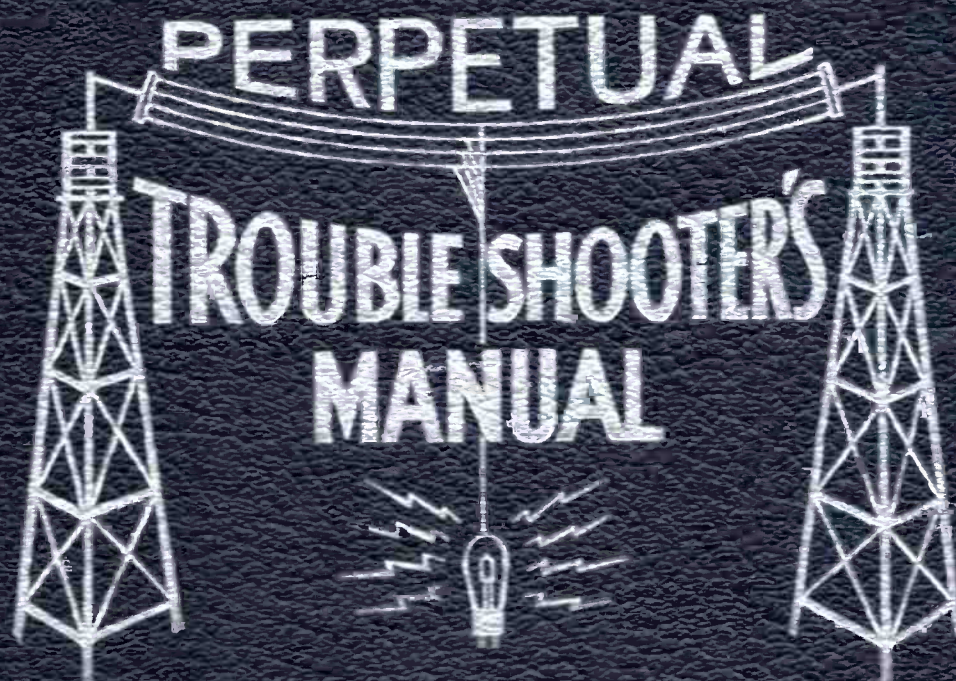


**VOLUME VI**



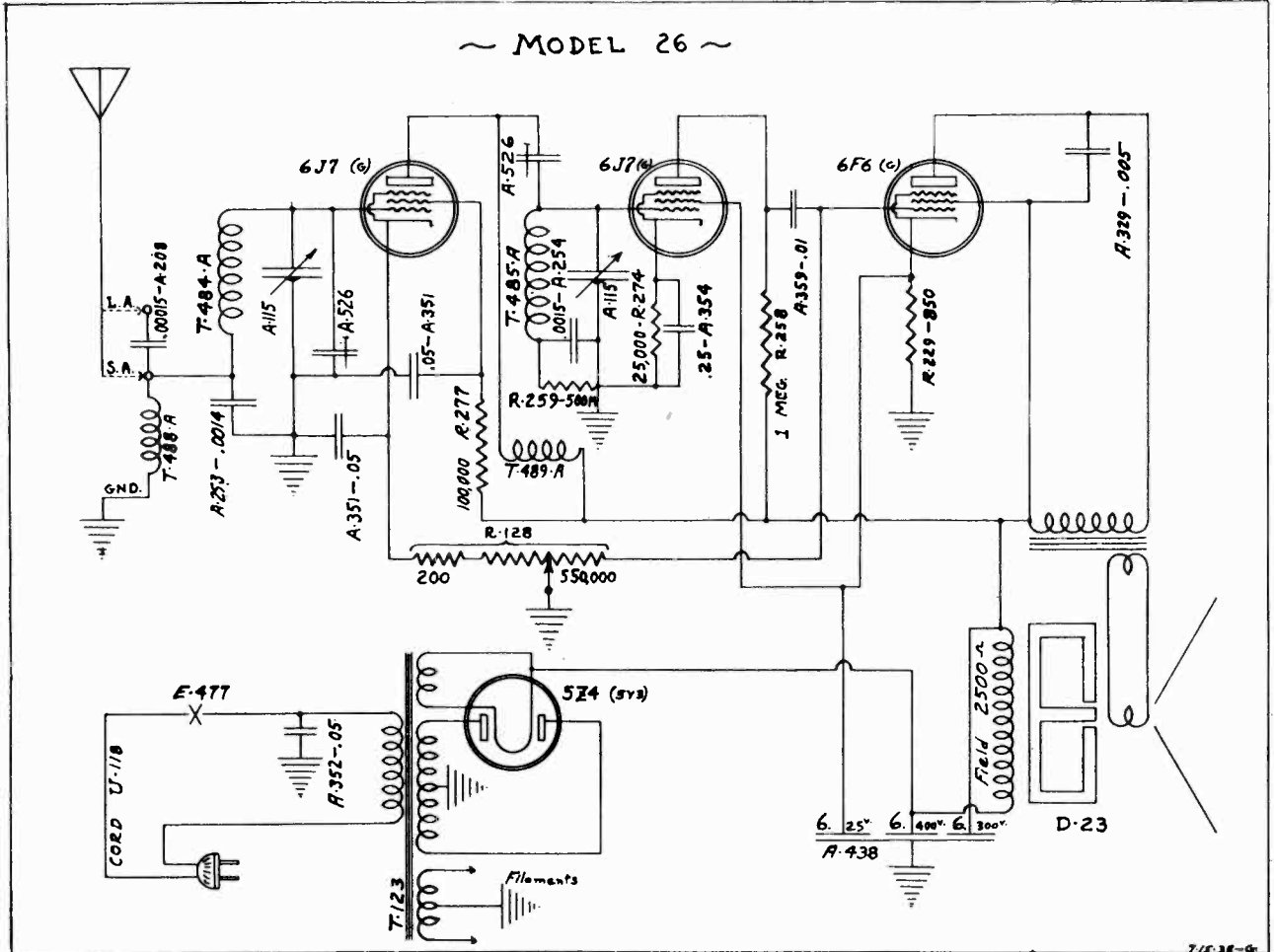
**JOHN F. RIDER**

INTERNATIONAL RADIO CORP.

MODELS 26, 226

Schematic  
Parts List

~ MODEL 26 ~



PARTS LIST

PART NO.	DESCRIPTION	LIST PRICE			
A-115...	2 gang tuning condenser	\$1.85	E-483.....	Pilot light socket	.10
A-208....	150 mmf. mica condenser	.20	H-53.....	6J7 tube socket	.10
A-253....	1400 mmf. mica condenser	.20	H-56.....	6F6 tube socket	.10
A-254....	1500 mmf. mica condenser	.20	H-57.....	5Y3 tube socket	.10
A-329....	.005 mf., 600 v. paper condenser	.15	R-128.....	Volume control	.55
A-351....	.05 mf., 200 v. paper condenser	.15	R-229.....	850 ohm, 1/2 w. carbon resistor	.20
A-352....	.05 mf., 300 v. paper condenser	.15	R-258.....	1 megohm, 1/3 w. carbon resistor	.20
A-354....	.25 mf., 25 v. paper condenser	.20	R-259.....	500M ohm, 1/3 w. carbon resistor	.20
A-359....	.01 mf., 400 v. paper condenser	.15	R-274.....	25M ohm, 1/3 w. carbon resistor	.20
A-438...	Electrolytic filter condenser block	1.35	R-277.....	100M ohm, 1 w. carbon resistor	.20
A-526...	Semi-variable trimmer condenser	.15	T-123.....	Power transformer	2.35
D-23.....	Dynamic speaker	3.50	T-484A.....	Antenna coil	.75
E-157.....	1" knob	.18	T-485A.....	Detector coil	.75
E-158.....	13/16" knob	.15	T-488A.....	Choke	.20
E-259.....	Dial pointer	.05	T-489A.....	Choke	.20
E-267.....	Dial scale	.25	U-118.....	A.C. cord and plug	.30
E-472.....	6-8 volt pilot light bulb	.15	U-207.....	4 wire speaker cable	.20
E-476...	Antenna-ground binding post strip	.10	X-341.....	Cabinet (model 26)	5.30
E-477...	A.C. power switch	.25	X-348.....	Cabinet (model 226)	5.30

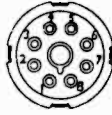
SEPTEMBER, 1935. Prices subject to change without notice

MODELS 26,226  
Voltage  
Alignment, Data

## INTERNATIONAL RADIO CORP.

## AVERAGE SOCKET VOLTAGES

Bottom View of Socket. VOLTAGES SHOWN ARE FROM TUBE PINS TO GROUND



	POSITION	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6	PIN 7	PIN 8
6J7	R. F.	Shell	HTR.	250	95	0	—	HTR.	7
6J7	Det.	Shell	HTR.	25	20	10	—	HTR.	10
6F6	A. F.	Shell	HTR.	240	250	0	—	HTR.	20
5Z4	Rect.	Shell	345	—	A.C.	—	A.C.	—	345

Line 118 volts. Volume Control Full On. 10% Variation Allowable.

This chassis is a four tube tuned-radio-frequency receiver designed to operate from 115 volts, 60 cycle A.C. power lines. It tunes the band of 1760 to 540 kilocycles. The following tubes are employed:

6J7 (metal) or 6J7G (glass) Radio frequency    6F6 (metal) or 6F6G (glass) Pentode output  
6J7 (metal) or 6J7G (glass) Detector            5Z4 (metal) or 5Y3 (glass) Rectifier

The metal and glass tubes are interchangeable but when changing from one type to the other it is advisable to realign for perfect resonance.

## ANTENNA LENGTH

- S. A. binding post accommodates antenna of 25 to 60 feet including lead-in.
- L. A. binding post, over 60 feet (useful in remote sections).

## ALIGNMENT DATA

The rear section of the 2 gang condenser tunes the R. F. stage; the front section the detector. The R. F. section only, has a trimmer condenser connected across it. The small semi-adjustable condenser attached to the detector section is the coupling condenser connected between the R. F. tube plate and Detector control grid.

Alignment may be accomplished using either a signal generator or weak broadcast signals although the signal generator is preferable. An output meter should be connected from the plate of the 6F6 tube to ground (blue and black speaker wires).

Set signal generator at 1400 kilocycles and feed signal to antenna binding post. Keep the output from signal generator as low as possible. Tune in signal on radio and make adjustments for maximum output. Rock the tuning condenser back and forth across the signal while adjusting the R. F. trimmer for resonance.

Next check the alignment at 1000 Kc. Insert a thin bakelite, celluloid or mica feeler strip between the plates of the variable condensers to determine whether the circuits are properly matched. The action is this—the dielectric constant of the celluloid feeler strip being higher than that of the air it displaces, results in an increase of capacity. Open the variable condenser just enough to indicate two or three points below maximum signal. As the feeler is inserted the meter reading should indicate increasing signal and then decreasing as the feeler is inserted farther. This procedure should be followed on both sections. Should the meter fail to show an increase in signal as the strip is inserted in one section this indicates too great a capacity for the section. This may be corrected by bending the outside rotor plates out at the point where they begin to mesh with the stator.

After checking the alignment at 1000 Kc. repeat the process at 600 Kc.

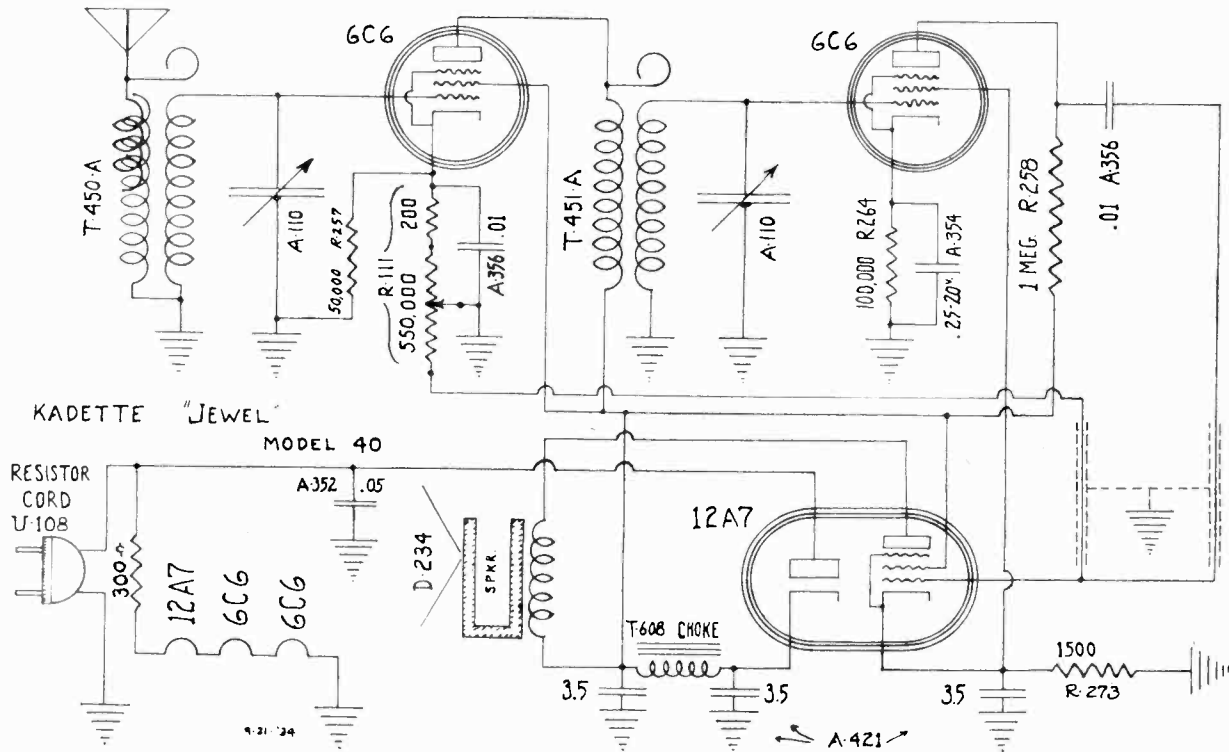
## INTERSTAGE COUPLING CONDENSER

The interstage coupling condenser connected between the plate of the R.F. tube and control grid of the detector should be adjusted so there is slight oscillation at the high frequency end of the band when the volume control is in full on position. Slight oscillation may be noticed also at the low frequency end.

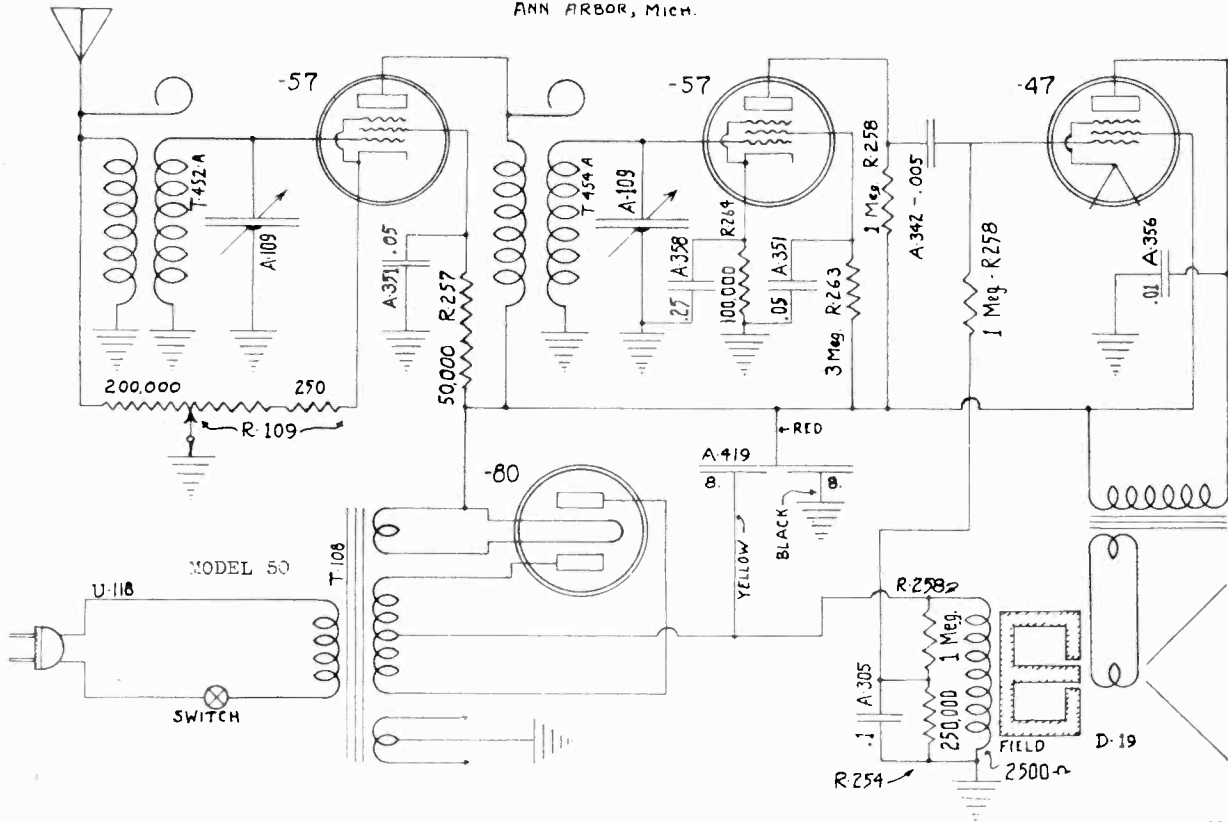


MODEL 40, Jewel  
 MODEL 50  
 Schematics

INTERNATIONAL RADIO CORP.

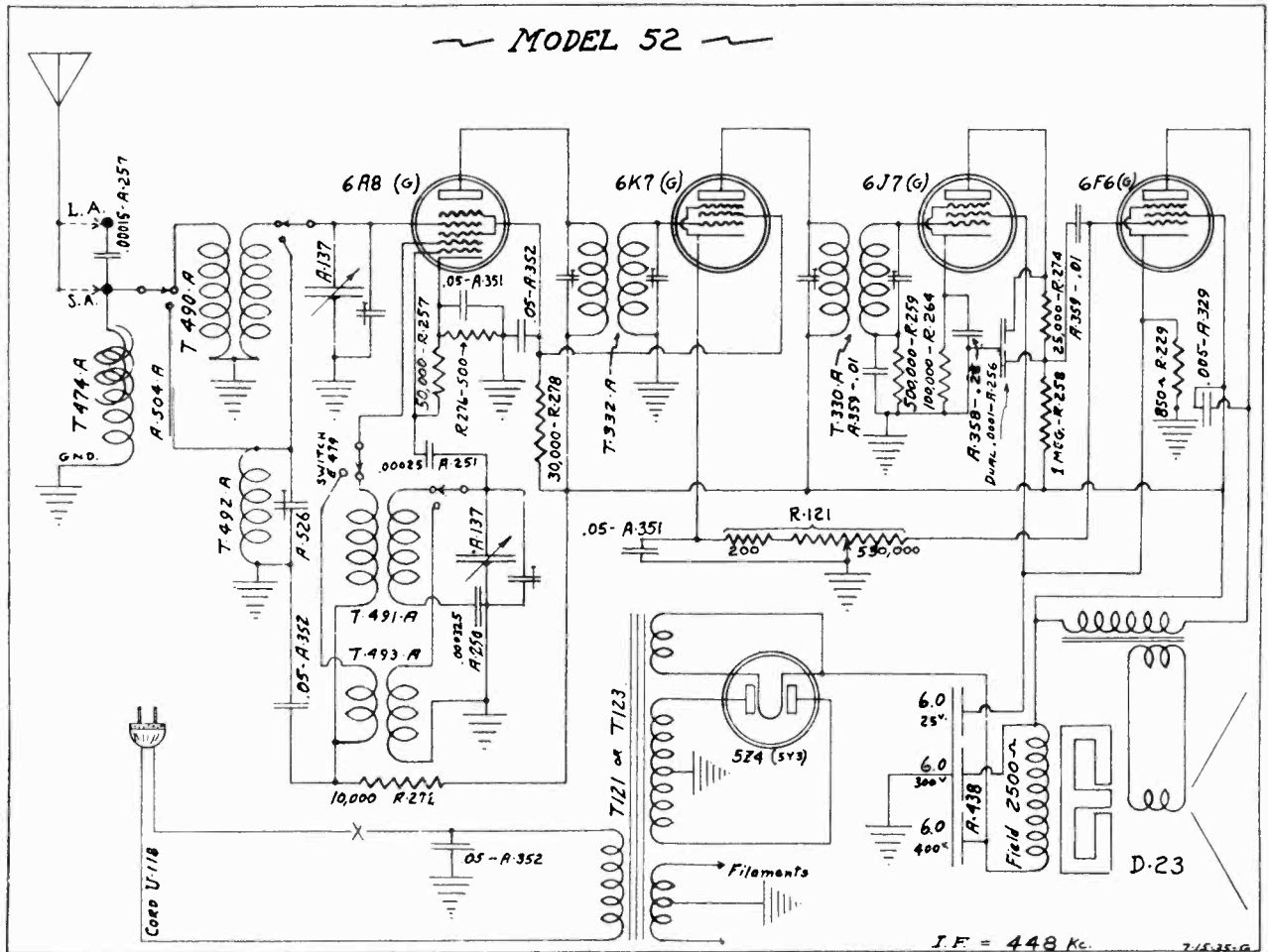


INTERNATIONAL RADIO CORPORATION  
 ANN ARBOR, Mich.



INTERNATIONAL RADIO CORP.

MODEL 52



PARTS LIST

PART NO.	DESCRIPTION	LIST PRICE
A-137	2 gang tuning condenser	\$1.65
A-208	150 mmf. mica condenser	.20
A-250	325 mmf. mica condenser	.20
A-251	.00025 mf. mica condenser	.20
A-256	Dual .0001 mf. mica condenser	.20
A-329	.005 mf., 600v. paper condenser	.15
A-351	.05 mf., 200v. paper condenser	.15
A-352	.05 mf., 300v. paper condenser	.15
A-358	.25 mf., 120v. paper condenser	.20
A-359	.01 mf., 400v. paper condenser	.15
A-438	6-6-6 mf. electrolytic filter condenser	1.35
A-526	Semi-variable trimmer condenser	.15
D-29	5 inch dynamic speaker	3.50
E-157	Black and silver knobs	.15
E-160	Black and silver knob with yellow and red dots	.15
E-265	Dial assembly	1.50
E-472	Pilot light bulbs 6-8 volts	.15
E-476	Antenna and ground strip	.10
E-479	Wave band switch	.45
H-49	6A8 tube socket	.10
H-53	6J7 tube socket	.10
H-54	6K7 tube socket	.10
H-56	6F6 tube socket	.10
H-57	5Y3 tube socket	.10
R-121	Volume control with power switch	.75
R-229	850 ohm, 1/2 w. carbon resistor	.20
R-257	50M ohm, 1/3 w. carbon resistor	.20
R-258	1 megohm, 1/3 w. carbon resistor	.20
R-259	500M ohm, 1/3 w. carbon resistor	.20
R-264	100M ohm, 1/3 w. carbon resistor	.20
R-272	10M ohm, 1/3 w. carbon resistor	.20
R-274	25M ohm, 1/3 w. carbon resistor	.20
R-276	500 ohm, 1/3 w. carbon resistor	.20
R-278	30M ohm, 1 w. carbon resistor	.20
S-102	Goat tube shield	.10
T-121	Power transformer	2.35
T-330A	2nd I.F. transformer	1.25
T-332A	1st I.F. transformer	1.25
T-474A	448 Kc. wave trap	.35
T-490A	Broadcast detector coil	1.00
T-491A	Broadcast oscillator coil	1.00
T-492A	Short wave detector coil	.35
T-493A	Short wave oscillator coil	.35
U-118	A.C. cord and plug	.30
U-206	4 wire speaker cable	.20
X-343	Cabinet	5.70

SEPTEMBER, 1935 Prices Subject to Change Without Notice

MODEL 52  
Voltage  
Alignment

INTERNATIONAL RADIO CORP.

AVERAGE SOCKET VOLTAGES



Bottom View of Socket. VOLTAGES SHOWN ARE FROM TUBE PINS TO GROUND

	POSITION	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6	PIN 7	PIN 8
6A8	Det.-Osc.	Shell	HTR.	195	70	— 10	140	HTR.	3
6K7	I. F.	Shell	HTR.	210	90	1.5	—	HTR.	1.5
6J7	2nd Det.	Shell	HTR.	50	15	4	—	HTR.	.4
6F6	A. F.	Shell	HTR.	200	210	0	—	HTR.	15
5Z4	Rect.	Shell	300	—	A.C.	—	A.C.	—	300

Line 118 volts. Switch on Broadcast Position. Volume Control Full On. 10% Variation Allowable.

Model 52 is designed to operate from 115 volts, 60 cycle alternating current power lines. It is a two band receiver covering the American broadcast and Foreign short wave bands.

The following tubes are employed:

- 6A8 (metal) or 6A8G (glass) 1st Detector-Oscillator
- 6K7 (metal) or 6K7G (glass) I.F. Amplifier
- 6J7 (metal) or 6J7G (glass) 2nd Detector
- 6F6 (metal) or 6F6G (glass) Pentode output
- 5Z4 (metal) or 5Y3 (glass) Rectifier

The metal and glass tubes are interchangeable but when changing from one type to the other it is advisable to realign for perfect resonance. The 6J7G tube should be shielded but shielding may be omitted when using the all metal 6J7.

**ALIGNMENT**

The standard type of output meter should be used to indicate signal strength. It should be connected from the plate (pin No. 3) of the 6F6 to ground. The signal from the signal generator *must be kept at a very low level.*

**ESSENTIAL DATA:** The intermediate frequency used is 448 Kc. On the broadcast band the oscillator frequency is 448 Kc. higher than the signal frequency. On the short wave band it is 448 Kc. lower than the signal frequency.

Aligning should be done on the following frequencies: Broadcast band 1400 and 600 kilocycles; Short wave band 12 and 6 megacycles.

It is permissible to bend condenser plates when aligning the broadcast band but not the short wave band.

**INTERMEDIATES:** To align the I.F. circuits, set the signal generator to 448 Kc. and feed its modulated signal direct to the antenna. Short out the oscillator section of the two gang condenser. Adjust the first I.F. transformer trimmers for maximum meter reading. Go over both adjustments at least three or four times for accuracy. Repeat this process on the second I.F. transformer. If adjustments are not made accurately, selectivity will be poor and I.F. oscillation may result.

**BROADCAST BAND:** Place the band change switch on Broadcast position. Turn the dial to 1400 Kc. and feed a *very weak* 1400 Kc. modulated signal from your signal generator to the antenna. Adjust the broadcast oscillator trimmer (on condenser gang) for maximum reading.

There is no adjustable paddler condenser in this model so resonance on the low frequency end is accomplished by bending plates on the tuning condensers.

**SHORT WAVE BAND:** There is a separate trimmer condenser across the short wave detector coil. It is mounted on the bottom of the chassis at the end. Adjustment should be made at 12 megacycles. Instead of bending condenser plates at 6 megacycles, alignment is accomplished by spreading or crowding turns on the short wave detector coil. If much crowding or spreading is necessary it is advisable to go back and recheck at 12 megacycles.

**MICROPHONIC HOWL**

The tuning condenser is cushion mounted to eliminate vibration. Do not allow the dial to touch the escutcheon plate on the cabinet or a microphonic condition will be created.

## INTERNATIONAL RADIO CORP.

MODELS 53, 553  
Early and Late  
Alignment

# Models 53 & 553

This chassis is designed to operate from 115 volt, 60 cycle, alternating current power lines. It is a three band receiver covering the American broadcast, police and airport, and Foreign shortwave bands. The following tubes are employed:

6A8 (metal) or 6A8G (glass) 1st Detector-Oscillator	6K7 (metal) or 6K7G (glass) 1. F. Amplifier
*6J7 (metal) or 6J7G (glass) 2nd Detector	* 75 (glass) 2nd Detector, A.V.C. and 1st A.F.
6F6 (metal) or 6F6G (glass) Pentode output	5Z4 (metal) or 5Y3 (glass) Rectifier

\*6J7 or 6J7G used in first production; 75 used in later production.

The metal and glass tubes are interchangeable but when changing from one type to the other it is advisable to realign for perfect resonance. Glass counterpart types should be shielded. The metal tubes need not be. Shielding provisions are provided. The 75 tube must be shielded at all times.

## TWO CIRCUITS

It will be noted by referring to the circuit diagram that sets of early production did not incorporate A.V.C. In later production the 6J7 tube has been replaced with a 75 and A.V.C. added. In other respects the two circuits are identical.

## ALIGNMENT

The standard type of output meter should be used to indicate signal strength. It should be connected from the plate (pin No. 3) of the 6F6 to ground. Tone control should be turned "high." The signal from the signal generator *must be kept at a very low level.*

**ESSENTIAL DATA:** The intermediate frequency employed is 448 Kc. On the broadcast and middle bands the oscillator frequency is 448 kilocycles higher than the signal frequency. On the short wave band it is 448 kilocycles lower than the signal frequency.

Aligning should be done on the following frequencies: Broadcast band, 1,400 and 600 Kc.; Middle band, 6,000 and 2,400 Kc.; Short wave band 15 megacycles.

Do not bend tuning condenser plates when aligning or it will be impossible to make all three bands track correctly. The front section of the two gang condenser is the oscillator section, the rear section the first detector.

**INTERMEDIATES:** To align the I.F. circuits, set the signal generator to 448 Kc. and feed its modulated signal direct to the antenna. Short out the oscillator section of the two gang condenser. Adjust the first I.F. transformer trimmers for maximum meter reading. Go over both adjustments at least three or four times for accuracy. Repeat this process on the second I.F. transformer. If adjustments are not made accurately, selectivity will be poor and I. F. oscillation may result.

**BROADCAST BAND:** Place the band change switch on Broadcast position. Turn the dial to 1400 Kc. and feed a very weak 1400 Kc. modulated signal from your signal generator to the antenna. Adjust the Broadcast oscillator trimmer (see sketch) for maximum reading. Although a trimmer is provided for the Broadcast detector coil it will be found not connected in many sets as it is not necessary in obtaining correct balance.

Turn dial and signal generator to 600 Kc. and rock the padder into correct adjustment. This is accomplished by very slowly adjusting the padder condenser and at the same time turning the dial slightly back and forth across 600 Kc. until an adjustment is obtained producing maximum output. Go back to 1400 Kc. and readjust the oscillator trimmer slightly if necessary. Then recheck padder at 600 Kc.

**MIDDLE BAND:** Turn the band change switch to the middle position and tune radio and signal generator to 6000 Kc. Adjust the oscillator trimmer and then the detector trimmer for maximum output.

Rock in the padder condenser at 2400 Kc. Then recheck at 6000 Kc. and 2400 Kc.

**SHORT WAVE BAND:** Turn band change switch to short wave band. Tune radio and signal generator to 15 megacycles and adjust trimmers. No padder condenser is used on the short wave band so no other adjustments are necessary. On this band the oscillator frequency is 448 Kc. lower than the signal frequency

## MICROPHONIC HOWL

The 2 gang condenser is cushion mounted to eliminate vibration of the plates. Do not allow the dial to touch the escutcheon plate on the cabinet or a microphonic condition will be created.

## LONG WAVE-EXPORT MODEL

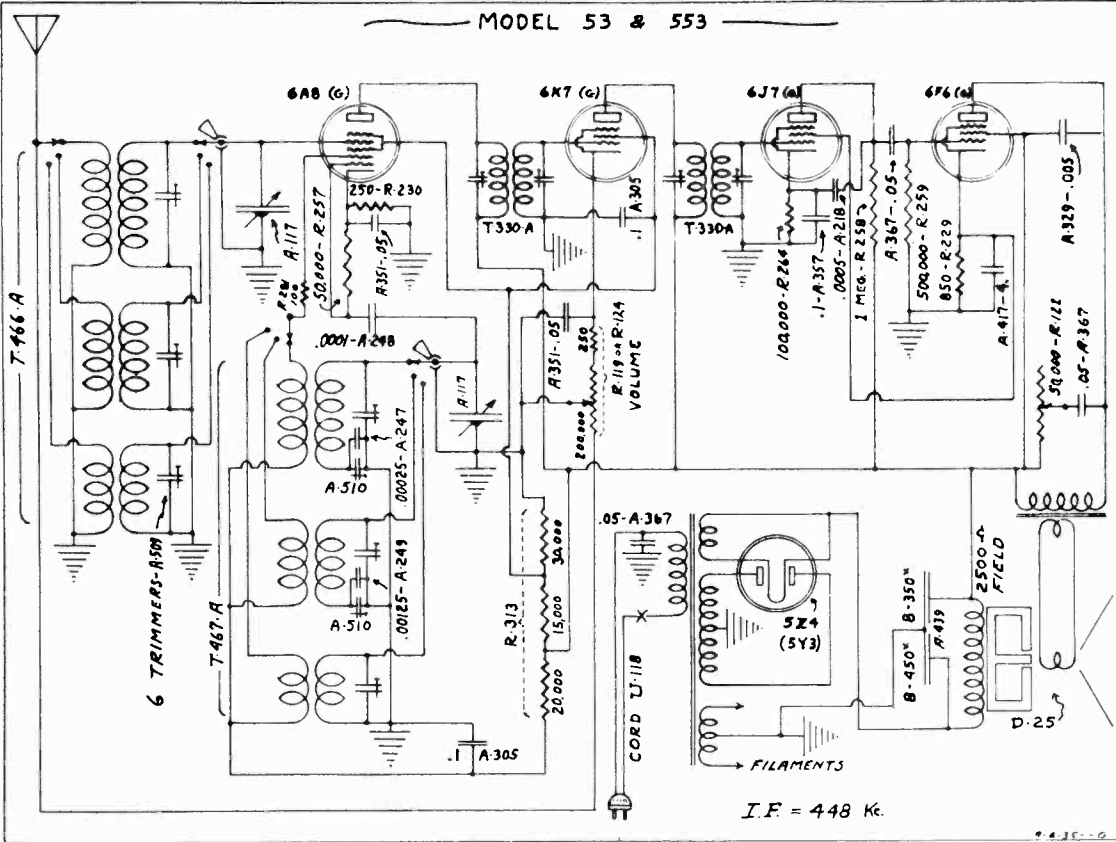
Model 53 is also built with a four position switch (part number E-482) and an extra set of coils tuning the foreign long wave band. The order of band change switch positions is broadcast, mid-band, short wave, long wave band. Alignment—adjust long wave trimmers at 350 Kc. and rock in long wave padder at 160 Kc. See sketch for location of coils and condensers.

Some export sets also contain a 25 cycle power transformer (part number T-502) which has a tapped primary winding allowing operation from 125, 150 or 250 volt A.C. power lines. The tap switch is made available by removing part of the cover of the power transformer. 25 cycle sets may be used on 60 cycle although the converse is not true.

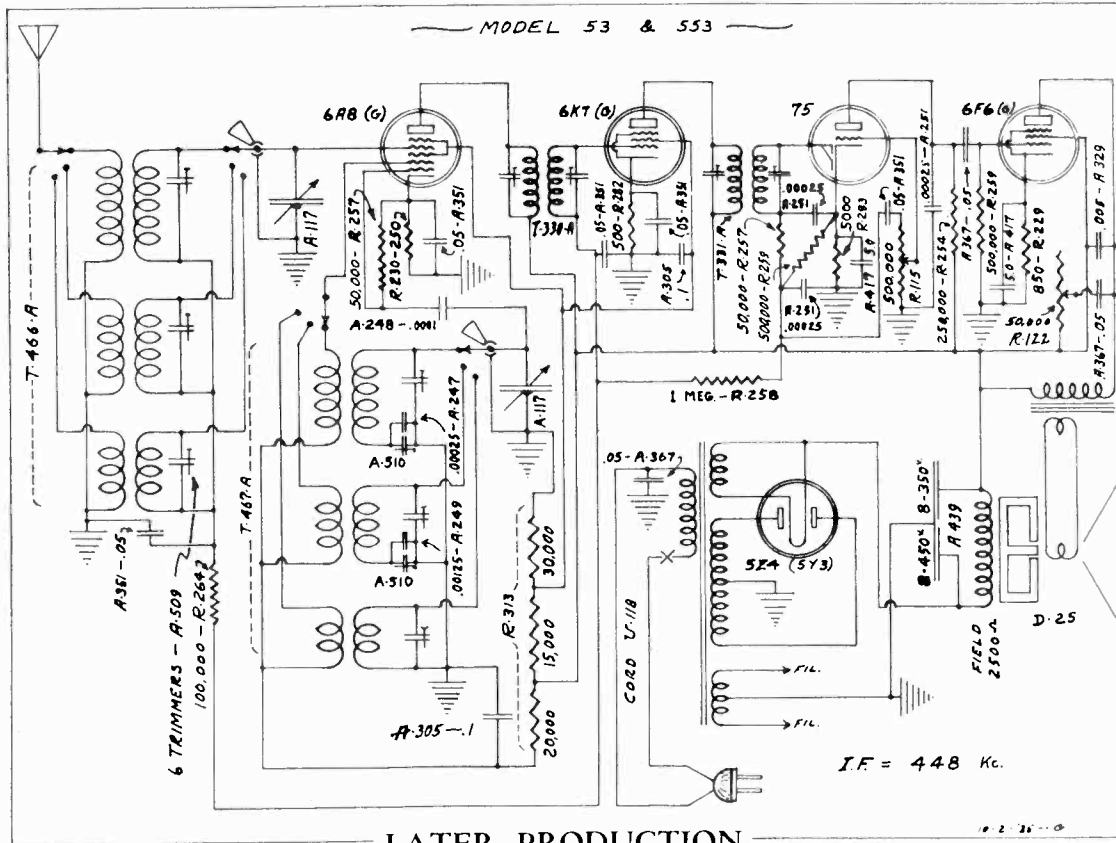


MODEL S 53, 553  
Early and Late  
Schematics

INTERNATIONAL RADIO CORP.



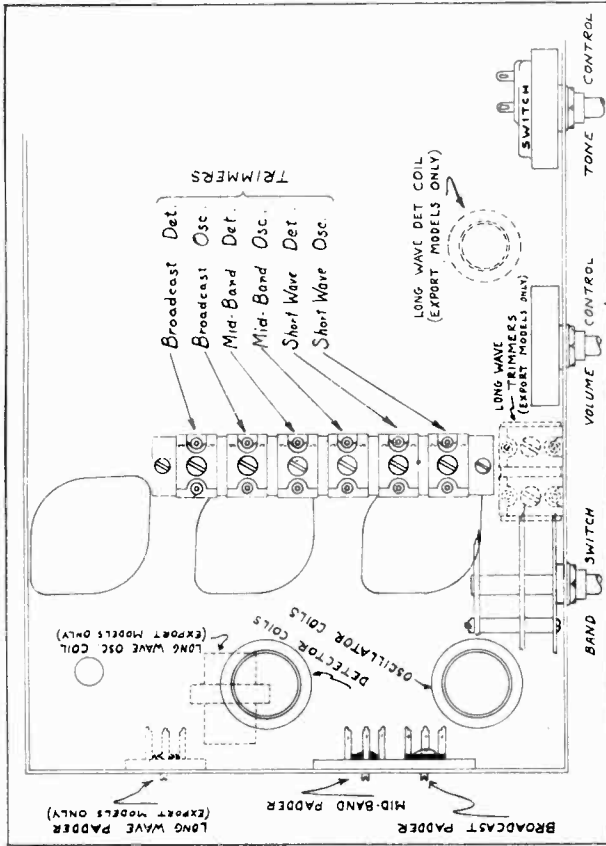
FIRST PRODUCTION



LATER PRODUCTION

INTERNATIONAL RADIO CORP.

MODELS 53, 553  
Trimmers, Parts  
Voltage



Bottom View of Socket. VOLTAGES SHOWN ARE FROM TUBE PINS TO GROUND

POSITION	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6	PIN 7	PIN 8
Det.-Osc.	Shell	HTR.	265	98	—5	138	HTR.	1
I. F.	Shell	HTR.	HTR.	265	98	1	—	HTR.
2nd Det.	Shell	HTR.	HTR.	55	20	5	—	HTR.
A. F.	Shell	HTR.	HTR.	255	265	0	—	HTR.
Rect.	Shell	390	—	A. C.	—	A. C.	—	390

Line 118 Volts. Switch On Broad-  
cast Position. Volume Control Full  
On. 10% Variation Allowable.

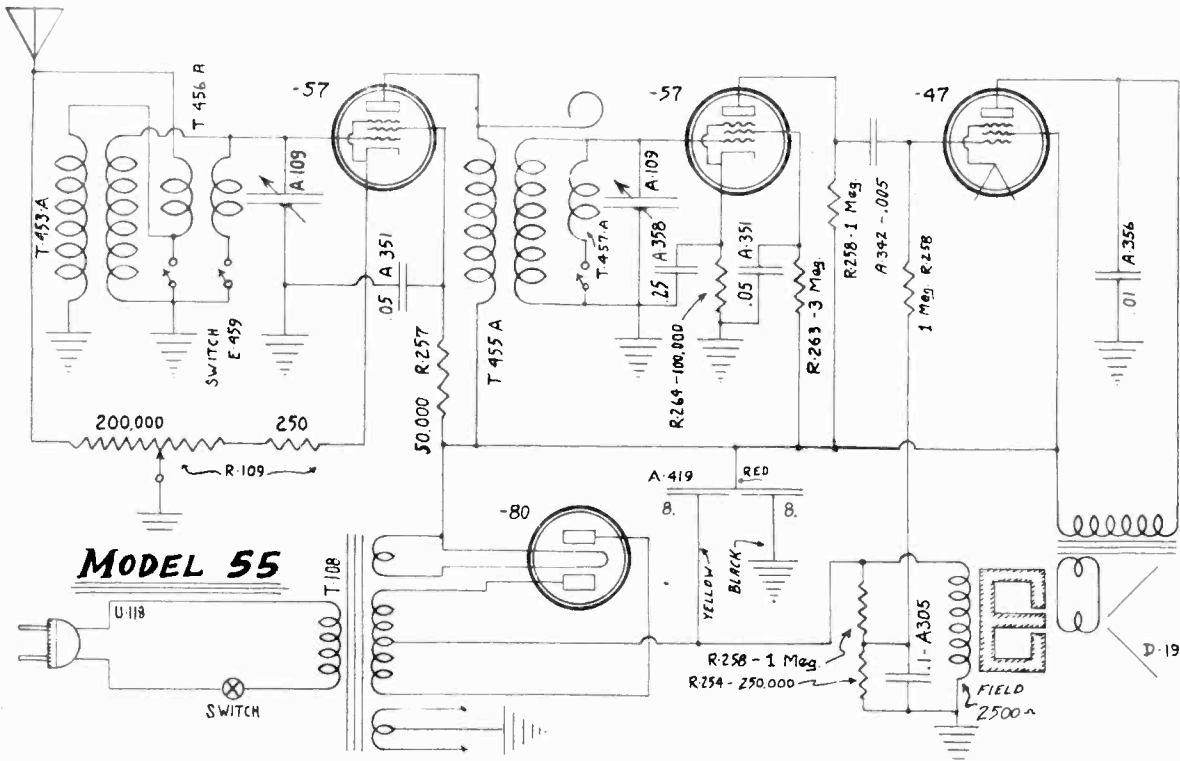
PARTS PRICE LIST  
MODELS 53 & 553

PART NO.	DESCRIPTION	LIST PRICE
A-117	2 gang tuning condenser	\$2.00
A-318	0005 mf. mica condenser	.20
A-347	00025 mf. mica condenser	.20
A-348	0001 mf. mica condenser	.20
A-349	00125 mf. mica condenser	.20
A-351	0025 mf. mica condenser	.20
A-352	005 mf. 600 v. paper condenser	.15
A-353	05 mf. 200 v. paper condenser	.15
A-357	1 mf. 25 v. paper condenser	.15
A-367	4 mf. 25 v. electrolytic condenser	.55
A-399	Electrolytic filter condenser	1.30
A-309	6 gang trimmer condenser	.55
A-310	Dual paddler condenser	.45
A-315	Single paddler (long wave model only)	.25
A-32*	Dual trimmer condenser (long wave model only)	.20
D-25	Dynamic speaker	1.35
E-155	1 inch knob	.15
E-156	1 3/16 inch knob	.15
E-159	1 inch knob with colored dots	.20
E-269	Dial assembly (for Long wave model)	1.65
E-271	Prong assembly	.05
E-281	3 position band change switch	1.00
E-482	1 position band change switch—(long wave model)	1.30
E-484	Antenna-ground binding post strip	.10
H-25	75 v. tube socket	.10
H-49	6A8 tube socket	.10
H-53	6I7 tube socket	.10
H-54	6K7 tube socket	.10
H-56	6F6 tube socket	.10
H-57	5Z4 tube socket	.10
H-5*	Volume control	.55
R-115	Volume control	.60
R-119 or R-124	Tone control with power switch	.70
R-122	850 ohm 1/2 w. carbon resistor	.20
R-229	250 ohm 4/5 w. carbon resistor	.20
R-230	300M ohm 1/5 w. carbon resistor	.20
R-254	200M ohm 1/4 w. carbon resistor	.20
R-258	500M ohm 1/4 w. carbon resistor	.20
R-264	100M ohm 1/3 w. carbon resistor	.20
R-281	100 ohm 1/4 w. carbon resistor	.20
R-282	500 ohm 1/3 w. carbon resistor	.20
R-283	3000 ohm 1/3 w. carbon resistor	.20
R-313	Candohm resistor 20M-12M-30M ohms	.55
S-102	Grid tube shield	.10
T-122	Power transformer (50 cycle)	2.50
T-340A	IF transformer	1.25
T-366A	Detector coil	1.75
T-167A	Oscillator coil	.85
T-167A	L. W. Detector coil (long wave model only)	.85
T-168A	L. W. Oscillator coil (long wave model only)	.85
T-169A	Power transformer 25 cycle, tapped primary (Export models only)	6.50
T-302	A. C. cord and plug	.20
U-118	Wire speaker	7.50
U-206	Case (Model 53)	2.00
X-311	Case (Model 553)	7.25

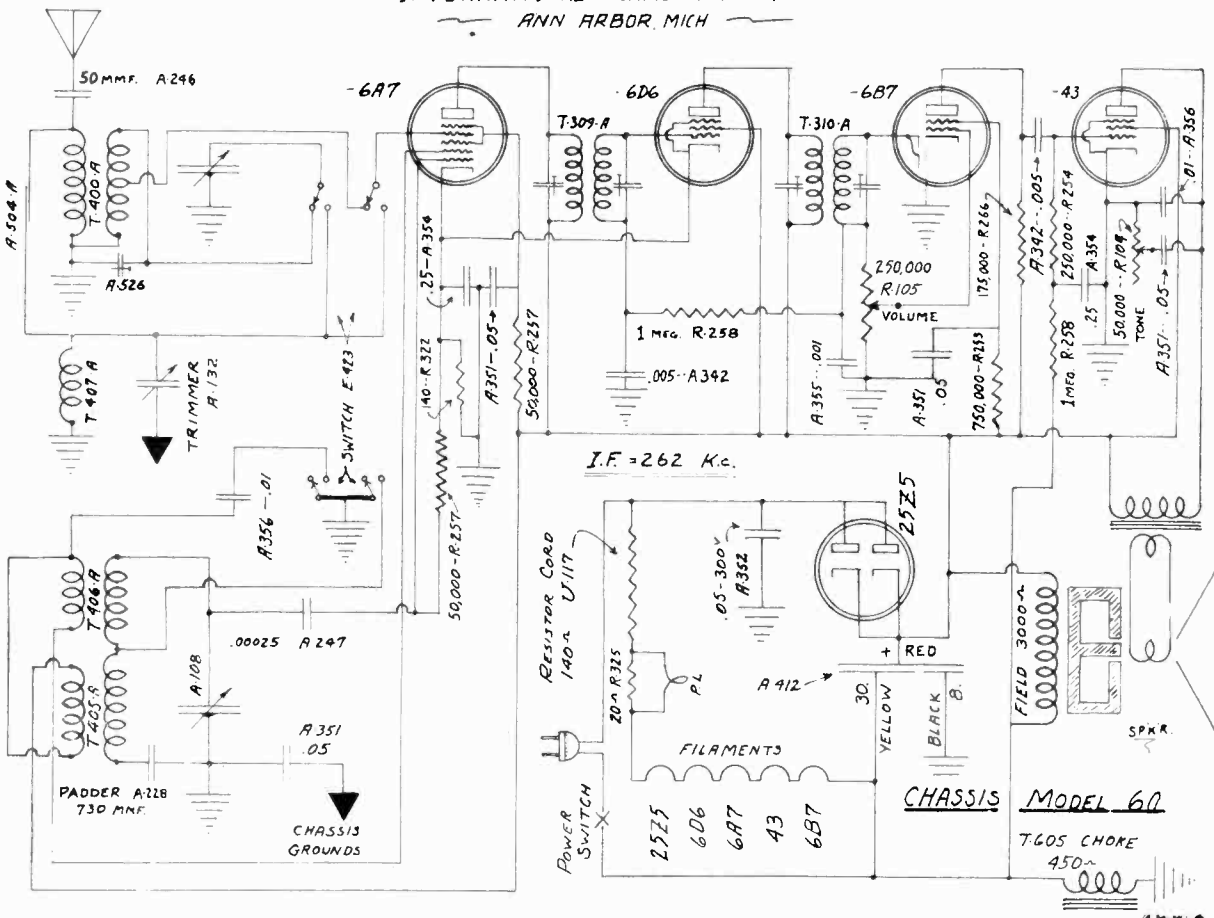
\*6J7 used in early production—75 in later production.

MODEL 55  
MODEL 60  
Schematics

INTERNATIONAL RADIO CORP.

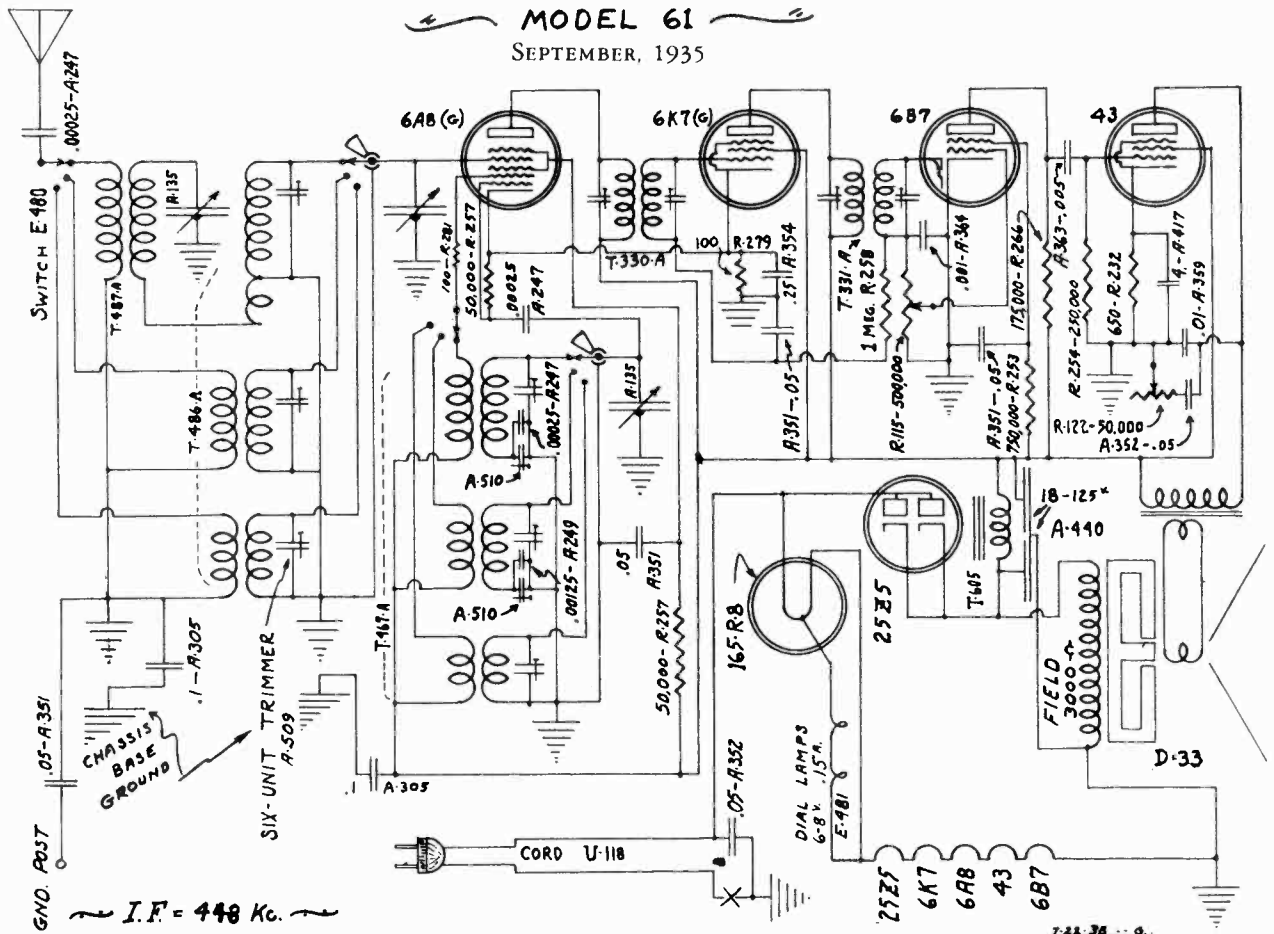


INTERNATIONAL RADIO CORPORATION  
ANN ARBOR, MICH



INTERNATIONAL RADIO CORP.

MODEL 61,661  
Schematic  
Parts



PARTS LIST

PART NO.	DESCRIPTION	LIST PRICE
A-135.....	3 gang tuning condenser	\$2.80
A-247.....	.00025 mf. mica condenser	.20
A-249.....	.00125 mf. mica condenser	.20
A-305.....	1 mf., 200 v. paper condenser	.15
A-351.....	.05 mf., 200 v. paper condenser	.15
A-352.....	.05 mf., 300 v. paper condenser	.15
A-354.....	.25 mf., 25v. paper condenser	.20
A-359.....	.01 mf., 400 v. paper condenser	.15
A-363.....	.005 mf., 400 v. paper condenser	.15
A-364.....	.001 mf., 400 v. paper condenser	.15
A-417.....	5 mf., 25 v. electrolytic condenser	.55
A-440.....	Electrolytic filter condenser	1.25
A-509.....	6 gang trimmer condenser	.55
A-510.....	Dual padder condenser	.45
A-515.....	Single padder (long wave model only)	.25
A-527.....	Dual trimmer condenser (long wave model only)	.20
D-33.....	Dynamic speaker	3.50
E-155.....	1 inch knob	.15
E-156.....	13/16 inch knob	.15
E-159.....	1 inch knob with colored dots	.20
E-269.....	Dial assembly	1.65
E-271.....	Dial assembly (for long wave model)	1.65
E-460.....	Antenna-ground binding post strip	.10
E-480.....	3 position band change switch	1.00
E-481.....	Special pilot lamps 6-8 v., .15 amperes	.15
E-482.....	4 position band change switch (long wave model)	1.50
H-18.....	25Z5 tube socket	.10
H-20.....	6B7 tube socket	.10
H-21.....	43 tube socket	.10
H-49.....	6A8 tube socket	.10
H-54.....	6K7 tube socket	.10
H-58.....	165R8 tube socket	.10
R-115.....	Volume control	.55
R-122.....	Tone control with power switch	.70
R-232.....	650 ohm, 1/2 w. carbon resistor	.20
R-253.....	750M ohm, 1/3 w. carbon resistor	.20
R-254.....	250M ohm, 1/3 w. carbon resistor	.20
R-257.....	50M ohm, 1/3 w. carbon resistor	.20
R-258.....	1 megohm, 1/3 w. carbon resistor	.20
R-266.....	175M ohm, 1/3 w. carbon resistor	.20
R-279.....	100 ohm, 1/3 w. carbon resistor	.20
R-281.....	100 ohm, 1/3 w. carbon resistor	.20
S-102.....	Goat tube shield	.10
T-330A.....	1st I.F. transformer	1.25
T-331A.....	2nd I.F. transformer	1.25
T-467A.....	Oscillator coil (model only)	1.75
T-468A.....	L. W. Detector coil (long wave)	.85
T-469A.....	L. W. Oscillator coil (long wave)	.85
T-486A.....	Detector coil (model only)	1.75
T-487A.....	Antenna coil	1.00
T-605.....	Filter choke	.65
U-118.....	A.C. cord and plug	.30
X-206.....	Four wire speaker cable	.20
X-345.....	Cabinet (Model 61)	8.50
X-350.....	Cabinet (Model 661)	8.00

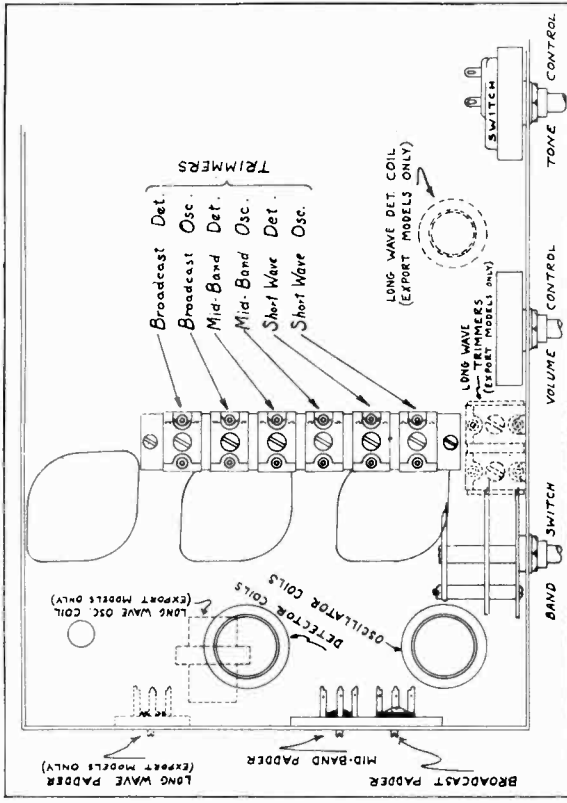
MODEL S 61,661

Voltage, Trimmers  
Alignment

INTERNATIONAL RADIO CORP.

LONG WAVE-EXPORT MODEL

Model 61 is also built with a four position switch (part number E-482) and an extra set of coils tuning the foreign long wave band. The order of band change switch positions is broadcast, mid-band, short wave, long wave band. Alignment—adjust long wave trimmers at 350 Kc. and rock in long wave pad-ler at 160 Kc. See sketch for location of coils and condensers.



AVERAGE SOCKET VOLTAGES

Bottom View of Socket. VOLTAGES SHOWN ARE FROM TUBE PINS TO GROUND

	Position	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6	PIN 7	PIN 8
6A8	Det-Osc.	Shell	HTR.	90	27	0	90	HTR.	0
6K7	I. F.	Shell	HTR.	90	90	0	—	HTR.	0
		$E_k$	$E_{g2}$	$E_p$	$E_{Dp}$				
6B7	2nd Det.	0	7	12	0				
43	A. F.	12	90	85	—				
25Z5	Rect.	105	—	A. C.	—				

Line 118 Volts. Switch On Broadcast Position. Volume Control Full On. 10% Variation Allowable.

This chassis is designed to operate from 115 volt power lines, either alternating or direct current. It is a three band receiver covering the American broadcast, police and airport, and Foreign short wave bands.

The following tubes are employed:

- 6A8 (metal) or 6ABG (glass) 1st Detector-Oscillator
- 6K7 (metal) or 6K7G (glass) I.F. amplifier
- 6B7 (glass) 2nd detector, A.V.C. and 1st A.F.
- 43 (glass) Pentode output
- 25Z5 (glass) Rectifier
- 165R8 (glass) Regulator

The metal and glass tubes are interchangeable but when changing from one type to the other it is advisable to realign for perfect resonance. Glass counterpart types should be shielded, the metal tubes need not be. Shielding provisions are provided.

ALIGNMENT

The standard type of output meter should be used to indicate signal strength. It should be connected from the plate of the 43 tube to ground. Tone control should be turned "high". The signal from the signal generator must be kept at a very low level.

ESSENTIAL DATA: The intermediate frequency employed is 448 Kc. On the broadcast and middle bands the oscillator frequency is 448 kilocycles higher than the signal frequency. On the short wave band it is 448 kilocycles lower than the signal frequency.

Aligning should be done on the following frequencies: Broadcast band, 1400 and 600 Kc.; Middle band, 6000 and 2100 Kc.; Short wave band 15 megacycles.

In aligning on broadcast band it is permissible to bend plates on the band pass section only of the three gang condenser. Do not bend plates when aligning the middle and short wave bands.

The front section of the three gang condenser is the oscillator section; the middle section, first detector; the rear section, band pass. The band pass is in circuit only on the broadcast band.

INTERIMETERS: To align the IF circuits first remove the grid clip from the 6A8 tube and connect a 1/2 meg. resistance from the 6A8 grid (top of tube terminal) to ground. Set the signal generator to 448 Kc. and feed its modulated signal direct to the grid of the 6A8 through a 100 mmf. condenser. Adjust the first IF transformer trimmers for maximum meter reading. Go over both adjustments at least three or four times for accuracy. Repeat this process on the second IF transformer. If adjustments are not made accurately selectivity will be poor and IF may oscillate.

BROADCAST BAND: Place the band change switch on Broadcast position. Turn the dial to 1400 Kc. and feed a very weak 1400 Kc. modulated signal from your signal generator to the antenna. Adjust the Broadcast oscillator trimmer (see sketch) and band pass trimmer (on condenser gang) for maximum reading. Although a trimmer is provided for the Broadcast detector coil it will be found not connected on many sets as it is not necessary in obtaining correct balance.

Turn dial and signal generator to 600 Kc. and rock the padler into correct adjustment. This is accomplished by very slowly adjusting the padler condenser and at the same time turning the dial slightly back and forth across 600 Kc. until an adjustment is obtained producing maximum output. Go back to 1400 Kc. and readjust the oscillator trimmer slightly if necessary. Then recheck padler at 600 Kc. It is permissible to bend plates on the band pass section only in resonating circuits.

MIDDLE BAND: Turn the band change switch to the middle position and tune radio and signal generator to 6000 Kc. Adjust the oscillator trimmer and then the detector trimmer for maximum output.

Rock in the padler condenser 2400 Kc. Then recheck at 6000 Kc. and 2400 Kc.

SHORT WAVE BAND: Turn band change switch to short wave band. Tune radio and signal generator to 15 megacycles and adjust trimmers. No padler condenser is used on the short wave band so no other adjustments are necessary. On this band the oscillator frequency is 448 Kc. lower than the signal frequency.

PILOT LAMPS

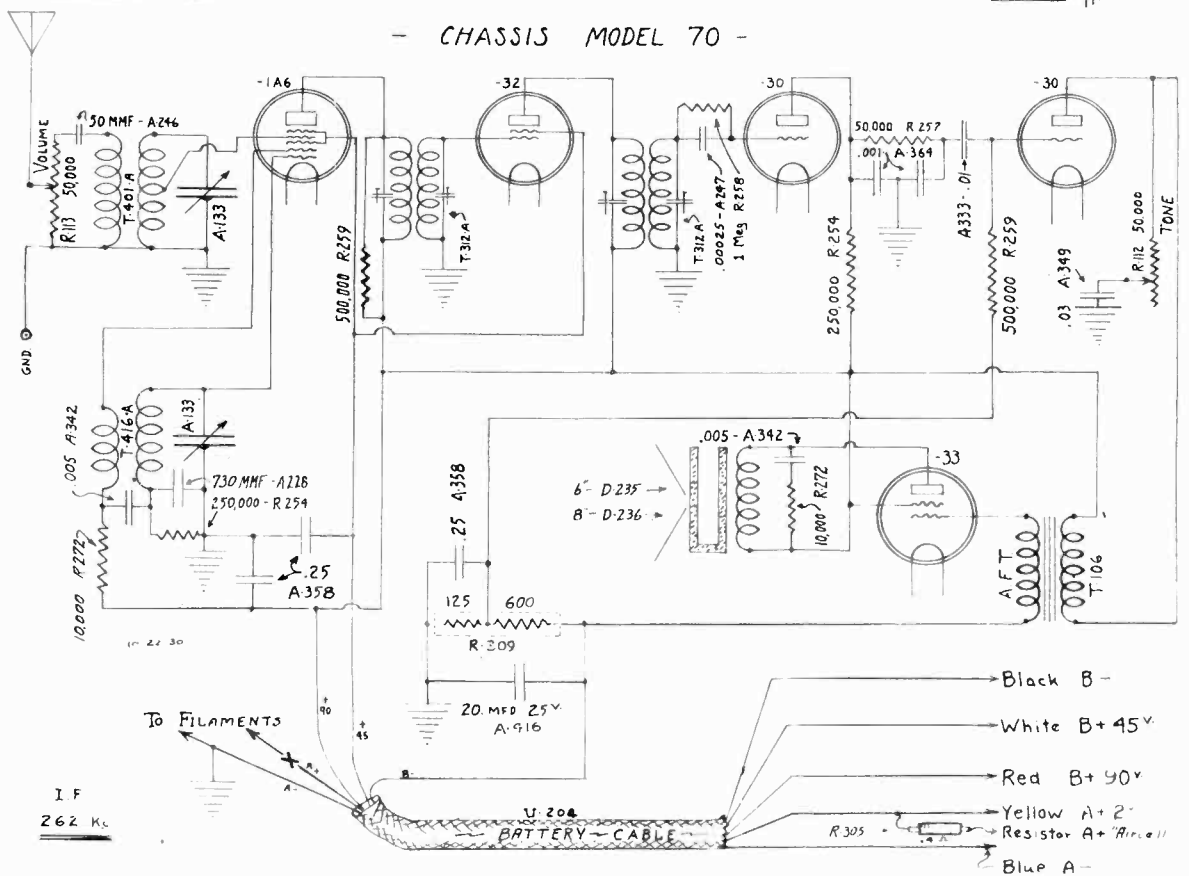
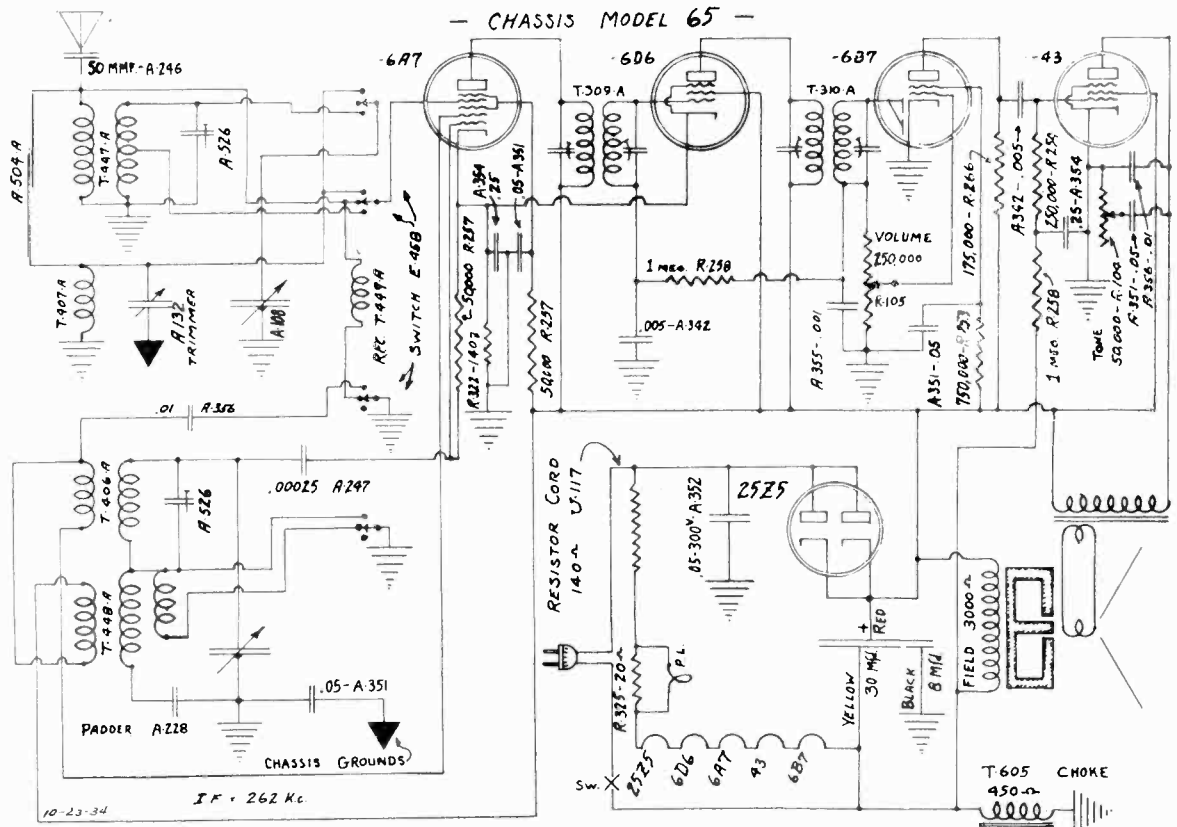
The pilot lamps are special 6-8 volt drawing only .15 amperes. It is necessary lamps of this rating only be used. In ordering specify our part number E-481.

MICROPHONIC HOWL

The tuning condenser is cushion mounted to eliminate vibration. Do not allow the dial to touch the esutchron plate on the cabinet or a microphonic condition will be created.

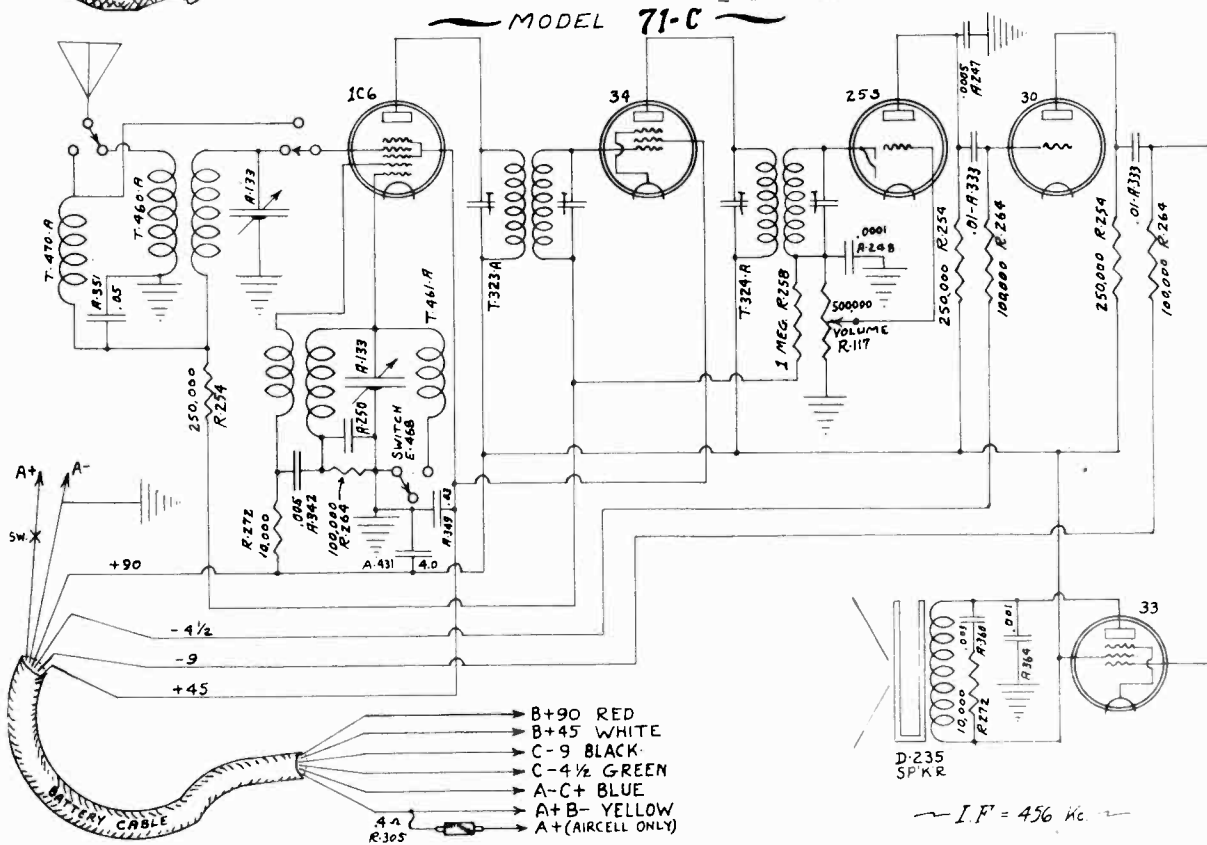
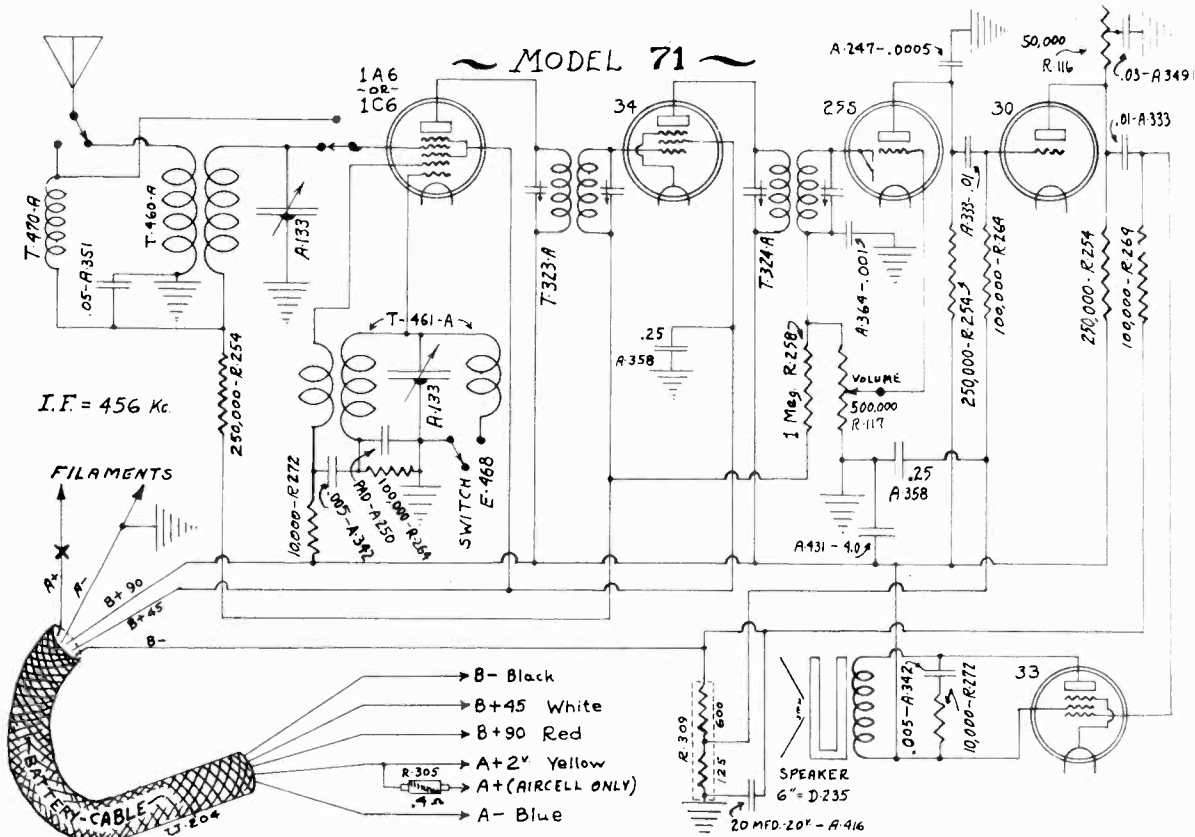
INTERNATIONAL RADIO CORP.

MODEL 65  
MODEL 70  
Schematics

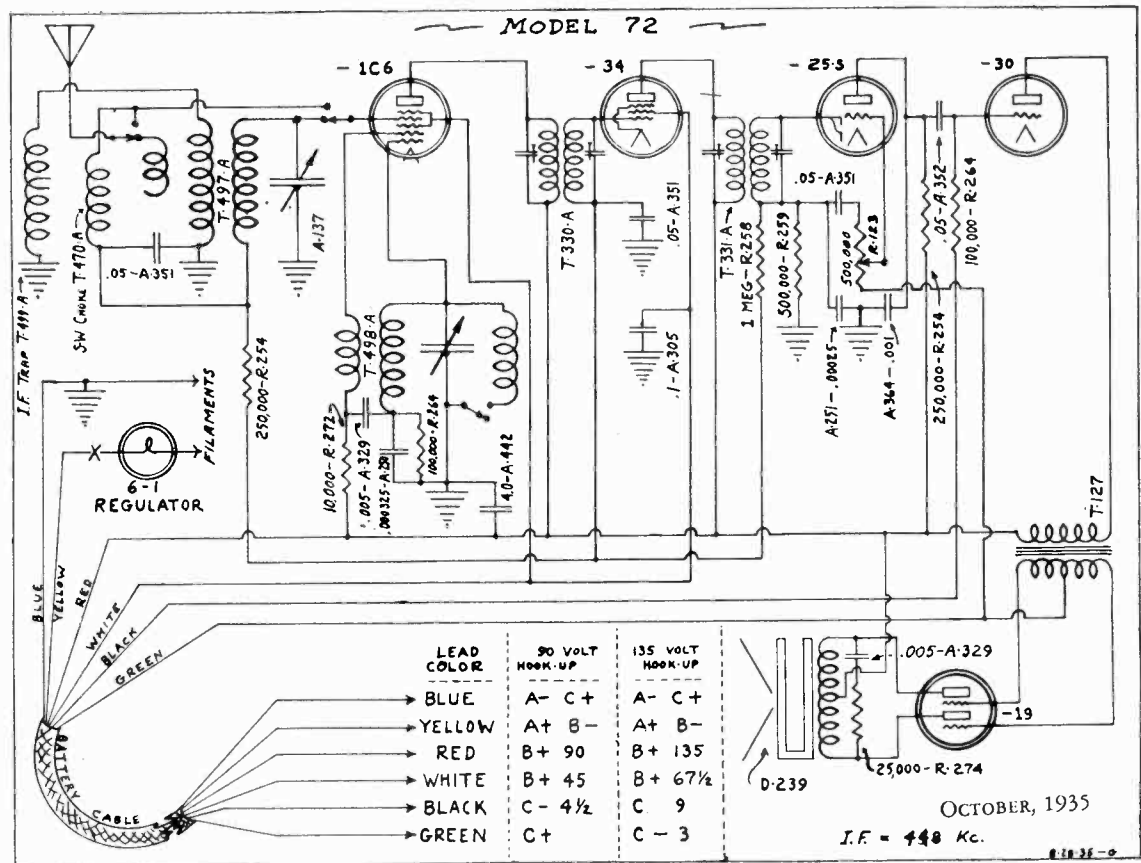


MODEL 71  
MODEL 71C  
Schematics

INTERNATIONAL RADIO CORP.



## INTERNATIONAL RADIO CORP.



**ESSENTIAL DATA:** The intermediate frequency employed is 448 Kc. On the broadcast band the oscillator frequency is 448 kilocycles higher than the signal frequency. On the short wave band it is 448 kilocycles lower than the signal frequency.

The rear section of the two gang condenser is the oscillator section; the front section, first detector.

**INTERMEDIATES:** To align the I.F. Circuits, set the signal generator to 448Kc. and feed its modulated signal direct to the antenna. Short out the oscillator section of the two gang condenser. Adjust the first I. F. transformer trimmers for maximum meter reading. Go over both adjustments at least three or four times for accuracy. Repeat this process on the second I.F. transformer. If adjustments are not made accurately, selectivity will be poor and I.F. oscillation may result. Due to the I.F. trap in the antenna circuit a strong signal is necessary.

**BROADCAST BAND:** Place the band change switch on Broadcast position. Turn the dial to 1400 Kc. and feed a *very weak* 1400 Kc. modulated signal from your signal generator to the antenna. Adjust the broadcast oscillator trimmer for maximum reading. On most sets the detector trimmer has its adjusting screw purposely removed.

There is no adjustable padder condenser in this model so resonance on the low frequency end is accomplished by bending plates on the tuning condensers. Check the alignment at 1000 Kc. Insert a thin bakelite, celluloid or mica feeler strip between the plates of the variable condensers to determine whether the circuits are properly matched. The action is this—the dielectric constant of the celluloid feeler strip being higher than that of the air it displaces, results in an increase of capacity. Open the variable condenser just enough to indicate two or three points below maximum signal. As the feeler is inserted the meter reading should indicate increasing signal and then decreasing as the feeler is inserted farther. This procedure should be followed on both sections. Should the meter fail to show an increase in signal as the strip is inserted in one section this indicates too great a capacity for that section. This may be corrected by bending the outside rotor plates out at the point where they begin to mesh with the stator.

After checking the alignment at 1000 Kc. repeat the process at 600 Kc.

**SHORTWAVE BAND:** No alignment necessary due to untuned detector circuit.



MODEL 72  
Parts List

INTERNATIONAL RADIO CORP.

## PARTS PRICE LIST

## MODEL 72

PART NO.	DESCRIPTION	LIST PRICE
A-137	2 gang tuning condenser	\$1.65
A-250	325 mmf. mica padder condenser	.20
A-251	250 mmf. mica condenser	.20
A-305	.1 mf., 200 v. paper condenser	.15
A-329	.005 mf., 600 v. paper condenser	.15
A-351	.05 mf., 200 v. paper condenser	.15
A-352	.05 mf., 300 v. paper condenser	.15
A-364	.001 mf., 400 v. paper condenser	.15
A-442	4 mf. electrolytic condenser	.65
D-239	Magnetic speaker	5.00
E-157	Large knob	.15
E-160	Small knob	.15
E-270	Dial assembly	1.50
E-479	Wave band switch	.45
E-486	Antenna-ground binding post strip	.10
H-33	30 tube socket	.10
H-45	25S tube socket	.10
H-46	34 tube socket	.10
H-58	6-1 regulator socket	.10
H-59	1C6 tube socket	.10
H-60	19 tube socket	.10
R-123	Volume control and switch	.65
R-254	250M ohm carbon resistor	.20
R-258	1 megohm carbon resistor	.20
R-259	500M ohm carbon resistor	.20
R-264	100M ohm carbon resistor	.20
R-272	10M ohm carbon resistor	.20
R-274	25M ohm carbon resistor	.20
S-102	Goat tube shield	.10
T-127	Push pull class B audio transformer	1.10
T-330A	1st I.F. transformer	1.25
T-331A	2nd I. F. transformer	1.25
T-470A	Short wave choke	.50
T-497A	Detector coil	1.00
T-498A	Oscillator coil	1.00
T-499A	I. F. trap	.35
U-208	Battery cable	.60
X-353	Cabinet	8.25

*Prices Subject to Change Without Notice*



**MODEL 85**  
**Alignment**  
**Voltage, Parts**

**INTERNATIONAL RADIO CORP.**

**AVERAGE TUBE OPERATING VOLTAGES**

Position	Tube	Ek	Eg <sup>1</sup>	Eg <sup>2</sup>	Eg <sup>3</sup>	Ep	Edp
1st Det-Osc.	6A7	8	Det. 0 Osc. 0	50	—	Det. 110 Osc. 110	—
IF Amp.	6D6	8	*	110	.8	110	—
2nd Det-AVC	6B7	0	.4	45	—	80	*
Power Amp.	43	0	.2	110	—	110	—
Rectifier	25Z5	110	—	—	—	—	—

k—Cathode; g<sup>1</sup>—Control grid; g<sup>2</sup>—Screen grid; g<sup>3</sup>—Suppressor grid; p—Plate; dp—Diode plates \*—Depends on applied signal strength. All voltages measured from indicated points to circuit ground. Line voltage 115 volts.

**PARTS PRICE LIST--Model 85**

PART NO.	DESCRIPTION	LIST PRICE
A-132	Trimmer condenser	R-104
A-133	2 gang tuning condenser	R-105
A-288	.00075 mfd. mica padder condenser	R-253
A-246	.50 mfd. mica condenser	R-254
A-247	.00025 mfd. mica condenser	R-257
A-250	.000325 mfd. mica padder condenser	R-258
A-251	.250 mfd. mica condenser	R-266
A-342	.005 mfd. paper condenser 200 volt	R-322
A-351	.05 mfd. paper condenser 400 volt	R-325
A-352	.05 mfd. paper condenser 400 volt	S-102
A-354	.25 mfd. paper condenser 100 volt	*T-315A
A-355	.001 mfd. paper condenser 200 volt	*T-316A
A-356	.01 mfd. paper condenser 200 volt	*T-323A
A-326	8-30 mfd. electrolytic filter condenser	*T-406A
D-11	Semi-variable trimmer condenser	T-407A
E-114	Dynamic speaker 6-inch	*T-447A
E-115	Large tuning knob	*T-448A
E-256	Small knob	T-449A
E-105	Pilot light	*T-460A
E-158	3 position band change switch	*T-461A
H-17	6A7 tube socket	*T-462A
H-18	25Z5 tube socket	T-605
H-19	6D6 tube socket	U-117
H-20	6B7 tube socket	U-117
H-21	13 tube socket	U-117
I-306	Speaker terminal strip	20
R-104	50M ohm tone control	1.25
R-105	250M ohm volume control with switch	1.25
R-253	750M ohm resistor	1.25
R-254	250M ohm resistor	1.25
R-257	50M ohm resistor	1.25
R-258	1 meg. resistor	1.25
R-266	175M ohm resistor	1.25
R-322	140 ohm flexible resistor	1.25
R-325	20 ohm "Canloham" resistor	1.25
S-102	Coat tube shield	1.25
*T-315A	1st IF coil assembly	1.25
*T-316A	2nd IF coil assembly	1.25
*T-323A	1st IF coil assembly	1.25
*T-406A	2nd IF coil assembly	1.25
T-407A	S. W. oscillator coil	1.25
*T-447A	S. W. antenna coil	1.25
*T-448A	B. C. antenna coil	1.25
T-449A	B. C. oscillator coil	1.25
*T-460A	R. F. C.	1.25
*T-461A	B. C. antenna coil	1.25
*T-462A	B. C. oscillator coil	1.25
T-605	S. W. oscillator coil	1.25
U-117	Filter choke	1.25
U-117	Power cord	1.25
U-117	Cabinet complete	1.25

\*Serial numbers under 185499 intermediate frequency is 262 Kc  
 \*\*Serial numbers above 185498 intermediate frequency is 456 Kc

Prices subject to change without notice  
 ALWAYS ORDER BY PART NUMBER

MODEL 85 is an AC-DC receiver designed to operate from 110-volt power lines. It tunes the American broadcast band, police band and foreign short wave bands.

**INTERMEDIATE FREQUENCY**

Sets bearing serial numbers under 185499 use an intermediate frequency of 262KC.

Sets bearing serial numbers over 185498 use an intermediate frequency of 456KC.

**ALIGNMENT**

The standard type of AC output meter should be used to indicate signal strength. It should be connected from the plate of the 43 tube to the circuit ground (variable condenser frame). The signal from the test oscillator must be kept at a very low level to get below the A.V.C. action.

A microammeter may be used to indicate signal strength if preferred (see Manual of General Service Information). One lead from the meter should be attached to the circuit ground and the other to the terminal of the volume control to which is connected a 1 megohm resistor.

To adjust 262KC IF circuits set the test oscillator to 262KC and couple it to the antenna wire of the set (wave band switch should be on B/C position). Short out oscillator section of 2 gang tuning condenser (rear section). Adjust IF transformers for maximum meter reading. Go over adjustments at least twice for accuracy. Use fibre screw driver.

To adjust 456KC IF circuits first remove grid clip from 6A7 tube and connect a 500M ohm resistance from the 6A7 grid (top of tube terminal) to ground. Set test oscillator to 456 KC and feed its signal direct to the grid of the 6A7. Short out oscillator section of 2 gang tuning condenser and proceed as in above paragraph.

Before aligning RF circuits see that the dial is correctly adjusted. With the 2 gang condenser all the way out of mesh the dial pointer should be on the 5000 KC mark.

Place band change switch on B/C position. The trimmer across the B/C antenna coil is located on the bottom of the chassis at the end. It should be set at approximately minimum capacity. Set the test oscillator to 1500 KC and couple to the antenna wire of the set. With the dial pointer on 1500 KC adjust the oscillator trimmer (on 2 gang condenser) for maximum signal. Shift the 2 gang condenser slightly to one side or the other of 1500 KC and continue adjustments for maximum signal. The correct balance between oscillator and antenna circuits will be found very close to the 1500 KC mark on the dial.

Check alignment at 1000 and 600KC (see Manual of General Service Information).

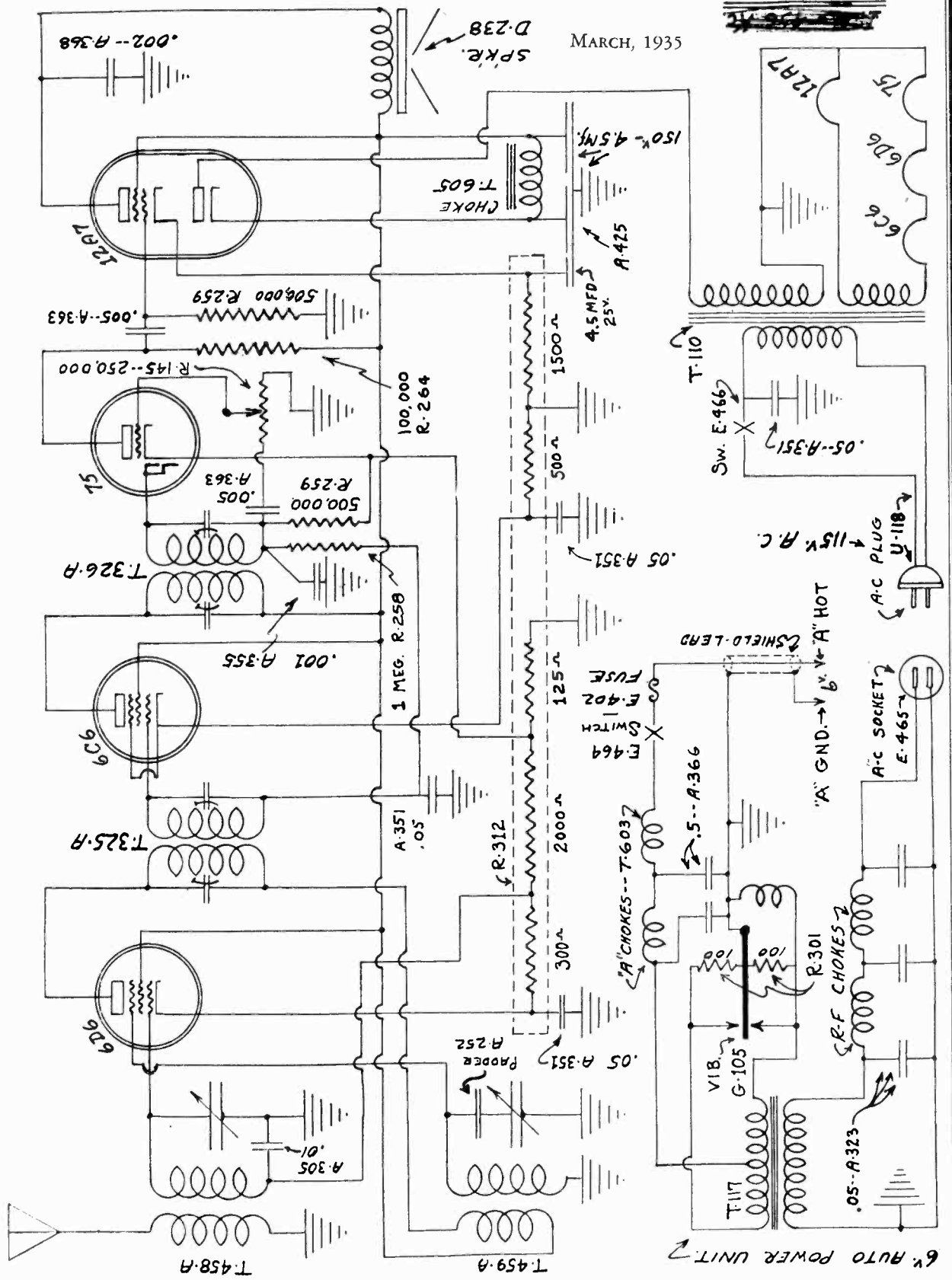
Tune test oscillator and radio to about 49 meters and check for resonance. Do not bend condenser plates to align but spread or crowd together turns on the short wave antenna coil (see Manual of General Service Information.) The two plate vernier condenser on top of the chassis should be in mesh while this is being done.

Tune test oscillator and radio to about 49 meters and check for resonance. Do not bend condenser plates to align but spread or crowd together turns on the short wave antenna coil (see Manual of General Service Information.) The two plate vernier condenser on top of the chassis should be in mesh while this is being done.

INTERNATIONAL RADIO CORP.

MARCH, 1935

INTERNATIONAL RADIO CORPORATION -- MODEL 90 RECEIVER & AUTO POWER UNIT.



MODEL 90  
Alignment  
Voltage, Parts

INTERNATIONAL RADIO CORP.

# PARTS PRICE LIST

## MODEL 90 AUTO POWER UNIT

PART NO.	DESCRIPTION	LIST PRICE
A-323	.05 mfd. tubular paper condenser, 400v.	.15
A-366	.5-.5 mfd. special filter condenser, 160v.	.60
B-166	metal case with top and bottom	1.00
E-402	15 amp. fuse	.05
E-464	toggle switch	.50
E-465	A.C. outlet	.70
F-6	fuse holder	.10
F-19	ammeter clip	.05
G-105	vibrator	3.25
H-43	vibrator socket	.10
R-301	200 ohm wire wound center tapped resistor	.15
T-117	power transformer	2.00

## MODEL 90 32-VOLT UNIT

Parts same as auto power unit with following exceptions

PART NO.	DESCRIPTION	LIST PRICE
G-106	vibrator	\$3.25
T-118	power transformer	2.20

## MODEL 90 RADIO

PART NO.	DESCRIPTION	LIST PRICE
A-113	.2 gang tuning condenser	\$1.85
A-228	.730 mmfd. mica padder condenser	.25
*A-248	.0001 mfd. mica antenna series condenser	.20
A-305	.1 mfd. tubular condenser, 200v.	.15
A-351	.05 mfd. tubular condenser, 200v.	.15
A-352	.05 mfd. tubular condenser, 300v.	.15
A-355	.001 mfd. tubular condenser, 200v.	.15
A-363	.005 mfd. tubular condenser, 400v.	.15
A-368	.002 mfd. tubular condenser, 300v.	.15

A-425	4.5-4.5-4.5 mfd. electrolytic filter condenser	.90
D-238	.5 inch speaker	4.25
E-133M	large tuning knob	.10
E-148G	small knob	.10
E-466	rotary power switch	.35
H-19	6D6 tube socket	.10
H-25	75 tube socket	.10
H-41	6C6 tube socket	.10
H-42	12A7 tube socket	.10
R-145	250M ohm volume control	.50
R-254	250M ohm carbon resistor	.20
R-258	1 megohm carbon resistor	.20
R-259	500M ohm carbon resistor	.20
R-264	100M ohm carbon resistor	.20
R-312	special candolim resistor	.45
S-114	goat tube shield	.15
T-110	power transformer	1.75
*T-317A	1st IF coil assembly	1.25
*T-318A	2nd IF coil assembly	1.25
**T-325A	1st IF coil assembly	1.25
**T-326A	2nd IF coil assembly	1.25
**T-458A	antenna coil assembly	.85
**T-459A	oscillator coil assembly	.90
*T-463A	antenna coil assembly	.85
*T-464A	oscillator coil assembly	.90
T-605	filter choke	.65
U-118	A.C. cord and plug	.30
WL20	antenna wire 22 ft.	.10
	cabinet (less back)	2.00
	back only	1.00

\*Serial numbers under ~~6500~~ use 2621F  
 \*\*Serial numbers over ~~6501~~ use 4561F

Prices subject to change without notice

### INTERMEDIATE FREQUENCY

Sets bearing serial numbers under ~~6500~~ use an intermediate frequency of 262 K.C.  
 Sets bearing serial numbers over ~~6500~~ use an intermediate frequency of 456 K.C.

### ALIGNMENT

The standard type of AC output meter should be used to indicate signal strength. It should be connected from the plate prong of the 12A7 amplifier section to ground. The signal from the test oscillator must be kept at a very low level to get below the A.V.C. action.

To adjust IF circuits first turn the tuning condenser to a setting approximating 600KC. Do not short out the oscillator section of the 2 gang condenser. Set test oscillator to correct intermediate frequency and attach to antenna of set. Adjust primary and secondary of 1st IF transformer for maximum reading on meter. Repeat with 2nd IF transformer and then go over all adjustments a second time. Fibre screw driver and socket wrench are necessary for accuracy.

Next set the test oscillator to 1500 KC. Turn the 2 gang condenser so the plates are just slightly meshed (about 1/8 inch). Adjust trimmers on both sections for maximum signal.

If coils have been changed it may be necessary to bend plates at 1000 KC and 550 KC. See Manual of General Service Information for instructions. Do not bend plates on the oscillator section (rear) unless absolutely necessary.

### SPEAKER ADJUSTMENT

To adjust speaker remove cover plate from speaker unit. Two screws will be found at each end of the unit within the magnets. When adjusting either pair of screws, one is to be loosened slightly and the other tightened. You will notice this moves the armature slightly to one side. The air gap on both sides of the armature should be the same.

### 6 VOLT POWER UNIT

The power unit should deliver between 110 and 120 volts AC under the load of the set. Low output usually indicates a poor vibrator or the set may be drawing an abnormal amount of current.

### AVERAGE TUBE OPERATING VOLTAGES

Position	Tube	Ek	Eg <sup>1</sup>	Eg <sup>2</sup>	Eg <sup>3</sup>	Ep	Edp
1st Det-Osc.	6D6	18	15	110	0	110	—
IF amp.	6C6	2.7	*	110	2.7	110	—
2nd Det-AVC	75	1	0	—	—	.75	*
Rect-Pwr. amp.	12A7	Amp. 11 Rect 120	0	115	—	Amp. 110 Rect 120AC	—

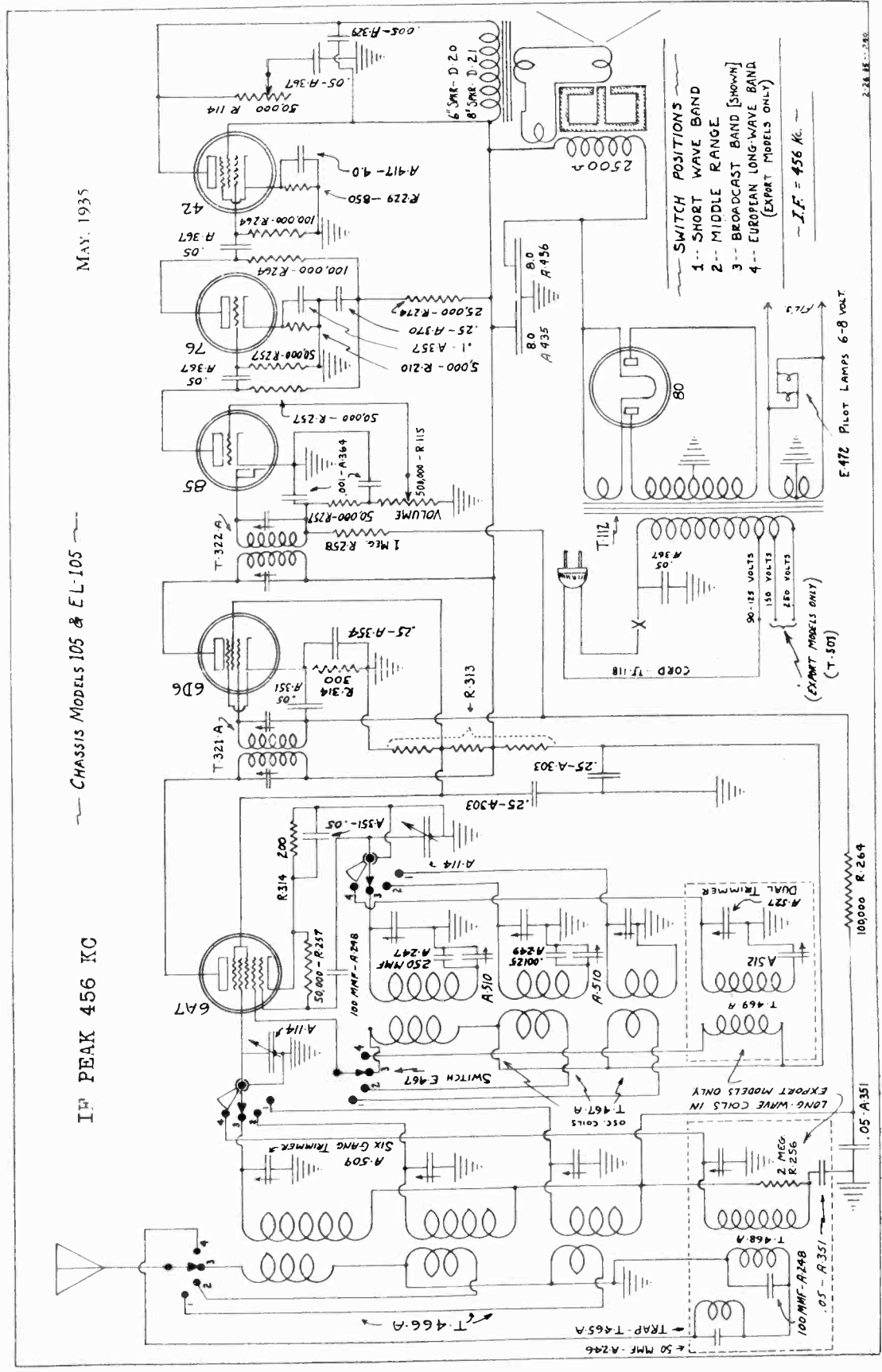
K—Cathode; g<sup>1</sup>—Control grid; g<sup>2</sup>—Screen grid; g<sup>3</sup>—Suppressor grid; p—Plate; dp—Diode plates; \*—Depends on applied signal strength. All voltages measured from indicated points to ground. Line voltage 115 volts.

INTERNATIONAL RADIO CORP.

MAY 1935

CHASSIS MODELS 105 & EL-105

I.F. PEAK 456 KC



SWITCH POSITIONS  
 1 -- SHORT WAVE BAND  
 2 -- MIDDLE RANGE  
 3 -- BROADCAST BAND [SHOWN]  
 4 -- EUROPEAN LONG-WAVE BAND  
 (EXPORT MODELS ONLY)

I.F. = 456 Kc.

E 472 Pilot Lamps 6-8 volt.

(EXPORT MODELS ONLY) (T-500)

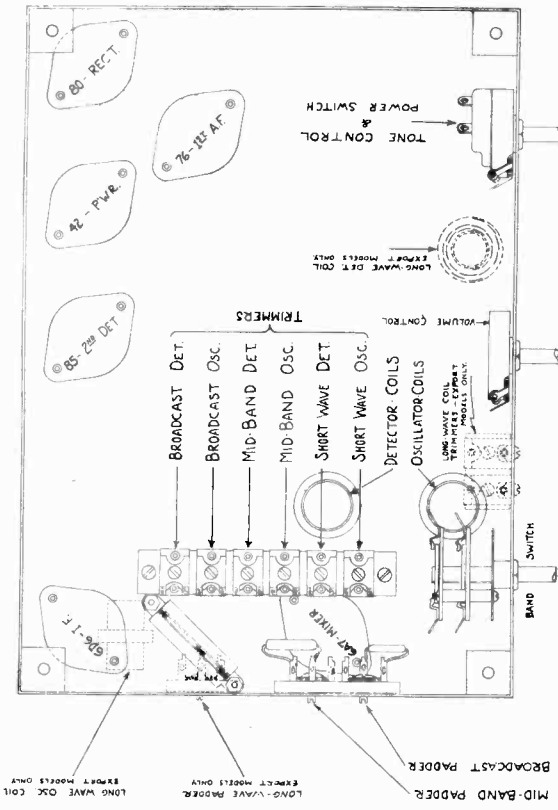
100,000 R-264

.05-A-351

TRAP-T-454

MODELS 105,1050  
Alignment, Voltage  
Trimmers, Parts

INTERNATIONAL RADIO CORP.



PARTS PRICE LIST--Models 105 & 1050

PART NO.	DESCRIPTION	PRICE
A-114	Two gang tuning condenser	H-26 \$1.90
A-247	00025 mfd. mica condenser	H-29
A-248	0001 mfd. mica condenser	H-36
A-249	00125 mfd. mica condenser	H-40
A-303	25 mfd. tubular condenser, 200 volt	H-14
A-329	005 mfd. tubular condenser, 600 volt	R-114
A-351	05 mfd. tubular condenser, 200 volt	R-115
A-354	25 mfd. tubular condenser, 25 volt	R-210
A-357	1 mfd. tubular condenser, 25 volt	R-257
A-364	001 mfd. tubular condenser, 400 volt	R-264
A-370	25 mfd. tubular condenser, 300 volt	R-274
A-417	4 mfd. (for larger) electrolytic condenser, 25 v	R-313
A-435	8 mfd. electrolytic filter condenser	R-314
A-436	8 mfd. electrolytic filter condenser	S-102
A-509	Six gang trimmer condenser unit	S-116
A-510	Dual padder condensers	T-112
D-20	Six inch dynamic speaker for Model 105	T-321A
D-21	Eight inch dynamic speaker for Model 1050	T-322A
E-114	Large tuning knobs	T-166A
E-115	Small knobs with gold line	T-167A
E-116	Large knob with gold line	T-168A
E-257	Dial assembly	T-469A
E-405	Pilot lamps, 3.8 volts for series connection	T-501
E-460	Antenna and ground binding post strip	T-5118
E-467	Wave band switch (3 position)	X-335
E-471	Wave band switch (4 position, export models)	X-336
E-472	Pilot lamps, 6.8 volt for parallel connection	
H-17	6A7 tube socket	
H-19	6D6 tube socket	

Prices subject to change without notice  
ALWAYS ORDER BY PART NUMBER

Models 105 and 1050 are A.C. receivers designed to operate from 115 volt power lines. They tune the American broadcast band, police and airport bands, and Foreign short wave bands. The models built for export also tune the European long wave band and because of the tapped power transformer in these models they may be operated on A.C. lines up to 250 volts. (See circuit diagram switch is available by removing part of cover of power transformer.)

ALIGNMENT

The standard type of AC output meter should be used to indicate signal strength. It should be connected from the plate of the 42 tube to ground. The tone control should be turned "high". The signal from the test oscillator must be kept at a very low level. The 6A7 tube and Foreign short wave bands. The models built for export also tune the European long wave band and because of the tapped power transformer in these models they may be operated on A.C. lines up to 250 volts. (See circuit diagram switch is available by removing part of cover of power transformer.)

BROADCAST BAND

Place the band change switch on Broadcast position. Turn the dial to 3000 KC. and read A. 107.5. 2000 KC. is indicated on trimmer is needed across the broadcast antenna coil.

Turn dial and test oscillator to 600 KC. and rock the padder into correct adjustment. This is accomplished by very slowly adjusting the padder condenser and at the same time turning the dial slightly backward from 600 KC. until an adjustment is obtained producing maximum output. Go back to 3000 KC. and readjust the oscillator trimmer slightly if necessary. Then reverse padder at 600 KC.

MIDDLE BAND

Turn the band change switch to the middle position and tune radio and test oscillator to 6000 KC. Adjust the oscillator trimmer and then the antenna trimmer for maximum output.

SHORT WAVE BAND

Rock in the padder condenser at 2100 KC. Then retune at 6000 KC. and 2100 KC.

EUROPEAN LONG WAVE BAND

Turn band change switch to short wave band. Tune radio and test oscillator to 16.5 megacycles and adjust trimmers. Generally the oscillator trimmer will be very loose. No padder condenser is used on the short wave band. No other adjustments are necessary.

MICROPHONIC HOWL

Alignment instructions are same as for broadcast band. Align at 350 and 160 KC.

PILOT LIGHTS

The 2 gang condenser is cushion mounted to eliminate vibration of the plates. Do not allow the dial to touch the escutcheon plate on the cabinet or a microphonic condition will be created.

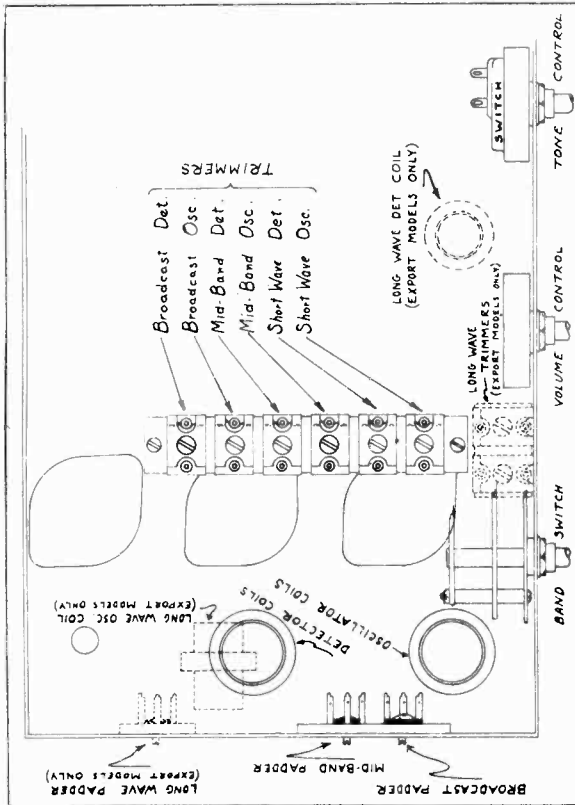
AVERAGE TUBE OPERATING VOLTAGES

Position	Tube	Ek	Eg1	Eg2	Eg3	Ep	Edp
1st Det-Osc.	6A7	2	Det * Osc-1	100		Det. 230 Osc. 145	
IF Amp	6D6	2	*	100	2	230	
2nd Det-AVC	85	0	0			30	*
1st AF Amp.	76	5	0			65	
Power Amp.	12	20	0	230		215	
Rectifier	80	Fil 270					

\* Cathode, g1 - Control grid, g2 - Screen grid, g3 - Suppressor grid, P - Plate, dp - Diode plates, \* - Depends on applied signal strength. All voltages measured from indicated points to ground using 1000 ohm per volt D.C. voltmeter. Line voltage 115 volts.

MODELS 120, 1200, 2200

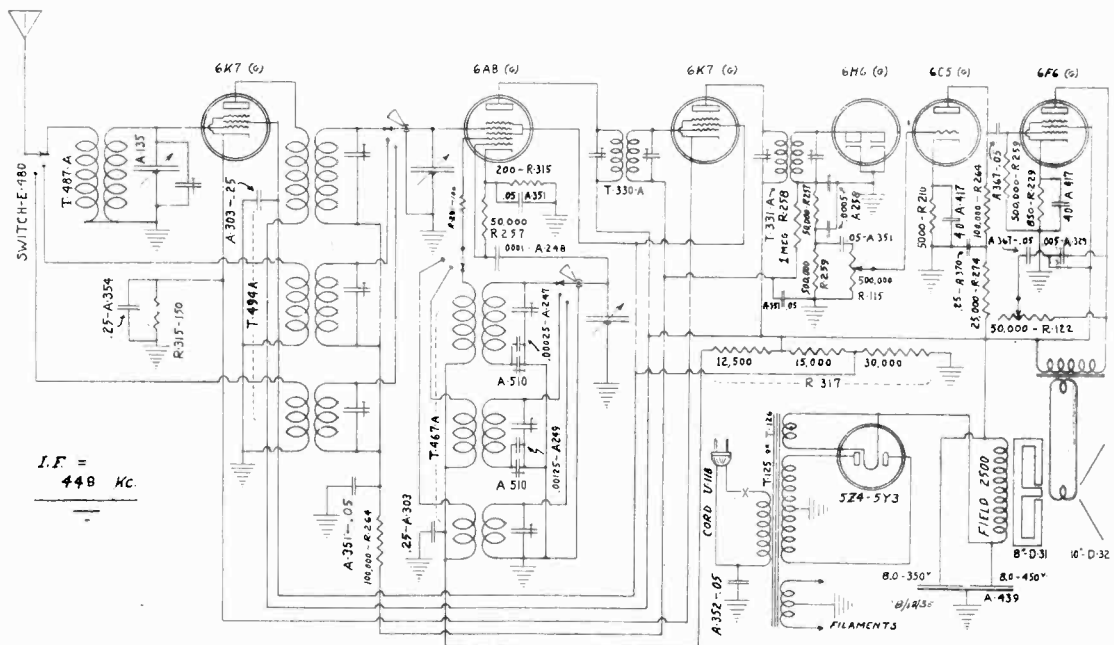
INTERNATIONAL RADIO CORP. Schematic, Trimmers  
Voltage



Bottom View of Socket. VOLTAGES SHOWN ARE FROM TUBE PINS TO GROUND

POSITION	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6	PIN 7	PIN 8
6K7	Shell	HTR	210	80	1.5	—	HTR	1.5
6A8	Shell	HTR	210	80	0	150	HTR	1.5
6K7	Shell	HTR	210	80	1.5	—	HTR	1.5
6H6	Shell	HTR	0	0	0	—	HTR	0
6C5	Shell	HTR	80	—	0	—	HTR	3
6H6	Shell	HTR	200	210	0	—	HTR	1.5
5Z1	Shell	345	—	A.C.	—	A.C.	—	345

Line 118 Volts. Switch on Broadcast Position. Volume Control Full On. 10% Variation Allowable.



I.F. = 448 KC.



**MODELS 120,1200  
2200**

**INTERNATIONAL RADIO CORP.**

**Alignment, Parts**

This chassis is designed to operate from 115 volt, 60 cycle, alternating current power lines. It is a three band receiver covering the American broadcast, police and airport, and Foreign short wave bands.

The following tubes are employed:

- |   |  |
|---|--|
| 6K7 (metal) or 6K7G (glass) R.F. amplifier          | 6C5 (metal) or 6C5G (glass) A.F. amplifier |
| 6A8 (metal) or 6A8G (glass) 1st Detector-Oscillator | 6F6 (metal) or 6F6G (glass) Pentode output |
| 6K7 (metal) or 6K7G (glass) I.F. amplifier          | 5Z4 (metal) or 5Y3 (glass) Rectifier       |
| 6H6 (metal) or 6H6G (glass) Diode detector          |  |

The metal and glass tubes are interchangeable but when changing from one type to the other it is advisable to realign for perfect resonance. Glass counterpart types should be shielded, the metal tubes need not be. Shielding provisions are provided.

**ALIGNMENT**

The standard type of output meter should be used to indicate signal strength. It should be connected from the plate (pin No. 3) of the 6F6 to ground. Tone control should be turned "high". The signal from the signal generator *must be kept at a very low level.*

**ESSENTIAL DATA:** The intermediate frequency employed is 448 Kc. On the broadcast and middle bands the oscillator frequency is 448 kilocycles higher than the signal frequency. On the short wave band it is 448 kilocycles lower than the signal frequency.

Aligning should be done on the following frequencies: Broadcast band, 1400 and 600 Kc.; Middle band, 6000 and 2400 Kc.; Short wave band 15 megacycles.

In aligning on broadcast band it is permissible to bend plates on the *R. F. section only* of the three gang condenser. Do not bend plates when aligning the middle and short wave bands.

The front section of the three gang condenser is the oscillator section; the middle section, first detector; the rear section, R.F. amplifier. The R.F. amplifier is in circuit only on the broadcast band.

**INTERMEDIATES:** To align the I.F. circuits, set the signal generator to 448 Kc. and feed its modulated signal direct to the antenna. Short out the oscillator section of the three gang condenser. Adjust the first I.F. transformer trimmers for maximum meter reading. Go over both adjustments at least three or four times for accuracy. Repeat this process on the second I.F. transformer. If adjustments are not made accurately, selectivity will be poor and I.F. oscillation may result.

**BROADCAST BAND:** Place the band change switch on Broadcast position. Turn the dial to 1400 Kc. and feed a *very weak* 1400 Kc. modulated signal from your signal generator to the antenna. Adjust the Broadcast oscillator trimmer (see sketch) and R.F. stage trimmer (on condenser gang) for maximum reading. Although a trimmer is provided for the Broadcast detector coil it will be found not connected on many sets as it is not necessary in obtaining correct balance.

Turn dial and signal generator to 600 Kc. and rock the padder into correct adjustment. This is accomplished by very slowly adjusting the padder condenser and at the same time turning the dial slightly back and forth across 600 Kc. until an adjustment is obtained producing maximum output. Go back to 1400 Kc. and readjust the oscillator trimmer slightly if necessary. Then recheck padder at 600 Kc. It is permissible to bend plates on the R.F. section only in resonating circuits.

**MIDDLE BAND:** Turn the band change switch to the middle position and tune radio and signal generator to 6000 Kc. Adjust the oscillator trimmer and then the detector trimmer for maximum output.

Rock in the padder condenser at 2400 Kc. Then recheck at 6000 Kc. and 2400 Kc.

**SHORT WAVE BAND:** Turn band change switch to short wave band. Tune radio and signal generator to 15 megacycles and adjust trimmers. No padder condenser is used on the short wave band so no other adjustments are necessary. On this band the oscillator frequency is 448 Kc. lower than the signal frequency.

**MICROPHONIC HOWL**

The tuning condenser is cushion mounted to eliminate vibration. Do not allow the dial to touch the escutcheon plate on the cabinet or a microphonic condition will be created.

**LONG WAVE-EXPORT MODELS**

These models are also built with a four position switch (part number E-482) and an extra set of coils tuning the foreign long wave band. The order of band change switch positions is broadcast, midband, short wave, long wave band. Alignment—adjust long wave trimmers at 350 Kc. and rock in long wave padder at 160 Kc. See sketch for location of coils and condensers.

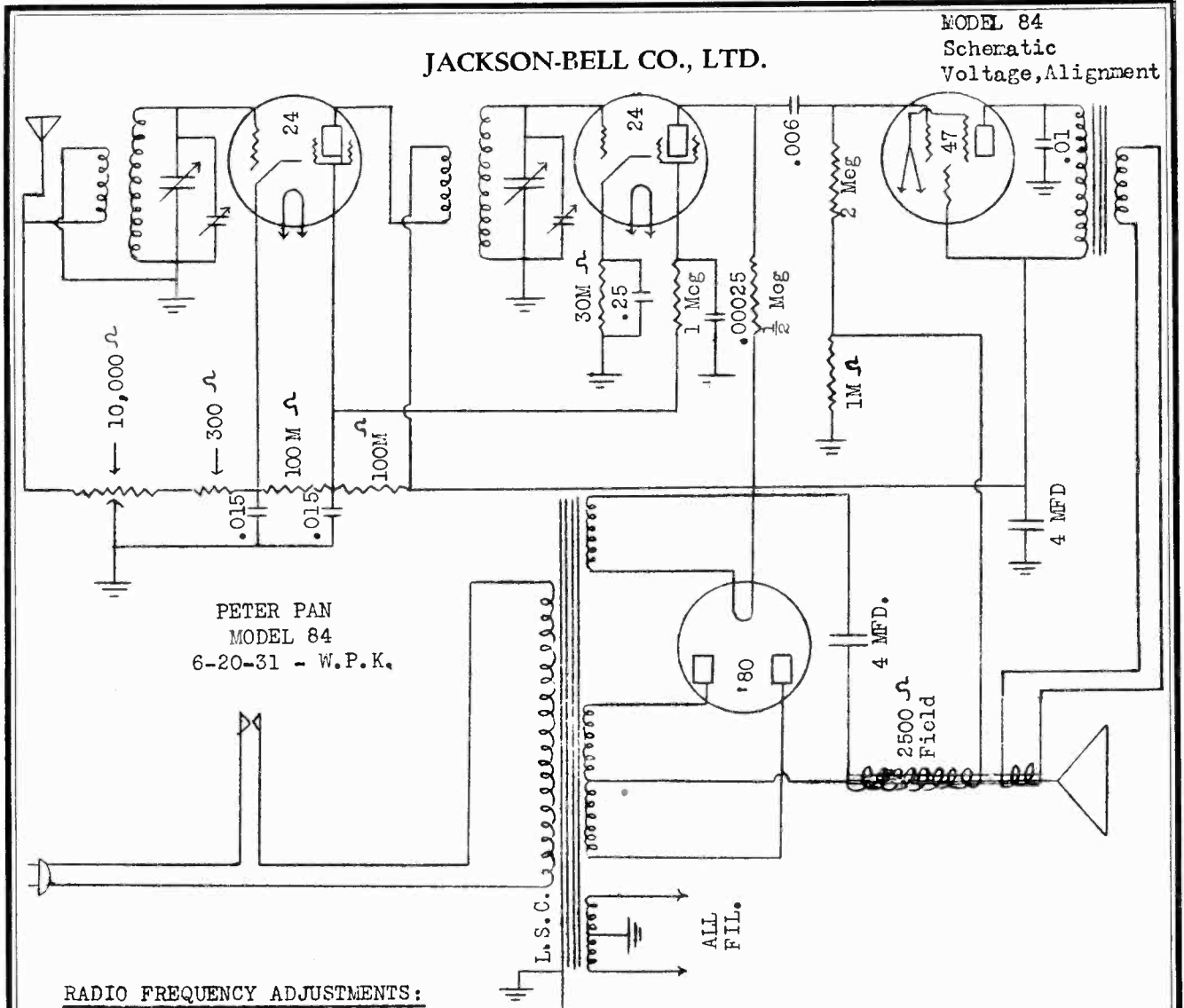
Some export sets also contain a 25 cycle power transformer (part number T-502) which has a tapped primary winding allowing operation from 125, 150 or 250 volt A.C. power lines. The tap switch is made available by removing part of the cover of the power transformer. 25 cycle sets may be used on 60 cycle although the converse is not true.

**PARTS LIST**

PART NO.	DESCRIPTION		
A-135...	3 gang tuning condenser	\$2.80	
A-247...	.00025 mf. mica condenser	.20	
A-248...	.001 mf. mica condenser	.20	
A-249...	.00125 mf. mica condenser	.20	
A-258...	.0005 mf. mica condenser	.20	
A-303...	.25 mf., 200 v. paper cond	.20	
A-329...	.005 mf., 600 v. paper cond	.15	
A-351...	.05 mf., 200 v. paper cond	.15	
A-352...	.05 mf., 300 v. paper cond	.15	
A-354...	.25 mf., 25 v. paper cond	.20	
A-367...	.05 mf., 400 v. paper cond	.15	
A-370...	.25 mf., 300 v. paper cond	.20	
A-417...	.5 mf., 25 v. electrolytic cond	.55	
A-439...	Electrolytic filter condenser	1.30	
A-509...	.6 gang trimmer condenser	.55	
A-510...	Dual padder condenser	.45	
A-515...	Single padder (long wave Mod.)	.25	
A-527...	Dual trimmer condenser	.20	
D-31...	8 inch Dynamic speaker	*1.20	
D-32...	10 inch Dynamic speaker	7.50	
E-154...	Duo dial knob	.20	
E-155...	1 inch knob	.15	
E-156...	.13/16 inch knob	.15	
E-159...	1 inch knob with colored dots	.20	
E-266...	Dial assembly	2.50	
E-272...	Dial assembly (long wave models)	2.50	
E-460...	Antenna-ground binding post strip	.10	
E-472...	Pilot lamps, 6-8 volt	.15	
E-480...	3 position band change switch	1.00	
E-482...	4 position band change switch	1.50	
H-49...	.6A8 tube socket	.10	
H-50...	.6C5 tube socket	.10	
H-52...	.6H6 tube socket	.10	
H-54...	.6K7 tube socket	.10	
H-56...	.6F6 tube socket	.10	
H-57...	5Z4 tube socket	.10	
R-115...	Volume control	.70	
R-122...	Tone control with power switch	.70	
R-210...	5M ohm, 1/3 w. carbon resistor	20	
R-229...	850 ohm, 1/2 w. carbon res	.20	
R-257...	50M ohm, 1/3 w. carbon res	.20	
R-258...	1 megohm, 1/3 w. carbon res	.20	
R-259...	500M ohm, 1/3 w. carbon res	.20	
R-264...	100M ohm, 1/3 w. carbon res	.20	
R-274...	25M ohm, 1/3 w. carbon resistor	.20	
R-281...	100 ohm, 1/3 w. carbon resistor	.20	
R-315...	Candohm resistor 150-200 ohms	.25	
R-317...	Candohm resistor, 12,500-15M	30.55	
S-102...	Goat tube shield	.10	
T-126...	Power transformer (60 cycle)	2.50	
T-330A...	1st I.F. transformer	1.25	
T-331A...	2nd I.F. transformer	1.25	
T-467A...	Oscillator coil	1.75	
T-468A...	L. W. Detector coil (long w.)	.85	
T-469A...	L. W. Oscillator coil (long w.)	.85	
T-487A...	Antenna coil	1.00	
T-494A...	Detector coil	1.75	
T-502...	Power transformer, 25 <sup>00</sup>	6.50	
U-118...	A.C. cord and plug	.30	
U-206...	4 wire speaker cable	.20	

JACKSON-BELL CO., LTD.

MODEL 84  
Schematic  
Voltage, Alignment



RADIO FREQUENCY ADJUSTMENTS:

Should it become necessary to resonate the radio frequency circuit, proceed as follows:

Set the tuning dial to road about 50° - then with a modulated oscillator and output meter (or a grid dip meter) resonate the two circuits at this point by means of the trimmer condensers on the main tuning condenser, then check for resonance at the end of each split plate in the condenser, bending plates where necessary. When properly resonated, and using about 50 feet of antenna, the set should oscillate, with volume control at maximum, up to 700 kilocycles,

VOLTAGE AND CURRENT VALUES

With the volume control at maximum, the following readings should be obtained, with an allowable 10% variation:-

Detector Plate Current,.....	0.15 M.A.	Line Voltage,.....	110 V.
Pentode Plate Voltage,.....	190 V.	R.F. Plate Voltage,.....	200 V.
Pentode Screen Voltage,.....	200 V.	R.F. Screen Voltage,.....	60 V. *
Pentode Grid Voltage,.....	13 V.	R.F. Cathode Bias,.....	1.5 V.
Pentode Plate Current,.....	24.0 M.A.	R.F. Plate Current,.....	2.2 M.A.
R.F. Filament,.....	2.2 V.	Detector Plate Voltage,.....	80 V.
Detector Filament,.....	2.2 V.	Detector Screen Voltage,.....	60 V.
Pentode Filament,.....	2.2 V.	Detector Cathode,.....	5 V.
Rectifier Filament,.....	4.1 V.		

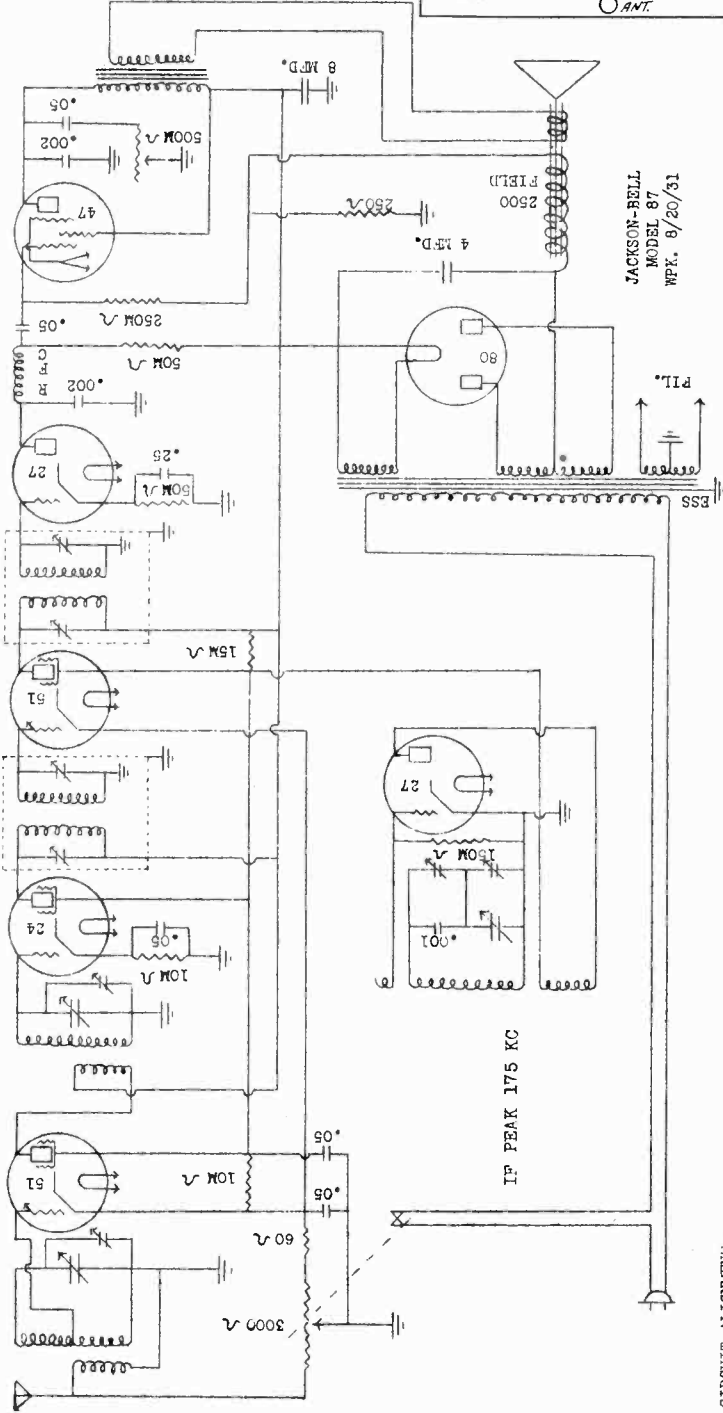
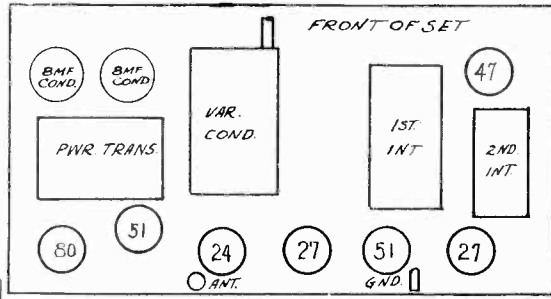
\*These readings made with the 300,000 ohm voltmeter in a Jewel 199 Set Analyzer are not true readings, due to the high resistances in the receiver circuit.

MODEL 87  
Schematic, Socket  
Voltage, Alignment

JACKSON-BELL CO., LTD.

RESISTOR CODE

60 OHM WIRE WOUND	
250 "	100 M.A.
10M "	BROWN, ORANGE, BLACK END
15M "	" GREEN "
50M "	GREEN, " BLACK "
150M "	BROWN, GREEN, YELLOW "
350M "	RED, " "



**CIRCUIT ALIGNMENT:**  
The first step in alignment of the receiver is to align the intermediate amplifier. This must be done with a test oscillator set at exactly 175 kilocycles, and an output indicating device. Remove the oscillator tube from the receiver and connect the test oscillator to the grid of the first detector tube. The trimming condensers for the intermediate circuit are adjusted by means of the screws accessible thru the holes in the sides of the intermediate transformer shield covers. The volume control should be in the maximum or full-on position. Rotate the adjusting screws until maximum response is shown in the output meter.

**ALIGNMENT OF THE SIGNAL FREQUENCY CIRCUIT:**  
For this operation, a modulated test oscillator covering the broadcast band is required, or stations of known frequency may be used. In order to properly resonate the signal frequency circuit of this receiver, turn the dial to some known frequency on the high end of the band, adjust the oscillator trimming condenser of the tuning condenser, until the greatest response is shown in the output meter. Then adjust the first detector section and next the first E.F. circuit section of the tuning condenser. Now move up to the next known frequency, preferably located at the next split section of the condenser. The alignment from here on is accom-

AVERAGE VOLTAGES & CURRENTS:

FIL. VOLTAGE	SCREEN VOLTAGE	VOLUME CONTROL MAXIMUM	
		GRID VOLTAGE	CATHODE CURRENT
2.25	95	0	1.5
2.25	95	0	3.25
2.25	95	0	1.5
2.25	145	0	12.5
2.25	65	0	3.25
2.25	185	11	24
4.5	280	--	45

plished by bending the split sections of the condenser plates to give the maximum alignment indicated by the output meter. If condenser plates have to be bent apparently too much at the low end of the band, it is advisable to start at the beginning and compensate the difference from the receiver and connect the test oscillator to the grid of the first detector tube. The trimming condensers for the intermediate circuit are adjusted by means of the screws accessible thru the holes in the sides of the intermediate transformer shield covers. The volume control should be in the maximum or full-on position. Rotate the adjusting screws until maximum response is shown in the output meter.

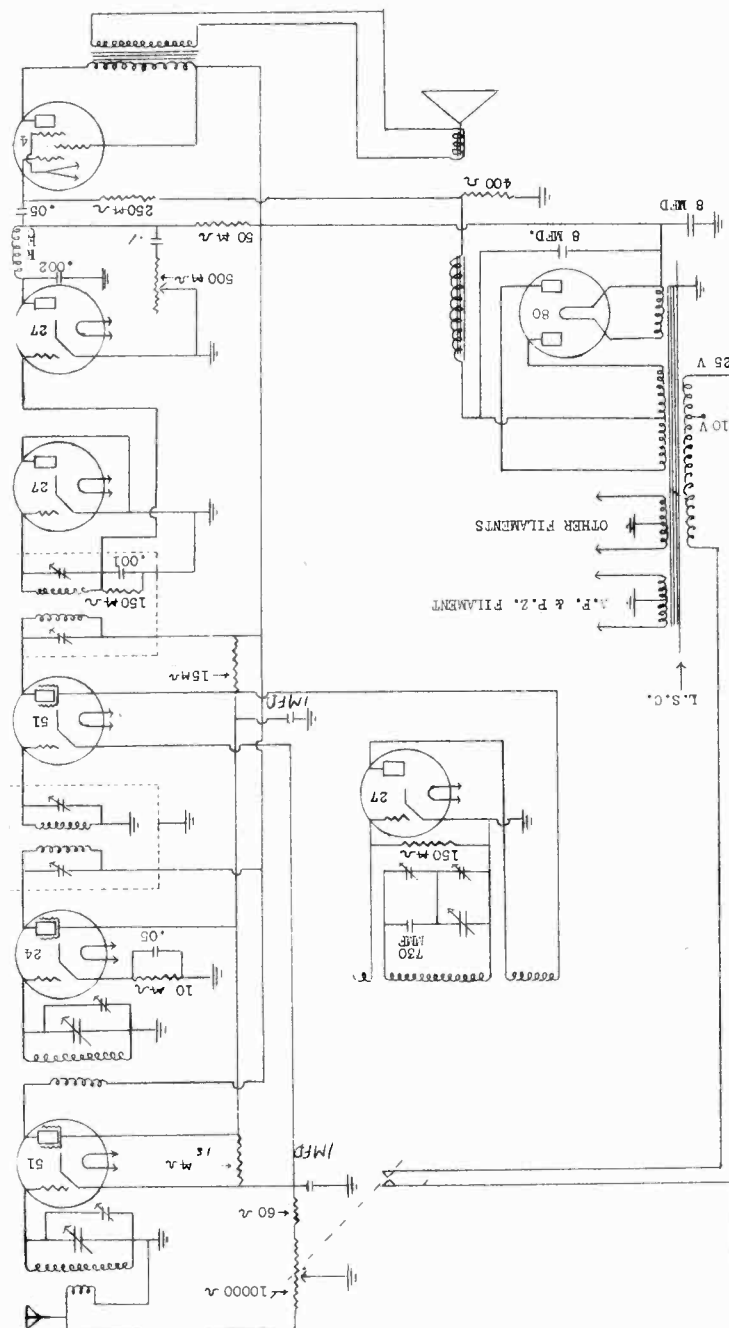
JACKSON-BELL CO., LTD.

MODEL 88  
Schematic, Voltage Alignment

JACKSON-BELL SUPERHETERODYNE  
MODEL 88 IMPROVED  
V.P.R. 6/9/31

CHECK VOLTAGES WITH VOLUME CONTROL  
AT MAXIMUM

R-f. Plate	200 v.
R-f. Screen	75 v.
R-f. Cathode	1.5 v.
R-f. Filament	2 v.
I-f. Plate	200 v.
I-f. Screen	75 v.
I-f. Cathode	1.5 v.
I-f. Filament	2 v.
Detector Plate	0 v.
Detector Grid	.5 v.
Detector Cathode to Gnd.	0 v.
Detector Filament	2.25v.
Trans. Plate	200 v.
Trans. Cathode	75 v.
Trans. Filament	5.25 v.
Osc. Plate	2 v.
Osc. Grid	75 v.
Osc. Cathode to Gnd.	.25 v.
1st A-f. Plate	40 v.
1st A-f. Grid	.5 v.
1st A-f. Cathode to Gnd.	0 v.
P.Z. or 47 Space Chg. Grid	200 v.
P.Z. or 47 Plate	195 v.
P.Z. or 47 Grid	16 v.
P.Z. or 47 Filament	2.25 v.
80 Filament	4.5 v.
80 Plate Drain per plate	25 m.e.



RADIO FREQUENCY CIRCUIT ADJUSTMENT.

The first operation in aligning the radio frequency circuit should be the tuning of the intermediate frequency transformers. First, remove the oscillator tube and connect a modulated oscillator tuned exactly to 175 kilocycles between the grid of the first detector and the chassis. Remove the first audio tube and insert an adapter in this socket with leads long enough so that the two may be placed in a position to make accessible the two holes in the I.F. transformer shield so that the adjusting screws may be turned. This adapter need contain simply a five prong socket at one end, and a five prong plug at the other end with about six or eight inches of flexible wire connecting the two. The top condenser of the second I.F. transformer, which is the one behind the '27 first audio tube, will be broad and unvertical in its adjustment. The bottom condenser which is the primary, should be sharp. Both coils will peak, but a little juggling may be necessary as the coupling is so close that one condenser will tend to tune both coils, so it may be necessary to back up on one to make the other balance and then rebalance the other.

Repeat this operation with the other transformer located behind the Pentode tube and adjust all screws for maximum reading on an output meter, which should be connected when these adjustments are being made.

When the I.F. circuit has been accurately adjusted to 175 kilocycles, the oscillator tube should be replaced and a test modulated oscillator connected to the antenna terminal of the receiver. Factory alignment of these receivers is started at 1720 kilocycles, in order to be able to cover the bands used by police broadcast stations. Should the test oscillator reach this frequency, then the dial should be adjusted to about 3 when alignment is made at this point.

If unable to test at 1720 kilocycles, the first alignment operation may be made at 1500 kilocycles, with the dial set so that the 1500 kilocycle mark is directly above the center of the condenser shaft. With the dial set in the position corresponding to the highest frequency which is used in the preliminary alignment, rotate the compensator screw on the center section of the variable condenser until maximum response is noted in the output meter. This center section tunes the oscillator circuit. Without changing the adjustment of either the oscillator or the receiver dial, adjust the antenna compensator, (the one nearest the front of the chassis) for maximum response. This should then be followed by the first detector, and when resonance is approached with the first detector compensator, the main tuning dial of the receiver should be rocked back and forth slightly at the same time that the compensator is rotated slowly until the highest output indication is obtained.

Best results will be obtained when a dummy antenna is used between the oscillator and the receiver when the three gang condenser is being aligned. This can consist of a .00025 condenser, a 20 ohm resistor, and about 25 turns of small magnetic wire wound on a one inch form, carried in series between the antenna terminal of the receiver and the output terminal of the oscillator. The alignment operation may then be completed at the lower frequencies by the customary bending of the split rotor plates.

For aligning the oscillator circuit, at 550 kilocycles, the variable padding condenser located under the chassis and accessible thru a hole to the left of the center section of the tuning condenser should be used in preference to bending plates. This may be done immediately after the 1500 kilocycle alignment, and then the set should be re-checked at 1500 kilocycles, and alignment continued from that point back to 550.

MODEL 89-A  
Schematic, Socket  
Voltage, Alignment

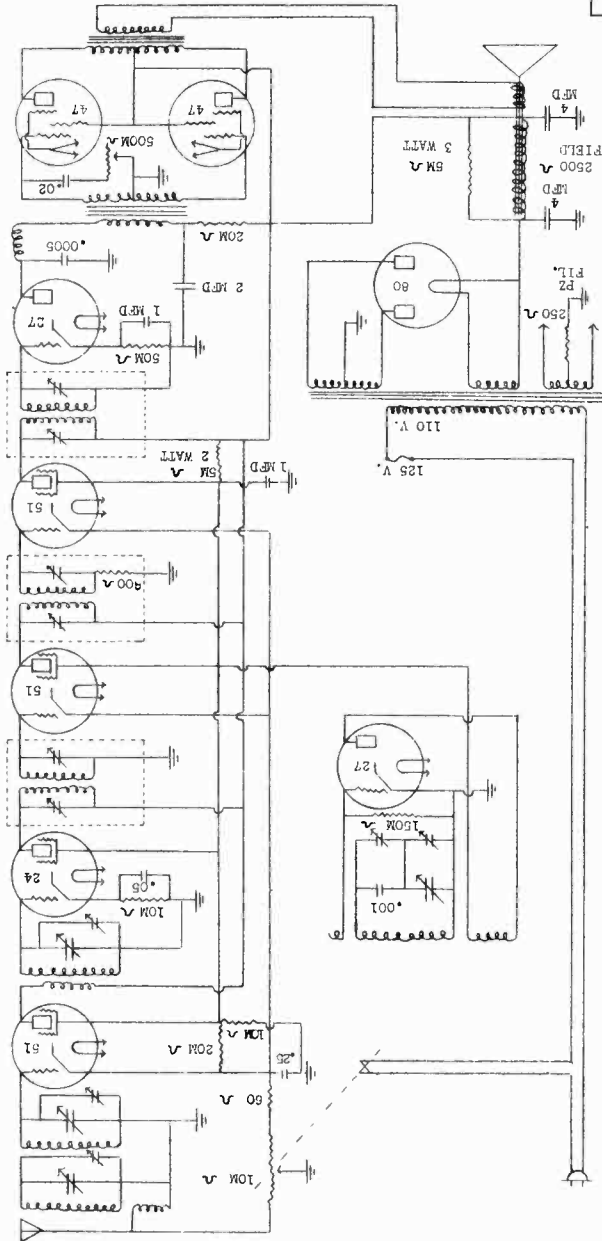
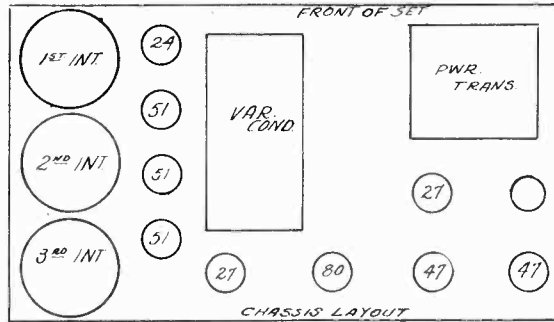
JACKSON-BELL CO., LTD.

JACKSON-BELL SUPER  
MODEL 89A  
W. P. K. 6-15-31

IF PEAK 175 KC

RESISTOR CODE

- 60 OHM WIRE WOUND
- 250 " GREEN, BLACK, RED DOT
- 5000 " BROWN, " ORANGE DOT
- 100000 " RED, " "
- 200000 " GREEN, " "
- 500000 " BROWN, GREEN, YELLOW "
- 1500000 " BROWN, GREEN, YELLOW "



CIRCUIT ALIGNMENT

The first step in alignment of the receiver is to align the intermediate amplifier. This must be done with a modulated test oscillator set at exactly 175 Kilocycles, and an output indicating device. Remove the oscillator tube from the receiver (see chassis drawing No. 1) and connect the test oscillator to the grid of the first detector tube. The six tuning condensers for the intermediate circuit are adjusted by means of the screws accessible thru the holes in the sides of the intermediate transformer shield covers. The valve control should be in the maximum or full-on position. Rotate the adjusting screws until maximum response is shown in the output meter.

Oscillation in the intermediate amplifier may be caused by:-

- 1) Open by-pass condenser.
- 2) Improper alignment.
- 3) Shorted suppressor resistor in the second intermediate transformer.
- 4) Defective tube.

ALIGNMENT OF THE SIGNAL FREQUENCY CIRCUIT

For this operation, a modulated test oscillator covering the broadest band is required. In order to properly resonate the signal frequency circuit of this receiver, the pro-selector and radio frequency amplifier circuits must be eliminated from the preliminary alignment operation, and a difference of 175 Kilocycles must be established between the first detector and oscillator tuning condensers.

- a) Short circuit that section of the main tuning condenser which is connected to the grid of the radio frequency amplifier tube. Couple the test oscillator to the first detector tube by placing the lead from the test oscillator near (but not touching) the grid terminal. Set the main tuning dial at 1500 kilocycles, and adjust the test oscillator to 1500 kilocycles.

- b) Rotate the adjusting screws of the oscillator and first detector sections of the tuning condenser until maximum response is obtained in the output meter.
- c) Remove the short from the radio frequency amplifier section of the tuning condenser and connect the test oscillator to the antenna terminal of the receiver. Now adjust the compensating condenser for the band selector and radio frequency section to give maximum response.

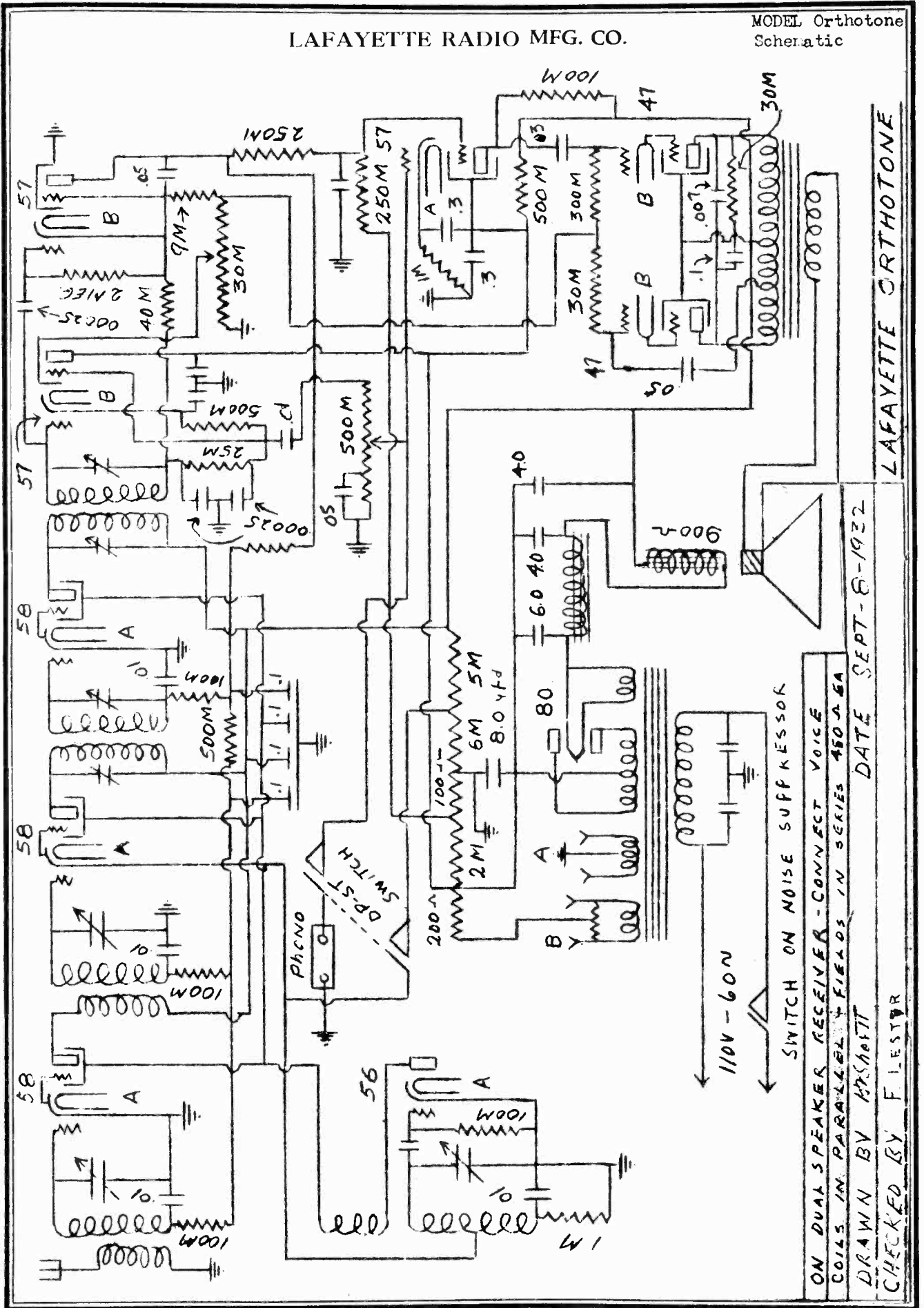
From this point on the alignment is the same as with a T.R.F. circuit, except the oscillator section. After bending the plates, where necessary, of the three signal frequency section of the tuning condenser for maximum response, bend the oscillator plate in and out while "rocking" the condenser shaft, and note for maximum response. It is recommended that a check of alignment be made at each split section of the rotor plates of the tuning condenser.

AVERAGE VOLTAGES & CURRENTS:

	FIL. VOLTS	PLATE VOLTS	SCREEN VOLTS	GRID VOLTS	CATHODE VOLTS	PLATE CURRENT
R.F. Amplifier Tube	2.5	200	100	0	2.0	3.5
First Detector Tube	2.5	200	100	0	4.0	4.5 MA
First I. F. Tube	2.5	200	100	0	2.0	3.5
Second I. F. Tube	2.5	200	100	0	2.0	3.5
Second Detector Tube	2.3	180	---	---	8	2 MA
Oscillator Tube	2.3	100	---	0	0	6 MA
Output Tube (1)	2.3	185	200	16	---	20 MA
Output Tube (2)	2.3	185	200	16	---	20 MA
Rectifier Tube	5.0	375	---	---	---	55 PER PLATE

LAFAYETTE RADIO MFG. CO.

MODEL Orthotone  
Schematic



LAFAYETTE ORTHOTONE

ON DUAL SPEAKER RECEIVER - CONNECT VOICE COILS IN PARALLEL & FIELD IN SERIES 450 Ω EA

DRAWN BY BRUSHOFF

CHECKED BY F. LESTER

DATE SEPT-8-1932

SWITCH ON NOISE SUPPRESSOR

110V-60N

MODEL 10C10

Condenser Data, Notes LAFAYETTE RADIO MFG. CO.  
Parts (Early Model)

**Bypass Condenser Block**

The key number, capacity, and lead colors of the sections of the original bypass condenser block used in the early models are shown in the following list. The key numbers refer to Fig. 3.

Key No.	Capacity	Lead Color	Lead Color
C22	.5 mfd.	Yellow	Yellow
C16	.5 mfd.	Red	Common Black
C4	.5 mfd.	Blue	Common Black
C8	.5 mfd.	Brown	Common Black
C5	.1 mfd.	White, Green Tr.	Common Black
C2	.1 mfd.	White, Green Tr.	Common Black
C7	.1 mfd.	White, Red Tr.	Common Black
C6	.1 mfd.	Black, White Tr.	Black, White Tr.
C13	.1 mfd.	White	White

Referring to sections C6 and C13 in the above list, it will be noted that these have two leads each with the same color code. This was changed in a later model to one lead each, the other lead of each section being connected to the common black lead.

At a later date, two further changes in this condenser block were made. Section C6 which bypassed the grid return of the first I.F. tube to ground was discontinued and section C4 was changed to .25 mfd. These changes bring the block up to date.

The key numbers (C5, etc.) in the above description of the condenser block refer to the key numbers as shown in the schematic circuit diagram of the early chassis, Fig. 3. The key numbers of the condenser block as shown in the parts list in the foregoing service manual conform with the key numbers as shown in the schematic of the present chassis, Fig. 1. As explained at the beginning of this supplement, the two sets of key numbers do not coincide.

**Resonance Meter**

In the early model receivers, the resonance meter was in the plate lead of the R.F., first detector, and first I.F. tubes. In the present receivers the resonance meter is in the plate lead of the R.F. tube only. The meter is not the same in both cases.

**Voltage Divider Resistor**

In the early models a "Candohm" armored wire wound voltage divider resistor was used. This was replaced in the later models by a vitreous enamel voltage divider. It will be noted that there are ten lugs on the "Candohm" resistor while there are only six resistor sections, which would ordinarily call for seven lugs. The extra three lugs are blank lugs not connected with the resistance element and used for wiring purposes only. Starting with the high potential end of the resistor, the blank lugs are the second, fourth and ninth. In ordering a new voltage divider resistor for the ten tube chassis be sure to order the correct type.

**Speaker**

The early models in this series of receivers used a single speaker and not the dual speakers as mentioned in the foregoing manual. The single speaker field resistance is 450 ohms.

**Supplementary Parts List for Early Models**

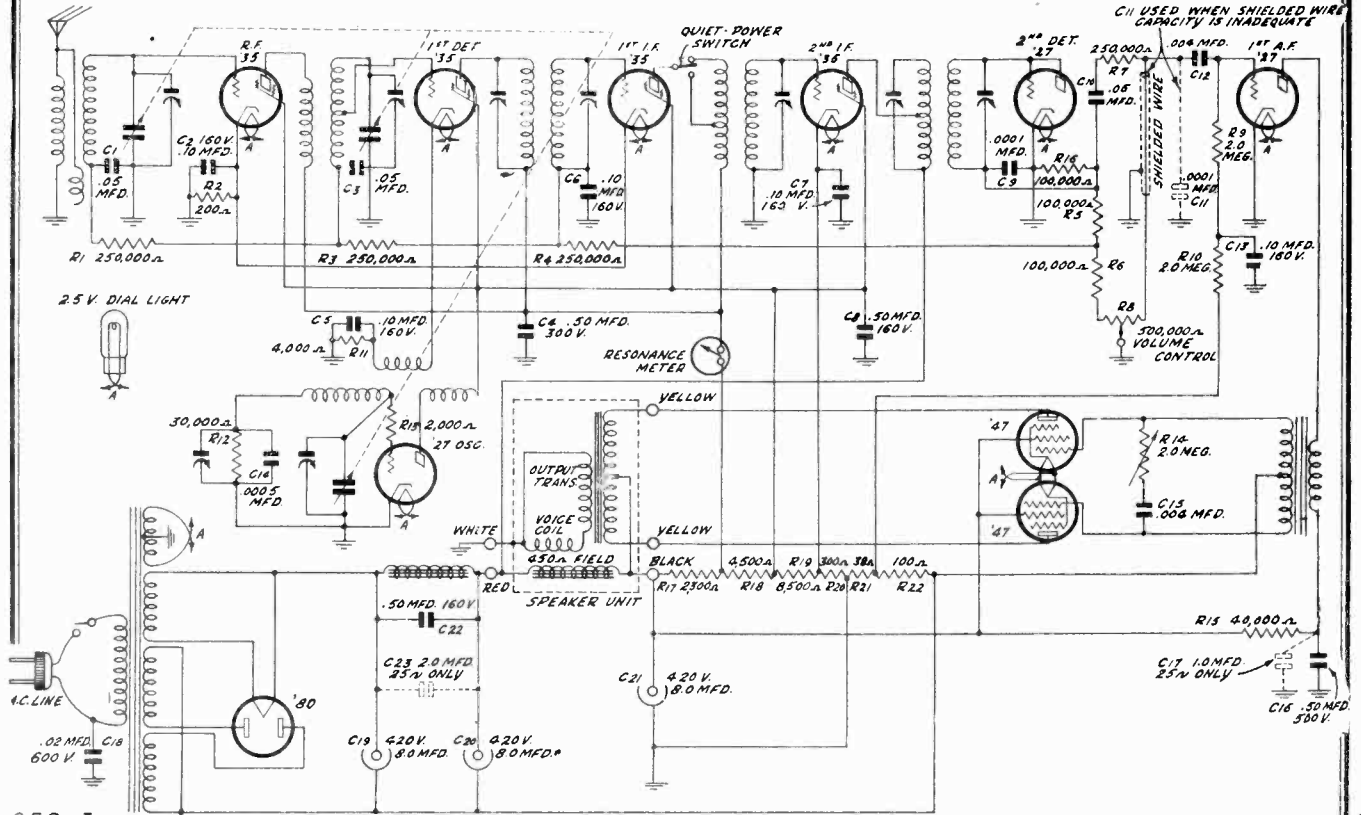
The parts in this list replace the corresponding parts as shown in the parts list in the foregoing service manual.

Stock No.	Name
P-1363	Interstage Transformer Assembly .....
P-90954-B	250,000 ohm Resistor (R3, R4) .....
P-90956-A	30,000 ohm Resistor (R12) .....
P-90977-B	Tone Control and On-Off Switch (R14) .....
P-80867	.0005 mfd. Condenser (C14) .....
P-80861-B	Bypass Condenser Block .....
P-1367	Shielded 1st I.F. Transformer Assembly .....
P-1364	Shielded 2nd I.F. Transformer Assembly .....
P-1365	Shielded 3rd I.F. Transformer Assembly .....
P-1349	Resonance Meter .....
P-1366	Shielded Oscillator Unit Assembly .....
P-90974-C	"Candohm" Voltage Divider Resistor .....
*P-1351	Drive Bracket and Bearing Assembly .....
*P-1197	Friction Drive Shaft Assembly .....
*P-1356	Dial Strip and Disc Assembly .....
*P-1177	Dial Light Bracket Assembly, less socket and bulb.

\*Asterisk refers to friction drive parts used on early models.

LAFAYETTE RADIO MFG. CO.

MODEL 10C10 (Early)  
Schematic, Data



259-7

Fig. 3. Schematic Circuit Diagram of Early Model

## Data on Earlier Models in This Series

The foregoing service manual describes the chassis of this series as it is manufactured at the present time. However, when the model was first brought out it was slightly different mechanically and electrically than the present model.

In this supplement, the changes of importance from a servicing standpoint from the first models to the present are discussed. This section should be gone over carefully by the service technician, as it is of importance both in servicing the set and when ordering replacement parts. The changes described were not all made at the same time. Investigation of the chassis will show which of the changes are incorporated. One way of eliminating error in replacing parts is to return the old part when ordering a new one.

### Key Numbers

In Fig. 3 is shown the schematic circuit diagram of the original model. In the changes as described below, reference will be made both to this diagram and to the schematic circuit diagram of the present model Fig. 1. Note that the key numbers of the resistors and condensers in Figs. 1 and 3 do not coincide.

### Interstage Transformer

The interstage R.F. transformer of the original sets contained a 250,000 ohm isolating resistor shown in Fig. 3 as R3. This is replaced by the present type of interstage R.F. transformer with no resistor.

### Isolating Resistors

Isolating resistor R3, as shown in Fig. 3 is omitted and isolating resistor R4, 250,000 ohms, is changed in the later models to 500,000 ohms.

### Tone Control and On-Off Switch

The early models in this series used a combination tone control and On-Off switch. In the later models these units are separate.

### I.F. Transformer Assemblies

The old I.F. assemblies were in square cans and the condenser adjusting screws were reached from the top of the chassis. The new assemblies as used on the present models are in round cans and the adjusting screws are reached from the bottom of the chassis through holes in the sub-panel.

### Oscillator Assembly

The oscillator assembly as used in the early models had the 600 K.C. tracking condenser in the same can as the balance of the assembly. In the new assembly as used in the present models, the 600 K.C. trimmer is mounted separately under the sub-panel. The adjusting screw for this condenser is reached from the top of the chassis. It is just in back of and to the side of the oscillator coil can.

Condenser C14, Fig. 3, .0005 mfd., is not used in the later models in which the afore-mentioned change in the oscillator assembly is made.

Resistor R12, 30,000 ohms, is changed to 40,000 ohms in the models in which the afore-mentioned oscillator assembly change is made.



MODEL 10C10

Alignment, Parts  
Data

LAFAYETTE RADIO MFG. CO.

Condenser Alignment

Misalignment or mistracking of condensers generally manifests itself in broad tuning and lack of volume at portions or all of the broadcast 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 an accurately calibrated signal of 175 K.C. and accurately calibrated signals over the broadcast band, and an output indicating meter are necessary. The procedure is as follows:

Set the signal generator for 175 K.C. Disconnect the grid cap from the first detector tube. Connect the antenna lead from the signal generator to the grid terminal of this tube. The ground lead goes to the ground connection. Then adjust the five intermediate frequency condensers for maximum output. The adjusting screws for these condensers are reached from the bottom of the chassis.

Next, set the signal generator for a signal of 1400 K.C. The input in this instance is made to the antenna lead of the receiver. Replace the grid cap on the first detector tube. Set the dial pointer on the 1400 K.C. mark on the dial scale and adjust the three trimmer condensers on the gang tuning condenser for maximum output, adjusting the oscillator trimmer first.

Then, set the signal generator for a signal of 600 K.C. The oscillator 600 K. C. trimmer condenser is underneath the chassis but the adjusting screw is reached from the top of the chassis and is adjacent to the oscillator coil can. Adjust this oscillator 600 K.C. trimmer condenser for maximum output, turning the rotor slowly back and forth over the 600 K.C. setting until highest output is obtained. A recheck may then be made of the alignment at 1400 K.C.

Replacing Rubber Drive

You will note that the Vernier tuning drive on this chassis uses a rubber pinion. Under normal operating conditions this rubber will last for a number of years. Should it become worn it can be readily replaced by loosening the set screw of the brass bushing located next to the rubber pinion and pulling out the station selector shaft. Place a new bushing in position, slip the station selector shaft in place and tighten the set screw.

Replacing R. F. Transformers and Oscillator Unit

The first and second R.F. transformers and oscillator assembly are matched. If one of these units is replaced, it is essential that the new one be of the correct value. At the bottom of the unit assembly a spot of paint will be seen. Be sure when ordering one of these assemblies to indicate in your order the color of the spot of paint.

Dual Speaker Connections

Two speakers are used in this model, one designed to give best response on the higher audio frequencies and the other designed to give best response on the lower frequencies. The fields of the two speakers are connected in series, and the voice coils in parallel. The resistance of the two fields in series is 450 ohms.

Part No.	Name
P-1464	'35 Tube Socket
P-1468	'47 Tube Socket
P-1474	'80 Tube Socket
P-1462	'27 Tube Socket
P-1422	Antenna Transformer Assembly (No Shield)
P-1423-A	Interstage Transformer Assembly (No Shield)
P-1400-A	Oscillator Unit Assembly (No Shield)
P-1433	Shielded 1st I. F. Transformer Assembly
P-1425	Shielded 2nd I. F. Transformer Assembly
P-1426	Shielded 3rd I. F. Transformer Assembly
P-50533	Pushpull Audio Input Transformer

Part No.	Name
P-20408	Tube Shield Base
P-1193	Laminated Phono Jack
P-50532	Power Transformer, 60 Cycle
P-50536	Power Transformer, 25 Cycle
P-5053	Power Transformer, 220 V., 40-60 Cycle
P-20461	Condenser Shield
P-1326	Aluminum Antenna Coil Shield with Bracket, (Rectangular)
P-1327	Aluminum Interstage Coil Shield with bracket (Rectangular)
P-70702	Attachment Cord and Plug
P-1355	Speaker Cable Terminal Strip
P-70716	Speaker Cable
P-1385-B	Oscillator 600 K. C. Trimmer Condenser
P-20406	Tube Shield
P-1273	Dial Light Bulb, 2.5 volts
P-1011	S. P. D. T. Switch (Quiet-Power or Phono)
P-1384	Resonance Meter
P-50534	Power Supply Choke
P-10180	Rubber Chassis Support (Large)
P-10181	Rubber Chassis Support (Small)
P-1146	Terminal Strip (Large)
P-1173	Terminal Strip (Small)
P-20422	Chassis Mounting Stud
P-20286	Resistor Spring Mtg. Bracket
P-1054	On-Off Toggle Switch
P-80889	3 Gang Condenser less drive for rubber pinion drive only
P-1383-B	Drive Bracket & Bearing Assembly
P-30365	Bushing for rubber pinion
P-10182	Rubber pinion
P-20473	Drive Shaft
P-1394	Dial Strip & Bracket Assembly
P-1382	Drive Disc Hub & Fulcrum Assembly
P-1393	Indicator Assembly
P-80866	3 Gang Condenser less drive for friction drive models
*P-1128	Drive Bracket & Bearing Assembly
*P-1197-B	Friction Drive Shaft Assembly
*P-1340	Dial Strip
*P-20283	Dial Drum

\*Asterisk refers to parts used on drum dial models.

RESISTORS

Part No.	Key No.	Resistance	Type
P-90954-B	R1	250,000	Carbon
P-90935-A	R2	200	Carbon
P-90938	R3	500,000	Carbon
P-90912-A	R4	100,000	Carbon
P-90912-A	R5	100,000	Carbon
P-90954-B	R6	250,000	Carbon
P-90980	R7	0-500,000	Volume Control
P-90923-A	R8	2 meg.	Carbon
P-90923-A	R9	2 meg.	Carbon
P-90947	R10	4,000	Carbon
P-90916	R11	40,000	Carbon
P-90986-B	R12	0-2 meg.	Tone Control
P-90945	R13	40,000	Carbon
P-90912-A	R14	100,000	Carbon
P-91000	R15	2,300	Vitreous Enamel Resistor
	R16	4,500	
	R17	8,500	
	R18	300	
	R19	38	
	R20	100	

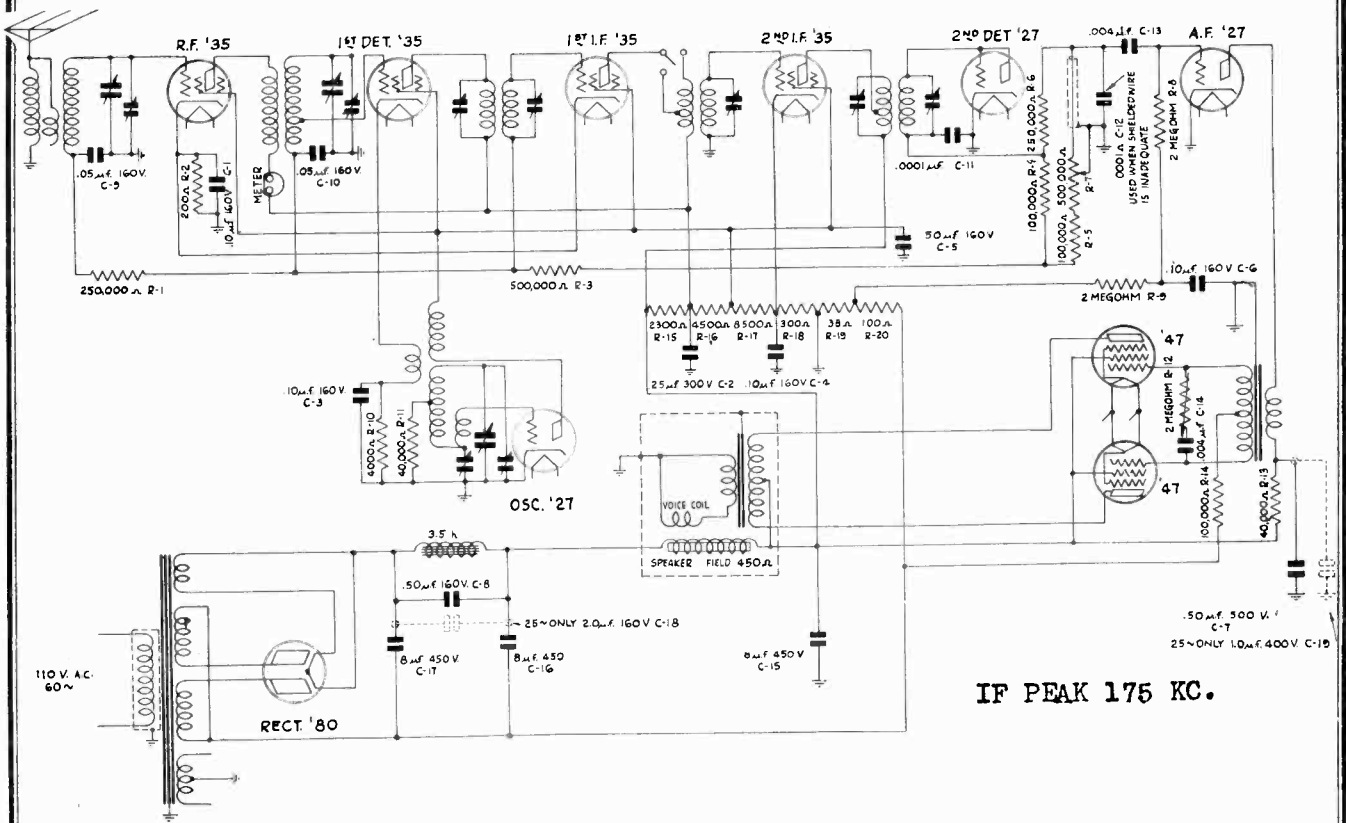
CONDENSERS

Part No.	Key No.	Capacity	Type	Voltage Rating	
P-80862	C9	.05	Tubular	160 V.	
P-80862	C10	.05	Tubular	160 V.	
P-80865	C11	.0001	Molded		
P-80865	C12	.0001	Molded		
P-80863	C13	.004	Tubular		
P-80863	C14	.004	Tubular		
P-80901	C15	8.0	Electrolytic	450 V.	
P-80900	C16	8.0	Electrolytic	450 V.	
P-80900	C17	8.0	Electrolytic	450 V.	
P-80861-F (Block)	C1	.1	Block	160 V.	White, Green Tr.
	C2	.25			Blue
	C3	.1			White, Green Tr.
	C4	.1			White, Red Tr.
	C5	.5			Brown
	C6	.1			White
	C7	.5			500 V. Red
	C8	.5			160 V. Yellow (2 Leads)
P-80879	C18	2.0	Block	160 V.	{ 25 cv. only }
	C19	1.0			400 V.

Common Black Lead

LAFAYETTE RADIO MFG. CO.

MODEL 10C10 (Late)  
Schematic, Socket  
Voltage

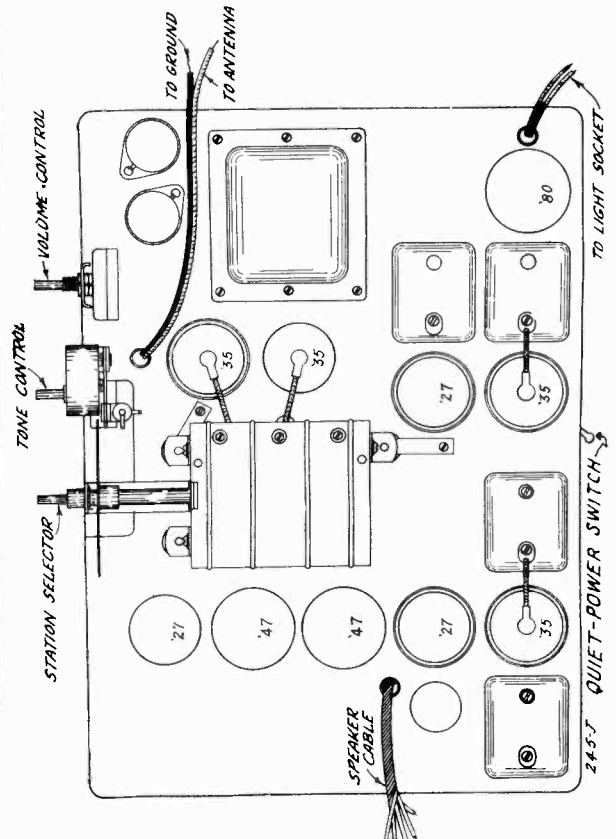


Voltages at Sockets

LINE VOLTAGE 115—VOLUME CONTROL AT  
MAXIMUM—SECOND DETECTOR TUBE  
REMOVED FROM SOCKET

Type of Tube	Function	Across Filament or Heater	Plate to Cathode	Screen to Cathode	Grid to Cathode	Normal Plate MA
'35	R.F.	2.2	180	92	3 <sup>(1)</sup>	6.2
'35	1st. Det.	2.2	178	85	10 <sup>(1)</sup>	2.2
'27	Oscil.	2.2	94		6 <sup>(2)</sup>	4.0 <sup>(2)</sup>
'35	1st. I.F.	2.2	180	92	3 <sup>(1)</sup>	6.0
'35	2nd. I.F.	2.2	260 <sup>(5)</sup>	90	6	5.5
'27	1st. Audio	2.2	105		5 <sup>(3)</sup>	4.2
'47	2nd. Audio	2.2	245	260	17 <sup>(4)</sup>	31.
'80	Rect.	4.8	725 volts plate to plate			66 per plate

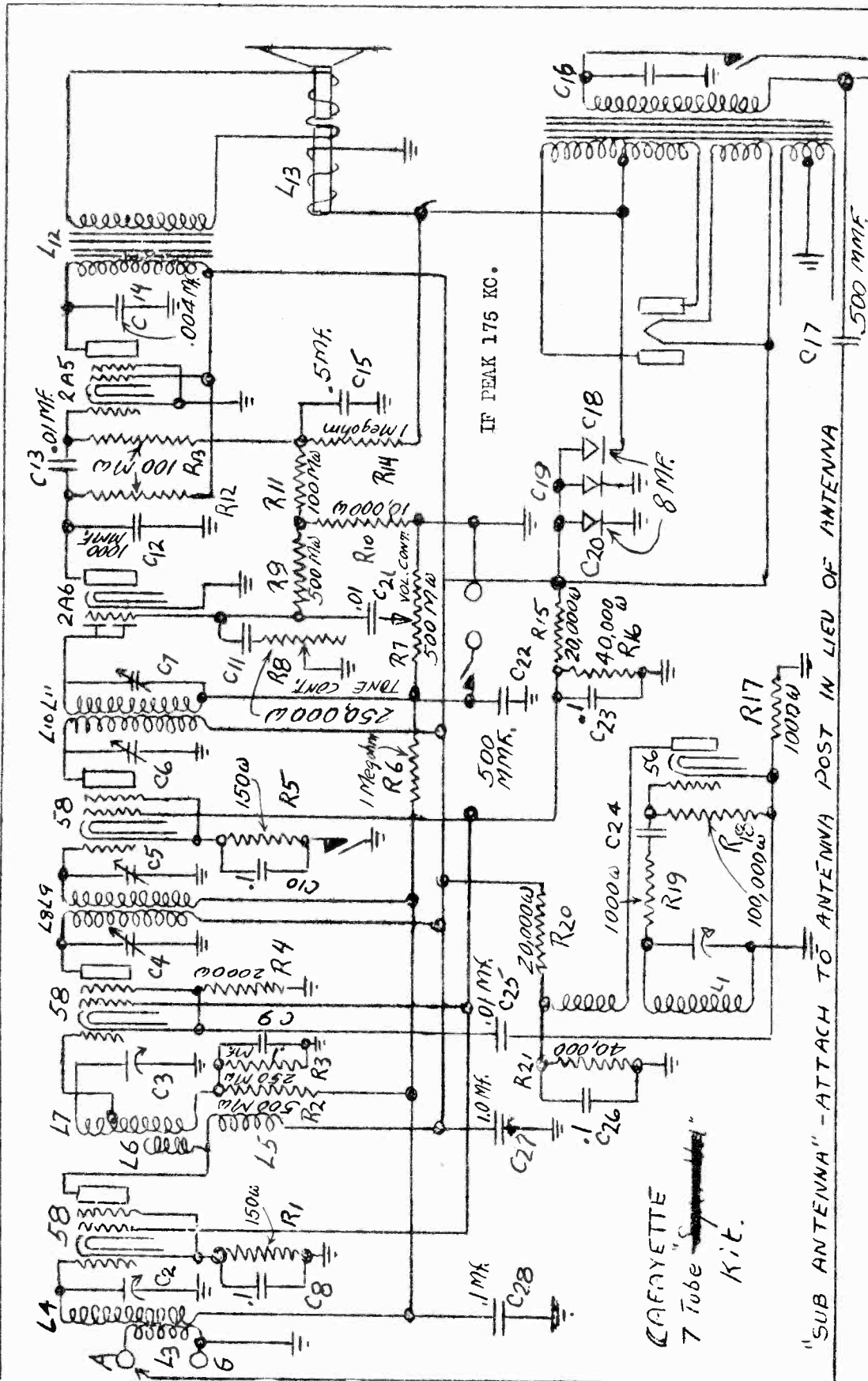
(1) Read from cathode to ground.  
 (2) Subject to variation with dial setting.  
 (3) Read across 38 ohm section of voltage divider resistor.  
 (4) Read across 38 and 100 ohm sections of voltage divider.  
 (5) Changes to 178 volts in latest models.  
 NOTE:—All readings, except heater, for second detector tube are zero.





LAFAYETTE RADIO MFG. CO.

MODEL A-20  
Schematic



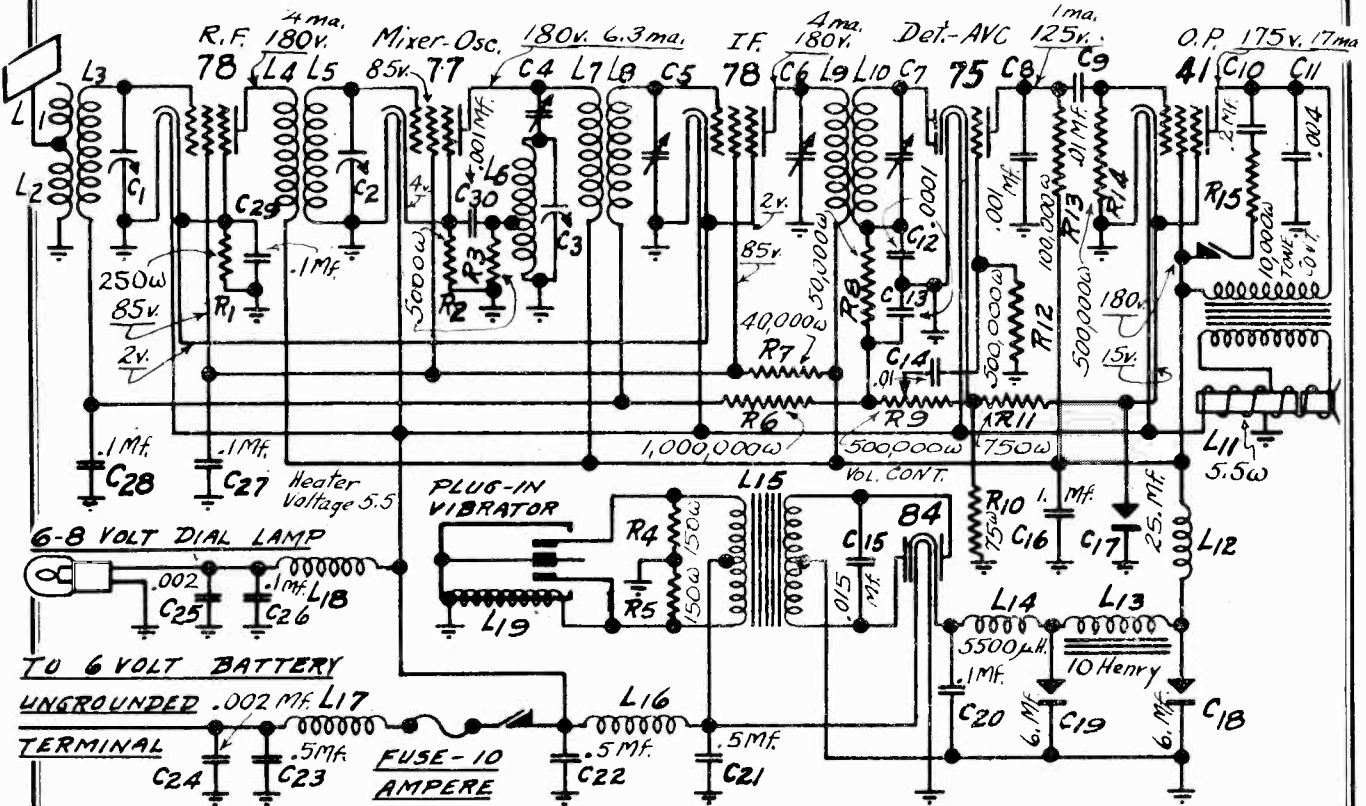
LAFAYETTE  
7 Tube Superheterodyne  
Kit.

"SUB ANTENNA" - ATTACH TO ANTENNA POST IN LIEU OF ANTENNA

LAFAYETTE RADIO & TELEVISION CORP. 100 SIXTH AV. N.Y.C. Drawn by F. SKIRNICKY CHECKED BY H. SHORR

MODEL AM-20  
Schematic, Voltage  
Alignment

LAFAYETTE RADIO MFG. CO.



The three R. F. trimming condensers are adjusted at 1400 K. C.. Proceed as follows:  
Procure a modulated oscillator giving a signal at 1400 K.C..

Remove the chassis from case, couple the output of the oscillator from antenna to ground, set the dial at 1400 and the oscillator at 1400 K.C..

Place the oscillator and receiver in operation and adjust the oscillator output so that a weak signal is heard in the loudspeaker when the volume control is at its maximum position.

Then adjust the trimming condensers starting with C 3, C 2 and then C 1 until maximum output is obtained. Readjust a second time as there is a slight interlocking of adjustments.

A more accurate adjustment can be made with an output meter.

I. F. Adjustment:

The four I. F. trimming condensers are adjusted at 175 K.C.. Proceed as follows:

Procure a modulated oscillator giving a signal at 175 K.C., a non-metallic screw driver and an output meter.

Connect the oscillator output between the first detector grid and ground. Connect output meter.

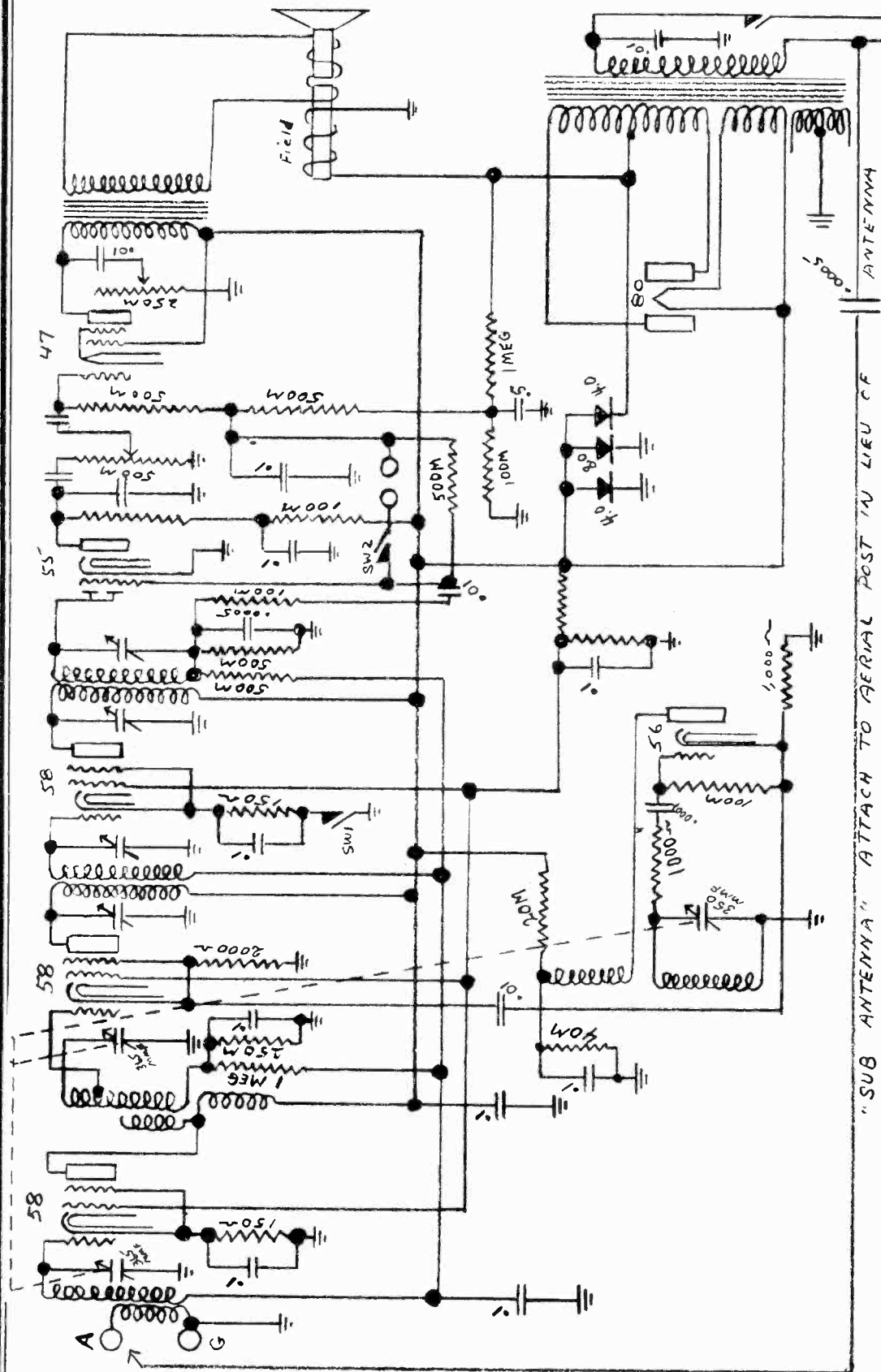
IF PEAK 175 KC.

Adjust the tuning condenser so that no signal except the I. F. oscillator is heard at maximum volume. With the volume control at maximum, reduce the oscillator output until a small deflection is obtained. Unless this is done the action of the AVC will make it impossible to obtain correct adjustments.

Trim in order C 4, C 5, C 6 and C 7, repeat adjustments and then follow with the R. F. adjustments.

LAFAYETTE RADIO MFG. CO.

MODELS M-35, 37, 53  
Schematic



IF PEAK 175 KC.

SW1 "ON" (CLOSED) For Radio  
 "OFF" (OPEN) For Phonograph  
 SW2 (CLOSED) For Phonograph  
 (OPEN) For Radio

"SUB ANTENNA" ATTACH TO AERIAL POST IN LIEU OF

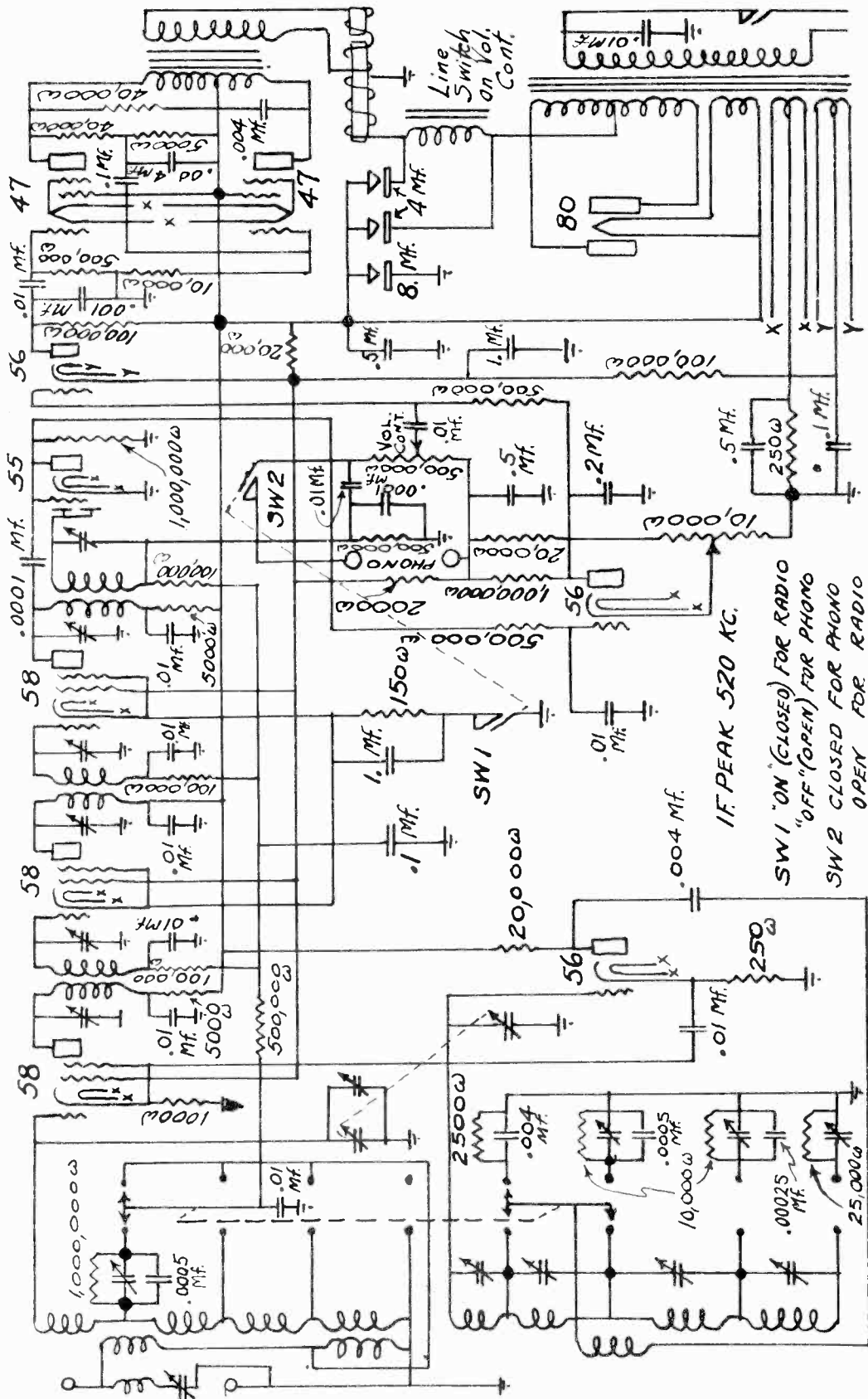
Models M35-37-53

LAFAYETTE RADIO & TELEVISION Corp. (F.H.S.) 100 SIXTH AV N.Y.C.

MODEL M-47

Schematic

LAFAYETTE RADIO MFG. CO.

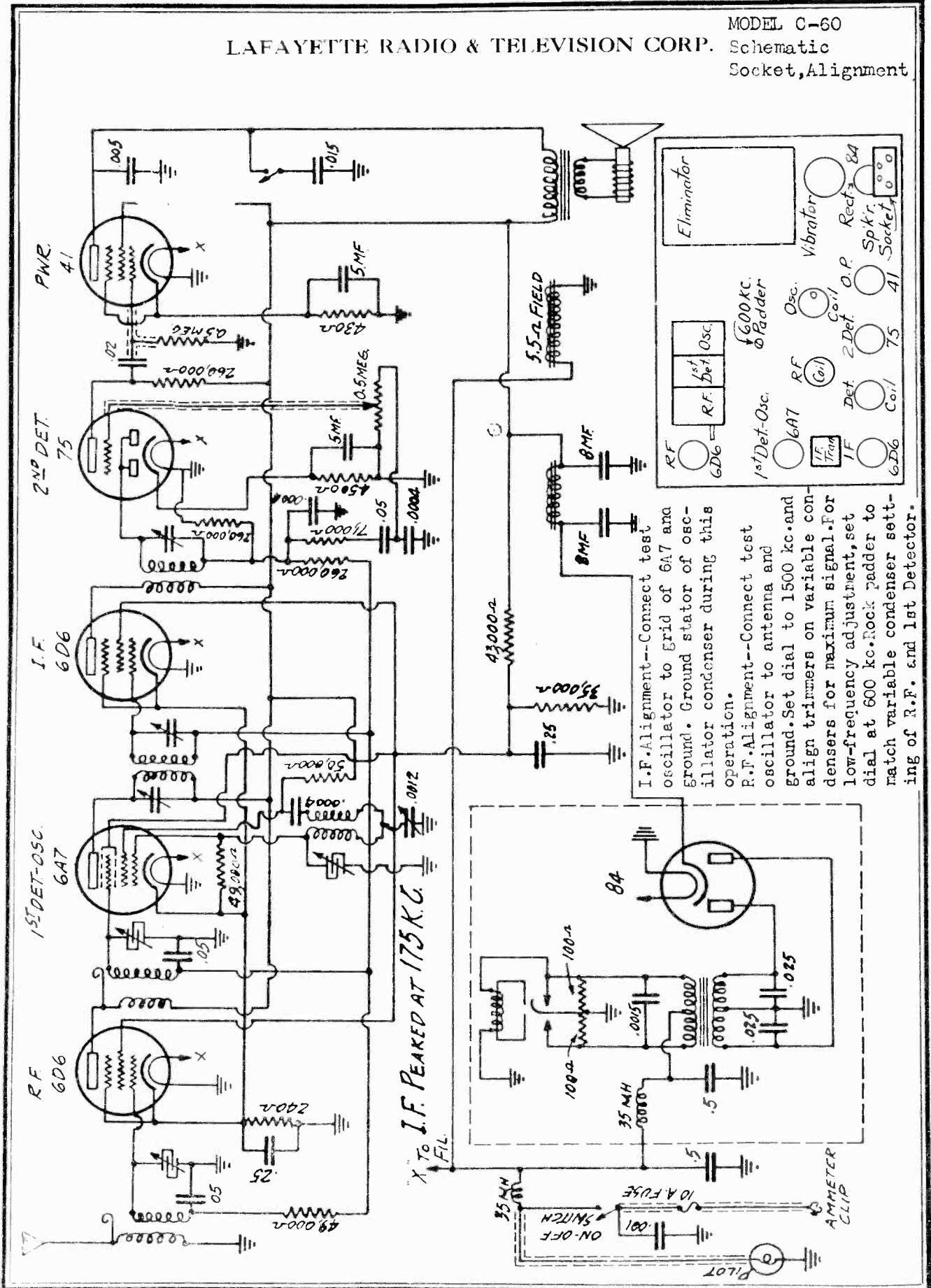


LAFAYETTE RADIO & TELEVISION CORP.

MODEL C-60

Schematic

Socket, Alignment



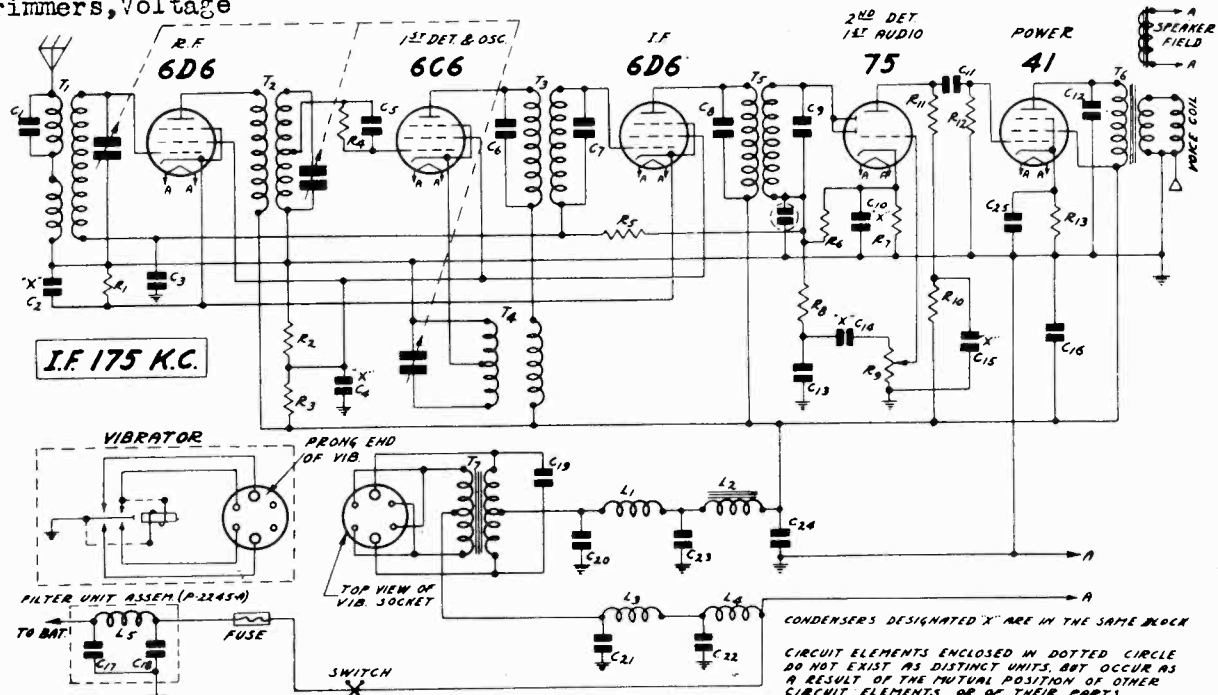


MODEL B-62

Schematic, Socket Trimmers, Voltage

LAFAYETTE RADIO & TELEVISION CORP.

Resistance Test

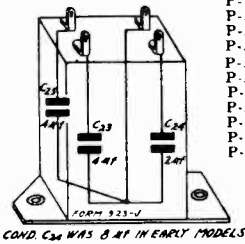
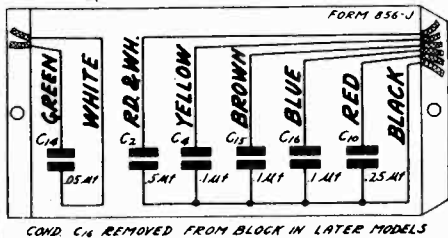


I.F. 175 K.C.

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.

Part No.	Item	Code	D.C. Resistance in Ohms
P-5247	Antenna Trans. Pri. in Series	T1	17.50
	Antenna Trans. Sec.	T1	5.25
P-5248	R. F. Interstage Trans. Pri.	T2	2.31
	R. F. Interstage Trans. Sec. (Center Tap to Inside)		3.23
	(Center Tap to Outside)		3.98
P-5249	1st I. F. Trans. Primary	T3	100.00
	1st I. F. Trans. Secondary	T3	100.00
	Oscillator Cathode Coil (Total)	T4	4.50
	Oscillator Plate Coil	T4	9.00
P-5250	2nd I. F. Trans. Pri.	T5	100.00
	2nd I. F. Trans. Sec.	T5	100.00
P-50656	Power Trans. Pri.	T7	0.36
	Power Trans. Sec.	T7	860.00
P-5174	"A" R. F. Choke	L1	1.65
P-50657	Power Choke	L2	390.00
P-5251	"A" Choke	L3	Small
P-5253	Line Choke	L4	Small
P-5252	Choke Coil	L5	Small
	Output Trans. Pri.	T6	690.00
P-2228	Output Trans. Sec. and Speaker Field		0.80 6.00



CONDENSERS

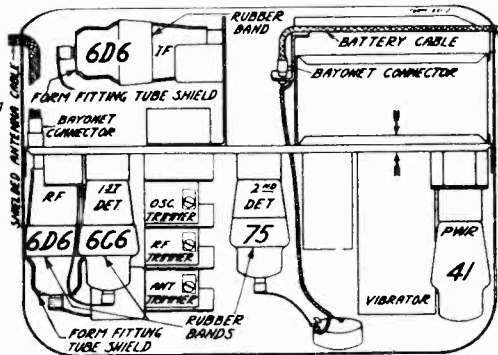
Part No.	Code	Capacity	Voltage	Type
P-81814	C1	250 mmf.	Part of Antenna (Coil Assembly)	
	C2	50 mf.	200V.	Bypass Block
	C4	10 mf.	140V.	
P-82600D	C10	25 mf.	140V.	
	C14	05 mf.	300V.	
	C15	10 mf.	200V.	
P-81116	C3	05 mf.	200V.	Tubular
P-81815	C5	35 mmf.	Part of Grid Leak Assembly	
P-81806	C6	70 mmf.	Part of 1st I. F. & Osc. Coil Assembly	
P-81806	C7	70 mmf.	Part of 2nd I. F. Coil Assembly	
	C8	70 mmf.		
	C9	70 mmf.		
P-81120	C11	05 mf.	300V	Tubular
P-81122	C12	006 mf.	600V.	Tubular
P-81121	C13	250 mmf.	300V.	Moulded
P-81816	C16	10 mf.	300V.	Tubular
	C17	01 mf.	120V.	[In Choke Condenser Unit]
	C18	01 mf.	120V.	
	C19	007 mf.	1600V.	Tubular
	C20	10 mf.	300V.	Tubular
	C21	50 mf.	140V.	Tubular
	C22	002 mf.	Moulded	
	C23	4.0 mf.	250V.	Dry Electrolytic Block
P-82002	C24	2.0 mf.	250V.	
	C25	4.0 mf.	25V.	
P-82500		Gang Condenser		

RESISTORS

Part No.	Code	Resistance	Wattage	Type
P-B94351ww	R1	350 Ohm	.5	Flexible Wire Wound
P-B95253	R2	25,000 Ohm	.5	Carbon
P-B95103	R3	10,000 Ohm	.5	Carbon
P-A95105	R4	1 Megohm	.2	Carbon
P-A95105	R5	1 Megohm	.2	Carbon
P-A95504	R6	500,000 Ohm	.2	Carbon
P-A94752	R7	7,500 Ohm	.2	Carbon
P-A95104	R8	100,000 Ohm	.2	Carbon
P-96017	R9	2 Megohm		Volume Control and Switch
P-A95503	R10	50,000 Ohm	.2	Carbon
P-A95204	R11	200,000 Ohm	.2	Carbon
P-A95504	R12	500,000 Ohm	.2	Carbon
P-B94801ww	R13	800 Ohm	.5	Flexible Wire Wound

Condenser Block Internal Wiring				Electrolytic Block Internal Wiring		
Type of Tube	Function	Volts at Heater	Plate to Cathode	Screen to Cathode	Grid to Cathode	Normal Plate M.A.
6D6	R. F.	6.2	154	95	3.0	5.2
6C6	1st Det. & Osc.	6.2	160	97	0	3.0
6D6	I. F.	6.2	154	95	3.0	5.2
75	2nd Det. & 1st A. F.	6.2	110	—	1.	.25
41	Power	6.2	143	146	14.	13.0

VOLTAGES AT SOCKETS  
Input 6.3 volts  
Antenna disconnected at connector.



Location of Tubes and Vibrator

LAFAYETTE RADIO MFG. CO.

MODEL 80-M  
2 Types  
Schematics

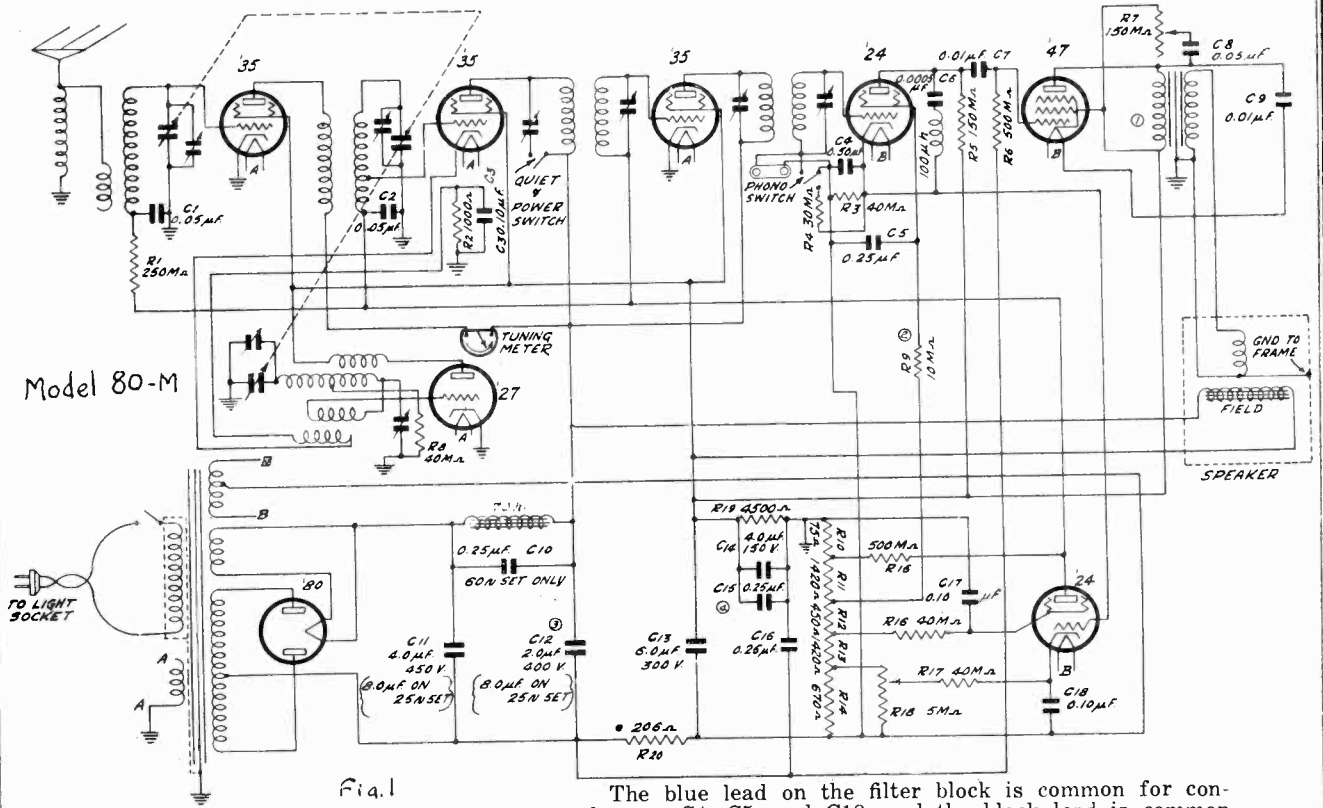


Fig. 1

IF PEAK 175 KC.

The blue lead on the filter block is common for condensers C4, C5, and C18, and the black lead is common for condensers C3, C15, C16, and C17. The second detector plate filter choke is also contained in the block and is connected by two yellow leads, C8, (white-red leads) and C10 (red leads) are connected as shown in Fig. 1 schematic

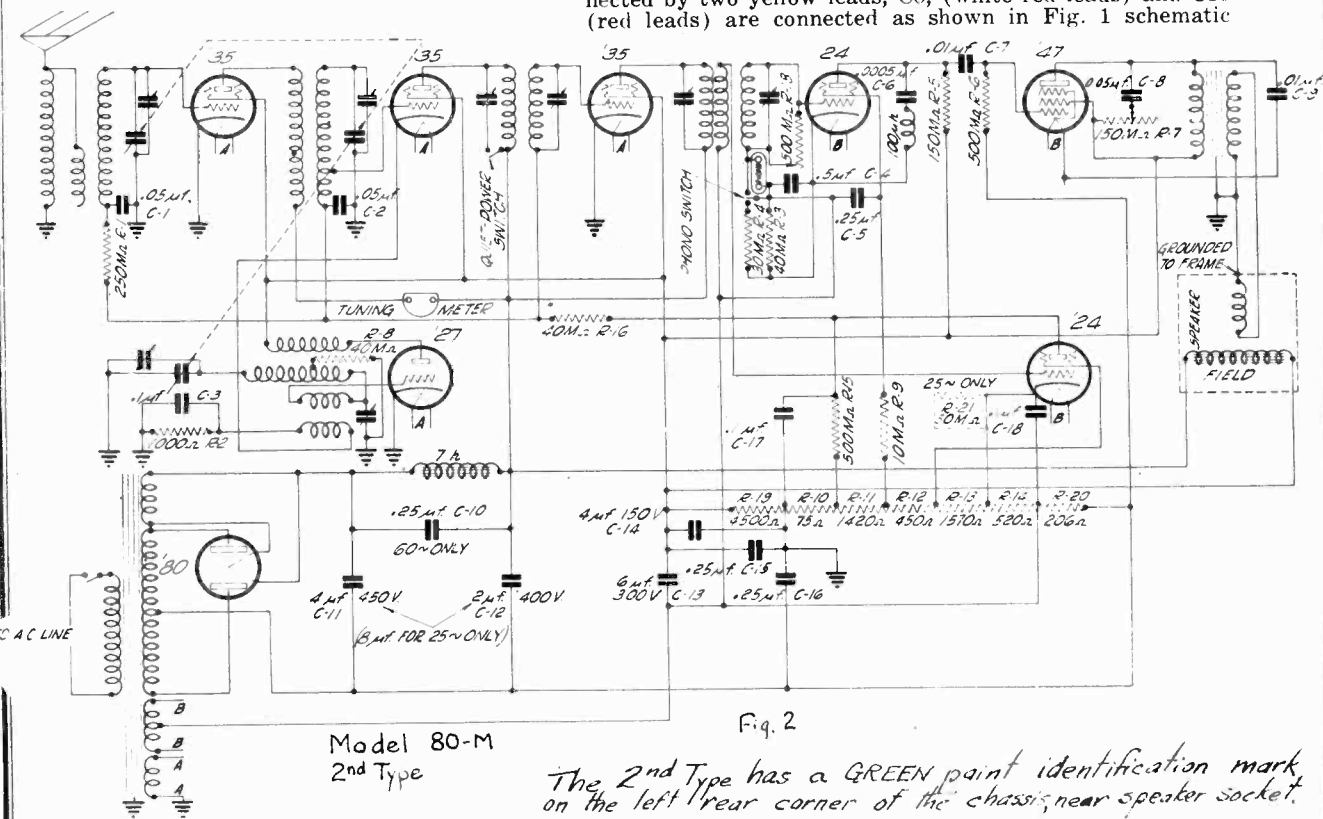


Fig. 2

Model 80-M  
2nd Type

The 2nd Type has a GREEN paint identification mark on the left rear corner of the chassis, near speaker socket.

MODEL 80-1  
Alignment, Parts

LAFAYETTE RADIO MFG. CO.

**INTERMEDIATE CIRCUITS.**—Tune the test oscillator to exactly 175 K.C., and connect its output to the grid of the first detector tube after removing the clip on the tip of the tube. Connect the output meter across the secondary of the speaker coupling transformer and then adjust all four condensers which tune the intermediate transformers, for the greatest deflection on the output meter. Check the settings of all four condensers to make certain the maximum output has been obtained.

When the above instructions have been followed remove the test oscillator coupling and replace the grid clip on the tip of the first detector tube.

**GANG CONDENSERS.**—Turn the gang condenser plates all the way in and see that the dial pointer is on the first dial division point below 550 K.C.

Tune the test oscillator to 1,400 K.C., turn the dial to read 1,400 K.C., and then adjust each gang condenser trimmer for maximum output.

**OSCILLATOR.**—Tune the test oscillator to 600 K.C., and tune the receiver to the signal. Disconnect the output meter and then, rotate the adjusting screw on the oscillator 600 K.C. tracking condenser. Rock the gang condenser back and forth across the signal at the same time, and listen closely until the maximum volume is obtained. The tracking condenser is then properly adjusted and remains fixed thereafter.

The gang condenser trimmers only must then be adjusted again at 1,400 K.C. for maximum output.

The receiver should be accurately aligned if the above instructions have been followed and no further adjustments need be made.

**REPAIR PARTS LIST**

"<sup>1st</sup> only" precedes the names of the parts used only on the Series <sup>80-14</sup> Chassis. "<sup>2nd</sup> only" precedes the names of the parts used only on the Series <sup>80-14 Type 2</sup> Chassis. When ordering repair parts, the number of the parts and the serial number of the chassis MUST be given.

Part No.	Name
1318	'35 Tube Socket
1316	'27 Tube Socket
1315	'24 Tube Socket
1322	'47 Tube Socket
1312	'80 Tube Socket
1387	Speaker Socket
1396	Antenna Transformer Assembly (no shield)
1397	Interstate R.F. Trans. Assembly (no shield)
1391	1st I.F. Transformer Assembly (with shield)
1400	Oscillator Coil Assembly (no shield)
1392 <sup>1st</sup>	ONLY, 2nd I.F. Transformer Assembly (with shield)
1446 <sup>2nd</sup>	ONLY, 2nd I.F. Transformer Assembly (with shield)
50539	Power Transformer, 60-cycle
50540	Power Transformer, 25-cycle
50537	Speaker Coupling Transformer
50538	Power Supply Choke
1092	Grid Clip Assembly
1402	"QUIET POWER" (S.P.S.T.) Switch
1054	"ON-OFF" Toggle Switch
20406	Tube Shield
1273	2 1/2-volt Dial Lamp
1336	Control Knob
1388	Escutcheon Plate
40412	Shield for R.F. and Oscillator Coils

1011	"PHONO" Switch, S.P.D.T.
1193	Phono Jacks Assembly
70719	Shielded Volume Control Wire Assembly
10142	1/2" Rubber Washer (for gang condenser mounting)
10143	1/4" Rubber Washer (for gang condenser mounting)
20252	3/4" Flat Metal Washer (for gang condenser mounting) 10 for
20388	Gang Condenser Cover
30365	Bushing for Rubber Pinion
10182	Rubber Pinion
20438	Drive Shaft
1384-C	Resonance Meter
1394	Dial Strip and Bracket Assembly
1363	Drive Bracket and Bearing Assembly
1382	Drive Disc, Hub and Fulcrum Assembly
1393	Indicator Assembly
70702	A.C. Cord and Plug
1407	Dial Lamp Clip Assembly (no lamp)

**RESISTORS**

Part No.	Key No.	Resistance	Type	Identification Base End Dot
90954-B	R-1	250,000 ohm	Carbon	Red Green Yellow
90940	R-2	1,000 ohm	Carbon	Brown Black Red
90916	R-3	40,000 ohm	Carbon	Yellow Black Orange
90956	R-4	30,000 ohm	Carbon	Orange Black Orange
90963	R-5	150,000 ohm	Carbon	Brown Green Yellow
90938-B	R-6	500,000 ohm	Carbon	Green Black Yellow
90984	R-7	500,000 ohm	Tone Control	
90916	R-8	40,000 ohm	Carbon	Yellow Black Orange
90930	R-9	10,000 ohm	Carbon	Brown Black Orange
90938	R-15	500,000 ohm	Carbon	Green Black Yellow
90916	R-16	40,000 ohm	Carbon	Yellow Black Orange
90916	R-17	40,000 ohm <sup>1st</sup>	ONLY CARBON	Yellow Black Orange
90983	R-18	5,000 ohm <sup>1st</sup>	Only Vol. Control	
90988	R-18	500,000 ohm <sup>2nd</sup>	Only Vol. Control	
	R-10	75 ohm		
	R-11	1,420 ohm		
	R-12	450 ohm		
90985	R-13	1,420 ohm	<sup>1st</sup> ONLY CANDOHM	
	R-14	670 ohm		
	R-19	4,500 ohm		
	R-20	206 ohm		
	R-10	75 ohm		
	R-11	1,420 ohm		
	R-12	450 ohm		
90989-A	R-13	1,570 ohm	<sup>2nd</sup> ONLY CANDOHM	
	R-14	520 ohm		
	R-19	4,500 ohm		
	R-20	206 ohm		

**CONDENSERS**

Part No.	Key No.	Capacity	Type	Voltage Rating
80862	C-1	.05 mfd.	Tubular	400 V.
80862	C-2	.05 mfd.	Tubular	400 V.
80855	C-6	.0005 mfd.	Molded	
80872	C-7	.01 mfd.	Tubular	500 V.
80872	C-9	.01 mfd.	Tubular	500 V.
80873-B	C-11	4.0 mfd.	Dry Electrolytic	450 V.
80874	C-12	2.0 mfd.	Dry Electrolytic	450 V.
80875	C-13	6.0 mfd.	Dry Electrolytic	450 V.
80878	C-14	4.0 mfd.	Dry Electrolytic	150 V.
	C-3	.1 mfd.		160 V. White-Green
	C-4	.5 mfd.		160 V. White
	C-5	.25 mfd.		160 V. White-Brown
	C-8	.1 mfd.		600 V. White-Red
	C-10	.25 mfd.		160 V. Red (2)
80876-G	C-15	.25 mfd.	Block	160 V. Brown
	C-16	.25 mfd.		200 V. Green
	C-17	.1 mfd.		160 V. White Green
	C-18	.1 mfd.		160 V. Black-White-Yellow
			Detector plate filter choke	
80871			Gang cond. only, no cover, dial assem. or drive assem.	
1385			Oscillator 600 K.C. adjustable tracking condenser	

## LAFAYETTE RADIO MFG. CO.

MODEL 80-M

Socket, Voltage  
Alignment, Pickup Data

## Voltages at Sockets

The voltages shown in the chart were taken with a 1,000 ohm per volt voltmeter; voltage measurements taken with a voltmeter having a different resistance will, of course, differ from those shown.

Turn the volume control all the way on, connect the antenna and ground leads together and turn the gang condenser plates all the way out. Check the line voltage.

Tube	Circuit	LINE VOLTAGE				
		90 V.	100 V.	110 V.	120 V.	130 V.
R. F. '35	Screen-Grid Plate	70	78	85	92	100
		143	159	175	191	207
1st Det. '35	Screen-Grid Plate	70	78	85	92	100
		143	159	175	191	207
I. F. '35	Screen-Grid Plate	70	78	85	92	100
		143	159	175 <td 191	207	
Oscillator '27	Plate	70	78	85	92	100
2nd Det. '24	Screen-Grid Plate	66	73	80	87	94
		127	134	141	148	155
A. V. C. '24	Grid Screen-Grid	14	15.5	17	18.5	20
		24	26	28	30	32
Audio '47	Accelerating-Grid Plate	199	221	244	267	289
		171	190	210	230	250
Rectifier '80	Current (both plates) Plate to Plate Volt.	67	75	82	89	96
		M.A	M.A	M.A	M.A	M.A
		512	569	625	682	739

## Condenser Alignment

A thorough check of the receiver should be made before any attempt is made to re-align any circuits. Examine the antenna and ground connections. Test all the tubes and check all voltages to determine if the failure of the receiver to operate properly is not due to some fault other than misalignment. A superheterodyne receiver must be accurately aligned to be selective and sensitive. This receiver has been accurately aligned at the factory, and due to the mechanical design of the gang and adjustable condensers, will not lose its alignment unless damaged by abuse or accident.

A modulated test oscillator and an output meter **MUST** be used when aligning this receiver to insure accurate alignment. It is important that the oscillator deliver a signal at exactly 175 K.C. in addition to frequencies in the broadcast band.

The adjustable condensers which tune the primaries and secondaries of the I.F. transformers are adjusted by inserting a screw driver through the holes in the chassis base directly below the I.F. transformer assemblies.

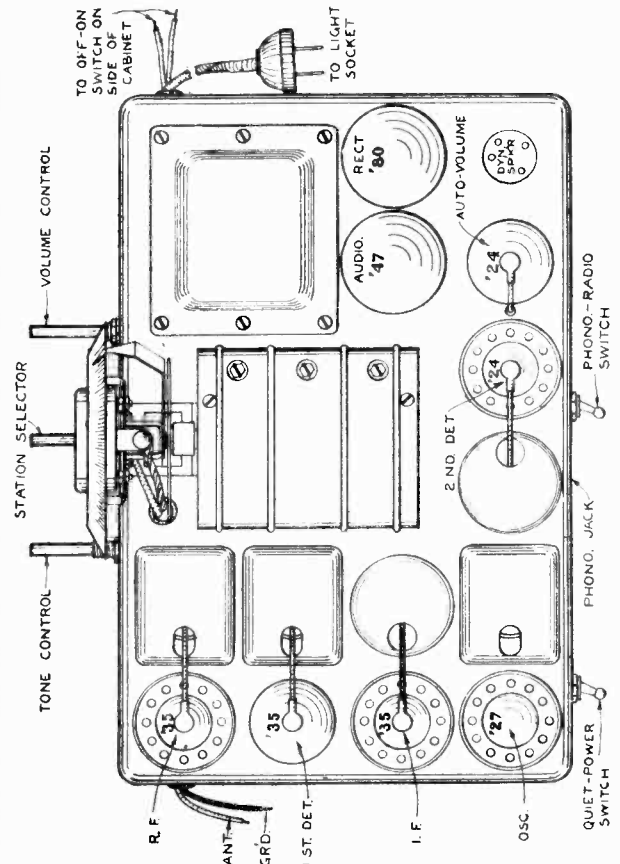
A trimmer condenser is mounted over each section in the gang and is adjusted by turning the screw located under the hole in the top of the gang shield.

The oscillator 600 K.C. tracking condenser is on the back of the chassis near the "QUIET-POWER" switch.

Make each adjustment in the order given below or the receiver may be thrown further out of alignment and it will then be a difficult task to align it properly.

The receiver and test oscillator must be well grounded and the output kept within the range of the output meter at all times.

All shields must be in place when making the adjustments.



## Phonograph Pickup

A high impedance pickup is recommended for use with this receiver, as that type gives greatest volume when a transformer is not available. A transformer should be used with a low impedance pickup, as that type of pickup generally does not otherwise provide sufficient volume. A transformer having a ratio of 4 to 1 will prove satisfactory in most instances.

A pickup with a self-contained volume control is required as the volume control on the chassis cannot be used to adjust the volume.

To connect the pickup, remove the wire between the two jacks, mounted on bakelite on the rear of the chassis, and plug in the tips of the pickup cord. The word "PHONO" is stamped on the bakelite. Turn the receiver on and then throw the switch, near the center, on the back of the chassis, to the right. The pickup will then be connected and records may be played.

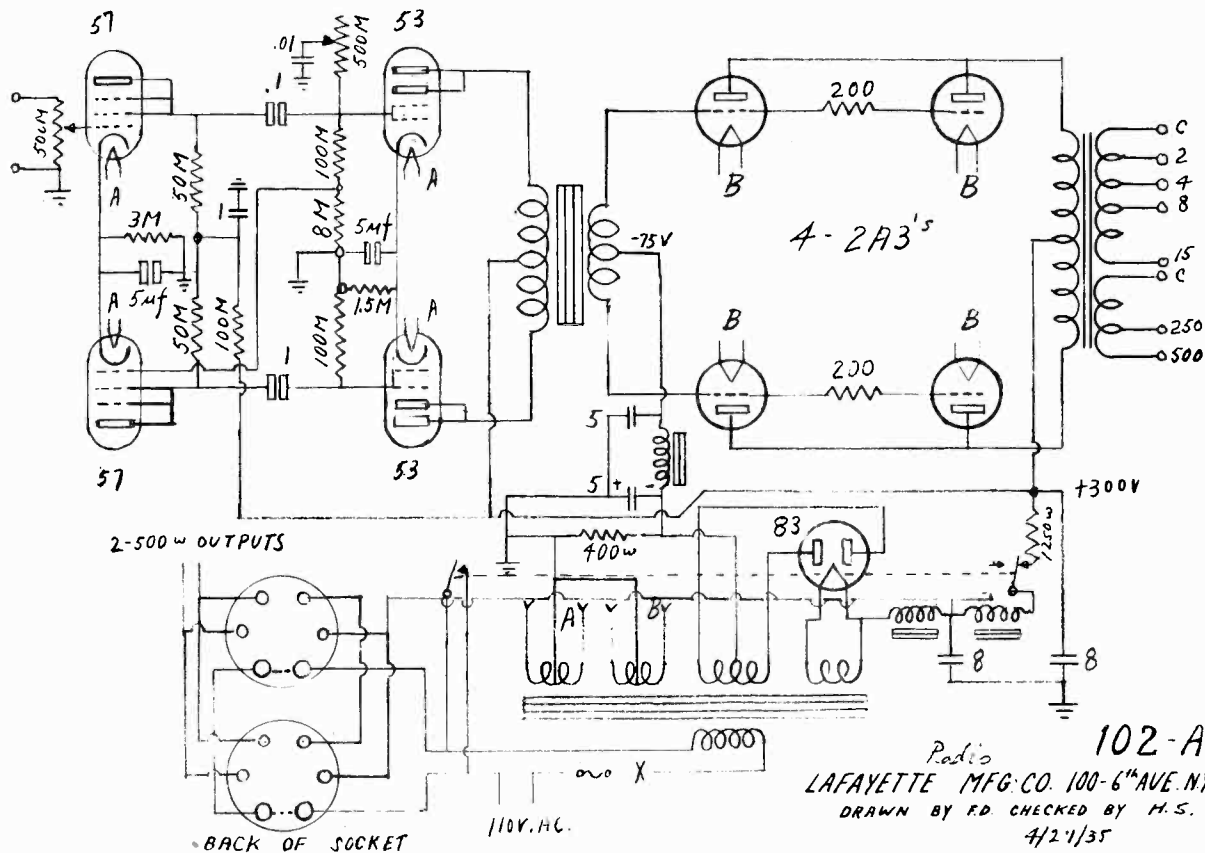
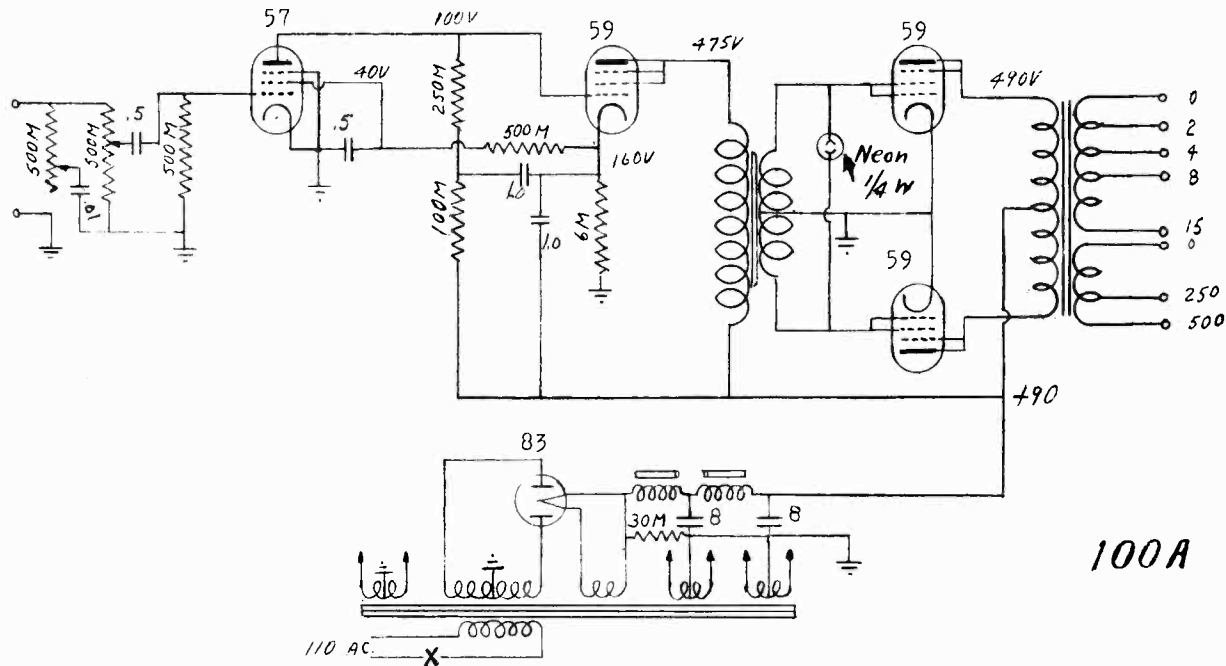
The switch connects the pickup in the grid circuit of the second detector tube and connects the 30,000 ohm cathode bias resistor (R4) so that a proper bias is obtained for record reproduction.

When a transformer is used, connect the pickup cord tips to the primary of the transformer and connect the secondary to the phono jacks on the chassis.

When it is desired to tune in broadcast signals it is only necessary to throw the switch to the left. The pickup cords must not be removed. If, for any reason, they are removed, the wire which originally connected the phono jacks **must** be replaced before the receiver is used for broadcast reception.

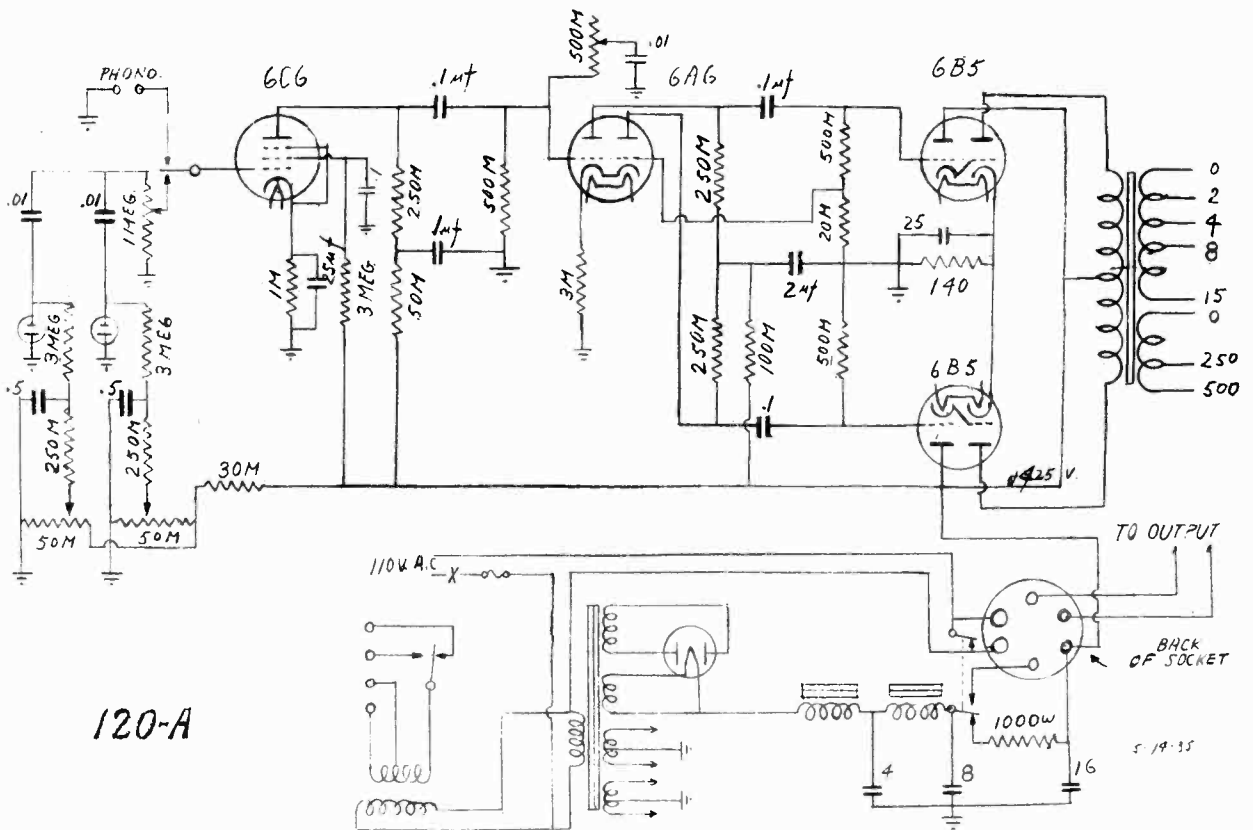
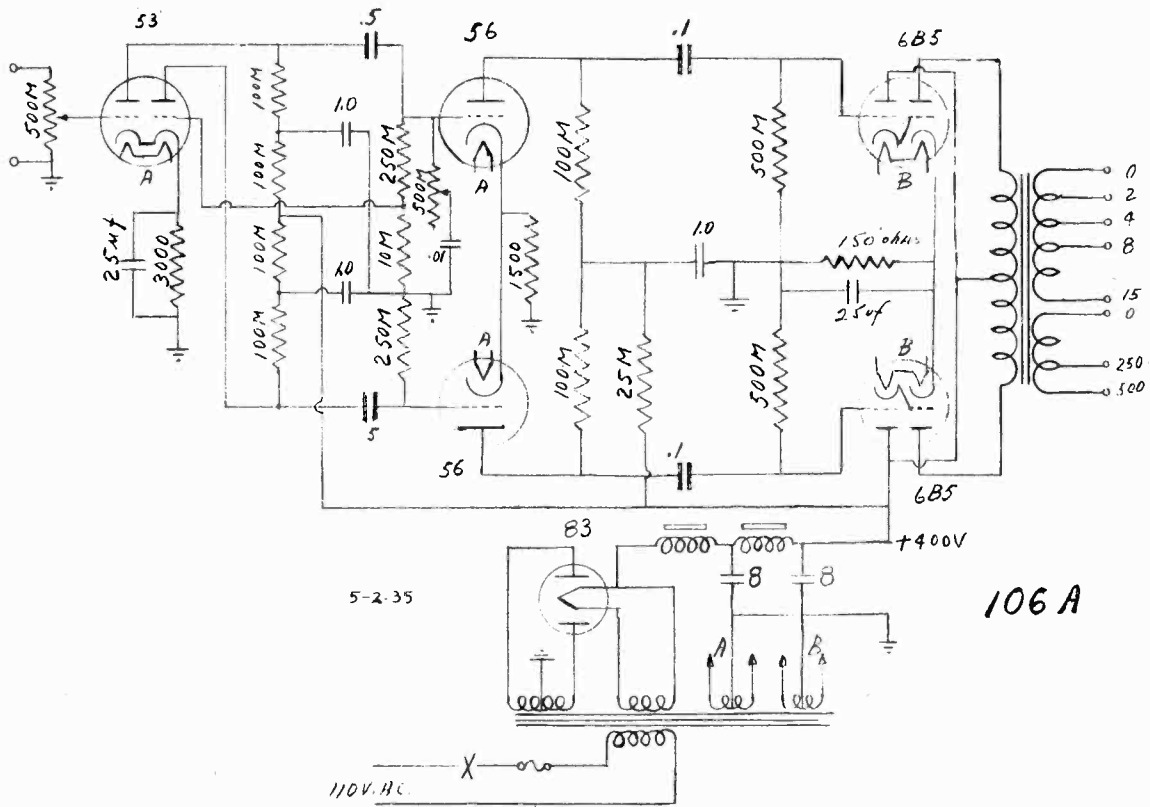
MODEL 100A  
MODEL 102A  
Schematics

LAFAYETTE RADIO MFG. CO.



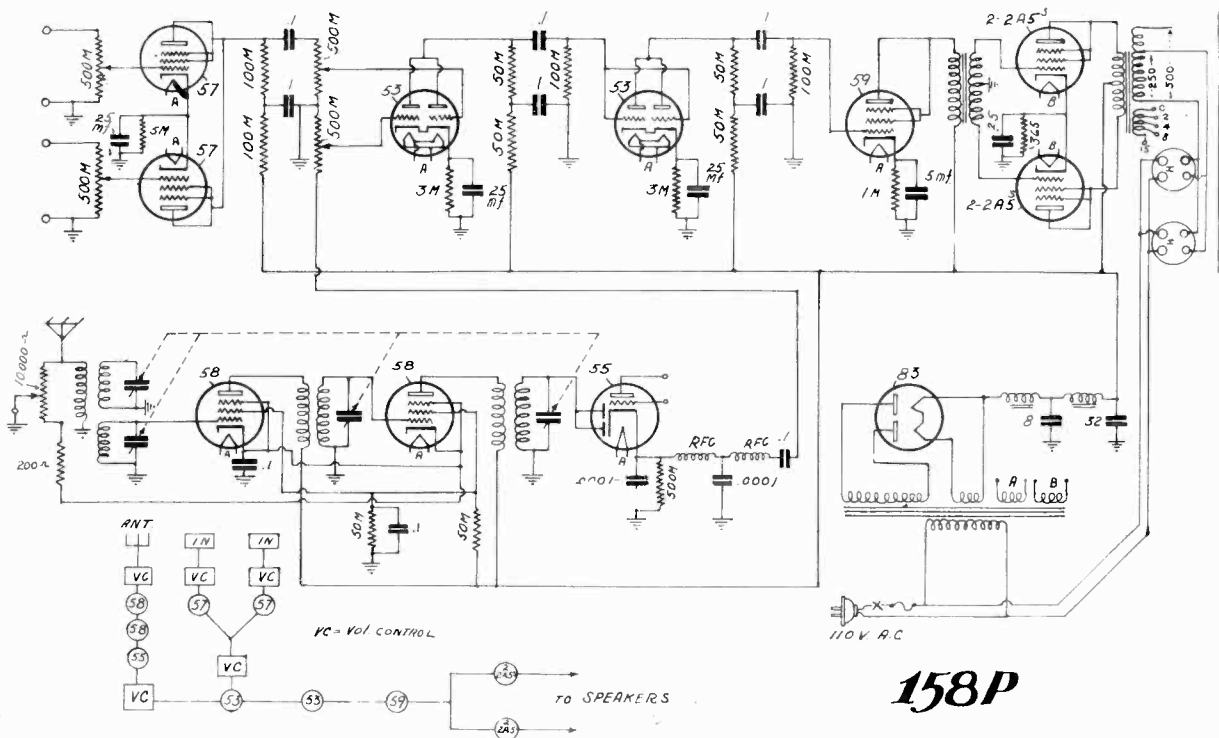
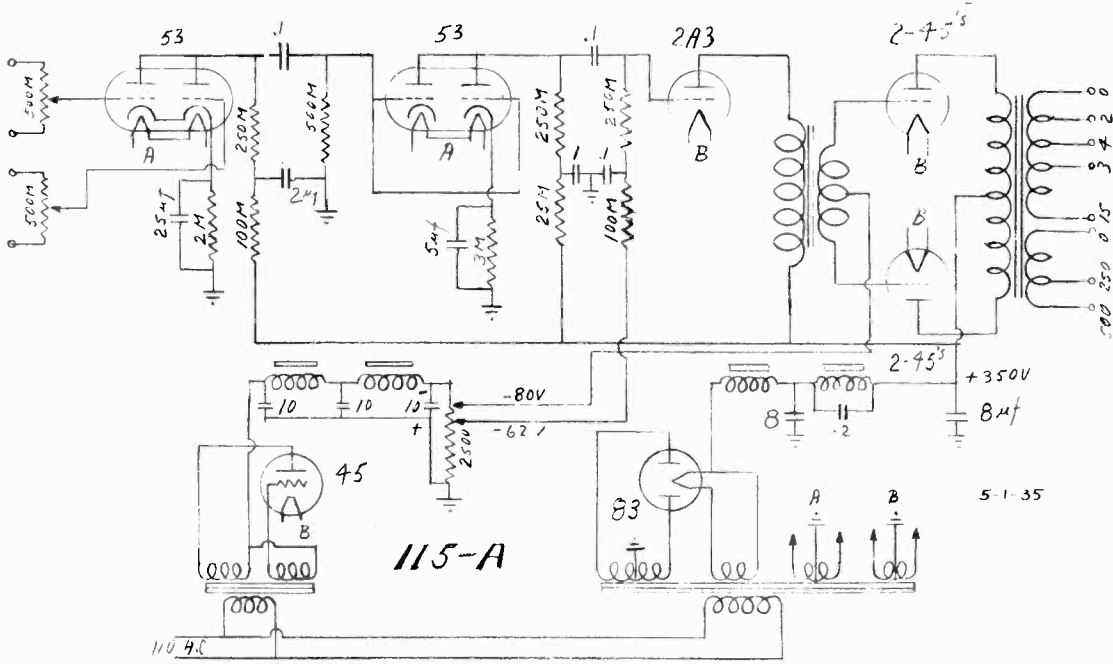
LAFAYETTE RADIO MFG. CO.

MODEL 106-A  
MODEL 120-A  
Schematics



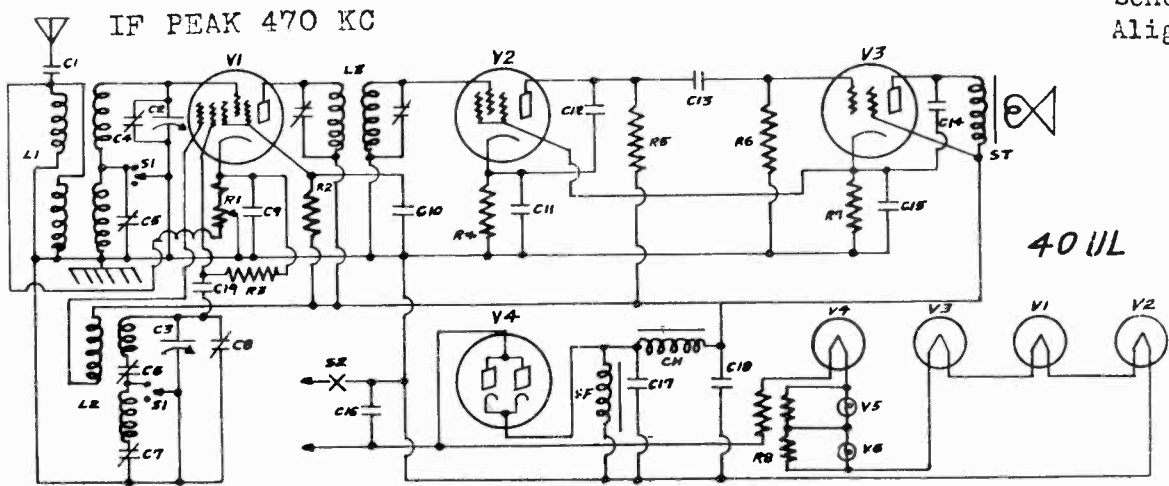
MODEL 115A  
MODEL 158P  
Schematics  
Voltage

LAFAYETTE RADIO MFG. CO.



LANG RADIO CORP. (New Co.)

MODEL 40-UL  
MODEL 50-US  
Schematics  
Alignment

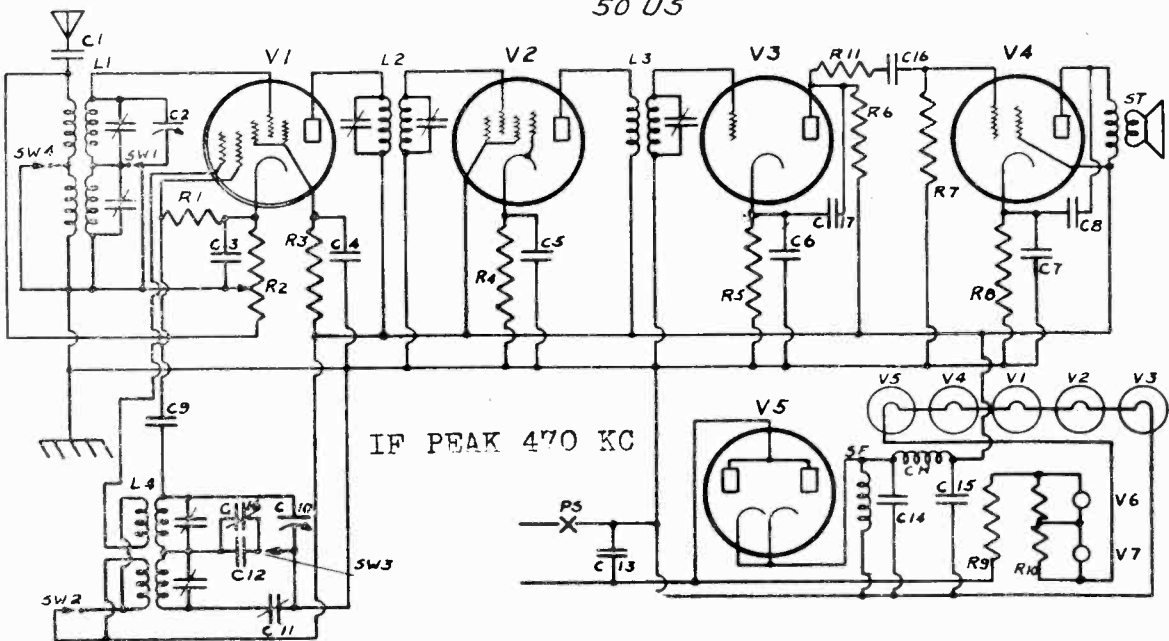


40 UL

- |                      |                                 |                        |
|----------------------|---------------------------------|------------------------|
| V1—6A7 Tube          | C9—10-16—.05 Mf. Cond.          | R7—700w Resistor       |
| V2—6C6 Tube          | C11—15—10 Mf. Cond.             | R8—150-25-25 Resistor  |
| V3—43 Tube           | C12—19—.00025 Mf. Cond.         | L1—Antenna Coil        |
| V4—25Z5 Tube         | C13—14—.01 Mf. Cond.            | L2—Oscillator Coil     |
| V5—6—6-8V Pilot Bulb | C17—12 Mf. Cond.                | L3—DT IF Trans—470 KC  |
| C1—.002 Mf. Cond.    | C18—8 Mf. Cond.                 | S1—Band Switch         |
| C2-3—365 Mmf. Cond.  | R1—10,000w Vol. Cont. 120w Min. | S2—Power Switch        |
| C4-5-8—40 Mmf. Cond. | R2—15,000w Resistor             | ST—Speaker Trans.      |
| C6—500 Mmf. Cond.    | R3-4—20,000 Resistor            | SF—Speaker Field—3000w |
| C7—140 Mmf. Cond.    | R5-6—500,000 Resistor           | CH—Choke Coil          |

TO ALIGN RECEIVER: Apply 470 KC to Grid of V1 and adjust L3—Turn Band Switch to Broadcast. Apply 1400 KC to Ant. and Adjust C4 and C8. Apply 600 KC and Adjust C6. Turn to Long Wave—Apply 150 KC and adjust C7—Apply 300 KC and adjust C5.

50 US



- |                              |                           |                            |
|------------------------------|---------------------------|----------------------------|
| V1—6A7                       | C3, 4, 5, 13—.05 Mfd.     | R3—15,000 Ohms             |
| V2—6D6                       | C8, 16—.01 Mfd.           | R4—400 Ohms                |
| V3—76                        | C9—.0001 Mfd.             | R6, 7—500,000 Ohms         |
| V4—43                        | C11, 16—300-600 Mmf.      | R8—700 Ohms                |
| V5—25Z5                      | C12—.0018 Mfd.            | R9—130 Ohms (Line Cord)    |
| V6, 7—6-8 V. Pilot Lamps     | C6, 7—10 Mfd.             | R10—25-25 Ohms             |
| L1—Antenna Coil              | C14—12 Mfd.               | CH—Filter Choke            |
| L2—D.T. I.F. Trans.—470 K.C. | C15—8 Mfd.                | PS—Power Switch            |
| L3—S.T. I.F. Trans.—470 K.C. | C17—.0005 Mfd.            | SF—Speaker Field-3000 Ohms |
| L4—Oscillator Coil           | R1, 5, 11—50,000 Ohms     | ST—Speaker Transformer     |
| C1—.002 Mfd.                 | R2—10,000 Ohms Vol. Cont. | SW 1, 2, 3, 4—Band Switch  |
| C2, 10—365 Mmf.              | 120 Mmf. Min.             |                            |

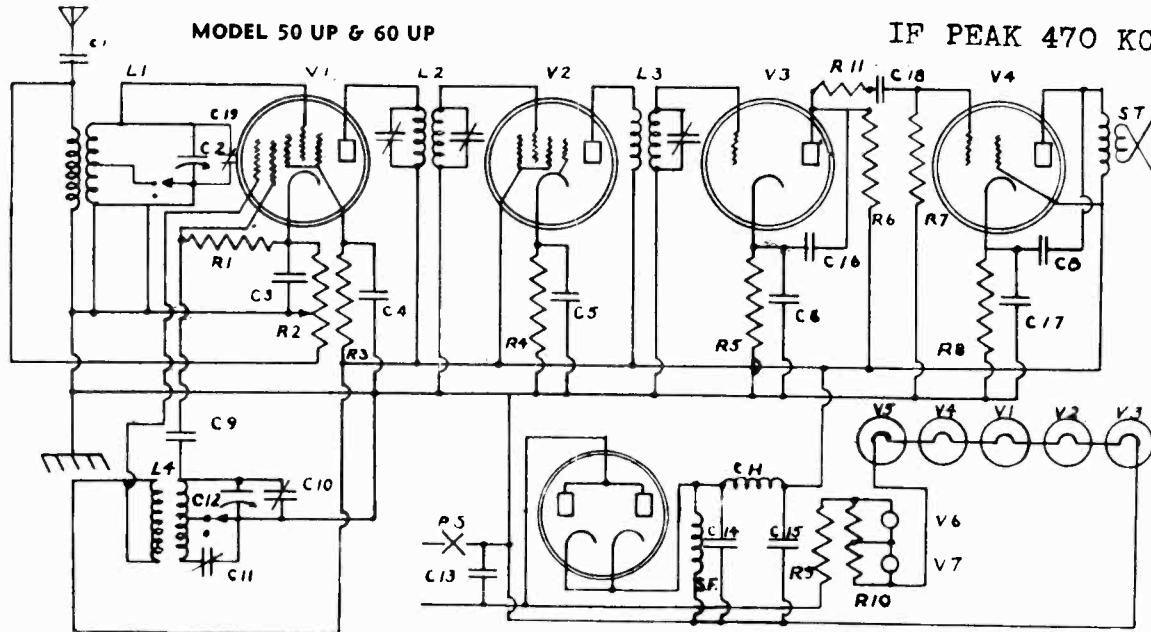
TO ALIGN RECEIVER:—Turn band switch to Short Wave. Short C10. Apply 470 kilocycles to grid of V1 and adjust L2 trimmers and L3 trimmer. Remove short from C10. Set dial to 15 megacycles calibration. Apply this frequency to antenna and adjust L4 short wave trimmer. Adjust L1 short wave trimmer. Turn band switch to Broadcast. Set dial to 150 calibration. Adjust L4 broadcast trimmer. Adjust L1 broadcast trimmer. Set dial to 60 calibration and adjust C11. Return dial to 150 calibration and re adjust L4 broadcast trimmer.



MODELS 50-UP, 60-UP  
MODEL 50-AS

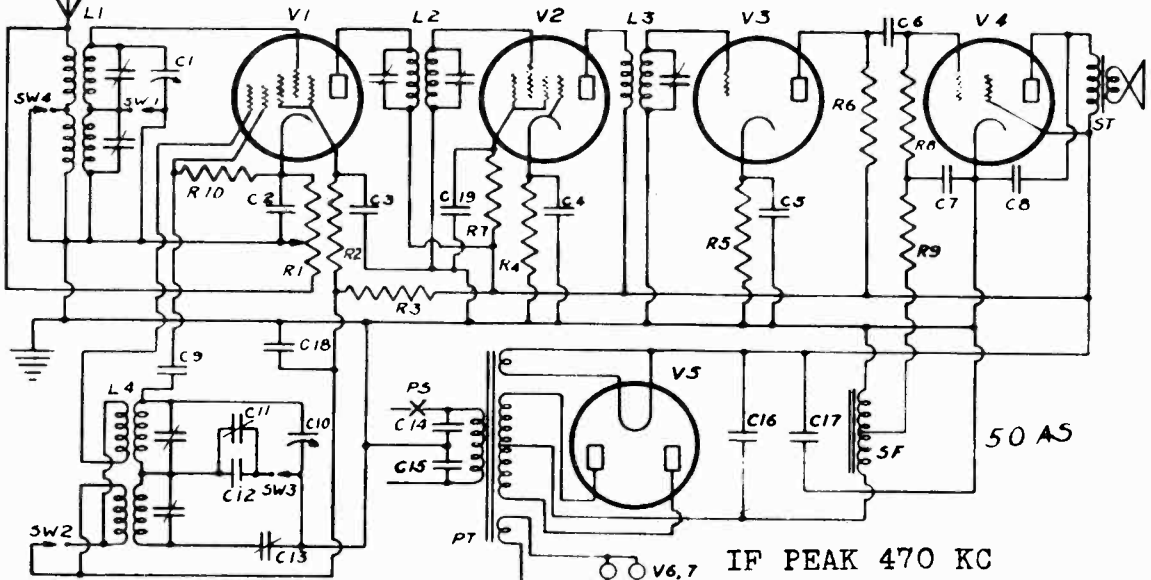
LANG RADIO CORP. (New Co.)

Schematics, Alignment



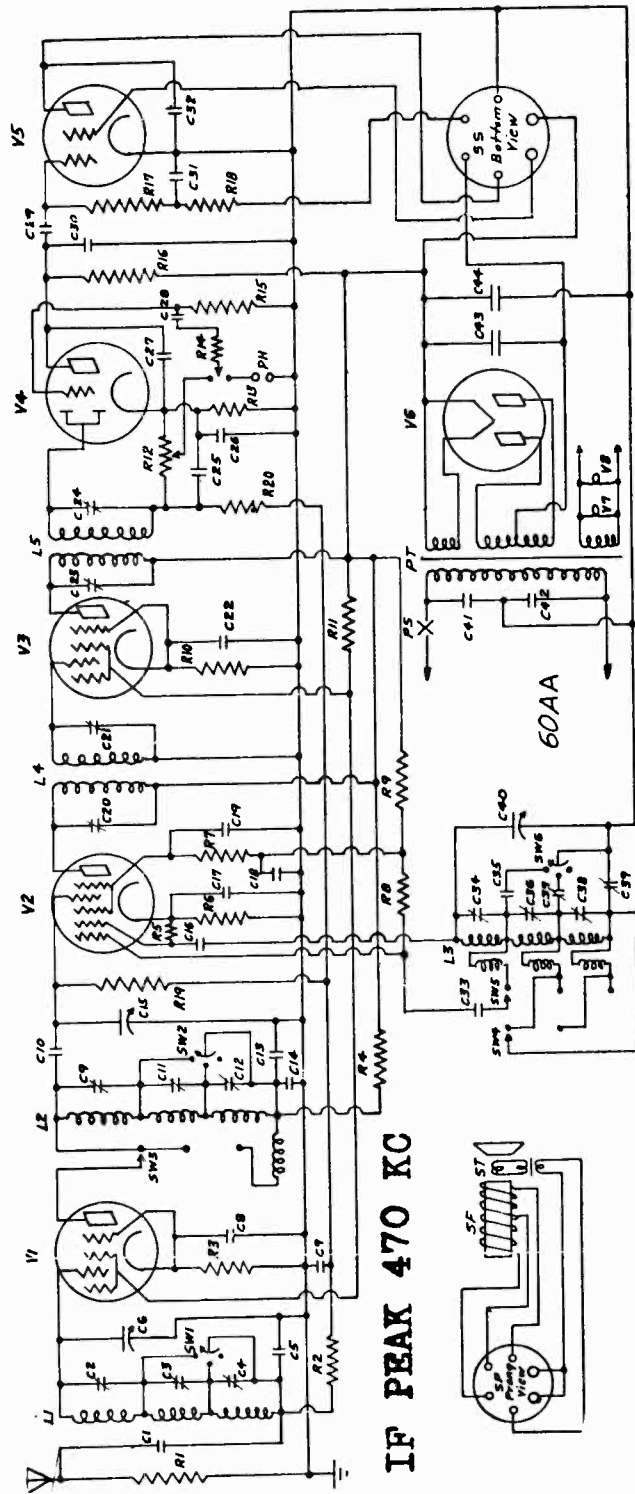
TO ALIGN RECEIVER:—Turn band switch to Short Wave. Short C12. Apply 470 kilocycles to grid of V1 and adjust L2 trimmers and L3 trimmer. Remove short from C12. Turn band switch to Broadcast. Set dial to 150 calibration. Adjust L4 broadcast trimmer. Adjust L1 broadcast trimmer. Set dial to 60 calibration and adjust C11. Return dial to 150 calibration and readjust L4 broadcast trimmer.

- |                            |                       |                                       |
|----------------------------|-----------------------|---------------------------------------|
| V1—6A7                     | C1—.002 Mfd.          | R1, 5, 11—50,000 Ohms                 |
| V2—6D6                     | C2, 12—365 Mmfd.      | R2—10,000 Ohms Vol. ont.              |
| V3—76                      | C3, 4, 5, 13—.05 Mfd. | R3—15,000 Ohms                        |
| V4—43                      | C10, 19—20 Mmfd.      | R4—400 Ohms                           |
| V5—25Z5                    | C8, 18—.01 Mfd.       | R6, 7—500,000 Ohms                    |
| V6, 7—6-8V. Pilot Lamp     | C6, 17—10 Mfd.        | R8—700 Ohms                           |
| L1—Ant. Coil               | C14—12 Mfd.           | R9—130 Ohms Line Cord or Ballast Tube |
| L2—D.T. I.F. Transformer   | C15—8 Mfd.            | R10—25-25                             |
| L3—S.T. I.F.               | C9, 16—.00025 Mfd.    | P.S.—Power Switch                     |
| L4—Oscillator Coil         | C11—600 Mmfd.         | S.F.—Speaker Field                    |
| SI, 2—Band Selector Switch | Ch—Filter Choke       | S.T.—Speaker Transformer              |



- |                          |                         |                   |                           |
|--------------------------|-------------------------|-------------------|---------------------------|
| V1—6A7                   | L4—Oscillator Coil      | C11, 13—600 Mmfd. | R1—10,000 Ohms Vol. Cont. |
| V2—6D6                   | PS—Power Switch         | C12—.0018 Mfd.    | 120 Ohms Minimum          |
| V3—76                    | C1, 10—365 Mmfd.        | C5—.10 Mfd.       | R2—30,000 Ohms            |
| V4—38                    | C2, 3, 4, 19—.05 Mfd.   | C16—8 Mfd.        | R3—20,000 Ohms            |
| V5—80                    | C6, 14, 15, 18—.01 Mfd. | C18—4 Mfd.        | R4—300 Ohms               |
| V6, 7—6-8 V. Pilot Lamp  | C7—.1 Mfd.              | C17—12 Mfd.       | R5, 9, 10—50,000 Ohms     |
| L1—Antenna Coil          | C9—.0001 Mfd.           |                   | R6, 8—500,000 Ohms        |
| L2—D.T. I.F. Transformer |                         |                   | R7—75,000 Ohms            |
| L3—S.T. I.F. Transformer |                         |                   | R9—50,000 Ohms            |
|                          |                         |                   | PT—Power Transformer      |
|                          |                         |                   | SF—Speaker Field          |
|                          |                         |                   | ST—Speaker Transformer    |
|                          |                         |                   | SW1, 2, 3, 4—Band Switch  |

LANG RADIO CORP. (New Co.)



IF PEAK 470 KC

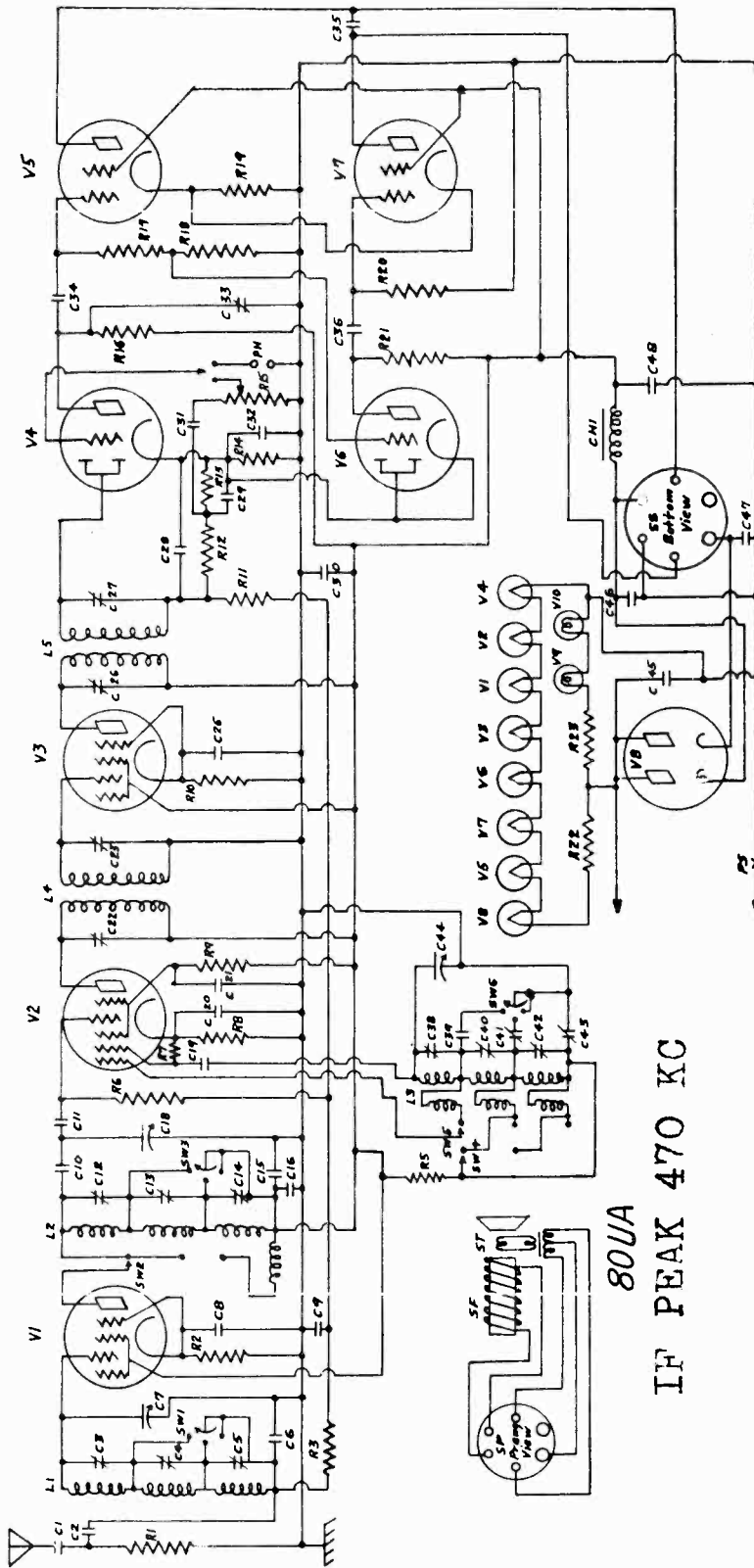
- V1-3—6D6 Tube
- V2—6A7 Tube
- V4-75 Tube
- V5-41 Tube
- V6-80 Tube
- V7-8—6.8V Pilot Bulb
- C1—.0001 Mf.
- C2-3-4-9-11-12-34-36-38—40 Mmf.
- C5—.001819 Mf.
- C6-15-40—440 Mmf.
- C7-8-17-19-22—.05 Mf.
- C10—.003636 Mf.
- C13—.1 Mf.
- C14-18—4 Mf.
- C16—.00005 Mf.
- C20-24—220 Mmf.
- C21-23—140 Mmf.
- C25—.0005 Mf.
- C26—5 Mf.

- C27—.00025 Mf.
- C28-29-41-42—.01 Mf.
- C30—.006 Tone Control
- C31—.25 Mf.
- C32—.006 Mf.
- C33—.002 Mf.
- C35—.001282 Mf.
- C37—1000-2000 Mf.
- C39—300-600 Mf.
- C43-44—8 Mf.
- R1-8—20,000 Ohm
- R2—100,000 Ohm
- R3—400 Ohm
- R4-9—10,000 Ohm
- R5-14—50,000 Ohm
- R6—300 Ohm
- R7—25,000 Ohm
- R10—500 Ohm
- R11—40,000 Ohm

- R12—500,000 Ohm Vol. Cont.
- R13—3,000 Ohm
- R15-17—500,000 Ohm
- R16-18—250,000 Ohm
- R-19-20—1,000,000 Ohm
- L1—Antenna Coil
- L2—R. F. Coil
- L3—Oscillator Coil
- L4—DT IF Trans. 470 KC—Step Up
- L5—DT IF Trans. 470 KC—Step Down
- SW1-2-3-4-5-6—Band Selector Switch
- PS—Power Switch
- PT—Power Transformer
- SS—Speaker Socket
- SP—Speaker Plug
- ST—Speaker Transformer
- SF—Speaker Field—1800 Ohm—Tap 266
- PH—Phono Jack

MODEL 80-UA  
Schematic

LANG RADIO CORP. (New Co.)



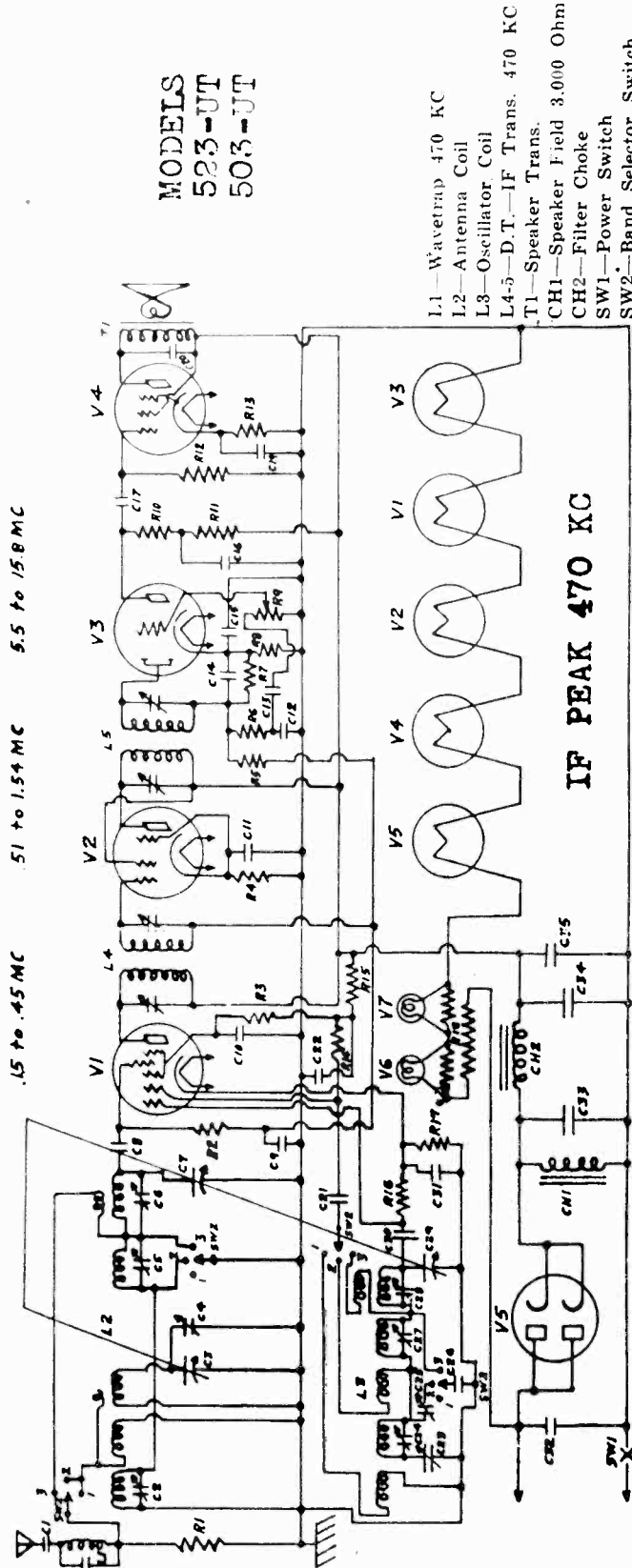
80UA  
IF PEAK 470 KC

- C30—.25 Mf.
- C31-34-36—.01 Mf.
- C33—.006 Tone Control
- C35—.002 Mf.
- C39—.001282 Mf.
- C41—1000-2000 Mmf.
- C43—300-600 Mmf.
- C46-47-48—16 Mf.
- C11-19—.00005 Mf.
- C15—.1 Mf.
- C16-32—4 Mf.
- C22-27—220 Mmf.
- C23-26—140 Mmf.
- C28-29—.00025 Mf.
- L1—Antenna Coil
- L2—R. F. Coil
- L3—Oscillator Coil
- L4—DT IF Trans. 470 KC—Step Up
- L5—DT IF Trans. 470 KC—Step Down
- SW1-2-3-4-5-6—Band Selector Switch
- PS—Power Switch
- SS—Speaker Socket
- SF—Speaker Field—3000 Ohm
- ST—Speaker Transformer
- SP—Speaker Plug
- CH1—Filter Choke
- PH—Phono Jack
- V1-3—6D6 Tube
- V2—6A7 Tube
- V4-6—75 Tube
- V5-7—43
- V8—25Z5 Tube
- V9-10—6-SV Pilot Bulb
- C1—.002 Mf.
- C2—.0001 Mf.
- C3-4-5-12-13-14-38-40-42-40 Mmf.
- C6—.001819 Mf.
- C7-18-44—440 Mmf.
- C8-9-20-21-25-45—.05 Mf.
- C10—.003636 Mf.
- R1—20,000 Ohm
- R2—200 Ohm
- R3-16-21—100,000 Ohm
- R6-11—1,000,000 Ohm
- R8-10—400 Ohm
- R9—15,000 Ohm
- R12-7—50,000 Ohm
- R13—500,000 Ohm
- R14—2,500 Ohm
- R15—500,000 Ohm
- R17-20—250,000 Ohm
- R18-5—10,000 Ohm
- R19—350 Ohm
- R22—50 Ohm
- R23—700 Ohm

LANG RADIO CORP. (New Co.)

MODELS 503-UT, 523-UT  
Schematic, Alignment

MODELS  
523-UT  
503-UT



- L1—Wavetrap 470 KC
- L2—Antenna Coil
- L3—Oscillator Coil
- L4-5—D.T.—IF Trans. 470 KC
- T1—Speaker Trans.
- CH1—Speaker Field 3,000 Ohm
- CH2—Filter Choke
- SW1—Power Switch
- SW2—Band Selector Switch

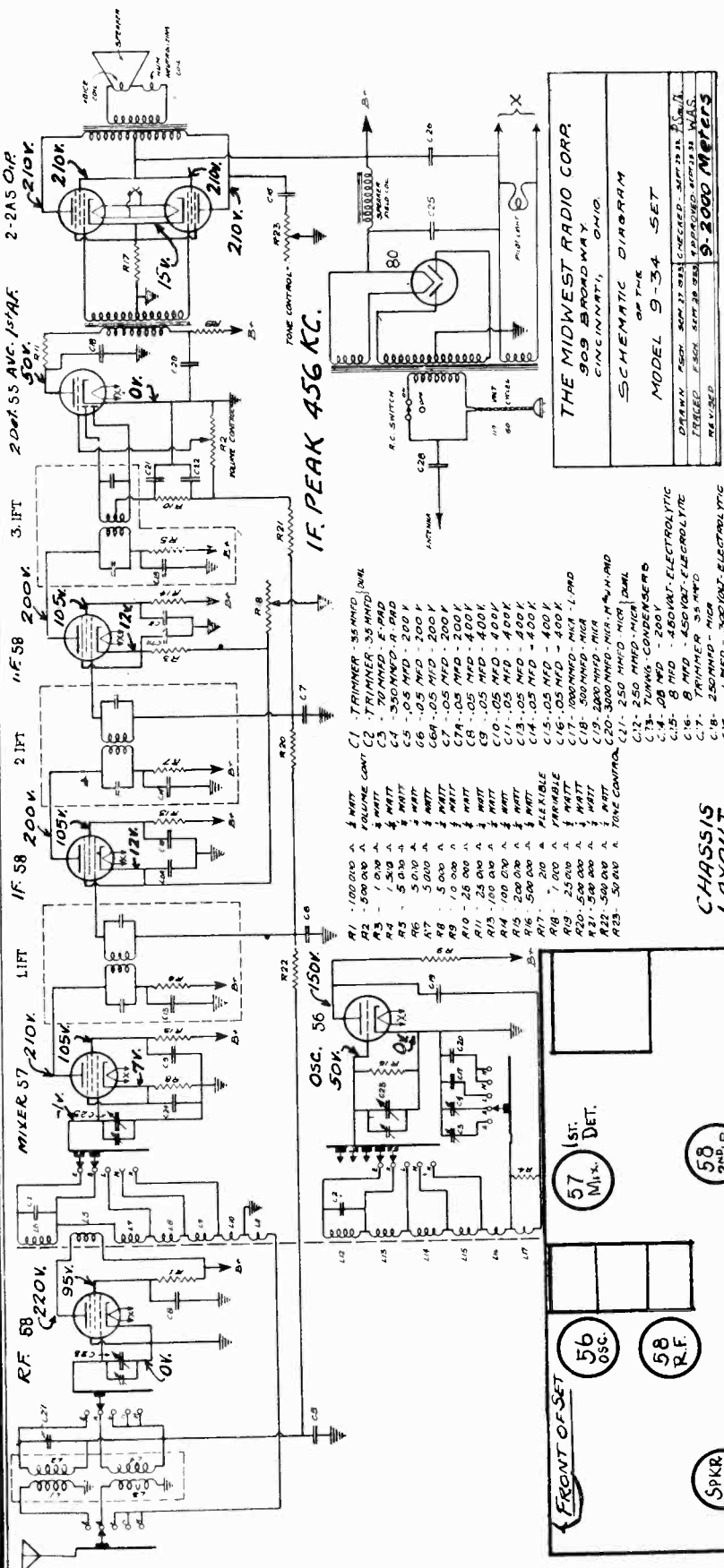
- C1-21—.002 Mf. Cond.
- C2-4-5-6-24-27-28-40 Mmf. Cond.
- C3-7-29-365 Mmf. Cond.
- C8—.0001 Mf. Cond.
- C9-10-11-16-31-32—.05 Mf. Cond.
- C12-14—.00025 Mf. Cond.
- C15-19—.10 Mf. Cond.
- C13-17-20—.01 Mf. Cond.
- C22-34—.8 Mf. Cond.
- C23—.140 Mmf. Cond.
- C25—.500 Mmf. Cond.
- C26—.016 Mf. Cond.
- C30—.00005 Mf. Cond.
- C33—.16 Mf. Cond.
- R1-8—5,000 Ohm Resistor
- R2-5—1,000,000 Ohm Resistor
- R3—15,000 Ohm Resistor
- R13—700 Ohm Resistor
- R6—50,000 Ohm Resistor
- R7—750,000 Ohm Resistor
- R10-11—100,000 Ohm Resistor
- R12—500,000 Ohm Resistor
- R14-16—20,000 Ohm Resistor
- R15—3,000 Ohm Resistor
- R4-17—400 Ohm Resistor
- R18—130-29-29 Ohm Resistor
- R9—1,000,000 Ohm Volume Control
- V1—6A7 Tube
- V2—6D6 Tube
- V3—75 Tube
- V4—43 Tube
- V5—25Z5 Tube
- V6-7—6-8V. Pilot Bulb

TO ALIGN THE RECEIVER:—Turn band switch to short wave—short C29—apply 470 KC to grid of V2 and adjust L5—apply 470 KC to grid of V1 and adjust L4—remove short from C29—apply 12MC to antenna and adjust C28 and C6 . . . Turn band switch to long wave—apply 150 KC to antenna and adjust C23—apply 300 KC and adjust C24 and C2—keep re-adjusting at these frequencies until done . . . Turn band switch to broadcast—apply 1400 KC to antenna and adjust C27, C4 and C5—apply 600 KC and adjust C25—readjust at 1400 KC if necessary.



MIDWEST RADIO CORP.

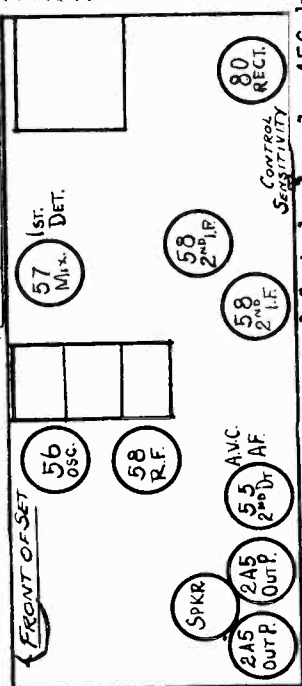
MODEL 9-34  
Schematic, Voltage  
Socket, Alignment



IF. PEAK 456 KC.

- R1 - 100,000 Ω
- R2 - 500,000 Ω
- R3 - 1,500 Ω
- R4 - 5,000 Ω
- R5 - 5,000 Ω
- R6 - 5,000 Ω
- R7 - 5,000 Ω
- R8 - 10,000 Ω
- R9 - 10,000 Ω
- R10 - 25,000 Ω
- R11 - 25,000 Ω
- R12 - 100,000 Ω
- R13 - 100,000 Ω
- R14 - 100,000 Ω
- R15 - 500,000 Ω
- R16 - 500,000 Ω
- R17 - 200 Ω
- R18 - 1,000 Ω
- R19 - 25,000 Ω
- R20 - 500,000 Ω
- R21 - 500,000 Ω
- R22 - 50,000 Ω
- R23 - 50,000 Ω
- R24 - 50,000 Ω
- R25 - 50,000 Ω
- C1 - TRIMMER - 35 MFD (VARIABLE)
- C2 - TRIMMER - 35 MFD (VARIABLE)
- C3 - 70 MFD - 50 V (ELECTROLYTIC)
- C4 - 350 MFD - 50 V (ELECTROLYTIC)
- C5 - 50 MFD - 200 V (ELECTROLYTIC)
- C6 - 50 MFD - 200 V (ELECTROLYTIC)
- C7 - 50 MFD - 200 V (ELECTROLYTIC)
- C8 - 50 MFD - 200 V (ELECTROLYTIC)
- C9 - 50 MFD - 400 V (ELECTROLYTIC)
- C10 - 50 MFD - 400 V (ELECTROLYTIC)
- C11 - 50 MFD - 400 V (ELECTROLYTIC)
- C12 - 50 MFD - 400 V (ELECTROLYTIC)
- C13 - 50 MFD - 400 V (ELECTROLYTIC)
- C14 - 50 MFD - 400 V (ELECTROLYTIC)
- C15 - 50 MFD - 400 V (ELECTROLYTIC)
- C16 - 50 MFD - 400 V (ELECTROLYTIC)
- C17 - 100 MFD - 50 V (ELECTROLYTIC)
- C18 - 500 MFD - 50 V (ELECTROLYTIC)
- C19 - 200 MFD - 50 V (ELECTROLYTIC)
- C20 - 300 MFD - 50 V (ELECTROLYTIC)
- C21 - 250 MFD - 50 V (ELECTROLYTIC)
- C22 - 250 MFD - 50 V (ELECTROLYTIC)
- C23 - 250 MFD - 50 V (ELECTROLYTIC)
- C24 - 250 MFD - 50 V (ELECTROLYTIC)
- C25 - 250 MFD - 50 V (ELECTROLYTIC)
- C26 - 250 MFD - 50 V (ELECTROLYTIC)
- C27 - 250 MFD - 50 V (ELECTROLYTIC)
- C28 - 250 MFD - 50 V (ELECTROLYTIC)
- C29 - 250 MFD - 50 V (ELECTROLYTIC)

CHASSIS LAYOUT



ALIGNMENT: Apply a modulated signal, 456 kc. to the control grid of the 57 Mixer Tube. Trim the i-f. transformers to greatest AVC voltage developed. Keep applied signal low.

ALIGNING BANDS: Turn wave-band switch to the (E) position and adjust the (E) trimmer at 160 kc. Adjust the (E) trimmer, osc., mixer, and the r-f. at 370 kc. Turn wave-band switch to (A) position and adjust the (A) trimmer at 530 kc. Adjust the (A) trimmer, osc., mixer, and the r-f. at 370 kc. which will be found on top of the variable condenser to 1500 kc.

The adjusting of the L, M and H bands is accomplished at the factory by adjusting the spacing of the turns of the coils. We do not advise that you try this, as it is critical work.

THE MIDWEST RADIO CORP.  
909 BROADWAY  
CINCINNATI, OHIO

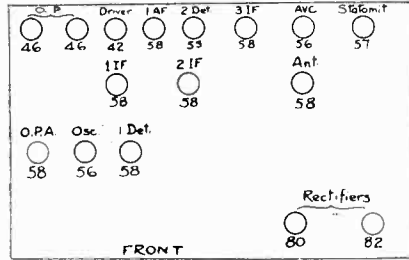
SCHEMATIC DIAGRAM  
OF THE  
MODEL 9-34 SET

DRAWN	FROM	SKETCH	CHECKED	DATE
FILED	BY	DATE	BY	DATE
REVISED			BY	
REVISED			BY	

MODEL 16-33

Voltage, Socket  
Trimmers, Alignment

MIDWEST RADIO CORP.



consistent with proper operation. Measure the AVC voltage developed for peaking purposes. If signal input is too great, it will result in double peaking of stations.

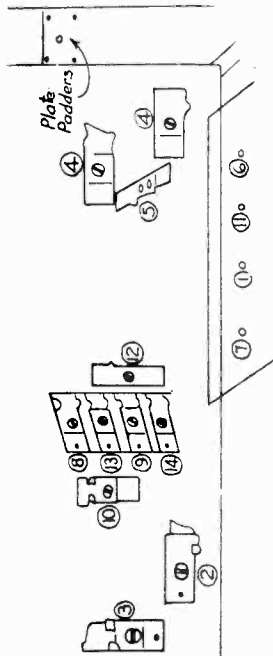
When the i-f. trimmers have been adjusted, the next step is the trimming of the "A" band (white). **NOTICE.** Do not attempt to adjust the plate padder. It was adjusted at the factory and should not be changed. Proceed as follows: Rotate the tuning dial to 5 and adjust the "A" band r-f. trimmers to highest output. The frequency will be about 1490 kc. Adjust the "A" band padder at 550 kc., with the dial set to 98.

Then set the tuning dial to "L" band (red). Dial should be at division 2. Adjust the "L" band r-f. trimmers. The frequency will be about 4.1 megacycles or 4100 kilocycles. Set dial to 98 and adjust padder for that band. The frequency for adjustment is 1712 kc. Adjust feed condenser until maximum sensitivity is reached all over the band. The condenser, in almost all cases, will be tight.

Then adjust "M" band (green). Proceed as for other bands. Adjust "M" band r-f. trimmers at 9.0 megacycles, 8000 kilocycles at 2 on the dial. Adjust the "M" band padder at 4.5 megacycles, which is 4500 kilocycles. Adjust the feed condenser same as for "L" band. Adjust "H" band (blue or amber). Adjust the "H" band r-f. trimmers at 5 on the dial. The frequency will be about 20. megacycles. Adjust the "H" band padder at 9.0 megacycles at 98 on the dial.

The alignment instructions follow: Before attempting to align the i-f. amplifier, we suggest that you inspect the i-f. transformers for correct spacing, as these transformers often collapse and cause broad tuning. The correct spacing of the windings is 3/4 inch between the faces of the coils. Wax the coils tightly in place and then start the procedure of alignment, by adjusting your signal generator to 450 kc., which is the i-f. peak in this receiver. Keep the test signal input at the lowest possible level

1. "A" band padder
2. "A" band r-f. trimmer
3. "A" band r-f. trimmer
4. "L" band r-f. trimmer
5. "L" band feeder condenser
6. "L" band padder
7. "M" band padder
8. "M" band r-f. trimmer
9. "M" band r-f. trimmer
10. "M" band feed condenser
11. "H" band padder
12. "H" band feed condenser
13. "H" band r-f. trimmer
14. "H" band r-f. trimmer



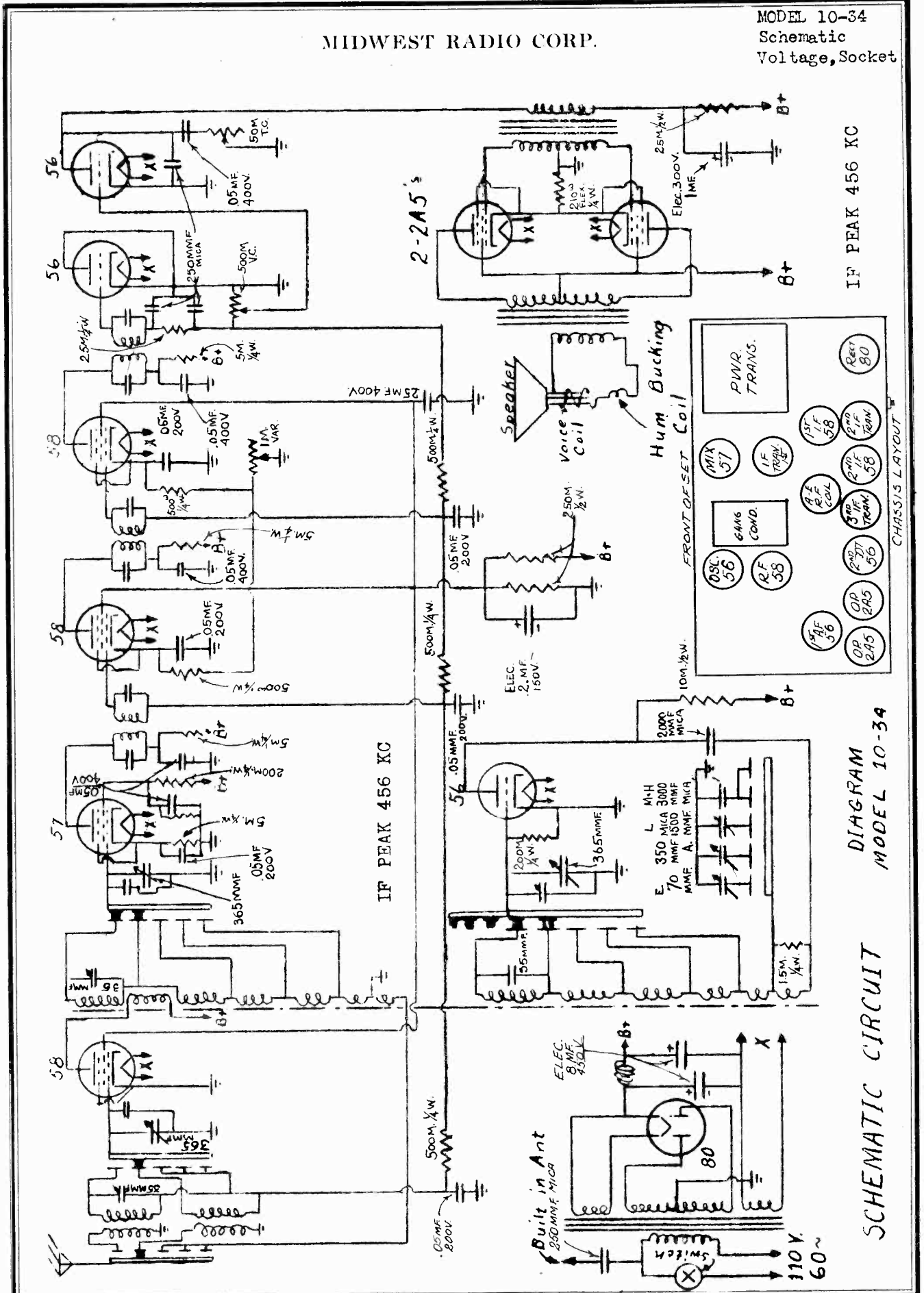
On the right will be found the locations of the padding and trimmers of the Midwest 16-tube receiver, 1933

Type	Function	Plate	Screen	Cathode	C. Grid	File
58	Ant.	220	88	0	25	2.5
58	Mixer	220	128	2	+ 25	2.5
56	Osc.	189	0	0	0	2.5
58	O.P.A.	128	92	0	3.5	2.5
58	1st IF.	216	80	7	2.0	2.5
58	2nd IF.	216	80	7	2.5	2.5
58	3rd IF.	216	76	8	0	2.5
55	2nd det.	0	...	0	AVC	2.5
56	A.V.C.	0	...	0	AVC	2.5
57	Statomit	33	76	8	0	2.5
58	1st AF.	98	97	94	36	6.2
42	Driver	184	216	14	0	2.5
46	Output	478	...	0	0	2.5
46	Output	478	...	0	0	2.5
80	Rect.	350 r.m.s. each plate	...	...	...	5.0
82	Rect.	345 r.m.s. each plate	...	...	...	2.6

All readings are taken with no signal input and Statomit full on (clockwise). All voltages are plus or minus 15 percent, depending on line voltage.

MIDWEST RADIO CORP.

MODEL 10-34  
Schematic  
Voltage, Socket



IF PEAK 456 KC

DIAGRAM  
MODEL 10-34

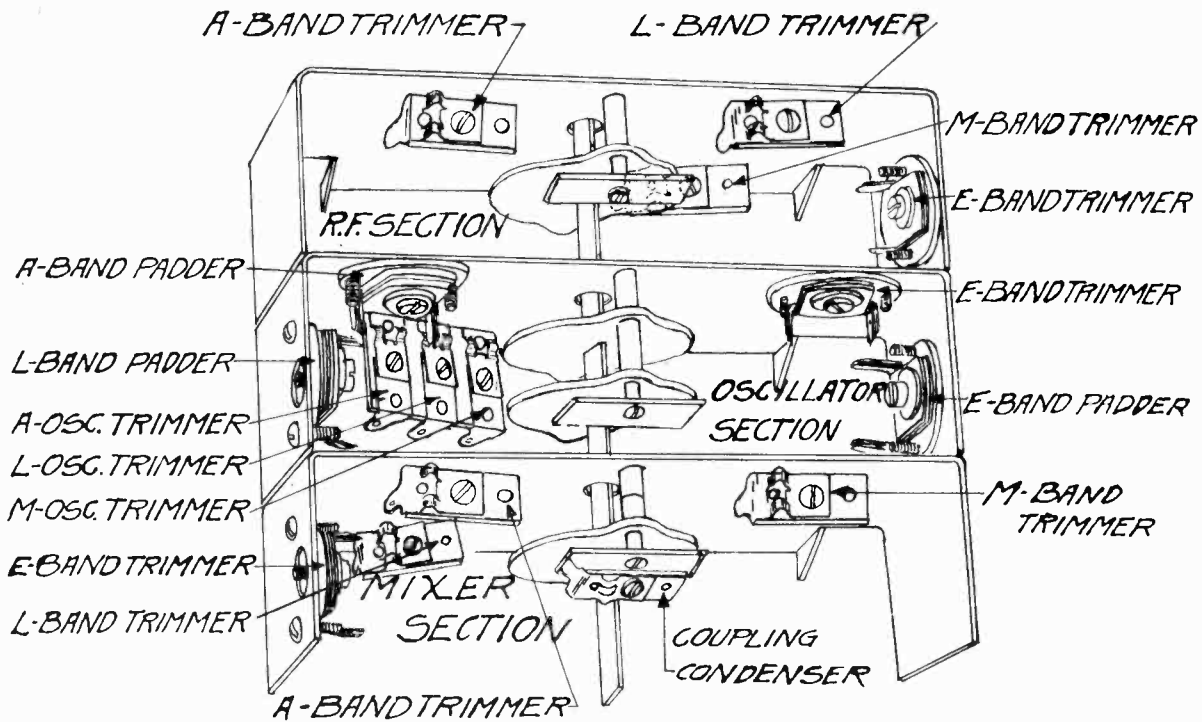
SCHEMATIC CIRCUIT

CHASSIS LAYOUT



MODEL 10-34  
 Trimmers, Alignment  
 Voltage

MIDWEST RADIO CORP.



THE MIDWEST RADIO CORP.			CINCINNATI, OHIO.
DATE	OCT. 16. 33	NO RECD.	LOCATION OF TRIMMERS AND PADDERS of 10-34 MODEL.
DRAWN FSCH.	OCT. 16. 33	MODEL NO 16-34	
TRACED FSCH.	OCT. 16. 33	SCALE NONE	
CHECKED		REVISIONS	
APPROVED			

INSTRUCTIONS FOR REBALANCING THE 9 & 10 TUBE ALL-WAVE  
 1934 MODEL

To rebalance the Midwest 9 and 10 tube all-wave 1934 model receivers proceed as follows:

Apply a signal (modulated) of 456 K. C. to the control grid of the 57 1st. Det. or Mixer tube. Trim the I. F. transformers to greatest A. V. C. voltage developed. Remember always to keep the signal applied to the 1st. Det. as low as possible.

To align the bands proceed as follows: Turn wave band switch to the (E) position and adjust the (E) padder at 160 K. C. Adjust the (E) trimmers, osc., mixer and the R. F., at 370 K.C.

Turn wave band switch to (A) position and adjust the (A) padder at 530 K. C. Adjust the (A) trimmers which will be found on top of the variable condenser to 1500 K. C.

The adjusting of the L.M. and H bands is accomplished at the factory by adjusting the spacing of the turns of the coils. We do not advise that you try this as it is very critical work and can be done only by very carefully trained experts.

ALL TESTS MADE WITH NO SIGNAL INPUT AND WITH SPATOMITY  
 TURNED FULL ON (CLOCKWISE)

TYPE	POSITION	PLATE VOLTS	SCREEN VOLTS	SUPP. VOLTS	KATHODE VOLTS	GRID VOLTS	FIL. VOLTS
58	R.F.	225	115	0	0	1 AVC	2.5
57	Mixer	225	25	2.5	2.5	0	2.5
56	Osc.	175			0	-45 on A Band	2.5
58	1 st. I.F.	225	110	.20	.20	AVC	2.5
58	2 nd. I.F.	225	110	.20	.20	AVC	2.5
56	2nd. Det.	0	---	---	0	AVC	2.5
56	1 st. A.F.	210	---	---	0	---	2.5
2A5	Output	235	240	---	- 15	---	2.5
2A5	Output	235	240	---	- 15	---	2.5
80	Rect.	240	---	---	---	---	5.0

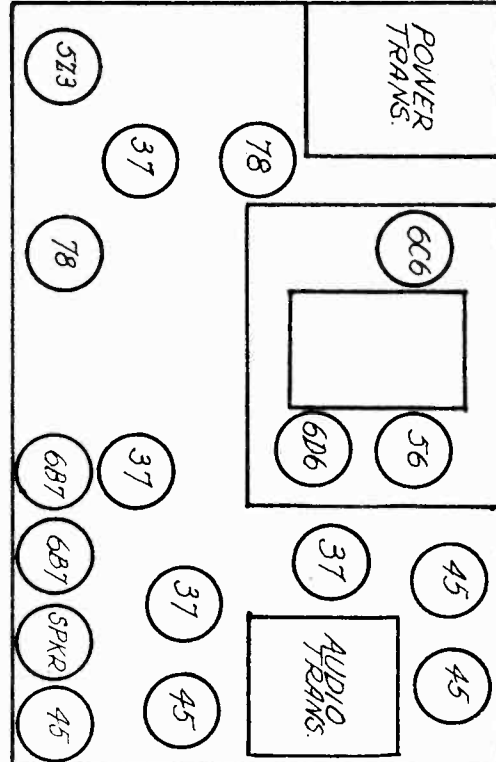
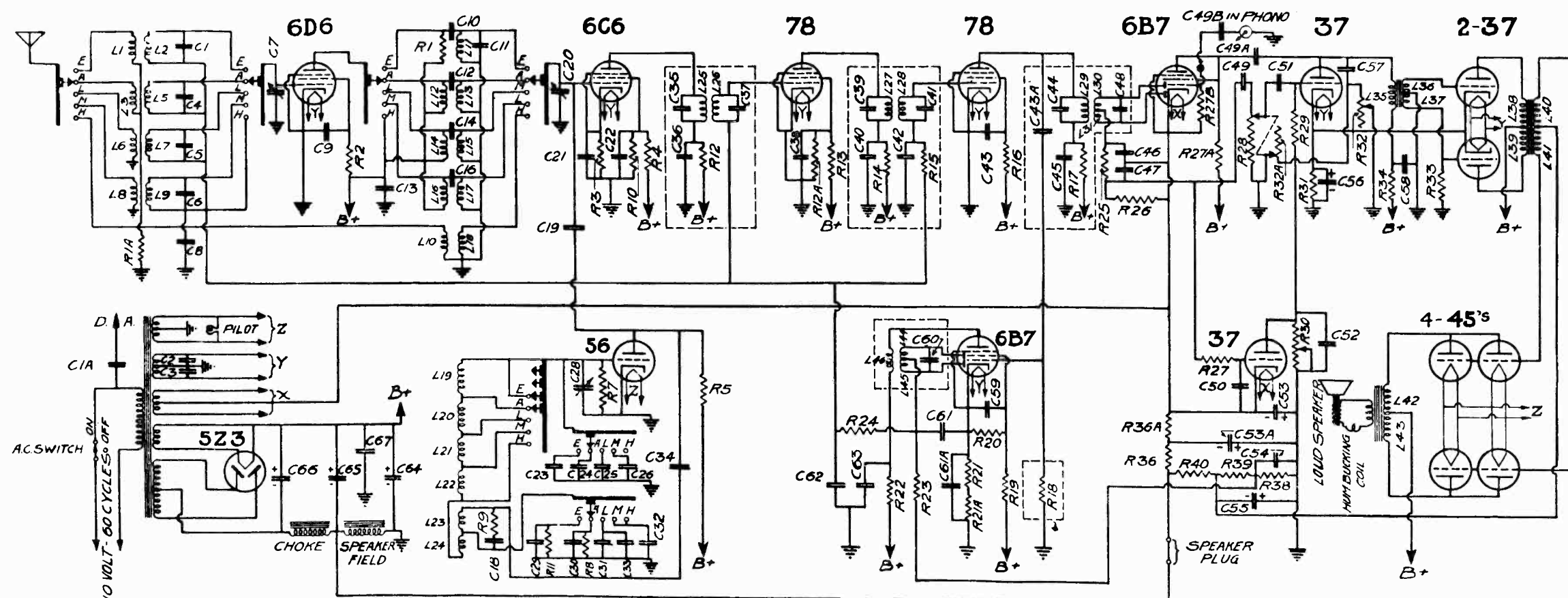
1000 Ohm per Volt Meter used for tests D.C. Measured from ground. Voltages ± 15% Depending on line voltage.







MIDWEST RADIO CORP.



C1A	.250	MMFD.	MICA	R18	5 000	.25	WATT
C1	.80	MFD.	TRIMMER	R1	75 000	.25	
C2	.05	MFD.	200 VOLT	R2	200 000	.25	
C3	.05	MFD.	200	R3	5 000	.25	
C4	20	MMFD.	TRIMMER	R4	50 000	.50	
C5	20	"	"	R5	15 000	.25	
C6	20	"	"	R7	500 000	.25	
C7	365	"	TUNING CONDENSER	R8	200 000	.25	
C8	.05	MFD.	200 VOLT	R9	1 000	.25	
C9	.05	MFD.	400	R10	10 000	.25	
C10	25	MMFD.	MICA	R11	50 000	.25	
C11	80	"	TRIMMER	R12	5 000	.25	
C12	20	"	"	R12A	100 000	.25	
C13	.05	MFD.	400 VOLT	R13	200 000	.25	
C14	20	MMFD.	TRIMMER	R14	5 000	.25	
C15	20	"	"	R15	3 NEG	.25	
C16	20	"	"	R16	200 000	.25	
C17	20	"	"	R17	5 000	.25	
C18	20	"	"	R18	5 000	.25	
C19	20	"	"	R19	25 000	.5	
C20	365	"	TUNING CONDENSER	R20	30 000	.25	
C21	.05	MFD.	200 VOLT	R21	4 000	.25	
C22	.05	MFD.	200	R22	5 000	.25	
C23	80	MMFD.	TRIMMER	R23	5 000	.25	
C24	20	"	"	R24	100 000	.25	
C25	20	"	"	R25	100 000	.25	
C26	20	"	"	R26	500 000	.25	
C27	365	"	TUNING CONDENSER	R27	500 000	.25	
C28	160	"	PRADER	R28	500 000	.25	
C29	360	"	"	R29	500 000	.25	
C30	360	"	"	R21A	500 000	.25	
C31	700	"	MICA	R22	500 000	.25	
C32	500	"	"	R23	500 000	.25	
C33	500	"	"	R24	500 000	.25	
C34	2000	"	"	R25	100 000	.25	
C35	.05	MFD.	400 VOLT	R26	500 000	.25	
C36	.05	MFD.	400 VOLT	R27	500 000	.25	
C37	.05	MFD.	400 VOLT	R28	500 000	.25	
C38	.05	MFD.	400 VOLT	R29	500 000	.25	
C39	.05	MFD.	400 VOLT	R30	50 000	.25	POT. STAT-O-MAT CONTROL
C40	.05	MFD.	400 VOLT	R31	700	1	POT. VOLUME CONTROL
C41	.05	MFD.	400 VOLT	R32	50 000	.25	POT. STAT-O-MAT CONTROL
C42	.05	MFD.	200 VOLT	R32A	50 000	.25	VARIABLE TONE CONTROL
C43	.05	MFD.	400	R33	10 000	.25	VARIABLE TONE CONTROL
C43A	25	MMFD.	MICA	R34	15 000	.25	WATT COMPENSATION
C44	.05	MFD.	400 VOLT	R35	10 000	.25	
C45	.05	MFD.	400 VOLT	R36	25 000	.25	
C46	.05	MFD.	400 VOLT	R36A	25 000	.25	
C47	.05	MFD.	400 VOLT	R37	10 000	.25	
C48	.05	MFD.	400 VOLT	R38	10 000	.25	
C49	.05	MFD.	200 VOLT	R39	100 000	.25	
C49A	.05	MFD.	200 VOLT	R40	50 000	.25	
C50	.05	MFD.	200 VOLT	R41	50 000	.25	
C51	.05	MFD.	200 VOLT	R42	50 000	.25	
C52	.05	MFD.	200 VOLT	R43	50 000	.25	
C53	.05	MFD.	200 VOLT	R44	50 000	.25	
C54	.05	MFD.	200 VOLT				
C55	.05	MFD.	200 VOLT				
C56	.05	MFD.	200 VOLT				
C57	.05	MFD.	200 VOLT				
C58	.05	MFD.	200 VOLT				
C59	.05	MFD.	200 VOLT				
C60	.05	MFD.	200 VOLT				
C61	.05	MFD.	200 VOLT				
C62	.05	MFD.	200 VOLT				
C63	.05	MFD.	200 VOLT				
C64	.05	MFD.	200 VOLT				
C65	.05	MFD.	200 VOLT				
C66	.05	MFD.	200 VOLT				
C67	.05	MFD.	200 VOLT				

THE MIDWEST RADIO CORP.  
909 BROADWAY. CINCINNATI, OHIO.

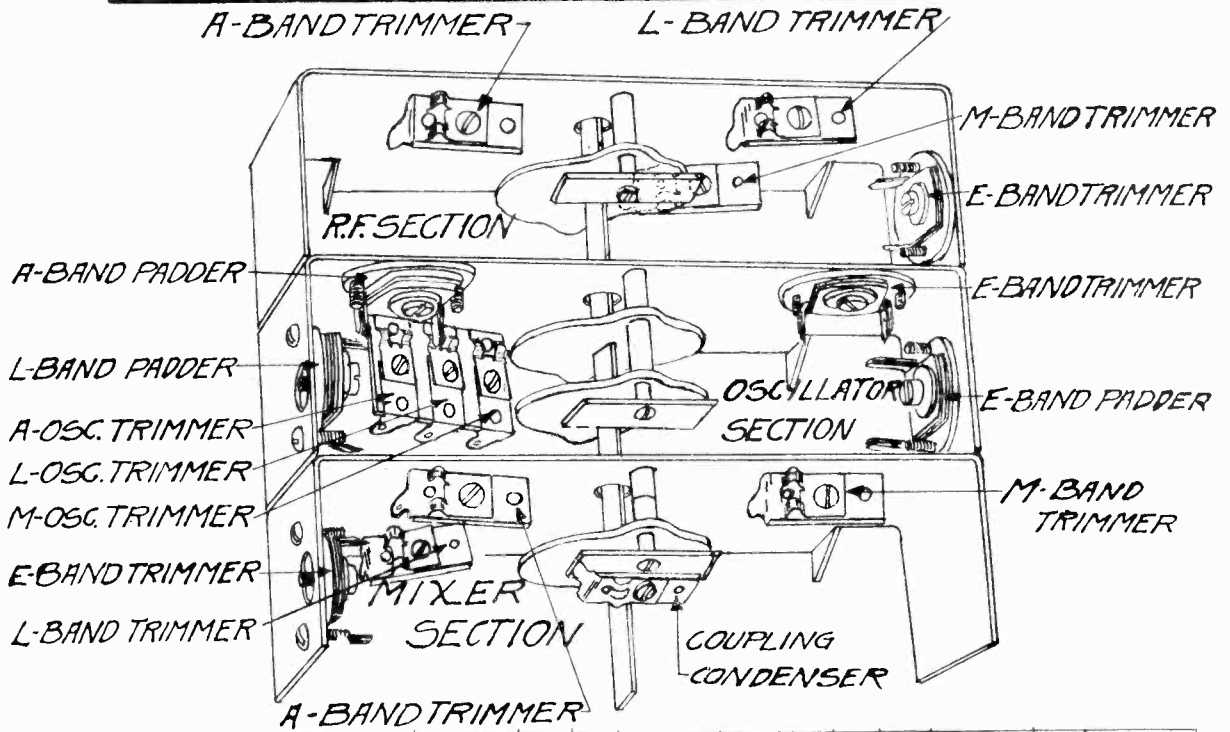
SCHEMATIC CIRCUIT DIAGRAM  
OF THE  
MODEL 16-34 SET

DRAWN F.SCH. SEPT. 14, 1933.  
TRACED F.SCH. OCT. 10, 1933.  
CHECKED P.S. OCT. 10, 1933.  
APPROVED W.A.S. OCT. 10, 1933.

MIDWEST RADIO CORP.

MODEL 16-34  
Trimmers, Voltage

THE MIDWEST RADIO CORP			CINCINNATI, OHIO.
DATE	NO. REQD.	LOCATION OF TRIMMERS AND PADDERs of 16-34 MODEL.	
DRAWN F.SCH. OCT. 10. 33	MODEL NO 16-34		
TRACED F.SCH. OCT. 16. 33	SCALE NONE		
CHECKED	REVISIONS		
APPROVED			



LIST OF TUBE VOLTAGES OF MODEL 16 - 1934		ALL TESTS MADE WITH NO SIGNAL INPUT AND WITH STATOMIT TURNED FULL ON (LOCKWISE)						
TYPE	POSITION	VOLTS	SCREEN SUPPRESSOR VOLTS	KATHODE VOLTS	GRID VOLTS	FIL. VOLTS		
6D6	R.F.	240	---	---	-5 AVC	6.3		
6C6	MIXER	230	3	3	---	6.3		
56	OSC.	125	---	---	---	2.5		
78	1st. IF TUBE	230	60	---	-5 AVC	6.3		
78	2nd IF TUBE	230	125	---	-5 AVC	6.3		
6B7	A.V.C. AMPL.	230	125	35	---	6.3		
6B7	2nd DET.	-20	---	40	---	6.3		
37	STATOMIT	Full On	---	40	---	6.3		
37	1st A.F.	170	---	13	---	6.3		
37	2nd A.F.	230	---	13	---	6.3		
37	2nd A.F.	230	---	13	---	6.3		
45	OUTPUT	240	---	60	---	2.5		
45	OU PUT	240	---	60	---	2.5		
45	OUTPUT	240	---	60	---	2.5		
45	OUTPUT	240	---	60	---	2.5		
5Z3	RECT.	350 R.M.S. PER ANODE	---	60	---	5.0		

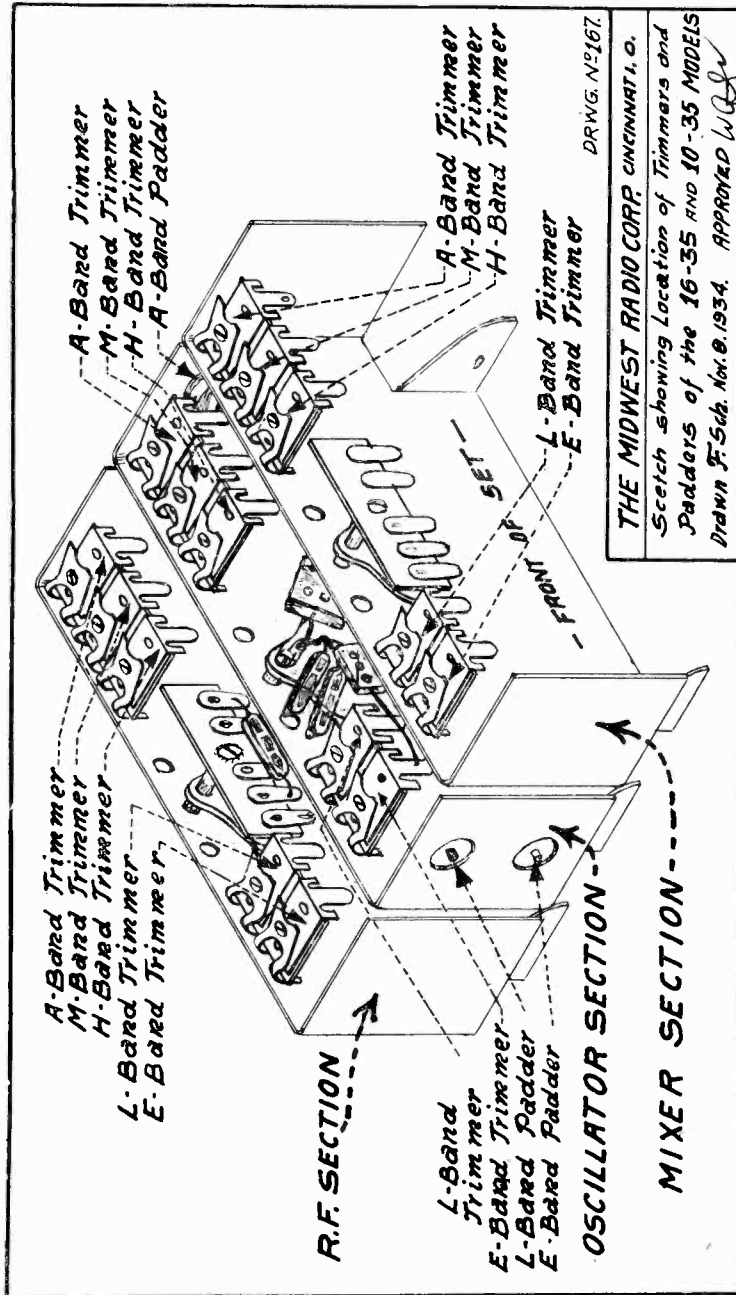
240 VOLT OUTPUT FROM FILER  
1000 ohm per volt meter used for test D.C. measured from ground voltages  $\pm$  15% depending on line voltage.

Drawn Fritz Sch 10-1-34  
Checked  
App  
Drawing No. 73

MODEL 10-35

Trimmers, Alignment

MIDWEST RADIO CORP.



Procedure for rebalancing the Midwest 10 - 1935 receiver is as follows:  
 The I.F. Amplifier is designed to operate at 456 K.C. Peak the 1st, 2nd and 3rd, I.F. transformers to maximum A.F. output. Trim small A.V.C. transformer to minimum A.F. output. Do not measure A.V.C. as an indication of output. The adjustments screws for the I.F. amplifier will be found in the top of the I.F. Transformers which may be located from the parts location chart.

After the I.F. amplifier has been aligned proceed as follows in the procedure of aligning the R.F. portion of the receiver.  
 Connect a modern signal generator to the Antenna and ground posts. Set wave change switch to the "E" band.

Set signal generator to 325 K.C. Rotate dial of receiver to 325 K.C. Trim "E" Osc. trimmer until maximum signal is obtained. Trim the "E" band R.F. and "E" band mixer trimmers until maximum signal is obtained. Set signal generator to 125 K.C. Rotate dial to 125 K.C. trim "E" band padder until signal is received.

Set wave change switch to the "A" band. Set signal generator to 1400 K.C. Set dial at 1400 K.C. adjust the "A"

band Osc. trimmer until the signal is received at maximum. Adjust the A.R.F. and "A" band mixer trimmers to maximum output. Set signal generator at 550 K.C. set dial at 550 band K.C. Adjust the "A" band Osc. padder until signal is received. Set wave change switch to the "H" band. Set signal generator to 4 Meg. Set dial to 4 Meg. Adjust the "L" band Osc. Trimmer until the signal is received at maximum. Adjust the "L" band R.F. and "L" band Mixer trimmers until the signal is received at maximum. Set signal generator to 1600 K.C. and adjust the "L" band padder until signal is received.

Set the wave change to the "M" band. Set signal generator to 11.5 Meg. Set dial to 11.5 Meg. Adjust the "M" band Osc. trimmer until the signal is received at maximum strength. Adjust the "M" band R.F. and "M" band Mixer trimmers until maximum signal is received. No padder is provided on this band.

Set wave change switch to the "H" band. Set the signal generator to 28 Meg. Set dial to 28 Meg. Adjust the "H" band Osc trimmer until the signal is received at maximum. Adjust the "H" band R.F. and "H" band Mixer trimmers until the maximum signal is received. No padder is provided for this band.

THE MIDWEST RADIO CORP. CINCINNATI, O.  
 Sketch showing Location of Trimmers and Padders of the 16-35 and 10-35 MODELS  
 Drawn F. Sch. Nov. 8, 1934. APPROVED W.R.

MIDWEST RADIO CORP.

MODEL 10-35  
Schematic, Voltage

DRAWING NO. 104.

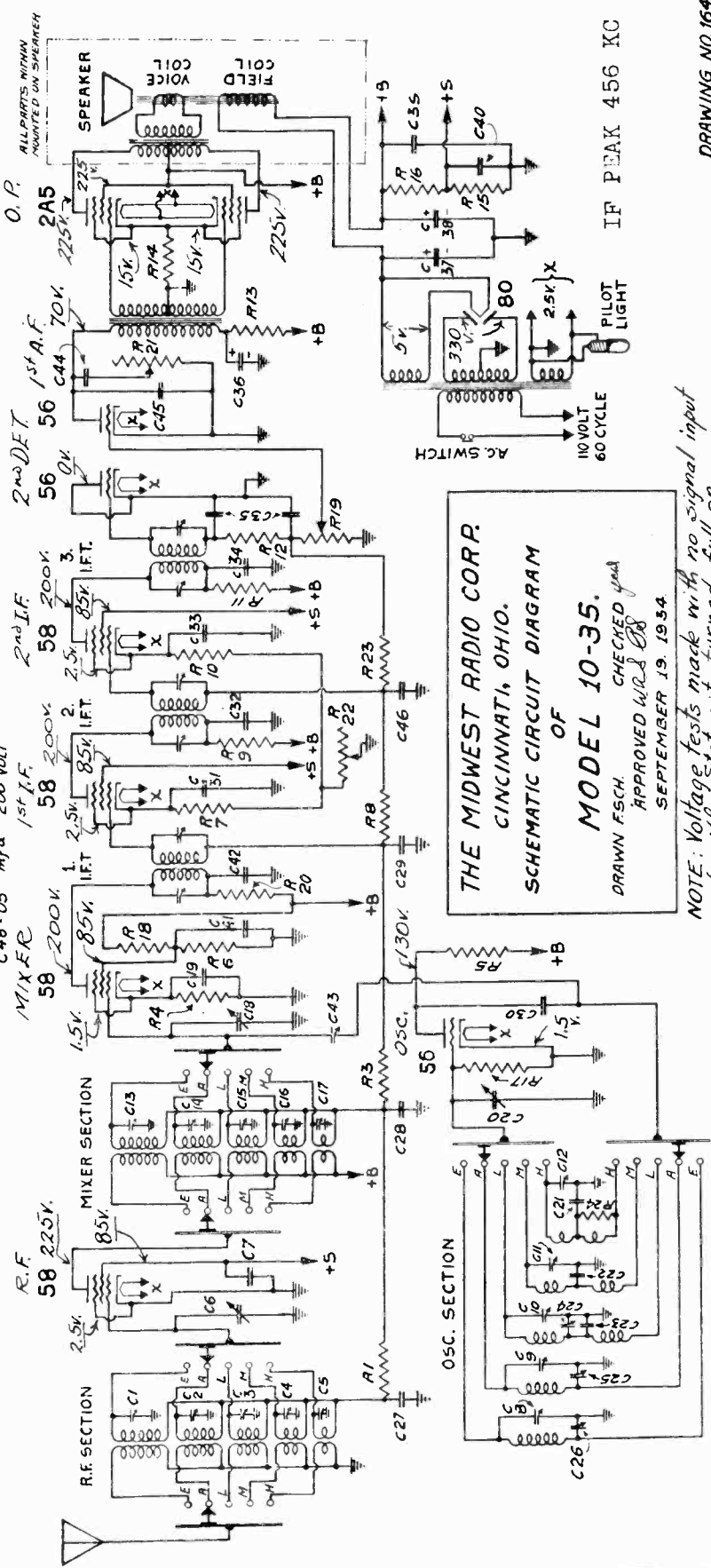
- R16 - 25 000  $\Delta$  .5 WATT
- R17 - 100 000  $\Delta$  .25 "
- R18 - 200 000  $\Delta$  .25 "
- R19 - 500 000  $\Delta$  VOLUME CONTROL
- R20 - 5 000  $\Delta$  .25 WATT
- R21 - 50 000  $\Delta$  TONE CONTROL
- R22 - 1 000  $\Delta$  VARIABLE
- R23 - 500 000  $\Delta$  .1 WATT
- R24 - 1 000  $\Delta$  .25 "

- R1 - 100 000  $\Delta$  .1 WATT
- R2 - 100 000 " " "
- R3 - 100 000 " " "
- R4 - 5 000 " " "
- R5 - 15 000 " " "
- R6 - 25 000  $\Delta$  .25 "
- R7 - 1 000  $\Delta$  .25 "
- R8 - 500 000  $\Delta$  .1 "
- R9 - 5 000  $\Delta$  .25 "
- R10 - 1 000  $\Delta$  .25 "
- R11 - 5 000  $\Delta$  .25 "
- R12 - 25 000  $\Delta$  .1 "
- R13 - 25 000  $\Delta$  .1 "
- R14 - 210  $\Delta$  .2 "
- R15 - 25 000  $\Delta$  .5 "

- C31 - .05 mfd 200 VOLT
- C32 - .05 " 400 " "
- C33 - .05 " 400 " "
- C34 - .05 " 400 " "
- C35 - 250 mfd - MICR-DUAL
- C36 - 1 mfd 500 VOLT
- C37 - 8 " 450 V. ELECTRO=
- C38 - 16 " 450 V. LYIC
- C39 - 25 " 400 VOLT
- C40 - 25 " 400 " "
- C41 - .05 " 200 " "
- C42 - .05 " 400 " "
- C43 - .05 mfd COUPLER
- C44 - .05 mfd 400 VOLT
- C45 - 250 mfd MICA
- C46 - .05 mfd 200 VOLT

- C16 - 35 mmfd - TRIMMER
- C17 - 35 " " TUNING COND.
- C18 - 365 " " 200 VOLT
- C19 - 05 mfd TUNING COND.
- C20 - 365 mmfd TUNING COND.
- C21 - .01 mfd 200V. H. BAND 1
- C22 - 5000 mmfd MICA M
- C23 - 500 " L " "
- C24 - 700 " L " "
- C25 - 400 " A " "
- C26 - 400 " A " "
- C27 - .01 mfd 200 VOLT
- C28 - .01 " 200 " "
- C29 - .05 " 200 " "
- C30 - 2000 mmfd MICA

- C1 - 35 mmfd - TRIMMER
- C2 - 35 " " "
- C3 - 35 " " "
- C4 - 35 " " "
- C5 - 35 " " "
- C6 - 365 " " TUNING COND.
- C7 - 2 mfd - 150 VOLT
- C8 - 35 mmfd - TRIMMER
- C9 - 35 " " "
- C10 - 35 " " "
- C11 - 35 " " "
- C12 - 35 " " "
- C13 - 35 " " "
- C14 - 35 " " "
- C15 - 35 " " "



THE MIDWEST RADIO CORP.  
CINCINNATI, OHIO.  
SCHEMATIC CIRCUIT DIAGRAM  
OF  
MODEL 10-35.  
DRAWN F.SCH. CHECKED J.P.B.  
APPROVED W.R.J. D.B.  
SEPTEMBER 19, 1934.

NOTE: Voltage tests made with no signal input and with Statomit turned full on.  
Line Voltage - 120

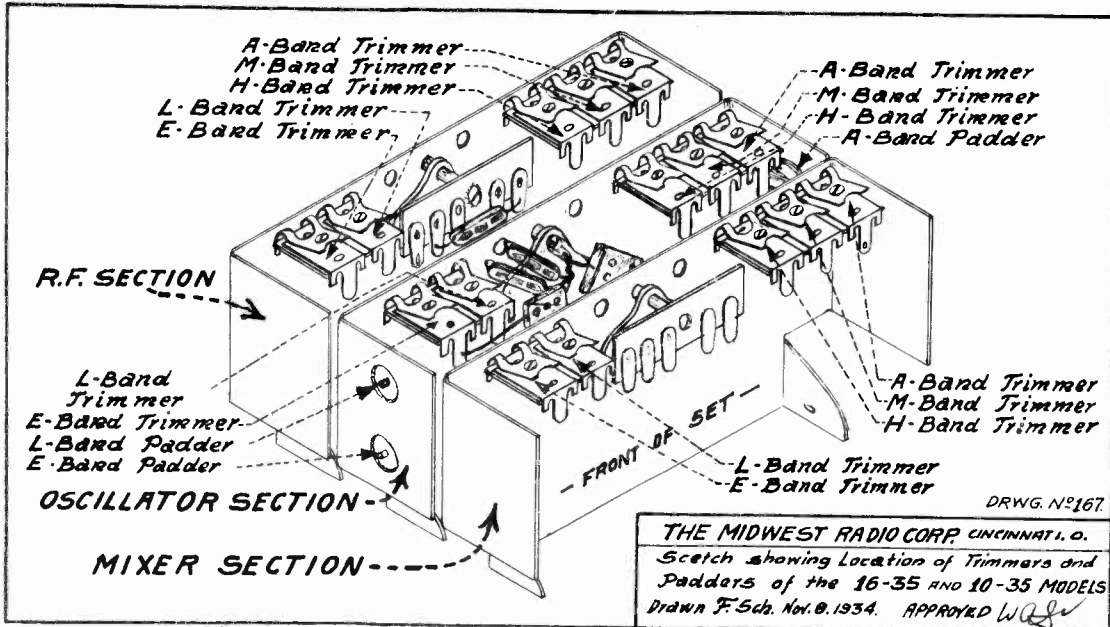
IF PEAK 456 KC



MODEL 16-35

Alignment  
Trimmers

MIDWEST RADIO CORP.



THE MIDWEST RADIO CORP. CINCINNATI, O.  
Sketch showing Location of Trimmers and Padders of the 16-35 AND 10-35 MODELS  
Drawn F. Sch. Nov. 8, 1934. APPROVED W.A.S.

REBALANCING

Procedure for rebalancing the Midwest 16 - 1935 receiver is as follows:

The I.F. Amplifier is designed to operate at 456 K.C. Peak the 1st, 2nd and 3rd, I.F. transformers to maximum A.F. output. Trim small A.V.C. transformer to minimum A.F. output. Do not measure A.V.C. as an indication of output. The adjustments screws for the I.F. amplifier will be found in the top of the I.F. Transformers which may be located from the parts location chart.

After the I.F. amplifier has been aligned proceed as follows in the procedure of aligning the R.F. portion of the receiver.

Connect a modern signal generator to the Antenna and Ground posts. Set wave change switch to the "E" band.

Set signal generator to 325 K.C. Rotate dial of receiver to 325 K.C. Trimm "E" Osc. trimmer until maximum signal is obtained. Trim the "E" band R.F. and "E" band mixer trimmers until maximum signal is obtained. Set signal generator to 125 K.C. Rotate dial to 125 K.C. trim "E" band padder until signal is received.

Set wave change switch to the "A" band. Set signal generator to 1400 K.C. Set dial at 1400 K.C. adjust the "A" band Osc. trimmer until the signal is received at maximum. Adjust the A.R.F. and "A" band mixer trimmers to maximum output. Set signal generator at 550 K.C. set dial at 550 band K.C. Adjust the "A" band Osc. padder until signal is received. Set wave change switch to the "L" band. Set signal generator to 4 Meg. Set dial to 4 Meg. Adjust the "L" band Osc. Trimmer until the signal is received at maximum. Adjust the "L" band R.F. and "L" band Mixer trimmers until the signal is received at maximum. Set signal generator to 1600 K.C. and adjust the "L" band padder until signal is received.

Set the wave change to the "M" band. Set signal generator to 11.5 Meg. Set dial to 11.5 Meg. Adjust the "M" band Osc. trimmer until the signal is received at maximum strength. Adjust the "M" band R.F. and "M" band Mixer trimmers until maximum signal is received. No padder is provided on this band.

Set wave change switch to the "H" band. Set the signal generator to 28 Meg. Set dial to 28 Meg. Adjust the "H" band Osc. trimmer until the signal is received at maximum. Adjust the "H" band R.F. and "H" band Mixer trimmers until the maximum signal is received. No padder is provided for this band.

This completes the alignment process.

TUBE VOLTAGES

TYPE	POSITION	PLATE VOLTS	SCREEN SUPP. VOLTS	SUPP. VOLTS	KATHODE VOLTS	FIL. VOLTS
6D6	R. F.	215	85	2.7	2.7	6.0
6D6	MIXER	210	20	2.2	2.2	6.0
6D6	OSC.	96	96	2.2	2.2	6.0
6D6	1st. I.F.	190	86	2.6	2.6	6.0
6D6	2nd I.F.	215	86	5.0	5.0	6.0
617	AVC. AMP.	190	46	---	6.0	6.0
6C6	Q.A.V.C.	130	86	0-AE 2.0-LM	0-AE 3.0-LM	6.0
76	2nd. LET.	0	--	---	0	6.0
76	DIM A LIGHT	115	A.C.--	---	0	6.0
76	1st. A.F.	60	--	---	2.3	6.0
2A5	DRIVER	210	--	---	18	2.5
45	OUTPUT	330	--	---	GRID 60	2.5
45	OUTPUT	330	--	---	60	2.5
45	OUTPUT	330	--	---	60	2.5
45	OUTPUT	330	--	---	60	2.5

5Z3 Rect. 355 volts from Filter

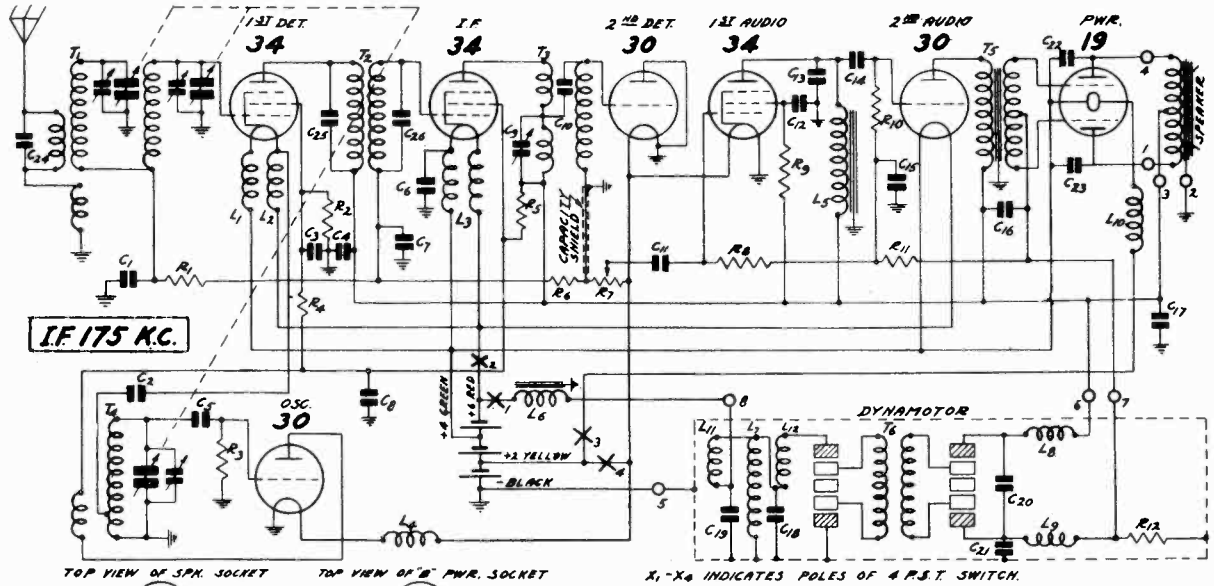
ALL TESTS MADE WITH POSITIVE INPUT

Line voltage 120

1000 ohm per volt meter used for all D.C. measurements from ground. Voltage 15% depending on line voltage.

MONTGOMERY-WARD & CO.

MODELS 62-114, 62-116  
Schematic, Socket, Parts



Sept., 1934

MISCELLANEOUS

Part No.	ITEM	Selling Price
P-1640	Speaker Socket	\$0.06
P-1833	No. 19 Socket	.08
P-1644	No. 30 Socket	.06
P-1645	No. 34 Socket	.06
P-1912	"B" PWR Socket	.06
P-50621	Plate Reactor Assem. L5	.70
P-50622	"A" Filter Reactor Assem. L6	.94
P-50625	Audio Transformer Assem. T5	.82
P-5172	Double Filament Reactor Assem. L1 and L2	.14
P-5173	Dual Filament Reactor Assem. L3 and L4	.22
P-5222	Single Filament Reactor L10	.18
P-5200	Antenna R. F. Transformer Assem. T1	.64
P-40433	Can for the above Assem.	.08
P-5170	1st I. F. Assem. Complete with Can T2	.80
P-5171	2nd I. F. Assem. Complete with Can T3	1.42
P-5169	Oscillator Coil. Complete with Can T4	.46
P-40415	Replacement Can for Osc. Coil	.04
P-10369	8" Black Drive Cord (V. C. or Switch)	.02
P-10370	29" Black Drive Cord (Cond. Drive)	.04

Part No.	Code	Capacity	Voltage	Type	Selling Price
P-80862	C3	0.050	Mf. 200V	Tubular	.08
P-80864	C4	0.100	Mf. 200V	Tubular	.10
P-81801	C5	35	Mmf. Cap.	Part of Osc. Coil Assem.	.08
P-80888	C6	0.250	Mf. 200V	Tubular	.12
P-80862	C7	0.050	Mf. 200V	Tubular	.08
P-80988	C8	1.500	Mf. 140V	Tubular	.40
P-1965	C9	70-140	Mmf.	Trimmer	.18
P-81800	C10	50	Mmf. Cap.	Part of 2nd I.F. Coil As.	.08
P-80981	C11	0.010	Mf. 400V	Tubular	.10
P-80888	C12	0.250	Mf. 200V	Tubular	.12
P-80946	C13	500	Mmf.	Moulded	.08
P-80862	C14	0.050	Mf.	Tubular	.08
P-80888	C15	0.250	Mf. 200V	Tubular	.12
P-81014	{C16 16.00 Mf. C17 16.00 Mf.}			Electrolytic Block	1.22
P-80914	C22	0.002	Mf. 600V	Tubular	.10
P-80914	C23	0.002	Mf. 600V	Tubular	.10
P-81812	C24	200	Mmf. Cap.	Part of Ant. Assem.	.08
P-81807	C25	70	Mmf. Cap.	Part of 1st I.F. Coil As.	.08
P-81805	C26	45	Mmf. Cap.	Part of 1st I.F. Coil As.	.08
P-81015				Three Gang Condenser	1.70

RESISTORS

Part No.	ITEM	Selling Price
P-2182	Dynamotor Complete with Case and Cover	\$12.00
P-2159	Gelotex Box and Cover	.50
P-5151	"B" Reactor Assem. L8 and L9	.12
P-60680	"A" Choke Coil	.20
P-70735B	Cable and Plug	.34
P-1504	Insulated Terminal Strip	.06
P-10191	Rubber Cushion	.02
P-98033	R12 200 Ohm .2 Wire Wound	.08
P-81047	{C18 0.250 mf 200V C19 0.250 mf 200V C20 0.250 mf 200V C21 0.250 mf 200V}	Condenser Block .58

Part No.	Code	Resistance	Wattage	Type	Selling Price
P-A95104	R1	100,000 Ohm	.2	Carbon	\$0.08
P-A98303	R2	30,000 Ohm	.2	Carbon	.10
P-A95104	R3	100,000 Ohm	.2	Carbon	.08
P-A98602	R4	6,000 Ohm	.2	Carbon	.10
P-B93902	R5	9,000 Ohm	.5	Carbon	.10
P-A95505	R6	5 Megohm	.2	Carbon	.08
P-96012	R7	1 Megohm		Volume Control	.40
P-A95505	R8	5 Megohm	.2	Carbon	.08
P-A94603	R9	60,000 Ohm	.2	Carbon	.08
P-A95104	R10	100,000 Ohm	.2	Carbon	.08
P-A95104	R11	100,000 Ohm	.2	Carbon	.08

CONDENSERS

Part No.	Code	Capacity	Voltage	Type	Selling Price
P-80862	C1	0.050	Mf. 200V	Tubular	\$0.08
P-80862	C2	0.050	Mf. 200V	Tubular	.08

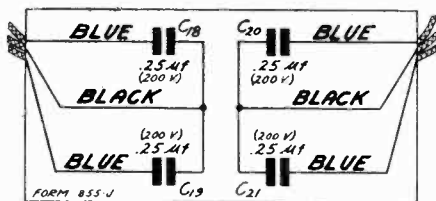


Fig. 3. Four Section Condenser in Power Unit Box

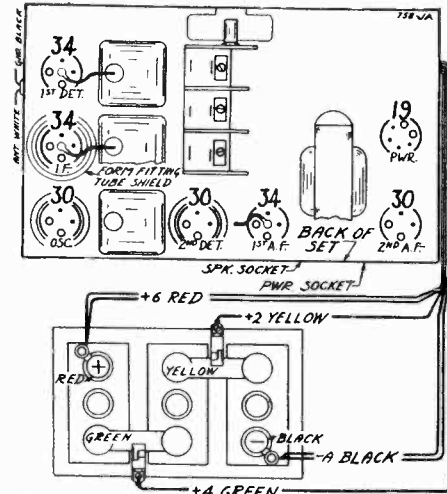


Fig. 2. Location of Tubes and Battery Connections

MODELS 62-114, 62-116

Voltage, Resistance Test MONTGOMERY-WARD & CO.

Alignment, Data

### Replacing Drive Cord

Remove chassis from cabinet.

Take off the pilot light assembly by lifting off the two sockets and spring clips.

Detach the large pointer by removing the screw at the center of the dial.

Loosen the dial assembly by taking out the two screws which secure the bottom of this assembly to the chassis.

Then lay the complete dial assembly face downward in front of the chassis. It is not necessary to remove the volume control and Off-On switch collars which hold the indicator cords of these two controls in position.

Turn the drive drum until the opening in this drum is approximately vertical and with the hole at the top

Remove the tension spring and the old drive cord.

See that the eyelet is in the hole in the drive drum

Insert one end of the drive cord from the outside through the hole in the eyelet in the drive drum.

Tie the end of the cord which has been inserted in the hole to one end of the tension spring.

Wrap the cord in a clockwise direction (facing front of chassis) around the drive drum approximately one-half turn.

Then tilt the chassis up on its back panel and bring the cord mentioned in the previous paragraph down to the drive shaft. Wrap it two and one-half times around the drive shaft

Then bring this cord up from the drive shaft and wrap it around the drive drum approximately one and one fifth turns in a clockwise direction until it is up to the hole in this drum as illustrated.

Insert the free end of the cord through the hole in the eyelet and tie it to the end of the tension spring. The end of the spring, when hanging free, should be approximately 3/4" from the flange of the drum as shown in Fig. 4. Cut off the surplus length of cord after it is knotted.

Then secure the other end of the tension spring over the spur on the drive drum.

Replace the dial assembly and pointer.

Replace the pilot light assembly after which the chassis may be reinstalled in the cabinet.

### Voltages at Sockets

ANTENNA SHORTED TO GROUND

Type of Tube	Function	Filament Volt.	Plate to Neg. Filament	Screen to Neg. Filament	Grid to Neg. Filament	Normal Plate M. A.
34	1st Detector	2.0	135	55	3.0 av.	1.90
30	Oscillator	2.0	75		0.0	3.70
34	I. F.	2.0	135	70	3.0 av.	3.00
30	2nd Detector	2.0	2			
34	1st A. F.	2.0	140	65	4.0	2.30
30	2nd A. F.	2.0	135		8.0	3.10
19	Output	2.0	137		6.0	1.00 per plate

### Condenser Alignment

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.

First set the signal generator to a frequency of 175 KC. Connect the antenna lead of the lead generator

to the grid of the 1st detector thru a .05 mfd. condenser. The ground lead from the signal generator goes to the ground lead of the receiver. Adjust trimmer condenser C9 on the back panel of the chassis until maximum output is obtained. A non-metallic screw driver should be used in making this adjustment as the I. F. trimmer is at B+ potential.

Next set the signal generator for 1730 KC. Turn the rotor to the full open position. The antenna lead from the signal generator is in this instance connected to the antenna lead of the receiver. Adjust the trimmer of the oscillator section of the 3 gang condenser until maximum output is obtained. The oscillator section is the one with the cut plate rotor.

Then set the signal generator for 1400 KC and turn the rotor until maximum output is obtained. Adjust the other two trimmers on the gang condenser for maximum output.

To obtain dial scale calibration tune in an 800 KC signal and set the dial pointer at that mark on the dial scale. When calibrated in this manner, the setting will be approximately correct at both ends of the scale.

The use of the cut plate type of condenser eliminates the necessity of a 600 KC padder and no adjustment at this frequency, therefore, is required.

### D. C. Resistance of Windings

Part No.	Item	Code	D. C. Resistance in Ohms
P-5168	Double Tuned Antenna Transformer, Primaries in series	T1	20.1
	Double Tuned Antenna Transformer Secondary Preselector	T1	3.3
	Double Tuned Antenna Transformer Secondary Detector	T1	3.1
P-5169	Oscillator Grid Coil	T4	3.6
	Oscillator Plate Coil	T4	1.6
P-5170	I. F. Coil Primary	T2	89.
	I. F. Coil Secondary	T2	126.
P-5171	I. F. Reactor Coil Plate Winding	T3	99.
	I. F. Reactor Coil Grid Winding	T3	429.
P-5172	Double Filament Reactor Assembly each section	L1, L2	Small
P-5173	Combined Filament Reactor Assembly each section	L3, L4	Small
P-50621	Audio Plate Reactor	L5	4940.
P-50622	Iron Core Isolating Reactor	L6	Small
P-50222	Filament Reactor	L10	Small
P-50625	Audio Transformer Primary	T5	1066.
	Audio Transformer Secondary (center tap to inside)	T5	614.
	Audio Transformer Secondary (center tap to outside)	T5	666.
P-2124	6" Magnetic Speaker (center tap to inside)		260.
	6" Magnetic Speaker (center tap to outside)		300.

MODELS 62-114, 62-116  
MONTGOMERY-WARD & CO. Wiring Changes, Schematic

Models 114 and 116 "B" Batteryless Receivers  
Method of changing the filament wiring to  
6 volt series operation.

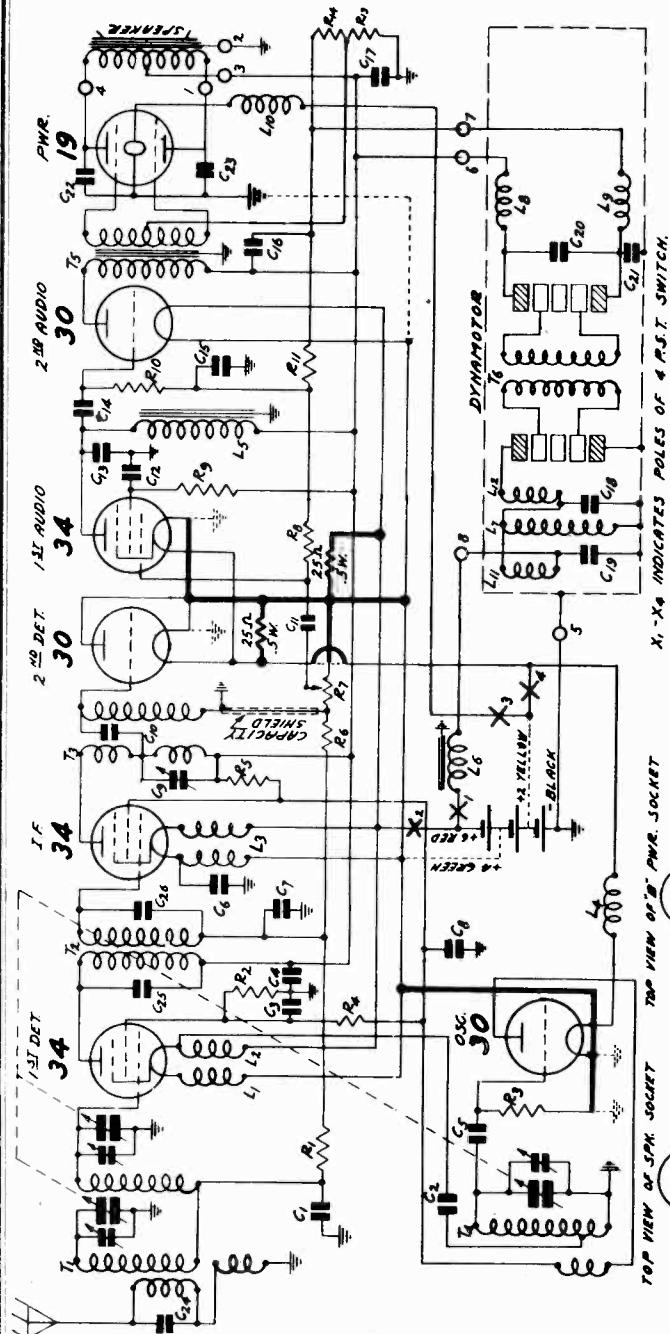


FIG. 1 SCHEMATIC CIRCUIT DIAGRAM SHOWING CHANGES NECESSARY TO WIRE FOR SERIES FILAMENT.  
DOTTED LINES DENOTE ORIGINAL WIRING TO BE REMOVED.  
HEAVY LINES DENOTE NEW WIRING TO BE ADDED.

TOP VIEW OF 3PK SOCKET  
TOP VIEW OF 'B' PWR. SOCKET

IF 175 KC.

July 1935

wiring the tube filaments so that they will be connected in series across the 6 volt battery. The rewiring is simple and can be accomplished in a short time by any experienced radio technician. After rewiring there are only two battery leads, the negative and the 6 volt positive.

It is not recommended that all sets be changed over as obviously most of them are working satisfactorily, and the customers understand how to use them. However, if you have any particularly troublesome cases where tube burn outs continue, it is advisable to rewire the chassis as described.

Complete information for making the change is contained in the following instructions. In the schematic circuit diagram Fig. 1, the old wiring removed is shown dotted while the new wiring is shown in the heavy lines. The actual wiring change is illustrated in Fig. 2.

This receiver uses 2 volt tubes and the power supply is a 6 volt storage battery. Power for the tube filaments is obtained from the individual cells of the battery. A 4 lead cable is used and connections are made at the negative terminal, 2 and 4 volt straps and 6 volt terminal.

If some of the connections are incorrectly made or are open due to corrosion at the battery, it is possible to impress excessive voltages on certain of the tube filaments, burning them out or paralyzing them.

To guard against this condition a cautionary tag was put on the battery cable of each of these sets, and complete information was included in the instruction book. In spite of this fact it was found that users frequently made poor or wrong connections, and changed batteries with the switch on. As a result tubes in many cases were damaged. For this reason, a system has been worked out for re-

MODELS 62-114, 62-116

Chassis View of Changes MONTGOMERY-WARD & CO.

Data

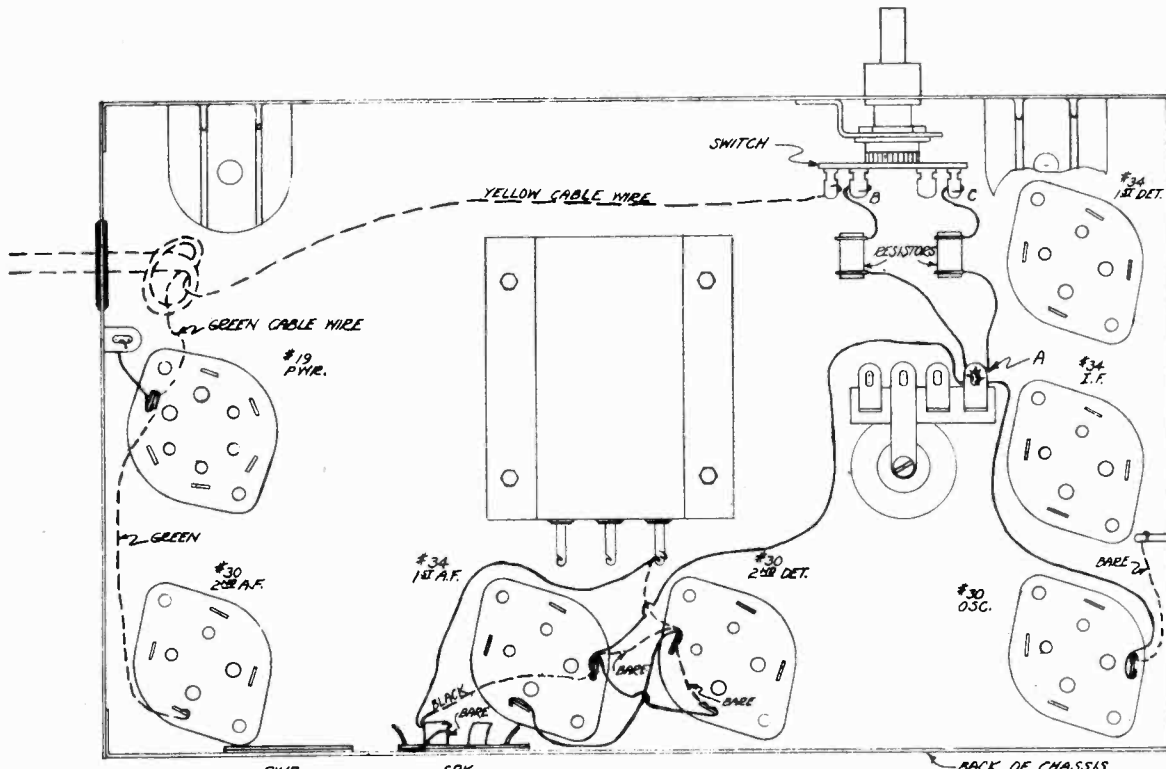


FIG 2 CHANGES IN WIRING

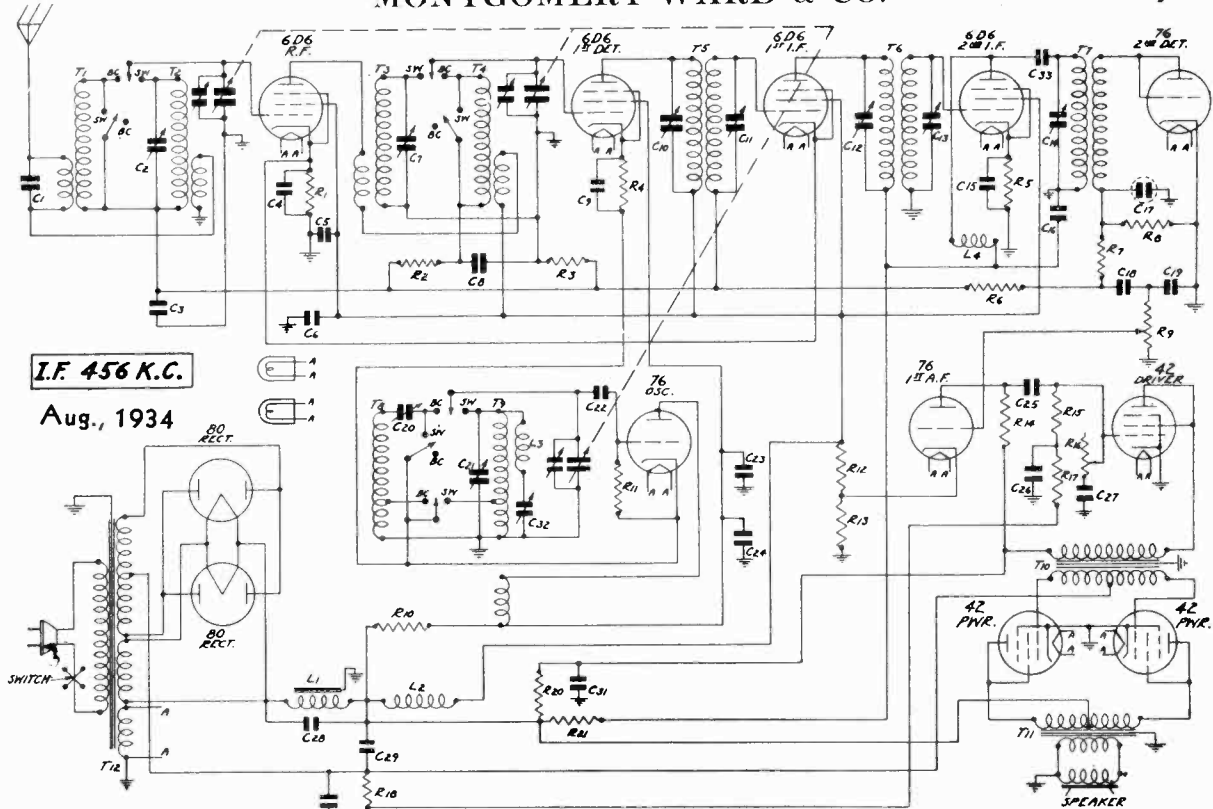
----- DENOTE ORIGINAL WIRING TO BE REMOVED.  
 \_\_\_\_\_ DENOTE NEW WIRING TO BE ADDED.

1. Cut the yellow battery lead at the switch and remove it from the cable. Use this for hook-up wire.
2. Disconnect the wire connecting the 2nd A.F. and 19 tube filaments at the 2nd A.F. terminal and ground it at the lug on the side of the chassis.
3. Remove rear mounting foot.
4. Cut out the bare wire jumpers from the 2nd Det. and 1st A.F. filaments to the plate of the second detector and replace with a bare wire jumper connecting between the two filaments only, leaving just the black wire on the second detector plate.
5. Disconnect that black wire at the condenser block and connect it to the same lug to which the green wire is connected on the 1st A.F. filament.
6. At the 1st A.F. tube socket disconnect the black wire from the filament prong and connect it to the empty lug on the condenser block.
7. Extend the lead from the bare wire junction of the 2nd Detector and 1st A.F. filaments to the lug marked "A." (Do not solder yet).
8. Remove filament ground on oscillator tube and extend the lead so that it can be connected to lug "A." (Do not solder yet).
9. Connect a 25 ohm .5 watt  $\pm 5\%$  resistor between lugs "A" and "B." (Do not solder lug A).
10. Connect a 25 ohm .5 watt  $\pm 5\%$  resistor between lugs "A" and "C." Note: All 4 connections can now be soldered to lug A.
11. Cut the green cable wire at the 19 tube socket and remove it from the cable.
12. Replace the mounting foot and check to see that the 25 ohm resistors are not in a position to short on the bottom plate or other connections.

Schematic, Parts

MODELS 62-134, 62-134X  
62-139, 62-139X

MONTGOMERY-WARD & CO.



I.F. 456 K.C.  
Aug., 1934

B.C. means Standard Wave  
S.W. means Short Wave

NOTE: 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.

REPAIR PARTS LIST FOR 12 TUBE SUPERHETERODYNE RECEIVER MISCELLANEOUS ITEM

Part No.	ITEM	Selling Price
P-5176	Sho. W. and Std. W. Antenna R. F. Transformer less can T1, T2	\$0.86
P-5241	Sho. W. and Std. W. Interstage R. F. Transformer less can T3, T4	.94
P-5183	Oscillator Coil Assembly less can T8, T9	.82
P-5245	3rd I. F. Transformer less can T7	.76
P-40433	Cans for the above assemblies	.08
P-5243	1st I. F. Trans. & Can Assem. T5	1.04
P-5244	2nd I. F. Trans. & Can Assem. T6	1.04
P-5190	H. F. Oscillator Tracking Coil L3	.18
P-5246	2nd I. F. Plate Reactor L4	.30
P-50650-2B	Power Choke L1	1.06
P-50653-2B	Input Transformer T10	1.32
P-50642A-2B	Output Transformer T11	.76
P-50620-2B	Power Transformer 115V 60 Cycle T12	3.40
P-50652-2B	Power Transformer 115V 25 Cycle T12	4.52
P-50651-2B	Power Transformer 115-230V 40-60 Cycle T12	3.74
P-2025	No. 80 Tube Socket	.08
P-1884	No. 42 Tube Socket	.08
P-2022	No. 76 Tube Socket	.08
P-1885	No. 6D6 Tube Socket	.08
P-1637	Speaker Socket	.06
P-40445	Tube Shield	.08
P-40443	Tube Shield Base	.04
P-1925	Speaker	5.92
P-10320	Glass Crystal	.08
P-20875	Crystal Retainer Ring	.06
P-2060	Knob, Small	.10
P-2062	Knob, Large	.12
P-10272	Rubber Chassis Cushion	.04
P-20912	Large Double End Pointer	.10
P-2101	Band Change Switch	.90
P-30456	Small Pointer	.04
P-2012	Pilot Light Bulb	.08
P-20905	Condenser Shield	.04
P-10369	8" Black Drive Cord (V. C. or T. C. Ind.)	.02
P-10370	29" Black Drive Cord (Con. Drive)	.04
P-2126	Pilot Light Socket and Clip Assem.	.06
P-70702	Cord and Plug Assem.	.32
P-30342	Grid Cap Only	.04
P-1504	8 Lug Terminal Strip	.06
P-1421	Single Lug Terminal Strip	.04

RESISTORS

Part No.	Code	Resistance	Wattage	Type	Selling Price
P-A93141ww	R1	140 Ohm		Wire Wound	\$0.08
P-A95204	R2	200,000 Ohm	0.2	Carbon	.08
P-A95105	R3	1.0 Megohm	0.2	Carbon	.08
P-A94252	R4	2,500 Ohm	0.2	Carbon	.08

Part No.	Code	Resistance	Wattage	Type	Selling Price
P-A93401ww	R5	400 Ohm	0.2	Wire Wound	.08
P-A95205	R6	2.0 Megohm	0.2	Carbon	.08
P-A95104	R7	100,000 Ohm	0.2	Carbon	.08
P-A94304	R8	300,000 Ohm	0.2	Carbon	.08
P-96005	R9	2.0 Megohm		& Sw. Vol. Con.	.60
P-E94403	R10	40,000 Ohm	3.0	Carbon	.16
P-A95104	R11	100,000 Ohm	0.2	Carbon	.08
P-98038	R12	4,000 Ohm	2.5	Armored Wire Wound	.38
	R13	390 Ohm	0.5		
	R18	128 Ohm	2.5		
	R19	145 Ohm	3.0		
P-B95603	R14	60,000 Ohm	0.5	Carbon	.08
P-A95603	R15	60,000 Ohm	0.2	Carbon	.08
P-97011	R16	150,000 Ohm		Tone Control	.36
P-A95203	R17	20,000 Ohm	0.2	Carbon	.08
P-98037	R20	4,000 Ohm	4.0	Armored Wire Wound	.34
	R21	6,000 Ohm	2.0		

CONDENSERS

Part No.	Code	Capacity	Voltage	Type	Selling Price
P-80919	C1	250 mmf	600V	Moulded	\$0.08
P-2102	C2	3-40 mmf	Short Wave Ant.	Trimmer	.08
P-81076	C3	0.05 mf	200V	Tubular	.10
P-81111	C4	0.25 mf	200V	Tubular	.12
P-81117	C5	0.25 mf	200V	Tubular	.12
P-81056	C6	6.0 mf	150V	Dry Electrolytic	.68
	C24	2.0 mf	350V		
P-2102	C7	3-40 mmf	Short Wave Inter.	Trimmer	.08
P-81076	C8	0.05 mf	200V	Tubular	.10
P-81076	C9	0.05 mf	200V	Tubular	.10
P-2103	C10	150-250 mmf	Double Trimmer (Part of 1st I. F. Trans.)		.28
P-1685	C14	40-100 mmf	3rd I. F. Trans. Pri. Trimmer	.18	
P-81076	C15	0.05 mf	200V	Tubular	.10
P-81097	C16	0.10 mf	500V	Tubular	.14
P-81076	C17		Integral Part of 3rd I. F. Assem.		
P-81076	C18	0.05 mf	200V	Tubular	.10
P-81081	C19	35 mmf	Wire Capacitor		.08
P-2112	C20	300-500 mmf	Osc. Std. W. Padding Cond.		.22
P-2102	C21	3-40 mmf	Osc. Sho. W. Trimmer		.08
P-81081	C22	35 mmf	Wire Capacitor		.08
P-81118	C23	0.10 mf	400V	Tubular	.14
P-81096	C25	0.25 mf	400V	Tubular	.18
P-81117	C26	25 mf	200V	Tubular	.10
P-81076	C27	0.05 mf	200V	Tubular	.12
P-81099	C28	0.15 mf	220V	AC Tubular	.26
P-81058	C29	16 mf	450V	Wet Electrolytic	.84
P-82000	C30	30 mf	50V	Dry Electrolytic	.62
P-81039A	C31	16 mf	400V	Wet Electrolytic	.72
P-1685	C32	40-100 mmf	Osc. Sho. W. Padding Cond.		.18
P-80919	C33	250 mmf	600V	Moulded	.08

MODELS 62-134,62-134X  
62-139,62-139X  
Resistance Test, Socket  
Trimmers, Voltage

MONTGOMERY-WARD & CO.

## 12 Tube A. C. Standard and Short Wave Superheterodyne Receiver

### D. C. Resistance of Windings

Following are the D. C. resistances of the various windings in the chassis.

Part No.	Item	Code	D. C. Resistance in Ohms	
P-5176	B. C. Antenna Transformer Primary	T1	28.	
	B. C. Antenna Transformer Secondary	T1	4.9	
P-5241	S. W. Antenna Transformer Primary	T2	.3	
	S. W. Antenna Transformer Secondary	T2	Small	
P-5243	B. C. & S. W. Interstage R. F. Transformer Primaries in series	T4	2.9	
	B. C. Interstage R. F. Trans. Sec.	T4	7.8	
	S. W. Interstage R. F. Trans. Sec.	T3	Small	
	1st I. F. Transformer Primary	T5	4.8	
P-5244	1st I. F. Transformer Secondary	T5	4.8	
	2nd I. F. Transformer Primary	T6	5.	
P-5245	2nd I. F. Transformer Secondary	T6	5.	
	3rd I. F. Transformer Primary	T7	12.0	
P-5183	3rd I. F. Transformer Secondary	T7	30.0	
	B. C. Oscillator Grid Coil	T8	3.3	
P-50653-2B	S. W. Oscillator Grid Coil	T9	Small	
	S. W. Oscillator Plate Coil	T9	0.25	
P-50653-2B	Audio Input Transformer Primary (Center Tap to Inside)	T10	400.	
	Audio Input Transformer Secondary (Center Tap to Outside)	T10	200.	
P-50642A-2B	Audio Output Transformer primary (Center Tap to Inside)	T11	280.	
	Audio Output Transformer Primary (Center Tap to Outside)	T11	300.	
P-50620-2B	Audio Output Transformer Secondary	T11	340.	
	Power Trans. (115V 60 Cycles) prim.	T12	.4	
P-50620-2B	Power Transformer (115V 60 Cycles) H. T. Sec. (Center Tap to Inside)	T12	2.5	
	H. T. Sec. (Center Tap to Outside)	T12	150.	
	Power Transformer (115V 60 Cycles) Secondary (80 Filament)	T12	165.	
	Power Transformer (115V 60 Cycles) Secondary A-A (Filament)	T12	Small	
	P-50650-2B	Power Choke	L1	140.
	P-5190	H. F. Oscillator Tracking Coil	L3	1.2
P-5246	2nd I. F. Plate Reactor	L4	57.	
P-1925	Speaker Voice Coil	L2	1.6	
	Speaker Field Coil	L2	5300.	

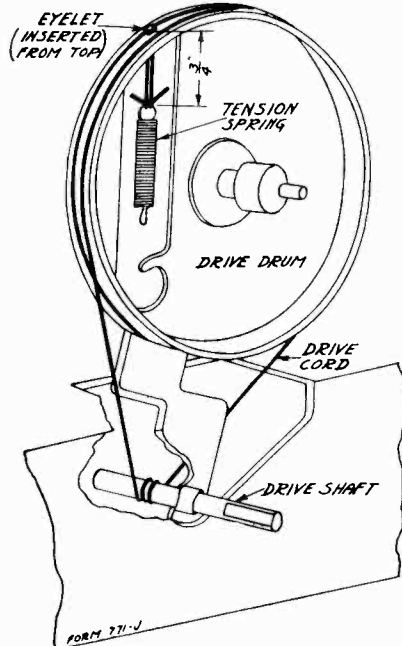


Fig. 3 Drive Cord Replacement,

**TUNING RANGE**  
Standard Wave Band  
530 to 1740 Kilocycles  
Short Wave Band  
5.8 to 18.3 Megacycles

60 Cycle { Model 62-134  
" " 62-139  
25 Cycle { " 62-134x  
" " 62-139x

### Voltages at Sockets LINE VOLTAGE — 115 ANTENNA SHORTED TO GROUND

Type of Tube	Function	Across Fila. or Heater	Plate to Cath.	Screen to Cathode	Grid to Cath.	Normal Plate M. A.
6D6	R. F.	6.3	105	105	2.8	8.8
6D6	1st Detector	6.3	95	105	10.0	3.3
76	Oscillator	6.3	115		0.0	5.8 <sup>(1)</sup> 7.7 <sup>(2)</sup>
6D6	1st I. F.	6.3	260	105	2.8	8.8
6D6	2nd I. F.	6.3	260	105	3.2	7.2
76	2nd Detector	6.3				
76	1st Audio	6.3	170		11.0	1.2
42	Driver Stage	6.3	235	235	18 <sup>(3)</sup>	26.5
42	Output	6.3	350	350	38.0	21.0
80	Rectifier	4.6	435			35.5 per plate

(1) Switch in Standard Wave position.  
(2) Switch in Short Wave position (No Signal).  
(3) Measured across resistor R19.

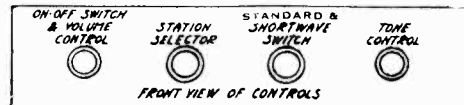
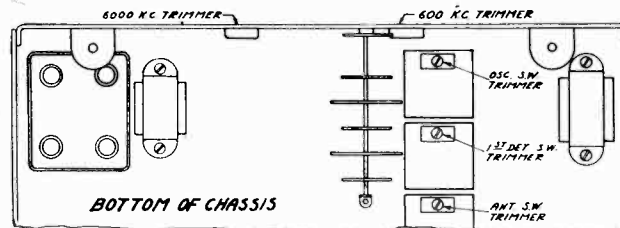
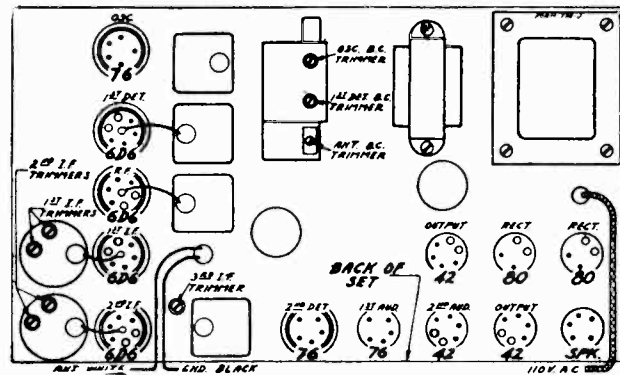


Fig. 2—Location of Tubes, Trimmers and Controls

## MONTGOMERY-WARD &amp; CO.

MODELS 62-134, 62-134X  
62-139, 62-139X

## Alignment, Data

**Intermediate Frequency Adjustment**

Set the signal generator for 456 K. C. Connect the antenna lead of the signal generator to the grid of the 1st detector through a .05 mfd. condenser. Turn the tuning condenser rotor until the plates are completely out. The ground lead from the signal generator goes to the ground lead of the receiver. The volume control should be at the maximum position. Reduce the signal so that A. V. C. action is not obtained.

Then adjust the five I. F. trimmer condensers until maximum output is obtained. The adjusting screws for the 1st and 2nd trimmer condensers are reached from the top of the chassis and are in the round I. F. cans—See Fig. 2. The openings to these trimmer condensers are covered over by small cover plates which are held in position by screws. Loosen these screws until the cover plates can be swung around. **CAUTION - Use an insulated screwdriver for adjusting trimmers to prevent short-circuiting to ground.** In the 3rd I. F. coil, only the primary has a variable trimmer condenser. This condenser is mounted on the top panel of the chassis as shown in Fig. 2 and the adjustment screw is reached through a hole in the top panel.

**Standard Wave Band Adjustment**

The standard-short wave switch should be in the standard wave position. Set the signal generator for 1740 K. C. Turn the rotor to the full open position. The antenna lead from the signal generator is in this instance connected to the antenna lead of the receiver. Reduce the signal so that A. V. C. action is not obtained. Adjust the oscillator standard wave trimmer until maximum output is obtained. This trimmer is on the tuning condenser and its location is shown in Fig. 2.

Then set the signal generator for 1500 K. C. Turn the rotor until maximum output is obtained. Loosen the set screw in the pointer hub and set the pointer at the 1500

K. C. mark on the standard wave band scale. Retighten the hub set screw. Then adjust the antenna and 1st detector standard wave trimmers until maximum output is obtained.

Next set the signal generator for 600 K. C. and adjust the 600 K. C. trimmer. The adjusting screw is reached through a hole in the front panel of the chassis as shown in Fig. 2. Turn the tuning condenser rotor until maximum output is obtained. Then turn the rotor slowly back and forth over this setting at the same time adjusting the 600 K. C. trimmer screw until the highest output is obtained.

**Short Wave Band Adjustment**

**CAUTION**—After the standard wave band alignment as described above has been made, do not change the adjustment of any of the standard wave band trimmers.

In aligning the short wave band of the receiver, it will be noted that the signal will be heard with the signal generator set at two points 912 K. C. apart. That is, if the receiver is tuned to 15,000 K. C. a signal will be heard when the signal generator is set at 15,000 K. C. and again at approximately 15,912 K. C. This is due to image reception or the fact that a 456 K. C. beat is obtained when the signal is 456 K. C. lower than the receiver oscillator and also when the signal is 456 K. C. higher than the receiver oscillator. Care should be taken to see that the receiver is tracked with the signal generator adjusted to the lower of the two frequencies at which a signal is heard, in order that the oscillator in the receiver will be 456 K. C. higher in frequency than the signal.

Turn the standard-short wave switch to the short wave position. Turn the rotor to the full open position. As explained above, the volume control should be at the maximum position and the signal should be reduced to prevent A. V. C. action. Set the signal generator for 18,300 K. C. Then adjust the oscillator short wave trimmer for maximum output. This trimmer is reached from under the chassis and its position is shown in Fig. 2. If a maximum

output peak cannot be reached, it may be due to the fact that the antenna and 1st detector short wave trimmers are screwed down too far. Back off these two trimmer screws two or three turns and then adjust the oscillator short wave trimmer for maximum output.

Next set the signal generator for 15,000 K. C. Turn the rotor until maximum output is obtained. Then adjust the antenna and 1st detector short wave trimmers for maximum output.

Next set the signal generator for 6000 K. C. and adjust the 6000 K. C. trimmer. This condenser is mounted on the front panel of the chassis as shown in Fig. 2 and is reached through a hole in the front panel. Turn the tuning condenser rotor until maximum output is obtained. Then turn the rotor slowly back and forth over this setting, at the same time adjusting the 6000 K. C. trimmer screw until the highest output is obtained.

**Condenser Alignment**

Correct alignment is extremely important in connection with all wave receivers. 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 of 456 K. C. and accurately

calibrated signals over the broadcast and short wave bands, 530-1740 K. C. and 5.8-18.3 M. C., is required. An output indicating meter is also necessary. It will be practically impossible to align the receiver if unsatisfactory apparatus is used.

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

**Replacing Drive Cord**

Remove chassis from cabinet.

Take off the pilot light assembly by lifting off the two sockets and spring clips.

Detach the large pointer by removing the screw at the center of the dial.

Loosen the dial assembly by taking out the two screws which secure the bottom of this assembly to the chassis.

Then lay the complete dial assembly face downward in front of the chassis. It is not necessary to remove the volume control and tone control collars which hold the indicator cords of these two controls 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. 3.

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. 3. Insert one end of the drive cord from the outside through the hole in the eyelet in the drive drum.

Tie the end of the cord which has been inserted in the hole to one end of the tension spring.

Wrap the cord in a clockwise direction (facing front of chassis) around the drive drum approximately one-half turn.

Then tilt the chassis up on its back panel and bring the cord mentioned in the previous paragraph down to the drive shaft. Wrap it two and one-half times around the drive shaft as shown in Fig. 3.

Then bring this cord up from the drive shaft and wrap it around the drive drum approximately one and one fifth turns in a clockwise direction until it is up to the hole in this drum as illustrated.

Insert the free end of the cord through the hole in the eyelet and tie it to the end of the tension spring. The end of the spring, when hanging free, should be approximately  $\frac{3}{4}$ " from the flange of the drum as shown in Fig. 3. Cut off the surplus length of cord after it is knotted.

Then secure the other end of the tension spring over the spur on the drive drum.

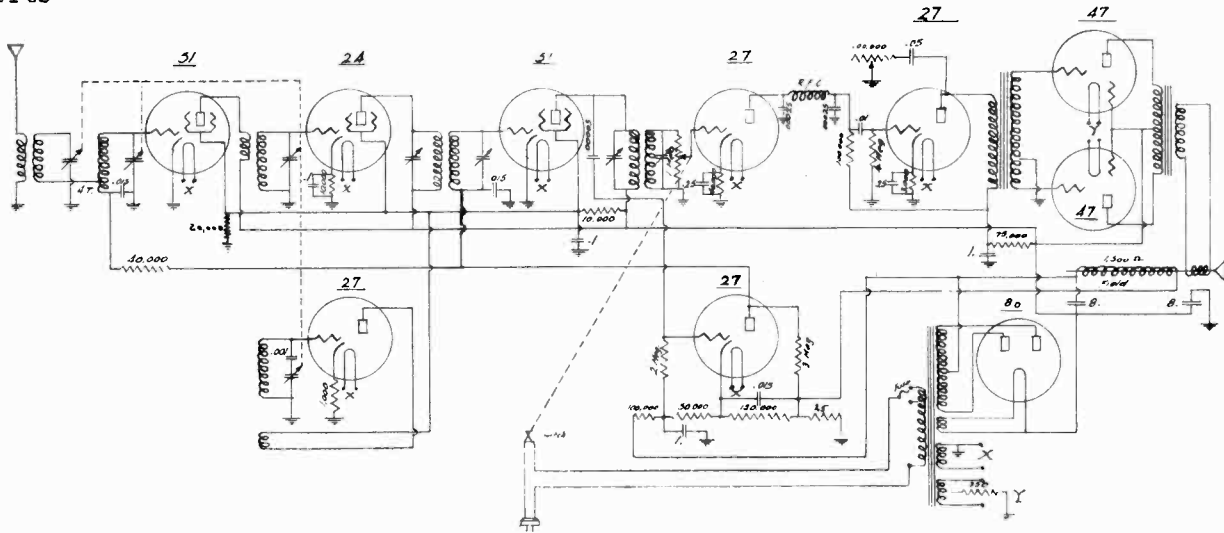
Replace the dial assembly and pointer.

Replace the pilot light assembly after which the chassis may be reinstalled in the cabinet.



MODEL 62-16  
Schematic, Voltage  
Parts

MONTGOMERY-WARD & CO.



Ten Tube Super-Heterodyne

This receiver is a super-heterodyne employing the following tubes: Signal frequency amplifier, type No. 235; First detector, type No. 224; Intermediate frequency amplifier, type No. 235; Second detector, type No. 227; First audio, type No. 227; Second audio, two type No. 247's; Rectifier, type No. 280 and AVC tube, type No. 227.

A pre-selector is used between the antenna and the signal frequency RF stage being tuned by the two rear sections of the gang condenser. One coil is mounted directly behind the condenser, in a shield, and the other is located to the right of the condenser, next to the RF tube. The oscillator and detector coils are magnetically coupled and are located underneath the variable condenser.

The I. F. amplifier is designed to give as nearly as possible a flat top response with a band width of ten kilocycles at a signal interference ratio of 1,000 to 1. The coils in the I. F. transformers, therefore are adjusted to approximately critical coupling, and in aligning the I. F. tuned circuits it is unnecessary to stagger the condensers to produce the desirable flat top tuning curve.

INSTALLATION

The sensitivity of this receiver being extremely high, (2 to 5 microvolts) certain precautions are necessary in the installation which are unimportant with receivers of poorer sensitivity. While no definite length can be established for the antenna due to varying local conditions, the average installation should be from 20 to 50 feet, including lead-in. In some locations where field strength is very low, longer antennas may be used, but in all cases, the antenna should be the shortest possible consistent with good station pickup.

The following voltages should be read with no signal being received: With 300,000 ohm voltmeter (200 volt scale, 1,000 ohms per volt)—

From ground to R. F. screen	95
From ground to R. F. plate	200
From ground to First detector cathode	10
From ground to Oscillator cathode	5
From ground to Second detector cathode	6
From ground to Second detector plate	50
From ground to Second detector plate resistance	75
From ground to First AF plate	75
From ground to Second AF screen	200
From ground to Second AF plate	190
From ground to Speaker field	140

With 10,000 ohm meter (30 volt scale, 1,000 ohms per volt)—

Second AF bias	13.5
Second RF bias	2.5
First AF bias	4.8

With 600,000 ohm meter (600 volt scale, 1,000 ohms per volt)—

80 filament to C. T. of power transformer secondary	345 V.
A. V. C. grid voltage	20
A. V. C. plate voltage	60
A. V. C. filter voltage	40

AC VOLTAGE

Heater filaments	2 V.
Pentode filaments	2.25
80 filaments	4.6

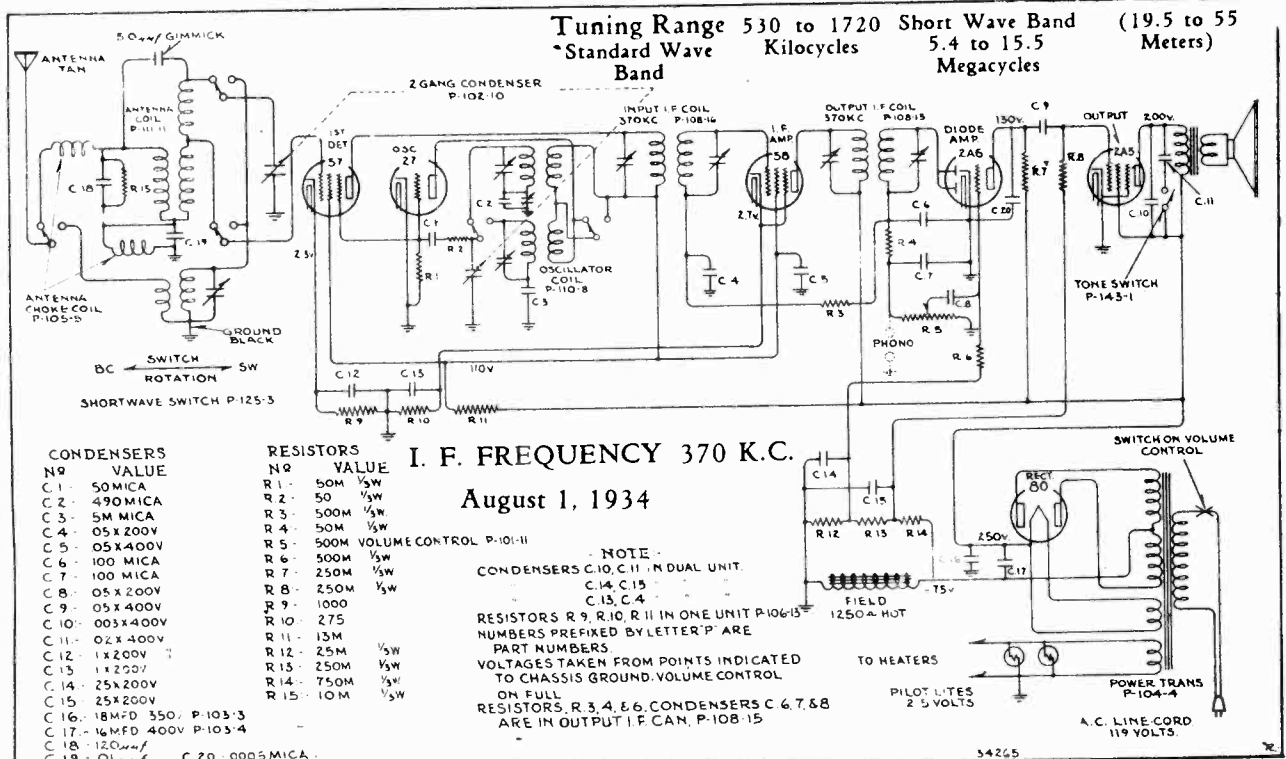
Replacement Parts List  
Model 62-16

Supplier: Davison-Haynes Mfg. Co., Los Angeles, California

Part No.	PART NAME	Unit Per Chassis	Cost Price	Selling Price	Part No.	PART NAME	Unit Per Chassis	Cost Price	Selling Price
62-A 1	Power Transformer	1	\$2.00	\$5.00	62-A22	50,000 ohm 1/3 watt	1	.08	.20
62-A 2	Audio Transformer	1	.87	2.17	62-A23	100,000 ohm 1/3 watt	3	.08	.20
62-A 3	Intermediate Coil—1st stage	1	.40	1.00	62-A24	150,000 ohm—1/3 watt	1	.08	.20
62-A 4	Intermediate Coil—2nd stage	1	.40	1.00	62-A25	250,000 ohm—1/3 watt	1	.08	.20
62-A 5	Band Pass Coil	1	.40	1.00	62-A26	2 meg ohm 1/3 watt	1	.08	.20
62-A 6	Antenna Coil	1	.40	1.00	62-A27	3 meg ohm 1/3 watt	1	.08	.20
62-A 7	Coil Shield Can	4	.08	.20	62-A28	60 ohm wirewound	1	.08	.20
62-A 8	Tube Shield Can	7	.08	.20	CONDENSERS				
62-A 9	Variable Condenser—4 gang	1	2.60	6.50	62-A29	.015—200 Volt	3	.12	.30
62-A10	Volume Control with Switch—1 meg ohm	1	.48	1.20	62-A30	.01—400 Volt	1	.15	.37
62-A11	Tone Control 100,000 ohm	1	.36	.90	62-A31	.05—400 Volt	1	.12	.30
62-A12	Electrolytic Condenser 8 mfd.	2	.60	1.50	62-A32	.25—200 Volt	2	.15	.37
62-A13	By Pass Block 2x1. mfd.	1	.50	1.25	62-A33	.1—400 Volt	1	.12	.30
62-A14	Dial Assembly with Escutcheon	1	.75	1.87	62-A34	.001—3%	1	.13	.32
RESISTORS					62-A35	R. F. Choke	1	.21	.52
62-A15	350 ohm—2 watt	1	.12	.30	62-A36	Tuning Meter	1	.75	1.88
62-A16	10,000 ohm—2 watt	1	.12	.30	62-A37	A. C. Cord and Plug	1	.16	.40
62-A17	75,000 ohm—1 watt	1	.09	.22	62-A38	Antenna and Ground Post	1	.12	.30
62-A18	3,000 ohm—1 watt	1	.09	.22	62-A39	Phonograph Jack	1	.12	.30
62-A19	40,000 ohm—1/3 watt	3	.08	.20	62-A40	Magnavox Speaker No. 154	2	2.75	6.88
62-A20	10,000 ohm—1/3 watt	1	.08	.20	62-A41	Knobs	3	.10	.25
62-A21	1,000 ohm—1/3 watt	1	.08	.20	62-A42	Tube Sockets:	11	.06	.15
					4-227, 2-247, 1-280, 1-224, 2-235, 1 speaker socket.				

MONTGOMERY-WARD & CO.

MODELS 62-135, 62-150  
62-154  
Schematic, Voltage, Parts



CONDENSERS	RESISTORS
No. VALUE	No. VALUE
C1 - 50 MICA	R1 - 50M 1/2W
C2 - 490 MICA	R2 - 50 1/2W
C3 - 5M MICA	R3 - 500M 1/2W
C4 - 05 x 200V	R4 - 50M 1/2W
C5 - 05 x 400V	R5 - 500M VOLUME CONTROL P-101-11
C6 - 100 MICA	R6 - 500M 1/2W
C7 - 100 MICA	R7 - 250M 1/2W
C8 - 05 x 200V	R8 - 250M 1/2W
C9 - 05 x 400V	R9 - 1000
C10 - 003 x 400V	R10 - 275
C11 - 02 x 400V	R11 - 13M
C12 - 1 x 200V	R12 - 25M 1/2W
C13 - 1 x 200V	R15 - 250M 1/2W
C14 - 25 x 200V	R14 - 750M 1/2W
C15 - 25 x 200V	R15 - 10M
C16 - 18MFD 350. P-103-3	
C17 - 16MFD 400V P-103-4	
C18 - 120uuf	
C19 - 01 uuf	
C20 - 0005 MICA	

MODEL NUMBERS FOLLOWED BY "X" INDICATES 25-CYCLES

**Repair Parts Price List**

Order all parts on stock order from Chicago or Oakland only.  
Return defective parts for credit to Chicago or Oakland only.

Part No.	Description	No. Used in Set	Selling Price
BE 100-9	.05 x 200 Volt Condenser—20%.....	1	.10
BE 100-13	.05 x 400 Volt Condenser—20%.....	2	.10
BE 100-14	.1 x 200 Volt Condenser—20%.....	1	.10
BE 100-18	.01 x 400 Volt Condenser—5%.....	1	.10
BE 101-11	Volume Control with Switch.....	1	.60
BE 102-10	Two Gang Variable Condenser.....	1	1.30
BE 103-3	18 Mfd. x 300 V. Electro. Cond.....	1	.70
BE 103-4	16 Mfd. x 350 V. Electro. Cond.....	1	.70
BE 104-4	Power Transformer—50-60 Cycle.....	1	2.00
BE 104-10	Power Transformer—25 Cycle.....	1	3.00
BE 104-11	Power Transformer—Universal Primary—40 Cycle.....	1	3.50
BE 104-15	Power Transformer—Universal Primary—25 Cycle.....	1	4.60
BE 105-5	Antenna Choke Coil.....	1	.30
BE 106-13	14,275 Ohm Metal Clad Resistor.....	1	.40
BE 107-5	Line Cord and Plug.....	1	.30
BE 108-15	Output I.F. Transformer Complete.....	1	.80
BE 108-16	Input I.F. Transformer Complete.....	1	.70
BE 110-8	Oscillator Coil Complete in Can.....	1	1.00
BE 111-11	Antenna Coil Complete in Can.....	1	1.10
BE 112-10	Drive Bracket—Less Planetary.....	1	.30
BE 112-21	Dial.....	1	.20
BE 112-23	Pointer.....	1	.06
BE 112-24	Dial Glass.....	1	.10
BE 112-26	Planetary Drive Complete.....	1	.50
BE 112-31	Compression Spring.....	1	.02
BE 112-38	Bakelite Escutcheon.....	1	.30
BE 112-40	Pilot Light Bracket.....	2	.10
BE 112-65	Glass Retaining Escutcheon with glass.....	1	.40
BE 112-68	Dial Scale used on sets with BE 112-65 escutcheons.....	1	.25
BE 112-70	Dial Bracket—Less Planetary Replaces BE 112-10 on sets using Glass Retaining Escutcheon BE 112-65.....	1	.30

Part No.	Description	No. Used in Set	Selling Price
BE 114-1	Dynamic Speaker—Six Inch.....	1	3.80
BE 114-4	Dynamic Speaker—Eight Inch.....	1	4.20
BE 116-1	2.5 Volt Pilot Lamp—41-G3 1/2.....	1	.10
BE 118-3	.05 x .1—200 Volt Condenser—20%.....	1	.20
BE 118-4	.003 x .02—400 Volt Dual Cond. 20%.....	1	.20
BE 118-5	.25 x .25—200 Volt Dual Cond. 20%.....	1	.20
BE 124-5	J-3-S Series Padder.....	1	.16
BE 125-3	Short Wave Switch.....	1	.70
BE 129-2	.0005 Mica Condenser—20%.....	1	.10
BE 129-5	.0001 Mica Condenser—20%.....	2	.10
BE 129-9	.005 Mica Condenser—10%.....	1	.30
BE 129-10	.00049 Mica Condenser—12%, Min. 8%.....	1	.10
BE 129-11	.00005 Mica Condenser—30%.....	1	.10
BE 129-13	120 Mmf. Mica Condenser—10%.....	1	.10
BE 130-1	25M Ohm—1/3 Watt Carbon Res.....	1	.10
BE 130-3	500M Ohm—1/3 Watt Carbon Res.....	2	.10
BE 130-11	250M Ohm—1/3 Watt Carbon Res.....	2	.10
BE 130-12	50M Ohm—1/3 Watt Carbon Res.....	2	.10
BE 130-17	10M Ohm—1/3 Watt Carbon Res.....	1	.10
BE 130-27	50M Ohm—1/3 Watt Carbon Res.....	1	.10
BE 130-28	750M Ohm—1/3 Watt Carbon Res.....	1	.10
BE 130-33	240M Ohm—1/3 Watt Carbon Res.....	1	.10
BE 131-2	Bakelite Knobs (Inc. Springs).....	3	.10
BE 143-1	Tone Switch.....	1	.12
	All Sockets.....	..	.20
	Cabinet—Model 62-135.....	..	5.60
	Cabinet—Model 62-150.....	..	5.60
	Cabinet—Model 62-154.....	..	13.00

All resistors are RMA color coded—specify value and/or resistor (per schematic diagram) and model number.

When ordering condensers, specify part number, model number and/or capacitor (per schematic diagram) and model number.

When ordering parts, always specify part and model number as well as serial number of chassis.

MODELS 62-135, 62-150, 62-154

Socket, Trimmers, Alignment MONTGOMERY-WARD & CO.

## 60 Cycle Chassis No. 62-135, No. 62-150 and 62-154

## 25 Cycle Chassis No. 62-135-X, No. 62-150-X and 62-154-X

### Service Notes

Voltages taken from different points of circuit to chassis are measured with volume control full on, right turn, with a voltmeter having a resistance of 1000 ohms per volt. These voltage are indicated on the schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of similar capacity, which is known to be in good condition, until the defective unit is located.

Excessive hum, low volume, stuttering and a reduction in all D.C. voltages is usually caused by a shorted electrolytic condenser.

Open by-pass condensers frequently cause oscillation and distorted reproduction.

Should the planetary type vernier dial drive mechanism fail to function properly, it will probably be found to be due to a cracked, broken or weak compression spring. This drive may be dis-assembled by removing the two screws which fasten it to the dial bracket. The part number of the compression spring is BE112-31. All of the other dial parts are hardened and should cause no trouble.

Part BE 106-13, a metal clad resistor combining resistors R9, R10, R11, can be repaired without removing by replacing open sections with carbon resistors.

R 9 = 1/4 watt 1000 ohms ± 10%

R10 = 1/2 watt 275 ohms ± 10%

R11 = 2 watts 13000 ohms ± 10%

Care should be used in replacing broken dial crystals, the small retaining ears sometimes break off unless they are carefully adjusted. Should they break, it is best to solder them in place rather than replace the entire BE112-10 unit.

Some chassis are equipped with glass retaining escutcheons. Part No. BE 112-65, on these chassis dial scale No. BE 112-68 replaces BE 112-21.

### 25 Cycle Chassis

The 25 cycle chassis, models 62-135X, 62-150X and 62-154X may be used on a power supply from 105 to 115 volts, 60 cycles, but the 60 cycle models must not under any circumstances be operated on 25 cycles.

Chassis equipped with transformers for special voltages or frequencies are so marked.

### Aligning I. F. Transformers:

1. With volume control full on, at extreme right of its rotation, and with wave selector switch in the broadcast position, extreme left of its rotation, with variable condenser at its minimum capacity position, plates entirely out of mesh, adjust the I.F. transformers, parts number BE108-15 and BE108-16 in the following manner:

- Connect an external oscillator adjusted to 370 kilocycles in series with a 1 mfd. condenser to the control grid cap of the type 57 first detector tube.
- Adjust trimming condensers of both I.F. transformers to resonance. Use as a resonance indicator an output meter connected across the primary of the speaker input transformer or by means of an adapter between the plate and screen terminals of the type 2A5 output tube. Maximum deflection of the meter indicates resonance. Care should be taken to use only enough signal to give a readily readable output.

Note: The two trimmer condensers which tune the primary and secondary of the I.F. transformers are adjusted by set screws and are accessible from the back of the chassis.

### Broadcast Band Alignment:

1. Shift the frequency of the external oscillator to 535 kilocycles and connect it in series with a 200 mmfd condenser to the tan antenna wire and the black ground wire.

- Set the variable condenser in its maximum capacity position, plates entirely in mesh.
- Adjust the broadcast oscillator series trimmer to resonance with oscillator. This adjustment is located between the variable condenser and the power transformer and is accessible from the top of the chassis.

### Alignment

The set should be carefully checked for all other possible causes of trouble, such as defective tubes, condensers, resistors, poor installations and low line voltages before any attempt is made at re-alignment.

Note: When making this adjustment, slowly vary the frequency of the external oscillator as the adjustment is made. Adjust for maximum output.

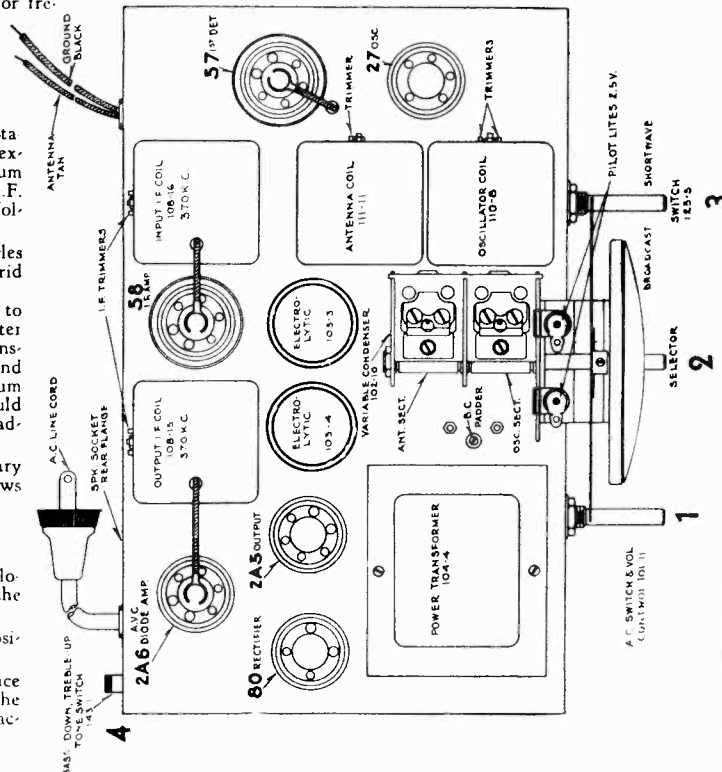
2. Shift frequency of external oscillator to 1712 kilocycles and set variable condenser in its minimum capacity position, plates entirely out of mesh:

- Adjust the broadcast oscillator shunt trimmer to resonance. This adjustment is the top adjustment in oscillator can assembly, part number BE110-8 (see top view).

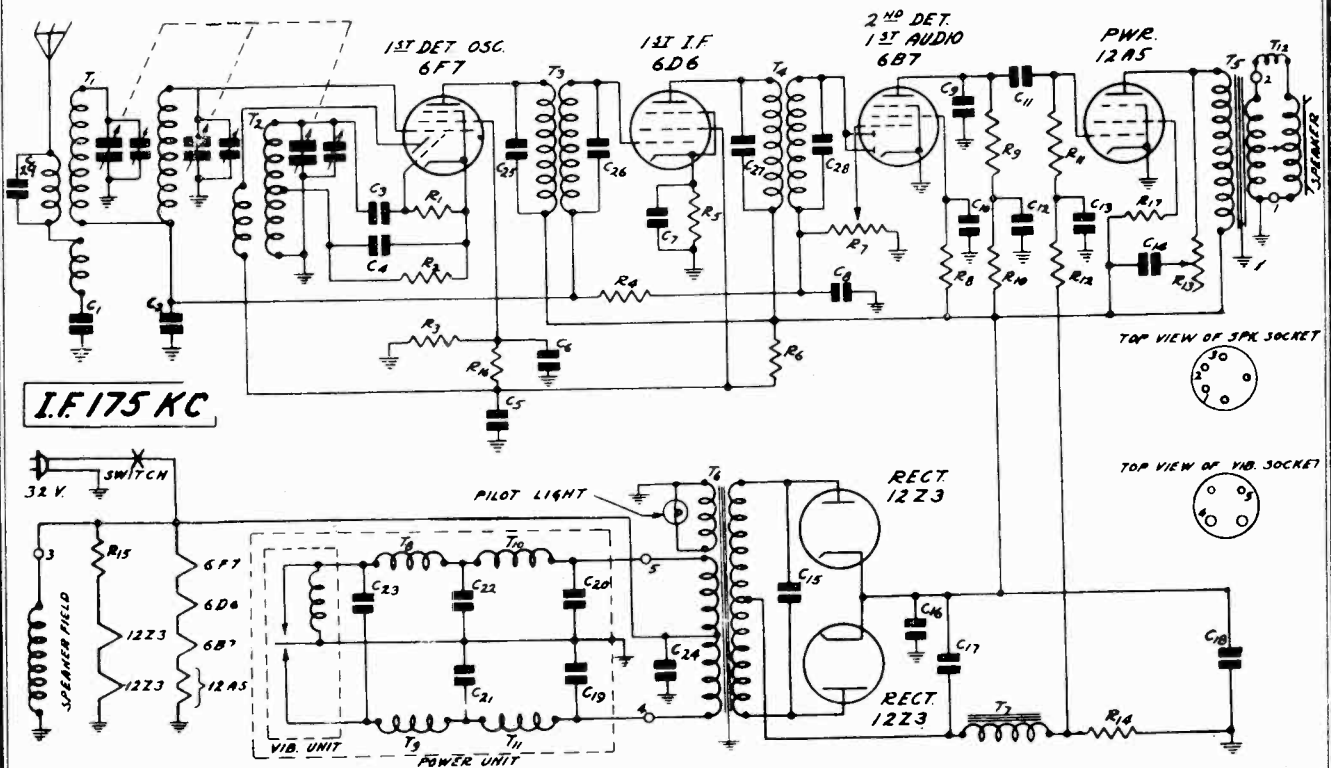
### Short Wave Band Alignment:

1. Set the wave changing switch in the short wave position, right turn, and shift external oscillator frequency to 15 megacycles. Connect oscillator to tan antenna lead in series with a 300 ohm resistor to black ground wire.

- With selector knob adjust variable condenser so that dial indicator points to the 15 megacycle calibration on the bottom sector of the dial.
- Adjust the short wave oscillator shunt trimmer to resonance with the 15 megacycle signal (use care and make certain that you do not adjust to resonance with the image instead of the signal). This adjustment is the one closest to the chassis on the side of the oscillator coil can assembly, part number BE110-8, and is accessible from the side of the chassis.
- Adjust the short wave antenna trimmer to resonance. This adjustment is the single adjustment on the side of the antenna coil can assembly, part number BE111-11, and is accessible from the side of the chassis, between the type 57 and 27 tubes.



MONTGOMERY-WARD & CO.



The numbers on the 2 sockets shown at the right above, correspond with the numbers as shown, in the circuit.

Part No.	Description	Price
P-5221	1st I. F. Coil and Can Assembly	.78
P-5203	2nd I. F. Coil and Can Assembly	.72
P-50626	Power Transformer	1.69
P-50624A	6B Output Transformer	.48
P-50637	"B" Filter Reactor	.42
P-1885	6D6 Tube Socket	.06
P-1944	6B7 Tube Socket	.06
P-1945	6F7 Tube Socket	.06
P-1946	12A5 Tube Socket	.06
P-2020	12Z3 Tube Socket	.06
P-1637	Speaker Socket	.06
P-2060	Knob, Small	.10
P-2062	Knob, Large	.10
P-10272	Rubber Chassis Cushions	.04
P-40445	Tube Shield	.08
P-40443	Tube Shield Base	.04
P-10320	Glass Crystal	.08
P-30875	Crystal Retainer Ring	.06
P-1421	Single Lug Mtg.	.04
P-2130	Double Insulated Mtg. Lug	.04
P-20912	Large Double End Pointer	.10
P-30456	Small Pointer	.04
P-30342	Grid Cap Only	.04
P-70702	115 Volt Line and Plug Assembly	.32
P-70703	Antenna and Ground Wires	.16
P-2012	Pilot Light Bulb (6.8 volts)	.08
P-2147	Speaker 6" Mantel	3.62
P-2173	Speaker 8" Console	4.20
P-10347	Rubber Grommet (Small Gang Cond. Mtg.)	.04
P-10296	Rubber Grommet (Large)	.04

"B" POWER UNIT PARTS		
P-70770	Shield Cable and Plug	.24
P-40439	Vibrator Shield Can	.12
P-2153	Vibrator Unit	2.98
P-5172	R. F. Choke Coils	.14
P-2021	Vibrator Socket	.06
P-10349	Rubber Band (For Mtg. Vib.)	.12
P-20926	Screw Hook (For Mtg. Vib.)	.04
P-81101	C19 .01 Mf. 400V Tubular Condenser	.08
P-81101	C20 .01 Mf. 400V Tubular Condenser	.08
P-80888	C21 .25 Mf. 200V Tubular Condenser	.12
P-80888	C22 .25 Mf. 200V Tubular Condenser	.12
P-81054	C23 .5 Mf. 140V Tubular Condenser	.16

CONDENSERS					Selling Price
Part No.	Code	Capacity	Voltage	Type	
P-80862	C1	.05 Mf.	200V	Tubular	.08
P-80862	C2	.05 Mf.	200V	"	.08
P-81891	C3	.35 Mmf.		Wire Capacitor Part of Osc. Assem.	.08
P-80862	C4	.05 Mf.	200V	Tubular	.08
P-80888	C5	.25 Mf.	200V	"	.12
P-81049	C6	.05 Mf.	200V	"	.20
P-81049	C7	.05 Mf.	200V	"	.20
P-81811	C8	100 Mmf.		Wire Capacitor	.08
P-81051	C9	.002 Mf.	600V	Tubular	.08
P-80888	C10	.25 Mf.	200V	"	.12
P-80872	C11	.01 Mf.	600V	"	.12
P-80888	C12	.25 Mf.	200V	"	.12
P-81062	C13	.01 Mf.	140V	"	.12
P-81055	C14	.05 Mf.	400V	"	.12
P-81052	C15	.015 Mf.	1600V	"	.18
P-80887	C16	.10 Mf.	400V	"	.10
P-81016	C17	8.0 Mf.	300V	Electrolytic Block	1.10
P-81016	C18	8.0 Mf.	300V	Electrolytic Block	1.10
P-80993	C24	.5 Mf.	140V	Tubular	.18
P-81806	C25	70 Mmf.		Wire Capac. Part of 1st I. F. Assem.	.08
P-81804	C26	45 Mmf.		Wire Capac. Part of 1st I. F. Assem.	.08
P-81808	C27	90 Mmf.		Wire Capac. Part of 2nd I. F. Assem.	.08
P-81810	C28	100 Mmf.		Wire Capac. Part of 2nd I. F. Assem.	.08
P-81812	C29	200 Mmf.		Wire Capac. Part of Ant. Assem.	.08
P-81015				Three Gang Condenser	1.70

RESISTORS					Selling Price
Part No.	Code	Resistance	Wattage	Type	
P-A95104	R1	100,000 Ohm	.2	Carbon	.08
P-A95152	R2	1,500 Ohm	.2	Carbon	.08
P-B94303	R3	30,000 Ohm	.5	Carbon	.08
P-A98205	R4	2 Megohm	.2	Carbon	.08
P-98021	R5	400 Ohm	.2	Wire Wound	.08
P-C93702	R6	7,000 Ohm	1.0	Carbon	.10
P-96014	R7	500,000 Ohm		Volume Control	.50
P-B94204	R8	200,000 Ohm	.5	Carbon	.08
P-B94603	R9	60,000 Ohm	.5	Carbon	.08
P-A95203	R10	20,000 Ohm	.2	Carbon	.08
P-A95504	R11	500,000 Ohm	.2	Carbon	.10
P-A94104	R12	100,000 Ohm	.2	Carbon	.08
P-97011	R13	150,000 Ohm		Tone Control	.36
P-98035	R14	450 Ohm	2.0	Wire Wound	.08
P-98034	R15	25 Ohm	3.0	Wire Wound	.08
P-B95602	R16	6,000 Ohm	.5	Carbon	.08

INTERFERENCE ELIMINATION PARTS		Selling Price
P-80933	Dual .5 Mfd. Generator Condenser	.60
62-5424	Spark Plug Suppressor	.25

MISCELLANEOUS ITEM		Selling Price
P-5200	Antenna Transformer Assembly less Can	\$ .64
P-40433	Can for Above Assembly	.00
P-5192	Oscillator Coil and Can Assembly	.50

MODELS 62-136, 62-138

Voltage, Socket, Data Alignment

MONTGOMERY-WARD & CO.

### Replacing Drive Cord

Remove chassis from cabinet.  
Take off the pilot light assembly by lifting off the two sockets and spring clips.  
Detach the large pointer by removing the screw at the center of the dial.  
Loosen the dial assembly by taking out the two screws which secure the bottom of this assembly to the chassis. Then lay the complete dial assembly face downward in front of the chassis. It is not necessary to remove the volume control and tone control collars which hold the indicator cords of these two controls 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. 4.

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. 4. Insert one end of the drive cord from the outside through the hole in the eyelet in the drive drum. Tie the end of the cord which has been inserted in the hole to one end of the tension spring.

Wrap the cord in a clockwise direction (facing front of chassis) around the drive drum approximately one-half turn.

Then tilt the chassis up on its back panel and bring the cord down to the drive shaft. Wrap it two and one-half times around the drive shaft as shown in Fig. 4.

Then bring this cord up from the drive shaft and wrap it around the drive drum approximately one and one-fifth turns in a clockwise direction until it is up to the hole in this drum as illustrated.

Insert the free end of the cord through the hole in the eyelet and tie it to the end of the tension spring. The end of the spring, when hanging free, should be approximately 3/4" from the flange of the drum as shown in Fig. 4. Cut off the surplus length of cord after it is knotted.

Then secure the other end of the tension spring over the spur on the drive drum.

Replace the dial assembly and pointer.

Replace the pilot light assembly after which the chassis may be reinstalled in the cabinet.

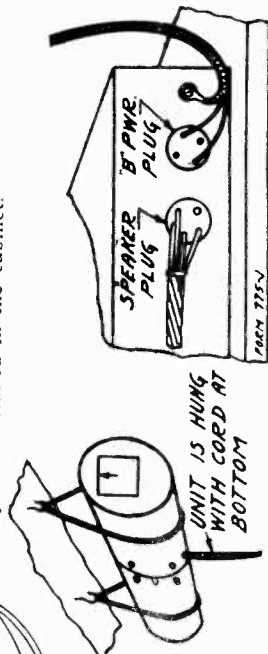


Fig. 3—Method of Installing "B" Power Unit

### Condenser Alignment

Misalignment or mistracking of condensers generally manifests itself as broad tuning and lack of volume at portions or all of the broadcast 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 broadcast band and at the intermediate frequency, and an output meter are required for indicating the effect of adjustments.

First set the signal generator for 1730 K. C. Turn the rotor to the full open position. The antenna lead from the signal generator adjustment is connected to the antenna section of the receiver. Adjust the trimmer of the oscillator section of the 3 gang condenser until maximum output is obtained. The oscillator section is the one with the cut plate rotor.

Now set the signal generator for 1400 K. C. and turn the rotor until maximum output is obtained. Adjust the other two trimmers on the gang condenser for maximum output.

To obtain dial scale calibration tune in an 800 K. C. signal and set the dial pointer at that mark on the dial scale. When calibrated in this manner, the setting will be approximately correct at both ends of the scale.

The use of the cut plate type of condenser eliminates the necessity of a 600 K. C. padder and no adjustment at this frequency, therefore, is required.

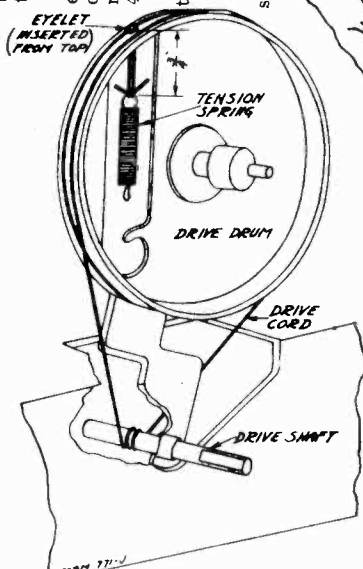


Fig. 4—Drive Cord Replacement

Power Transformer H. V. Secondary	To	322
Center Tap to Inside	T6	350
Power Transformer Pilot Lamp Sec.	T6	.3
Vibrator Unit Magnetizing Coil	T6	1025
Vibrator Unit Filter Chokes		3.0

### VOLTAGES AT SOCKETS

Input 32 Volts—Antenna Shorted to Ground

Type of Tube	Function	Across Filament	Plate to Cathode	Screen to Cathode	Grid to Cathode	Normal Plate M.A.
6F7	1st Det. & Osc.	6.3	167(1) 117(2)	90	2.6	7.0(1) 2.8(2)
6D6	I. F.	6.3	172	120	3.2	8.2
6B7	2nd Det.	6.3	25	25	7.25	2.0
12A5	Output	12.6	180	180	25	32
12Z3	Rectifier	12.6	225			25

(1) Pentode Section (2) Triode Section of Tube

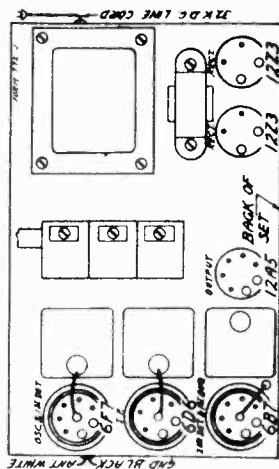


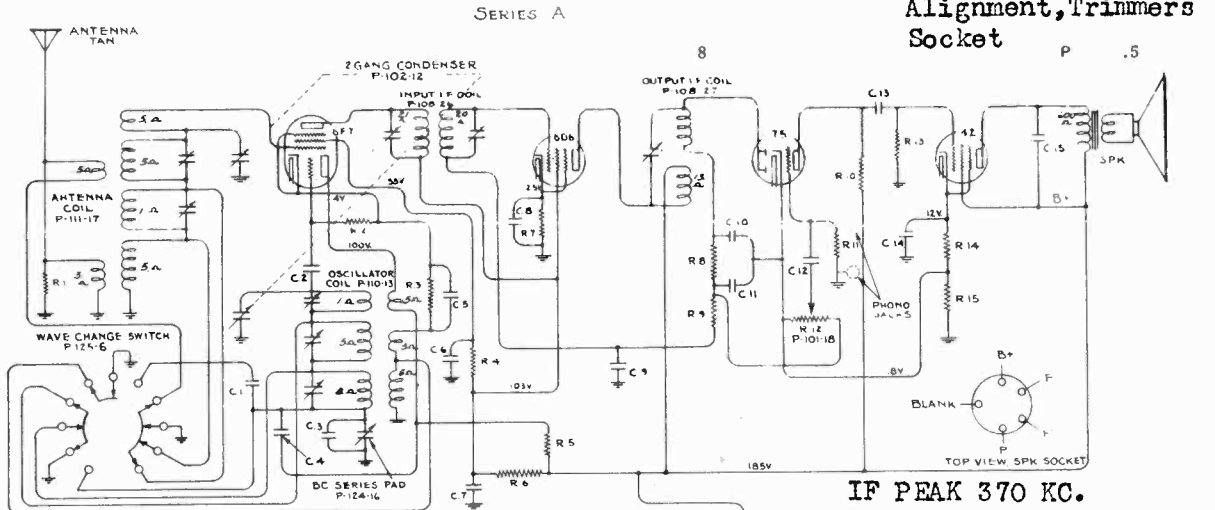
Fig. 2—Arrangement of Tubes

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

Part No.	Item	Code	D. C. Resistance in Ohms
P-500	Primaries of Antenna Trans. in Series	T1	Small
	1st Secondary of Antenna Transformer	T1	3.2
	2nd Secondary of Antenna Transformer	T1	2.4
P-502	Oscillator Plate Coil	T2	2.0
	Oscillator Grid Coil	T2	3.5
P-521	1st I. F. Transformer Primary	T3	67
	1st I. F. Transformer Secondary	T3	93
P-523	2nd I. F. Transformer Primary	T4	63
	2nd I. F. Transformer Secondary	T4	63
P-5024	Output Transformer Primary	T5	241
	Output Transformer Secondary and Bucking Coil in Series	T5 & L12	Small
P-5067	"B" Filter Reactor	T7	300
P-347	Speaker Field		97
P-2173	Speaker Voice Coil		Small
P-5026	Power Transformer Primary	T6	3.6
	Center Tap to Inside	T6	3.6
	Center Tap to Outside	T6	4.4

MONTGOMERY-WARD & CO.

MODELS 62-147, 62-156,  
62-164. Series A  
Schematic, Voltage  
Alignment, Trimmers  
Socket



CONDENSERS

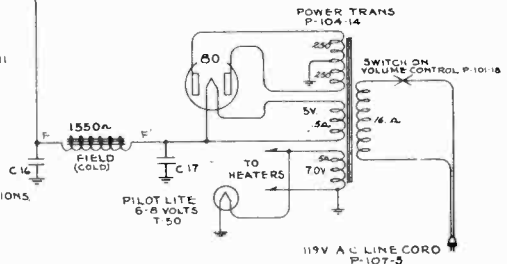
NO	VALUE
1	2870 MICA
2	100
3	475
4	1 X 200V
5	1 X 200V
6	1 X 200V
7	1 X 200V
8	1 X 200V
9	1 X 200V
10	500 MICA
11	500 MICA
12	05X200V
13	01X400V
14	4.0MFD X 25V
15	015X400V
16	3.0MFD X 250V
17	4.0MFD X 300V

RESISTORS

NO	VALUE
R-1	800 A 1/2W
R-2	50M A
R-3	700
R-4	100M A 1/2W
R-5	20M A 1/2W
R-6	19M A 1/2W
R-7	200 A
R-8	50M A 1/2W
R-9	1MEG
R-10	250M A
R-11	2MEG
R-12	500M VOL CONTROL
R-13	500M A 1/2W
R-14	500 A
R-15	35 A

NOTE  
C-7, C-9 ARE IN ONE UNIT P-118-1  
C-14, C-16, C-17 ONE UNIT LYTC P-119-11  
R-7, R-14, R-15, ONE UNIT P-106-18  
NUMBERS PREFIXED BY LETTER 'P'  
ARE PART NUMBERS.  
VOLTAGES TAKEN FROM POINTS  
INDICATED TO CHASSIS GROUND.  
VOLUME CONTROL ON FULL  
WAVE CHANGE SWITCH P-125-6 3 POSITIONS  
ROTATING CLKWISE -  
1ST POSITION - BC 1720-540KC  
2ND - MW 7.6-23MC  
3RD - SW 23.0-7.5MC  
SWITCH SHOWN AT 3RD POSITION

IF PEAK 370 KC.

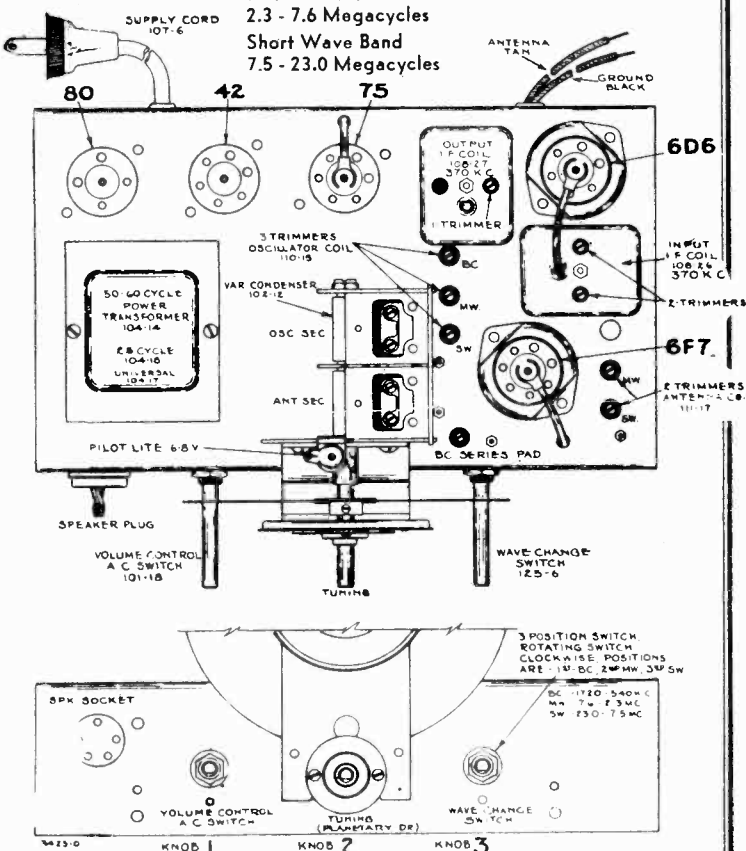


TUNING RANGE—SERIES A:

- Standard Broadcast Band  
540 - 1720 Kilocycles
- Intermediate Band  
2.3 - 7.6 Megacycles
- Short Wave Band  
7.5 - 23.0 Megacycles

Series "A" chassis are equipped with dry electrolytic filter condensers and are serially numbered on paper tags which are attached to the line cord and to the inside of the cabinet.

X AFTER MODEL NUMBER  
INDICATES 25-CYCLE  
OPERATION



ALIGNING INSTRUCTIONS—SERIES A

Description of various dummy antennas used and referred to in these instructions:

- (1) I.F. Dummy—Consists of a .1 mfd. condenser connected in series with the external oscillator.
- (2) Broadcast Dummy—Consists of a 200 mmfd. condenser and a 20 ohm resistor connected in series with each other and in series with the external oscillator.
- (3) Intermediate and Short Wave Dummy—Consists of a .1 mfd. condenser and a 400 ohm resistor connected in series with each other and in series with the external oscillator.

Resonance Indicator:  
Use as a resonance indicator an output meter connected across the primary of the speaker input transformer, or by means of an adapter between the plate and screen terminals of the type 42 output tube. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable output. A low range output meter or the low scale of a multi-range volt meter should be used.

MODELS 62-147, 62-156  
62-164, Series A

MONTGOMERY-WARD & CO.

### Alignment

#### Aligning I. F. Transformers

1. With volume control full on, the extreme right of its rotation, and with wave changing switch in the broadcast position, extreme left of its rotation, and with variable condenser at its minimum capacity position, plates entirely out of mesh, adjust the I.F. transformers (adjustments at the top of parts number 108-26 and 108-27—see top view).
    - (a) Connect external oscillator in series with I.F. dummy antenna. With external oscillator adjusted to 370 kilocycles, in series with I.F. dummy antenna to the control grid cap of the type 6D6 tube and chassis ground, adjust output I.F. transformer, part number 108-27, to resonance.
- Note: Output I.F. transformer, part number 108-27, has only one adjustment.
- (b) Move generator output clip from grid of 6D6 to grid cap of type 6F7 tube and align input I.F. transformer, part number 108-26, to resonance. NOTE: IT IS EXTREMELY NECESSARY TO ALIGN BOTH I.F. STAGES SEPARATELY.

#### Broadcast Band Alignment— (540 - 1720 Kilocycles)

1. With wave changing switch in the broadcast position, extreme left of its rotation, and with gang condenser in its minimum capacity position, plates entirely out of mesh, and with external oscillator connected in series with broadcast dummy antenna to tan antenna lead and black ground lead, make the following adjustments:
  - (a) Set external oscillator to 1720 kilocycles and adjust oscillator trimmer to resonance. This adjustment is the rear adjustment of a group of three located next to the variable condenser.
  - (b) Readjust external oscillator to 600 kilocycles and adjust broadcast series pad to resonance by rotating condenser to approximately 600 kilocycles, rocking it slowly to and fro until by adjusting pad maximum output is attained. This adjustment is located at the front of the chassis next to the variable condenser and wave changing switch.
  - (c) Check for tracking and sensitivity at 1400 and 1000 kilocycles. NOTE: It is extremely necessary in making all of the above adjustments that the fundamental signal of the oscillator be tuned in and not the image frequency, which will fall below the fundamental.

#### Short Wave Band Alignment— (7.5 - 23.0 Megacycles)

1. This band is aligned after the I.F. adjustments have been completed. Set wave selector switch in the short wave position, extreme right of its rotation, set pointer of dial to 21 megacycles.
  - (a) With external oscillator set at 21 megacycles, and connected to the tan antenna lead in series with the short wave dummy and to the black ground lead, adjust the oscillator short wave trimmer until generator signal is picked up. This trimmer is the one closest to the front of the chassis of the group of three trimmers located next to the gang condenser (see top view of chassis).
  - (b) Adjust short wave antenna trimmer to resonance. This adjustment is to the right of the 6F7 tube and is the one closest to the front of the chassis (see top view).
  - (c) Re-set external oscillator to 9 megacycles and pick up oscillator signal by rotating variable condenser, moving dial pointer. Check for tracking and sensitivity and do not bend plates. NOTE: It is extremely necessary in making all of the above adjustments that the fundamental signal of the oscillator be tuned in and not the image frequency, which will fall below the fundamental.

#### Intermediate Band Alignment— (2.3 - 7.6 Megacycles)

1. With wave selector switch in the center position and with dial pointer set to 7 megacycles, makes the following adjustments:
  - (a) With external oscillator set at 7 magacycles and connected in series with the short wave dummy antenna to the tan antenna lead and black ground lead, same as for short wave adjustments, adjust center trimmer of oscillator coil, part number 110-13, until 7 magacycle signal is picked up. This is the center adjustment of a group of three located next to the gang condenser (see top view).
  - (b) Adjust antenna trimmer to resonance, this adjustment is the rear of a group of two located at the right of the chassis next to the 6F7 tube (see top view).
  - (c) Re-set external oscillator to 2.5 magacycles (2500 kilocycles), pick up signal by rotating condenser and moving dial pointer. Check for tracking and sensitivity. Do not bend plates. NOTE: It is extremely necessary in making all of the above adjustments that the fundamental signal of the oscillator be tuned in and not the image frequency, which will fall below the fundamental.

#### Service Notes

To check for open by-pass condensers, shunt each condenser with another of similar capacity and of the same voltage rating, which is known to be good, until the defective unit is located. Open by-pass condensers frequently cause oscillation and distorted tone. Defective and shorted electrolytic filter condensers cause excessive hum, motor-boating, low volume and a reduction in all D.C. voltages. Open or shorted electrolytic and by-pass condensers (across bias resistor of type 42 tube) will cause low volume and distorted tone.

Should the planetary vernier dial drive mechanism fail to function properly, it will probably be found to be due to a cracked or broken compression spring. The drive may be disassembled to replace the compression spring (part number 112-31) by removing the two screws which fasten it to the dial bracket. Before reassembling all parts should be carefully cleaned and a small amount of vaseline applied to the ball bearings. All other dial parts are hardened and should cause no trouble.

#### Notes—(Series "A" Only)

25 Cycle chassis differ from regular 60 cycle and 40 cycle chassis in that a larger electrolytic filter condenser is used. The regular condenser is part number 119-11 and the larger unit for the 25 cycle chassis is part number 119-12.

Part number 106-18, a metal clad resistor, consists of the following sections with resistances and wattages as noted: one, 500 ohms; one, 35 ohms; one, 200 ohms, all 1/3 watt, plus or minus 10%.

#### X AFTER MODEL NUMBER INDICATES 25-CYCLE OPERATION

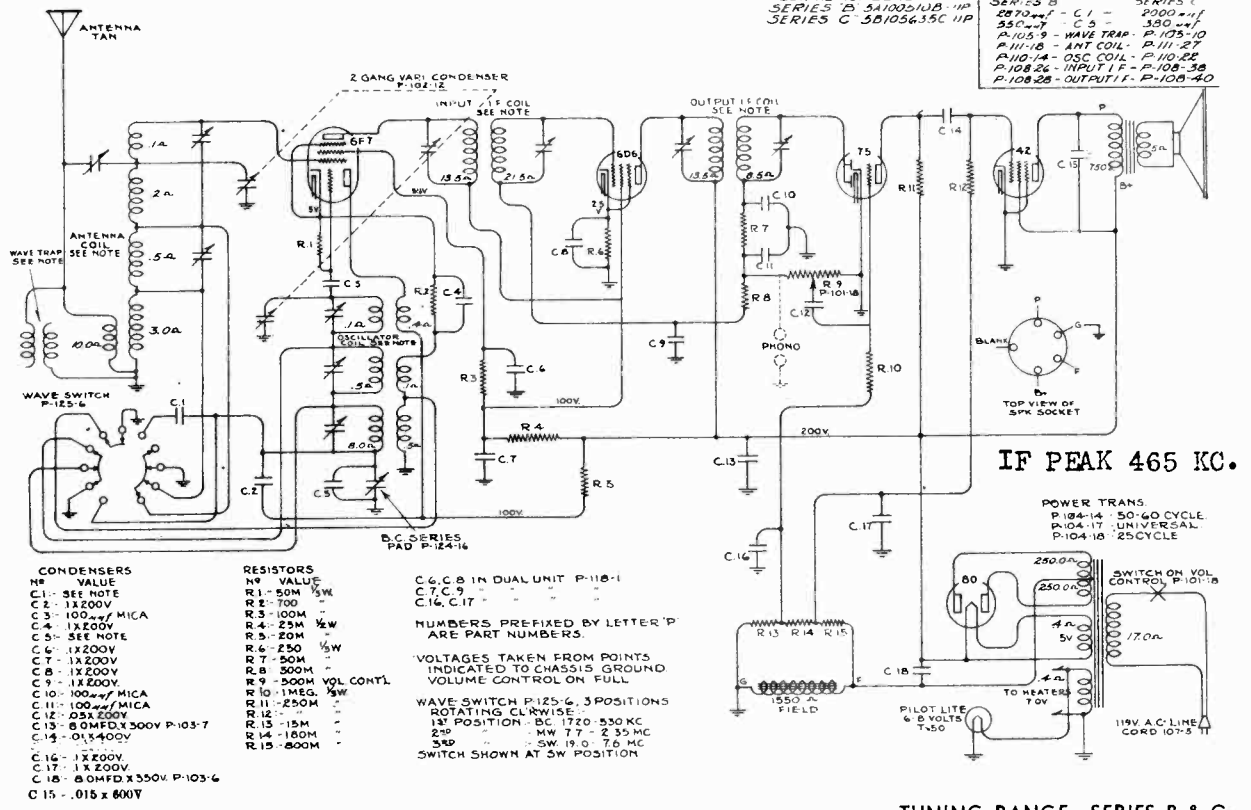
#### SERIES A

#### Alignment

No aligning adjustments should be attempted without first thoroughly checking over all other possible causes of trouble, such as poor installations, open or grounded antenna systems, low line voltages, defective tubes, condensers and resistors. In order to properly align this chassis, an oscillator (generator) is absolutely necessary. No aligning adjustments should be attempted with the chassis in the cabinet. To remove the knobs, pull them off and to take the chassis out of the cabinet, remove the three bolts by which it is fastened and the speaker plug which you will find on the front flange of the chassis.

MONTGOMERY-WARD & CO.

MODELS 62-147, 62-156, 62-164. Series B & C. Schematic, Voltage Socket, Trimmers



SERIAL NUMBERS  
 SERIES B 5A100510B-11P  
 SERIES C 5B105635C-11P

SERIES B  
 2870-41 - C-1 - 2000 WHT  
 2870-41 - C-5 - 380 WHT  
 P-105-9 - WAVE TRAP - P-105-10  
 P-111-18 - ANT COIL - P-111-27  
 P-110-14 - OSC COIL - P-110-22  
 P-108-26 - INPUT I.F. - P-108-38  
 P-108-28 - OUTPUT I.F. - P-108-40

- CONDENSERS
- C1 - SEE NOTE
  - C2 - 1X200V
  - C3 - 100µF MICA
  - C4 - 1X200V
  - C5 - SEE NOTE
  - C6 - 1X200V
  - C7 - 1X200V
  - C8 - 1X200V
  - C9 - 1X200V
  - C10 - 100µF MICA
  - C11 - 100µF MICA
  - C12 - 25X250V
  - C13 - 80MFD X 350V P-103-7
  - C14 - 0.1X400V
  - C16 - 1X200V
  - C17 - 1X200V
  - C18 - 80MFD X 350V P-103-6
  - C15 - .015 x 800V

- RESISTORS
- R1 - 50M 1/2W
  - R2 - 700
  - R3 - 100M
  - R4 - 25M 1/2W
  - R5 - 20M
  - R6 - 250 1/2W
  - R7 - 50M
  - R8 - 500M
  - R9 - 500M VOL CONTL
  - R10 - 1MEG 1/2W
  - R11 - 250M
  - R12 -
  - R13 - 15M
  - R14 - 160M
  - R15 - 800M

C6, C8 IN DUAL UNIT P-118-1  
 C7, C9  
 C16, C17

NUMBERS PREFIXED BY LETTER 'P' ARE PART NUMBERS.

VOLTAGES TAKEN FROM POINTS INDICATED TO CHASSIS GROUND VOLUME CONTROL ON FULL

WAVE SWITCH P-125-6, 3 POSITIONS ROTATING COUNTERWISE:  
 1st POSITION - BC 1720-530 KC  
 2nd - MW 77 - 7.35 MC  
 3rd - SW 19.0 - 7.6 MC  
 SWITCH SHOWN AT 3rd POSITION

IF PEAK 465 KC.

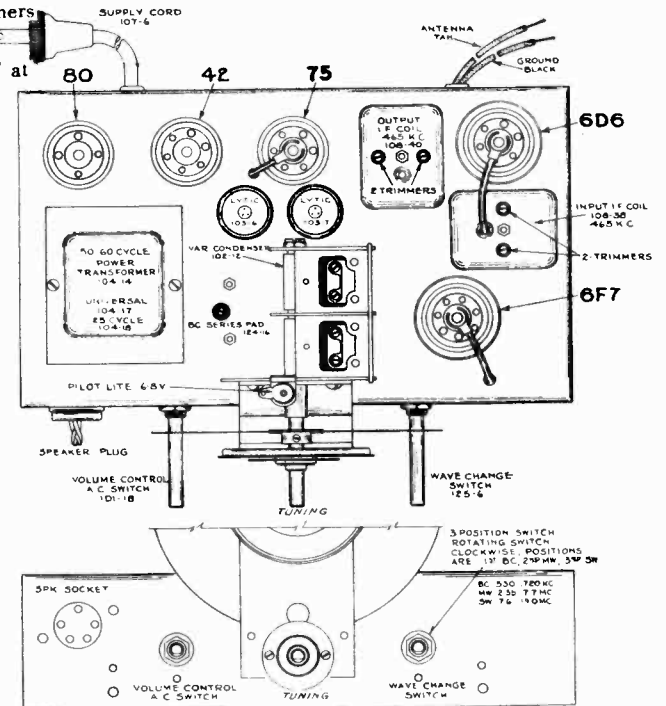
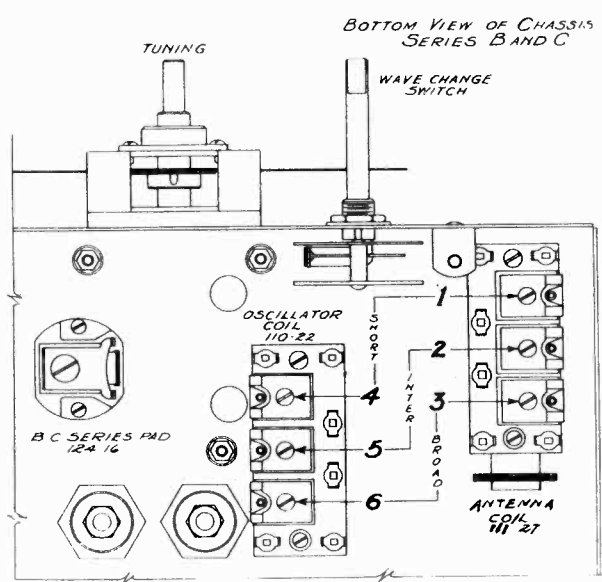
POWER TRANS  
 P-104-14 - 50-60 CYCLE  
 P-104-17 - UNIVERSAL  
 P-104-10 - 25 CYCLE

TUNING RANGE—SERIES B & C:  
 Standard Broadcast Band  
 530 - 1720 Kilocycles  
 Intermediate Band  
 2.35 - 7.7 Megacycles  
 Short Wave Band  
 7.6 - 19.0 Megacycles

Series "B" and "C" chassis are serially numbered on the back flange of the chassis, series "B" beginning with number "5A100510B" and up; series "C" chassis, beginning with number "5B105635C", differs only from series "B" in that the I.F. frequency was changed from 370 to 465 kilocycles.

Transformers are available and chassis are sometimes equipped with universal transformers for operation on 40 and 60 cycles and with primary taps for 108, 125, 150, 220 and 250 volts (see illustrations) and also sometimes equipped with 25 cycle transformers with 105-115 volt or 220 volt primaries, not universals.

Series "B" and "C" may be identified by the letter "B" and "C" at the end of the serial numbers.





MODELS 62-147, 62-156,  
62-164. Series B & C.  
Alignment, Notes

## MONTGOMERY-WARD &amp; CO.

## ALIGNING INSTRUCTIONS—SERIES "B" & "C"

NOTE: These instructions are written for series "C". The instructions are identical for series "B", except that for series "B" the I.F. frequency is 370 kilocycles and for series "C", 465 kilocycles. Also, the I.F. transformers are different:

## Series "B"

Part No. 108-26—Input I. F. Trans.  
Part No. 108-28—Output I. F. Trans.

## Series "C"

Part No. 108-38—Input I. F. Trans.  
Part No. 108-40—Output I. F. Trans.

Description of various dummy antennas used and referred to in these instructions:

- (1) I.F. Dummy—Consists of a .1 mfd. condenser connected in series with the external oscillator.
- (2) Broadcast Dummy—Consists of a 200 mmfd. condenser and a 20 ohm resistor connected in series with each other and in series with the external oscillator.
- (3) Intermediate and Short Wave Dummy—Consists of a .1 mfd. condenser and a 400 ohm resistor connected in series with each other and in series with the external oscillator.

## Resonance Indicator:

Use as a resonance indicator an output meter connected across the primary of the speaker input transformer, or by means of an adapter between the plate and screen terminals of the type 42 output tube. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable output. A low range output meter or the low scale of a multi-range volt meter should be used.

## SERIES B & C

### Alignment

No aligning adjustments should be attempted without first thoroughly checking over all other possible causes of trouble, such as poor installations, open or grounded antenna systems, low line voltages, defective tubes, condensers and resistors. In order to properly align this chassis, an oscillator (generator) is absolutely necessary. No aligning adjustments should be attempted with the chassis in the cabinet. To remove the knobs, pull them off and to take the chassis out of the cabinet, remove the three bolts by which it is fastened and the speaker plug which you will find on the front flange of the chassis panel.

### Aligning I. F. Transformers

1. With volume control full on, the extreme right of its rotation, and with wave changing switch in the broadcast position, extreme left of its rotation, and with variable condenser at its minimum capacity position, plates entirely out of mesh, adjust the I.F. transformers (two adjustments at the top of parts number 108-38 and 108-40—see top view).
  - (a) Connect external oscillator which has been adjusted to 465 kilocycles in series with I.F. dummy antenna, to the control grid cap of the type 6D6 tube and chassis ground. Adjust output I.F. transformer, part number 108-40, to resonance.
  - (b) Move generator output clip from grid of 6D6 to grid cap of 6F7 tube and align input I.F. transformer, part number 108-38.
  - (c) With generator connected to grid of type 6F7 tube, readjust output I.F. transformer, part number 108-40, to resonance.

### Broadcast Band Alignment— (530 - 1720 Kilocycles)

1. With wave changing switch in the broadcast position, extreme left of its rotation, and with gang condenser in its minimum capacity position, plates entirely out of mesh, connect an external oscillator in series with broadcast dummy antenna to tan antenna and black ground leads and make the following adjustments:
  - (a) With external oscillator set at 1720 kilocycles, adjust oscillator trimmer to resonance, for location of this adjustment, number 6, see diagram.

- (b) Re-set external oscillator to 1400 kilocycles, rotate condenser, pick up oscillator signal and adjust antenna trimmer to resonance. For location of this adjustment, number 3, see diagram.
- (c) Re-set external oscillator to 600 kilocycles and adjust series pad to resonance, rotate condenser and move dial pointer to 600 kilocycles by gently rocking condenser to and fro. Pick up oscillator signal while adjusting series pad to resonance, maximum deflection on an output meter. This adjustment is accessible from the top of the chassis and is located between variable condenser and power transformer, see top view—part number 124-16.
- (d) Check for tracking and sensitivity at 1000 kilocycles.

NOTE (Series "B" and "C" Only)

25 Cycle Chassis differ only from 60 cycle chassis in that part number 104-18 transformer is used in place of 50/60 cycle transformer, part number 104-14.

### Short Wave Band Alignment— (7.6 - 19.0 Megacycles)

1. This band is aligned after the I.F. adjustments have been completed. Set wave changing switch to short wave position, extreme right of its rotation, set dial pointer to 18 megacycles.
  - (a) With external oscillator adjusted to 18 megacycles and connected in series with short wave dummy antenna to tan antenna and black ground leads, adjust the oscillator short wave trimmer until generator signal is picked up. For location of this adjustment, number 4, see diagram.
  - (b) Adjust short wave antenna trimmer to resonance. For location of this adjustment, number 1, see diagram.
  - (c) Re-set external oscillator to 9 megacycles, rotate condenser, move dial pointer to 9 megacycles and check for tracking and sensitivity. Do not bend plates. NOTE: It is extremely necessary in making all of the above adjustments that the fundamental signal of the oscillator be tuned in and not the image frequency, which will fall below the fundamental.

### Intermediate Band Alignment— (2.35 - 7.7 Megacycles)

1. With wave changing switch in center position, and with dial pointer set to 7 megacycles, make the following adjustments:
  - (a) With external oscillator set at 7 megacycles and connected in series with short wave dummy antenna, as for short wave adjustments, adjust trimmer of oscillator coil, part number 110-22 until 7 megacycle signal is picked up. For location of this adjustment, number 5, see diagram.
  - (b) Adjust antenna trimmer to resonance, adjustment number 2, see diagram.
  - (c) Re-set external oscillator to 2.5 megacycles (2500 kilocycles), rotate variable condenser, move pointer, pick up oscillator signal and check for tracking and sensitivity. NOTE: It is extremely necessary in making all of the above adjustments that the fundamental signal of the oscillator be tuned in and not the image frequency, which will fall below the fundamental.

### Service Notes

To check for open by-pass condensers, shunt each condenser with another of similar capacity and of the same voltage rating, which is known to be good, until the defective unit is located. Open by-pass condensers frequently cause oscillation and distorted tone. Defective and shorted electrolytic filter condensers cause excessive hum, motor-boating, low volume and a reduction in all D.C. voltages. Open or shorted electrolytic and by-pass condensers (across bias resistor of type 42 tube) will cause low volume and distorted tone.

Should the planetary vernier dial drive mechanism fail to function properly, it will probably be found to be due to a cracked or broken compression spring. The drive may be disassembled to replace the compression spring (part number 112-31) by removing the two screws which fasten it to the dial bracket. Before re-assembling all parts should be carefully cleaned and a small amount of vaseline applied to the ball bearings. All other dial parts are hardened and should cause no trouble.

MONTGOMERY-WARD & CO.

MODELS 62-147,62-147X,  
62-156,62-156X,62-164,  
62-164X. Series A, B & C  
Parts List

LIST OF REPAIR PARTS

RETAIL STORES: ORDER ALL PARTS FROM DIVISION SUPERINTENDENT AT CHICAGO OR OAKLAND, ON STOCK ORDER. RETURN DEFECTIVE PARTS TO DIVISION SUPERINTENDENT ONLY

Parts Used in Ser. A.	Parts Used in Ser. B.	Parts Used in Ser. C.	DESCRIPTION	No. Used in Set	BE 110-13	Not Used.	BE 121	Not Used.	BE 110-14	Not Used.	Oscillator Coil Complete	1
BE 100-11	BE 100-11	BE 100-11	.01 x 400V-25%	1	Not Used.	BE 121	BE 121	BE 121	BE 110-22	BE 110-22	Oscillator Coil Complete	1
BE 100-15	BE 100-15	BE 100-15	.015 x 400V-Plus 10% ; Minus 20%	1	Not Used.	BE 121	BE 121	BE 121	BE 110-22	BE 110-22	Oscillator Coil Complete	1
BE 100-19	BE 100-19	BE 100-19	.006 x 600V-25%	1	Not Used.	BE 121	BE 121	BE 121	BE 110-22	BE 110-22	Oscillator Coil Complete	1
BE 100-20	BE 100-20	BE 100-20	.1 x 120V-25%	4	Not Used.	BE 121	BE 121	BE 121	BE 111-18	BE 111-18	Antenna Coil Complete	1
Not Used.	BE 100-22	BE 100-22	.05 x 200V-25%	1	Not Used.	BE 121	BE 121	BE 121	BE 111-27	BE 111-27	Antenna Coil Complete	1
Not Used.	BE 103-6	BE 103-6	8 Mfd. x 350V Electrolytic	1	Not Used.	BE 121	BE 121	BE 121	BE 111-27	BE 111-27	Antenna Coil Complete	1
Not Used.	BE 103-7	BE 103-7	8 Mfd. x 300V Electrolytic	1	Not Used.	BE 121	BE 121	BE 121	BE 111-27	BE 111-27	Antenna Coil Complete	1
Not Used.	BE 103-7	BE 103-7	Dual .1 x 200V-Plus 50% ; Minus 10%	1	Not Used.	BE 121	BE 121	BE 121	BE 111-27	BE 111-27	Antenna Coil Complete	1
BE 118-1	BE 118-1	BE 118-1	(Series B & C use 3 per set)	1	Not Used.	BE 121	BE 121	BE 121	BE 111-27	BE 111-27	Antenna Coil Complete	1
BE 119-11	Not Used.	Not Used.	4-3-3 Mfd. Electrolytic	1	Not Used.	BE 121	BE 121	BE 121	BE 111-27	BE 111-27	Antenna Coil Complete	1
BE 119-12	Not Used.	Not Used.	8-8-4 Mfd. Electrolytic (For 25 Cy. Only)	1	Not Used.	BE 121	BE 121	BE 121	BE 111-27	BE 111-27	Antenna Coil Complete	1
BE 129-2	BE 129-2	BE 129-2	.0005 Mica-MT-20%	2	Not Used.	BE 121	BE 121	BE 121	BE 111-27	BE 111-27	Antenna Coil Complete	1
BE 129-5	BE 129-5	BE 129-5	.0001 Mica-MT-20%	1	Not Used.	BE 121	BE 121	BE 121	BE 111-27	BE 111-27	Antenna Coil Complete	1
BE 129-15	BE 129-15	BE 129-15	.00055 Mica-MT-5%	1	Not Used.	BE 121	BE 121	BE 121	BE 111-27	BE 111-27	Antenna Coil Complete	1
BE 129-16	BE 129-16	BE 129-16	.00287 Mica-MW-5%	1	Not Used.	BE 121	BE 121	BE 121	BE 111-27	BE 111-27	Antenna Coil Complete	1
Not Used.	BE 129-23	BE 129-23	.002 Mica-MW-5%	1	Not Used.	BE 121	BE 121	BE 121	BE 111-27	BE 111-27	Antenna Coil Complete	1
Not Used.	BE 129-24	BE 129-24	.000425 Mica-MT-5%	1	Not Used.	BE 121	BE 121	BE 121	BE 111-27	BE 111-27	Antenna Coil Complete	1
BE 130-3	BE 130-3	BE 130-3	500M Ohm-1/5 Watt-20%-100V-Carbon	1	Not Used.	BE 121	BE 121	BE 121	BE 111-27	BE 111-27	Antenna Coil Complete	1
BE 130-11	BE 130-11	BE 130-11	250M Ohm-1/3 Watt-20%-50V-Carbon	1	Not Used.	BE 121	BE 121	BE 121	BE 111-27	BE 111-27	Antenna Coil Complete	1
BE 130-12	BE 130-12	BE 130-12	50M Ohm-1/3 Watt-20%-20V-Carbon	1	Not Used.	BE 121	BE 121	BE 121	BE 111-27	BE 111-27	Antenna Coil Complete	1
BE 130-19	BE 130-19	BE 130-19	1 Meg Ohm-1/3 Watt-20%-100V-Carbon	1	Not Used.	BE 121	BE 121	BE 121	BE 111-27	BE 111-27	Antenna Coil Complete	1
BE 130-20	BE 130-20	BE 130-20	100M Ohm-1/5 Watt-20%-50V-Carbon	1	Not Used.	BE 121	BE 121	BE 121	BE 111-27	BE 111-27	Antenna Coil Complete	1
Not Used.	BE 130-32	BE 130-32	250 Ohm-1/3 Watt-20%-10V-Wire W.	1	Not Used.	BE 121	BE 121	BE 121	BE 111-27	BE 111-27	Antenna Coil Complete	1
BE 130-38	Not Used.	Not Used.	2 Meg Ohm-1/3 Watt-20%-20V-Carbon	1	Not Used.	BE 121	BE 121	BE 121	BE 111-27	BE 111-27	Antenna Coil Complete	1
BE 130-39	BE 130-39	BE 130-39	700 Ohm-1/3 Watt-20%-20V-Carbon	1	Not Used.	BE 121	BE 121	BE 121	BE 111-27	BE 111-27	Antenna Coil Complete	1
BE 130-40	Not Used.	Not Used.	19M Ohm-1/2 Watt-20%-150V-Carbon	1	Not Used.	BE 121	BE 121	BE 121	BE 111-27	BE 111-27	Antenna Coil Complete	1
BE 130-41	Not Used.	Not Used.	800 Ohm-1/3 Watt-20%-20V-Carbon	1	Not Used.	BE 121	BE 121	BE 121	BE 111-27	BE 111-27	Antenna Coil Complete	1
BE 130-42	BE 130-42	BE 130-42	20M Ohm-1/2 Watt-20%-100V-Carbon	1	Not Used.	BE 121	BE 121	BE 121	BE 111-27	BE 111-27	Antenna Coil Complete	1
Not Used.	BE 130-44	BE 130-44	25M Ohm-1/2 Watt-20%-150V-Carbon	1	Not Used.	BE 121	BE 121	BE 121	BE 111-27	BE 111-27	Antenna Coil Complete	1
Not Used.	BE 130-46	BE 130-46	800M Ohm-1/5 Watt-10%-100V-Carbon	1	Not Used.	BE 121	BE 121	BE 121	BE 111-27	BE 111-27	Antenna Coil Complete	1
Not Used.	BE 130-47	BE 130-47	180M Ohm-1/5 Watt-10%-100V-Carbon	1	Not Used.	BE 121	BE 121	BE 121	BE 111-27	BE 111-27	Antenna Coil Complete	1
Not Used.	BE 130-48	BE 130-48	15M Ohm-1/5 Watt-10%-20V-Carbon	1	Not Used.	BE 121	BE 121	BE 121	BE 111-27	BE 111-27	Antenna Coil Complete	1
BE 104-14	BE 104-14	BE 104-14	POWER TRANSFORMERS	1	Not Used.	BE 121	BE 121	BE 121	BE 111-27	BE 111-27	Antenna Coil Complete	1
BE 104-17	BE 104-17	BE 104-17	50/60 Cycle Power Transformer	1	Not Used.	BE 121	BE 121	BE 121	BE 111-27	BE 111-27	Antenna Coil Complete	1
BE 104-18	BE 104-18	BE 104-18	Universal Power Transformer-40 Cy. Pri.	1	Not Used.	BE 121	BE 121	BE 121	BE 111-27	BE 111-27	Antenna Coil Complete	1
Not Used.	BE 105-9	Not Used.	25 Cycle Power Transformer	1	Not Used.	BE 121	BE 121	BE 121	BE 111-27	BE 111-27	Antenna Coil Complete	1
Not Used.	BE 105-10	Not Used.	COILS	1	Not Used.	BE 121	BE 121	BE 121	BE 111-27	BE 111-27	Antenna Coil Complete	1
BE 108-26	BE 108-26	BE 108-26	Antenna Choke Coil	1	Not Used.	BE 121	BE 121	BE 121	BE 111-27	BE 111-27	Antenna Coil Complete	1
BE 108-27	Not Used.	Not Used.	Input I.F. Transformer Complete	1	Not Used.	BE 121	BE 121	BE 121	BE 111-27	BE 111-27	Antenna Coil Complete	1
Not Used.	BE 108-28	Not Used.	Output I.F. Transformer Complete	1	Not Used.	BE 121	BE 121	BE 121	BE 111-27	BE 111-27	Antenna Coil Complete	1
Not Used.	BE 108-38	Not Used.	Output I.F. Transformer Complete	1	Not Used.	BE 121	BE 121	BE 121	BE 111-27	BE 111-27	Antenna Coil Complete	1
Not Used.	BE 108-40	Not Used.	Output I.F. Transformer Complete	1	Not Used.	BE 121	BE 121	BE 121	BE 111-27	BE 111-27	Antenna Coil Complete	1

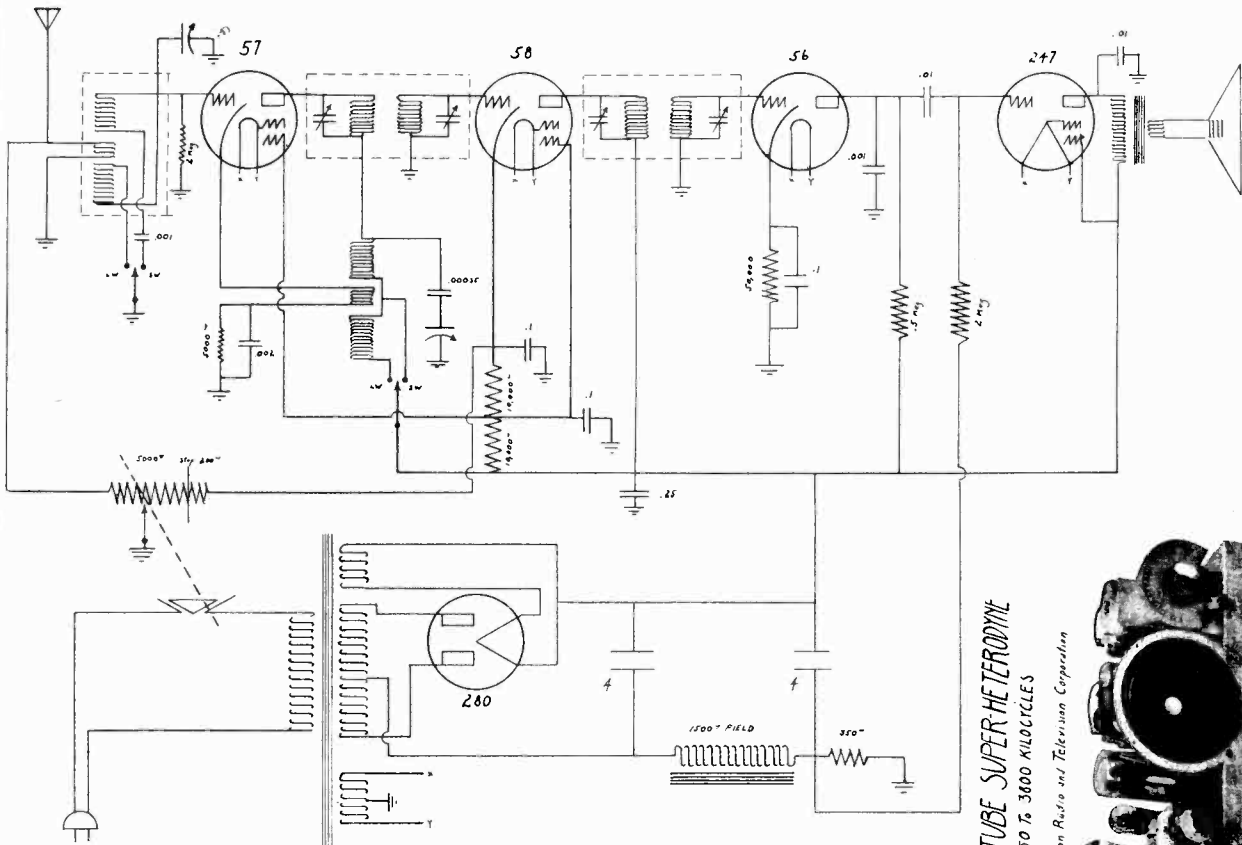
Tolerance Percent  
2 1/2% White  
5% Green  
10% Blue  
15% Yellow  
20% Red

\* NOTE: Speakers cannot be ordered, defective speakers must be repaired.  
Mica condensers are RMA color coded and on the reverse side they are coded with an extra dot which indicates the capacity tolerance, tolerances wider than 20% are not coded.

All resistors are RMA color coded—specify value and/or resistor (per schematic diagram) and model number.  
When ordering condensers, specify part number, model and/or capacitor (per schematic diagram) and model number.  
When ordering parts, always specify part and model number as well as serial number of chassis.

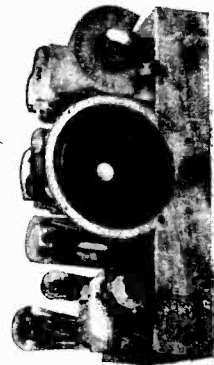
MODEL 62PC43  
Schematic  
Voltage, Parts

MONTGOMERY-WARD & CO.



5 TUBE SUPER HETERODYNE  
550 To 3600 KILOCYCLES

Davison Radio and Television Corporation



VOLTAGES

With the volume control at maximum and no signal being received, the following values of voltage should be observed at the points indicated:

- Ground to R. F. Plate, 240
- Ground to First Detector Plate, 240
- Ground to Second Detector Plate, 60
- Ground to A. F. Plate, 220

- Ground to Screens, 115.
- Across Field, 95
- Across 350w Bias Resistor, 20
- Across Second Detector Bias, 10
- Across First Detector Bias, 10
- Across I. F. Bias, 3 1/2.
- Filament, 2.25 A. C.
- Rectifier, 4.8 A. C.

Replacement Parts List

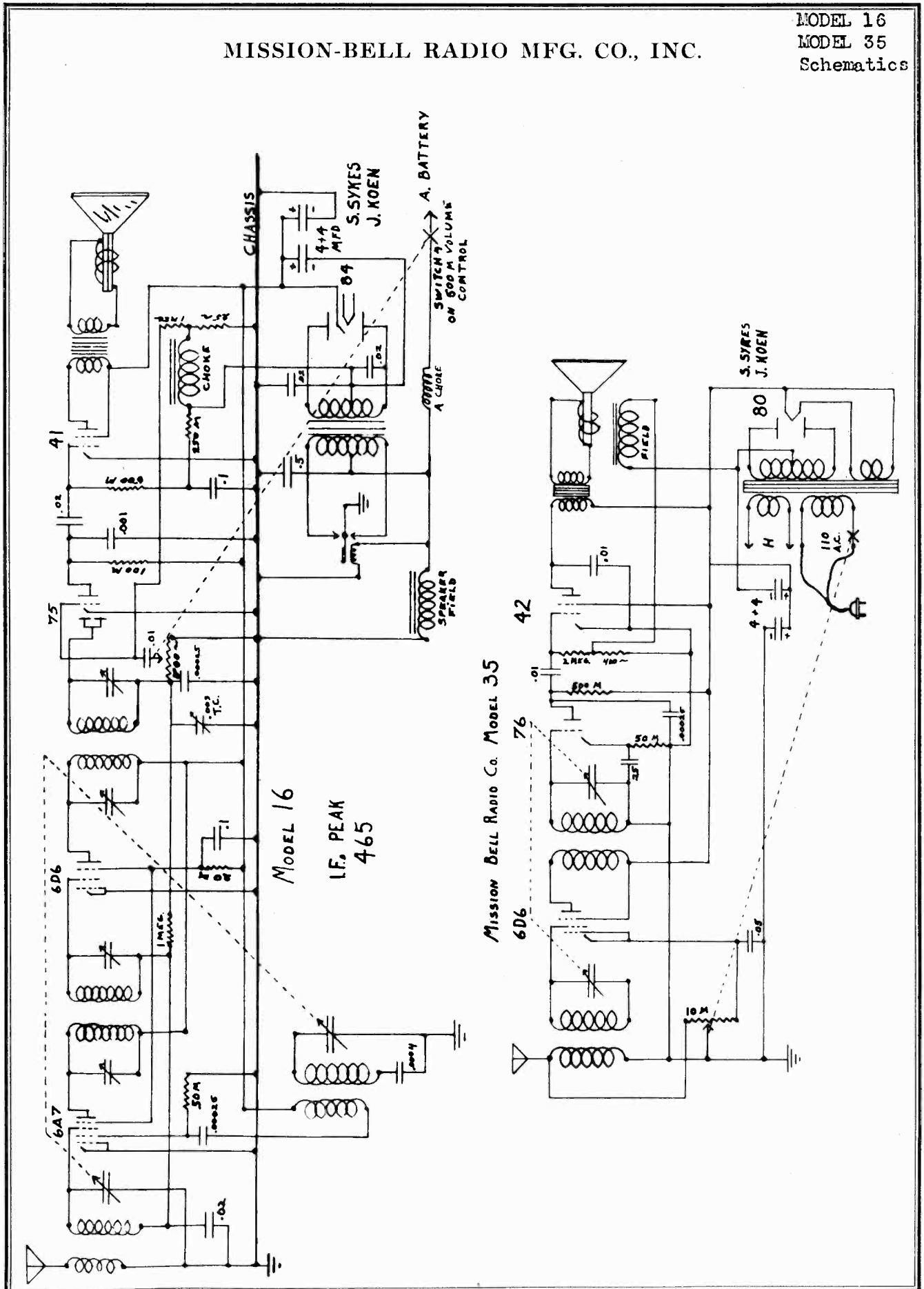
Airline Model 62-PC-43

Supplier: Davison Radio and Television Corporation, Los Angeles, California

Part No.	PART NAME	Unit Per Chassis	Cost Price	Selling Price	Part No.	PART NAME	Unit Per Chassis	Cost Price	Selling Price
SW-431	Tube Socket No. 56	1	.06	.15	SW-4317	R. F. Coil	1	.25	.63
SW-432	Tube Socket No. 57	1	.06	.15	SW-4318	Oscillator Coil	1	.25	.63
SW-433	Tube Socket No. 58	1	.06	.15	SW-4319	Electrolytic Condenser, Dual, 4 Mfd.	1	.60	1.50
SW-434	Tube Socket No. 47	1	.06	.15	SW-4320	Wave Switch	1	.75	1.88
SW-435	Tube Socket No. 80	1	.06	.15	SW-4321	Cub Condenser, .1-200 Volt	3	.12	.30
SW-436	Variable Condenser, 2 Gang	1	1.00	2.50	SW-4322	Cub Condenser, .1-400 Volt	1	.18	.45
SW-437	Dial	1	.75	1.88	SW-4323	Cub Condenser, .01	2	.12	.30
SW-438	Power Transformer	1	1.25	3.13	SW-4324	Cub Condenser, .001-10%	1	.12	.30
SW-439	Volume Control	1	.48	1.20	SW-4325	Cub Condenser, .001-3%	1	.18	.45
SW-4310	Speaker	1	1.75	4.38	SW-4326	Cub Condenser, .00035-3%	1	.18	.45
SW-4311	Coil Shields	3	.06	.15	SW-4327	Resistor Strip—350 W. W.	1	.10	.25
SW-4312	Tube Shields	2	.06	.15	SW-4328	Resistor Strip—Two 10,000 Ohms	1	.25	.63
SW-4313	I. F. Transformer	2	.40	1.00	SW-4329	Resistor—2 Meg. 1/3 Watt	2	.06	.15
SW-4314	Varitor	2	.20	.50	SW-4330	Resistor—5,000 Ohm 1/3 Watt	1	.06	.15
SW-4315	Ant. and Ground Post	1	.10	.25	SW-4331	Resistor—50,000 Ohm 1/3 Watt	1	.06	.15
SW-4316	Pilot Light	1	.06	.15	SW-4332	Resistor—1 Megohm 1/3 Watt	1	.06	.15

MISSION-BELL RADIO MFG. CO., INC.

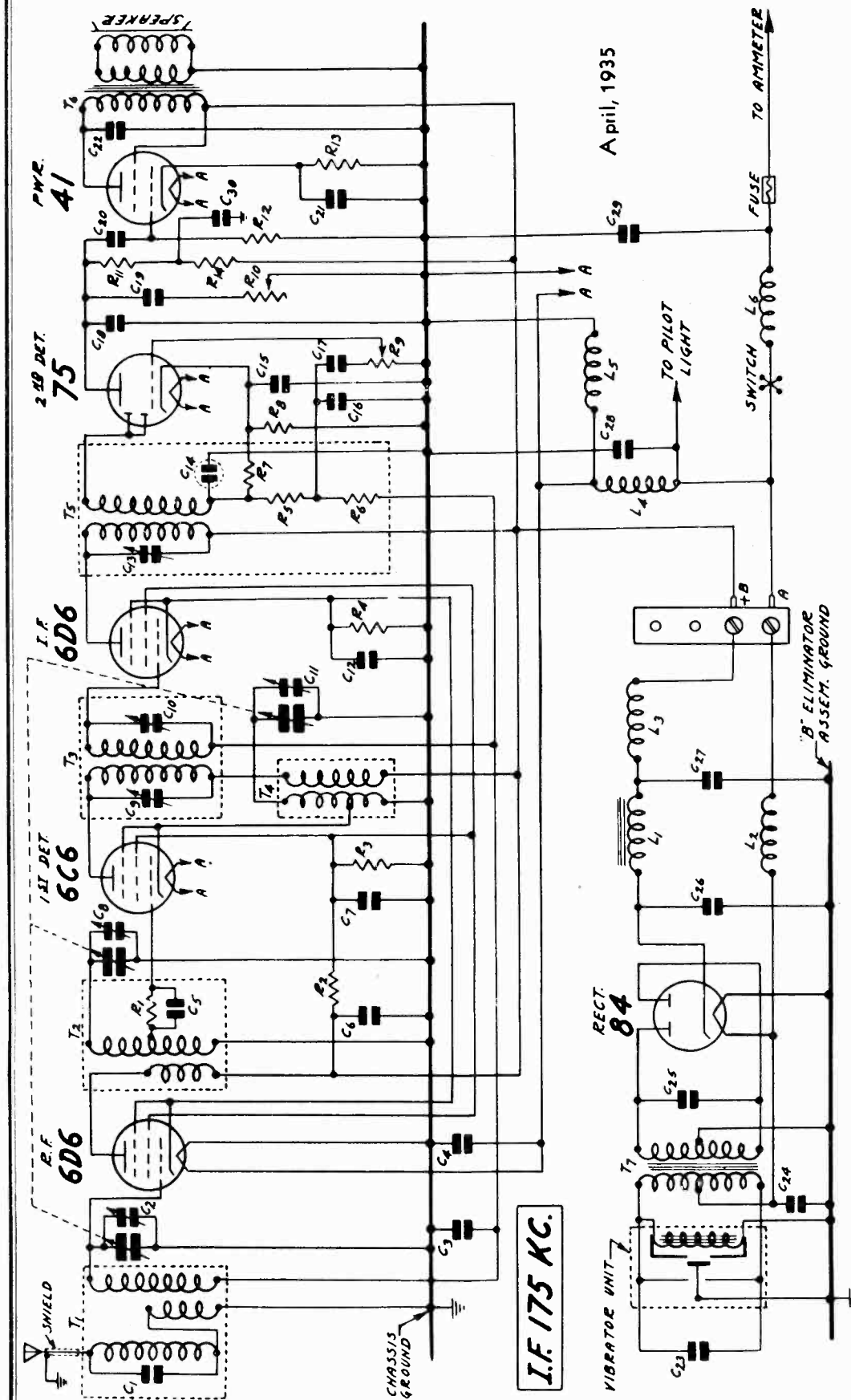
MODEL 16  
MODEL 35  
Schematics





MONTGOMERY-WARD & CO.

MODEL 62-166  
Schematic



NOTE:  
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.

- C1 500 MMF. MOULDED
- C2 GANG TRIMMER
- C3 .05 MF. 100 V.
- C4 .003 MF. MOULDED
- C5 33. MMF. MOULDED
- C6 .10 MF. 100 V.
- C7 .10 MF. 100 V.
- C8 GANG TRIMMER
- C9 130-300 MMF. } ONE
- C10 130-300 MMF. } ASSEMBLY
- C11 GANG TRIMMER
- C12 .10 MF. 100 V.
- C13 70-140 MMF.
- C14 250. MMF. MOULDED
- C15 12.0 MF. 25 V. } ELECTRO.
- C16 .00025 MF. MOULDED
- C17 .01 MF. 100 V.
- C18 .00025 MF. MOULDED
- C19 .006 MF. 600 V.
- C20 .01 MF. 400 V.
- C21 .002 MF. 600 V.
- C22 .30 MF. 180 V.
- C23 1.65 MF. 180 V.
- C24 .01 MF. 1800 V.
- C25 .50 MF. 180 V.
- C26 .00025 MF. MOULDED
- C27 8.0 MF. 350 V. } LYTIC
- C28 2.5 MF. 300 V.
- C29 .003 MF. MOULDED
- C30 6.0 MF. 350 V. } ELECTRO.
- C31 8.0 MF. 350 V. } LYTIC
- C32 2.0 MF. 300 V.
- C33 1.0 MEGOHM .2 W.
- C34 3000 OHM .5 W.
- C35 450 OHM .2 W. } ONE
- C36 800 OHM .5 W. } ASSEMBLY
- R1 150000 OHM .2 W.
- R2 150000 OHM .2 W.
- R3 500000 OHM .2 W.
- R4 500000 OHM .2 W.
- R5 50000 OHM .2 W.
- R6 1.0 MEGOHM .2 W.
- R7 500000 OHM .2 W.
- R8 7500 OHM .2 W.
- R9 2.0 MEGOHM VOL. CONTROL
- R10 150000 OHM .2 W.
- R11 150000 OHM .2 W.
- R12 500000 OHM .2 W.
- R13 500000 OHM .2 W.
- R14 500000 OHM .2 W.

April, 1935

**MODEL 62-166**

Alignment, Voltage  
Socket, Trimmers  
Resistance Test

**MONTGOMERY-WARD & CO.**

**I. F. Adjustment**

Remove chassis from case.  
Establish ground connection between chassis and power supply.

Reconnect A and B wires from power supply to chassis.  
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 (middle) section of the tuning condenser. 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 A.V.C.

Then adjust the three I.F. trimmers until maximum output is obtained. The location of these trimmers are 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.

Connect the shielded antenna lead from the chassis through a 250 mmf. condenser to the antenna post 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 A. V. C. 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 K C. 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 the trimmer condenser closest to the terminal strip—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**

After installing the receiver in the car, it will be necessary to calibrate the control unit. Tune in a station of known frequency at about the center of the dial. At the back of the control unit is a calibration screw—See Fig. 4 in the installation manual enclosed with each receiver. Remove the pilot light assembly.

The calibration screw will be seen at the bottom of the receptacle from which the pilot light assembly is withdrawn. Insert a 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.

**Changes In Early Models**

In the early models, resistor R14, and condenser C30, were not used. In these models resistor R11 was rated at 200,000 ohms.

The capacity range of the 1st I.F. Trimmer Condensers, C9 and C10, was from 130 to 300 mmf. in the early models.

**Voltages at Sockets**  
Antenna Disconnected - Voltage at Battery 6.1

Type of Tube	Function	Across Heater	Plate to Ground	Screen to Ground	Cath. to Ground	Normal Plate M.A.
6D6	R. F.	5.8	218	100	5.2	5.8
6C6	1st Det. and Osc.	5.8	218	100		2.0
6D6	I. F.	5.8	218	100	5.2	5.8
75	2nd Det. & 1st A. F.	5.8	160 (1)		1.4	2.8
41	Output	5.8	210	220	16.0	16.0
84	Rectifier	5.8				20.0 per plate

Speaker Field . . . . .1.15 Amperes "B" Unit . . . . .3.00 Amperes  
Chassis . . . . .1.50 Amperes Pilot Lamp . . . . .0.1 Amperes

(1) Measured on 1000 V. Scale (1000 Ohms per volt)

**D. C. Resistance of Windings**

Following are the D. C. resistances of the various

Part No.	ITEM	Code	D. C. Resistance in Ohms
P-9A368	Antenna Trans. Primaries in Series . . . . .	T1	6.3
	Antenna Trans. Secondary . . . . .	T1	2.5
P-9A369	R.F. Interstage Trans. Pri. . . . .	T2	4.5
	R.F. Interstage Trans. Sec. . . . .	T2	1.8
	(Center Tap to inside) . . . . .		1.3
	(Center Tap to ground) . . . . .		1.3
P-9A371	1st I.F. Trans. Primary . . . . .	T3	58.
	1st I.F. Trans. Secondary . . . . .	T3	58.
P-9A370	Oscillator Cathode Coil (Total) . . . . .	T4	3.
	Oscillator Plate Coil . . . . .	T4	6.
P-9A372	2nd I.F. Trans. Primary . . . . .	T5	46.
	2nd I.F. Trans. Secondary . . . . .	T5	46.
P-51X17	Output Trans. Primary . . . . .	T6	440.
	Output Trans. Sec. and Voice coil in parallel . . . . .	T6	4.
P-53X72	Power Trans. Primary . . . . .	T7	3.
	Power Trans. Secondary . . . . .	T7	500.
P-52X27	Filter Choke . . . . .		300.
P-9A374	Filament Reactor . . . . .	I.1	Small
P-9A268	R.F. "B" Choke . . . . .	I.2	3.5
P-9A375	Pilot Light Choke Assembly . . . . .	I.3	Small
P-12A62A	Speaker Field . . . . .	I.4	5.
P-9A373	Motor Noise Choke . . . . .	I.5	Small

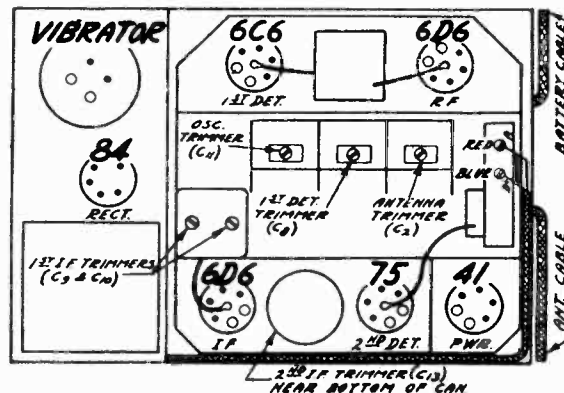


Fig. 2—Tube Arrangement and Trimmers

MONTGOMERY-WARD & CO.

Replacement Parts List

INSTALLATION ITEMS

Part No.	Quan. Used	Description	Selling Price
P-18A31	1	25" Volume Control Flexible Drive Shaft (Standard Equipment)	.58
P-18A34	1	25" Tuning Condenser Flexible Drive Shaft (Standard Equipment)	.62
P-18A32	1	20" Volume Control Flexible Drive Shaft	.54
P-18A37	1	20" Tuning Condenser Flexible Drive Shaft	.54
P-18A38	1	32" Volume Control Flexible Drive Shaft	.74
P-13X52	1	32" Tuning Condenser Flexible Drive Shaft	.78
P-13X204	1	Ammeter Cable and Fuse Receptacle	.16
P-13X211	1	Antenna Cable and Fitting	.36
P-7A32	1	Pilot Light Cable Assembly	.58
P-20X59	4	Pilot Light Bulb—Bayonet Pin Base (6-8 V)	.10
P-20X74	4	Double End Hexagon Bolts for Mounting Chassis to dash	.04
P-19X18	8	5/16" Shakeproof Lockwashers for above Mounting Assembly	.04
P-20X75	8	Flat Washers for above mounting assembly	.08
P-20X77	8	5/16" Split Lockwashers for above mounting assembly	.04
P-20X72	8	5/16" 18 Hexagon Nuts for above assembly	.08
P-28X33	1	Ground Spring (to ground Tuning Condenser Flexible Shaft)	.04
P-20X76	1	No. 6 Shakeproof Lockwasher to assemble Ground Spring	.04
P-20X78	1	6-32x1/4" Round Head Machine Screw to mount Ground Spring	.04
P-16X14	1	20 Ampere Fuse	.04
P-16X3	1	Fuse Shield	.16
P-21A6	1	Distributor Suppressor	.30
P-48X27	1	Generator Condenser	.30
P-20X74	1	Additional 5/16" Shakeproof Lockwasher to Ground Chassis Case to Metal Dash Surface on Engine Side	.04
P-21A5	1	Choke Condenser Unit (not shipped with set)	.72
P-21A7	1	Spark Plug Suppressors (not shipped with set)	.20
P-25A33	1	Set of Steering Column Mounting Brackets complete with necessary mounting screws, nuts and lockwashers	.40
P-25A34	1	Under-Instrument Panel Mounting Bracket complete with necessary mounting screws, nuts and lockwashers	.30

MISCELLANEOUS

Part No.	Description	Selling Price
P-3A114	6C6 Tube Socket	.06
P-3A113	6D6 Tube Socket	.06
P-3A116	4I Tube Socket	.06
P-3A99	75 Tube Socket	.03
P-8X8	Rubber Bands (for above tubes)	.04
P-12A62	6" Speaker	2.71
P-13X53	"A" Cable	.14
P-3A108	Small Pin Jack (For Pilot Light Connection)	.06
P-3A136	Large Pin Jack (For Antenna Connection)	.06
P-4A46	2 Lug Terminal Strip (Ground Lug Extended)	.04
P-4A48	"A" & "B+" Power Terminal Strip	.01
P-4A38	1 Lug Terminal Strip (Insulated—Left Hand Mounting)	.01
P-30X14	Grid Cap Only	.01
P-10A20	Tone Control Knob	.06
P-30X1	Wire Clamp	.06
P-29X16	Flexible Shaft Anchor Bushing	.12
P-20X27	Anchor Bushing Clamping Nut	.06
P-20X28	Hexagon Nut for above assembly	.06
P-20A80	Shakeproof Lockwasher (for above assembly)	.04
P-19X13	Flat Washers (for above assembly)	.04
P-20X61	8-32 Wing Nuts for securing cover to case	.08
P-20X79	No. 8 Split Lockwashers (for above nuts)	.04

"B" UNIT PARTS

Part No.	Description	Code	Selling Price
P-9A268	R.F. "B" Choke Coil Assembly	L3	.06
P-9A374	Filament Reactor	L2	.24
P-53X22	Power Transformer	T7	1.52
P-52X22	Filter Choke	L1	.48
P-19A14	Vibrator—Mallory		2.62
P-19A16	Vibrator—Radiart		2.42
P-3A127	Vibrator Socket		.06
P-3A128	84 Tube Socket		.06
P-4A42	2 Lug Terminal Strip (Both Insulated)		.06
P-4A17	1 Lug Terminal Strip (Insulated—Right Hand Mounting)		.01
P-45X204	Dry Electrolytic (See Condensers)	C26 (C27)	1.69
P-46X89	1.65 mf. 180 Volt Tubular Condenser	C24	.38
P-46X88	.01 mf. 1800 Volt Tubular Condensers	C25	.14
P-46X93	.50 mf. 180 Volt Tubular Condensers	C28	.18

TRANSFORMERS AND COILS

Part No.	Description	Code	Selling Price
P-51X17	Output Transformer	T6	.78
P-9A368	Antenna Coil Assembly (Less Can)	T1	.44
P-9A369	R.F. Interstage Coil Assembly (Less Can)	T2	.60
P-1A23	Dual-Coil Can Assembly Only (for above two coils)		.16
P-9A371	1st I.F. Coil & Can Assembly Complete	T3	.82
P-9A370	Oscillator Coil & Can Assembly Complete	T4	.30
P-9A372	2nd I.F. Coil & Can Assembly Complete	T5	.98
P-9A375	Pilot Light Choke Assembly	L4	.08
P-9A373	Motor Noise Choke	L6	.14
P-9A268	R.F. "B" Choke Coil Assembly	L3	.05
P-9A374	Filament Reactor	L2	.24
P-53X27	Power Transformer	T7	1.52
P-52X22	Filter Choke	L1	.44

CONDENSERS

Part No.	Code	Capacity	Voltage	Type	Selling Price
P-47X54	C1	.0005 mf.		Moulded	.08
	C2	Antenna Trimmer-Part of Gang Condenser			.08
P-46X80	C3	.05 mf.	180	Tubular	.12
P-47X50	C4	.003 mf.		Moulded	.12
P-47X53	C5	.00035 mf.		Moulded	.06
P-46X81	C6	.10 mf.	400	Tubular	.12
P-46X83	C7	.10 mf.	180	Tubular	.12
	C8	1st Detector Trimmer-Part of Gang Condenser			.21
*P-17A32	C9	130-340 mmf. 1st I.F. Trimmer Condensers			.18
†P-17A33	C9	70-150 mmf. 1st I.F. Trimmer Condensers			.18
	C10	70-150 mmf. 1st I.F. Trimmer Condensers			.18
	C11	Oscillator Trimmer-Part of Gang Condenser			.12
P-46X82	C12	.10 mf.	180	Tubular	.18
P-17A18	C13	70 140 mmf. 2nd I.F. Trimmer Condenser			.18
	C14	.00025 mf. Part of 2nd I.F. Coil Assembly			.50
	C15	12.00 mf.	25	Dry Electrolytic Block	.08
P-45X203	C16	.00025 mf.	180	Moulded	.08
P-47X52	C17	.01 mf.	180	Tubular	.08
P-46X84	C18	.00025 mf.	600	Tubular	.10
P-47X52	C19	.006 mf.	400	Tubular	.10
P-46X86	C20	.01 mf.	600	Tubular	.10
P-46X85	C22	.002 mf.	180	Tubular	.18
P-46X87	C23	.50 mf.	180	Tubular	.38
P-46X89	C24	1.65 mf.	180	Tubular	.14
P-46X88	C25	.01 mf.	1800	Tubular	1.00
P-45X204	C26	6.00 mf.	350	Dry Electrolytic Block	1.00
P-46X93	C27	8.00 mf.	350	Tubular	1.18
P-47X50	C28	.50 mf.	180	Moulded	.12
P-46X94	C29	.003 mf.	300	Tubular	.14
P-14A39	C30	.25 mf.		3 Section Gang Condenser	2.00

RESISTORS

Part No.	Code	Resistance	Wattage	Type	Selling Price
P-A95504	R1	500,000 Ohm	0.2	Carbon	.06
P-B94153	R2	15,000 Ohm	0.5	Carbon	.08
P-B94203	R3	20,000 Ohm	0.5	Carbon	.08
P-43X41	R4	450 Ohm	0.2	Armored Wire	.14
P-A95503	R13	800 Ohm	0.5	Wound	.06
P-A95501	R5	50,000 Ohm	0.2	Carbon	.06
P-A95105	R6	1.0 Megohm	0.2	Carbon	.06
P-A94504	R7	500,000 Ohm	0.2	Carbon	.06
P-95752	R8	7,500 Ohm	0.2	Carbon	.06
P-36X209	R9	2.0 Megohm		Volume Control & Switch	.56
P-40X201	R10	300,000 Ohm		Tone Control	.34
*P-A95204	R11	200,000 Ohm	0.2	Carbon	.06
†P-A95154	R11	150,000 Ohm	0.2	Carbon	.06
P-A95504	R12	500,000 Ohm	0.2	Carbon	.06
†P-A95503	R14	50,000 Ohm	0.2	Carbon	.06

CONTROL UNIT PARTS

Part No.	Quan. Used	Description	Selling Price
P-20A17	1	Complete Remote Control Less Flexible Shafts and Pilot Light Cable Assembly	\$2.07
P-35X37	1	Control Unit Case (front) With Screws	.30
P-35X38	1	Control Unit Case (back) With Screws	.42
P-35X41	1	Dial Scale Assembly with Pointer and Celluloid Gear (Specify for part P-20A17)	.48
P-35X39	1	Station Selector Shaft Complete with Gear and Horse Shoe Lock	.20
P-24X211	1	Intermediate Gear	.06
P-26X214	1	Volume Control Shaft	.01
P-28X43	1	Volume Control Tension Spring with Nut and Lockwasher	.12
P-17X9	1	Celluloid Crystal	.04
P-10A52	2	Knob with Set Screw	.08

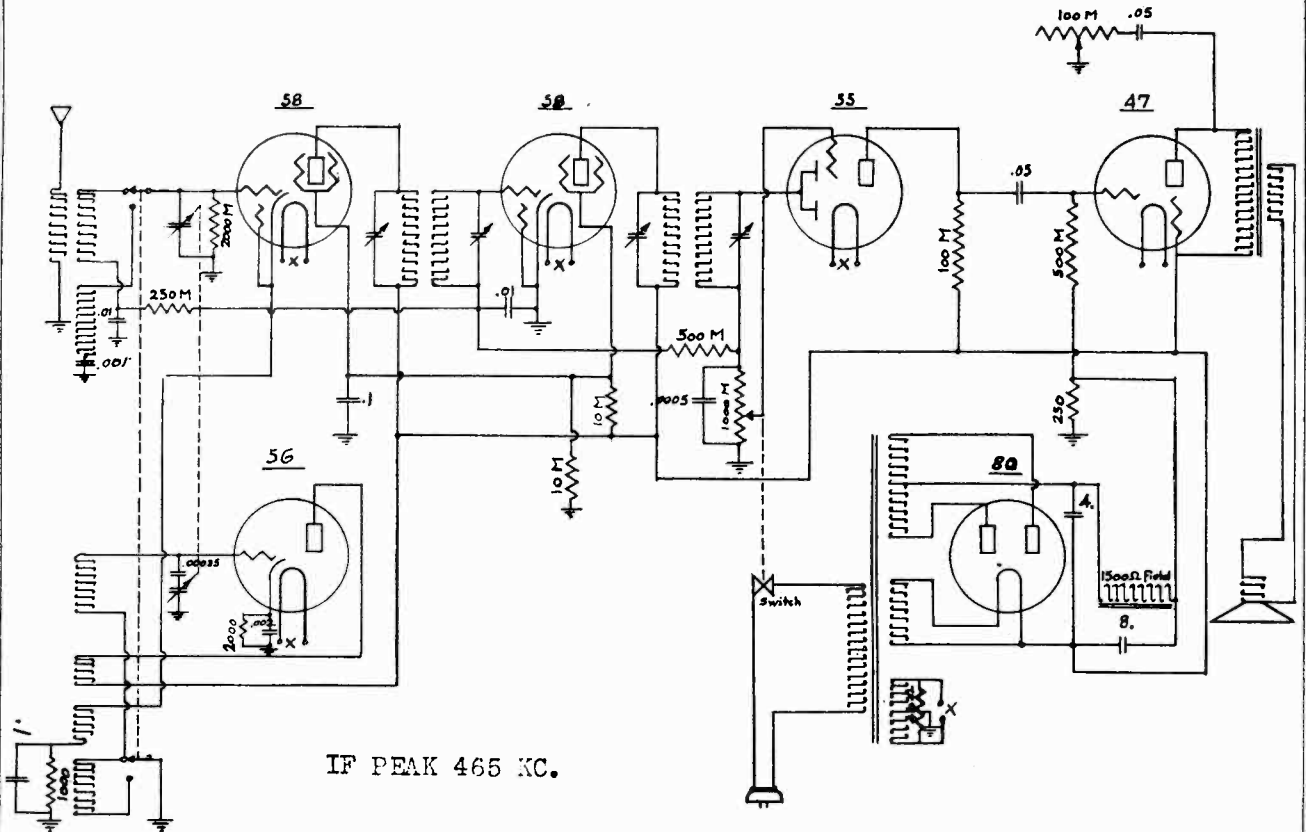
\* Used in early models. (See article on changes in this manual.)  
† Used in later models. (See article on changes in this manual.)



MODEL 62PC55

Schematic, Voltage Alignment

MONTGOMERY-WARD & CO.



IF PEAK 465 KC.

SERVICE NOTES ON MODEL 62-PC-55

6-TUBE AIRLINE RECEIVER

The No. 55 is a combination long and short wave receiver, with a frequency range from 3400 K.C. to 550 K.C., and the change from the short wave to broadcast band is accomplished by a 2-section change-over switch.

The oscillator uses a separate 56 tube. The first detector is also connected to the A.V.C. section of the No. 55 tube, so that better A.V.C. action may be had. The I.F. amplifier is resonated at 465 K.C. The No. 55 tube is used as second detector, and functions as an automatic volume control and triode audio stage also. The 247 power pentode is connected to the output of the 55 through a resistance or capacity circuit. The high voltage rectifier is an 80 tube.

CIRCUIT ADJUSTMENTS

In aligning this receiver, a 465 K.C. modulated oscillator and output meter are required, and the following procedure is recommended:

Use output meter connected in parallel with the plate circuit of the power pentode. Connect the oscillator with the grid of the first detector. Adjust each of the trimming condensers on the I.F. transformers located underneath the chassis, until maximum signal is shown on the output meter. Go over these trimmers several times, as the over-all performance of this receiver depends on I.F. transformer adjustment. If a signal other than 465 K.C. is used, for aligning the amplifier, the oscillator and pre-selector circuit will fail to track. Images will also appear at the low frequency end of the broadcast band. Next, set the dial at 100 degrees when the variable condenser plates are fully meshed. Then set the oscillator to give a 1400 K.C. signal. When the dial is turned to 1400 K.C., a signal should be heard. Adjust the

trimming condenser on the variable condenser section nearest the front of the chassis, until the maximum signal is indicated by output meter. Now, adjust the trimmers on the other two sections for maximum signal. The same procedure should be followed with the oscillator set at 900, 700 and 600 K.C.

CAUTION

Do not attempt to bend oscillator plates. All balancing should be done with volume control wide open, and to test oscillator, adjust it to low signal level.

If the intermediate transformers and 2-gang condenser are properly aligned for broadcast, no adjustment is necessary for the tracking of the high frequency bands.

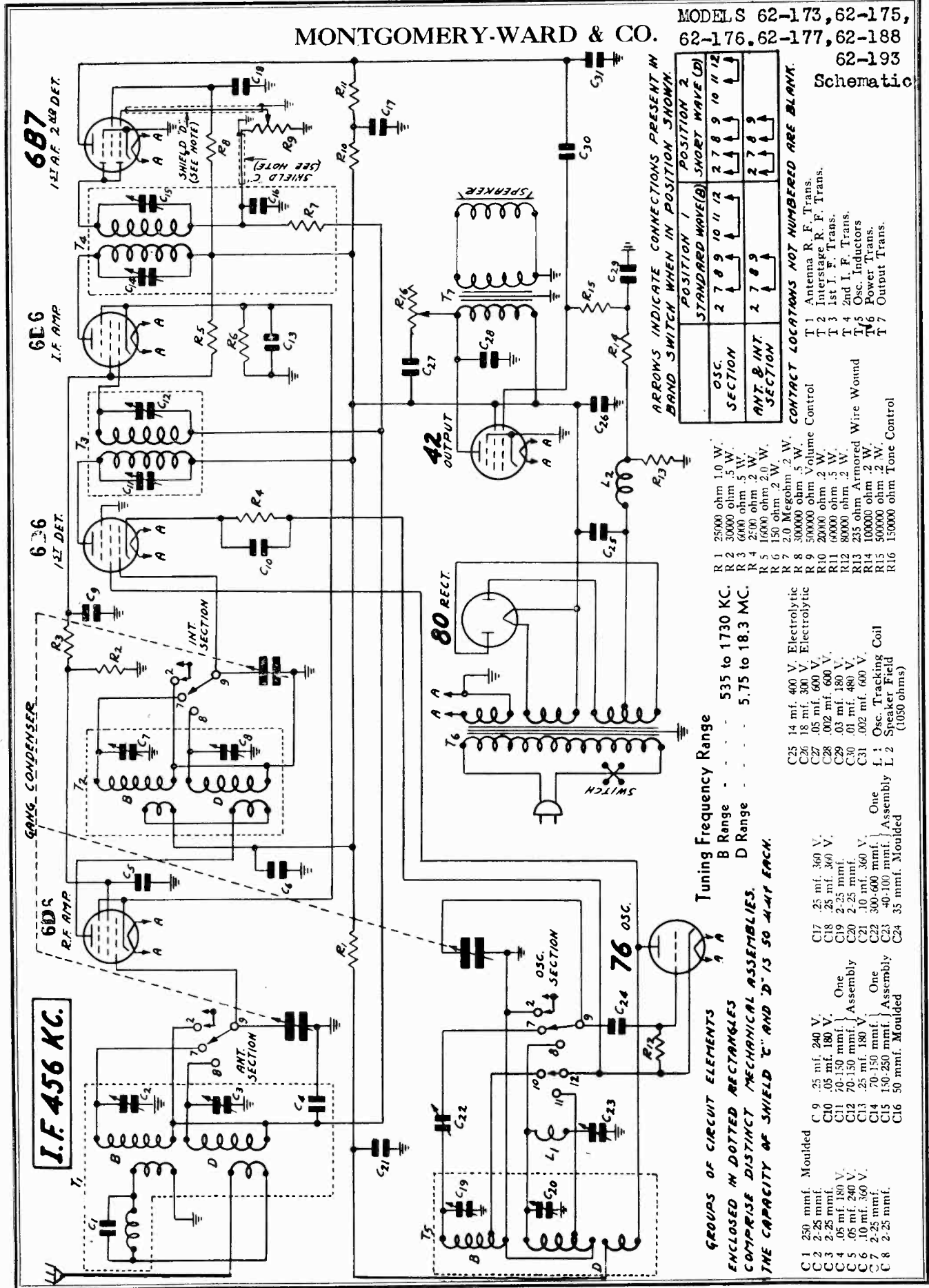
VOLTAGES OF 6-TUBE SET

Ground to Audio Plate	215 Volts
Ground to Audio Screen	240 Volts
Ground to 2nd Detector Plate	70 Volts
Ground to I.F. and 1st Detector Plates	240 Volts
Ground to I.F. and 1st Detector Screens	80 Volts
Ground to Oscillator Plate	80 Volts
Drop through Speaker Fields	105 Volts
Measured with 300,000 Ohm Meter.	
Ground to 1st Detector Cathode	2 Volts
Ground to Oscillator Cathode	21 Volts
Measured with 30,000 Ohm Meter.	
A. C.	
All Filaments	2.35 Volts
80 Filaments	4.75 Volts
Input Filaments	111 Volts

MONTGOMERY-WARD & CO.

MODELS 62-173, 62-175,  
62-176, 62-177, 62-188  
62-193

Schematic



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

OSC. SECTION	POSITION 1												POSITION 2															
	STANDARD WAVE (A)						SHORT WAVE (B)						STANDARD WAVE (A)						SHORT WAVE (B)									
OSC.	2	7	8	9	10	11	12	2	7	8	9	10	11	12	2	7	8	9	10	11	12	2	7	8	9	10	11	12
ANT. & INT. SECTION	2	7	8	9				2	7	8	9				2	7	8	9				2	7	8	9			

- CONTRACT LOCATIONS NOT NUMBERED ARE BLANK.
- T 1 Antenna R. F. Trans.
  - T 2 Interstage R. F. Trans.
  - T 3 1st I. F. Trans.
  - T 4 2nd I. F. Trans.
  - T 5 Osc. Inductors
  - T 6 Power Trans.
  - T 7 Output Trans.

- R 1 25000 ohm 1.0 W.
- R 2 30000 ohm .5 W.
- R 3 6000 ohm .5 W.
- R 4 2500 ohm .2 W.
- R 5 16000 ohm 2.0 W.
- R 6 150 ohm .2 W.
- R 7 2.0 Megohm .2 W.
- R 8 300000 ohm .5 W.
- R 9 500000 ohm Volume Control
- R 10 20000 ohm .2 W.
- R 11 6000 ohm .5 W.
- R 12 80000 ohm .2 W.
- R 13 235 ohm Armored Wire Wound
- R 14 100000 ohm .2 W.
- R 15 500000 ohm .2 W.
- R 16 150000 ohm Tone Control

- C 25 14 mf. 400 V. Electrolytic
- C 26 18 mf. 300 V. Electrolytic
- C 27 .05 mf. 600 V.
- C 28 .02 mf. 600 V.
- C 29 .03 mf. 180 V.
- C 30 .01 mf. 480 V.
- C 31 .002 mf. 600 V.
- L 1 Osc. Tracking Coil
- L 2 Speaker Field (1050 ohms)

- Tuning Frequency Range
- B Range 535 to 1730 KC.
  - D Range 5.75 to 18.3 MC.

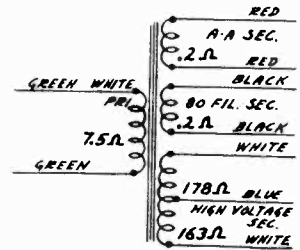
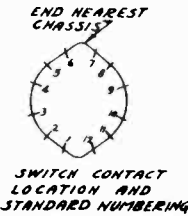
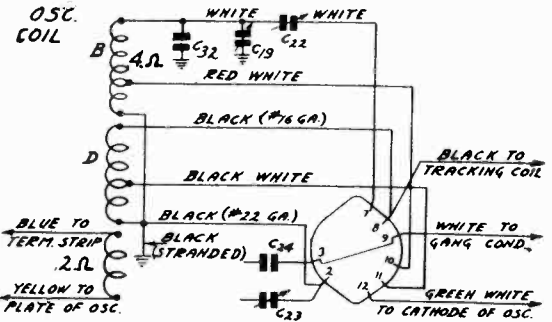
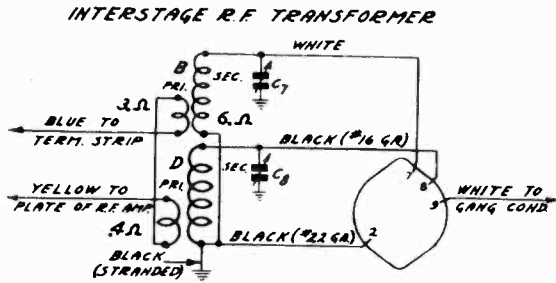
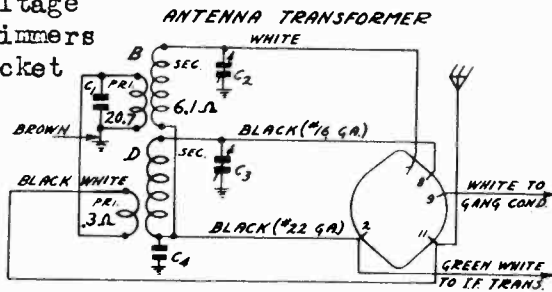
- GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES. THE CAPACITY OF SHIELD 'C' AND 'D' IS 50 MMF. EACH.
- C 1 250 mmf. Moulded
  - C 2 2-25 mmf.
  - C 3 2-25 mmf.
  - C 4 .05 mf. 180 V.
  - C 5 .05 mf. 180 V.
  - C 6 .10 mf. 360 V.
  - C 7 2-25 mmf.
  - C 8 2-25 mmf.
  - C 9 .25 mf. 240 V.
  - C 10 .05 mf. 180 V.
  - C 11 70-150 mmf. } Assembly
  - C 12 70-150 mmf. } Assembly
  - C 13 .25 mf. 180 V.
  - C 14 70-150 mmf. } Assembly
  - C 15 150-250 mmf. } Assembly
  - C 16 50 mmf. Moulded
  - C 17 25 mf. 360 V.
  - C 18 25 mf. 360 V.
  - C 19 2-25 mmf.
  - C 20 2-25 mmf.
  - C 21 10 mf. 360 V.
  - C 22 300-600 mmf. } Assembly
  - C 23 40-100 mmf. } Assembly
  - C 24 35 mmf. Moulded

MODELS 62-173, 62-175,  
62-176, 62-177, 62-188  
62-193

MONTGOMERY-WARD & CO.

Color Coding,  
Resistance Data

Voltage  
Trimmers  
Socket



NOTE: RESISTANCE VALUES NOT SHOWN ARE SMALL.

Fig. 3—Color Coding of Coil Wires and D. C. Resistance of Windings

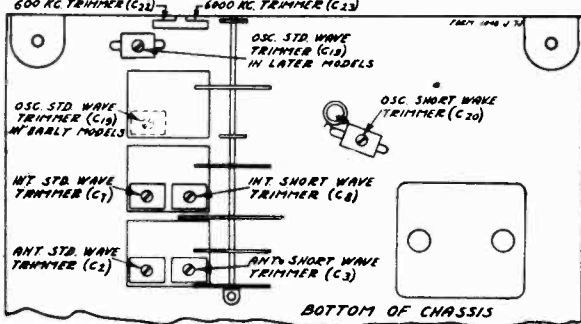


Fig. 4—Location of Trimmers

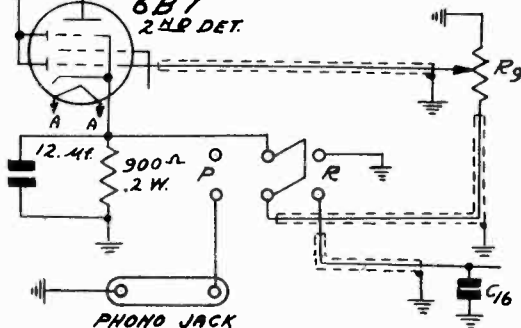


Fig. 7—Phonograph Connections

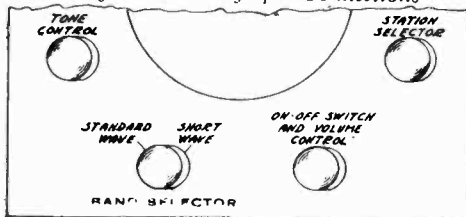


Fig. 1—Arrangement of Controls

VOLTAGES AT SOCKETS  
Line Voltage - 112  
Antenna Shorted to Ground

Type of Tube	Function	Heater Volts	Plate to Ground	Screen to Ground	Cathode to Ground	Plate M. A.
6D6	R. F.	6.1	240	95	3	7.
6D6	1st Det.	6.1	240	100	9	3.5
76	Osc.	6.1	100			5.
6D6	I. F.	6.1	240	120	3	7.5
6B7	2nd Det.	6.1	55	45	0	2.3
42	Power	6.1	225	240	17 (1)	38.0
80	Rectifier	4.6				32.0 per plate

(1) As read across R13.

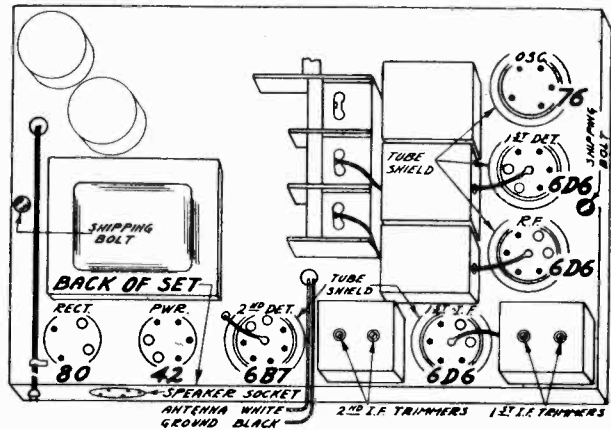


Fig. 6—Location of Tubes

MODEL S 62-173, 62-175,  
62-176, 62-177, 62-188  
62-193  
Resistance Test, Parts

## General Service Data

### 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. Refer to Fig. 3.

New Part No.	Item	Code	D. C. Resistance in Ohms
9A368	Antenna Transformer		
	Range B Primary Winding	T1	20.7
	Range D Primary Winding	T1	0.3
	Range B Secondary Winding	T1	6.1
	Range D Secondary Winding	T1	Small
9A387	R. F. Interstage Transformer		
	Range B Primary Winding	T2	3.0
	Range D Primary Winding	T2	0.4
	Range B Secondary Winding	T2	6.0
	Range D Secondary Winding	T2	Small
9A388	Oscillator Coils		
	Range B Grid Coil	T5	
	Red White to White		4.0
	Red White to ground		Small
	Range D Grid Coil	T5	
	Black White to Black		Small
	Black White to ground		Small
	Oscillator Plate Coil	T5	0.2
9A389	1st I. F. Transformer		
	Primary Winding	T3	12.0
	Secondary Winding	T3	11.1
9A390	2nd I. F. Transformer		
	Primary Winding	T4	12.0
	Secondary Winding	T4	4.5
	Output Transformer (Part of Speaker Assembly)		
	Primary Winding	T7	510.
	Secondary Winding	T7	1.0
	Dynamic Speaker		
	Speaker Field	L2	1025.
	Speaker Voice Coil		4.1
	Speaker Bucking Coil		0.2
53X91	115 volt 60 cycle Power Transformer		
	Primary Winding	T6	7.5
	Tube Filament Secondary (A-A)	T6	0.2
	80 Filament Secondary	T6	0.2
	High Voltage Secondary Winding	T6	
	Center tap to inside		153.
	Center tap to outside		178.
9A391	High Frequency Oscillator Tracking Coil	L1	1.1

### Replacement Parts

New Part No.	Old Part No.	Description	List Price
12A222		6" Dynamic Speaker Comp. with Output Trans. T7	4.15
12A223		8" Dynamic Speaker Comp. with Output Trans. T7	4.90
12A221		10" Dynamic Speaker Comp. with Output Trans. T7	6.45
2A41		Two Section Band Change Switch	1.65
25X221		Chassis Mounting Feet	.10
30X14	30342	Grid Clip	.10
4A38	2106	Two Lug Terminal Strip (1 Lug Insulated)	.10
4A17	1421	Single Lug Terminal Strip	.10
4A49		Single Lug Terminal Strip (Mtg. hole used)	.10
4A50		Two Lug Terminal Strip (Both Lugs Insulated - Mtg. Foot in Center)	.10
9A386	T1	Antenna Trans. and Can Assembly	\$2.35
9A387	T2	R.F. Interstage Trans. and Can Assembly	1.75
9A389	T3	1st I.F. Coil and Can Assembly	1.50
9A390	T4	2nd I.F. Coil and Can Assembly	2.10
9A388	T5	Oscillator Coil and Can Assembly	1.70
53X91	T6	Power Transformer 115 Volt; 60 cycles	3.60
53X92	T6	Power Transformer 115 Volt; 25 cycles	5.95
53X99	T6	Power Transformer 230 Volt; 50 cycles	4.10
9A391	L1	High Frequency Oscillator Tracking Coil Assembly	.25
47X59	C1	.250 mfd. Moulded	\$.15
17A36	C2	2-25 mmfd. Antenna Standard Wave Trimmer	.70
17A36	C3	2-25 mmfd. Antenna Short Wave Trimmer	.10
46X80	C4	.050 mfd. 180 Tubular	.15
46X103	C5	.050 mfd. 240 Tubular	.15
46X105	C6	.100 mfd. 360 Tubular	.20
17A36	C7	2-25 mmfd. R.F. Interstage Standard Wave Trimmer	.10
17A36	C8	2-25 mmfd. R.F. Interstage Short Wave Trimmer	.10
		46X104	
		46X80	
		17A33	
		46X102	
		17A34	
		47X56	
		46X107	
		46X116	
		17A36	
		17A36	
		46X105	
		17A35	
		47X53	
		44X10	
		44X11	
		46X108	
		46X100	
		46X110	
		46X109	
		46X100	
		47X63	
		14A42	
		C94253	
		B93303	
		B94602	
		A94252	
		D93163	
		A94151	
		A95205	
		B94304	
		36X205	
		A94203	
		B94603	
		A94803	
		43X42	
		A94104	
		A95504	
		40X204	
		2A31	
		3A12	
		10A36	
		45X37	
		A94901	
		C9	.250 mfd. 240 Tubular .25
		C10	.050 mfd. 180 Tubular .15
		{ C11 70-150 mmfd. }	1st I.F. Trimmers .40
		{ C12 70-150 mmfd. }	180 Tubular .30
		C13	.250 mfd. 180 Tubular .30
		{ C14 70-150 mmfd. }	2nd I.F. Trimmers .40
		{ C15 150-250 mmfd. }	Moulded .10
		C16	.50 mfd. 360 Tubular .30
		C17	.250 mfd. 360 Tubular .35
		C18	.250 mfd. Oscillator Standard Wave Trimmer .10
		C19	2-25 mmfd. Oscillator Short Wave Trimmer .10
		C20	2-25 mmfd. 360 Tubular .20
		C21	.100 Oscillator 600 KC Padding Trimmer .45
		{ C22 300-600 mmfd. }	Oscillator 600 KC Padding Trimmer .10
		{ C23 40-100 mmfd. }	Moulded .10
		C24	35 mmfd. 400 Wet Electrolytic 1.25
		C25	14.00 mfd. 300 Wet Electrolytic 1.10
		C26	18.00 mfd. 600 Tubular .20
		C27	.050 mfd. 600 Tubular .15
		C28	.002 mfd. 600 Tubular .15
		C29	.030 mfd. 180 Tubular .15
		C30	.010 mfd. 480 Tubular .15
		C31	.002 mfd. 600 Tubular .15
		C32	10 mmfd. Moulded .10
			3 Section Gang Condenser 3.85
		R1	25,000 ohms 1.0 Carbon .15
		R2	30,000 ohms .5 Carbon .20
		R3	6,000 ohms .5 Carbon .15
		R4	2,500 ohms .2 Carbon .15
		R5	16,000 ohms 2.0 Carbon .45
		R6	150 ohms .2 Carbon .15
		R7	2.0 Megohms .2 Carbon .10
		R8	300,000 ohms .5 Carbon .15
		R9	500,000 ohms Volume Control & Switch 1.05
		R10	20,000 ohms 2 Carbon .15
		R11	60,000 ohms .5 Carbon .15
		R12	80,000 ohms .2 Carbon .15
		R13	235 ohms 2.0 Armored Wire Wound .25
		R14	100,000 ohms .2 Carbon .15
		R15	500,000 ohms .2 Carbon .10
		R16	150,000 ohms Tone Control .75
			Phono Switch (Double Pole Double Throw Switch) \$ .60
			Phono Jack .10
			Switch Knob .20
			12.0 Mf. - 25 Volt - Dry Electrolytic Condenser .75
			900 Ohm - 0.2 Watt .15
			12 Inches of No. 722G Shielded Hookup Wire .10
			Dial and Drive Assembly (Specify name and Model No.) 2.35
			Dial Strip Only (Specify name and Model No.) .55

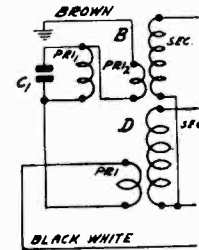


Fig. 5—Antenna Transformer on Early Models

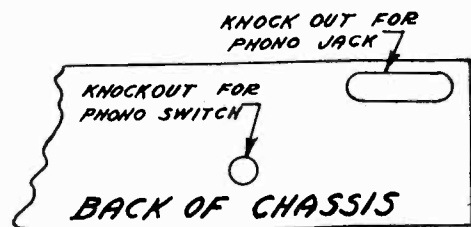


Fig. 8—Location of Phono Knockouts

MODEL S 62-173, 62-175  
62-176, 62-177, 62-188  
62-193

MONTGOMERY-WARD & CO.

Alignment, Data

**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 chassis 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 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.

For mounting the 12 mfd. 55 volt dry electrolytic condenser, two No. 27 drill holes should be drilled in the side of the chassis base directly below the wet electrolytic condensers. These holes are 1/4" from the bottom, 7/8" and 3/4" from the front of the chassis.

The ground lug which extends out from the side of the chassis should be bent back into the chassis wall. The connections are made by opening the diode retentive cap which runs from the I. F. transformer to the volume control at the lug on the volume control. Cut this lead to length and connect it to the switch as shown in Fig. 7. The extra length of shielded lead which is provided, is connected from the volume control R9 to the phono switch as illustrated.

Remove the ground from the cathode terminal of the 6B7 2nd detector tube by bending the chassis ground lug away from this terminal. Be sure to solder back to this ground lug any leads that were connected to it (not including cathode connection of socket).

Connect one side of the 12 mfd. 25 volt electrolytic condenser to ground and the other side of the condenser to the cathode terminal of the 6B7 2nd detector and the phono switch as shown in Fig. 7. To this same terminal on the phono switch connect the 900 ohm 2 watt resistor. The other side of this resistor goes to ground. Complete the other connections as illustrated.

A high impedance pick-up should be used. If a low impedance pick-up is used a step-up transformer will be required for sufficient volume. The volume control and tone control of the set will regulate the phono volume and tone.

**Changes in Early Models**

In the early models of this receiver the oscillator standard wave trimmer C19 was in the oscillator coil can—see Fig. 4.

In the early models the antenna transformer had two B primary windings as shown in Fig. 5. In later models only one winding was used as shown in Fig. 3.

**18,300 KC Adjustment**

Set the signal generator for 18,300 KC. Turn the rotor of the tuning condenser to the full open position.

Turn the hand switch to the short wave position. As mentioned above, keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent A.V.C. action.

Adjust the oscillator short wave trimmer (C20) until maximum output is obtained. See Fig. 4 for location of this trimmer.

If a maximum output peak cannot be reached it may be due to the fact that the antenna and interstage short wave trimmers are screwed down too far. Back off these two trimmer screws two or three turns and then adjust the oscillator short wave trimmer for maximum output.

**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 short wave trimmer (C8) and antenna short wave trimmer (C1) until maximum output is obtained.

When adjusting the interstage short wave 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.

Then go back and repeat the procedure as given for the 18,300 KC adjustment. If it is found necessary to make any appreciable change in the setting of the oscillator short wave trimmer, the 1,000 KC adjustment must be repeated.

Do not make any further change in the setting of the oscillator short wave 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. 4 for location of this trimmer.

Use a non-metallic screw driver for this adjustment.

**Servicing R. F. Coil Assemblies**

The R. F. coil assemblies in this receiver are sold complete with can. This is due to the fact that the trimmers are soldered to the can, and cannot be easily disassembled.

The lead colors and resistances of the various windings in each assembly are shown in Fig. 3.

If it is ever necessary to remove one of coil assemblies from the can, proceed as follows: First remove the nuts from the screws at the top of the can. The outside lug on the trimmer condenser is inserted into a slot in the coil can, and this lug is soldered into position.

Apply a soldering iron to the can at the point of the soldered connection. Then with a screw driver lift up on the outside edge of the trimmer (edge soldered to can) until the trimmer is clear of the can. After the trimmers are all unsoldered, the coil can be taken out.

grid coil in use is tuned by the oscillator section of the three gang condenser. The oscillating circuit is always resonant at 456 KC above the frequency to which the R. F. amplifier is tuned. When the switch is in the standard wave position, connections are completed to the B grid coil and the D grid coil is open circuited. When the switch is in the short wave position, connections are completed to the D grid coil and the B grid coil is short circuited. Padding condensers C22 and C23 are used in conjunction with the standard wave and short wave oscillator circuits respectively.

The oscillator potential is fed into the cathode circuit of the 6D6 first detector tube. This results in the intermediate or beat frequency of 456 K. C. being present in the plate circuit of this tube.

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

A type 6B7 duo diode pentode tube functions as the second detector and a one stage audio amplifier. The two diode plates are connected together. A.V.C. voltage is applied through isolating resistors to the control grid circuits of the R. F. and I. F. tubes. The audio voltage developed across volume control resistor R9 is applied through the movable arm to the control grid of the 6B7 tube. Resistance coupling is used between the first audio stage and the output stage which employs a type 42 output pentode tube. A type 80 full wave rectifier tube is used in the power unit.

**Alignment and Calibration**

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

Adjust the oscillator standard wave trimmer (C19) until maximum output is obtained. The location of this trimmer is shown in Fig. 4.

**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 pointer at the 1500 KC mark on the standard wave band scale. Retighten the set screw.

Adjust the interstage standard wave trimmer (C7) and antenna standard wave trimmer (C2) until maximum output is obtained.

Do not change the setting of the oscillator standard wave 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. 4 for location of this trimmer.

Be sure to use a non-metallic screw driver for this adjustment.

Dual band coverage is accomplished by means of dual sets of R. F. and oscillator coils and a three section double throw switch. The various circuits made and broken as this switch is thrown are indicated in the schematic circuit diagram Fig. 2.

Referring to the schematic, the standard wave coils are indicated by the letter B, while the short wave coils are indicated by the letter D. The antenna transformer primaries are connected in series. When the switch is in the standard wave position, the B secondary is connected to the grid circuit of the 6D6 R. F. amplifier while the C secondary is open circuited. When the switch is in the short wave position, the C secondary is connected to the grid circuit of this tube while the B secondary is short circuited. The secondary in use is tuned by the antenna section of the three gang condenser.

The output of the R. F. 6D6 tube is fed through another R. F. transformer with tuned secondary into a second 6D6 tube which functions as the first detector. The interstage section of the three gang condenser is used for tuning this circuit. As in the case of the antenna transformer, the R. F. interstage transformer standard wave windings are indicated in the schematic by the letter B, while the short wave windings are indicated by the letter D. The connections to the two coils are made in the same manner as described above for the antenna R. F. transformer.

A separate type 76 tube is employed in the oscillator circuit. Referring to the schematic, B is the standard wave grid coil and D is the short wave grid coil. The winding shown below is the oscillator plate coil. The

A signal generator that 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 screw driver for the adjustments. The complete procedure is as follows:

**I. F. Adjustment**

Set the signal generator for a signal of 456 KC. Connect the antenna lead of the signal generator thru a 1 MF condenser to the grid of the 1st detector. Connect the ground lead of the signal generator to the chassis ground.

Turn the hand switch to the standard wave position.

Turn the volume control to the maximum position. Attenuate the signal from the signal generator to prevent the leveling-off action of the A.V.C.

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. 6.

**1730 KC Adjustment**

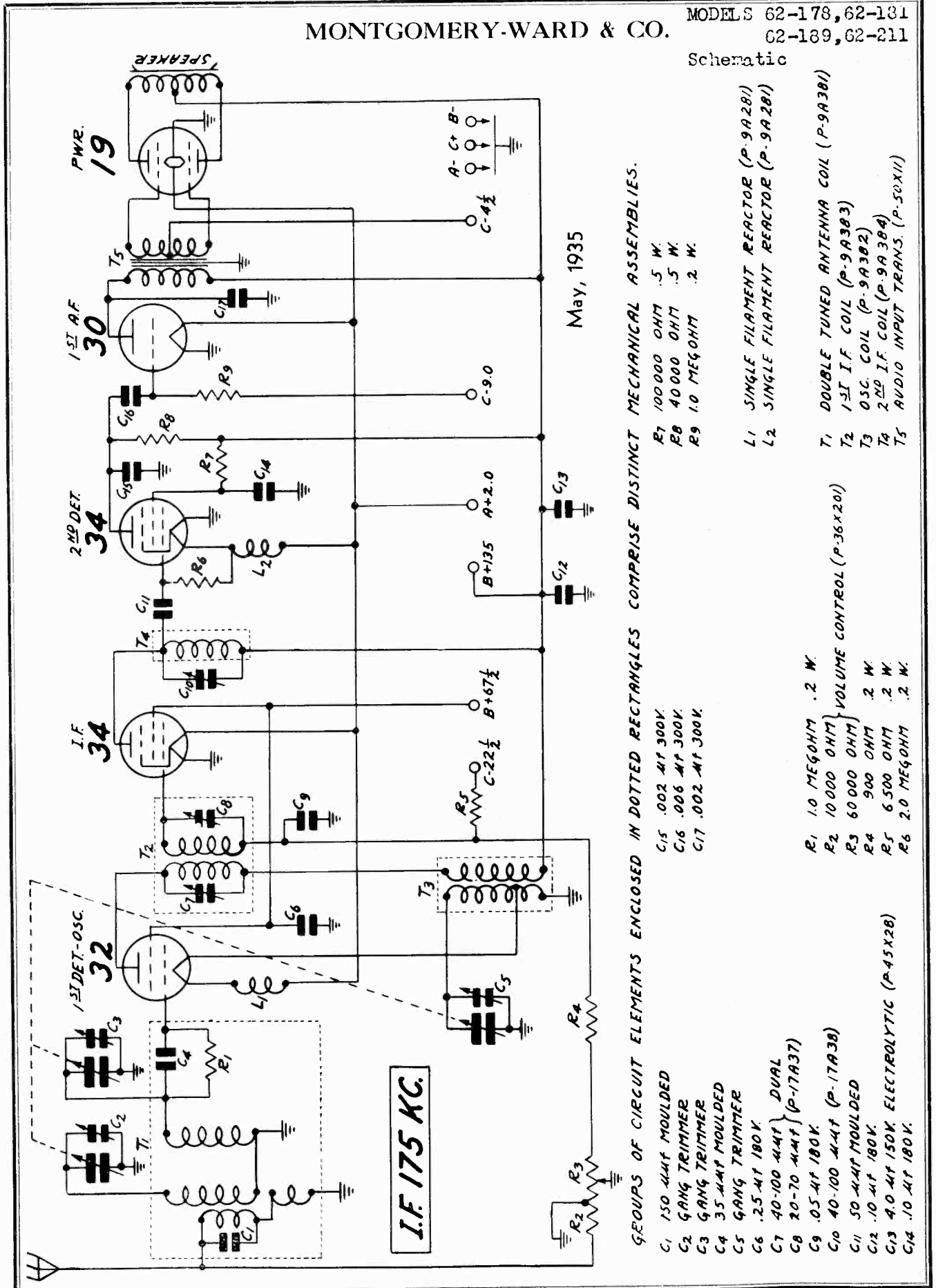
Set the signal generator for 1730 KC. Turn the rotor of the tuning condenser to the full open position.

Keep the hand switch in the standard wave position. Connect the antenna lead of the receiver through a 250 mmf. condenser to the output of the signal generator.

MONTGOMERY-WARD & CO.

MODEL S 62-178, 62-131  
62-189, 62-211

Schematic



GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES.

- C1 150 44kF MOULDED
- C2 GANG TRIMMER
- C3 GANG TRIMMER
- C4 35 44kF MOULDED
- C5 GANG TRIMMER
- C6 .25 41F 180V
- C8 40-100 44kF DUAL
- C9 .05 41F 180V
- C10 40-100 44kF (P-17A38)
- C11 50 44kF MOULDED
- C12 .10 41F 180V
- C13 4.0 41F 150V ELECTROLYTIC (P-45X28)
- C14 .10 41F 180V

- R7 100000 OHM .5 W.
- R8 40000 OHM .5 W.
- R9 1.0 MEGOHM .2 W.

- L1 SINGLE FILAMENT REACTOR (P-9A281)
- L2 DOUBLE TUNED ANTENNA COIL (P-9A381)

- R1 1.0 MEGOHM .2 W.
- R2 10000 OHM } VOLUME CONTROL (P-36X201)
- R3 60000 OHM }
- R4 900 OHM .2 W.
- R5 6500 OHM .2 W.
- R6 2.0 MEGOHM .2 W.

- T1 SINGLE FILAMENT REACTOR (P-9A281)
- T2 DOUBLE TUNED ANTENNA COIL (P-9A381)
- T3 OSC. COIL (P-9A382)
- T4 250 I.F. COIL (P-9A384)
- T5 AUDIO INPUT TRANS. (P-50X11)

I.F. 175 KC.

May, 1935

MODELS 62-178, 62-181  
62-189, 62-211  
Alignment, Data

MONTGOMERY-WARD & CO.

## Alignment Procedure and Dial 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 .1 MF condenser to the coil end of the grid leak resistor R1. There is a lead which runs from the center tuning condenser stator to a lug at the bottom of the R. F. coil assembly. This connection can be made at the lug on the coil to which this lead is connected.

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

Turn the volume control to the maximum position. Then adjust the three 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. 8.

As stated above, use a non-metallic screwdriver to make the adjustment.

### 1750 KC Adjustment

Set the signal generator for 1750 KC.

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

Connect the antenna lead of the receiver thru a 250 mmf. condenser to the output of the signal generator.

Keep the volume control at the maximum position.

Adjust the trimmer of the oscillator section of the three gang condenser until maximum output is obtained. The location of this trimmer is shown in Fig. 8.

### 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 1st detector and antenna trimmers for maximum output.

Do not change the setting of the oscillator trimmer.

## Circuit

A type 32 tube functions as the first detector-oscillator. Referring to Fig. 1, T2 is the 1st I.F. transformer while T3 is the oscillator assembly. 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. circuit is tuned.

One stage of I.F. amplification is employed using a 34 tube. The primary and secondary of the first I.F. transformer are tuned by small trimmer condensers. A second I.F. unit of the impedance coupled type is provided in which the inductance T4 is tuned by a trimmer condenser C10.

The volume control is of the variable antenna input and I.F. bias type. Referring to Fig. 1, it will be noted that one end of the volume control strip is connected to the antenna and the other end is connected to resistor R4. Also note that the volume control strip is tapped. Bias voltage for the 34 I.F. tube is obtained from a potentiometer consisting of resistors R5, R4 and R3, which resistors are connected across the 22½ volt "C" battery.

A 34 tube is used as the 2nd detector or demodulator. Demodulation takes place in the grid circuit of this tube.

## Batteries

**3 Volt "A" Battery**—The voltage regulator required with this type of battery as illustrated in Fig. 4 is not supplied with the receiver unless specified. This device consists of a rheostat which controls the voltage, a voltmeter for measuring its value as supplied to the receiver and a small push button switch for cutting the voltmeter in and out of the circuit. It has two prongs at the bottom which plug into the socket in the platform at the rear left corner of the chassis. The circuit diagram of the regulator is shown in Fig. 5.

The receiver is shipped from the factory with a jumper between the two socket connections and a fibre strip over the socket. This strip must be removed and the jumper taken out as illustrated in Figs. 6 and 7 before the regulator can be inserted as shown in Fig. 4. The jumper is in the "A+" line.

When a new 3 volt "A" battery is inserted, the adjusting knob must be turned to the left hand position and then turned up until the voltmeter indicates 1.9 to 2 volts. The push button must be held in until the adjustment is complete. Caution the user never to operate the receiver with the adjustment beyond 2 volts.

## Replacing Drive Cord

Remove chassis from cabinet.

Take off the pointer by removing the screw at the center of the dial.

Remove the dial by taking out the six rivets from the dial assembly.

Remove the on-off indicator dial by pulling it forward.

With the condenser plates in a completely open position, slip the new drive cord thru hole "A" (from the front) in the drive drum. See Fig. 9.

Pull the cord thru this hole far enough to tie a knot near the end. Make this knot large enough so that it will not pull back thru the hole.

Slip the opposite end of the drive cord thru hole "B" of the drive drum.

Now slip the piece of fine tubing (about ¼" long) over the drive cord and insert about half of this tubing into hole "B" as shown in the illustration. This is important to prevent the cord from being cut.

Bring the drive cord down to the drive shaft and wrap the cord in a clockwise direction about two and one-half times around this shaft, progressing toward the front.

Bring the cord up from the drive shaft and wrap it around the drive drum approximately one and one-half times in a clockwise direction, progressing toward the front until the cord is up to the turned-in portion of the flange "C". See Fig. 9.

Pull the cord tight and tie the end of the cord to the tension spring as shown in the illustration. The knot should be at the bend in the flange so that the spring will be under sufficient tension to prevent the drive cord from slipping.

Now, by applying a little tension on the spring, hook the other end of the spring into hole "D" on the opposite side of the drum. Hook the spring from the inside (in later models hole "D" is replaced by a hook on the inside of the drive drum).

Turn the drive shaft back and forth several times to take out the slack and see if the drive is operating properly. If the cord slips on the drive shaft, remove the spring from the drive drum and add an additional knot in the cord at the spring in order to put greater tension on the spring.

Replace the on-off indicator dial; care being taken that the indicator is so placed that it will properly show the on and off positions.

Re-assemble the pointer and dial to the drive assembly. If the rivets are broken use No. 2 by ¼" long round head machine screws and nuts.

MONTGOMERY-WARD & CO.

MODELS 62-178, 62-181
62-189, 62-211
Voltage, Socket, Trimmers
Resistance Test, Parts

D. C. Resistance of Windings
Following are the D. C. resistances of the various windings in the chassis.

Table with columns: Part No., Description, D. C. Resistance in Ohms. Includes items like Double Tuned Ant. Trans., Oscillator Coil, etc.

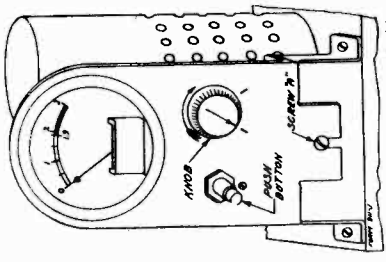


Fig. 4 - Voltage Regulator in Position

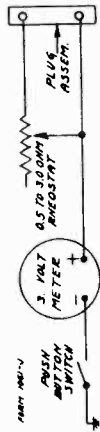


Fig. 5 - Schematic Diagram of Voltage Regulator

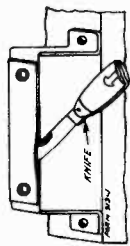


Fig. 6 - Prying off Fiber Cover

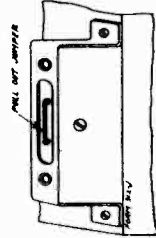


Fig. 7 - Removing Jumper Wires

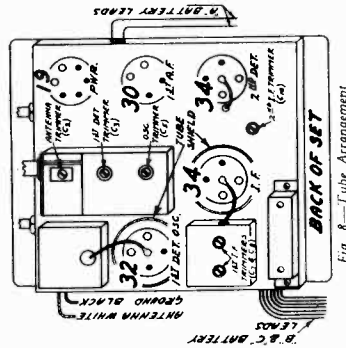


Fig. 8 - Tube Arrangement

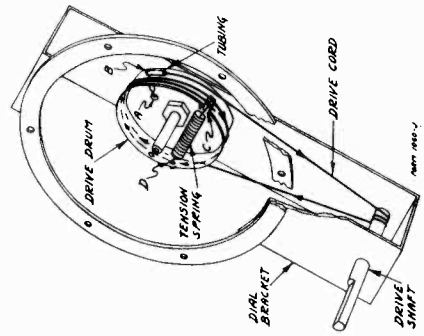


Fig. 9 - Replacing Drive Cord

"A" Battery and Regulator

This receiver is designed to operate with a 2 volt storage cell, but may be operated with a 3 volt dry "A" battery if used with a voltage regulator. The receiver may also be used with an air cell "A" battery provided a series resistor is used.

Air Cell "A" Battery.—If an air cell "A" battery is used, a series resistor will be required to reduce the voltage to the proper level of 2 volts for the tube filaments. Although the voltage regulator mentioned above can be used, the series resistor is cheaper and is satisfactory as the voltage of one of these batteries drops very little during the useful life of the battery

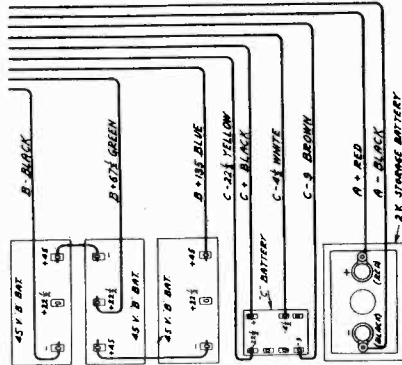


Fig. 2 - Complete Battery Wiring Connections

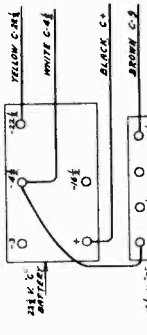


Fig. 3 - C Battery Connections Using Standard "C" Battery

Table with columns: Type of Tube, Function, Across Filament, Plate to Gnd., Screen to Gnd., Grid to Gnd., Normal Plate R. A. Includes rows for 32, 34, 34, 34, and 19 tubes.

(1) With 250,000 ohm meter. (2) Slightly to variation. (3) With 25,000 ohm meter. (4) Read at "C" battery.

Replacement Parts

Table with columns: New Part No., Old Part No., Description, List Price. Includes items like Double Tuned Antenna Transformer, 1st I.F. Transformer, etc.

RESISTORS

Table with columns: New Part No., Old Part No., Resistance, Watts, Type, List Price. Includes items like 1.0 Megohm, 10,000 Ohms, etc.

CONDENSERS

Table with columns: New Part No., Old Part No., Capacity, Voltage, Type, List Price. Includes items like 150 mfd., 25 mfd., etc.

MISCELLANEOUS

Table with columns: New Part No., Old Part No., Description, List Price. Includes items like 30 Tube Socket, 3 Volt Battery, etc.

DIAL ASSEMBLY

Table with columns: New Part No., Old Part No., Description, List Price. Includes items like Dial and Drive Assembly Complete, Drive and Dial Bracket, etc.



MODEL 62PC68  
Schematic, Voltage  
Alignment

MONTGOMERY-WARD & CO.

SERVICE NOTES ON MODEL 62-PC-68  
9-TUBE AIRLINE RECEIVER

The 68 receiver uses the following tubes:—

- 1 No. 56 Oscillator.
- 1 No. 58 R. F.
- 1 No. 57 First Detector.
- 1 No. 58 Intermediate.
- 1 No. 55 Second Detector.
- 1 No. 46 First Audio.
- 2 No. 46 Push Pull in Second Audio.
- 1 No. 82 Rectifier.

The oscillatory and intermediate circuits of this receiver are of the conventional type. The Second Detector, incorporating No. 55 tube, will be found very interesting as it performs as a diode detector and automatic control and one stage of audio, which is equivalent to three tubes in the usual receiver. The audio channel uses the 46 to drive a pair of 46's in Class B. It will be found in voltage checks that the plate is near 400 volts, while the current drain will be in the order of 7 M.A., with no signal on the grids of the 46's in push pull, but when sufficient power is furnished by the driver, the power output may reach 15 watts with an instantaneous current drain of 200 M.A.

The noise control, or noise suppressor, is a 10,000 ohm variable resistor in the cathode circuit of the I.F. and R.F. tubes, working much the same as the volume control in the older types of sets.

CIRCUIT ALIGNMENT

The intermediate frequency is tuned at 175 K.C. and 2 I.F. transformers are used. The usual care must be used in adjusting these if good results are to be had. All adjustments of this receiver should be made with the volume control at maximum. The following procedure is recommended:—

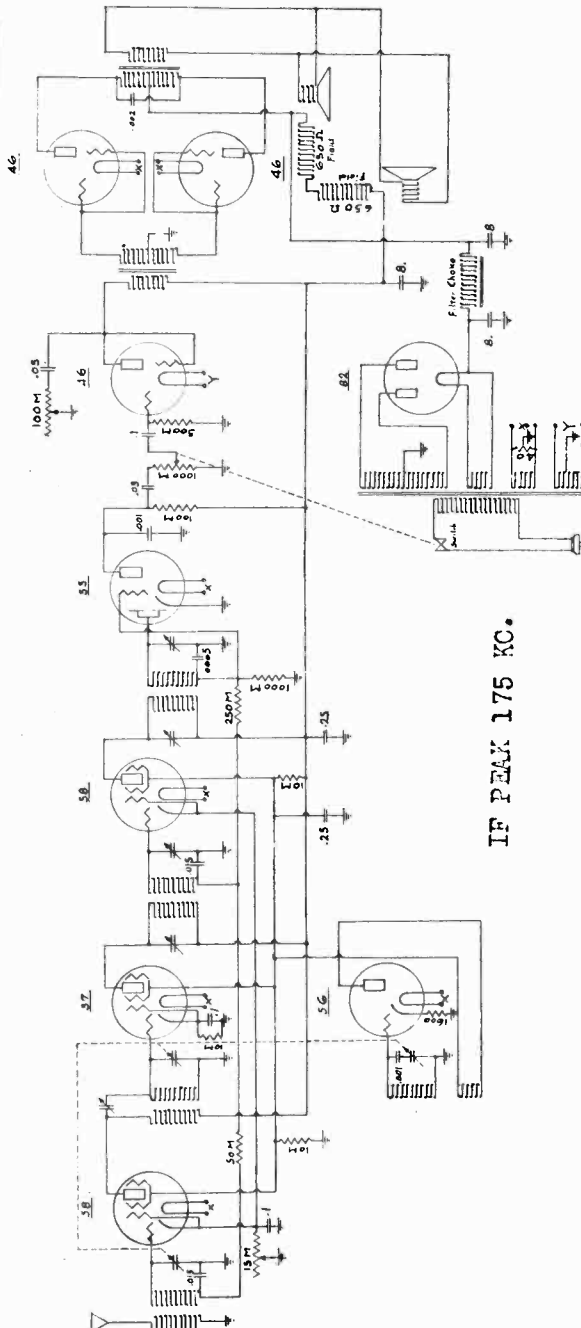
Use output meter connected in parallel with the plate circuit of the power pentode. Connect the oscillator with the grid of the first detector. Adjust each of the trimming condensers on the I.F. transformers located underneath the chassis, until maximum signal is shown on the output meter. Go over these trimmers several times, as the overall performance of this receiver depends on I.F. transformer adjustment. If a signal other than 175 K.C. is used for aligning the amplifier, the oscillator and pre-selector circuit will fail to track. Images will also appear at the low frequency end of the broadcast band. Next, set the dial at 100 degrees when the variable condenser plates are fully meshed. Then set the oscillator to give a 1400 K.C. signal. When the dial is turned to 1400 K.C., a signal should be heard. Adjust the trimming condenser on the variable condenser section nearest the front of the chassis, until the maximum signal is indicated by output meter. Now, adjust the trimmers on the other two sections for maximum signal. The same procedure should be followed with the oscillator set at 900, 700 and 600 K.C.

CAUTION

Do not attempt to bend oscillator plates. All balancing should be done with volume control wide open, and to test oscillator, adjust it to low signal level.

VOLTAGES OF 9-TUBE SET

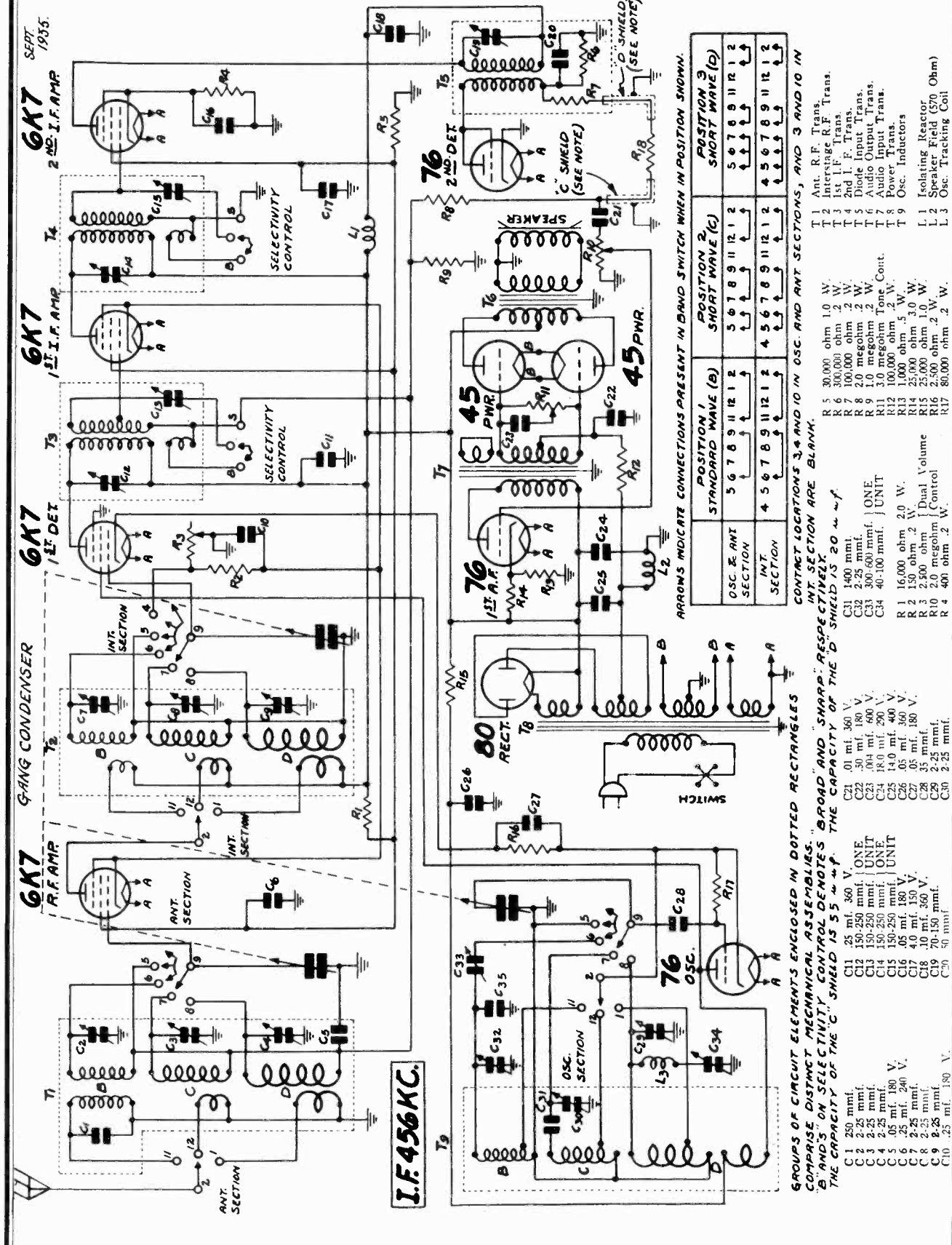
Ground to 2nd Audio Plates	340 Volts
Ground to High side of speaker Fields	340 Volts
Measured with Meter 1000 ohms per volt.	
Ground to Other side of speaker Fields	260 Volts
Drop Across Fields	80 Volts
Ground to 2nd Detector Plate	35 Volts
Ground to I.F. and 1st Detector Plates	260 Volts
Ground to Oscillator Plate	90 Volts
Ground to I.F. and 1st Detector Screens	90 Volts
Ground to 46 Driver	260 Volts
Measured with Meter 1000 ohms per volt.	
Drop through Filter Choke	17 Volts
Ground to I.F. Cathodes	3-5 Volts
Measured with Meter 1000 ohms per volt.	
A. C.	
246 Audio Filament	2.15 Volts
Heater Filament	2.10 Volts
82 Filament	2.20 Volts
Input	106. Volts



IF PEAK 175 KC.

MONTGOMERY-WARD & CO.

MODEL S 62-179, 62-194  
62-206, 62-216, 62-218  
Schematic



SEPT. 1935.  
6K7  
2 NO. I.F. AMP

6K7  
1ST I.F. AMP

6K7  
1ST DET.

6K7  
R.F. AMP

I.F. 456 KC.

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

	POSITION 1	POSITION 2	POSITION 3
OSC. E. ANT. SECTION	5 6 7 8 9 11 12 1 2	5 6 7 8 9 11 12 1 2	5 6 7 8 9 11 12 1 2
INT. SECTION	4 5 6 7 8 9 11 12 1 2	4 5 6 7 8 9 11 12 1 2	4 5 6 7 8 9 11 12 1 2
SHORT WAVE (C)	5 6 7 8 9 11 12 1 2	5 6 7 8 9 11 12 1 2	5 6 7 8 9 11 12 1 2
SHORT WAVE (D)	5 6 7 8 9 11 12 1 2	5 6 7 8 9 11 12 1 2	5 6 7 8 9 11 12 1 2

CONTACT LOCATIONS 3, 4 AND 10 IN OSC. AND ANT. SECTIONS, AND 3 AND 10 IN INT. SECTION ARE BLANK.

- GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES. "B" AND "C" ON SELECTIVITY CONTROL DENOTES THE CAPACITY OF THE "C" SHIELD IS 55  $\mu$  F. "B" AND "C" ON SELECTIVITY CONTROL DENOTES THE CAPACITY OF THE "D" SHIELD IS 20  $\mu$  F.
- C1 200 mmf.
  - C2 2-25 mmf.
  - C3 2-25 mmf.
  - C4 2-25 mmf.
  - C5 .05 mf. 180 V.
  - C6 .25 mf. 240 V.
  - C7 2-25 mmf.
  - C8 2-25 mmf.
  - C9 2-25 mmf.
  - C10 .25 mf. 180 V.
  - C11 25 mf. 360 V.
  - C12 150-250 mmf. | UNIT
  - C13 150-250 mmf. | UNIT
  - C14 150-250 mmf. | UNIT
  - C15 150-250 mmf. | UNIT
  - C16 .05 mf. 180 V.
  - C17 4.0 mf. 150 V.
  - C18 10 mf. 360 V.
  - C19 70-150 mmf.
  - C20 50 mmf.
  - C21 01 mf. 360 V.
  - C22 30 mf. 180 V.
  - C23 .04 mf. 600 V.
  - C24 18.0 mf. 290 V.
  - C25 14.0 mf. 400 V.
  - C26 .05 mf. 360 V.
  - C27 .05 mf. 180 V.
  - C28 35 mmf.
  - C29 2-25 mmf.
  - C30 2-25 mmf.
  - C31 1400 mmf.
  - C32 2-25 mmf.
  - C33 300-600 mmf. | ONE
  - C34 40-100 mmf. | UNIT
  - R1 16,000 ohm 2.0 W.
  - R2 15,000 ohm 3.0 W.
  - R3 2,500 ohm 1.0 W.
  - R10 2.0 megohm | Control
  - R4 400 ohm 2 W.
  - R5 30,000 ohm 1.0 W.
  - R6 300,000 ohm 2 W.
  - R7 300,000 ohm 2 W.
  - R8 2.0 megohm 2 W.
  - R9 1.0 megohm 2 W.
  - R11 3.0 megohm Tone Cont.
  - R12 100,000 ohm 2 W.
  - R13 1,000 ohm 5 W.
  - R14 25,000 ohm 3.0 W.
  - R15 25,000 ohm 1.0 W.
  - R16 2,500 ohm 2 W.
  - R17 80,000 ohm 2 W.
  - T1 Ant. R.F. Trans.
  - T2 Interchange R.F. Trans.
  - T3 1ST I.F. Trans.
  - T4 2ND I.F. Trans.
  - T5 Dual Input Trans.
  - T6 Audio Output Trans.
  - T7 Audio Input Trans.
  - T8 Power Trans.
  - T9 Osc. Inductors
  - L1 Isolating Reactor
  - L2 Speaker Field (570 Ohm)
  - L3 Osc. Tracking Coil

MODELS 62-179, 62-194  
62-206, 62-216, 62-218  
Alignment, Changes  
Data

MONTGOMERY-WARD & CO.

**Metal Tubes**

One type of the new metal tubes is used in this receiver, namely the 6K7. This replaces the type 6D6 tubes and is nearly identical in characteristics to the 6D6 tubes which it replaces. In the chassis shown the metal tube pin positions from a bottom socket view:

The shells of metal tubes get quite hot and users should be cautioned against touching them.

**Servicing R. F. Coil Assemblies**

The R. F. transformer and oscillator coil assemblies in this receiver are sold complete with can. This is due to the fact that the trimmers are soldered to the can, and cannot be easily disassembled. The lead colors and resistances of the various windings in each assembly are shown in Fig. 4.

If it is ever necessary to remove one of coil assemblies from the can, proceed as follows: First remove the nut from the screws at the top of the can. The outside lug on the trimmer condenser is inserted into a slot in the can can, and this lug is soldered into position. Apply a soldering iron to the can at the point of the soldered connection. Then with a screw driver lift up on the outside edge of the trimmer (edge soldered to can) until the trimmer is clear of the can. After the trimmers are all unsoldered, the coil can be taken out.

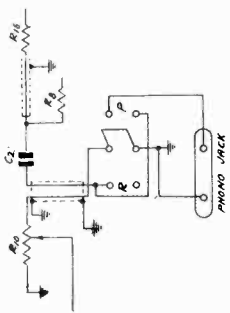


Fig. 7.—Phonograph Connections

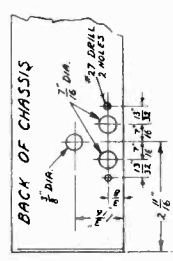


Fig. 8.—Details of Phono Drilling for Phono Assembly

**Tuning Frequency Range**

B Range . . . . . 535 to 1730 KC.  
C Range . . . . . 1715 to 5800 KC.  
D Range . . . . . 5750 to 18300 KC.

**Sensitivity**

B Range Average . . . . . 0.7 Microvolts Absolute  
C Range Average . . . . . 9.0 Microvolts Absolute  
D Range Average . . . . . 9.0 Microvolts Absolute

**Power Consumption** - 90 Watts (At 115 volts 60 cycles)

**Power Output** . . . . . 5 Watts Undistorted

**Selectivity** - 28 KC Band at 1000 times Signal (Sharp)

**Intermediate Frequency** . . . . . 456 KC.

**Speaker** . . . . . 10" Dynamic

Adjust the oscillator Range D trimmer (C29) until maximum output is obtained. See Fig. 3 for location of this trimmer.

**15,000 KC Adjustment**

Turn the signal generator tuning condenser carefully until maximum output is obtained. (C2) and antenna Range D trimmer (C5) 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. Then go back and repeat the procedure as given for the 18,300 KC adjustment. If it is found necessary to adjust the antenna Range D trimmer, the 15,000 KC adjustment must be repeated.

Do not make any further change in the setting of the oscillator Range D trimmer.

**6000 KC Adjustment**

Turn the tuning condenser rotor until maximum output is obtained. Then adjust the antenna Range D trimmer until the peak of greatest intensity is obtained. See Fig. 3 for location of this trimmer.

**Phonograph Connections**

Before reassembling the chassis into the cabinet observe the position of the shield sleeve provided, being sure to ground the shielding to the chassis base at the extreme ends. At the point where the shielding passes the electrolytic condensers cover the cable with insulating tape. Complete the connections as shown in Fig. 7.

Before reassembling the chassis into the cabinet observe the position of the shield sleeve provided, being sure to ground the shielding to the chassis base at the extreme ends. At the point where the shielding passes the electrolytic condensers cover the cable with insulating tape. Complete the connections as shown in Fig. 7.

A high impedance phonograph pickup of good quality should be used. If a low impedance pickup is used, a step-up transformer will be required for sufficient volume. The volume control and tone control of the set will regulate the phono volume and tone.

**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 115-220 Volt, 40 to 60 cycle as well as other power transformers with special power ratings are also available for this model.

**Changes in Early Models**

In the early models of this receiver the tone control resistor (R11) was connected in series through the antenna lead.

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—green dial color). Adjust the oscillator Range C trimmer (C19) 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 (C8) and antenna Range C trimmer (C5) to maximum.

**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—red dial color).

Phonograph connections can be made as shown in Fig. 7. The parts required to make this installation are shown in the parts list.

To mount the phono switch and phono jack, drill holes of a size and in the position shown in Fig. 8 at the left-hand side (from back) of the rear panel of the chassis.

The connections are made by opening the circuit at the volume control. Unsolder the condenser C21 from the lug on the volume control and reconnect it to the new terminal strip provided (see parts list). This terminal strip should be secured to the inside of the front panel of the chassis base at a point near the volume control and should be soldered in position. From the terminal lug on the above strip, and from the volume control lug from which the condenser C21 was removed, connect leads to the volume switch on the rear panel of the chassis as shown in Fig. 7. Before connecting these two leads permanently to the switch, twist them together and enclose.

**Selectivity Control**—Referring to the 1st and 2nd transformers (T1 and T2) in Fig. 2, it will be noted that there are three different windings shown in the illustration below the primaries.

When the selectivity control is in the sharp position, the secondary winding is open circuited and the loose coupling which exists between the primary and secondary of this transformer results in high selectivity.

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

**Dual Volume Control**—A dual manual volume control is employed. In one section (R10) voltage applied to the 76 tube audio tube is varied (R10) in the lower section the R, R, and L sections are varied (R3) to reduce the sensitivity of the receiver at low volume settings in order to cut down noise pickup between stations. The variable section R3 is shorted out through contact No. 4 of the interstage section of the band selector when in the 2nd short wave position.

A type 76 tube functions as a dual, second detector. AVC voltage is applied through isolating resistors to the control grid circuits of the R, F, and L sections. The audio voltage developed across volume control resistor R10 is applied through the motor winding of the AVC transformer to the AVC section of the AVC stage and the output stage which employs two type 45 tubes. A type 80 full wave rectifier tube is used in the power unit.

**Alignment and Calibration**

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 mfd. 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 A.V.C. 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 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 (C7) and antenna Range B trimmer (C3) to maximum.

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.

**Range C Alignment**

**5800 KC Adjustment**  
Connect the antenna lead of the receiver through

This model is a three band receiver with a tuning range in each band as shown in the frequency chart above. The three sections of the R. F. transformer and a three section triple throw switch.

Referring to the schematic circuit diagram, Fig. 1, T1 and T2 are the antenna and interstage R. F. transformer assemblies and T3 is the oscillator coil assembly. The standard wave, 1st and 2nd short wave coils in each assembly are indicated by the letters B, C and D respectively. The three sections of the band selector are designated in the schematic as the antenna, interstage and oscillator sections.

The band switch completes connections to the coils in use. It also short circuits the R. F. transformer secondary and oscillator coil of lower frequency not in use.

The antenna transformer with tuned secondary feeds into a type 6K7 R. F. amplifier tube. The output of this tube is fed through the interstage R. F. transformer with tuned secondary into another 6K7 tube which functions as the 1st detector.

A separate type 76 tube is employed in the control section of the receiver. The AVC section of the AVC stage is shorted out through contact No. 4 of the interstage section of the band selector when in the 2nd short wave position. 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 6K7 first detector tube. This results in the intermediate or beat frequency of 456 KC being present in the plate circuit of this tube.

Two stages of I. F. amplification are employed using 6K7 tubes. The primaries and secondaries of the first and second I. F. transformers and the primary of the 3rd I. F. transformer are tuned by small trimmer condensers.

Correct alignment is extremely important in connection with these receivers. The trimmers are all properly aligned at the factory with the instruments and resistance 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, 6000, 5800, 1000, 18,300, 15,000 and 6000 KC and an output inductance meter are required. It will be practically impossible to align the receiver if unsatisfactory apparatus is used. The selectivity control in the broad position and this control is then turned to the sharp position, the station may disappear. This is not an indication that the receiver is out of alignment.

**I. F. Adjustment**

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

**1500 KC Adjustment**  
Set the signal generator for a signal of 456 KC. Connect the output of the signal generator through a 0.1 mf. condenser to the grid of the 1st detector.

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

Turn the band selector to the Range B position (standard wave band—purple dial color).

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 A.V.C.

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. 5.

**Range B Alignment**

**1730 KC Adjustment**  
Set the signal generator for 1730 KC.

MONTGOMERY-WARD & CO.

MODELS 62-179, 62-194  
62-206, 62-216, 62-218  
Voltage, Trimmers  
Socket, Data

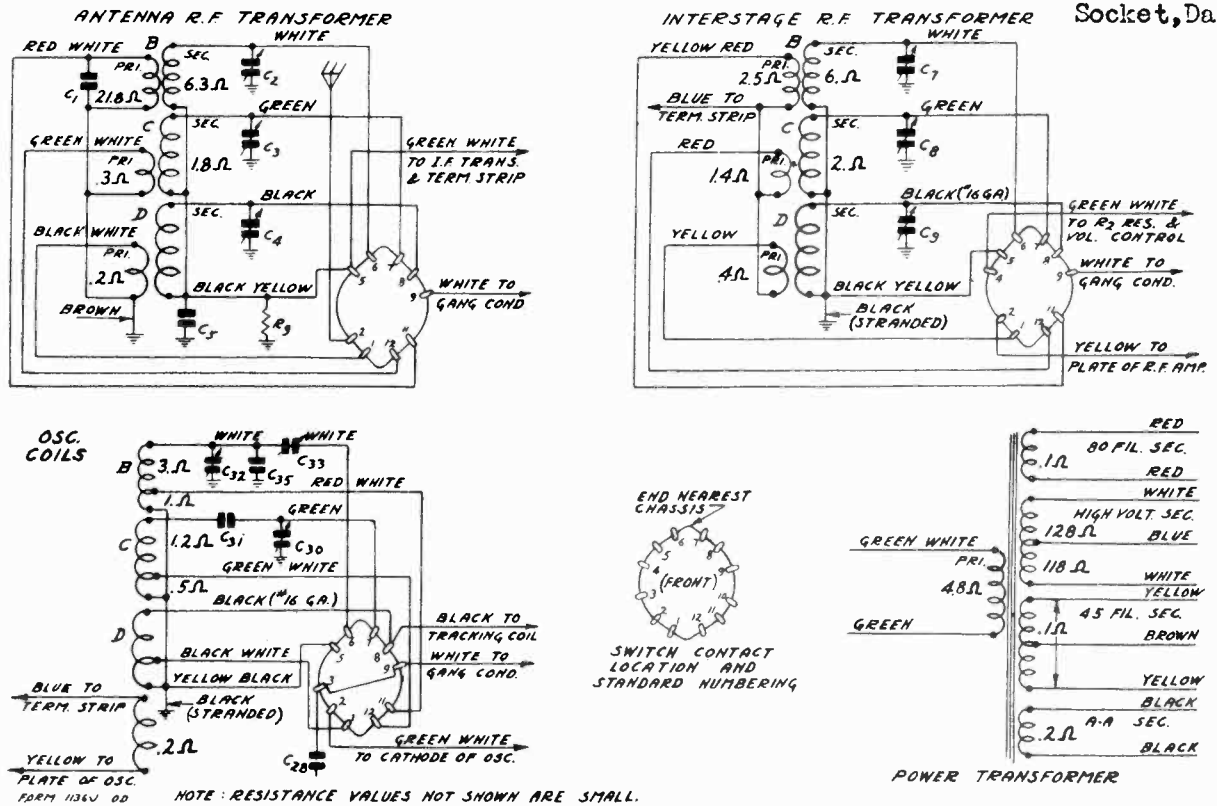


Fig. 4—Color Coding of Coil Wires and D. C. Resistance of Windings (Also see complete D. C. Resistance List in this Manual)

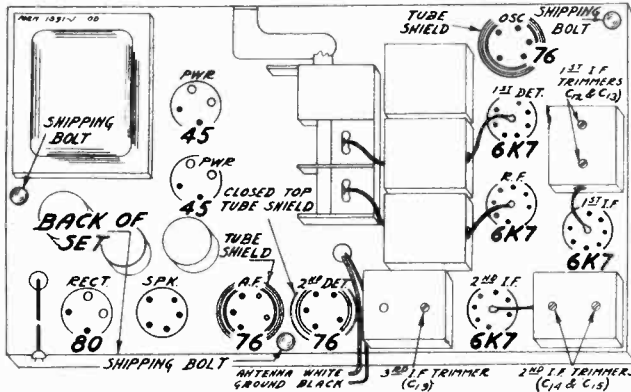


Fig. 5—Location of Tubes

**VOLTAGES AT SOCKETS**  
Line Voltage, 115 - Volume Control at Maximum  
Antenna Shorted to Ground

Type of Tube	Function	Heater or Filament	Plate to Ground	Screen to Ground	Cathode to Ground	Cathode M. A.
6K7 (6D6)	R. F.	6.1	265	120	3.7	9.0
6K7 (6D6)	1st Det.	6.1	265	110	9.5	3.8
76	Osc.	6.1	110			5.8
6K7 (6D6)	1st. I. F.	6.1	265	120	3.7	9.0
6K7 (6D6)	2nd I. F.	6.1	265	120	3.7	9.0
76	2nd Det.	6.1				
76	1st A. F.	6.1	265		14.	5.0
45	Power	2.5	265		50.(1)	22.
80	Rectifier	4.9				90. (total)

(1) As read with 500 Volt Scale. Grid to Ground.

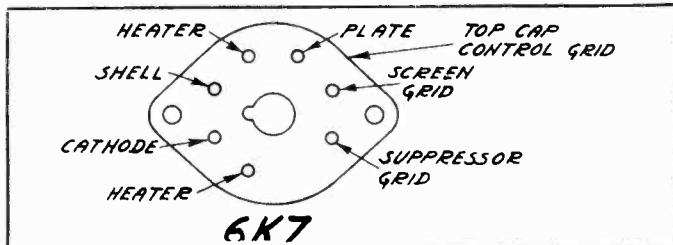


Fig. 6—Metal Tube—Bottom View of Socket

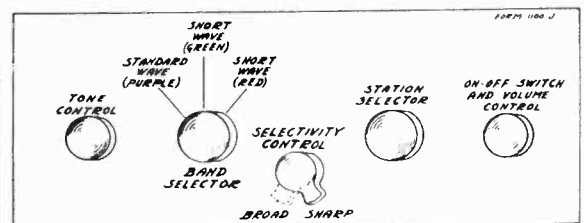


Fig. 7—Arrangement of Controls



MONTGOMERY-WARD & CO.

MODELS 62-185, 62-187  
62-190, 62-196

Tuning Frequency Range

- B Range - 535 to 1730 KC.
- C Range - 1715 to 5800 KC.
- D Range - 5750 to 18300 KC.

THE CAPACITY OF SHIELD "C" "D"  
AND "E" IS 50 MMF EACH.

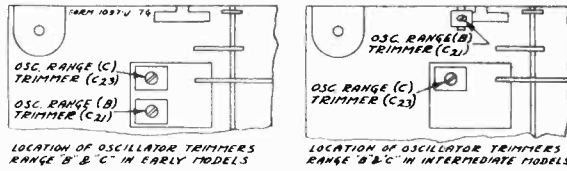


Fig. 4—Oscillator Trimmer Location in Early and Intermediate Models

Three Types Schematic Trimmers

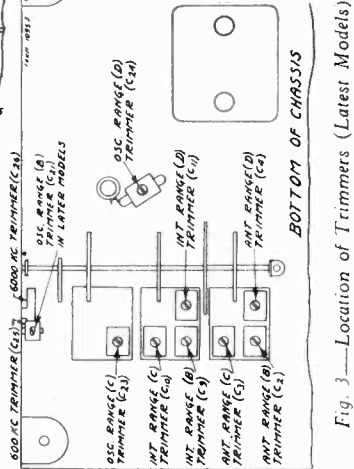
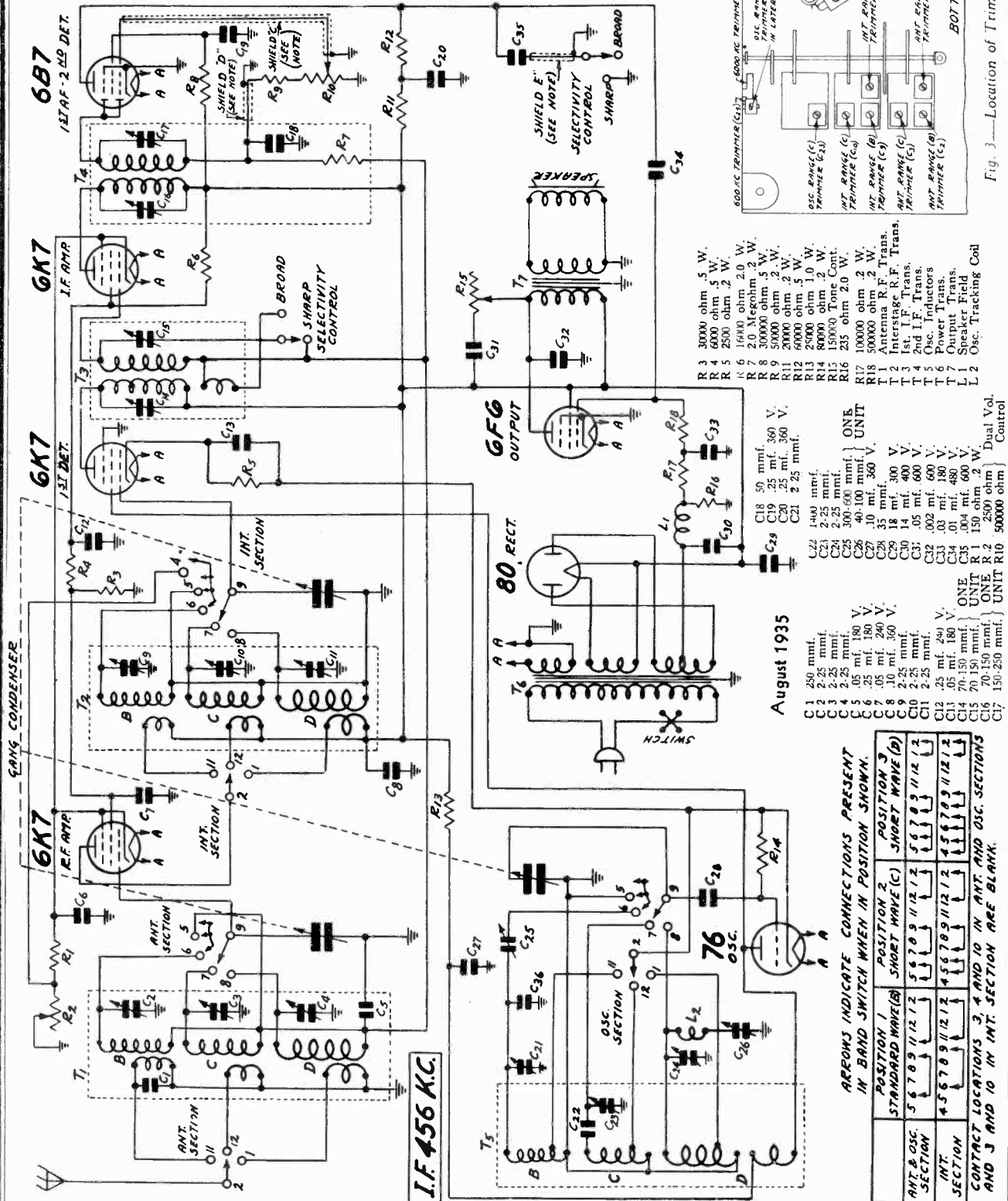


Fig. 3—Location of Trimmers (Latest Models)



- R 3 3000 ohm .5 W.
- R 4 6000 ohm .5 W.
- R 5 2500 ohm .2 W.
- R 6 16000 ohm .2 W.
- R 7 2.0 Megohm .2 W.
- R 8 30000 ohm .2 W.
- R 9 50000 ohm .2 W.
- R 10 20000 ohm .2 W.
- R 11 150000 Tone Cont.
- R 12 60000 ohm .5 W.
- R 13 80000 ohm .2 W.
- R 14 80000 ohm .2 W.
- R 15 150000 Tone Cont.
- R 16 235 ohm 2.0 W.
- R 17 100000 ohm .2 W.
- R 18 500000 ohm .2 W.
- T 1 Antenna R.F. Trans.
- T 2 Interstage R.F. Trans.
- T 3 1st. I.F. Trans.
- T 4 2nd I.F. Trans.
- T 5 Power Trans.
- T 6 Power Trans.
- T 7 Output Trans.
- L 1 Speaker Field
- L 2 Osc. Tracking Coil
- C 1 250 mmf.
- C 2 2-25 mmf.
- C 3 2-25 mmf.
- C 4 2-25 mmf.
- C 5 .05 mf. 180 V.
- C 6 .25 mf. 240 V.
- C 7 .10 mf. 360 V.
- C 8 .05 mf. 360 V.
- C 9 2-25 mmf.
- C 10 2-25 mmf.
- C 11 .25 mf. 240 V.
- C 12 .25 mf. 180 V.
- C 13 .25 mf. 180 V.
- C 14 .25 mf. 180 V.
- C 15 70-150 mmf.
- C 16 70-150 mmf.
- C 17 150-250 mmf.
- C 18 50 mmf.
- C 19 .25 mf. 360 V.
- C 20 .25 mf. 360 V.
- C 21 2-25 mmf.
- C 22 140 mmf.
- C 23 2-25 mmf.
- C 24 2-25 mmf.
- C 25 300-600 mmf. } ONE UNIT
- C 26 40-100 mmf. }
- C 27 .10 mf. 360 V.
- C 28 35 mmf.
- C 29 18 mf. 300 V.
- C 30 14 mf. 400 V.
- C 31 .05 mf. 600 V.
- C 32 .002 mf. 600 V.
- C 33 .01 mf. 480 V.
- C 34 .01 mf. 480 V.
- C 35 .01 mf. 480 V.
- C 36 70-150 mmf. } ONE UNIT
- C 37 150-250 mmf. }

August 1935

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

	POSITION 1	POSITION 2	POSITION 3
STANDARD WAVE (A)	5 6 7 8 9 11 12 1 2	5 6 7 8 9 11 12 1 2	5 6 7 8 9 11 12 1 2
SHORT WAVE (C)	5 6 7 8 9 11 12 1 2	5 6 7 8 9 11 12 1 2	5 6 7 8 9 11 12 1 2
SHORT WAVE (D)	5 6 7 8 9 11 12 1 2	5 6 7 8 9 11 12 1 2	5 6 7 8 9 11 12 1 2
ANT. & OSC. SECTION	5 6 7 8 9 11 12 1 2	5 6 7 8 9 11 12 1 2	5 6 7 8 9 11 12 1 2
INT. SECTION	5 6 7 8 9 11 12 1 2	5 6 7 8 9 11 12 1 2	5 6 7 8 9 11 12 1 2

CONTACT LOCATIONS 3, 4 AND 10 IN ANT. AND OSC. SECTIONS AND 3 AND 10 IN INT. SECTION ARE BLANK.

MODELS 62-185, 62-187  
62-190, 62-196

MONTGOMERY-WARD & CO.

Voltage, Socket, Color Code

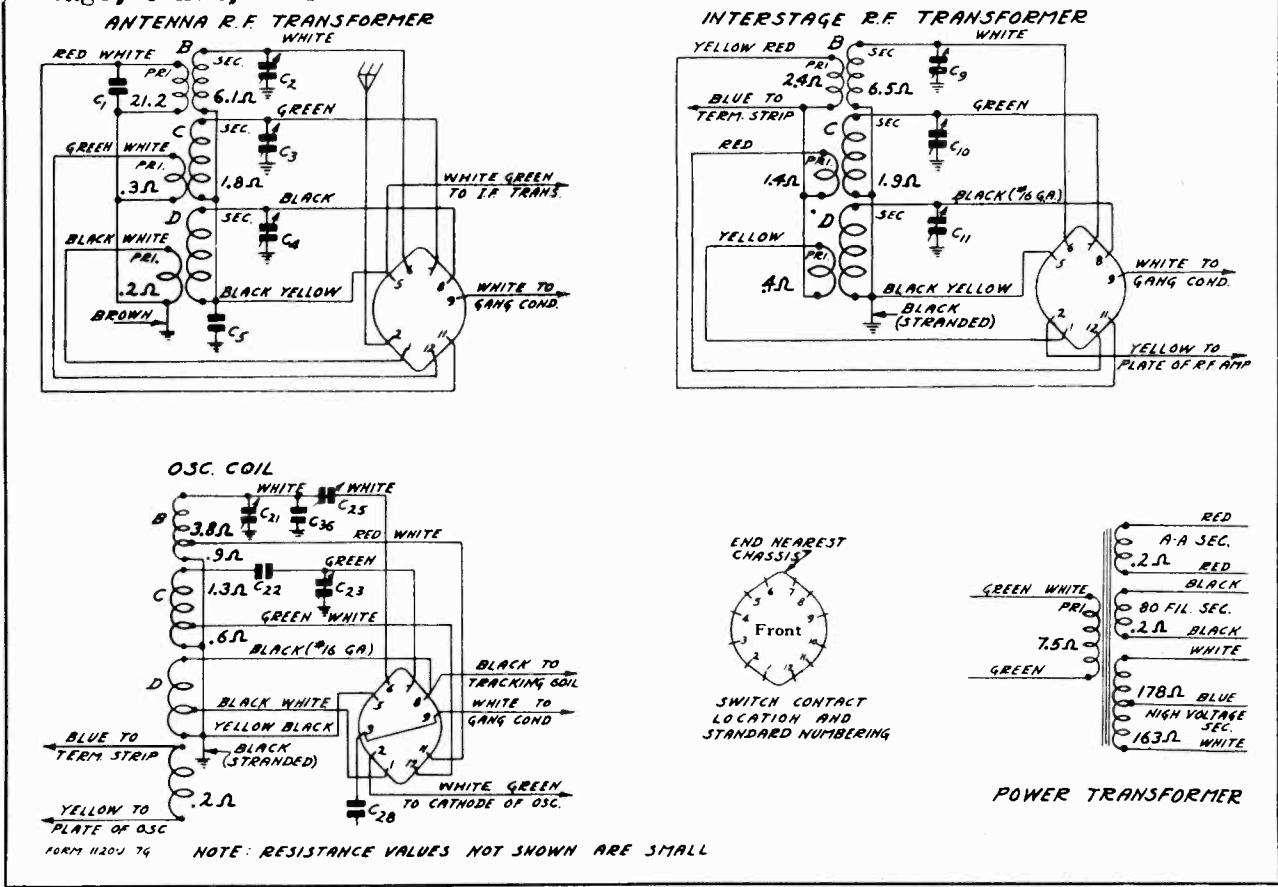


Fig. 5—Color Coding of Coil Wires and D. C. Resistance of Windings (Also see complete D. C. Resistance List in this Manual)

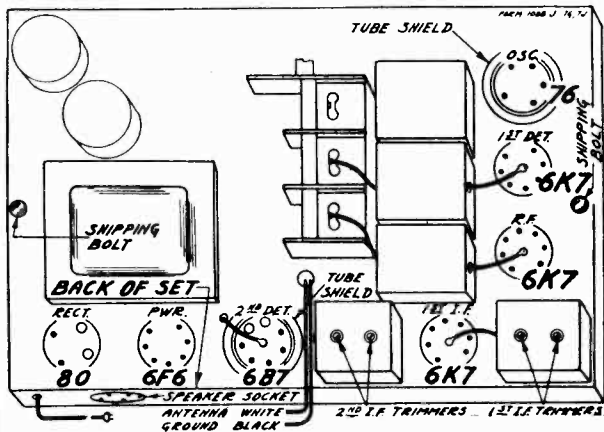


Fig. 6—Location of Tubes

**VOLTAGES AT SOCKETS**  
Line Voltage, 115 - Volume Control at Maximum  
Antenna Shorted to Ground

Type of Tube	Function	Heater or Filam't	Plate to Ground	Screen to Ground	Cathode to Ground	Plate M. A.
6K7 (6D6)	R. F.	6.1	230	95	3.0	6.4
6K7 (6D6)	1st Det.	6.1	230	100	9.0	3.2
76	Osc.	6.1	100			5.2
6K7 (6D6)	I. F.	6.1	230	120	3.0	9.
6B7	2nd Det.	6.1	55(1)	40		2.3
6F6 (42)	Power	6.1	215	230	17(2)	30.0
80	Rectifier	4.7				34. per plate

(1) As read with 500,000 ohm meter  
(2) As read across R16

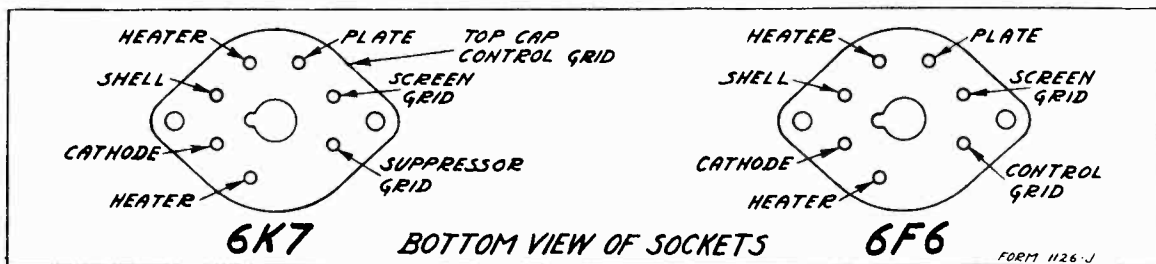


Fig. 7—Metal Tubes—Bottom View of Sockets

MONTGOMERY-WARD & CO.

MODELS 62-185, 62-187 62-190, 62-196

Three Types Alignment, Changes, Data

Phonograph Connections

Phonograph connections can be made as shown in Fig. 9. 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. 10.

For mounting the 12 mfd. 25 volt dry electrolytic condenser, two No. 27 drill holes should be drilled in the side of the chassis directly below the wet electrolytic condensers. These holes are 1 1/2" from the bottom, 1/8" and 3/4" from the front of chassis. The ground lug, which extends out from the side of the chassis should be bent back into the chassis wall.

Replace the single lug insulated terminal strip located on the rear panel, directly in back of the band selector switch) with (P-1A-39) double lug insulated terminal strip with ground lug. Be sure to solder back to this new terminal strip any leads that were connected to the other terminal strip.

The connections are made by opening the diode return circuit at the volume control. Unsolder the 50,000 ohm resistor R9 (covered with saturated sleeve) and from the shielded lead which runs from the I. F. transformer. Cut this shielded lead to length and connect to the open lug on the new terminal strip. Connect one side of the 50,000 ohm resistor R9 to the same lug and the other side to the phono switch—the terminal on the shield to the ground lug of the oscillator. Ground the shield to the ground lug of the chassis.

The extra shielded lead which is provided should be inserted into a piece of saturated sleeve.

Connect this shielded lead from the volume control to the phono switch as shown in Fig. 9. Be sure that the saturated sleeve covers the shielded lead where it passes over the volume control.

Remove the ground from the cathode terminal of the 6B7 2nd detector tube socket by bending the chassis ground lug away from this terminal. Be sure to solder back to this lug any leads that were connected to it (not including the cathode connection).

Connect one side of the 12 mfd. 25 volt electrolytic condenser to ground and the other side of this condenser to the cathode of the 6B7 2nd detector tube socket and to the phono switch as shown in Fig. 9. To this same terminal on the phono switch connect the 900 ohm resistor. The other side of the resistor is connected to ground. Complete the other connections as illustrated in Fig. 9.

A high impedance pickup should be used. If a low impedance pickup is used a step-up transformer will be required for sufficient volume. The volume control and tone control of the set will regulate the phono volume and tone.

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.

Metal Tubes

Two types of the new metal tubes are used in this receiver, namely, 6K7 and 6B6. These replace the type 6B6 and 42 glass tubes respectively. The metal tubes operate at the same voltages and are mechanically identical to the glass tubes. In Fig. 7 is shown the metal tube pin positions from a bottom socket view. The shells of the metal tubes get quite hot and users should be cautioned against touching them.

Servicing R. F. Coil Assemblies

The R. F. transformers and oscillator coil assemblies in this receiver are not complete with can. This is due to the fact that the trimmers are soldered to the can, and cannot be easily disassembled. The lead colors and resistances of the various windings in each assembly are shown in Fig. 5.

If it is ever necessary to remove one of coil assemblies from the can, proceed as follows: First remove the nuts from the screws at the top of the can. The outside lug on the trimmer condenser is inserted in a slot in the coil can, and this lug is soldered into position.

Apply a soldering iron to the can at the point of the soldered connection. Then with a screw driver lift up on the outside edge of the trimmer (edge soldered to can) until the trimmer is clear of the can. After the trimmers are all unsoldered, the coil can be taken out.

Changes in Early Models

In the early models of this receiver, the antenna transformer (T1) had two Range B Primary windings as shown in Fig. 8. The oscillator Range B and C trimmer locations varied in the early and intermediate models of this receiver as shown in Figs. 3 and 4.

Referring to Fig. 2, in the early models of this receiver, contact No. 4 in the interstage section of the band selector was not used. The purpose of this contact arrangement is to short out variable resistor R3 in the second short wave position. In these models the relative positions of resistors R1 and R2 were reversed. The common connection from the suppressor grid and cathode of the R. F. and I. F. amplifier tubes was connected to the control arm of variable resistor R1. The latter was connected to resistor R1 which was grounded at the other end. The by-pass condenser, C3, was connected to the control arm of the I. F. and suppressor grid connection. The type 6K7 and 6B6 metal tubes replace the types 6D6 and 42 glass tubes respectively which were used in the early models.

Range C Alignment

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—green dial color). Adjust the oscillator Range C trimmer (C23) until maximum output is obtained. See Figs. 3 and 4 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.

Range D Alignment

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—red dial color). Adjust the oscillator Range D trimmer (C24) 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 (C4) and antenna Range D trimmer (C3) 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.

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.

Switch Contact Location Numbering

A standard arrangement for switch contact location numbering has been adopted. This numbering is illustrated in Fig. 4. In contact locations not used, the number applying to that particular location is not employed.

Alignment and Calibration

Correct alignment is extremely important in connection with all wave receivers. 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 technician has the proper equipment.

A signal generator that will provide an accurately calibrated signal at 456, 1730, 1500, 600, 5800, 5000, 18,300, 15,000 and 6000 KC and an output in-decibel meter are required. It will be practically impossible to align the receiver if unsatisfactory apparatus is used. If a station is tuned in with the selectivity control in the broad position and this control is then turned to the sharp position, the station may disappear. This is not an indication that the receiver is out of alignment.

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 m. condenser to the grid of the I. F. 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 signal generator. Turn the selectivity switch to the sharp position open position. Turn the volume control to the maximum position. (2nd short wave band—purple dial color) and keep it in this position for all adjustments. Turn the volume control to the signal generator to prevent the leveling-off action of the A.V.C. 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. 6.

Range B Alignment

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 700 ohm condenser to the output of the signal generator. For this and all subsequent adjustments keep the volume control at the maximum position and adjust the signal from the signal generator to prevent A.V.C. action.

1500 KC Adjustment

Set the signal generator for 1500 KC. Turn the rotor of the tuning condenser carefully until maximum output is obtained. There is a lever arm in front of the large gear on the tuning condenser shaft by means of which the position of the station pointer may be adjusted. Set scale by placing this lever at the 600 KC mark on the dial.

600 KC Adjustment

Adjust the interstage Range B trimmer (C9) and antenna Range B trimmer (C2) to maximum. 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.

Circuit

Referring to the schematic diagram, Fig. 2, T1 and T2 are the antenna and interstage R. F. transformer assemblies and T3 is the oscillator coil assembly. The standard wave, 1st and 2nd short wave coils in each assembly are indicated by the letters B, C and D, respectively. The three sections of the band switch are designated in the schematic as the antenna, interstage and oscillator sections.

The band switch completes connections to the coils in use. It also short circuits the R. F. transformer secondary and oscillator coil of lower frequency not in use. The antenna transformer with tuned secondary feeds into a type 6K7 R. F. amplifier tube. The output of this tube is fed through the interstage R. F. transformer with tuned secondary into another 6K7 tube which functions as the 1st detector.

A separate type 76 tube is employed in the oscillator circuit. Referring to the oscillator assembly T5, Fig. 2, B, C and D refer to the standard wave, 1st short wave and 2nd short wave oscillator coils respectively. 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 6K7 first detector tube. This results in the intermediate or beat frequency of 456 KC being 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.

Selectivity Control—Referring to the 1st I. F. transformer T3 in Fig. 2, it will be noted that there is a coupling winding shown in the illustration below the primary. Refer also to the by-pass arrangement in the pentode plate circuit of the 6B7. When the selectivity control is in the sharp position, the coupling winding is open circuited and the loose coupling which exists between the primary and secondary of this transformer results in high selectivity. High audio frequencies are by-passed to ground through condenser C35.

When the selectivity control is in the broad position, the coupling winding which is wound under the primary is connected in series with the secondary. This provides overcoupling which results in a greatly widened resonance curve. Passage of a wide range of audio frequencies is thus obtained. In order to allow passage of the higher audio frequencies in the broad position, the capacity of the by-pass condenser in ground is greatly reduced (C35) and the capacity of shield E in series).

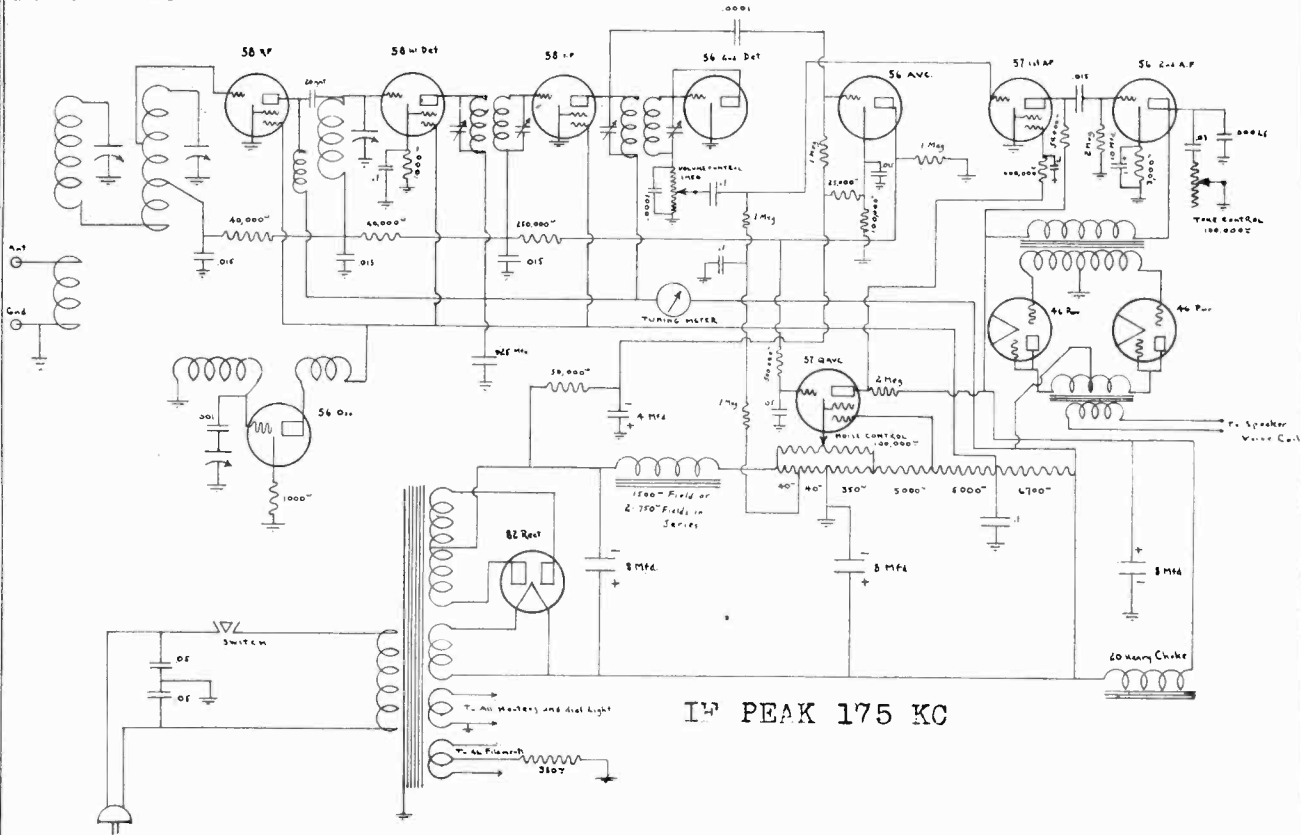
Dual Volume Control—A dual manual volume control is employed. In one section the audio voltage applied to the 1st audio section of the 6B7 tube is varied (R10). In the other section the R. F. and I. F. bias is varied (R2). The purpose of the latter section is to reduce the sensitivity of the receiver at low volume settings in order to cut down noise pick-up between stations. The variable section R3 is shorted out through contact No. 4 in the interstage section of the band selector when in the 2nd short wave position.

A type 6B7 duo diode pentode tube functions as the second detector and a one stage audio amplifier. The two diode plates are connected together. AVC voltage is applied through volume resistors to the control grid circuits of the R. F. 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 6B7 tube. Resistance coupling is used between the first audio stage and the output stage which employs a type 6B6 output pentode tube. A type 80 full wave rectifier tube is used in the power unit.



MODEL 62PC64  
Schematic, Voltage  
Parts List

MONTGOMERY-WARD & CO.



VOLTAGE READINGS

The following voltages should be observed at the points indicated:—

NOTE: In making these readings, a high resistance volt meter should be used, having resistance of at least 1000 ohms per volt.

- Across each field, 75 volts.
- Across entire voltage divider, 215.
- Across first 40 ohm section, 4.
- Across second 40 ohm section, 4.
- Across 350 ohm section, 3.
- Across first 5000 ohm section, 42.
- Across second 5000 ohm section, 42.
- Across 6700 ohm section, 120.

- Across 46 bias resistance, 17½.
- Across filter choke, 1.
- Across second audio bias resistor, 10.
- Across 50,000 ohm A.V.C. filter resistor, 45.
- Across 25,000 ohm A.V.C. Grid resistor, 25.
- Across 100,000 ohm A.V.C. plate resistor, 80.
- From ground to second AF plate, 200.
- From ground to first AF plate, 150.
- From ground to RF and I.F. plates, 200.
- From ground to RF screens, 85.
- From ground to oscillator cathode, 5.
- From ground to first detector cathode, 5.

Replacement Parts List

12 Tube Super-Heterodyne Model 62-PC-64

Supplier: Davison Radio and Television Corporation, Los Angeles, California

Part No.	DESCRIPTION	Unit Per Chassis	Unit Price	Selling Price	Part No.	DESCRIPTION	Unit Per Chassis	Unit Price	Selling Price
PC-641	Power Transformer	1	\$1.75	\$4.38	PC-6422	Resistor—50,000 ohm 1/3 W.	1	\$.06	\$.15
PC-642	Dual 8 Elec. Condenser	1	.75	1.88	PC-6423	Resistor—¼ meg ohm 1/3 W.	1	.06	.15
PC-643	Dual 8-4 Elec. Condenser	1	1.00	2.50	PC-6424	Resistor—½ meg ohm 1/3 W.	1	.06	.15
PC-644	Filter Choke No. 370	1	.21	.52	PC-6425	Resistor—1 meg ohm 1/3 W.	4	.06	.15
PC-645	Toggle Switch	1	.25	.63	PC-6426	Resistor—2 meg ohm 1/3 W.	2	.06	.15
PC-646	Volume Control 1 meg ohm.	1	.48	1.20	PC-6427	Resistor—400,000 ohm 1/3 W.	1	.06	.15
PC-647	Tone Control 100,000 ohm	1	.36	.90	PC-6428	Resistor—25,000 ohm 1/3 W.-5%	1	.10	.25
PC-648	Noise Control 100,000 ohm	1	.36	.90	PC-6429	Resistor—50,000 ohm 1/3 W.-5%	1	.10	.25
PC-649	Variable Condenser 4 Gang	1	2.00	5.00	PC-6430	Resistor—100,000 ohm 1/3 W.-5%	1	.10	.25
PC-6410	Intermediate Base No. 140	2	.30	.75	PC-6431	Resistor—350 Candohm Strip	1	.08	.20
PC-6411	Dial Assembly	1	2.00	5.00	PC-6432	Resistor—6 Section Candohm Strip	1	.36	.90
PC-6412	Escutcheon Plate	1	.75	1.88	PC-6433	Condenser .0001-10%	2	.08	.20
PC-6413	Noise Control Escutcheon	1	.25	.63	PC-6434	Condenser .00025-10%	1	.08	.20
PC-6414	Audio Transformer No. 0984	1	.87	2.18	PC-6435	Condenser .001-3%	1	.15	.37
PC-6415	Antenna Coil	1	.40	1.00	PC-6436	Condenser .015	5	.10	.75
PC-6416	Band Pass Coil	1	.40	1.00	PC-6437	Condenser .03	1	.08	.20
PC-6417	Translator Coil	1	.60	1.50	PC-6438	Condenser .05-200 V.	1	.08	.20
PC-6418	Litz Intermediate Coils	2	.40	1.00	PC-6439	Condenser .05-400 V.	2	.08	.20
PC-6419	Resistor—1000 ohm 1/3 W.	2	.06	.15	PC-6440	Condenser .1-200 V.	5	.08	.20
PC-6420	Resistor—3000 ohm 1/3 W.	1	.06	.15	PC-6441	Condenser .25-400 V.	1	.10	.25
PC-6421	Resistor—40,000 ohm 1/3 W.	1	.06	.15	PC-6442	Condenser 10 Mfd.-25 V.	1	.25	.63

MONTGOMERY-WARD & CO.

MODEL 62-199  
Schematic, Voltage  
Socket, Trimmers  
Parts List

**VOLTAGES AT SOCKETS**  
Input 6.3 Volts—Antenna Disconnected at Connector

Type of Tube	Function	Volts at Heater	Plate to Cathode	Screen to Cathode	Grid to Cathode	Normal Plate M.A.
6D6	R. F.	6.2	154	95	3.0	5.2
6C6	1st Det. & Osc.	6.2	160	97	0	3.0
6D6	I. F.	6.2	154	95	3.0	5.2
75	2nd Det. & 1st A. F.	6.2	110	—	1.	.25
41	Power	6.2	143	146	14.	13.0

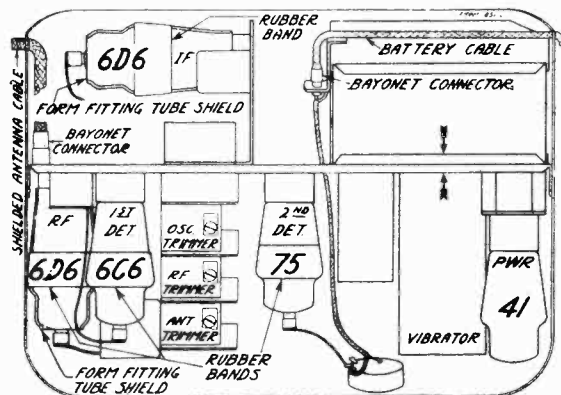


Fig. 2—Location of Tubes and Vibrator

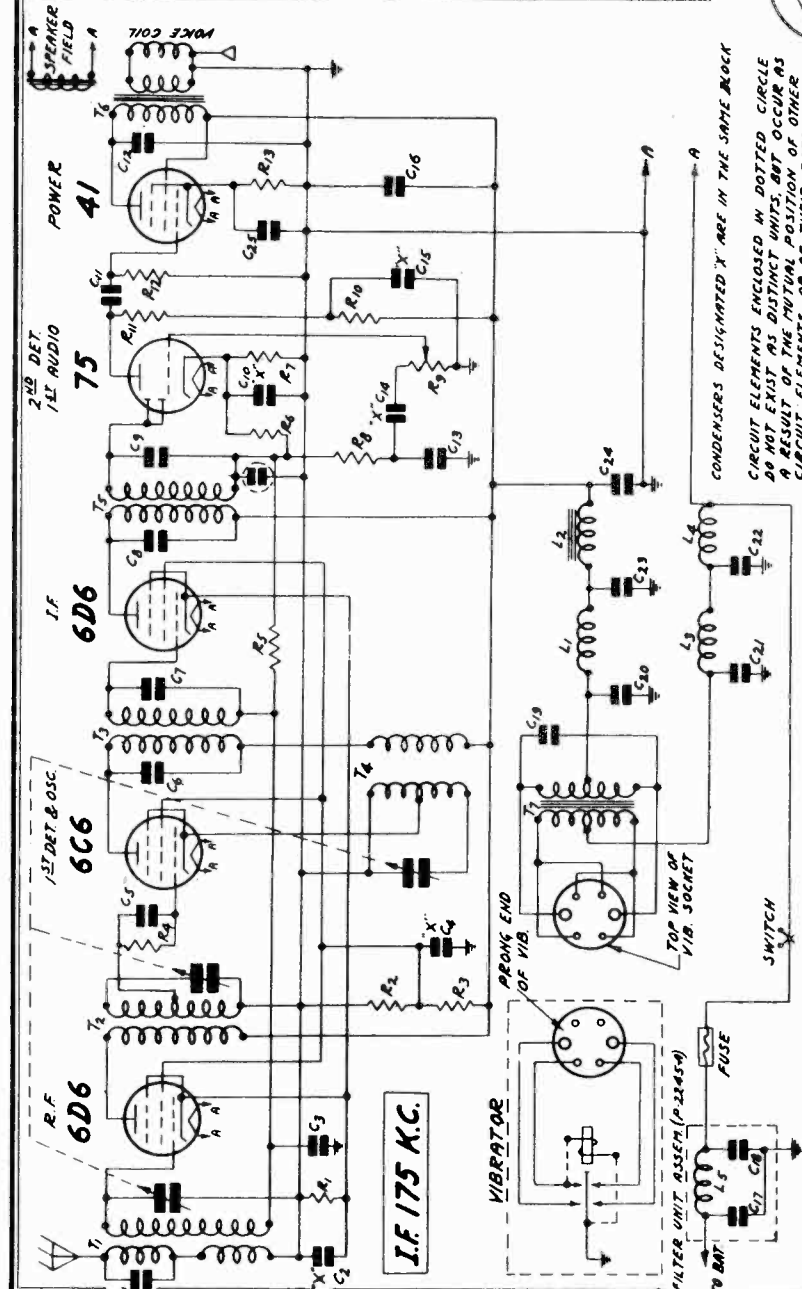


Fig. 1—Schematic Circuit Diagram

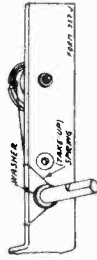
Part No.	Code	Capacity	Voltage	Type
P-81814	C1	250 mmf.	200V.	Part of Antenna Coil Assembly
P-8260D	C4	10 mf.	140V.	Bypass Block
	C10	25 mf.	140V.	
	C14	05 mf.	300V.	
P-81116	C3	05 mf.	200V.	Tubular
	C5	35 mf.	200V.	
P-81815	C6	70 mmf.	200V.	Part of Grid Leak Assembly
P-81806	C7	70 mmf.	200V.	Part of 1st I. F. & Osc. Coil Assembly
P-81806	C8	70 mmf.	200V.	Part of 2nd I. F. Coil Assembly
P-81115	C11	05 mf.	300V.	Tubular
P-81114	C12	06 mf.	600V.	Tubular
P-81814	C13	250 mmf.	300V.	Moulded
P-81132	C16	10 mf.	300V.	Tubular
P-81120	C17	01 mf.	120V.	[In Choke Condenser Unit]
	C18	01 mf.	120V.	
P-81120	C19	007 mf.	1600V.	Tubular
P-81121	C20	10 mf.	300V.	Tubular
P-81816	C21	50 mf.	140V.	Tubular
P-8200?	C22	002 mf.	250V.	Moulded
	C23	4.0 mf.	250V.	
P-82500	C24	2.0 mf.	250V.	Dry Electrolytic Block
	C25	4.0 mf.	25V.	

Part No.	Code	Resistance	Wattage	Type
P-894351ww	R1	350 Ohm	3	Flexilife Wire Wound
P-895253	R2	25,000 Ohm	5	Carbon
P-895403	R3	10,000 Ohm	5	Carbon
P-895105	R4	1 Megohm	2	Carbon
P-895105	R5	1 Megohm	2	Carbon
P-895504	R6	500,000 Ohm	2	Carbon
P-894752	R7	7,500 Ohm	2	Carbon
P-895104	R8	101,000 Ohm	2	Carbon
P-96017	R9	2 Megohm	2	Volume Control and Switch
P-895303	R10	50,000 Ohm	2	Carbon
P-895204	R11	200,000 Ohm	2	Carbon
P-895804	R12	500,000 Ohm	2	Carbon
P-894801ww	R13	800 Ohm	5	Flexilife Wire Wound

MODEL 62-199  
Alignment  
Service Notes

MONTGOMERY-WARD & CO.



Then bring the cord inside of the drum by way of the turned-in portion of the flange at "B". Tie the drive tension spring "D" to the loose end of the cord at the point "C" just above the top edge of the "B" as shown in the illustration. This should be done so that the lower hook of spring "D" at point "C" will be between 1/4" and 1/2" from the top edge of the turned-in portion of the flange. The hook and the drive turned over several times the tension in the cord will cause this distance to become about 1/4".

Now, by applying a tension on the drive spring "D", hook the other end of the spring into the hole "E" inside out. After the cord has been put on it may be necessary to adjust the receiver as explained in the article on condenser alignment.

All of the earlier models did not have drive shaft "take-up" springs. This spring will prevent any tendency toward change of setting should the receiver be subjected to any shocks or vibrations and fibre washers on the drive shaft proceed as follows:

Remove the station selector knob by pulling it off of the shaft.

Slip the small fibre washer over the shaft and clip the "take-up" spring to the drive bracket as shown in Fig. 5.

The chassis may now be replaced into the case in the reverse order of the manner in which it was removed.

Changes in Later Models

In the first models of this receiver a bypass condenser block (P-82600) containing condensers: C2, C1, C10, C14, C15 and C16 was used. Condenser C16 was removed in the later models and added as a separate tubular condenser (P-811321) while the other condensers remained in the block (P-82600-D).

A second condenser change from the earlier models was in the electrolytic filter block (P-82002). In this block section, C24 was changed from an 8 mfd., 250 volt to a 2 mfd., 250 volt condenser.

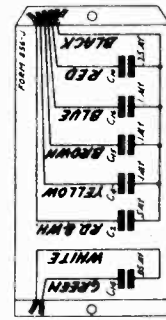


Fig. 6—Condenser Block Internal Wiring

Replacing Drive Cord

The drive cord in this receiver may be replaced as follows:

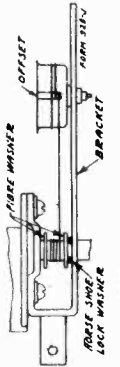


Fig. 3—Cord Drive—Top View

First remove the chassis from the case as explained on page 4. Some of the first models did not have two fibre "end" washers on the drive shaft to protect the drive cord as shown in Fig. 3. If this is the case, these washers should be put on as follows:

Separate and take off the brass shoe lock washer which holds the drive shaft in position. This may be done with a fine jewel long nose plier.

Now pull the drive shaft out just far enough to permit the two fibre washers to be slipped over the end of the shaft.

Then slip the shaft back into place and replace the brass shoe lock washer.

Knot one end of the new drive cord and with the condenser plates in a completely closed position, slip the drive cord through the small hole "A" in the drive drum — see Fig. 4. The knot will then be on the inside of the drum.

Now wrap the cord around the lower half of the drive drum as indicated and bring it up to the drive shaft.

Proceed by wrapping it in a clockwise direction (from front) around the drive shaft three and one-quarter turns

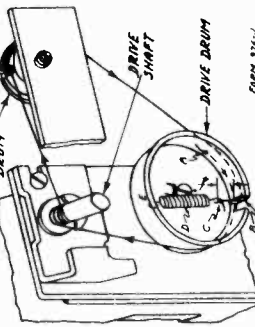


Fig. 4—Cord Drive Replacement

around the drive shaft three and one-quarter turns from the front of the chassis. Be sure the cord is held tight. Set the dial indicator drum so that the offset is at the top or a little to the right of the center — see Fig. 4.

Wrap the cord from the drive shaft once around the offset in the dial indicator drum and then approximately one and one-half turns around the drum itself in a clockwise direction, progressing toward the back. From the dial indicator drum draw the cord over the lower right hand quarter of drive drum as shown in Fig. 4.

When servicing this receiver, a new vibrator unit should be tried out in the same manner as a new set of tubes would be tried out.

One or more vibrator units should be kept on hand for replacement purposes.

Replacing Volume Control

To remove the volume control, and the switch, first pull the knob from the volume control shaft. Next loosen the hexagonal nut on the inside of the case with a flat end wrench. Then unscrew and remove the round knurled nut from the front.

The old volume control and switch connections may now be disconnected and the new unit put in its place and the leads resoldered.

Fasten the volume control to the case in the reverse order in which it was removed.

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 K. C. with the volume control about three-fourths on. Drop the antenna trimmer down until maximum output is obtained. CAUTION—Do not turn the trimmer adjusting screws for this adjustment.

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.

Part No.	Item	D.C. Resistance in Ohms
P-5347	Antenna Trans. Pri. in Series	17.50
P-5348	Antenna Interm. Trans. Pri.	2.31
	R. F. Interm. Trans. Sec.	2.31
	Center Tap to Primary	1.34
	1st I. F. Trans. Primary	3.24
	1st I. F. Trans. Secondary	100.00
	Oscillator Plate Coil (Total)	100.00
	2nd I. F. Trans. Pri.	9.00
	2nd I. F. Trans. Sec.	9.00
	Power Trans. Pri.	0.36
	Power Trans. Sec.	86.00
	Power Choke	390.00
	"A" Choke	3.50
	Choke Coil	6.00
	Output Trans. Sec. and Voice Coil in P.	0.80
	Speaker Field	6.00

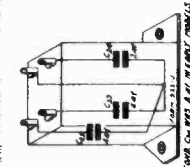


Fig. 7—Electrolytic Block Internal Wiring

Condenser Alignment

Misalignment or mistuning of condensers generally manifests itself as broad tuning and lack of selectivity in the reception of stations. The receivers will usually tune at the factory with the 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 an output meter are required for indicating the effect of adjustments.

First remove the cover of the box. Leave the antenna and battery cables connected to the chassis.

Disconnect the car antenna and connect antenna cable lead to the lead from the signal generator. Set the signal generator for 1650 K. C. Turn the rotor to the full open position. The antenna trimmer on the lead of the receiver is connected to the antenna section of the 3 gang condenser until maximum output is obtained. The oscillator section is the one with the cut plate rotor.

Now set the signal generator for 1400 K. C. and turn the trimmer until maximum output is obtained. Adjust the other two trimmers on the gang condenser for maximum output.

To calibrate the receiver, tune in a station of known frequency and compare the pointer on the scale with the scale on the receiver. The pointer is held in position by friction. Grasp the trimmer at the center and turn it until it points to the frequency of the station being received.

The use of a cut plate type of condenser eliminates the necessity of a 600 K. C. paddler and, therefore, no adjustment at this frequency is required.

Removing Chassis From Case

First unsolder the black, brown, yellow, and green speaker leads which connect to the terminal strip adjacent to the vibrator unit. Next, notice the small length that protrudes from the chassis and is soldered to the shield and the station selector control shaft. Unsolder this shielding at the lug.

Remove the 4 screws which hold the chassis in the case — 2 are in the side and 2 on the speaker mounting chassis case. (Do not remove the four speaker mounting screws.)

Remove the two control knobs by pulling them off of the shaft.

Next, remove the volume control. To do this first loosen the hexagonal nut on the inside of the case with a flat end wrench. Then unscrew and remove the round knurled nut from the front.

The chassis may then be taken out.

Replacing Vibrator Unit

The vibrator unit is plugged in in the same manner as a tube. This unit may, in case of failure, be readily replaced. CAUTION—Polarity, as explained in the label on the unit and in the label on the metal box in the chassis, must be observed when plugging in vibrator unit.

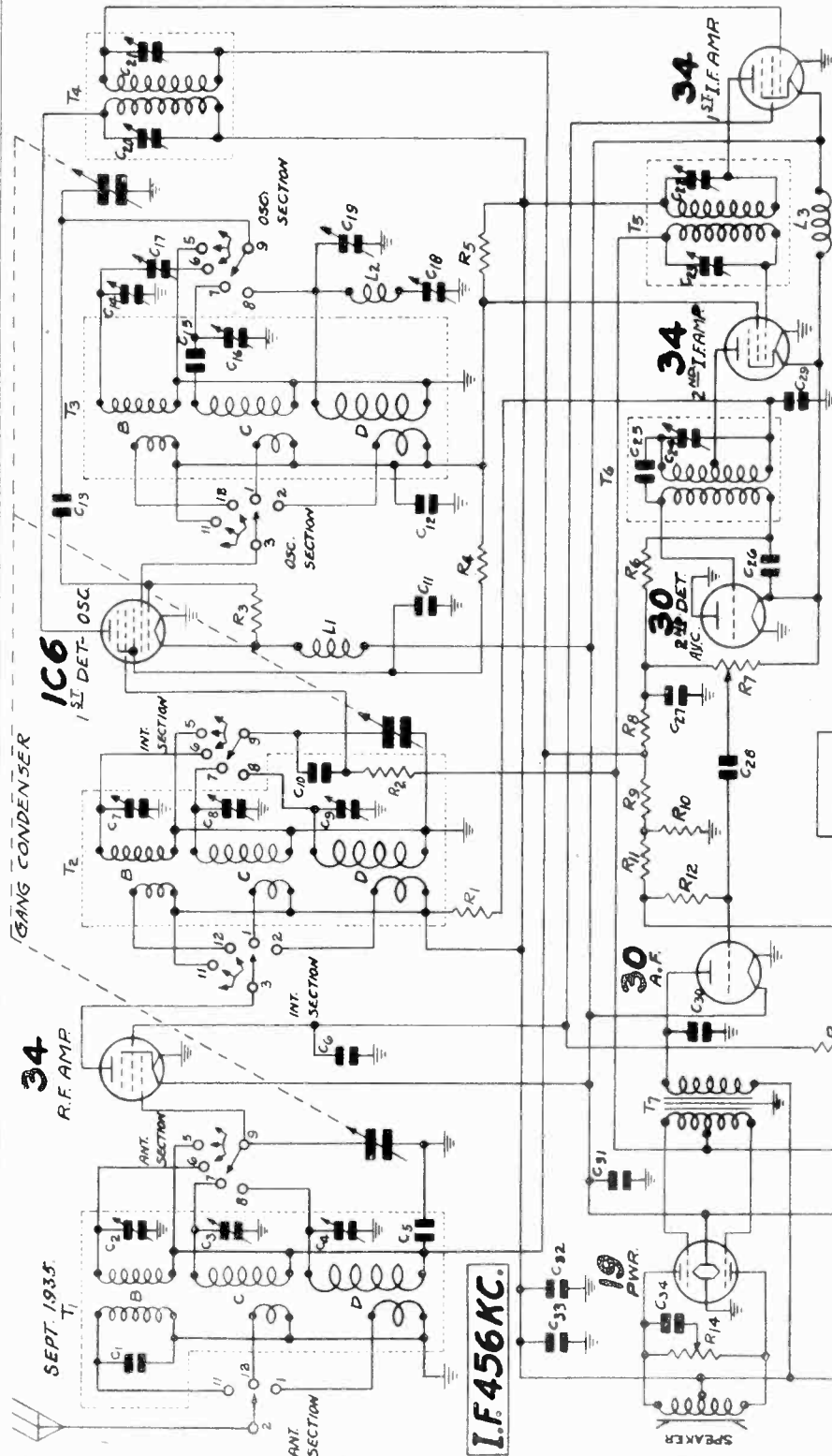
In replacing the vibrator unit be sure to replace the corrugated cardboard pad, which prevents the unit from working its way out of the socket.

MONTGOMERY-WARD & CO.

Tuning Frequency Range  
 B Range ..... 535 to 1730 KC.  
 C Range ..... 1680 to 4800 KC.  
 D Range ..... 5650 to 16000 KC.

MODELS 62-203, 62-205  
 62-208, 62-212, 62-217  
 62-219  
 Schematic, Trimmers

- |                    |                     |                      |          |                                   |                               |
|--------------------|---------------------|----------------------|----------|-----------------------------------|-------------------------------|
| C 1 250 mmf.       | C 11 .05 mf. 180 V. | C 22 70-150 mmf.     | ONE      | C 33 20.0 mf. 150 V. Electrolytic | R 8 3.0 Megohm .2 W.          |
| C 2 2-25 mmf.      | C 12 .25 mf. 180 V. | C 23 70-150 mmf.     | ASSEMBLY | C 34 .05 mf. 240 V.               | R 9 1.0 Megohm .2 W.          |
| C 3 2-25 mmf.      | C 13 35 mmf.        | C 24 40-100 mmf.     |          |                                   | R 10 2,000 Ohm .2 W.          |
| C 4 2-25 mmf.      | C 14 2-25 mmf.      | C 25 50 mmf.         |          |                                   | R 11 7,000 Ohm .2 W.          |
| C 5 .05 mf. 180 V. | C 15 1400 mmf.      | C 26 100 mmf.        |          |                                   | R 12 3.0 Megohm .2 W.         |
| C 6 .25 mf. 180 V. | C 16 2-25 mmf.      | C 27 50 mmf.         |          |                                   | R 13 30,000 Ohm .2 W.         |
| C 7 2-25 mmf.      | C 17 300-600 mmf.   | C 28 .002 mf. 600 V. | ONE      |                                   | R 14 150,000 Ohm Tone Control |
| C 8 2-25 mmf.      | C 18 40-100 mmf.    | C 29 .05 mf. 180 V.  | ASSEMBLY |                                   |                               |
| C 9 2-25 mmf.      | C 19 2-25 mmf.      | C 30 250 mmf.        |          |                                   |                               |
| C 10 35 mmf.       | C 20 70-150 mmf.    | C 31 .50 mf. 180 V.  | ONE      |                                   |                               |
|                    | C 21 70-150 mmf.    | C 32 .25 mf. 180 V.  | ASSEMBLY |                                   |                               |



- T 1 Antenna R.F. Trans.  
 T 2 Interstage R.F. Trans.  
 T 3 Osc. Inductors  
 T 4 1st. I.F. Trans.  
 T 5 2nd. I.F. Trans.  
 T 6 3rd. I.F. Trans.  
 T 7 Push-Pull Input Trans.

- L 1 Single Filament Reactor  
 L 2 Osc. Tracking Coil  
 L 3 Single Filament Reactor

Fig. 2—Schematic Circuit Diagram

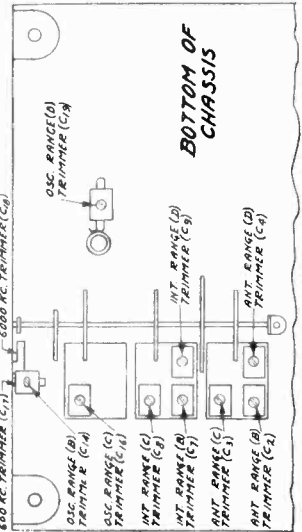


Fig. 9—Arrangement of Trimmers

GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES.

ARROWS INDICATE CONNECTIONS PRESENT IN BAND SWITCH WHEN IN POSITION SHOWN

	POSITION 1	POSITION 2	POSITION 3
	STANDARD WAVE (A)	SHORT WAVE (C)	SHORT WAVE (D)
OSC. & INT. SECTION	5 6 7 8 9	11 12 13	5 6 7 8 9
ANT. SECTION	5 6 7 8 9	11 12 13	5 6 7 8 9

Contact Locations 4 and 10 in Osc. & Int. Sections and 3, 4 and 10 in Ant. Section are Blank.

MODELS 62-203, 62-205  
62-208, 62-212, 62-217  
62-219

MONTGOMERY-WARD & CO.

Voltage, Socket, Data

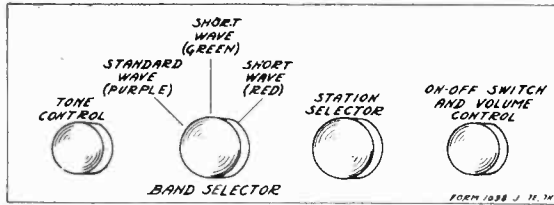


Fig. 1—Arrangement of Controls

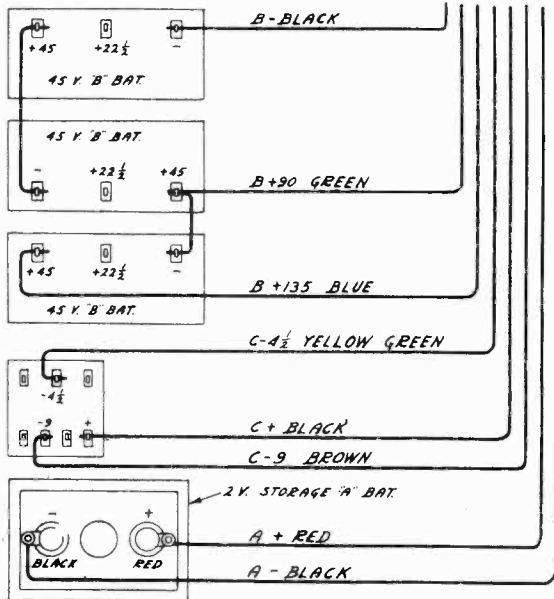


Fig. 3—Complete Battery Wiring Connections

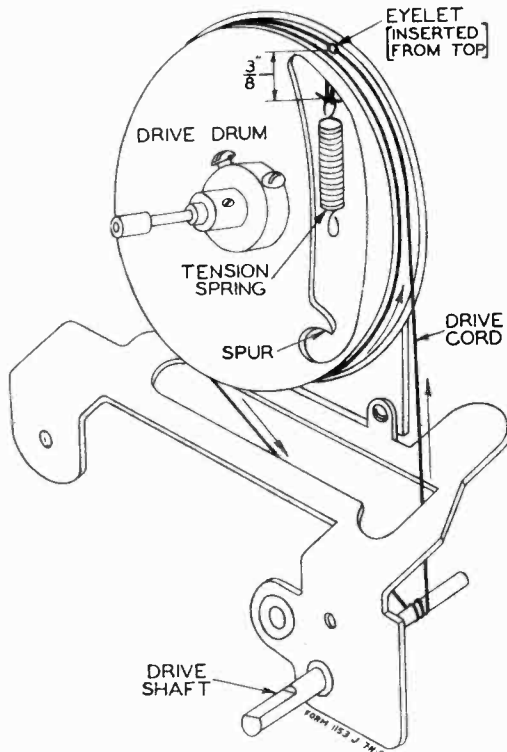


Fig. 12—Drive Cord Replacement

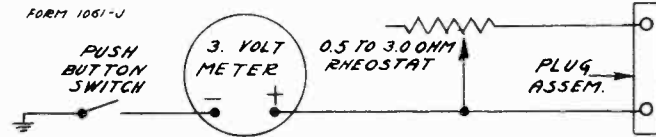


Fig. 6—Schematic Diagram of Voltage Regulator

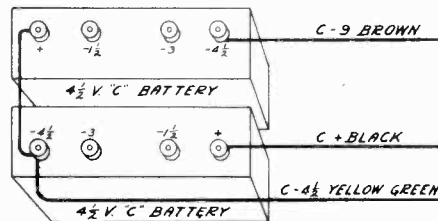


Fig. 4—"C" Battery Connections Using Standard "C" Batteries

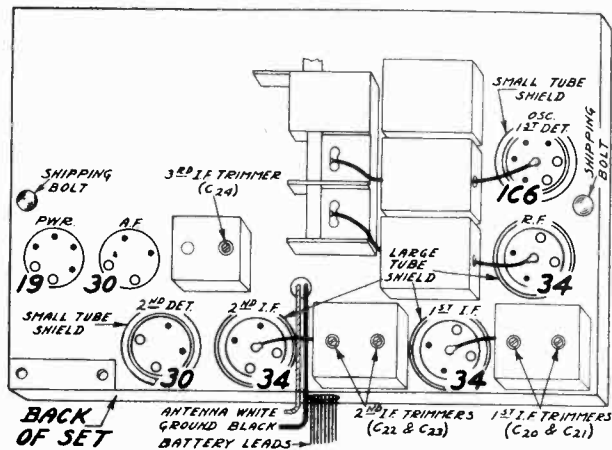


Fig. 10—Tube Arrangement

**VOLTAGES AT SOCKETS**  
Batteries up to Rated Voltages Ant. Shorted to Ground  
Voltages Read from Negative Fil. Terminal  
Volume Control at Maximum

Type of Tube	Function	Across Filam't	Plate to Ground	Screen to Ground	Control Grid to Ground	Normal Plate M. A.
34	R. F. Amp.	2.0	135	45		1.8
1C6	1st Detector Oscillator	2.0	135 75(1)	65		2.6 1.8(1)
34	1st I. F. Amp.	2.0	135	45		1.8
34	2nd I. F. Amp.	2.0	133	75	4.5	2.25
30	2nd Detector	2.0				
30	A. F. Amp.	2.0	135			3.0
19	Power Amp.	2.0	135		4.5	1.0 Per Plate

(1) Anode Grid

# MONTGOMERY-WARD & CO.

MODELS 62-203, 62-205  
62-208, 62-212, 62-217  
62-219  
Alignment, Drive Cord  
Changes, Data

## Circuit

Referring to the schematic circuit diagram, Fig. 2, T1 and T2 are the antenna and message R. F. transformer assemblies and T3 is the oscillator coil assembly. The standard wave, 1st and 2nd short wave coils in each assembly are indicated by the letters B, C and D respectively. The three sections of the band switch are designated in the schematic as the antenna, intermediate and oscillator sections.

The band switch completes connections to the coils in use. It also short-circuits the antenna R. F. transformer secondaries, the message R. F. transformer primaries and secondaries and the oscillator grid and plate windings of lower frequency, not in use.

The antenna transformer with tuned secondary feeds into a type 34 R. F. amplifier tube. The output of this tube is fed through the interstage R. F. transformer with tuned secondary into the control grid circuit of a 1C6 pentagrid converter tube which functions as the oscillator and 1st detector.

A type 30 tube functions as a double second detector and as the automatic volume control tube. AVC voltage is applied to the R. F. and 1st I. F. tubes.

The audio voltage developed across the volume control resistor R7 is applied to the control grid of the type 50 1st AF tube.

The output stage employs a type 19 tube. This tube is a Class "B" power amplifier and combines 2 triodes in one envelope. A magnetic reproducer is used.

## Batteries

### "A" Battery and Regulator

This receiver is designed to operate with a 2 volt storage cell, but may be operated with a "wet dry" "A" battery if used with a voltage regulator. The receiver may also be used with an air cell "A" battery provided a series resistor is used.

**3 Volt "A" Battery**—The voltage regulator required with this type of battery as illustrated in Fig. 5 consists of a resistor and a variable resistor. This device consists of a rheostat which controls the voltage, a voltmeter for measuring its value as supplied to the receiver and a small push button switch for cutting the voltmeter in and out of the circuit. It has two prongs at the bottom which plug into the socket on the platform at the rear left corner of the chassis. The circuit diagram of the regulator is shown in Fig. 6.

The receiver is shipped from the factory with a jumper between the two socket connections and a three strip over the socket. This strip must be removed and the jumper taken out as illustrated in Figs. 7 and 8 before the regulator can be inserted as shown in Fig. 5. The jumper is in the "A+" line.

When a new 3 volt "A" battery is inserted, the adjusting knob must be turned to the left hand position and then turned up until the voltmeter indicates 1.9 to 2 volts. The push button must be held in until the adjustment is completed. **Caution the user never to operate the receiver with the adjustment beyond 2 volts.**

**Air Cell "A" Battery**—If an air cell "A" battery is used, a series resistor will be required to reduce the voltage to the proper level of 2 volts for the tube filaments. Although the voltage regulator mentioned above can be used, the series resistor is cheaper and is satisfactory as the voltage of one of these batteries drops very little during the useful life of the battery.

## Alignment and Calibration

A signal generator that will provide an accurately calibrated signal of 455, 1710, 1500, 600, 4800, 4200, 16,000, 15,000 and 6000 KC and 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 0.1 mf. condenser to the switch end of condenser C-10—see Fig. 3. There is a lead which goes to the lug on the top of the center sector of the tuning condenser—see Fig. 10. The connection can be made at this lug.

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—purple dial color).

Turn the volume control to the maximum position.

Attenuate the signal from the signal generator to prevent the beating effect.

Turn the volume control trimmer (C1) 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. 10.

### Range B Alignment

#### 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 mf. 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 A.V.C. action.

Adjust the oscillator Range B trimmer (C14) until maximum output is obtained. The location of this trimmer is shown in Fig. 9.

#### 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 (C7) and antenna Range B trimmer (C1) to maximum.

#### 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. 9 for location of this trimmer.

Be sure to use a non-metallic screwdriver for this adjustment.

## Range C Alignment

### 4800 KC Adjustment

Set the signal generator for 4800 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—green dial color).

As mentioned above, keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent A.V.C. action.

Adjust the oscillator Range C trimmer (C16) until maximum output is obtained. See Fig. 9 for location of this trimmer.

### 4200 KC Adjustment

Set the signal generator for 4200 KC. Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the interstage Range C trimmer (C8) and antenna Range C trimmer (C3) to maximum.

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

## Range D Alignment

### 16,000 KC Adjustment

Set the signal generator for 16,000 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 (And short wave band—red dial color).

Adjust the oscillator Range D trimmer (C19) until maximum output is obtained. See Fig. 9 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 (C4) 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.

Then go back and repeat the procedure as given for the 16,000 KC adjustment. If it is found necessary to make any appreciable change in the setting of the oscillator Range D trimmer, the 15,000 KC adjustment must be repeated.

Do not make any further change in 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 (C18) until the peak of greatest intensity is obtained. See Fig. 9 for location of this trimmer.

Use a non-metallic screwdriver for this adjustment.

## Tubes

The tubes used in this receiver are of the 2 volt series. The 1C6 is a pentagrid converter tube while the 34's are R. F. Pentodes with the suppressor grid tied internally to the cathode. The 30 tubes are of general purpose triodes. The 19 tube consists of two class "B" output tubes in one envelope. All of these tubes are of the filament or directly heated type. 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 over or under these values will be injurious to the tubes or may affect operation of the receiver.

### Changes in Early Models

Condenser C35—7 mmf. (not shown in Fig. 2) was added to the oscillator coil assembly in parallel with oscillator Range B trimmer condenser C14. It is not, however, used in all cases but only when this capacity is required in this circuit.

## Replacing Drive Cord

Remove the chassis from the cabinet.

Take off the station pointer by removing the screw at the center of the dial.

Loosen the two set screws in the collar on the band selector shaft.

Loosen the dial assembly by taking out the two screws which secure the bottom of this assembly to the chassis and one screw at the top which secures this assembly to the bracket.

Pull the dial assembly forward until the collar is free of the band selector shaft; and lay the assembly face downward in front of the chassis.

Turn the drive drum until the opening in this drum is approximately vertical and with the hole at the top as shown in Fig. 12.

Remove the tension spring and the old drive cord, as shown in Fig. 12. Insert one end of the new drive cord from the outside through the hole in the eyelet in the drive drum.

Tie the end of the cord, which has been inserted through the hole, 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 half 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 it two and one half times around this shaft as shown in Fig. 12, progressing toward the back of chassis.

Wrap the cord on directly under the drive drum above.

Then bring this cord up to the drive drum until it is up to the hole in the drive drum as shown in the illustration.

Now insert the free end of the cord through the hole in the eyelet and tie it to the end of the tension spring. Tie the end of the spring when hanging free should be approximately  $\frac{1}{8}$ " from the flange of the drum as shown in Fig. 2. Cut off the surplus length of cord after it is snipped.

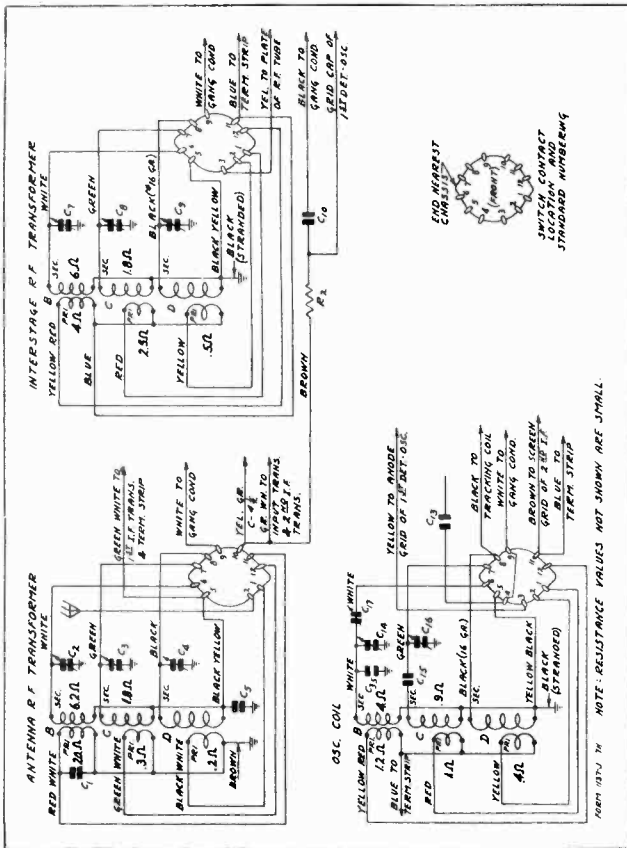
Then secure the other end of the tension spring over the spur on the drive drum.

Turn the drive shaft back and forth several times. Replace the drive assembly and pointer.

Replace the chassis in the cabinet.

MODELS 62-203, 62-205  
62-208, 62-212, 62-217  
62-219  
Resistance Test, Parts  
Color Coding, Data

MONTGOMERY-WARD & CO.



NOTE: RESISTANCE VALUES NOT SHOWN ARE JUMPER.

Fig. 11—Color Coding of Coil Wires and D. C. Resistance of Windings (Also See Complete D. C. Resistance List Below)

D. C. Resistance of Windings  
Refer to Fig. 11.

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

Part No.	Winding	D. C. Resistance in Ohms
P-9A394 1st	I. F. Transformer Primary Winding	11.4
	Secondary Winding	11.4
P-9A395 2nd	I. F. Transformer Primary Winding	11.4
	Secondary Winding	11.4
P-9A396 3rd	I. F. Transformer Primary Winding Tap to B+	8.0
	Tap to Variable Trimmer	8.2
	Secondary Winding	150.0
P-5A111	Audio Input Transformer Primary Winding	1085.0
	Secondary Winding Center Tap to Inside	380.0
	Center Tap to Outside	630.0
P-12A118	Magnetic Shaker Speaker Coil	255.6
	Center Tap to Inside	300.0
	Center Tap to Outside	300.0
P-9A281	Single Filament Reactor	1.2
P-9A281	High Frequency Oscillator Tracking Coil	0.7
P-9A281	Single Filament Reactor	1.3
P-9A281	Single Filament Reactor	1.2
	*Speakers with other part numbers may have slightly different values of D. C. Resistance.	
P-9A416	Antenna R. F. Transformer Range B Primary Winding	20.0
	Range C Primary Winding	0.1
	Range D Primary Winding	0.2
	Range B Secondary Winding	6.2
	Range C Secondary Winding	1.8
	Range D Secondary Winding	Small
P-9A392	Interstage R. F. Transformer Range B Primary Winding	4.0
	Range C Primary Winding	2.5
	Range D Primary Winding	0.5
	Range B Secondary Winding	6.0
	Range C Secondary Winding	1.8
	Range D Secondary Winding	Small
P-9A393	Oscillator Coils	
	Range B Plate Coil	1.2
	Range C Plate Coil	1.1
	Range B Grid Coil	0.4
	Range C Grid Coil	0.4
	Range D Grid Coil	0.9
	Range D Grid Coil	Small

Series 7H—Replacement Parts

MISCELLANEOUS

New Part No.	Description	List Price
4A79	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A80	Two Lug Terminal Strip (One lug inlabeled)	10
4A81	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A82	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A83	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A84	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A85	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A86	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A87	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A88	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A89	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A90	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A91	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A92	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A93	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A94	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A95	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A96	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A97	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A98	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A99	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A100	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A101	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A102	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A103	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A104	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A105	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A106	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A107	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A108	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A109	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A110	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A111	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A112	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A113	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A114	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A115	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A116	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A117	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A118	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A119	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A120	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A121	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A122	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A123	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A124	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A125	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A126	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A127	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A128	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A129	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A130	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A131	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A132	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A133	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A134	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A135	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A136	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A137	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A138	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A139	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A140	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A141	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A142	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A143	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A144	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A145	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A146	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A147	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A148	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A149	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A150	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A151	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A152	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A153	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A154	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A155	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A156	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A157	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A158	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A159	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A160	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A161	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A162	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A163	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A164	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A165	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A166	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A167	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A168	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A169	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A170	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A171	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A172	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A173	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A174	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A175	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A176	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A177	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A178	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A179	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A180	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A181	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A182	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A183	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A184	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A185	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A186	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A187	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A188	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A189	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A190	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A191	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A192	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A193	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A194	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A195	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A196	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A197	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A198	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A199	Two Lug Terminal Strip (Both lugs inlabeled)	10
4A200	Two Lug Terminal Strip (Both lugs inlabeled)	10

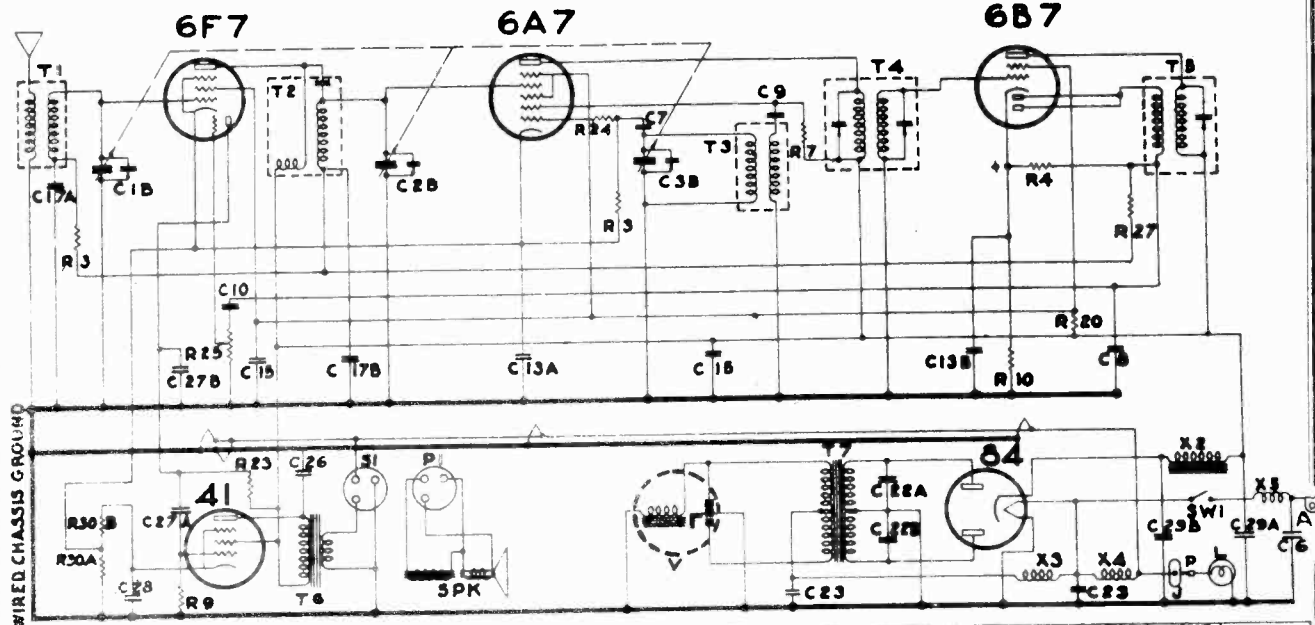
VOLTAGE REGULATOR

New Part No.	Description	List Price
4A201	1000 Ohm	0.2
4A202	5000 Ohm	0.2
4A203	10000 Ohm	0.2
4A204	20000 Ohm	0.2
4A205	30000 Ohm	0.2
4A206	40000 Ohm	0.2
4A207	50000 Ohm	0.2
4A208	60000 Ohm	0.2
4A209	70000 Ohm	0.2
4A210	80000 Ohm	0.2
4A211	90000 Ohm	0.2
4A212	100000 Ohm	0.2
4A213	150000 Ohm	0.2
4A214	200000 Ohm	0.2
4A215	300000 Ohm	0.2
4A216	400000 Ohm	0.2
4A217	500000 Ohm	0.2
4A218	600000 Ohm	0.2
4A219	700000 Ohm	0.2
4A220	800000 Ohm	0.2
4A221	900000 Ohm	0.2
4A222	1000000 Ohm	0.2
4A223	1500000 Ohm	0.2
4A224	2000000 Ohm	0.2
4A225	3000000 Ohm	0.2
4A226	4000000 Ohm	0.2
4A227	5000000 Ohm	0.2
4A228	6000000 Ohm	0.2
4A229	7000000 Ohm	0.2
4A230	8000000 Ohm	0.2
4A231	9000000 Ohm	0.2
4A232	10000000 Ohm	0.2
4A233	15000000 Ohm	0.2
4A234	20000000 Ohm	0.2
4A235	30000000 Ohm	0.2
4A236	40000000 Ohm	0.2
4A237	50000000 Ohm	0.2
4A238	60000000 Ohm	0.2
4A239	70000000 Ohm	0.2
4A240	80000000 Ohm	0.2
4A241	90000000 Ohm	0.2
4A242	100000000 Ohm	0.2
4A243	150000000 Ohm	0.2
4A244	200000000 Ohm	0.2
4A245	300000000 Ohm	0.2
4A246	400000000 Ohm	0.2
4A247	500000000 Ohm	0.2
4A248	600000000 Ohm	0.2
4A249	700000000 Ohm	0.2
4A250	800000000 Ohm	0.2
4A251	900000000 Ohm	0.2
4A252	1000000000 Ohm	0.2
4A253	1500000000 Ohm	0.2
4A254	2000000000 Ohm	0.2
4A255	3000000000 Ohm	0.2
4A256	4000000000 Ohm	0.2
4A257	5000000000 Ohm	0.2
4A258	6000000000 Ohm	0.2
4A259	7000000000 Ohm	0.2
4A260	8000000000 Ohm	0.2
4A261	9000000000 Ohm	0.2
4A262	10000000000 Ohm	0.2
4A263	15000000000 Ohm	0.2
4A264	20000000000 Ohm	0.2
4A265	30000000000 Ohm	0.2
4A266	40000000000 Ohm	0.2
4A267	50000000000 Ohm	0.2
4A268	60000000000 Ohm	0.2
4A269	70000000000 Ohm	0.2
4A270	80000000000 Ohm	0.2
4A271	90000000000 Ohm	0.2
4A272	100000000000 Ohm	0.2
4A273	150000000000 Ohm	0.2
4A274	200000000000 Ohm	0.2
4A275	300000000000 Ohm	0.2
4A276	400000000000 Ohm	0.2
4A277	500000000000 Ohm	0.2
4A278	600000000000 Ohm	0.2
4A279	700000000000 Ohm	0.2
4A280	800000000000 Ohm	0.2
4A281	900000000000 Ohm	0.2
4A282	1000000000000 Ohm	0.2
4A283	1500000000000 Ohm	0.2
4A284	2000000000000 Ohm	0.2
4A285	3000000000000 Ohm	0.2
4A286	4000000000000 Ohm	0.2
4A287	5000000000000 Ohm	0.2
4A288	6000000000000 Ohm	0.2
4A289	7000000000000 Ohm	0.2
4A290	8000000000000 Ohm	0.2
4A291	9000000000000 Ohm	0.2
4A292	10000000000000 Ohm	0.2
4A293	15000000000000 Ohm	0.2
4A294	20000000000000 Ohm	0.2
4A295	30000000000000 Ohm	0.2
4A296	40000000000000 Ohm	0.2
4A297	50000000000000 Ohm	0.2
4A298	60000000000000 Ohm	0.2
4A299	70000000000000 Ohm	0.2
4A300	80000000000000 Ohm	0.2
4A301	90000000000000 Ohm	0.2
4A302	100000000000000 Ohm	0.2
4A303	150000000000000 Ohm	0.2
4A304	200000000000000 Ohm	0.2
4A305	300000000000000 Ohm	0.2
4A306	400000000000000 Ohm	0.2
4A307	500000000000000 Ohm	0.2
4A308	600000000000000 Ohm	0.2
4A309	700000000000000 Ohm	0.2
4A310	800000000000000 Ohm	0.2

NOBLITT SPARKS INDUSTRIES

MODEL 7  
Schematic, Voltage  
Resistances, Parts

ARVIN CAR RADIO ~ MODEL 7



RESISTORS		CONDENSERS		CHOKES & TRANSFORMERS		MISCELLANEOUS UNITS	
QTY	RESISTANCE	CAPACITY	VOLTS	TYPE	DESCRIPTION	QTY	DESCRIPTION
1	100 Ω	100 μF	50V	1	ANTENNA	1	DYNAMIC SPEAKER
4	500 Ω	10 μF	50V	2	500 FREQ.	1	VIBRATOR
1	100 Ω	10 μF	50V	3	OSCILLATOR	1	VOLUME CONTROL SWITCH
1	100 Ω	10 μF	50V	4	FIRST I.F.	1	DIAL LIGHT JACK
1	100 Ω	10 μF	50V	5	SECOND I.F.	1	DIAL LIGHT CONNECTING PIN
1	100 Ω	10 μF	50V	6	OUTPUT	1	SPEAKER SOCKET
1	100 Ω	10 μF	50V	7	POWER	1	SPEAKER PLUG
1	100 Ω	10 μF	50V	8	41	1	DIAL LIGHT 6.0 VOLT
1	100 Ω	10 μF	50V	9	84	1	AMMETER CONNECTION

I.F. PEAK = 170 K.C.

SOCKET VOLTAGES

Make voltage tests with at least 1000 ohm per volt meter. Voltages given in table are only comparative due to variance in battery voltage. Plus or minus 20% on all voltages is acceptable.

Tube	Heaters	Plate	Screen	Cathode	Triode Plate	Anode Grid 1500 KC	Osc. Grid 1500 KC
6F7	6	220	100	2.3	50	—	—
6A7	6	220	100	2.3	—	175	5 to 10
6B7	6	220	100	3.5	—	—	—
41	6	205	220	18	—	—	—
84	6	230 (A. C.)	—	230	—	—	—

POINT TO POINT RESISTANCES

All readings taken to ground unless otherwise specified. Readings taken with all tubes, vibrator and speaker removed from set.

6F7	6A7	6B7
+ Heater ..... Inf.	+ Heater ..... Inf.	+ Heater ..... Inf.
- Heater ..... 0	- Heater ..... 0	- Heater ..... 0
Plate to B+ ..... 100	Plate to B+ ..... 82	Plate to B+ ..... 120
Screen to B+ ..... 25,000	Screen to B+ ..... 25,000	Screen to B+ ..... 25,000
Cathode ..... 52	Anode Grid to B+ ..... 20,000	Cathode ..... 500
Control Grid ..... 2,300,500	Oscillator Grid ..... 101,052	Control Grid ..... 82
Triode Grid ..... 500,000	Cathode ..... 52	Diodes ..... 200,620
Triode Plate to B+ ..... 250,000	Control Grid ..... 2,200,500	
41	84	
+ Heater ..... Inf.	+ Heater ..... Inf.	
- Heater ..... 0	- Heater ..... 0	
Plate to B+ ..... 625	Plate ..... 196	
Screen to B+ ..... 0	Plate ..... 165	
Cathode ..... 692	Plate to Plate ..... 361	
Control Grid ..... 1,000,000	Cathode to B+ ..... 165	

COIL RESISTANCES

Ant. Primary ..... 13	Oscillator Primary ..... 2	Second I. F. Secondary ..... 120	Speaker Field Coil ..... 5.5
Ant. Secondary ..... 5	Oscillator Secondary ..... 4	Output Trans. Primary ..... 625	Speaker Voice Coil ..... 3
R. F. Primary ..... 100	First I. F. Primary ..... 82	Output Trans. Secondary ..... 0.5	"B" Filter Choke ..... 165
R. F. Secondary ..... 5	First I. F. Secondary ..... 82	Power Trans. Secondary	
	Second I. F. Primary ..... 120	CT 165 & 196, Total ..... 361	



**MODEL 7**  
Parts, Changes

**NOBLITT SPARKS INDUSTRIES**

**MODEL 7**

**MISCELLANEOUS**

PART NO.	DESCRIPTION	PRICE
17-4294	Spark Plug Suppressor	.09
17-4295	Distributor Suppressor	.50
17-4701	Generator Condenser	.50
00-4743	Dome Light Filter	.50
00-4529	Ground Clamps	.10
17-1772	Dial Light 6-8 Volts (Screw Base)	.15
17-4732	Vibrator (4 prong)	4.00
17-4235	6" Speaker Cone Assembly (in carton)	1.20
17-4231	6" Speaker Assembly	4.00
23-1490	Stud and Nut (Set Mounting)	.10
12-565		
29-4664	Carton	.60
17-2048	6A7 Socket	.15
17-2049	6B7 Socket	.15
17-2045	41 Socket	.15
17-2047	84 Socket	.15
17-4790	6F7 Socket	.15
17-4736	Vibrator Socket	.15
10-4804	Speaker Front Screw, per dozen	.10
10-4810	Flex Shaft Set Screw, per dozen	.10
10-4811	No. 8x1/4 Self Tapping Screw, Hex Head, per dozen	.10
10-4844	No. 8x5/16 Self Tapping Screw, Binding Head, dozen	.10
29-4850	Worm Gear Drive Assembly	1.00
17-4152-3	Volume Control, 500M ohms	1.00
17-4760	Speaker Plug (3 Prong)	.15
17-4797	Dial Light Pin Jack	.10
17-4857	Dial Light (Bayonet Base)	.15

**RESISTORS**

17-2060	50,000 ohm Resistor, 1/4 watt	.20
17-2065	1000 ohm Resistor, 1/4 watt	.20
17-2088	500 ohm Resistor, 1/4 watt	.20
17-2072	20,000 ohm Resistor, 1/4 watt	.20
17-2080	1 Megohm Resistor, 1/4 watt	.20
17-3011	250,000 ohm Resistor, 1/4 watt	.20
17-4722	25,000 ohm Resistor, 1/2 watt	.25
17-2068	100,000 ohm Resistor, 1/4 watt	.20
17-2069	200,000 ohm Resistor, 1/4 watt	.20
17-4788	2 Megohm Resistor, 1/4 watt	.28
17-3031	Muter 3 Tap Candohm Resistor	.35

**CONDENSERS**

17-2063	.002-600 Volt Mica Condenser	.20
17-4702	.05-160 Volt Condenser	.30
17-4731	.05-.05-160 Volt Condenser	.35
17-4193	.02-.02-1000 Volt Condenser	.60
17-4708	.5-15 Volt Condenser	.45
17-4712	.10-.10-15 Volt Condenser	.75
17-4714	.15-400 Volt Condenser	.55
17-4759	.006-600 Volt Mica Condenser	.25
17-4292	.001-600 Volt Mica Condenser	.20
17-2211	.0005-600 Volt Mica Condenser	.20
17-2064	.0001-600 Volt Mica Condenser	.20
17-4798	3 Gang Variable Condenser	4.00
17-4785	.0005-.01-600 Volt Dual Condenser	.50
17-4786	12 mfd 25 Volt Condenser	1.00
17-4787	2 & 6 mfd 450 V. Filter Condenser	1.25

**TRANSFORMERS & COILS**

PART NO.	DESCRIPTION	PRICE
00-4792	Radio Frequency Coil	\$1.00
00-4791	Antenna Coil	.90
00-4793	Oscillator Coil	.85
00-4794	1st Intermediate Frequency Transformer	1.75
00-4795	2nd Intermediate Frequency Transformer	1.75
00-4757	Output Transformer	1.50
00-4796	Power Transformer	3.00
00-4754	"B" Filter Choke	1.30
00-1516	"A" Filament Choke	.40

**REMOTE CONTROL PARTS**

29-4673	Remote Control Without Bracket or Housing	\$2.75
29-4532	Metal Housing	.25
29-4533	Eye Bolt and Nut	.10
29-4534	Strap	.05
29-4538	Dial Glass	.15
29-4539	Steering Column Bracket	.20
29-4527	Tuning Knob—Black Bakelite	.10
29-4528	Switch Key Shank (less knob) (7-17-17A-27-37)	.05
34-4540	Key Retaining Spring (7-17-17A-27-37)	.05

**FLEXIBLE SHAFTS**

00-4641	Condenser Drive 6" length	.45
00-4642	Condenser Drive 9" length	.50
00-4643	Condenser Drive 12" length	.60
00-4644	Condenser Drive 15" length	.70
00-4645	Condenser Drive 18" length	.85
00-4649	Condenser Drive 21" length	.95
00-4646	Condenser Drive 24" length	1.00
00-4647	Condenser Drive 30" length	1.20
00-4648	Condenser Drive 36" length	1.40
00-4651	Volume Control Drive 6" length	.45
00-4652	Volume Control Drive 9" length	.50
00-4653	Volume Control Drive 12" length	.60
00-4654	Volume Control Drive 15" length	.70
00-4655	Volume Control Drive 18" length	.85
00-4659	Volume Control Drive 21" length	.95
00-4656	Volume Control Drive 24" length	1.00
00-4657	Volume Control Drive 30" length	1.20
00-4658	Volume Control Drive 36" length	1.40

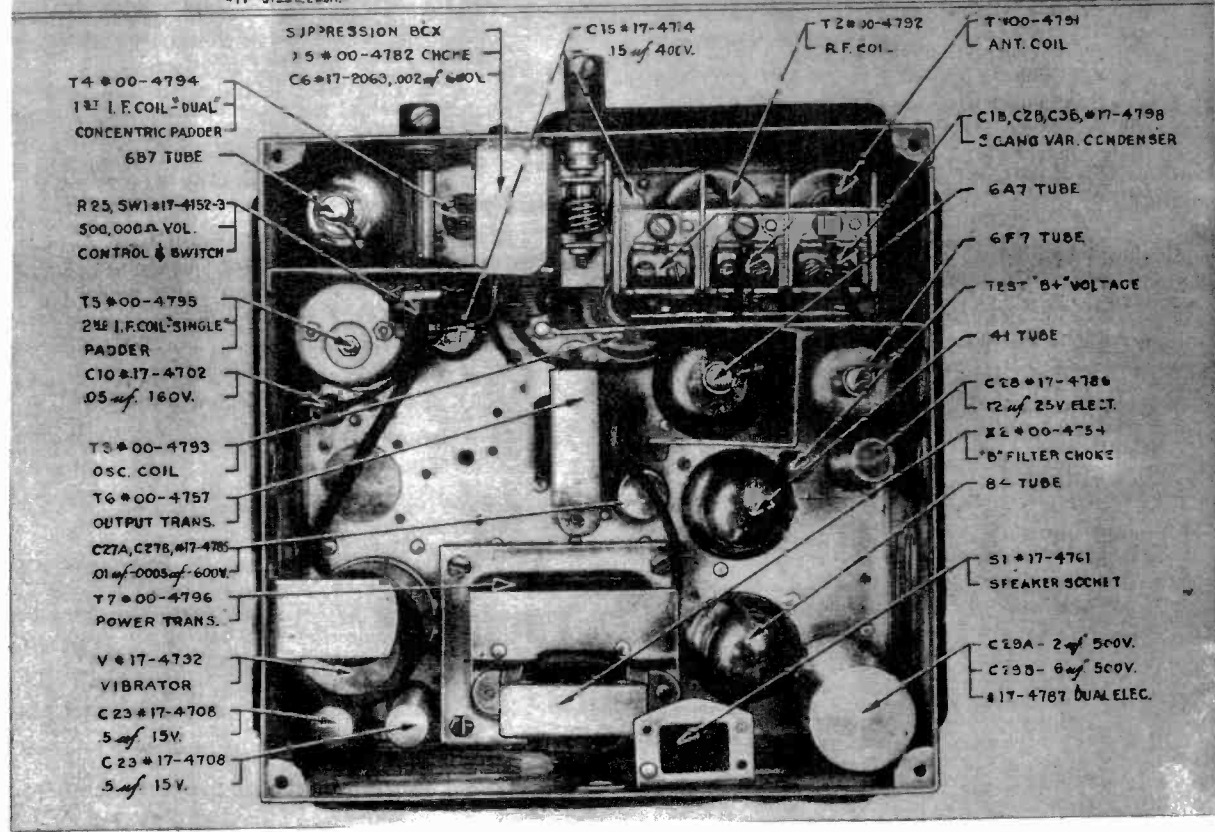
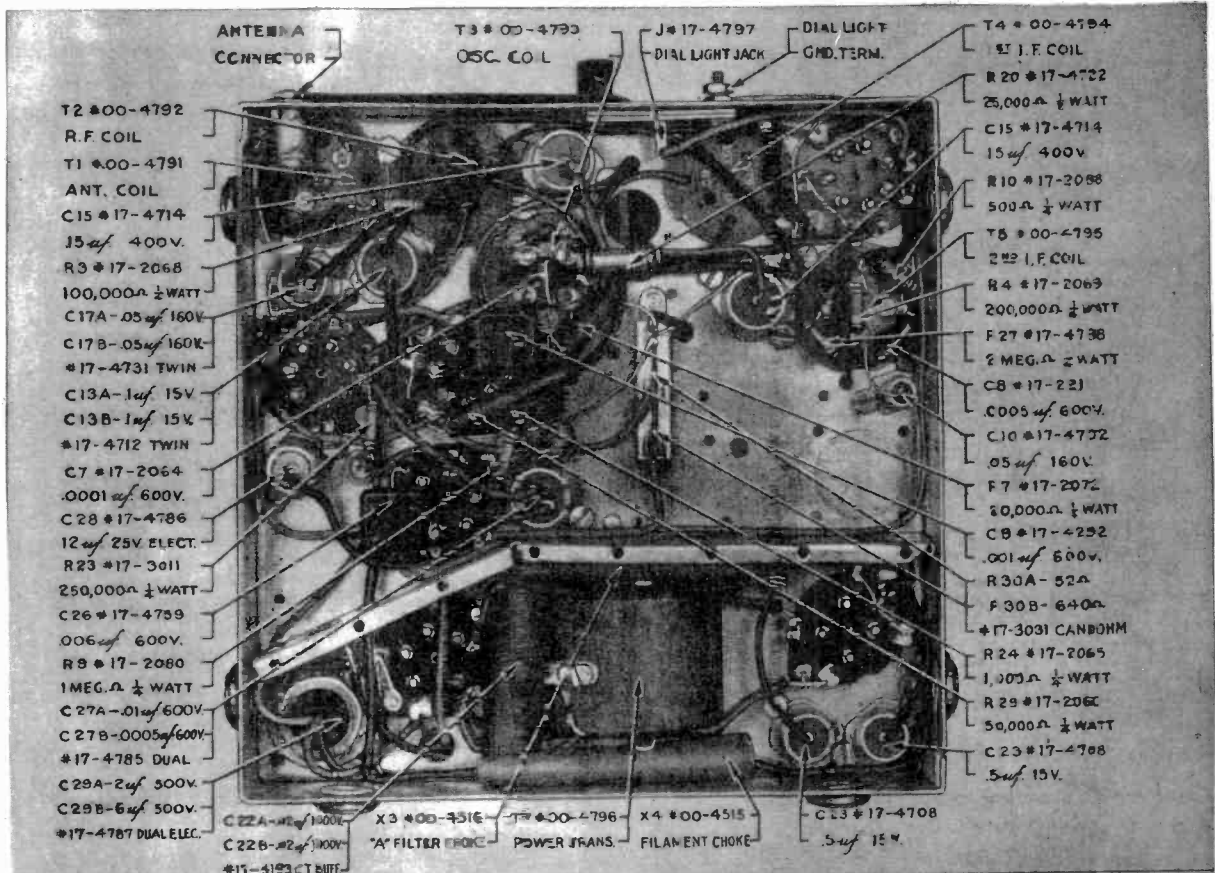
DATE: May 23, 1935

**MODEL NO. 7**

**SUBJECT: Circuit Changes, Model 7**

- R14—200 ohm 1/4 watt resistor has been added in power pack across vibrator points. to speaker plug socket, part No. 17-4447 (4 prong).
- R3—100,000 ohm 1/4 watt (17-2068) resistor in 6A7 No. 1 grid circuit has been changed to R29—50,000 ohm 1/4 watt (17-2060).
- Dial light, part No. 17-2145 (with screw base), has been changed to dial light, part No. 17-4857 (with bayonet base).
- Speaker plug socket, part No. 17-4761 (3 prong), has been changed
- Ammeter cable, part No. 00-4778-1, has been added. List Price, \$ .70.
- Fuse, part No. 17-2228, has been added. List Price, \$ .05.
- It was found in the field that in some instances motor noise entered the receiver where the local-distance plug and tone control plug were attached. A change in the mechanical design which eliminated this difficulty was made beginning with those sets from which the louvers were omitted.

NOBLITT SPARKS INDUSTRIES



1935 Receivers  
Installation Data

## NOBLITT SPARKS INDUSTRIES

### INSTALLATION PROCEDURE FOR 1935 ARVIN CAR RADIOS

There are several things which should be done CAREFULLY as a car radio is being installed. Care in making the original installation will pay for itself, particularly if you find it necessary to do additional work because of motor noise.

Some of the major points often overlooked are:

1. The set must be well grounded at the place where it is mounted. Scrape the paint off around the mounting holes drilled in the car so the nut and washer will make contact with a clean, bright surface.

In some cases where the bulkhead is padded on both sides, it will be necessary to run a piece of shielding from one of the mounting bolts to some NEAR-BY point where a good ground can be made.

2. In the case of a roof antenna, the antenna lead should be shielded continuously from the set to a point as far up the corner post as possible. Unless the set is mounted on the opposite side of the car from which the antenna lead comes down, the shielded lead supplied will be sufficient. Solder the antenna lead to the shielded lead supplied, tape neatly, and take up any slack by pulling the shielded lead out through the shielding on the connector end. Cut off the excess wire and solder the bakelite button back in place. Push the shielding as far up the corner post as possible and ground the shielding at the point where it enters the corner post.
3. In the case of under-car or running-board antenna, the antenna should preferably be installed so it will clear the car by a few inches. This distance will be governed by a sensible allowance for road clearance, depending on the type of antenna used. It is good practice to shield the antenna lead continuously from the set to a point close to the antenna, grounding the shielding wherever convenient.
4. When installing the remote control, and excess length of tone control cable, and in installing the No. 37, the local-long distance cable as well, should be neatly coiled and taped in place up under the dash out of sight. It is desirable to ground the shielding on these cables at this point also.
5. In some cars a metal tube—supplying the windshield wiper—goes up a corner post. This should be grounded as near the corner post as possible.
6. When installing the dome light filter and generator condenser, be sure that each unit has a good, clean ground connection.
7. When the receiver has been completely installed, turn the set on and tune in a station whose frequency is known. If necessary, remove the small screw in the center of the dial face and with a toothpick or other small implement turn the pointer to the correct frequency. Replace the small screw.

Start the motor (remember that exhaust gasses are dangerous in closed garages) to determine whether the installation is picking up motor noise.

The 1935 Arvin Car Radio is so constructed that on the majority of new cars spark-plug suppressors are not necessary. However, on some of the older cars as well as a couple of the more popular new ones, suppressors will be necessary to eliminate motor noise. These suppressors can be obtained from your jobber.

Some general instructions are given here any one or combination of which has been found very useful in the elimination of motor noise which can be classified as of two kinds:

1. The so-called "feed-back" and radiation, which is audible when the aerial of the set is disconnected.
  2. Antenna Pick-up, or motor noise that is heard when the aerial is connected.
- I. If motor noise is heard with the antenna disconnected, try the following, leaving the antenna disconnected until the noise is remedied:

First: Run a bonding wire from the dial light and tone control cable shielding of the remote control to the set itself, thus insuring a good ground for the shielding on that cable. It can be determined whether or not this cable is bringing in motor noise by pulling out the plug where it plugs into the set. If the motor noise decreases, it will be necessary to ground this cable as it is bringing in motor noise.

Second: Place an ammeter condenser on the ammeter of the car.

Third: Place a condenser on the ignition switch.

Fourth: Peen out the rotor of the distributor or build up the rotor with solder until the gap between the rotor and the distributor cap is .003 of an inch.

Fifth: If the primary lead to the coil and the distributor run through the same conduit as the spark-plug wires themselves, remove these primary wires from the conduit and keep them as far away as possible from the spark-plugs or high tension wires.

Sixth: Inspect the distributor points, and if they are badly pitted, replace and reset.

Seventh: On Ford V-8 installation, the generator condenser, furnished with each set should be placed on the distributor.

- II. For the second kind of motor noise, namely Antenna Pick-up, that is, when the antenna is connected to the set, the following methods may be tried for its elimination:

First: Change location of the dome light filter to the dome light itself.

Second: Place condenser on ammeter.

Third: If the coil is on the passenger side of the dash, shield the high tension lead running from the coil to the distributor and ground this shielding at the point where it passes through the bulkhead.

Fourth: Ground the motor to the frame on each side of the motor.

Fifth: Bond the choke and throttle control rods to the chassis of the car with flexible wire or bonding material.

Sixth: Ground the steering column post to the instrument panel.

Seventh: Ground brake and clutch pedals on motor side of bulkhead to some metal part of the dash.

Eighth: On some cars you will find that the battery lead from the battery to the starting motor radiates through the foot board and any person directly over the battery lead will carry that radiation directly to the antenna. This difficulty may be overcome by placing a copper screen under the floor mat, and grounding this screen to the frame of the car.

NOBLITT SPARKS INDUSTRIES

MODEL 16  
Voltage  
Test Data

MODEL 16 SOCKET VOLTAGES

Make voltage tests with 1666 ohm per volt meter. Voltages given in table are only comparative due to variance in battery voltages. Plus or minus 20% on all voltages is acceptable.

Tube	Heaters	Plate	Screen	Cathode	Suppressor	Anode Grid 1500 KC	Osc. Grid 1500 KC
78	6.0	230	100	4.5	0	—	—
6A7	6.0	240	100	4.5	—	180	5-10
78	6.0	240	100	7.0	0	—	—
75	6.0	85	—	1.5	—	—	—
41	6.0	235	240	18.5	—	—	—
84	6.0	235 (AC)	—	235	—	—	—

MODEL 16 POINT TO POINT RESISTANCE CHECK

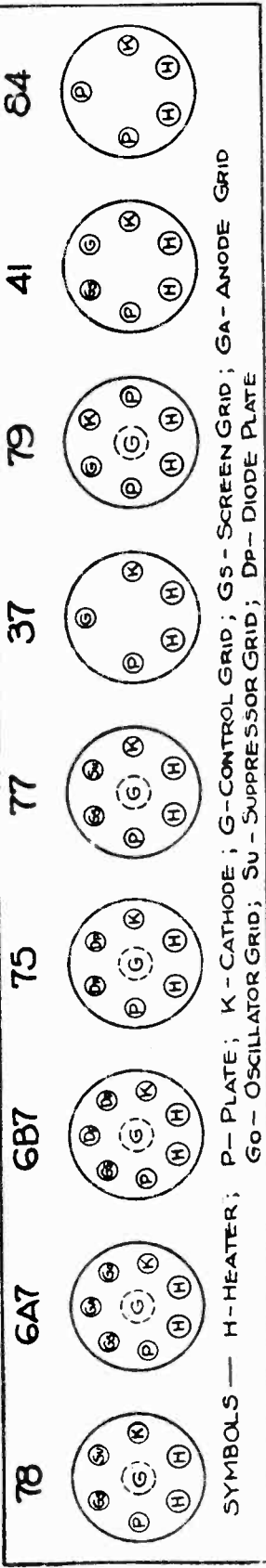
All readings to ground unless otherwise specified. Readings taken with all tubes removed from set and R. F. chassis and speaker disconnected from power pack unit and R. F. chassis.

1st 6D6 78	2nd 6D6 41	84
+ Heater .....	+ Heater .....	+ Heater .....
- Heater .....	- Heater .....	- Heater .....
Plate to B— .....	Plate to B— .....	Plate .....
Screen Grid to B— .....	Screen Grid to B— .....	Plate .....
Suppressor Grid .....	Control Grid .....	Plate to Plate .....
Cathode .....	Cathode .....	Cathode .....
Control Grid .....	Control Grid .....	Control Grid .....
6A7	75	79
+ Heater .....	+ Heater .....	+ Heater .....
- Heater .....	- Heater .....	- Heater .....
Plate to B— .....	Plate .....	Plate .....
Screen Grid to B— .....	Plate .....	Plate .....
Anode Grid to B— .....	Diodes .....	Diodes .....
Oscillator Grid .....	Cathode .....	Cathode .....
Cathode .....	Control Grid .....	Control Grid .....
Control Grid .....	Control Grid .....	Control Grid .....

Coil Resistances Model 16

Ant. Primary .....	13 ohms
Ant. Secondary .....	5 ohms
R. F. Primary .....	100 ohms
R. F. Secondary .....	5 ohms
Oscillator Primary .....	2 ohms
Oscillator Secondary .....	3 ohms
First I. F. Primary .....	82 ohms
First I. F. Secondary .....	82 ohms
Second I. F. Primary .....	90 ohms
Second I. F. Secondary .....	90 ohms
Primary Output Transformer .....	.650 ohms

LOOKING AT BOTTOM OF TUBE SOCKETS



SYMBOLS — H-HEATER; K-CATHODE; G-CONTROL GRID; GS-SCREEN GRID; GA-ANODE GRID; G0-OSCILLATOR GRID; SU-SUPPRESSOR GRID; DP-DIODE PLATE

**MODEL 16**

**Installation Data  
Parts List**

**NOBLITT SPARKS INDUSTRIES**

**GENERAL MECHANICAL PARTS**

00-4213-1	Antenna Cable Assembly.....
00-4215	Battery Cable Assembly.....
00-4216	Pilot Light Wire Assembly.....
29-4525-A	Remote Control Assembly.....
29-4525-B	Steering Column Bracket.....
29-4525-D	Steering Column Bracket Strap.....
29-4525-K	Pilot Light Bulb.....
29-4525-L	Control Knob and Set Screw.....
29-4525-M	Key.....
00-4333	24" Flexible Shaft Assembly.....
00-4330	12" Flexible Shaft Assembly (Special Order).....
00-4331	15" Flexible Shaft Assembly (Special Order).....
00-4332	18" Flexible Shaft Assembly (Special Order).....
00-4334	30" Flexible Shaft Assembly (Special Order).....
00-4335	36" Flexible Shaft Assembly (Special Order).....
17-2228	Fuse.....
17-2262	4-Prong Mounting Plug (with cover).....
17-2263	5-Prong Mounting Plug (with cover).....
	Antenna & Battery Cable Connectors (complete set)
	Shielded Loom (yard).....
00-4371	Speaker (6" Dynamic).....
17-4226	Spark Plug Suppressor.....
17-4294	Distributor Suppressor.....
17-4295	Volume Control Switch.....
17-4132-1	Tube Shield Assembly.....
29-3026	Vibrator and (Rubber Casing.10).....
29-2169-C	Tube Type 6D6.....
17-2050	Tube Type 78.....
17-2052	Tube Type 75.....
17-2053	Tube Type 41.....
17-2054	Tube Type 84.....
17-2056	Tube Type 6A7.....
17-2057	Case (complete).....
	Accessories.....
	Set and Tubes.....
	Power Pack.....
	Generator Condenser.....
17-2225	Ammeter Condenser.....
17-4296	
	<b>CHOKES</b>
	See diagram for description.....
00-2178E	See diagram for description.....
00-2178-F	See diagram for description.....
00-4141	See diagram for description.....

INSTALLATION OF AIRPLANE CONTROL IN ASH TRAY COMPARTMENT IN 1934 DODGES AND PLYMOUTHS

This control is designed to fit either on the steering column or in the ash tray compartment. A chromium-plated panel is furnished for this ash tray mounting.

On the 1934 Dodges and Plymouths there is a wide bracket directly behind this ash tray that interferes with the shafts of the remote control. It is impossible to run the shafts around the control, for that causes too sharp a bend in the cables and so they bind.

This condition can be easily remedied by locating the control with the chromium plate attached in the hole left by the ash tray on the panel. Remove the key from the control and mark through the key hole on to the bracket. With this center located, measure one-half inch above and three-sixteenths of an inch to the right of this first mark, and locate the center of the second hole.

Drill a three-eighths inch hole at both places. Run the two flexible shafts through these holes from the rear and fasten them onto the remote control. Then fasten the control on the dash with the bracket furnished and hook the other end of the shafts into the radio set as described in the instructions.

\* \* \* \* \*

INSTALLATION OF TONE CONTROL ON ARVIN MODEL 16 RECEIVERS

When a customer desires a lower pitch in this set, connect together the two external speaker leads. Obtain two phone tips similar to the one on the dial light lead, and put one of these on each end of a 2.5 inch piece of wire. Slip a small piece of rubber tubing over each phone tip, or use tape. Then plug the two tips -- one into each of the external speaker connections.

This will give the set's tone a greater depth, which is desirable in some cases.

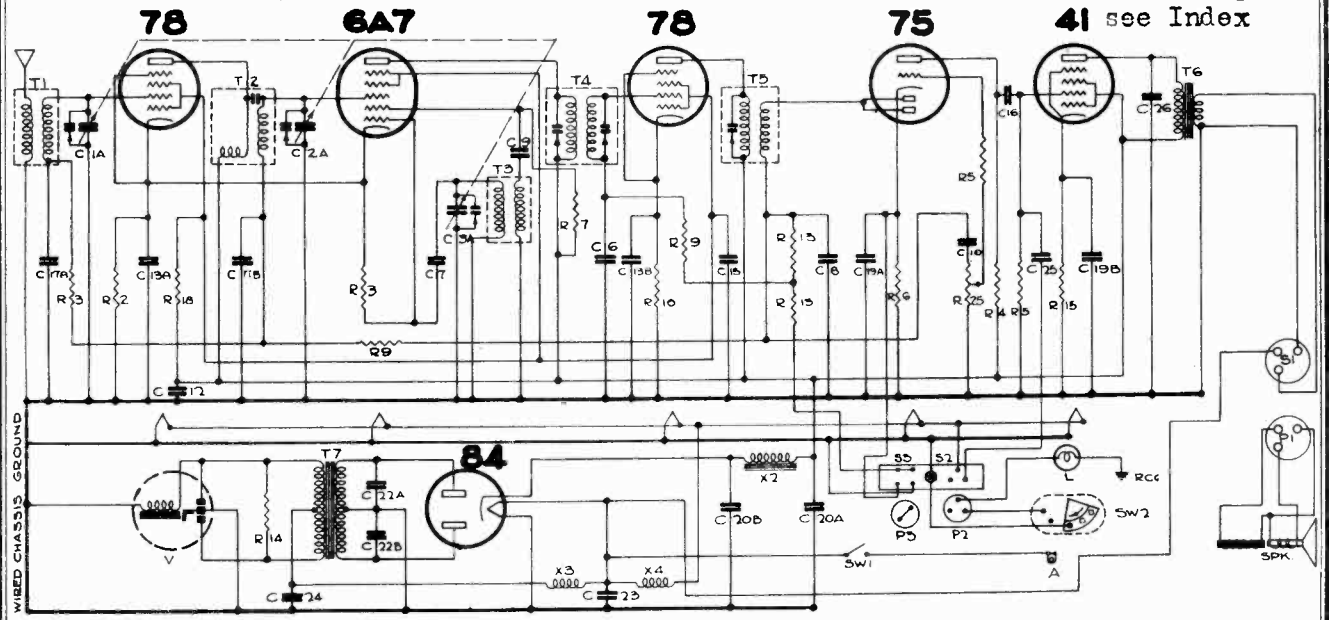
NOBLITT SPARKS INDUSTRIES

MODEL 17  
Schematic, Voltage  
Resistances, Parts

I.F. PEAK = 175 KC

ARVIN CAR RADIO - MODEL 17

For Changes,  
41 see Index



RESISTORS				CONDENSERS				CHOKES & TRANSFORMERS				MISCELLANEOUS UNITS									
R	OHMS	W	PRICE	C	CAPACITY	VOLT	PRICE	X	TYPE	PART NO.	PRICE	SYMBOL	DESCRIPTION	PART NO.							
1	400	1/4	17-4762	1A	5 GANG TUNING	17-4745	4.50	16	.10	600	17-4715	.40	1	ANTENNA	00-4810	.90	SPK	SPEAKER VIBRATOR	17-4732		
2	100M	1/4	17-3058	2A				17A	.05	TWIN	180	17-4731	.55	2	RADIO FREQUENCY	00-4811	1.00	W	REMOTE CONTROL GROUND	368R25	
3	200M	1/4	17-3059	3A				17B	.05	TWIN	180	17-4731	.55	3	OSCILLATOR	00-4812	.85	RCG	VOLUME CONTROL SWITCH	17-4733	
4	500M	1/4	17-3070	4				17C	.10	TWIN	25	17-4707	1.50	4	FIRST I.F.	00-4813	1.75	SW1	TO NE CONTROL SWITCH	17-4734	
5	500M	1/4	17-3071	5	.002	600	17-3065	70	19A	17.0	TWIN	25	17-4707	1.50	5	SECOND I.F.	00-4814	1.75	SW2	DIAL LITE - TONE SOCKET	17-4735
6	20M	1/4	17-3072	6	.001	600	17-4192	20	19B	17.0	DUAL	500	17-4708	2.40	6	OUTPUT	00-4815	1.50	S1	SPEAKER SOCKET	17-4736
7	20M	1/4	17-3073	7	.0005	600	17-2211	20	20A	4.0		500	17-4708	2.40	7	POWER	00-4746	3.00	SW2	LOC. DIST. CONTROL SOCKET	17-4737
8	1ME8	1/4	17-3080	8	.001	600	17-4192	20	20B	7.0		500	17-4708	2.40	8						
9	500	1/4	17-3088	9	.05	180	17-4702	20	21A												
10				10	.002	600	17-3065	70	21B												
11				11	.001	600	17-2211	20	22A	.02	TWIN	1000	17-4708	.60	X1	X2 'B' FILTER CHOKE	00-4754	1.30	P1	SPEAKER PLUS	17-4738
12	75M	1/4	17-2067	12	.10	15	17-4712	75	22B	.02		15	17-4708	.40	X2	'A' FILTER CHOKE	00-4816	.40	P2	DIAL - LITE - TONE PLUS	17-4739
13	200	1/4	17-4287	13	.10	15	17-4712	75	23	1.0		15	17-4708	.25	X3	FILAMENT CHOKE	00-4815	.40	P3	LOC. DIST. CONTROL PLUS	17-4740
14	500	1/4	17-4717	14	.10	15	17-4712	75	24	.005		600	17-4741	.75	X4						
15				15	.005	600	17-4702	20	25	.005		600	17-4741	.75							
16				16	.005	600	17-4702	20	26	.005		600	17-4708	.75							
17				17	.005	600	17-4702	20	27	.005		600	17-4708	.75							

SOCKET VOLTAGES

Make voltage tests with at least 1000 ohm per volt meter. Voltages given in table are only comparative due to variance in battery voltage. Plus or minus 20% on all voltages is acceptable.

Tube	Heaters	Plate	Screen	Cathode	Suppressor	Anode Grid 1500 KC	Osc. Grid 1500 KC
78	5.8	220	70	3.3	3.3	—	—
6A7	5.8	220	70	3.3	—	175	5-10
78	5.8	220	70	2.5	2.5	—	—
75	5.8	115	—	1.5	—	—	—
41	5.8	208	220	14.0	—	—	—
84	5.8	230 (AC)	—	225	—	—	—

POINT TO POINT RESISTANCES

All readings taken to ground unless otherwise specified. Readings taken with all tubes, vibrator and speaker removed from set.

78 (R. F.)	6A7	78 (I. F.)	41
+ Heater	+ Heater	+ Heater	+ Heater
— Heater	— Heater	— Heater	— Heater
Plate to B+	Plate to B+	Plate to B+	Plate to B+
Screen to B+	Screen to B+	Screen to B+	Screen to B+
Suppressor Grid	Oscillator Grid	Suppressor Grid	Cathode
Cathode	Cathode	Cathode	Control Grid
‡Control Grid	‡Control Grid	‡Control Grid	
75	84		
+ Heater	+ Heater		
— Heater	— Heater		
Plate to B+	Plate		
Cathode	Plate		
‡Diodes	Plate to Plate		
Control Grid V. C. on	Cathode to B+		
Control Grid V. C. off			

COIL RESISTANCES

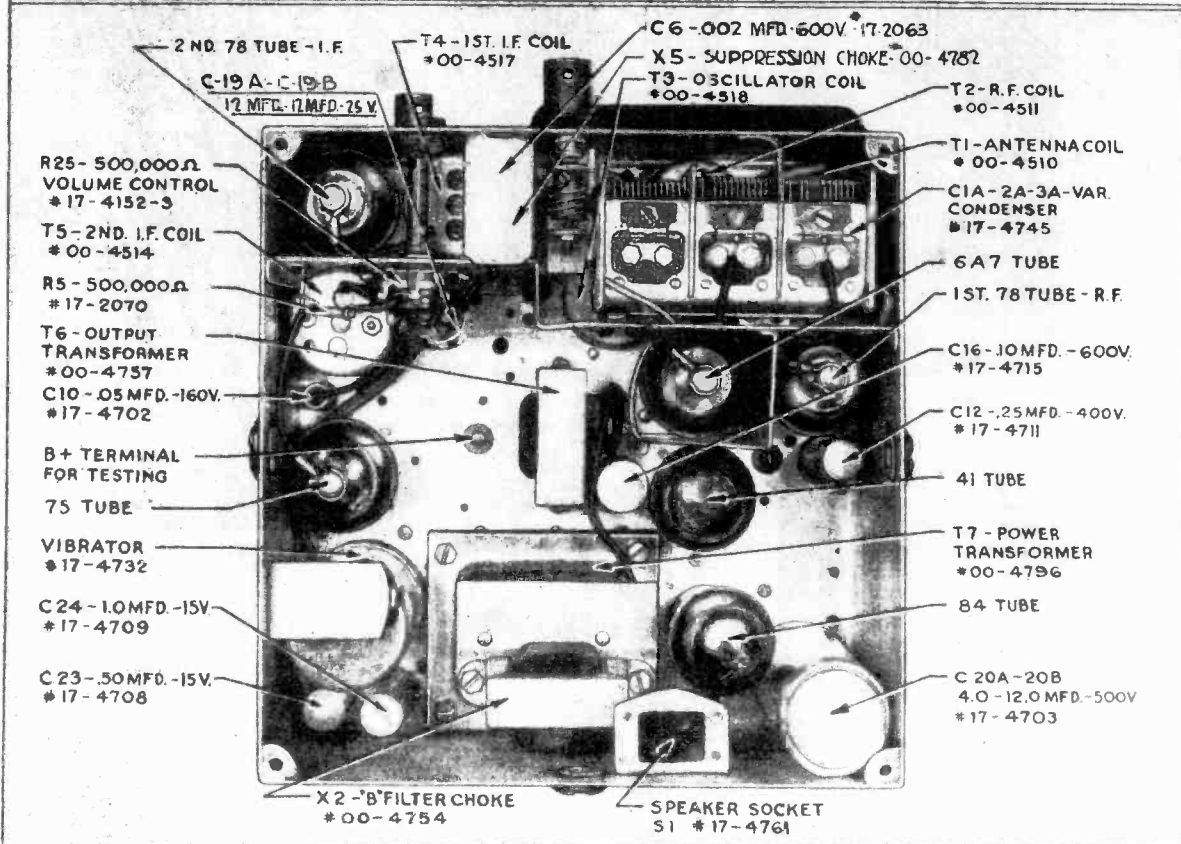
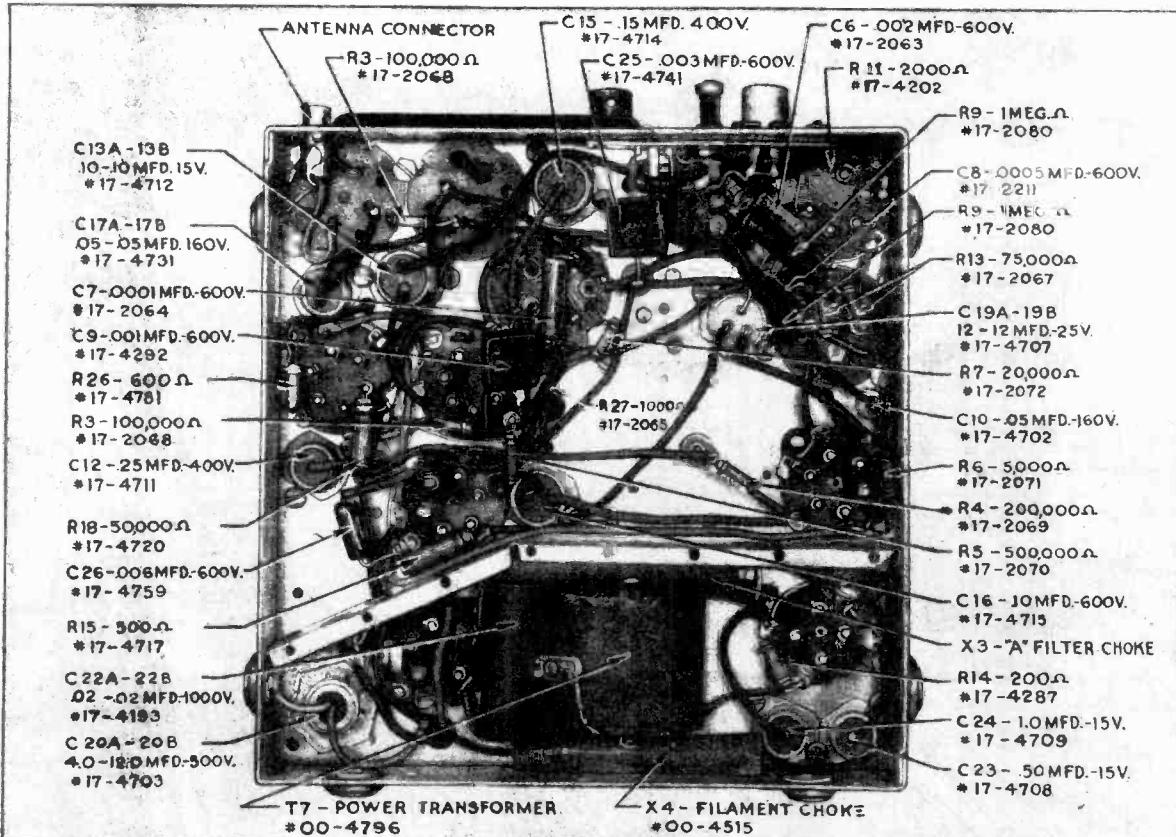
Ant. Primary	12.0	Oscillator Primary	3.0	Second I. F. Primary	85.0	Power Transformer Secondary {165} 361
Ant. Secondary	4.0	Oscillator Secondary	1.5	Second I. F. Secondary	85.0	{196} 361
R. F. Primary	113.0	First I. F. Primary	115.0	Output Transformer Primary	625	Speaker Field Coil
R. F. Secondary	4.0	First I. F. Secondary	115.0	Output Transformer Secondary	0.5	Speaker Voice Coil
						"B" Filter Choke

‡ Readings given for sensitivity switch in "Local" position, for "Distance" add 5000 ohms.

MODEL 17

Chassis Layouts

NOBLITT SPARKS INDUSTRIES



## NOBLITT SPARKS INDUSTRIES

MODELS 17,27

Changes

## MODEL NO. 17

1. R3—100,000 ohm  $\frac{1}{4}$  watt (17-2068) resistor in 6A7 No. 1 grid circuit has been changed to R29—50,000 ohm  $\frac{1}{4}$  watt (17-2060).
2. R24—1,000 ohm  $\frac{1}{4}$  watt resistor has been inserted in 6A7 No. 1 grid circuit.
3. R2—400 ohm  $\frac{1}{4}$  watt resistor has been changed to R10—500 ohm  $\frac{1}{4}$  watt. Allowable variations on R2 was from 200 to 600 ohms. Allowable variation on R10 is from 400 to 600 ohms.
4. R10—500 ohm  $\frac{1}{4}$  watt resistor on cathode of 78 tube has been changed to R28—1,500 ohm  $\frac{1}{4}$  watt.
5. C12 and C26 capacitors have been combined into one dual condenser, part No. 17-4742, .006 mfd 800 volt (lead with red dot is .006 mfd unit) and .25 mfd 400 volt.
6. X5 suppression choke, 00-4782, has been added in "A" line.

## MODEL NO. 27

1. R3—100,000 ohm  $\frac{1}{4}$  watt (17-2068) resistor in 6A7 No. 1 grid circuit has been changed to R29—50,000 ohm  $\frac{1}{4}$  watt (17-2060).
2. R24—1,000 ohm  $\frac{1}{4}$  watt resistor has been inserted in 6A7 No. 1 grid circuit.
3. R2—400 ohm  $\frac{1}{4}$  watt resistor has been changed to R10—500 ohm  $\frac{1}{4}$  watt. Allowable variation on R2 was from 200 to 600 ohms. Allowable variation on R10 is from 400 to 600 ohms.
4. R10—500 ohm  $\frac{1}{4}$  watt resistor on cathode of 78 tube has been changed to R28—1,500 ohm  $\frac{1}{4}$  watt.
5. C12 and C26 capacitors have been combined into one dual condenser, part No. 17-4742, .006 mfd 800 volt (lead with red dot is .006 mfd unit) and .25 mfd 400 volt.
6. X5 suppression choke, 004782, has been added in "A" line.
7. C6—.002 mfd mica condenser has been inserted ahead of X5 suppression choke and connected from battery side of X5 to ground.
8. Dial light, part No. 17-2145 (with screw base), has been changed to dial light, part No. 17-4857 (with bayonet base).
9. Speaker plug socket, 17-4761 (3 prong), has been changed to speaker plug socket, 17-4447 (4 prong).
10. Ammeter cable, 00-4778-1, has been added. List Price, \$ .70.  
Note: On Model 17A this cable is shorter and carries part No. 00-4778-2. List Price, \$ .65.
11. Fuse, 17-2228, has been added. List Price, \$ .05.
12. It was found in the field that in some instances motor noise entered the receiver where the local-distance plug and tone control plug were attached. A change in the mechanical design which eliminated this difficulty was made beginning with those sets from which the louvers were omitted.
11. Ammeter cable, 00-4778-1, has been added. List Price, \$ .70.
12. Fuse, 17-2228, has been added. List Price, \$ .05.
13. Beginning with serial No. D44011H the type 75 tube was replaced with a 6B7, triode connected.
14. C25—.003 mfd 600 volt condenser was changed to C26—.006 mfd 600 volt.
15. Beginning with serial No. E45219H, the triode connection on the 6B7 was changed to a pentode connection, and changes as per paragraphs 16, 17, and 18 were made.
16. C12—.25 mfd 400 volt condenser was added as a screen by-pass from screen of 6B7 tube to ground.
17. R9—1 megohm  $\frac{1}{4}$  watt resistor was added as a screen dropping resistor from +B to screen of 6B7 tube.
18. C26—.006 mfd 600 volt condenser was changed to C25—.003 mfd 600 volt.
19. Under conditions outlined in paragraph 15, voltages on the 6B7 are as follows (using a 1333 ohm per volt meter): Plate 60, Screen 30, cathode 1.7.
20. It was found in the field that in some instances motor noise entered the receiver where the local-distance plug and tone control plug were attached. A change in the mechanical design which eliminated this difficulty was made beginning with those sets from which the louvers were omitted.



MODEL 35  
Above Serial E31577H  
Voltage, Resistances

NOBLITT SPARKS INDUSTRIES

NOTE: The following values are correct for all Model 35 Arvin Car Radios, beginning with and including Serial No. E31577H.

MODEL 35 SOCKET VOLTAGES

Make voltage tests with 1000 ohm per volt meter. Voltages given in table are only comparative due to variance in battery voltage. Plus or minus 20% on all voltages is acceptable.

Tube	Heaters	Plate	Screen	Cathode	Suppressor	Control
78	6.3	250	60	1.6	2.2	*2.0
77	6.3	250	60	2.2	2.2	*2.2
6B7	6.3	250	60	1.6	—	*1.4
79	6.3	135	—	1.6	—	*1.6
41	6.3	245	250	18	—	*18
41	6.3	245	250	18	—	*18
37	6.3	60	—	0	—	*6—1500 KC
84	6.3	275 (AC)	—	255	—	—

\*Measured with vacuum tube voltmeter only.

MODEL 35 POINT TO POINT RESISTANCE CHECK

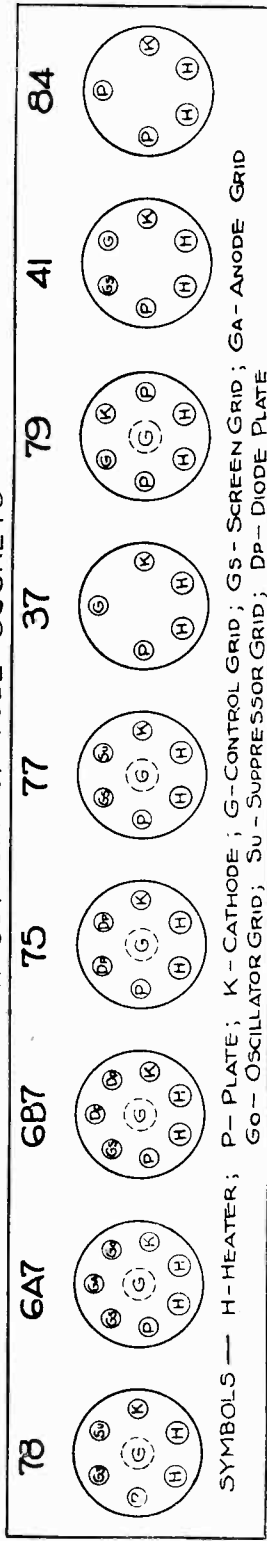
All readings to ground unless otherwise specified. Readings taken with all tubes, vibrator and speaker removed from set and R. F. chassis disconnected from power pack unit.

Tube	Heater	Plate	Screen Grid to B+	Suppressor Grid	Cathode	Control Grid
78	Inf.	0	100	25,000	500	1,530,000
77	Inf.	0	100	25,000	500	1,530,000
6B7	Inf.	0	100	25,000	500	1,530,000
79	Inf.	0	100	25,000	500	1,530,000
41	Inf.	0	100	25,000	500	1,530,000
41	Inf.	0	100	25,000	500	1,530,000
37	Inf.	0	100	25,000	500	1,530,000
84	Inf.	0	100	25,000	500	1,530,000

COIL RESISTANCES

Ant. Primary	2
Ant. Secondary	6
R. F. Primary	.50
R. F. Secondary	.6
Osc. Primary	2
Osc. Secondary	7
Voice Coil	.35

LOOKING AT BOTTOM OF TUBE SOCKETS

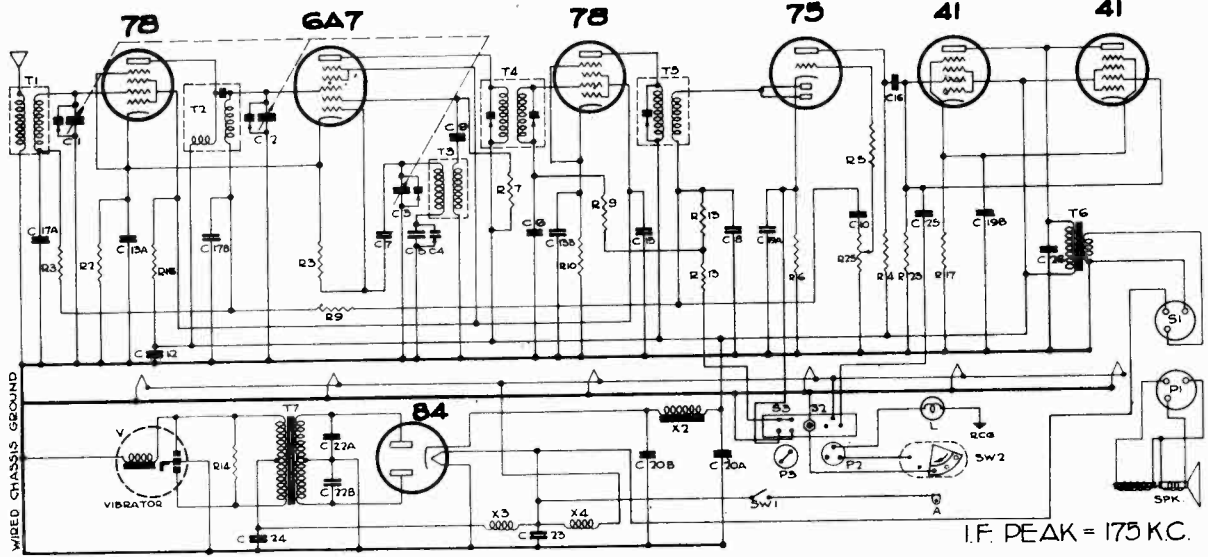


SYMBOLS — H-HEATER; P- PLATE; K- CATHODE; G- CONTROL GRID; GS- SCREEN GRID; GA- ANODE GRID; Su- OSCILLATOR GRID; Su- SUPPRESSOR GRID; Dp- DIODE PLATE

NOBLITT SPARKS INDUSTRIES

MODEL 27  
Schematic, Voltage  
Resistances, Parts

ARVIN CAR RADIO — MODEL 27



I.F. PEAK = 175 KC.

RESISTORS				CONDENSERS				CHOKES AND TRANSFORMERS				MISCELLANEOUS UNITS												
Q	OHMS	W	PART NO	PRICE	Q	OHMS	W	PART NO	PRICE	C	CAPACITY	VOLT	PART NO	PRICE	T	K	TYPE	PART NO	PRICE	SYMBOL	DESCRIPTION	PART NO	PRICE	
2	1400	1/4	17-4763	10	18	1000	1/2	17-4763	10	1	3 GANG TUNING	450	17-4775	450	16	17A	05	100	17-4710	40	1	ANTENNA	00-4810	50
3	1000	1/4	17-2065	20	20	500	1/2	17-2065	20	2	00012	50	17-4726	40	17A	05	TWIN	180	17-4713	85	2	RADIO FREQUENCY	00-4811	1.00
4	2000	1/4	17-2069	20	20	500	1/2	17-2069	20	3	00011	50	17-4100	30	17A	05	100	17-4713	85	3	OSCILLATOR	00-4812	55	
5	5000	1/4	17-2070	20	20	500	1/2	17-2070	20	4	00012	50	17-4100	30	17A	05	100	17-4713	85	4	FIRST I.F.	00-4813	1.75	
6	5000	1/4	17-2071	20	20	150M	1/2	17-3011	20	5	00011	50	17-2069	20	19A	170	TWIN	75	17-4707	180	5	SECOND I.F.	00-4814	1.75
7	20M	1/4	17-2072	20	24	250M	1/2	17-4057-3	100	6	00011	50	17-2069	20	19A	170	TWIN	75	17-4707	180	6	OUTPUT POWER	00-4706	1.00
8	1M6	1/4	17-2080	20	26	100	1/2	17-4711	55	7	00005	30	17-2211	20	20A	40	DUAL	500	17-4705	240	7	POWER	00-4747	3.00
9	500	1/4	17-2088	20	26	100	1/2	17-4711	55	8	00010	30	17-4711	55	21A	10	DUAL	500	17-4705	240	8	ANTENNA	00-4754	1.50
10	500	1/4	17-2088	20	27	100	1/2	17-4711	55	9	00010	30	17-4711	55	21A	10	DUAL	500	17-4705	240	9	ANTENNA	00-4754	1.50
11	75M	1/4	17-2087	20	27	100	1/2	17-4711	55	10	00010	30	17-4711	55	21A	10	DUAL	500	17-4705	240	10	ANTENNA	00-4754	1.50
12	200	1/4	17-4287	20	28	100	1/2	17-4711	55	11	00010	30	17-4711	55	21A	10	DUAL	500	17-4705	240	11	ANTENNA	00-4754	1.50
13	75M	1/4	17-2087	20	28	100	1/2	17-4711	55	12	00010	30	17-4711	55	21A	10	DUAL	500	17-4705	240	12	ANTENNA	00-4754	1.50
14	200	1/4	17-4287	20	29	100	1/2	17-4711	55	13	00010	30	17-4711	55	21A	10	DUAL	500	17-4705	240	13	ANTENNA	00-4754	1.50
15	80M	1	17-4785	50	30	100	1/2	17-4711	55	14	00010	30	17-4711	55	21A	10	DUAL	500	17-4705	240	14	ANTENNA	00-4754	1.50
16	250	1/2	17-4719	50	31	100	1/2	17-4711	55	15	00010	30	17-4711	55	21A	10	DUAL	500	17-4705	240	15	ANTENNA	00-4754	1.50

SOCKET VOLTAGES

Make voltage tests with at least 1000 ohm per volt meter. Voltages given in table are only comparative due to variance in battery voltage. Plus or minus 20% on all voltages is acceptable.

Tube	Heaters	Plate	Screen	Cathode	Suppressor	Anode Grid 1500 KC	Osc. Grid 1500 KC
78	5.8	235	75	4.2	4.2	—	—
6A7	5.8	235	75	4.2	—	170	5-10
78	5.8	235	75	3.3	3.3	—	—
75	5.8	120	—	1.7	—	—	—
41	5.8	220	235	13.0	—	—	—
41	5.8	220	235	13.0	—	—	—
84	5.8	260 (AC)	—	245	—	—	—

POINT TO POINT RESISTANCES

All readings taken to ground unless otherwise specified. Readings taken with all tubes, vibrator and speaker removed from set.

78 (R. F.)	6A7	78 (I. F.)	75
+ Heater ..... Inf.	+ Heater ..... Inf.	+ Heater ..... Inf.	+ Heater ..... Inf.
- Heater ..... 0	- Heater ..... 0	- Heater ..... 0	- Heater ..... 0
Plate to B+ ..... 113	Plate to B+ ..... 115	Plate to B+ ..... .85	Plate to B+ ..... 200,000
Screen to B+ ..... 50,000	Screen to B+ ..... 50,000	Screen to B+ ..... 50,000	Diodes ..... 150,000
Suppressor Grid ..... 400	Oscillator Grid ..... 100,400	Suppressor Grid ..... 500	Cathode ..... 5000
Cathode ..... 400	Cathode ..... 400	Cathode ..... 500	Control Grid V. C. on ..... 1,000,000
‡Control Grid ..... 1,250,000	‡Control Grid ..... 1,150,000	‡Control Grid ..... 1,075,000	Control Grid V. C. off ..... 500,000
41	41	84	
+ Heater ..... Inf.	+ Heater ..... Inf.	+ Heater ..... Inf.	
- Heater ..... 0	- Heater ..... 0	- Heater ..... 0	
Plate to B+ ..... 330	Plate to B+ ..... 330	Plate to B+ ..... 240	
Screen to B+ ..... 0	Screen to B+ ..... 0	Plate to Plate ..... 210	
Cathode ..... 250	Cathode ..... 250	Plate to Plate ..... 450	
Control Grid ..... 250,000	Control Grid ..... 250,000	Cathode to B+ ..... 165	

‡ Add 5000 Ω to these readings when sensitivity switch is on "Distance" position.

COIL RESISTANCES

Ant. Primary ..... 12.0	Oscillator Primary ..... 3.0	Second I. F. Primary ..... 85.0	Power Transformer Secondary
Ant. Secondary ..... 4.0	Oscillator Secondary ..... 1.5	Second I. F. Secondary ..... 85.0	"B" Filter Choke ..... 240-CT-210=450
R. F. Primary ..... 113.0	First I. F. Primary ..... 115.0	Output Transformer Primary ..... 330	Speaker Field Coil ..... 4.0
R. F. Secondary ..... 4.0	First I. F. Secondary ..... 115.0	Output Transformer Secondary ..... .05	Speaker Voice Coil ..... 3.0

MODEL 27

Chassis Layouts

NOBLITT SPARKS INDUSTRIES

C15 #17-4712  
 .35 MFD. 400V.  
 C7 #17-2064  
 100M MFD. 600V.  
 T3 #00-4512  
 OSCILLATOR COIL  
 C9 #17-4292  
 .001 MFD. 600V.  
 6A7 TUBE  
 T2 #00-4911  
 RADIO FREQUENCY COIL

ANTENNA CONNECTOR

T1 #00-4510  
 ANTENNA COIL  
 R3 #17-2068  
 100MΩ 1/4 WATT  
 C13A-C13B #17-4712  
 1-1 MFD. 15V.  
 C17A-C17B #17-4731  
 .05-.05 MFD. 160V.  
 78 TUBE

R16 #17-4753  
 50MΩ 1 WATT  
 R26 #17-4781  
 600Ω 1/4 WATT  
 R24 #17-2065  
 1000Ω 1/4 WATT  
 R3 #17-2068  
 100MΩ 1/4 WATT

R23 #17-3011  
 250MΩ 1/4 WATT  
 C16 #17-4716  
 0.1 MFD. 600V.  
 C12 #17-4711  
 25 MFD. 400V.

C26 #17-4759  
 .006 MFD. 600V.  
 4-1 TUBES

8-4 TUBE

C20A-C20B #17-4703  
 4-12 MFD. ELECT. 500V.

X3 #00-4516  
 "A" INPUT CHOKE  
 C22A-C22B #17-4193  
 .02-.02 MFD. 1000V.

R7 #17-2072  
 20MΩ 1/4 WATT

P3 LOCAL-DISTANCE CONTROL PLUG  
 C25 #17-4741  
 .003 MFD. 600V.  
 C5 #17-4700  
 .0011 MFD. 600V.  
 C4 #17-4726  
 .0022 MFD. PADDER

S2 TONE-PILOT  
 S3 LOCAL-DISTANCE #17-4375

R11 #17-4202  
 2000Ω 1/4 WATT

T4 #00-4517  
 1ST. IF TRANS.  
 C6 #17-2063  
 .002 MFD. 600V.  
 C8 #17-2211  
 .0005 MFD. 600V.  
 R2 #17-2080  
 1 MEG. 1/4 WATT  
 78 TUBE

R13 #17-2067  
 75MΩ 1/4 WATT  
 C18A-C18B #17-4707  
 12-12 MFD. ELECT. 25V.  
 T5 #00-4514  
 2ND. IF TRANS.

C10 #17-4702  
 .05 MFD. 160V.  
 R6 #17-2071  
 5000Ω 1/4 WATT  
 75 TUBE

R4 #17-2069  
 200MΩ 1/4 WATT  
 R17 #17-4719  
 250Ω 2 WATT  
 V #17-4732

VIBRATOR

R14 #17-4287  
 200Ω 1/4 WATT  
 T7 #00-4746  
 POWER TRANSFORMER  
 C24 #17-4709  
 1.0 MFD. 15V.  
 C23 #17-4708  
 .5 MFD. 15V.

X4 #00-4515  
 FILAMENT CHOKE

C6 #17-2063  
 .002 MFD. 600V.  
 X5 #00-4782  
 SUPPRESSION CHOKE

T4 #00-4517  
 1ST IF TRANS.  
 78 TUBE

C19A-C19B #17-4707  
 12-12 MFD. ELECT. 25V.

R25 #17-4152-3  
 500MΩ VOL. CONT.  
 R5 #17-2070  
 500MΩ 1/4 WATT  
 T5 #00-4514  
 2ND. IF TRANS.

C4 #17-4726  
 .00022 MFD. PAD.

C10 #17-4702  
 .05 MFD. 160V.

T6 #00-4756  
 OUTPUT TRANS.

75 TUBE

V #17-4732  
 VIBRATOR

X2 #00-4754  
 "B" FILTER CHOKE

C23 #17-4708  
 .5 MFD. 15V.

C24 #17-4709  
 1.0 MFD. 15V.

C15 #17-4714  
 15 MFD. 400V.

T2 #00-4511  
 RADIO FREQUENCY COIL

T1 #00-4510  
 ANTENNA COIL

C1-C2-C3 #17-4725  
 3 GANG TUNING COND.

T3 #00-4512  
 OSCILLATOR COIL

6A7 TUBE  
 78 TUBE

TEST +B HERE

C12 #17-4711  
 25 MFD. 400V.

C16 #17-4715  
 1 MFD. 600V.

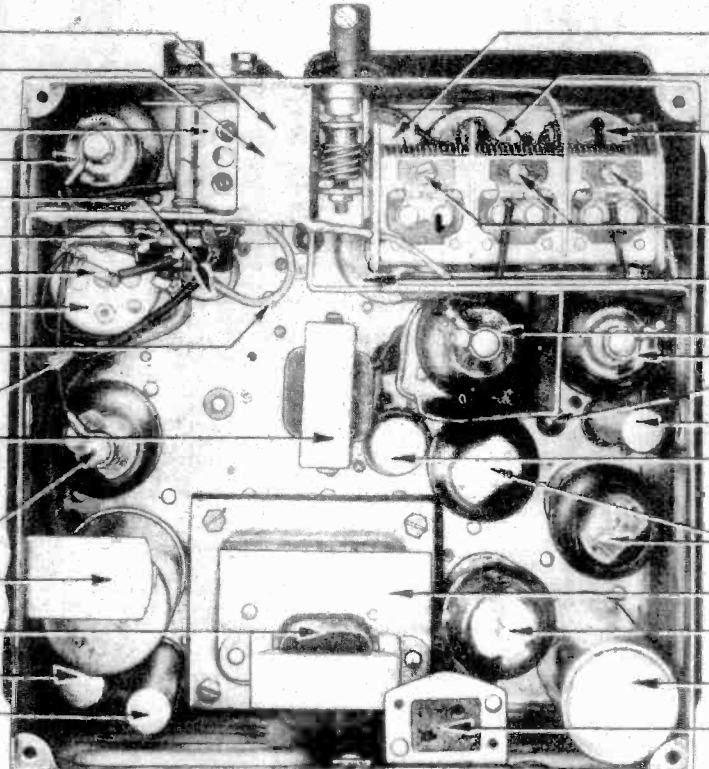
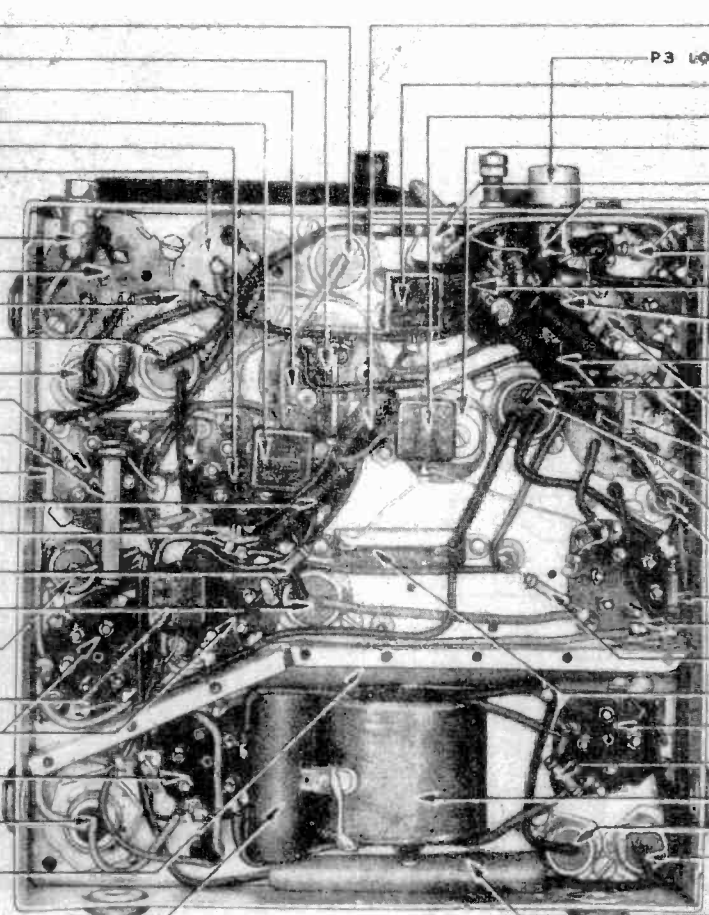
4-1 TUBES

T7 #00-4746  
 POWER TRANSFORMER

8-4 TUBE

C20A-C20B #17-4703  
 4-12 MFD. ELECT. 500V.

S1 #17-4761  
 SPEAKER SOCKET

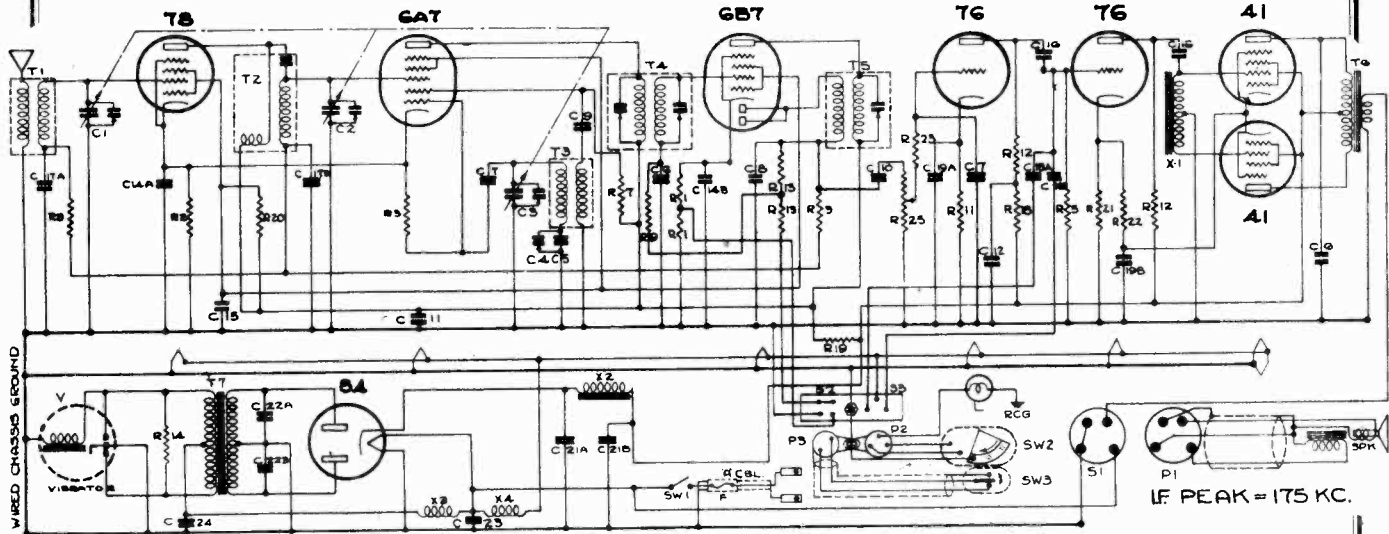


NOBLITT SPARKS INDUSTRIES

MODEL 37  
Schematic, Voltage  
Resistances, Parts

SCHMATIC CIRCUIT DIAGRAM  
ARVIN CAR RADIO MODEL-37

For Changes,  
see Index



RESISTORS				CONDENSERS				CHOKES & TRANSFORMERS				MISCELLANEOUS UNITS						
QTY	VAL	PART NO/PRICE	QTY	VAL	PART NO/PRICE	QTY	VAL	PART NO/PRICE	QTY	VAL	PART NO/PRICE	SYMBOL	DESCRIPTION	PART NO				
2	500K	1T-4762	20	10	50P	1T-4720	25	1	3 GANG	1T-4728	450	16	10	00-4510	80	SPK	SPEAKER	1T-4234
2	500K	1T-4762	20	10	50P	1T-4720	25	1	3 GANG	1T-4728	450	16	10	00-4511	100	V	VIBRATOR	1T-4752
3	100M	1T-2068	20	20	25M	1T-4722	25	3	4	0002Z	PRD 1T-4726	40	5A	00-4512	85	RCG	REMOTE CONTROL GROUND	SEE R25
4	500K	1T-2070	20	22	300	1T-4724	30	4	0011	600 1T-4704	30	86	05	00-4515	1.75	SW 1	VOLUME CONTROL SWITCH	SEE R25
5	20M	1T-2072	20	24	2500M	1T-5011	30	5	002	600 1T-2064	20	98	12.0	00-4514	1.75	SW 2	TONE CONTROL SWITCH	SEE R25
6	1M5	1T-2000	20	24	2500M	1T-4804	1.00	6	0005	600 1T-2111	20	98	12.0	00-4750	1.85	SW 3	LOCAL-DISTANCE SWITCH	SEE R25
7	500	1T-2076	20	27	10	05	10	7	001	600 1T-4292	20	208	2.0	00-4747	300	S-1	SPEAKER SOCKET	1T-4447
8	1M5	1T-2000	20	24	2500M	1T-4804	1.00	8	001	600 1T-4702	30	21A	12.0	00-4750	1.60	S-2	DIAL-LITE - TONE SOCKET	1T-4575
9	500	1T-2076	20	27	10	05	10	9	001	400 1T-4710	115	21B	12.0	00-4750	1.60	S-3	LOCAL-DIST. CONTROL SOCKET	1T-4576
10	500	1T-2076	20	27	10	05	10	10	05	400 1T-4711	35	22A	02	00-4750	1.60	P-1	SPEAKER PLUS	1T-4458
11	2M	1T-4202	20	28	10	05	10	11	40	15 1T-4715	95	24	1.0	00-4747	300	P-2	DIAL-LITE - TONE PLUS	1T-4577
12	10M	1T-4275	20	28	10	05	10	12	.25	400 1T-4710	115	21B	12.0	00-4750	1.60	P-3	LOCAL-DIST. CONTROL PLUS	1T-4740
13	75M	1T-2081	20	30	100M	VAR. BAL. VAR. FROM 150K TO 500K	1.00	13	75M	15 1T-4715	95	24	1.0	00-4747	300	L	DIAL LITE G-8 VOLT	1T-2145
14	200	1T-4267	20	32	CONTROL DENSITY	150K TO 500K	1.00	14	200	400 1T-4711	35	22A	02	00-4747	300	F	FUSE - 20 AMPERE	1T-2718
15	10	10	10	10	10	10	10	15	.15	400 1T-4714	35	24	1.0	00-4747	300	A.CBL	'A' CABLE	00-4002

SOCKET VOLTAGES

Make voltage tests with at least 1000 ohm per volt meter. Voltages given in table are only comparative due to variance in battery voltage. Plus or minus 20% on all voltages is acceptable.

Tube	Heaters	Plate	Screen	Cathode	Suppressor	Anode Grid 1500 KC	Osc. Grid 1500 KC
78	5.8	170	75	4.0	4.2	135	5-10
6A7	5.8	170	75	4.0	—	—	—
6B7	5.8	100	—	4.7	—	—	—
1st 76	5.8	165	—	5.3	—	—	—
2nd 76	5.8	230	235	18.0	—	—	—
41	5.8	230	235	18.0	—	—	—
41	5.8	260 (AC)	—	245	—	—	—

POINT TO POINT RESISTANCES

All readings taken to ground unless otherwise specified. Readings taken with all tubes, vibrator and speaker removed from set.

<b>78</b>	<b>6A7</b>	<b>6B7</b>	<b>1st 76</b>
+ Heater ..... Inf.	+ Heater ..... Inf.	+ Heater ..... Inf.	+ Heater ..... Inf.
- Heater ..... 0	- Heater ..... 0	- Heater ..... 0	- Heater ..... 0
Plate to B+ ..... 5,113	Plate to B+ ..... 5,093	Plate to B+ ..... 5,085	Plate to B+ ..... 60,000
Screen to B+ ..... 30,000	Screen to B+ ..... 30,000	Screen to B+ ..... 30,000	Cathode ..... 2,000
Suppressor Grid ..... 400	Anode Grid to B+ ..... 25,000	†Diodes ..... 150,250	Control Grid V. C. on ..... 750,000
Cathode ..... 400	Oscillator Grid ..... 100,400	Cathode ..... 500	Control Grid V. C. off ..... 500,000
†Control Grid ..... 1,250,250	Cathode ..... 400	†Control Grid ..... 1,075,250	
	†Control Grid ..... 1,150,250		
<b>2nd 76</b>	<b>41</b>	<b>41</b>	<b>84</b>
+ Heater ..... Inf.	+ Heater ..... Inf.	+ Heater ..... Inf.	+ Heater ..... Inf.
- Heater ..... 0	- Heater ..... 0	- Heater ..... 0	- Heater ..... 0
Plate to B+ ..... 10,000	Plate to B+ ..... 250	Plate to B+ ..... 220	Plate ..... 240
Screen to B+ ..... 100	Screen to B+ ..... 0	Screen to B+ ..... 0	Plate to Plate ..... 210
Cathode ..... 500,000	Cathode ..... 400	Cathode ..... 400	Plate to Plate ..... 450
Control Grid ..... 500,000	Control Grid ..... 750	Control Grid ..... 680	Cathode to B+ ..... 165

† Add 250 Ω to these readings when sensitivity switch is on "Distance" position.

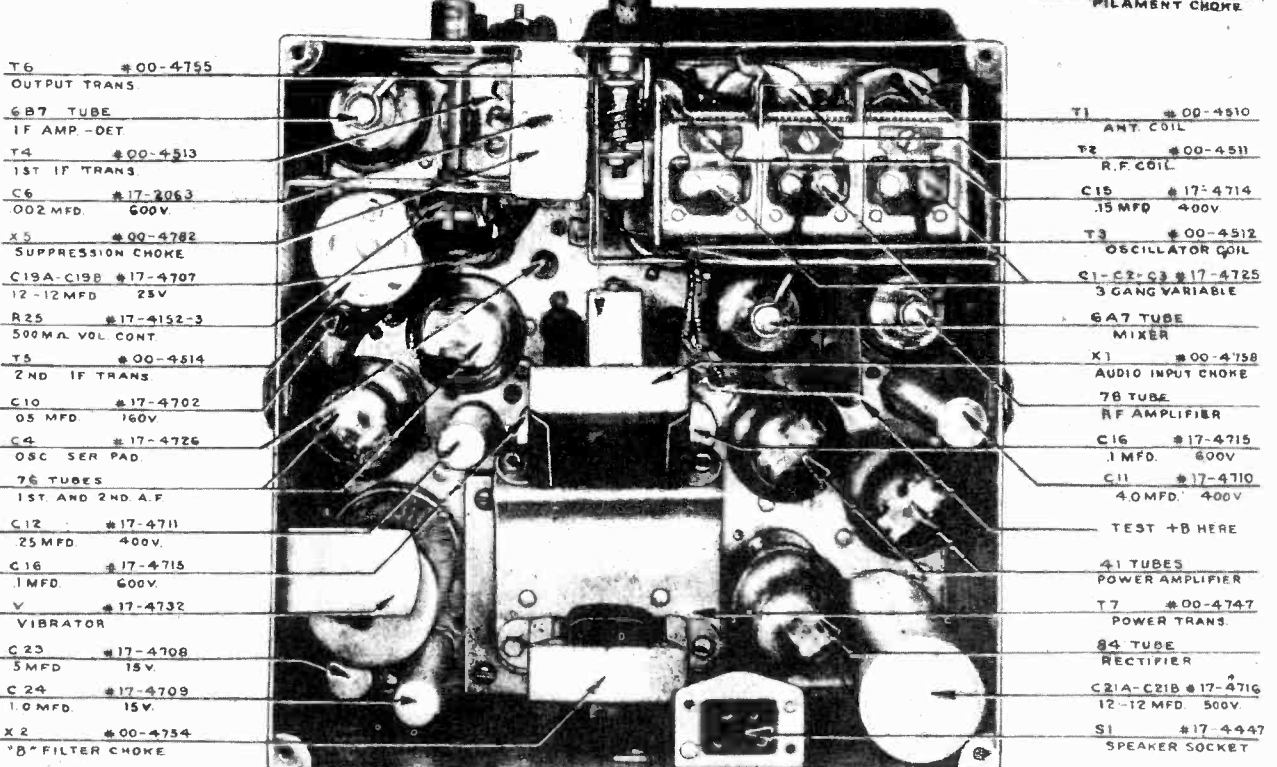
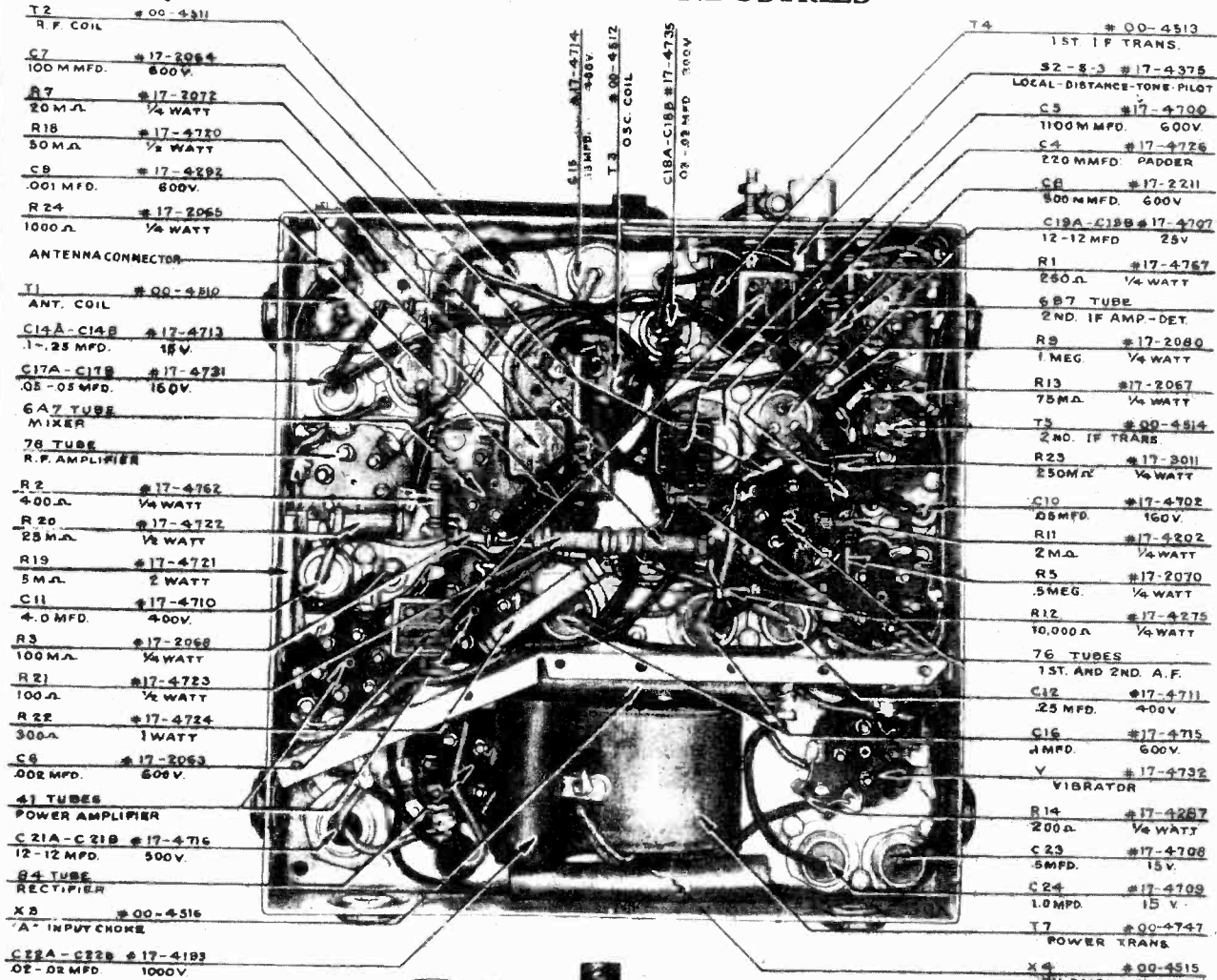
COIL RESISTANCES

Ant. Primary ..... 12.0	Oscillator Secondary ..... 1.5	Output Transformer Primary ..... 165
Ant. Secondary ..... 4.0	First I. F. Primary ..... 93.0	250-CT-220=470
R. F. Primary ..... 113.0	First I. F. Secondary ..... 93.0	Output Transformer Secondary ..... 0.4
R. F. Secondary ..... 4.0	Second I. F. Primary ..... 85.0	Power Transformer Secondary ..... 2.5
Oscillator Primary ..... 3.0	Second I. F. Secondary ..... 85.0	240-CT-210=450
		"B" Filter Choke ..... 165
		Audio Input Choke ..... 750-CT-480=1430
		Speaker Field Coil ..... 4.0
		Speaker Voice Coil ..... 2.5

MODEL 37

Chassis Layouts

NOBLITT SPARKS INDUSTRIES



NOBLITT SPARKS INDUSTRIES

MODELS 17, 17A, 27, 37  
Alignment, Parts  
MODEL 37  
Changes

MODEL NO. 37

MODELS 17-17A-27-37

5. C6—002 mfd mica condenser has been inserted ahead of X5 suppression choke and connected from battery side of X5 to ground.

6. Dial light, part No. 17-2145 (with screw base), has been changed to dial light, part No. 17-4857 (with bayonet base).

7. Battery cable assembly, 00-4200-2. Part number changed to 00-4776.

8. It was found in the field that in some instances motor noise entered the receiver where the local-distance plug and tone control plug were attached. A change in the mechanical design which eliminated this difficulty was made beginning with those sets from which the louvers were omitted.

SPECIAL NOTE:

All 1935 Arvin Car Radios may be balanced for a maximum of 1720 kilocycles to cover some of the police bands in that region. The following procedure is necessary:

1. Rotate condenser fully out of mesh. Connect oscillator to antenna lead and set to 1720 K. C.
2. Adjust oscillator trimmer until maximum signal is obtained.
3. Set oscillator input to 1400 K. C. and turn dial until signal is tuned in.
4. Adjust R. F. and antenna trimmer for maximum output.

For remainder of balancing procedure follow instructions exactly as directed for standard adjustment in 7 and 8. With adjustment for 1720 K. C. maximum, the dial will not read accurately for all frequencies above 1000 kilocycles.

1. R3—100,000 ohm 1/4 watt (17-2068) resistor in 6A7 No. 1 grid circuit has been changed to R29—50,000 ohm 1/4 watt (17-2060).

2. R24—1,000 ohm 1/4 watt resistor has been inserted in 6A7 No. 1 grid circuit.

3. R2—400 ohm 1/4 watt resistor has been changed to R26—600 ohm 1/4 watt. Allowable variation on R2 was from 200 to 600 ohms. Allowable variation on R26 is from 500 to 700 ohms.

4. X5 suppression choke, 00-4782, has been added in "A" line.

1. Remove front cover, connect oscillator to grid cap of 6A7 tube. Set to 175 K. C. (Set volume control full on for all adjustments.) Adjust output of oscillator until output meter begins to read.

2. With a screwdriver adjust the 2nd. I. F. trimmer for maximum output.

3. Adjust 1st. I. F. trimmers (inside screw and outer box nut also) for maximum output.

4. Connect oscillator to antenna lead; set to 1400 K. C.

5. Turn variable condenser fully out of mesh; set dial pointer to 1620 K. C. Then turn control knob until pointer is at 140.

6. Adjust oscillator trimmer until signal is received. Then adjust R. F. and antenna trimmers for maximum output.

7. Set sensitivity control in "full sensitivity position." Set dial to 600 K. C. Adjust series padder for maximum hiss. (Circuit noise.)

8. Connect set to car aerial and tune in a very weak station 120 to 150 on dial. Adjust antenna trimmer only.

PART NO.	MISCELLANEOUS DESCRIPTION	PRICE
17-4294	Spark Plug Suppressor	.40
17-4295	Distributor Suppressor	.50
17-4701	Generator	.50
00-4743	Dome Light Filter	.60
00-4529	Ground Clamps	1.00
17-4772	Dial Light 6-8 Volts	4.00
17-4772	Vibrator (4 prong)	4.00
17-4236	8" Speaker Cone Assembly (in carton)	1.80
17-4235	6" Speaker Cone Assembly (in carton)	1.20
17-4232	Speaker Assembly (17)	5.50
17-4233	Speaker Assembly (27)	8.50
17-4237	Speaker Assembly (17A)	4.50
17-4237	Speaker Assembly (17A)	4.50
22-1490	Stud and Nut (Set Mounting)	.10
12-565		.15
23-1097	Stud and Nut (Speaker Mounting) Model 37	.15
23-4263		.60
29-4664	Carton—17 or 27	.96
29-4665	Carton—37	1.15
17-2043	78 Socket	.15
17-2048	6A7 Socket	.15
17-2049	6A7 Socket	.15
17-2044	75 Socket	.15
17-2045	41 Socket	.15
17-2047	84 Socket	.15
17-4734	76 Socket	.15
17-4736	Vibrator Socket	.15
10-4804	Speaker Front Screw, per dozen	.10
10-4810	Flex Shaft Set Screw, per dozen	.10
10-4811	No. 8x 1/4 Self Tapping Screw, Hex Head, per dozen	.10
10-4844	No. 8x 1/4 Self Tapping Screw, Briding Head, dozen	1.00
29-4850	Worm Gear Drive Assembly	1.00

REMOTE CONTROL PARTS

29-4679	Remote Control (17A) Without Bracket or Housing	2.75
29-4678	Remote Control (17) Without Bracket or Housing	2.75
29-4549	Remote Control (37) Without Bracket or Housing	2.75
29-4548	Remote Control (27) Without Bracket or Housing	2.75
29-4531	Streamline Housing (27—37)	.60
29-4532	Metal Housing (Model 17 only)	.25
29-4533	Eye Bolt and Nut	.10
29-4534	Strap	.06
29-4535	Tuning Knob—Walnut Bakelite	.10
29-4536	Tuning Knob—Ivory	.10
29-4537	Local Distance or Tone Control Knob	.15
29-4538	Steering Column Bracket	.20
29-4539	Steering Column Bracket	.20
29-4538	Porcelain Taupé Tuning Knob (17A)	.10

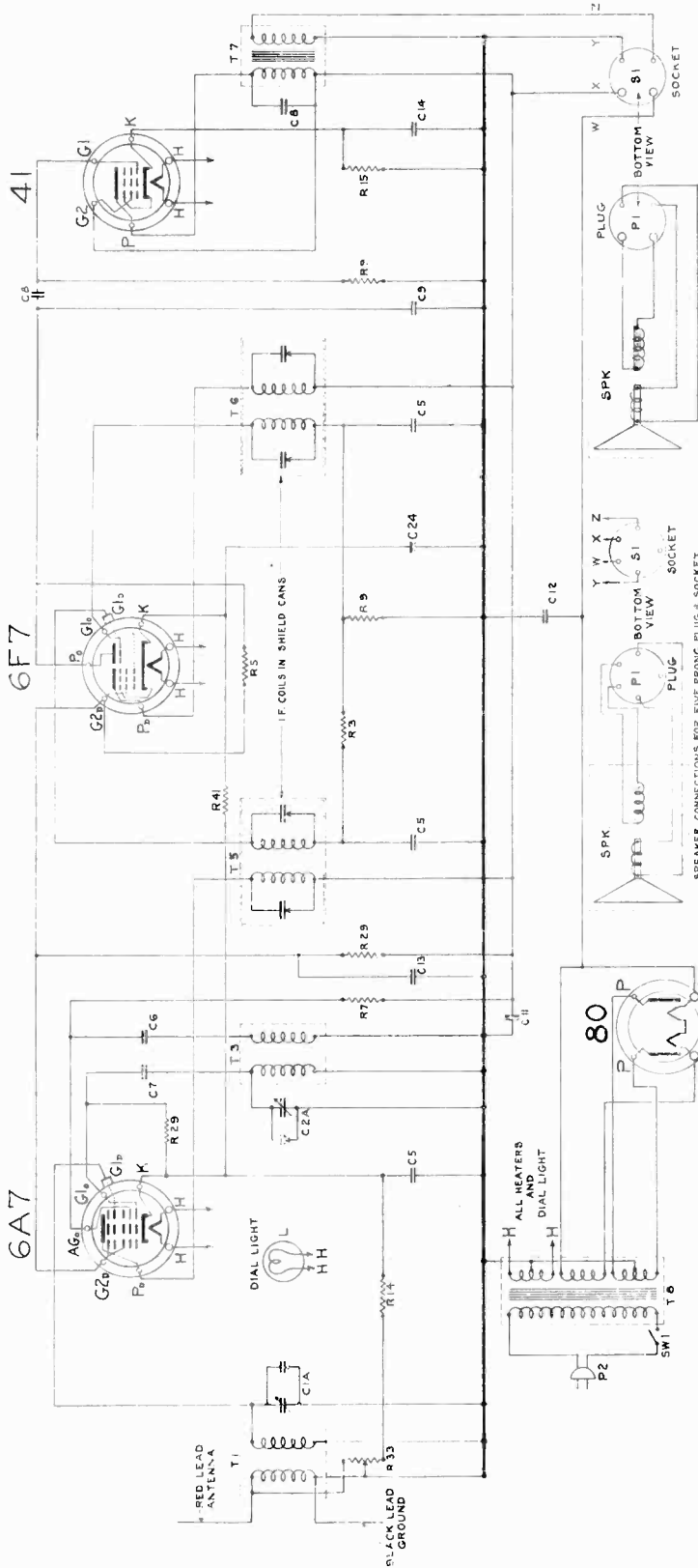
FLEXIBLE SHAFTS

00-4641	Condenser Drive 6" length	.45
00-4642	Condenser Drive 9" length	.50
00-4643	Condenser Drive 12" length	.70
00-4644	Condenser Drive 18" length	.70
00-4645	Condenser Drive 21" length	.85
00-4646	Condenser Drive 24" length	.95
00-4647	Condenser Drive 30" length	1.00
00-4648	Condenser Drive 36" length	1.40
00-4651	Volume Control Drive 6" length	.45
00-4652	Volume Control Drive 9" length	.50
00-4653	Volume Control Drive 12" length	.60
00-4654	Volume Control Drive 15" length	.70
00-4655	Volume Control Drive 18" length	.85
00-4656	Volume Control Drive 21" length	.85
00-4657	Volume Control Drive 24" length	1.00
00-4658	Volume Control Drive 30" length	1.20
00-4659	Volume Control Drive 36" length	1.40

MODEL 41  
Schematic, Parts

NOBLITT SPARKS INDUSTRIES

SCHEMATIC CIRCUIT DIAGRAM  
ARVIN HOME RADIO ~ MODEL 41



RESISTORS		CONDENSERS		CHOKES & TRANSFORMERS		MISCELLANEOUS UNITS	
R	OHMS/W	C	CAPACITY/VOLT	T	TYPE	SYMBOL	DESCRIPTION
1	100 M	2A	TUNING	1	ANTENNA COIL	SW 1	DYNAMIC SPEAKER
2	22	3A	4	2	OSCILLATOR	S1	VOLUME CONTROL SWITCH (SEE R 33)
3	100 M 1/4	4	5	3	FIRST I.F. COIL	P1	SPEAKER SOCKET
4	5	5	6	4	SECOND I.F. COIL	P2	DIAL LIGHT
5	500 M 1/4	6	7	5	POWER TRANSF		POWER CORD PLUG
6	20 M 1/4	7	8	6	CHOKES		
7	20 M 1/4	8	9	7	CHOKES		
8	20 M 1/4	9	10	8	CHOKES		
9	1 MEG 1/4	10	11	9	CHOKES		
10	10 M	11	12				
11	10 M	12	13				
12	10 M	13	14				
13	10 M	14	15				
14	200	15	16				
15	500	16	17				
16	10 M	17	18				
17	10 M	18	19				
18	10 M	19	20				
19	10 M						
20	10 M						

I.F. PEAK 456 K.C.  
BALANCE 1500 K.C.

NOBLITT SPARKS INDUSTRIES

MODEL 45  
Above Serial E403561  
Voltage, Resistances

NOTE: The following values are correct for all Arvin Car Radios, Model 35, beginning with and including Serial No. E403561.

MODEL 45 SOCKET VOLTAGES

Make voltage tests with 1000 ohm per volt meter. Voltages given in table are only comparative due to variance in battery voltage. Plus or minus 20% on all voltages is acceptable.

Tube	Heaters	Plate	Screen	Cathode	Suppressor	Control
78	6.3	250	60	1.6	2.2	*2.0
77	6.3	250	60	2.2	2.2	*2.2
78	6.3	250	60	1.6	1.6	*1.4
37	6.3	60	—	0	—	*6—1500 KC
75	6.3	135	—	1.3	—	*1.3
75	6.3	135	—	1.3	—	*1.3
41	6.3	245	250	18	—	*18
41	6.3	245	250	18	—	*18
84	6.3	275 (AC)	—	255	—	—

\* Measured with vacuum tube voltmeter only.

MODEL 45 POINT TO POINT RESISTANCE CHECK

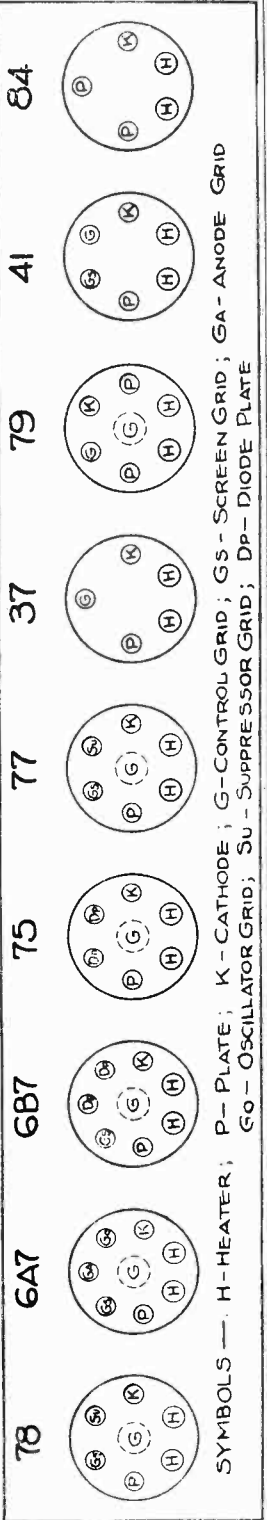
All readings to ground unless otherwise specified. Readings taken with all tubes, vibrator and speaker removed from set and R. F. chassis disconnected from power pack unit.

1st 78	Inf.	2nd 78	Inf.	37	Inf.
+ Heater	0	+ Heater	0	+ Heater	0
- Heater	50	- Heater	100	- Heater	0
Plate to B+	25,000	Plate to B+	60,000	Plate to B+	60,000
Screen Grid to B+	500	Screen Grid to B+	3,000	Screen Grid to B+	50,000
Suppressor Grid	500	Suppressor Grid	3,000	Control Grid	50,000
Cathode	1,600,000	Cathode	3,000	Cathode	0
Control Grid	—	Control Grid	500	Control Grid	—
75	Inf.	75	Inf.	41	Inf.
+ Heater	0	+ Heater	0	+ Heater	0
- Heater	250,000	- Heater	250,000	- Heater	0
Plate to B+	500,000	Plate to B+	500,000	Plate to B+	0
Diode	500,000	Diode	500,000	Screen Grid to B+	0
Diode	2,500	Diode	500,000	Control Grid	508,000
Cathode	8000	Cathode	2,500	Cathode	400
Control Grid	—	Control Grid	500,000	Control Grid	—
84	Inf.	V. C. on	500,000	V. C. off	250,000
+ Heater	0	V. C. off	250,000	Ant. Primary	2
- Heater	190	Ant. Secondary	6	Ant. Secondary	100
Plate	160	R. F. Primary	50	1st I. F. Primary	100
Plate to Plate	350	R. F. Secondary	6	2nd I. F. Primary	82
Cathode	Inf.†	Osc. Primary	2	2nd I. F. Secondary	82
		Osc. Secondary	7	Primary Output Transformer	600
				Voice Coil	35

COIL RESISTANCES

1st I. F. Primary	100
1st I. F. Secondary	100
2nd I. F. Primary	82
2nd I. F. Secondary	82
Primary Output Transformer	600
Voice Coil	35

LOOKING AT BOTTOM OF TUBE SOCKETS



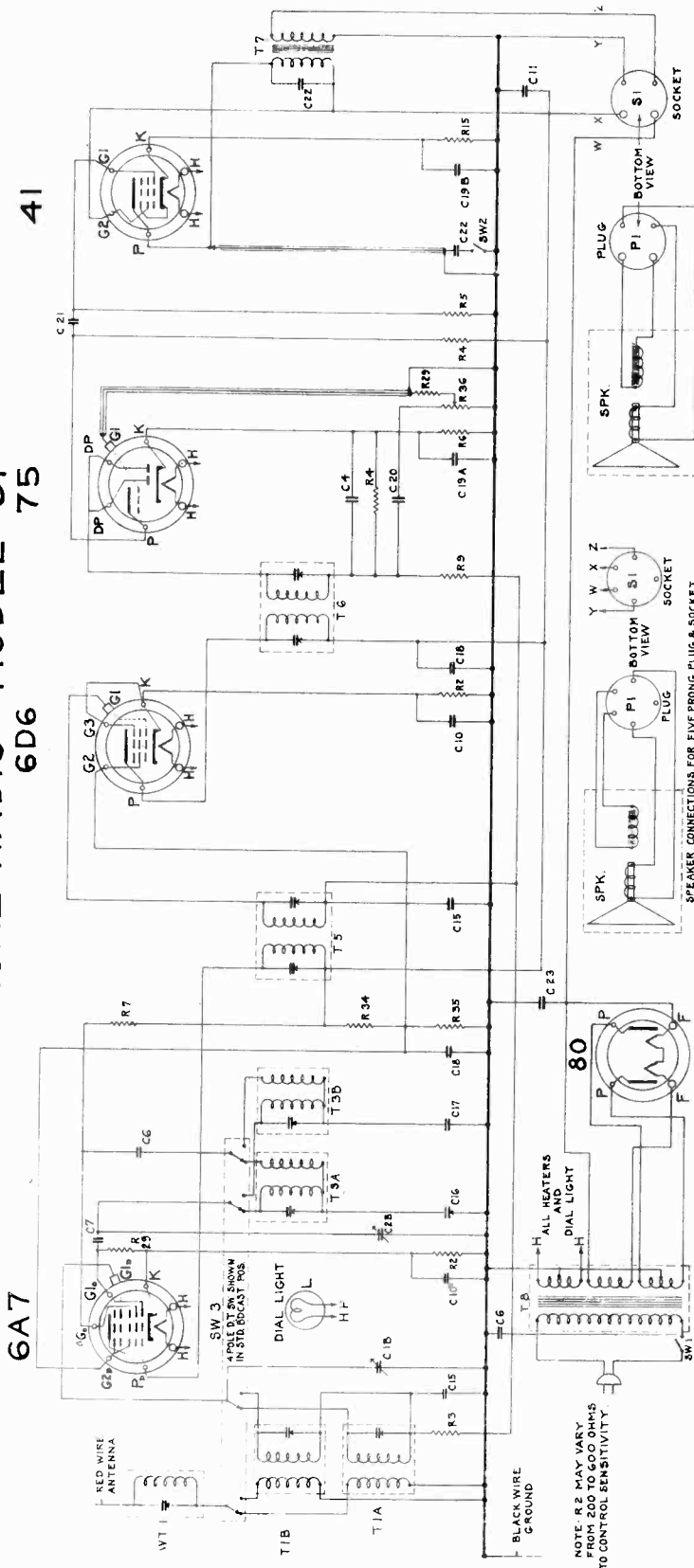
SYMBOLS — H - HEATER; K - CATHODE; G - CONTROL GRID; GS - SCREEN GRID; GA - ANODE GRID  
G0 - OSCILLATOR GRID; Su - SUPPRESSOR GRID; DP - DIODE PLATE



MODEL 51  
Schematic, Parts

NOBLITT SPARKS INDUSTRIES

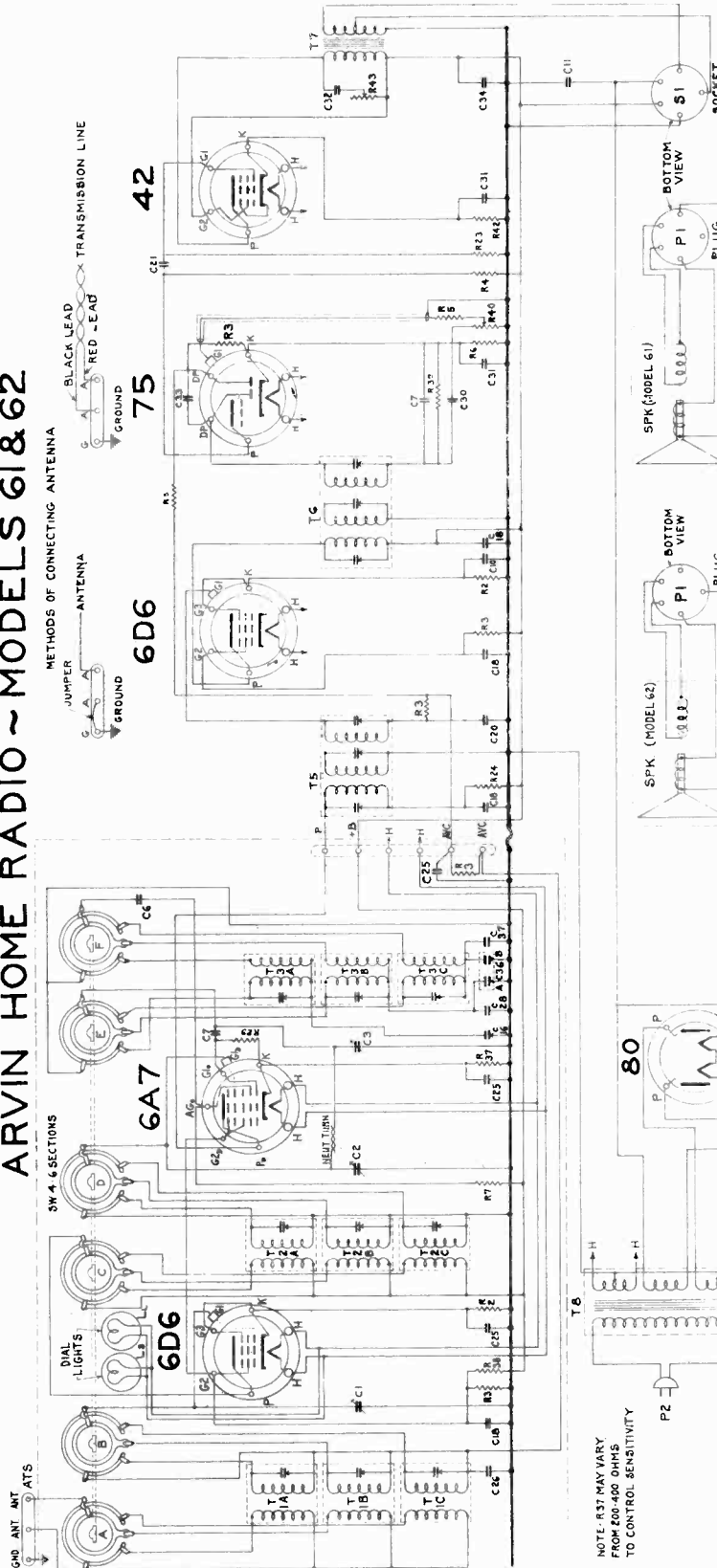
SCHEMATIC CIRCUIT DIAGRAM  
ARVIN HOME RADIO ~ MODEL 51  
6D6 75



RESISTORS		CONDENSERS		CHOSES & TRANSFORMERS		MISCELLANEOUS UNITS	
R	OHMS W PART NO PRICE	R	OHMS W PART NO PRICE	T	TRANSFORMERS	W	WAVE TRAP
1	400 1/4 17-4762	1B	2 GANG	20	5000 STAP 200 17-14027	SW1	VOLUME CONTROL SWITCH (SEE P. 34)
2	200M 1/4 17-5065	2B	TUNING	21	02MFLCMT 600 17-14006	SW2	DIAL LIGHT PLUG
3	500M 1/4 17-5070	3B	1005 MICA	22	01 600 17-14043	SW3	5 BAND CONTROL SWITCH
4	500M 1/4 17-5071	4	.002 MICA	23	12 WET LECT. 475 17-14000	PI	SPEAKER PLUG (FURNISHED WITH SPK.)
5	500M 1/4 17-5072	5	.005 MICA	1	1-A STD BRST ANT. COIL 00-13219	P1	DIAL LIGHT PLUG
6	500M 1/4 17-5073	6	.002 MICA	2	1-B S.W. ANT. COIL 00-13221	P2	5 BAND CONTROL SWITCH
7	20M 1/4 17-2071	7	.001	3	STD BOKAST OSCILLATOR 00-13220	SW2	5 BAND CONTROL SWITCH
8	1 MEG 1/4 17-2080	8	1000	3B	5B S.W. 00-13222	SW3	5 BAND CONTROL SWITCH
9	1 MEG 1/4 17-2080	9	1000	4	5B S.W. 00-13222		
10	1 MEG 1/4 17-2080	10	1000	5	1ST I.F. COIL 00-13200		
11	1 MEG 1/4 17-2080	11	1000	6	2ND I.F. COIL 00-13201		
12	1 MEG 1/4 17-2080	12	1000	7	3RD I.F. COIL 00-13202		
13	1 MEG 1/4 17-2080	13	1000	8	POWER TRANSF. 00-13208		
14	1 MEG 1/4 17-2080	14	1000				
15	500 1/2 17-4717	15	500 MLD 200 17-14036				
16	500 1/2 17-4717	16	PAPER 100 17-14037				
17	500 1/2 17-4717	17	1005 MICA 600 17-14039				
18	500 1/2 17-4717	18	1005 MICA 600 17-14040				
19	500 1/2 17-4717	19A	1500M V.C 17-14005				
20	500 1/2 17-4717	19B	TWIN 25 17-4707				

NOBLITT SPARKS INDUSTRIES

SCHEMATIC CIRCUIT DIAGRAM  
ARVIN HOME RADIO ~ MODELS 61 & 62



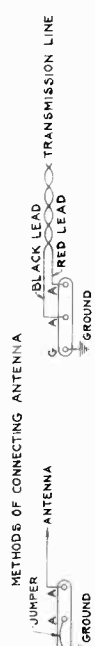
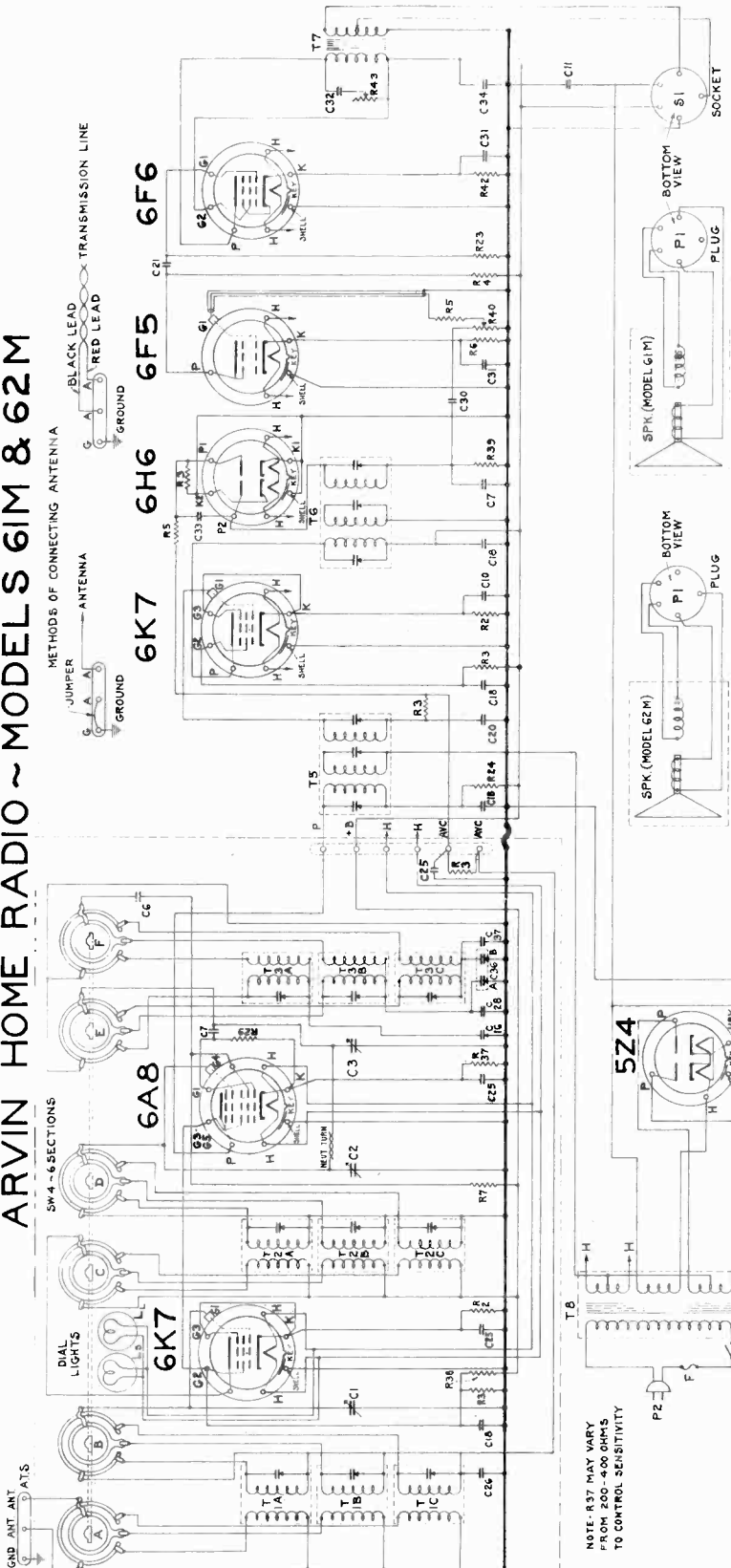
RESISTORS		CONDENSERS		CHOKES & TRANSFORMERS		MISCELLANEOUS UNITS	
R	OHMS/W	C	CAPACITY/VOLT	T	TYPE	SYMBOL	DESCRIPTION
1	400 1/4 W	1	3 GANG TUNING	1A	55.18 M.C. ANT. COIL	SPK	DYNAMIC SPEAKER - MODEL G1
2	100 M 1/4 W	2	02 CAN	1B	18.55 M.C. ANT. COIL	SW 1	DYNAMIC SPEAKER - MODEL G2
3	100 M 1/4 W	3	02 CAN	1C	55.18 M.C. ANT. COIL	SI	TOUCH CONTROL & POWER SWITCH (SEE R43)
4	200 M 1/4 W	4	02 MICA	2A	18.55 M.C. R.F. COIL	P1	TOUCH CONTROL & POWER SWITCH (SEE R43)
5	500 M 1/4 W	5	02 MICA	2B	55.18 M.C. R.F. COIL	P2	SPEAKER SOCKET
6	200 M 1/4 W	6	02 MICA	3A	18.55 M.C. OSCILL.	P3	SPEAKER PLUG - FURNISHED WITH SPK
7	200 M 1/4 W	7	02 MICA	3B	55.18 M.C. OSCILL.	P4	TOUCH CONTROL & POWER SWITCH (SEE R43)
8	200 M 1/4 W	8	02 MICA	3C	18.55 M.C. OSCILL.	P5	TOUCH CONTROL & POWER SWITCH (SEE R43)
9	200 M 1/4 W	9	02 MICA	4	18.55 M.C. OSCILL.	SW 4-F	6 SECTION WAVE BAND SWITCH WAFER
10	200 M 1/4 W	10	02 MICA	5	55.18 M.C. OSCILL.	LL	DIAL LIGHT
11	200 M 1/4 W	11	02 MICA	6	18.55 M.C. OSCILL.	ATS	ANTENNA TERMINAL STRIP
12	200 M 1/4 W	12	02 MICA	7	55.18 M.C. OSCILL.		
13	200 M 1/4 W	13	02 MICA	8	18.55 M.C. OSCILL.		
14	200 M 1/4 W	14	02 MICA				
15	200 M 1/4 W	15	02 MICA				
16	200 M 1/4 W	16	02 MICA				
17	200 M 1/4 W	17	02 MICA				
18	200 M 1/4 W	18	02 MICA				
19	200 M 1/4 W	19	02 MICA				
20	200 M 1/4 W	20	02 MICA				
21	200 M 1/4 W	21	02 MICA				
22	200 M 1/4 W	22	02 MICA				
23	250 M 1/4 W	23	02 MICA				

IF PEAK 456 K.C.  
BALANCE 15 M.C. PAD 60 M.C.  
BALANCE 47 M.C. PAD 19 M.C.  
BALANCE 15 M.C. CHECK 60 M.C.

MODELS 61M, 62M  
Schematic, Parts

NOBLITT SPARKS INDUSTRIES

SCHEMATIC CIRCUIT DIAGRAM  
ARVIN HOME RADIO ~ MODELS 61M & 62M



NOTE: R37 MAY VARY FROM 200-400 OHMS TO CONTROL SENSITIVITY

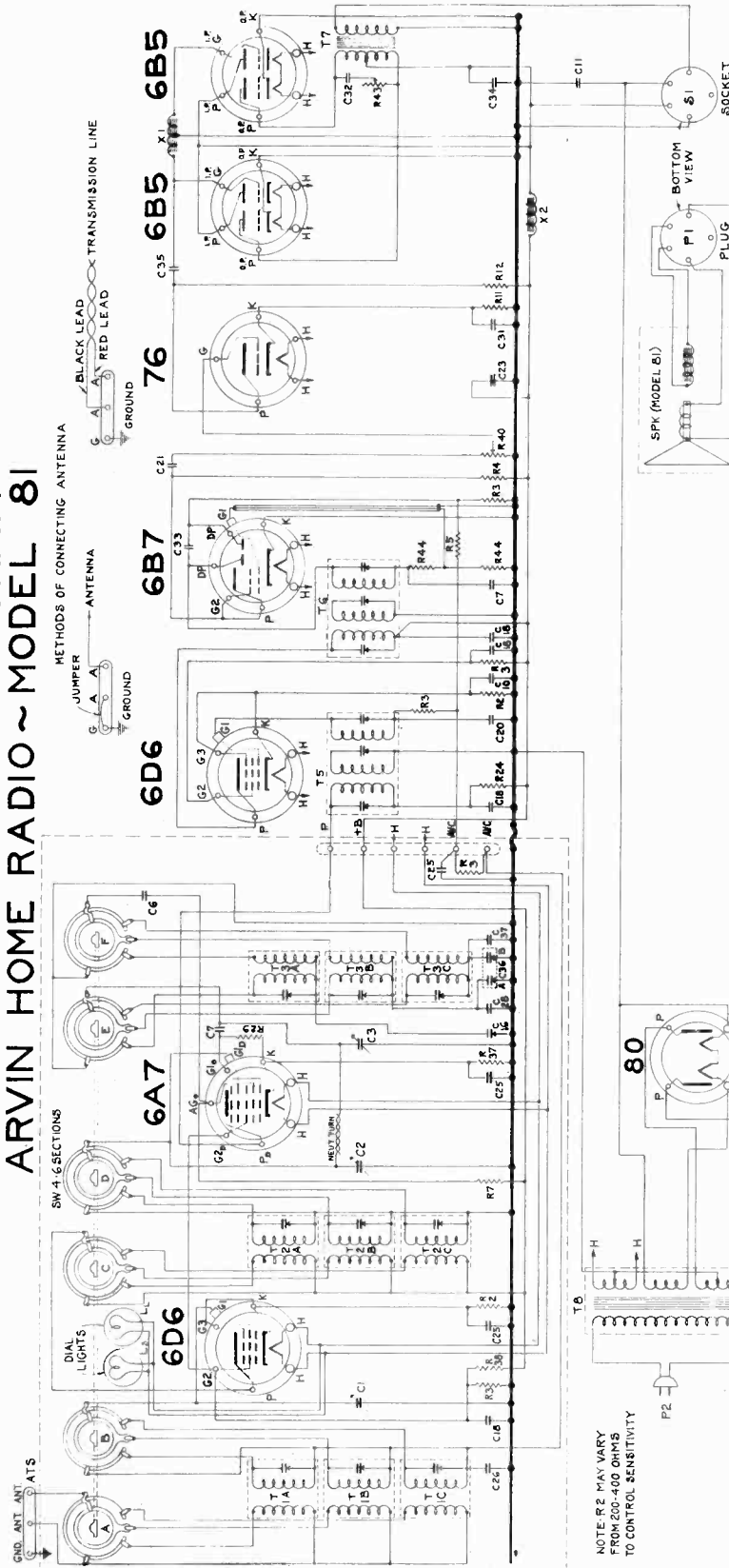
RESISTORS		CONDENSERS		CHOKES & TRANSFORMERS		MISCELLANEOUS UNITS	
R	OHMS/W PART NO/PRICE	C	CAPACITY/W PART NO/PRICE	T	TYPE	SYMBOL	DESCRIPTION
1	400 1/4 17-4762	24	3 GANG TUNING 17-13000	1A	25-18 M.C. ANT. COIL	SPK	DYNAMIC SPEAKER - MODEL G1M
2	100M 1/4 17-2069	25	.05 CAN 600 17-2063	1B	18-18 M.C. ANT. COIL	SPK	DYNAMIC SPEAKER - MODEL G2M
3	500M 1/4 17-2070	26	.02 CAN 600 17-2064	1C	15-18 M.C. ANT. COIL	SW1	TOE CONTROL & POWER SWITCH (SEE R43)
4	5M 1/4 17-2071	27	.001 ± 10% 600 17-14023	2A	35-18 M.C. RF. COIL	PI	SPEAKER PLUG - FURNISHED WITH SPEAKER
5	20M 1/4 17-2072	28	0.001MICA 600 17-14010	2B	18-18 M.C. RF. COIL	L5	POWER CORD PLUG
6	50M 1/4 17-2060	29	0.001MICA 600 17-14011	2C	15-18 M.C. RF. COIL	SW2	POWER SWITCH
7	100M 1/4 17-2061	30	0.001MICA 600 17-14012	3A	18-18 M.C. RF. COIL	SW F	ANTENNA WAVEBAND SWITCH WAFER
8	200M 1/4 17-2062	31	0.001MICA 600 17-14013	3B	15-18 M.C. RF. COIL	ATS	ANTENNA TERMINAL STRIP
9	500M 1/4 17-2063	32	0.001MICA 600 17-14014	3C	12-18 M.C. RF. COIL	LL	DIAL LIGHT
10	1000 1/4 17-2065	33	0.0005 MICA 600 17-14047	4	18-18 M.C. OSCILL.		
11	2000 1/4 17-2066	34	16 ELECT 475 17-14003	5	15-18 M.C. OSCILL.		
12	5000 1/4 17-2067	35	50 ELECT 475 17-14003	6	FIRST I.F. COIL		
13	10000 1/4 17-2068	36	10000 MICA 600 17-14054	7	SECOND I.F. COIL		
14	20000 1/4 17-2069	37	10000 MICA 600 17-14053	8	OUTPUT TRANSFORMER		
15	50000 1/4 17-2070						
16	100000 1/4 17-2071						
17	200000 1/4 17-2072						
18	500000 1/4 17-2073						
19	1000000 1/4 17-2074						
20	2000000 1/4 17-2075						
21	5000000 1/4 17-2076						
22	10000000 1/4 17-2077						
23	20000000 1/4 17-2078						

I.F. PEAK 456 K.C.  
BALANCE 15 MC PAD 60 MC  
BALANCE 47 MC PAD 19 MC  
BALANCE 15 M.C. CHECK 60 MC.

NOBLITT SPARKS INDUSTRIES

MODEL 81  
Schematic, Parts

SCHEMATIC CIRCUIT DIAGRAM  
ARVIN HOME RADIO ~ MODEL 81

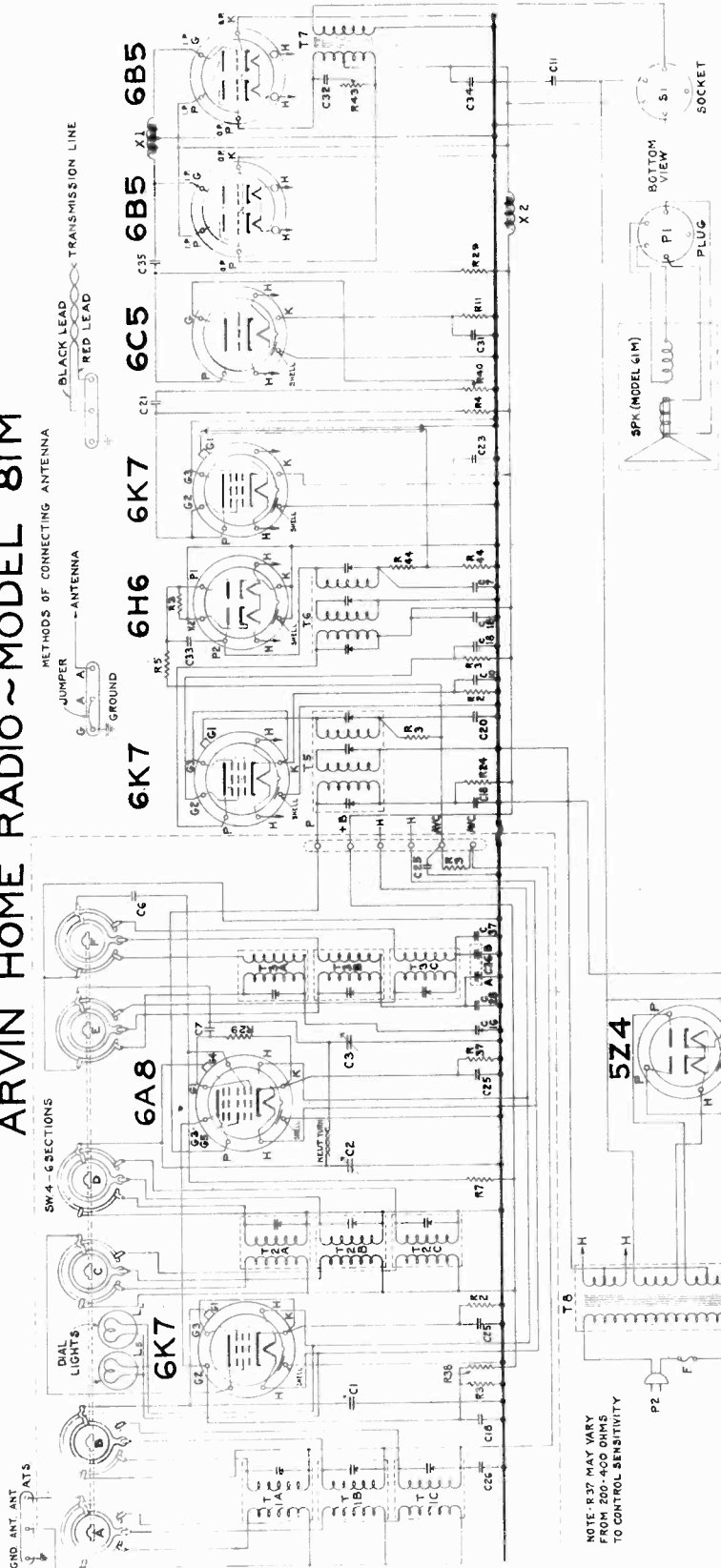


RESISTORS		CONDENSERS		CHOKES & TRANSFORMERS		MISCELLANEOUS UNITS	
R	OHMS/W	C	CAPACITY/VOLT	T	TYPE	SYMBOL	DESCRIPTION
1	450 1/4 W	1	3 GANG TUNING	T	TRANSFORMERS	SPK	DYNAMIC SPEAKER - MODEL 81
2	100M 1/4 W	2	1000 MICA	1A	55-18 M.C. ANT. COIL	SW 1	TO NE CONTROL & POWER SWITCH (SEE #43)
3	500M 1/4 W	3	1000 MICA	1C	55-18 M.C. ANT. COIL	SW 2	SECTION WAVE BAND SWITCH WAFER
4	500M 1/4 W	4	1000 MICA	1D	55-18 M.C. ANT. COIL	PI	SPEAKER PLUG - FURNISHED WITH SPK.
5	500M 1/4 W	5	1000 MICA	2A	55-18 M.C. R.F. COIL	L5	DIAL LIGHT
6	20M 1/4 W	6	1000 MICA	2B	18-55 M.C. R.F. COIL	PL	POWER CORD PLUG
7	20M 1/4 W	7	1000 MICA	3A	55-18 M.C. OSCIL.	LL	DIAL LIGHT
8	20M 1/4 W	8	1000 MICA	3B	18-55 M.C. OSCIL.	LL	DIAL LIGHT
9	10000 1/4 W	9	1000 MICA	4	FIRST I.F. COIL		
10	10000 1/4 W	10	1000 MICA	5	SECOND I.F. COIL		
11	10M 1/4 W	11	1000 MICA	6	OUTPUT TRANSF.		
12	10M 1/4 W	12	1000 MICA	7	POWER TRANSF.		
13	10M 1/4 W	13	1000 MICA	8	POWER TRANSF.		
14	10M 1/4 W	14	1000 MICA	9	POWER TRANSF.		
15	10M 1/4 W	15	1000 MICA	10	POWER TRANSF.		
16	10M 1/4 W	16	1000 MICA	11	POWER TRANSF.		
17	10M 1/4 W	17	1000 MICA	12	POWER TRANSF.		
18	10M 1/4 W	18	1000 MICA	13	POWER TRANSF.		
19	10M 1/4 W	19	1000 MICA	14	POWER TRANSF.		
20	10M 1/4 W	20	1000 MICA	15	POWER TRANSF.		
21	10M 1/4 W	21	1000 MICA	16	POWER TRANSF.		
22	10M 1/4 W	22	1000 MICA	17	POWER TRANSF.		
23	10M 1/4 W	23	1000 MICA	18	POWER TRANSF.		
24	1000 1/4 W	24	1000 MICA	19	POWER TRANSF.		
25	1000 1/4 W	25	1000 MICA	20	POWER TRANSF.		
26	1000 1/4 W	26	1000 MICA	21	POWER TRANSF.		
27	1000 1/4 W	27	1000 MICA	22	POWER TRANSF.		
28	1000 1/4 W	28	1000 MICA	23	POWER TRANSF.		
29	1000 1/4 W	29	1000 MICA	24	POWER TRANSF.		
30	1000 1/4 W	30	1000 MICA	25	POWER TRANSF.		
31	1000 1/4 W	31	1000 MICA	26	POWER TRANSF.		
32	1000 1/4 W	32	1000 MICA	27	POWER TRANSF.		
33	1000 1/4 W	33	1000 MICA	28	POWER TRANSF.		
34	1000 1/4 W	34	1000 MICA	29	POWER TRANSF.		
35	1000 1/4 W	35	1000 MICA	30	POWER TRANSF.		
36	1000 1/4 W	36	1000 MICA	31	POWER TRANSF.		
37	1000 1/4 W	37	1000 MICA	32	POWER TRANSF.		
38	1000 1/4 W	38	1000 MICA	33	POWER TRANSF.		
39	1000 1/4 W	39	1000 MICA	34	POWER TRANSF.		
40	1000 1/4 W	40	1000 MICA	35	POWER TRANSF.		
41	1000 1/4 W	41	1000 MICA	36	POWER TRANSF.		
42	1000 1/4 W	42	1000 MICA	37	POWER TRANSF.		
43	1000 1/4 W	43	1000 MICA	38	POWER TRANSF.		
44	1000 1/4 W	44	1000 MICA	39	POWER TRANSF.		
45	1000 1/4 W	45	1000 MICA	40	POWER TRANSF.		
46	1000 1/4 W	46	1000 MICA	41	POWER TRANSF.		
47	1000 1/4 W	47	1000 MICA	42	POWER TRANSF.		
48	1000 1/4 W	48	1000 MICA	43	POWER TRANSF.		
49	1000 1/4 W	49	1000 MICA	44	POWER TRANSF.		
50	1000 1/4 W	50	1000 MICA	45	POWER TRANSF.		
51	1000 1/4 W	51	1000 MICA	46	POWER TRANSF.		
52	1000 1/4 W	52	1000 MICA	47	POWER TRANSF.		
53	1000 1/4 W	53	1000 MICA	48	POWER TRANSF.		
54	1000 1/4 W	54	1000 MICA	49	POWER TRANSF.		
55	1000 1/4 W	55	1000 MICA	50	POWER TRANSF.		
56	1000 1/4 W	56	1000 MICA	51	POWER TRANSF.		
57	1000 1/4 W	57	1000 MICA	52	POWER TRANSF.		
58	1000 1/4 W	58	1000 MICA	53	POWER TRANSF.		
59	1000 1/4 W	59	1000 MICA	54	POWER TRANSF.		
60	1000 1/4 W	60	1000 MICA	55	POWER TRANSF.		
61	1000 1/4 W	61	1000 MICA	56	POWER TRANSF.		
62	1000 1/4 W	62	1000 MICA	57	POWER TRANSF.		
63	1000 1/4 W	63	1000 MICA	58	POWER TRANSF.		
64	1000 1/4 W	64	1000 MICA	59	POWER TRANSF.		
65	1000 1/4 W	65	1000 MICA	60	POWER TRANSF.		
66	1000 1/4 W	66	1000 MICA	61	POWER TRANSF.		
67	1000 1/4 W	67	1000 MICA	62	POWER TRANSF.		
68	1000 1/4 W	68	1000 MICA	63	POWER TRANSF.		
69	1000 1/4 W	69	1000 MICA	64	POWER TRANSF.		
70	1000 1/4 W	70	1000 MICA	65	POWER TRANSF.		
71	1000 1/4 W	71	1000 MICA	66	POWER TRANSF.		
72	1000 1/4 W	72	1000 MICA	67	POWER TRANSF.		
73	1000 1/4 W	73	1000 MICA	68	POWER TRANSF.		
74	1000 1/4 W	74	1000 MICA	69	POWER TRANSF.		
75	1000 1/4 W	75	1000 MICA	70	POWER TRANSF.		
76	1000 1/4 W	76	1000 MICA	71	POWER TRANSF.		
77	1000 1/4 W	77	1000 MICA	72	POWER TRANSF.		
78	1000 1/4 W	78	1000 MICA	73	POWER TRANSF.		
79	1000 1/4 W	79	1000 MICA	74	POWER TRANSF.		
80	1000 1/4 W	80	1000 MICA	75	POWER TRANSF.		
81	1000 1/4 W	81	1000 MICA	76	POWER TRANSF.		
82	1000 1/4 W	82	1000 MICA	77	POWER TRANSF.		
83	1000 1/4 W	83	1000 MICA	78	POWER TRANSF.		
84	1000 1/4 W	84	1000 MICA	79	POWER TRANSF.		
85	1000 1/4 W	85	1000 MICA	80	POWER TRANSF.		
86	1000 1/4 W	86	1000 MICA	81	POWER TRANSF.		
87	1000 1/4 W	87	1000 MICA	82	POWER TRANSF.		
88	1000 1/4 W	88	1000 MICA	83	POWER TRANSF.		
89	1000 1/4 W	89	1000 MICA	84	POWER TRANSF.		
90	1000 1/4 W	90	1000 MICA	85	POWER TRANSF.		
91	1000 1/4 W	91	1000 MICA	86	POWER TRANSF.		
92	1000 1/4 W	92	1000 MICA	87	POWER TRANSF.		
93	1000 1/4 W	93	1000 MICA	88	POWER TRANSF.		
94	1000 1/4 W	94	1000 MICA	89	POWER TRANSF.		
95	1000 1/4 W	95	1000 MICA	90	POWER TRANSF.		
96	1000 1/4 W	96	1000 MICA	91	POWER TRANSF.		
97	1000 1/4 W	97	1000 MICA	92	POWER TRANSF.		
98	1000 1/4 W	98	1000 MICA	93	POWER TRANSF.		
99	1000 1/4 W	99	1000 MICA	94	POWER TRANSF.		
100	1000 1/4 W	100	1000 MICA	95	POWER TRANSF.		

MODEL 81M  
Schematic, Parts

NOBLITT SPARKS INDUSTRIES

SCHEMATIC CIRCUIT DIAGRAM  
ARVIN HOME RADIO ~ MODEL 81M





MODEL 483-A, 2483-A,  
5-483-A, 5-2483-A  
Schematic

OPERADIO MFG. CO.

