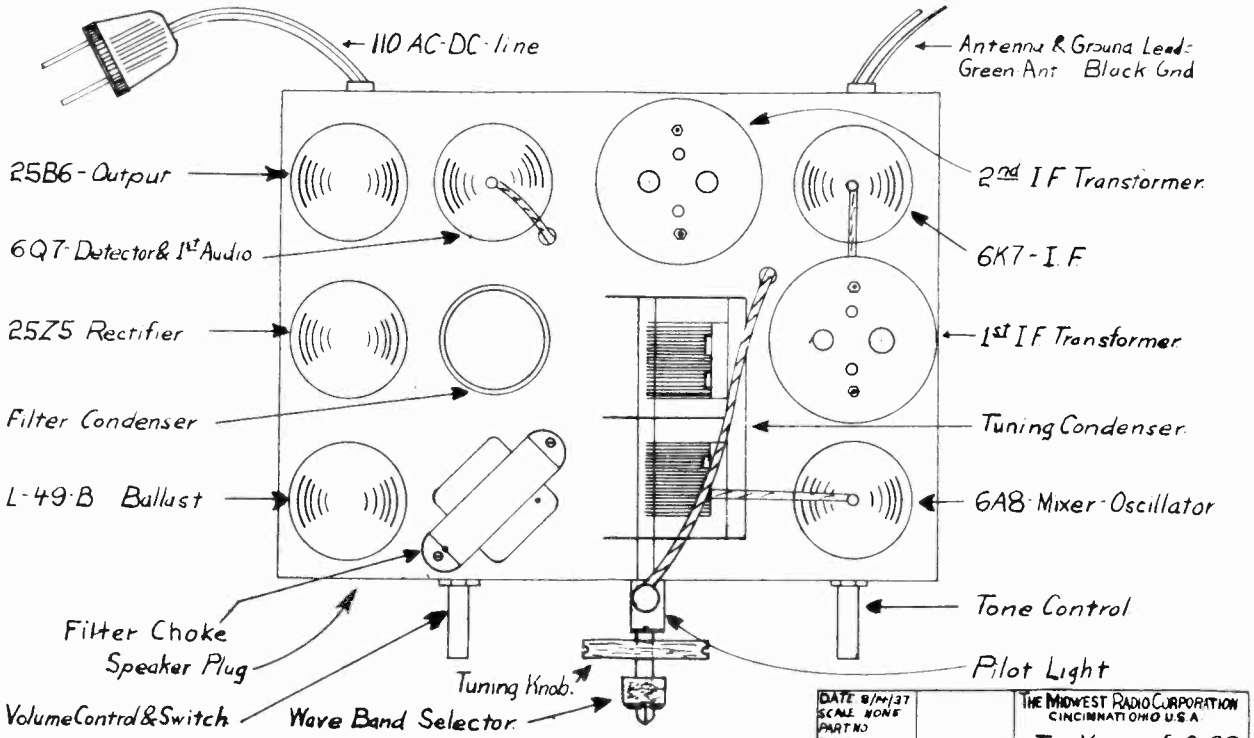
NOTE
ALL R.F. & OSC. TRIMMERS ARE 45 MMFD MAX. CAP.
OSC. PADDERS ARE 500MMFD. MAX. CAP.

E BAND NOTE
In sets having long wave band, E (long wave) band coil replaces L. Band coil. The oscillator is connected [illegible]

I.F. = 456 K.C.

EXPORT 6-38 AC DC

DATE 3.20.37 SCALE NONE PART NO DRAWN RHU TRACED RHU CHECKED APPROVED	DRG. No. 814	THE MIDWEST RADIO CORPORATION CINCINNATI OHIO U.S.A. SCHEMATIC CIRCUIT DIAGRAM OF THE 6-38 A AC DC

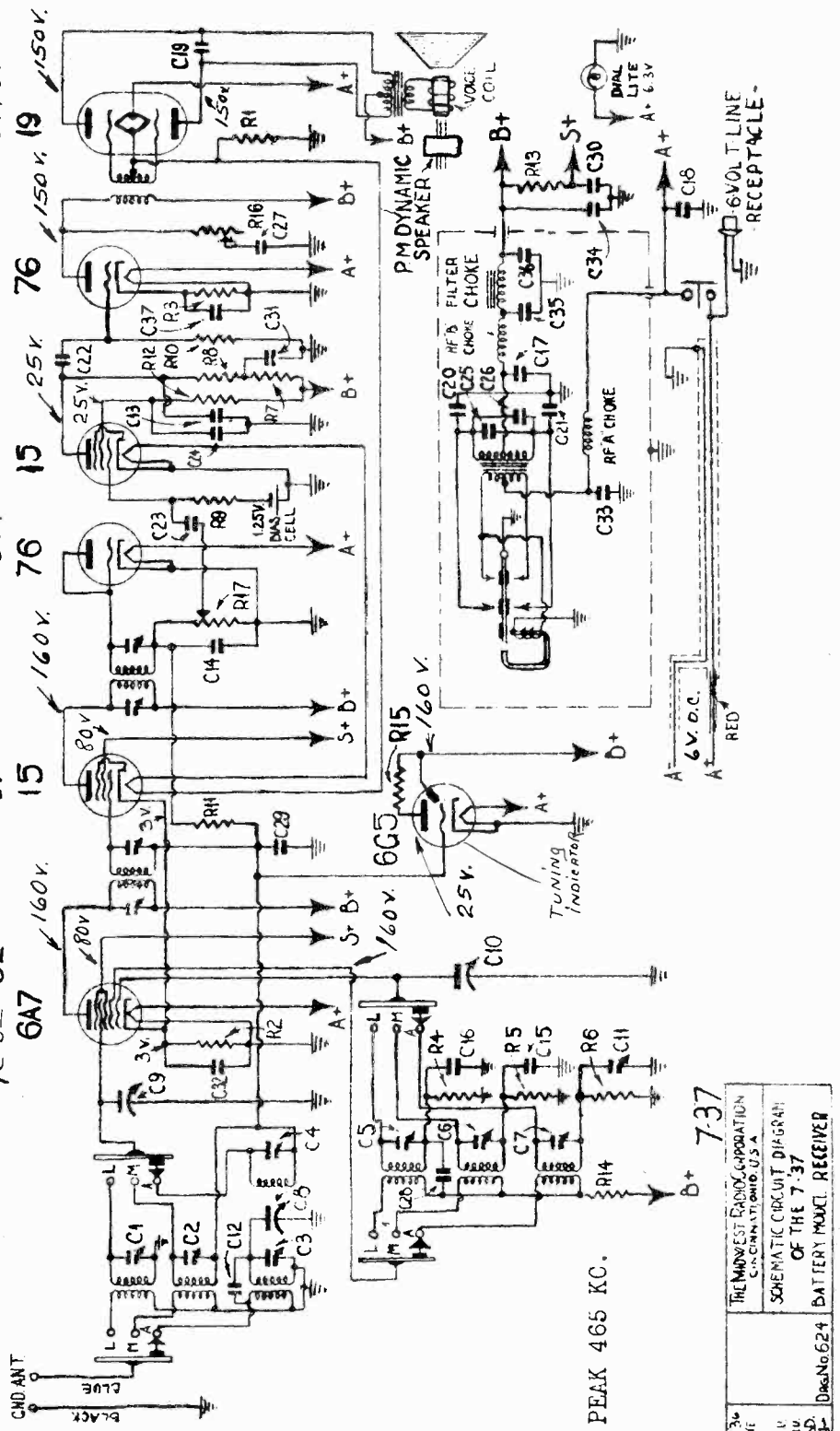


FOR TRIMMERS, SEE INDEX

DATE 8/11/37 SCALE NONE PART NO DRAWN G.W. TRACED CHECKED APPROVED	DRG. No. 971	THE MIDWEST RADIO CORPORATION CINCINNATI OHIO U.S.A. Top View of 6-38 Export.

MODEL 7-37 Batt.
Schematic, Voltage

MID-WEST RADIO CORP.



CONDENSERS

C1	45 MMF TRIMMER	C11	600 MMF PADDER	C21	.005 MFD -400V	C31	.1 MFD 200V
C2	" "	C12	6 MMF.	C22	.01 MFD "	C32	.2 MFD "
C3	" "	C13	.00025 MFD MICA	C23	" "	C33	.5 MFD "
C4	" "	C14	" "	C24	" "	C34	" "
C5	" "	C15	.0021 MFD MICA.	C25	.01 MFD 1200V	C35	8 MFD DRY ELECT
C6	" "	C16	.0027 MFD "	C26	" "	C36	" "
C7	" "	C17	.004 MFD "	C27	.03 MFD 400V.	C37	40 MFD "
C8	TUNING COND	C18	.004 MFD "	C28	.1 MFD 200V.		
C9	" "	C19	.004 MFD 600 V.	C29	" "		
C10	" "	C20	.005 MFD 400 V.	C30	" "		

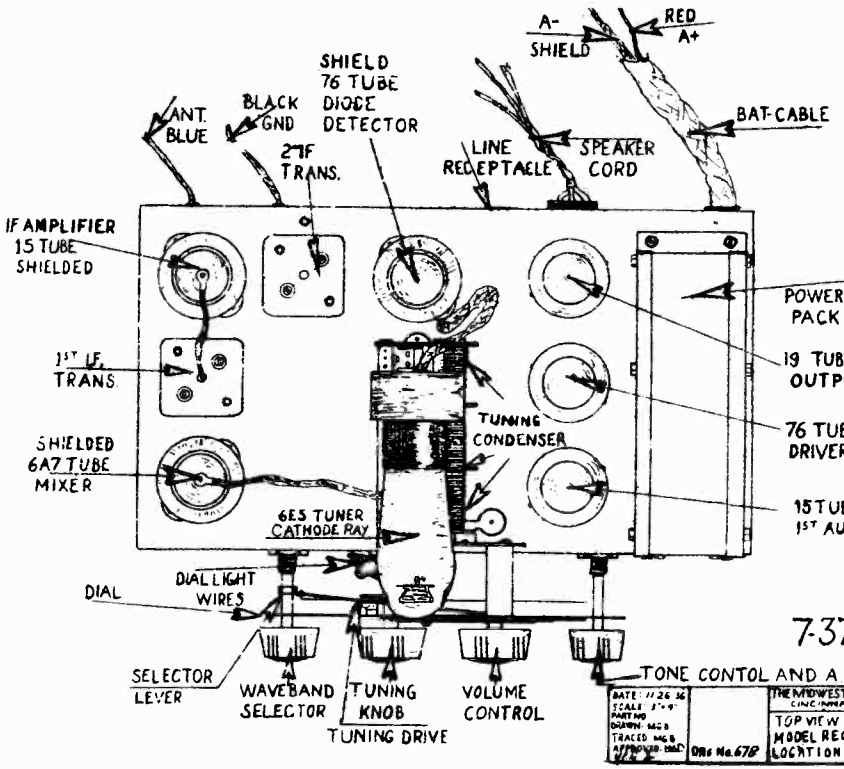
RESISTORS

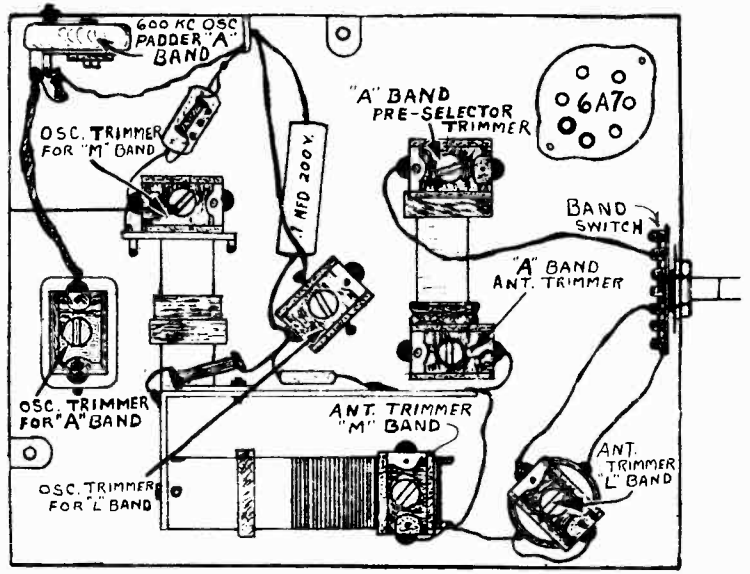
R1	100 OHM ½ WATT	R11	1 MEGOHM ½ WATT
R2	200 OHM "	R12	2 MEGOHM "
R3	2500 OHM "	R13	15,000 OHM .5 WATT
R4	15,000 OHM "	R14	20,000 OHM "
R5	25,000 OHM "	R15	1 MEGOHM 1 WATT
R6	50,000 OHM "	R16	50,000 OHM TONE CONT
R7	100,000 OHM "	R17	.5 MEGOHM VOL CONT.
R8	250,000 OHM "		
R9	500,000 OHM "		
R10	" "		

DATE 10-7-36
SCALE NONE
DRAWN RHU
TRACED RHU
CHECKED H.S.D.
APPROVED J.F.R.
DWG. No. 624

THE MIDWEST RADIO CORPORATION
CINCINNATI, OHIO, U.S.A.

SCHEMATIC CIRCUIT DIAGRAM
OF THE 7-37
BATTERY MODEL RECEIVER





(1) I.F. Alignment:- Set test oscillator at 465 k.c. and connect output from oscillator to grid of 6A7 tube through an .02 mfd. series condenser.
Important: Do not remove grid clip from tube.
Peak each of the first and second I.F. transformer trimmer for maximum gain on output meter.

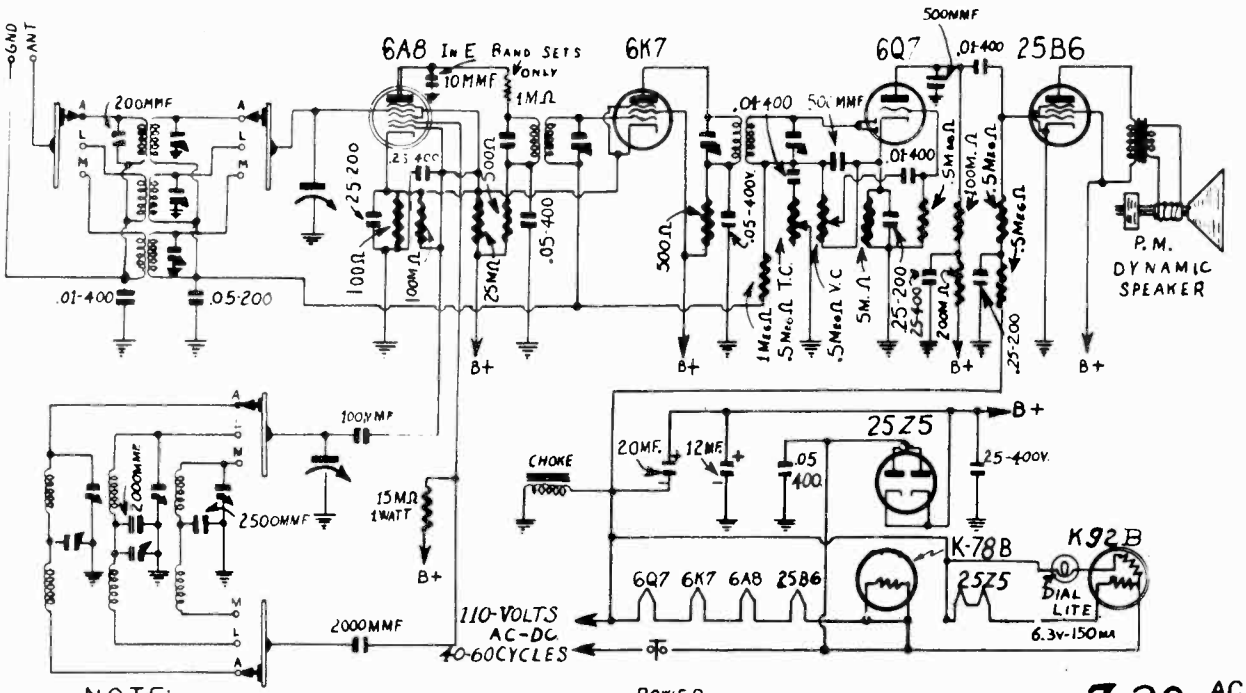
(2) Aligning 720 - 535 k.c. Band:- Check tuning dial. Adjust by turning gang condenser until plates touch maximum capacity stop, at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration.
Connect test oscillator to antenna lead through a standard dummy antenna.
Set test oscillator to 1720 k.c. and, using 1720 k.c. oscillator trimmer, adjust to maximum signal output at 1720 k.c. on the dial.
Set test oscillator at 1400 k.c. and adjust 1400 k.c. preselector and antenna trimmers for maximum output.
Set test oscillator at 600 k.c. and adjust 600k.c. oscillator padder for maximum signal strength at 600 k.c. on the dial.

(3) Aligning 1.8. - 5.8 m.c. Band:- Disconnect dummy antenna from test oscillator and insert a 400 ohm resistor in series with the test oscillator output. Set test oscillator frequency to 5.6 m.c. Bring in 5.6 m.c. signal on dial to maximum output by adjusting 5.6. m.c. oscillator trimmers.
Set test oscillator frequency to 5 m.c. and adjust 5 m.c. antenna trimmers for maximum output.

(4) Aligning 5.8 - 18.3 m.c. Band:- Leaving 400 ohm resistor in series with test oscillator output, set oscillator frequency to 18 m.c., and adjust 18 m.c. oscillator trimmers for maximum output. It is important that the fundamental peak on 18 m.c. be reached.
Start with trimmers at minimum capacity, the first peak on the trimmers will be the fundamental frequency if trimmer is screwed toward maximum capacity another peak will be observed. This is the image peak and is not used in aligning the receiver.
Set test oscillator at 15 m.c. and adjust 15 m.c. antenna trimmers for maximum output.

MODEL 7-38 AC-DC
Schematic
Socket

MID-WEST RADIO CORP.



NOTE:
ALL R.F. & OSC. TRIMMERS ARE 45 MMFD MAX CAP.
OSC. PADDERS ARE 500MMFD. MAX. CAP.

E BAND NOTE
IN SETS HAVING LONG WAVE BAND, E (LONG WAVE) BAND COIL REPLACES L BAND COIL THE OSCILLATOR IS CONNECTED COLPITTS

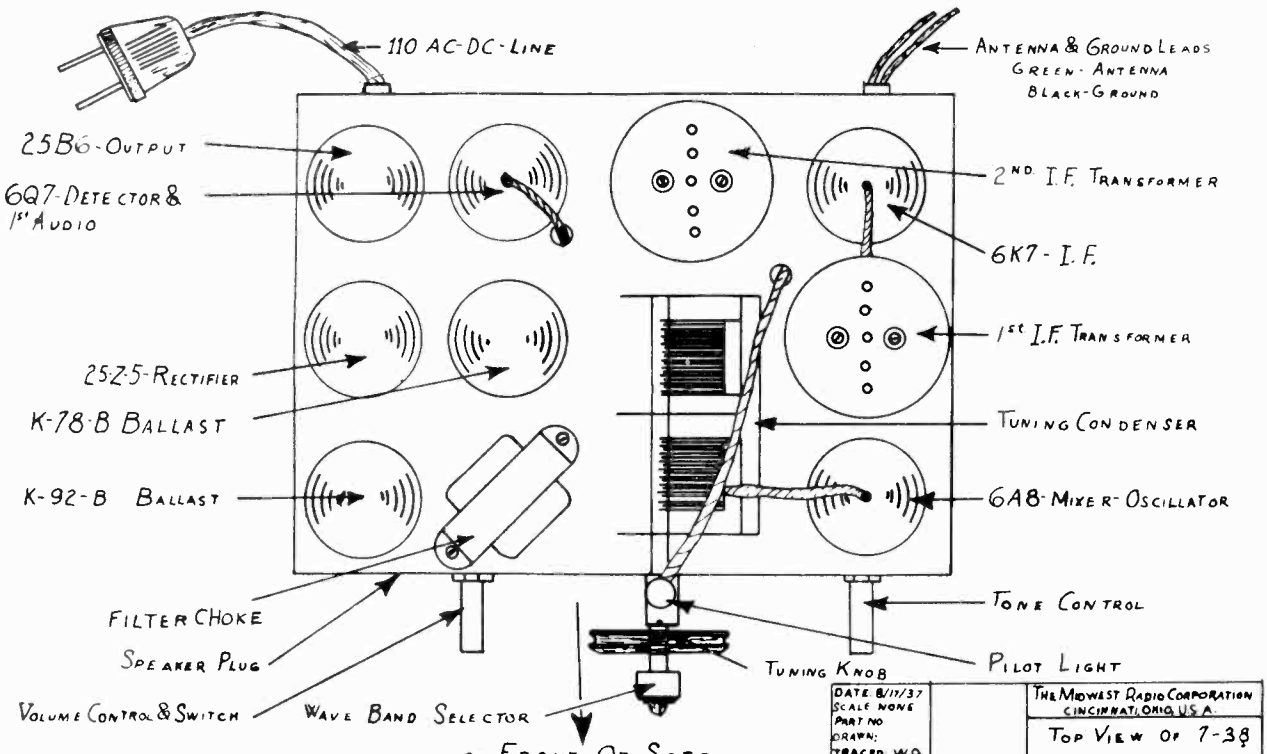
POWER SWITCH
(MOUNTED ON VOL. CONT.)

I.F.=456K.C.

7-38 AC DC

DATE 8-18-37 SCALE NONE PART NO DRAWN TRACED CHECKED APPROVED	Drg No. 981	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO, U.S.A. SCHEMATIC CIRCUIT DIAGRAM OF THE 7-38 AC DC

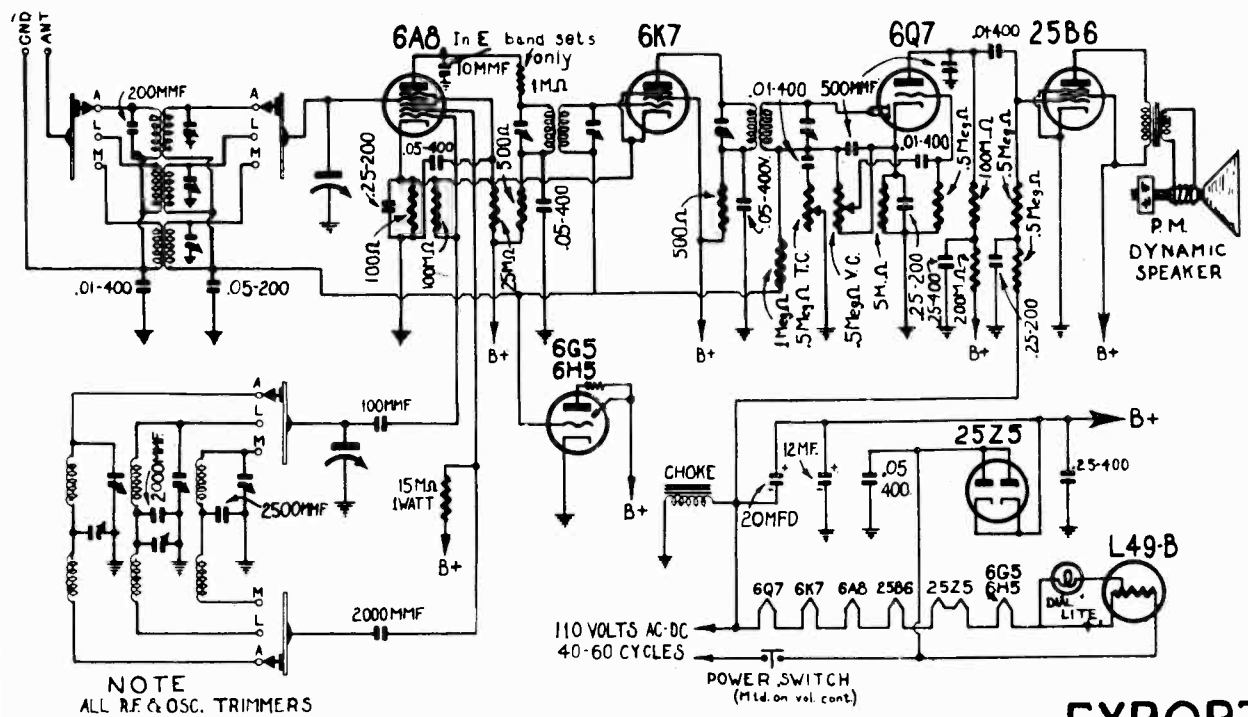
FOR TRIMMERS, SEE INDEX



DATE 8/11/37 SCALE NONE PART NO DRAWN: TRACED W.O. CHECKED: APPROVED	Drg No. 978	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO U.S.A. TOP VIEW OF 7-38

MODEL 7-38 AC-DC
(Export)
Schematic, Socket

MID-WEST RADIO CORP.



NOTE
ALL R.F. & OSC. TRIMMERS ARE 45 MMFD MAX. CAP.
OSC. PADDERS ARE 500MMFD. MAX. CAP.

E-BAND NOTE

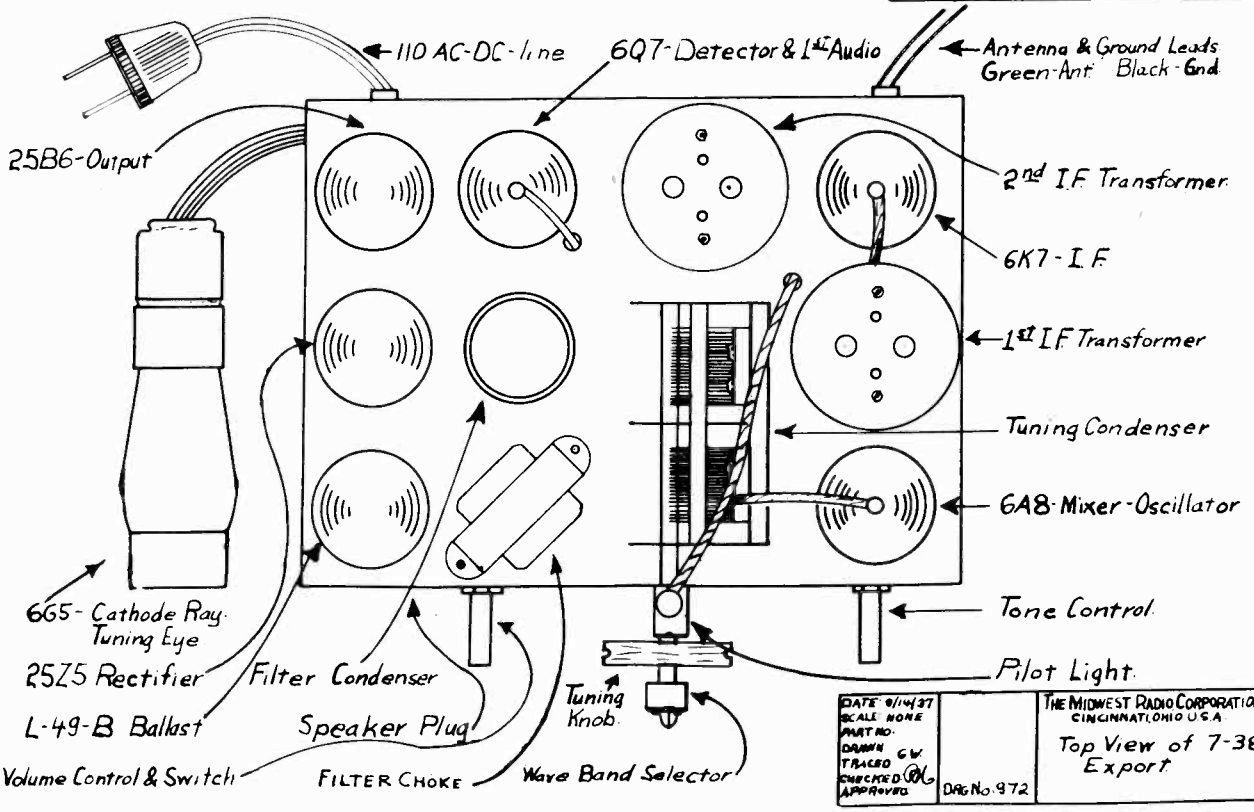
In sets having long wave band, E (long wave) band coil replaces L band coil. Colpitts oscillator is used — no tickler coil. No fixed padder is used. Variable padder is 140MMFD. Max. Cap. in place of 500 MMFD. R.F. filter is added in plate circuit of 6A8

I.F. = 456 K.C.

EXPORT 7-38 AC DC

DATE 6/18/37 SCALE — PART NO — DRAWN RHC TRACED RHC APPROVED	Dwg No 932	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO, U.S.A. SCHEMATIC CIRCUIT DIAGRAM OF THE 7-38A AC DC

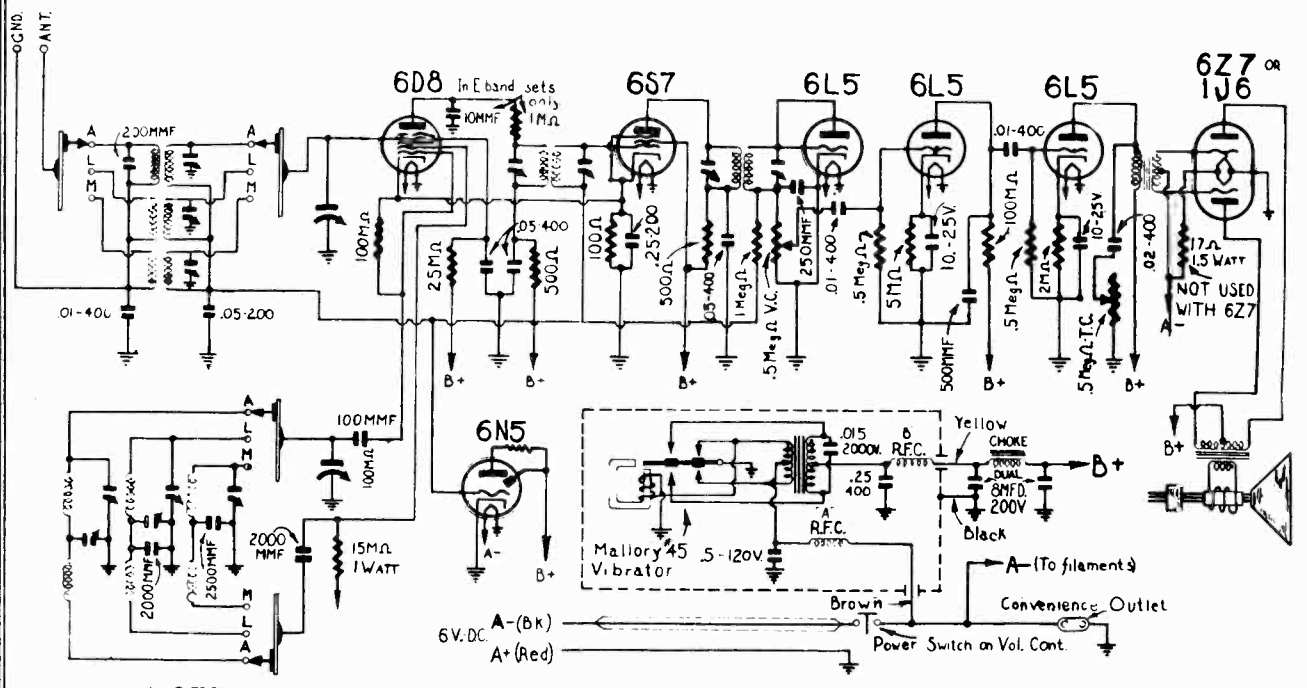
FOR TRIMMERS, SEE INDEX



DATE 6/14/37 SCALE NONE PART NO. DRAWN CW TRACED CW CHECKED RK APPROVED	DRG No. 972	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO U.S.A. Top View of 7-38 Export

MODEL 7-38 Batt. (Export) Schematic, Socket

MID-WEST RADIO CORP.



NOTE

All R.F. and Osc. trimmers are 45 MMFD. Max. Cap. Osc padders are 500 MMFD. Max. Cap.

E-BAND NOTE

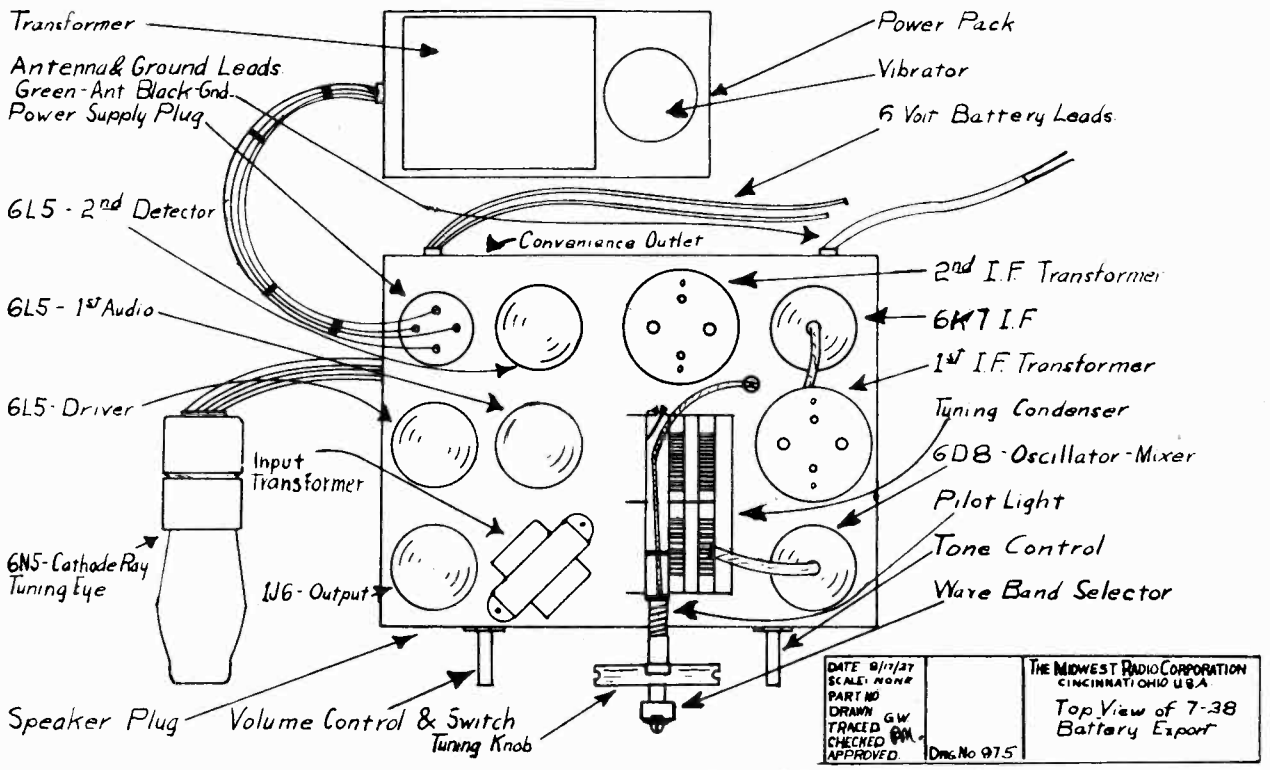
In sets having long wave band, E (long wave) band coil replaces L band coil. Colpitts oscillator is used—no tickler coil. No fixed padder is used. Variable padder is 140 MMFD. Max Cap in place of 500 MMFD. R.F. filter is added in plate circuit of 6D8.

EXPORT 7-38 BATT

I.F. = 456 KC.

DATE: 6-16-37 SCALE: NONE PART NO: — DRAWN: RHL TRACED: CHECKED: APPROVED:	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO, U.S.A.
Doc. No. 926	SCHEMATIC CIRCUIT DIAGRAM OF THE 7-38A. BATT.

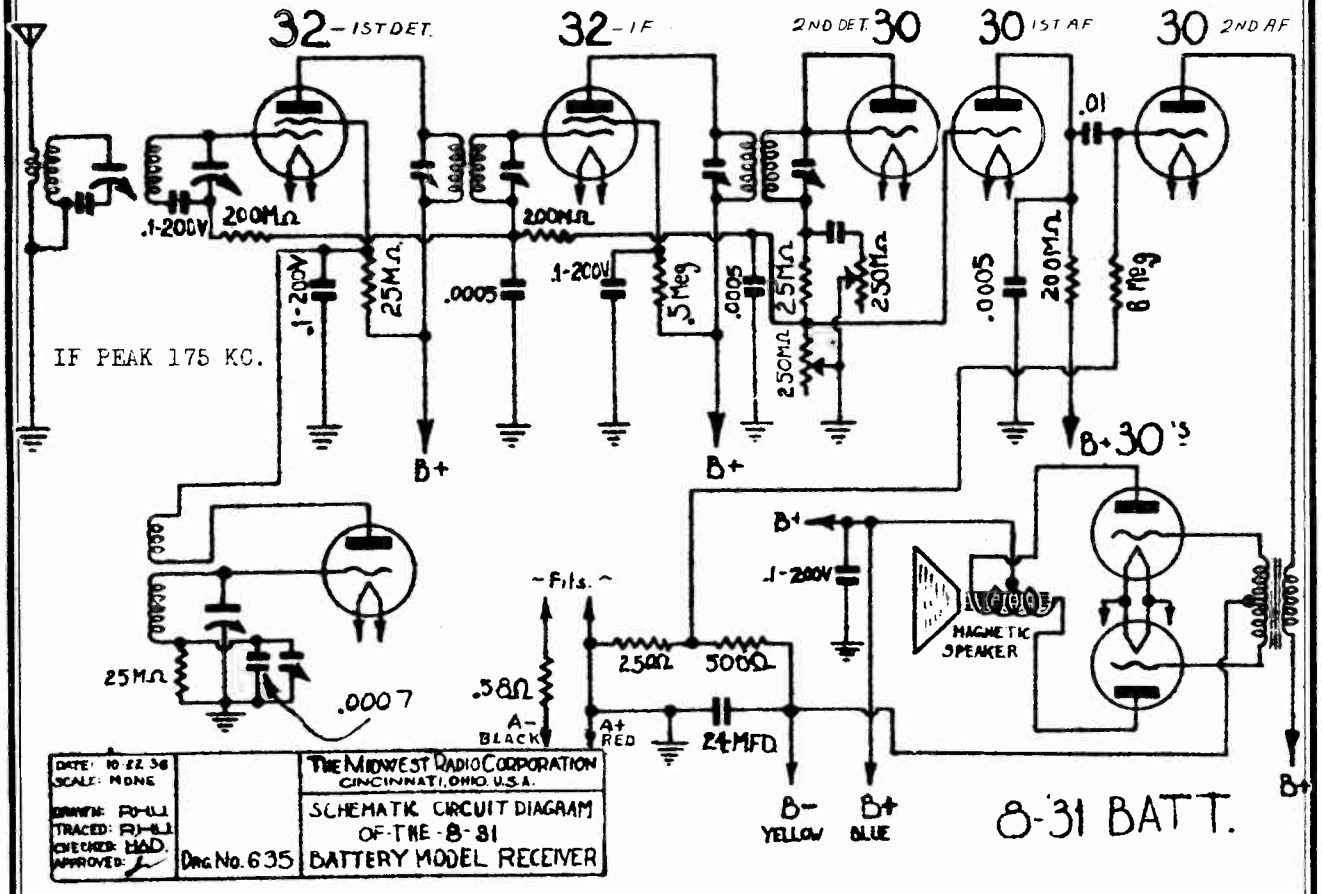
FOR TRIMMERS, SEE INDEX

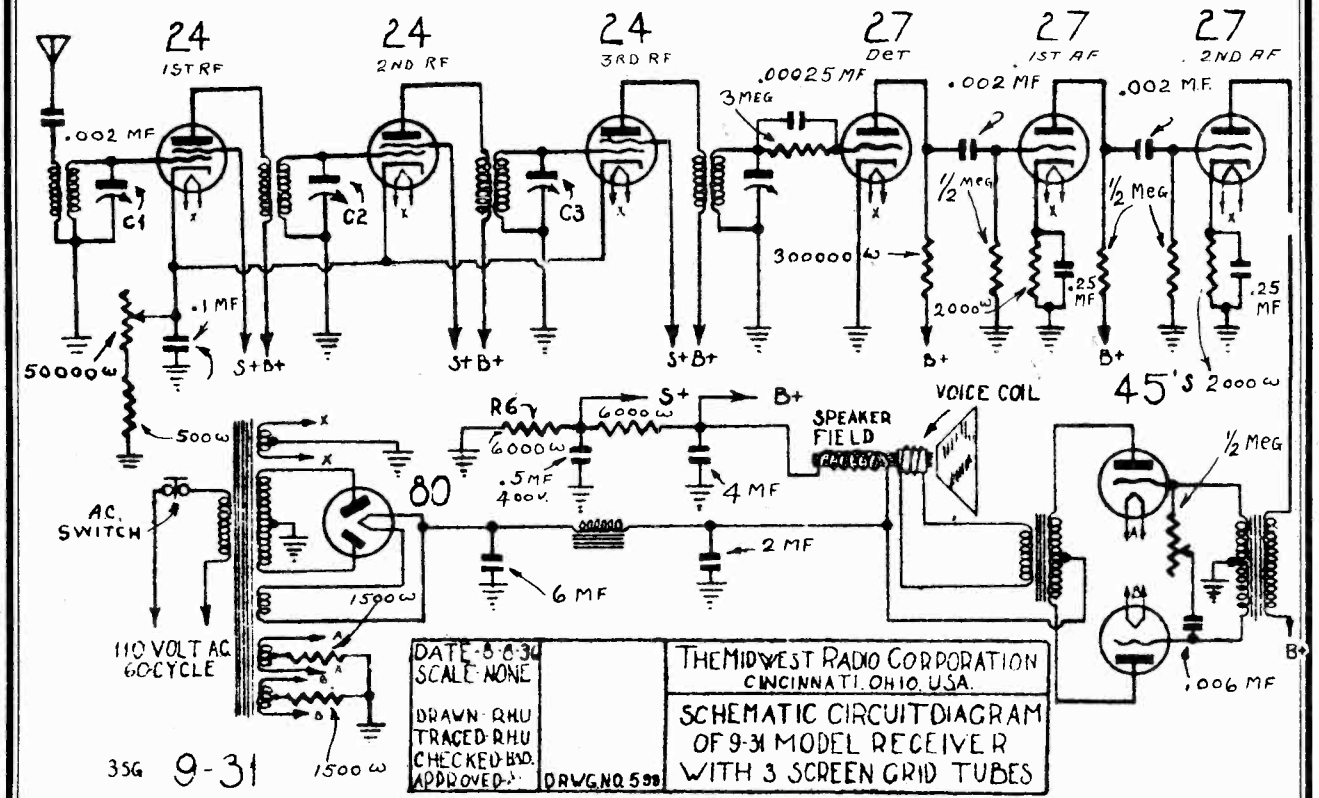


DATE 8/17/37 SCALE: NONE PART NO DRAWN GW TRACED CHECKED APPROVED	THE MIDWEST RADIO CORPORATION CINCINNATI OHIO U.S.A.
Dwg. No 975	Top View of 7-38 Battery Export

MODEL 8-31 Batt.
MODEL 9-31 (3SG)
Schematics

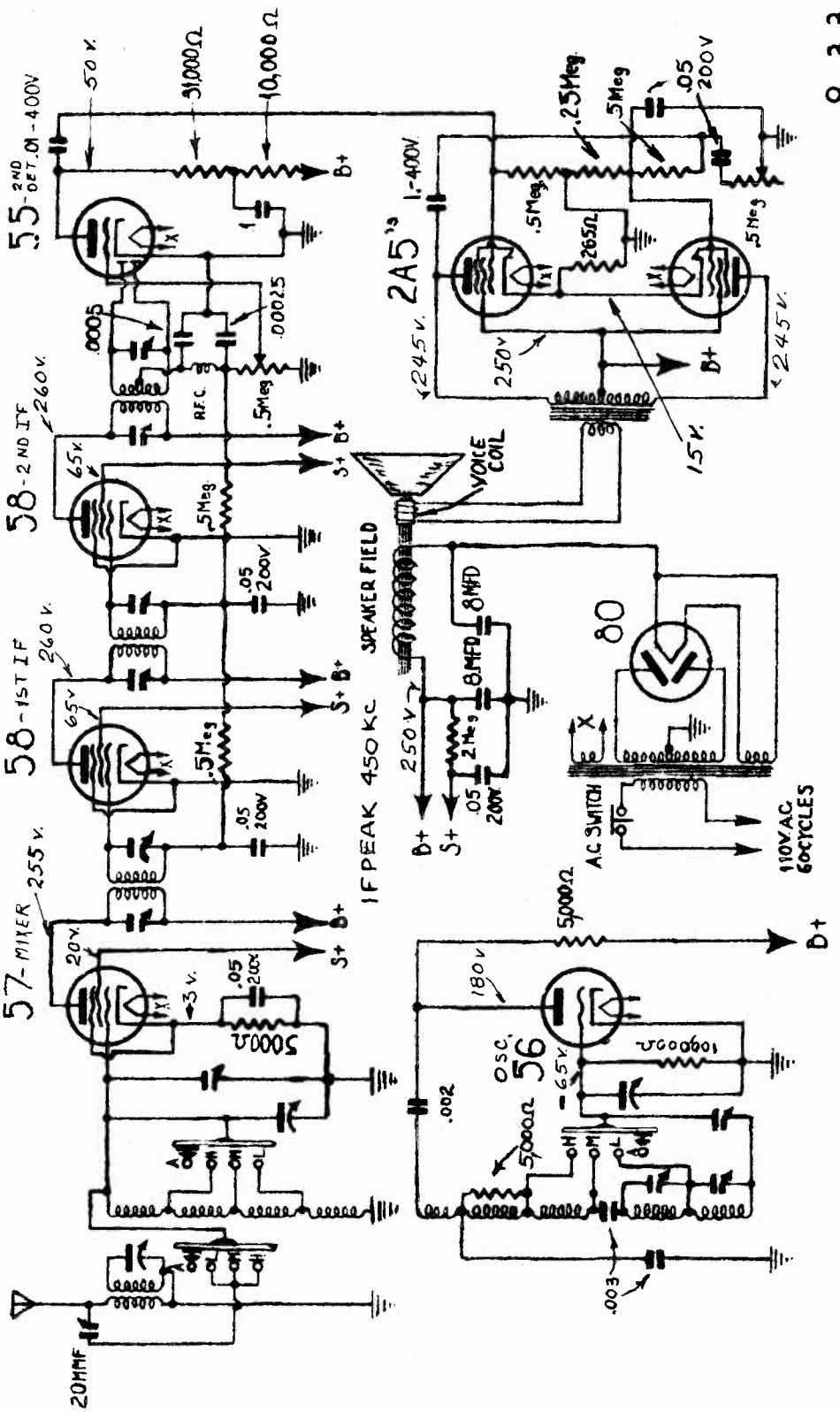
MID-WEST RADIO CORP.





MODEL 8-33
Early
Schematic, Voltage

MID-WEST RADIO CORP.



ALL VOLTAGES MEASURED WITH NO SIGNAL IMPUT
1000 ohm per volt meter used, all measurements made from ground

MODEL 8-33, Early
Socket, Trimmers
Alignment

MID-WEST RADIO CORP.

Using a standard signal generator and having approximate frequency from 400 k.c. to 20 m.c. and a standard output meter.

I. F. ALIGNMENT

(1) Connect output of signal generator to control grid of 57 first detector tube. Connect output meter to plate of output tube to ground. Set signal generator to 450 k.c. and adjust the trimmers of the three I.F. transformers for the greatest output. The 1st I. F. transformer will be found to contain two adjustments; the 2nd, one adjustment; and the 3rd, two adjustments.

This completes the I. F. alignment.

Note: To assure more accurate trimmer setting always use lowest possible test oscillator output consistent with readable output meter scale deflection.

R. F. ALIGNMENT

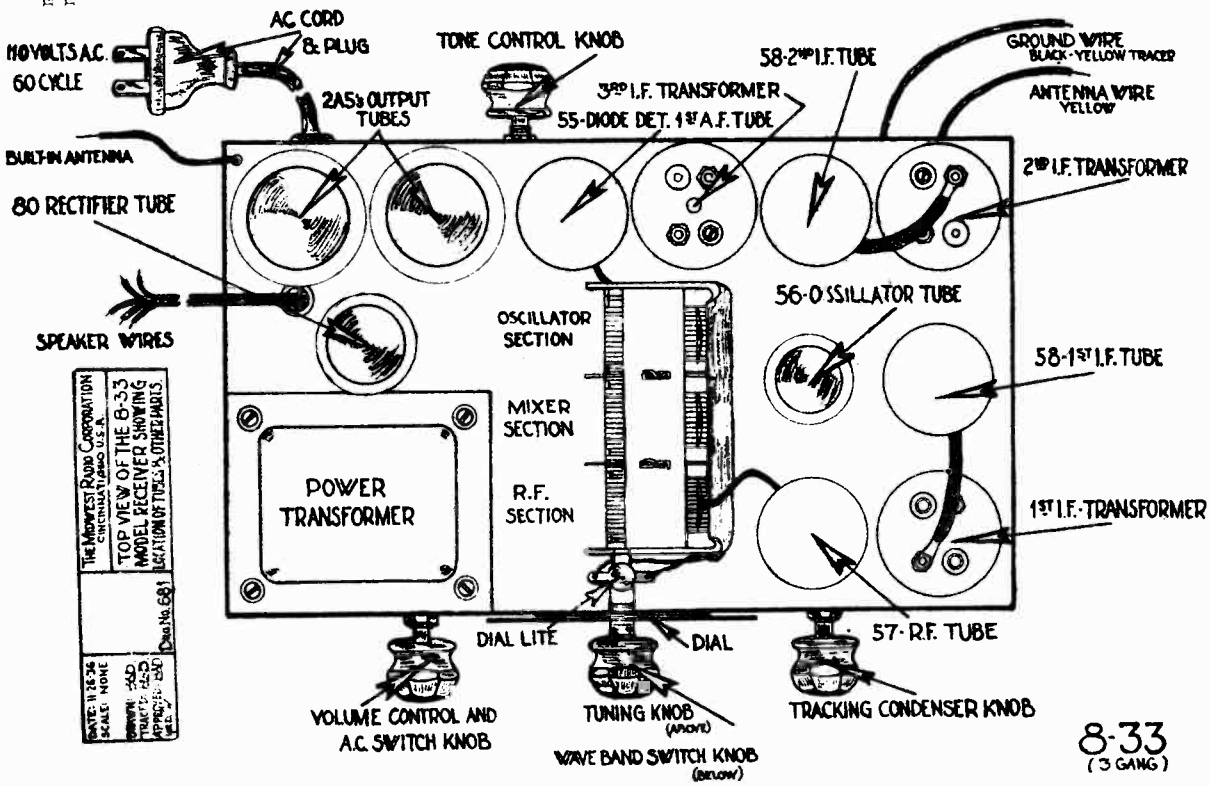
(2) Connect signal generator to antenna post of the receiver through a standard dummy antenna with the band selector switch in the A position and the variable trimmer at minimum capacity and the dial at 100. Set signal generator at 540 k.c. and adjust the A padder for maximum gain. Set signal generator at 1400 k.c. and adjust R. F. and mixer trimmers for maximum gain. Receiver dial during this operation is set at about 15. Tighten the A trimmer as tight as it will go and turn it back one half turn for proper adjustment.

(3) Turn band selector switch to L position. Set signal generator to 3800 k.c. and adjust trimmer D to the greatest output. This setting will be at about 15 on the dial.

This completes the R. F. alignment.

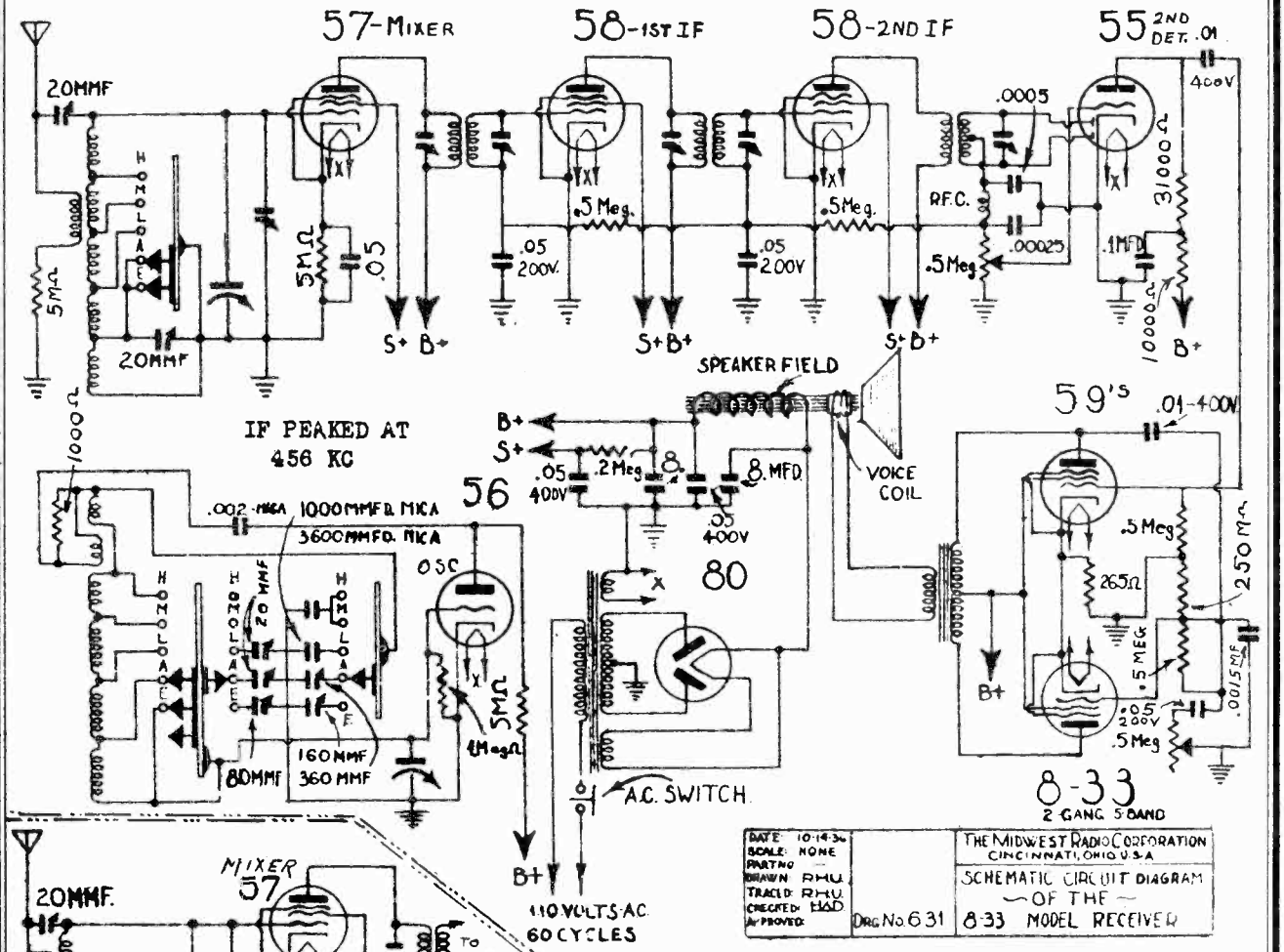
Note: We do not advise the customer to attempt adjustment on the M and H bands as this is done at the factory by experts. If set appears to be broad in tuning, we suggest that you inspect the spacing of the I. F. transformers. The correct spacing for I.F. transformers is 5/8".

Note: To assure more accurate trimmer setting always use lowest possible test oscillator output consistent with readable output meter scale deflection.

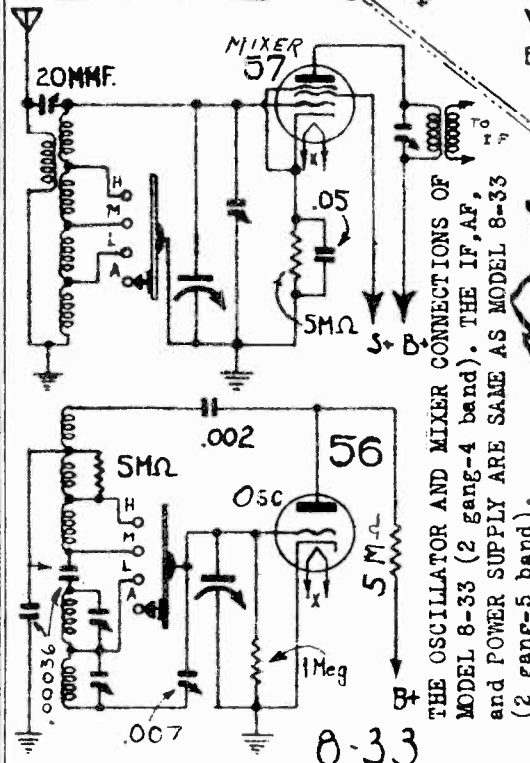


MID-WEST RADIO CORP.

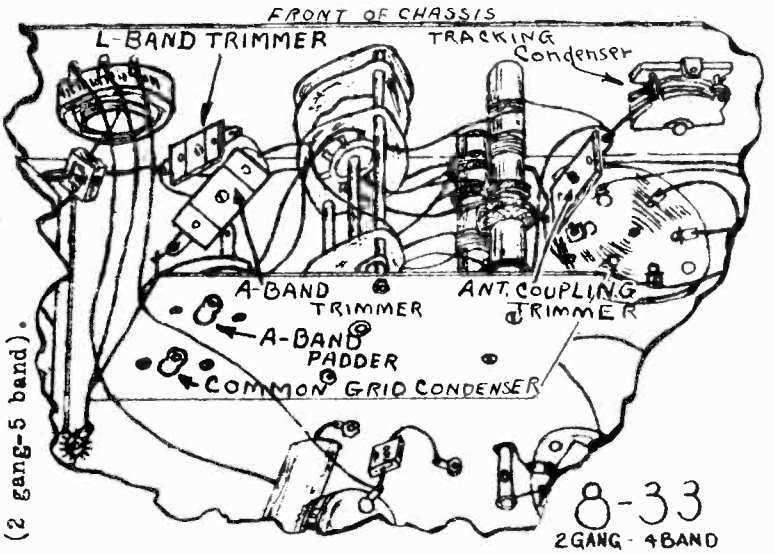
MODEL 8-33(2 Gang,4 Band)
MODEL 8-33(2 Gang,5 Band)
Schematics,Trimmers



DATE: 10-14-36 SCALE: NONE PART NO: DRAWN: RHU TRACED: RHU CHECKED: HAD APPROVED:	Drg. No. 631	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO U.S.A. SCHEMATIC CIRCUIT DIAGRAM —OF THE— 8-33 MODEL RECEIVER



THE OSCILLATOR AND MIXER CONNECTIONS OF MODEL 8-33 (2 gang-4 band). THE IF, AF, and POWER SUPPLY ARE SAME AS MODEL 8-33 (2 gang-5 band).



DATE: 10-17-36 SCALE: NONE DRAWN: RHU TRACED: RHU CHECKED: HAD APPROVED:	Drg. No. 632	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO U.S.A. SCHEMATIC CIRCUIT DIAGRAM —OF THE— 8-33 MODEL RECEIVER

IF PEAK
456KC

DATE: 11-4-36 SCALE: NONE PART NO: DRAWN: RHU TRACED: RHU CHECKED: HAD APPROVED:	Drg. No. 647	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO U.S.A. TRIMMER AND PADDER LOCATION FOR MODEL 8-33 -RECEIVER

MODEL 8-33(2 Gang,4 Band)
MODEL 8-33(2 Gang,5 Band) MIDWEST RADIO CORP.
Alignment

ALIGNMENT PROCEDURE
MODEL 8-33 (2 GANG-4 BAND), 8-33 (2 GANG-5 BAND)

(1) Set the signal generator to 456 KC and connect it from the mixer grid to ground.
(2) Remove the oscillator tube from the receiver.
(3) Using a moderately weak signal approximately 40 micro-volts, align the three IF transformers to maximum output.
(4) Keep decreasing the oscillator (signal generator) input and repeat the alignment for maximum output and gain.

Insert the oscillator tube into the receiver. Connect the signal generator and mixer grid lead between the antenna and ground.

"E" Band Alignment

(1) Set the wave band change switch to the "E" band position.
(2) Set the signal generator to 325 KC.
(3) Adjust the "E" oscillator trimmer to maximum gain, then adjust the "E" band mixer trimmers for maximum gain.
(4) Reset the signal generator to 135 KC and rotate the receiver dial to 135 KC setting.
(5) Adjust the "E" band padder for maximum signal.

"A" Band Alignment

(1) Set the receiver wave change switch to the "A" band position.
(2) Set the signal generator to 1490 KC.
(3) Adjust the "A" oscillator trimmer to maximum gain, then adjust the "A" band RF and the "A" band mixer trimmers for maximum gain.
(4) Reset the signal generator to 550 KC, and rotate the receiver dial position to 550 KC.
(5) Adjust the "A" band padder for maximum signal.
(6) Repeat the adjustment of trimmers and padders until the adjustment of one does not effect the adjustment of the other.

"L" Band Alignment

(1) Set the wave change switch to the "L" band position.
(2) Set the signal generator to 3.8 MC.
(3) Adjust the "L" band oscillator trimmer to maximum gain, then adjust the "L" band RF and Mixer trimmers for maximum gain.
(4) Reset the signal generator to 1.6 MC, and rotate the receiver dial to the 1.6 MC position.
(5) Adjust the "L" band padder for maximum signal.
(6) Repeat the adjustment of trimmers and padders until the adjustment of one does not effect the adjustment of the other.

"M" Band Alignment

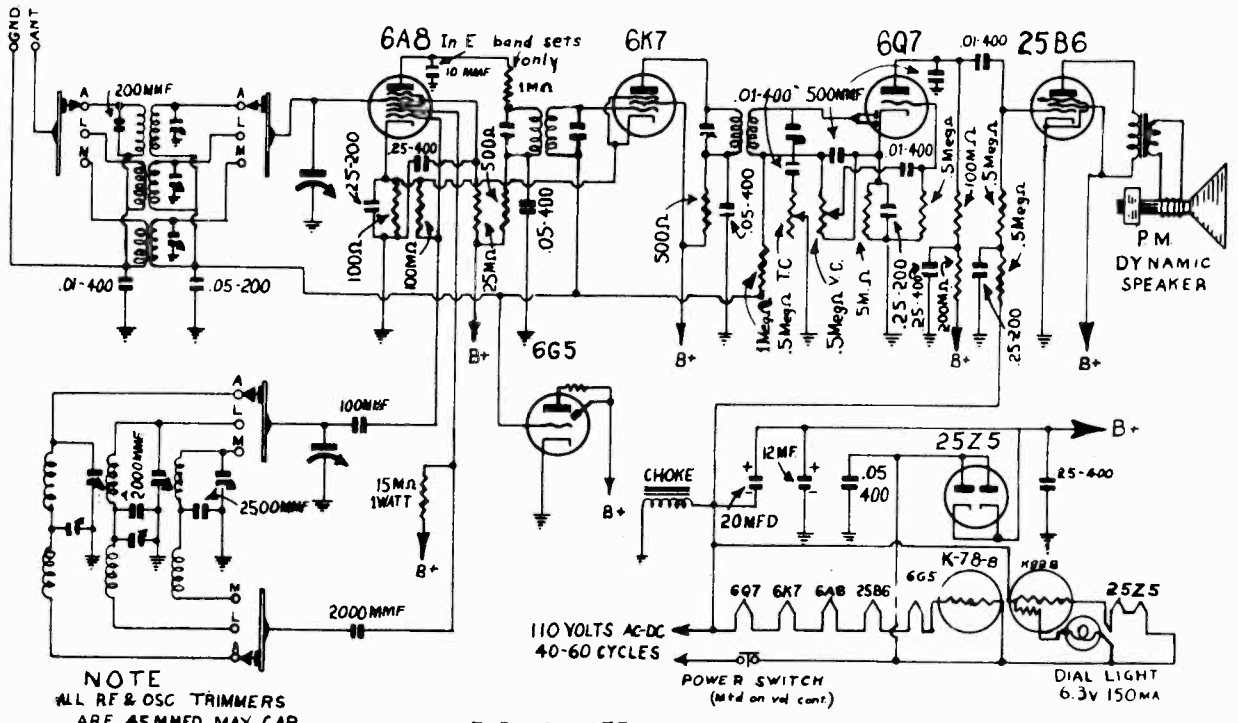
(1) Set the wave change switch to the "M" band position.
(2) Set the signal generator to 11.5 MC.
(3) Adjust the "M" band oscillator trimmer to maximum gain, then adjust the "M" band RF and Mixer trimmers for maximum gain.

"H" Band Alignment

(1) Set the wave change switch to the "H" band psotion.
(2) Set the signal generator to 28 MC.
(3) Adjust the "H" band oscillator trimmer to maximum gain, the adjust the "H" band RF and Mixer trimmers for maximum gain.

MODEL 8-38 AC-DC
Schematic, Socket

MID-WEST RADIO CORP.



NOTE
ALL RF & OSC TRIMMERS ARE 45 MMFD MAX CAP
OSC PADDERS ARE 500MMFD MAX CAP

E-BAND NOTE

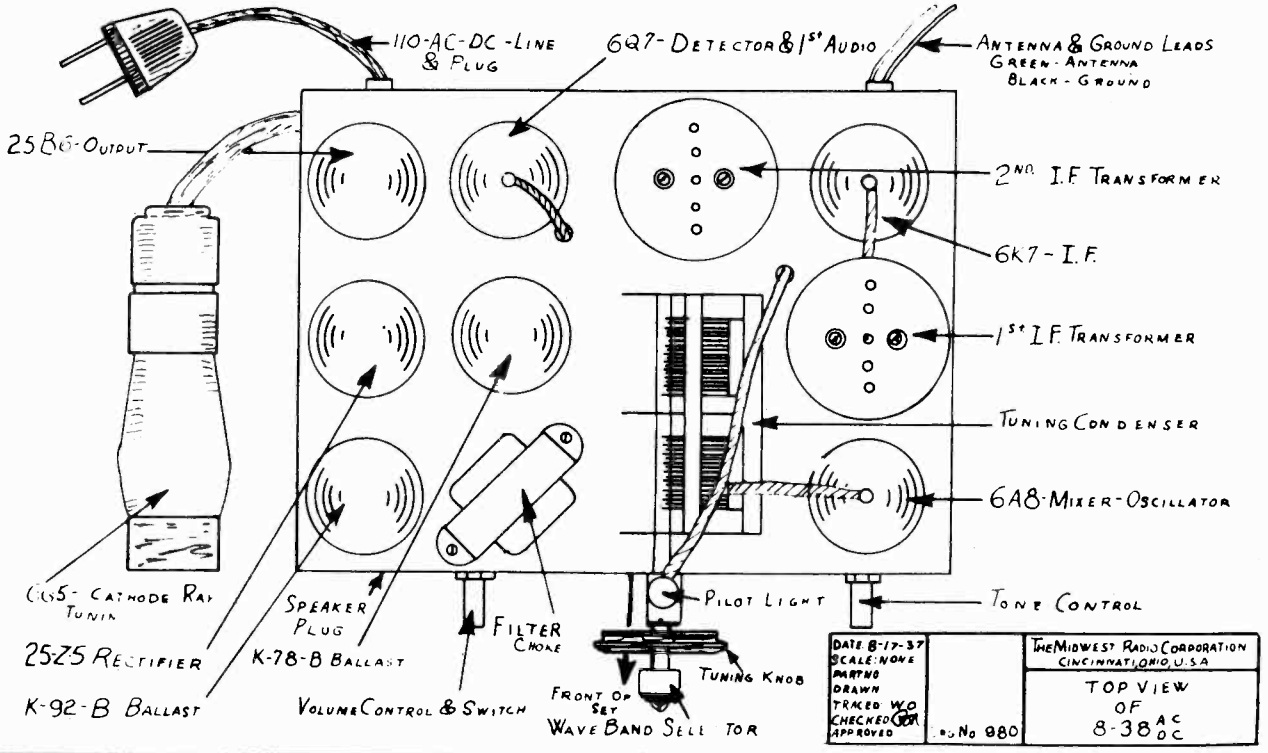
In sets having long wave band, E (long wave) band coil replaces L band coil. Colpitts oscillator is used - no tickler coil. No fixed padder is used. Variable padder is 140MMFD Max Cap. in place of 500 MMFD. RF filter is added in plate circuit of 6A8.

I.F. = 456KC.

8-38 AC DC

DATE 11/19/37 SCALE NONE PART NO — DRAWN TRACED G.W. CHECKED APPROVED	DRG NO 986	THE MIDWEST RADIO CORPORATION CINCINNATI OHIO U.S.A. SCHEMATIC CIRCUIT DIAGRAM OF THE 8-38 AC DC

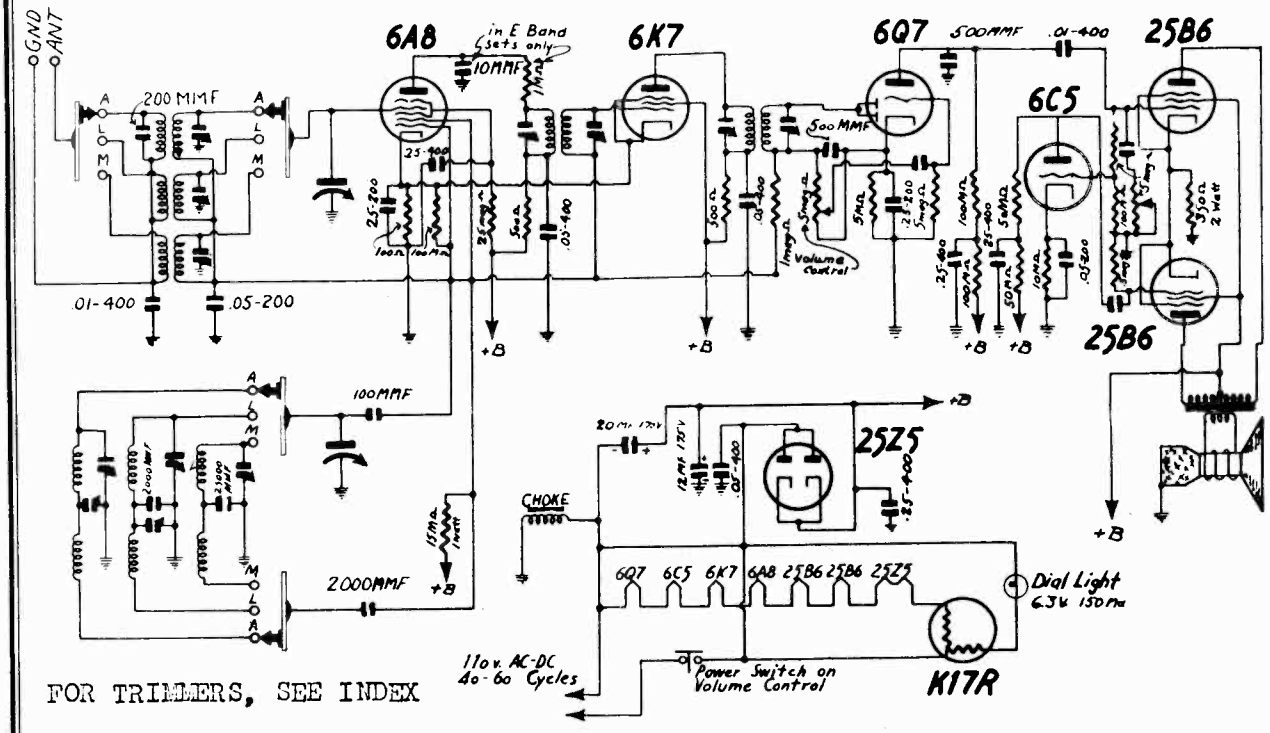
FOR TRIMMERS, SEE INDEX



DATE 8-17-37 SCALE: NONE PART NO DRAWN TRACED W.O. CHECKED APPROVED	DRG No 980	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO, U.S.A. TOP VIEW OF 8-38 AC DC

MODEL 8-38 AC-DC
Export
Schematic, Socket

MID-WEST RADIO CORP.



FOR TRIMMERS, SEE INDEX

NOTE

All R.F. & Osc. trimmers are 45 MMFD Maximum Capacity. Osc. padders are 500MMFD Maximum Capacity. E Band Padder 150 MMFD Maximum Capacity.

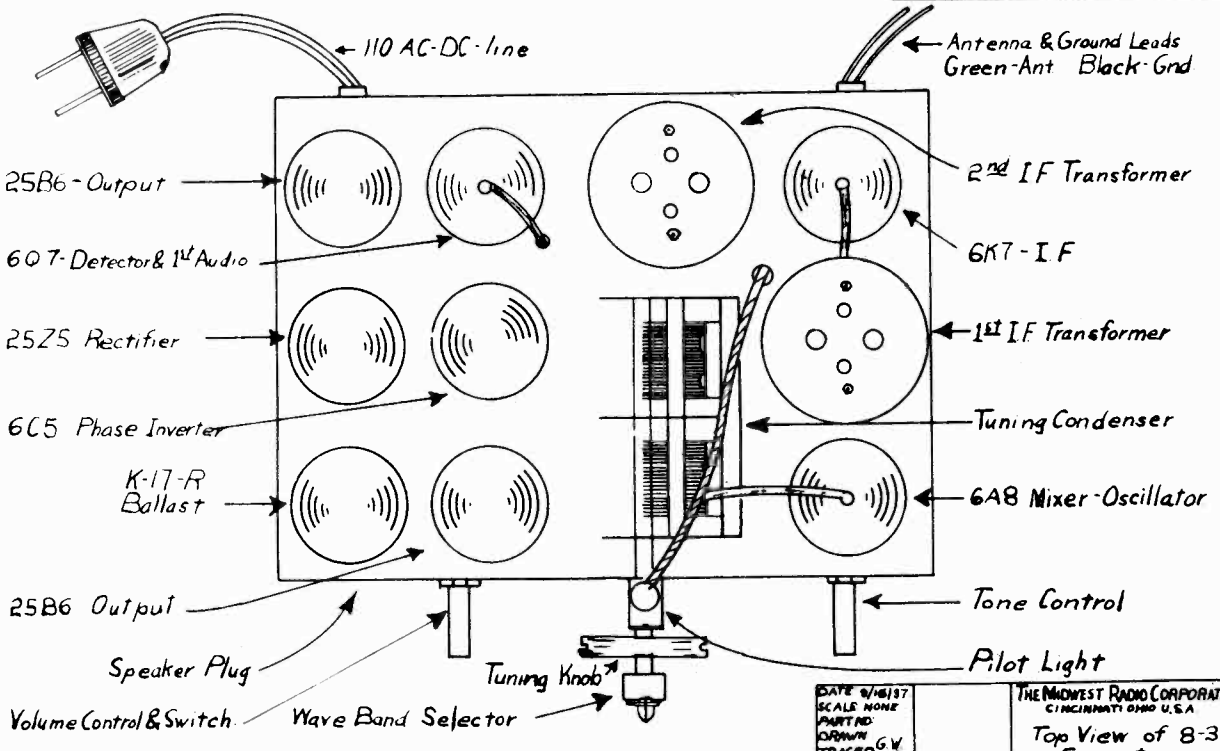
E BAND NOTE

•In sets having long wave band E (long wave) band coil replaces L band coil. The oscillator is connected colpitts.

I.F. = 456 KC

EXPORT 8-38 AC/DC

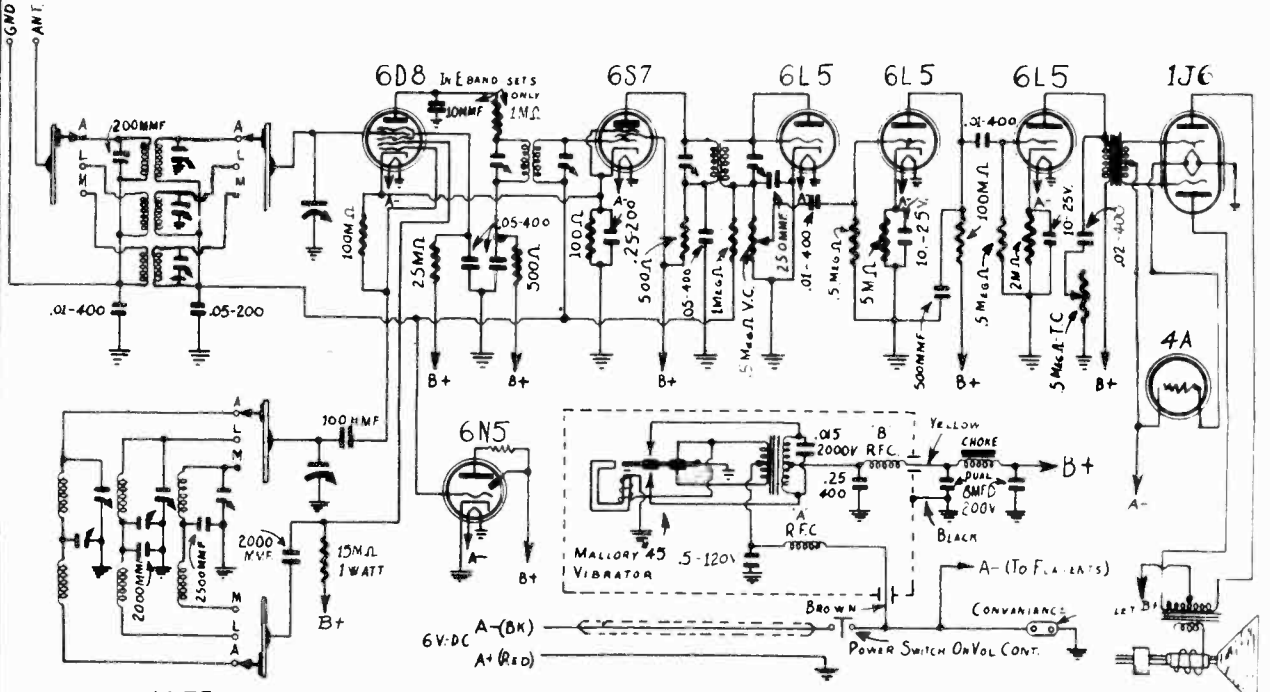
DATE 8-9-37 SCALE NONE DRAWN TRACED CHECKED APPROVED	Dwg No. 969	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO, U.S.A. SCHEMATIC CIRCUIT DIAGRAM OF THE EXPORT 8-38 AC-DC



DATE 9/16/37 SCALE NONE PART NO. DRAWN G.W. TRACED CHECKED APPROVED	DRG No 973	THE MIDWEST RADIO CORPORATION CINCINNATI OHIO U.S.A. Top View of 8-38 Export

MODEL 8-38 Batt.
Schematic, Socket

MID-WEST RADIO CORP.



NOTE

ALL RF AND OSC TRIMMERS ARE 45MMFD MAX. CAP
OSC PADDERS ARE 500MMFD MAX CAP

E-BAND NOTE

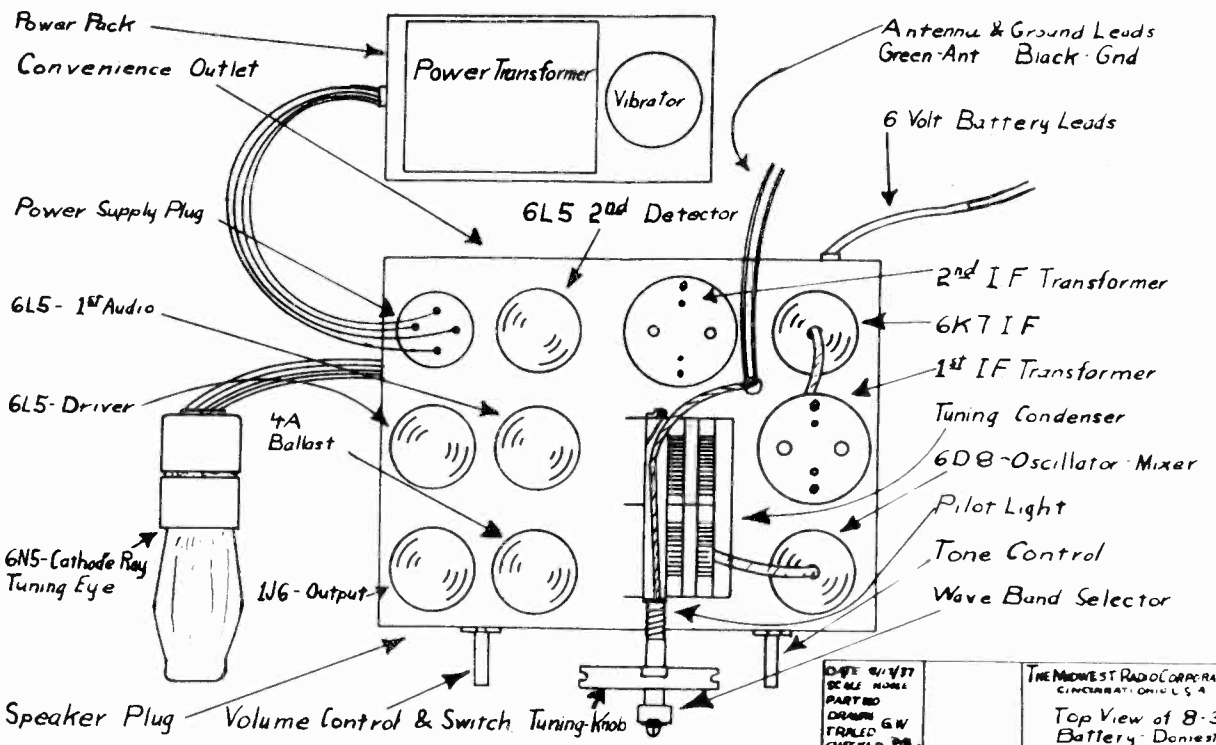
IN SETS HAVING LONG WAVE BAND, E (LONG WAVE) BAND COIL REPLACES L BAND COIL. COLPITTS OSCILLATOR IS USED - NO TICKLER COIL. NO FIXED PADDER IS USED. VARIABLE PADDER IS 140MMFD MAX CAP. IN PLACE OF 500 MMFD. RF. FILTER IS ADDED IN PLATE CIRCUIT OF 6D8.

8-38 BATT.

I.F. = 456KC.

DATE 6/1/37 SCALE NONE PART'D DRAWN TRACED CHECKED APPROVED	DRG. No 987	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO U.S.A. SCHEMATIC CIRCUIT OF THE 8-38 BATT

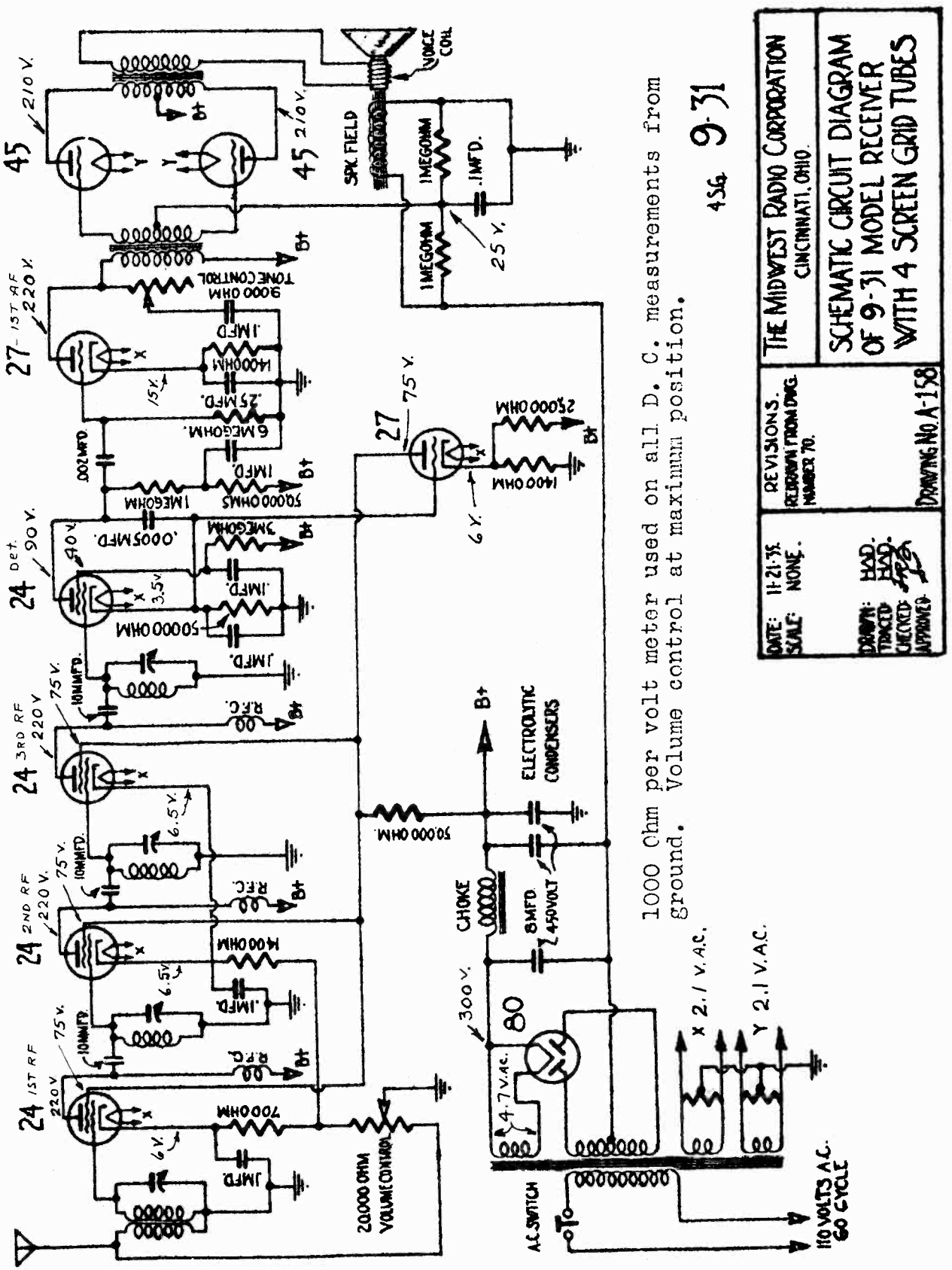
FOR TRIMMERS, SEE INDEX



DATE 6/1/37 SCALE NONE PART'D DRAWN G.W. TRACED CHECKED APPROVED	DRG. No 972	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO U.S.A. Top View of 8-38 Battery Domestic

MODEL 9-31 (48G)
Schematic, Voltage

MID-WEST RADIO CORP.



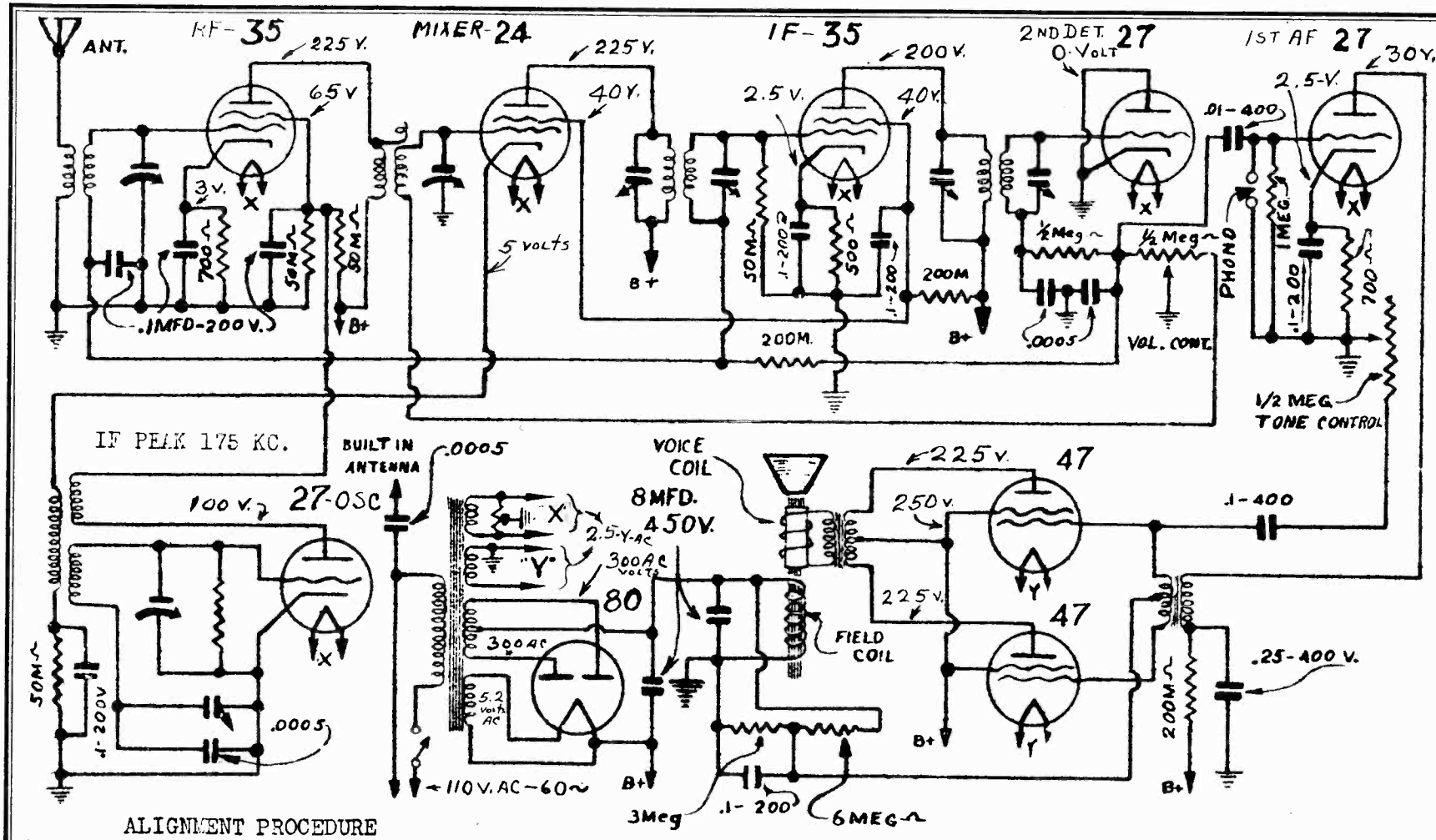
1000 Ohm per volt meter used on all D. C. measurements from ground. Volume control at maximum position.

48G 9-31

DATE: 11-21-31 SCALE: NONE. DRAWN: HAD. TRACED HAD. CHECKED APPROVED	REVISIONS. REDRAWN FROM DWG. NUMBER 70.	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO. SCHEMATIC CIRCUIT DIAGRAM OF 9-31 MODEL RECEIVER WITH 4 SCREEN GRID TUBES DRAWING NO. A-158

MODEL 9-32
Schematic, Voltage Alignment

MID-WEST RADIO CORP.



ALIGNMENT PROCEDURE

(1) Set the signal generator to 175 KC and connect it from the mixer grid to ground.
(2) Remove the oscillator tube from the receiver, using weak signal (approx. 4o microvolts), align the IF transformers to maximum output.

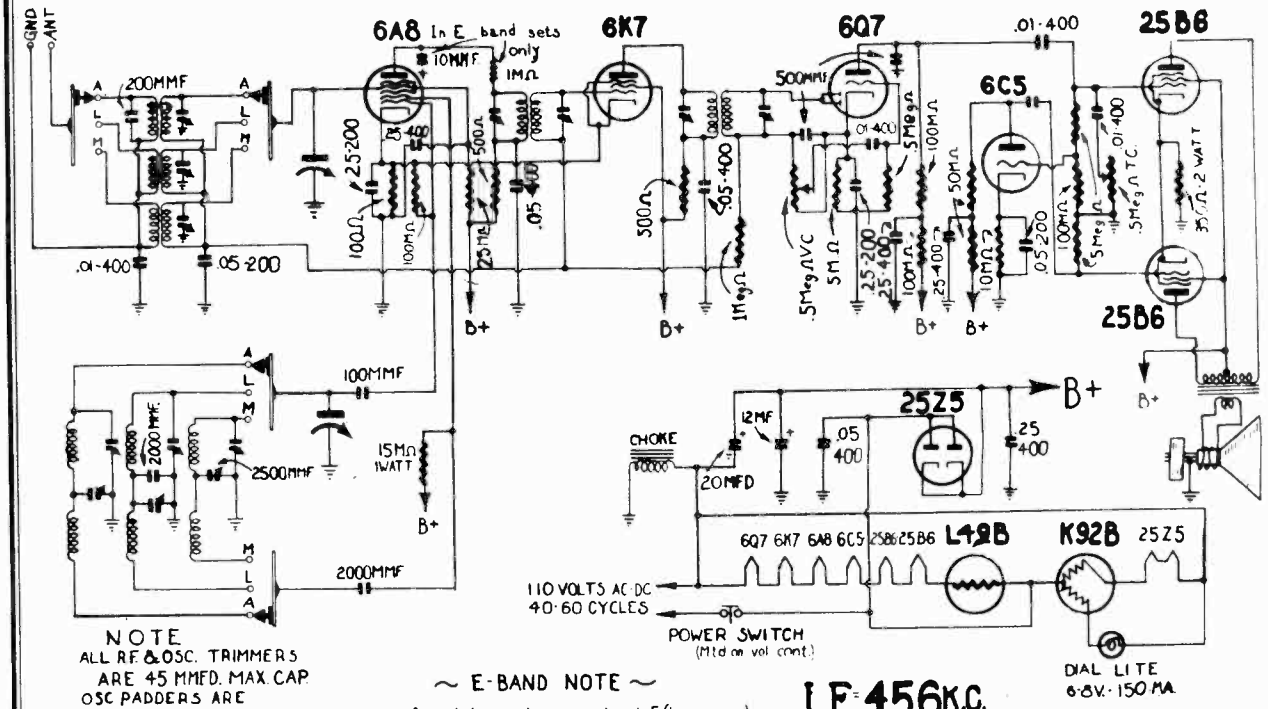
Insert the oscillator tube. Connect the signal generator between antenna and ground. Connect the mixer lead to the grid of the mixer tube.

(1) Set signal gencrator and receiver to 149o KC, located at 1o on the receiver dial. (variable condenser.)
(2) Oscillator section is adjusted by bending plates of the
(3) Adjust mixer & RF trimmers for maximum gain.

DATE: 10-1-36 SCALE: NONE PART NO: DRAWN: C.W.F. TRACED: CHECKED: HAD. APPROVED:	DRG. NO. 619	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO. U.S.A. SCHEMATIC CIRCUIT DIAGRAM OF THE 9-32 MODEL RECEIVER

MODEL 9-38 AC-DC
Schematic, Socket

MID-WEST RADIO CORP.



NOTE
ALL R.F. & OSC. TRIMMERS ARE 45 MMFD. MAX. CAP.
OSC PADDERS ARE 500MMFD. MAX. CAP.

~ E-BAND NOTE ~

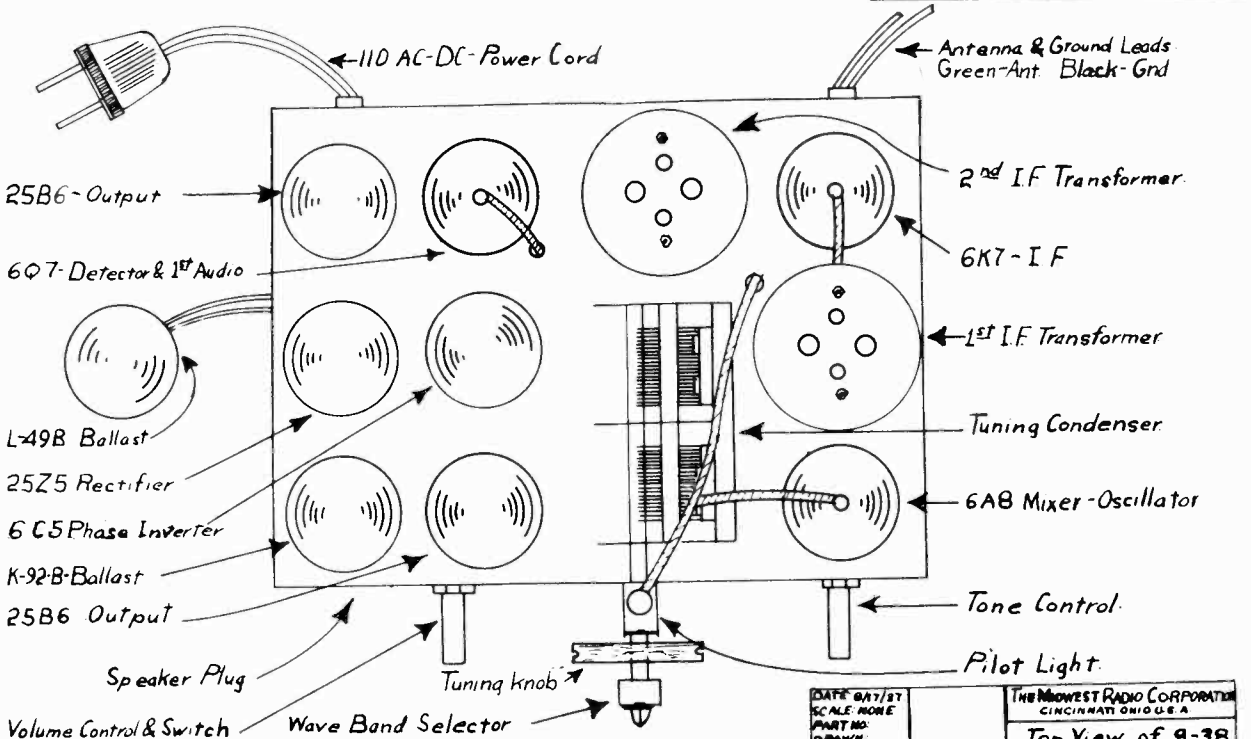
In sets having long wave band, E (long wave) band coil replaces L band coil. - Colpitts oscillator is used — no tickler coil. - No fixed padder is used - Variable padder is 140MMFD Max Cap in place of 500 MMFD. - R.F. filter is added in plate circuit of 6A8.

I.F. = 456 K.C.

9-38 AC DC

FOR TRIMMERS, SEE INDEX

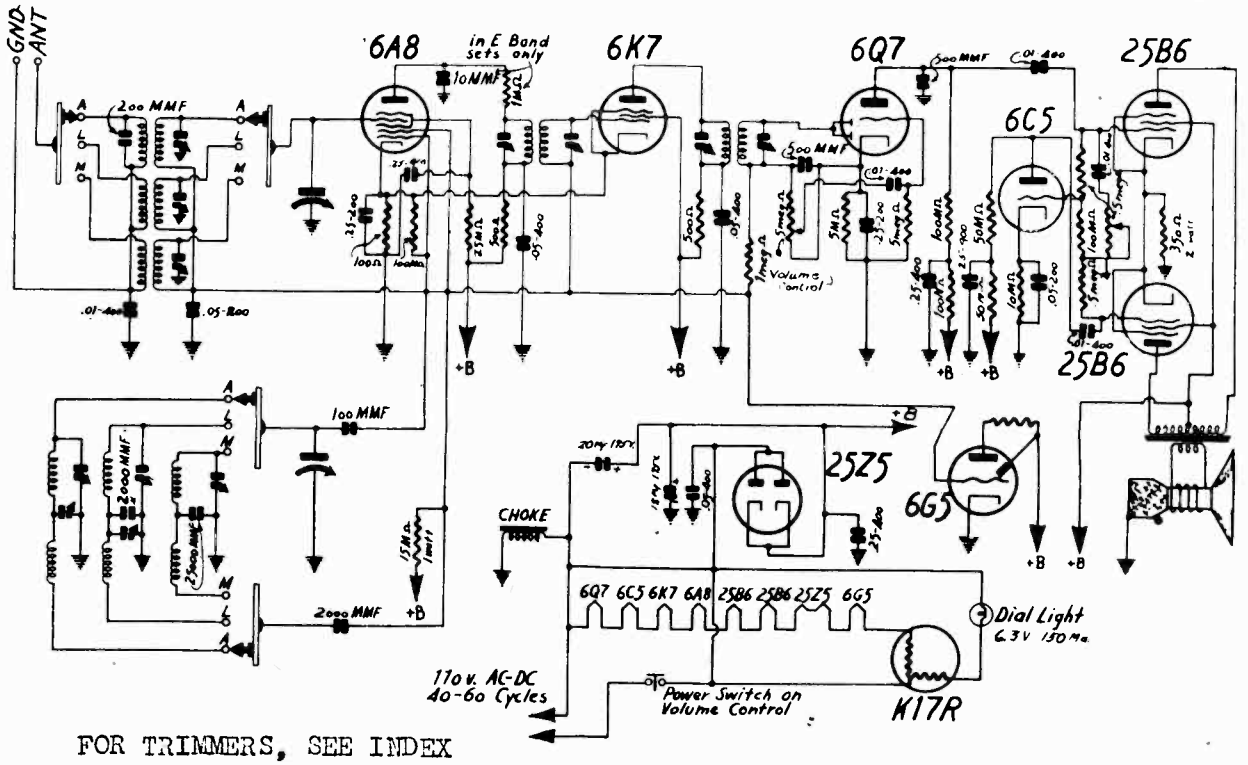
DATE 6/17/37 SCALE: NONE PART NO: DRAWN TRACED CHECKED APPROVED: Dwg No 985	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO U.S.A. SCHEMATIC CIRCUIT DIAGRAM OF THE 9-38 AC DC



DATE 6/17/37 SCALE: NONE PART NO: DRAWN G.W. TRACED CHECKED APPROVED: Dwg No 982	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO U.S.A. Top View of 9-38 AC-DC [redacted]

MID-WEST RADIO CORP.

MODEL 9-38 AC-DC
Export
Schematic, Socket



FOR TRIMMERS, SEE INDEX

NOTE

- All R.F. & Osc. trimmers are 45 MMFD Maximum Capacity.
- Osc. padders are 500 MMFD Maximum Capacity.
- E Band Padder 150 MMFD Maximum Capacity.

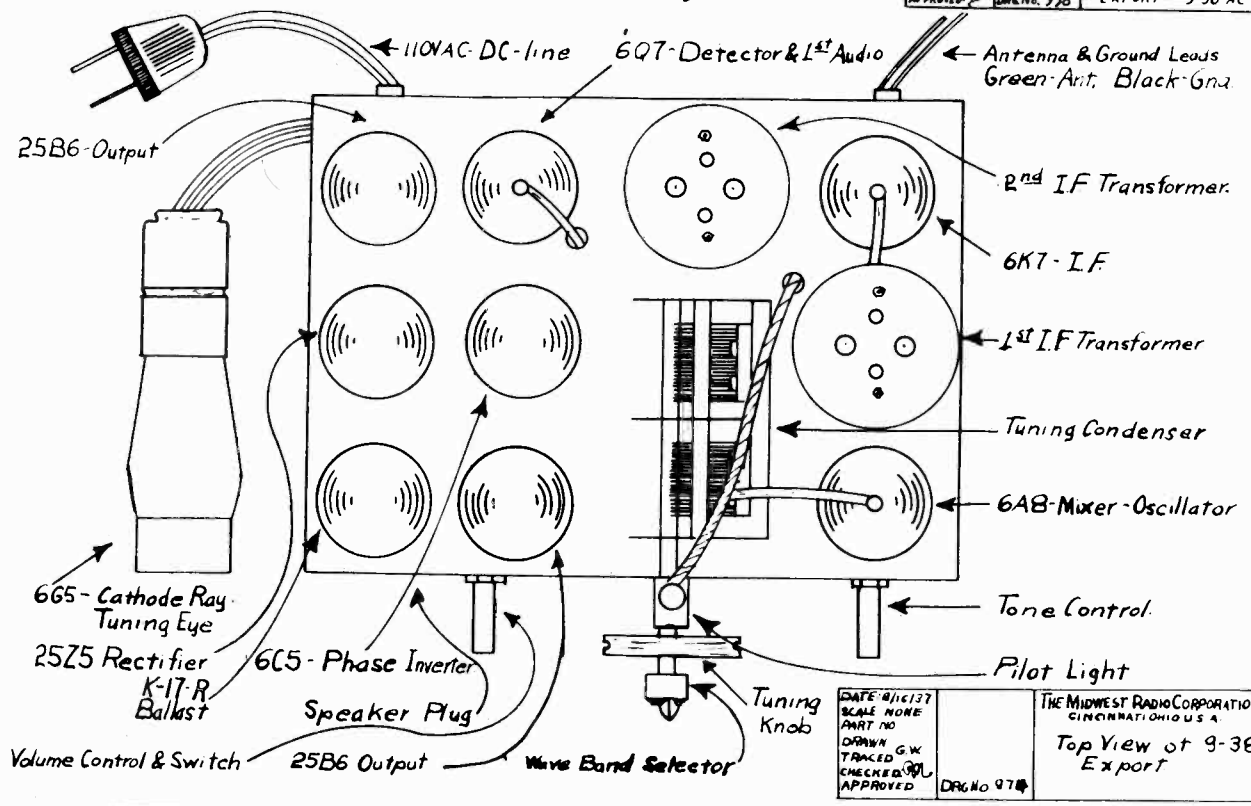
E BAND NOTE

- In sets having long wave band E (long wave) band coil replaces L band coil. The oscillator is connected colpitts.

I.F. = 456 KC

EXPORT 9-38 AC DC

DATE 7-29-37 SCALE NONE DRAWN J.G.S. TRACED CHECKED APPROVED	Drg. No. 958	THE MIDWEST RADIO CORPORATION CINCINNATI OHIO U.S.A. SCHEMATIC CIRCUIT DIAGRAM OF THE EXPORT 9-38 AC DC

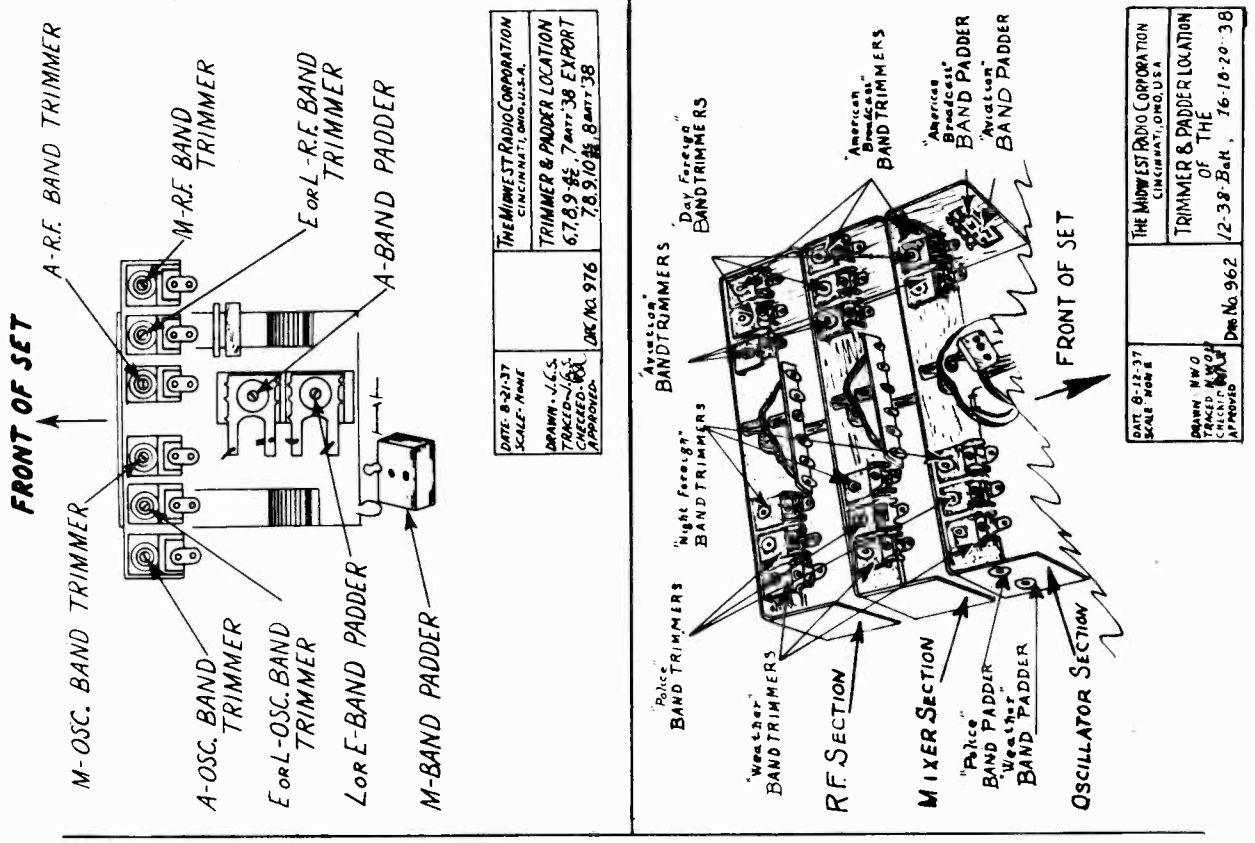


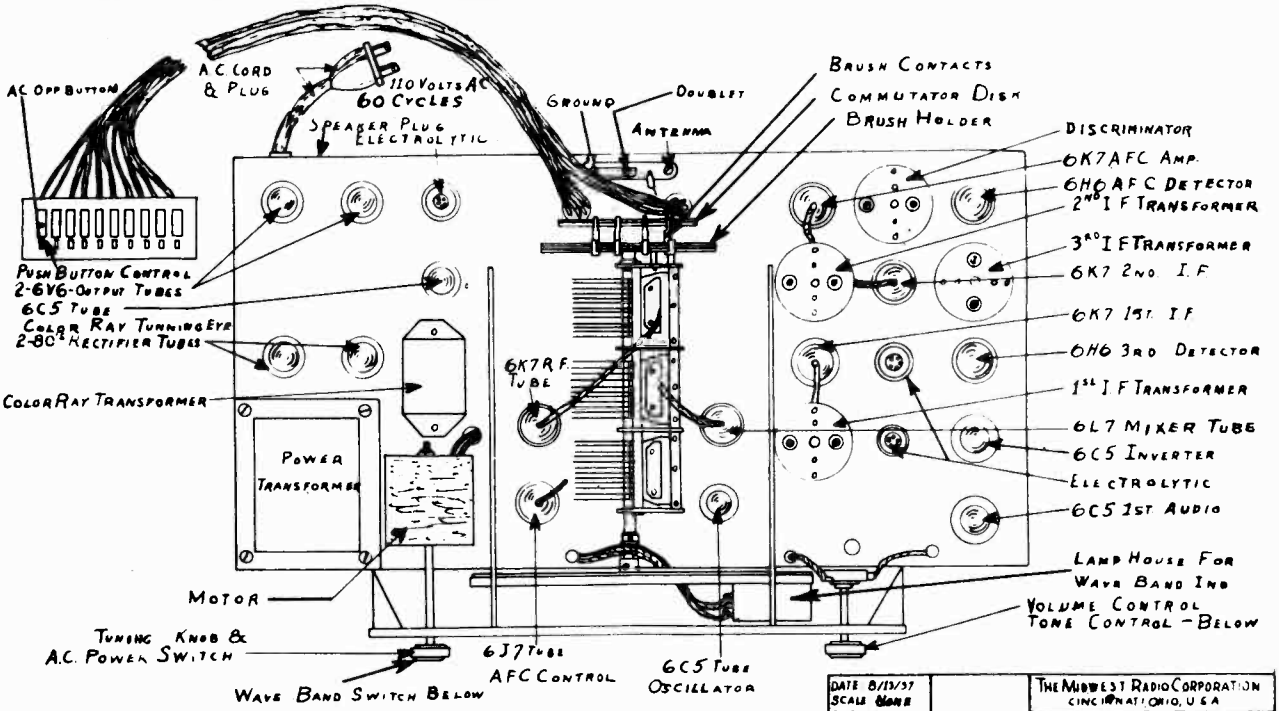
DATE 8/16/37 SCALE NONE PART NO DRAWN G.W. TRACED CHECKED APPROVED	DRG. NO 971	THE MIDWEST RADIO CORPORATION CINCINNATI OHIO U.S.A. Top View of 9-38 Export

MODELS 6-38,7-38,8-38,
9-38 Export AC-DC
MODEL 7-38 Batt.Export
MODELS 7-38,8-38,9-38
10-38 AC-DC
MODEL 8-38 Batt,12-38 Batt.

MID-WEST RADIO CORP.

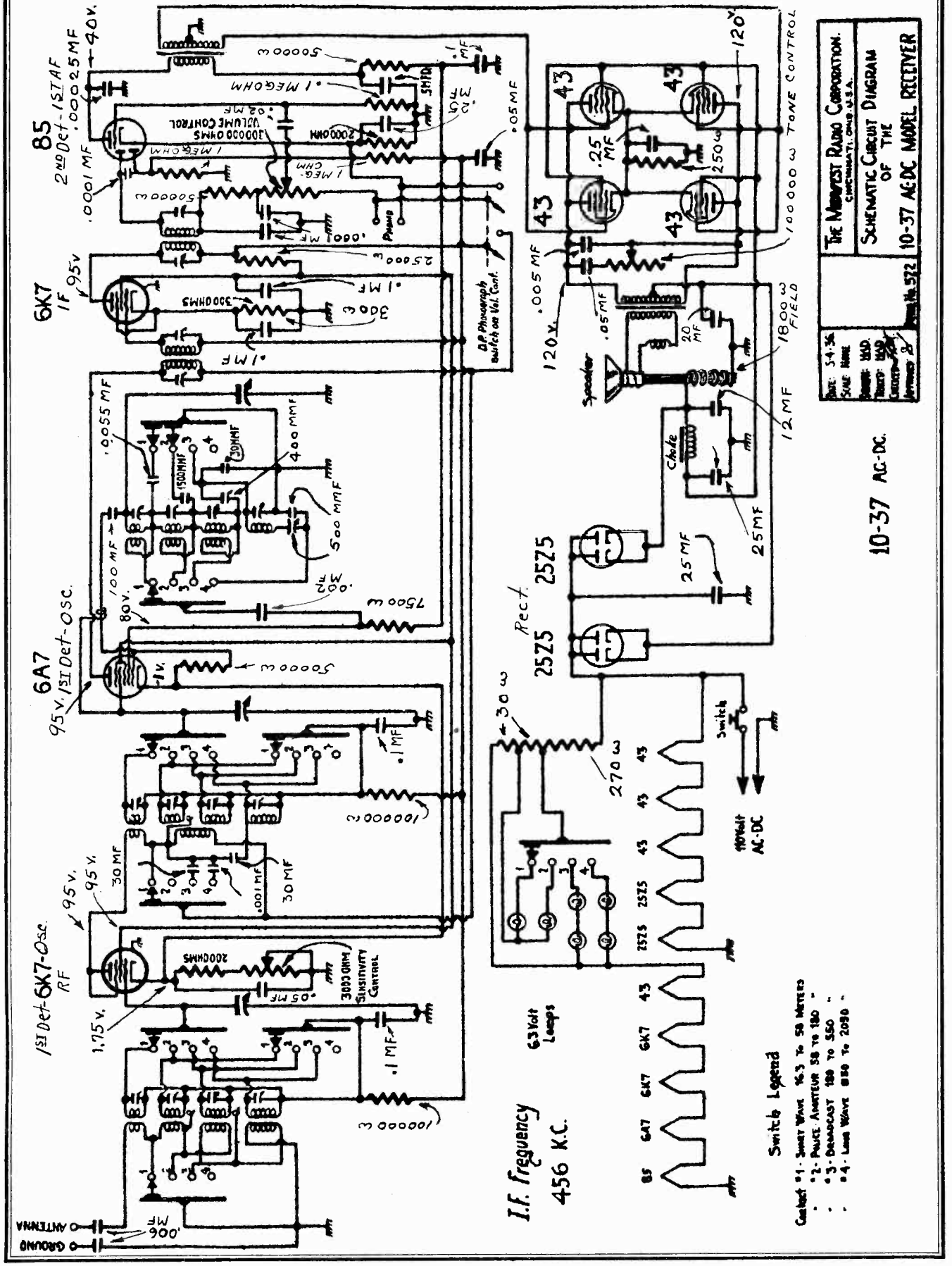
MODELS 16-38,18-38,20-38
Trimmers
MODEL 16-38
Socket Layout





MODEL 10-37 AC-DC
Schematic, Voltage

MID-WEST RADIO CORP.



MODEL 10-37 AC-DC
Socket, Trimmers
Alignment

MID-WEST RADIO CORP.

I. F. ADJUSTMENT - The signal generator is set at 456 KC and is connected to the grid of the first detector (6A7). With the oscillator section of the tuning condenser short-circuited and the receiver volume control at its maximum position, the I. F. trimmers are adjusted for maximum output. These trimmers may be found on the I.F. transformer shield cans to the right and rear of the gang condenser.

18 MEGACYCLE ADJUSTMENT - The high side of the signal generator is connected to the antenna lead of the receiver and the low side of the ground lead. The receiver and the signal are both tuned to a frequency of 18 MC With the selector switch in position for band No. 1. The oscillator trimmer condenser is adjusted so that the 18 MC signal is tuned in exactly at the 18 M C calibration point, with the volume control on full and the signal generator adjusted for minimum input. The antenna preselector and first detector trimmers are then adjusted in the order named for maximum output. These trimmers are located on the tops of the shield cans at the left side of the chassis, reading from front to back, these coils are as follows: -1. antenna preselector; 2. first detector; 3. oscillator. It will be noted that there are four trimmers on each of these coils. The adjustment screw for the trimmer in the front left hand corner of each is painted red. This denotes the trimmer for the No. 1 band.

5 MC ADJUSTMENT - With the band selector switch in position for operation on band No. 2 and the receiver and signal generator both set at 5 MC. The procedure outlined above is repeated. The oscillator trimmer is found on the rear coil can, and is located to the right of the red painted trimmer. The antenna preselector and interstage coil trimmers are located in the same positions on the corresponding shield cans.

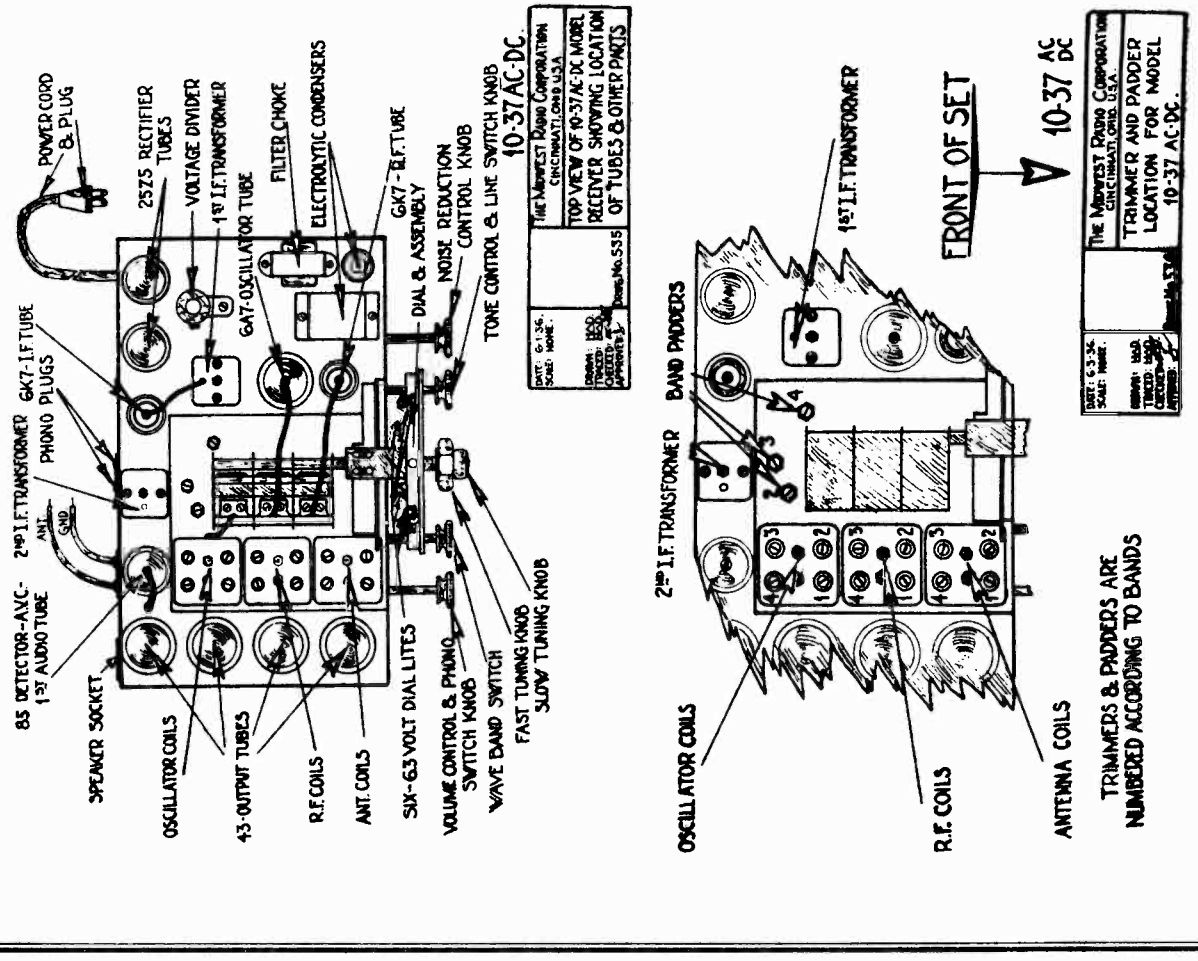
The signal generator is set at 1.7 MC and the signal tuned in on the dial. The padder condenser for this band is adjusted for maximum gain while the gang tuning condenser is rocked slightly to the right and left. The 5 MC adjustment should then be rechecked. The 1.7 MC padder is located on the subbase on which the gang tuning condenser is mounted and is the left hand one at the group of three found here.

1400 KC ADJUSTMENT - The band selector switch is set in position for operation on the No. 3 band. The receiver and signal generator are both set at 1400 KC and the procedure outlined above is repeated. The oscillator trimmer is found on the rear coil can, and is located diagonally opposite the red painted trimmer. The other trimmers for this band are located in similar positions on the corresponding coil cans.

The signal generator is set at 600 KC and the signal tuned in on the dial. The padder condenser for this band is adjusted for maximum response while the gang tuning condenser is rocked slightly to the right and left. The 1400 KC adjustment should then be rechecked. The 600 KC padder is located on the sub-panel on which the gang tuning condenser is mounted and is the center of the three located at this point.

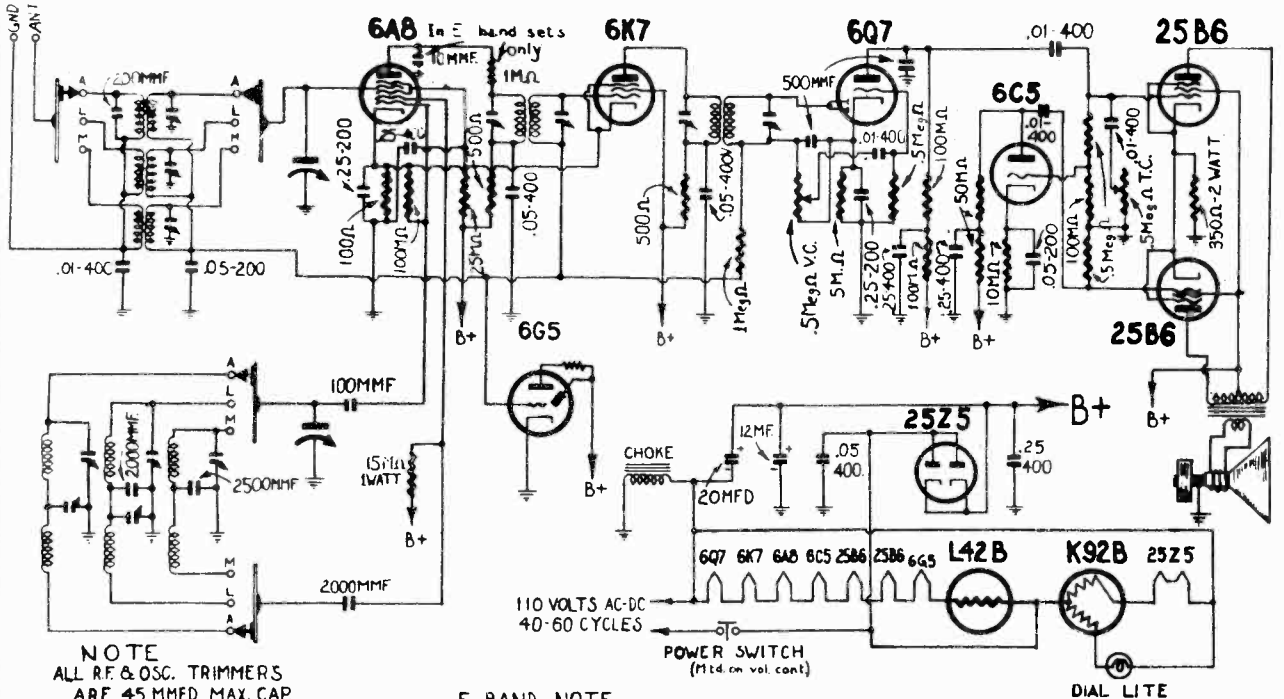
340 KC ADJUSTMENT - The band selector switch is set in position for operation on band No. 4. The receiver and generator are both tuned to 340 KC and the procedure outlined above is repeated. The oscillator trimmer is located on the rear coil can. It is the one directly behind the trimmer marked in red. The other trimmers for this band are located in similar positions on the corresponding shield cans.

The signal generator is set at 150 KC and the signal is tuned in on the dial. The padder condenser for this band is adjusted for maximum response while the gang tuning condenser is rocked slightly to the right and left. The 340 KC adjustment should then be rechecked. The 150 KC padder is located on the sub-panel on which the tuning condenser is mounted and is the right hand one of this group.



MODEL 10-38 AC-DC
Schematic, Socket

MID-WEST RADIO CORP.



NOTE
ALL R.F. & OSC. TRIMMERS ARE 45 MMFD. MAX. CAP.
OSC PADDERS ARE 500MMFD. MAX. CAP.

E-BAND NOTE

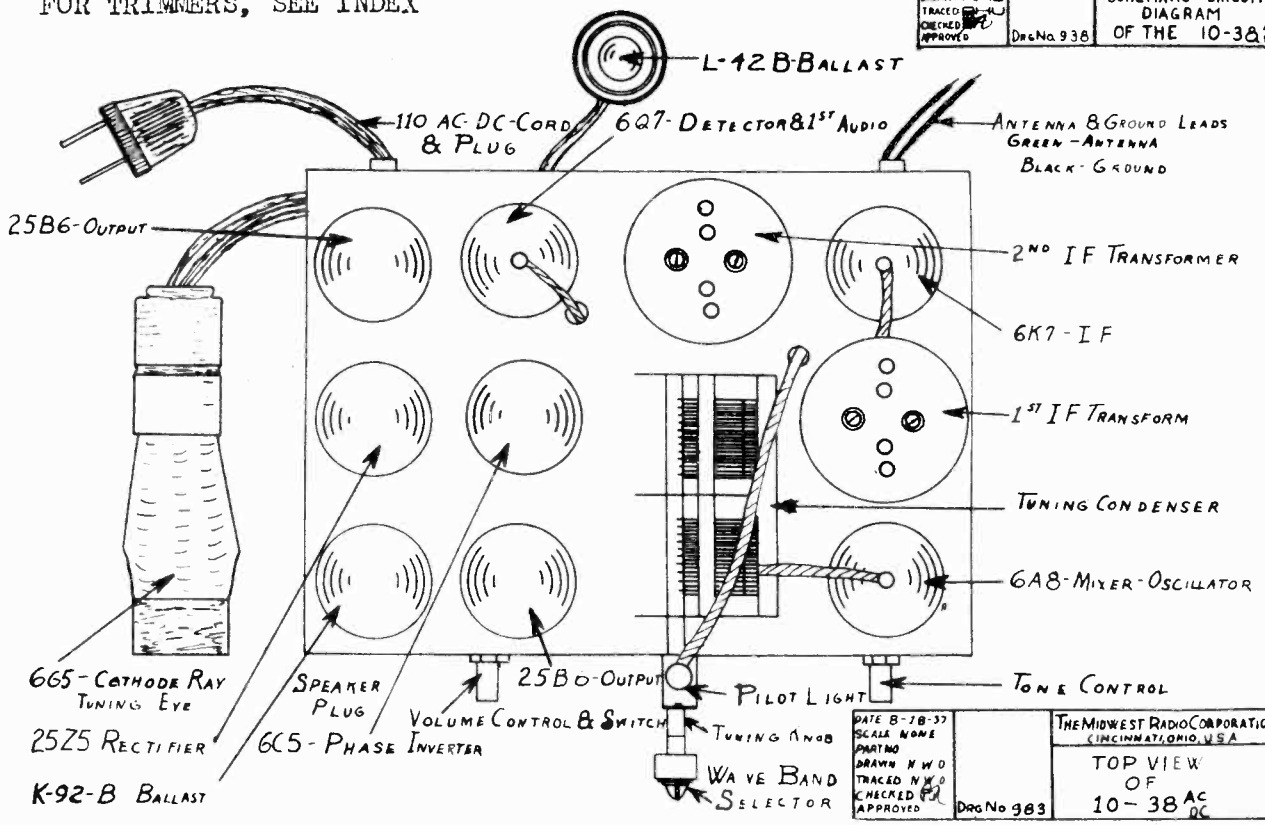
In sets having long wave band, E (long wave) band coil replaces L band coil. Colpitts oscillator is used—no tickler coil. No fixed padder is used. Variable padder is 140MMFD Max. Cap. in place of 500 MMFD. R.F. filter is added in plate circuit of 6A8

I.F. = 456 K.C.

10-38 AC DC

DATE 6-28-37 SCALE — PART NO — DRAWN R.H.J. TRACED R.H.J. CHECKED APPROVED	Drg. No. 938	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO U.S.A. SCHEMATIC CIRCUIT DIAGRAM OF THE 10-38 AC DC

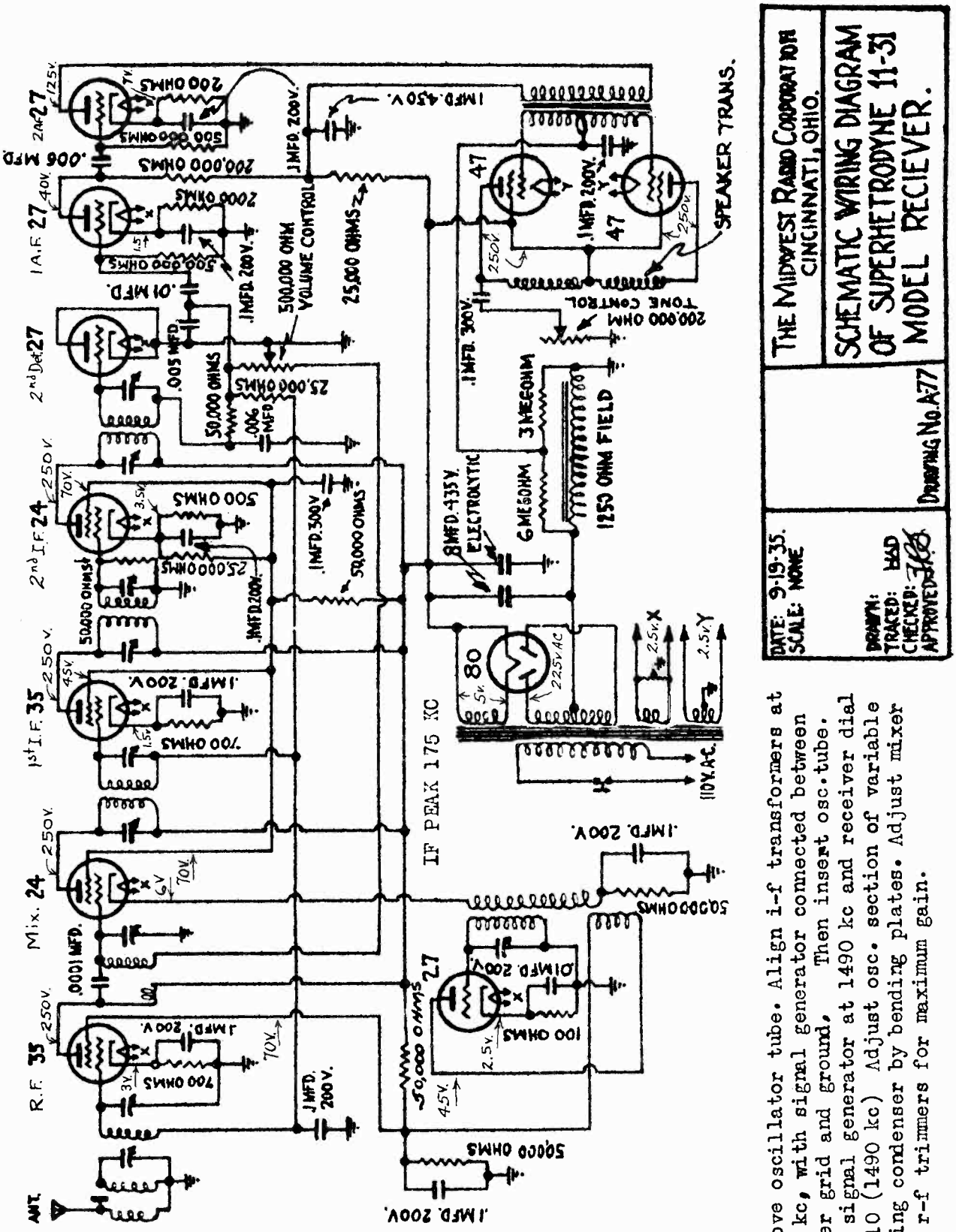
FOR TRIMMERS, SEE INDEX



DATE 8-18-37 SCALE NONE PART NO DRAWN N.W.O. TRACED N.W.O. CHECKED APPROVED	Drg. No. 983	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO, U.S.A. TOP VIEW OF 10-38 AC DC

MODEL 11-31
Schematic, Voltage
Alignment

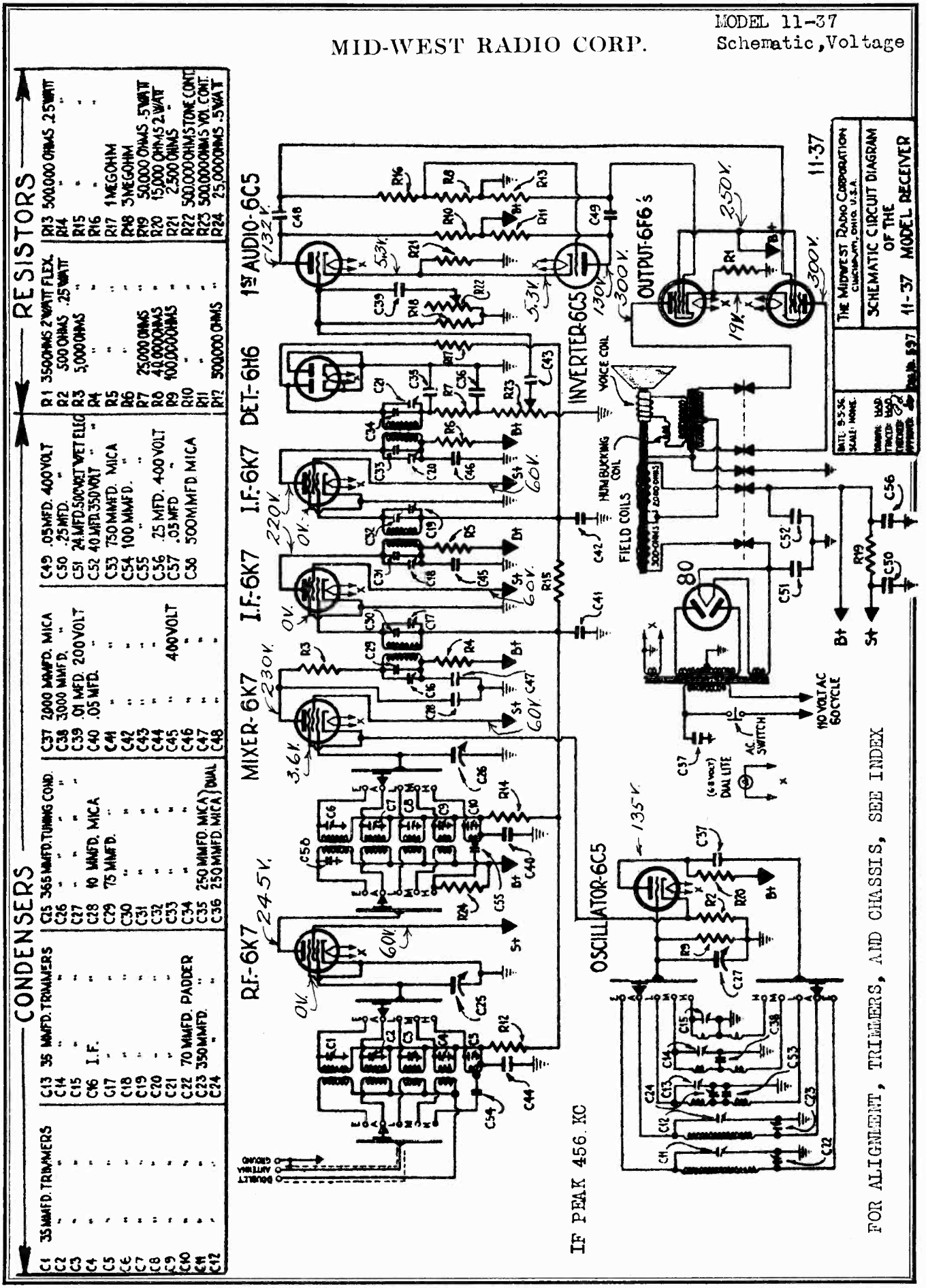
MID-WEST RADIO CORP.



Remove oscillator tube. Align i-f transformers at 175 kc, with signal generator connected between mixer grid and ground. Then insert osc. tube. Set signal generator at 1490 kc and receiver dial at 10 (1490 kc) Adjust osc. section of variable tuning condenser by bending plates. Adjust mixer and r-f trimmers for maximum gain.

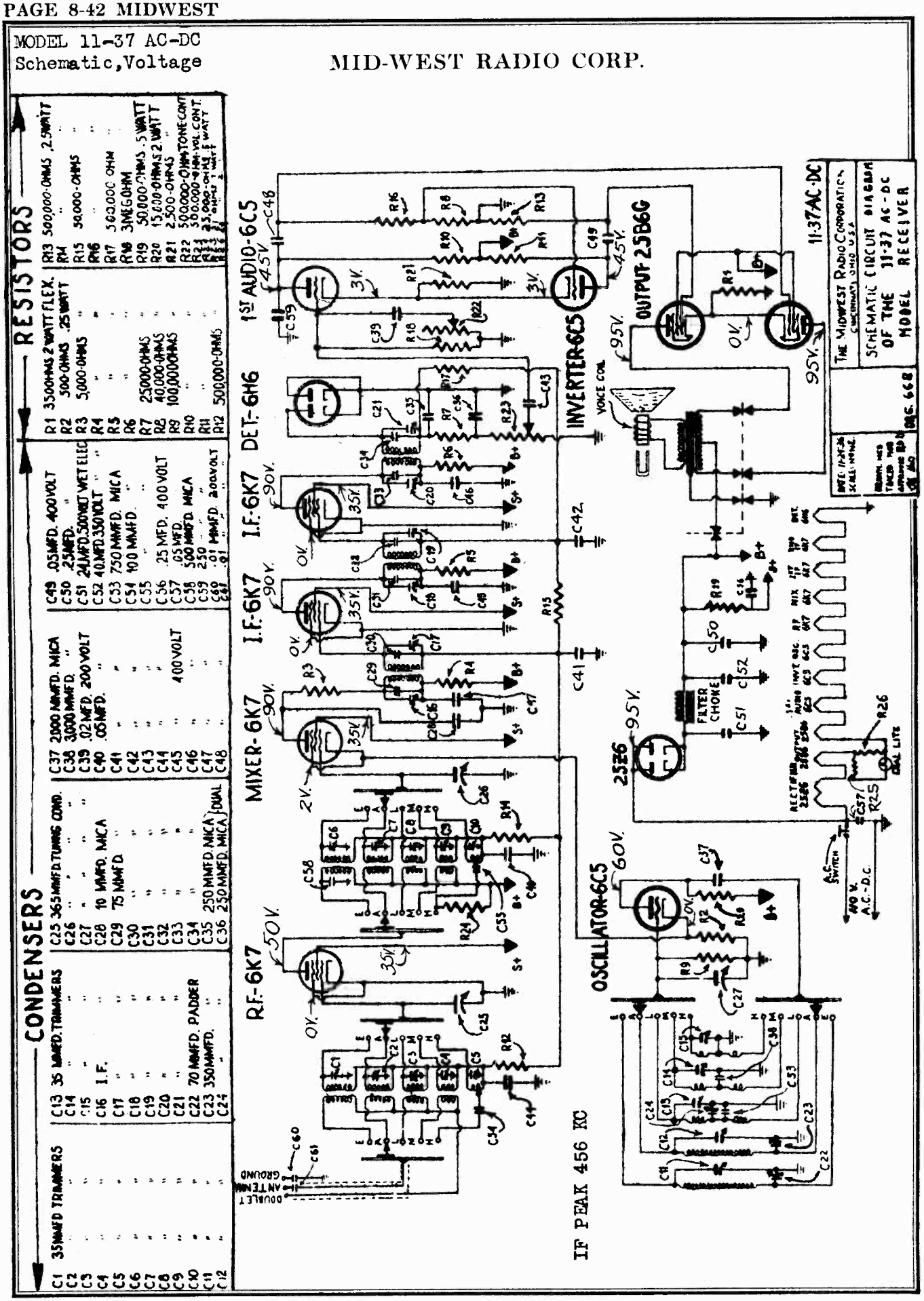
MODEL 11-37
Schematic, Voltage

MID-WEST RADIO CORP.



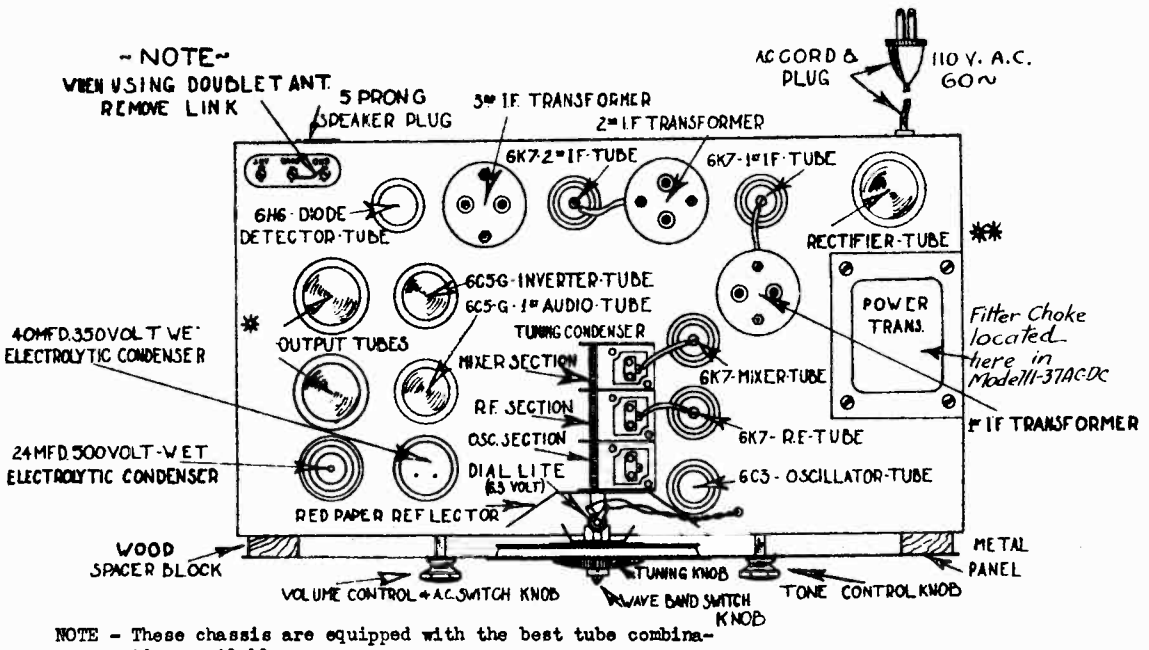
MODEL 11-37 AC-DC
Schematic, Voltage

MID-WEST RADIO CORP.



MODEL 11-37
Socket, Trimmers
MODEL 11-37 AC-DC
Trimmers

MID-WEST RADIO CORP.



NOTE - These chassis are equipped with the best tube combination available

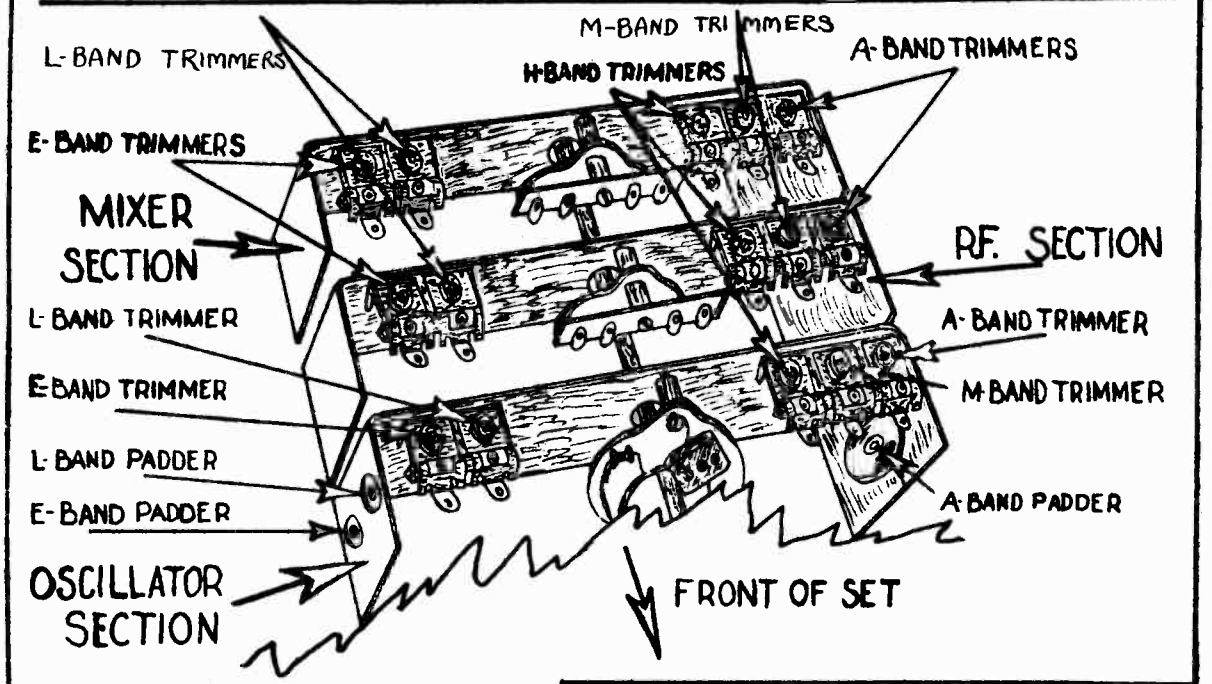
* 6F6G output tubes in 11-37 AC and 25B6G tubes in 11-37 AC-DC.

** 80 rectifier in 11-37 AC and 25Z6 in 11-37 AC-DC.

Metal, metal-glass, or glass counterpart tubes may be used, but the rectifier tubes should be those specified.

11-37

DATE: 9-17-36 SCALE: NONE DRAWN: RHU TRACED: RHU CHECKED: HHD. APPROVED:	Dwg. No. 605	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO U.S.A. TOP VIEW OF THE 11-37 MODEL RECEIVER SHOWING LOCATION OF TUBES & OTHER PARTS



DATE: 11-24-36 SCALE: NONE. DRAWN: RHU TRACED: RHU APPROVED: HHD.	Drg. No. 676	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO, U.S.A. TRIMMER & PADDER LOCATION OF THE 11-37 AC & DC 11-37 MODEL RECEIVER

ALIGNMENT INSTRUCTIONS FOR MODEL 11-37 AC AND MODEL 11-37 AC-DC

(1) Set the signal generator to 456 k.c. and connect it from the mixer grid to ground.

(2) Remove the oscillator tube from the receiver.

(3) Connect the output meter from the plate of the output tube to positive B.

(4) Using a moderately weak signal approximately 40 microvolts, align the three I.F. transformers to maximum output.

(5) Keep decreasing the oscillator input and re-aligning for maximum gain.

This completes the alignment of the I.F. amplifier.

Insert the oscillator tube. Connect the signal generator between antenna and ground. Connect micer lead to grid of mixer tube.

(1) Set the wave change switch to the "E" band.

(2) Set the signal generator to 325 k.c., and also the dial.

(3) Adjust the "E" oscillator trimmer to maximum gain, then adjust the "E" band R. F. and the "E" band mixer trimmers for maximum gain.

(4) Reset the signal generator to 135 k.c. and rotate the receiver dial to 135 k.c.

(5) Adjust the "E" band padder for maximum signal.

(6) Repeat the adjustment of trimmers and padders until the adjustment of one does not effect the adjustment of the other.

This completes the alignment of the "E" band.

(1) Set the wave change switch to the "A" band.

(2) Set the signal generator to 1490 k.c.

(3) Adjust the "A" oscillator trimmer to maximum gain, then adjust the "A" band R.F. and The "A" band mixer trimmers for maximum gain.

(4) Reset the signal generator to 550 k.c. and rotate the receiver dial to 550 k.c.

(5) Adjust the "A" band padder for maximum signal.

(6) Repeat the adjustment of trimmers and padders until the adjustment of one does not effect the adjustment of the other.

This completes the alignment of the "A" band.

(1) Set the wave change switch to the "L" band.

(2) Set the signal generator to 3.8 m.c.

(3) Adjust the "L" oscillator trimmer to maximum gain, then adjust the "L" band R.F. and the "L" band mixer trimmers for maximum gain.

(4) Reset the signal generator to 1.6 m.c. and rotate the receiver dial to 1.6 m.c.

(5) Adjust the "L" band padder for maximum signal.

(6) Repeat the adjustment of trimmers and padders until the adjustment of one does not effect the adjustment of the other.

This completes the alignment of the "L" band.

(1) Set the wave change switch to the "M" band.

(2) Set the signal generator to 11.5 m.c.

(3) Adjust the "M" oscillator trimmer to maximum gain, then adjust the "M" band R.F. and the "M" band mixer trimmers for maximum gain.

This completes the alignment of the "M" band.

(1) Set the wave change switch to the "H" band.

(2) Set the signal generator to 28 m.c.

(3) Adjust the "H" band oscillator trimmer to maximum gain, then adjust the "H" band R.F. and the "H" band mixer trimmers for maximum gain.

This completes the alignment of the "H" band.

MODEL 12-33
Schematic
Voltage

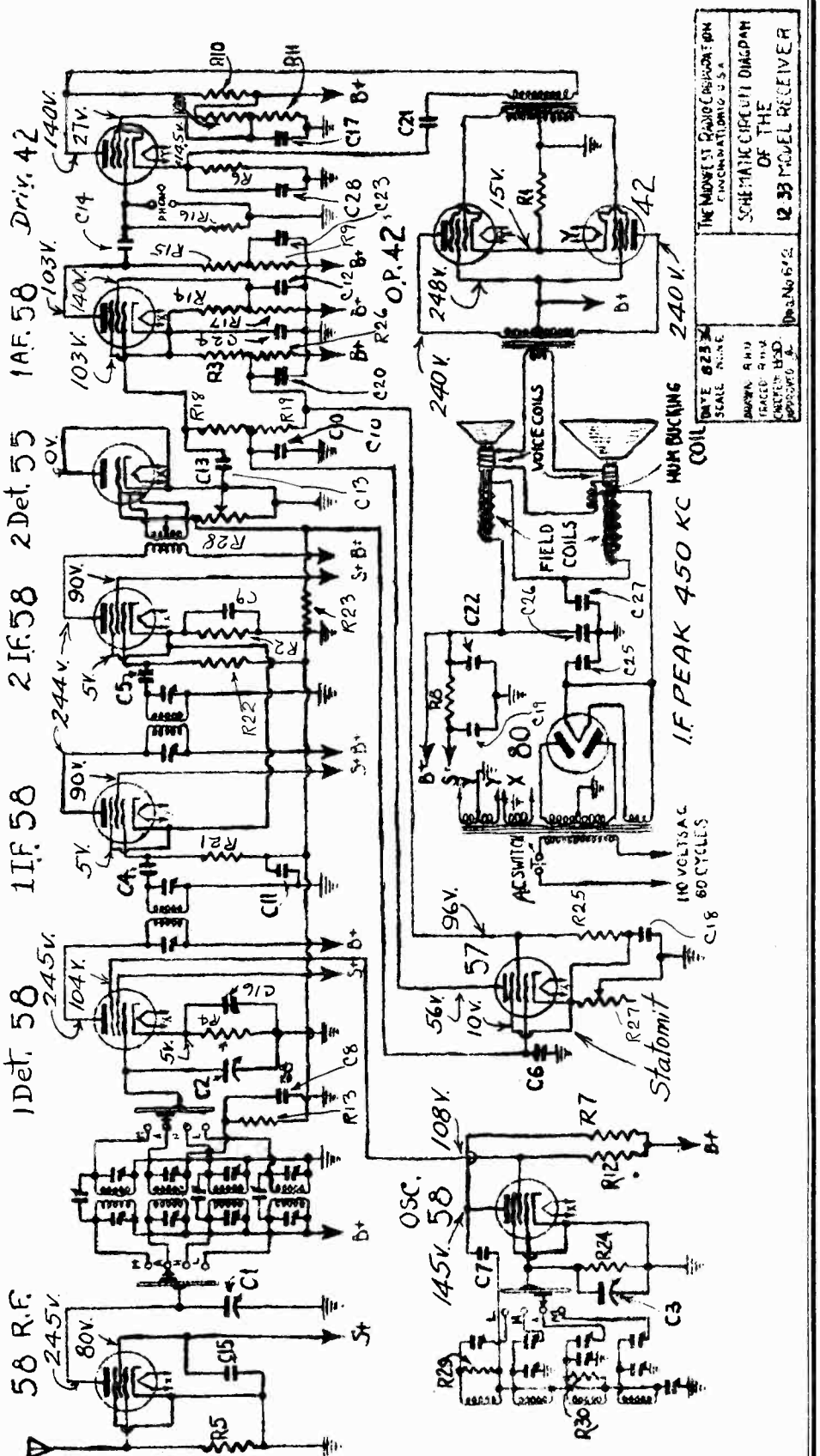
MID-WEST RADIO CORP.

CONDENSERS

C1 TUNING CONDENSER	C11 .05MFD - 200V.	C21 .25MFD 400V.	
C2 " "	C12 " - 400V.	C22 " "	
C3 " "	C13 " "	C23 .1MFD - 300V.	
C4 250MFD. MICA	C14 " "	C24 .5MFD - 200V.	
C5 " "	C15 .1MFD 200V.	C25 8MFD WET-ELECT.	
C6 500MMFD "	C16 " "	C26 " DRY "	
C7 .002 MFD "	C17 " "	C27 " "	
C8 .05MFD 200V.	C18 " "	C28 .25MFD 25V "	
C9 " "	C19 " "		
C10 " "	C20 " 300V		

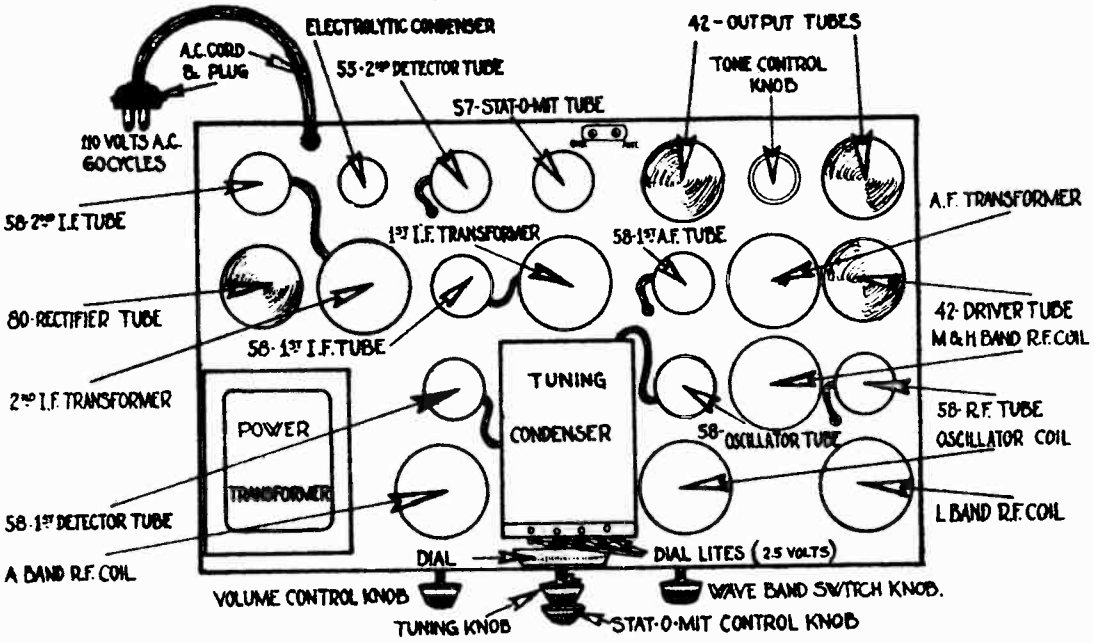
RESISTORS

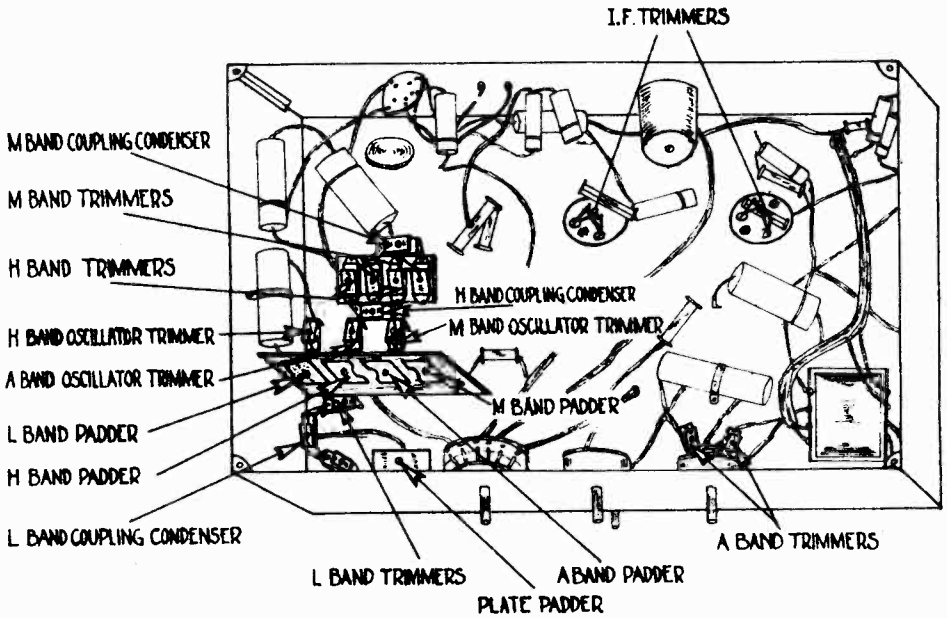
R1 210 OHM FLEXIBLE		R11-50,000-OHM .5WATT	R21-400,000-OHM .5WATT
R2 700-OHMS "		R12-150,000-OHM "	R22 " "
R3 " "		R13-200,000-OHM "	R23 " "
R4 1000 OHM "		R14 " "	R24 .3 MEGOHM "
R5 50,000-OHM .25WATT		R15 " "	R25 10,000 OHM 1WATT
R6 5,000-OHM .5WATT		R16 " "	R26 15,000-OHM .5WATT
R7 19,000-OHM "		R17 " "	R27 1,000 OHM VARIABLE
R8 31,000-OHM "		R18 " "	R28 500,000OHM VOL CONT
R9 " "		R19 " "	R29 31,000-OHM
R10 " "		R20 " "	R30 50,000 OHM



MODEL 12-33
Socket, Trimmers
Alignment

MID-WEST RADIO CORP.





Before aligning the i-f amplifier, check the spacing of the i-f transformers, as they sometimes collapse resulting in broad tuning. The spacing should be 3/4 inch between faces of the coils. Wax coils in place. Set signal generator at 450 kc and adjust i-f trimmers. Measure the AVC voltage developed for peaking purposes.

A BAND-WHITE. Do not adjust the plate padder. This has been done at the factory and should not be changed. Set dial at 5 and signal generator at 1490 kc. Adjust A-Band r-f trimmers to maximum output and then padder at 550 kc with dial set at 98.

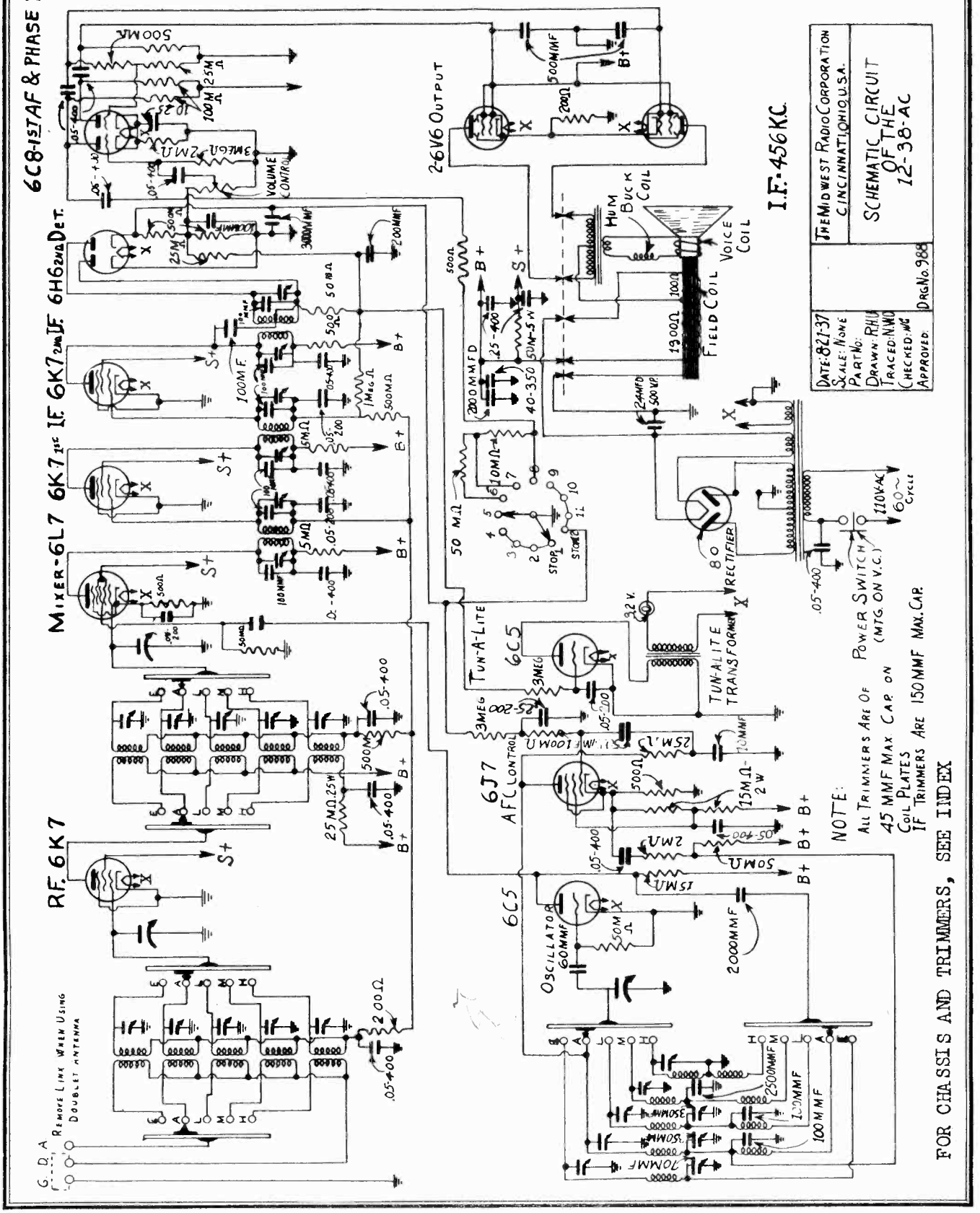
L BAND-RED. Set dial at 2. Adjust r-f trimmers at 4.1 mc. Set dial at 98 and adjust padder at 1712 kc. Adjust feed condenser until maximum sensitivity is reached over the whole band. Generally this condenser will be tight.

M BAND-GREEN. Set dial at 2. Adjust r-f trimmers at 9 mc. Adjust padder at 4.5 mc. Adjust feed condenser as was done in L Band.

H BAND-AMBER or BLUE. Set dial at 5. Adjust r-f trimmers at 20 mc. Adjust padder at 9 mc. with dial at 98 Adjust feed condenser as was done in L Band.

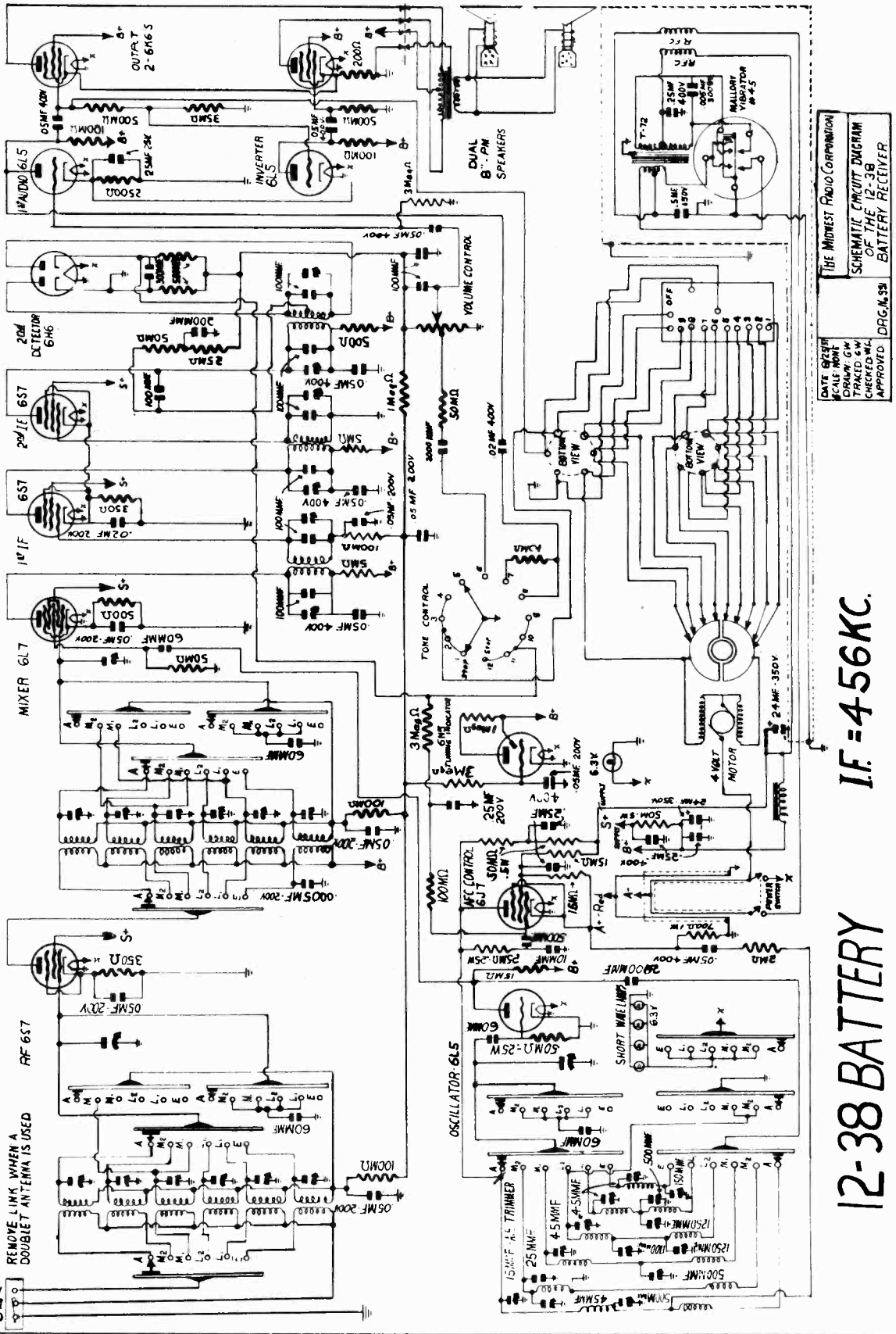
MODEL 12-38 AC
Schematic

MID-WEST RADIO CORP.



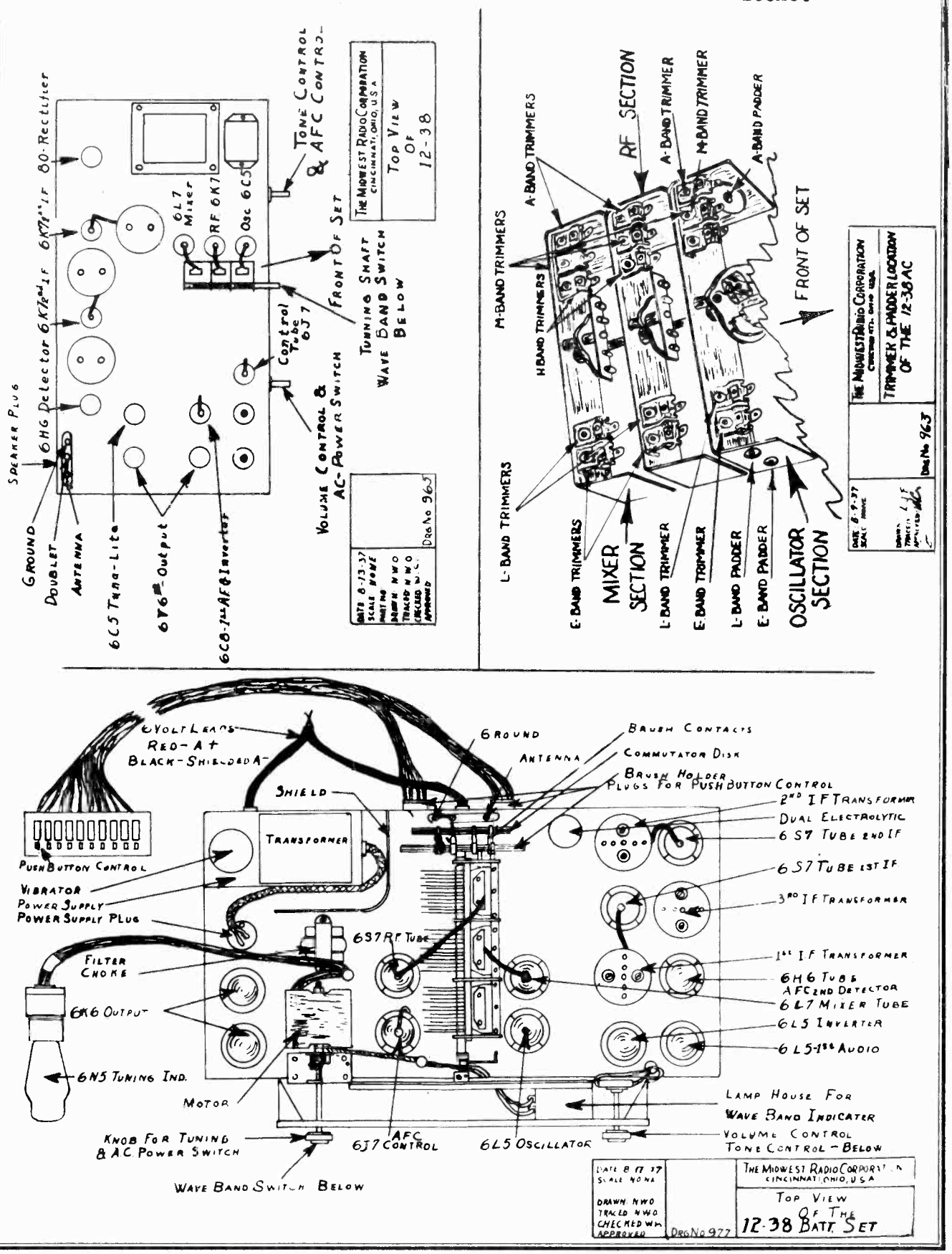
MODEL 12-38 Batt.
Schematic

MID-WEST RADIO CORP.



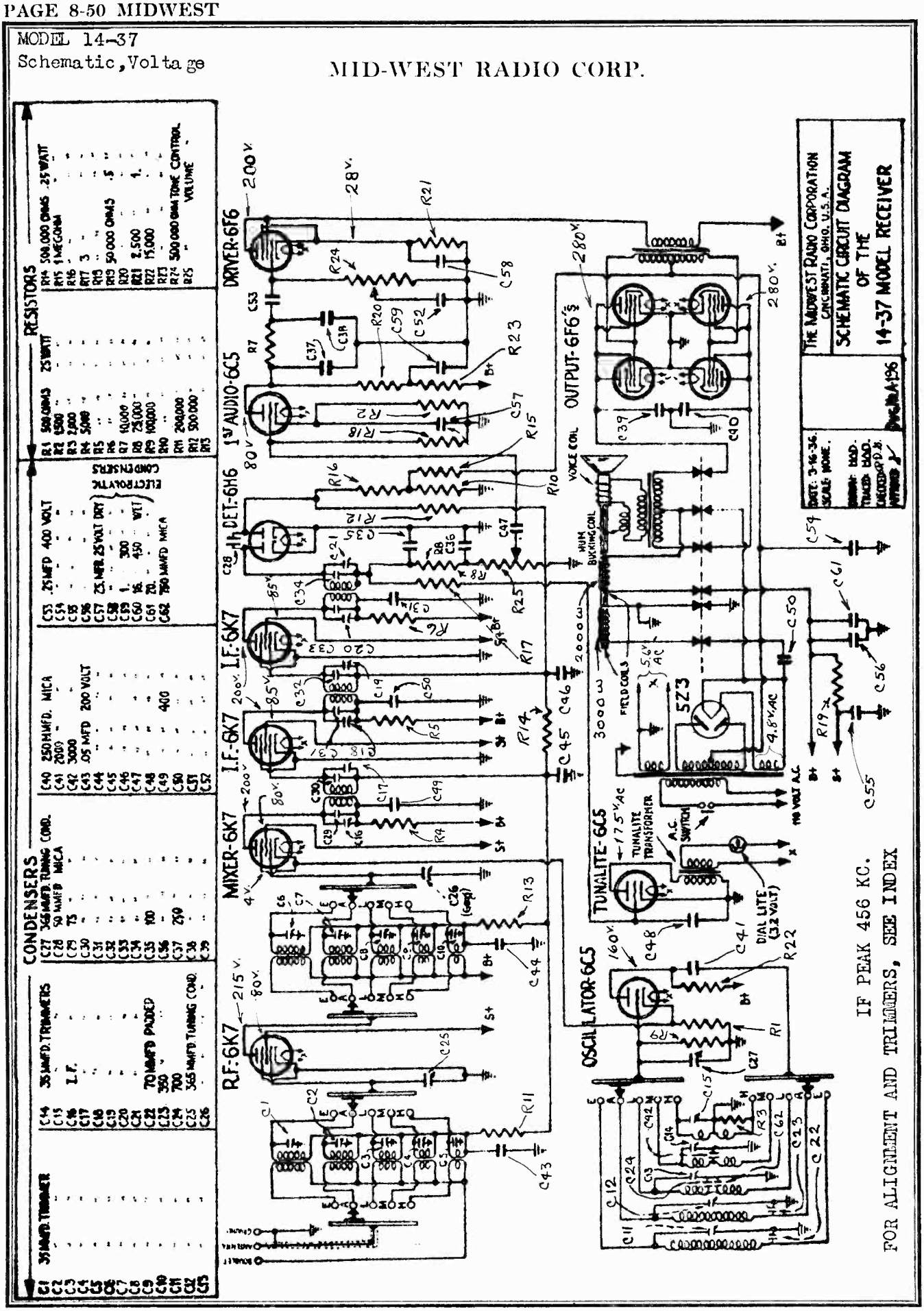
MODEL 12-38 AC
Socket, Trimmers
MODEL 12-38 Batt.
Socket

MID-WEST RADIO CORP.



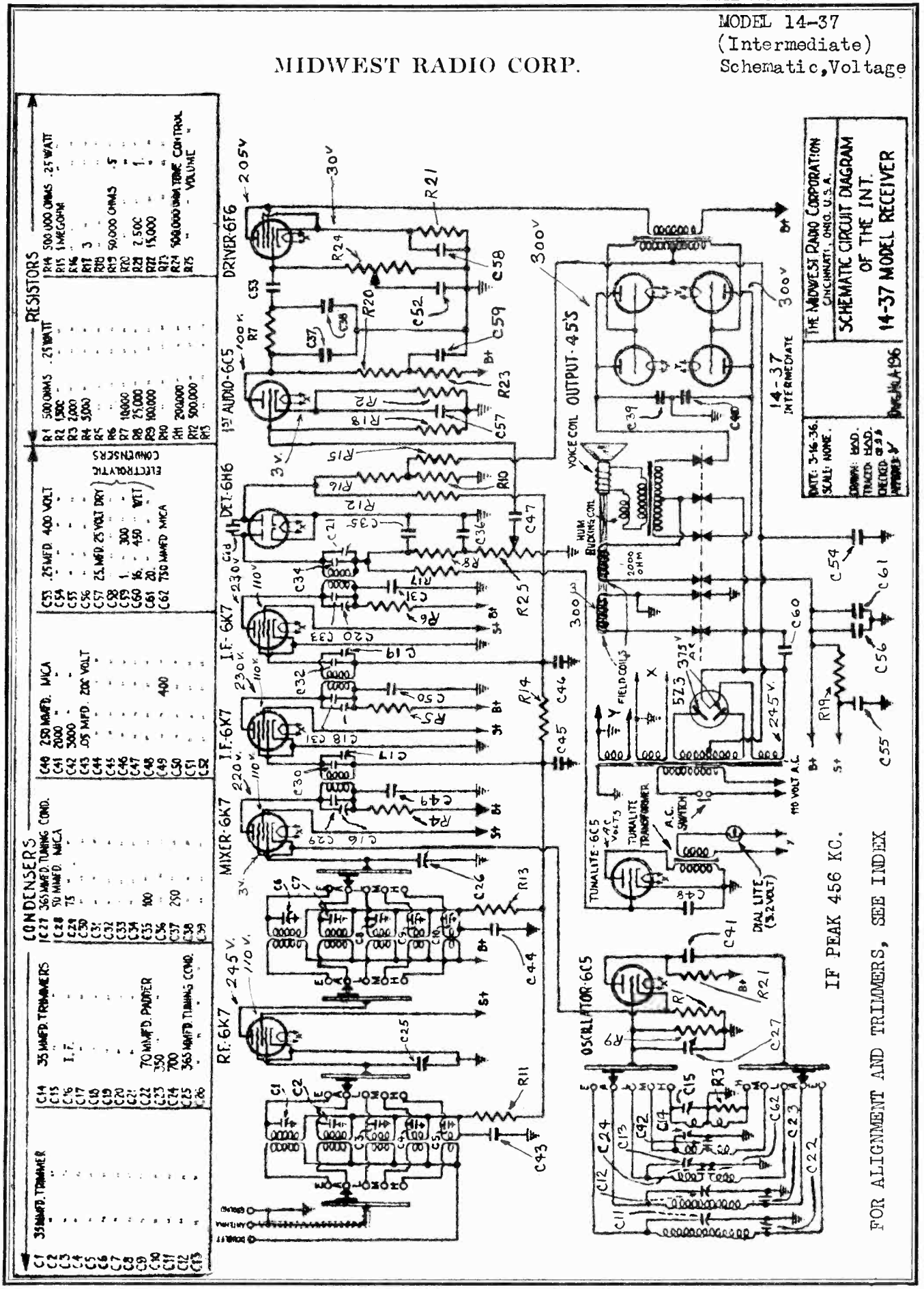
MODEL 14-37
Schematic, Voltage

MID-WEST RADIO CORP.



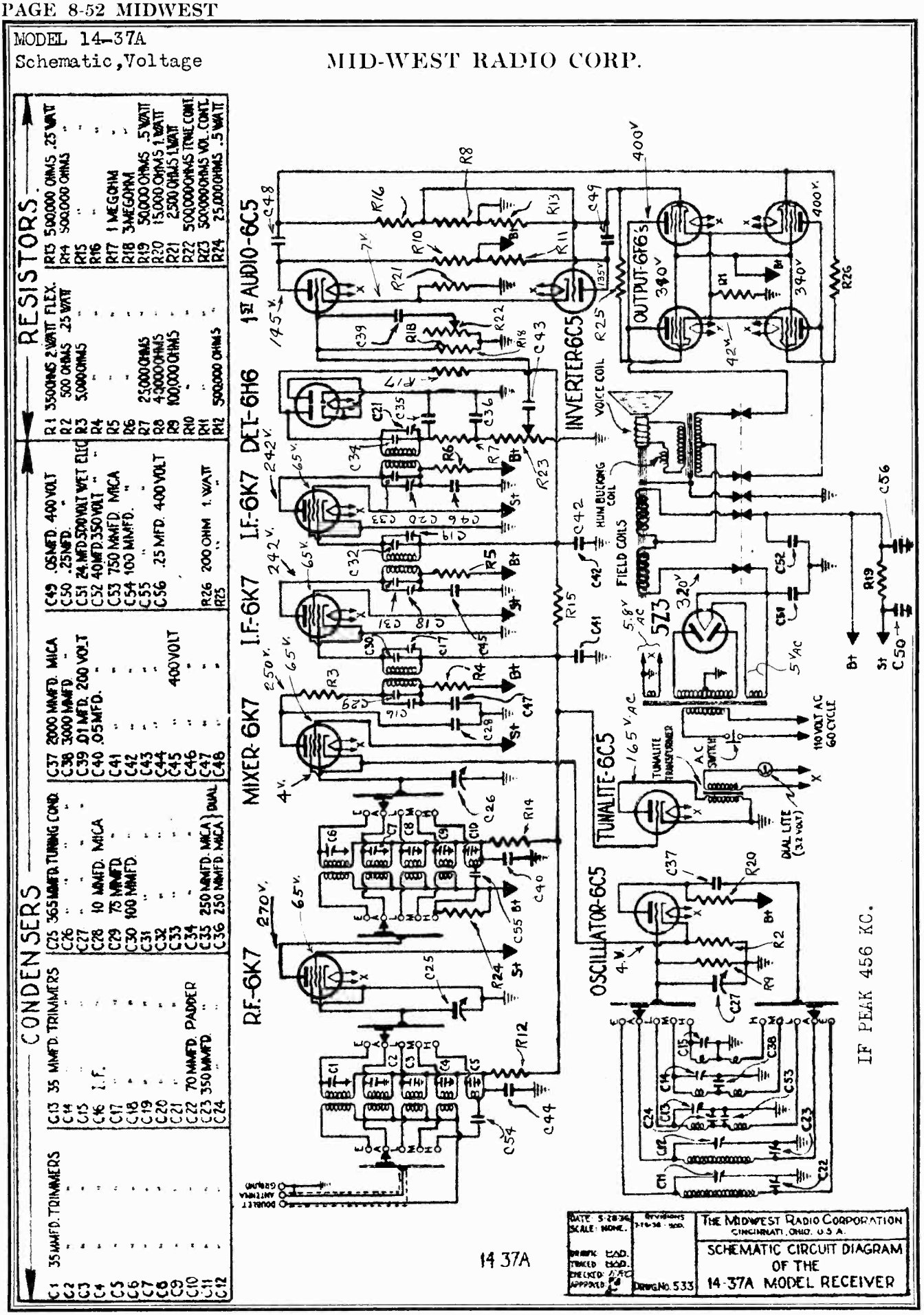
MODEL 14-37
(Intermediate)
Schematic, Voltage

MIDWEST RADIO CORP.



MODEL 14-37A
Schematic, Voltage

MID-WEST RADIO CORP.



MODEL 14-37
MODEL 14-37(Int.)
MODEL 14-37A
Trimmers,Alignment

MID-WEST RADIO CORP.

ALIGNMENT PROCEDURE

MODELS 14-37, 14-37A, AND 14-37 INTERMEDIATE

INTERMEDIATE FREQUENCY ALIGNMENT

(1) Set the signal generator to 456 KC and connect it from the Mixer tube grid to ground.
(2) Remove the Oscillator tube from the receiver.
(3) Connect the output meter from the plate of the output tube to the positive"B".
(4) Using a moderately weak signal of approximately 40 microvolts, align the three IF transformers to maximum output.
(5) Keep decreasing the signal generator input and re-align for maximum gain.

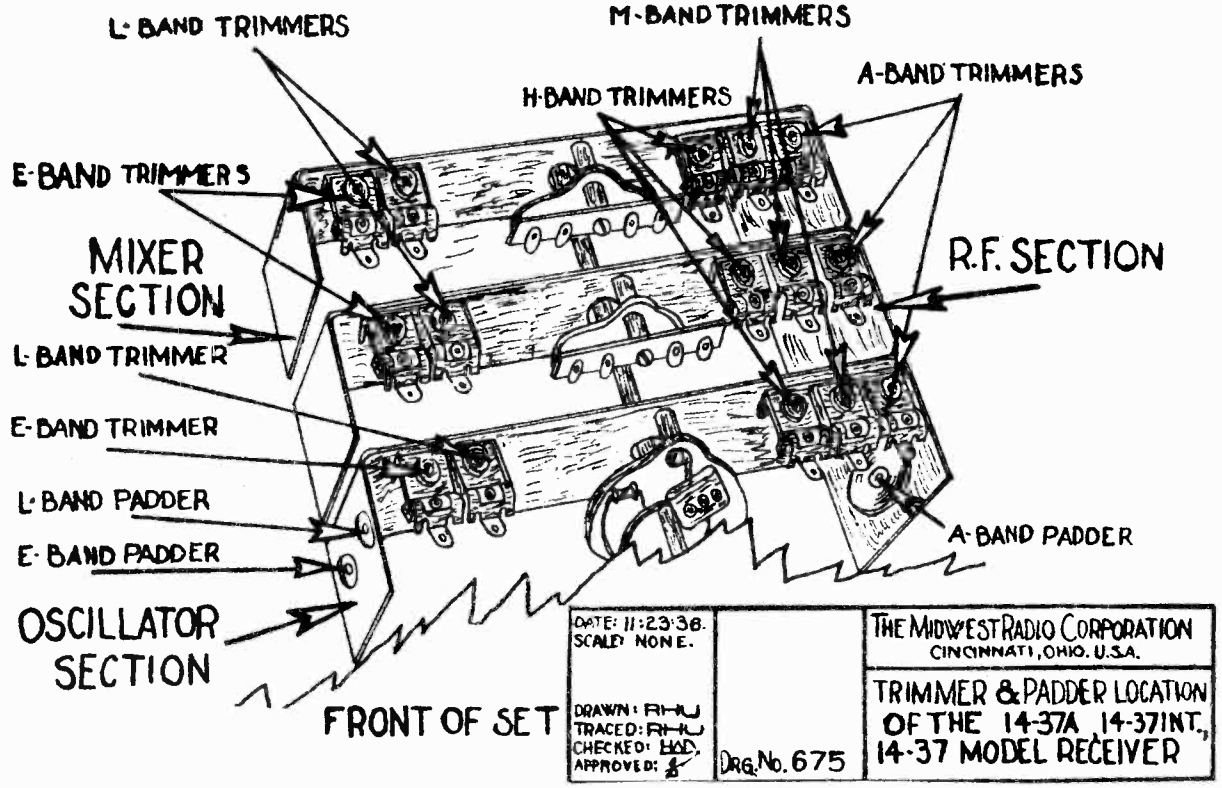
"E" Band ALIGNMENT

(1) Set the receiver wave change switch to the "E" Band.
(2) Set the signal generator to 325 KC.
(3) Adjust the "E" Band Oscillator trimmer to maximum gain, then adjust the RF and Mixer trimmers of the same band to maximum gain.
(4) Reset the signal generator to 135 KC and set the receiver dial to the same frequency.
(5) Adjust the "E" band padder for maximum signal.
(6) Repeat the adjustments of trimmers and padder until the adjustment of one does not affect the adjustment of the other.

"A","L","M", AND "H" BAND ALIGNMENT

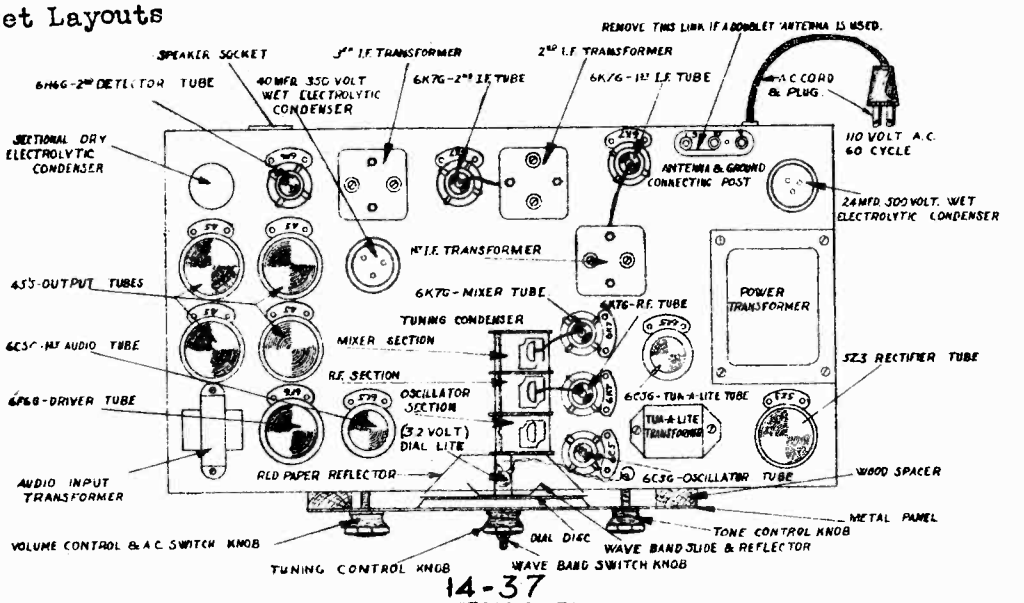
The procedure of alignment of these bands are the same as given above for the "E" band . The frequencies for their adjustment are as follows :-

"A" BAND- Adjust Osoillator,RF,and Mixers trimmers to 1490 KC
Adjust Oscillator padder to 550 KC.
"L" BAND- Adjust Oscillator,RF,and Mixer trimmers to 3.8 MC
Adjust Oscillator padder to 1.6 MC.
"M" BAND- Adjust Oscillator, RF, and Mixer trimmers to 11.5 MC
No padder adjustment.
"H" BAND- Adjust Oscillator, RF, and Mixer trimmers to 28 MC
No padder adjustment.



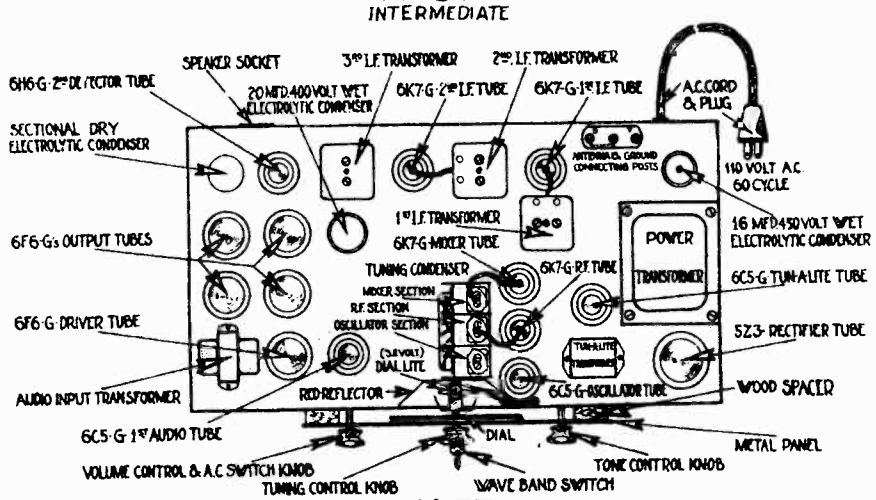
MODEL 14-37
MODEL 14-37(Int.)
MODEL 14-37A
Socket Layouts

MID-WEST RADIO CORP.



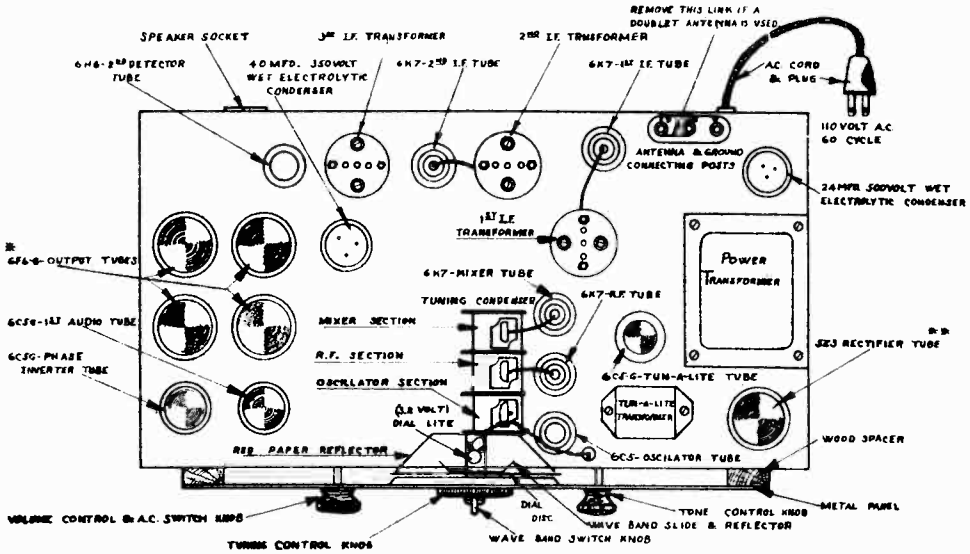
14-37
INTERMEDIATE

THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO, U.S.A.
TOP VIEW OF 14-37 INT. MODEL RECEIVER SHOWING LOCATION OF PARTS.
Dwg. No. 610
DATE: 9-22-36
SCALE: NONE
PART NO.
DRAWN BY:
TRACED BY:
CHECKED BY:
APPROVED BY:



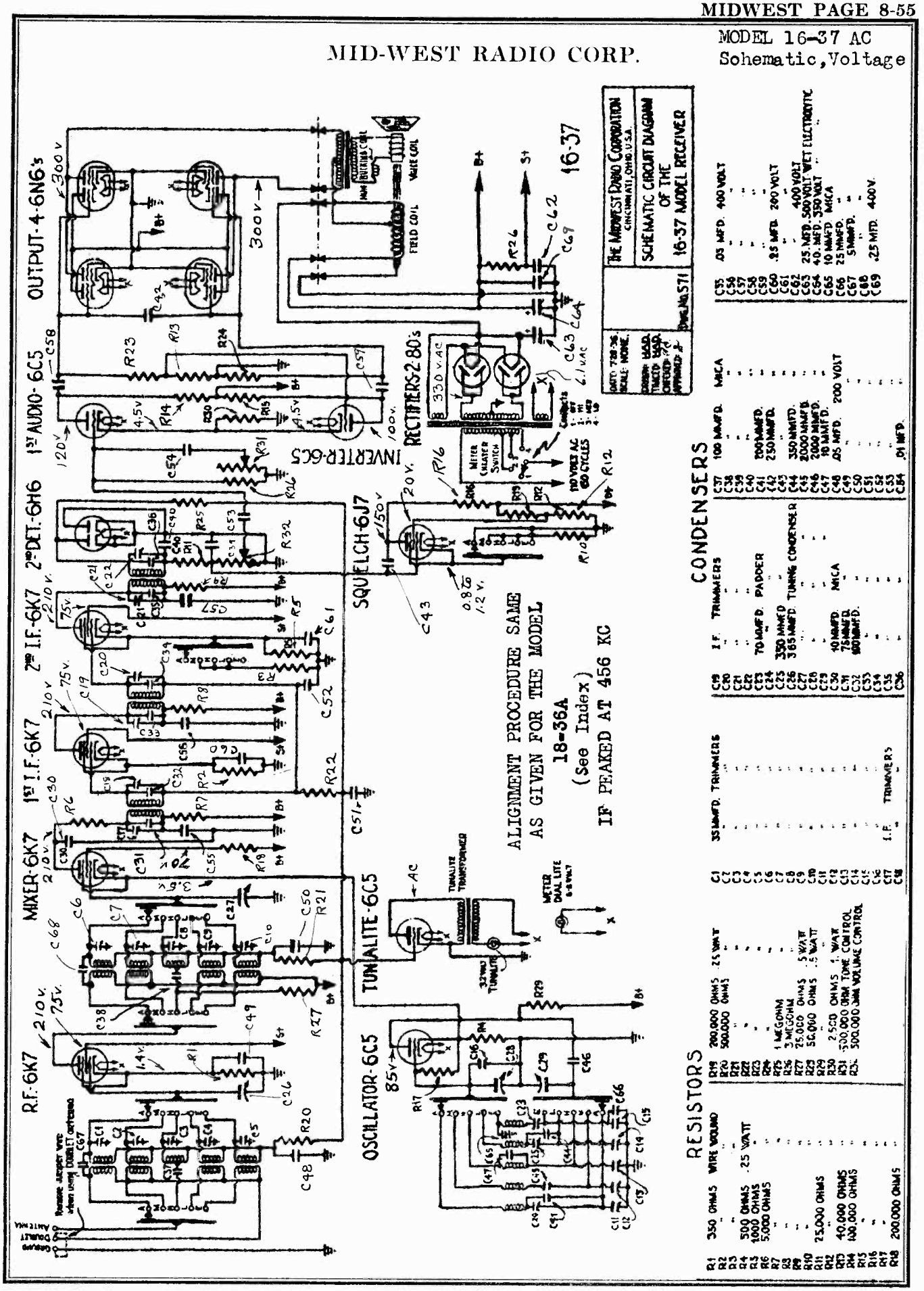
14-37

THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO, U.S.A.
TOP VIEW OF 14-37 MODEL RECEIVER SHOWING LOCATION OF TUBES & OTHER PARTS.
Drwg. No. A-104
DATE: 2-1-36
SCALE: NONE
DRAWN BY:
TRACED BY:
CHECKED BY:
APPROVED BY:



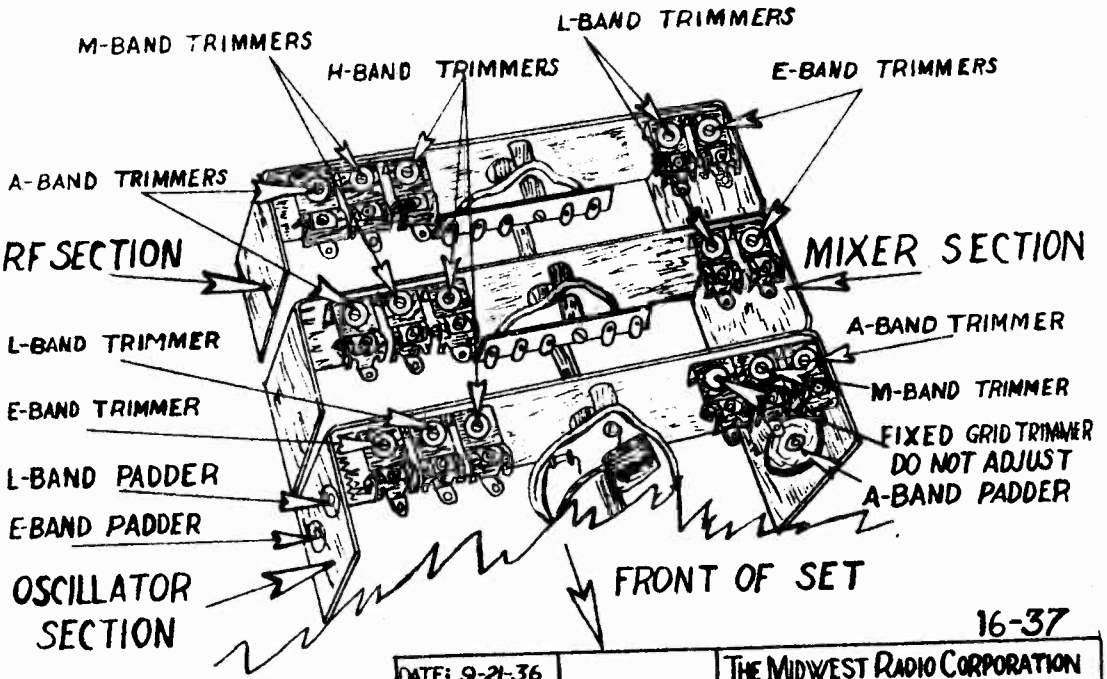
14-37A

THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO, U.S.A.
TOP VIEW OF 14-37A SHOWING LOCATION OF TUBES & OTHER PARTS
Dwg. No. 606
DATE: 9-17-36
SCALE: NONE
PART NO.
DRAWN BY: C.W.F.
TRACED BY: C.W.F.
CHECKED BY:
APPROVED BY:



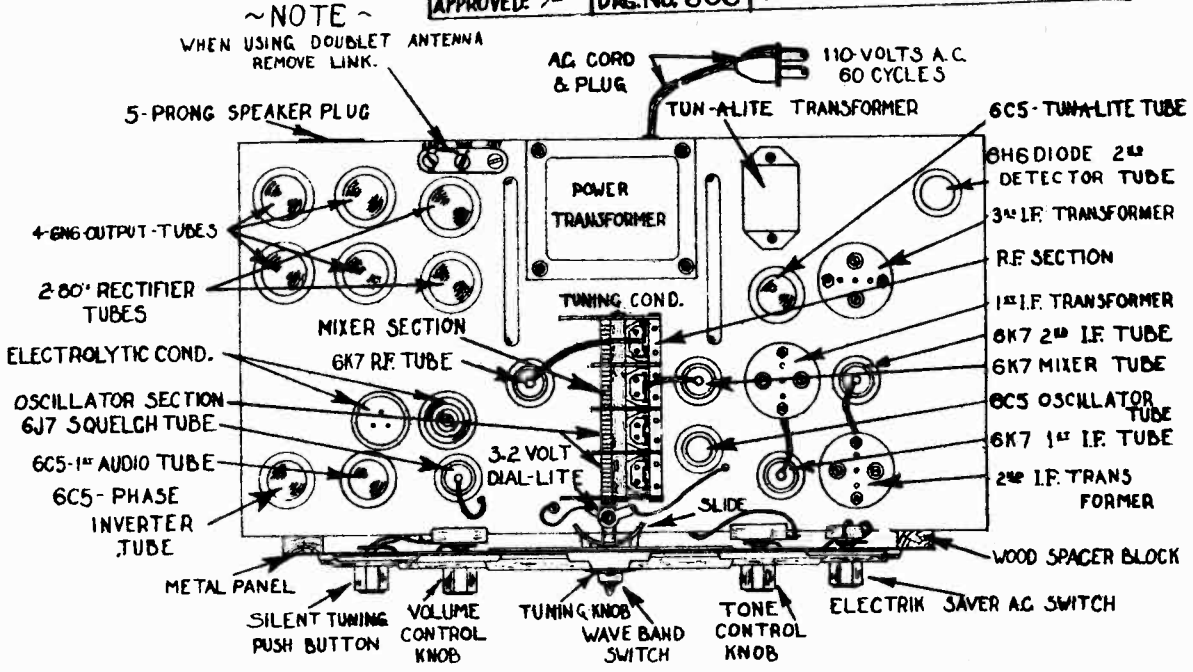
MODEL 16-37 AC
Socket, Trimmers

MID-WEST RADIO CORP.



16-37

DATE: 9-21-36 SCALE: NONE PART NO: DRAWN: C.W.F. TRACED: C.W.F. CHECKED: H&D APPROVED:	Drg. No. 608	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO, U.S.A. TRIMMER & PADDER LOCATION OF THE 16-37 MODEL RECEIVER

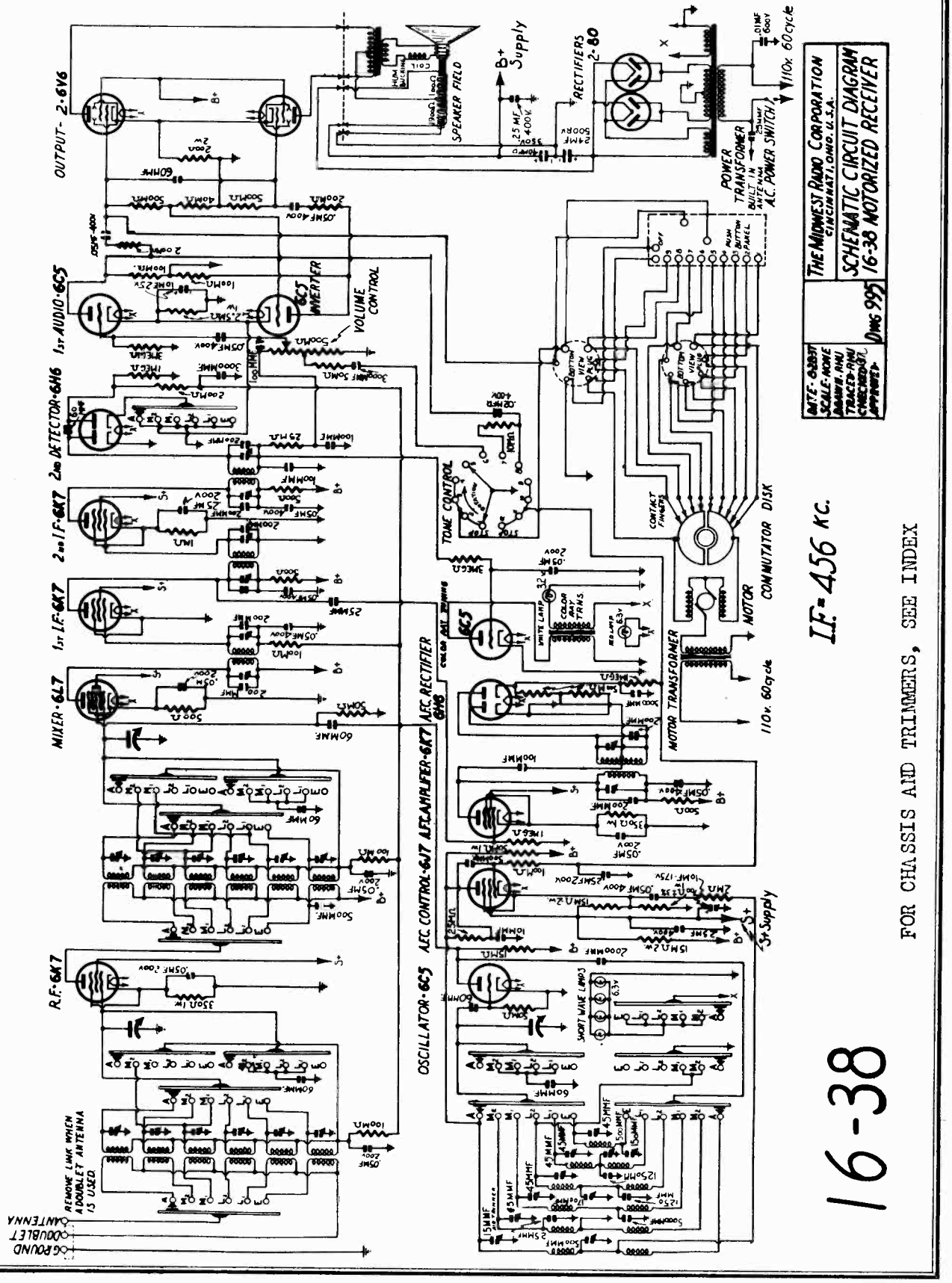


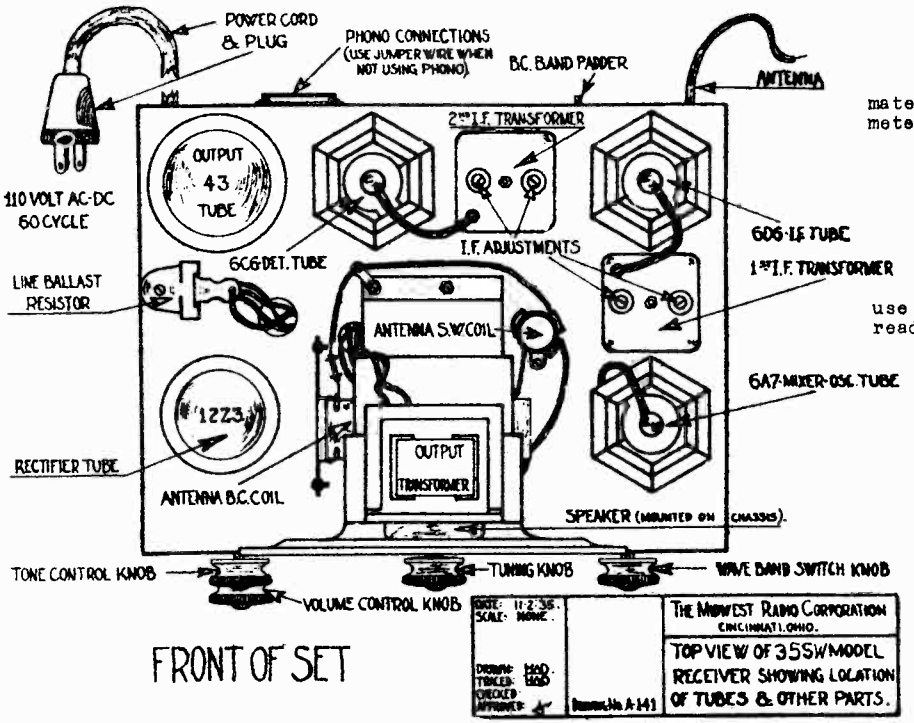
16-37

DATE: 11-20-36 SCALE: NONE DRAWN: RH-U TRACED: RH-U CHECKED: H&D APPROVED:	Drg. No. 872	THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO U.S.A. TOP VIEW OF MODEL 16-37 RECEIVER SHOWING LOCATION OF TUBES & OTHER PARTS

MODEL 16-38 AC
Schematic

MID-WEST RADIO CORP.





FRONT OF SET

DATE: 11-2-35. SCALE: NONE. DRAWN: MAD. TRACED: MAD. CHECKED: APPROVED: Drawing No. A-141

THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO.

TOP VIEW OF 35SW MODEL RECEIVER SHOWING LOCATION OF TUBES & OTHER PARTS.

NOTE :-

The schematic of the MODEL 35 SW is the same as the MODEL 35-5-SW, with the exception that the 6A7 screen grid by-pass condenser has a value of 0.1 MFD capacity instead of 0.02 MFD. The Model 35-5-SW schematic should show one side of the line grounded to the same point on chassis that the series filaments are grounded.

The Intermediate Frequency for the Short -Wave Model is 465 KC. For the Long-Wave Model the "IF" is peaked at 175 KC. For the latter additional padders are shown on the top view.

SEE INDEX FOR SCHEMATIC

		VOLTAGE DATA				
TYPE	POSITION	PLATE VOLTS	SCREEN VOLTS	SUPP VOLTS	CATHODE VOLTS	FIL. VOLTS
6A7	OSC	100	60	9	9	6.2
	Mixer	100				
6D6	1st IF	100	60	9	9	6.2
6C6	2nd Det	25	23	4	4	6.2
43	OUTPUT	95	100	----	13	25
12Z3	RECT.	120	---	---	-----	12

All voltages measured with no signal input.
Voltages depending on the voltage of the line supplying set.

Using a standard signal generator and having an approximate frequency from 400 k.c. to 14 m.c. and a standard output meter.

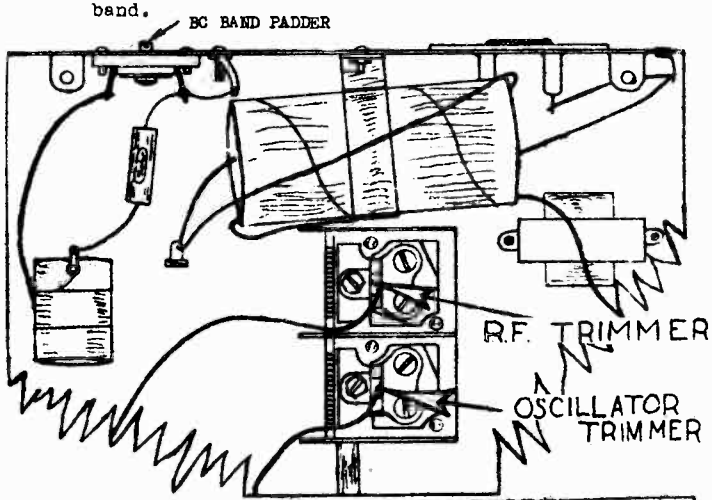
I. F. ALIGNMENT

(1) Set signal generator to 465 k.c. and connect output of signal generator to grid of 6A7 tube, shorting out front section of variable condenser. Connect output meter to plate of 43 tube and ground. Adjust both 1st and 2nd I.F. grid and plate trimmers for maximum output on meter.

NOTE: To assure more accurate trimmer setting always use lowest possible test oscillator output consistent with readable output meter scale deflection.

R. F. ALIGNMENT

(2) Setting dial and signal generator at 1450 k.c., connect signal generator to antenna post of receiver through a standard dummy antenna. Adjust R. F. trimmers on variable condenser so that maximum output is obtained at this frequency. Set signal generator and dial at 550 k.c. and adjust "A" band padder in rear of set for maximum output. Short wave adjustments are automatically taken care of by carefully calibrated coils and fixed condensers. No adjustment is needed for the particular band.



DATE: 10-6-36 SCALE: NONE PARTNO: — DRAWN: RJH TRACED: RJH CHECKED: MAD APPROVED: JV

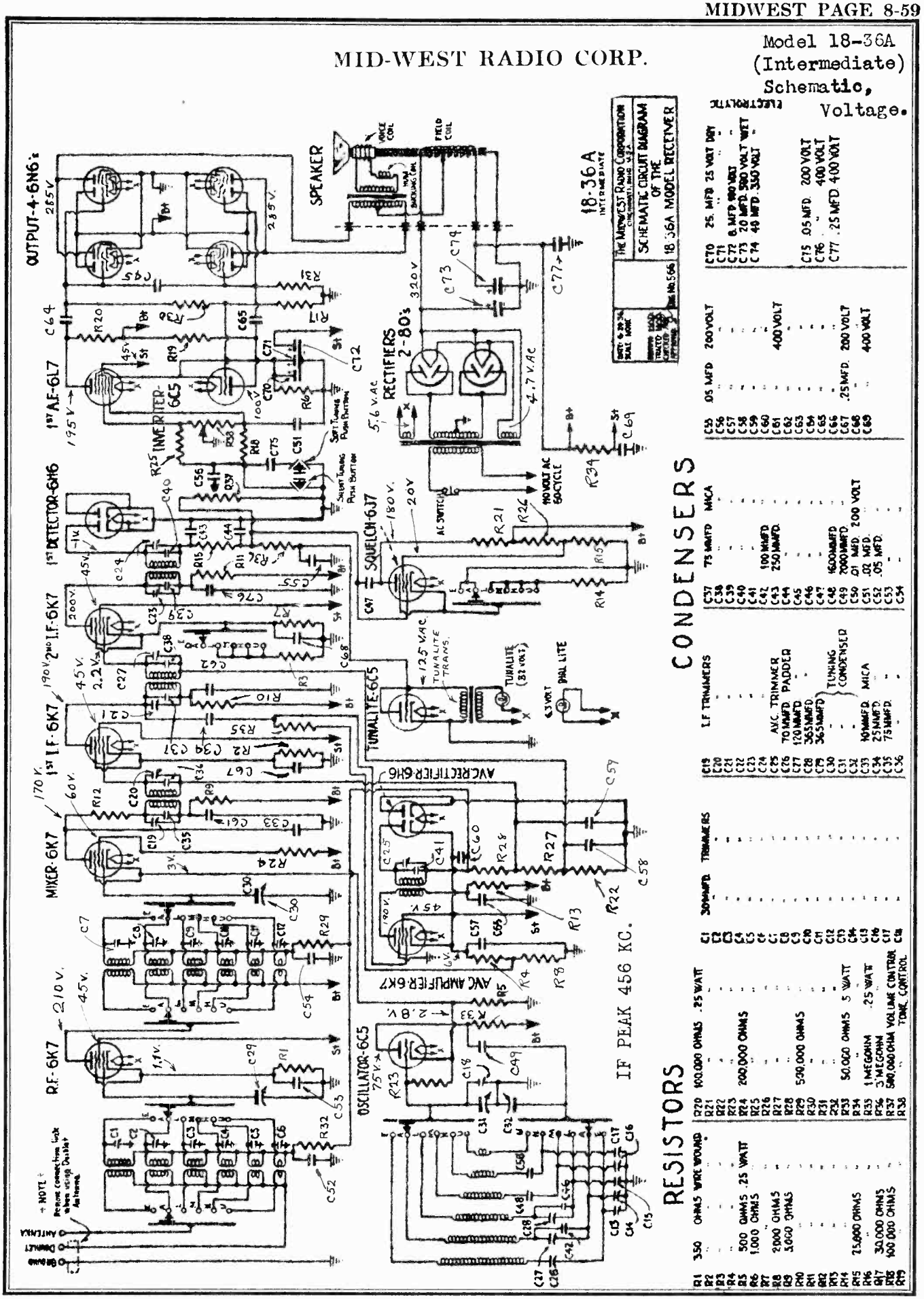
Dwg No. 651

THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO, U.S.A.

TRIMMER AND PADDER LOCATION FOR MODEL -35-SW.

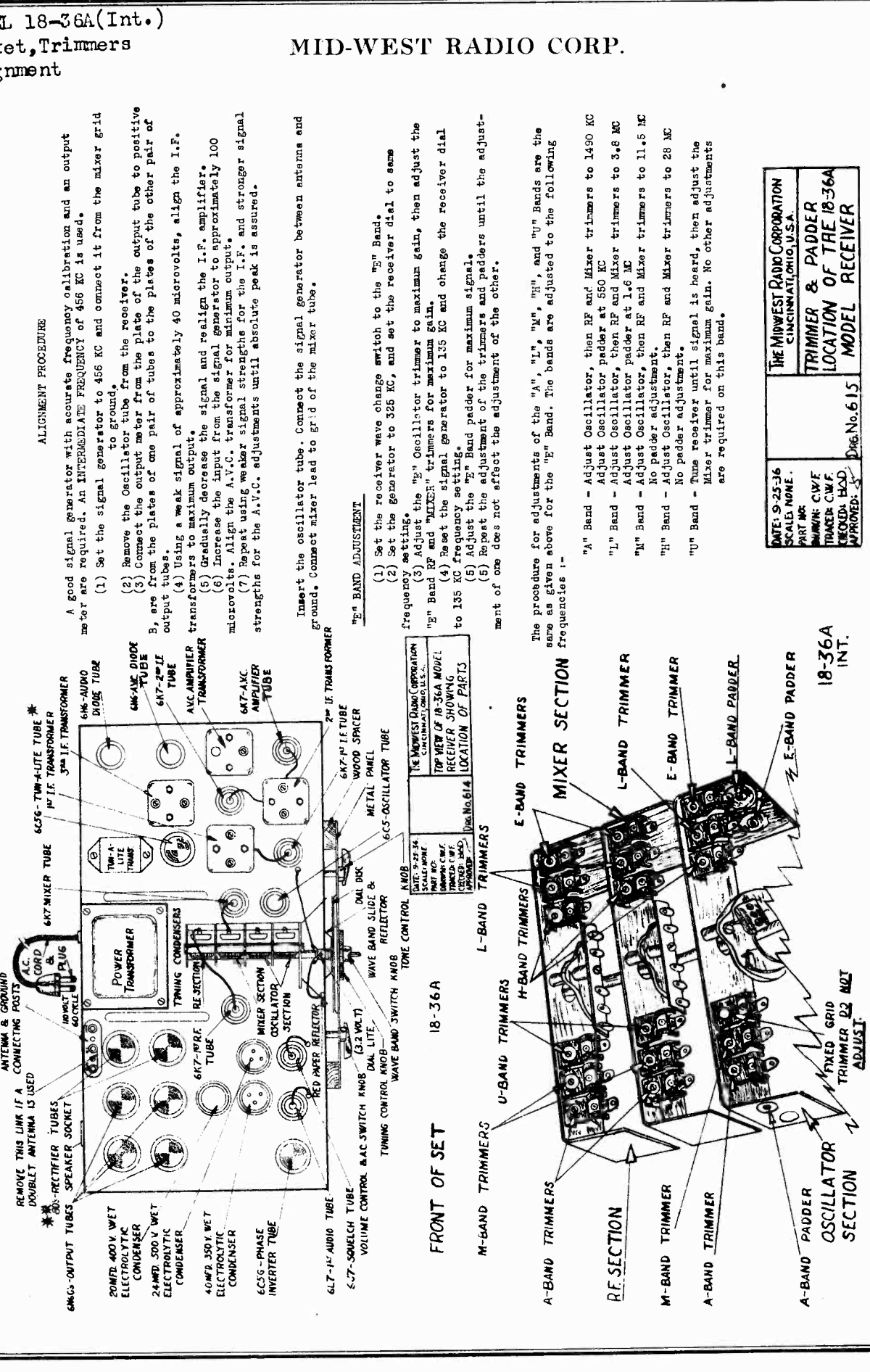
MID-WEST RADIO CORP.

Model 18-36A
(Intermediate)
Schematic,
Voltage.



MODEL 18-36A(Int.)
Socket, Trimmers
Alignment

MID-WEST RADIO CORP.



ALIGNMENT PROCEDURE

A good signal generator with accurate frequency calibration and an output meter are required. An INTERMEDIATE FREQUENCY of 456 KC is used.

(1) Set the signal generator to 456 KC and connect it from the mixer grid to ground.
(2) Remove the Oscillator tube from the receiver.
(3) Connect the output meter from the plate of the output tube to positive B, are from the plates of one pair of tubes to the plates of the other pair of output tubes.
(4) Using a weak signal of approximately 40 microvolts, align the I.F. transformers to maximum output.
(5) Gradually decrease the signal and realign the I.F. amplifier.
(6) Increase the input from the signal generator to approximately 100 microvolts. Align the A.V.C. transformer for minimum output.
(7) Repeat using weaker signal strengths for the I.F. and stronger signal strengths for the A.V.C. adjustments until absolute peak is assured.

Insert the oscillator tube. Connect the signal generator between antenna and ground. Connect mixer lead to grid of the mixer tube.

"E" BAND ADJUSTMENT

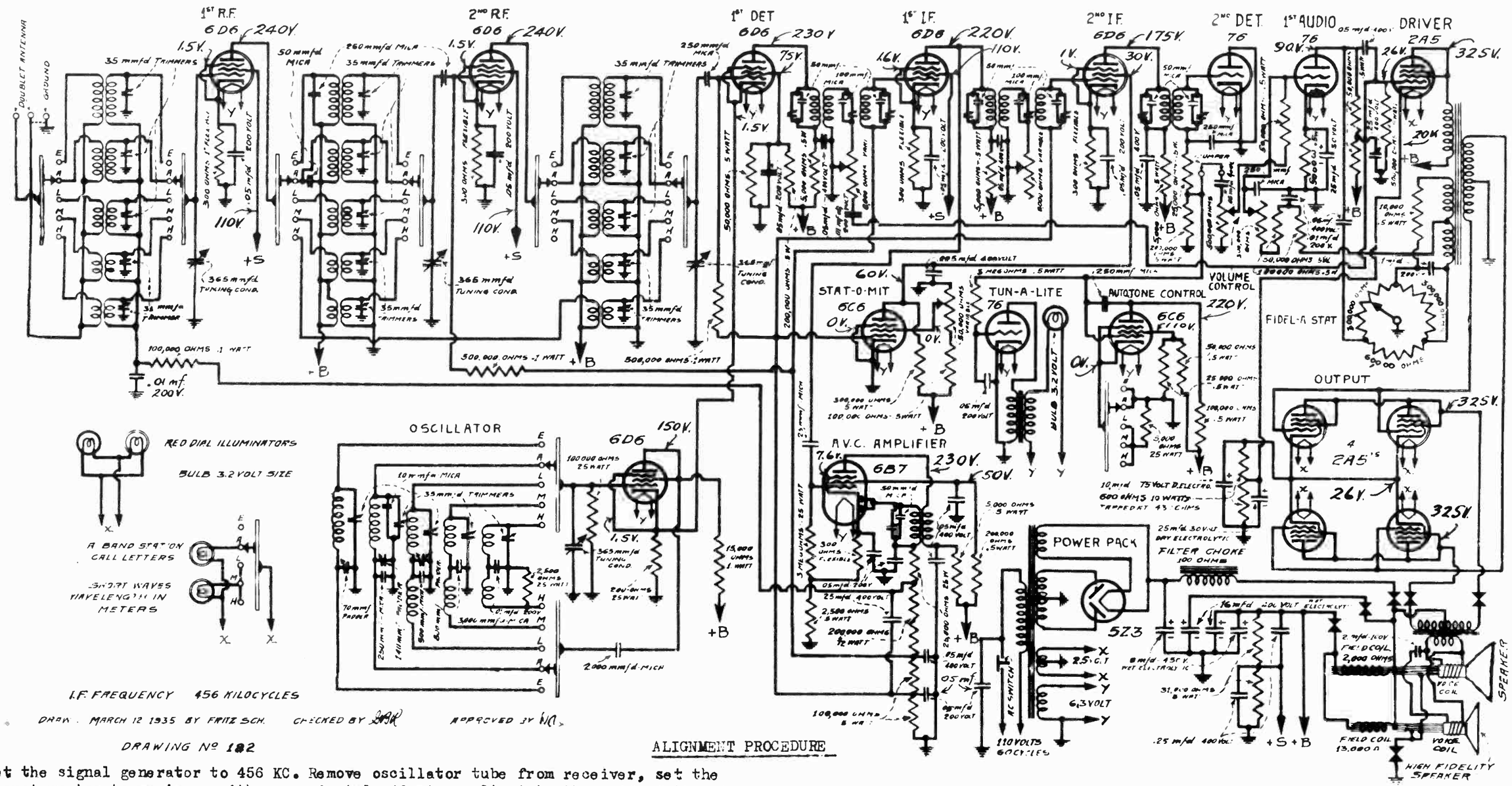
(1) Set the receiver wave change switch to the "E" Band.
(2) Set the generator to 325 KC, and set the receiver dial to same frequency setting.
(3) Adjust the "E" Oscillator trimmer to maximum gain, then adjust the "E" Band RF and "MIXER" trimmers for maximum gain.
(4) Reset the signal generator to 135 KC and change the receiver dial to 135 KC frequency setting.
(5) Adjust the "E" Band padder for maximum signal.
(6) Repeat the adjustment of the trimmers and padders until the adjustment of one does not affect the adjustment of the other.

The procedure for adjustments of the "A", "L", "M", and "U" Bands are the same as given above for the "E" Band. The bands are adjusted to the following frequencies :-

"A" Band - Adjust Oscillator, then RF and Mixer trimmers to 1490 KC
Adjust Oscillator padder at 550 KC
"L" Band - Adjust Oscillator, then RF and Mixer trimmers to 3.8 MC
Adjust Oscillator padder at 1.6 MC
"M" Band - Adjust Oscillator, then RF and Mixer trimmers to 11.5 MC
No padder adjustment.
"H" Band - Adjust Oscillator, then RF and Mixer trimmers to 28 MC
No padder adjustment.
"U" Band - Tune receiver until signal is heard, then adjust the Mixer trimmer for maximum gain. No other adjustments are required on this band.

MODEL Imperial 18(1935)
Schematic, Voltage, Alignment

MID-WEST RADIO CORP.



DRAWING Nº 182

ALIGNMENT PROCEDURE

Set the signal generator to 456 KC. Remove oscillator tube from receiver, set the Microtenuator to maximum, with approximately 40 microvolts into the grid of the mixer, peak the 3rd, 2nd, and 1st IF Transformers to maximum audio output. Do not measure AVC as indication of output.

Increase input to Mixer grid to 100 microvolts, tune AVC transformer to maximum dip, set microtenuator at minimum setting. Do not shield coils to maximum dip. Recheck adjustments to the above procedure. Replace oscillator tube in receiver.

"E" BAND ADJUSTMENT - Connect signal generator to ANT. and Gnd. posts. Set wave change switch to "E" Band. Set signal generator to 325 KC. Trim "E" Band Osc. trimmers for maximum signal. Trim the "E" Band RF and Mixer trimmers for maximum signal, set signal generator and receiver dial to 135 KC. Trim "E" Band padder for maximum gain.

"A" BAND ADJUSTMENT - Set switch to "A" Band. Set signal generator and dial of receiver to 1490 KC. Trim "A" Band OScillator, RF, and Mixer trimmers to maximum gain. Reset signal generator and receiver to 550 KC. Adjust "A" Band padder to maximum gain.

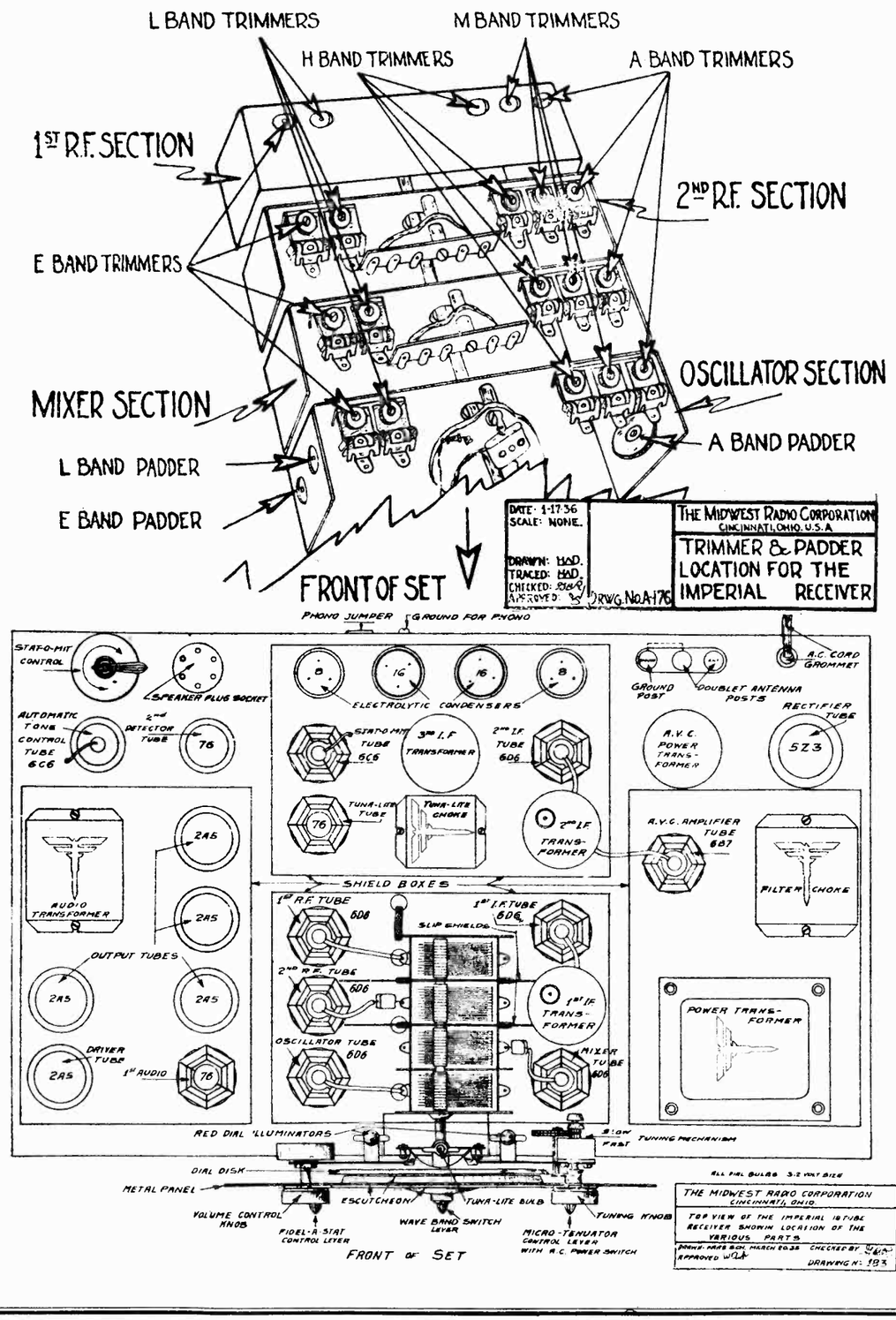
"L" BAND ADJUSTMENT - Set switch to "L" Band. Set signal generator and receiver to 3.8 MC. Trim "L" Band Oscillator, RF, and Mixer trimmers to maximum gain. Reset signal generator and receiver to 1.6 MC, and adjust "L" Band padder to maximum signal.

"M" BAND ADJUSTMENT - Set switch to "M" Band. Set signal generator and receiver to 11.5 MC. Adjust Oscillator, RF, and Mixer trimmers for maximum gain. No padder is provided on the "M" Band.

"H" BAND ADJUSTMENT - Set the wave change switch of the receiver to the "H" Band. Set the signal generator and receiver to 28 MC. Adjust the "H" Band trimmers of the Oscillator, RF, and Mixer circuits until a maximum signal is obtained. No padder adjustment is provided for on the "H" Band.

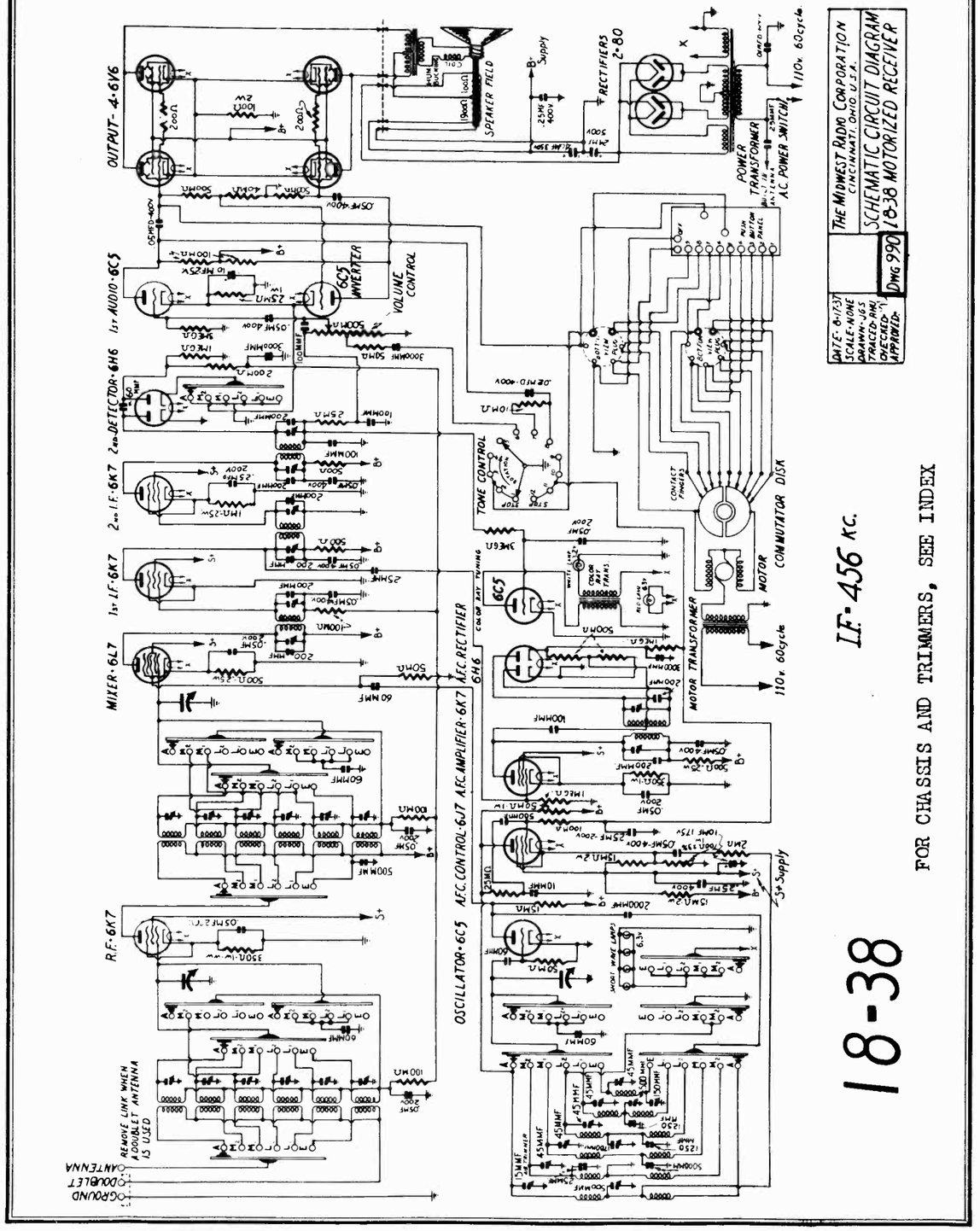
MODEL Imperial 18(1935)
Socket, Trimmers

MID-WEST RADIO CORP.



MODEL 18-38AC
Schematic

MID-WEST RADIO CORP.



MID-WEST RADIO CORP.

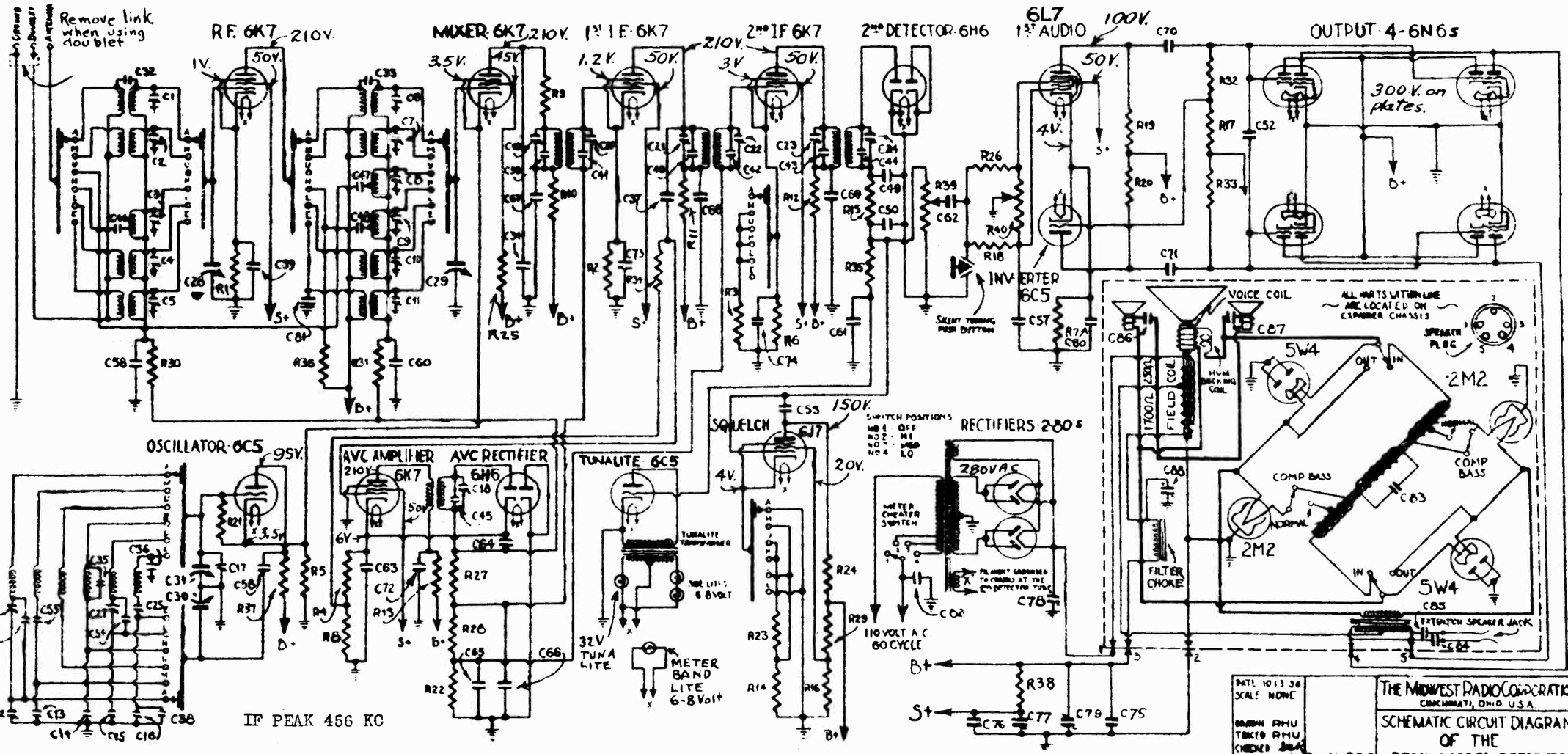
MODEL Regal(1936)
Schematic,Voltage

CONDENSERS

C1	35MMFD TRIMMER	C19	I.F TRIMMER	C37	25MMFD MICA	C55	2000 MMFD MICA	C73	.25MFD 200 VOLT
C2	" "	C20	" "	C38	" "	C56	" "	C74	" "
C3	" "	C21	" "	C39	75MMFD "	C57	.02 MFD 200 VOLT	C75	.25 MFD 400 VOLT
C4	" "	C22	" "	C40	" "	C58	.05 MFD "	C76	" "
C5	" "	C23	" "	C41	180MMFD "	C59	" "	C77	20 MFD 175V WET ELECTROLYTIC
C6	" "	C24	" "	C42	" "	C60	" "	C78	25 MFD 500V "
C7	" "	C25	70 MMFD PADDER	C43	" "	C61	" "	C79	40 MFD 350V "
C8	" "	C26	" "	C44	" "	C62	" "	C80	60 MFD 10 V. "
C9	" "	C27	350MMFD	C45	" "	C63	" "		
C10	" "	C28	365MMFD TUNING COND	C46	" "	C64	" "	C81	300MMFD MICA
C11	" "	C29	" " " "	C47	" "	C65	" "	C82	.05 MFD 400 VOLT
C12	" "	C30	" " " "	C48	" "	C66	" "	C83	.1MFD 200 VOLT
C13	" "	C31	" " " "	C49	" "	C67	.05MFD 400VOLT	C84	25MFD 600 VOLT
C14	" "	C32	5 MMFD MICA	C50	" "	C68	" "	C85	" "
C15	" "	C33	" " "	C51	200MMFD "	C69	" "	C86	2 MFD, 200 VOLT
C16	" "	C34	10MMFD "	C52	250 MMFD "	C70	" "	C87	" "
C17	" "	C35	" " "	C53	" "	C71	" "	C88	24MFD 500V WET ELECT.
C18	" "	C36	" " "	C54	350 MMFD "	C72	" "		

RESISTORS

R1	350 OHMS WIREWOUND	R19	100,000 OHM .25 WATT	R37	50,000 OHMS .5 WATT
R2	" "	R20	" "	R38	" " "
R3	" "	R21	" "	R39	500,000 " VOL. CONT.
R4	" "	R22	45,000 OHMS "	R40	" " TONE "
R5	500 OHM .25 WATT	R23	100,000 "		
R6	1,000 OHM "	R24	" "		
R7	" "	R25	200,0000HM "		
R8	4000 OHM "	R26	" "		
R9	5,000 OHM "	R27	" "		
R10	" "	R28	" "		
R11	" "	R29	" "		
R12	" "	R30	580,000 OHM "		
R13	" "	R31	" "		
R14	" "	R32	" "		
R15	25,000 OHM "	R33	" "		
R16	" "	R34	1 MEGOHM "		
R17	40,000 OHM "	R35	3 MEGOHM "		
R18	100,000 OHM "	R36	25,000 OHM .5 WATT		



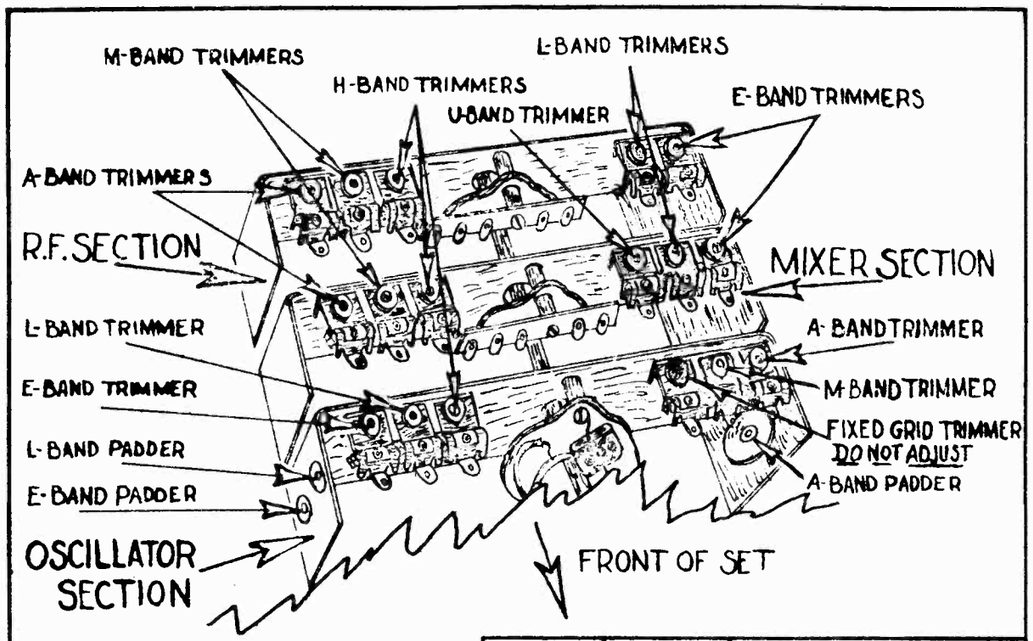
DATE 10-13-36
SCALE NONE
DRAWN RHU
TRACED RHU
CHECKED
APPROVED
DWG No 629

THE MIDWEST RADIO CORPORATION
CINCINNATI, OHIO, U.S.A.

SCHEMATIC CIRCUIT DIAGRAM OF THE REGAL MODEL RECEIVER

MODEL Regal(1936)
Alignment,Trimmers

MID-WEST RADIO CORP.



DATE: 11-2-36. SCALE: NONE. DRAWN: MJD. TRACED: RHU. CHECKED: MJD. APPROVED:
Drg.No.644
THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO. U.S.A.
TRIMMER & PADDER LOCATION OF THE REGAL MODEL RECEIVER

I-F ALIGNMENT: Remove oscillator tube from its socket. Set signal generator to 456 kc and connect it from mixer grid to ground. Using a signal of about 40 microvolts, adjust i-f trimmers to maximum. Decrease signal and re-align i-f amplifier. Increase signal to about 100 microvolts and align AVC transformer for minimum output. Repeat using weaker signal for i-f amplifier and stronger signal for AVC adjustments until an absolute peak is assured. Replace oscillator tube .

R-F ALIGNMENT: Signal generator connected to antenna post and ground.

E-Band: Set band switch to E band and signal generator and dial of set to 325 kc. Adjust "E" oscillator trimmer for maximum; then "E" r-f and mixer trimmers for maximum. Set signal generator and dial to 135 kc and adjust "E" padder for maximum. Repeat adjustments until one does not affect the adjustment of the others.

A-Band: Set band switch to A band and signal generator and dial to 1490 kc. Adjust oscillator, r-f, and mixer trimmers of "A" band for maximum. Set signal generator and dial to 550 kc and adjust "A" padder for maximum. Repeat adjustments as before.

L-Band: Set band switch to L band and signal generator and dial to 3.8 mc. Adjust oscillator, r-f, and mixer trimmers of "L" band for maximum. Set signal generator and dial to 1.6 mc and adjust "L" padder for maximum. Repeat adjustments as before.

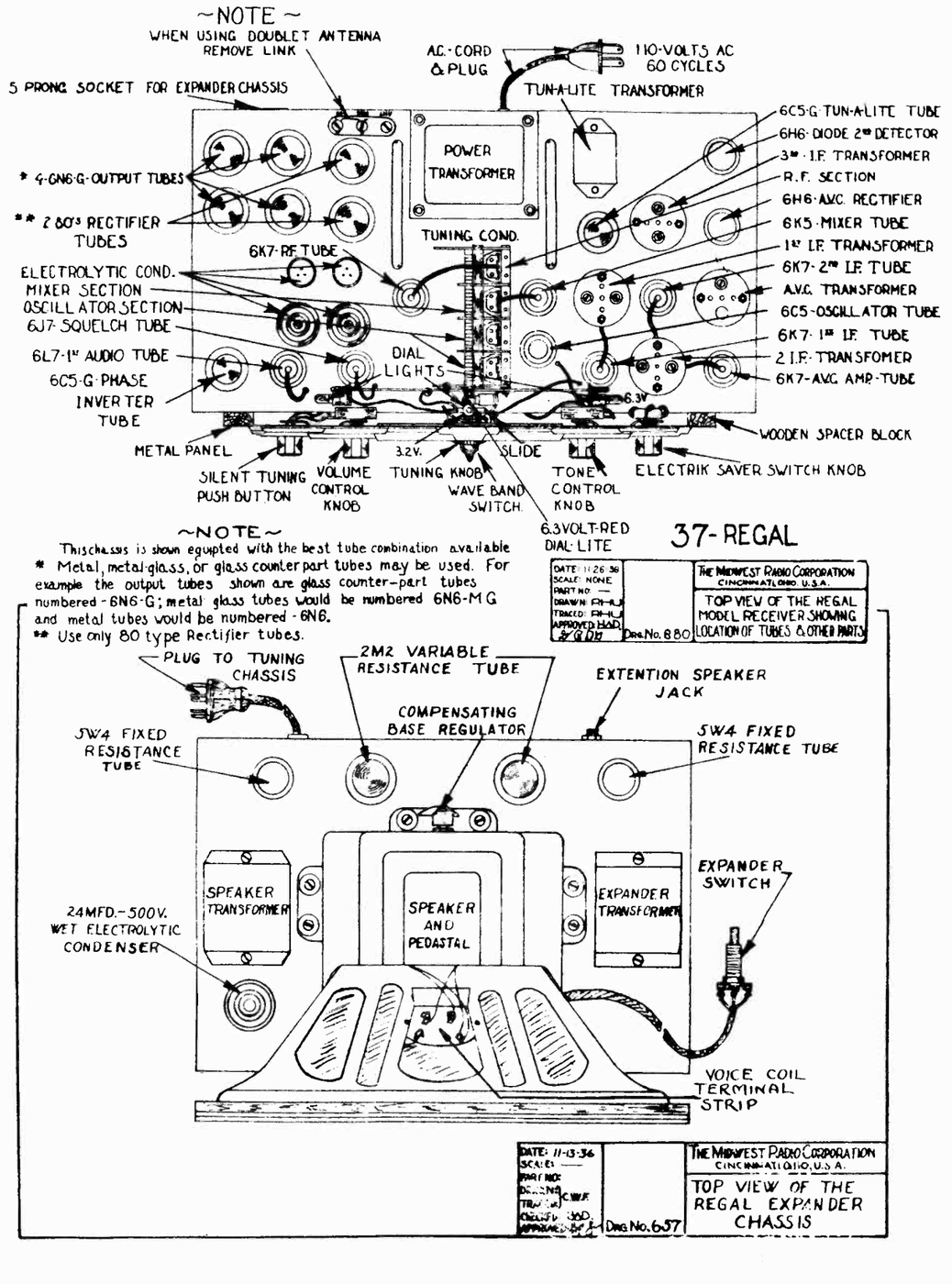
M-Band: Set band switch to M band, and signal generator and dial to 11.5 mc. Adjust oscillator, r-f, and mixer trimmers for maximum.

H-Band: Set band switch to H band and signal generator and dial to 28 mc. Adjust oscillator, r-f, and mixer trimmers for maximum.

U-Band: Set band switch to U band and signal generator to 60 mc. Tune set until signal is received. Adjust "U" mixer trimmer for maximum.

MODEL Regal(1936)
Socket,Chassis

MID-WEST RADIO CORP.



~NOTE~
This chassis is shown equipted with the best tube combination available
* Metal, metal-glass, or glass counter part tubes may be used. For example the output tubes shown are glass counter-part tubes numbered - 6N6-G; metal glass tubes would be numbered 6N6-M G and metal tubes would be numbered - 6N6.
** Use only 80 type Rectifier tubes.

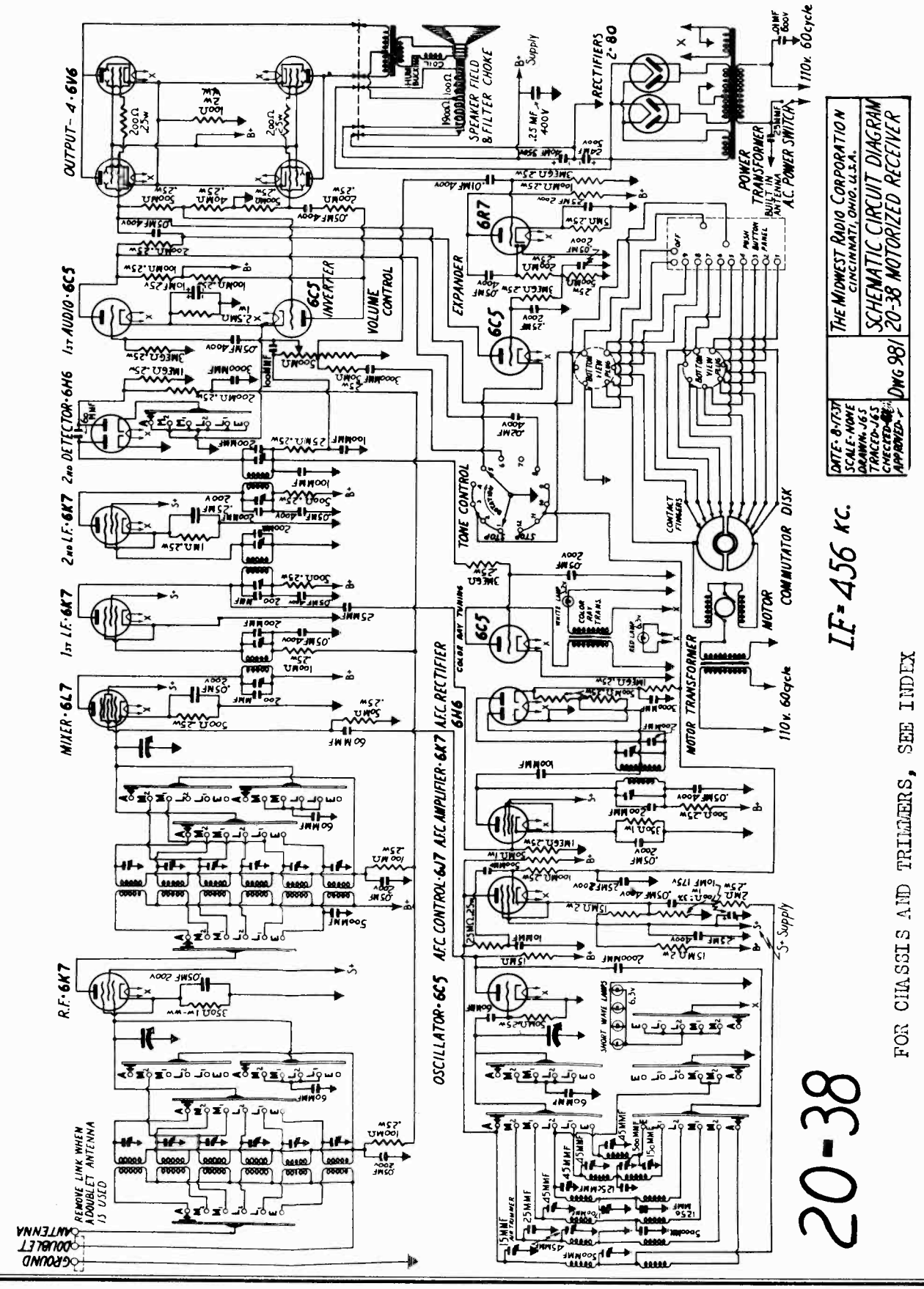
37-REGAL

DATE: 11-26-36. SCALE: NONE. PART NO: —. DRAWN: RHU. TRACED: RHU. APPROVED: MJD.
Drg.No.680
THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO. U.S.A.
TOP VIEW OF THE REGAL MODEL RECEIVER SHOWING LOCATION OF TUBES & OTHER PARTS

DATE: 11-13-36. SCALE: —. PART NO: —. DESIGNED: C.W.F. TRACED: —. CHECKED: MJD. APPROVED: —
Drg.No.657
THE MIDWEST RADIO CORPORATION CINCINNATI, OHIO. U.S.A.
TOP VIEW OF THE REGAL EXPANDER CHASSIS

MODEL 20-38 AC
Schematic

MID-WEST RADIO CORP.



IF-456 KC.

20-38

FOR CHASSIS AND TRIMMERS, SEE INDEX

THE MIDWEST RADIO CORPORATION
CINCINNATI, OHIO, U.S.A.

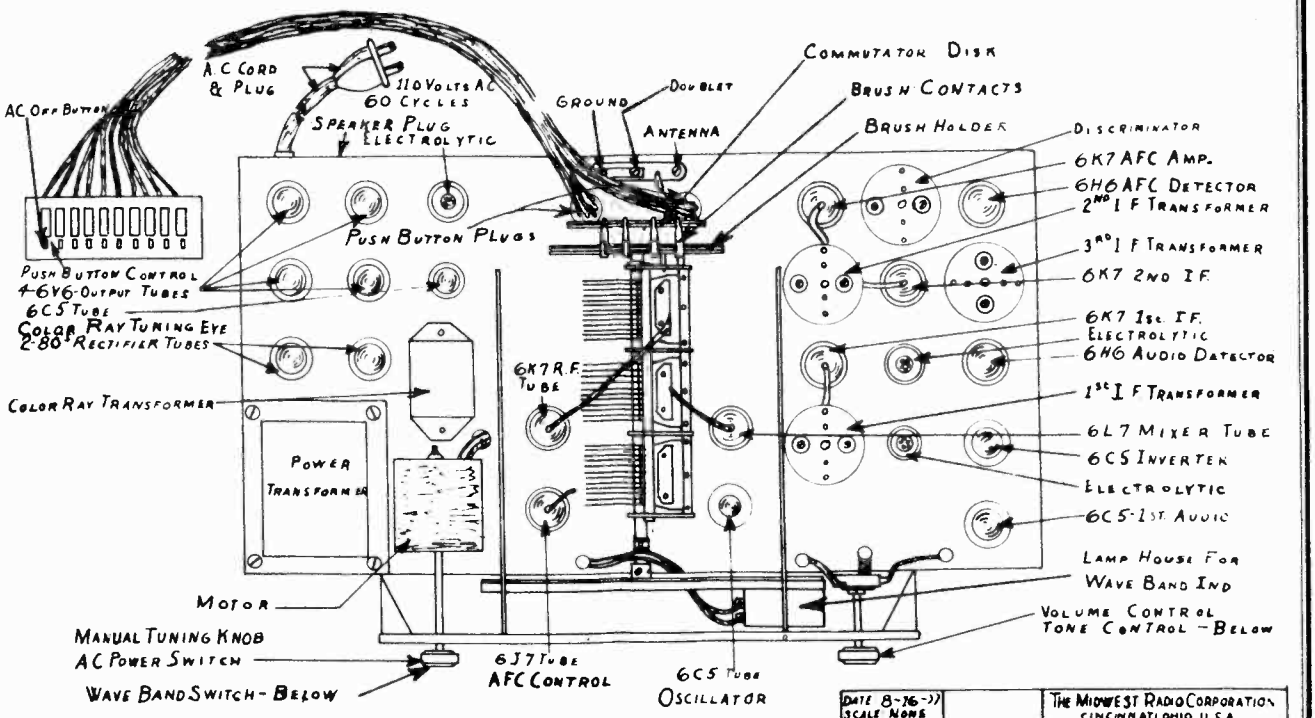
SCHEMATIC CIRCUIT DIAGRAM
20-38 MOTORIZED RECEIVER

DWG 98

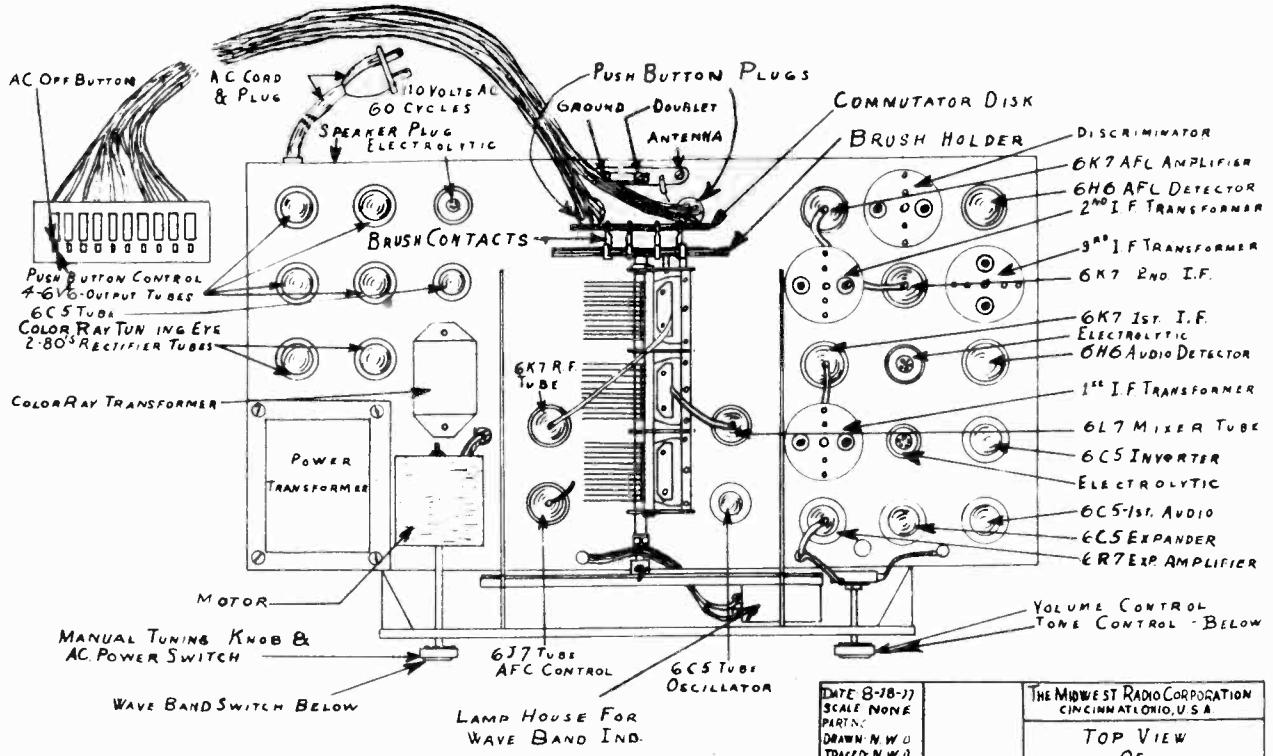
DATE: 8-1-37
SCALE: NONE
DRAWN: J.G.S.
TRACED: J.G.S.
CHECKED:
APPROVED:

MODEL 18-38 AC
MODEL 20-38 AC
Socket Layouts

MID-WEST RADIO CORP.



Date 8-26-37 Scale None Part No. Drawn N.W.O. Traced N.W.O. Checked Approved	Dwg No. 969	The Midwest Radio Corporation Cincinnati, Ohio, U.S.A. Top View Of 18-38



Date 8-18-37 Scale None Part No. Drawn N.W.O. Traced N.W.O. Checked Approved	Dwg No. 970	The Midwest Radio Corporation Cincinnati, Ohio, U.S.A. Top View Of 20-38

MONTGOMERY-WARD & CO.

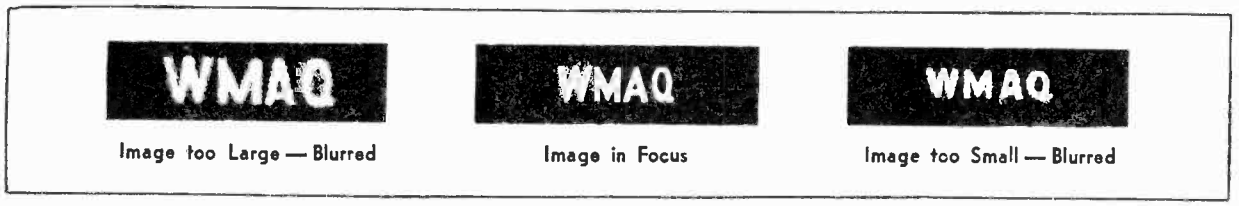


Fig. 1—Effect of Lens Focus

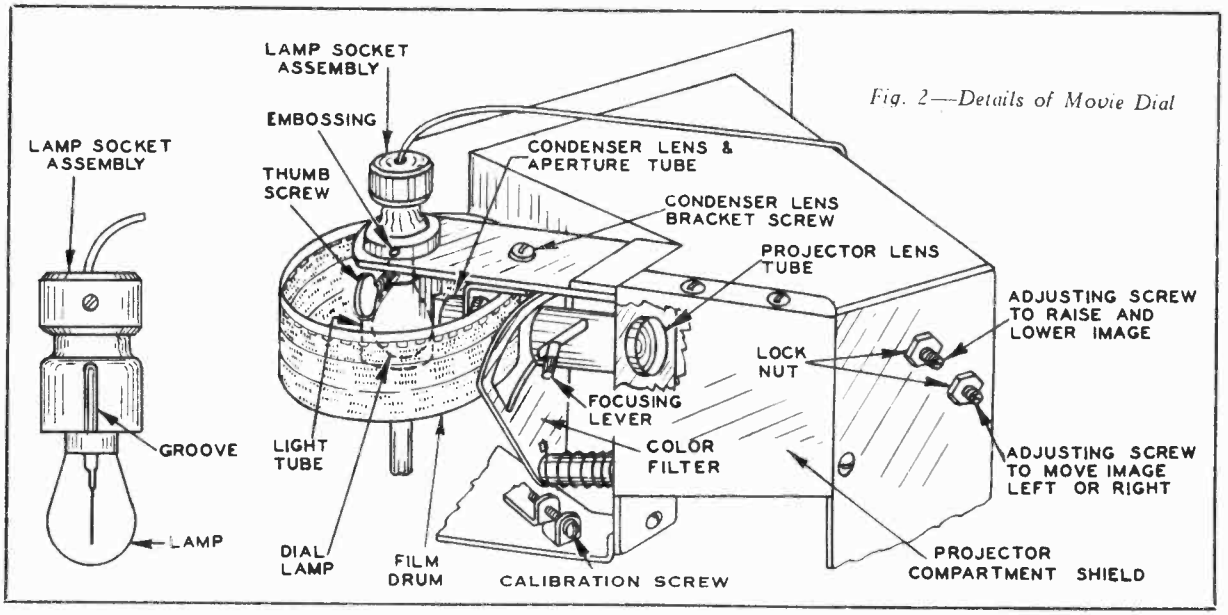


Fig. 2—Details of Movie Dial

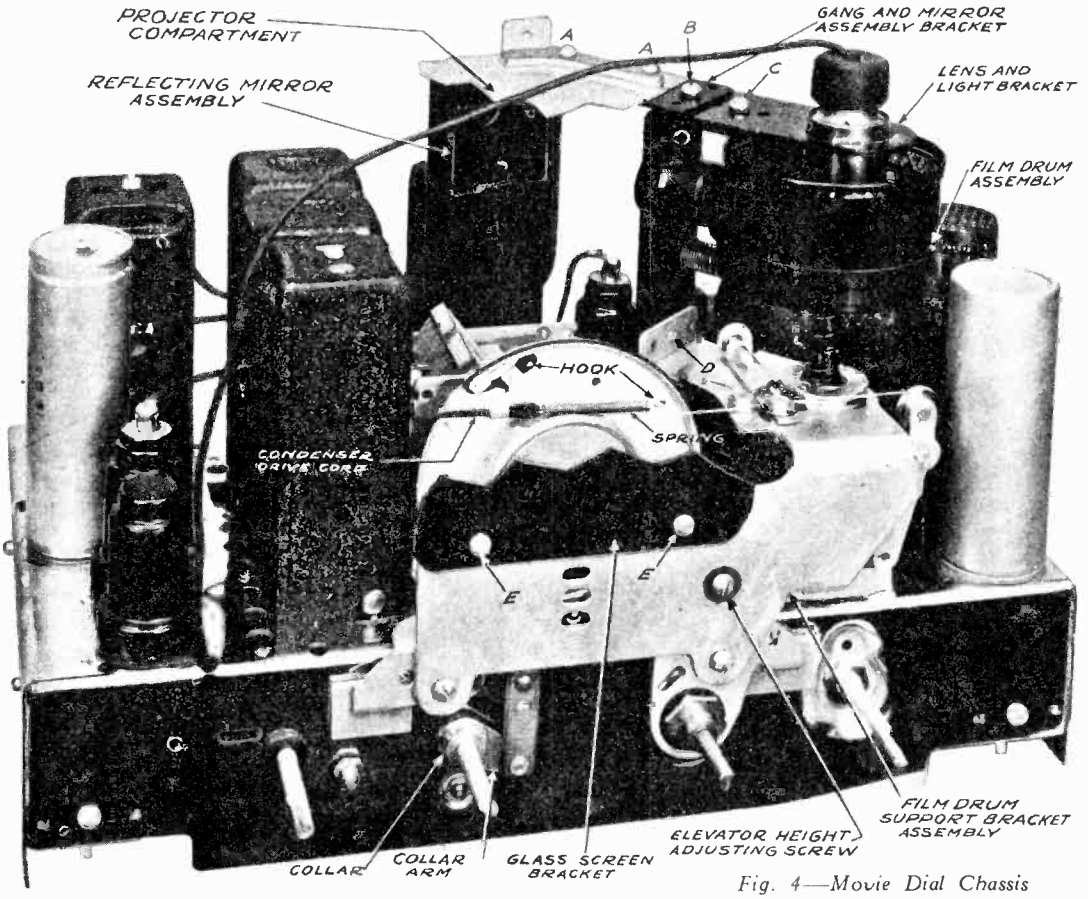


Fig. 4—Movie Dial Chassis

MODEL Movie Dial Drive
Lamp and Takeup Assemblies MONTGOMERY-WARD & CO.
Drive Cord Diagram

Caution

In all work on the chassis and movie dial, extreme care must be taken not to scratch the film or damage the color filter. The film is easily scratched and should not be touched by the hand or any other object.

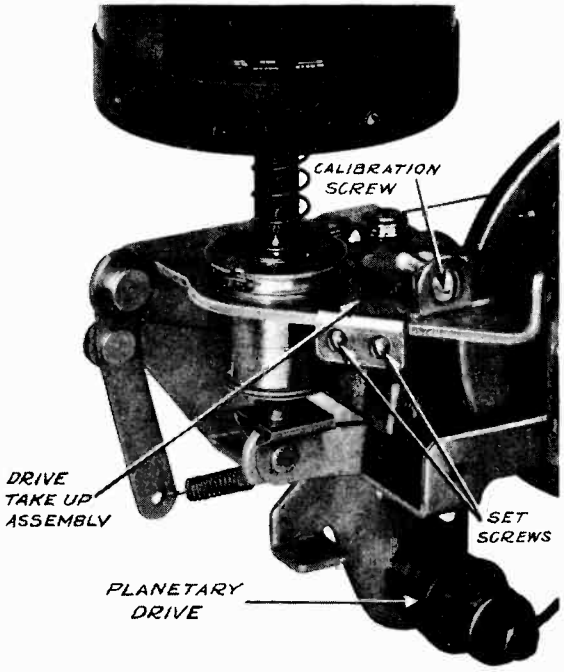


Fig. 3—Drive Takeup Assembly

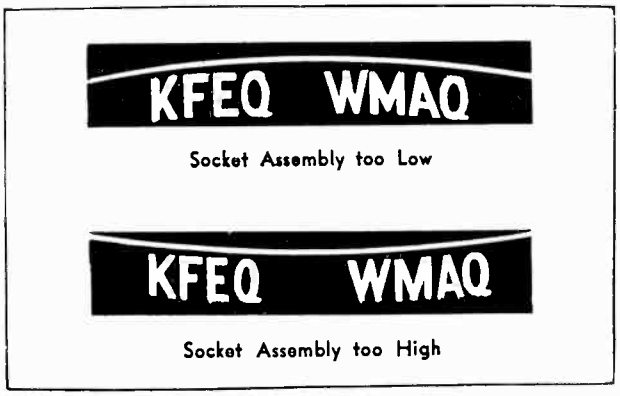


Fig. 5—Effect of Lamp Socket Assembly Height

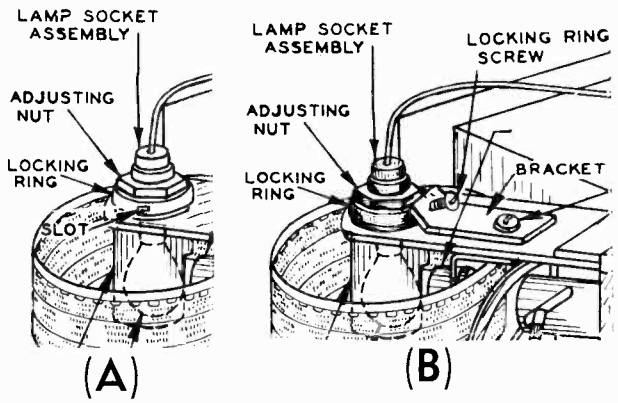


Fig. 6—Early Dial Lamp Assemblies

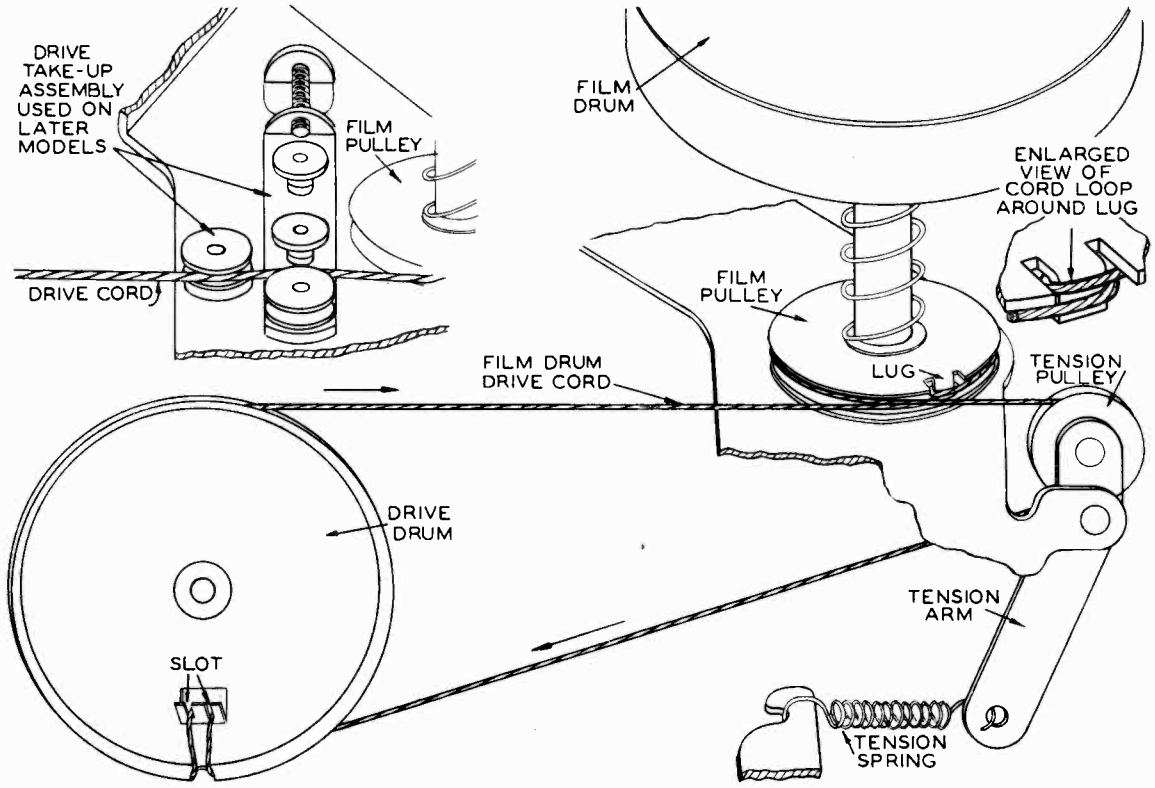


Fig. 7—Replacement of Film Drum Drive Cord

MODEL Movie Dial Drive
Adjustments, Notes

MONTGOMERY-WARD & CO.

Adjustments and Service Data MOVIE DIAL AND DRIVE August, 1936

Bringing Lens Adjustment to a Focus

Important—Turn the band switch to the standard wave position.

Move the focusing lever (see Fig. 2) up or down until the image on the screen is clearest. In Fig. 1 is shown the effect of correct and incorrect focusing. Care should be taken not to touch the color filter.

Adjusting Reflecting Mirror

On the back wall of the projector compartment are two screws as shown in Fig. 2, the purpose of which is to adjust the position of the reflecting mirror vertically and horizontally.

If the raising and lowering adjustment screw (see Fig. 2) is not adjusted properly, the image will be too high or too low on the screen and the kilocycle or megacycle lines will not be horizontal. Also, part of the image may be cut off. If this condition exists loosen the nut which holds this screw in place. Back this nut off about one turn and then carefully turn this screw until the image is centered on the screen and the lines are horizontal. Use a fine blade screwdriver for this adjustment. Retighten the nut.

If the image cannot be centered from top to bottom, it may be necessary to adjust the elevator height in accordance with the article on this subject in this manual.

If the image on the screen is too far to the right, there will be a space at the left of the screen without light. If the image is too far to the left the same condition is true on the right side of the screen. In either case, loosen the nut which holds the left and right adjusting screw in place—see Fig. 2. Back this nut off about one turn and then carefully turn this screw with a fine blade screwdriver until the image is centered. Retighten the nut.

Drive Takeup Assembly

Later models are equipped with a drive takeup assembly illustrated in Fig. 7, by means of which the dial drum can be rotated a slight amount for calibration purposes. The earlier models do not have this adjustment. However, a special unit illustrated in Fig. 3 can be put on.

This unit is assembled to the film drum bracket and drive cord as shown in Fig. 3. Unscrew the two set screws and open the slot to the maximum position by turning the adjusting screw in a counter-clockwise direction. Place the unit in position on the bracket.

Push it as far to the left as possible (from back of chassis) and tighten the two set screws. These will extend beneath the film drum bracket. Then place the drive cord between the two pulleys as shown.

Tighten the calibration screw to secure the required cord tension. When this is done the radio might be out of calibration. If this condition occurs, the film drum may be shifted to the proper position by loosening the two screws inside the drum at the bottom. After these two screws are tightened, a fine calibration adjustment may then be obtained by turning the calibration screw.

Dial Calibration

The radio is properly calibrated if, when a station is correctly tuned in, the vertical red line on the screen crosses the call letters of that station. If the red line is found to be on one side of the call letters of a large number of stations on the standard wave band (the same side in each case), the dial is out of calibration.

To re-calibrate, tune in the signal of one of the larger nearby stations. Choose a station which is near the 1500 KC end of the dial and tune carefully to resonance. Turn the calibration screw (see Fig. 2, 3 or 7) until the vertical red line on the screen is at the center of the call letters of that station.

If the film drum cannot be turned a sufficient amount by means of the calibration screw, loosen the 2 screws at the bottom of the drum which hold it in place. Adjust the position of the drum and tighten the screws. The early models do not have the cord take-up calibration screw mentioned above. These models must be calibrated by loosening the drum screws.

The dial will then be properly calibrated and this adjustment should not be changed unless re-calibration again becomes necessary. It should be remembered that after calibration a few of the stations will be tuned in when the vertical red line is near the end of the call letters and city of a station. That is because of slight variations in the film.

Adjusting Elevator to Raise or Lower Image

Adjust the lamp assembly height until the lines on the screen are straight—see article on this adjustment in this manual.

Turn the upper reflecting mirror adjusting screw—see Fig. 2, until the lines on the screen are horizontal.

Turn the band switch to the second short wave position (green).

Loosen the elevator adjusting screw—see Fig. 4.

Raise and lower the elevator until the megacycle line (at bottom) is between the letters "S" and "T" of the word "West" on the glass at either side of the glass screen.

Tighten the elevator adjusting screw.

Removing Play between Band Switch and Elevator

If the elevator arm stops and the band switch stops do not coincide, there will be a certain amount of play between the band switch and the elevator. When this condition occurs, the position of the image on the screen will not be fixed, but can be moved up or down by turning the band switch knob.

To remedy this condition, first turn the band switch to the second short wave position (green).

Loosen the set screw and square head screw on the band switch shaft collar, see Fig. 4. Turn the band switch shaft clockwise as far as it will go. Push the collar arm clockwise as far as it will go without pulling the elevator arm ball bearing out of the bottom slot.

Then tighten the square head screw and set screw in the elevator arm collar.

Planetary Drive Assembly

The planetary assembly is the unit that is integral with the tuning shaft. It is illustrated in Fig. 3.

If the nut of this assembly is too tight, the drive will be jerky and will turn hard in high speed. If this condition exists, back off this nut one or two turns and note the effect.

If this nut is too loose, the drive will slip in slow speed. The remedy in this case, of course, is to tighten the nut.

Should the condenser drive cord slip when the planetary pulley is turning, inspect the tuning condenser, drive drum and film drum to see if they are turning properly or if they are being obstructed in some way.

If the drive turns unevenly (rough in spots), this may mean that the planetary assembly is defective or damaged internally and a new unit will be required.

Changes in Early Models

Film Drum Base—In the early models a metal film drum base was used. This was replaced in later models with a molded base. The latter type is used in filling orders and is interchangeable with the early type. A clamping plate is now included with the molded base Film Drum Assembly.

Lamp Socket Assembly—Two changes were made in the lamp socket assemblies in the early models The type used with each receiver is illustrated in the instruction book packed with that model. For further information regarding this assembly see the article "Replacing and Positioning the Dial Lamp" in this manual.

Cleaning Light Reflecting and Transmitting Parts

Cleaning the Lenses

It is very seldom necessary to clean the lenses. Occasionally, however, dust or dirt on the lens may cause the image on the screen to be spotted or foggy. If this is the case, the lenses may be removed as explained below and may then be cleaned by wiping carefully with a clean chamois or soft cloth.

Removing Condenser Lens—This lens is inside the film drum as shown in Fig. 2. Turn the band switch to the standard wave position. Take out screw (C) holding the condenser lens bracket in place—see Fig. 4. Turn this bracket in a clockwise direction (from top) and lift it out carefully to avoid scratching the film.

This lens can be cleaned without removal or may be forced out of the tube with a wood block. When the lens is replaced, line up the end of the lens barrel with the edge of the tube.

In replacing the condenser lens bracket, shift this bracket until the end of the condenser lens tube is about ⅛ inch from the dial lamp.

Removing Projector Lens—This lens is inside the projector lens tube as shown in Fig. 2. Turn the band switch to the standard wave position. Take out the three screws which hold the projector compartment shield in place. Then remove the projector compartment shield by tilting the top slightly to the back and toward the right (from back of shield). Move the focusing lever to the highest position. Unscrew and remove this lever.

Push the color filter in a counter-clockwise direction (from front) as far as it will go. Insert a fine blade screwdriver into the projector lens tube (from the front). The blade of the screwdriver should engage the end of the barrel of this lens and push against it until it has been pushed a slight distance toward the projector compartment. CAUTION—Do not let the screwdriver touch the glass. Then insert the screwdriver through the slot in the side of this tube, again engaging the barrel of the lens. Push against the barrel until the lens can be removed by hand from the projector compartment.

Cleaning the Reflecting Mirror, Film, Color Filter and Glass Screen

As in the case of the lenses, it is very seldom necessary to clean the reflecting mirror, film, color filter or glass screen. If, however, the image on the screen is spotted or foggy, it may be necessary to clean these items as explained below.

Reflecting Mirror—The reflecting mirror is located within the projector compartment. Remove the projector compartment shield as described above under "Removing Projector Lens". The glass may then be cleaned without removal of this assembly. Wipe the glass carefully with a clean chamois or soft cloth.

Film—The film may be dusted with a camel hair brush or fine cloth. CAUTION—Extreme care must be taken not to scratch the film.

Color Filter—To clean the color filter, turn the band switch to the second short wave position (green). Clean the filter using a fine cloth or chamois. CAUTION—Extreme care must be taken not to damage the filter.

Glass Screen—If the screen should become dirty, the front may be cleaned by wiping with a clean, dry cloth. If the back of the screen becomes dirty, it should be cleaned with alcohol. Care should be taken not to get any alcohol on the paint on the letters at the sides of the screen, or on the r[illegible] line at the front of the screen.

Replacing Parts

Replacing and Positioning the Dial Lamp

Caution—If a new lamp is required, use only the correct lamp as shown in the parts list and on the label on each radio.

These are special lamps and can be purchased only through Wards stores and mail order houses. The life of the lamp is somewhat less than that of a radio tube.

First, turn the radio off.

Loosen the thumb screw and lift the lamp socket assembly out of the light tube—see Fig. 2. This can be lifted vertically by grasping the insulated top of the assembly through which the wire runs.

Remove the old lamp from the socket and put in the new one.

Replace the lamp socket assembly in the light tube with the light tube embossing in the groove of the lamp socket assembly—see Fig. 2. Do not tighten the thumb screw yet.

Turn the radio on.

Then grasp the top of the lamp socket assembly and move it up or down until the image on the screen is clearest and the lines are horizontal. The effect of having the lamp assembly too high or low is shown in Fig. 5. Tighten the thumb screw.

Early Types—There were two earlier types of lamp socket assemblies.

In the assembly shown in Fig. 6(A) the procedure differs from the above as follows:

To remove the socket assembly from the light tube, grasp the locking ring and turn it in a counter-clockwise direction until the pins are at the vertical portion of the slots. Then lift it out.

When replacing the lamp socket assembly in the light tube, line up the slots in the locking ring over the pins at the top of the light tube. Push the locking ring down and turn it clockwise until the pins move as far as possible into the horizontal portion of the slot—See Fig. 6(A).

To make the image on the screen clear and the lines horizontal, turn the adjusting nut. This moves the lamp assembly up or down depending on the direction of rotation.

In the assembly shown in Fig. 6(B), the procedure differs from that used in the (A) type as follows:

To remove the lamp socket assembly, unscrew the locking ring screw until it is free of the locking ring. Then pry the locking ring upward with a screw driver and lift the assembly out of the light tube.

When replacing the assembly in the light tube, line up one of the holes in the locking ring with the screw in the bracket. Push the locking ring down on the light tube and tighten the locking ring screw until it enters the hole in the locking ring.

Turn the adjusting nut as explained for the type (A) assembly. If the adjusting nut turns hard, grasp the black insulated top of the assembly and lift upward slightly until the nut turns freely.

Important—Latest type used for parts orders. In filling orders for this assembly the latest type, illustrated in the parts list, is shipped. This is interchangeable with all early types.

The early types of lamp socket and light tube did not have the groove and embossing illustrated in Fig. 2. When one of the latest type of socket assembly is used in these models, it will be necessary to turn the assembly until the filament is at right angles to the lens.

Replacing the Film Drum Assembly

Remove the lamp socket assembly from the light tube by lifting it out in accordance with instructions in "Replacing and Positioning the Dial Lamp".

Remove the projector compartment shield by taking out the three screws which hold it in place—See Fig. 2.

Take out the two screws (B and D) which hold the lens and light bracket in place—See Fig. 4. Now remove the lens and light bracket taking care not to scratch the inside of the film.

Remove the film drum assembly by unscrewing the two small screws located inside the drum at the bottom.

Mount the new film drum assembly on the film drum supports leaving the paper around the film for protection, and insert the clamping plate within the film drum. The film drum and clamping plate should then be so placed that the small screws are in the center of the two slots.

Replace the lens and light bracket taking care not to scratch the inside of the film.

Replace the projector compartment shield and dial lamp assembly.

Now remove the paper from the film, turn the radio on and calibrate the dial in accordance with the instructions in the article "Dial Calibration".

The film and mounting drum are sold as one assembly and cannot be ordered separately.

Replacing the Glass Screen

Loosen the screws holding the glass screen clamps on each side of the screen. Loosen these only enough to enable the glass screen to be removed by lifting it out from the top.

Mount the new screen from the top being very careful not to touch the back of the screen, as touching the screen will leave fingerprints on the roughened or ground portion.

Push the glass screen down until it rests on the shelves provided for it.

Tighten the four screws holding the screen clamps just enough so that the glass is held firmly in place.

Replacing Film Drum Drive Cord

Remove the projector compartment and glass screen assembly together. To do this, take out the 2 screws (A) see Fig. 4, at the back of the top of the projector compartment, the 2 screws (E) at the bottom of the glass screen bracket, and the 2 brass collars from the volume control and tone control shafts.

Disconnect the tension spring from the arm at the right side of drive mechanism—see Fig. 7.

Remove the old cord by unsoldering it from the small lug on the film pulley. Clean the excess solder off of this lug. With a narrow blade screwdriver carefully bend this lug out toward the vertical position, a slight amount.

Turn the tuning shaft until the condenser plates are completely in mesh.

Turn the film drum so that the lug on the film pulley is in the position shown in Fig. 7. This is important.

Insert the new drive cord in the left slot in the drive drum (from front) and wind the cord in a clockwise direction one half turn around the drive drum.

Continue the cord horizontally to the lug on the film pulley. Loop the cord around this lug in the manner shown in Fig. 7.

Wind the cord on the film pulley one turn counter-clockwise, being sure that the end coming from the pulley passes over the cord from the drive drum.

Bring the cord over the brass tension pulley and back again to the left. Insert the end in the right slot in the drive drum.

Replace tension spring and reassemble projector compartment, glass screen and collars to the chassis.

Set the signal generator to 600 KC and carefully tune in the signal. Adjust the position of the film drum in accordance with the article "Dial Calibration" in this manual until the 600 KC mark on the dial is at the red line on the screen. **Do not touch the film with the fingers.**

When the above adjustments have been made, carefully bend the lug on the film pulley down over the cord and solder, being sure that the upper cord leaving the pulley receives no solder.

Replacing Condenser Drive Cord

Remove the projector compartment and glass screen assembly together. To do this, take out the 2 screws (A) see Fig. 4, at the back of the top of the projector compartment, the 2 screws (E) at the bottom of the glass screen bracket and the 2 brass collars from the volume control and tone control shafts.

Turn the drive drum until it is in the position shown in Fig. 4.

Place the loop at the end of the drive cord (without the spring) over the small hook **nearest** the cut out part of the drive drum.

Now turn the chassis on its back. Bring the cord down over the right side (from front) of the drive drum and over the planetary drive pulley, keeping the cord in the groove provided for it. Bring the drive cord up over the left side (from front) of the drive drum to the cut out part of the drum. While holding the cord in place, return the chassis to normal position.

Then bring the cord in toward the inside of the drum, attaching the tension spring to the small hook provided for it.

Reassemble the projector compartment, glass screen and collars to the chassis.

Replacing the Color Filter Semaphore

Push the focusing lever up as far as it will go.

Cut a strip of paper the width of the film drum assembly and place this around the film holding it on with a string wound around the drum. This will protect the film from being scratched on the outside.

Remove the projector compartment shield by taking out the three screws which hold it in place—See Fig. 2.

Remove the lens and light bracket by taking out screws (B and D) which hold it in place—See Fig. 4. Care must be taken not to scratch the inside of the film when removing this bracket.

Remove the horseshoe washer from the stud holding the color filter semaphore in place. Then take off the color filter semaphore.

Take the spring off of the old assembly. Put this spring on the new assembly, the straight end of the spring being placed under the small clip provided for it on the color filter semaphore.

Now replace the color filter semaphore on the stud on which it mounts. Put on the horseshoe washer, pinching the open ends together. The free end of the spring should catch the edge of the lens and light bracket.

Next turn the color filter one complete turn in a counter-clockwise direction (from front) to provide tension on the spring.

Holding the semaphore in this position, replace the entire assembly with the semaphore stop placed under the film drum. (drum in second short wave or highest position). Care must be taken not to scratch the inside of the film when replacing the lens and light bracket assembly.

Now replace the projector compartment shield and remove the paper from around the film.

Turn the radio on and bring the letters on the screen into proper focus by means of the focusing lever—See Fig. 2. The effects of incorrect focusing are shown in Fig. 1.

MONTGOMERY-WARD & CO.

MODELS 62-226, 62-228
62-259, 62-308
62-318, 62-408
62-418
Schematic

May, 1936

FOR MOVIE DIAL DRIVE DATA, SEE INDEX

ARROWS INDICATE CONNECTIONS PRESENT IN BAND SWITCH WHEN IN POSITION SHOWN.

	POSITION 1 STANDARD WAVE B	POSITION 2 SHORT WAVE C	POSITION 3 SHORT WAVE D
BACK SECT. 1	1 2 3	1 2 3	1 2 3
FRONT SECT. 1	9 10 11 12 4 5 6 7 8	9 10 11 12 4 5 6 7 8	9 10 11 12 4 5 6 7 8
FRONT SECT. 2	4 5 6 7 8	4 5 6 7 8	4 5 6 7 8
BACK SECT. 2	10 11 12 1 2	10 11 12 1 2	10 11 12 1 2

END NEAREST CHASSIS

SWITCH CONTACT LOCATION NUMBERING

METAL TUBE TERMINAL NUMBERING BOTTOM OF SOCKET

TUBE ELEMENT LEGEND

SH - Shell
H - Heater
K - Cathode
P - Plate
G_1 - Control Grid
G_2 - Screen Grid
G_3 - Suppressor Grid
D_P - Diode Plate
T_A - Target
HK - Heater and Cathode

6F6 PWR.
6Q7 1ST AF-2ND DET.
6K7 I.F.
6K7 R.F.
6K7 1ST DET.
6C5 OSC.
6G5 TUNING INDICATOR
5Z4MG RECT.

MODELS WITH 6G5 TUBE ARE WIRED AS SHOWN WITH DOTTED LINES.

NOTE RESISTANCE VALUES NOT SHOWN ARE SMALL.

I.F. 456 KC

MODELS 62-226, 62-228, 62-259
62-308, 62-318, 62-408
62-418

MONTGOMERY-WARD & CO.

Trimmers, Voltage, Socket, Coils
Sensitivity, Phono Data

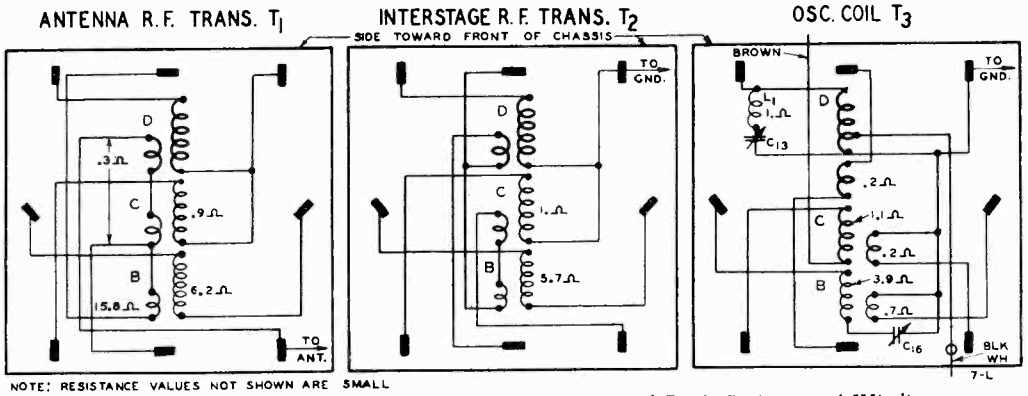


Fig. 4—R. F. and Oscillator Coil Base Terminal Arrangement and D. C. Resistance of Windings

Tuning Frequency Range
B Range ..... 528 to 1730 KC.
C Range ..... 1710 to 5800 KC.
D Range ..... 5750 to 18300 KC.

Sensitivity
B Range ..... 0.5 to 2 Microvolts Absolute
C Range ..... 0.5 to 2 Microvolts Absolute
D Range ..... 1.0 to 4 Microvolts Absolute

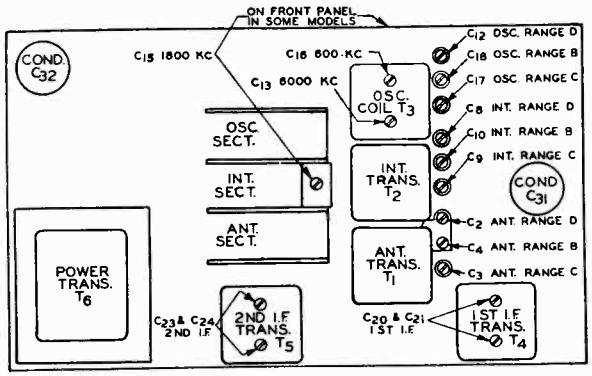


Fig. 3—Location of Trimmers

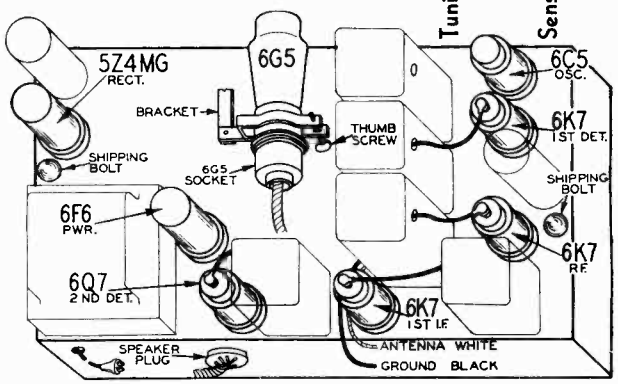


Fig. 6—Location of Tubes

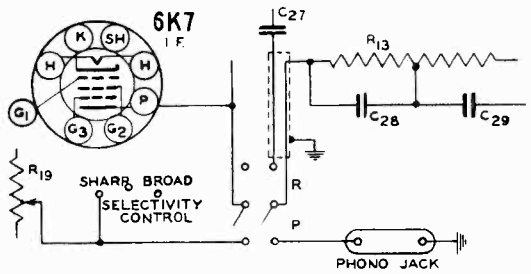


Fig. 7—Phonograph Connections

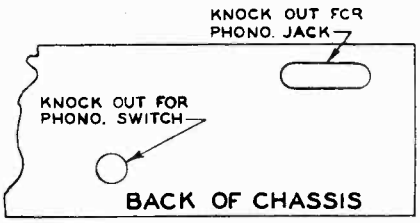


Fig. 8—Location of Phono Knockouts

Speaker ..... 8" and 10" Dynamic
Power Consumption ..... 85 Watts (At 115 volts 60 cycles)
Power Output ..... 3 Watts Undistorted
Selectivity ..... 28 KC Broad at 1000 times Signal (Sharp)
Intermediate Frequency ..... 456 KC.

Line Voltage: 115
Volume Control: Maximum

Antenna Shorted to Ground
Position of Band Switch: Standard Wave

TUBE	FUNCTION	VOLTAGE BETWEEN SOCKET PRONGS AND GROUND (Unless otherwise indicated)							
		Prong No. 1	Prong No. 2	Prong No. 3	Prong No. 4	Prong No. 5	Prong No. 6	Prong No. 7	Prong No. 8
6K7	RF	0	6.1(1)	260	100	4.0	....	6.1(1)	4.0
6K7	1st Det.	0	6.1(1)	260	118	0	....	6.1(1)	9.0
6C5	Osc.	0	6.1(1)	120	...	0	....	6.1(1)	0
6K7	I F	0	6.1(1)	260	138	4.0	....	6.1(1)	4.0
6Q7	1st A.F.—2nd Det.	0	6.1(1)	105	0	0	....	6.1(1)	1.4
6F6	Power Amp.	0	6.1(1)	238	260	18	....	6.1(1)	0
5Z4MG	Rect.	0	4.9(2)	...	680(3)	...	680(3)	....	4.9(2)
6E5	Tuning Indicator	Plate to Ground 30(4)		Target to Ground 270		Cathode to Ground 0		Across Heater 6.1 A.C.	

(1) A.C. voltage as read across heater terminals 2 and 7.
(2) A.C. voltage as read across heater terminals 2 and 8.
(3) A.C. voltage as read across terminals 4 and 6.
(4) As read with 500,000 ohm meter.

Phonograph Connections

Phonograph connections can be made as shown in Fig. 7. The parts required are shown in the parts list. Knockouts are provided in the back panel of the chassis for mounting the phono jack and phono switch —See Fig 8.

The phono switch must be mounted with one set of terminals nearest the bottom of the chassis base.

The connections are made by opening the diode return circuit at the volume control. Unsolder the .01 mf. condenser C27 from the volume control.

Strip about 2¾ inches of the shielding from each end of the cable furnished with the phono attachment parts. Connect one lead of the cable to the terminal on the volume control from which condenser C27 was removed. The other end of this lead is connected to the phono switch as shown in Fig. 7. The second cable lead is connected to the open end of condenser C27. Then connect the other end of this lead to the phono switch as shown in Fig. 7. Both of the shielded cable leads connected to the phono switch are connected to the switch terminals nearest the chassis base. Before connecting the cable leads to the phono switch, it will be necessary to slip a piece of varnished tubing over the portion of the cable that passes near the 6K7 1st I.F. tube socket.

Now ground the shielding by soldering it to the lugs on the chassis base. One of these lugs is located just below the planetary drive; the other is near the rear mounting foot of the gang condenser.

Complete the other connections as illustrated in Fig. 7. The lead between the tone control and the .05 mf. tubular condenser C36 mounted on the back of the chassis base, should be covered with a piece of varnished tubing.

The tin plate shield is soldered to the tone control mounting bracket in such a way that when it is bent down toward the bottom and back of the chassis it will shield the lower leads of the phono switch and the lead between the tone control and tubular condenser C36.

After making the phono connections, the I.F. stages should be realigned.

Alignment and Calibration

I. F. Adjustment

Set the signal generator for a signal of 456 KC.

Connect the output of the signal generator through a .1 mf. condenser to the grid of the 1st detector.

Connect the ground lead of the receiver to the ground post of the signal generator.

Turn the band selector to the Range B position (standard wave band).

Turn the selectivity control to the sharp position and keep it in this position for all adjustments.

Turn the volume control to the maximum position.

Attenuate the signal from the signal generator to prevent the levelling-off action of the AVC.

Then adjust the four I.F. trimmers until maximum output is obtained. The adjusting screws for these condensers are reached from the top of the chassis, and the location is shown in Fig. 3.

Range B Alignment

After the procedure for the alignment of each range, as explained below, is completed, it is advisable to repeat the procedure as a final check.

1730 KC Adjustment

Set the signal generator for 1730 KC.

Turn the rotor of the tuning condenser to the full open position.

Keep the band selector in the standard wave position.

Connect the antenna lead of the receiver through a 200 mmf. condenser to the output of the signal generator.

For this and *all* subsequent adjustments keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent AVC action.

Adjust the oscillator Range B trimmer (C18) until maximum output is obtained. The location of this trimmer is shown in Fig. 3.

1500 KC Adjustment

Set the signal generator for 1500 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Loosen the pointer set screw and set the large pointer at the 1500 KC mark on the standard wave band scale. Retighten the set screw.

Adjust the interstage Range B trimmer (C10) and antenna Range B trimmer (C4) to maximum.

Do not change the setting of the oscillator Range B trimmer.

600 KC Adjustment

Set the signal generator for 600 KC.

Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth, at the same time adjusting the 600 KC trimmer, until the peak of greatest intensity is obtained. See Fig. 3 for location of this trimmer.

Range C Alignment

CAUTION—When aligning the short wave bands be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 5000 KC. The signal will then be heard at 5000 KC on the dial of the radio. The image signal, which is much weaker, will be heard at 5000 less 912 KC, or 4088 KC. It may be necessary to increase the input signal to hear the image.

5800 KC Adjustment

Set the signal generator for 5800 KC.

Connect the antenna lead of the receiver through a 400 ohm resistor to the output of the signal generator.

Turn the rotor of the tuning condenser to the full open position.

Turn the band selector to the Range C position (1st short wave band).

Adjust the oscillator Range C trimmer (C17) until maximum output is obtained. See Fig. 3 for location of this trimmer.

5000 KC Adjustment

Set the signal generator for 5000 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the interstage Range C trimmer (C9) and antenna Range C trimmer (C3) to maximum.

Do not change the setting of the oscillator Range C trimmer.

1800 KC Adjustment

Set the signal generator for 1800 KC.

Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth, at the same time adjusting the 1800 KC trimmer, until the peak of greatest intensity is obtained. See Fig. 3 for location of this trimmer.

Range D Alignment

18,300 KC Adjustment

Set the signal generator for 18,300 KC.

Keep the antenna lead of the receiver connected through the 400 ohm resistor to the output of the signal generator.

Turn the rotor of the tuning condenser to the full open position.

Turn the band selector to the Range D position (2nd short wave band).

Adjust the oscillator Range D trimmer (C12) until maximum output is obtained. See Fig. 3 for location of this trimmer.

15,000 KC Adjustment

Set the signal generator for 15,000 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the interstage Range D trimmer (C8) and antenna Range D trimmer (C2) to maximum.

When adjusting the interstage Range D trimmer, it will be necessary at the same time to turn the tuning condenser rotor slowly back and forth until the peak of greatest intensity is obtained.

Do not change the setting of the oscillator Range D trimmer.

6000 KC Adjustment

Set the signal generator for 6000 KC.

Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 6000 KC trimmer until the peak of greatest intensity is obtained. See Fig. 3 for location of this trimmer.

Drive Assembly

This model uses a two-speed planetary drive.

All of the early sets are equipped with a flat belt and may be identified by the ¼ inch wide belt. The later sets use the same type of drive, but have a black cord belt. This is a bronze cable with a black fabric covering. It is about ⅛ inch in diameter.

The belt type also has an idler pulley which the cord type does not have.

The planetary assembly is the unit that is integral with the tuning shaft. It is at the bottom of the belt. If the nut of this assembly is too tight, the drive will be jerky and will turn hard in high speed. If this condition exists, back off this nut one or two turns and note the effect. If the nut is too loose, the drive will slip in slow speed. The remedy in this case is, of course, to tighten up the nut.

Should the drive belt slip when the planetary pulley is turning, first inspect the drive drum assembly. This is the assembly which is mounted on the tuning condenser shaft. If this assembly and the tuning condenser rotor turn satisfactorily, the belt is probably too loose and a new one will be required. In the sets with the flat belt type of drive, there is an idler pulley which can be positioned, and by means of which the belt tension can be increased. In this type, therefore, the belt tension should be increased before attempting to put on a new one.

The replacement parts list shows the parts used in each type of drive and the parts common to both types.

Switch Contact Location Numbering

A standard arrangement for switch contact location numbering has been adopted. This numbering is illustrated in Fig. 2. In contact locations not used, the number applying to that particular location is not employed.

Twenty-five Cycle Receivers

The twenty-five cycle receiver differs from the sixty cycle receiver only in the fact that a different power transformer is used. The correct power transformer is shown in the parts list.

The twenty-five cycle receiver can be operated satisfactorily from a sixty cycle power supply. However, the reverse is not true, the sixty cycle receiver cannot be operated from a twenty-five cycle power supply.

A 115-230 volt, 40 to 60 cycle as well as other power transformers with special power ratings are also available for this model.

Trimmer Replacement

If one trimmer of the gang trimmer strip should become defective, it is not necessary to replace the entire strip. A single trimmer P-17A36, as shown in the replacement parts list, may be used. Disconnect the lead from the coil side (side not grounded) of the defective trimmer in the strip. This connection is then made to the single trimmer. Connect it to the side of the trimmer not in contact with the adjusting screw. The other side of the single trimmer is then connected to a good ground, using a piece of heavy wire in order to support the trimmer adequately. In replacing a trimmer, be sure to keep both leads as short as possible and keep the ungrounded lead as far from ground as possible.

Voltage Chart

The voltage readings are taken with a voltmeter having a resistance of 1000 ohms per volt.

The standard metal tube socket terminal numbering system (bottom of socket) is shown in Fig. 5. On the schematic circuit diagram, Fig. 2 is a list giving the complete names of the tube elements and the corresponding symbols as used on the sockets on the schematic.

MODEL 62-236
Voltage, Coils
Panel Mtg. Kits

MONTGOMERY-WARD & CO.

Instrument Panel Mounting Kits

Car	Year & Model	Panel Kit No.
Buick	1936	21A16
Cadillac	1936	21A39
Chevrolet	1936-35 Standard & Master	21A11
Chrysler	1936 Six	21A19
	1936 Eight	21A30
	1936 Airflow	21A31
	1935-34 Except Imperial	21A47
DeSoto	1936 Airflow & Airstream Custom	21A22
	1936 Airstream DeLuxe	21A26
	1935 DeLuxe	21A46
	1934	21A47
Dodge	1936 DeLuxe	21A13
	1935	21A45
	1934	21A49
Ford	1936 Standard & DeLuxe	21A10
	1935 DeLuxe	21A32
	1935 Standard	21A38
	1934	
Hudson	1936	21A17
	1935	21A48
	1934	21A35
Lafayette	1936-35	21A50
LaSalle	1936	21A40
Lincoln	Zephyr 1936	21A10
Nash	1936-35	21A36
Oldsmobile	1936	21A14
	1935	21A34
Packard	1936 120-B	21A21
	1935 120	21A41
Plymouth	1936 DeLuxe	21A12
	1936-35 Standard	21A37
	1935 DeLuxe	21A33
	1934	21A49
Pontiac	1936-35 Standard, DeLuxe 6 & 8	21A15
Studebaker	1936 Dictator	21A20
	1936 President	21A24
Terraplane	1936	21A18
	1935	21A48
	1934	21A35
Steering column and under panel kit		21A23

The mounting kit includes escutcheon plate, dial crystal, knobs, special mounting brackets and small items such as screws. The other items are shipped with the radio.

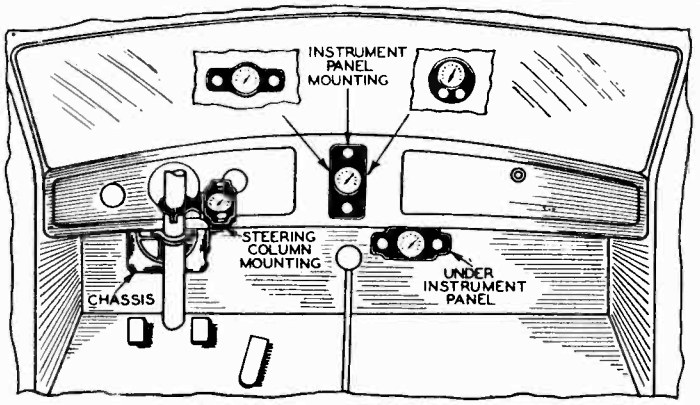


Fig. 6—Various Control Head Mountings

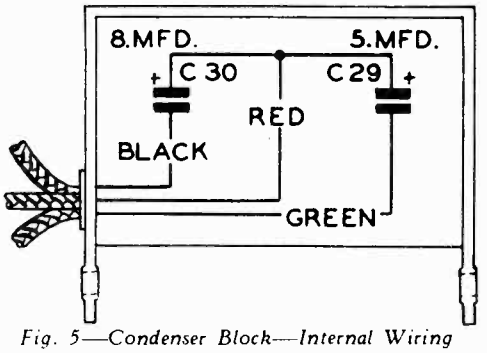


Fig. 5—Condenser Block—Internal Wiring

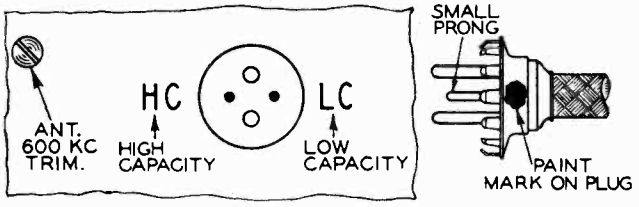


Fig. 3—Antenna Plug Insertion

Antenna Disconnected Battery 6 Volts Under Load

Type of Tube	Function	Across Heater	Plate to Ground	Screen to Ground	Cathode to Ground
6D6	R.F.	6	233	103	4.0
6C6	1st Det. & Osc.	6	233	103	
6D6	I.F.	6	233	103	4.0
75	2nd Det.	6	130		
41	Power	6	215	233	16.0(1)
84	Rectifier	6	560(2)		

(1) Grid bias read across filter choke L6
(2) Plate to Plate A.C. voltage

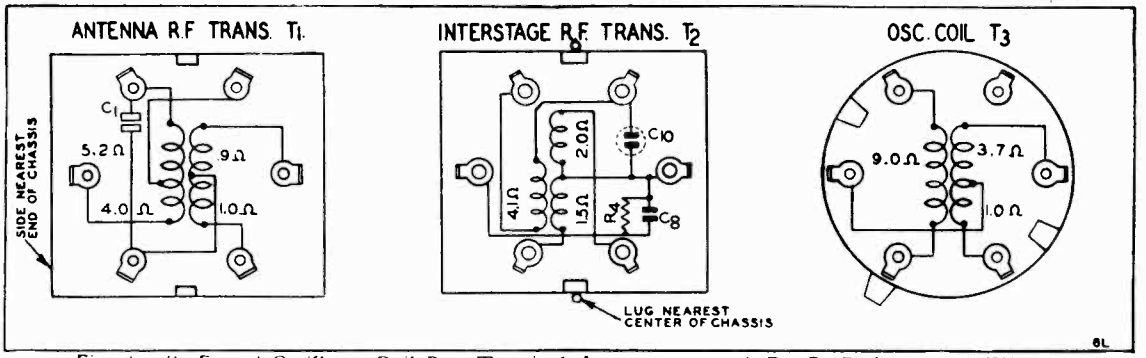
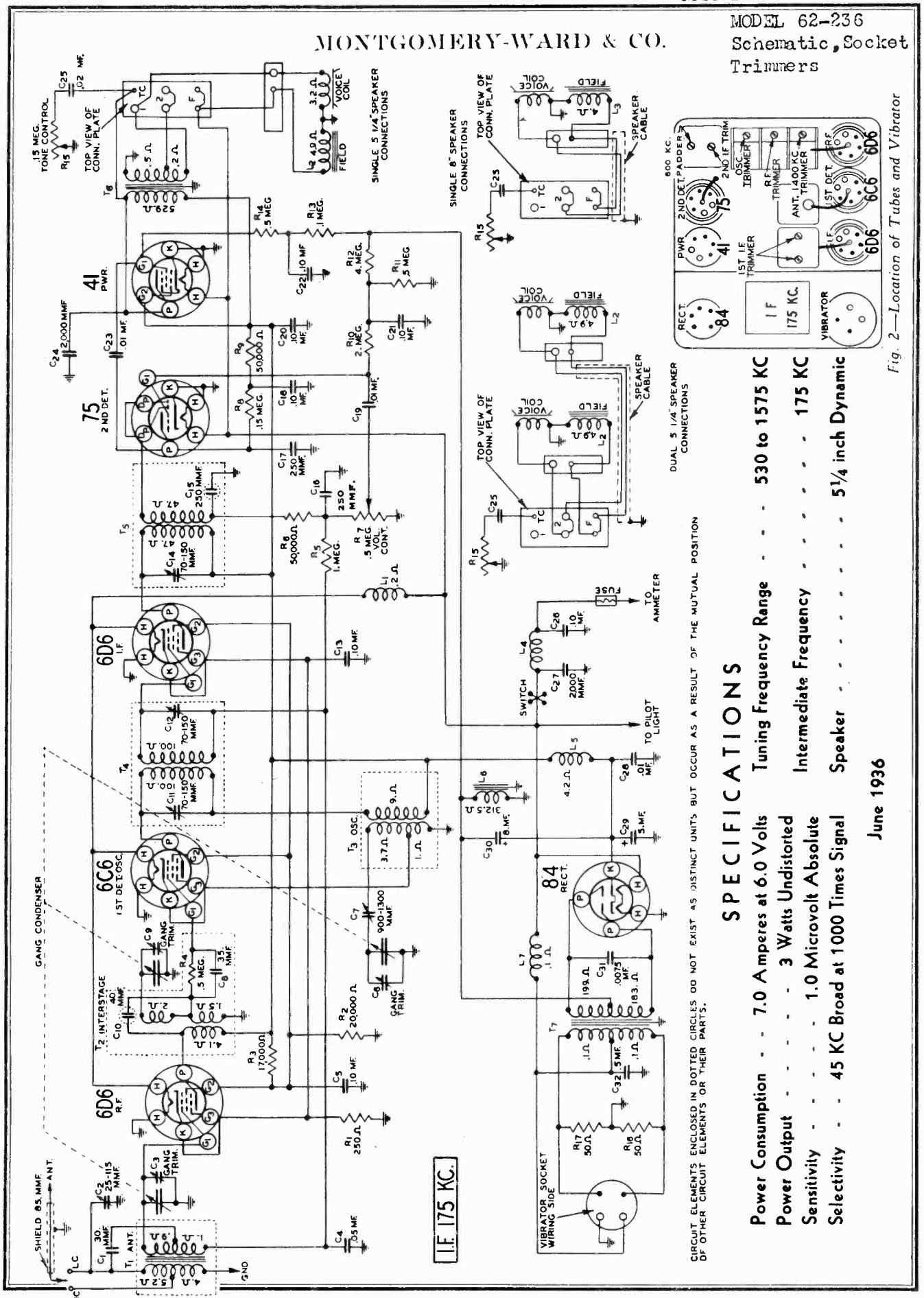


Fig. 4—R. F. and Oscillator Coil Base Terminal Arrangement and D. C. Resistance of Windings

MONTGOMERY-WARD & CO.

MODEL 62-236
Schematic, Socket Trimmers



CIRCUIT ELEMENTS ENCLOSED IN DOTTED CIRCLES DO NOT EXIST AS DISTINCT UNITS BUT OCCUR AS A RESULT OF THE MUTUAL POSITION OF OTHER CIRCUIT ELEMENTS OR THEIR PARTS.

SPECIFICATIONS

Power Consumption - - -	7.0 Amperes at 6.0 Volts
Power Output - - - - - -	3 Watts Undistorted
Sensitivity - - - - - -	1.0 Microvolt Absolute
Selectivity - - -	45 KC Broad at 1000 Times Signal
Tuning Frequency Range - - -	530 to 1575 KC
Intermediate Frequency - - - - - - - -	175 KC
Speaker - - - - - - - - -	5¼ inch Dynamic

June 1936

Fig. 2—Location of Tubes and Vibrator

Alignment and Calibration

Misalignment of condensers generally manifests itself as broad tuning and lack of volume at portions or all of the standard wave band. The receivers are all properly aligned at the factory with precision instruments and realignment should not be attempted unless all other possible causes of the faulty operation have first been investigated and unless the service technician has the proper equipment.

A signal generator that will provide accurately calibrated signals over the standard wave band and at the intermediate frequency, and an output meter are required for indicating the effect of adjustments.

Use a non-metallic screwdriver for the adjustments. The complete procedure is as follows:

I. F. Adjustment

Set the signal generator for a signal of 175 KC.

Connect the output of the signal generator through a .05 mf. condenser to the stator of the R. F. interstage section of the tuning condenser. (See Fig. 2 for location of this section.)

Connect the ground lead of the signal generator to the chassis ground.

Set the volume control at the maximum position.

Attenuate the signal from the signal generator to prevent the levelling-off action of the AVC.

Then adjust the three I.F. trimmers until maximum output is obtained. The location of these trimmers is shown in Fig. 2.

1575 KC Adjustment

Set the signal generator for 1575 KC.

Turn the rotor of the tuning condenser to the full open position.

If a low capacity antenna is used, connect the shielded antenna lead from the chassis through a 150 mmf. condenser to the antenna post of the signal generator. (If high capacity, use 1500 mmf.)

For this and all subsequent adjustments keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent AVC action.

Adjust the trimmer of the oscillator section of the three gang condenser until maximum output is obtained—see Fig. 2 for location of this trimmer.

1400 KC Adjustment

Set the signal generator for 1400 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the R.F. interstage and antenna 1400 KC trimmers for maximum output.

Do not change the setting of the oscillator trimmer.

600 KC Adjustment

Set the signal generator for 600 KC.

Connect the output of the signal generator through a .05 mf. condenser to the control grid of the 6D6 R.F. tube.

Turn the tuning condenser rotor until maximum output is obtained. Then turn the tuning condenser rotor back and forth, at the same time adjusting the 600 KC padder (see Fig. 2) until the peak of greatest infensity is obtained.

Re-connect the output of the signal generator to the shielded antenna lead through a 150 mmf. condenser (1500 mmf. if antenna is high capacity).

Adjust the 600 KC antenna trimmer to maximum. This trimmer is reached from the outside of the case —see Fig. 3.

Adjusting Antenna 600 KC Trimmer

After the receiver is installed and the car antenna is connected, it will be necessary to adjust the antenna trimmer. Tune in a weak signal at approximately 600 KC with the volume control about three-fourths on. Turn the adjusting screw of the antenna 600 KC trimmer up or down until maximum output is obtained. See Fig. 3 for location of this trimmer

Calibrating the Receiver

To calibrate the receiver, tune in a station of known frequency. At the back of the control head is the calibration screw. Remove the pilot lamp assembly. Insert a fine blade screwdriver and turn this screw until the pointer on the dial scale is at the frequency of the station being received. The knob must be held during this adjustment.

If the control head is inaccessible it may be calibrated by setting the pointer from the front. Remove the crystal by inserting a knife blade under the lower edge. Loosen the pointer screw, set the pointer and retighten.

General Service Data

Roof Speaker

The Ford and General Motors 1936 automobiles have provision for mounting a speaker in the car roof (Ford 5¼ inch speaker, General Motors 5¼ or 8 inch speaker). This model is so designed that roof speaker installations in those cars can readily be made.

There are three general types of speaker installation. In the first type of installation the single 5¼ inch speaker attached to the chassis cover is used.

In the second type of installation a single 5¼ inch or 8 inch roof speaker is used. The third type of installation is the dual speaker mounting using two 5¼ inch speakers, one in the car roof and the other on the chassis cover. (The 8 inch and 5¼ inch speakers cannot be used together).

The electrical connections of the different speaker installations are shown in the schematic—Fig. 1. Complete information regarding the method of making the installations and the kits of parts required are in the installation manual packed with each radio.

Control Head Mounting

This auto radio is supplied with a new type of control head known as the No. 4 Universal. This head in conjunction with suitable escutcheon plates and mounting brackets can be mounted in the instrument panel of practically all widely sold 1936 automobiles. In the case of 1935 and earlier cars, it can be mounted in the instrument panel, under the panel or on the steering column.

The escutcheon plate, dial crystal, special mounting brackets and knobs for the various cars are put up in kit form.

The control head, volume control fitting, flexible shafts, pilot lamp assembly, dial scale and pointer are packed with each radio.

In Fig. 6 are shown the various locations at which the control head is mounted. The head is intended for installation primarily in the instrument panel of the car. Most 1936 and many 1935 cars have a name plate or ash receiver on the instrument panel, the removal of which permits installation of the radio control head. Complete installation data is contained in the instruction booklet packed with each radio.

Installation and Noise Suppression

The necessary information for installing this receiver and for suppression of ignition and generator noise is contained in the Installation Manual which is packed with each receiver.

Be sure that the cover is well grounded to the chassis case—clean off paint or particles of dirt which may prevent a good ground.

Voltages at Sockets

In the voltage chart are given the voltages at the sockets with all tubes in and the set in operating condition. The antenna should be disconnected.

The voltages can be read with the chassis in the case, by means of an analyzer plug.

If the chassis unit is taken out of the case all of the socket terminals can easily be reached under the

Circuit

This model is a 6 tube automobile radio covering the standard wave band. It has a tuning range as shown in the specifications above. The signal is fed through an antenna transformer with tuned secondary into a 6D6 tube which functions as an R.F. amplifier. A tapped connection is provided in the primary of the antenna transformer for installations in cars in which a high capacity antenna is used.

The output of the R.F. tube is fed through another R. F. transformer with tuned secondary into a 6C6 tube which functions as the first detector and oscillator. The oscillating circuit is tuned by the oscillator section of the gang condenser and is always resonant at a frequency 175 KC above the frequency to which the R.F. circuits are tuned.

One stage of I.F. amplification is employed using a 6D6 tube. The primary and secondary of the first I.F. transformer and the primary of the second I.F. transformer are tuned by small trimmer condensers.

A 75 dual diode-triode tube functions as a diode 2nd detector, AVC tube and a one stage audio amplifier. AVC voltage is applied to the control grid circuits of the 6D6 R.F. and I.F. tubes. The manual volume control varies the audio voltage applied to the grid of the 75 tube.

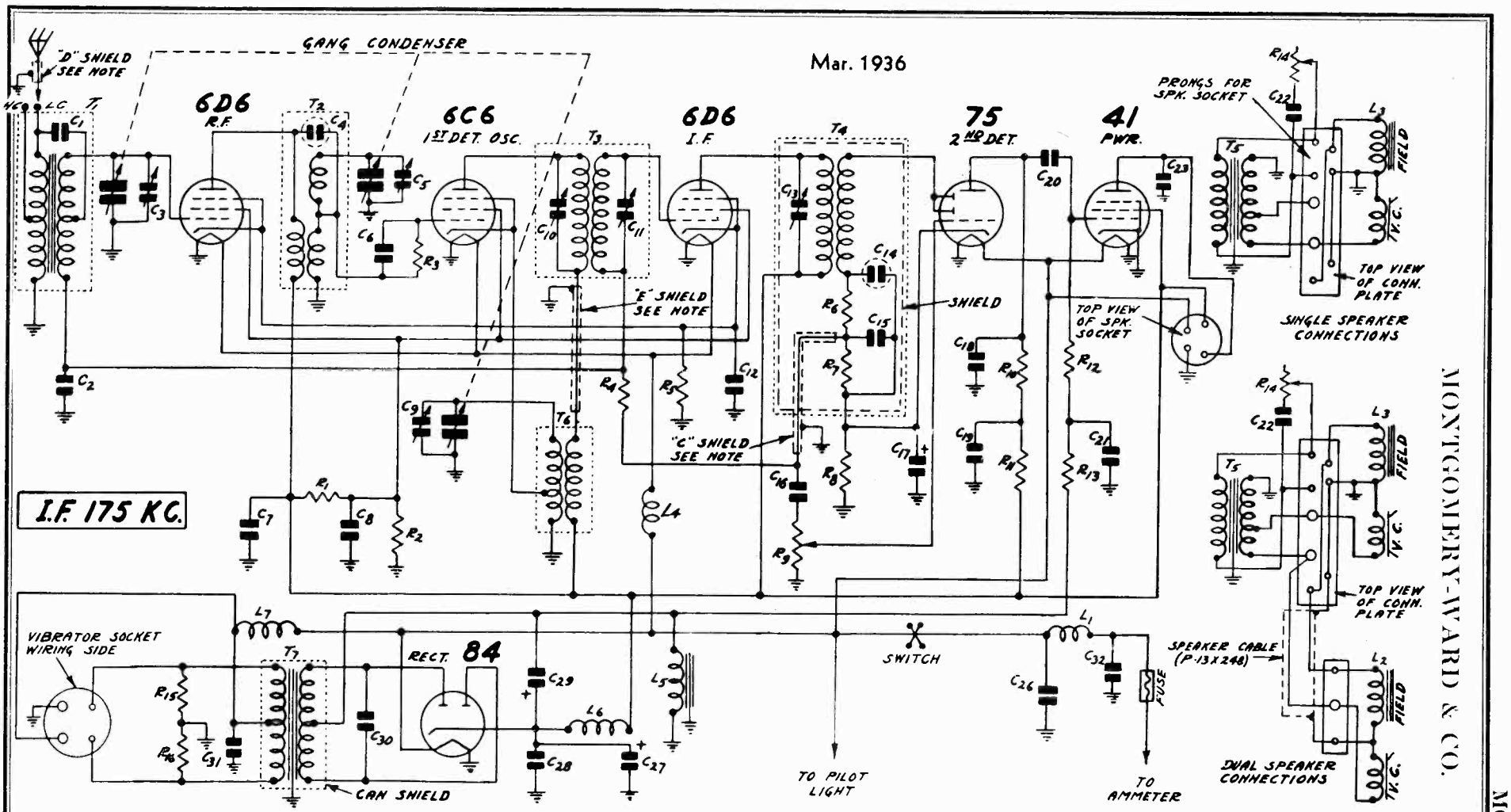
In the output stage a 41 tube is employed. A dynamic reproducer is used. Provision is made for a single roof speaker and dual speaker (chassis and roof) connections. The electrical connections for the different speaker installations are shown in the schematic. For the single 8 inch or dual 5¼ inch speakers, the tapped connection of the output transformer secondary is used.

The vibrator in the power unit interrupts the current through the primary of the power transformer. The use of a vibrating interrupter in the primary circuit and a high ratio transformer results in the application of high voltage AC to the rectifier tube plates. The 84 full wave rectifier tube, filter choke and filter condensers convert this high voltage AC into high voltage DC for the plate and screen circuits.

MONTGOMERY-WARD & CO.

MODEL 62-242
Schematic

Mar. 1936



GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES. CIRCUIT ELEMENTS ENCLOSED IN DOTTED CIRCLES DO NOT EXIST AS DISTINCT UNITS BUT OCCUR AS A RESULT OF THE MUTUAL POSITION OF OTHER CIRCUIT ELEMENTS OR THEIR PARTS.
THE CAPACITY OF "C" SHIELD IS 37 MMF, THE CAPACITY OF "D" SHIELD IS 85 MMF AND THE CAPACITY OF "E" SHIELD IS 15 MMF.

C 1 10 mmf.
C 2 .05 mf. 180 V.
C 3 Gang Trimmer
C 4 40 mmf.
C 5 Gang Trimmer
C 6 35 mmf.
C 7 .10 mf. 360 V.
C 8 .10 mf. 180 V.
C 9 Gang Trimmer
C10 70-150 mmf. } Dual
C11 70-150 mmf. }

C12 .10 mf. 180 V.
C13 70-150 mmf.
C14 250 mmf.
C15 250 mmf.
C16 .01 mf. 360 V.
C18 250 mmf.
C19 .10 mf. 360 V.
C20 .01 mf. 360 V.
C21 .25 mf. 180 V.

C22 .02 mf. 600 V.
C23 .002 mf. 600 V.
C26 2000 mmf.
C28 2000 mmf.
C30 .0075 mf. 1600 V.
C31 .50 mf. 180 V.
C32 2000 mmf.
C17 4.0 mf. 25 V. } Electrolytic
C27 5.0 mf. 350 V. } Block
C29 8.0 mf. 350 V. }

R 1 17000 ohm 1.0 W.
R 2 20000 ohm .5 W.
R 3 .50 Megohm .2 W.
R 4 1.0 Megohm .2 W.
R 5 350 ohm .2 W.
R 6 50000 ohm .2 W.
R 7 500000 ohm .2 W.
R 8 6000 ohm .2 W.
R 9 2.0 Megohm Vol. Control
R10 150000 ohm .2 W.
R11 50000 ohm .2 W.

R12 .50 Megohm .2 W.
R13 100000 ohm .2 W.
R14 150000 ohm Tone Control
R15 50 ohm .5 W.
R16 50 ohm .5 W.

T 1 Antenna Trans.
T 2 R.F. Inter. Trans.
T 3 1st I.F. Trans.
T 4 2nd I.F. Trans.
T 5 Output Trans.

T 6 Osc. Inductor
T 7 Power Trans.

L 1 Motor Noise Reactor
L 2 Speaker Field 4.9 ohm
L 3 Speaker Field 5.3 ohm
L 4 Filament Reactor
L 5 Filter Reactor
L 6 "B" Reactor
L 7 Vibrator Reactor

MODEL 62-242
Resistance,Coils
Voltage,Socket,Trimmers

MONTGOMERY-WARD & CO.

6 Tube Automobile Radio

Power Consumption - - 7.0 Amperes at 6.0 Volts
Power Output - - - - - 3 Watts Undistorted
Sensitivity - - - - - 1.0 Microvolt Absolute
Selectivity - - 45 KC Broad at 1000 Times Signal

Tuning Frequency Range - - - 530 to 1650 KC
Intermediate Frequency - - - - - - - 175 KC
Speaker - - - - - - - - - - 6 inch Dynamic

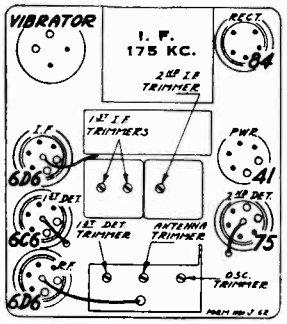


Fig. 2—Location of Tubes and Trimmers

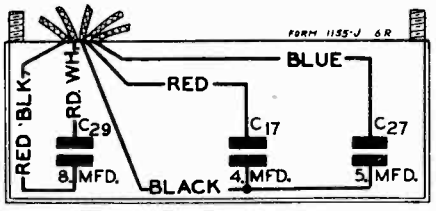


Fig. 4—Condenser Block—Internal Wiring

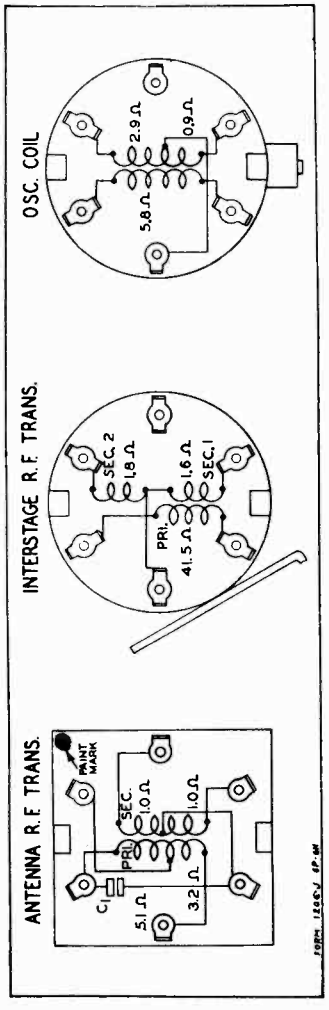


Fig. 3—R. F. and Oscillator Coil Base Terminal Arrangement and D. C. Resistance of Windings

D. C. Resistance of Windings

Following are the D. C. resistances of the various windings in the chassis. The values given below will vary slightly in different sets.

Code	Winding	D. C. Resistance in Ohms
T1	Antenna Transformer	
	Primary Winding	
	Long Portion	5.1
	Short Portion	3.2
	Secondary Winding—Either Portion	1.0
T2	Interstage Transformer	
	Primary Winding	41.5
	Secondary Winding	
	No. 1	1.6
	No. 2	1.8
T3	1st I. F. Transformer	
	Primary Winding	88.0
	Secondary Winding	87.0
T4	2nd I. F. Transformer	
	Primary Winding	43.0
	Secondary Winding	48.2
T5	Dynamic Speaker Output Transformer	
	Primary	416.6
	Secondary	Small
L3	Speaker Field	5.3
	Speaker Voice Coil	Small
T6	Oscillator Coils	
	Grid Coil	
	Long Portion	2.9
	Short Portion	0.9
	Plate Coil	5.8
T7	Power Transformer	
	Primary Winding	
	Center Tap to Inside	Small
	Center Tap to Outside	Small
	Secondary Winding	
	Center Tap to Inside	200.0
	Center Tap to Outside	200.0
L1	Motor Noise Reactor	Small
L4	Filament Reactor	.22
L5	Filter Choke	300.0
L6	R. F. "B" Plate Reactor	4.0
L7	Vibrator Filter Reactor	Small

VOLTAGES AT SOCKETS
Antenna Disconnected Battery 6 Volts Under Load

Type of Tube	Function	Across Heater	Plate to Ground	Screen to Ground	Cathode to Ground	Cathode Current M. A.
6D6	R. F. Amp.	5.6	245	105	5.2	7.5
6C6	1st Det. Osc.	5.6	245	105	0	2.9
6D6	I. F. Amp.	5.6	245	105	5.2	7.5
75	2nd Det.	5.8	120(1)		1.4	0.14
41	Power	5.8	235	245	15.0(2)	30.0
84	Rectifier	5.8				52.0

(1) With 250,000 Ohm Meter
(2) Read Across Filter Choke

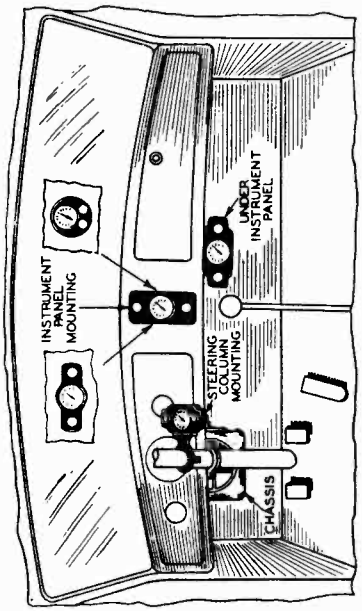


Fig. 5—Various Control Head Mountings

MODEL 62-242
Alignment, Notes
Panel Mtg. Kits

MONTGOMERY-WARD & CO.

Instrument Panel Mounting Kits

Car	Year & Model	Panel Kit No.
Buick	1936	21A16
Cadillac	1936	21A39
Chevrolet	1936-35 Standard & Master	21A11
Chrysler	1936 Six	21A19
	1936 Eight	21A30
	1936 Airflow	21A31
	1935-34 Except Imperial	21A47
DeSoto	1936 Airflow & Airstream Custom	21A22
	1936 Airstream DeLuxe	21A26
	1935 DeLuxe	21A46
	1934	21A47
Dodge	1936 DeLuxe	21A13
	1935	21A45
	1934	21A49
Ford	1936 Standard & DeLuxe	21A10
	1935 DeLuxe	21A32
	1935 Standard	21A32
	1934	21A38
Hudson	1936	21A17
	1935	21A48
	1934	21A35
Lafayette	1936-35	21A36
LaSalle	1936	21A40
Lincoln	Zephyr 1936	21A10
Nash	1936-35	21A36
Oldsmobile	1936	21A14
	1935	21A34
Packard	1936 120-B	21A21
	1935 120	21A41
Plymouth	1936 DeLuxe	21A12
	1936 Standard	21A37
	1935 DeLuxe	21A33
	1934	21A49
Pontiac	1936-35 Standard-DeLuxe 6 & 8	21A15
Studebaker	1936 Dictator	21A20
	1936 President	21A24
Terraplane	1936	21A18
	1935	21A48
	1934	21A35
Steering column and under panel kit		21A23

The mounting kit includes escutcheon plate, dial crystal, knobs, special mounting brackets and small items such as screws. The other items are shipped with the radio.

General Service Data

Circuit

This model is a 6 tube automobile receiver covering the standard wave band. It has a tuning range as shown in the specifications above. The signal is fed through an antenna transformer with tuned secondary into a 6D6 tube which functions as an R.F. amplifier. The output of this tube is fed through another R.F. transformer with tuned secondary into a 6C6 tube which functions as the first detector and oscillator. The oscillating circuit is tuned by the oscillator section of the gang condenser and is always resonant at a frequency 175 KC above the frequency to which the R.F. circuits are tuned.

One stage of I.F. amplification is employed using a 6D6 tube. The primary and secondary of the first I.F. transformer and the primary of the second I.F. transformer are tuned by small trimmer condensers.

A 75 dual diode-triode tube functions as a diode 2nd detector, AVC tube and a one stage audio amplifier. AVC voltage is applied to the control grid circuits of the 6D6 R.F. and I.F. tubes. The manual volume control varies the audio voltage applied to the grid of the 75 tube.

In the output stage a 41 tube is employed. A dynamic reproducer is used.

The vibrator in the power unit interrupts the current through the primary of the power transformer. The use of a vibrating interrupter in the primary circuit and a high ratio transformer results in the application of high voltage AC to the rectifier tube plates. The 84 full wave rectifier tube, filter choke, and filter condensers convert this high voltage AC into high voltage DC for the plate and screen circuits.

Alignment and Calibration

Misalignment or mistracking of condensers generally manifests itself as broad tuning and lack of volume at portions or all of the standard wave band. The receivers are all properly aligned at the factory with precision instruments and realignment should not be attempted unless all other possible causes of the faulty operation have first been investigated and unless the service technician has the proper equipment.

A signal generator that will provide accurately calibrated signals over the standard wave band and at the intermediate frequency, and an output meter are required for indicating the effect of adjustments.

Use a non-metallic screwdriver for the adjustments. The complete procedure is as follows:

I. F. Adjustment

Set the signal generator for a signal of 175 KC.

Connect the antenna lead of the signal generator thru a .05 mf. condenser to the stator of the 1st detector section of the tuning condenser. (See Fig. 2 for location of this section.) This can be done by pushing a wire or conductor between the stator plates or by extending an insulated wire thru the hole in the shield over the stator and pushing the wire thru the hole in the lug which extends up from the insulated stator assembly.

Connect the ground lead of the signal generator to the chassis ground.

Short out the oscillator section of the tuning condenser.

Set the volume control at the maximum position.

Attenuate the signal from the signal generator to prevent the levelling-off action of the AVC.

Then adjust the three I.F. trimmers until maximum output is obtained. The location of these trimmers is shown in Fig. 2.

1650 KC Adjustment

Set the signal generator for 1650 KC.

Turn the rotor of the tuning condenser to the full open position.

If a low capacity antenna is used connect the shielded antenna lead from the chassis through a 150 mmf. condenser to the antenna post of the signal generator. (If high capacity, use 1500 mmf.)

For this and all subsequent adjustments keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent AVC action.

Adjust the trimmer of the oscillator section of the three gang condenser until maximum output is obtained—see Fig. 2 for location of this trimmer.

1400 KC Adjustment

Set the signal generator for 1400 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the 1st detector and antenna trimmers for maximum output.

Do not change the setting of the oscillator trimmer.

Adjusting Antenna Trimmer

After the receiver is installed and the car antenna is connected it will be necessary to adjust the antenna trimmer. Tune in a weak signal between 1200 and 1400 KC with the volume control about three-fourths on. Remove the cover of the chassis case. The antenna trimmer is on the center tuning condenser section—see Fig. 2. Turn the adjusting screw of this condenser up or down until maximum output is obtained. CAUTION—Do not turn any of the other trimmer adjusting screws for this adjustment.

Calibrating the Receiver

To calibrate the receiver, tune in a station of known frequency. At the back of the control head is the calibration screw. Remove the pilot lamp assembly. Insert a fine blade screwdriver and turn this screw until the pointer on the dial scale is at the frequency of the station being received. The knob must be held during this adjustment.

If the control head is inaccessible it may be calibrated by setting the pointer from the front. Remove the crystal by inserting a knife blade under the lower edge. Loosen the pointer screw, set the pointer and retighten.

Installation and Noise Suppression

The necessary information for installing this receiver and for suppression of ignition and generator noise is contained in the Installation Manual which is packed with each receiver. Two additional items regarding reduction of noise can be mentioned as follows:

Be sure that the cover is well grounded to the chassis case—clean off paint or particles of dirt which may prevent a good ground.

In extreme cases of motor noise it is advisable to peen the distributor rotor arm, that is, increase the length of the arm by using a small machinist's hammer. This will lessen the gap between the rotor arm and the stationary contacts, reducing the spark. Be sure, after peening the arm, that it does not strike the stationary contacts.

Voltages at Sockets

In the voltage chart are given the voltages at the sockets with all tubes in and the set in operating condition. The antenna should be disconnected.

The voltages can be read with the chassis in the case, by means of an analyzer plug.

If the chassis unit is taken out of the case all of the socket terminals can easily be reached under the chassis with test prods.

Control Head Mounting

This auto radio is supplied with a new type of control head known as the No. 4 Universal. This head in conjunction with suitable escutcheon plates and mounting brackets can be mounted in the instrument panel of practically all widely sold 1936 automobiles. In the case of 1935 and earlier cars, it can be mounted in the instrument panel under the panel or on the steering column.

The escutcheon plate, dial crystal, special mounting brackets and knobs for the various cars are put up in kit form.

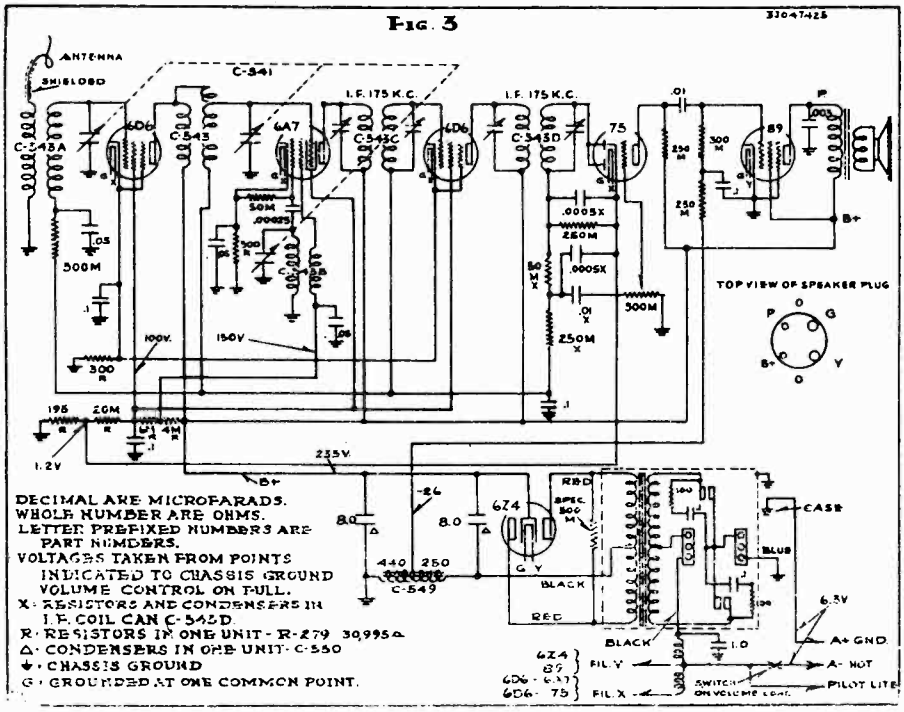
The control head, volume control fitting, flexible shafts, pilot lamp assembly, dial scale and pointer are packed with each radio.

In Fig. 5 are shown the various locations at which the control head is mounted. The head is intended for installation primarily in the instrument panel of the car. Most 1936 and many 1935 cars have a name plate or ash receiver on the instrument panel, the removal of which permits installation of the radio control head. Complete installation data is contained in the instruction booklet packed with each radio.

MODEL 62-130
Schematic, Voltage
Socket, Trimmers
Parts

MONTGOMERY-WARD & CO.

FIG. 3



SCHEMATIC CIRCUIT DIAGRAM

See instructions for serial notes etc.

PARTS LIST

Part No.	Description	List Price Each
A 660	Battery Cable—Plug Type.	1.75
B 104	Cable Shaft Brackets.....	.35
B 660	Antenna Cable—Plug Type	.80
C 106	Shaft Couplings	.35
C 117	"A" Choke—Small	.25
C 118	"A" Choke—Large	.35
C 144	Dual .1-200 Volt Condenser	.35
C 152	.00025 Mica Condenser...	.20
C 155	.0005 Mica Condenser....	.20
C 522	.01-400 Volt Condensers...	.25
C 531A	Dual .05 Condenser.....	.30
C 535	Dual .1—200 Volt Condenser	.35
C 541B	3 Gang Condenser	3.75
C 543	R.F. Coil	.80
C 543A	Antenna Coil	.80
C 543B	Oscillator Coil	.70
C 543C	Input I.F. Transformer...	1.25
C 543D	Output I.F. Transformer with Parts	2.50
C 547	.1-200 Volt Condenser....	.30
C 549	690 Ohm Choke	1.40
C 550	8-8 Mfd. Electrolytic Condenser	2.25
C 551	1 Mfd.—120 Volt Condenser	.35
C 553	.05-200 Volt Condenser...	.25
C 554	.5 Mfd. Generator Condenser	.50
R 232A	Special 500M Ohm Resistor Identified with 2 Yellow Dots	.35
R 279	30,995 Ohm Resistor.....	.60
R 281	100 Ohm Resistor.....	.20
S 338	18" Volume Control Shaft.	1.25
S 339	18" Selector Control Shaft	1.25
S 338S	Special 24" Volume Control Shaft	1.50
S 339S	Special 24" Selector Control Shaft	1.50
V 660	Complete "B" Unit—OAK	8.00
V 603	Volume Control	1.50
660	Remote Control Head Complete Less Shafts.....	5.00
	20 Ampere Fuses.....	.10
	Mounting Bolts	.10
	All carbon resistors.....	.20
	All sockets	.20
	Dynamic speakers	5.00

IF PEAK 175 KC

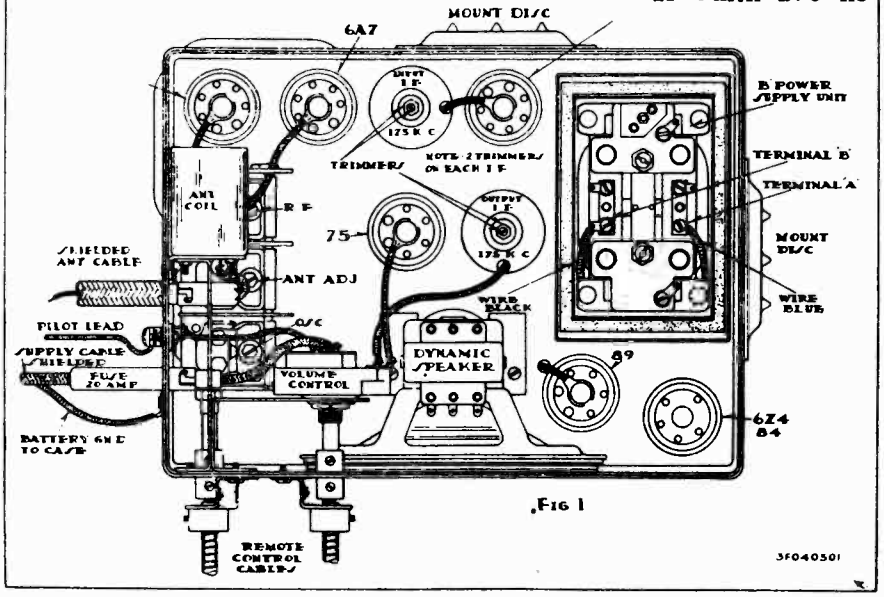


FIG 1

MONTGOMERY-WARD & CO.

MODEL 62-254
Schematic, Voltage
Socket, Trimmers

November, 1936

TUBE ELEMENT LEGEND

F - FILAMENT	G_{1O} - CONTROL GRID OSCILLATOR
P - PLATE	G_{1D} - CONTROL GRID DETECTOR
P_D - PLATE DETECTOR	G_2 - SCREEN GRID
D_P - DIODE PLATE	G_{2D} - SCREEN GRID DETECTOR
G_1 - CONTROL GRID	A_{GO} - ANODE GRID OSCILLATOR

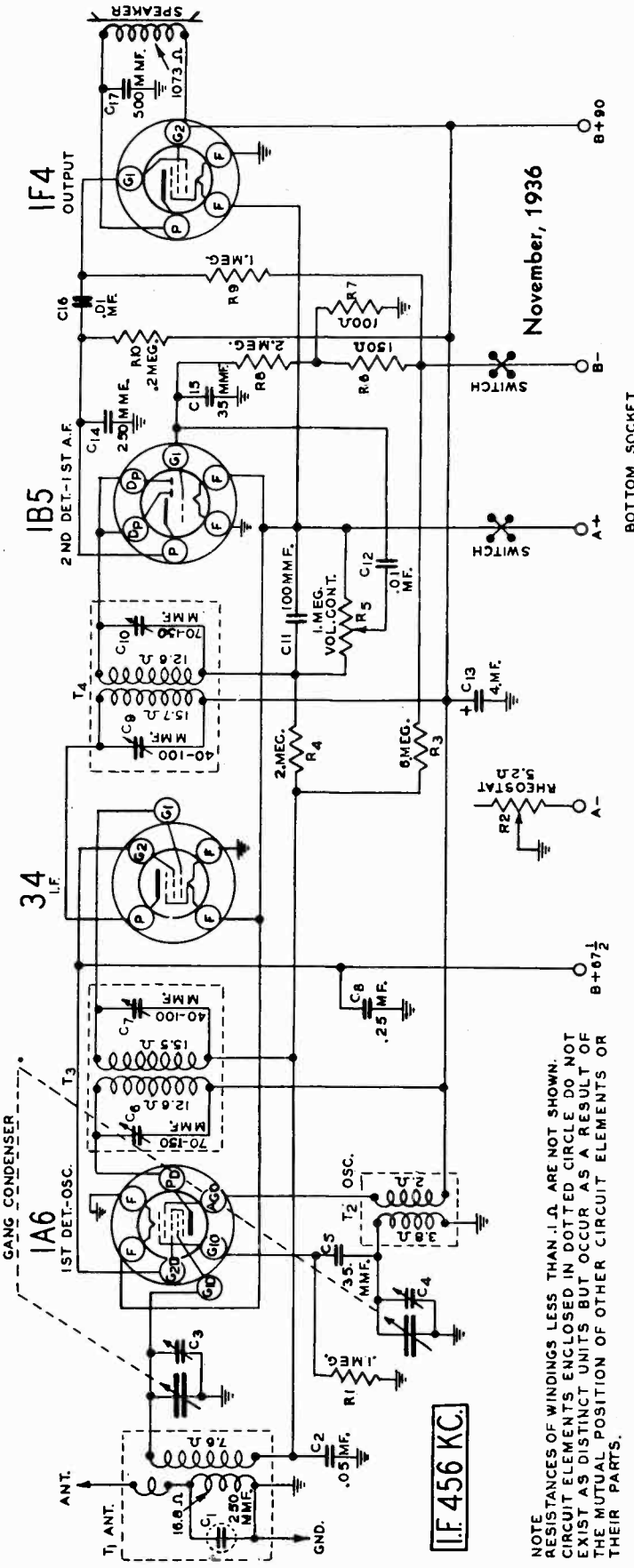


Fig. 2—*Schematic Circuit Diagram*

NOTE
RESISTANCES OF WINDINGS LESS THAN 1 Ω ARE NOT SHOWN.
CIRCUIT ELEMENTS ENCLOSED IN DOTTED CIRCLE DO NOT EXIST AS DISTINCT UNITS BUT OCCUR AS A RESULT OF THE MUTUAL POSITION OF OTHER CIRCUIT ELEMENTS OR THEIR PARTS.

VOLTAGES AT SOCKETS
Volume Control at Maximum — Antenna Shorted to Ground
"A" Battery — 2 Volts

Type of Tube	Function	Across Filament	Plate to Ground	Screen to Ground	Grid to Ground
1A6	1st Det.-Osc.	2.0	87 87(1)	64.5	
34	I.F.	2.0	87	64.5	
1B5	2nd Det.-1st Audio	2.0	42(2)		1.2(3)
1F4	Power	2.0	82	87	3.0(4)

(1) Anode Grid (AGo) to ground
(2) As read on 250 volt scale (1000 ohm per volt meter)
(3) As read across R7
(4) As read across R6 and R7

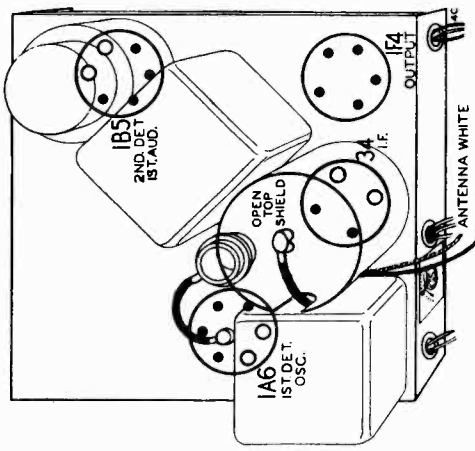


Fig. 6—*Tube Arrangement*

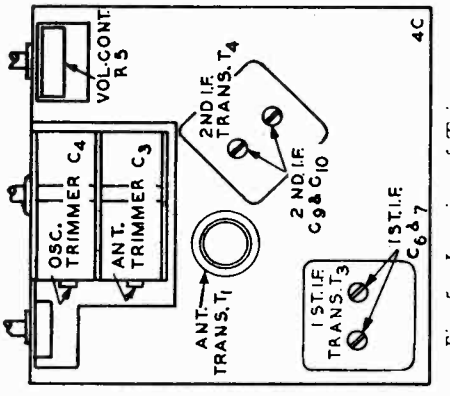


Fig. 5—*Location of Trimmers*

SPECIFICATIONS

Input Voltages and Currents	
"A" Battery	2 Volts—.3 Amperes
"B" Battery	90 Volts—11.5 to 15 Ma.
Power Output	135 Milliwatts Undistorted
Selectivity	40 KC Broad at 1000 Times Signal
Intermediate Frequency	456 KC.
Speaker	6" Magnetic
Tuning Frequency Range	528 to 1730 KC.
Sensitivity	45 Microvolts Absolute

Alignment and Calibration

Alignment Procedure

The receivers are all properly aligned at the factory with precision instruments and re-alignment should not be attempted unless all other possible causes of the faulty operation have first been investigated and unless the service technician has the proper equipment.

A signal generator which will provide an accurately calibrated signal at 456, 1730 and 1500 KC and an output indicating meter are required. It will be practically impossible to align the receiver if unsatisfactory apparatus is used.

Use a non-metallic screwdriver for the adjustments. The complete procedure is as follows:

I. F. Adjustment

Set the signal generator for a signal of 456 KC.

Connect the output of the signal generator through a .1 mf. condenser to the grid of the 1st detector. (G_{1D}).

Connect the ground lead of the radio to the ground post of the signal generator.

Turn the volume control to the maximum position.

Attenuate the signal from the signal generator to prevent the levelling-off action of the AVC.

Then adjust the four I.F. trimmers until maximum output is obtained. The adjusting screws for these condensers are reached from the top of the chassis, and the location is shown in Fig. 5.

1730 KC Adjustment

Set the signal generator for 1730 KC.

Turn the rotor of the tuning condenser to the full open position.

Connect the antenna lead of the radio through a 200 mmf. condenser to the output of the signal generator.

Adjust the oscillator trimmer (C4) until maximum output is obtained. The location of this trimmer is shown in Fig. 5.

1500 KC Adjustment

Set the signal generator for 1500 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the antenna trimmer (C3) to maximum.

Do not change the setting of the oscillator trimmer.

Dial Calibration

To obtain dial scale calibration, carefully tune in the signal of one of the larger nearby stations near the middle of the dial and set the dial pointer at the frequency of the station tuned in. When calibrated in this manner, the setting will be approximately correct at both ends of the scale.

Batteries

Batteries Required

The batteries and voltages required are shown in Figs. 2 and 3. The "A" drain is .3 amperes at 2 volts while the "B" drain is discussed below.

"B" Battery Life

The majority of potential complaints on short "B" battery life can be prevented if proper instructions are given to the customer at the time the radio is installed.

The "B" consumption will depend, to some extent, upon the strength of the incoming signal as the latter affects the AVC voltage. When no signal is being received, the "B" drain is 15 milliamperes. As the input signal increases, the AVC voltage increases and reduces the "B" drain to 11.5 milliamperes. A **milliammeter in the "B" line will quickly determine if the "B" drain is excessive or normal.**

As this radio does not have a pilot lamp, it is easy to forget to turn it off. When this happens, the radio may be on as long as 24 hours or more. A continuous drain of this kind for a long period will shorten the life of the "B" batteries considerably. **Caution the customer regarding this.**

"A" Battery and Voltage Regulator

The voltage regulator on the back panel of the chassis permits the use of any type of "A" battery delivering from 2 to 3 volts.

3 Volt Dry "A" Battery—When this type of battery is used, turn the voltage regulator pointer (See Fig. 4) to the left as far as possible. The purpose of this regulator is to reduce the voltage of the 3 volt battery to the 2 volts required by the tubes. Keep this pointer turned to the left as far as possible. Advance it one-half mark when reception gets weak. This should be about once a week if the radio is used from two to three hours per day. If it is used from four to five hours a day, it will generally be necessary to turn the pointer up one mark a week.

Caution the customers not to turn the pointer up higher than necessary as it will burn out the tubes and run down the battery. Also tell them to turn the pointer back to the starting position when a new 3 volt "A" battery is installed.

2 Volt Storage Battery—When this type of battery is used, turn the voltage regulator pointer to the position on the scale marked "2 Volt storage battery," and leave it there at all times.

Testing Batteries

If the receiver does not operate satisfactorily test the batteries under load. A high resistance meter is required for the "B" voltages. If any of the batteries are considerably below their rated voltage, new ones should be used.

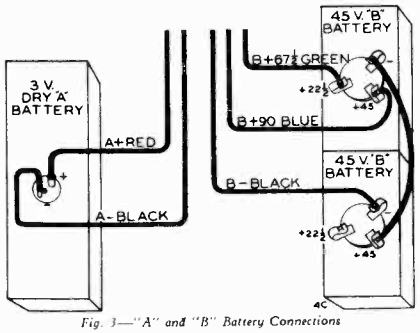


Fig. 3—"A" and "B" Battery Connections

Voltages

Check the voltages at the sockets to see if correct values are being delivered to the tubes. The antenna and ground should be disconnected and the antenna and ground leads from the set connected together. The volume control should be turned to the right or maximum position.

All of the voltage readings as shown in the chart are read with a 1,000 ohm-per-volt meter. As high a range as possible should be used. In general, the higher the resistance of the meter, the more accurate the reading will be.

The voltage chart gives the voltages with all tubes in, the speaker connected and the set in operating condition. These voltages are typical of the sets but will vary slightly with variations in individual receivers, tubes, test equipment used and battery voltages.

Tubes

The tubes used in this radio are of the 2 volt series. All of them are of the filament or directly heated types. All of them have a 2 volt filament and should not be connected to a power supply not intended for this type of tube. **Maximum filament voltage range is 1.8 to 2.0 volts. Operation of the tubes at under or over these values will be injurious to the tubes and may affect operation of the receiver.**

Replacement Parts List

RETAIL STORES: Order any parts from division superintendent at Chicago or Oakland, on stock order. Order by bin number and description. If no bin number is shown order by part number and description.

Return defective parts to division superintendent only.

There is a large letter on the chassis which identifies the set as to major part changes. When ordering parts please be sure to mention the model number and this large letter.

MISCELLANEOUS

SOCKETS

Bin No.	Part No.	Description	Selling Price
	3A247	Tube Socket (6 Prong)	$0.06
	3A248	Tube Socket (5 Prong)	.06
	3A244	Tube Socket (4 Prong)	.04

SPEAKER

9574	12A261	6" Magnetic Speaker	2.40
	13X279	Speaker Cable complete	.14

KNOBS

10823	10A98	Knobs ea.	.06

GENERAL

10065	32X32	Tube Shield (Small-Open Top)	.08
	32X63	Tube Shield (Large)	.10
	32X18	Tube Shield Base (Large)	.04
	32X30	Tube Shield Base (Small)	.04
10884	2X38	Felt Washers doz.	.02
10733	30X14	Grid Clip Only doz.	.06
10822	4A17	Single Lug Terminal Strip	.04
10526	13X214	Antenna and Ground Lead Assembly	.14
	13X277	"A" Battery Cable and Plug	.18
	13X278	"B" Battery Cable (Type without plugs—Used on early models)	.14
	13X288	"B" Battery Cable and Plugs (Used on late models)	.32
	25X301	Chassis Mounting Feet	.04
10385	2A71	On-Off Switch	.20
10824	15X86	Station Pointer	.04
9114	58X162	Dial Strip	.08

TRANSFORMERS AND COILS

Bin No.	Part No.	Code	Description	Selling Price
9123	9A702	T1	Antenna Transformer and Can Assembly	$0.50
9140	9A703	T2	Oscillator Coil and Can Assembly	.30
	9A704	T3	1st I.F. Transformer and Can Assembly	.70
	9A705	T4	2nd I.F. Transformer and Can Assembly	.70

CONDENSERS

TUBULAR

Bin No.	Part No.	Code	Capacitance	Voltage	Selling Price
11387	46X80	C2	.05 mf.	180	$0.08
10903	46X117	C8	.25 mf.	180	.12
11256	46X124	C12	.01 mf.	180	.08
11256	46X124	C16	.01 mf.	180	.08

MOLDED

10049	47X53	C5	35 mmf.		.04
10876	47X57	C11	100 mmf.		.04
10897	47X65	C14	250 mmf.		.08
10049	47X53	C15	35 mmf.		.04
10508	47X61	C17	500 mmf.		.08

ELECTROLYTIC

10851	45X212	C13	4.0 mf.	100 Dry	.32

TRIMMER

	C3	Antenna Trimmer		
	C4	Oscillator Trimmer		Part of Gang Condenser
	C6	70-150 mmf.		
17A51	C7	40-100 mmf.	1st I.F. Trimmers	.18
	C9	40-100 mmf.		
17A51	C10	70-150 mmf.	2nd I.F. Trimmers	.18

MISCELLANEOUS

9158	14A63	2 Gang Condenser Only		1.06

RESISTORS

CARBON

Bin No.	Part No.	Code	Resistance	Wattage	Selling Price
10968	A95104	R1	100,000 Ohm	0.2 Watt	$0.06
11062	A94605	R3	6.0 Megohm	0.2 Watt	.08
11086	A94205	R4	2.0 Megohm	0.2 Watt	.08
11087	A94151	R6	150 Ohm	0.2 Watt	.08
11005	A94101	R7	100 Ohm	0.2 Watt	.08
11086	A95205	R8	2.0 Megohm	0.2 Watt	.06
11188	A95105	R9	1.0 Megohm	0.2 Watt	.06
11097	A95204	R10	200,000 Ohm	0.2 Watt	.06

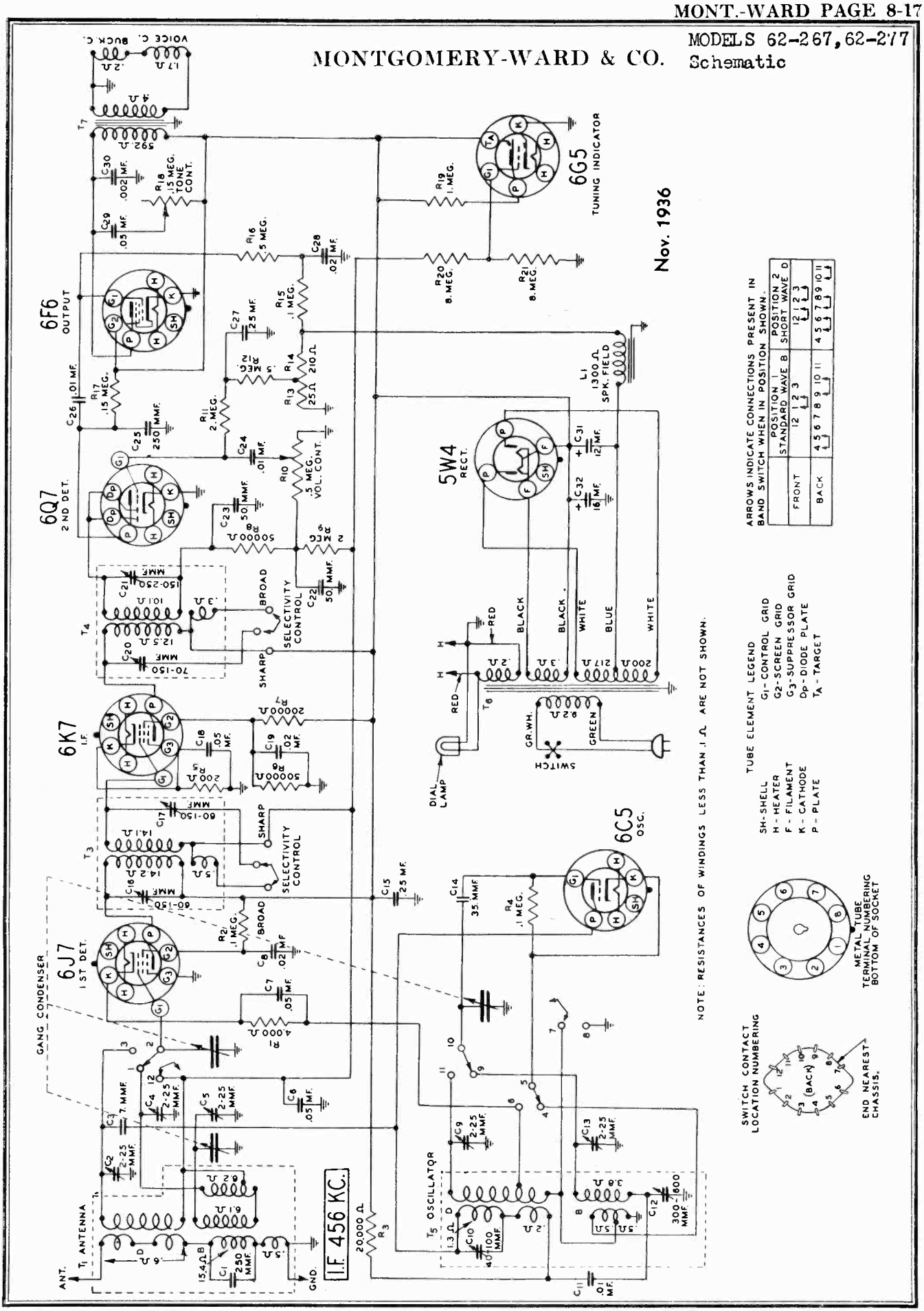
VARIABLE

11069	43X70	R2	5.2 Ohm	Filament Rheostat (Voltage Regulator) .22
10218	34X229	R5	1.0 Megohm	Volume Control .32

Prices subject to change without notice

MODELS 62-267, 62-277

MONTGOMERY-WARD & CO. Schematic



MODELS 62-267, 62-277
Trimmers, Socket Voltage, Coils

MONTGOMERY-WARD & CO.

Power Consumption - 60 Watts (At 115 volts 60 cycles)
Power Output - - - - - - 2.5 Watts Undistorted
Selectivity - 30 KC Broad at 1000 times Signal (Sharp)
Intermediate Frequency - - - - - - - - 456 KC
Speaker - - - - - - - - - - - - - 8" Dynamic

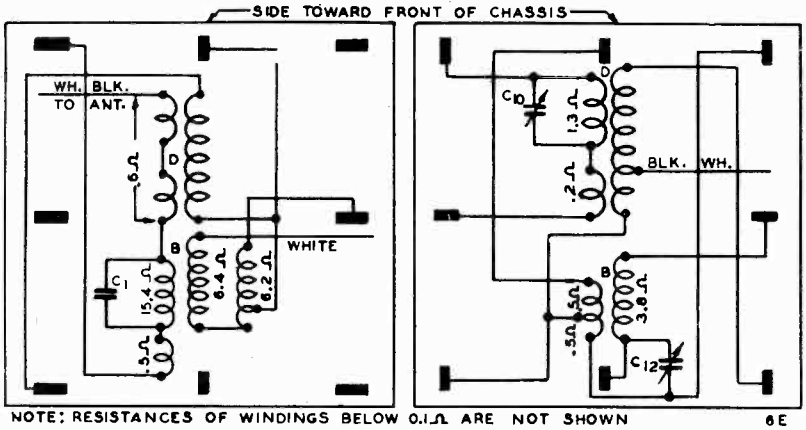
Tuning Frequency Range

B Range..... 528 to 1730 KC
D Range.....5750 to 18300 KC

Sensitivity

B Range.....4 to 5 Microvolts Absolute
D Range.....5 to 6 Microvolts Absolute

ANTENNA TRANS. T_1



OSC. TRANS. T_5

Fig. 6—R.F. and Oscillator Coil Base Terminal Arrangement and D.C. Resistance of Windings.

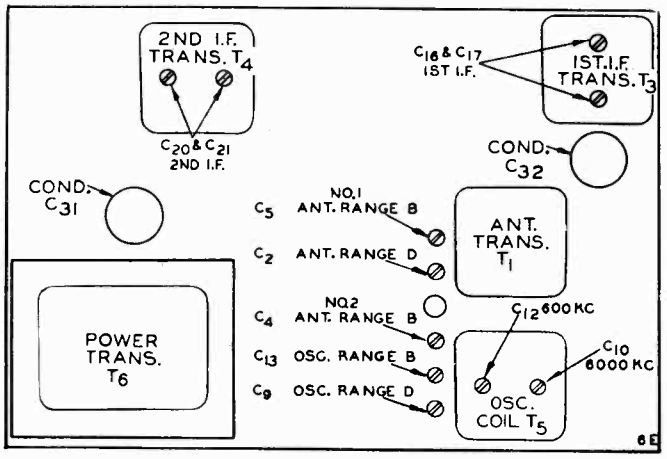


Fig. 3—Location of Trimmers

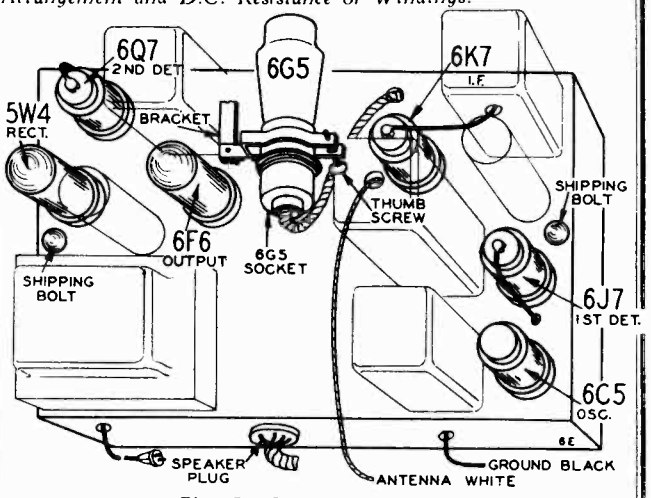


Fig. 5—Location of Tubes

VOLTAGES AT SOCKETS

Line Voltage: 115
Volume Control: Maximum

Antenna Shorted to Ground
Position of Band Switch: Standard Wave

TUBE	FUNCTION	VOLTAGE BETWEEN SOCKET PRONGS AND GROUND (Unless otherwise indicated)							
		Prong No. 1	Prong No. 2	Prong No. 3	Prong No. 4	Prong No. 5	Prong No. 6	Prong No. 7	Prong No. 8
6J7	1st Det.	0	6.1(1)	220	130	0		6.1(1)	9
6C5	Osc.	0	6.1(1)	140		0		6.1(1)	0
6K7	I.F.	0	6.1(1)	220	125	2.1		6.1(1)	2.1
6Q7	1st A.F.-2nd Det.	0	6.1(1)	110	0	0		6.1(1)	0(2)
6F6	Power	0	6.1(1)	200	220	12(3)		6.1(1)	0
5W4	Rectifier	0	4.9(4)		615(5)		615(5)		4.9(4)
6G5	Tuning Indicator	Plate to Ground 20		Target to Ground 220		Cathode to Ground 0		Across Heater 6.1	

(1) A. C. voltage as read across heater terminals 2 and 7.
(2) Bias (1.3 volts) as read across resistor R13.
(3) Bias voltage as read across resistor R13 and R14.
(4) A.C. voltage as read across filament terminals 2 and 8.
(5) A.C. voltage as read across terminals 4 and 6.

Alignment and Calibration

Correct alignment is extremely important in connection with standard and short wave radios. The receivers are all properly aligned at the factory with precision instruments and re-alignment should not be attempted unless all other possible causes of the faulty operation have first been investigated and unless the service technician has the proper equipment.

A signal generator which will provide an accurately calibrated signal at 456, 1730, 1500, 600, 18,300, 15,000 and 6000 KC and an output indicating meter are required. It will be practically impossible to align the receiver if unsatisfactory apparatus is used.

Use a non-metallic screwdriver for the adjustments. The complete procedure is as follows:

I. F. Adjustment

Set the signal generator for a signal of 456 KC.

Connect the output of the signal generator through a .1 mf. condenser to the grid of the 1st detector.

Connect the ground lead of the radio to the ground post of the signal generator.

Turn the band switch to the Range B position (standard wave band).

Turn the selectivity control to the sharp position and keep it in this position for all adjustments.

Turn the volume control to the maximum position.

Attenuate the signal from the signal generator to prevent the levelling-off action of the AVC.

Then adjust the four I.F. trimmers until maximum output is obtained. The adjusting screws for these condensers are reached from the top of the chassis, and the location is shown in Fig. 3.

Range B Alignment

After the procedure for the alignment of each range, as explained below, is completed, it is advisable to repeat the procedure as a final check.

1730 KC Adjustment

Set the signal generator for 1730 KC.

Turn the rotor of the tuning condenser to the full open position.

Keep the band switch in the standard wave position.

Connect the antenna lead of the radio through a 200 mmf. condenser to the output of the signal generator.

For this and all subsequent adjustments keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent AVC action.

Adjust the oscillator Range B trimmer (C13) until maximum output is obtained. The location of this trimmer is shown in Fig. 3.

1500 KC Adjustment

Set the signal generator for 1500 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Loosen the two screws inside of the film drum at the bottom which hold the drum in place. Set the drum at the 1500 KC mark and retighten the screws.

Adjust the antenna Range B trimmers (C4) and (C5) to maximum.

Do not change the setting of the oscillator Range B trimmer.

Turn the band switch to the Range D position (short wave band).

Adjust the oscillator Range D trimmer (C9) until maximum output is obtained. See Fig. 3 for location of this trimmer.

15,000 KC Adjustment

Set the signal generator for 15,000 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the antenna Range D trimmer (C2) to maximum.

When adjusting this trimmer, it will be necessary at the same time to turn the tuning condenser rotor slowly back and forth until the peak of greatest intensity is obtained.

600 KC Adjustment

Set the signal generator for 600 KC.

Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 600 KC trimmer (C12) until the peak of greatest intensity is obtained. See Fig. 3 for location of this trimmer.

Range D Alignment

CAUTION—When aligning the short wave band be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 15,000 KC. The signal will then be heard at 15,000 on the dial of the radio. The image signal, which is much weaker, will be heard at 15,000 less 912 KC, or 14,088 KC. It may be necessary to increase the input signal to hear the image.

18,300 KC Adjustment

Set the signal generator for 18,300 KC.

Connect the antenna lead of the receiver through a 400 ohm resistor to the output of the signal generator.

Turn the rotor of the tuning condenser to the full open position.

Do not change the setting of the oscillator Range D trimmer.

6000 KC Adjustment

Set the signal generator for 6000 KC.

Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 6000 KC trimmer (C10) until the peak of greatest intensity is obtained. See Fig. 3 for location of this trimmer.

Trimmer Replacement

If one trimmer of the gang trimmer strip should become defective, it is not necessary to replace the entire strip. A single trimmer 17A36, as shown in the replacement parts list, may be used. Disconnect the lead from the coil side (side not grounded) of the defective trimmer in the strip. This connection is then made to the single trimmer. Connect it to the side of the trimmer not in contact with the adjusting screw. The other side of the single trimmer is then connected to a good ground, using a piece of heavy wire in order to support the trimmer adequately. In replacing a trimmer, be sure to keep both leads as short as possible and keep the ungrounded lead as far from ground as possible.

Twenty-five Cycle Radios

The twenty-five cycle model differs from the sixty cycle model only in the fact that a different power transformer is used. The correct power transformer is shown in the parts list.

The twenty-five cycle receiver can be operated satisfactorily from a sixty cycle power supply. However, the reverse is not true, the sixty cycle receiver cannot be operated from a twenty-five cycle power supply.

A 115-230 volt, 40 to 60 cycle as well as other power transformers with special power ratings are also available for this model.

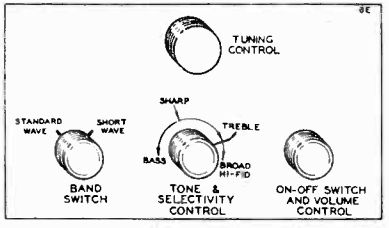


Fig. 1—Arrangement of Controls

Circuit

This model is a two band radio with a tuning range in each band as shown in the specifications above. Two band coverage is accomplished by means of two sets of R.F. and oscillator coils and a single section double throw switch.

Referring to the schematic circuit diagram, Fig. 2, T1 and T5 are the antenna transformer and oscillator coil assemblies. The standard wave and short wave coils are indicated by the letters B and D respectively.

The band switch completes connections to the coils in use. When it is in the Range B position, a double tuned antenna R.F. stage is used while for the D Range, a single tuned secondary is used. A type 6J7 tube functions as the 1st detector.

A separate type 6C5 tube is employed in the oscillator circuit. The oscillating circuit is always resonant at 456 KC above the frequency to which the R.F. amplifier is tuned.

The oscillator potential is fed into the cathode circuit of the 6J7 1st detector tube. As a result of the beating of the two frequencies, the intermediate or beat frequency of 456 KC is present in the plate circuit of this tube.

One stage of I.F. amplification is employed using a 6K7 tube. The primaries and secondaries of the first and second I.F. transformers are tuned by small trimmer condensers.

Referring to the 1st and 2nd I.F. transformers, T3 and T4, in Fig. 2, it will be noted that there is a coupling winding shown below the primary of T3 and below the secondary of T4.

When the selectivity control is in the sharp position, the coupling windings are open circuited and the loose coupling which exists between the primary and secondary of these transformers results in high selectivity.

When the selectivity control is in the broad position, the coupling winding which is wound under the primary in the case of T3 is connected in series with the secondary. In the case of T4, the coupling winding which is wound under the secondary is in series with the primary. This provides overcoupling which results in a greatly widened resonance curve. Passage of a wide range of audio frequencies is thus obtained.

A type 6Q7 duo-diode triode tube functions as the 2nd detector and a one stage amplifier. AVC voltage is applied through isolating resistors to the control grid circuits of the 1st detector and I.F. tubes. The audio voltage developed across volume control resistor R10 is applied through the movable arm to the control grid of the 6Q7 tube.

Resistance coupling is used between the first audio stage and the output stage which employs a type 6F6 output pentode tube. A type 5W4 full wave rectifier is used in the power unit.

The 6G5 tuning indicator tube is wired as shown in the schematic. The action of this tube is described in other service manuals as well as in current literature and will not be repeated here.

MODELS 62-267, 62-277
Movie Dial Data

MONTGOMERY-WARD & CO.

Fig. 7—Effect of Lens Focus

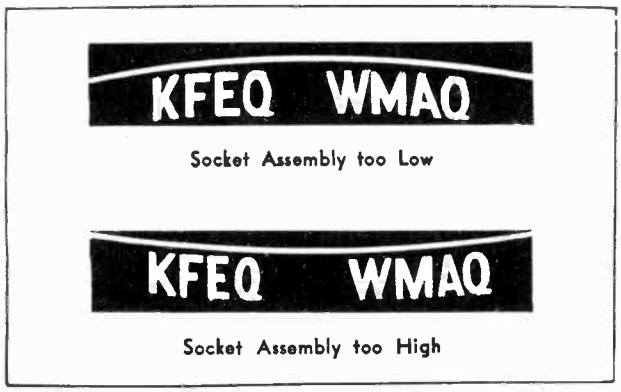


Fig. 8—Effect of Lamp Socket Assembly Height

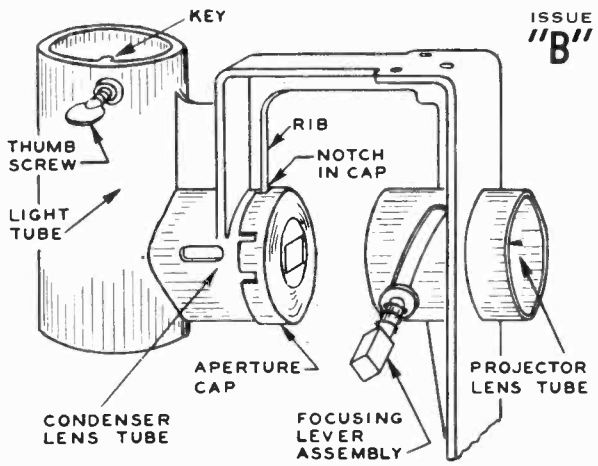


Fig. 10—Issue "B" Lens and Light Bracket

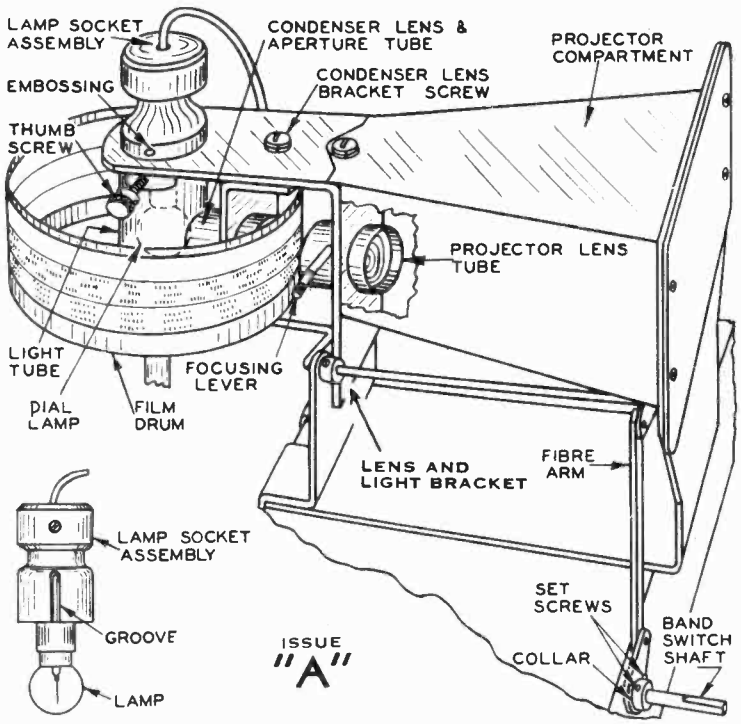


Fig. 9—Details of Movie Dial

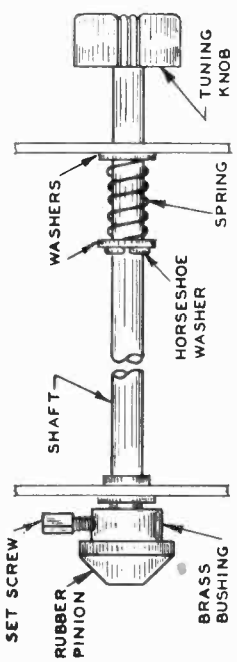


Fig. 11—Drive Shaft Assembly

FOR ADDITIONAL DATA ON MOVIE DIAL, SEE INDEX

Movie Dial Adjustments and Replacements

Issue Letter of Radio

The issue letter is the large letter appearing on the under side of the chassis which identifies the chassis as to major part changes. There are two distinct types of chassis known as Issue A and Issue B. The adjustments, as decribed in the following paragraphs, cover both issues unless otherwise specified.

A chassis bearing the issue letter "A" may be further identified by the die stamped Light and Projector Lens Bracket and the separate die stamped Condenser Lens and Aperture Bracket. See Fig. 9.

The chassis bearing the issue letter "B" may be further identified by a die cast combination Lens, Light and Aperture Bracket. See Fig. 10.

Bringing Lens Adjustment to a Focus

Important—Turn the band switch to the standard wave position.

Move the focusing lever (see Fig. 9) up or down until the image on the screen is clearest. In Fig. 7 is shown the effect of correct and incorrect focusing.

Replacing and Positioning the Dial Lamp

Caution—If a new lamp is required, use only a G. E. lamp, Wards catalogue No. 61P8204. Get this from your nearest Ward store or Ward Mail Order House.

First, turn the radio off.

Loosen the thumb screw and lift the lamp socket assembly out of the light tube—see Fig. 9. This can be lifted vertically by grasping the insulated top of the assembly through which the wire runs.

Remove the old lamp from the socket and put in the new one.

Replace the lamp socket assembly in the light tube with the light tube embossing in the groove of the lamp socket assembly—see Fig. 9. Do not tighten the thumb screw yet.

Turn the radio on.

Then grasp the top of the lamp socket assembly and move it up or down until the image on the screen is clearest and the lines are horizontal. The effect of having the lamp assembly too high or low is shown in Fig. 8. Tighten the thumb screw.

Dial Calibration

The radio is properly calibrated if, when a station is correctly tuned in, the vertical red line on the screen crosses the call letters of that station. If the red line is found to be on one side of the call letters of a large number of stations on the standard wave band (the same side in each case), the dial is out of calibration.

To re-calibrate, carefully tune in the signal of one of the larger nearby stations in accordance with the instructions under "Tuning in a Signal." Choose a station which is near the middle of the dial. Loosen the two screws seen at the inside of the film drum at the bottom. Adjust the position of the drum and tighten the screws.

The dial will then be properly calibrated and this adjustment should not be changed unless re-calibration again becomes necessary. It should be remembered that after calibration a few stations may be tuned in when the vertical red line is near one end or the other of the call letters and city of a station. That is because of slight variations in the film.

Adjusting Film Drum Position to Raise or Lower Image

If the raising and lowering mechanism is not adjusted properly, the image will be too high or too low on the screen and part of the image may be cut off.

If this condition exists, turn the radio on and turn the band switch to the standard wave position. Then loosen the two set screws in the collar on the band switch shaft—See Fig. 9. Move the elevator assembly up or down by means of the fibre arm until the image on the screen is centered from top to bottom. Then tighten the two set screws.

Cleaning the Lenses

It is very seldom necessary to clean the lenses. Occasionally, however, dust or dirt on the lens may cause the image on the screen to be spotted or foggy. If this is the case, the lenses may be removed as explained below and may then be cleaned by wiping carefully with a clean chamois or soft cloth.

Removing Condenser Lens—Remove the four screws which hold the projector compartment and glass screen to the glass screen mounting bracket. Remove the screw at the top and back of the projector compartment. See Fig. 9. Lift the projector compartment up and away from the chassis. Remove the screw from the bottom of the lens and light bracket and take out this bracket, being careful not to scratch the film.

Issue A—Remove the condenser lens bracket from the lens and light bracket—See Fig. 9. The lens can then be cleaned without removal, or it may be forced out of the tube with a wood block. After the lens has been cleaned, reinsert it in the lens tube until the end of the lens barrel is about $\frac{1}{16}$ inch inside the tube.

Issue B—Remove the aperture cap—See Fig. 10. Insert a fine blade screw driver into the slot and then push the condenser lens away from the light tube until it is possible to remove the lens. Clean the lens carefully. Replace the lens so that the lens barrel projects about 1/32 inch beyond the lens tube. Replace the aperture cap so that the square notch of the aperture cap fits over the square rib as illustrated.

Removing Projector Lens—Remove the projector compartment and lens and light bracket as explained in the first paragraph of the article "Removing Condenser Lens."

The projector lens may then be removed by first unscrewing the focusing lever assembly (Issue A radios have focusing lever only). Then push the lens barrel out of the projector lens tube. Clean the lens carefully. Replace the lens barrel so that the threaded hole will coincide with the slot opening of the bracket. Replace the focusing lever assembly.

Reassembling—Replace the lens and light bracket taking care not to scratch the inside of the film.

Replace the projector compartment, glass screen and dial lamp assembly.

When replacing the glass screen, the glass is put on with the frosted side toward the inside of the assembly.

Refocus the projector lens.

Cleaning the Film and Glass Screen

As in the case of the lenses, it is very seldom necessary to clean the film or glass screen. If, however, the image on the screen is spotted or foggy, it may be necessary to clean these items as explained below.

Film—The film may be dusted with a camel hair brush or fine cloth. CAUTION—Extreme care must be taken not to scratch the film.

Glass Screen—If the screen should become dirty, the front may be cleaned by wiping with a clean, dry cloth. If the back of the screen becomes dirty, it should be cleaned with alcohol. Care should be taken not to get any alcohol on the red line at the front of the screen.

Replacing the Film Drum Assembly

Remove the lamp socket assembly from the light tube by lifting it out in accordance with instructions in "Replacing and Positioning the Dial Lamp."

Remove the glass screen, projector compartment and lens and light bracket as described in the article "Removing Condenser Lens."

Remove the film drum assembly by unscrewing the two small screws located inside the drum at the bottom.

Mount the new film drum assembly on the film drum supports leaving the paper around the film for protection, and insert the clamping plate within the film drum. The film drum and clamping plate should then be so placed that the small screws are in the center of the two slots.

Replace the lens and light bracket taking care not to scratch the inside of the film.

Replace the projector compartment, glass screen and dial lamp assembly.

Now remove the paper from the film, turn the radio on and calibrate the dial in accordance with the instructions in the article "Dial Calibration."

The film and mounting drum are sold as one assembly and cannot be ordered separately.

Replacing Rubber Friction Drive Pinion

Loosen the set screw on the brass bushing which holds the rubber pinion—See Fig. 11. Push out the small horseshoe washer on the tuning shaft in back and below the glass screen. Pull the tuning shaft from the front until the brass bushing may be removed. Place the new rubber pinion over the brass bushing and replace the bushing on the tuning shaft. Tighten the set screw on the brass bushing after the bushing has been returned to its original position Replace the horseshoe washer.

Replacing Friction Drive Drum

If it is ever necessary to replace the friction drive drum, be sure that the stop on the drum hits the stop on the condenser before the gang rotor is either completely meshed or completely open (maximum or minimum position).

MODELS 62-310, 62-410
Battery Data

MONTGOMERY-WARD & CO.

Caution the customers not to turn the pointer up higher than necessary as it will burn out the tubes and run down the battery. Also tell them to turn the pointer back to the starting position when a new 3 volt "A" battery is installed.

2 Volt Storage Battery—When this type of battery is used, turn the voltage regulator pointer to the position on the scale marked "2 Volt storage battery", and leave it there at all times.

"A" Battery (Models without Voltage Regulator)

These models are designed for use with a 2 volt storage battery. Any other battery of higher voltage, if connected directly, will damage the tubes.

Air Cell "A" Battery—If this type of battery is used, a series resistor will be required to reduce the voltage to the proper level of 2 volts for the tube filaments.

Testing Batteries

If the receiver does not operate satisfactorily test the batteries under load. A high resistance meter is required for the "B" and "C" voltages. If any of the batteries are considerably below their rated voltage, new ones should be used. When the "B" batteries are replaced the "C" battery should also be replaced. The reason for this is that the "C" drain is such that the "C" battery is run down in about the same time as the "B" batteries.

Fig. 4—3 V. Dry "A" Battery Connections

Fig. 5—"A" Battery Voltage Regulator

Batteries Required

The batteries and voltages required are shown in Figs. 2 and 3. The "A" drain is .6 amperes at 2 volts while the "B" drain is discussed below.

"B" Battery Life

The majority of potential complaints on short "B" battery life can be prevented if proper instructions are given to the customer at the time the receiver is installed.

Class "B" amplification is used in the output stage and the "B" battery consumption will, therefore, depend upon the output volume. The "B" consumption will also depend, to some extent, upon the strength of the incoming signal as the latter affects the AVC voltage. When no signal is being received the "B" drain is 21 milliamperes. When the volume control is at maximum and with high output volume, the "B" drain can become 47 milliamperes. **A milliammeter in the "B" line will quickly determine if the "B" drain is excessive or normal.**

As the dial lamp is not turned on except when tuning in a station, it is easy to forget to turn the radio off. When this happens, the radio may be on as long as 24 hours or more. A continuous drain of this kind for a long period will shorten the life of the "B" batteries considerably. **Caution the customer regarding this.**

"C" Battery

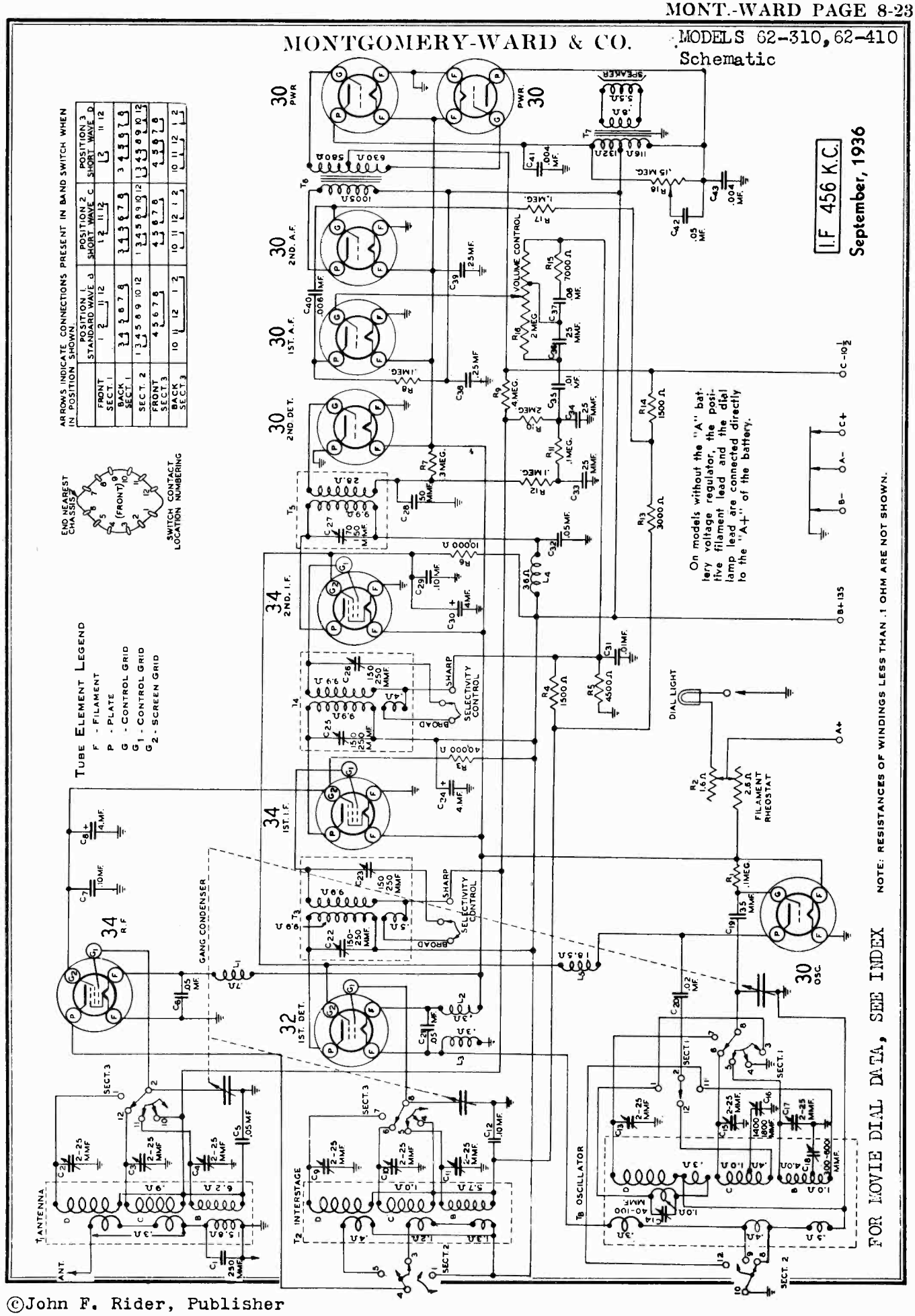
Any special "C" battery may be used from which a 10½ volt connection can be obtained. It is connected as shown in Fig. 3.

"A" Battery (Models with Voltage Regulator)

Models equipped with the voltage regulator on the back panel of the chassis may use any type of "A" battery delivering from 2 to 3 volts.

3 Volt Dry "A" Battery—When this type of battery is used, turn the voltage regulator pointer (See Fig. 5) to the left as far as possible. The purpose of this regulator is to reduce the voltage of the 3 volt battery to the 2 volts required by the tubes. Keep this pointer turned to the left as far as possible. Advance it one-half mark when reception gets weak. This should be about once a week if the radio is used from two to three hours per day. If it is used from four to five hours a day, it will generally be necessary to turn the pointer up one mark a week.

Fig. 3—"A", "B" and "C" Battery Connections



MODELS 62-310, 62-410
Socket, Trimmers, Coils
Voltage, Sensitivity

MONTGOMERY-WARD & CO.

SPECIFICATIONS

Input Voltages and Currents

"A" Battery	2 Volts—.6 Amperes
"B" Batteries	135 Volts—21 to 47 Ma.
"C" Battery	10½ Volts

Power Output - - - - 1.4 Watts Undistorted

Selectivity - 21 KC Broad at 1000 times Signal (Sharp)

Intermediate Frequency - - - - - - - 456 KC

Speaker - - - - - - - - - 8" P. M. Dynamic

Tuning Frequency Range

B Range	528 to 1730 KC.
C Range	1710 to 5800 KC.
D Range	5750 to 18300 KC.

Sensitivity

B Range	1 to 3 Microvolts Absolute
C Range	1 to 4 Microvolts Absolute
D Range	1 to 7 Microvolts Absolute

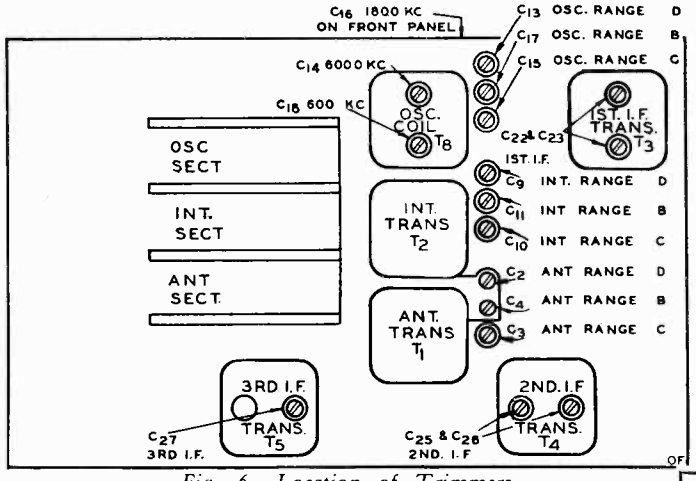


Fig. 6—Location of Trimmers

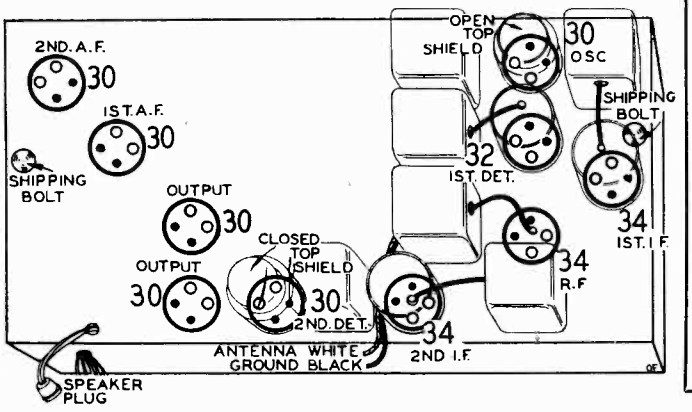


Fig. 7—Location of Tubes

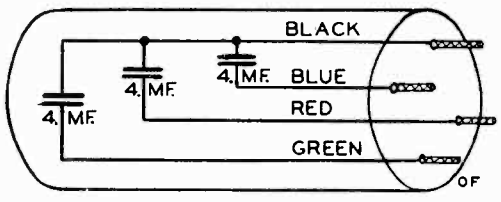


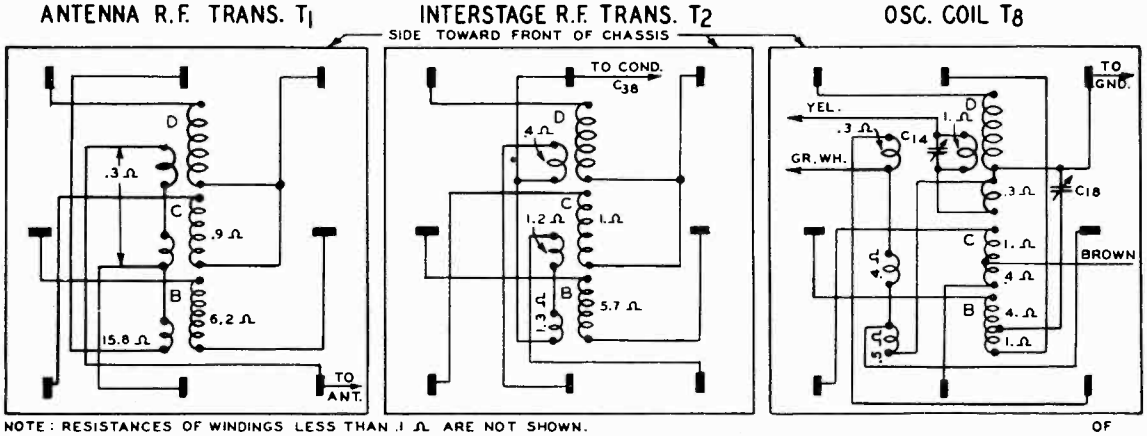
Fig. 9—Electrolytic Condenser Internal Connections

VOLTAGES AT SOCKETS

Volume Control at Maximum — Antenna Shorted to Ground
Band Switch in Standard Wave Position

Type of Tube	Function	Across Filament	Plate to Ground	Screen to Ground	Control Grid to Ground
34	R. F.	2.0	135	65	
32	1st Det.	2.0	135	90	6
30	Osc.	2.0	90		
34	1st I. F.	2.0	135	65	
34	2nd I. F.	2.0	135	90	4.5
30	2nd Det.	2.0			
30	1st A. F.	2.0	75		4.5(1)
30	2nd A. F.	2.0	132		9 (2)
30	Power	2.0	135		10.5

(1) Volume control at minimum setting.
(2) As read from connection between R13 and R14, and ground.



NOTE: RESISTANCES OF WINDINGS LESS THAN .1 Ω ARE NOT SHOWN.

Fig. 8—R. F. and Oscillator Coil Base Terminal Arrangement and D. C. Resistance of Windings

Alignment and Calibration

Alignment Procedure

Correct alignment is extremely important in connection with all wave radios. The receivers are all properly aligned at the factory with precision instruments and realignment should not be attempted unless all other possible causes of the faulty operation have first been investigated and unless the service technician has the proper equipment.

A signal generator that will provide an accurately calibrated signal at 456, 1730, 1500, 600, 5800, 5000, 1800, 18,300, 15,000 and 6000 KC and an output indicating meter are required. It will be practically impossible to align the receiver if unsatisfactory apparatus is used.

Use a non-metallic screwdriver for the adjustments. The complete procedure is as follows:

I. F. Adjustment

Set the signal generator for a signal of 456 KC.

Connect the output of the signal generator through a .1 mf. condenser to the grid of the 1st detector.

Connect the ground lead of the receiver to the ground post of the signal generator.

Turn the band switch to the Range B position (standard wave band).

Turn the selectivity control to the sharp position and keep it in this position for all adjustments.

Turn the volume control to the maximum position.

Attenuate the signal from the signal generator to prevent the levelling-off action of the AVC.

Then adjust the five I.F. trimmers until maximum output is obtained. The adjusting screws for these condensers are reached from the top of the chassis and the location is shown in Fig. 6.

Range B Alignment

After the procedure for the alignment of each range, as explained below, is completed, it is advisable to repeat the procedure as a final check.

1730 KC Adjustment

Set the signal generator for 1730 KC.

Turn the rotor of the tuning condenser to the full open position.

Keep the band switch in the standard wave position.

Connect the antenna lead of the receiver through a 200 mmf. condenser to the output of the signal generator.

For this and all subsequent adjustments keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent AVC action.

Adjust the oscillator Range B trimmer (C17) until maximum output is obtained. The location of this trimmer is shown in Fig. 6.

1500 KC Adjustment

Set the signal generator for 1500 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Turn the calibration screw (under color filter) until the 1500 KC mark on the dial scale is at the vertical red line on the screen. If the film drum cannot be turned a sufficient amount by means of the calibration screw, loosen the 2 screws inside the drum which hold it in place. Adjust the position of the drum and tighten the screws. The early models do not have the calibration screw mentioned above. These models must be adjusted by loosening the drum screws.

Adjust the interstage Range B trimmer (C11) and antenna Range B trimmer (C4) to maximum.

Do not change the setting of the oscillator Range B trimmer.

600 KC Adjustment

Set the signal generator for 600 KC.

Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth, at the same time adjusting the 600 KC trimmer, until the peak of greatest intensity is obtained. See Fig. 6 for location of this trimmer.

Range C Alignment

CAUTION—When aligning the short wave bands be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 5000 KC. The signal will then be heard at 5000 KC on the dial of the radio. The image signal, which is much weaker, will be heard at 5000 less 912 KC, or 4088 KC. It may be necessary to increase the input signal to hear the image.

5800 KC Adjustment

Set the signal generator for 5800 KC.

Connect the antenna lead of the receiver through a 400 ohm resistor to the output of the signal generator.

Turn the rotor of the tuning condenser to the full open position.

Turn the band switch to the Range C position (first short wave band).

Adjust the oscillator Range C trimmer (C15) until maximum output is obtained. See Fig. 6 for location of this trimmer.

5000 KC Adjustment

Set the signal generator for 5000 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the interstage Range C trimmer (C10) and antenna Range C trimmer (C3) to maximum.

Do not change the setting of the oscillator Range C trimmer.

1800 KC Adjustment

Set the signal generator for 1800 KC.

Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth, at the same time adjusting the 1800 KC trimmer, until the peak of greatest intensity is obtained. See Fig. 6 for location of this trimmer.

Range D Alignment

18,300 KC Adjustment

Set the signal generator for 18,300 KC.

Keep the antenna lead of the receiver connected through the 400 ohm resistor to the output of the signal generator.

Turn the rotor of the tuning condenser to the full open position.

Turn the band switch to the Range D position (second short wave band).

Adjust the oscillator Range D trimmer (C13) until maximum output is obtained. See Fig. 6 for location of this trimmer.

15,000 KC Adjustment

Set the signal generator for 15,000 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the interstage Range D trimmer (C9) and antenna Range D trimmer (C2) to maximum.

When adjusting the interstage and antenna Range D trimmers, it will be necessary at the same time to turn the tuning condenser rotor slowly back and forth until the peak of greatest intensity is obtained.

Do not change the setting of the oscillator Range D trimmer.

6000 KC Adjustment

Set the signal generator for 6000 KC.

Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth, at the same time adjusting the 6000 KC trimmer, until the peak of greatest intensity is obtained. See Fig. 6 for location of this trimmer.

General Service Data

Tubes

The tubes used in this receiver are of the 2 volt series. All of them are of the filament or directly heated types. All of them have a 2 volt filament and should not be connected to a power supply not intended for this type of tube. **Maximum filament voltage range is 1.8 to 2.0 volts. Operation of the tubes at under or over this value will be injurious to the tubes and may affect operation of the receiver.**

Voltages

Check the voltages at the sockets to see if correct values are being delivered to the tubes. The antenna and ground should be disconnected and the antenna and ground leads from the set connected together. The volume control should be turned to the right or maximum position.

All of the voltage readings as shown in the chart are read with a 1,000 ohm-per-volt meter. As high a range as possible should be used. In general, the higher the resistance of the meter, the more accurate the reading will be.

The voltage chart gives the voltages with all tubes in, the speaker connected and the set in operating condition. These voltages are typical of the sets but will vary slightly with variations in individual receivers, tubes, test equipment used and battery voltages.

Switch Contact Location Numbering

A standard arrangement for switch contact location numbering has been adopted, This numbering is illustrated in Fig. 2. In contact locations not used, the number applying to that particular location is not employed.

Trimmer Replacement

If one trimmer of the gang trimmer strip should become defective, it is not necessary to replace the entire strip. A single trimmer P-17A36, as shown in the replacement parts list, may be used. Disconnect the lead from the coil side (side not grounded) of the defective trimmer in the strip. This connection is then made to the single trimmer. Connect it to the side of the trimmer not in contact with the adjusting screw. The other side of the single trimmer is then connected to a good ground, using a piece of heavy wire in order to support the trimmer adequately. In replacing a trimmer, be sure to keep both leads as short as possible and keep the ungrounded lead as far from ground as possible.

Planetary Drive Assembly

The planetary assembly is the unit that is integral with the tuning shaft.

If the nut on the back end of this assembly is too tight, the drive will be jerky and will turn hard in high speed. If this condition exists, back off this nut one or two turns and note the effect.

If this nut is too loose, the drive will slip in slow speed. The remedy in this case, of course, is to tighten the nut.

Should the condenser drive cord slip when the planetary pulley is turning, inspect the tuning condenser, drive drum and film drum to see if they are turning properly or if they are being obstructed in some way.

If the drive turns unevenly (rough in spots), this may mean that the planetary assembly is defective or damaged internally and a new unit will be required.

Dial and Drive Assembly

Complete information regarding the movie dial and drive assembly will be found in the Movie Dial Manual No. 108.

MODELS 62-313, 62-314
Voltage, Socket, Coils
Trimmers, Phono data

MONTGOMERY-WARD & CO.

Power Consumption - 170 Watts (At 115 volts 60 cycles)

Power Output - - - - - - 20 Watts Undistorted

Selectivity - 19 KC Broad at 1000 times Signal (Sharp)

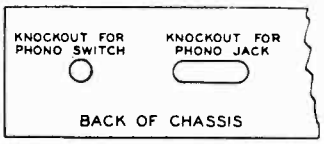
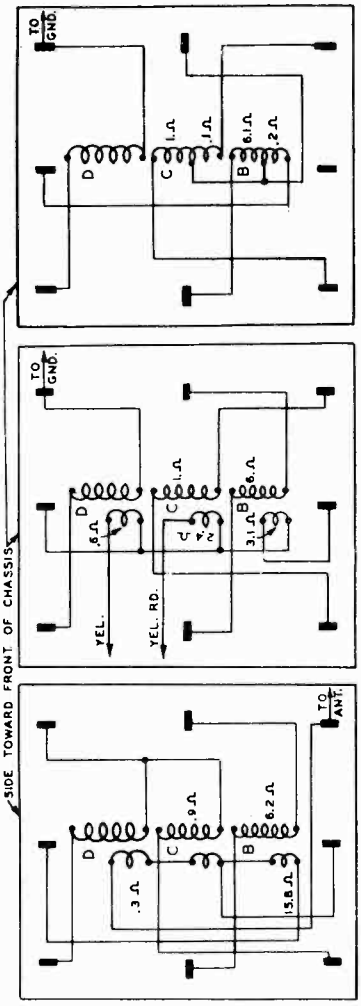
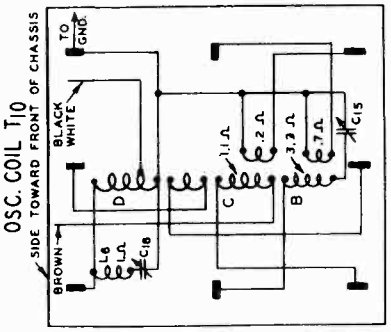


Fig. 8—Location of Phono Knockouts



NOTE: RESISTANCES OF WINDINGS LESS THAN 1 Ω ARE NOT SHOWN.



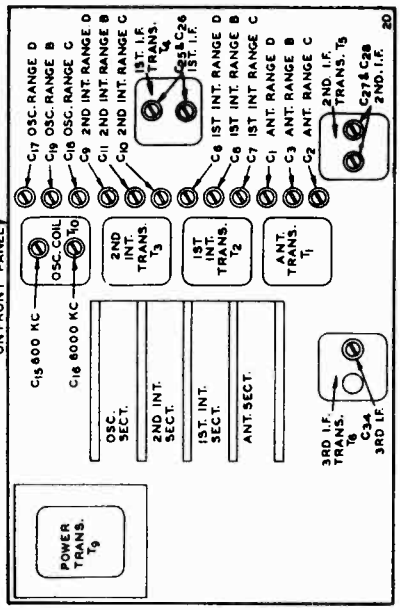


Fig. 6—R.F. and Oscillator Coil Base Terminal Arrangement and D.C. Resistance of Windings

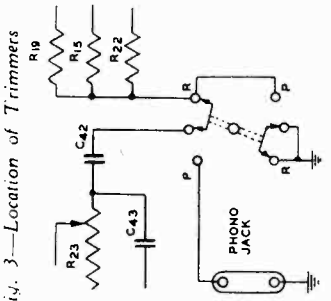


Fig. 3—Location of Trimmers

Fig. 7—Phonograph Connections

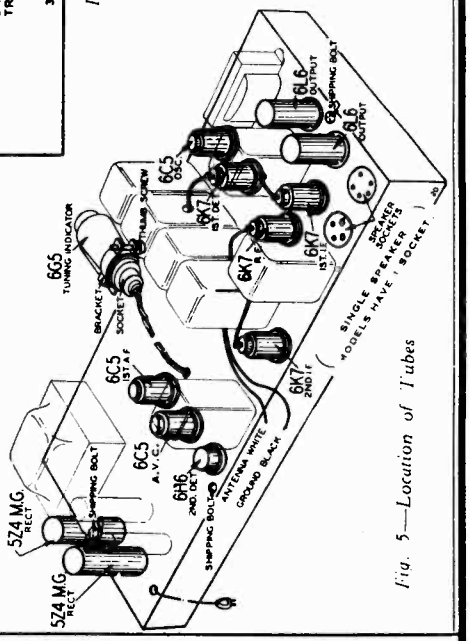


Fig. 5—Location of Tubes

Line Voltage: 115
Volume Control: Maximum

Antenna Shorted to Ground
Position of Band Switch: Standard Wave

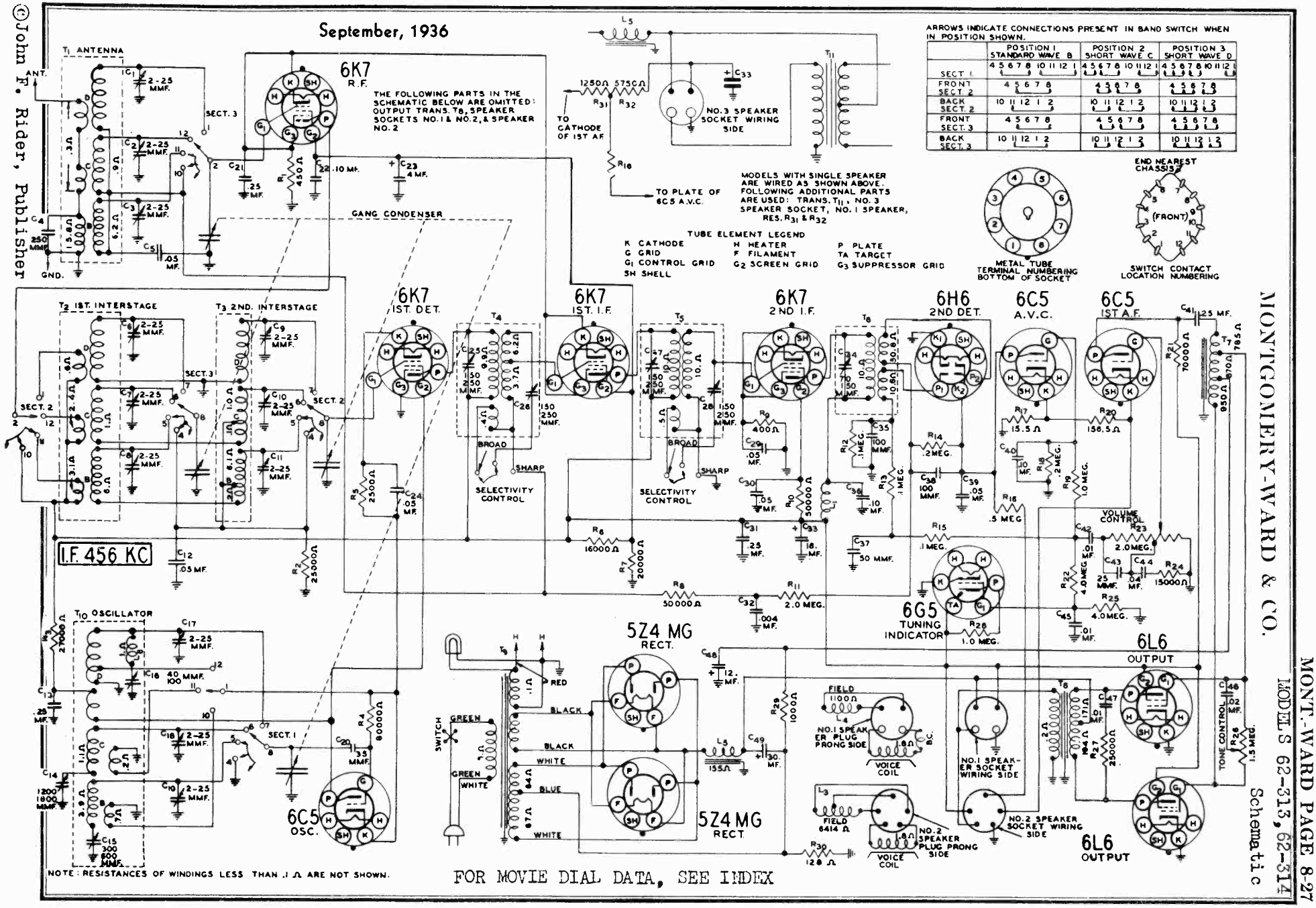
TUBE	FUNCTION	VOLTAGE BETWEEN SOCKET PRONGS AND GROUND (Unless otherwise indicated)							
		Prong No. 1	Prong No. 2	Prong No. 3	Prong No. 4	Prong No. 5	Prong No. 6	Prong No. 7	Prong No. 8
6K7	R.F.	0	6.2(1)	250	110	7.5(2)		6.2(1)	7.5(2)
6K7	1st Det.	0	6.2(1)	250	110			6.2(1)	9.0
6C5	Osc.	0	6.2(1)	110				6.2(1)	
6K7	1st I.F.	0	6.2(1)	250	110	7.5		6.2(1)	7.5(2)
6K7	2nd I.F.	0	6.2(1)	250	115	5(2)		6.2(1)	5.0
6H6	2nd Det.	0	6.2(1)					6.2(1)	
6C5	A.V.C.	0	6.2(1)	5(3)				6.2(1)	0.5
6C5	1st A.F.	0	6.2(1)	130				6.2(1)	6.0
6L6	Power	0	6.2(1)	350	250	20(4)		6.2(1)	
5Z4MG	Rectifier	0	5.0(5)		1024(6)		1024(6)		5.0(5)

Tuning Frequency Range
B Range ..... 528 to 1730 KC.
C Range ..... 1710 to 5800 KC.
D Range ..... 5750 to 18300 KC.

Sensitivity
B Range ..... 1.0 Microvolt Absolute
C Range ..... 0.5 to 3 Microvolts Absolute
D Range ..... 1.0 to 5 Microvolts Absolute

6G5	Tuning Indicator	Plate to Ground 25(3)	Target to Ground 250	Cathode to Ground 0	Across Heater 6.2 A.C.

(1) A.C. voltage as read across heater terminals 2 and 7.
(2) Subject to variation.
(3) As read with 500,000 ohm meter.
(4) As read across R-30.
(5) A.C. voltage as read across heater terminals 2 and 8.
(6) A.C. voltage as read across terminals 4 and 6.



Alignment and Calibration

Correct alignment is extremely important in connection with all wave radios. The receivers are all properly aligned at the factory with precision instruments and realignment should not be attempted unless all other possible causes of the faulty operation have first been investigated and unless the service technician has the proper equipment.

A signal generator that will provide an accurately calibrated signal at 456, 1730, 1500, 600, 5800, 5000, 1800, 18,300, 15,000 and 6000 KC and an output indicating meter are required. It will be practically impossible to align the receiver if unsatisfactory apparatus is used.

Use a non-metallic screwdriver for the adjustments. The complete procedure is as follows:

I. F. Adjustment

Set the signal generator for a signal of 456 KC.

Connect the output of the signal generator through a .1 mf. condenser to the grid of the 1st detector.

Connect the ground lead of the receiver to the ground post of the signal generator.

Turn the band switch to the Range B position (standard wave band).

Turn the selectivity control to the sharp position and keep it in this position for all adjustments.

Turn the volume control to the maximum position.

Attenuate the signal from the signal generator to prevent the levelling-off action of the AVC.

Then adjust the five I.F. trimmers until maximum output is obtained. The adjusting screws for these condensers are reached from the top of the chassis and the location is shown in Fig. 3.

Range B Alignment

After the procedure for the alignment of each range, as explained below, is completed, it is advisable to repeat the procedure as a final check.

1730 KC Adjustment

Set the signal generator for 1730 KC.

Turn the rotor of the tuning condenser to the full open position.

Keep the band switch in the standard wave position.

Connect the antenna lead of the receiver through a 200 mmf. condenser to the output of the signal generator.

For this and all subsequent adjustments keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent AVC action.

Adjust the oscillator Range B trimmer (C19) until maximum output is obtained. The location of this trimmer is shown in Fig. 3.

1500 KC Adjustment

Set the signal generator for 1500 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Turn the calibration screw (under color filter) until the 1500 KC mark on the dial scale is at the vertical red line on the screen. If the film drum cannot be turned a sufficient amount by means of the calibration screw, loosen the 2 screws inside the drum which hold it in place. Adjust the position of the drum and tighten the screws. The early models do not have the calibration screw mentioned above. These models must be adjusted by loosening the drum screws.

Adjust the 1st and 2nd interstage Range B trimmer (C8 and C11) and antenna Range B trimmer (C3) to maximum.

Do not change the setting of the oscillator Range B trimmer.

600 KC Adjustment

Set the signal generator for 600 KC.

Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 600 KC trimmer until the peak of greatest intensity is obtained. See Fig. 3 for location of this trimmer.

Range C Alignment

CAUTION—When aligning the short wave bands be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 5000 KC. The signal will then be heard at 5000 KC on the dial of the radio. The image signal, which is much weaker, will be heard at 5000 less 912 KC, or 4088 KC. It may be necessary to increase the input signal to hear the image.

5800 KC Adjustment

Set the signal generator for 5800 KC.

Connect the antenna lead of the receiver through a 400 ohm resistor to the output of the signal generator.

Turn the rotor of the tuning condenser to the full open position.

Turn the band switch to the Range C position (first short wave band).

Adjust the oscillator Range C trimmer (C18) until maximum output is obtained. See Fig. 3 for location of this trimmer.

5000 KC Adjustment

Set the signal generator for 5000 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the 1st and 2nd interstage Range C trimmers (C7 and C10) and antenna Range C trimmer (C2) to maximum.

Do not change the setting of the oscillator Range C trimmer.

1800 KC Adjustment

Set the signal generator for 1800 KC.

Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 1800 KC trimmer until the peak of greatest intensity is obtained. See Fig. 3 for location of this trimmer.

Range D Alignment

18,300 KC Adjustment

Set the signal generator for 18,300 KC.

Keep the antenna lead of the receiver connected through the 400 ohm resistor to the output of the signal generator.

Turn the rotor of the tuning condenser to the full open position.

Turn the band switch to the Range D position (second short wave band).

Adjust the oscillator Range D trimmer (C17) until maximum output is obtained. See Fig. 3 for location of this trimmer.

15,000 KC Adjustment

Set the signal generator for 15,000 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the 1st and 2nd interstage Range D trimmers (C6 and C9) and antenna Range D trimmer (C1) to maximum.

When adjusting the 2nd interstage Range D trimmer, it will be necessary at the same time to turn the tuning condenser rotor slowly back and forth until the peak of greatest intensity is obtained.

Do not change the setting of the oscillator Range D trimmer.

6000 KC Adjustment

Set the signal generator for 6000 KC.

Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 6000 KC trimmer until the peak of greatest intensity is obtained. See Fig. 3 for location of this trimmer.

Trimmer Replacement

If one trimmer of the gang trimmer strip should become defective, it is not necessary to replace the entire strip. A single trimmer P-17A36, as shown in the replacement parts list, may be used. Disconnect the lead from the coil side (side not grounded) of the defective trimmer in the strip. This connection is then made to the single trimmer. Connect it to the side of the trimmer not in contact with the adjusting screw. The other side of the single trimmer is then connected to a good ground, using a piece of heavy wire in order to support the trimmer adequately. In replacing a trimmer, be sure to keep both leads as short as possible and keep the ungrounded lead as far from ground as possible.

Planetary Drive Assembly

The planetary assembly is the unit that is integral with the tuning shaft.

If the nut on the back end of this assembly is too tight, the drive will be jerky and will turn hard in high speed. If this condition exists, back off this nut one or two turns and note the effect.

If this nut is too loose, the drive will slip in slow speed. The remedy in this case, of course, is to tighten the nut.

Should the condenser drive cord slip when the planetary pulley is turning, inspect the tuning condenser, drive drum and film drum to see if they are turning properly or if they are being obstructed in some way.

If the drive turns unevenly (rough in spots), this may mean that the planetary assembly is defective or damaged internally and a new unit will be required.

Twenty-five Cycle Models

The twenty-five cycle receiver differs from the sixty cycle receiver only in the fact that a different power transformer is used. The correct power transformer is shown in the parts list.

The twenty-five cycle receiver can be operated satisfactorily from a sixty cycle power supply. However, the reverse is not true, the sixty cycle receiver cannot be operated from a twenty-five cycle power supply.

A 115-230 volt, 40 to 60 cycle as well as other power transformers with special power ratings are also available for this model.

Phonograph Connections

Phonograph connections can be made as shown in Fig. 7. The parts required as shown in the parts list. Knockouts are provided in the back of the chassis for mounting the phono jack and phono switch—See Fig. 8.

The phono switch should be mounted with one set of terminals nearest the bottom of the chassis base.

The connections are made by opening the diode return circuit at the volume control. This is done by removing the wire connecting condenser C42 to resistors R15, R19 and R22, at the terminal strip located near the back of the planetary drive. Cut this wire to correct length and solder it to the proper terminal on the phono switch—See Fig. 7, keeping the wire close to the back of the chassis base.

A wire is then connected from the lug on the above mentioned terminal strip to which C42 was connected, to the correct terminal on the phono switch—See Fig. 7. This wire should be brought directly to the back of the chassis at a point close to the phono jack pin tip nearest the channel provided for a chassis mounting bolt, and then routed over to the switch.

Complete the other connections as illustrated in Fig. 7.

It will be necessary to re-route the AC line cord away from the 6C5 1st audio grid lead by running it between the volume control and the filter choke and then straight back to the hole provided for it in the chassis base.

If a hum is heard when the phono pickup is touched, reverse the two pickup leads.

MODELS 62-273, 62-283

MONTGOMERY-WARD & CO Tuning Eye Installation

Adding 6N5 Tuning Eye Tube to 6 Volt "B" Batteryless Movie Dial Radios

SERVICE MANUAL SUPPLEMENT

Models 62-273 and 62-283 differ from the earlier models 62-327, etc., only in the inclusion of a 6N5 cathode ray tuning eye tube. This service manual gives the tuning eye circuit and parts list and describes the changes necessary to convert the earlier models to the later by adding the tuning eye.

Installation of Tuning Eye in Early Models

Remove the chassis from the cabinet. Drill the necessary hole in the panel from the front of the cabinet to avoid splitting the veneer—See Fig. 1 for location of the hole. As shown in this illustration, the location of the hole depends upon whether the cabinet is a console or a table model. The location of the tuning eye bracket is shown in dotted lines in Fig. 1. This is attached to the back of the panel by means of two small wood screws.

The circuit connections are made in the following manner: Bring the cable from the 6N5 tube socket through the hole in the chassis base adjacent to the oscillator coil—See Fig. 3 in service manual No. 105 for location of the oscillator coil.

Remove the 3 megohm resistor R14 as shown in Figs. 2 and 3. Solder the terminal strip to the chassis base at the point shown in Fig. 3. Connect resistors R19, R20 and R21 and the wires of the cable as shown schematically and pictorially in Figs. 2 and 3.

The brown lead of the cable, shown soldered to the chassis base, is the shorter of the two brown leads of the cable.

Do not remove any parts, except resistor R14, or any wires from the circuit. The connections to some terminals in Fig. 3 are not shown in order to simplify the illustration.

New Parts Used

(Not Shown in Manual No. 105 Parts List)

Bin No.	Part No.	Description			Selling Price
	21A81	6N5 KIT ASSEMBLY COMPLETE (LESS TUBE)..... Includes the following parts:			$ .84
	13X291	6N5 Tube Socket and Cable Assembly			.26
	4A17	Terminal Strip			.04
	25A71	Tube Clamp Assembly—Includes screws			.20
	9X15	Cardboard Spacer			.04
	4X136	Escutcheon for Tuning Eye—Includes Screws			.10
10971	A94254	Resistor R19	250,000 Ohm	0.2 Watt	.08
11115	A94205	Resistor R20	2 Megohm	0.2 Watt	.08
11188	A94105	Resistor R21	1 Megohm	0.2 Watt	.08

Type 6N5 Tuning Eye Tube is not included in the above Assembly

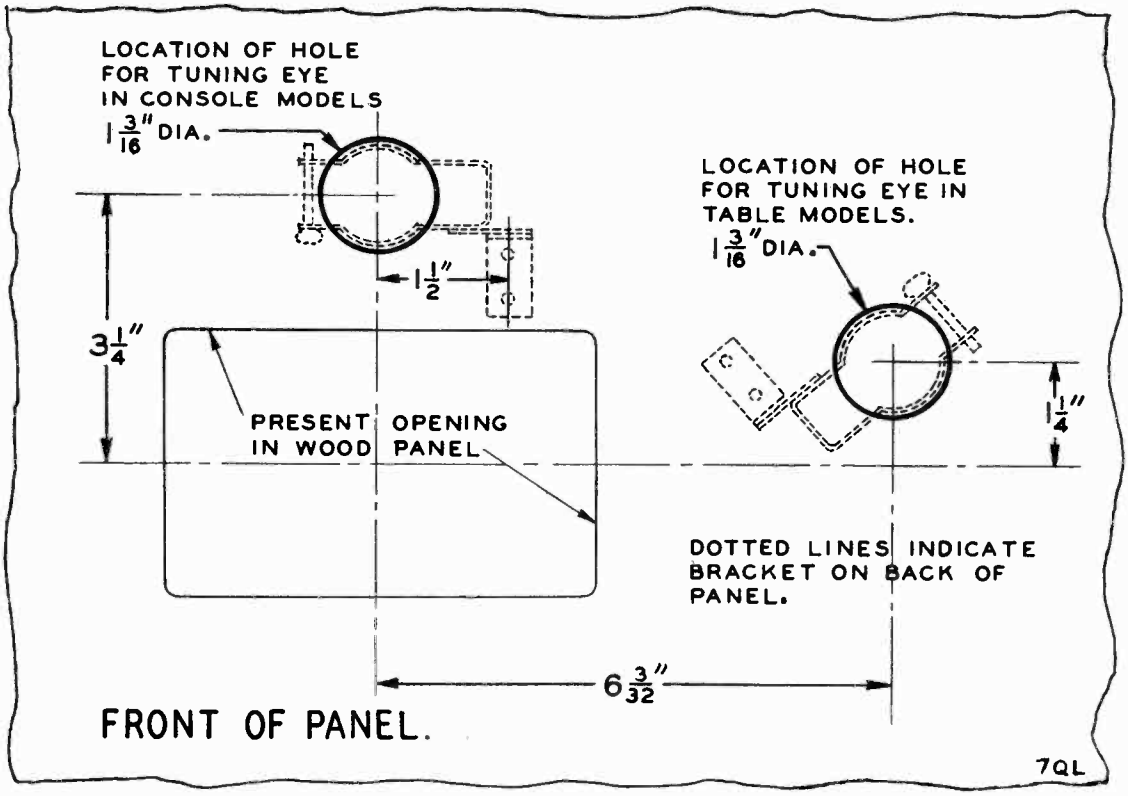


Fig. 1—Location of Holes for Panel Drilling

MODELS 62-273, 62-283
Schematic, Chassis Wiring MONTGOMERY-WARD & CO.

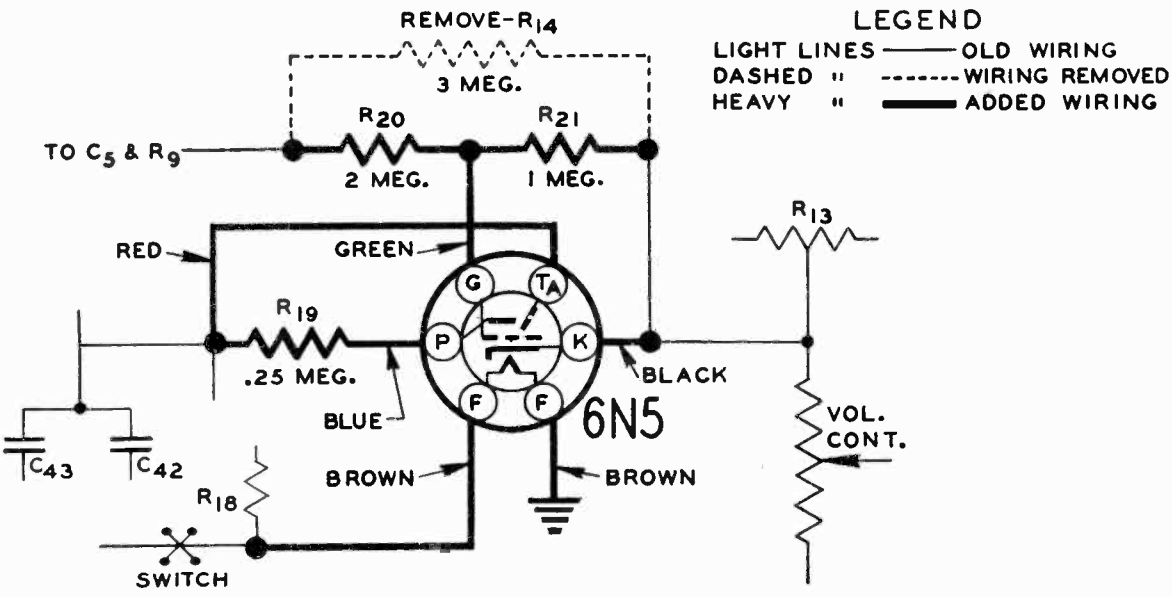


Fig. 2—Supplementary Schematic Circuit Diagram

FOR COMPLETE DATA, SEE MODEL 62-327

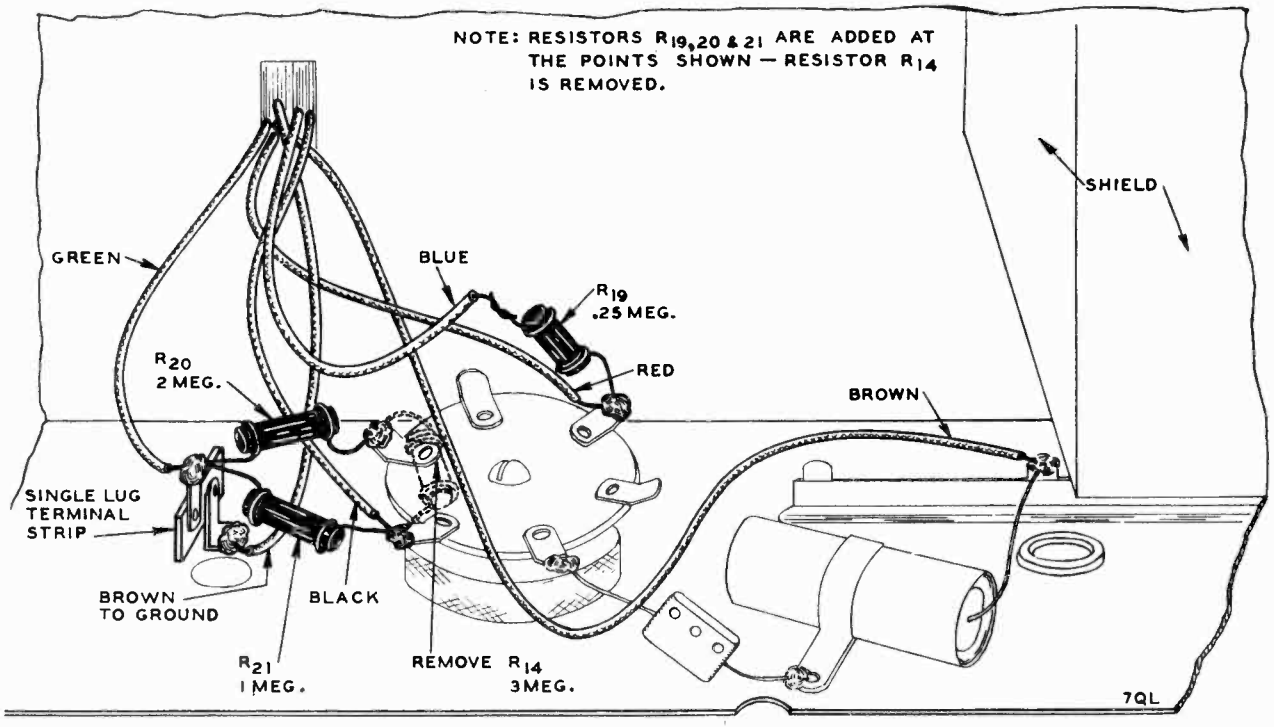


Fig. 3—Location of Parts Added to Chassis and Their Connections

MONTGOMERY-WARD & CO.

MODELS 62-326, 62-336
62-426, 62-436
Schematic, Voltage
Socket, Trimmers

July 1936

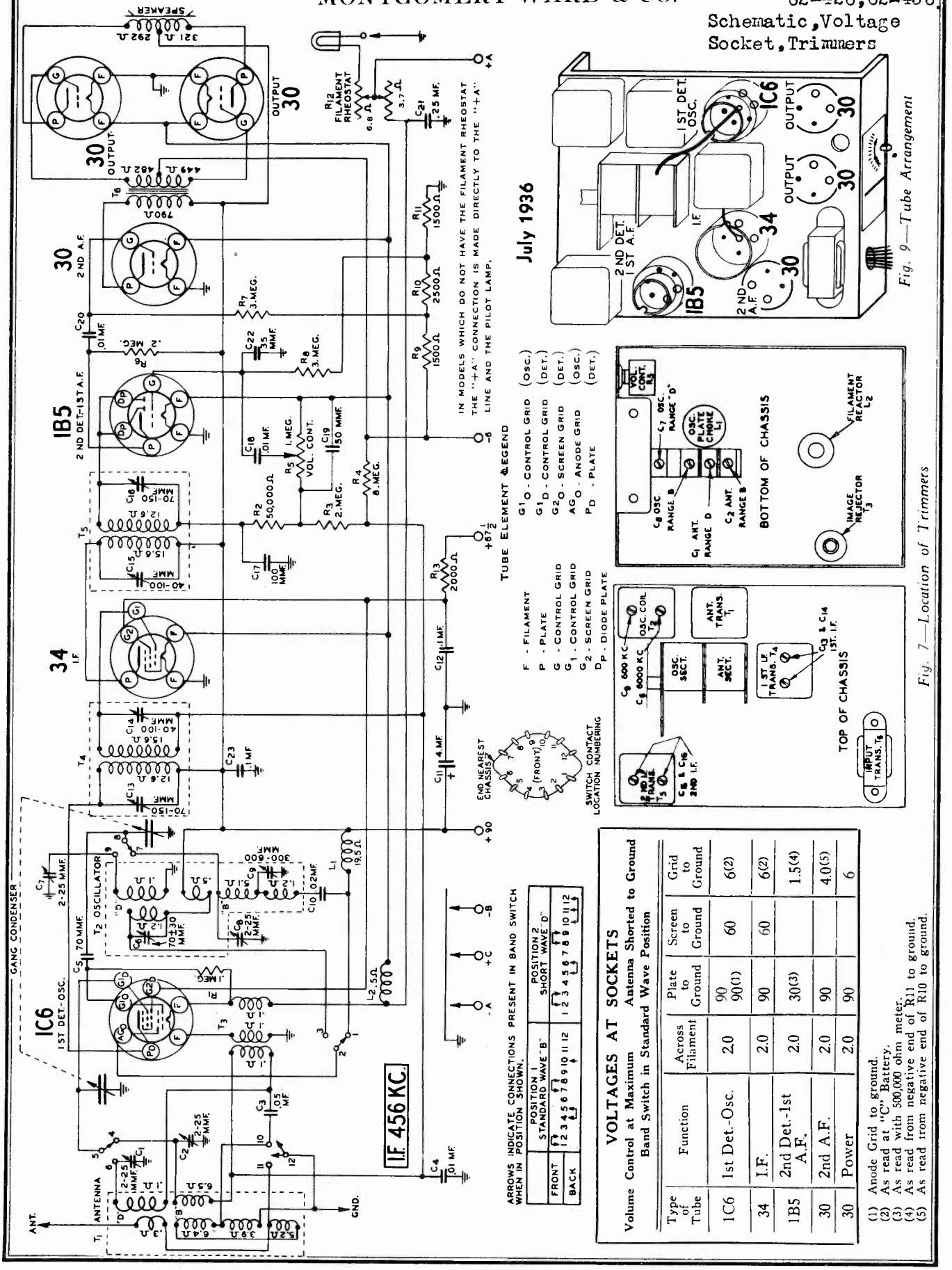


Fig. 9—Tube Arrangement

Fig. 7—Location of Trimmers

VOLTAGES AT SOCKETS

Volume Control at Maximum — Antenna Shorted to Ground
Band Switch in Standard Wave Position

Type of Tube	Function	Across Filament	Plate to Ground	Screen to Ground	Grid to Ground
1C6	1st Det.-Osc.	2.0	90 90(1)	60	6(2)
34	I.F.	2.0	90	60	6(2)
1B5	2nd Det.-1st A.F.	2.0	30(3)		1.5(4)
30	2nd A.F.	2.0	90		4.0(5)
30	Power	2.0	90		6

(1) Anode Grid to ground.
(2) As read at "C" Battery.
(3) As read with 500,000 ohm meter.
(4) As read from negative end of R11 to ground.
(5) As read from negative end of R10 to ground.

MODELS 62-326, 62-336
62-426, 62-436
Coils, Batt. Connections

MONTGOMERY-WARD & CO.

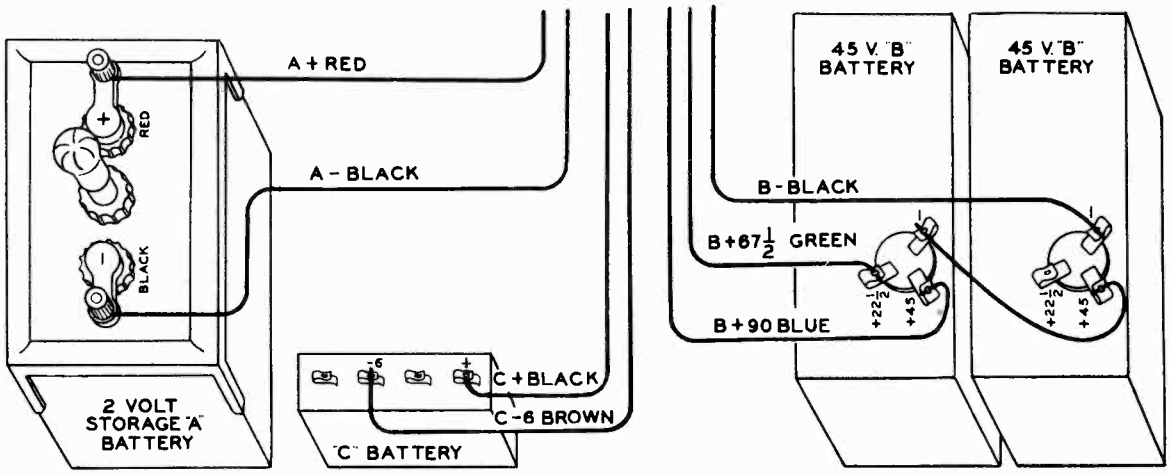


Fig. 3—"A", "B", and "C" Battery Connections

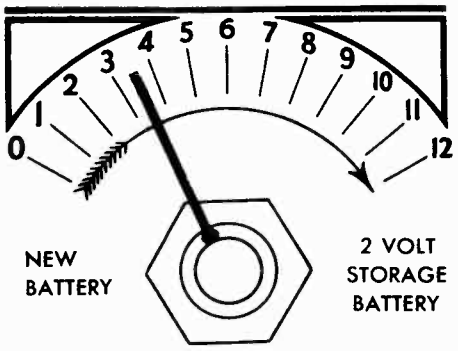


Fig. 6—"A" Battery Voltage Regulator

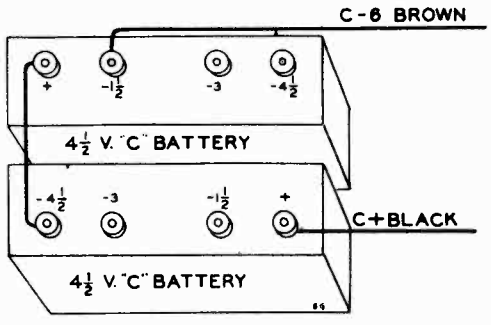


Fig. 4—Optional "C" Battery Connections

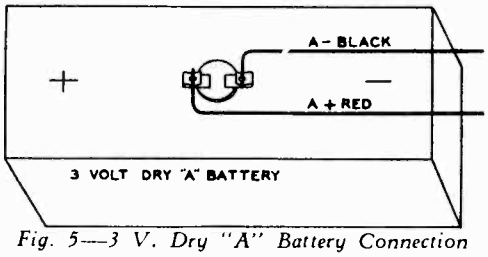


Fig. 5—3 V. Dry "A" Battery Connection

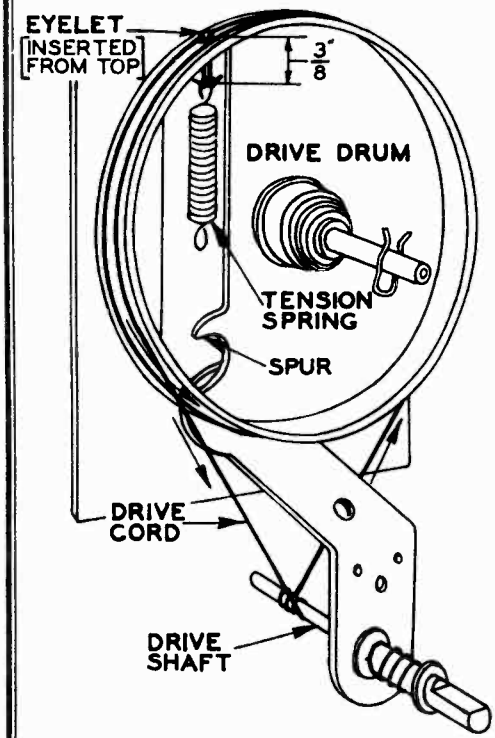


Fig. 10—Replacing Drive Cord

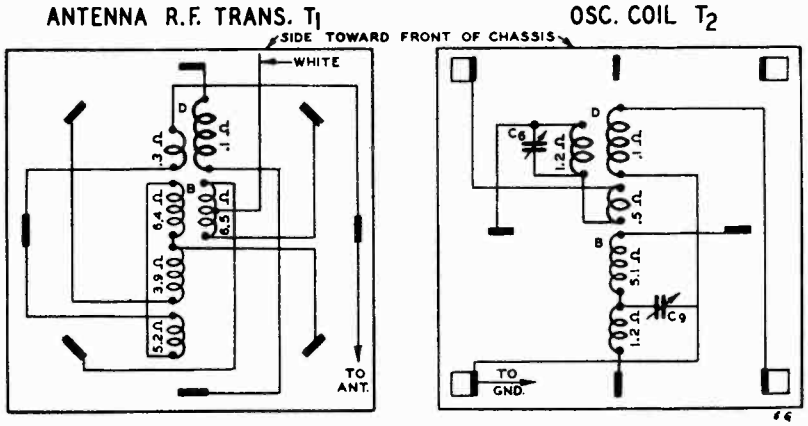


Fig. 8—R.F. and Oscillator Coil Base Terminal Arrangement and D.C. Resistance of Windings

MODELS 62-326, 62-336
62-426, 62-436
Alignment, Notes

MONTGOMERY-WARD & CO

Input Voltages and Currents

"A" Battery - - - - - - 2 Volts—.42 Amperes
"B" Batteries - 90 & 67½ Volts—11.5 to 25.5 Ma.
"C" Battery - - - - - - - - - - - 6 Volts

Power Output - - - 400 Milliwatts Undistorted

Selectivity - - 30 KC Broad at 1000 Times Signal

Intermediate Frequency - - - - - - - 456 KC

Speaker - - - 6 inch Magnetic—Mantel Models
8 inch Magnetic—Console Models

Tuning Frequency Range

B Range - - - - - - - - - 528 to 1730 KC
D Range - - - - - - - - - 5650 to 16,000 KC

Sensitivity

B Range Average - 25 to 35 Microvolts Absolute
D Range Average - 25 to 60 Microvolts Absolute

Alignment and Calibration

Alignment Procedure

Correct alignment is extremely important in connection with all wave receivers. The receivers are all properly aligned at the factory with precision instruments and re-alignment should not be attempted unless all other possible causes of the faulty operation have first been investigated and unless the service technician has the proper equipment.

A signal generator that will provide an accurately calibrated signal at 456, 1730, 1500, 600, 16,000, 15,000 and 6000 KC and an output indicating meter are required. It will be practically impossible to align the receiver if unsatisfactory apparatus is used.

Use a non-metallic screwdriver for the adjustments. The complete procedure is as follows:

I. F. Adjustment

Set the signal generator for a signal of 456 KC.
Connect the output of the signal generator through a .1 mf. condenser to the grid of the 1st detector.
Connect the ground lead of the radio to the ground post of the signal generator.
Turn the band switch to the Range B position (standard wave band).
Turn the volume control to the maximum position.
Attenuate the signal from the signal generator to prevent the levelling-off action of the AVC.
Then adjust the four I.F. trimmers until maximum output is obtained. The adjusting screws for these condensers are reached from the top of the chassis, and the location is shown in Fig. 7.

Range B Alignment

After the procedure for the alignment of each range, as explained below, is completed, it is advisable to repeat the procedure as a final check.

1730 KC Adjustment

Set the signal generator for 1730 KC.
Turn the rotor of the tuning condenser to the full open position.
Keep the band switch in the standard wave position.
Connect the antenna lead of the radio through a 200 mmf. condenser to the output of the signal generator.
For this and all subsequent adjustments keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent AVC action.
Adjust the oscillator Range B trimmer (C8) until maximum output is obtained. The location of this trimmer is shown in Fig. 7.

1500 KC Adjustment

Set the signal generator for 1500 KC.
Turn the rotor of the tuning condenser carefully until maximum output is obtained.
Loosen the pointer screw and set the pointer at the 1500 KC mark on the standard wave band scale. Retighten the screw.
Adjust the antenna Range B trimmer (C2) to maximum.
Do not change the setting of the oscillator Range B trimmer.

600 KC Adjustment

Set the signal generator for 600 KC.
Turn the tuning condenser rotor until maximum output is obtained.
Turn the rotor slowly back and forth at the same time adjusting the 600 KC trimmer (C9) until the peak of greatest intensity is obtained. See Fig. 7 for location of this trimmer.

Range D Alignment

CAUTION—When aligning the short wave band be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 15,000 KC. The signal will then be heard at 15,000 on the dial of the radio. The image signal, which is much weaker, will be heard at 15,000 less 912 KC, or 14,088 KC. It may be necessary to increase the input signal to hear the image.

16,000 KC Adjustment

Set the signal generator for 16,000 KC.
Connect the antenna lead of the radio through a 400 ohm resistor to the output of the signal generator.
Turn the rotor of the tuning condenser to the full open position.
Turn the band switch to the Range D position (short wave band).
Adjust the oscillator Range D trimmer (C7) until maximum output is obtained. See Fig. 7 for location of this trimmer.

15,000 KC Adjustment

Set the signal generator for 15,000 KC.
Turn the rotor of the tuning condenser carefully until maximum output is obtained.
Adjust the antenna Range D trimmer (C1) to maximum. When adjusting this trimmer, it will be necessary at the same time to turn the tuning condenser rotor slowly back and forth until the peak of greatest intensity is obtained.
Do not change the setting of the oscillator Range D trimmer.

6000 KC Adjustment

Set the signal generator for 6000 KC.
Turn the tuning condenser rotor until maximum output is obtained.
Turn the rotor slowly back and forth at the same time adjusting the 6000 KC (C6) trimmer until the peak of greatest intensity is obtained. See Fig. 7 for location of this trimmer.

General Service Data

Tubes

The tubes used in this receiver are of the 2 volt series. All of them are of the filament or directly heated types. All of them have a 2 volt filament and should not be connected to a power supply not intended for this type of tube. **Maximum filament voltage range is 1.8 to 2.0 volts. Operation of the tubes at under or over this value will be injurious to the tubes and may affect operation of the receiver.**

Voltages

Check the voltages at the sockets to see if correct values are being delivered to the tubes. The antenna and ground should be disconnected and the antenna and ground leads from the set connected together. The volume control should be turned to the right or maximum position.

All of the voltage readings as shown in the chart are read with a 1,000 ohm-per-volt meter. As high a range as possible should be used. In general, the higher the resistance of the meter, the more accurate the reading will be.

The voltage chart gives the voltages with all tubes in, the speaker connected and the set in operating condition. These voltages are typical of the sets but will vary slightly with variations in individual receivers, tubes, test equipment used and battery voltages.

MODELS 62-326, 62-336
62-426, 62-436

MONTGOMERY-WARD & CO.

Battery Data
Drive Cord Replacements

BATTERIES REQUIRED

The batteries and voltages required are shown in Figs. 2 and 3. The "A" drain is .42 amperes at 2 volts while the "B" drain is discussed below.

"B" BATTERY LIFE

The majority of potential complaints on short "B" battery life can be prevented if proper instructions are given to the customer at the time the receiver is installed.

Class "B" amplification is used in the output stage and the "B" battery consumption will, therefore, depend upon the output volume. The "B" consumption will also depend, to some extent, upon the strength of the incoming signal as the latter affects the AVC voltage. When no signal is being received the "B" drain is 11.5 milliamperes. When the volume control is at maximum and with high output volume, the "B" drain can become 25.5 milliamperes. A milliammeter in the "B" line will quickly determine if the "B" drain is excessive or normal.

As the pilot lamp is not turned on except when tuning in a station, it is easy to forget to turn the radio off. When this happens, the radio may be on as long as 24 hours or more. A continuous drain of this kind for a long period will shorten the life of the "B" batteries considerably. Caution the customer regarding this.

"C" BATTERY

Any special "C" battery may be used from which a 6 volt connection can be obtained. It is connected as shown in Fig. 3.

If standard 4 1/2 Volt "C" batteries are used, connect them as shown in Fig. 4.

"A" BATTERY (MODELS WITH VOLTAGE REGULATOR)

Models equipped with the voltage regulator on the back panel of the chassis may use any type of "A" battery delivering from 2 to 5 volts.

3 Volt Dry "A" Battery - When this type of battery is used, turn the voltage regulator pointer (See Fig. 6) to the left as far as possible. The purpose of this regulator is to reduce the voltage of the 3 volt battery to the 2 volts required by the tubes. Keep this pointer turned to the left as far as possible. Advance it one-half mark when reception gets weak. This should be about once a week if the radio is used from two to three hours per day. If it is used from four to five hours a day, it will generally be necessary to turn the pointer up one mark a week.

Caution the customers not to turn the pointer up higher than necessary as it will burn out the tubes and run down the battery. Also tell them to turn the pointer back to the starting position when a new 3 volt "A" battery is installed.

2 Volt Storage Battery - When this type of battery is used, turn the voltage regulator pointer to the position on the scale marked "2 Volt storage battery", and leave it there at all times

"A" BATTERY (MODELS WITHOUT VOLTAGE REGULATOR)

These models are designed for use with a 2 volt storage battery. Any other battery of higher voltage, if connected directly, will damage the tubes.

Air Cell "A" Battery - If this type of battery is used, a series resistor will be required to reduce the voltage to the proper level of 2 volts for the tube filaments.

TESTING BATTERIES

If the receiver does not operate satisfactorily test the batteries under load. A high resistance meter is required for the "B" and "C" voltages. If any of the batteries are considerably below their rated voltage, new ones should be used. When the "B" batteries are replaced the "C" batteries should also be replaced. The reason for this is that the "C" battery drain is such that the "C" batteries are run down in about the same time as the "B" batteries.

REPLACING DRIVE CORD

Take off the station pointer by removing the screw at the center of the dial.

Remove the pilot lamp assembly by pulling the socket clip upward off the dial assembly.

Remove the dial assembly by removing the two screws which secure this assembly to the chassis. One screw is located on the drive assembly bracket; the other is on a bracket attached to the top of the gang condenser. The on-off indicator cord tension spring is removed from the small bracket at the upper left hand corner of the dial (from front).

Then lay the complete dial assembly face down in front of the chassis. Remove the on-off indicator disc from the pointer shaft. It is not necessary to remove the volume control collar which holds the indicator cord of this control in position.

Turn the drive drum until the opening in this drum is approximately vertical and with the hole at the top as shown in Fig. 10.

Remove the tension spring and the old drive cord.

See that the eyelet is in the hole in the drive drum as shown in Fig. 10. Insert one end of the new drive cord from the outside through this eyelet in the drive drum.

Tie the end of the cord which has been inserted through the eyelet to one end of the tension spring.

Wrap the cord in a counter clockwise direction (facing front of chassis) around the drive drum approximately one and one-quarter turns progressing toward the front.

Then tilt the chassis up on its back panel and bring the cord mentioned in the previous paragraph down to the drive shaft. Wrap this cord directly below the drive drum three and one-half turns around the drive shaft, as shown in Fig. 10, progressing toward the back of chassis.

Then bring this cord up to the drive drum and wrap it around the drum in back of cord already on the drum until it is up to the eyelet as shown in Fig. 10.

Now insert the free end of the cord through the hole in the eyelet and tie it to the end of the spring. The end of the spring when hanging free and with all slack removed from the drive cord should be 3/8" or less from the flange of the drum, as shown in Fig. 10. Cut off the surplus length of cord after it is tied to the spring.

Then secure the other end of the tension spring over the spur on the drive drum.

Turn the drive shaft back and forth several times.

Replace the dial assembly, pointer and pilot lamp assembly.

MONTGOMERY-WARD & CO.

MODELS 62-326, 62-336
62-426, 62-436
Circuit Data, Parts

Circuit

This radio is designed to operate from a battery power supply the values of which are shown in Figs. 2 and 3. The tubes used are of the 2 volt type. The radio is designed to operate at a very low current drain from the batteries.

Two bands are covered with a tuning range in each band as shown in the specifications above. Two band coverage is accomplished by means of two sets of antenna and oscillator coils and a single section double throw switch.

Referring to the schematic circuit diagram, Fig. 2, T1 and T2 are the antenna transformer and oscillator coil assemblies and T3 is the image rejector coil assembly. The standard wave and short wave coils are indicated by the letters B and D respectively.

The band switch completes connections to the antenna transformer secondary and oscillator grid coil in use. It also disconnects the antenna transformer secondary and oscillator grid coil not in use.

The antenna transformer with tuned secondary feeds into a type 1C6 pentagrid converter tube which functions as the oscillator and 1st detector. The image rejector pickup coil which is connected to the antenna "B" range transformer, is effective in bucking out the image frequencies on the standard wave band.

The oscillator potential on the oscillator control grid of this tube modulates the electron stream from the cathode in such a manner as to impress on it the oscillator frequency which is always 456 KC above the frequency to which the R.F. amplifier is tuned. The electron stream is also modulated at the signal frequency by the detector control grid. As a result of the beating of the two frequencies, the intermediate or beat frequency of 456 KC is present in the plate circuit of this tube.

One stage of I.F. amplification is employed using a 34 tube. The primaries and secondaries of the first and second I.F. transformers are tuned by small trimmer condensers.

A type 1B5 duo-diode triode tube functions as the second detector and a one stage audio amplifier. The two diode plates are connected together. AVC voltage is applied through isolating resistors to the control grid circuits of the 1st detector and I.F. tubes. The audio voltage developed across volume control resistor R5 is applied through the movable arm to the control grid of the 1B5 tube.

Resistance coupling is used between the 1st audio tube and the 2nd audio stage which employs a 30 tube. The latter is transformer coupled to the output stage which uses two type 30 tubes in a stage of class "B" amplification. A magnetic reproducer is used.

"C" voltages are obtained from the 6 volt "C" battery connection and from a potentiometer consisting of resistors R9, R10 and R11 connected between the 6 volt "C" connection and ground.

Models with the filament rheostat are connected as shown in Fig. 2. This rheostat permits the use of a 3 volt "A" battery. As shown in Fig. 2, there are two separate variable resistors one of which controls the filament voltage and the other the pilot lamp voltage. In models which do not have the filament rheostat the "+A" line and the pilot lamp.

Fig. 1—Arrangement of Controls

Replacement Parts List

MISCELLANEOUS

SOCKETS

Part No.	Description	Selling Price
P-3A44	30 Tube Socket	
P-3A45	34 Tube Socket	$0.06
P-3A230	1B5 Tube Socket	.06
P-3A203	1C6 Tube Socket	.06

SPEAKERS

P-12A217	6" Magnetic Speaker	2.84
P-12A218	8" Magnetic Speaker	3.16
P-13X212	Speaker Cable and Socket Assembly	.30

KNOBS

P-10A69	Volume Control Knob	.08
P-10A72	Tuning Control Knob	.08
P-10A74	Band Switch Knob	.08

GENERAL

Part No.	Description	Selling Price	
P-8X23	Rubber, Chassis Mounting Cushions	.04	
P-32X69	Tube Shield—Large	.10	
P-32X72	Tube Shield—Small	.08	
P-32X18	Tube Shield Base—Large	.04	
P-32X30	Tube Shield Base—Small	.04	
P-2X38	Felt Washers (Used behind Knobs)	.04	ea.
P-17X16	Glass Dial Crystal	.10	
P-28X67	Crystal Retaining Ring	.06	
P-2A85	1 Section, 2 Position, Band Change Switch	.36	
P-14A51	Single Lug Terminal Strip (Mounting Hole Used)	.04	
P-30X14	Grid Clip	.04	
P-13X214	Antenna and Ground Lead Assembly	.14	
P-13X266	A, B and C Battery Cable	.50	

TRANSFORMERS AND COILS

Part No.	Code	Description	Selling Price
P-9A543	T1	Antenna Trans. and Can Assembly	$1.02
P-9A544	T2	Oscillator Coil and Can Assembly	.12
P-9A548	T3	Image Rejector	.18
P-9A545	T4	1st I. F. Trans. and Can Assembly	.72
P-9A546	T5	2nd I. F. Trans. and Can Assembly	.72
P-50X33	T6	Input Transformer	.62
P-9A547	L1	Oscillator Plate Choke	.18
P-9A612	L2	Filament Choke Coil	.10

DIAL AND DRIVE ASSEMBLY

DIAL ASSEMBLY

Part No.	Description	Selling Price
P-15A44	Dial Bracket Assembly, Less Pilot Lamp, Pilot Light Socket and Spring Clip, Pointer, and On-Off Indicator Assembly	$0.70
P-15X48	Pointer	.04
P-2X177	On-Off Indicator Disc Assembly	.08
P-7A90	Pilot Lamp	.06
P-7A8	Pilot Light Socket and Spring Clip	.06
P-25A94	Pilot Light Spring Contact Assembly (on drive shaft)	.10

RETAIL STORES: Order any parts from division superintendent at Chicago or Oakland, on stock order.

Return defective parts to division superintendent only.

There is a large letter on the chassis which identifies the set as to major part changes. When ordering parts please be sure to mention the model number and this large letter.

Prices subject to change without notice

DRIVE ASSEMBLY

Part No.	Description	Selling Price
P-5A12	Drive Bracket Assembly, less Drive Drum and Pointer Shaft	$0.16
P-24X225	Drive Drum and Pointer Shaft (Mounted on Tuning Condenser Shaft)	
	20" Black Tuning Drive Cord	doz. .22
P-28X27	Tuning Drive Cord Tension Spring	.04
	Black On-Off Indicator Drive Cord	doz. .10
P-29X20	Brass Collar with Set Screw for Securing above Cord to Shaft	.04
P-28X44	On-Off Indicator Cord Tension Spring	.04

DIAL AND DRIVE ASSEMBLY (Continued)

CONDENSERS

TUBULAR

Part No.	Code	Capacitance	Voltage	Selling Price
P-46X80	C3	.05 mf.	180	$0.08
P-46X188	C4	.01 mf.	180	.08
P-46X187	C10	.02 mf.	180	.08
P-46X98	C12	.1 mf.	180	.10
P-46X124	C18	.01 mf.	180	.08
P-46X174	C20	.01 mf.	180	.08
P-46X167	C21	.25 mf.	180	.12
P-46X98	C23	.1 mf.	180	.10

ELECTROLYTIC

P-45X212	C11	4.0 mf.	100 Dry	.32

MOLDED

P-47X62	C5	70 mmf.		.06
P-47X55	C17	100 mmf.		.04
P-47X64	C19	90 mmf.		.04
P-47X53	C22	35 mmf.		.06

TRIMMER

P-17A52	C1	2-25 mmf.	Range "D" Antenna Trimmer	.22
	C2	2-25 mmf.	Range "B" Antenna Trimmer	
	C7	2-25 mmf.	Range "D" Oscillator Trimmer	
	C8	2-25 mmf.	Range "B" Oscillator Trimmer	
P-17A35	C6	40-100 mmf.	6000 KC Trimmer	.22
	C9	370-1400 mmf.	600 KC Trimmer	
P-17A51	C13	40-100 mmf.	1st I. F. Trimmer	.18
	C14	40-100 mmf.		
P-17A51	C15	70-150 mmf.	2nd I. F. Trimmer	.18
	C16	40-100 mmf.		

MISCELLANEOUS

P-14A54	2 Gang Condenser less Drive Drum and Dial Assembly	$1.20

RESISTORS

CARBON

Part No.	Code	Resistance	Watts	Selling Price
P-A95104	R1	100,000 Ohm	0.2	$0.06
P-A95503	R2	50,000 Ohm	0.2	.06
P-A94205	R3	2.0 Megohm	0.2	.08
P-A94805	R4	8.0 Megohm	0.2	.08
P-A95204	R6	200,000 Ohm	0.2	.06
P-A95305	R7	3.0 Megohm	0.2	.06
P-A95305	R8	3.0 Megohm	0.2	.06
P-A94152	R9	1,500 Ohm	0.2	.08
P-A94252	R10	2,500 Ohm	0.2	.08
P-A94152	R11	1,500 Ohm	0.2	.08
P-A95202	R13	2,000 Ohm	0.2	.06

VARIABLE

P-36X218	R5	1.0 Megohm	Volume Control and On-Off Switch	.50
P-43X55	R12	3.7 Ohm / 6.8 Ohm	Filament Rheostat	.24

MODELS 62-327, 62-337
62-427, 62-437

MONTGOMERY-WARD & CO.

Socket, Trimmers, Coils
Voltage, Batt. Connections

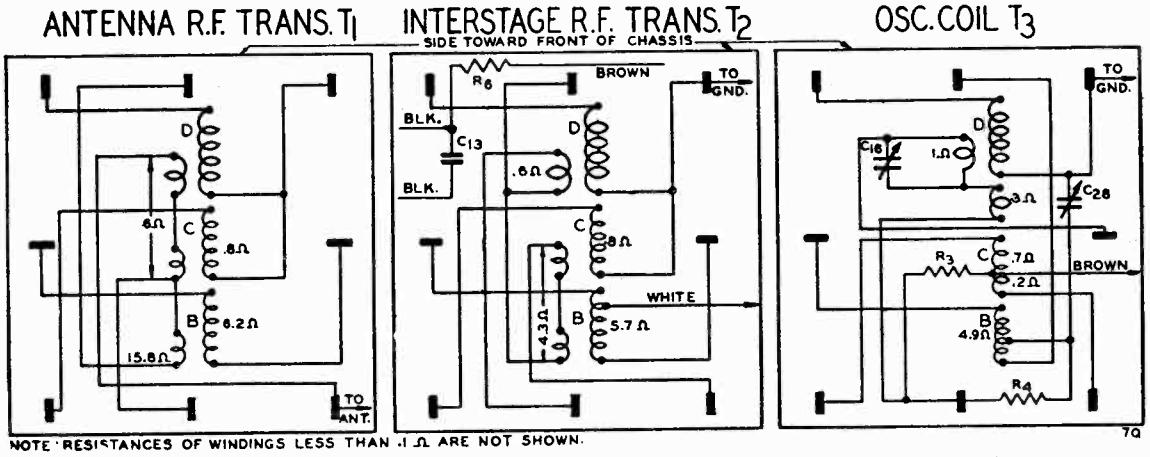


Fig. 7—R.F. and Oscillator Coil Base Terminal Arrangement and D. C. Resistance of Windings

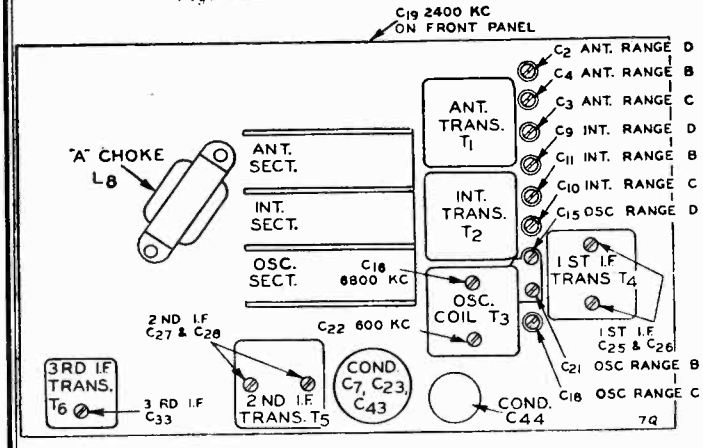


Fig. 3—Location of Trimmers

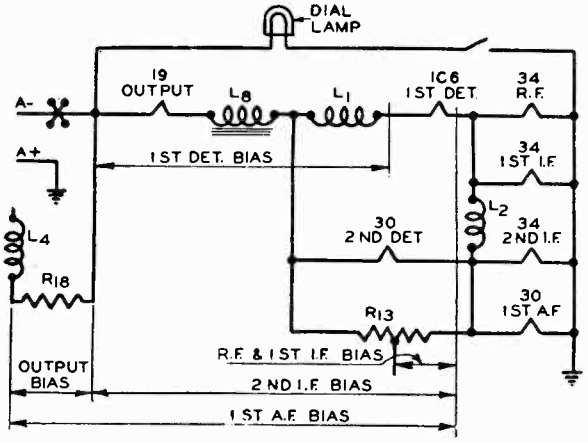


Fig. 5—Abridged wiring diagram showing filament wiring system and points at which no-signal bias voltages are obtained.

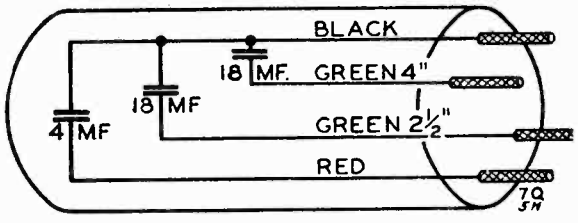


Fig. 8—Electrolytic Condenser Internal Connections

FOR MOVIE DIAL DATA, SEE INDEX

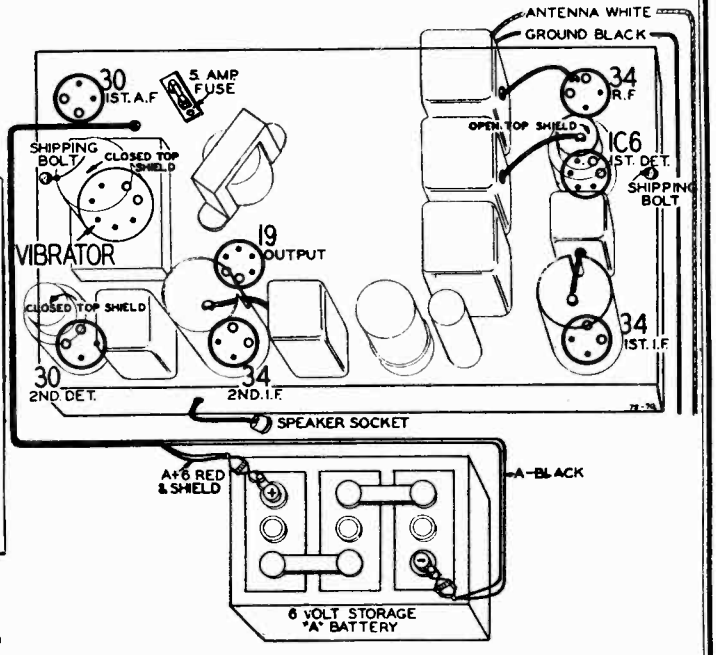


Fig. 4—Tube Arrangement and Battery Connections

VOLTAGES AT SOCKETS

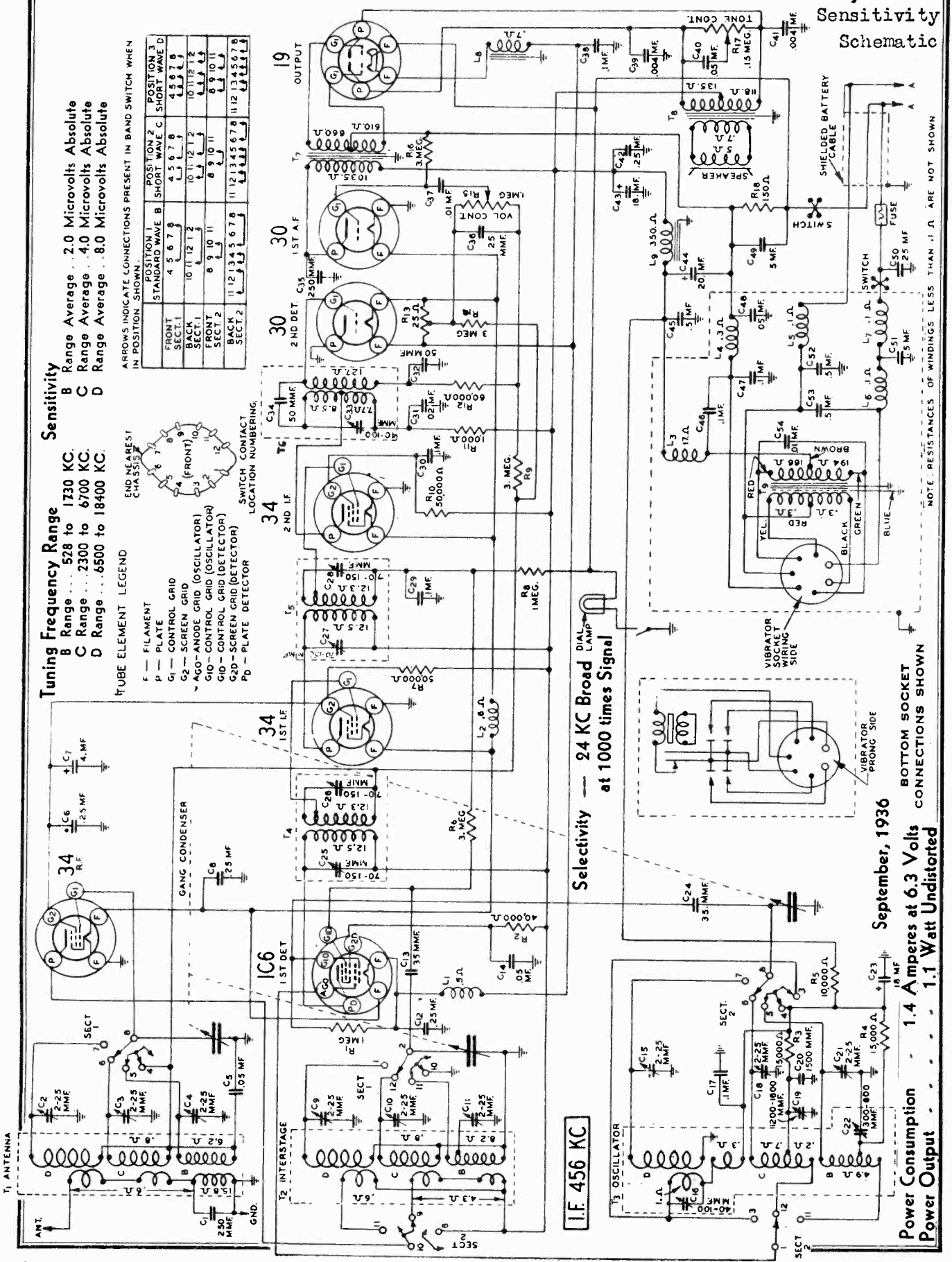
Volume Control at Maximum — Antenna Shorted to Ground
Battery - 6 Volts — Band Switch in Standard Wave Position

Type of Tube	Function	Across Filament	Plate to Ground	Screen to Ground	Bias Voltage See Notes
34	R.F.	2.0	145	55	1.0(1)
IC6	1st Det.-Osc.	2.0	145 90(2)	60	2 (3)
34	1st I.F.	2.0	145	55	1.0(1)
34	2nd I.F.	2.0	140	90	4.0(3)
30	2nd Det.	2.0			
30	1st A.F.	2.0	140		9 (4)
19	Power	2.0	140		5 (5)

(1) As read from negative filament leg to tap of resistor R13.
(2) Anode grid to ground.
(3) As read from negative filament leg to A—.
(4) Total voltage drop from negative filament leg to low potential end of resistor R18.
(5) As read across resistor R18.

MONTGOMERY-WARD & CO.

MODELS 62-327, 62-337
62-427, 62-437
Sensitivity
Schematic



I. F. Adjustment

Set the signal generator for a signal of 456 KC.

Connect the output of the signal generator through a .1 mf. condenser to the grid of the 1st detector G_{1D}.

Connect the ground lead of the receiver to the ground post of the signal generator.

Turn the band switch to the Range B position (standard wave band).

Turn the volume control to the maximum position.

Attenuate the signal from the signal generator to prevent the levelling-off action of the AVC.

Then adjust the five I.F. trimmers until maximum output is obtained. The adjusting screws for these condensers are reached from the top of the chassis and the location is shown in Fig. 3.

Range B Alignment

After the procedure for the alignment of each range, as explained below, is completed, it is advisable to repeat the procedure as a final check.

1730 KC Adjustment

Set the signal generator for 1730 KC.

Turn the rotor of the tuning condenser to the full open position.

Keep the band switch in the standard wave position.

Connect the antenna lead of the receiver through a 200 mmf. condenser to the output of the signal generator.

For this and all subsequent adjustments keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent AVC action.

Adjust the oscillator Range B trimmer (C21) until maximum output is obtained. The location of this trimmer is shown in Fig. 3.

1500 KC Adjustment

Set the signal generator for 1500 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Loosen the pointer screw and set the pointer at the 1500 KC mark on the standard wave band scale. Retighten the screw.

Adjust the interstage Range B trimmer (C11) and antenna Range B trimmer (C4) to maximum.

Do not change the setting of the oscillator Range B trimmer.

600 KC Adjustment

Set the signal generator for 600 KC.

Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 600 KC trimmer until the peak of greatest intensity is obtained. See Fig. 3 for location of this trimmer.

Range C Alignment

CAUTION—When aligning the short wave bands be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 5000 KC. The signal will then be heard at 5000 KC on the dial of the radio. The image signal, which is much weaker, will be heard at 5000 less 912 KC, or 4088 KC. It may be necessary to increase the input signal to hear the image.

6700 KC Adjustment

Set the signal generator for 6700 KC.

Connect the antenna lead of the receiver through a 400 ohm resistor to the output of the signal generator.

Turn the rotor of the tuning condenser to the full open position.

Turn the band switch to the Range C position (first short wave band).

Adjust the oscillator Range C trimmer (C18) until maximum output is obtained. See Fig. 3 for location of this trimmer.

6000 KC Adjustment

Set the signal generator for 6000 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the interstage Range C trimmer (C10) and antenna Range C trimmer (C3) to maximum.

Do not change the setting of the oscillator Range C trimmer.

2400 KC Adjustment

Set the signal generator for 2400 KC.

Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 2400 KC trimmer until the peak of greatest intensity is obtained. See Fig. 3 for location of this trimmer.

Range D Alignment

18,400 KC Adjustment

Set the signal generator for 18,400 KC.

Keep the antenna lead of the receiver connected through the 400 ohm resistor to the output of the signal generator.

Turn the rotor of the tuning condenser to the full open position.

Turn the band switch to the Range D position (second short wave band).

Adjust the oscillator Range D trimmer (C15) until maximum output is obtained. See Fig. 3 for location of this trimmer.

15,000 KC Adjustment

Set the signal generator for 15,000 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the interstage Range D trimmer (C9) and antenna Range D trimmer (C2) to maximum.

When adjusting the interstage and antenna Range D trimmers, it will be necessary at the same time to turn the tuning condenser rotor slowly back and forth until the peak of greatest intensity is obtained.

Do not change the setting of the oscillator Range D trimmer.

6800 KC Adjustment

Set the signal generator for 6800 KC.

Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 6800 KC trimmer until the peak of greatest intensity is obtained. See Fig. 3 for location of this trimmer.

Caution

Do not turn the radio on unless ALL the tubes are in the sockets. Removal of any of them will result in abnormal voltages on the remaining tubes.

Be sure that the battery clips are connected to the battery with the correct polarity. Reversed connections may damage the radio.

Do not use any power source other than a 6 volt storage battery.

If the radio does not operate after being turned on, turn the switch off immediately, examine the battery connections and the fuse and see if all tubes are properly inserted.

Servicing Power Unit

The power unit is that portion of the chassis assembly contained within the large rectangular shield can and the circuit for which is shown within the dotted lines at the lower right side of the schematic diagram, Fig. 2.

Continuity Resistance Check—The power transformer, choke coil circuits and condenser shorts may be checked by utilizing the vibrator socket terminals and various points on the "A" or "B" lines, without removal of the shield can. For example: when checking the continuity or resistance of the upper half of the transformer secondary, contact may be made with the test prods at the proper vibrator socket terminal, as shown on the circuit diagram, and at the positive terminal of the 20 mf. electrolytic condenser, C44.

Removing Transformer and Vibrator Socket Assembly—Take off the [illegible] unit shield can by removing the four self [illegible] screws at the right side (from front) of the [illegible] base and the five hex nuts from the bolts at the top of the chassis.

Unsolder the ground connections from the two lugs on the inside of the chassis base (right side from front). Unsolder the black and white coded wire from the terminal strip lug nearest the front of the chassis. This terminal strip is mounted on the transformer cover. Now unsolder the bracket holding the terminal strip to the transformer cover.

Remove the four nuts from the bolts holding the transformer assembly to the chassis. Do not remove these bolts from the transformer core. Then lift the assembly to free it from the chassis so that all parts of the assembly are readily accessible.

Proceed with replacement of the power transformer or with any other necessary service or replacements and then reassemble.

Replacement of Buffer Condenser C54—This condenser is located in the top of the transformer and vibrator assembly just underneath the vibrator socket. To replace, remove the assembly as explained in the preceding article.

In addition, the two screws holding the vibrator socket to the transformer cover assembly should be taken out. The condenser is then easily replaced.

The planetary assembly is the unit that is integral with the tuning shaft.

If the nut on the back end of this assembly is too tight, the drive will be jerky and will turn hard in high speed. If this condition exists, back off this nut one or two turns and note the effect.

If this nut is too loose, the drive will slip in slow speed. The remedy in this case, of course, is to tighten the nut.

Should the condenser drive cord slip when the planetary pulley is turning, inspect the tuning condenser, drive drum and gears to see that they are turning properly and that they are not being obstructed in some way.

If the drive turns unevenly (rough in spots), this may mean that the planetary assembly is defective or damaged internally and a new unit will be required.

Trimmer Replacement

If one trimmer of the gang trimmer strip should become defective, it is not necessary to replace the entire strip. A single trimmer P-17A36, as shown in the replacement parts list, may be used. Disconnect the lead from the coil side (side not grounded) of the defective trimmer in the strip. This connection is then made to the single trimmer. Connect it to the side of the trimmer not in contact with the adjusting screw. The other side of the single trimmer is then connected to a good ground, using a piece of heavy wire in order to support the trimmer adequately. In replacing a trimmer, be sure to keep both leads as short as possible and keep the ungrounded lead as far from ground as possible.

Replacement Parts

NOTICE—There is a large letter on the chassis which identifies the set as to major part changes. When ordering parts, please be sure to mention the series number and this large letter.

MISCELLANEOUS

SOCKETS

Part No.	Description	List Price
P-3A244	Tube Socket (6 Prong)	$0.10
P-3A247	Tube Socket (6 Prong)	.10
*P-3A334	Vibrator Socket (7 Prong)	.20

SPEAKERS

P-12A252	6" P.M. Dynamic Speaker complete with Output Trans. T8	5.70
P-12A253	8" P.M. Dynamic Speaker complete with Output Trans. T8	6.00
P-13X268	Speaker Cable and Socket Assembly	.45

KNOBS

Specify Name of Knob and Name and Model of Radio		
	Tone Control—Small Push-on Type	.15
	Volume Control—Small Push-on Type	.15
	Tuning Control—Large Push-on Type	.15
	Band Switch—Large Set Screw Type	.20

GENERAL

P-2X38	Felt Washers (Used behind Knobs)	ea.	.10
P-8X23	Rubber Chassis Mounting Cushions	ea.	.10
P-4A38	Terminal Strip—Single Lug Insulated (with Mounting Foot to left of lug)		.10
P-4A49	Terminal Strip—Single Lug Insulated (with Mounting Hole at one end)		.10
P-4A50	Terminal Strip—Two Lugs Insulated (with Mounting Hole in Center)		.10
P-4A17	Terminal Strip—Single Lug Insulated (with Mounting Foot to Right of Lug)		.10
P-30X14	Grid Clip Only		.10
P-13X269	Shielded Battery Cable		1.00
P-30X25	Battery Clips (rated at 25 amps.)	ea.	.15
P-13X214	Antenna and Ground Lead Assembly		.30
P-1A39	Fuse Clip Assembly		.10
P-1AX19	5 amp. Fuse		.10
*P-28X52	Vibrator Spring Clip		.10
*P-22X18	Vibrator Shield Base		.10
P-32X72	Vibrator Shield		.20
P-19A37	Vibrator		4.95
P-32X18	Tube Shield Base (Large)		.10
P-32X30	Tube Shield Base (Small)		.10
P-32X63	Tube Shield (Large)		.20
P-32X32	Tube Shield (Small—Open Top)		.15
P-32X50	Tube Shield (Small—Closed Top)		.10
P-2A58	2 Section, 3 Position, Band Change Switch		1.55
P-8X43	Rubber Mounting Cushions for Gang Condenser (Front)	ea.	.10
P-8X44	Rubber Mounting Cushion for Gang Condenser (Rear)		.10
P-8X45	Rubber Mounting Cushion for Gang Condenser (Rear, under Chassis Base)		.10
P-32X71	Shield Can for Filter Assembly (Under Vibrator Assembly)		.50
P-25X221	Chassis Mounting Foot	ea.	.10

TRANSFORMERS AND COILS

Part No.	Code	Description	List Price
P-9A634	T1	Antenna Trans. and Can Assembly	$1.85
P-9A635	T2	R.F. Interstage Trans. and Can Assembly	2.35
P-9A636	T3	Oscillator Coil and Can Assembly	3.20
P-9A637	T4	1st I.F. Trans. and Can Assembly	1.50
P-9A638	T5	2nd I.F. Trans. and Can Assembly	1.50
P-9A639	T6	3rd I.F. Trans. and Can Assembly	1.60
P-50X36	T7	Input Transformer	1.95
P-81X44	T8	Output Transformer (Part of Speaker Assembly)	1.30
*P-53X128	T9	Power Transformer Only	2.45
P-25A84		Power Transformer Assembly (Includes Parts Marked *)	3.85
P-9A613	L1	1st Det. Filament Reactor	.40
P-9A607	L2	Filament Reactor	.35
P-9A609	L3	"B" Reactor	.30
P-9A611	L4	"B" Reactor	.30
P-9A683	L5	"A" Line Reactor	.35
P-9A608	L6	"A" Line Reactor	.35
P-9A685	L7	"A" Line Reactor	.35
P-52X47	L8	"A" Choke (Iron Core)	.85
P-52X27	L9	"B" Choke (Iron Core)	1.00

CONDENSERS

TUBULAR

Part No.	Code	Capacitance	Voltage	List Price
P-46X80	C5	.05 mf.	180	.15
P-46X117	C6	.25 mf.	180	.25
P-46X117	C8	.25 mf.	180	.25
P-46X117	C12	.25 mf.	180	.25
P-46X80	C14	.05 mf.	180	.15
P-46X98	C17	.1 mf.	180	.20
P-46X98	C29	.1 mf.	180	.20
P-46X98	C30	.1 mf.	180	.20
P-46X187	C31	.02 mf.	180	.15
P-46X124	C37	.01 mf.	180	.15
P-46X195	C38	.1 mf.	180	.15
P-46X114	C39	.004 mf.	600	.15
P-46X103	C40	.05 mf.	200	.15
P-46X114	C41	.004 mf.	600	.15
P-46X117	C42	.25 mf.	180	.25
P-46X135	C45	.5 mf.	180	.40
P-46X98	C46	.1 mf.	180	.20
P-46X98	C47	.1 mf.	180	.20
P-46X80	C48	.05 mf.	180	.15
P-46X196	C49	.5 mf.	180	.30
P-46X117	C50	.25 mf.	180	.25
P-46X195	C51	.5 mf.	180	.40
P-46X135	C52	.5 mf.	180	.40
P-46X204	C53	.5 mf.	180	.30
P-46X201	C54	.1 mf.	1000	.16

ELECTROLYTIC

P-45X215	C7	4 mf.	150	Dry	1.50
	C23	18 mf.	150		
	C33	18 mf.	150		
P-44X17	C44	20 mf.	150	Wet	.95

MOLDED

P-47X66	C1	750 mmf.	.15
P-47X53	C13	35 mmf.	.10
P-47X74	C20	1800 mmf.	.20
P-47X53	C24	35 mmf.	.10
P-47X56	C32	50 mmf.	.10
P-47X56	C34	50 mmf.	.10
P-47X68	C35	250 mmf.	.15
P-47X72	C36	25 mmf.	.10
P-17A45 Trimmer Strip	C2	2-25 mmf. Range "D"	Antenna Trimmer
	C3	2-25 mmf. Range "C"	Antenna Trimmer
	C4	2-25 mmf. Range "B"	Antenna Trimmer
	C9	2-25 mmf. Range "D"	Interstage Trimmer
	C10	2-25 mmf. Range "C"	Interstage Trimmer
	C11	2-25 mmf. Range "B"	Interstage Trimmer
	C15	2-25 mmf. Range "D"	Oscillator Trimmer
	C18	2-25 mmf. Range "C"	Oscillator Trimmer
	C21	2-25 mmf. Range "B"	Oscillator Trimmer

See Part Number 17A36 for replacement of any one section

P-17A36	C16	40-100 mmf.	Oscillator Padding Condensers .45
	C22	300-600 mmf.	
P-17A58	C19	1200-1600 mmf.	Oscillator Padding Condenser .50
P-17A33	C25	70-150 mmf.	1st I.F. Trimmer Condensers .40
	C26	70-150 mmf.	
P-17A33	C27	70-150 mmf.	2nd I.F. Trimmer Condensers .40
	C28	70-150 mmf.	
P-17A38	C33	40-100 mmf.	3rd I.F. Trimmer Condenser .25
P-17A36		2-25 mmf. (To be used for replacement of any one section of Trimmer Strip P-17A45)	.10

MISCELLANEOUS

P-14A58	3 Gang Condenser Less Drive Mechanism and Dial Assembly	3.60

RESISTORS

Part No.	Code	Resistance	Wattage	List Price
P-A94104	R1	100,000 Ohm	0.2	.15
P-A95403	R2	40,000 Ohm	0.2	.10
P-A95153	R3	15,000 Ohm	0.2	.10
P-A95153	R4	15,000 Ohm	0.2	.10
P-A94103	R5	10,000 Ohm	0.2	.15
P-A95305	R6	3 Megohm	0.2	.10
P-A94503	R7	50,000 Ohm	0.2	$0.15
P-A95104	R8	100,000 Ohm	0.2	.10
P-A94305	R9	3 Megohm	0.2	.15
P-A94503	R10	50,000 Ohm	0.2	.15
P-A95102	R11	1,000 Ohm	0.2	.10
P-A95403	R12	40,000 Ohm	0.2	.10
P-A94305	R14	3 Megohm	0.2	.15
P-A95305	R16	3 Megohm	0.2	.10

WIRE WOUND

P-43X60	R13	25 Ohm	0.3	.45
	R18	150 Ohm	2.0	

VARIABLE

P-36X222	R15	1 Megohm	Volume Control and On-Off Switch 1.00
P-40X215	R17	15 Megohm	.65

DIAL AND DRIVE ASSEMBLY

DIAL ASSEMBLY

Part No.	Description	List Price
Specify Name and Model of Radio	Dial Assembly Complete with Dial Glass; Dial Plate; Dial Cardboard; Small Pointers; Reflectors; Small Pointer Cords, Springs, Pulleys and Collars; and Band Indicator Assembly less Large Station Pointer and Micrometer Pointer	$3.85
See above	Dial Glass Only	1.45
P-25A125	Dial Assembly Mounting Plate, Includes Small Pointer Shafts and Pulleys, and Band Indicator Assembly	1.20

DIAL AND DRIVE ASSEMBLY—Continued

DIAL ASSEMBLY

Part No.	Description	List Price
P-25X297	Dial Assembly Support Brackets (Attached to Gang Condenser) ea.	$0.10
P-15X59	Large Station Pointer	.20
P-15X60	Micrometer Pointer	.10
P-15X57	Small Volume or Tone Control Pointer ea.	.10
P-93X16	Dial Cardboard	.10
P-11X41	Fibre Strip (At Bottom of Dial Glass)	.10
P-41X12	Dial Lamp Reflectors (At each side of Dial Plate) ea.	.10
P-7A37	Dial Lamp Sockets and Clips ea.	.10
P-7A32	Dial Lamps ea.	.20
	10" Black Cord for Small Pointers doz.	.45
P-29X20	Brass Collars with Set Screws for Securing Small Pointer Cords to Shafts ea.	.10
P-28X44	Tension Springs for Small Pointer Cords ea.	.10
P-76X229	Small Pointer Shafts and Pulleys ea.	.10
P-17X15	Glass Dial Crystal	.35
P-28X58	Crystal Retaining Ring	.15
P-2A60	Dial Lamp Push Button Switch Assembly	.50

DRIVE ASSEMBLY

P-5A34	Planetary Assembly Complete with Hex Nut and Lock-washer (This is the unit mounted at the front of the chassis base. It is integral with the tuning shaft.)	1.25
P-10X14	Black Tuning Drive Cord Only	.30
P-28X69	Tension Spring for Tuning Drive Cord	.10
P-25X269	Drive Assembly Bracket Only (Mounted on Gang Condenser)	.25
P-25X283	Rear Mounting Foot for Gang Condenser	.10
P-24X239	Drive Drum Assembly Complete with Gears, Micrometer and Main Pointer Shaft	1.35
P-28X84	Spreader Spring for Rotary Gear (Part of Above Assembly)	.10
P-28X83	Spreader Spring for Stationary Gear (Part of Above Assembly)	.10

Prices Subject to Change Without Notice

MODEL HRO
Schematic, Socket
Trimmers, Alignment

NATIONAL COMPANY, INC.

R.F. COIL UNIT REMOVED FROM ITS SHIELD

locking between the first detector and oscillator circuits. In adjusting the No. 2 trimmer, it will be necessary to have the antenna connected with some signal or noise input.

Band-Spread Adjustment

The four screws must be shifted to the right-hand terminal blocks, as outlined under "Coil Ranges" in the preceding section. The tuning dial is set at 450 and a test oscillator adjusted to the exact high-frequency edge of the proper amateur band. Trimmer No. 7 (of the layout diagram) is adjusted until the signal is picked up. Trimmers Nos. 1, 3 and 5 are then adjusted for maximum sensitivity. The dial is then rotated to the low-frequency end of the band; that is, to 50; and the left-hand calibration curve should be checked. If found incorrect, it will be necessary to adjust the band-spread series padding condenser, mounted inside the oscillator coil and adjustable from the rear by means of a socket wrench. If the low-frequency end of the band is tuned in at any dial reading above 50, the capacity of this series padding condenser must be decreased.

Tracking of the two R. F. and first detector circuits may then be checked by tuning to the low-frequency end of the band and checking the adjustment of the Nos. 1, 3 and 5 trimmers. If more capacity is needed for best sensitivity (as indicated by improved signal strength when the trimmer is rotated clockwise), the series padding condenser of the coil being adjusted must have more capacity. If any of the Nos. 1, 3 or 5 trimmers require less capacity, a corresponding decrease must be made in the capacity of the series padding condenser. After the series padding condenser has been adjusted for trial, the dial is returned to 450 and the procedure repeated.

The coil panel screws must be in the left-hand terminal blocks to give the full coverage range.

The tuning dial is turned to approximately 490 and a frequency meter, or accurate test oscillator, is set to the frequency indicated by the general coverage calibration chart.

The oscillator coil trimmer, shown on the layout diagram of the receiver as No. 8, is then adjusted so that the dial reading checks the calibration curve. Trimmers Nos. 2, 4 and 6 are then adjusted for maximum sensitivity.

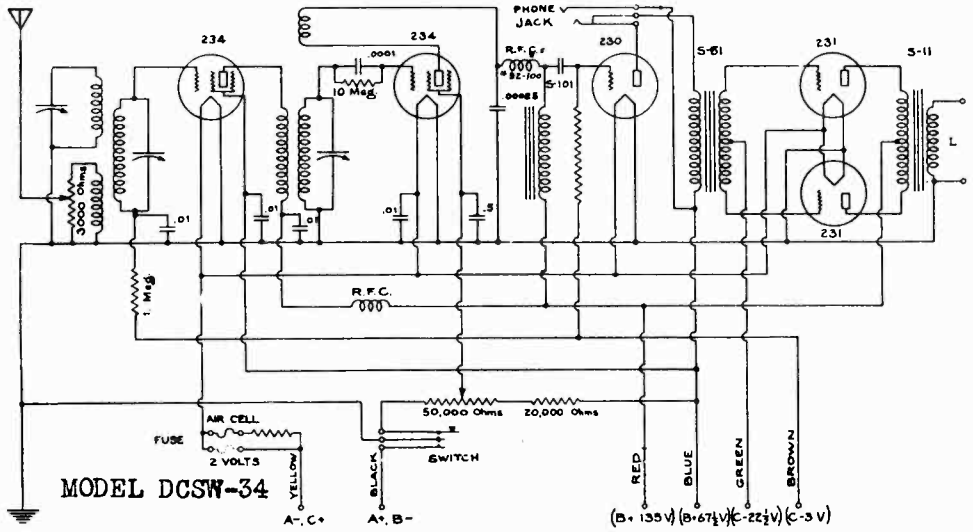
The ganging is checked by pressing the outside rotor plate of the oscillator condenser sideways toward the stator.

If sensitivity increases, the oscillator coil inductive trimmer must be adjusted to decrease inductance. In the case of the 14 to 30 megacycle coils, inductive trimming is accomplished by moving a loop of wire around the end of the oscillator coil. Bending this loop from right to left across the end of the coil form will increase inductance. After any change in the oscillator coil inductance has been made, it will be necessary to tune back to the high-frequency end of the range in order to readjust the No. 8 trimmer condenser.

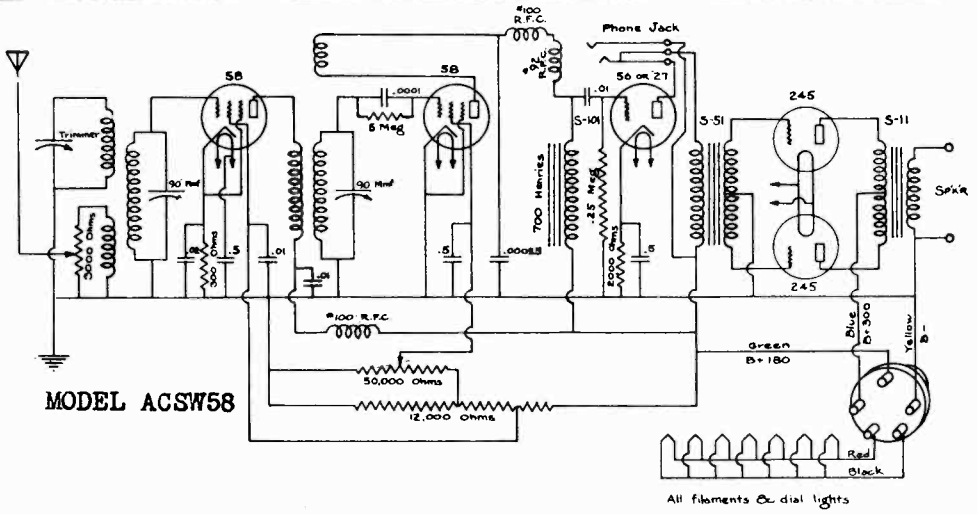
In the case of the 14 to 30 megacycle coils, special care must be exercised to see that the oscillator is operating on the high-frequency side of the signal. Two points will be found when adjusting the No. 8 trimmer and of these, the correct one is on the counter-clockwise side. Furthermore, in adjusting the No. 6 trimmer of this coil assembly, there will be some interaction or inter-

MODEL DCSW-34
MODEL ACSW-58
MODELS FBX,FBXA
Schematics,Notes

NATIONAL COMPANY, INC.



MODEL DCSW-34

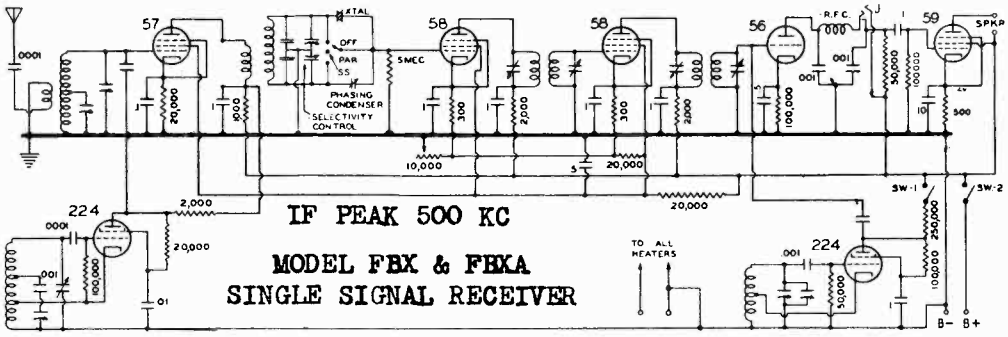


MODEL ACSW58

FREQUENCY RANGE AND COILS

Five sets of coils are furnished with each SW-58 and SW-34, two coils to a set, and covering wavelengths from 13.5 to 200 meters. One coil of each set is plugged into the r-f circuit (left hand coil socket) and one coil into the detector coil socket. The two coils of each set are identical, and the wave bands they cover are indicated on the chart on the cover of the receiver and in the catalog coil list. The coils for the a-c receiver are designated by numbers only, beginning with the number 60 and increasing with wavelength. The d-c coils may be identified by number — from 10 to 21 increasing with wavelength — and by the color strip molded into the top ring. The wavelength of the coils increases with the number of turns of wire.

Coils can be had extending the wavelengths of the receivers as high as 2000 meters (see catalog page 19), and the coils forms are available for the home winding of special inductors.



IF PEAK 500 KC

MODEL FBX & FBXA
SINGLE SIGNAL RECEIVER

See Special Section and Model NC100 (see index) for Alignment of this receiver.

FREQUENCY RANGES

(Approximate, see calibration chart on inside of receiver cover)

Coil A -11500 to 19500 KC
Coil B - 6900 to 11750 KC
Coil C - 4100 to 7400 KC
Coil D - 2350 to 4350 KC
Coil E - 1500 to 2550 KC

MODEL NC-100
Schematic, Parts

NATIONAL COMPANY, INC.

TYPE NC-100 RECEIVER

C_{24}	H.F. Oscillator Coupling	.01 mfd.	400 volt	C_{34}	Crystal Filter Bridge	.0001 mfd.	Mica
C_{25}	Tuning Indicator Grid Filter	.01 mfd.	400 volt	C_{35}	Crystal Filter Coupling	35 mmf.	Variable
C_{26}	C.W. Oscillator Heater Bypass	.1 mfd.	200 volt	X_1	B+ (stand-by) Switch		
C_{27}	C.W. Oscillator Screen Bypass	.1 mfd.	200 volt	X_2	AC On-Off Switch		
C_{28}	AVC Cathode Bypass	.1 mfd.	200 volt	X_3	C.W. Oscillator Switch		
C_{29}	Tone Control	.01 mfd.	400 volt	X_4	AVC On-Off Switch		
C_{30}	B-Supply Filter	8 mfd.	450 volt				
C_{31}	B-Supply Filter	8 mfd.	450 volt	L_1	2nd Det. I.F. Choke	7. mh.	
C_{32}	B-Supply Filter	8 mfd.	450 volt	L_2	Tone Filter Choke	18. Henry	
C_{33}	Crystal Filter Bridge	.0001 mfd.	Mica	L_3	B-Supply Filter Choke	20. Henry	

T_1 Push-Pull Input Audio Transformer 4:1 Ratio
T_2 Power Transformer
T_3 Output Transformer Mounted on Speaker

IF PEAK 456 KC

R_1	R.F. Grid filter	.5 megohm	½ watt	R_{21}	H.F. Oscillator Voltage Divider	100,000 ohms	½ watt	C_4	R.F. and H.F. Osc. Plate Bypass	1 mfd.	400 volt
R_2	R.F. Cathode Bias	350 ohms	½ watt	R_{22}	1st Det. Screen Filter	100,000 ohms	½ watt	C_7	1st Det. Cathode Bypass	.1 mfd.	200 volt
R_3	1st Det. Cathode Bias	5000 ohms	½ watt	R_{23}	Tuning Indicator Grid Filter	.5 megohm	½ watt	C_6	1st Det. Plate Filter	.1 mfd.	400 volt
R_4	H.F. Circuit B+ Filter	2000 ohms	½ watt	R_{24}	Tuning Indicator Target	.1 megohm	⅛ watt	C_7	1st I.F. Grid Filter	.01 mfd.	400 volt
R_5	1st I.F. Grid Filter	.5 megohm	½ watt	R_{25}	C.W. Oscillator Grid Leak	50,000 ohms	½ watt	C_8	1st I.F. Cathode Bypass	.1 mfd.	200 volt
R_6	1st I.F. Cathode Bias	350 ohms	½ watt	R_{26}	C.W. Oscillator Voltage Divider	100,000 ohms	½ watt	C_9	1st and 2nd I.F. Plate Filter	.1 mfd.	400 volt
R_7	2nd I.F. Grid Filter	.5 megohm	½ watt	R_{27}	C.W. Oscillator Voltage Divider	100,000 ohms	½ watt	C_{10}	2nd I.F. Grid Filter	.01 mfd.	400 volt
R_8	2nd I.F. Cathode Bias	500 ohms	½ watt	R_{28}	AVC Grid Return	.5 megohm	½ watt	C_{11}	2nd I.F. Cathode Bypass	.1 mfd.	200 volt
R_9	2nd I.F. Screen Filter	2000 ohms	½ watt	R_{29}	AVC Voltage Divider	350 ohms	1 watt	C_{12}	2nd I.F. Screen Filter	.1 mfd.	200 volt
R_{10}	2nd Det. Cathode Bias	20,000 ohms	½ watt	R_{30}	AVC Voltage Divider	1000 ohms	2 watt	C_{13}	2nd Det. Cathode Bypass	10. mfd.	50 volt
R_{11}	Audio Volume Control	50,000 ohm potentiometer		R_{31}	AVC Voltage Divider	1000 ohms	2 watt	C_{14}	2nd Det. Plate Bypass	.001 mfd.	Mica
R_{12}	AVC Plate	.5 megohm	½ watt	R_{32}	Tone Control	500,000 ohm potentiometer		C_{15}	Phone Coupling	.1 mfd.	400 volt
R_{13}	I.F. B+ Filter	2000 ohms	½ watt	R_{33}	Output Cathode Bias	250 ohms	2 watt	C_{16}	AVC Plate Bypass	.1 mfd.	200 volt
R_{14}	R.F. Gain Control	10,000 ohm variable		R_{34}	C.W. Oscillator Plate Filter	.25 megohm	½ watt	C_{17}	AVC Grid Coupling	.0001 mfd.	Mica
R_{15}	Common Grid Filter	.5 megohm	½ watt					C_{18}	C.W. Oscillator Coupling	2 mmf.	Special
R_{16}	Gain Control Bleeder	50,000 ohms	½ watt					C_{19}	C.W. Oscillator Grid	.001 mfd.	Mica
R_{17}	Voltage Divider	20,000 ohms	2 watt	C_1	R.F. Grid Filter	.01 mfd.	400 volt	C_{20}	H.F. Oscillator Grid	.0001 mfd.	Mica
R_{18}	Voltage Divider	20,000 ohms	2 watt	C_2	R.F. Cathode Bypass	.1 mfd.	200 volt	C_{21}	H.F. Oscillator Series Padding — Different range	for each	
R_{19}	H.F. Oscillator Grid Leak	20,000 ohms	½ watt	C_3	R.F. and 1st I.F. Screen Bypass	.1 mfd.	200 volt	C_{22}	H.F. Oscillator Heater Bypass	.01 mfd.	400 volt
R_{20}	H.F. Oscillator Voltage Divider	50,000 ohms	½ watt					C_{23}	H.F. Oscillator Screen Bypass	.1 mfd.	200 volt

MODEL NC-100
Chassis, Trimmers
Alignment, Socket

NATIONAL COMPANY, INC.

Preliminary Adjustments — The I.F.

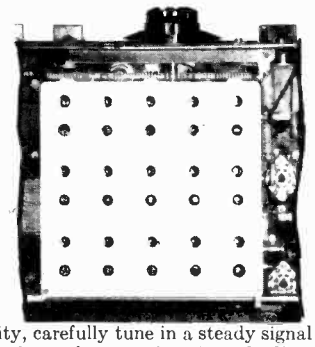
All the I.F. transformers are now adjusted for maximum signal. This adjustment need not be made with any great degree of precision, since the crystal will not oscillate at exactly the same frequency to which it will be resonant in the receiver. The Phasing control should be set at "0".

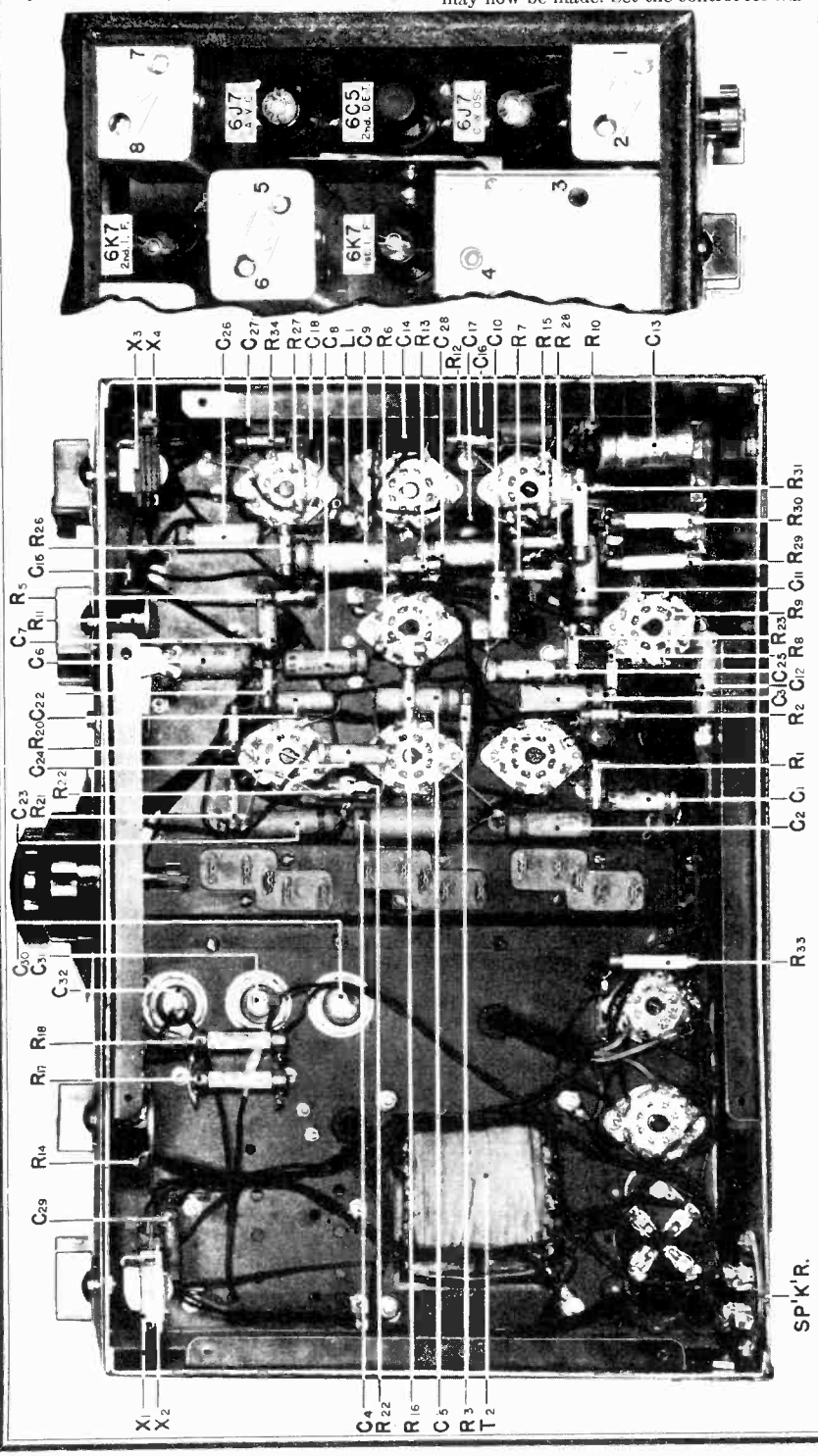
The I.F. adjustments are indicated on the layout diagram, page 4, Nos. 4 to 8 (inclusive).

The crystal filter output coupling condenser, adjustment No. 3, serves as a fixed I.F. gain control and, in general, **should not** be touched.

The crystal may now be removed from the oscillator and installed in the receiver. Throw the switch to connect the crystal for single signal reception. Set the selectivity control for maximum selectivity; that is, with the pointer rotated all the way to the right. Now, tune in a steady signal from a local oscillator or monitor. Tuning very slowly across the carrier, there should be one point at which the signal will peak very sharply. The audio pitch of this peak will be nearly the same as the pitch of the beat used when the crystal oscillator was being picked up.

The final adjustment of the I.F. transformers may now be made. Set the control for maximum selectivity, carefully tune in a steady signal until it is exactly on the crystal peak, and adjust each of the I.F. transformer tuning condensers for maximum signal strength. (*In almost all cases where the I.F. amplifier has once been aligned to the crystal, this check is all that would be required, and it is not necessary to put the crystal in an external oscillator.*) Even if the I.F. amplifier is considerably out of alignment, the crystal frequency may be found by employing a strong local signal from a monitor or frequency meter, slowly tuning across it while listening for a peak in the audio beat note. If the peak is found at a very high audio pitch it will be necessary to change the tuning of the beat oscillator so that the audio peak will be well inside the limits of audibility. It is probable that if the peak signal is found at all, the I.F. amplifier will not be far out of tune and the readjustments required will be small.





R.F. and H.F. Oscillator Alignment

Complete alignment of any one coil range is made as follows: Set the tuning dial near the high frequency end of the range between 470 and 490, check the dial reading against the calibration curve by means of an accurate test oscillator or a signal of known frequency; readjustment should be made if the dial reading is in error by more than five or six divisions. In checking the error, disregard the numbers between 495 and 500.

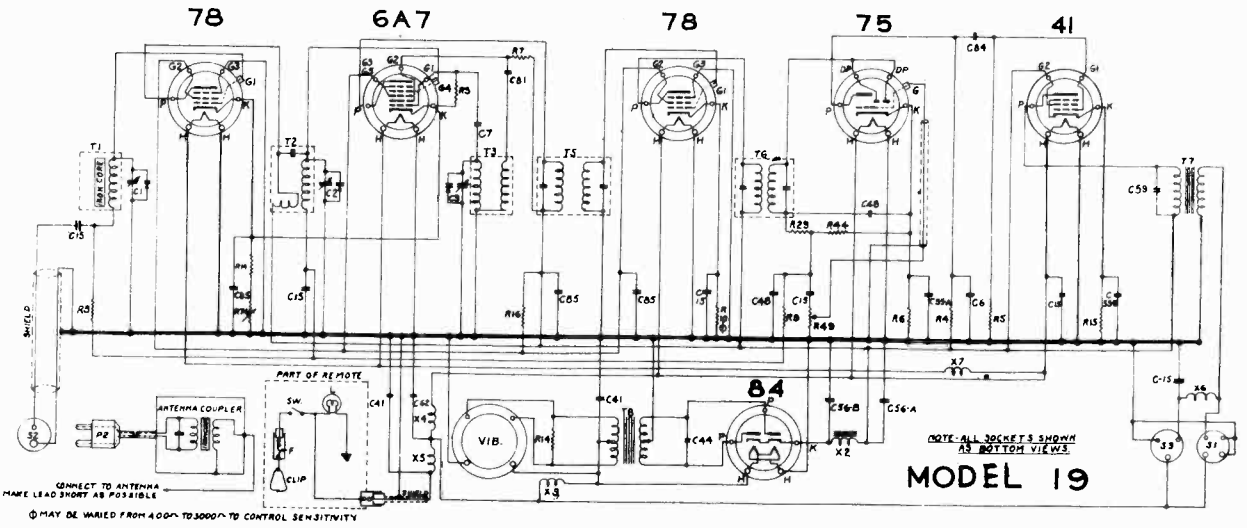
Correction for calibration is made by adjustment of the high frequency oscillator trimmer (nearest the front of the receiver).

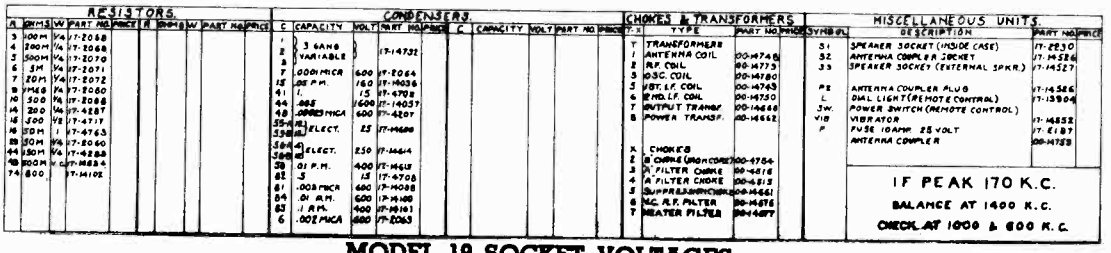
With calibration correct at the high frequency end of the range, the dial should be rotated toward the lower numbers. The background noise may vary slightly over the range but should not get appreciably weaker except in the case of the .54 to 1.3 mc. coils. Ganging is checked by pressing one of the outside rotor plates of the oscillator condenser sideways toward the stator, but not enough to make the plates touch. The same check may be applied to the first detector and R.F. tuning condensers. Any bending of the rotor plates should make the background noise definitely weaker. A similar check can, of course, be made by bending the rotor plates out, away from the stator, care being taken not to bend the plates so far that they will not return to their original position.

On the two highest frequency ranges, it may be possible to make the initial oscillator adjustment incorrectly. There are two settings of the oscillator trimmer condenser which will tune in the desired signal at the proper point on the dial; of these, the higher frequency setting (least trimmer capacity) is correct. In checking the ganging of the 13.5 to 30. mc. range, the R.F. condenser has little effect upon the background noise at the low frequency end of the scale and at this one point it is better to use a test signal. Should any error in tracking be found on one range, it is probable that the same error will be present on all ranges and correction may be made by permanently bending the rotor plates of the tuning condenser section in question.

NOBLITT SPARKS INDUSTRIES

MODEL 19 Auto
Schematic, Voltage
Resistance, Parts





MODEL 19 SOCKET VOLTAGES

Voltages given here are actually for an input battery voltage of 5.8 amp., even though the normal heater voltage is shown as 6.3 amp.

Tube	Heater	Cathode	Suppressor Grid	Screen Grid	Plate	*Oscillator Grid	Anode Grid	†Diode Plates
78	6.3	2.5-4.5	0	76	227	....	....	....
6A7	6.3	2.5-4.5	....	76	227	5-12	160	....
78	6.3	2.5	0	76	227	....	....	....
75	6.3	1.3	....	....	100	....	....	2.0
41	6.3	12.0	....	2.30	220	....	....	....
84	6.3	235	....	....	250	....	....	....

* Measured at 1500 K. C.

† Measured with Vacuum Tube Voltmeter.

POINT TO POINT RESISTANCES—MODEL 19

78—R. F. Amplifier

Heater	0
Heater	∞
Cathode, adj. max.	1,000 Ω
Suppressor	0
Screen to +B.	50,000 Ω
Plate to +B.	100 Ω
Control Grid	1,255,000 Ω

6A7—1st Det. Oscillator

Heater	0
Heater	∞
Cathode, adj. max.	1,000 Ω
Osc. Grid	100,600 Ω
Anode Grid to +B.	20,000 Ω
Screen Grid to +B.	50,000 Ω
Plate to +B.	74 Ω
Control Grid	1,155,000 Ω

78—I. F. Amplifier

Heater	0
Heater	∞
Cathode (See Diag.)	1,000 Ω
Suppressor	0
Screen to +B.	50,000 Ω
Plate to +B.	74 Ω
Control Grid	74 Ω

75—AVC Det; 1st Audio

Heater	0
Heater	∞
Cathode	5,000 Ω
Diode	205,000 Ω
Diode	205,000 Ω
Plate to +B.	200,000 Ω
Control Grid, V. C. on	500,000 Ω
Control Grid, V. C. off	Max. 25 Ω

41—Power Output

Heater	0
Heater	∞
Cathode	500 Ω
Control Grid	500,000 Ω
Screen to +B.	0
Plate to +B.	625 Ω

84—Rectifier

Heater	0
Heater	∞
Cathode to +B.	140 Ω
Plate	250 Ω
Plate	270 Ω
Plate to Plate	520 Ω

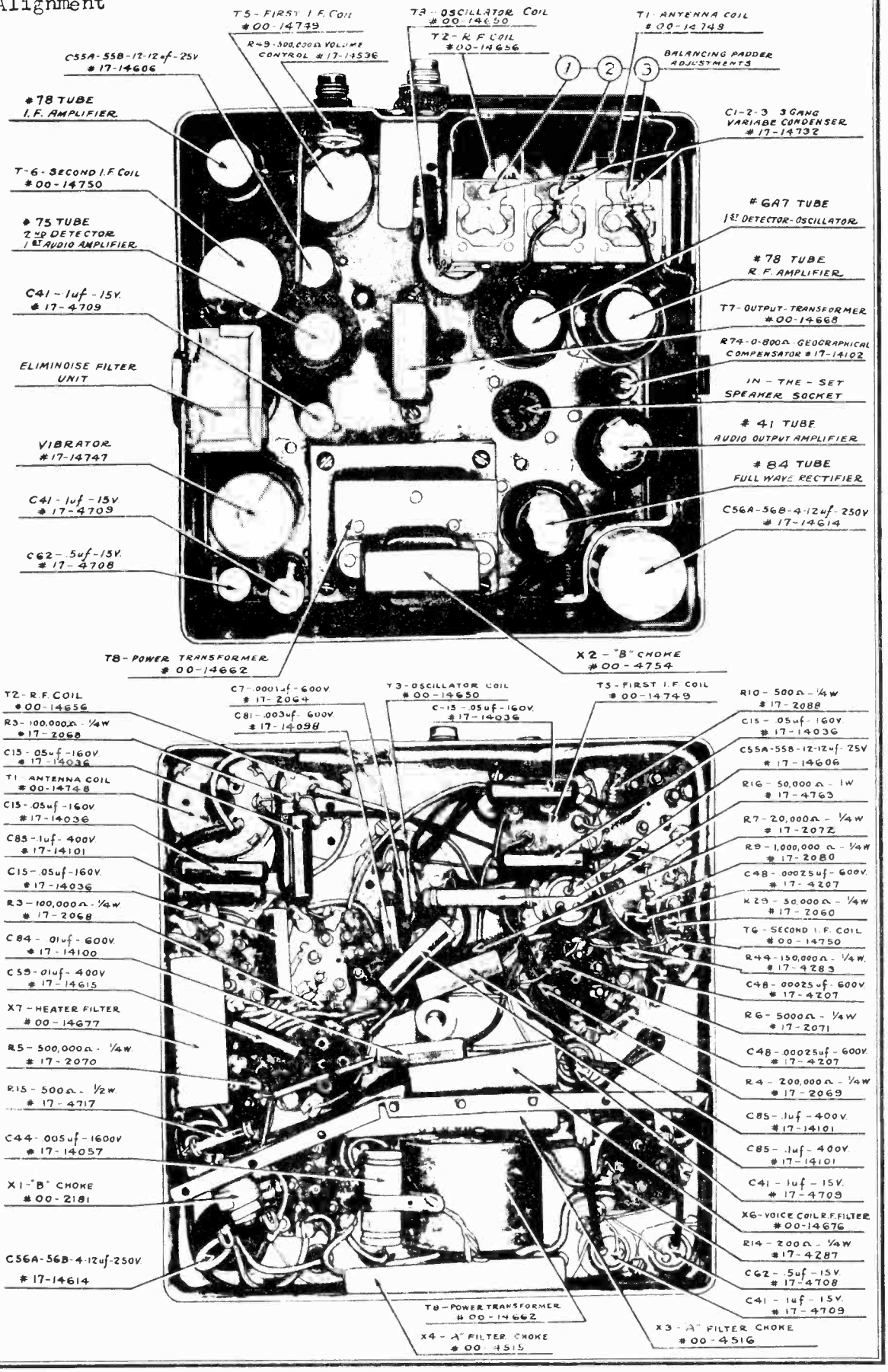
COIL AND TRANSFORMER RESISTANCES

Phant. Filter Pri.	8.5 Ω
Phant. Filter Sec.	1.0 Ω
Antenna Coil	2.325 Ω
R. F. Coil Pri.	100.0 Ω
R. F. Coil Sec.	3.475 Ω
Osc. Coil Pri.	3.0 Ω
Osc. Coil Sec.	1.8 Ω
1st I. F. Trans. Pri.	75.0 Ω
1st I. F. Trans. Sec.	75.0 Ω
2nd I. F. Trans. Pri.	75.0 Ω
2nd I. F. Trans. Sec.	75.0 Ω
Output Trans. Pri.	625.0 Ω
Output Trans. Sec.	40 Ω
"B" Filter Choke	140.0 Ω
"B" R. F. Choke	1.35 Ω
Power Trans. Pri.	.075-0-.075 Ω
Power Trans. Sec.	175.0-0-200.0 Ω

MODEL 19 Auto
Socket, Chassis
Trimmers, Alignment

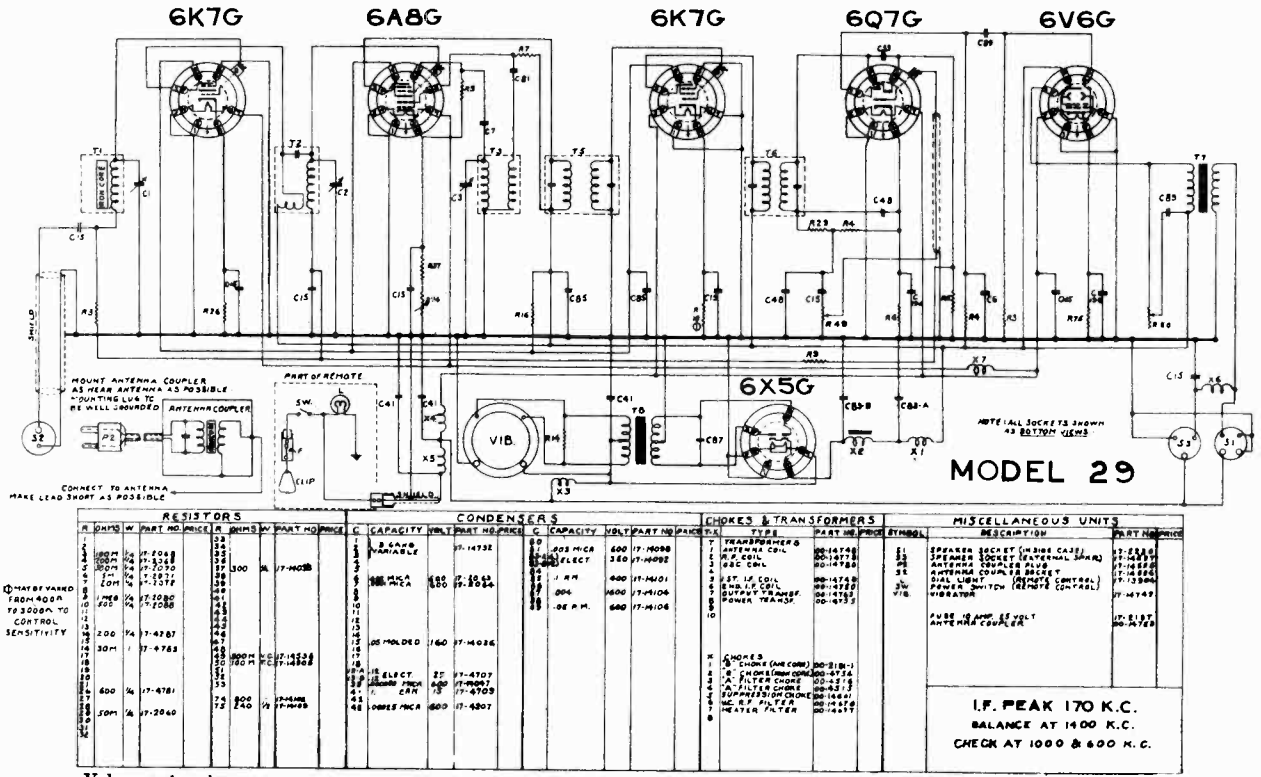
NOBLITT SPARKS INDUSTRIES

ALIGNMENT-Pormaset prebalanced IF transformers require no adjustment. Gen. connected to Ant. post of Phantom-Filter. Gang out of mesh. Gen. grounded to chassis. Generator set to 1575 KC, adjust Padder No.1 for maximum output. Reset Generator to 1400 KC, rotate gang until signal is resonated. Reduce Generator output, then adjust padders NO.2 and No. 3 for maximum output. After installation in a car tune in a weak station between 1150 and 1400 KC, readjust padder No.3 for maximum output.



NOBLITT SPARKS INDUSTRIES

MODEL 29
Schematic, Voltage
Resistance, Parts



Voltages given here are actually for an input battery voltage of 5.8 amp., even though the normal heater voltage is shown as 6.3 amp.

Tube	Heater	Cathode	Suppressor Grid	Screen Grid	Plate	*Oscillator Grid	Anode Grid	†Diode Plates
6K76	6.3	2.7	0	74	243	....	....	....
6A8G	6.3	2-6.4	....	74	243	5-12	176	....
6K7G	6.3	3.1	0	74	242	....	....	....
6Q7G	6.3	1.8	....	....	146	....	....	2.0
6V6G	6.3	10.5	....	250	224	....	....	....
6X5G	6.3	255	....	....	275	....	....	....

* Measured at 1500 K. C.

† Measured with Vacuum Tube Voltmeter.

POINT TO POINT RESISTANCES—MODEL 29

6K7G—R. F. Amplifier

Heater	0
Heater	∞
Cathode	600 Ω
Suppressor	0
Screen to +B	50,000 Ω
Plate to +B	100 Ω
Control Grid	1,600,000 Ω

6A8G—1st Det. Oscillator

Heater	0
Heater	∞
Cathode, adj. max	1,000 Ω
Osc. Grid	100,600 Ω
Anode Grid to +B	20,000 Ω
Screen to +B	50,000 Ω
Plate to +B	74 Ω
Control Grid	1,500,000 Ω

6K7G—I. F. Amplifier

Heater	0
Heater	∞
Cathode	500 Ω
Suppressor	0
Screen to +B	50,000 Ω
Plate to +B	74 Ω
Control Grid	74 Ω

6Q7G—AVC 2nd Det.; 1st Audio

Heater	0
Heater	∞
Cathode	5,000 Ω
Diode	205,000 Ω
Diode	205,000 Ω
Plate to +B	200,000 Ω
Control Grid, V. C. on	500,000 Ω
Control Grid, V. C. off	Max. 25 Ω

6V6G—Beam Power Output

Heater	0
Heater	∞
Cathode	240 Ω
Control Grid	100,000 Ω
Screen to +B	0
Plate to +B	395 Ω

6X5G—Rectifier

Heater	0
Heater	∞
Cathode to +B	140 Ω
Plate	185 Ω
Plate	163 Ω
Plate to Plate	348 Ω

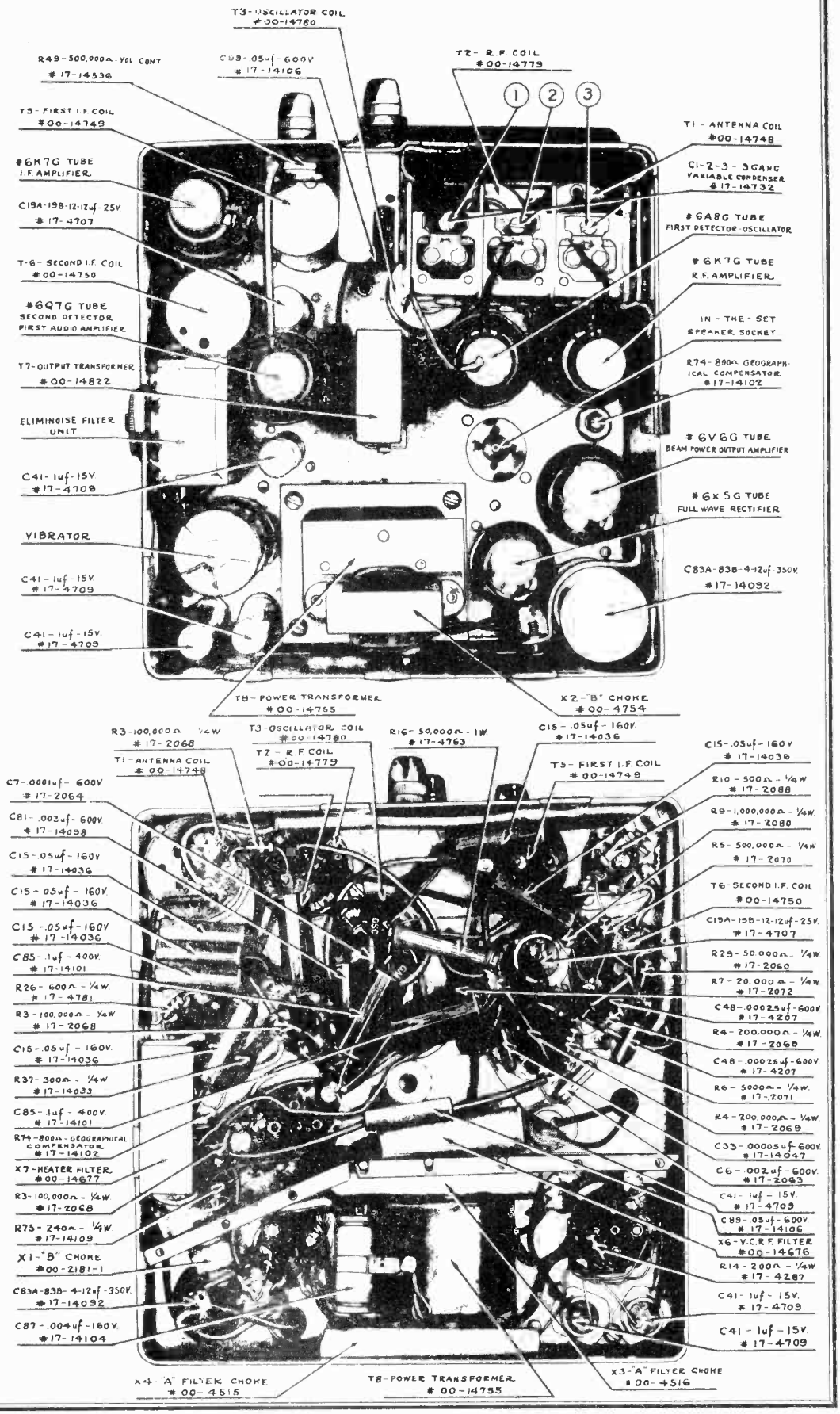
COIL AND TRANSFORMER RESISTANCES

Phant. Filter Pri.	8.5 Ω
Phant. Filter Sec.	1.0 Ω
Antenna Coil	2.325 Ω
R. F. Coil Pri.	100.0 Ω
R. F. Coil Sec.	3.475 Ω
Osc. Coil Pri.	3.0 Ω
Osc. Coil Sec.	1.8 Ω
1st I. F. Trans. Pri.	75.0 Ω
1st I. F. Trans. Sec.	75.0 Ω
2nd I. F. Trans. Pri.	75.0 Ω
2nd I. F. Trans. Sec.	75.0 Ω
Output Trans. Pri.	395.0 Ω
Output Trans. Sec.	1 Ω
Power Trans. Pri.	.075-.075 Ω
Power Trans. Sec.	175-0-200.0 Ω
"B" Filter Choke	140.0 Ω
"B" R. F. Choke	1.35 Ω

MODEL 29
Socket, Trimmers
Chassis, Alignment

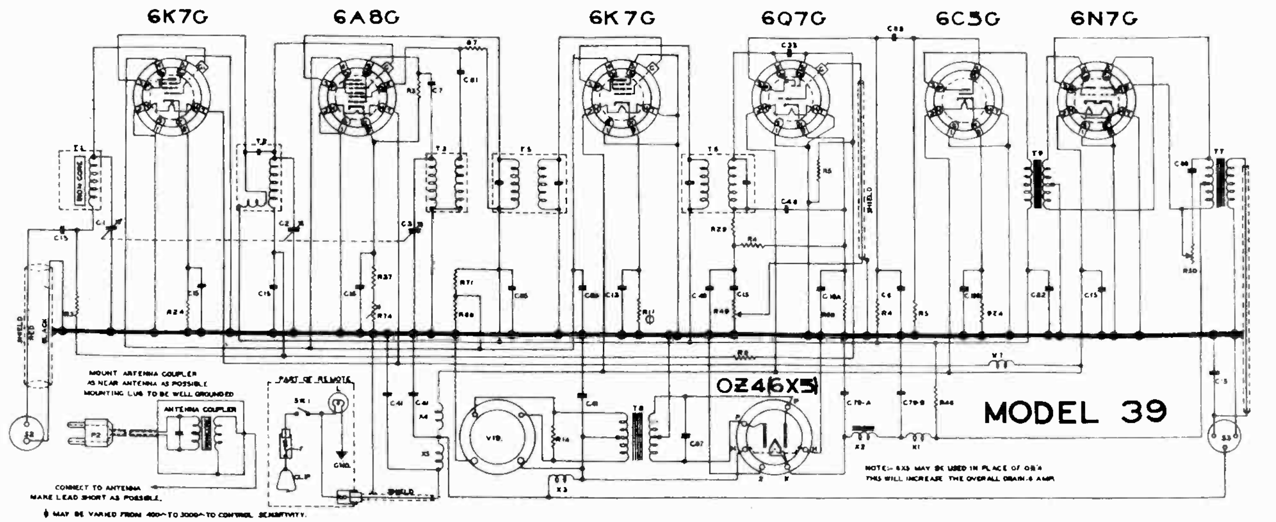
NOBLITT SPARKS INDUSTRIES

ALIGNMENT- Permaset prebalanced IF transformers require no adjustment. Gen. connected to ANT. post of Phantom-Filter. Gang out of mesh, Generator grounded to chassis, and set to 1575 KC, adjust padder NO. 1 for maximum output. Reset generator to 1400 KC, rotate gang until signal is resonated. Reduce the generator output, then adjust padders NO.2 and NO.3 for maximum output. After installation in a car tune in a weak station between 1150 and 1400 KC, readjust padder NO.3 for maximum output.



MODEL 39
Schematic, Voltage
Resistance, Parts

NOBLITT SPARKS INDUSTRIES



RESISTORS

R	Ω	W	PART NO.
3	100 M	1/4	17-2060
4	200 M	1/4	17-2066
5	500 M	1/4	17-2070
7	20 M	1/4	17-2072
9	1 MEG	1/4	17-2080
11	2 M	1/4	17-4202
14	200	1/4	17-4207
24	1000	1/4	17-2066
29	50 M	1/4	17-2080
37	300	1/4	17-14033
46	1000	1	17-14048
48	500 M	V.C.	17-14536
50	100 M	T.C.	17-14805
58	8 M	1/4	17-4290
59	60 M	1/2	17-4190
71	40 M	1	17-14087
74	600	—	17-14102

CONDENSERS

C	CAPACITY	VOLT	PART NO.
1, 2, 3	2 GANG VARIABLE		17-14732
6	.002 MICA	600	17-2063
7	.0001 MICA	600	17-2064
19	.05 MOULDED	140	17-14038
19-A, 19-B	12-12 ELECT.	25	17-4707
33	.000050 MICA	600	17-14047
41	1 CAN	15	17-4706
48	.00025 MICA	600	17-4207
79-A, 79-B	12-12 ELECT.	450	17-14090
82	4. ELECT.	350	17-4710
81	.003 MICA	600	17-14098
86	.1 P.M.	400	17-14101
87	.004	1600	17-14104
88	.02 P.M.	600	17-14105
89	.05 P.M.	600	17-14106

CHOKES & TRANSFORMERS

T-X	TYPE	PART NO.
T	TRANSFORMERS	
1	ANT. COIL	00-14748
2	R.F. COIL	00-14779
3	OSC. COIL	00-14780
5	FIRST I.F. COIL	00-14749
6	SECOND I.F. COIL	00-14750
7	OUTPUT TRANSF.	00-14778
8	POWER TRANSF.	00-14786
9	INPUT TRANSF.	00-14783
X	CHOKES	
1	"B" CHOKE	00-2181-1
2	"B" CHOKE (IRON CORE)	00-4754
3	"A" FILTER CHOKE	00-4518
4	"A" FILTER CHOKE	00-4613
5	SUPPRESSION CHOKE	00-14961
7	HEATER FILTER	00-14977

MISCELLANEOUS UNITS

SYMBOL	DESCRIPTION	PART NO.
	ANTENNA COUPLER	00-14750
S2	ANT. COUPLER SOCKET	17-14526
S3	SPEAKER SOCKET	17-14527
P2	ANT. COUPLER PLUG	17-14525
L	DIAL LIGHT (IN REMOTE CONTROL)	17-13004
SW	POWER SWITCH (INTEGRAL WITH REMOTE)	——
F	FUSE RENEWAL 30 AMP - 25 V.	17-2220
VIB	VIBRATOR.	17-14562

I.F. PEAK 170 K.C.
BALANCE AT 1400 K.C.
CHECK AT 600 K.C.

MODEL 39 SOCKET VOLTAGES

Voltages given here are actually for an input battery voltage of 5.8 amp., even though the normal heater voltage is shown as 6.3 amp.

Tube	Heater	Cathode	Suppressor Grid	Screen Grid	Plate	*Oscillator Grid	Anode Grid	†Diode Plates
6K76	6.3	3.5	0	78	273	....	....	....
6A8G	6.3	3.0	....	78	273	5-12	184	....
6K76	6.3	5.0	0	78	273	....	....	....
6Q7G	6.3	1.9	....	....	150	....	....	2.0
6C5	6.3	7.15	....	....	265	....	....	....
6N7	6.3	0	....	....	290	....	....	....
6X4G	6.3	285	....	....	310	....	....	....

* Measured at 1500 K. C.
† Measured with Vacuum Tube Voltmeter.

POINT TO POINT RESISTANCES—MODEL 39

6K7G—R. F. Amplifier

Heater 0
Heater .... ∞
Cathode .... 600 Ω
Suppressor 0
Screen to +B .... 40,000 Ω
Screen .... 60,000 Ω
Plate to +B .... 100 Ω
Control Grid .... 1,700,000 Ω

6A8G—1st Det. Oscillator

Heater 0
Heater .... ∞
Cathode, adj. max .... 1,000 Ω
Osc. Grid .... 100,600 Ω
Anode Grid to +B .... 20,000 Ω
Screen to +B .... 50,000 Ω
Plate to +B .... 74 Ω
Control Grid .... 400,000 Ω

6K7G—I. F. Amplifier

Heater 0
Heater .... ∞
Cathode .... †2,000 Ω
Suppressor 0
Screen to +B .... 40,000 Ω
Screen .... 60,000 Ω
Plate to +B .... 74 Ω
Control Grid .... 500,000 Ω

6Q7G—AVC, 2nd Det.; 1st Audio

Heater 0
Heater .... ∞
Cathode .... 8,000 Ω
Diode .... 258,000 Ω
Diode .... 600,000 Ω
Plate to +B .... 200,000 Ω
Control Grid, V. C. on .... 500,000 Ω
Control Grid, V. C. off .... Max. 25 Ω

6C5G—2nd Audio

Heater 0
Heater .... ∞
Cathode .... 1,000 Ω
Plate to +B .... 1,200 Ω
Control Grid .... 500,000 Ω

6N7G—Power Output

Heater 0
Heater .... ∞
Cathode 0
Control Grid .... 320 Ω
Control Grid .... 235 Ω
Plate to +B .... 175 Ω
Plate to +B .... 160 Ω

0Z4 (or 6X5)—Rectifier

Heater 0
Heater .... ∞
Cathode to +B .... 140 Ω
Plate .... 175 Ω
Plate .... 200 Ω
Plate to Plate .... 375 Ω

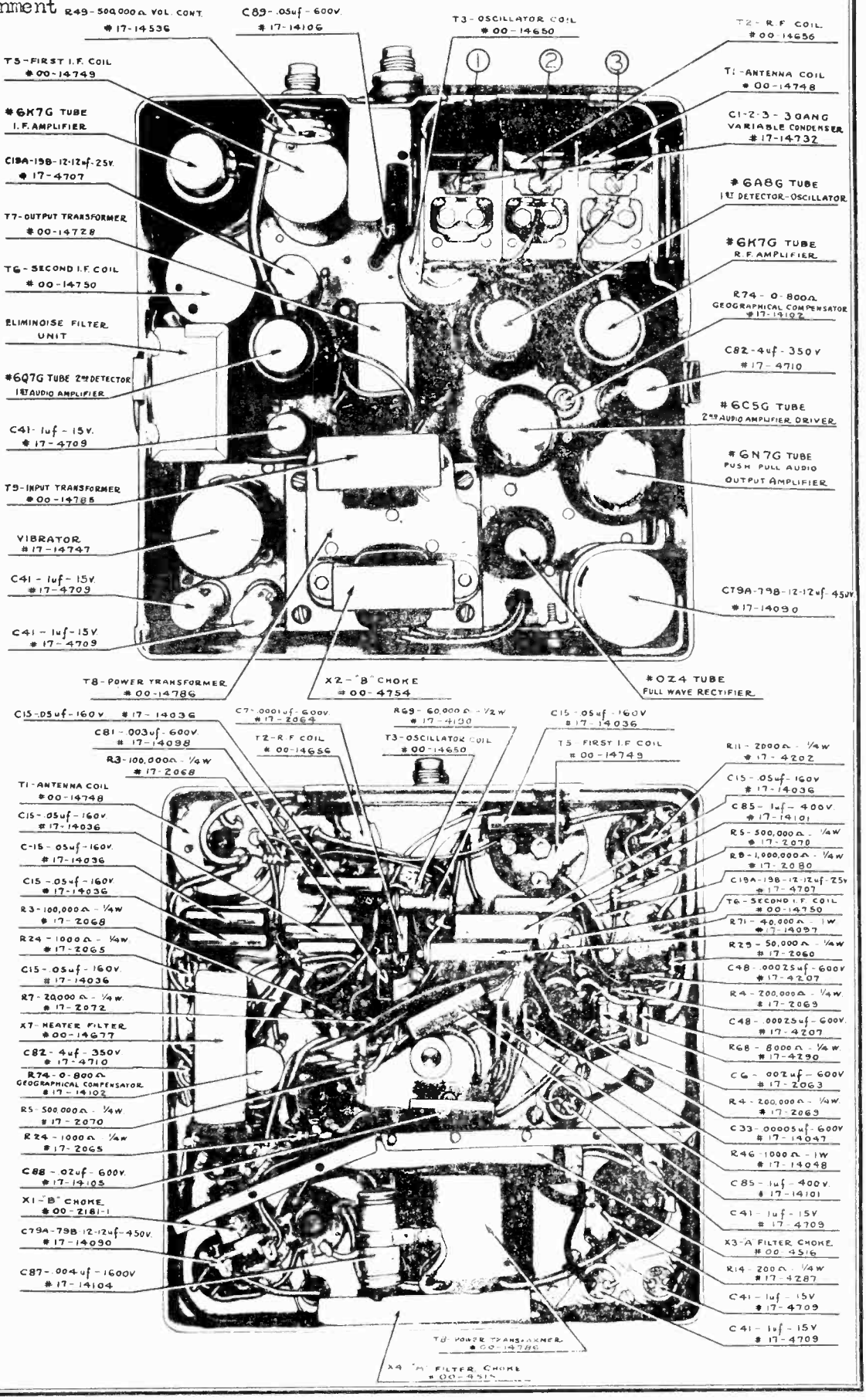
†This resistor may be varied to further control receiver sensitivity.

COIL AND TRANSFORMER RESISTANCES

Phant. Filter Pri. .... 8.5 Ω
Phant. Filter Sec. .... 1.0 Ω
Antenna Coil .... 2.325 Ω
R. F. Coil Pri. .... 100.0 Ω
R. F. Coil Sec. .... 3.475 Ω
Osc. Coil Pri. .... 3.0 Ω
Osc. Coil Sec. .... 1.8 Ω
1st I. F. Trans. Pri. .... 75 Ω
1st I. F. Trans. Sec. .... 75 Ω
2nd I. F. Trans. Pri. .... 75 Ω
2nd I. F. Trans. Sec. .... 75 Ω
Output Trans. Pri. .... 175-0-160 Ω
Output Trans. Sec. .... .1 Ω
Power Trans. Pri. .... .075-0-.075 Ω
Power Trans. Sec. .... 175-0-200 Ω
"B" Filter Choke .... 140. Ω
"B" R. F. Choke .... 1.35 Ω

MODEL 39
Socket, Trimmers
Chassis, Alignment

NOBLITT SPARKS INDUSTRIES

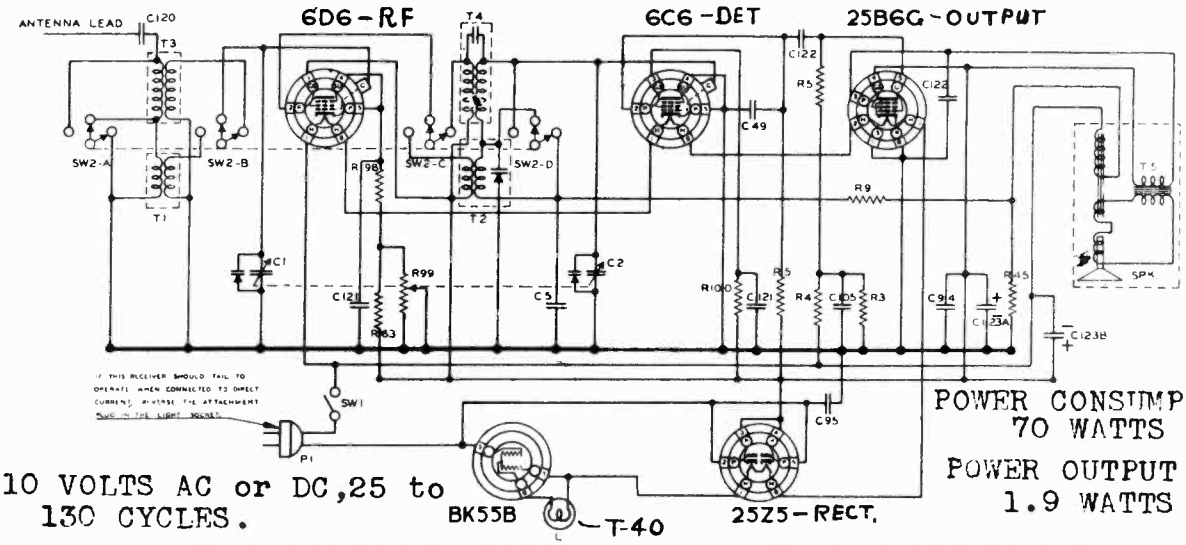


ALIGNMENT- Permaset prebalanced IF transformers require no adjustment. Gen. connected to Ant. post of Phantom -Filter. Gang out of mesh, Generator grounded to chassis, and set to 1575 KC, adjust the Padder No.1 for maximum output. Reset generator to 1400 KC, rotate gang until signal is resonated. Reduce the generator output, then adjust the padders No.2 and No.3 for maximum output. After the installation in a car readjust padder No.3 on a signal between 1150 and 1400 KC for maximum output.

NOBLITT SPARKS INDUSTRIES

MODEL 508 AC-DC
Schematic, Voltage
Resistance, Parts

ARVIN HOME RADIO MODEL 508



110 VOLTS AC or DC, 25 to 130 CYCLES.

POWER CONSUMPTION 70 WATTS

POWER OUTPUT - 1.9 WATTS

RESISTORS

	OHM	W	PART NO.
5	100K	½	17-2084
4	200K	½	17-2044
5	500K	½	17-2070
6	MEG	½	17-2080
R3	25	½	17-4043
R3	25K	½	17-4044
R8	250	½	17-4056
R9	5K	½	17-4058
100	5MEG	½	17-4081

CONDENSERS

C	CAPACITY	VOLT	PART NO.
1	TWO GANG		17-3722
2	VARIABLE		
1	.05	200	17-4015
49	.0005	600	17-4093
R4		200	17-4113
R5	.02	600	17-4125
105	.25	200	17-4115
CPC	001	400	17-4208
2	08	200	17-4249A
122	0	400	17-4149
123A	8	50	17-4160
123B	8	50	

TRANSFORMERS

	TYPE	PART NO.
1	SHORT WAVE ANTENNA	17-3628
2	SHORT WAVE R.F. COIL	17-3629
3	BROADCAST ANTENNA	17-3630
4	BROADCAST R.F. COIL	17-3631
5	OUTPUT TRANS.	17-3634

MISCELLANEOUS

SYMBOL	DESCRIPTION	PART NO.
SPK	DYNAMIC SPEAKER	17-3633
—	PILOT LAMP - 40 MA 12.6V	
P1	LINE CORD & PLUG ASSEMBLY	379
SW1	LINE SWITCH - PART OF 488	
SW2	BAND SWITCH	17-3632

"A" BAND - BALANCE AT 1400 K.C.
CHECK AT 600 K.C.
"B" BAND - BALANCE AT 3.5 M.C.
CHECK AT 1.7 M.C.

FREQUENCY RANGE-
BAND "A"-540 to 1600 KC
BAND "B"-1600 to 4250 KC

SENSITIVITY -
BAND A - 250 Microvolts minimum 50 milliwatts output.
BAND B - 400 Microvolts minimum at 2400 KILOCYCLES.

MODEL 508 SOCKET VOLTAGES

(INPUT VOLTAGE 110 AC)

	Heater	Plate	Screen	Suppressor	Cathode	Grid Bias
6D6	6.3	94	94	....	2	....
6C6	6.3	30	20	0	0	....
25B6	25.0	87	94	....	0	15
25Z5	25.0	—44	....	....	94	....
BK55B	51.4	....	....	....	....	....
DIAL LITE	6.0	....	....	....	....	....

POINT TO POINT RESISTANCES

All readings taken to ground unless otherwise specified. Tubes in sockets and speaker connected. All shell terminals grounded. Volume control in full-on position.

6D6

Heater to Ground	780 Ω
Heater to 110 V. Cord	6 Ω
*Cathode	200 Ω
*Suppressor	200 Ω
Screen to B+	0
‡ Plate to B+	60 Ω
* Volume control off	15,200 Ω
‡ Broadcast Band only	
x Volume control off	40,000 Ω

6C6

Heater to 110 V. Cord	.015 Ω
Heater to 110 V. Cord	.5 Ω
Cathode	0
Suppressor	0
Screen to B+	3,000,000 Ω
Plate to B+	500,000 Ω

25B6G

Heater to 110 V. Cord	4.2 Ω
Heater to 110 V. Cord	18.2 Ω

BK55B—Cold

Resistance Terminal 3 to 8	145.0 Ω
Resistance Terminal 7 to 8	10.0 Ω
Cathode	0
Control Grid	600,000 Ω
Screen Grid to B+	0
Plate to B+	110 Ω

25Z5

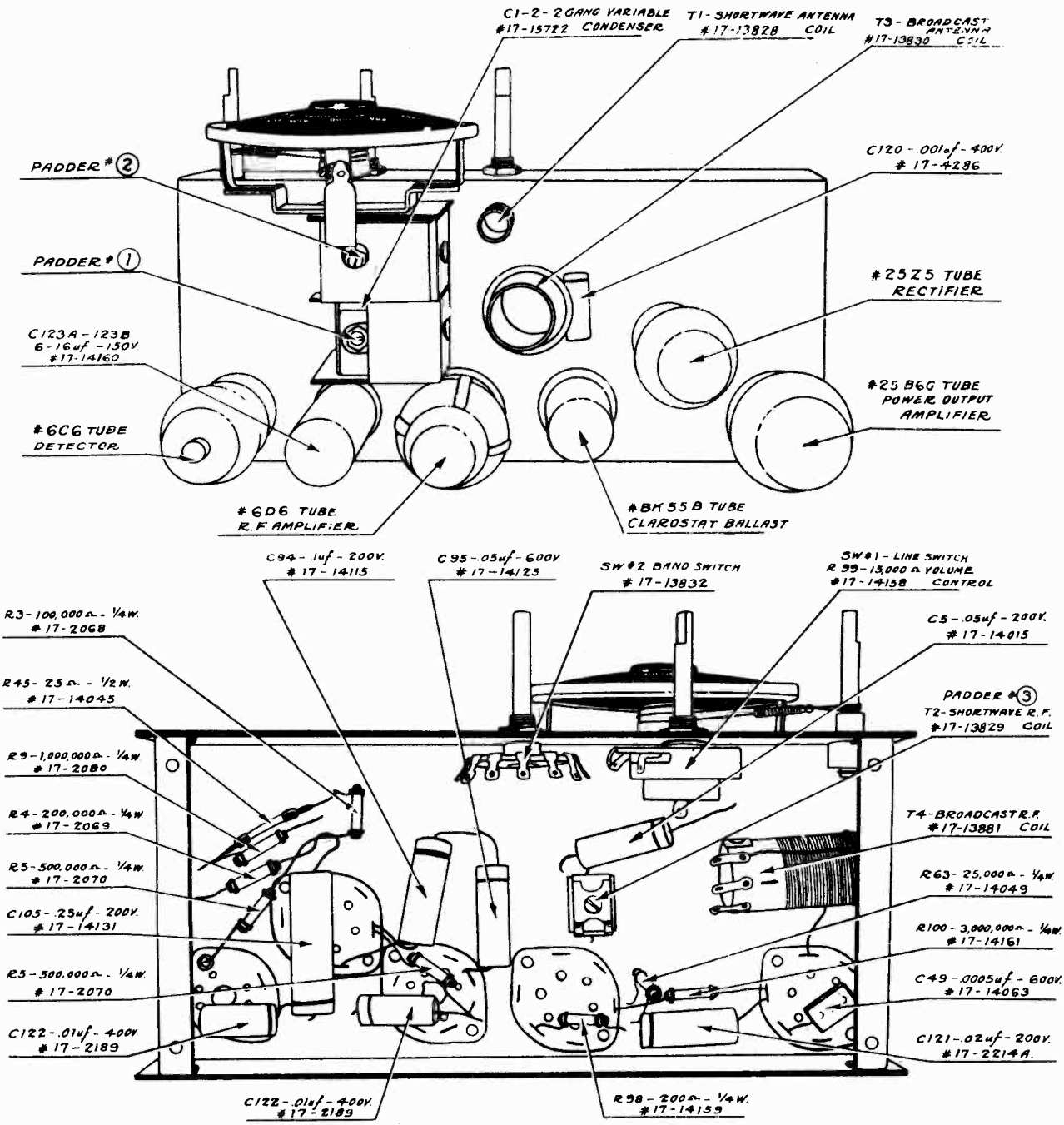
Heater to 110 V. Cord	18.2 Ω
Heater to 110 V. Cord	30.0 Ω
x Cathode	25,000 Ω
x Cathode	25,000 Ω
Plate	185 Ω
Plate	185 Ω

COIL, TRANSFORMER AND SPEAKER RESISTANCES

T1 Broadcast Ant. Pri.	60.0 Ω
T1 Broadcast Ant. Sec.	3.6 Ω
T3 Short Wave Ant. Pri.	.3 Ω
T3 Short Wave Ant. Sec.	.2 Ω
T2 Broadcast R. F. Pri.	60.0 Ω
T2 Broadcast R. F. Sec.	3.7 Ω
T4 Short Wave R. F. Pri.	.5 Ω
T4 Short Wave R. F. Sec.	1.0 Ω
T5 Output Trans. Pri.	110 Ω
T5 Output Trans. Sec.	.6 Ω
Speaker Field	740 Ω
Speaker Voice Coil	1.7 Ω

MODEL 508 AC-DC
Socket, Trimmers
Alignment

NOBLITT SPARKS INDUSTRIES

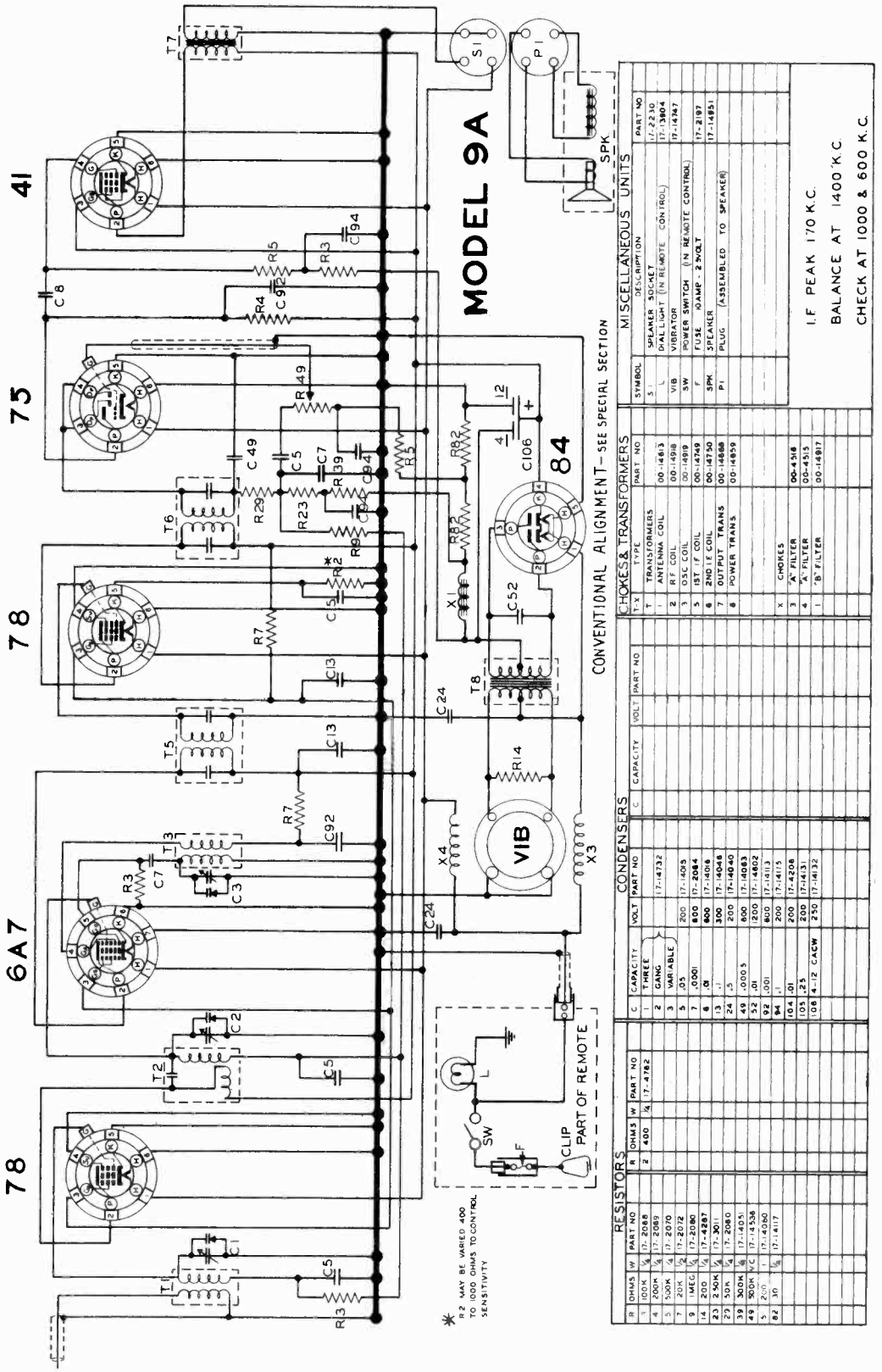


BALANCING INSTRUCTIONS

1. Rotate tuning condenser to extreme left and check to see that pointer lines up with horizontal lines across dial face.
2. Connect Generator to antenna terminal thru 200 MMF condenser. Set dial and signal generator to 1400 KC. Set wave band switch to Broadcast position. Adjust padders 1 and 2 for maximum output.
3. Set dial and Generator to approximately 2400 KC. Set wave band switch to short wave position. Adjust padder No. 3 for maximum output.

MODEL 9A Auto
Schematic, Parts

NOBLITT SPARKS INDUSTRIES



RESISTORS

R	OHMS	W	PART NO
1	100K	½	17-2068
4	200K	½	17-2069
5	500K	½	17-2070
7	20K	½	17-2072
9	1MEG	½	17-2080
14	200	½	17-4287
23	2.50K	½	17-301
29	50K	½	17-2060
39	300K	½	17-4051
49	300K	½	17-4058
5	250	1	17-4060
82	30	½	17-4117
1	100K	½	17-2068
2	400	¼	17-4782

CONDENSERS

C	CAPACITY	VOLT	PART NO
1	THREE		17-4732
2	GANG		
3	VARIABLE		
5	.05	200	17-4095
7	.0001	600	17-2044
8	.01	600	17-4016
13	.1	300	17-4048
24	.5	200	17-4040
49	.0005	600	17-4063
52	.01	1200	17-4802
92	.001	600	17-4113
94	.1	200	17-4115
104	.01	200	17-4206
105	.25	200	17-4131
108	4-12 CACW	250	17-4132

CHOKES & TRANSFORMERS

T-X	TYPE	PART NO
T	TRANSFORMERS	
1	ANTENNA COIL	00-14613
2	R.F. COIL	00-14918
3	OSC. COIL	00-14919
5	1ST I.F. COIL	00-14749
6	2ND I.F. COIL	00-14750
7	OUTPUT TRANS	00-14868
8	POWER TRANS	00-14959
X	CHOKES	00-4518
3	"A" FILTER	00-4515
1	"B" FILTER	00-14917

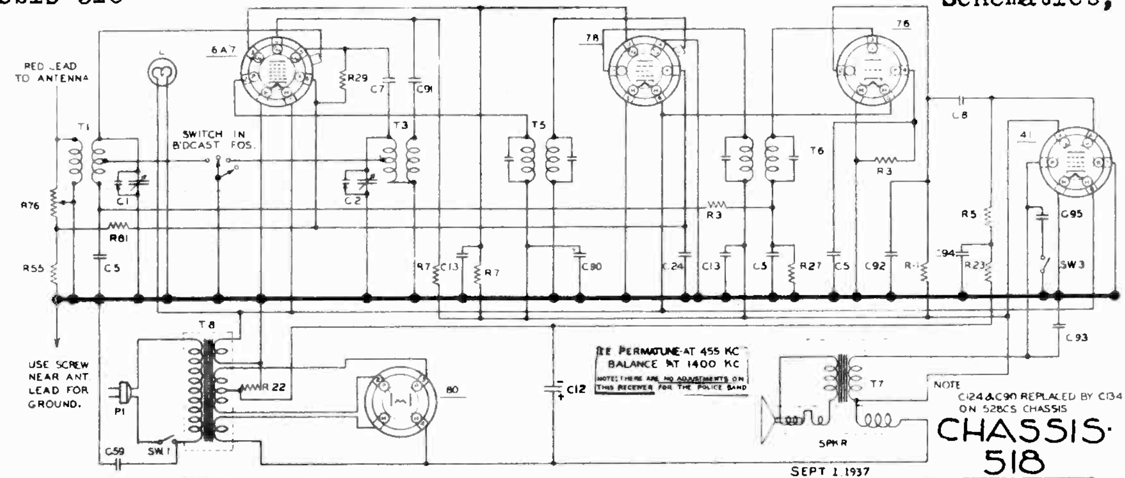
MISCELLANEOUS UNITS

SYMBOL	DESCRIPTION	PART NO
S1	SPEAKER SOCKET	17-2230
L	DIAL LIGHT (IN REMOTE CONTROL)	17-13804
VIB	VIBRATOR	17-14747
SW	POWER SWITCH (IN REMOTE CONTROL)	
F	FUSE 10AMP - 2 VOLT	17-2197
SPK	SPEAKER	17-14851
P1	PLUG (ASSEMBLED TO SPEAKER)	

MODELS 518, 518A, 518DW 528CS, 568, 568A 568DW
Chassis 518

NOBLITT SPARKS INDUSTRIES

MODEL 578B 628CS
MODELS 618, 618A, 628 638, 638CS
Schematics, Parts

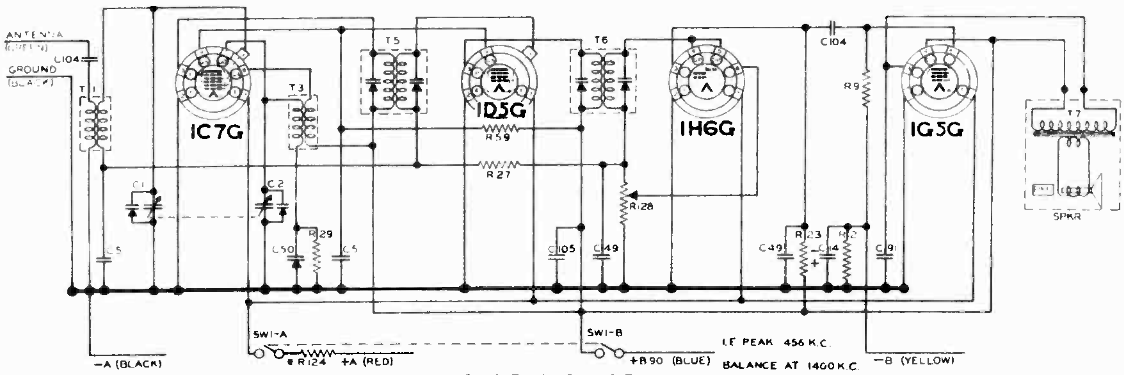


RESISTORS							
R	OHM	W	PART NO	R	OHM	W	PART NO
3	100M	1/4	17-2060	78	10M	VC	17-13834
5	300M	1/4	17-2070	79	270	1	17-14110
7	20M	1/2	17-2072	81	100	1/2	17-14116
23	250M	1/4	17-2011	22	200	1	17-4724
27	2 MEG	1/4	[illegible]	4	300M	1/4	17-2069
29	50M	1/4	17-2060				
37	300	1/4	[illegible]				
41	[illegible]	1/4	[illegible] 4052				
55	2500	1/4	[illegible]				

CAPACITORS							
C	CAPACITY	MULT	PART NO	C	CAPACITY	MULT	PART NO
1	2 GANG		17-13717	94	.1	800	17-14115
2	VARIABLE			95	.02	600	17-14125
5	.05	200	17-14015	134	DUAL 8 UF	450	17-14[illegible]
7	.0001	400	17-2044	88	.02	600	17-14105
8	.01	600	17-14016	90	8 UF REG	325	17-14111
12	8.0 ELECT	475	17-14001	91	.002	600	17-14112
13	.1 UF	300	17-14044	92	.001	600	17-14113
24	.5	200	17-14040	93	.005	600	17-14114
59	.01	400	17-14615				

TRANSFORMERS		
T	TYPE	PART NO
1	ANTENNA COIL	00-13650
3	OSCILLATOR COIL	00-13690
5	1ST IF TRANSFORMER	00-13698
6	2ND IF TRANSFORMER	00-13699
7	OUTPUT TRANSFORMER	17-13661
8	POWER TRANSFORMER	00-13670

MISCELLANEOUS		
SYMBOL	DESCRIPTION	PART NO
SW 1	SWITCH ON VOLUME CONTROL - SEE R78	[illegible]13434
SW 2	BAND SWITCH	[illegible]3657
L	DIAL LIGHT	[illegible]
P1	POWER CORD AND PLUG ASSEMBLY	[illegible]
SW3	TONE SWITCH	17-13651
SPK	DYNAMIC [illegible] ON STANDARD 518 CHASSIS	[illegible]
	[illegible] CHASSIS	[illegible]



CONVENTIONAL ALIGNMENT
(SEE SPECIAL SECTION)

MODEL 578B

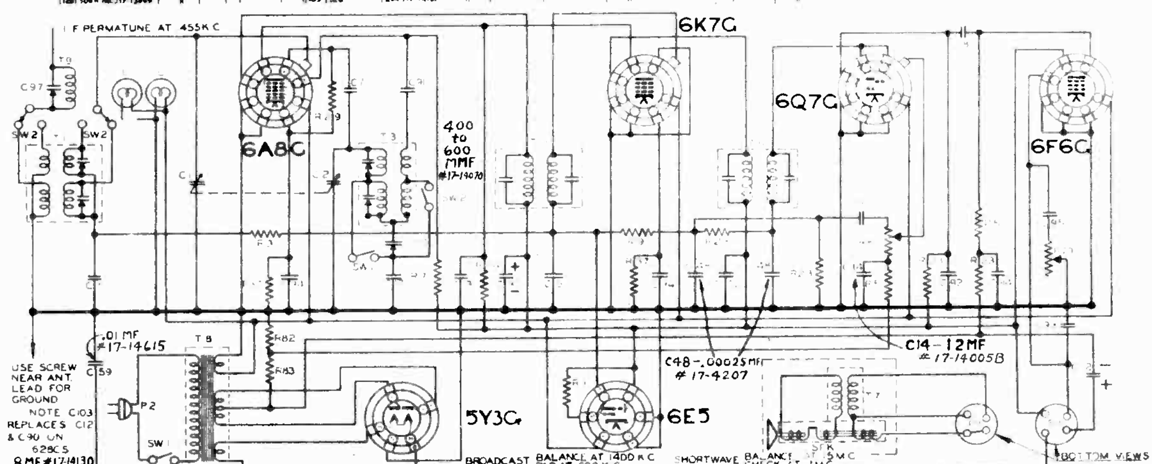
* NOTE - USE R124 FOR AIRCELL (2.5 VOLT)
USE R125 FOR 2.0 VOLT "A" BATTERY OR DRY CELL

RESISTORS			
R	OHM	W	PART NO
5	400	1/4	17-4702
6	1M	1/4	17-[illegible]
23	250M	1/4	17-2011
27	2M	1/4	17-4[illegible]
29	50M	1/4	17-2060
51	15M	1/4	17-4[illegible]
124	1.25		17-14164
125	2.7		17-14145
128	500M	VC	17-13[illegible]

CONDENSERS			
C	CAPACITY	MULT	PART NO
1	TWO GANG		17-13870
2	VARIABLE		
5	.05	200	17-14018
16	[illegible]	25	17-[illegible]
49	.0005	400	17-14043
50	[illegible]	[illegible]	17-[illegible]
91	.005	600	17-1402[illegible]
104	.01	200	17-4200
105	.25	200	17-14131

TRANSFORMERS		
T	TRANSFORMER	PART NO
1	ANTENNA COIL	17-450
3	OSCILLATOR COIL	17-464
5	FIRST I.F. COIL	17-462
6	SECOND I.F. COIL	17-455
7	OUTPUT TRANS.	17-13867

MISCELLANEOUS UNITS		
SYMBOL	DESCRIPTION	PART NO
SPKR	PERMANENT MAGNET DYNAMIC SPEAKER	17-13[illegible]
SW1-A	FILAMENT SWITCH - SEE R128	
SW1-B	"B" SWITCH - SEE R128	



RESISTORS							
R	OHM	W	PART NO	R	OHM	W	PART NO
[illegible]	[illegible]	1/4	17-4704	[illegible]	20		[illegible]
[illegible]	[illegible]	1/4	17-2068	64	3M		[illegible]
[illegible]	[illegible]	1/2	17-2072	37	300	1/2	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	79	[illegible]		[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	80	1M		[illegible]
[illegible]	[illegible]	1/4	[illegible]	82	10	1/2	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]				

CONDENSERS							
C	CAPACITY	MULT	PART NO	C	CAPACITY	MULT	PART NO
[illegible]	TWO GANG		17-[illegible]	60	8 UF REG	[illegible]	[illegible]
2	VARIABLE			[illegible]	.002	600	[illegible]
5	.05	[illegible]	17-4015	62	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	17-2064	63	.005	600	[illegible]
8	[illegible]	600	17-4016	[illegible]	[illegible]	[illegible]	17-[illegible]
[illegible]	8.0 ELECT	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	17-4125
[illegible]	[illegible]	[illegible]	[illegible]4046	[illegible]	[illegible]	[illegible]	17-4[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	17-4129

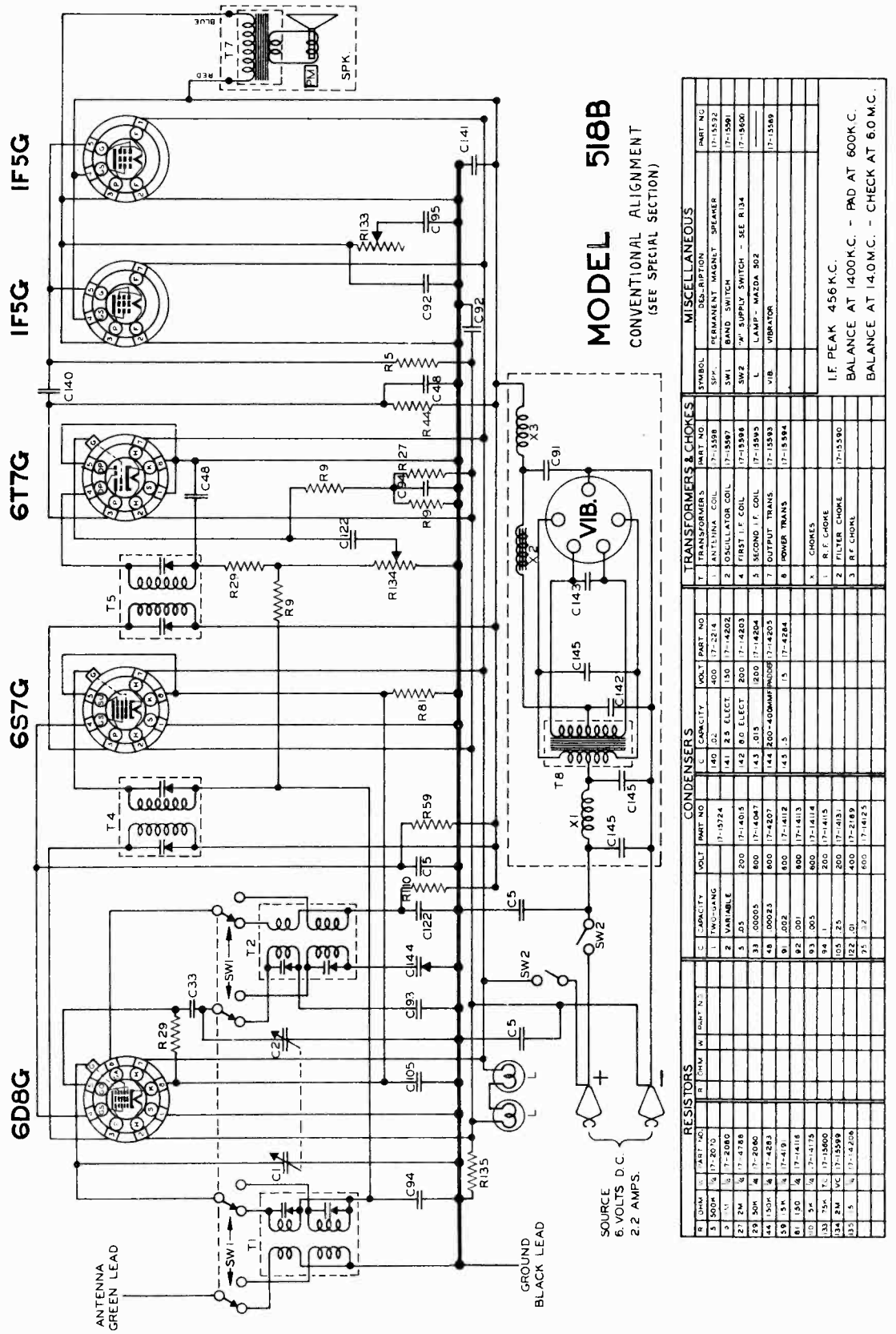
TRANSFORMERS		
T	TYPE	PART NO
1	ANTENNA COIL	[illegible]
3	OSCILLATOR COIL	[illegible]
5	1ST IF TRANSFORMER	00-[illegible]
6	2ND IF TRANSFORMER	[illegible]
[illegible]	OUTPUT TRANSFORMER	[illegible]3693
[illegible]	OUTPUT TRANSFORMER	[illegible]
8	POWER TRANSFORMER	[illegible]
9	WAVE TRAP COIL	[illegible]

MISCELLANEOUS		
SYMBOL	DESCRIPTION	PART NO
SW	[illegible] SEE R78	[illegible]
SW 2	BAND SWITCH (SHOWN IN BROADCAST POSITION)	[illegible]3666
[illegible]	DIAL LIGHT	[illegible]
[illegible]	SPEAKER SOCKET	[illegible]
[illegible]	SPEAKER PLUG	[illegible]
[illegible]	POWER CORD & PLUG ASSEMBLY	[illegible]
[illegible]	SPEAKER [illegible]	[illegible]
[illegible]	SPEAKER FOR 628 & 628CS	[illegible]

MODELS 618-618A 628-638 -628CS -638CS

MODEL 518B
Schematic
Parts

NOBLITT SPARKS INDUSTRIES



RESISTORS

R	OHM	W	PART NO
5	500M	½	17-2010
9	1 "	½	17-2080
21	2M	½	17-4788
29	50K	½	17-2080
44	150K	½	17-4283
59	5K	½	17-419
81	150	½	17-4118
110	5K	½	17-4175
133	75K	T.	17-15600
134	2M	VC	17-15599
135	5	½	17-14238

CONDENSERS

C	CAPACITY	VOLT	PART NO
1	TWO-GANG VARIABLE		17-15724
5	.05	200	17-14015
33	.00005	800	17-14047
48	.00023	600	17-4207
90	.002	600	17-14112
92	.001	800	17-14113
93	.005	600	17-14114
94	1	200	17-14115
105	.25	200	17-413
122	.01	400	17-2189
75	.2	600	17-14125
140	.02	400	17-224
141	2.5 ELECT.	150	17-14202
142	80 ELECT.	200	17-14203
143	.015	200	17-14204
144	200-400MMF PADDER		17-14205
145	.5	15	17-4284

TRANSFORMERS & CHOKES

T	TRANSFORMERS	PART NO
1	ANTENNA COIL	17-1598
2	OSCILLATOR COIL	17-15597
4	FIRST I.F. COIL	17-15596
5	SECOND I.F. COIL	17-15595
7	OUTPUT TRANS.	17-15593
8	POWER TRANS.	17-15594
X	CHOKES	
1	R.F. CHOKE	
2	FILTER CHOKE	17-15590
3	R.F. CHOKE	

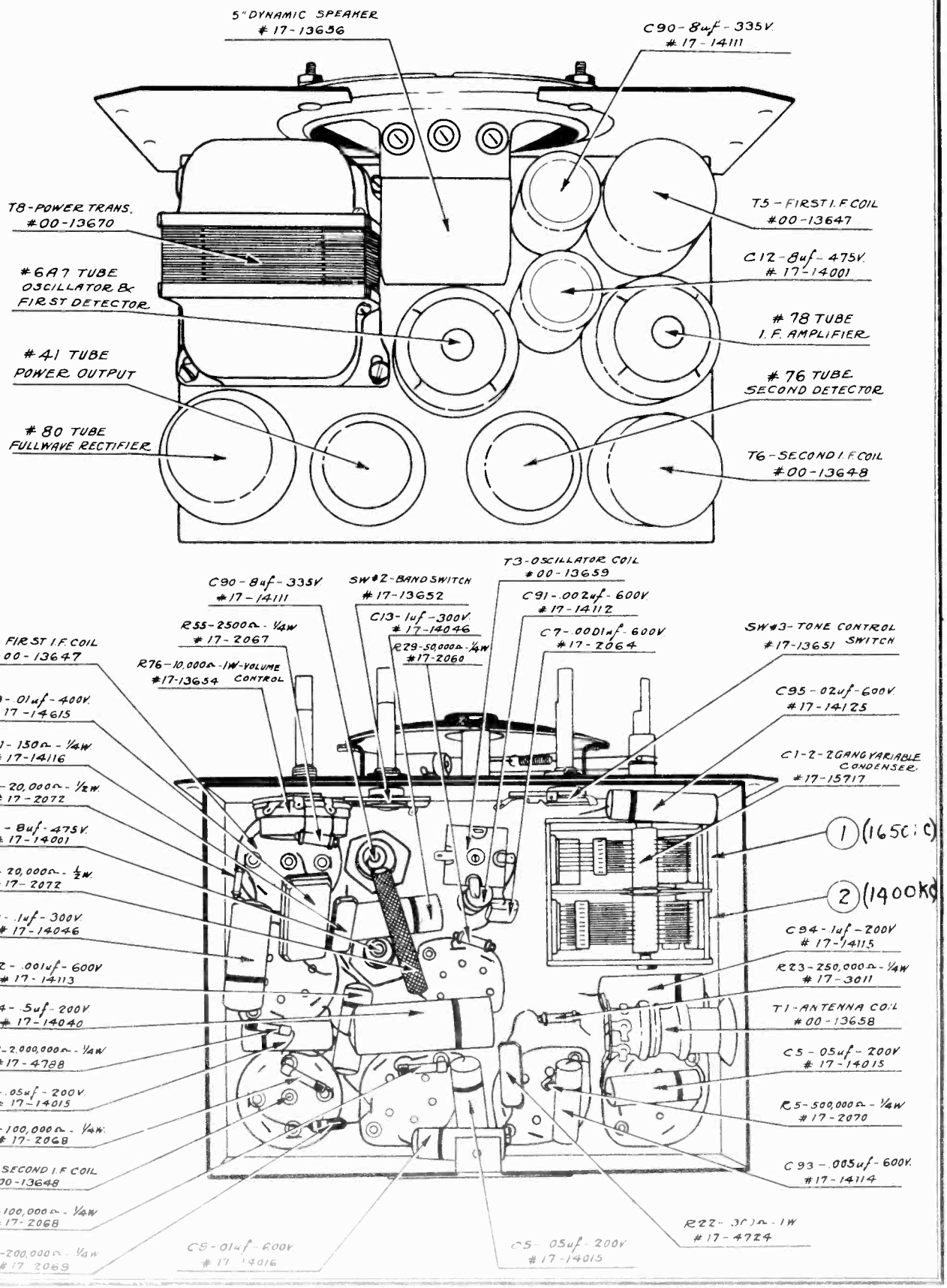
MISCELLANEOUS

SYMBOL	DESCRIPTION	PART NO
SPK.	PERMANENT MAGNET SPEAKER	17-15532
SW1	BAND SWITCH	17-15591
SW2	"A" SUPPLY SWITCH - SEE R134	17-15600
L	LAMP - MAZDA 302	——
VIB.	VIBRATOR	17-15569

MODELS 518, 518A, 518DW
528CS, 568, 568A
568DW

NOBLITT SPARKS INDUSTRIES

Socket, Trimmers, Chassis



NOBLITT SPARKS INDUSTRIES

MODELS 518, 518A, 518DW
528CS, 568, 568A
568DW
Voltage, Resistance
Alignment, Sensitivity

POWER OUTPUT: 3.5 watts

SPEAKER: 5" Dynamic; 3 ohm voice coil

VOLTAGE & FREQUENCY: 110 V. 60 cycles

WATTS POWER CONSUMPTION: 65 watts

6A7—1st Detector—Oscillator
78—I. F. Amplifier
76—2nd Detector—AVC Bias Rectifier
41—Audio Output Amplifier
80—Full Wave Rectifier

SENSITIVITY: 1400 KC 100 microvolts minimum for 50 milliwatts
2400 KC 100 microvolts minimum for 50 milliwatts

FREQUENCY RANGE:
540-1650 Kilocycles
1650-4000 Kilocycles

MODEL 518-518A-568-568A SOCKET VOLTAGES

Tube	Heater	Plate	Screen	Suppressor	Cathode	Osc. Grid	Osc. Plate
6A7	6.3	225	100	.....	2.8	6-15	150
78	6.3	225	100	0	2.8	.....	.....
76	6.3	190	.....	.....	8.4	.....	.....
41	6.3	200	225	.....	15	.....	.....
80	5.0	385	.....	.....	325	.....	.....

POINT TO POINT RESISTANCES

All Readings taken to ground unless otherwise specified. Tubes removed and speaker connected.

6A7

Heater	25 Ω
Heater	0
Anode Grid to B+	20,000 Ω
Plate to B+	11 Ω
Screen to B+	20,000 Ω
Cathode (V.C. on—)	150 Ω
Cathode (V.C. off—)	12,500 Ω
*Control Grid	2,100,000 Ω
Oscillator Grid	50,150 Ω

*Band Switch in Broadcast Position

78

Heater	25 Ω
Heater	0
Cathode	2,650 Ω
Suppressor	0
Screen Grid to B+	20,000 Ω
Control Grid	11 Ω
Plate to B+	11 Ω

76

Heater	25 Ω
Heater	0
Cathode	100,000 Ω
Control Grid	2,000,000 Ω
Plate to B+	200,000 Ω

41

Heater	25 Ω
Heater	0
Cathode	0
Control Grid	750,000 Ω
Screen to B+	0
Plate to B+	700 Ω

80

Filament to B+	1,600 Ω
Filament to B+	1,600 Ω
Plate	740 Ω
Plate	700 Ω

COIL, TRANSFORMER AND SPEAKER RESISTANCES

Speaker Field	1,600 Ω	P3 Oscillator Secondary	2.8 Ω	T7 Output Trans. Secondary	1 Ω
Speaker Voice Coil	1 Ω	T5 1st I. F. Primary	11 Ω	T8 Power Trans. Primary	20 Ω
T1 Ant. Primary	.25 Ω	T5 1st I. F. Secondary	11 Ω	T8 Power Trans. Sec. (High Voltage)	740-700 Ω
T1 Ant. Secondary	3 Ω	T6 2nd I. F. Primary	11 Ω	T8 Power Trans. Sec. (5 volt)	.9 Ω
T3 Oscillator Primary	2.5 Ω	T6 2nd I. F. Secondary	11 Ω	T8 Power Trans. Sec. (6 volt)	.25 Ω

BALANCING INSTRUCTIONS

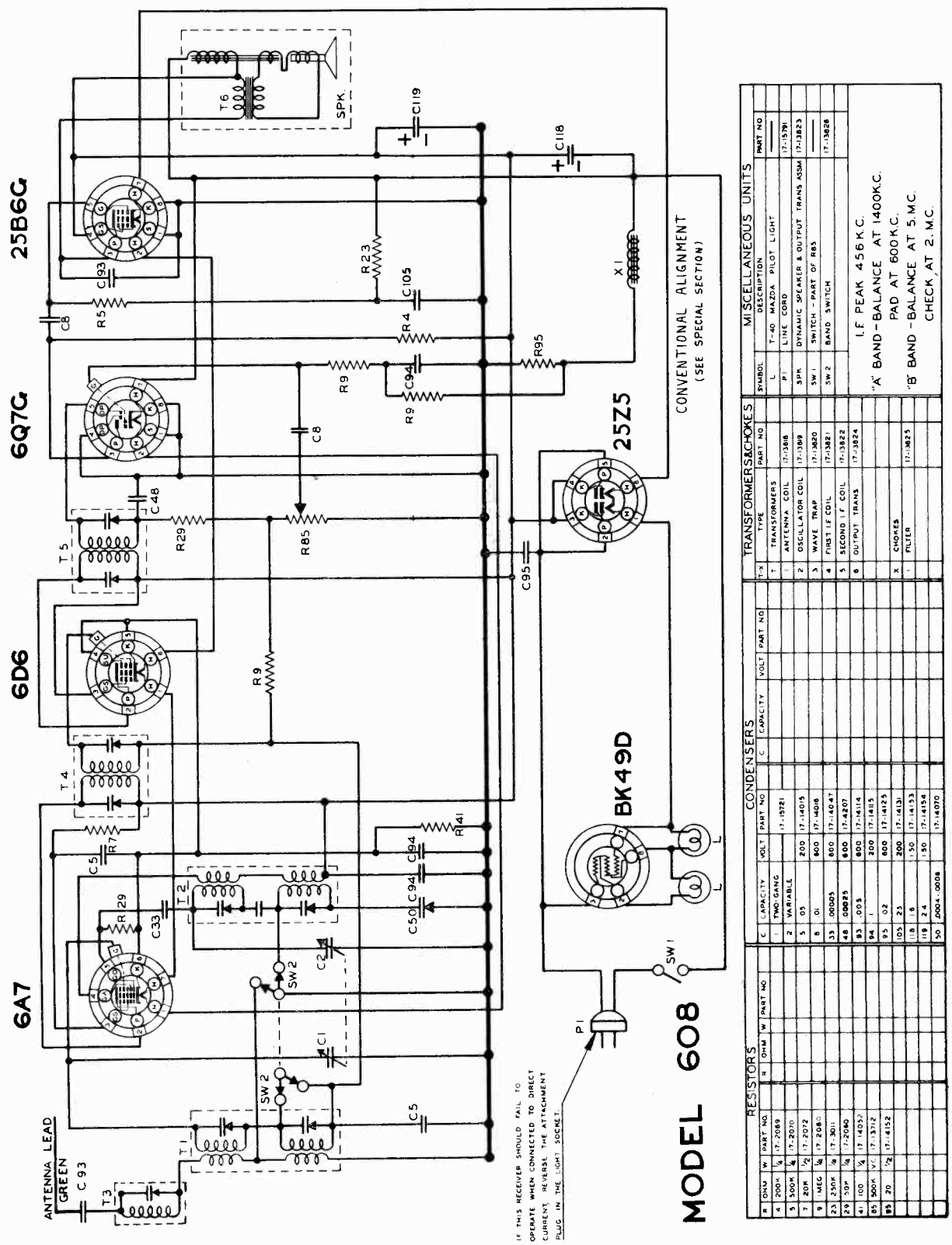
Models 518, 518A, 568, and 568A uses the Permatune Intermediate frequency transformers. All intermediate frequency adjustments are therefore eliminated.

If a check of sensitivity of the I.F. circuits is desired simply connect the output of a signal generator through 200 MMF dummy antenna to the grid cap of the 6A7 tube. Rotate the volume control to full position. The sensitivity at 455 KC should be 200 microvolts minimum for 50 milliwatts at three ohms load across the output of the voice coil winding of the speaker transformer.

1. Connect the Generator to the red antenna wire on the rear of radio chassis. Ground the outside shield of the generator output cable to the radio chassis.
2. Rotate the tuning condenser entirely out of mesh and set dial pointer to 1650 KC. Adjust padder No.1 for maximum output with 1650 KC input from the signal generator.
3. Reset the balancing or signal generator to 1400 KC and retune the radio until the signal is received.
4. Adjust the padder No.2 for maximum output.

MODEL 608
Schematic
Parts

NOBLITT SPARKS INDUSTRIES



RESISTORS

R	OHM	W	PART NO
4	200K	½	17-2069
5	500K	½	17-2070
7	20K	½	17-2072
9	MEG	½	17-2080
23	250K	½	17-3011
29	50K	½	17-2090
41	100	½	17-14052
85	500K	½	17-3712
95	20	½	17-4152

CONDENSERS

C	CAPACITY	VOLT	PART NO
1	TWO GANG		17-15721
2	VARIABLE		
5	.05	200	17-14015
8	.01	600	17-14018
33	.00005	600	17-14047
48	.00025	600	17-4207
93	.005	600	17-14114
94	.1	200	17-14115
95	.02	600	17-14125
105	.25	200	17-14131
118	16	150	17-14153
119	24	150	17-14154
50	.0004-.0008		17-14070

TRANSFORMERS & CHOKES

T-X	TYPE	PART NO
T	TRANSFORMERS	
1	ANTENNA COIL	17-3818
2	OSCILLATOR COIL	17-3819
3	WAVE TRAP	17-3820
4	FIRST I.F. COIL	17-3821
5	SECOND I.F. COIL	17-3822
6	OUTPUT TRANS	17-3824
X	CHOKES	
1	FILTER	17-3825

MISCELLANEOUS UNITS

SYMBOL	DESCRIPTION	PART NO
L	T-40 MAZDA PILOT LIGHT	—
P1	LINE CORD	17-15791
SPK.	DYNAMIC SPEAKER & OUTPUT TRANS ASSM	17-13823
SW 1	SWITCH - PART OF R85	—
SW 2	BAND SWITCH	17-13828

I.F PEAK 456 K.C.
"A" BAND - BALANCE AT 1400 K.C.
PAD AT 600 K.C.
"B" BAND - BALANCE AT 5 M.C.
CHECK AT 2 M.C.

MODELS 618,618A,628
628CS,638,638CS
Voltage,Resistance
Alignment,Sensitivity

NOBLITT SPARKS INDUSTRIES

FREQUENCY RANGE: 540 to 1750 Kilocycles
5.7 to 18.0 Megacycles

POWER OUTPUT: 3.75 Watts

SPEAKER: 6" Dynamic in Model 618, 8" Dynamic in 618, 618A, 628, 628CS

VOLTAGE AND FREQUENCY: 110 V. 60 cycles

SENSITIVITY: At any point on either broadcast or short wave band not less than 60 microvolts for 50 milliwatts output.

Intermediate sensitivity: Not less than 100 microvolts for 50 milliwatts output.

WATTS POWER CONSUMPTION: 75 Watts

TUBES:

6A8G—Ist Detector Oscillator
6K7G—I. F. Amplifier
6Q7G—2nd Detector, 1st Audio Amplifier AVC
6F6G—Audio Output Amplifier
5Y3G—Full Wave Rectifier
6E5 —Electric Tuning Indicator

CONVENTIONAL ALIGNMENT
(see special section)

MODEL 618-618A-628-628CS SOCKET VOLTAGES

(INPUT VOLTAGE 110 V. RMS)

Tube	Heaters	Plate	Screen	Cathode	Suppressor	Anode Grid	Oscillator Grid	Target	Grid Bias
6A8G	6.3	238	95	3.2	.....	131	6-15	238	.....
6K7G	6.3	238	95	1.9	0	.....	.....	.....	.....
6Q7G	6.3	155	.....	0	.....	.....	.....	.....	1.5
6F6G	6.3	221	238	0	.....	.....	.....	.....	13.8
5Y3G	5.0	395	.....	355	.....	.....	.....	.....	.....
6E5	6.3	*40	.....	0	.....	.....	.....	.....	.....

* No Signal.

POINT TO POINT RESISTANCES

All Readings taken to ground unless otherwise specified. Tubes removed and speaker connected. Volume and tone control in full on position. All shell pins grounded.

6A8G

Heater	0
Heater	25 Ω
Cathode	300 Ω
Oscillator Grid	50,000 Ω
Anode Grid to B+	20,000 Ω
Screen to B+	30,000 Ω
Plate to B+	11 Ω
Control Grid	1,350,000 Ω

6K7G

Heater	0
Heater	25 Ω
Cathode	300 Ω
Suppressor Grid	0
Screen Grid to B+	30,000 Ω
Plate to B+	11 Ω
Control Grid	1,250,000 Ω

6Q7G

Heater	0
Heater	25 Ω
Cathode	0
Diode Plate	300,000 Ω
Diode Plate	300,000 Ω
Plate to B+	250,000 Ω
Control Grid	1,500,000 Ω

6F6G

Heater	0
Heater	25 Ω
Cathode	0
Control Grid	750,000 Ω
Screen Grid to B+	0
Plate to B+	500 Ω

5Y3G

Filament to B+	1,450 Ω
Filament to B+	1,450 Ω
Plate	600 Ω
Plate	620 Ω

6E5

Heater	0
Heater	25 Ω
Cathode	0
Control Grid	1,250,000 Ω
Plate to B+	1,000,000 Ω
Target to B+	0

COIL TRANSFORMER AND SPEAKER RESISTANCES

T1 Antenna Coil Pri. (BC)	17 Ω
T1 Antenna Coil Sec. (BC)	3.5 Ω
T1 Antenna Coil Pri. (SW)	.3 Ω
T1 Antenna Coil Sec. (SW)	.07 Ω
T3 Oscillator Coil Pri.	1 Ω
T3 Oscillator Coil Sec.	2.3 Ω
T5 Ist I. F. Trans. Pri.	11 Ω
T5 Ist I. F. Trans. Sec.	11 Ω
T6 2nd I. F. Trans. Pri.	11 Ω
T6 2nd I. F. Trans. Sec.	11 Ω
T7 Output Trans. Pri. (618)	600 Ω
T7 Output Trans. Sec. (618)	1 Ω
T7 Output Trans. Pri. (618A-628-628CS)	500 Ω
T7 Output Trans. Sec. (618A-628-628CS)	1 Ω
T8 Power Trans. Pri. 110 Volt	17 Ω
T8 Power Trans. Sec. Hi-Volt	600-0-620 Ω
T8 Power Trans. Sec. 6 Volt	.15 Ω
T8 Power Trans. Sec. 5 Volt	.25 Ω
IV Wave Trap	2.3 Ω
Speaker Field	1,450 Ω

ALIGNMENT

Models 618,618A,628,628CS,638, and 638CS are designed to utilize the full efficiency of the Permatune Intermediate Frequency transformers. Therefore all IF adjustments are eliminated. If a check of sensitivity is desired, connect the output of a standard signal generator thru a 200 MMF antenna dummy to grid cap of the 6A8G tube. Rotate the volume control to maximum position. The sensitivity at 455 KC should be 100 Microvolts for 50 Milliwatts at 3 ohms load across the output of the voice coil winding of speaker transformer.

1.- Rotate tuning condenser completely out of mesh and check to see that dial pointer is parallel to horizontal dial stripes.

2.- Connect Generator to receiver with a standard 200 MF dummy antenna and after setting the wave band switch to the Short wave position, tune dial to 15 MC, and Generator to same frequency.

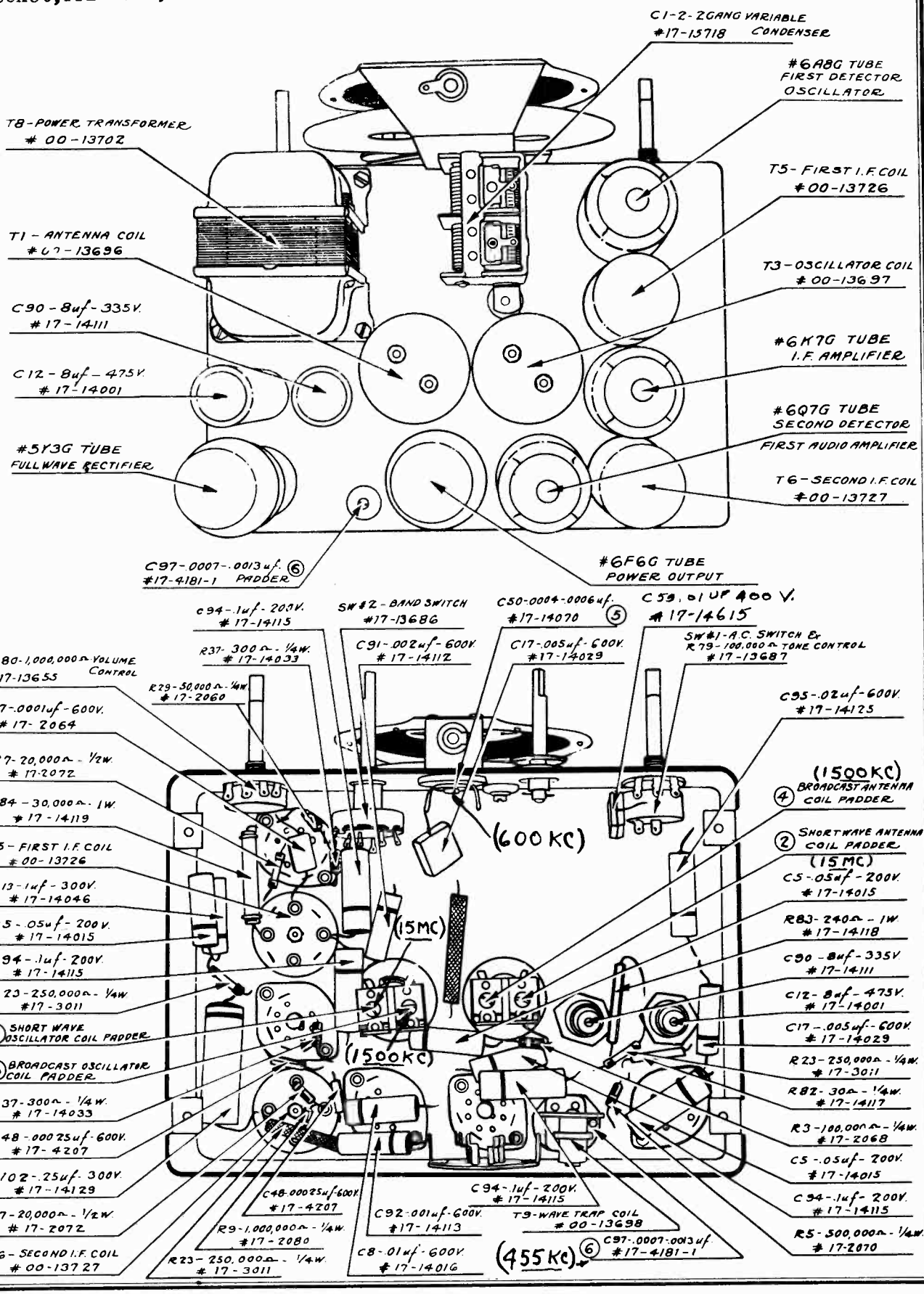
3.-Adjust padder No.1 and then padder No.2 for maximum output.

4.- Reset band switch to broadcast band. Set dial to 1500 KC and Generator to same frequency. Adjust padders No.3 and 4 for maximum output.

5.- Retune radio set to 600 KC, reset generator to same frequency, adjust padder No.5 for maximum output. Leave radio tuned to 600 KC, change Generator to 455 KC and increase the output of Generator until signal is heard thru the speaker. Adjust padder No.6 for minimum output. Repeat adjustments.

MODELS 618, 618A, 628
628CS, 638, 638CS
Socket, Trimmers, Chassis

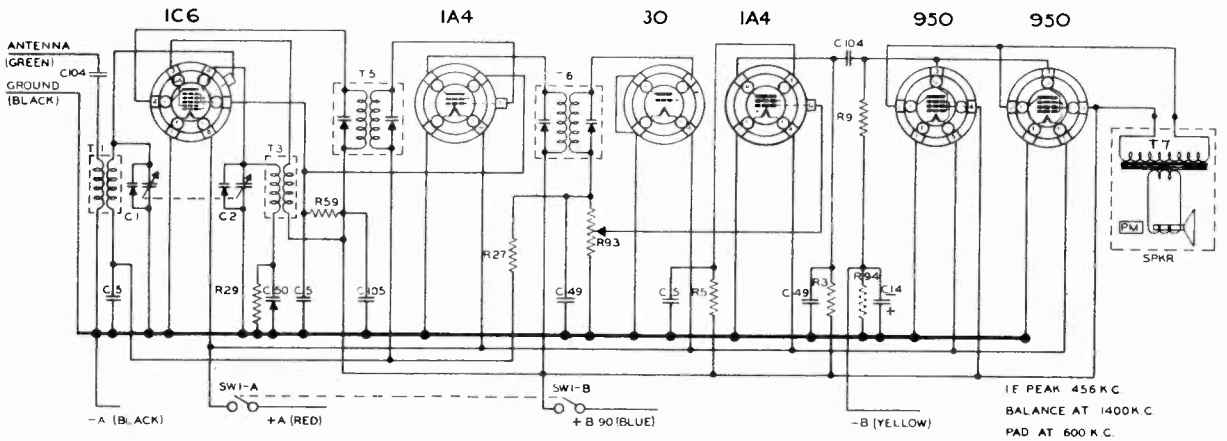
NOBLITT SPARKS INDUSTRIES



NOBLITT SPARKS INDUSTRIES

MODELS 618B, 628B
Schematic, Voltage
Alignment, Parts

ARVIN HOME RADIO MODELS 618B-628B



RESISTORS

R	OHMS	W	PART NO.
1	100M	½	17-2068
5	900M	½	17-2070
9	1M	½	17-2060
27	2M	½	17-4788
29	50M	½	17-2080
59	.5M	½	17-4191
93	500M	WC	17-13754
94	450	1½	17-14158

CONDENSERS

C	CAPACITY	VOLT	PART NO.
1	TWO-GANG VARIABLE		17-514
5	.05	200	17-14053
14	.2 M F	25	17-14005B
43	.0005	400	17-14063
50	800 M M F MAX	PAD	17-14070
104	.01	200	17-4208
105	.25	200	17-413

CHOKES & TRANSFORMERS

R	TYPE	PART NO.
1	TRANSFORMER	17-450
1	ANTENNA COIL	17-450
3	OSCILLATOR COIL	17-484
5	FIRST I.F. COIL	17-462
6	SECOND I.F. COIL	17-463
7	OUTPUT TRANS.	17-13836

MISCELLANEOUS UNITS

SYMB.	DESCRIPTION	PART NO.
SPKR	PERMANENT MAG. DYNAMIC 618B	41-7854
SPKR	PERMANENT MAGNET DYNAMIC 628B	41-7858
SW-A	VOLUME SWITCH (SEE R93)	
SW-B	RF SWITCH (SEE R93)	

POWER OUTPUT - 315 MILLIWATTS

VOLTAGE AND POWER CONSUMPTION -
"A" Battery -540 MA at 2.1 Volts
"B" Battery -15 to 18 MA at 90 Volts.

SENSITIVITY - 1500 to 600 KC - 50 Microvolts minimum for 50 Milliwatts output.
456 KC - 150 Microvolts minimum for 50 Milliwatts output.

FREQUENCY RANGE - 540 TO 1725 KILOCYCLES

TUBES - 1C6 -1st Det. and Osc.
1A4 -1st IF Amplifier.
30 -2nd Det., AVC.
1A4 -1st AF Amplifier.
950 -Power output.
950 -Power output.

CONVENTIONAL ALIGNMENT
(see special section)

MODEL 618B-628B SOCKET VOLTAGES

Tube	Filament	Plate	Screen	Control Grid	Anode Grid	Oscillator Grid
1C6	2.1	90	45	*10 V. max.	90	6 to 10 V.
1A4	2.1	90	45	*10 V. max.	.....	.....
30	2.1	0	....	....	.....	.....
1A4	2.1	26	15	*10 V. max.	.....	.....
950	2.1	90	90	8.2	.....	.....
950	2.1	90	90	8.2	.....	.....

Measured with vacuum tube voltmeter; 100,000 microvolts R. F. input to Antenna Terminal.

POINT TO POINT RESISTANCES

All tubes removed and speaker disconnected. Volume control in full-on position. All resistances to ground unless otherwise specified.

1C6

Filament	0
Filament	∞
Plate to B+	15.0 Ω
Screen to B+	15,000 Ω
Oscillator Grid	50,000 Ω
Anode Grid to B+	4.0 Ω
Control Grid	2,500,000 Ω

1A4

Filament	0
Filament	∞
Plate to B+	15.0 Ω
Screen to B+	15,000 Ω
Control Grid	2,500,000 Ω

30

Filament	0
Filament	∞
Grid	500,000 Ω
Plate	0

1A4

Filament	0
Filament	∞
Screen to B+	500,000 Ω
Plate to B+	100,000 Ω
Control Grid	500,000 Ω

950

Filament	0
Filament	∞
Plate to B+	750 Ω
Screen to B+	0
Control Grid	1,000,000 Ω

950

Filament	0
Filament	
Plate to B+	750 Ω
Screen to B+	0
Control Grid	1,000,000 Ω

COIL, TRANSFORMER AND SPEAKER RESISTANCES

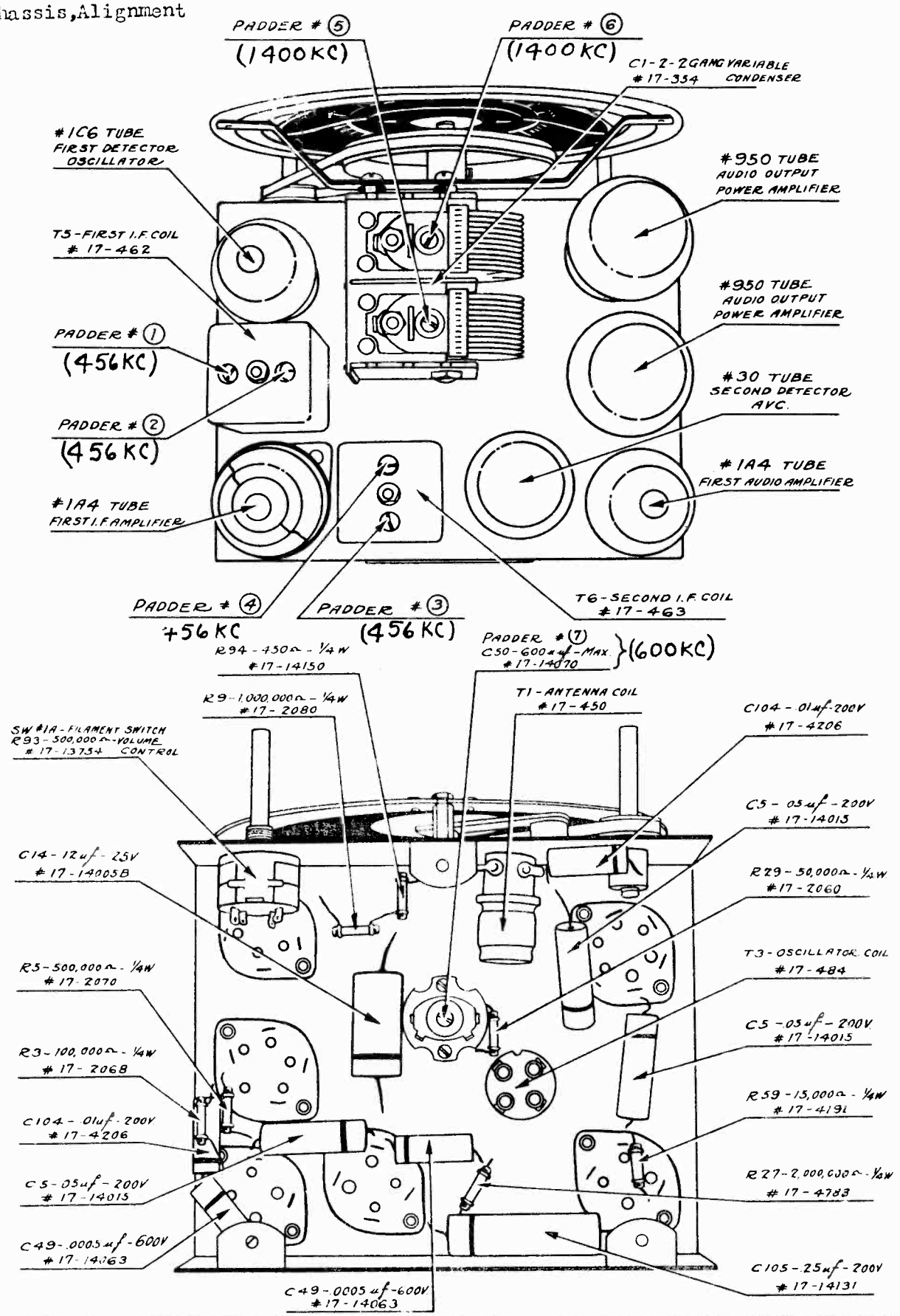
T1 Antenna Coil Pri.	13.0 Ω
T1 Antenna Coil Sec.	3.0 Ω
T3 Oscillator Coil Pri.	4.0 Ω
T3 Oscillator Coil Sec.	3.8 Ω
T5 1st I. F. Trans. Pri.	15.0 Ω
T5 1st I. F. Trans. Sec.	15.0 Ω
T6 2nd I. F. Trans. Pri.	15.0 Ω
T6 2nd I. F. Trans. Sec.	15.0 Ω
T7 Output Trans. Pri.	750 Ω
T7 Output Trans. Sec.	1.3 Ω
Speaker Voice Coil	4.0 Ω

COLOR CODE OF BATTERY CABLES

+90 V. "B"	BLUE
—B	YELLOW
+2.1 V. "A"	RED
—2.1 V. "A"	BLACK
ANTENNA	GREEN
GROUND	BLACK

MODELS 618B, 628B
Socket, Trimmers
Chassis, Alignment

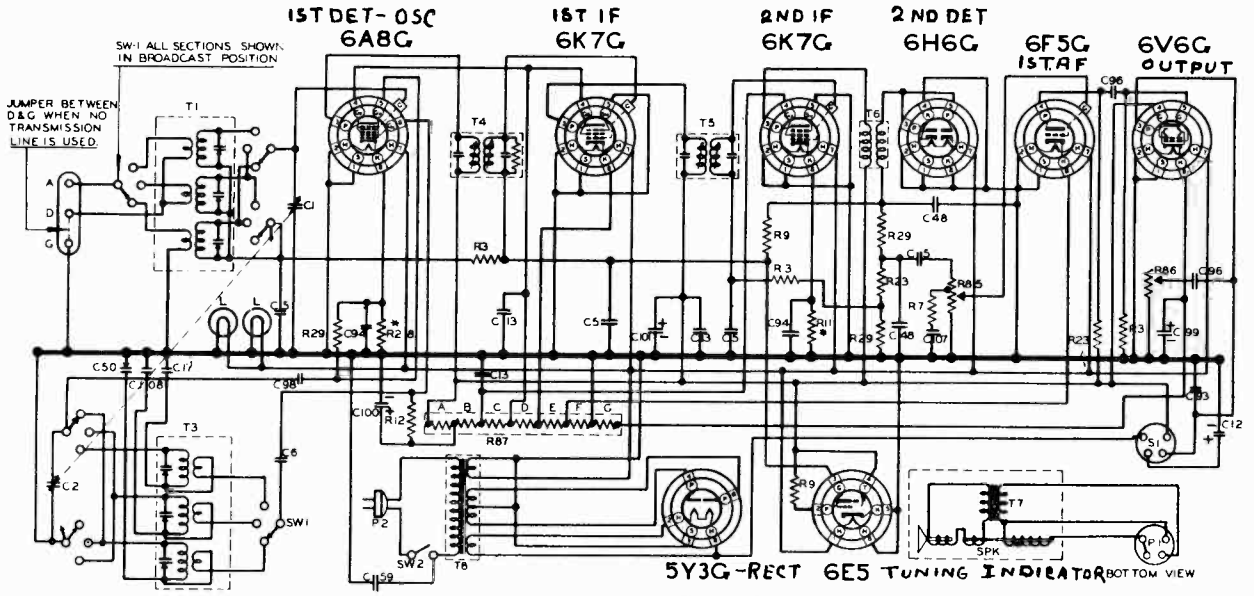
NOBLITT SPARKS INDUSTRIES



Parts, Alignment
Sensitivity, Resistance

NOBLITT SPARKS INDUSTRIES

MODELS 818, 828
828A, 838CS
Schematic, Voltage



NOTE R 87

	OHM	W	PART NO
A	1640 OHMS		
C	1950		
D	3800		
E	220		
F	50		
G	235		

RESISTORS

	OHM	W	PART NO
1	100K	1/4	17-2060
2	250K	1/2	17-2072
3	1 MEG	1/4	17-2080
12	10K	1/4	17-4275
23	250K	1/4	17-3041
29	50K	1/4	17-2090
37	300	1/4	17-14033
45	5000	1/2	17-13712
86	100K	1/2	17-13713
87	TAPPED		17-14187
	2 M	1/4	17-4262
28	1500	1/4	17-4205

CONDENSERS

	CAPACITY	VOLT	PART NO
1	2 GANG		17-13719
2	VARIABLE		
5	.05	200	17-14019
6	.002	600	17-2063
12	8 ELECT	475	17-14001
13		300	17-14048
17	.005 + 5%	600	17-14029
50	.0058 MAX PADG		17-14070
88	.00025	600	17-4287
98	.01	400	17-1483
83	.005	800	17-14114
84	1	200	17-14115
85	.02	200	17-14123
86	.05	600	17-14121
96	.000075	600	17-14122
99	.50 ELECT	15	17-14123
100	8 ELECT	300	17-14124
101	10 MEG	300	17-14125
107	.03	200	17-14133
108	.0013 ±2%	600	17-14134

NOTE R 87 MAY BE VARIED FROM 400 TO 2000 OHMS TO CONTROL SENSITIVITY

TRANSFORMERS

	TYPE	PART NO
1	ANTENNA COIL	00-13724
2		
3	OSCILLATOR COIL	00-13725
4	1ST I.F. TRANS	00-13748
5	2ND I.F. TRANS	00-13747
6	3RD I.F. TRANS	00-13750
7	OUTPUT TRANS. 818	17-13730
7	OUTPUT TRANS. 828	17-13731
8	POWER TRANS.	00-13900

MISCELLANEOUS

SYMBOL	DESCRIPTION	PART NO
SPK	8" SPEAKER FOR MODEL 818	17-13738
SPK	10" SPEAKER FOR MODEL 828	17-13720
S1	SPEAKER SOCKET	17-13245
P1	SPEAKER PLUG	
P2	LINE CORD & PLUG	17-13701
L	DIAL LIGHT	17-13804
SW 1	BAND SWITCH	17-13729
SW 2	LINE SWITCH - SEE 990	17-13713

CONVENTIONAL ALIGNMENT
(SEE SPECIAL SECTION)

3 BANDS: LF PEAK 455 KC
BALANCE 15 MC. PAD 60 MC.
BALANCE 4.7 MC. CHECK 20 MC.
BALANCE 1.5 0 M.C. CHECK 6.0 MC.

SENSITIVITY :
BAND A -50 microvolts minimum
BAND B -75 microvolts minimum
BAND C -100 microvolts minimum

POWER OUTPUT :
5 Watts maximum

FREQUENCY RANGE :
BAND A - 540 to 1750 KC
BAND B - 1750 to 5500 KC
BAND C - 5.5 to 18 MC

MODEL 818-828 SOCKET VOLTAGES

(INPUT VOLTAGE 110 V RMS)

Tube	Heaters	Plate	Screen	Cathode	Osc. Grid	Anode Grid	Control Grid Bias
6A8G	6.3	252	75	3.4	5 to 22V	155	.....
6K7G	6.3	252	75	5.8	.....	.....	.....
6K7G	6.3	252	114	3.1	.....	.....	.....
6H6G	6.3	.....	.....	0	.....	.....	.....
6F5G	6.3	135	.....	1.0	.....	.....	.....
6V6G	6.3	240	252	10.8	.....	.....	.....
6E5	6.3	150	.....	0	.....	.....	‡
5Y3G	5.0	365	.....	325	.....	.....	.....

‡ AVC Voltage developed approx. 30 volts with 100,000 Microvolts Input to Antenna.

CONVENTIONAL ALIGNMENT
(see special section)

POINT TO POINT RESISTANCES

All Readings taken to ground unless otherwise stated. Tubes removed but speaker connected. Volume control in full on position. All shell terminals grounded to chassis.

6A8G

Heater	0
Heater	.05 Ω
Cathode	400 Ω
Oscillator Grid	50,400 Ω
Anode Grid to B+	11,640 Ω
Screen to B+	7,750 Ω
Plate to B+	12.0 Ω
Control Grid	1,450,000 Ω

6K7G

Heater	0
Heater	.05 Ω
Cathode	270 Ω
Suppressor	0
Screen to B+	7,750 Ω
Plate to B+	12.0 Ω
Control Grid	1,350,000 Ω

6K7G

Heater	0
Heater	.05 Ω
Cathode	400 Ω
Suppressor	0
Screen to B+	5,840 Ω
Plate to B+	64 Ω
Control Grid	150,000 Ω

6H6G

Heater	0
Heater	.05 Ω
Cathode	0
Plate	350,000 Ω
Plate	350,000 Ω
Cathode	0

6F5G

Heater	0
Heater	.05 Ω
Cathode	50 Ω
Control Grid	500 000 Ω
Plate to B+	250,000 Ω

6V6G

Heater	0
Heater	.05 Ω
Cathode	235 Ω
Control Grid	100,000 Ω
Screen Grid to B+	0
Plate to B+	760 Ω

6E5

Heater	0
Heater	.05 Ω
Cathode	0
Control Grid	1,350,000 Ω
Plate to B+	1,000,000 Ω
Target to B+	0

6Y3G

Filament to B+	1,000 Ω
Filament	11,860 Ω
Plate	155 Ω
Plate	145 Ω

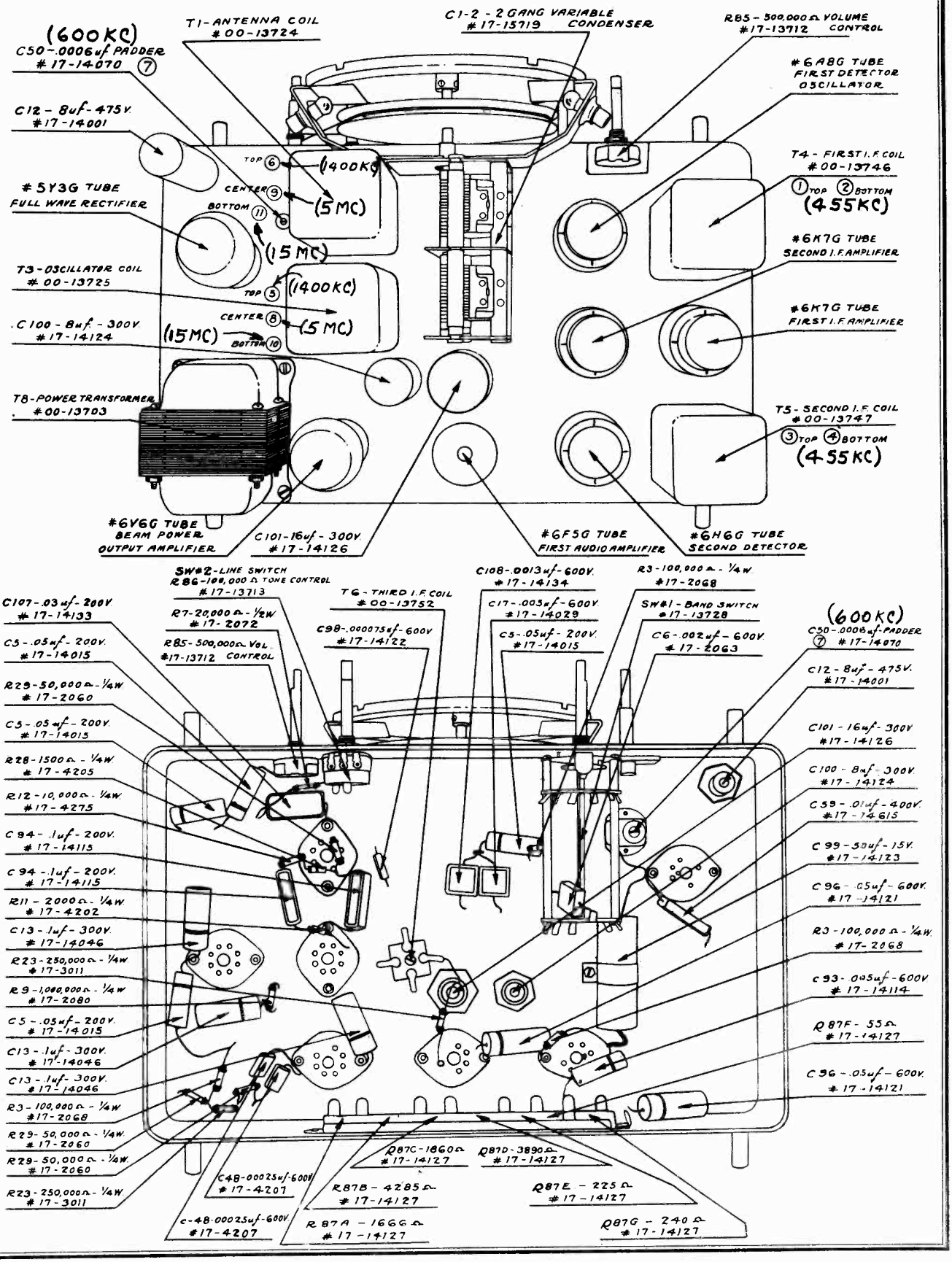
R87 TAPPED AS FOLLOWS: A—1,640 ohms; B—4,200 ohms; C—1,950 ohms; D—3,800 ohms; E—220 ohms; F—50 ohms; G—235 ohms.

COIL TRANSFORMER AND SPEAKER RESISTANCES

T1 A Band Ant. Pri.	18.5 Ω
T1 B Band Ant. Pri.	1 Ω
T1 C Band Ant. Pri.	.05 Ω
T1 A Band Ant. Sec.	.350
T1 B Band Ant. Sec.	.07 Ω
T1 C Band Ant. Sec.	.02 Ω
T3 A Band Osc. Pri.	.15 Ω
T3 B Band Osc. Pri.	.08 Ω
T3 C Band Osc. Pri.	.08 Ω
T3 A Band Osc. Sec.	.27 Ω
T3 B Band Osc. Sec.	.06 Ω
T3 C Band Osc. Sec.	.01 Ω
T4 1st I. F. Trans. Pri.	12.0 Ω
T4 1st I. F. Trans. Sec.	12.0 Ω
T5 2nd I. F. Trans. Pri.	12.0 Ω
T5 2nd I. F. Trans. Sec.	12.0 Ω
T6 3rd I. F. Trans. Pri.	64.0 Ω
T6 3rd I. F. Trans. Sec.	64.0 Ω
T7 Output Trans. Pri. (818)	760 Ω
T7 Output Trans. Sec. (818)	1 Ω
T7 Output Trans. Pri. (828)	760 Ω
T7 Output Trans. Sec. (828)	1 Ω
T8 Power Trans. 110 V. Pri.	6.5 Ω
T8 Power Trans. Hi-Volt. Sec.	150.0-145 Ω
T8 Power Trans. 6 Volt Sec.	.05 Ω
T8 Power Trans. 5 Volt Sec.	.05 Ω
Speaker Field 818 or 828	1,000 Ω

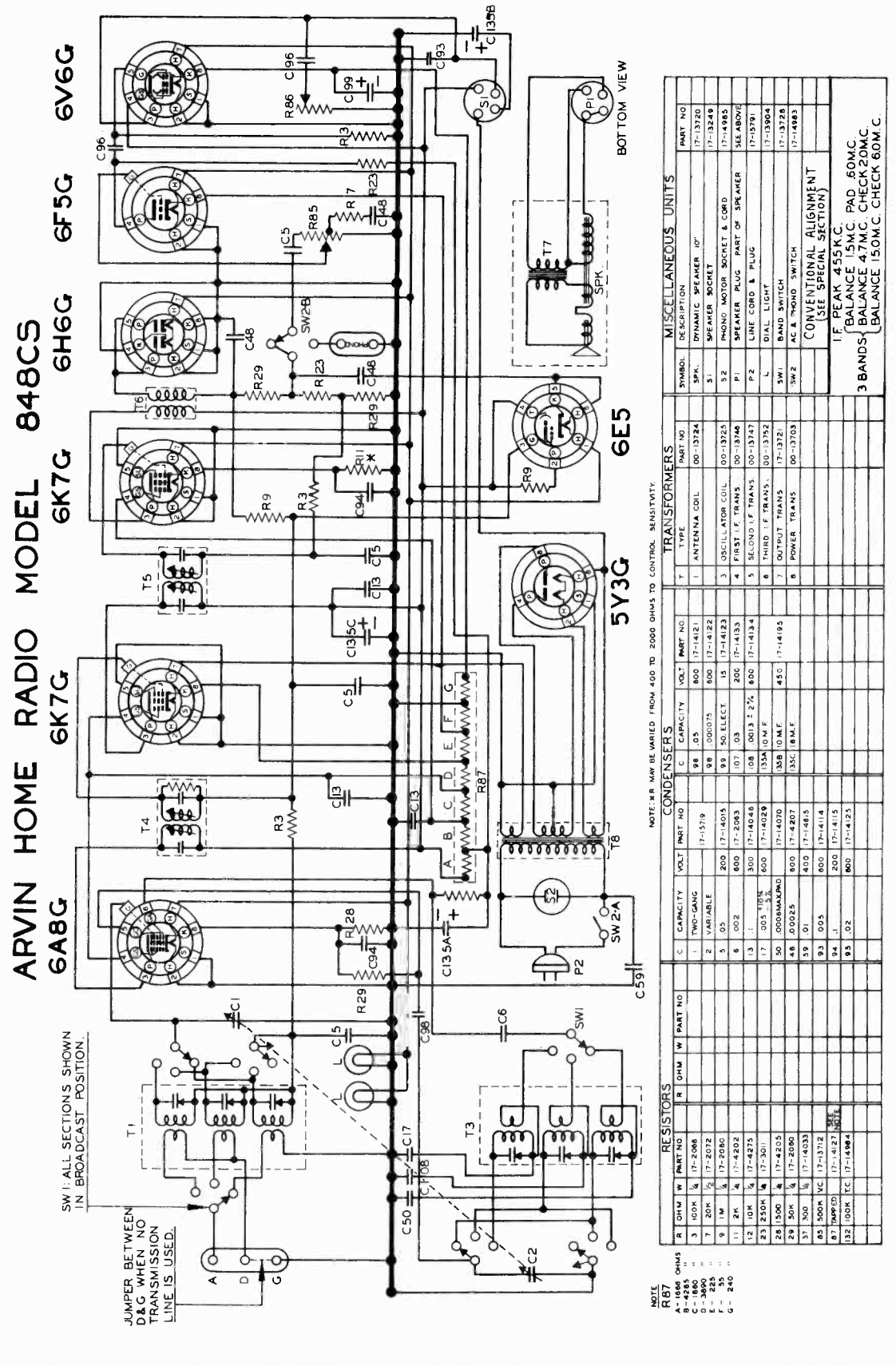
MODELS 818,828
828A,838CS
Socket,Trimmers
Chassis

NOBLITT SPARKS INDUSTRIES



MODEL 848CS
Schematic, Parts
Alignment

NOBLITT SPARKS INDUSTRIES



RESISTORS

R	OHM	W	PART NO
3	100K	¼	17-2068
7	20K	½	17-2072
9	1M	¼	17-2080
11	2K	¼	17-4202
12	10K	¼	17-4275
23	250K	¼	17-3011
28	1500	¼	17-4205
29	50K	½	17-2080
37	300	½	17-14033
85	500K	VC	17-13712
87	TAPPED		17-14127
132	100K	TC	17-14984

CONDENSERS

C	CAPACITY	VOLT	PART NO
1	TWO-GANG		17-1579
2	VARIABLE		
5	.05	200	17-14015
6	.002	600	17-2083
13	.1	300	17-14048
17	.005 ±10%	600	17-14029
50	.0008 MAX PAD		17-14070
48	.0025	600	17-4207
59	.01	400	17-14815
93	.005	600	17-14114
94	.1	200	17-14115
95	.02	600	17-14125
98	.05	600	17-14121
98	.000075	600	17-14122
99	50 ELECT	15	17-14123
107	.03	200	17-14133
108	.0013 ± 2%	600	17-14134
135A	10 M F		
135B	10 M F	450	17-14195
135C	8 M F		

TRANSFORMERS

T	TYPE	PART NO
1	ANTENNA COIL	00-13724
3	OSCILLATOR COIL	00-13725
4	FIRST I.F. TRANS.	00-13746
5	SECOND I.F. TRANS.	00-13747
6	THIRD I.F. TRANS.	00-13752
7	OUTPUT TRANS	17-13721
8	POWER TRANS	00-13703

MISCELLANEOUS UNITS

SYMBOL	DESCRIPTION	PART NO
SPK.	DYNAMIC SPEAKER 10"	17-13720
S1	SPEAKER SOCKET	17-13249
S2	PHONO MOTOR SOCKET & CORD	17-14985
P1	SPEAKER PLUG PART OF SPEAKER	SEE ABOVE
P2	LINE CORD & PLUG	17-13791
L	DIAL LIGHT	17-13904
SW1	BAND SWITCH	17-13728
SW2	AC & PHONO SWITCH	17-14983

CONVENTIONAL ALIGNMENT
(SEE SPECIAL SECTION)

I.F. PEAK 455 K.C.
3 BANDS { BALANCE 1.5 M.C. PAD .60 M.C.
BALANCE 4.7 M.C. CHECK 20 M.C.
BALANCE 15 0 M.C. CHECK 60 M.C.

MODELS 1237, 1247
1247A
Schematic, Parts
Alignment

NOBLITT SPARKS INDUSTRIES