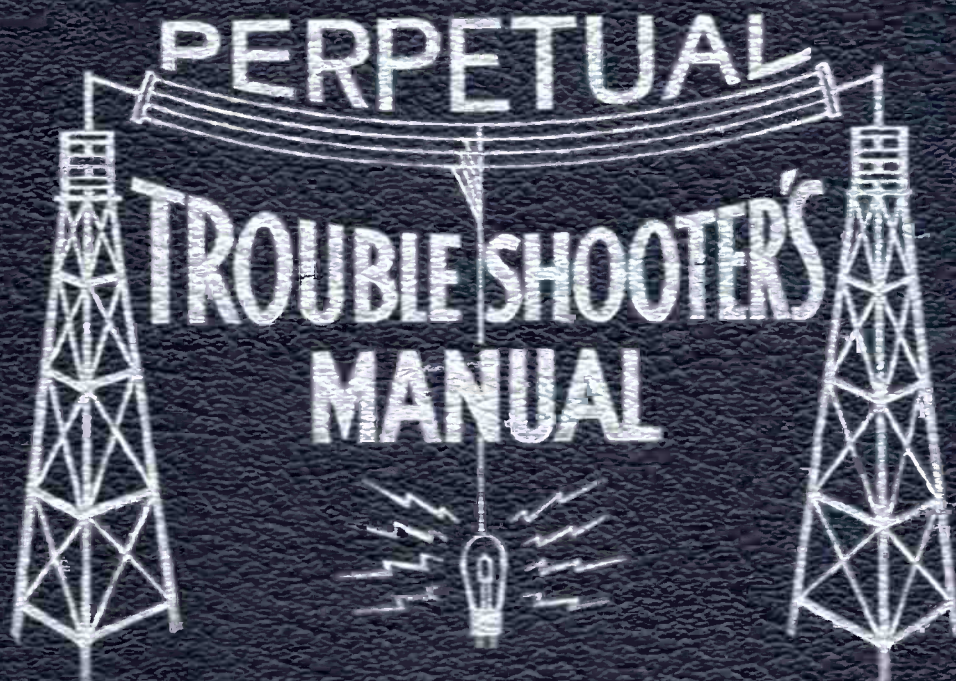


VOLUME VI

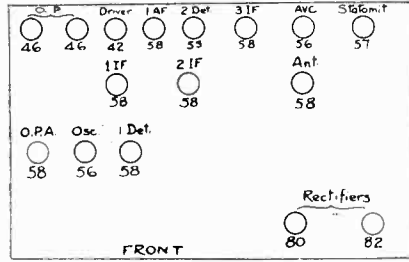


JOHN F. RIDER

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.

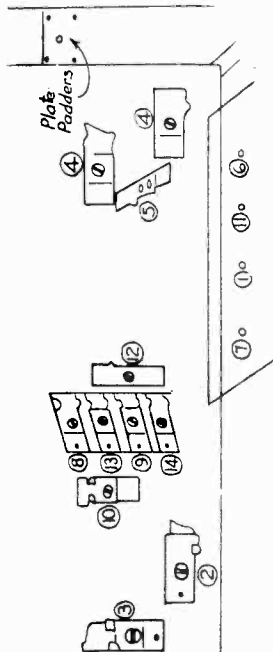
When the i-f. trimmers have been adjusted, the next step is the trimming of the "A" band (white). **NOTICE.** Do not attempt to adjust the plate padder. It was adjusted at the factory and should not be changed. Proceed as follows: Rotate the tuning dial to 5 and adjust the "A" band r-f. trimmers to highest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



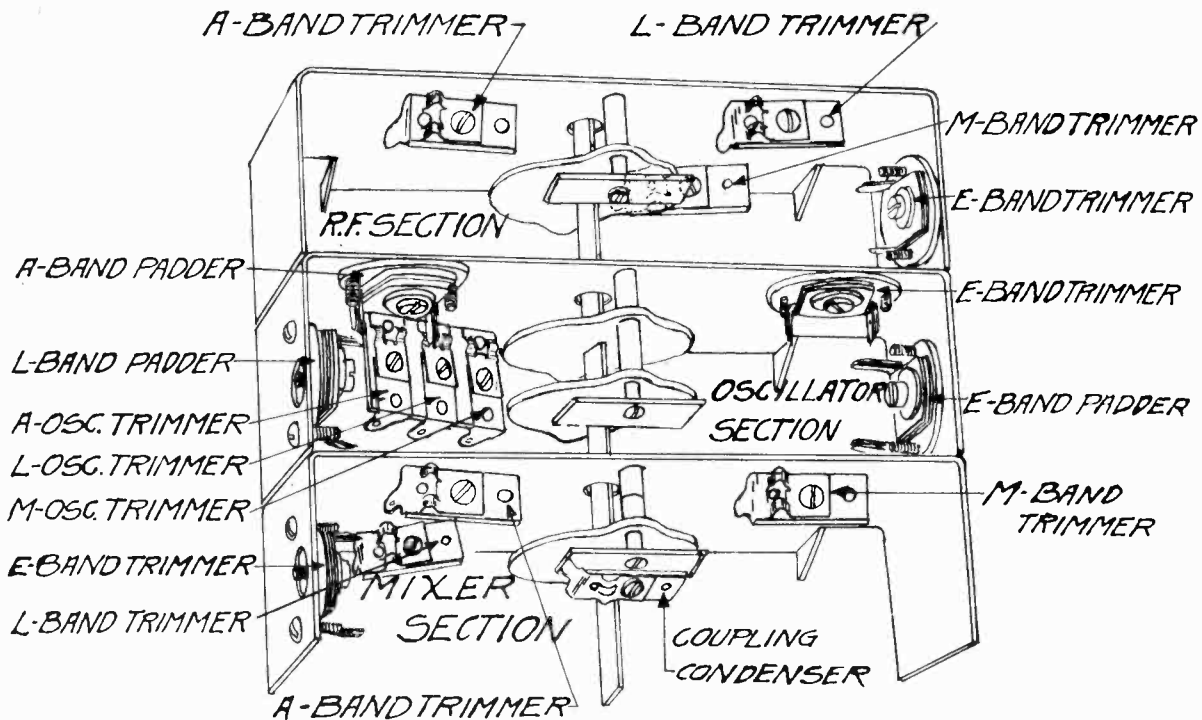
On the right will be found the locations of the padding and trimming condensers of the Midwest 16-tube receiver, 1933

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.

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 (A) 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.

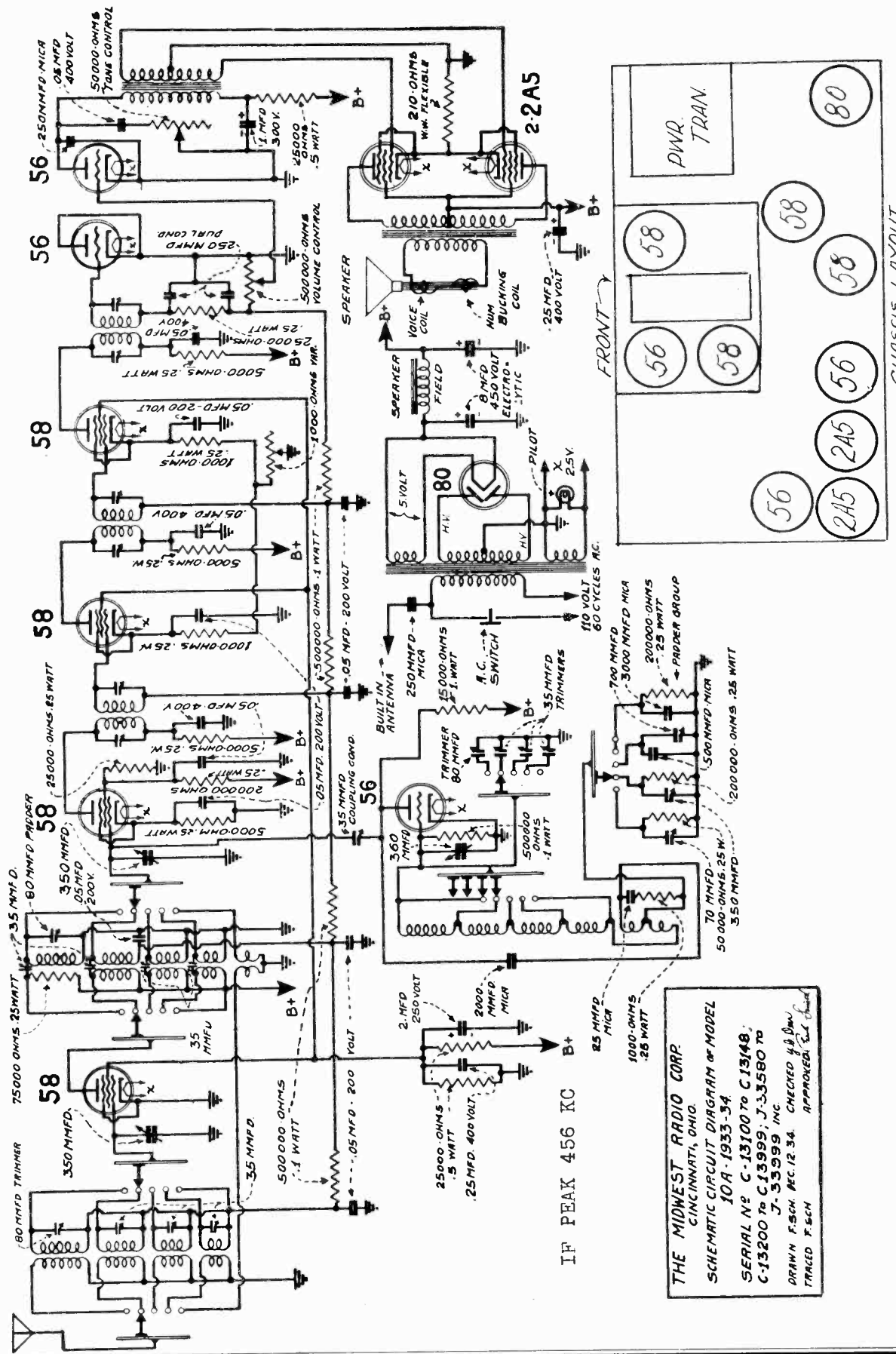
The adjusting of the L.M. and H bands is accomplished at the factory by adjusting the spacing of the turns of the coils. We do not advise that you try this as it is very critical work and can be done only by very carefully trained experts.

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 \pm 15% Depending on line voltage.

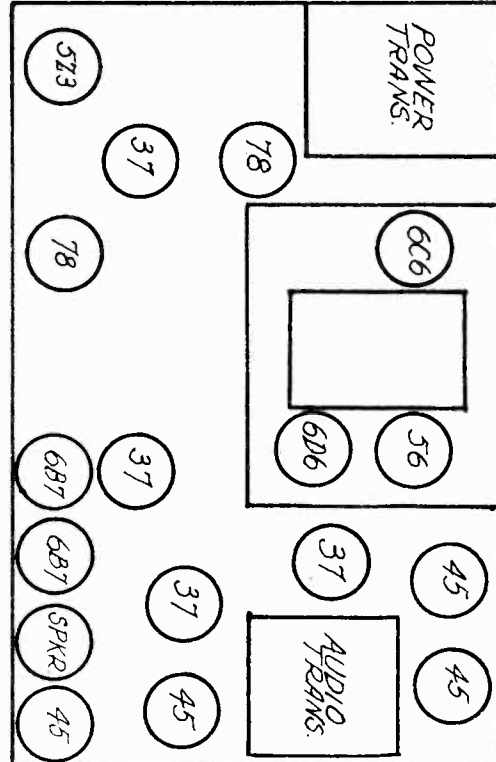
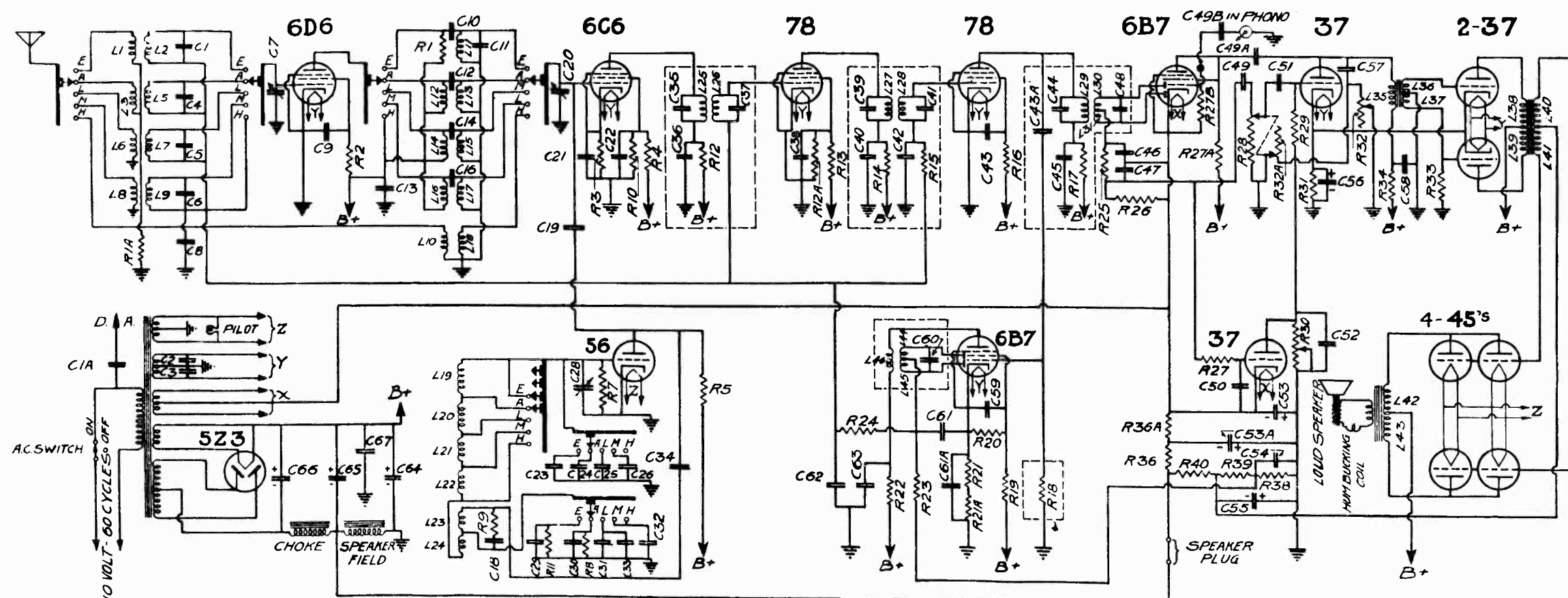
MIDWEST RADIO CORP.



IF PEAK 456 KC

THE MIDWEST RADIO CORP.
CINCINNATI, OHIO
10A-1933-34
SERIAL No C-13100 TO C13148;
C-13200 TO C13999; J-33580 TO
J-33999 INC.
DRAWN F.SCH. REC. 12.34. CHECKED J.B. (S) (S)
TRACED F.SCH. APPROVED E.L. (S) (S)

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	MMFD.	TRIMMER	R5	15 000	.25	
C6	20	MMFD.	TRIMMER	R7	500 000	.25	
C7	365	MFD.	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	MMFD.	TRIMMER	R12	5 000	.25	
C12	20	MMFD.	TRIMMER	R12A	100 000	.25	
C13	.05	MFD.	400 VOLT	R13	200 000	.25	
C14	20	MMFD.	TRIMMER	R14	5 000	.25	
C15	20	MMFD.	TRIMMER	R15	3 NEG	.25	
C16	20	MMFD.	TRIMMER	R16	200 000	.25	
C17	20	MMFD.	TRIMMER	R17	5 000	.25	
C18	20	MMFD.	TRIMMER	R18	5 000	.25	
C19	20	MMFD.	TRIMMER	R19	25 000	.5	
C20	365	MFD.	TUNING CONDENSER	R20	30 000	.25	
C21	.05	MFD.	200 VOLT	R21	4 000	.25	
C22	.05	MFD.	400 VOLT	R22	5 000	.25	
C23	80	MMFD.	TRIMMER	R23	5 000	.25	
C24	20	MMFD.	TRIMMER	R24	100 000	.25	
C25	20	MMFD.	TRIMMER	R25	100 000	.25	
C26	20	MMFD.	TRIMMER	R26	500 000	.25	
C27	20	MMFD.	TRIMMER	R27	500 000	.25	
C28	365	MFD.	TUNING CONDENSER	R27A	500 000	.25	
C29	160	MMFD.	TRIMMER	R28	500 000	.25	
C30	560	MMFD.	TRIMMER	R29	500 000	.25	
C31	700	MMFD.	TRIMMER	R21A	500 000	.25	
C32	500	MMFD.	TRIMMER	R22A	500 000	.25	
C33	500	MMFD.	TRIMMER	R23A	500 000	.25	
C34	2000	MMFD.	TRIMMER	R24A	500 000	.25	
C35	.05	MFD.	400 VOLT	R25A	500 000	.25	
C36	.05	MFD.	400 VOLT	R26A	500 000	.25	
C37	.05	MFD.	400 VOLT	R27A	500 000	.25	
C38	.05	MFD.	400 VOLT	R28A	500 000	.25	
C39	.05	MFD.	400 VOLT	R29A	500 000	.25	
C40	.05	MFD.	400 VOLT	R30	50 000	.25	POT. STAT-O-MAT CONTROL
C41	.05	MFD.	200 VOLT	R31	700	1	POT. VOLUME CONTROL
C42	.05	MFD.	200 VOLT	R32	50 000	.25	POT. STAT-O-MAT CONTROL
C43	.05	MFD.	400	R32A	50 000	.25	POT. VOLUME CONTROL
C44	25	MMFD.	MICA	R33	50 000	.25	POT. STAT-O-MAT CONTROL
C45	.05	MFD.	400 VOLT	R34	15 000	.25	POT. STAT-O-MAT CONTROL
C46	250	MMFD.	MICA	R35	10 000	.25	POT. STAT-O-MAT CONTROL
C47	250	MMFD.	MICA	R36	25 000	.25	POT. STAT-O-MAT CONTROL
C48	.05	MFD.	200 VOLT	R37	10 000	.25	POT. STAT-O-MAT CONTROL
C49	.05	MFD.	200 VOLT	R38	10 000	.25	POT. STAT-O-MAT CONTROL
C49A	.05	MFD.	200 VOLT	R39	100 000	.25	POT. STAT-O-MAT CONTROL
C50	.05	MFD.	200	R40	50 000	.25	POT. STAT-O-MAT CONTROL
C51	.05	MFD.	200 VOLT	R41	50 000	.25	POT. STAT-O-MAT CONTROL
C52	20	MMFD.	TRIMMER	R42	5 000	.25	POT. STAT-O-MAT CONTROL
C53	20	MMFD.	TRIMMER	R43	5 000	.25	POT. STAT-O-MAT CONTROL
C54	20	MMFD.	TRIMMER	R44	5 000	.25	POT. STAT-O-MAT CONTROL
C55	20	MMFD.	TRIMMER	R45	5 000	.25	POT. STAT-O-MAT CONTROL
C56	20	MMFD.	TRIMMER	R46	5 000	.25	POT. STAT-O-MAT CONTROL
C57	20	MMFD.	TRIMMER	R47	5 000	.25	POT. STAT-O-MAT CONTROL
C58	12	MMFD.	TRIMMER	R48	5 000	.25	POT. STAT-O-MAT CONTROL
C59	.05	MFD.	400	R49	5 000	.25	POT. STAT-O-MAT CONTROL
C60	.05	MFD.	400	R50	5 000	.25	POT. STAT-O-MAT CONTROL
C61	.001	MFD.	600 VOLT	R51	5 000	.25	POT. STAT-O-MAT CONTROL
C62	.001	MFD.	600	R52	5 000	.25	POT. STAT-O-MAT CONTROL
C63	.05	MFD.	400	R53	5 000	.25	POT. STAT-O-MAT CONTROL
C64	.05	MFD.	400	R54	5 000	.25	POT. STAT-O-MAT CONTROL
C65	.05	MFD.	400	R55	5 000	.25	POT. STAT-O-MAT CONTROL
C66	.05	MFD.	400	R56	5 000	.25	POT. STAT-O-MAT CONTROL
C67	.25	MMFD.	400 VOLT	R57	5 000	.25	POT. STAT-O-MAT CONTROL

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

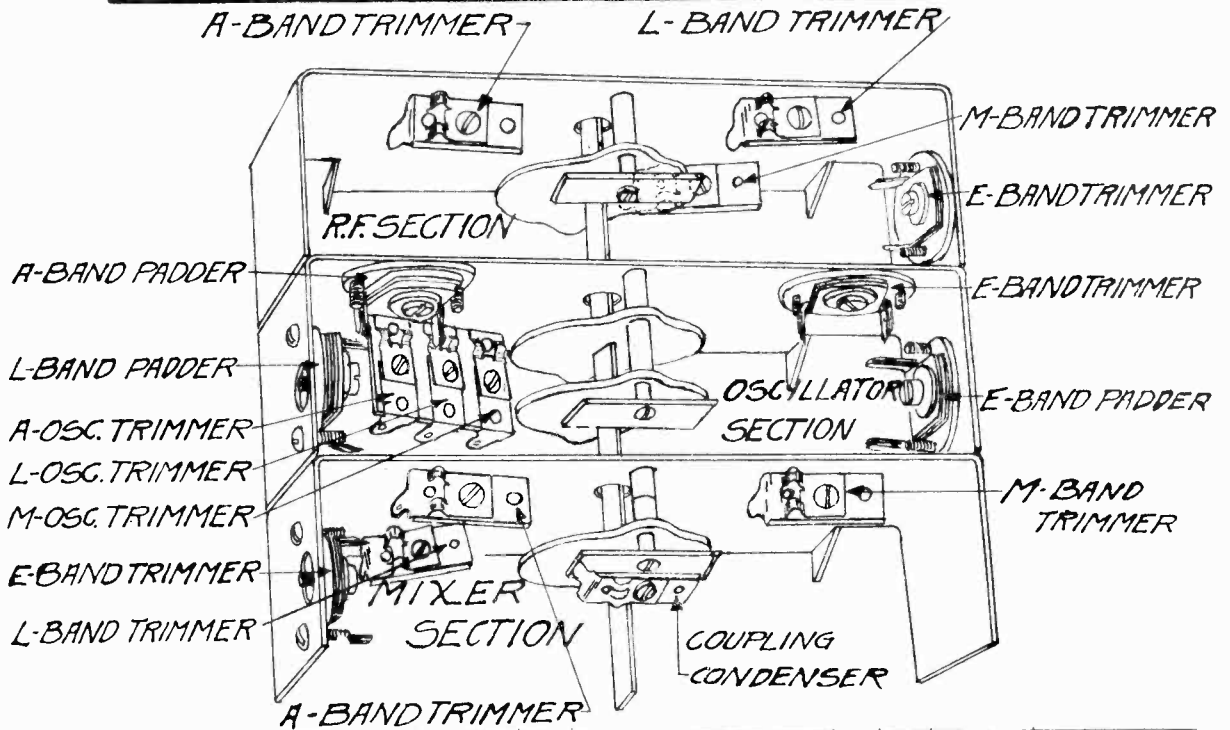
SCHEMATIC CIRCUIT DIAGRAM
OF THE
MODEL 16-34 SET

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	KATHODE	GRID	FIL.		
			VOLTS	VOLTS	VOLTS	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	---	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	OUTPUT	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		

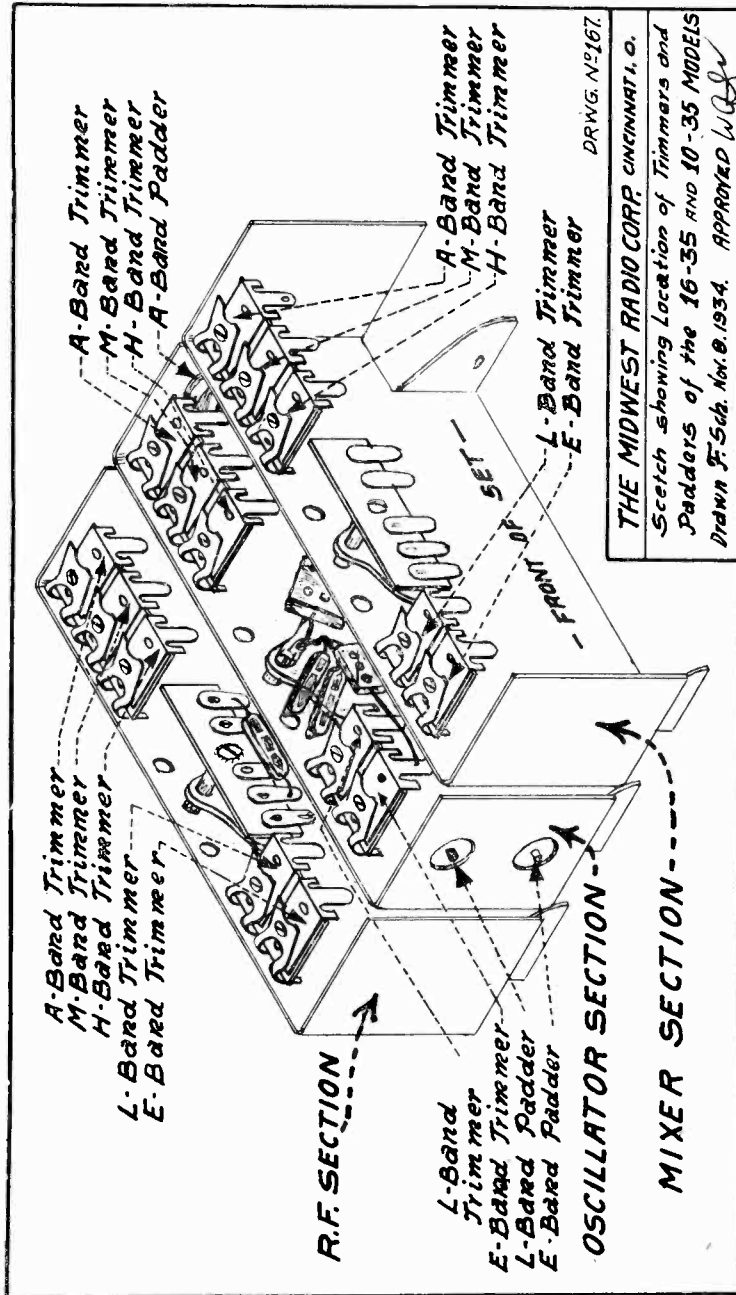
240 VOLT OUTPUT FROM FILER
1000 ohm per volt meter used for test D.C. measured from ground voltages ± 15% depending on line voltage.

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

MODEL 10-35

Trimmers, Alignment

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. R. J.

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 or 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 or 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 or 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 or 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.

MIDWEST RADIO CORP.

MODEL 10-35
Schematic, Voltage

DRAWING NO. 104.

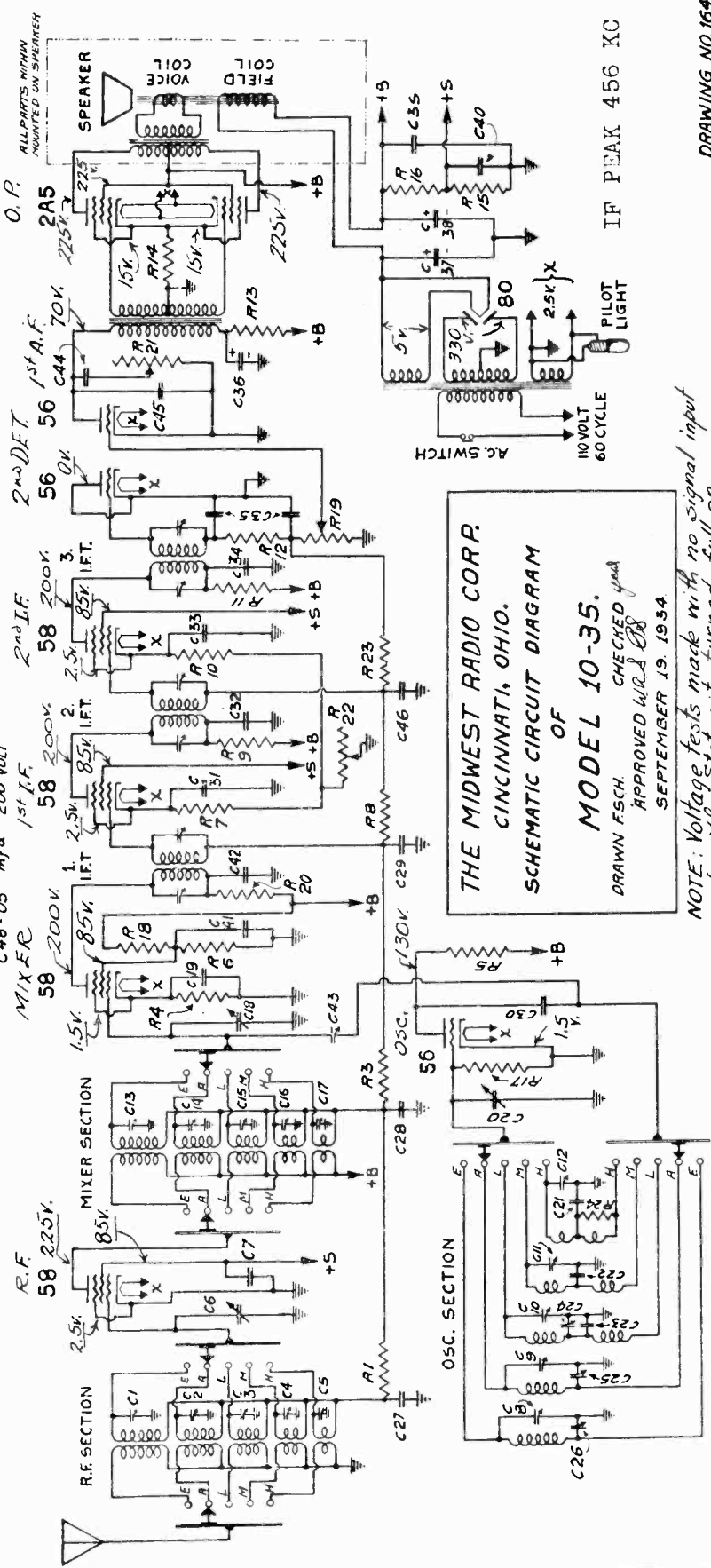
- R16 - 25 000 Δ .5 WATT
- R17 - 100 000 Δ .25 "
- R18 - 200 000 Δ .25 "
- R19 - 500 000 Δ VOLUME CONTROL
- R20 - 5 000 Δ .25 WATT
- R21 - 50 000 Δ TONE CONTROL
- R22 - 1 000 Δ VARIABLE
- R23 - 500 000 Δ .1 WATT
- R24 - 1 000 Δ .25 "

- R1 - 100 000 Δ .1 WATT
- R2 - 100 000 " " "
- R3 - 100 000 " " "
- R4 - 5 000 " " "
- R5 - 15 000 " " "
- R6 - 25 000 Δ .25 "
- R7 - 1 000 Δ .25 "
- R8 - 500 000 Δ .1 "
- R9 - 5 000 Δ .25 "
- R10 - 1 000 Δ .25 "
- R11 - 5 000 Δ .25 "
- R12 - 25 000 Δ .1 "
- R13 - 25 000 Δ .1 "
- R14 - 210 Δ .2 "
- R15 - 25 000 Δ .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 " " " "
- C18 - 365 " " TUNING COND.
- C19 - 05 mfd 200 VOLT
- C20 - 365 mfd 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.

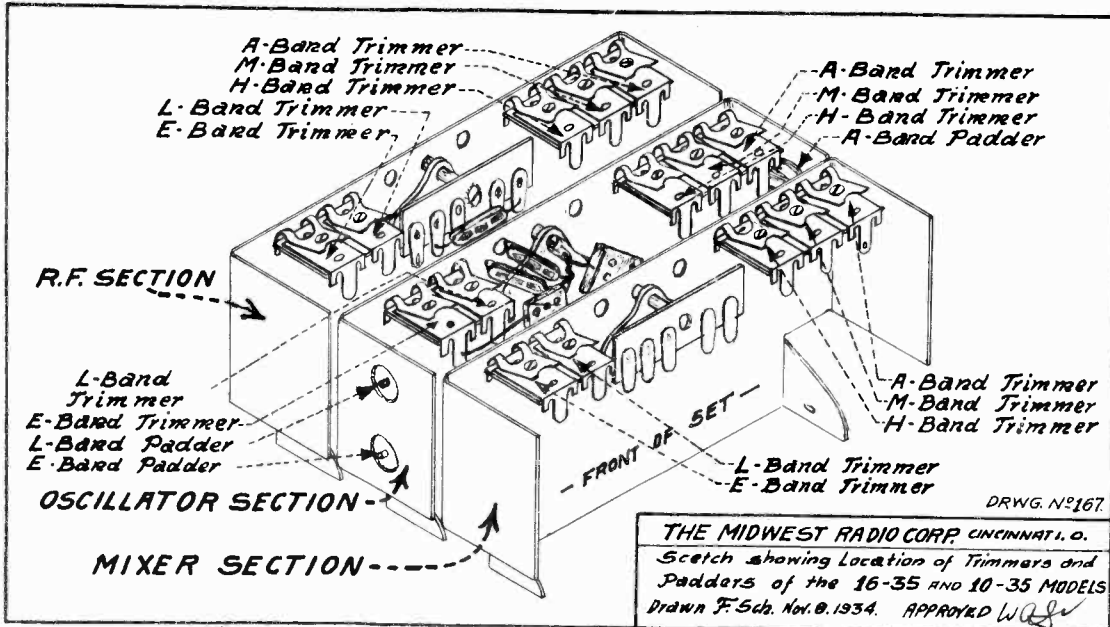
NOTE: Voltage tests made with no signal input and with Statomit turned full on.
Line Voltage - 120

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

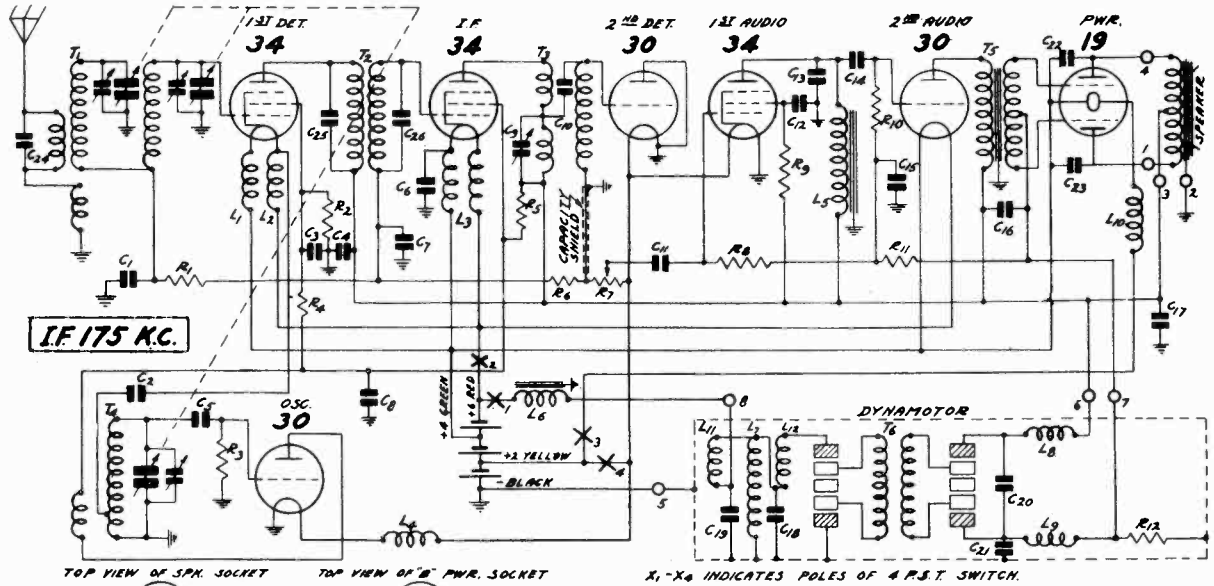
ALL TESTS MADE WITH POSITIVE INPUT

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 0.2 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

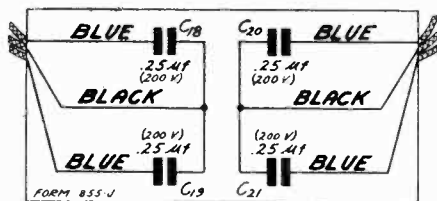


Fig. 3. Four Section Condenser in Power Unit Box

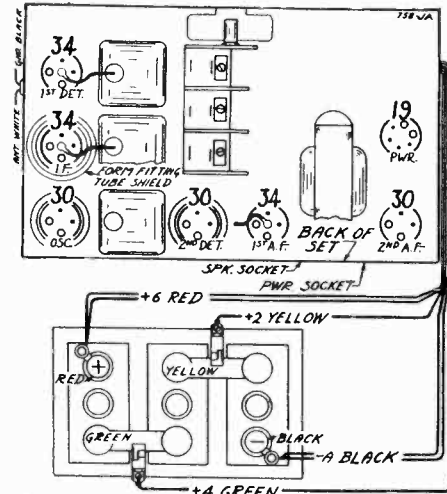


Fig. 2. Location of Tubes and Battery Connections

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.

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.

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

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.

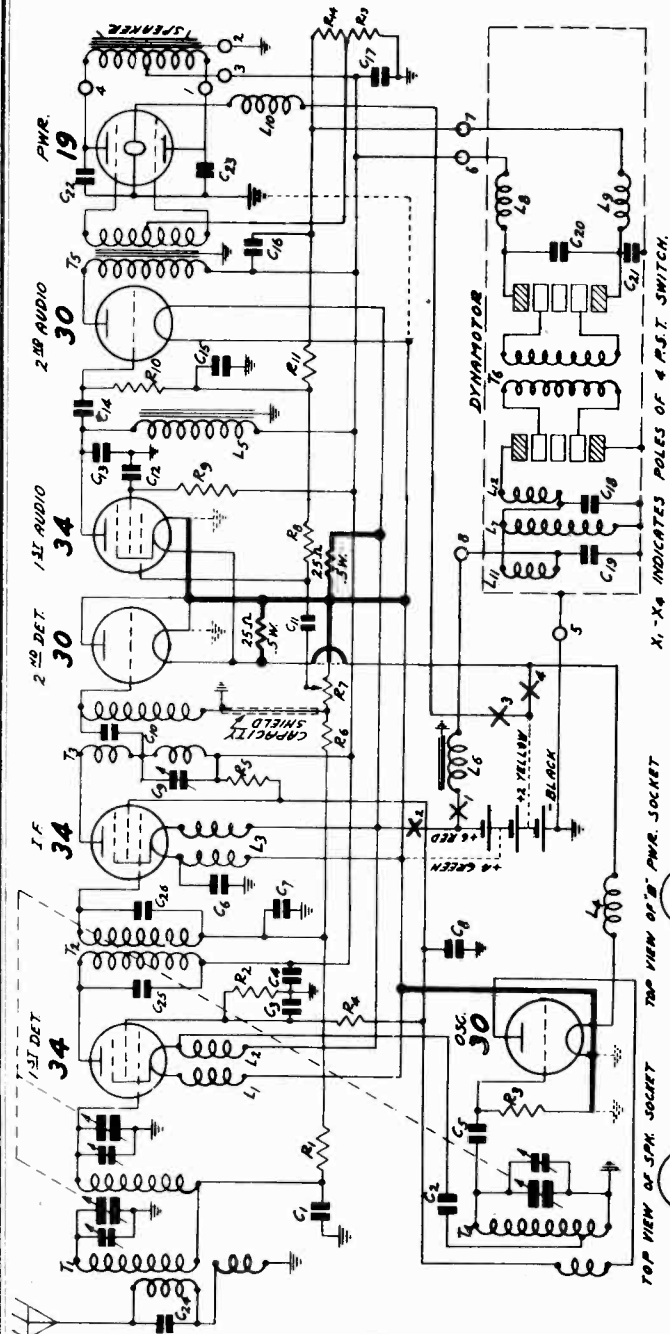


FIG. 1 SCHEMATIC CIRCUIT DIAGRAM SHOWING CHANGES NECESSARY TO WIRE FOR SERIES FILAMENT.
DOTTED LINES DENOTE ORIGINAL WIRING TO BE REMOVED.
HEAVY LINES DENOTE NEW WIRING TO BE ADDED.

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-

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.

IF 175 KC.

July 1935

MODELS 62-114, 62-116

Chassis View of Changes MONTGOMERY-WARD & CO.

Data

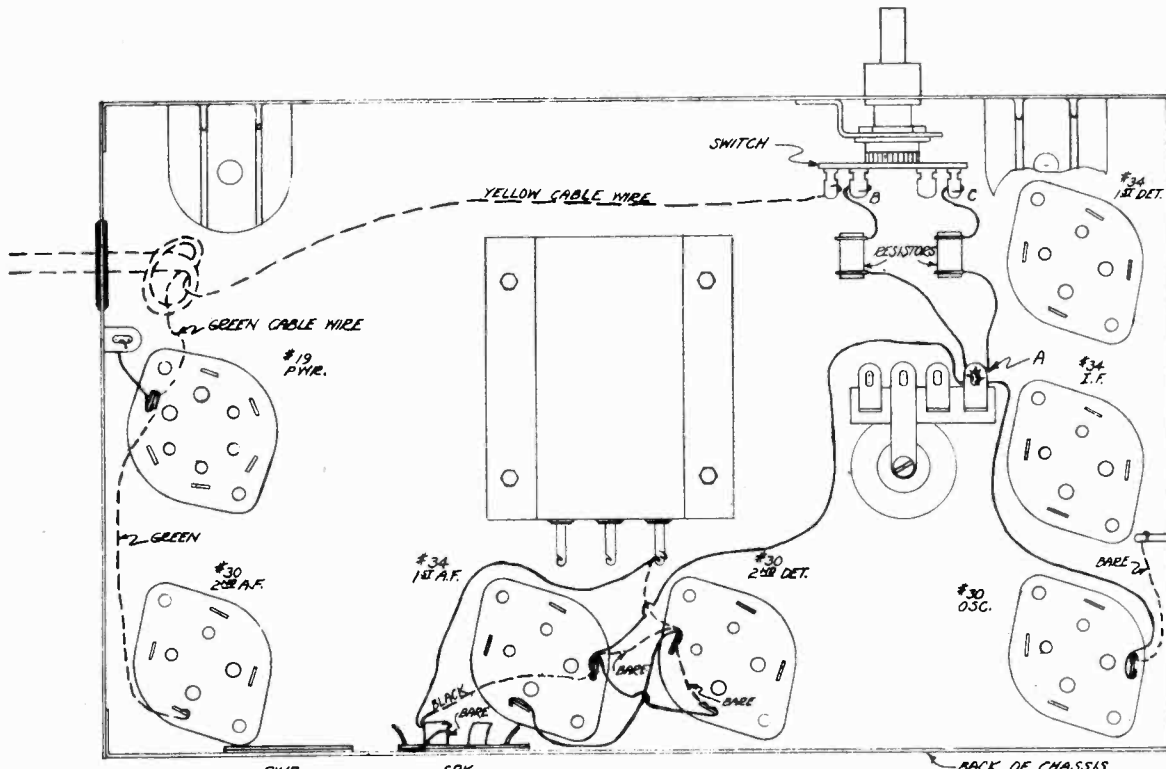


FIG 2 CHANGES IN WIRING

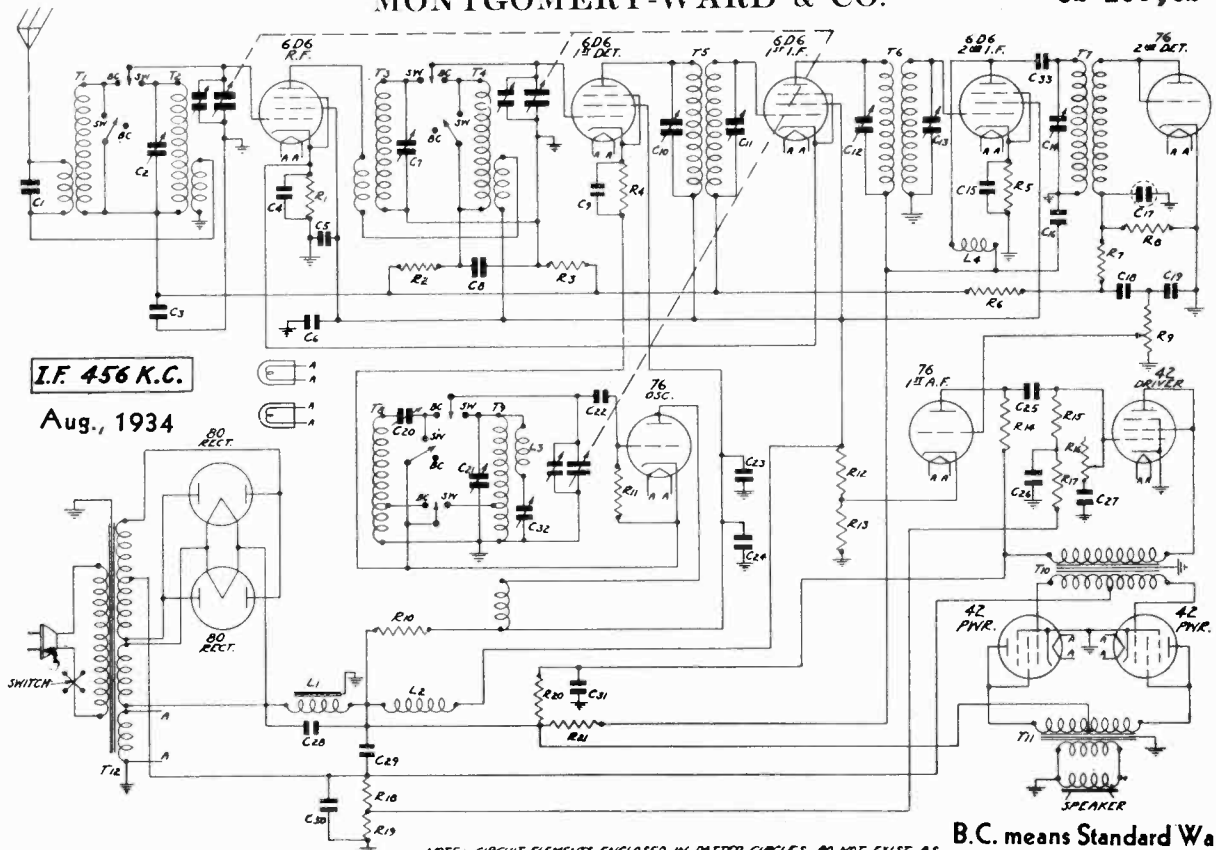
----- DENOTE ORIGINAL WIRING TO BE REMOVED.
 _____ DENOTE NEW WIRING TO BE ADDED.

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

REPAIR PARTS LIST FOR 12 TUBE
SUPERHETERODYNE RECEIVER
MISCELLANEOUS

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	.28
	C11	150-250 mmf	1st I. F. Trans.)		
P-2103	C12	150-250 mmf	Double Trimmer	(Part of	.28
	C13	150-250 mmf	2nd I. F. Trans.)		
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.		.10
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

MONTGOMERY-WARD & 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.

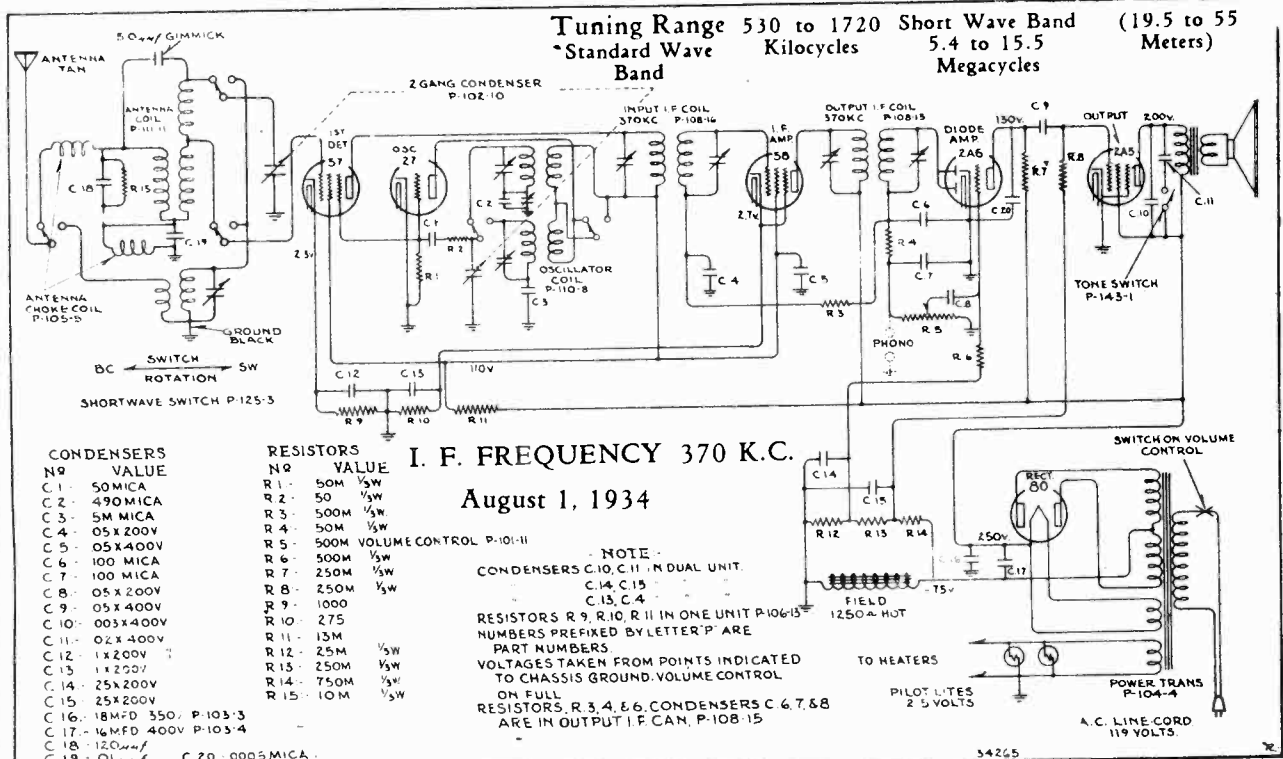
Then secure the other end of the tension spring over the spur on the drive drum.

Replace the dial assembly and pointer.

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

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 400V	R4 - 50M 1/2W
C5 - .05 x 200V	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 1/2W
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.

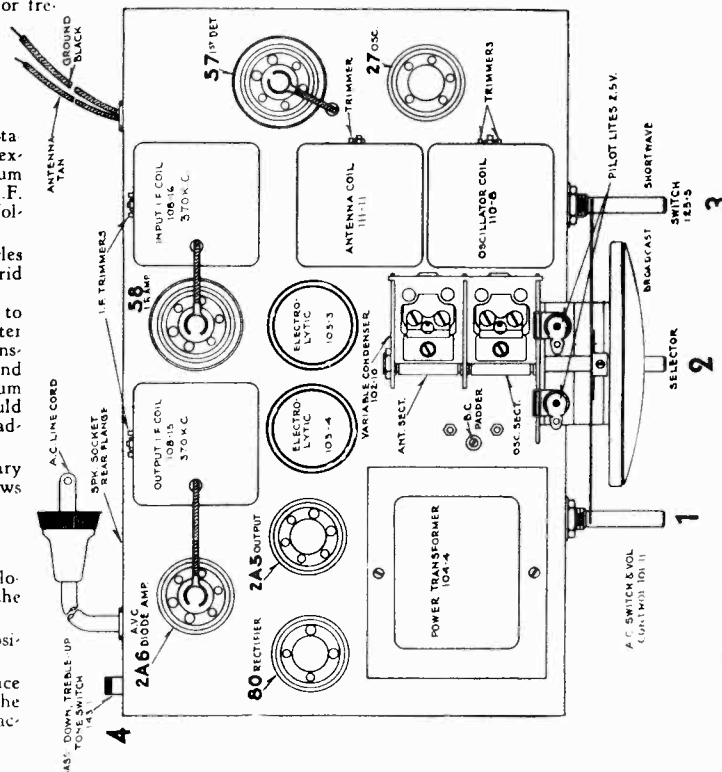
2. Shift frequency of external oscillator to 1712 kilocycles and set variable condenser in its minimum capacity position, plates entirely out of mesh:

- 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:

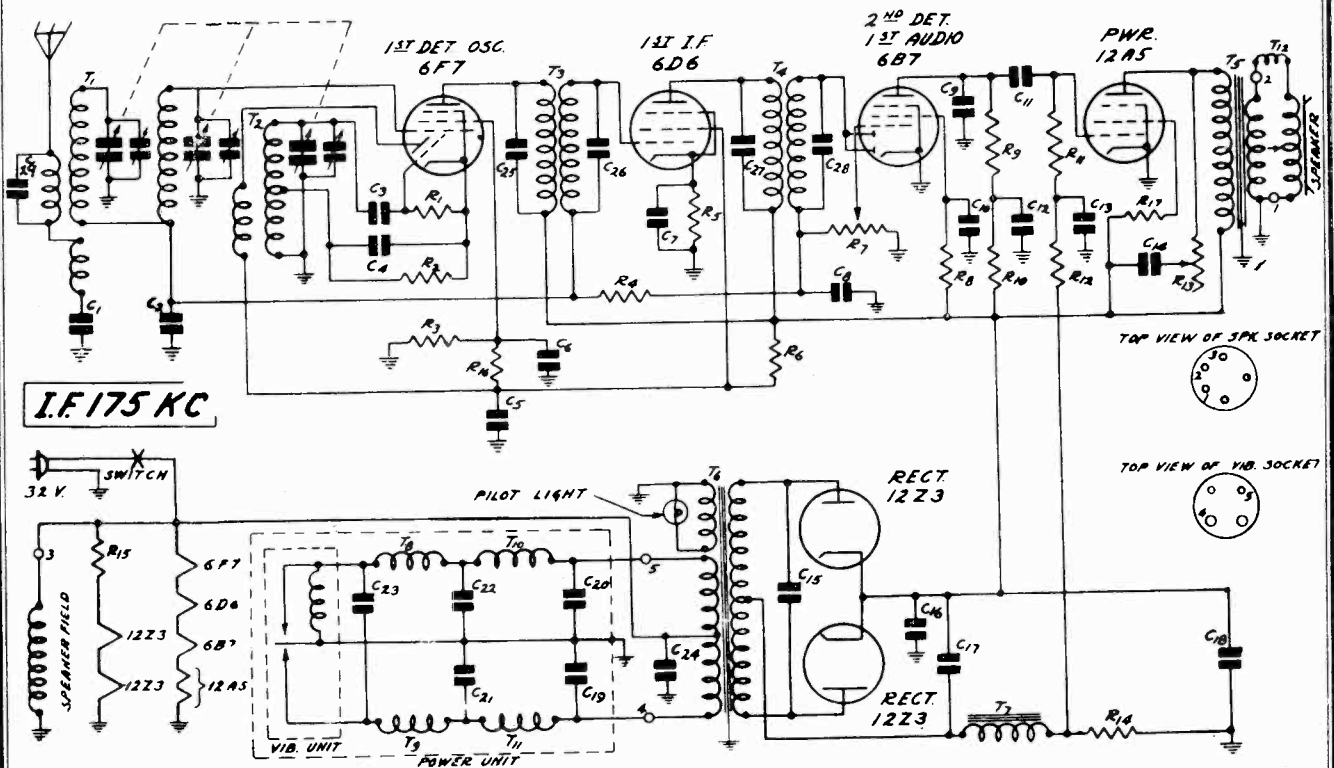
1. Set the wave changing switch in the short wave position, right turn, and shift external oscillator frequency to 15 megacycles. Connect oscillator to tan antenna lead in series with a 300 ohm resistor to black ground wire.

- 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.

MODELS 62-136, 62-138
Schematic, Parts



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

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

Part No.	Code	Capacity	Voltage	Type	Selling Price
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-81894	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

Part No.	Code	Resistance	Wattage	Type	Selling Price
P-A95104	R1	100,000 Ohm	.2	Carbon	\$.02
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	.68
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

P-80933	Dual .5 Mfd. Generator Condenser	.60
62-5424	Spark Plug Suppressor	.25

MISCELLANEOUS ITEM

P-5200	Antenna Transformer Assembly less Can	\$.64
P-40433	Can for Above Assembly	.05
P-5192	Oscillator Coil and Can Assembly	.50

MODELS 62-136, 62-138
Voltage, Socket, Data
Alignment

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.

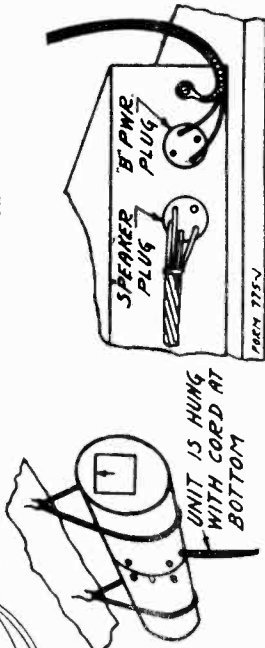


Fig. 3—Method of Installing "B" Power Unit

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.

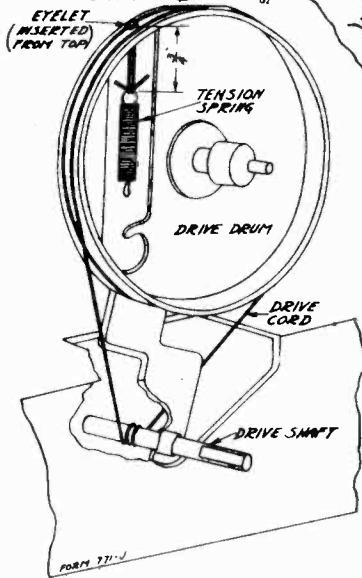


Fig. 4—Drive Cord Replacement

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

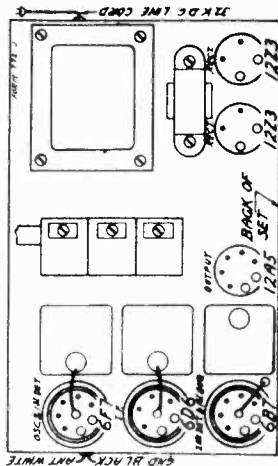


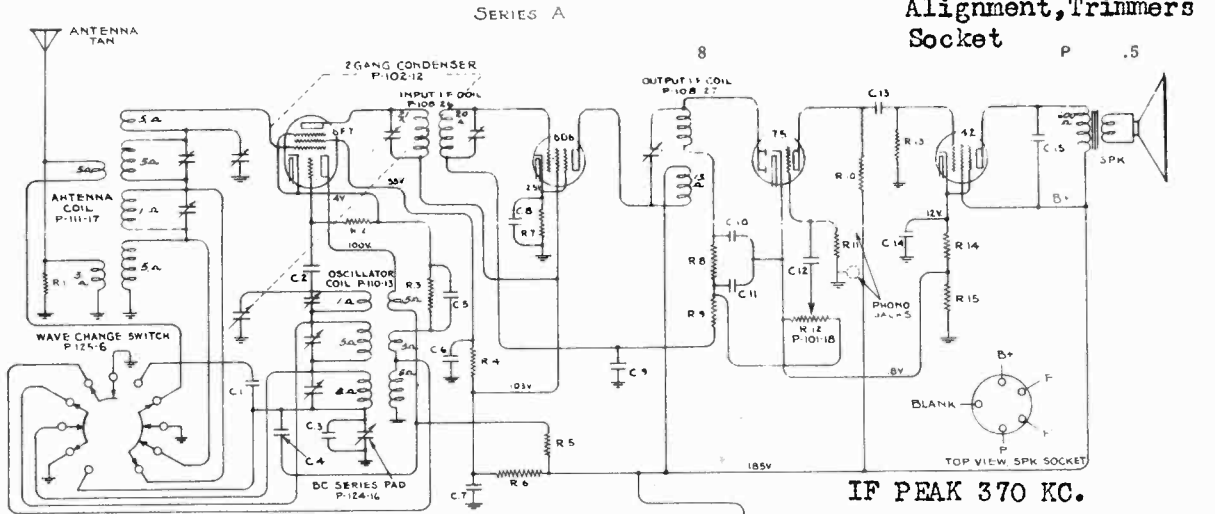
Fig. 2—Arrangement of Tubes

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	D. C. Resistance in Ohms
P-500	Primaries of Antenna Trans. in Series	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-107	Speaker Field	97
P-173	Power Transformer Primary	Small
P-5026	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

C.1	2870 MICA
C.2	100
C.3	475
C.4	1 X 200V
C.5	1 X 200V
C.6	1 X 200V
C.7	1 X 200V
C.8	1 X 200V
C.9	1 X 200V
C.10	500 MICA
C.11	500 MICA
C.12	0.5 X 200V
C.13	0.1 X 400V
C.14	4.0 MFD X 25V
C.15	0.15 X 400V
C.16	3.0 MFD X 250V
C.17	4.0 MFD X 300V

LEGEND

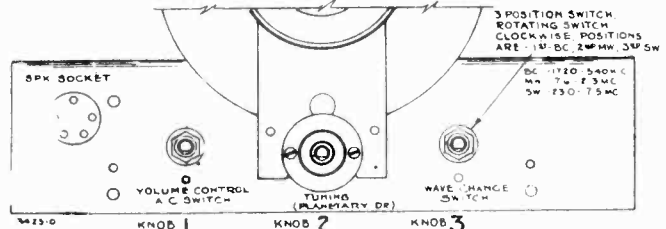
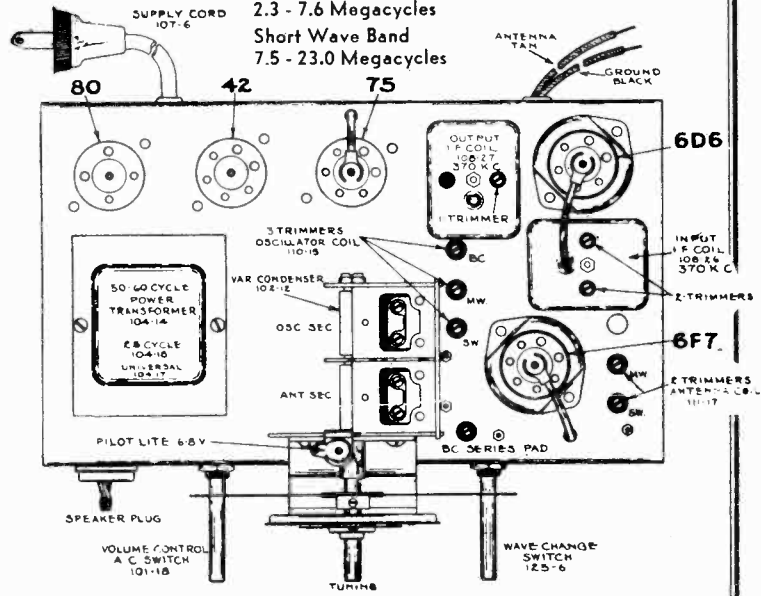
RESISTORS	NO	VALUE	W
R.1	800 A	1/2 W	
R.2	50 M A		
R.3	700 A		
R.4	100 M A	1/2 W	
R.5	20 M A	1/2 W	
R.6	19 M A	1/2 W	
R.7	200 A	1/2 W	
R.8	50 M A	1/2 W	
R.9	1 MEG		
R.10	250 M A		
R.11	2 MEG		
R.12	500 M A VOL CONTROL		
R.13	500 M A	1/2 W	
R.14	500 A		
R.15	35 A		

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 1720-540 KC
2ND - MW 7.6-23 MC
3RD - SW 23.0-7.5 MC
SWITCH SHOWN AT 3RD POSITION

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.

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

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**

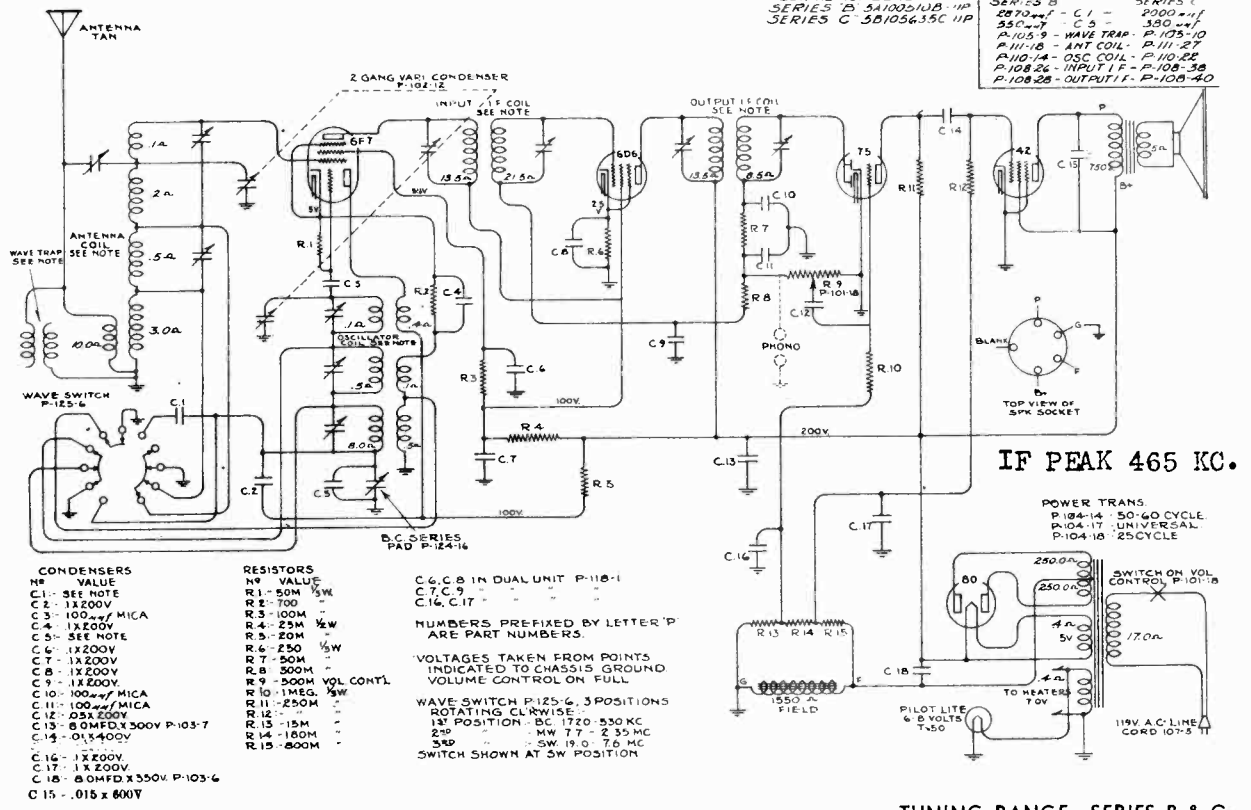
SERIES A

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 - C1 - 2000 μ F
 2870-41 - C5 - 350 μ F
 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

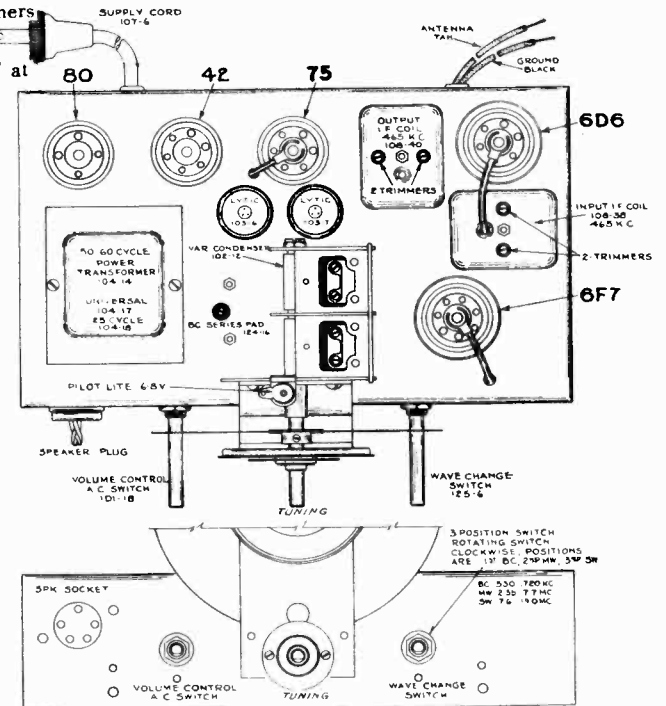
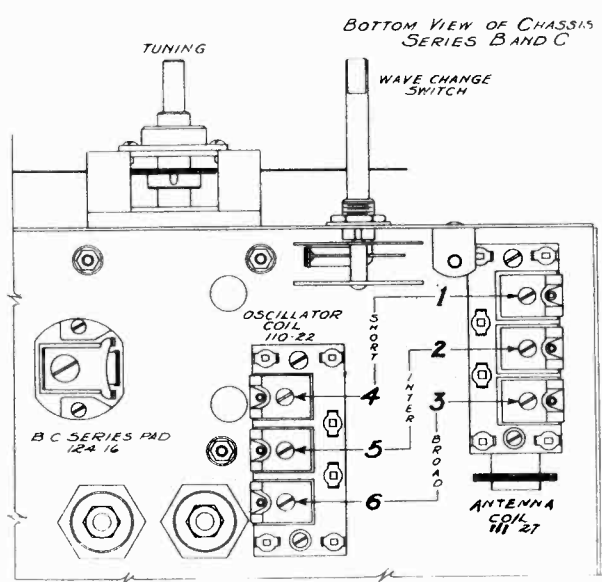
IF PEAK 465 KC.

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.

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



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

MONTGOMERY-WARD & 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 110-22	Not Used.	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 110-22	Not Used.	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 111-17	Not Used.	Antenna Coil Complete	1	
BE 100-20	BE 100-20	BE 100-20	.1 x 120V-25%	4	Not Used.	BE 121	BE 121	BE 111-18	Not Used.	Antenna Coil Complete	1	
Not Used.	BE 100-22	BE 100-22	.05 x 200V-25%	1	Not Used.	BE 121	BE 121	BE 111-27	Not Used.	Antenna Coil Complete	1	
Not Used.	BE 103-6	BE 103-6	8 Mfd. x 350V Electrolytic	1	BE 121	BE 121	BE 121	BE 111-27	Not Used.	SOCKETS		
Not Used.	BE 103-7	BE 103-7	8 Mfd. x 300V Electrolytic	1	BE 121	BE 121	BE 121	BE 121	BE 121	Four Prong Socket—Type 80	1	
BE 118-1	BE 118-1	BE 118-1	Dual .1 x 200V-Plus 50% ; Minus 10% (Series B & C use 3 per set)	1	BE 121	BE 121	BE 121	BE 121	BE 121	Five Prong Socket—Speaker	1	
BE 119-11	Not Used.	Not Used.	4-3-3 Mfd. Electrolytic	1	BE 121	BE 121	BE 121	BE 121	BE 121	Six Prong Socket—Type 42	1	
BE 119-12	Not Used.	Not Used.	8-8-4 Mfd. Electrolytic (For 25 Cy. Only)	1	BE 121	BE 121	BE 121	BE 121	BE 121	Six Prong Socket—Type 75	1	
BE 129-2	BE 129-2	BE 129-2	.0005 Mica-MT-20%	2	BE 121	BE 121	BE 121	BE 121	BE 121	Six Prong Socket—Type 6D6	1	
BE 129-5	BE 129-5	BE 129-5	.0001 Mica-MT-20%	1	BE 121	BE 121	BE 121	BE 121	BE 121	Seven Prong Socket—Type 6F7	1	
BE 129-15	BE 129-15	BE 129-15	.00055 Mica-MT-5%	1	BE 121	BE 121	BE 121	BE 121	BE 121	MISCELLANEOUS		
BE 129-16	BE 129-16	BE 129-16	.00287 Mica-MW-5%	1	BE 121	BE 121	BE 121	BE 121	BE 121	Volume Control	1	
Not Used.	BE 129-23	BE 129-23	.002 Mica-MW-5%	1	BE 121	BE 121	BE 121	BE 121	BE 121	Two Gang Variable Condenser	1	
Not Used.	BE 129-24	BE 129-24	.000425 Mica-MT-5%	1	BE 121	BE 121	BE 121	BE 121	BE 121	Metal Clad Resistor	1	
BE 130-3	BE 130-3	BE 130-3	500M Ohm-1/5 Watt-20%-100V-Carbon	1	BE 101-18	BE 101-18	BE 101-18	BE 101-18	BE 101-18	Line Cord	1	
BE 130-11	BE 130-11	BE 130-11	250M Ohm-1/3 Watt-20%-50V-Carbon	1	BE 102-12	BE 102-12	BE 102-12	BE 102-12	BE 102-12	Crystal	1	
BE 130-12	BE 130-12	BE 130-12	50M Ohm-1/3 Watt-20%-20V-Carbon	1	BE 106-18	Not Used.	Not Used.	Not Used.	Not Used.	Pointer	1	
BE 130-19	BE 130-19	BE 130-19	1 Meg Ohm-1/3 Watt-20%-100V-Carbon	1	BE 107-5	BE 107-5	BE 107-5	BE 107-5	BE 107-5	Drive Disc Complete	1	
BE 130-20	BE 130-20	BE 130-20	100M Ohm-1/5 Watt-20%-50V-Carbon	1	BE 112-15	BE 112-15	BE 112-15	BE 112-15	BE 112-15	Planetary Drive Complete	1	
Not Used.	BE 130-32	BE 130-32	250 Ohm-1/3 Watt-20%-10V-Wire W.	1	BE 112-16	BE 112-16	BE 112-16	BE 112-16	BE 112-16	Compression Spring	1	
BE 130-38	Not Used.	Not Used.	700 Ohm-1/3 Watt-20%-20V-Carbon	1	BE 112-19	BE 112-19	BE 112-19	BE 112-19	BE 112-19	Pilot Light Bracket	1	
BE 130-39	BE 130-39	BE 130-39	19M Ohm-1/2 Watt-20%-150V-Carbon	1	BE 112-26	BE 112-26	BE 112-26	BE 112-26	BE 112-26	Drive Bracket Assembly	1	
BE 130-40	Not Used.	Not Used.	800 Ohm-1/3 Watt-20%-20V-Carbon	1	BE 112-31	BE 112-31	BE 112-31	BE 112-31	BE 112-31	Bakelite Escutcheon with Glass	1	
BE 130-41	Not Used.	Not Used.	20M Ohm-1/2 Watt-20%-100V-Carbon	1	BE 112-40	BE 112-40	BE 112-40	BE 112-40	BE 112-40	Dial Scale	1	
BE 130-42	BE 130-42	BE 130-42	25M Ohm-1/2 Watt-20%-150V-Carbon	1	BE 112-62	BE 112-62	BE 112-62	BE 112-62	BE 112-62	Dial Scale	1	
Not Used.	BE 130-44	BE 130-44	800M Ohm-1/5 Watt-10%-100V-Carbon	1	BE 112-66	BE 112-66	BE 112-66	BE 112-66	BE 112-66	Tube Shield	2	
Not Used.	BE 130-46	BE 130-46	180M Ohm-1/5 Watt-10%-100V-Carbon	1	BE 112-66A	BE 112-66A	BE 112-66A	BE 112-66A	BE 112-66A	Pilot Light Bulb—6-8V-T50	1	
Not Used.	BE 130-47	BE 130-47	15M Ohm-1/5 Watt-10%-20V-Carbon	1	BE 114-11	Not Used.	Not Used.	Not Used.	Not Used.	Type J-2.5 Padder	1	
BE 104-14	BE 104-14	BE 104-14	50/60 Cycle Power Transformer	1	BE 114-16	BE 114-16	BE 114-16	BE 114-16	BE 114-16	Wave Change Switch	1	
BE 104-17	BE 104-17	BE 104-17	Universal Power Transformer—40 Cy. Pri.	1	BE 114-16	BE 114-16	BE 114-16	BE 114-16	BE 114-16	Bakelite Knobs	2	
BE 104-18	BE 104-18	BE 104-18	25 Cycle Power Transformer	1	BE 114-16	BE 114-16	BE 114-16	BE 114-16	BE 114-16	Bakelite Knob—(3 Dots)	1	
Not Used.	BE 105-9	Not Used.	COILS		BE 114-16	BE 114-16	BE 114-16	BE 114-16	BE 114-16	Five Inch Speaker—*	1	
Not Used.	BE 105-10	Not Used.	Antenna Choke Coil	1	BE 114-16	BE 114-16	BE 114-16	BE 114-16	BE 114-16	Five Inch Speaker—*	1	
BE 108-26	BE 108-26	BE 108-26	Antenna Choke Coil	1	BE 114-16	BE 114-16	BE 114-16	BE 114-16	BE 114-16	Five Inch Speaker—*	1	
BE 108-27	Not Used.	Not Used.	Input I.F. Transformer Complete	1	BE 114-16	BE 114-16	BE 114-16	BE 114-16	BE 114-16	Five Inch Speaker—*	1	
Not Used.	BE 108-28	Not Used.	Output I.F. Transformer Complete	1	BE 114-16	BE 114-16	BE 114-16	BE 114-16	BE 114-16	Five Inch Speaker—*	1	
Not Used.	BE 108-38	BE 108-38	Output I.F. Transformer Complete	1	BE 114-16	BE 114-16	BE 114-16	BE 114-16	BE 114-16	Five Inch Speaker—*	1	
Not Used.	BE 108-40	Not Used.	Output I.F. Transformer Complete	1	BE 114-16	BE 114-16	BE 114-16	BE 114-16	BE 114-16	Five Inch Speaker—*	1	

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

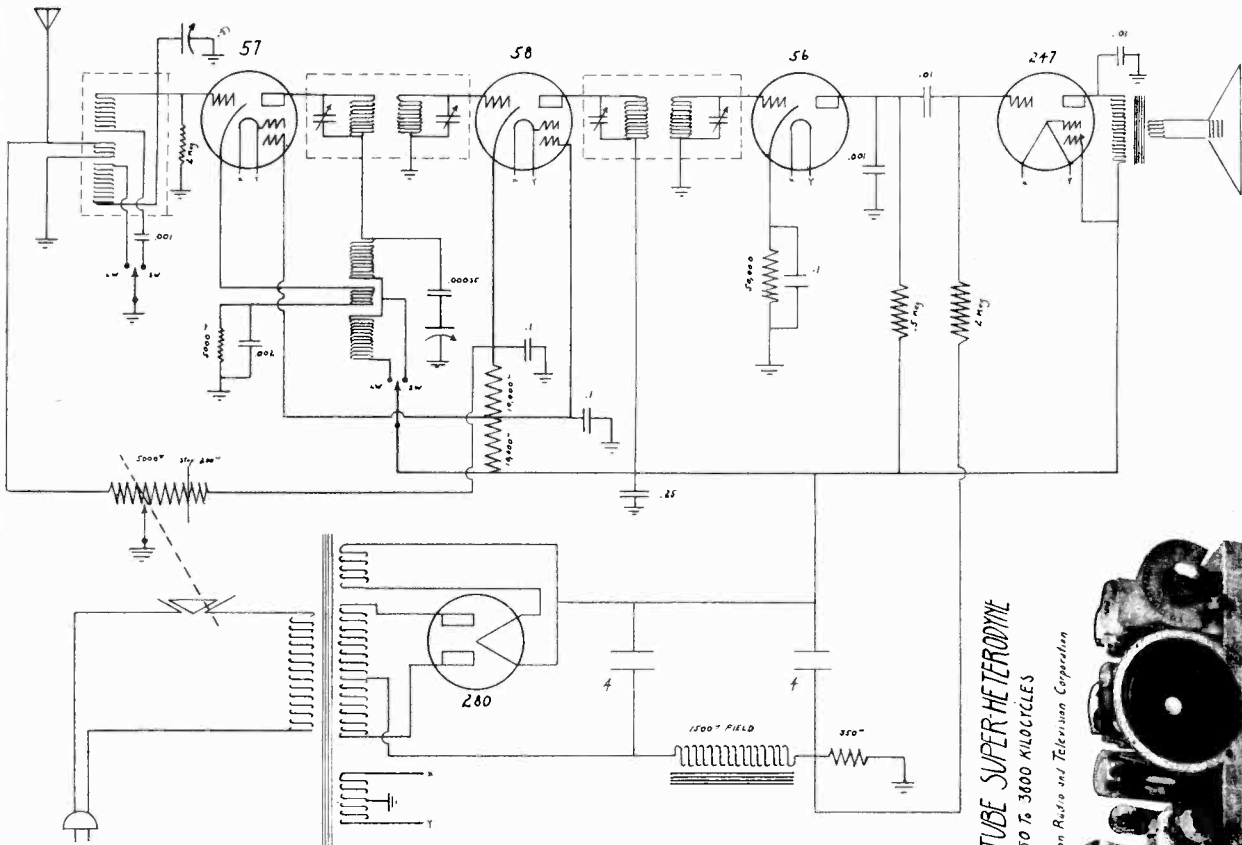
* NOTE: Speakers cannot be ordered, defective speakers must be repaired.

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.

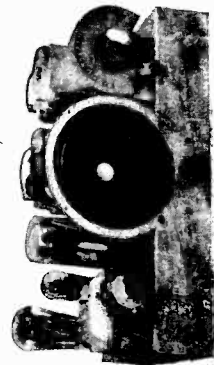
MODEL 62PC43
Schematic
Voltage, Parts

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

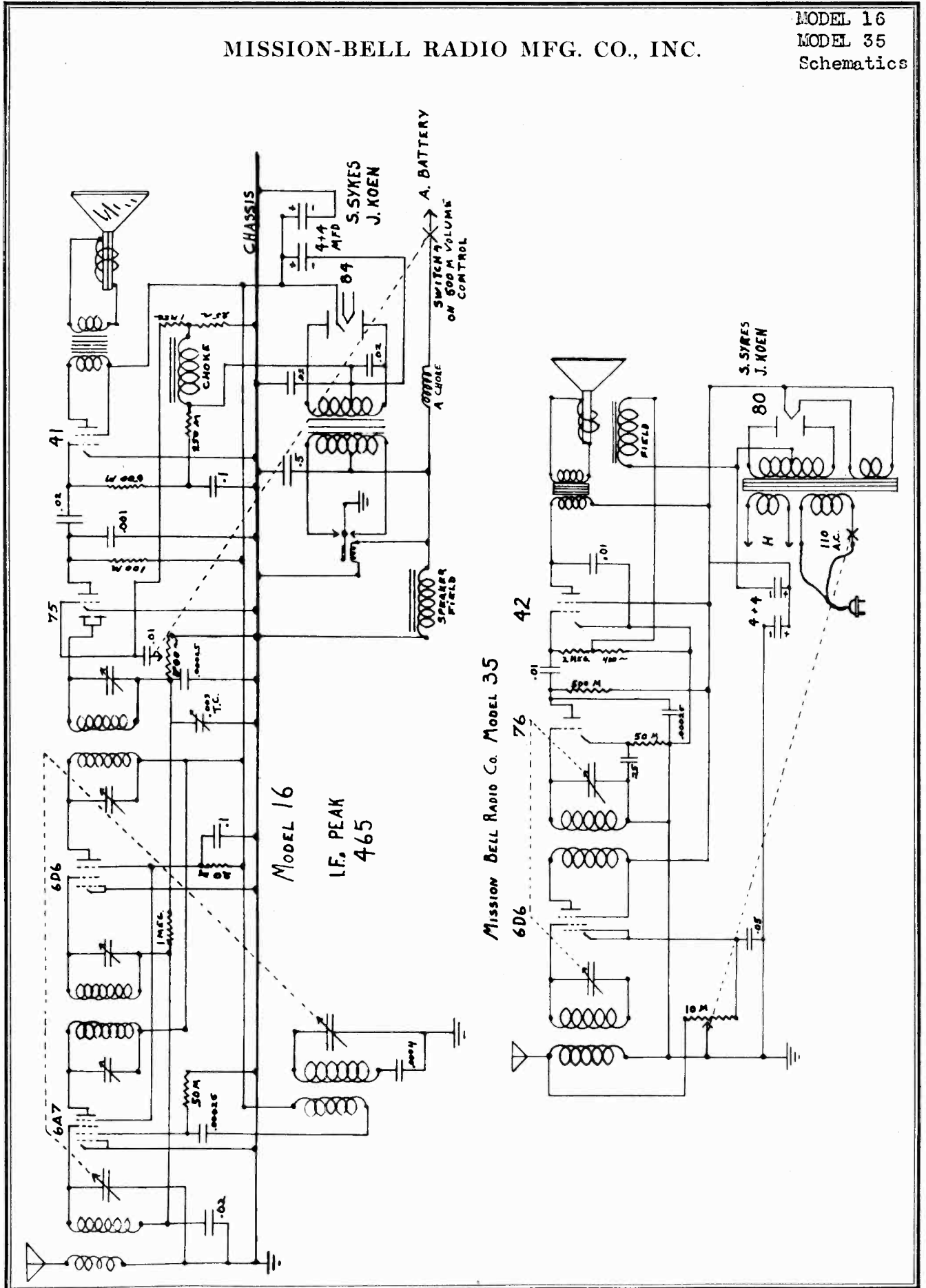
Airline Model 62-PC-43

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

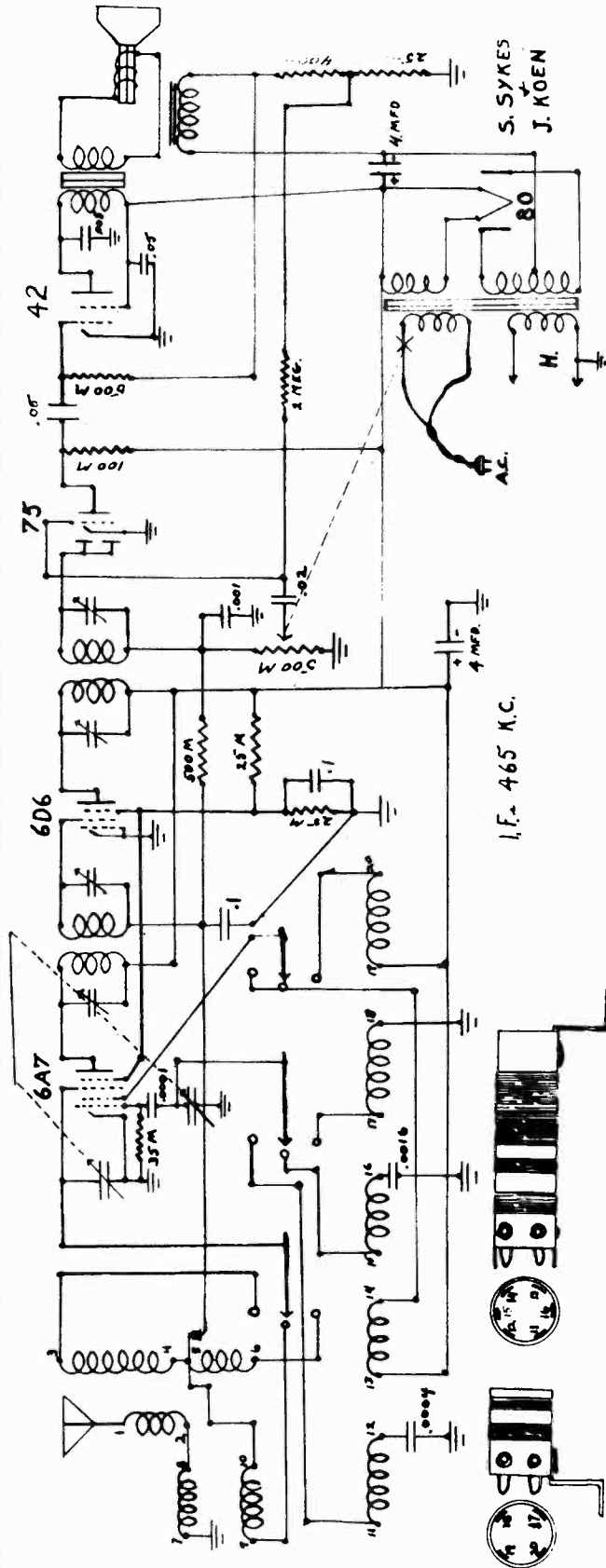
Part No.	PART NAME	Unit Per Chassis	Cost Price	Selling Price	Part No.	PART NAME	Unit Per Chassis	Cost Price	Selling Price
SW-431	Tube Socket No. 56	1	.06	.15	SW-4317	R. F. Coil	1	.25	.63
SW-432	Tube Socket No. 57	1	.06	.15	SW-4318	Oscillator Coil	1	.25	.63
SW-433	Tube Socket No. 58	1	.06	.15	SW-4319	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.

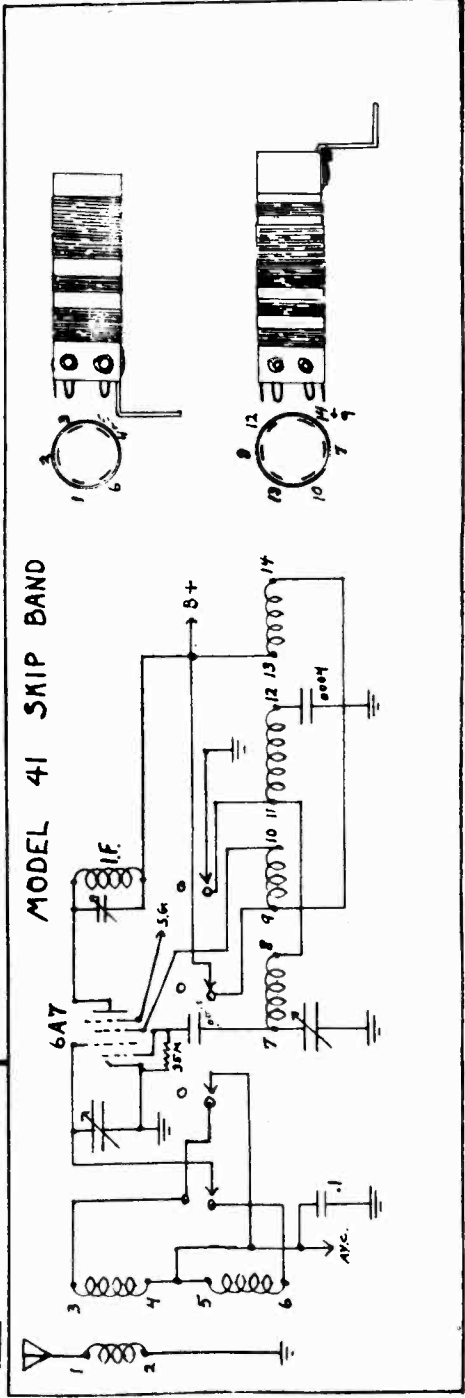
MODEL 16
MODEL 35
Schematics



MODEL 41AW
 MODEL 41 Skip Band MISSION-BELL RADIO MFG. CO., INC.
 Schematics

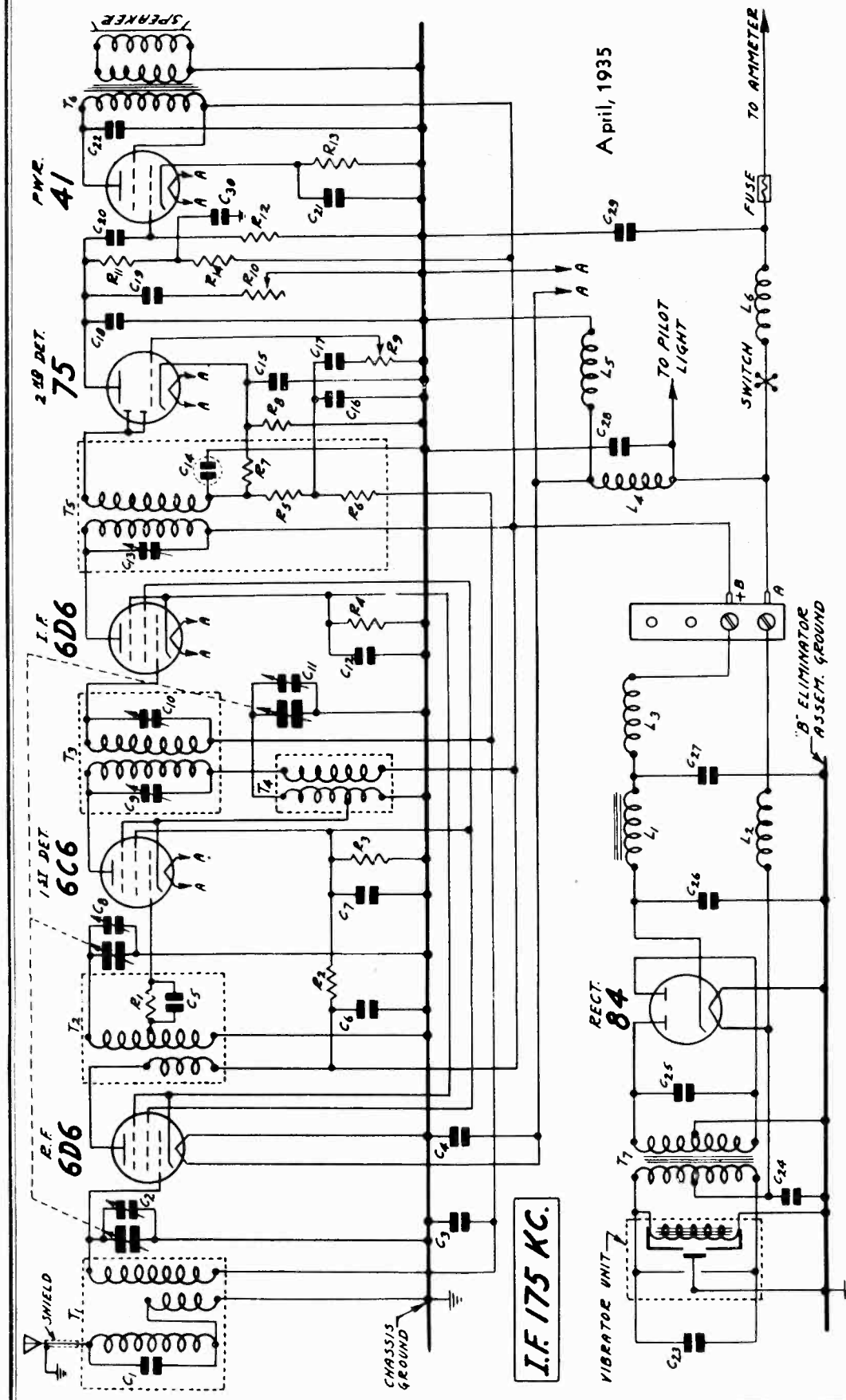


MISSION BELL MODEL 41
 ALL WAVE-



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 1.0 MEGOHM .2 W.
- C32 1.0 MEGOHM .2 W.
- C33 15000 OHM .5 W.
- C34 50000 OHM .2 W.
- C35 300000 OHM .2 W.
- C36 50000 OHM .2 W.
- C37 500000 OHM .2 W.
- C38 500000 OHM .2 W.
- C39 500000 OHM .2 W.
- R1 1.0 MEGOHM .2 W.
- R2 15000 OHM .5 W.
- R3 20000 OHM .5 W.
- R4 450 OHM .2 W. } ONE
- R5 300000 OHM .2 W. } ASSEMBLY
- 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 Field1.15 Amperes "B" Unit3.00 Amperes
Chassis1.50 Amperes Pilot Lamp0.1 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	L1	300.
P-9A374	Filament Reactor	L2	Small
P-9A268	R.F. "B" Choke	L3	3.5
P-9A375	Pilot Light Choke Assembly	L4	Small
P-12A62A	Speaker Field	L5	5.
P-9A373	Motor Noise Choke	L6	Small

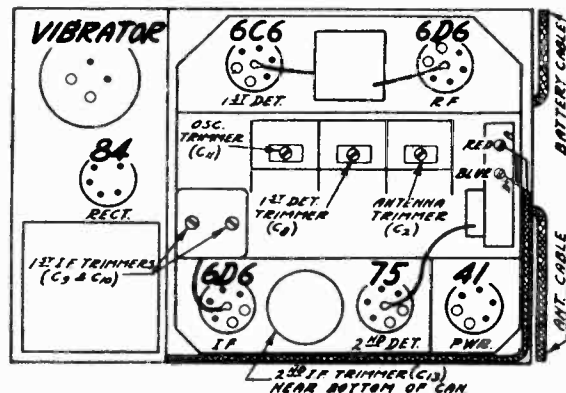


Fig. 2—Tube Arrangement and Trimmers

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-18A36	1	20" Tuning Condenser Flexible Drive Shaft	.54
P-18A37	1	32" Volume Control Flexible Drive Shaft	.74
P-18A38	1	32" Tuning Condenser Flexible Drive Shaft	.78
P-13X52	1	Ammeter Cable and Fuse Receptacle	.16
P-13X204	1	Antenna Cable and Fitting	.36
P-13X211	1	Pilot Light Cable Assembly	.58
P-7A32	1	Pilot Light Bulb—Bayonet Pin Base (6-8 V)	.10
P-20X59	4	Double End Hexagon Bolts for Mounting Chassis to dash	.04
P-20X74	4	5/16" Shakeproof Lockwashers for above Mounting Assembly	.04
P-19X18	8	Flat Washers for above mounting assembly	.08
P-20X75	8	5/16" Split Lockwashers for above mounting assembly	.04
P-20X77	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)	1.00
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	L3	.14
P-9A268	R.F. "B" Choke Coil Assembly	L2	.24
P-9A374	Filament Reactor	T7	1.52
P-53X22	Power Transformer	L1	.44
P-52X22	Filter Choke		

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	.12
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	12.00 mf.	25	Dry Electrolytic Block	.08
P-47X52	C16	.00025 mf.		Moulded	.08
P-46X84	C17	.01 mf.	180	Tubular	.08
P-47X52	C18	.00025 mf.	600	Tubular	.10
P-46X92	C19	.006 mf.	400	Tubular	.10
P-46X86	C20	.01 mf.	600	Tubular	.10
P-46X85	C22	.002 mf.	600	Tubular	.18
P-46X93	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	Dry Electrolytic Block	1.00
P-47X50	C28	.50 mf.	180	Tubular	.12
P-46X94	C29	.003 mf.	300	Moulded	.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-36X200	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	\$2.00
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

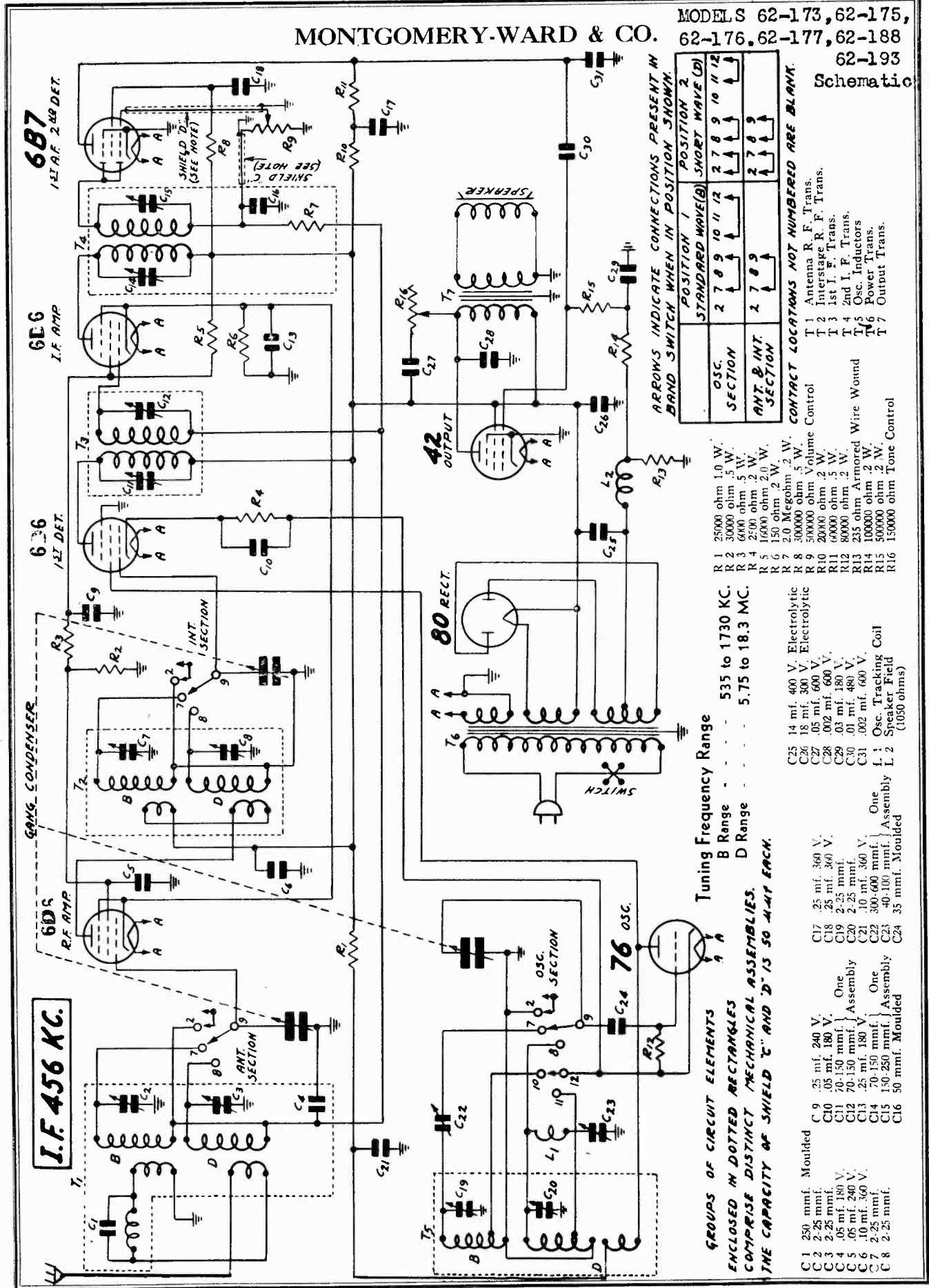
* Used in early models. (See article on changes in this manual.)

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

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											
	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	10	11	12	2	7	8	9	10	11	12	2	7	8	9	10	11	12			

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

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.

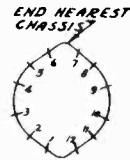
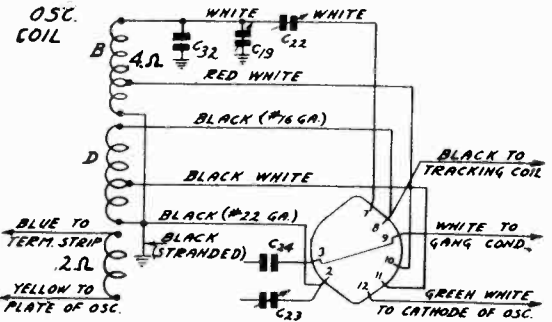
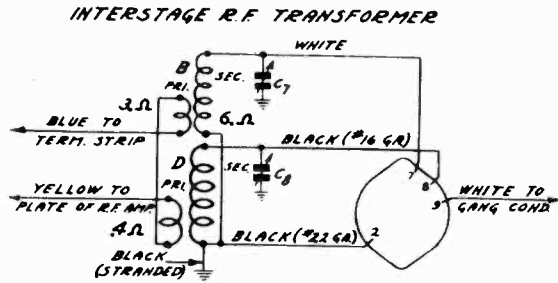
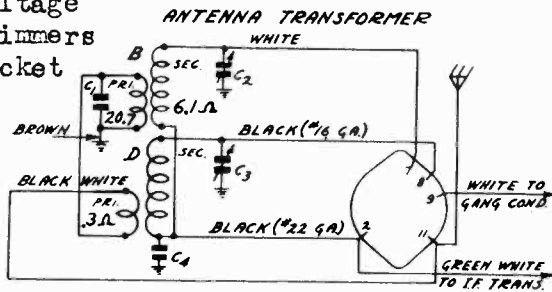
- C 1 250 mmf. Moulded
- C 2 2-25 mmf.
- C 3 2-25 mmf.
- C 4 .05 mf. 180 V.
- C 5 .05 mf. 240 V.
- C 6 .10 mf. 360 V.
- C 7 2-25 mmf.
- C 8 2-25 mmf.
- C 9 .25 mf. 240 V.
- C 10 .05 mf. 180 V.
- C 11 70-150 mmf. Assembly
- C 12 70-150 mmf. Assembly
- C 13 .25 mf. 180 V.
- C 14 70-150 mmf. Assembly
- 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

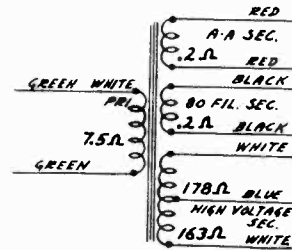
MONTGOMERY-WARD & CO.

Color Coding,
Resistance Data

Voltage
Trimmers
Socket



SWITCH CONTACT LOCATION AND STANDARD NUMBERING



POWER TRANSFORMER

NOTE: RESISTANCE VALUES NOT SHOWN ARE SMALL.

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

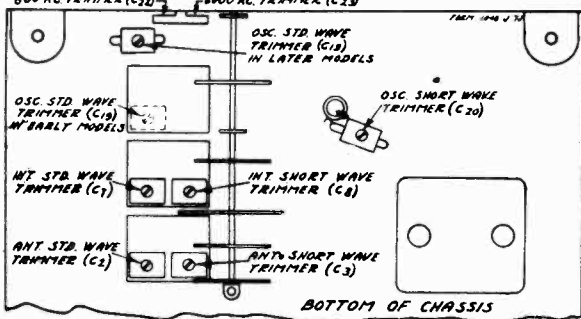


Fig. 4—Location of Trimmers

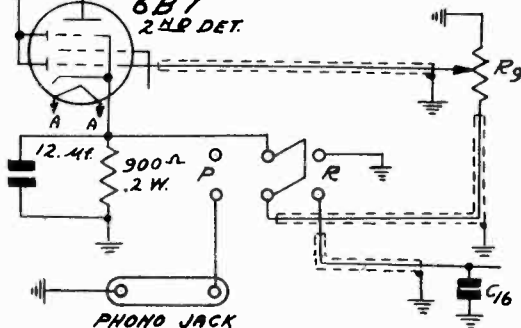


Fig. 7—Phonograph Connections

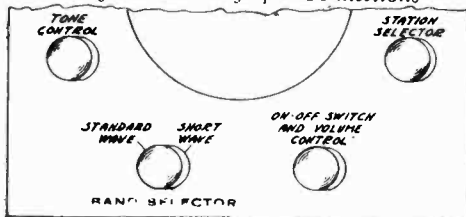


Fig. 1—Arrangement of Controls

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.

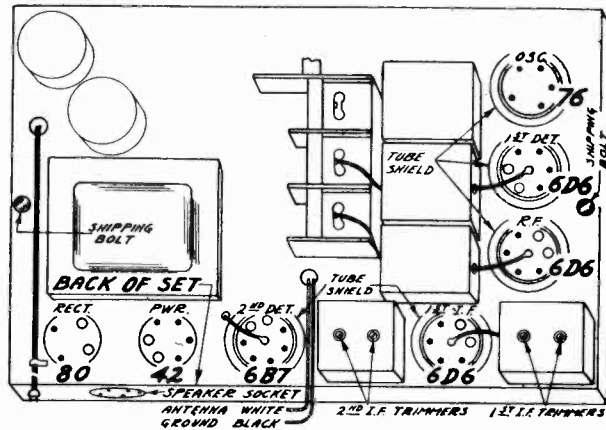


Fig. 6—Location of Tubes

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 mmfd. 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
	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

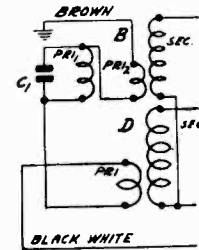


Fig. 5—Antenna Transformer on Early Models

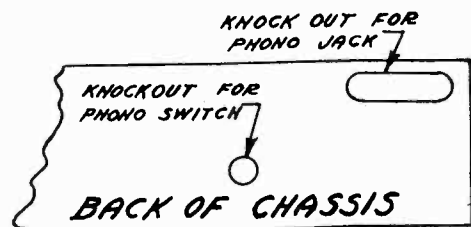


Fig. 8—Location of Phono Knockouts

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, 18,000, 15,000 and 6000 KC and an output indicating meter are required. It will be practically impossible to align the receiver if unsatisfactory apparatus is used.

Use a non-metallic 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

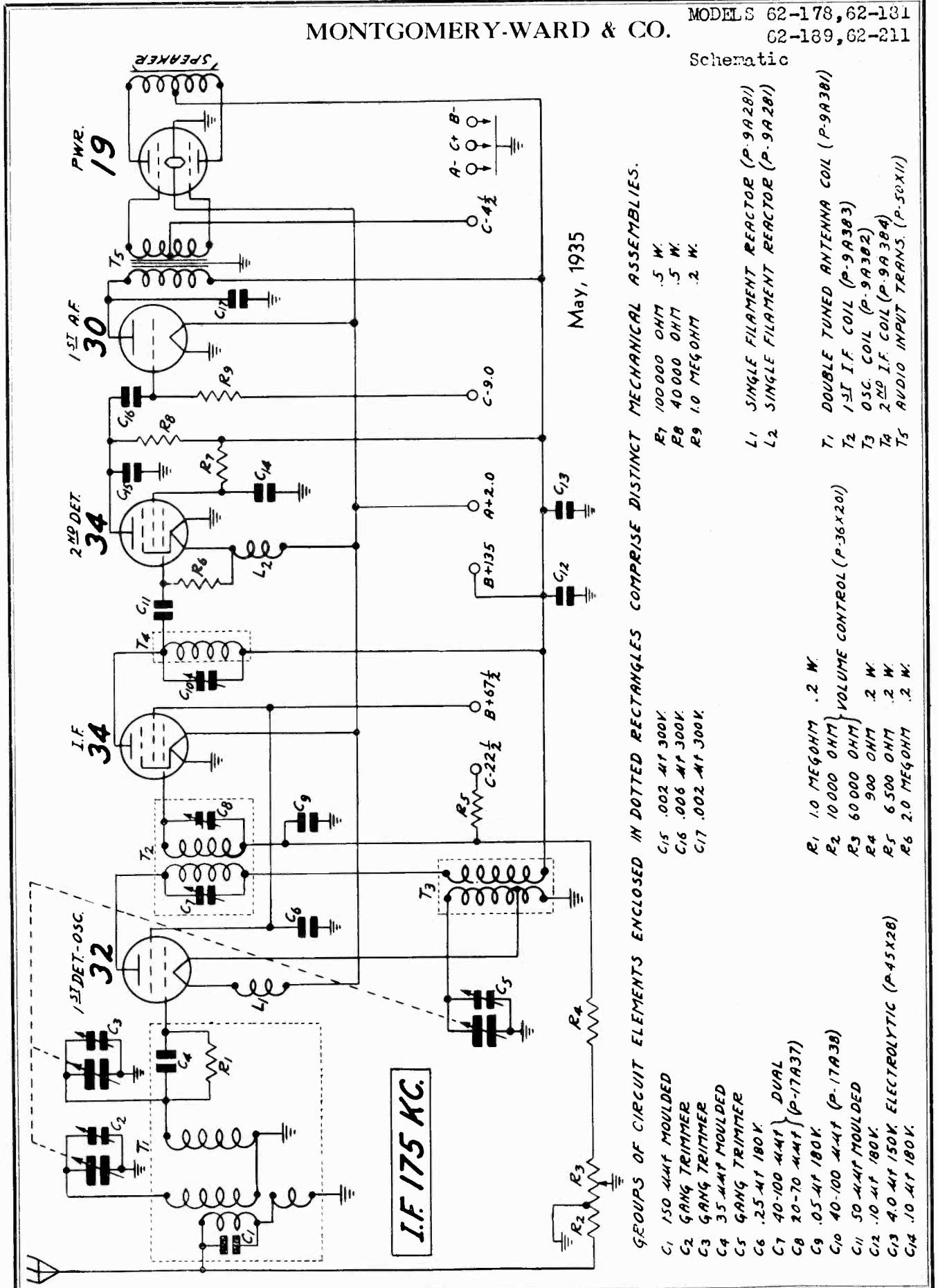
Set the signal generator for 1730 KC. Turn the rotor of the tuning condenser to the full open position.

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



May, 1935

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

- C1 150-44kF MOULDED GANG TRIMMER
- C2 GANG TRIMMER
- C3 GANG TRIMMER
- C4 35-44kF MOULDED GANG TRIMMER
- C5 GANG TRIMMER
- C6 .25-41F 180V
- C8 40-100-44kF DUAL GANG TRIMMER (P-17A37)
- C9 .05-41F 180V
- C10 40-100-44kF (P-17A38)
- C11 50-44kF MOULDED GANG TRIMMER
- C12 .10-41F 180V
- C13 4.0-41F 150V ELECTROLYTIC (P-45X28)
- C14 .10-41F 180V
- R1 10 MEGOHM .2 W.
- R2 10,000 OHM
- R3 60,000 OHM
- R4 900 OHM .2 W.
- R5 6,500 OHM .2 W.
- R6 2.0 MEGOHM .2 W.
- R7 100,000 OHM .5 W.
- R8 40,000 OHM .5 W.
- R9 1.0 MEGOHM .2 W.
- L1 SINGLE FILAMENT REACTOR (P-9A281)
- L2 SINGLE FILAMENT REACTOR (P-9A281)
- T1 DOUBLE TUNED ANTENNA COIL (P-9A381)
- T2 .5I IF COIL (P-9A383)
- T3 OSC. COIL (P-9A382)
- T4 2.5I IF COIL (P-9A384)
- T5 AUDIO INPUT TRANS. (P-50X11)

I.F. 175 KC.

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.

Part No.	Description	Code	D. C. Resistance in Ohms
9A381	Double Tuned Ant. Trans. Pri. (in series)	T1	17
	Double Tuned Ant. Trans. Sec.	T1	3.5
	Double Tuned Ant. Trans. Sec. (1st Det.)	T1	3.5
9A383	1st I.F. Trans. Primary	T2	80
9A382	1st I.F. Trans. Secondary	T2	105
9A384	Oscillator Coil Plate Winding	T3	7
9A281	2nd I.F. Reactor Coil	T4	50
9A281	2nd I.F. Reactor (In 1st Det. Ckt.)	L1	Small
9A281	Fluxon Reactor (In 2nd Det. Ckt.)	L2	Small
9A281	Audio Transformer Primary	T5	950
9A281	Audio Transformer Secondary (Center Tap to outside boundary)	T5	600
9A281	Audio Transformer Secondary (Center Tap to inside)	T5	590
9A281	Magnetic Speaker (Center Tap to outside)	T5	590
9A281	Magnetic Speaker (Center Tap to inside)	T5	239

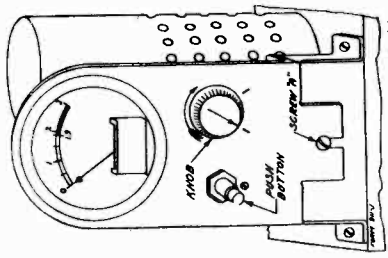


Fig. 4—Voltage Regulator in Position

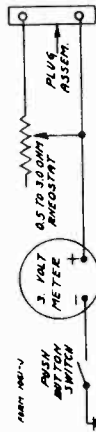


Fig. 5—Schematic Diagram of Voltage Regulator

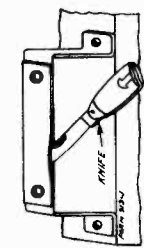


Fig. 6—Prying off Fiber Cover

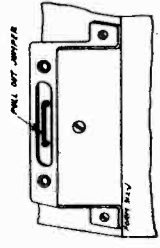


Fig. 7—Removing Jumper Wires

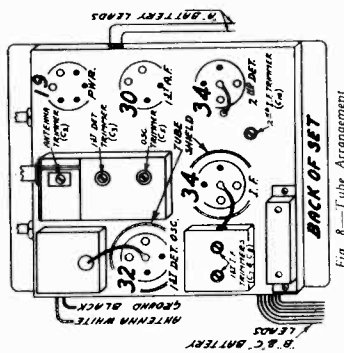


Fig. 8—Tube Arrangement

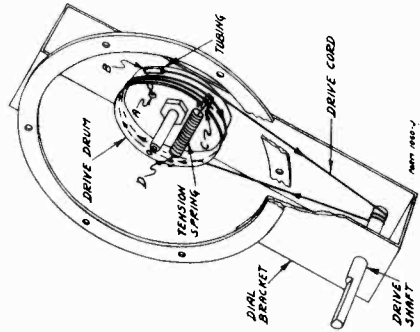


Fig. 9—Replacing Drive Cord

"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 filament. 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.

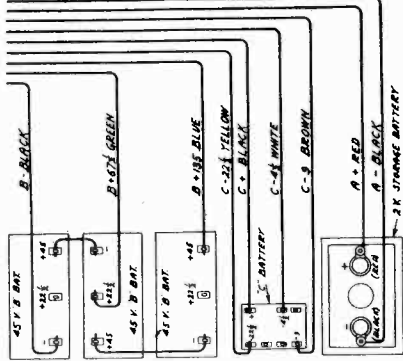


Fig. 2—Complete Battery Wiring Connections

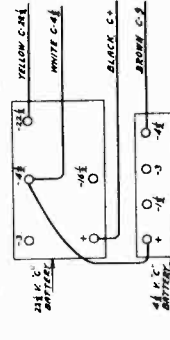


Fig. 3—C Battery Connections Using Standard Battery

VOLTAGES AT SOCKETS

Volume Control at Maximum—Antenna Shorted to Ground. B-135 Volts

Type of Tube	Function	Across Filament	Plate to Gnd.	Screen to Gnd.	Grid to Gnd.	Normal Plate R. A.
32	1st Det. & Osc.	2.0	135	67.5	7.5 (1) (2)	2.5
34	I. F.	2.0	135	67.5	2.5 (3)	1.8
34	2nd Det.	2.0	50	40 (1) 0	0	2.8
30	1st Audio	2.0	135	67.5	9 (4)	5.0
19	Output	2.0	135	67.5	4.5	3.2 Total

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

Replacement Parts

TRANSFORMERS AND COILS

New Part No.	Old Part No.	Description	List Price
9A381	T1	Double Tuned Antenna Transformer	1.75
42543	T1	1st I.F. Transformer and Can Assembly	1.15
9A382	T2	1st I.F. Transformer and Can Assembly	2.00
9A383	T2	Oscillator Coil and Can Assembly	1.00
9A384	T4	2nd I.F. Reactor Coil and Can Assembly	1.75
9A381	L1	2nd I.F. Reactor	2.00
9A281	L2	Fluxon Reactor in 1st Det. Circuit	1.85
9A281	L2	Fluxon Reactor in 2nd Det. Circuit	2.25

RESISTORS

New Part No.	Old Part No.	Resistance	Watts	Type	List Price
A93105	R1	1.0 Megohm	0.2	Carbon	10
	R2	10,000 Ohms	0.2	Dual Volume Control	1.20
	R3	900 Ohms	0.2	Carbon	15
A94901	R4	900 Ohms	0.2	Carbon	15
A94902	R5	6,900 Ohms	0.2	Carbon	15
A93005	R6	2.0 Megohm	0.2	Carbon	10
B94104	R7	100,000 Ohms	0.5	Carbon	15
B94601	R8	40,000 Ohms	0.5	Carbon	15
A93105	R9	1.0 Megohm	0.2	Carbon	10

CONDENSERS

New Part No.	Old Part No.	Capacity	Voltage	Type	List Price
47X55	C1	150 mmf.		Mouled	15
47X53	C2	Antenna Trimmer—Part of Gang Condenser			10
46X79	C3	1st Det. Trimmer—Part of Gang Condenser			10
46X79	C4	Oscillator Trimmer—Part of Gang Cond.			10
46X79	C5	25 mf. 180 V. Tubular			35
46X79	C6	40-100 mmf. 1st I.F. Trimmer Cond.			35
46X79	C7	40-100 mmf. 2nd I.F. Trimmer Cond.			35
46X79	C8	65-70 mmf. 1st I.F. Trimmer Cond.			35
46X79	C9	50 mmf. 2nd I.F. Trimmer Cond.			35
46X79	C10	40-100 mmf. 100 V. Tubular			25
46X79	C11	180 Tubular			10
46X79	C12	0.1 mf. 180 Tubular			20
46X79	C13	4.0 mf. 180 Tubular			85
46X79	C14	4.0 mf. 180 Tubular			20
46X79	C15	0.05 mf. 300 Tubular			30
46X79	C16	0.05 mf. 300 Tubular			15
46X79	C17	0.05 mf. 300 Tubular			30
46X79	C18	3 Section Gang Condenser			30

MISCELLANEOUS

New Part No.	Old Part No.	Description	List Price
1644	30	Type 30 Tube Socket (4 Prong)	10
1645	31	Type 31 Tube Socket (4 Prong)	10
1813	19	Type 19 Tube Socket (6 Prong)	10
3094		Shoaker Cable and Socket Assembly	85
3094		1/2" and 3/4" Battery Cable	40
3094		Antenna Ground Lead Assembly	30
3094		6" Magnetic Speaker	4.35
3094		8" Magnetic Speaker	4.99
3094		Crystal Retainer Ring	10
3094		Glass Crystal	20
3094		Crystal Retainer Ring	10
3094		1087 Feet Washers (for use behind knobs)	10
3094		20796 Tube Shield Base	10
3094		1022 Rubber Chassis Mounting Cushions	10
3094		1441 1/2" Rite, Front in Center	10
3094		30342 Grid Clip Only	10

DIAL ASSEMBLY

New Part No.	Old Part No.	Description	List Price
3094		Dial and Drive Assembly Complete	2.70
3094		Drive and Dial Bracket Assembly Only	65
3094		Indicator Disc and Hub Assembly Only	25
3094		Drive Shaft Only	10
3094		Horse Shoe Lockwasher for use on above shaft	10
3094		Pointer Shaft	10
3094		Drive Drum	10
3094		16" Back Drive Cord	25
3094		16" Back Drive Cord	15
3094		Brass Collar (6.12 x 1/16") Set Screw for securing above indicator cord to shaft of volume control and on offset shaft of dial	10
3094		Volume Control and On Off Switch, Model No. and Name of Manufacturer	35
3094		Double End Pointer	10
3094		Indicator Spring	10

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:—

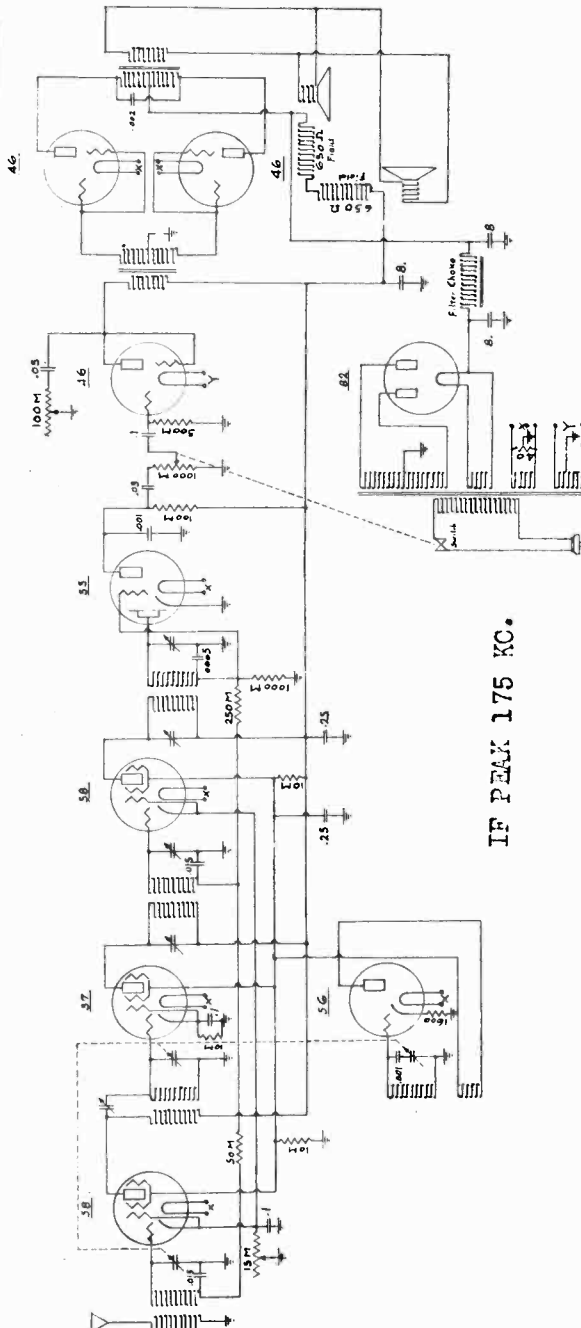
Use output meter connected in parallel with the plate circuit of the power pentode. Connect the oscillator with the grid of the first detector. Adjust each of the trimming condensers on the I.F. transformers located underneath the chassis, until maximum signal is shown on the output meter. Go over these 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.

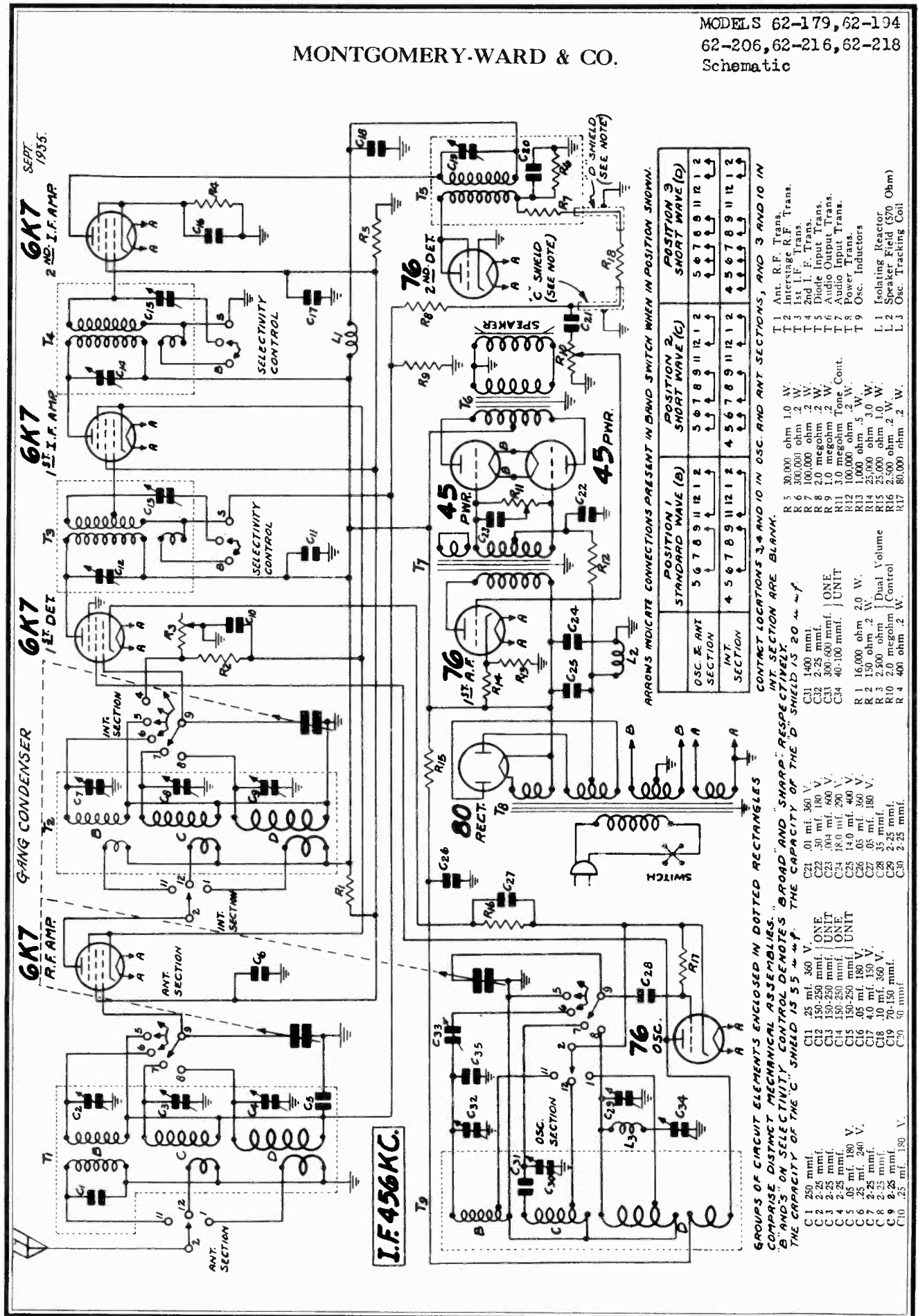
VOLTAGES OF 9-TUBE SET

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



MONTGOMERY-WARD & CO.

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



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

	POSITION 1 STANDARD WAVE (B)	POSITION 2 SHORT WAVE (C)	POSITION 3 SHORT WAVE (D)
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

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 "BROAD" AND "SHARP" RESPECTIVELY. THE CAPACITY OF THE "C" SHIELD IS 55 μ F. THE CAPACITY OF THE "D" SHIELD IS 20 μ 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 20 W.
 - R2 15,000 ohm 30 W.
 - R3 2,500 ohm 1.0 W.
 - 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 210 megohm 2 W.
 - R9 1.0 megohm 2 W.
 - R10 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 I.F. 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 tube. This metal tube operates at the same voltage and is readily substituted when it replaces in this receiver. The metal tube pin positions from a 6-pin 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 coils 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 hole 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.

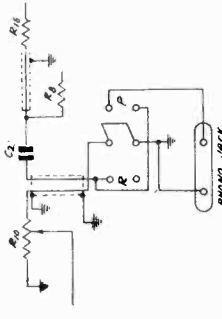


Fig. 7.—Phonograph Connections

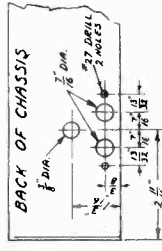


Fig. 8.—Details of Panel Drilling for Phono Assembly

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.

Adjust the interstage Range D trimmer (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 15,000 KC adjustment.

If it is found necessary to readjust 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.

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

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

Tune the band selector to the Range D position (2nd short wave band—red dial color).

Turn the volume control knob 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.

Before reassembling the chassis into the cabinet observe the position of the 80 rectifier tube socket. If the socket of the type 80 rectifier tube has the filament prongs nearest the electrolytic condensers, remove the rivets which secure this socket to the chassis base and then rotate the socket 180 degrees, so that the filament prongs are nearest the corner of the chassis. Replace the rivets.

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.

Adjust the volume control knob and forth at the same time adjusting the 6000 KC trimmer until the peak of greatest intensity is obtained.

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

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

Tune the band selector to the Range D position (2nd short wave band—red dial color).

Turn the volume control knob and forth at the same time adjusting the 6000 KC trimmer until the peak of greatest intensity is obtained.

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

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

Tune the band selector to the Range D position (2nd short wave band—red dial color).

Turn the volume control knob and forth at the same time adjusting the 6000 KC trimmer until the peak of greatest intensity is obtained.

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

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

Tune the band selector to the Range D position (2nd short wave band—red dial color).

Turn the volume control knob and forth at the same time adjusting the 6000 KC trimmer until the peak of greatest intensity is obtained.

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

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

Tune 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.

Adjust the interstage Range D trimmer (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 15,000 KC adjustment.

If it is found necessary to readjust 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.

Turn the tuning condenser rotor until maximum output is obtained.

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

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

Tune the band selector to the Range D position (2nd short wave band—red dial color).

Turn the volume control knob and forth at the same time adjusting the 6000 KC trimmer until the peak of greatest intensity is obtained.

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

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

Tune the band selector to the Range D position (2nd short wave band—red dial color).

Turn the volume control knob and forth at the same time adjusting the 6000 KC trimmer until the peak of greatest intensity is obtained.

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

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

Tune the band selector to the Range D position (2nd short wave band—red dial color).

Turn the volume control knob and forth at the same time adjusting the 6000 KC trimmer until the peak of greatest intensity is obtained.

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

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

Tune the band selector to the Range D position (2nd short wave band—red dial color).

Turn the volume control knob and forth at the same time adjusting the 6000 KC trimmer until the peak of greatest intensity is obtained.

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

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

Tune the band selector to the Range D position (2nd short wave band—red dial color).

Turn the volume control knob and forth at the same time adjusting the 6000 KC trimmer until the peak of greatest intensity is obtained.

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

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

Tune the band selector to the Range D position (2nd short wave band—red dial color).

Circuit

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

When the selectivity control is in the sharp position, the secondary winding is open circuit 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 audio tube is varied (R10) in the other section the R. F. and I. F. 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 I. F. tubes. The audio voltage developed across volume control resistor R10 is applied through the motor tube transformer to the 45 tubes. Transformer coupling is used between the first audio 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.

Losen 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 B trimmer.

6000 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 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
Set the signal generator for 5800 KC.

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. There are three sections of R. F. and oscillator coils 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 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 to another 6K7 tube which functions as the 1st detector.

A separate type 76 tube is employed in the 2nd detector section of the receiver. The AVC voltage is derived from the 76 tube through the motor tube transformer to the 45 tubes. Transformer coupling is used between the first audio 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
Correct alignment is extremely important in construction of this receiver. The trimmers should be all properly aligned at the factory with the receivers and resistances and positions should not be attempted unless all other possible causes of the faulty operation have first been investigated and unless the service technician has the proper equipment.

A signal generator that will provide an accurately calibrated signal at 456, 1730, 1500, 600, 5800, 1000, 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 for the signal generator 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.

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 .01 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.

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.

Set the signal generator for 1730 KC.

Set the signal generator for 1730 KC.

Set the signal generator for 1730 KC.

Set the signal generator for 1730 KC.

Set the signal generator for 1730 KC.

Set the signal generator for 1730 KC.

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

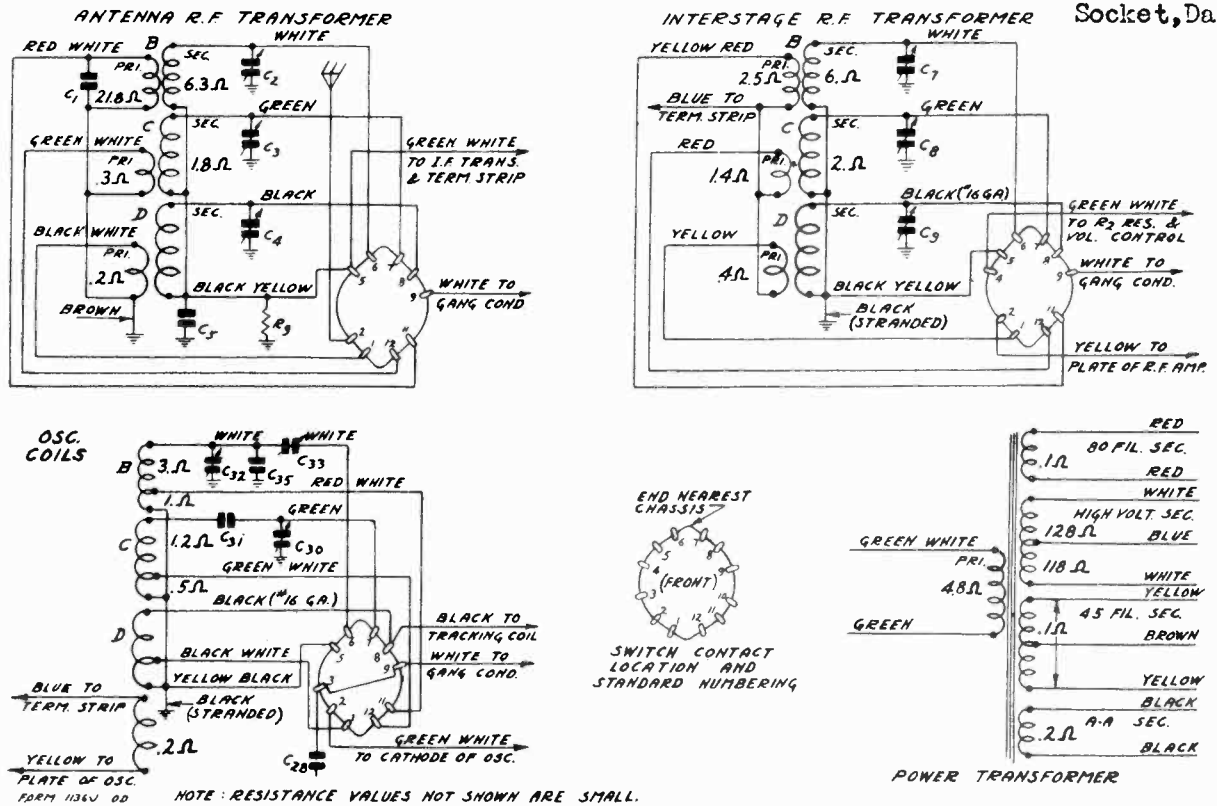


Fig. 4—Color Coding of Coil Wires and D. C. Resistance of Windings (Also see complete D. C. Resistance List in this Manual)

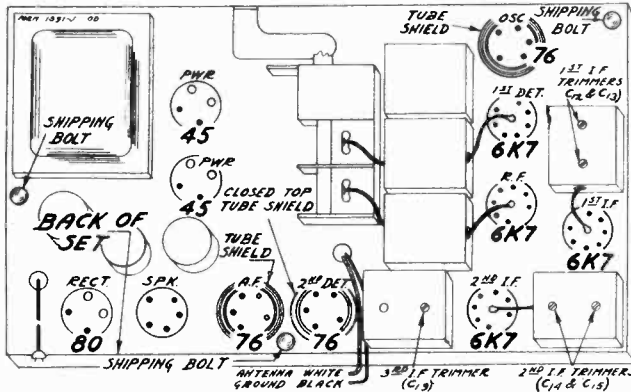


Fig. 5—Location of Tubes

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.

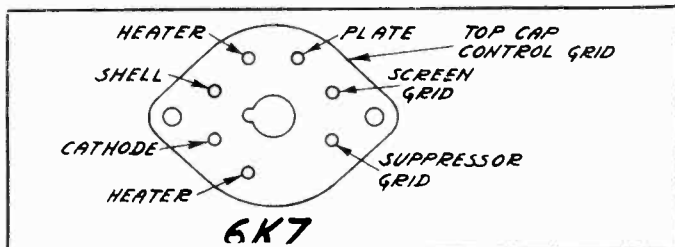


Fig. 6—Metal Tube—Bottom View of Socket

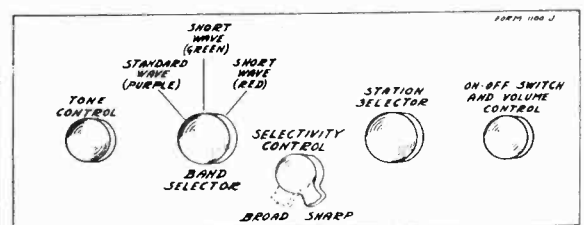


Fig. 7—Arrangement of Controls

MODELS 62-179,62-194
62-206,62-216,62-218
Resistance Test,Parts

MONTGOMERY-WARD & CO.

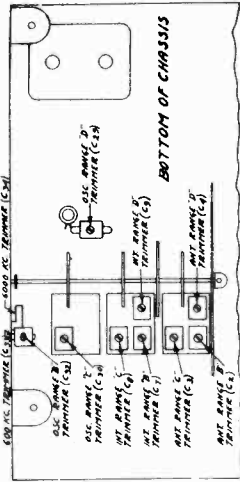


Fig. 3—Location of Trimmers

D. C. Resistance of Windings

Refer to Fig. 4.
Following are the D. C. resistances of the various windings in the chassis. The values given below will vary slightly in different sets.

Table with columns: Part No., Winding, D. C. Resistance in Ohms. Rows include: P-9A405 Antenna R. F. Transformer (21.8), Range B Primary Winding (0.3), Range C Primary Winding (0.3), Range D Primary Winding (0.3), Range E Primary Winding (0.3), Range F Primary Winding (0.3), Range G Primary Winding (0.3), Range H Primary Winding (0.3), Range I Primary Winding (0.3), Range J Primary Winding (0.3), Range K Primary Winding (0.3), Range L Primary Winding (0.3), Range M Primary Winding (0.3), Range N Primary Winding (0.3), Range O Primary Winding (0.3), Range P Primary Winding (0.3), Range Q Primary Winding (0.3), Range R Primary Winding (0.3), Range S Primary Winding (0.3), Range T Primary Winding (0.3), Range U Primary Winding (0.3), Range V Primary Winding (0.3), Range W Primary Winding (0.3), Range X Primary Winding (0.3), Range Y Primary Winding (0.3), Range Z Primary Winding (0.3).

Table with columns: Part No., Winding, D. C. Resistance in Ohms. Rows include: P-9A425 Interstage R. F. Transformer (2.5), Range B Primary Winding (1.4), Range C Primary Winding (1.4), Range D Primary Winding (1.4), Range E Primary Winding (1.4), Range F Primary Winding (1.4), Range G Primary Winding (1.4), Range H Primary Winding (1.4), Range I Primary Winding (1.4), Range J Primary Winding (1.4), Range K Primary Winding (1.4), Range L Primary Winding (1.4), Range M Primary Winding (1.4), Range N Primary Winding (1.4), Range O Primary Winding (1.4), Range P Primary Winding (1.4), Range Q Primary Winding (1.4), Range R Primary Winding (1.4), Range S Primary Winding (1.4), Range T Primary Winding (1.4), Range U Primary Winding (1.4), Range V Primary Winding (1.4), Range W Primary Winding (1.4), Range X Primary Winding (1.4), Range Y Primary Winding (1.4), Range Z Primary Winding (1.4).

Table with columns: Part No., Winding, D. C. Resistance in Ohms. Rows include: P-9A497 1st L. F. Transformer (4.6), Secondary Winding (1.4), Long Formion (1.7), Coupling Winding (0.2), P-9A498 2nd L. F. Transformer (T4), Primary Winding (9.4), Secondary Winding (0.9), Coupling Winding (0.5), P-9A499 3rd L. F. Transformer (T5), Primary Winding (10.2), Secondary Winding (28.4), P-9A416 Audio Input Transformer (2350), Primary Winding (2000), Secondary Winding (2690), Center Tap to Inside (198), Center Tap to Outside (222), P-51A32 Audio Output Transformer (T6), Primary Winding (198), Secondary Winding (222), Center Tap to Inside (0.4), Center Tap to Outside (1.6), P-12A308 Dynamic Speaker (107), Speaker Voice Coil (570), Volt 60 Cycle Power Jiaus (T8), P-53A94 115 Volt 60 Cycle Power Jiaus (T8), Tube Filament Secondary (A-A) (4.8), Rectifier Filament Secondary (B-B) (45) (0.1), High Frequency Secondary Winding (118), Center Tap to Inside (36), Center Tap to Outside (28), P-9A400 2nd L. F. Plate Isolating Reactor (L1) (1.2), P-9A491 High Frequency Oscillator Tracking Coil (L3) (1.2).

DIAL AND DRIVE ASSEMBLY—Continued

Table with columns: New Part No., Old Part No., Description, List Price. Rows include: P-15A48 Dial Bracket Assembly Complete (30), P-28X34 4" Black Drive Cord Only (10), P-28X42 Brass Collars and Set Screws Only for Securing above Drive Cord to Shaft (10), P-28X44 Gang Condenser and Drive Assembly, less Dial Assembly, can be purchased complete—see Condenser List.

RESISTORS

Table with columns: Part No., Code, Resistance, Watts, Type, List Price. Rows include: P-09A163 R1 16,000 ohms 2.0 Carbon (10), P-09A164 R2 150 ohms 0.2 Carbon (15), P-09A165 R3 2,300 ohms 0.2 Carbon (15), P-09A166 R4 20 ohms 0.2 Carbon (1.75), P-09A167 R5 400 ohms 0.2 Carbon (1.75), P-09A168 R6 30,000 ohms 1.0 Carbon (1.75), P-09A169 R7 30,000 ohms 0.2 Carbon (1.75), P-09A170 R8 100,000 ohms 0.2 Carbon (1.75), P-09A171 R9 100,000 ohms 0.2 Carbon (1.75), P-09A172 R10 1.0 Megohms 0.2 Carbon (1.75), P-09A173 R11 3.0 Megohms 0.2 Carbon (1.75), P-09A174 R12 100,000 ohms 0.2 Carbon (1.75), P-09A175 R13 1,000 ohms 0.5 Carbon (1.75), P-09A176 R14 25,000 ohms 1.0 Carbon (1.75), P-09A177 R15 2,300 ohms 0.2 Carbon (1.75), P-09A178 R16 80,000 ohms 0.2 Carbon (1.75), P-09A179 R17 100,000 ohms 0.2 Carbon (1.75), P-09A180 R18 100,000 ohms 0.2 Carbon (1.75).

CONDENSERS

Table with columns: Part No., Code, Capacity, Voltage, Type, List Price. Rows include: P-47X59 C1 250 mmf. Moulded (50.15), P-17A30 C2 180 Tubular Trimmer (10), P-47X58 C3 2.25 mmf. Range C Antenna Trimmer (10), P-17A36 C4 2.25 mmf. Range D Antenna Trimmer (10), P-46X80 C5 0.05 mmf. 180 Tubular (15), P-46X104 C6 0.25 mmf. 360 Tubular (25), P-17A36 C7 2.25 mmf. Range C Interstage Trimmer (10), P-17A36 C8 2.25 mmf. Range D Interstage Trimmer (10), P-46X117 C9 0.25 mmf. 180 Tubular (25), P-46X121 C10 0.25 mmf. 360 Tubular (30), P-17A30 C11 150-250 mmf. 1st L. F. Trimmer Condensers (45), C12 150-250 mmf. 2nd L. F. Trimmer Condensers (45), C13 150-250 mmf. (45), C14 150-250 mmf. (45), C15 150-250 mmf. (45), P-17A30 C16 0.05 mmf. 180 Tubular (15), P-46X80 C17 4.0 mmf. 360 Wet Electrolytic (20), P-44X18 C18 4.0 mmf. 360 Wet Electrolytic (20), P-17A30 C19 70-150 mmf. 3rd L. F. Primary Trimmer (30), P-47X56 C20 50 mmf. Moulded (15), P-46X120 C21 0.01 mmf. 360 Tubular (15), C22 0.30 mmf. 180 Tubular (30), C23 0.04 mmf. 360 Tubular (30), P-46X114 C24 14.0 mmf. 400 Wet Electrolytic (1.25), P-46X119 C25 14.0 mmf. 400 Wet Electrolytic (1.25), P-46X120 C26 0.05 mmf. 360 Tubular (20), P-46X121 C27 0.05 mfm. 180 Tubular (15), P-47X53 C28 2.25 mmf. Moulded (15), P-17A36 C29 2.25 mmf. Oscillator Range D Trimmer (10), P-17A36 C30 2.25 mmf. Oscillator Range C Trimmer (10), P-17A41 C31 1400 mmf. Oscillator Range B Trimmer (10), C32 2.25 mmf. 600 K.C. Padding Condenser (45), C33 300-600 mmf. 600 K.C. Padding Condenser (45), C34 40-10 mmf. Moulded (15), C35 40-10 mmf. Moulded (15), P-25A38 3 Section Gang Condenser Complete with Drive Assembly—Less Dial (5.40).

PHONO ATTACHMENT PARTS

Table with columns: New Part No., Old Part No., Description, List Price. Rows include: P-2A31 2172 Phono Switch (Double Pole Double Throw Switch) (50.60), P-3A12 1993 Phono Jack (20), P-10A36 2122 Switch Knob (20), P-4A17 1421 7 Inches Knit Strip (10), P-5A18 1421 7 Inches Knit Strip (10), P-5A19 1421 7 Inches Knit Strip (10), P-5A20 1421 7 Inches Knit Strip (10), P-5A21 1421 7 Inches Knit Strip (10), P-5A22 1421 7 Inches Knit Strip (10), P-5A23 1421 7 Inches Knit Strip (10), P-5A24 1421 7 Inches Knit Strip (10), P-5A25 1421 7 Inches Knit Strip (10), P-5A26 1421 7 Inches Knit Strip (10), P-5A27 1421 7 Inches Knit Strip (10), P-5A28 1421 7 Inches Knit Strip (10), P-5A29 1421 7 Inches Knit Strip (10), P-5A30 1421 7 Inches Knit Strip (10), P-5A31 1421 7 Inches Knit Strip (10), P-5A32 1421 7 Inches Knit Strip (10), P-5A33 1421 7 Inches Knit Strip (10), P-5A34 1421 7 Inches Knit Strip (10), P-5A35 1421 7 Inches Knit Strip (10), P-5A36 1421 7 Inches Knit Strip (10), P-5A37 1421 7 Inches Knit Strip (10), P-5A38 1421 7 Inches Knit Strip (10), P-5A39 1421 7 Inches Knit Strip (10), P-5A40 1421 7 Inches Knit Strip (10), P-5A41 1421 7 Inches Knit Strip (10), P-5A42 1421 7 Inches Knit Strip (10), P-5A43 1421 7 Inches Knit Strip (10), P-5A44 1421 7 Inches Knit Strip (10), P-5A45 1421 7 Inches Knit Strip (10), P-5A46 1421 7 Inches Knit Strip (10), P-5A47 1421 7 Inches Knit Strip (10), P-5A48 1421 7 Inches Knit Strip (10), P-5A49 1421 7 Inches Knit Strip (10), P-5A50 1421 7 Inches Knit Strip (10), P-5A51 1421 7 Inches Knit Strip (10), P-5A52 1421 7 Inches Knit Strip (10), P-5A53 1421 7 Inches Knit Strip (10), P-5A54 1421 7 Inches Knit Strip (10), P-5A55 1421 7 Inches Knit Strip (10), P-5A56 1421 7 Inches Knit Strip (10), P-5A57 1421 7 Inches Knit Strip (10), P-5A58 1421 7 Inches Knit Strip (10), P-5A59 1421 7 Inches Knit Strip (10), P-5A60 1421 7 Inches Knit Strip (10), P-5A61 1421 7 Inches Knit Strip (10), P-5A62 1421 7 Inches Knit Strip (10), P-5A63 1421 7 Inches Knit Strip (10), P-5A64 1421 7 Inches Knit Strip (10), P-5A65 1421 7 Inches Knit Strip (10), P-5A66 1421 7 Inches Knit Strip (10), P-5A67 1421 7 Inches Knit Strip (10), P-5A68 1421 7 Inches Knit Strip (10), P-5A69 1421 7 Inches Knit Strip (10), P-5A70 1421 7 Inches Knit Strip (10), P-5A71 1421 7 Inches Knit Strip (10), P-5A72 1421 7 Inches Knit Strip (10), P-5A73 1421 7 Inches Knit Strip (10), P-5A74 1421 7 Inches Knit Strip (10), P-5A75 1421 7 Inches Knit Strip (10), P-5A76 1421 7 Inches Knit Strip (10), P-5A77 1421 7 Inches Knit Strip (10), P-5A78 1421 7 Inches Knit Strip (10), P-5A79 1421 7 Inches Knit Strip (10), P-5A80 1421 7 Inches Knit Strip (10), P-5A81 1421 7 Inches Knit Strip (10), P-5A82 1421 7 Inches Knit Strip (10), P-5A83 1421 7 Inches Knit Strip (10), P-5A84 1421 7 Inches Knit Strip (10), P-5A85 1421 7 Inches Knit Strip (10), P-5A86 1421 7 Inches Knit Strip (10), P-5A87 1421 7 Inches Knit Strip (10), P-5A88 1421 7 Inches Knit Strip (10), P-5A89 1421 7 Inches Knit Strip (10), P-5A90 1421 7 Inches Knit Strip (10), P-5A91 1421 7 Inches Knit Strip (10), P-5A92 1421 7 Inches Knit Strip (10), P-5A93 1421 7 Inches Knit Strip (10), P-5A94 1421 7 Inches Knit Strip (10), P-5A95 1421 7 Inches Knit Strip (10), P-5A96 1421 7 Inches Knit Strip (10), P-5A97 1421 7 Inches Knit Strip (10), P-5A98 1421 7 Inches Knit Strip (10), P-5A99 1421 7 Inches Knit Strip (10), P-5A100 1421 7 Inches Knit Strip (10).

NOTICE—A change has been made in our parts numbering system. Old parts which are used in new receivers will have a new number assigned to them. For your convenience we are listing below the new part number and the corresponding old part number, should there be one. Order by new part number only. There is a large letter on the chassis which identifies the set as to major part changes. When ordering parts please refer to this large letter.

MISCELLANEOUS

Table with columns: New Part No., Old Part No., Description, List Price. Rows include: P-12A308 Knob & Model (6.70), P-12A309 Knob & Model (6.70), P-12A310 Knob & Model (6.70), P-12A311 Knob & Model (6.70), P-12A312 Knob & Model (6.70), P-12A313 Knob & Model (6.70), P-12A314 Knob & Model (6.70), P-12A315 Knob & Model (6.70), P-12A316 Knob & Model (6.70), P-12A317 Knob & Model (6.70), P-12A318 Knob & Model (6.70), P-12A319 Knob & Model (6.70), P-12A320 Knob & Model (6.70), P-12A321 Knob & Model (6.70), P-12A322 Knob & Model (6.70), P-12A323 Knob & Model (6.70), P-12A324 Knob & Model (6.70), P-12A325 Knob & Model (6.70), P-12A326 Knob & Model (6.70), P-12A327 Knob & Model (6.70), P-12A328 Knob & Model (6.70), P-12A329 Knob & Model (6.70), P-12A330 Knob & Model (6.70), P-12A331 Knob & Model (6.70), P-12A332 Knob & Model (6.70), P-12A333 Knob & Model (6.70), P-12A334 Knob & Model (6.70), P-12A335 Knob & Model (6.70), P-12A336 Knob & Model (6.70), P-12A337 Knob & Model (6.70), P-12A338 Knob & Model (6.70), P-12A339 Knob & Model (6.70), P-12A340 Knob & Model (6.70), P-12A341 Knob & Model (6.70), P-12A342 Knob & Model (6.70), P-12A343 Knob & Model (6.70), P-12A344 Knob & Model (6.70), P-12A345 Knob & Model (6.70), P-12A346 Knob & Model (6.70), P-12A347 Knob & Model (6.70), P-12A348 Knob & Model (6.70), P-12A349 Knob & Model (6.70), P-12A350 Knob & Model (6.70), P-12A351 Knob & Model (6.70), P-12A352 Knob & Model (6.70), P-12A353 Knob & Model (6.70), P-12A354 Knob & Model (6.70), P-12A355 Knob & Model (6.70), P-12A356 Knob & Model (6.70), P-12A357 Knob & Model (6.70), P-12A358 Knob & Model (6.70), P-12A359 Knob & Model (6.70), P-12A360 Knob & Model (6.70), P-12A361 Knob & Model (6.70), P-12A362 Knob & Model (6.70), P-12A363 Knob & Model (6.70), P-12A364 Knob & Model (6.70), P-12A365 Knob & Model (6.70), P-12A366 Knob & Model (6.70), P-12A367 Knob & Model (6.70), P-12A368 Knob & Model (6.70), P-12A369 Knob & Model (6.70), P-12A370 Knob & Model (6.70), P-12A371 Knob & Model (6.70), P-12A372 Knob & Model (6.70), P-12A373 Knob & Model (6.70), P-12A374 Knob & Model (6.70), P-12A375 Knob & Model (6.70), P-12A376 Knob & Model (6.70), P-12A377 Knob & Model (6.70), P-12A378 Knob & Model (6.70), P-12A379 Knob & Model (6.70), P-12A380 Knob & Model (6.70), P-12A381 Knob & Model (6.70), P-12A382 Knob & Model (6.70), P-12A383 Knob & Model (6.70), P-12A384 Knob & Model (6.70), P-12A385 Knob & Model (6.70), P-12A386 Knob & Model (6.70), P-12A387 Knob & Model (6.70), P-12A388 Knob & Model (6.70), P-12A389 Knob & Model (6.70), P-12A390 Knob & Model (6.70), P-12A391 Knob & Model (6.70), P-12A392 Knob & Model (6.70), P-12A393 Knob & Model (6.70), P-12A394 Knob & Model (6.70), P-12A395 Knob & Model (6.70), P-12A396 Knob & Model (6.70), P-12A397 Knob & Model (6.70), P-12A398 Knob & Model (6.70), P-12A399 Knob & Model (6.70), P-12A400 Knob & Model (6.70).

TRANSFORMERS AND COILS

Table with columns: New Part No., Old Part No., Description, List Price. Rows include: P-9A405 T1 Antenna R. F. Transformer & Can Assembly (52.80), P-9A425 T2 Interstage R. F. Transformer & Can Assembly (2.30), P-9A497 T3 1st L. F. Transformer & Can Assembly (2.30), P-9A498 T4 2nd L. F. Transformer & Can Assembly (1.85), P-9A499 T5 3rd L. F. Transformer & Can Assembly (2.30), P-51X32 T6 Audio Input Transformer (Part of Speaker Assembly May be Secured Separately) (2.40), P-51X32 T7 Audio Output Transformer (Part of Speaker Assembly May be Secured Separately) (2.40), P-51X32 T8 Power Transformer—115 Volt; 60 Cycle (4.70), P-53X94 T8 Power Transformer—115 Volt; 25 Cycle (8.20), P-53X96 T8 Power Transformer—115-230 Volt; 40-60 Cycle (6.70), P-9A391 L1 High Frequency Oscillator Tuning Coil (6.70), P-9A400 L3 2nd L. F. Plate Isolating Reactor (6.70).

DIAL AND DRIVE ASSEMBLY

Table with columns: New Part No., Old Part No., Description, List Price. Rows include: P-5A27 Gang Condenser Bracket and Bearing (45), P-5A28 Drive Shaft with Set Screw (15), P-5A29 Drive Pulley with Set Screw (15), P-5A30 Gear (Stationary) (10), P-5A31 Gear (Rotary) (10), P-5A32 Gear (Stationary) (10), P-5A33 Main Pointer Shaft Assembly (45), P-5A34 Main Pointer Shaft Assembly (45), P-5A35 Gear (Stationary) (10), P-5A36 Gear (Rotary) (10), P-5A37 Gear (Stationary) (10), P-5A38 Gear (Rotary) (10), P-5A39 Gear (Stationary) (10), P-5A40 Gear (Rotary) (10), P-5A41 Gear (Stationary) (10), P-5A42 Gear (Rotary) (10), P-5A43 Gear (Stationary) (10), P-5A44 Gear (Rotary) (10), P-5A45 Gear (Stationary) (10), P-5A46 Gear (Rotary) (10), P-5A47 Gear (Stationary) (10), P-5A48 Gear (Rotary) (10), P-5A49 Gear (Stationary) (10), P-5A50 Gear (Rotary) (10), P-5A51 Gear (Stationary) (10), P-5A52 Gear (Rotary) (10), P-5A53 Gear (Stationary) (10), P-5A54 Gear (Rotary) (10), P-5A55 Gear (Stationary) (10), P-5A56 Gear (Rotary) (10), P-5A57 Gear (Stationary) (10), P-5A58 Gear (Rotary) (10), P-5A59 Gear (Stationary) (10), P-5A60 Gear (Rotary) (10), P-5A61 Gear (Stationary) (10), P-5A62 Gear (Rotary) (10), P-5A63 Gear (Stationary) (10), P-5A64 Gear (Rotary) (10), P-5A65 Gear (Stationary) (10), P-5A66 Gear (Rotary) (10), P-5A67 Gear (Stationary) (10), P-5A68 Gear (Rotary) (10), P-5A69 Gear (Stationary) (10), P-5A70 Gear (Rotary) (10), P-5A71 Gear (Stationary) (10), P-5A72 Gear (Rotary) (10), P-5A73 Gear (Stationary) (10), P-5A74 Gear (Rotary) (10), P-5A75 Gear (Stationary) (10), P-5A76 Gear (Rotary) (10), P-5A77 Gear (Stationary) (10), P-5A78 Gear (Rotary) (10), P-5A79 Gear (Stationary) (10), P-5A80 Gear (Rotary) (10), P-5A81 Gear (Stationary) (10), P-5A82 Gear (Rotary) (10), P-5A83 Gear (Stationary) (10), P-5A84 Gear (Rotary) (10), P-5A85 Gear (Stationary) (10), P-5A86 Gear (Rotary) (10), P-5A87 Gear (Stationary) (10), P-5A88 Gear (Rotary) (10), P-5A89 Gear (Stationary) (10), P-5A90 Gear (Rotary) (10), P-5A91 Gear (Stationary) (10), P-5A92 Gear (Rotary) (10), P-5A93 Gear (Stationary) (10), P-5A94 Gear (Rotary) (10), P-5A95 Gear (Stationary) (10), P-5A96 Gear (Rotary) (10), P-5A97 Gear (Stationary) (10), P-5A98 Gear (Rotary) (10), P-5A99 Gear (Stationary) (10), P-5A100 Gear (Rotary) (10).

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.

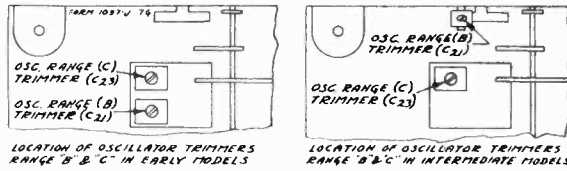


Fig. 4—Oscillator Trimmer Location in Early and Intermediate Models

Three Types Schematic Trimmers

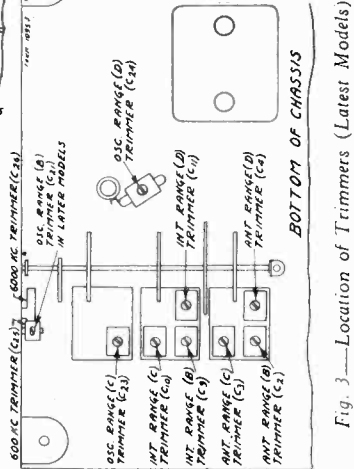
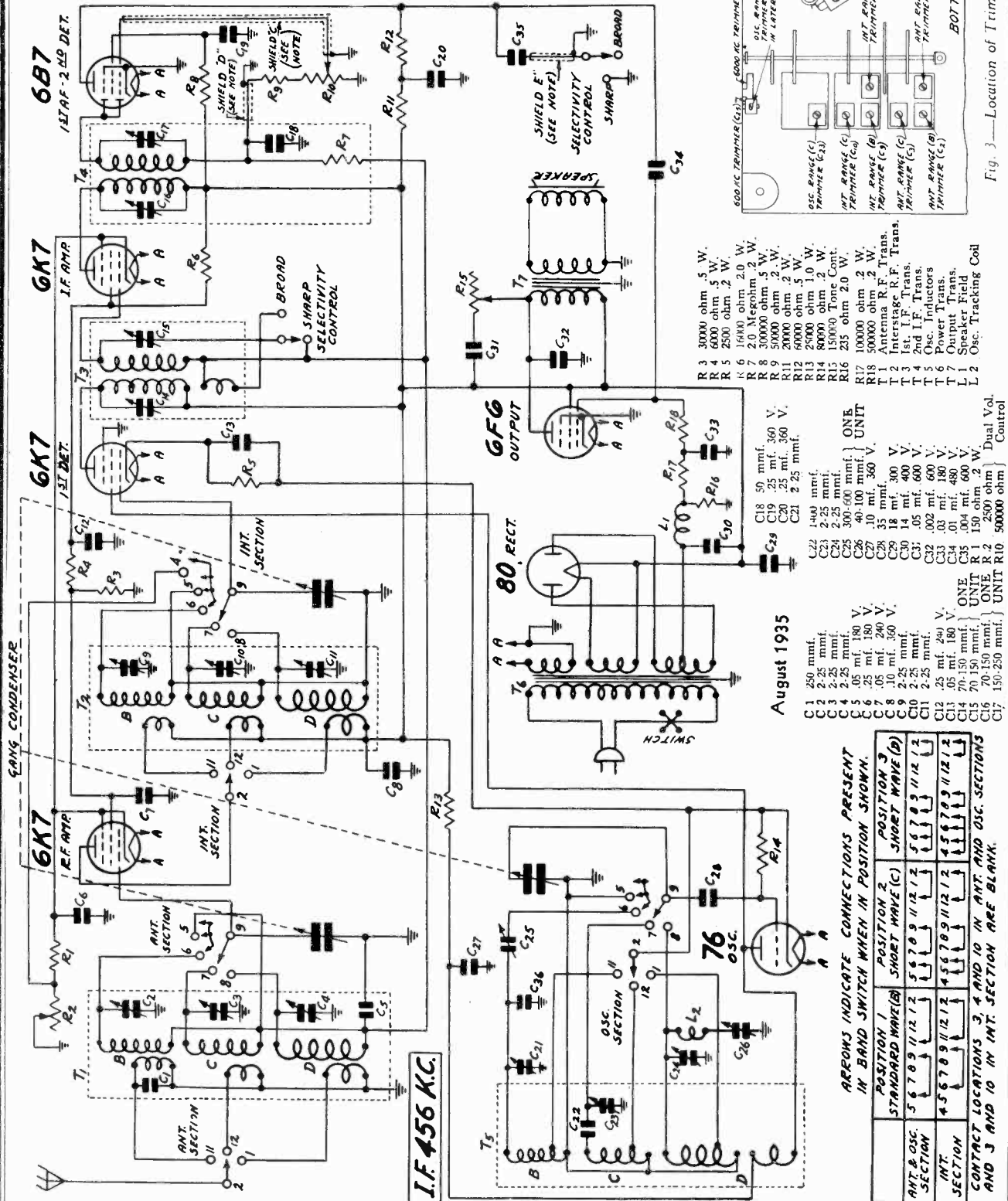


Fig. 3—Location of Trimmers (Latest Models)



- R 3 30000 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 .5 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.
- L 1 Osc. Inductors
- L 2 Speaker Field
- L 3 Tracking Coil
- L 4
- L 5
- L 6
- L 7
- L 8
- L 9
- L 10
- L 11
- L 12
- 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 1-40 mmf.
- C 23 2-25 mmf.
- C 24 2-25 mmf.
- C 25 300-600 mmf. } ONE UNIT
- C 26 40-100 mmf. } ONE UNIT
- 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 .01 mf. 480 V.
- C 37 150-250 mmf. } ONE UNIT
- C 38 150-250 mmf. } ONE UNIT
- C 39 150-250 mmf. } ONE UNIT
- C 40 150-250 mmf. } ONE UNIT
- C 41 150-250 mmf. } ONE UNIT
- C 42 150-250 mmf. } ONE UNIT
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- C 95 150-250 mmf. } ONE UNIT
- C 96 150-250 mmf. } ONE UNIT
- C 97 150-250 mmf. } ONE UNIT
- C 98 150-250 mmf. } ONE UNIT
- C 99 150-250 mmf. } ONE UNIT
- C 100 150-250 mmf. } ONE UNIT

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
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

CONTRACT 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

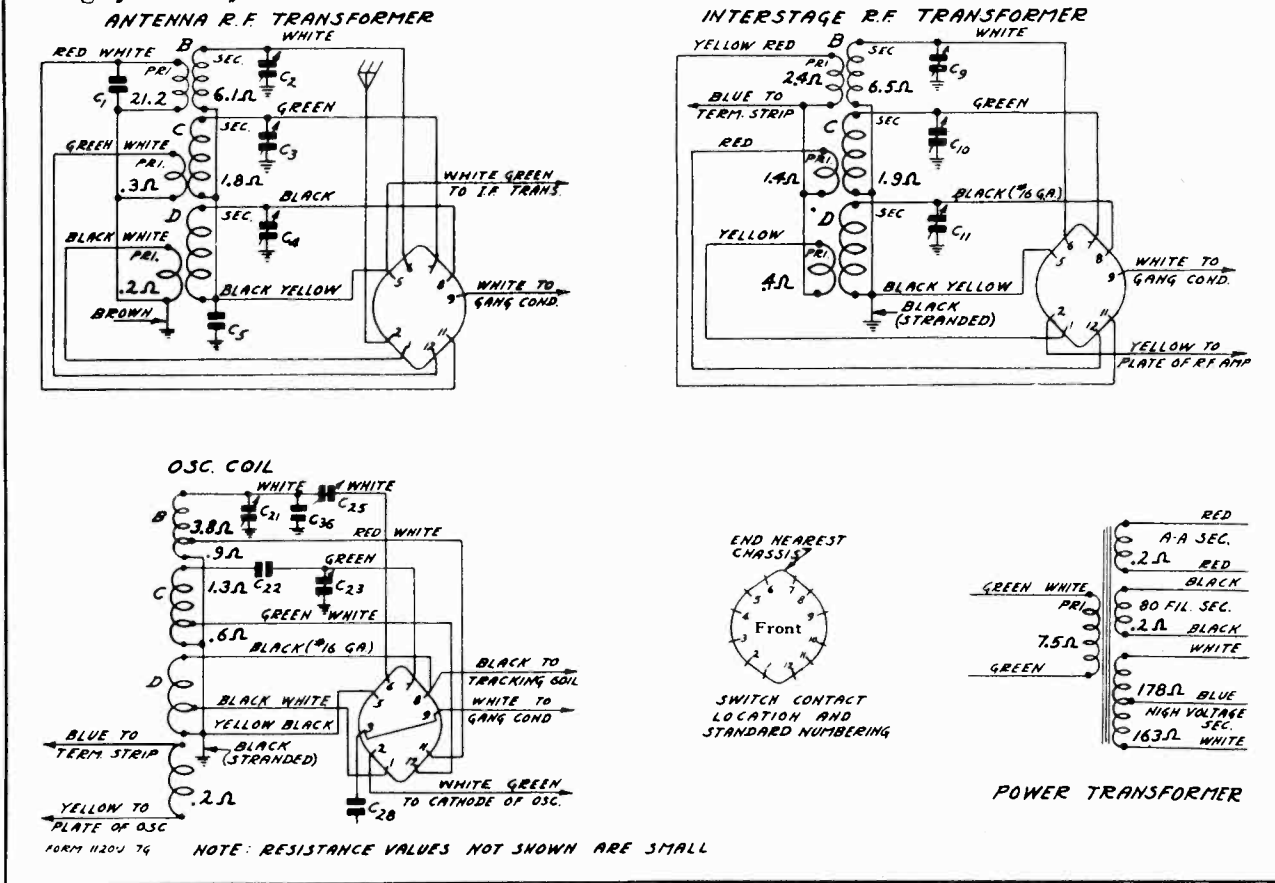


Fig. 5—Color Coding of Coil Wires and D. C. Resistance of Windings (Also see complete D. C. Resistance List in this Manual)

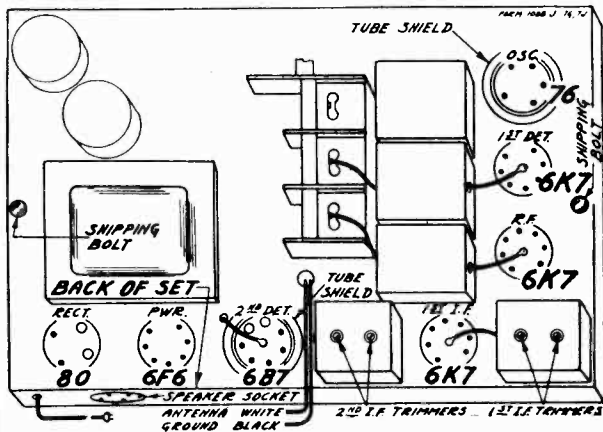


Fig. 6—Location of Tubes

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
6L6 (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

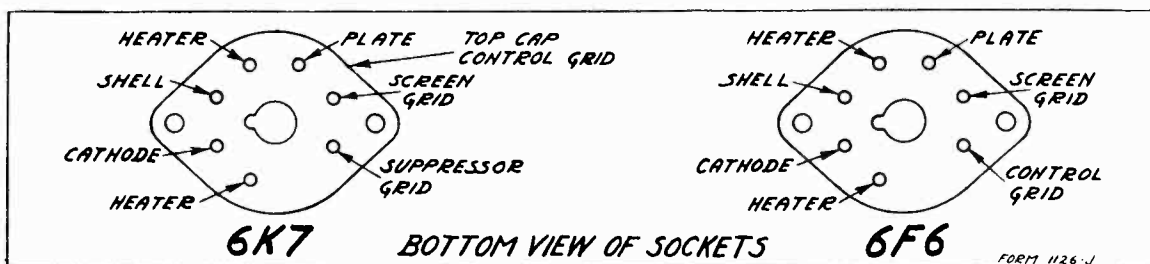


Fig. 7—Metal Tubes—Bottom View of Sockets

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 1/32" 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-1A39) 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 lug on the shield to the ground lug of the Fig. 9. 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 nearly identical in characteristics to the corresponding metal tubes which they replace. In Fig. 7 we show 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 cathodes of the R. F. and I. F. amplifier tubes was connected to the control arm of variable resistor R2. The latter was connected to resistor R1 which was grounded at the other end. The by-pass condenser, C1, was connected as before to the cathode 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

5800 KC Adjustment
Set the signal generator for 5800 KC. Connect the antenna lead of the receiver through a 400 ohm resistor to the output of the signal generator.

Turn the rotor of the tuning condenser to the full open position.
Turn the band selector to the Range C position (1st short wave band—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

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).
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 (C11) 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 18,300 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 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 mfd. condenser to the grid of the 1st detector.
Connect the ground lead of the receiver to the ground post of the signal generator.

Turn the band selector to the Range B position 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).
Turn 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.

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 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.

Adjust the oscillator Range B trimmer (C21) until the maximum output is obtained. The location of this trimmer is shown in Figs. 3 and 4.

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.

Adjust the interstage Range B trimmer (C9) and antenna Range B trimmer (C2) 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. 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 T3, 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 1st 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 tube.
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.

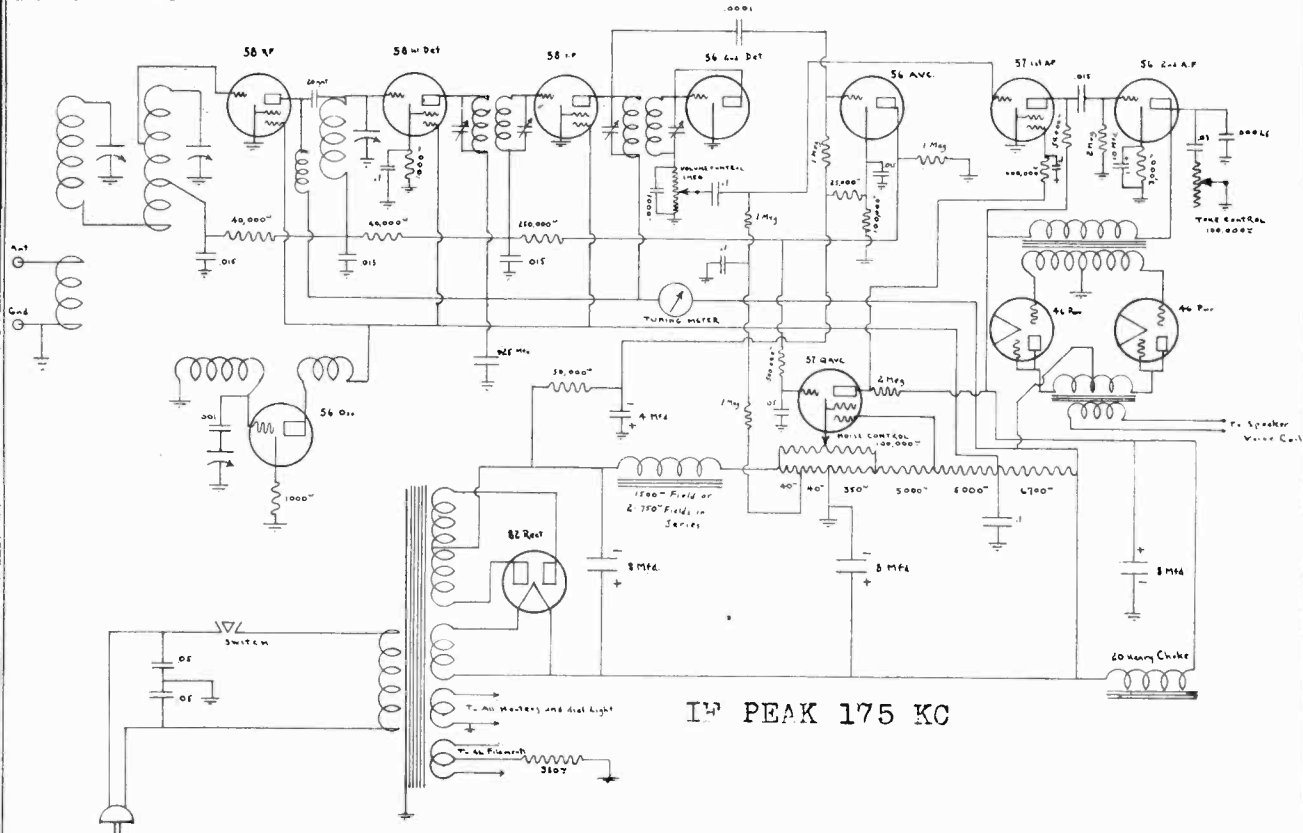
In order to allow passage of the higher audio frequencies in the broad position, the capacity of the by-pass condenser in ground is greatly reduced (C35) and the capacity of shield E in series).

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 (R2) 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

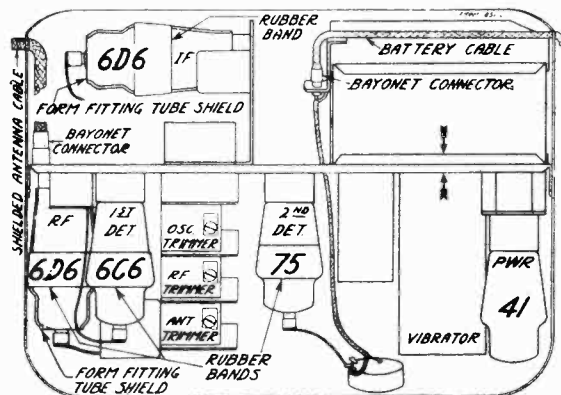


Fig. 2—Location of Tubes and Vibrator

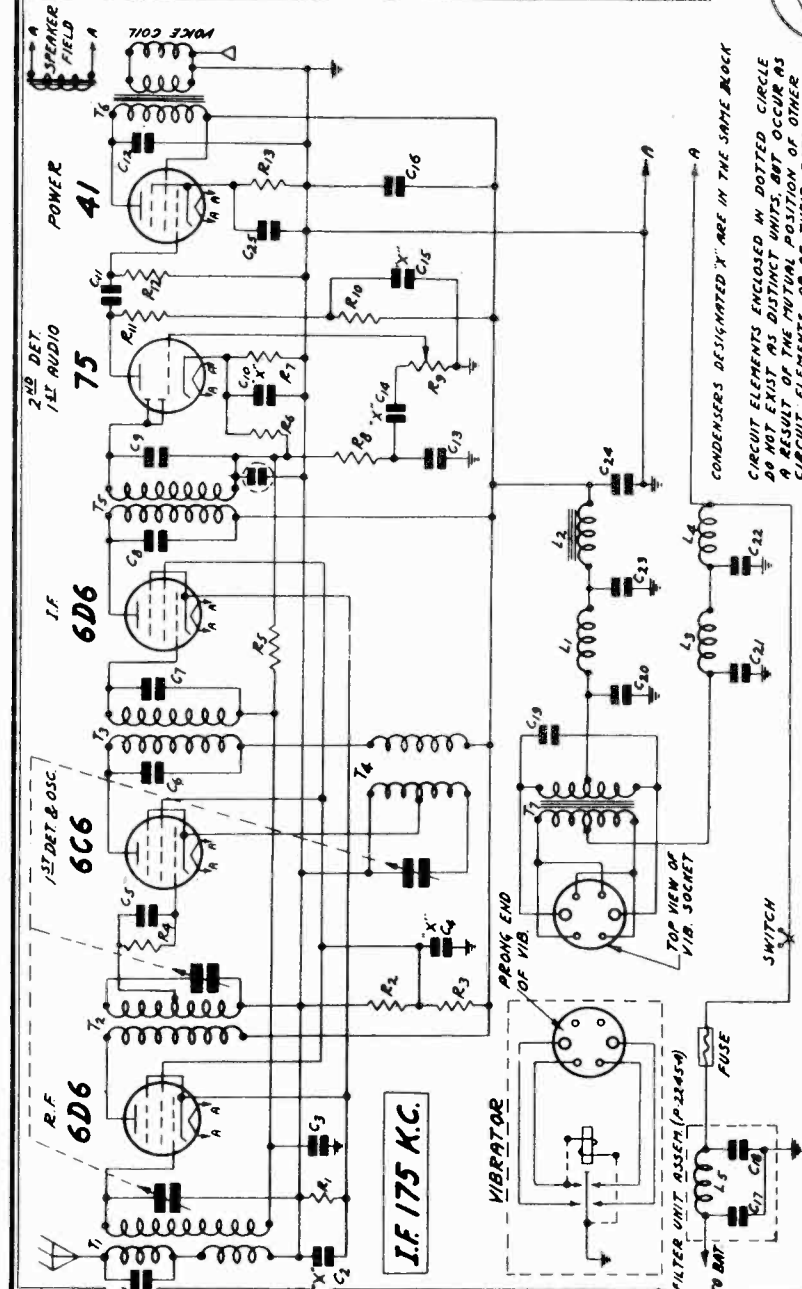


Fig. 1—Schematic Circuit Diagram

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.	
	C15	10 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
	C17	01 mf.	120V.	
P-81120	C18	01 mf.	120V.	In Choke Condenser Unit
	C19	007 mf.	1600V.	
P-81122	C20	10 mf.	300V.	Tubular
P-81121	C21	50 mf.	140V.	Tubular
P-81816	C22	002 mf.	250V.	Moulded
P-8200?	C63	4.0 mf.	250V.	Dry Electrolytic Block
	C24	2.0 mf.	250V.	
P-82500	C25	4.0 mf.	25V.	Gang Condenser

Part No.	Code	Resistance	Wattage	Type
P-894351ww	R1	350 Ohm	3	Flexilife
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	101,000 Ohm	2	Carbon
P-96017	R9	2 Megohm	2	Volume Control and Switch
P-A95303	R10	50,000 Ohm	2	Carbon
P-A95204	R11	200,000 Ohm	2	Carbon
P-A95804	R12	500,000 Ohm	2	Carbon
P-B94801ww	R13	800 Ohm	5	Flexilife

MODEL 62-199
Alignment
Service Notes

MONTGOMERY-WARD & CO.

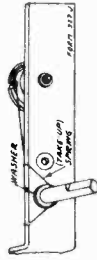


Fig. 5—Drive "Take-up" Spring
Then bring the cord inside of the drum by way of the turned-in portion of the flange at "B".
Tie the drive tension spring "D" to the loose end of the cord at the point "C" just above the top edge of the "B" as shown in the illustration. This should be done so that the lower 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 "B" and hooked 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 in 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 and the bearings 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.

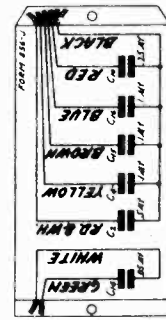


Fig. 6—Condenser Block Internal Wiring
COW CO. APPROVED FROM BLOCK IN LATER MODELS

Replacing Drive Cord

The drive cord in this receiver may be replaced as follows:

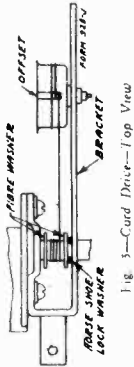


Fig. 3—Cord Drive—Top View

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

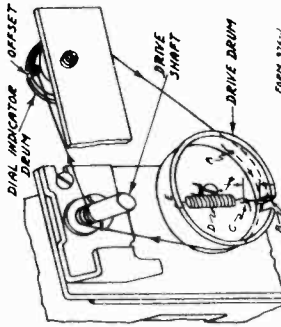


Fig. 4—Cord Drive Replacement

around the drive shaft three and one-quarter turns front of the chassis. Be sure the dial indicator plate is kept in a closed position and that 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 trimmer screw 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 Trans. Sec.	2.31
	R. F. Interstage Trans. Pri.	2.31
	R. F. Interstage Trans. Sec.	2.31
	1st I. F. Tr. (to Primary)	3.24
	1st I. F. Tr. (Secondary)	100.00
	2nd I. F. Tr. (Total)	100.00
	Oscillator Plate Coil	9.00
	2nd I. F. Trans. Pri.	100.00
	2nd I. F. Trans. Sec.	100.00
	Power Trans. Pri.	0.36
	Power Trans. Sec.	86.00
	Power Choke	390.00
	"A" Choke	390.00
	"B" Choke	390.00
	Speaker Field	690.00
	Output Trans. Pri.	0.80
	Output Trans. Sec. and	6.00
	Vibrator Coil	
	Speaker Field	

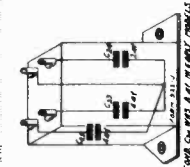


Fig. 7—Electrolytic Block Internal Wiring
COW CO. APPROVED FROM BLOCK IN LATER MODELS

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 log and the station selector control shaft. Unsolder this shielding at the log.

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.

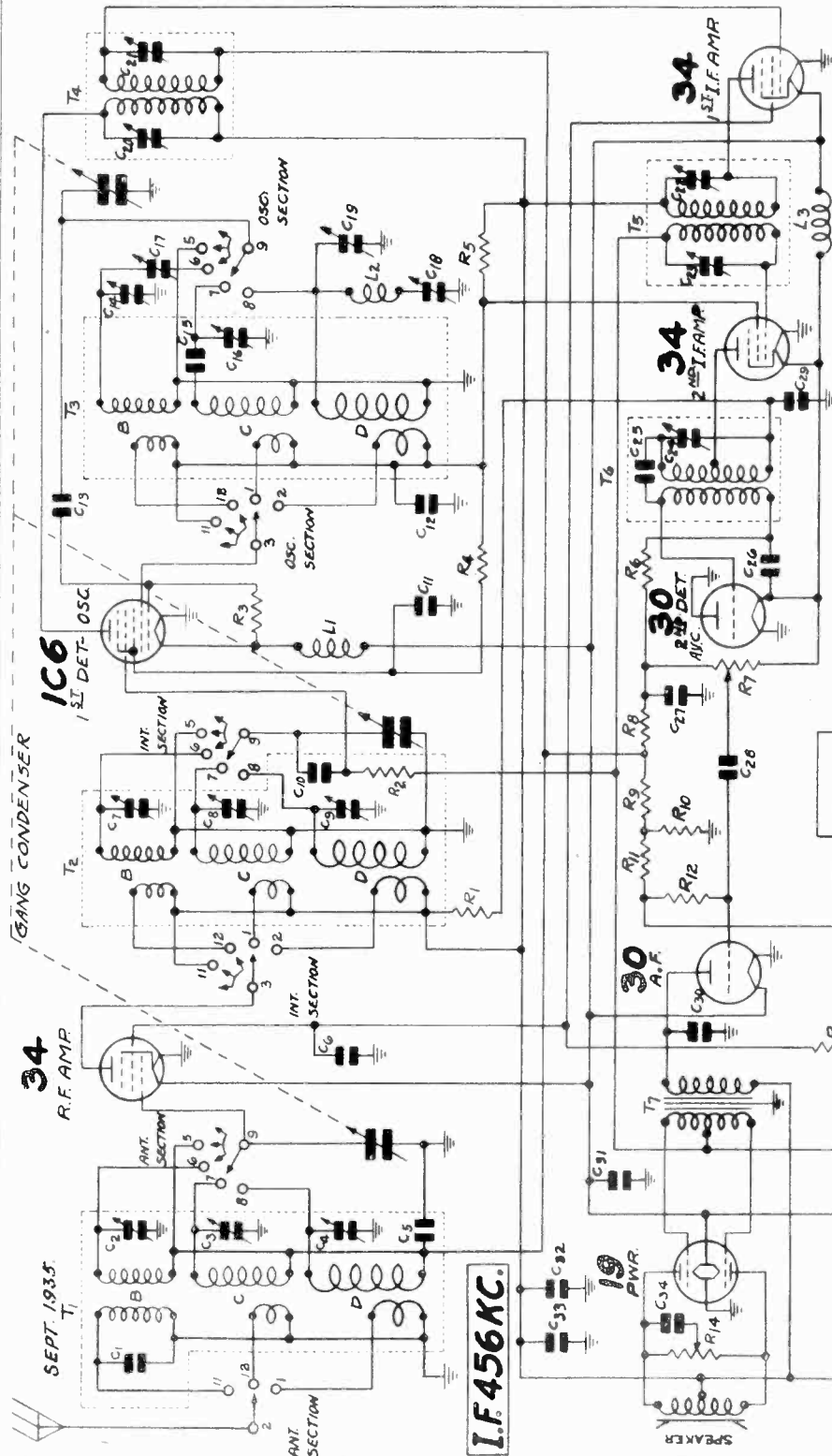
In replacing the vibrator unit be sure to replace the corrugated cardboard pad, which prevents the unit from working its way out of the socket.

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. | C11 .05 mf. 180 V. | C22 70-150 mmf. ONE | C33 20.0 mf. 150 V. Electrolytic | R 8 3.0 Megohm .2 W. |
| C 2 2-25 mmf. | C12 .25 mf. 180 V. | C23 70-150 mmf. ASSEMBLY | C34 .05 mf. 240 V. | R 9 1.0 Megohm .2 W. |
| C 3 2-25 mmf. | C13 35 mmf. | C24 40-100 mmf. | | R10 2,000 Ohm .2 W. |
| C 4 2-25 mmf. | C14 2-25 mmf. | C25 50 mmf. | | R11 7,000 Ohm .2 W. |
| C 5 .05 mf. 180 V. | C15 1400 mmf. | C26 100 mmf. | | R12 3.0 Megohm .2 W. |
| C 6 .25 mf. 180 V. | C16 2-25 mmf. | C27 50 mmf. | | R13 30,000 Ohm .2 W. |
| C 7 2-25 mmf. | C17 300-600 mmf. ONE | C28 .002 mf. 600 V. | | R14 150,000 Ohm Tone Control |
| C 8 2-25 mmf. | C18 40-100 mmf. ASSEMBLY | C29 .05 mf. 180 V. | | |
| C 9 2-25 mmf. | C19 2-25 mmf. ONE | C30 250 mmf. | | |
| C10 35 mmf. | C20 70-150 mmf. ONE | C31 .50 mf. 180 V. | | |
| | C21 70-150 mmf. ASSEMBLY | C32 .25 mf. 180 V. | | |



- 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

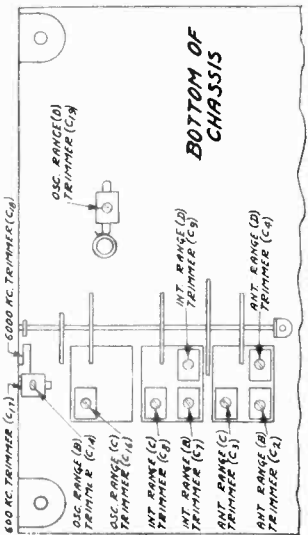


Fig. 9—Arrangement of Trimmers

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 1 2 3	5 6 7 8 9 1 2 3	5 6 7 8 9 1 2 3
ANT. SECTION	5 6 7 8 9 1 2 3	5 6 7 8 9 1 2 3	5 6 7 8 9 1 2 3

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

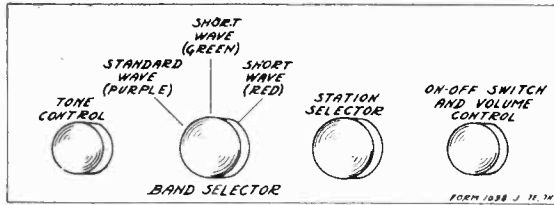


Fig. 1—Arrangement of Controls

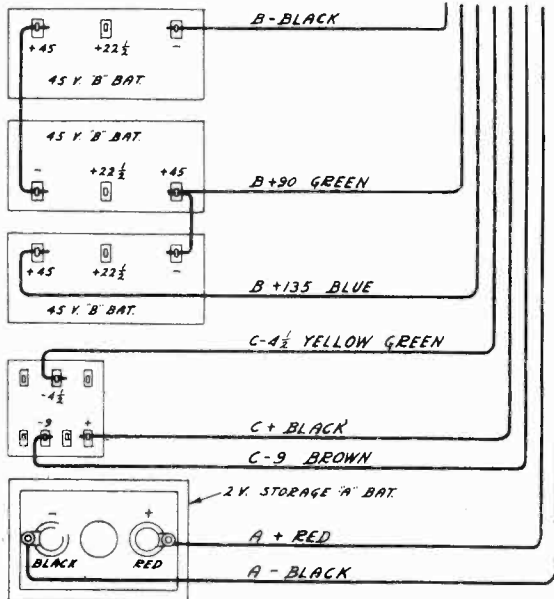


Fig. 3—Complete Battery Wiring Connections

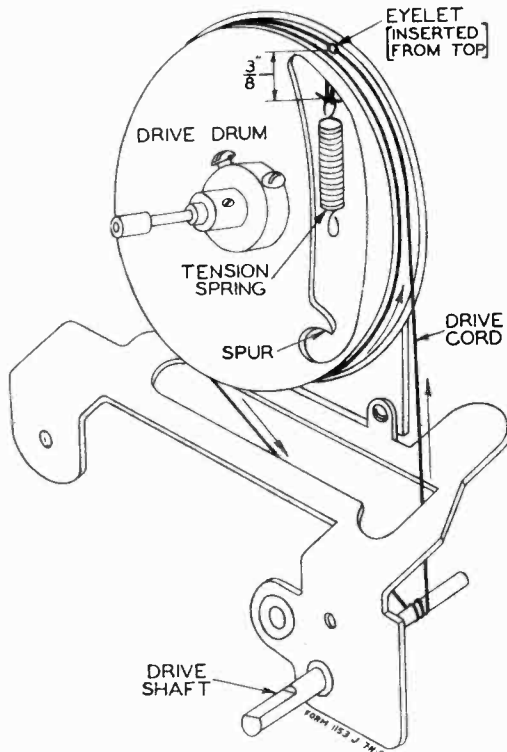


Fig. 12—Drive Cord Replacement

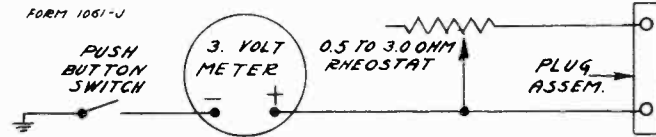


Fig. 6—Schematic Diagram of Voltage Regulator

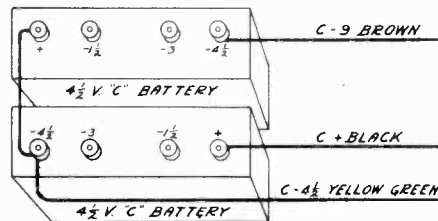


Fig. 4—"C" Battery Connections Using Standard "C" Batteries

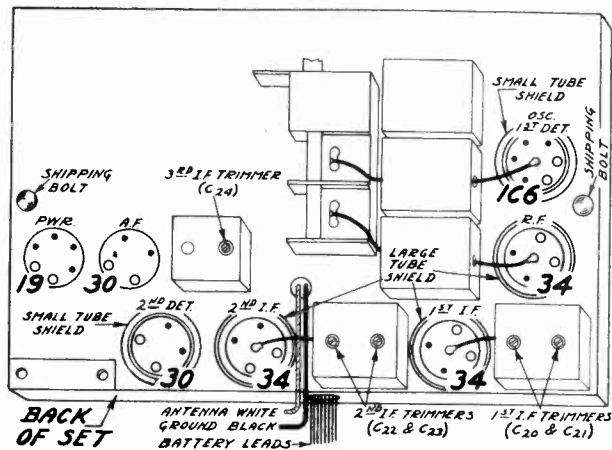


Fig. 10—Tube Arrangement

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 455, 475, 1500, 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 section 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 of the A.V.C. 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 work 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 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.

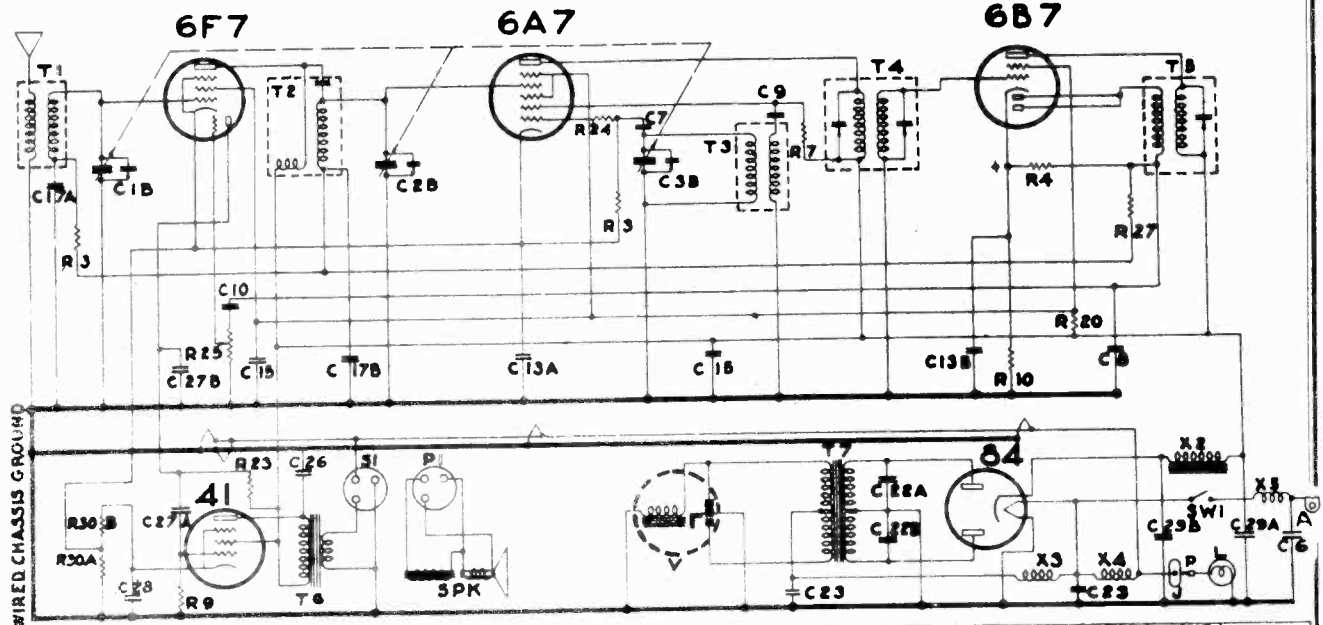
Turn the drive shaft back and forth several times. Replace the drive assembly and pointer.

Replace the chassis in the cabinet.

NOBLITT SPARKS INDUSTRIES

MODEL 7
Schematic, Voltage
Resistances, Parts

ARVIN CAR RADIO ~ MODEL 7



RESISTORS		CONDENSERS		CHOKES & TRANSFORMERS		MISCELLANEOUS UNITS	
QTY	RESISTANCE	QTY	CAPACITY	QTY	TYPE	QTY	DESCRIPTION
1	100 Ω	1	10 μF	1	ANTENNA	1	DYNAMIC SPEAKER
2	100 Ω	2	20 μF	2	2ND FREQUENCY	1	VIBRATOR
4	100 Ω	4	50 μF	4	OSCILLATOR	1	VOLUME CONTROL SWITCH
6	100 Ω	6	100 μF	6	FIRST I.F.	1	DIAL LIGHT JACK
8	100 Ω	8	200 μF	8	SECOND I.F.	1	DIAL LIGHT CONNECTING PIN
10	100 Ω	10	500 μF	10	OUTPUT	1	SPEAKER SOCKET
12	100 Ω	12	1000 μF	12	POWER	1	SPEAKER PLUG
14	100 Ω	14	1000 μF	14	CHOKES	1	DIAL LIGHT 6-0 VOLT
16	100 Ω	16	1000 μF	16	B FILTER	1	AMMETER CONNECTION
18	100 Ω	18	1000 μF	18	A FILTER		
20	100 Ω	20	1000 μF	20	FILAMENT		
22	100 Ω	22	1000 μF	22	SUPPRESSION		

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 361	
	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	.20
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

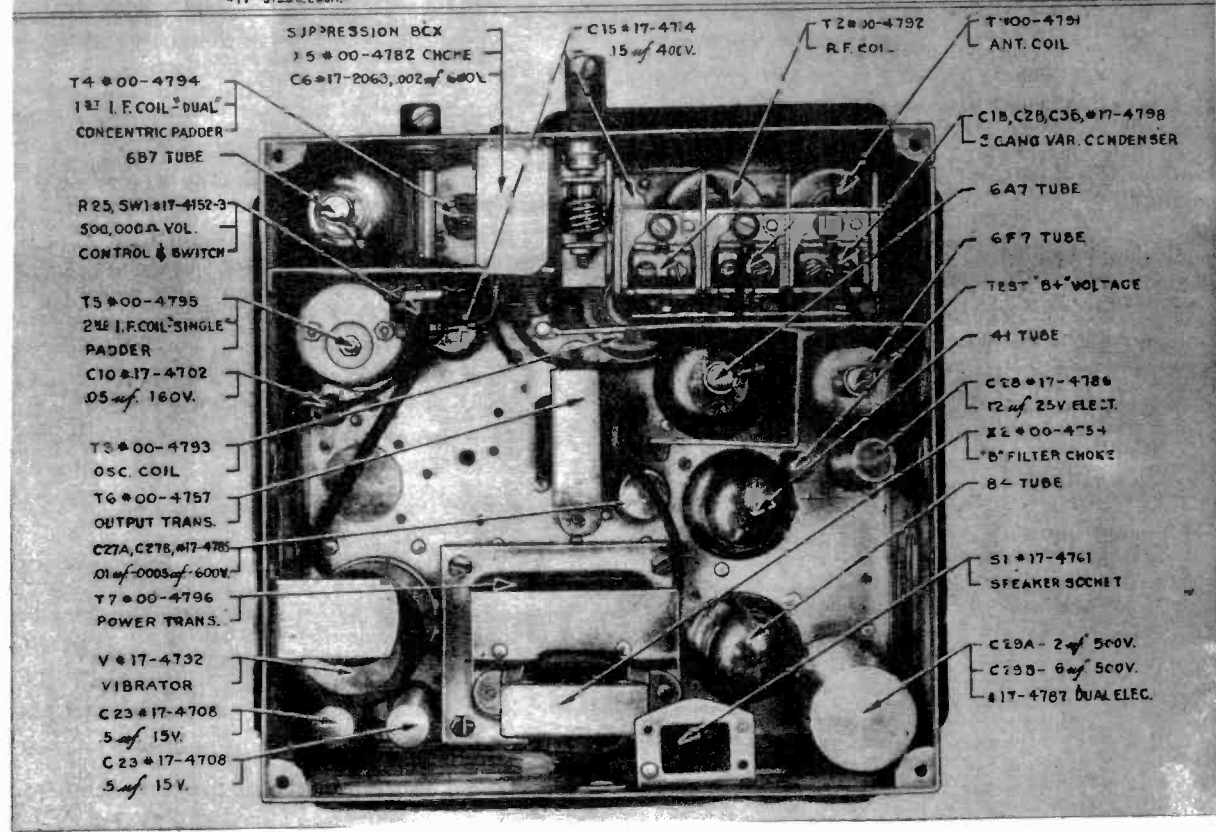
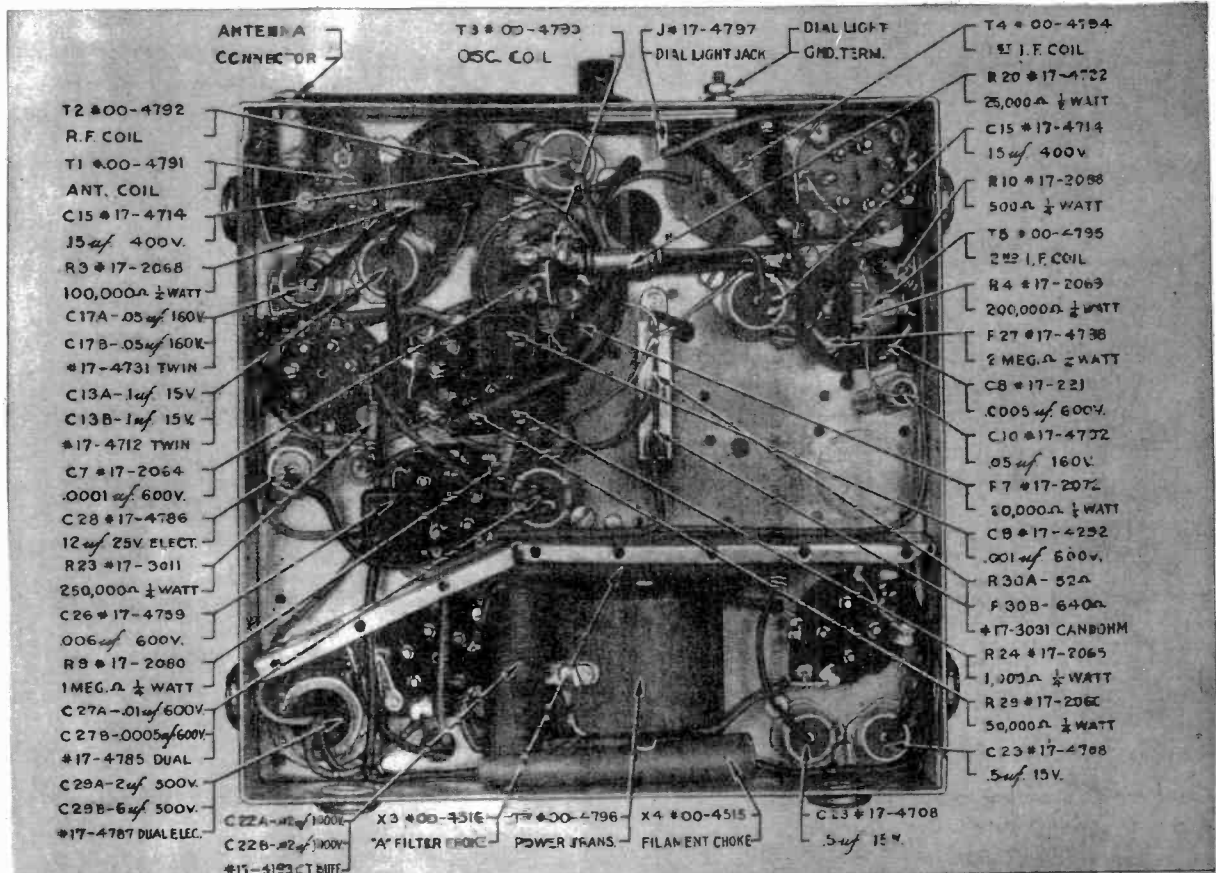
MODEL NO. 7

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

MODEL 7
Chassis Layouts



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

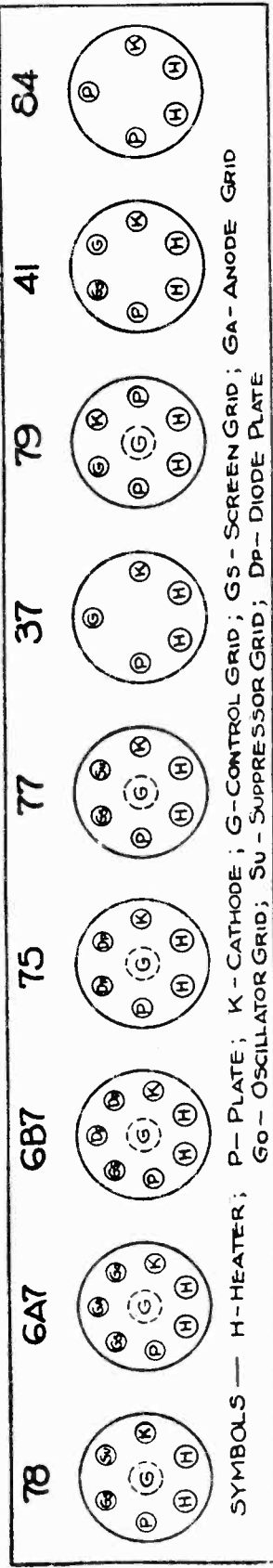
All readings to ground unless otherwise specified. Readings taken with all tubes removed from set and R. F. chassis and speaker disconnected from power pack unit and R. F. chassis.

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		

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 Transformer650 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	Remote Control Assembly.....
29-4525-A	Steering Column Bracket.....
29-4525-B	Pilot Light Bulb.....
29-4525-D	Control Knob and Set Screw.....
29-4525-K	Key.....
29-4525-L	24" Flexible Shaft Assembly.....
29-4525-M	12" Flexible Shaft Assembly (Special Order).....
00-4333	15" Flexible Shaft Assembly (Special Order).....
00-4330	18" Flexible Shaft Assembly (Special Order).....
00-4331	30" Flexible Shaft Assembly (Special Order).....
00-4332	36" Flexible Shaft Assembly (Special Order).....
00-4334	Fuse.....
00-4335	4-Prong Mounting Plug (with cover).....
17-2228	5-Prong Mounting Plug (with cover).....
17-2262	Antenna & Battery Cable Connectors (complete set)
17-2263	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	
	CHOKES
	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.

CHOKES

See diagram for description.....
See diagram for description.....
See diagram for description.....

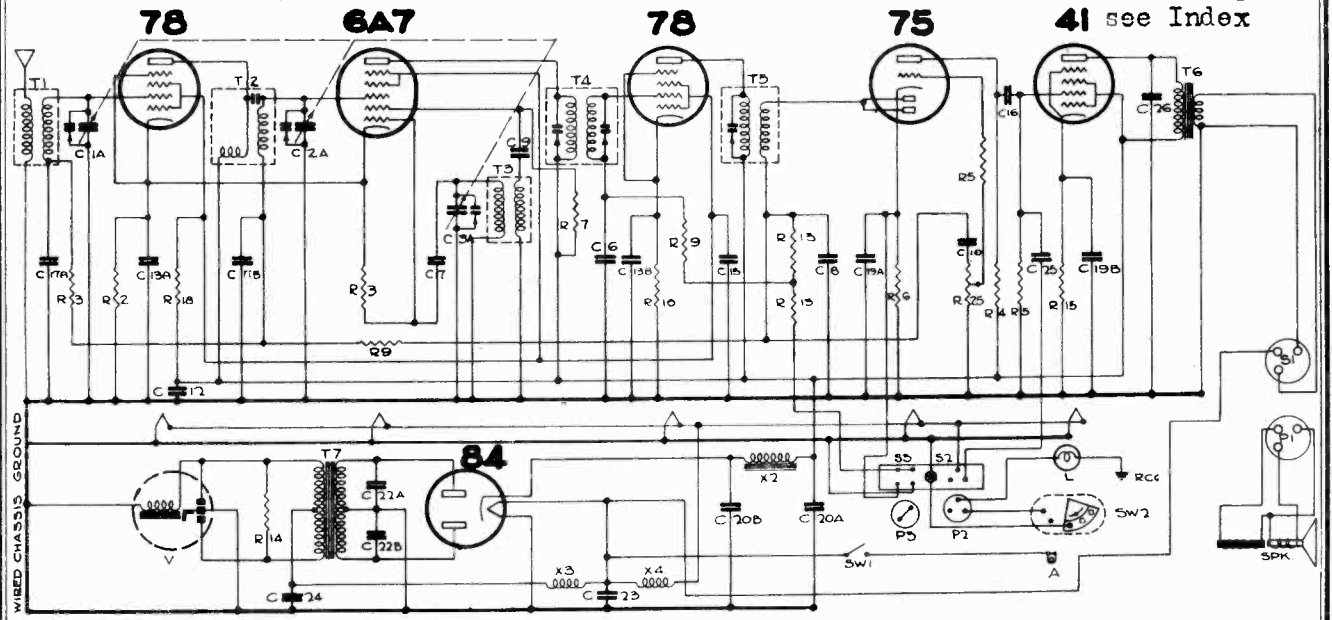
NOBLITT SPARKS INDUSTRIES

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 OSCILLATOR	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	368R25	
4	500M	1/4	17-3070	4				17C	.10	TWIN	25	17-4707	1.50	4	FIRST I.F.	00-4817	1.75	SW1	REMOTE CONTROL SWITCH	368R25	
5	500M	1/4	17-3071	5	.002	600	17-3065	70	19A	1.0	25	17-4707	1.50	5	SECOND I.F.	00-4814	1.75	SW2	TONE CONTROL SWITCH	17-4761	
6	20M	1/4	17-3072	6	.001	600	17-4192	20	19B	1.0	25	17-4707	1.50	6	OUTPUT	00-4787	1.50	S1	SPEAKER SOCKET	17-4750	
7	20M	1/4	17-3073	7	.0005	600	17-2711	20	20A	4.0	DUAL	500	17-4708	2.40	7	POWER	00-4746	3.00	SW2	DIAL LITE - TONE SOCKET	17-4751
8	1ME8	1/4	17-1080	8	.001	600	17-4192	20	20B	7.0	DUAL	500	17-4708	2.40	8	ANTENNA	00-4810	.90	SPK	SPEAKER VIBRATOR	17-4732
9	500	1/4	17-3058	9	.05	180	17-4702	20	21A	.02	TWIN	1000	17-4708	.60	9	ANTENNA	00-4810	.90	SPK	SPEAKER VIBRATOR	17-4732
10	75M	1/4	17-2067	10	.02	400	17-4711	55	22A	.02	TWIN	1000	17-4708	.60	10	ANTENNA	00-4810	.90	SPK	SPEAKER VIBRATOR	17-4732
11	200	1/4	17-4787	11	.10	15	17-4712	75	22B	.02	TWIN	1000	17-4708	.60	11	ANTENNA	00-4810	.90	SPK	SPEAKER VIBRATOR	17-4732
12	500	1/4	17-4717	12	.10	15	17-4712	75	23	1.0	15	17-4708	.40	12	ANTENNA	00-4810	.90	SPK	SPEAKER VIBRATOR	17-4732	
13	500	1/4	17-4717	13	.10	15	17-4712	75	24	.005	600	17-4741	.75	13	ANTENNA	00-4810	.90	SPK	SPEAKER VIBRATOR	17-4732	
14	500	1/4	17-4717	14	.10	15	17-4712	75	25	.005	600	17-4741	.75	14	ANTENNA	00-4810	.90	SPK	SPEAKER VIBRATOR	17-4732	
15	500	1/4	17-4717	15	.10	15	17-4712	75	26	.005	600	17-4741	.75	15	ANTENNA	00-4810	.90	SPK	SPEAKER VIBRATOR	17-4732	
16	500	1/4	17-4717	16	.10	15	17-4712	75	27	.005	600	17-4741	.75	16	ANTENNA	00-4810	.90	SPK	SPEAKER VIBRATOR	17-4732	
17	500	1/4	17-4717	17	.10	15	17-4712	75	28	.005	600	17-4741	.75	17	ANTENNA	00-4810	.90	SPK	SPEAKER VIBRATOR	17-4732	

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

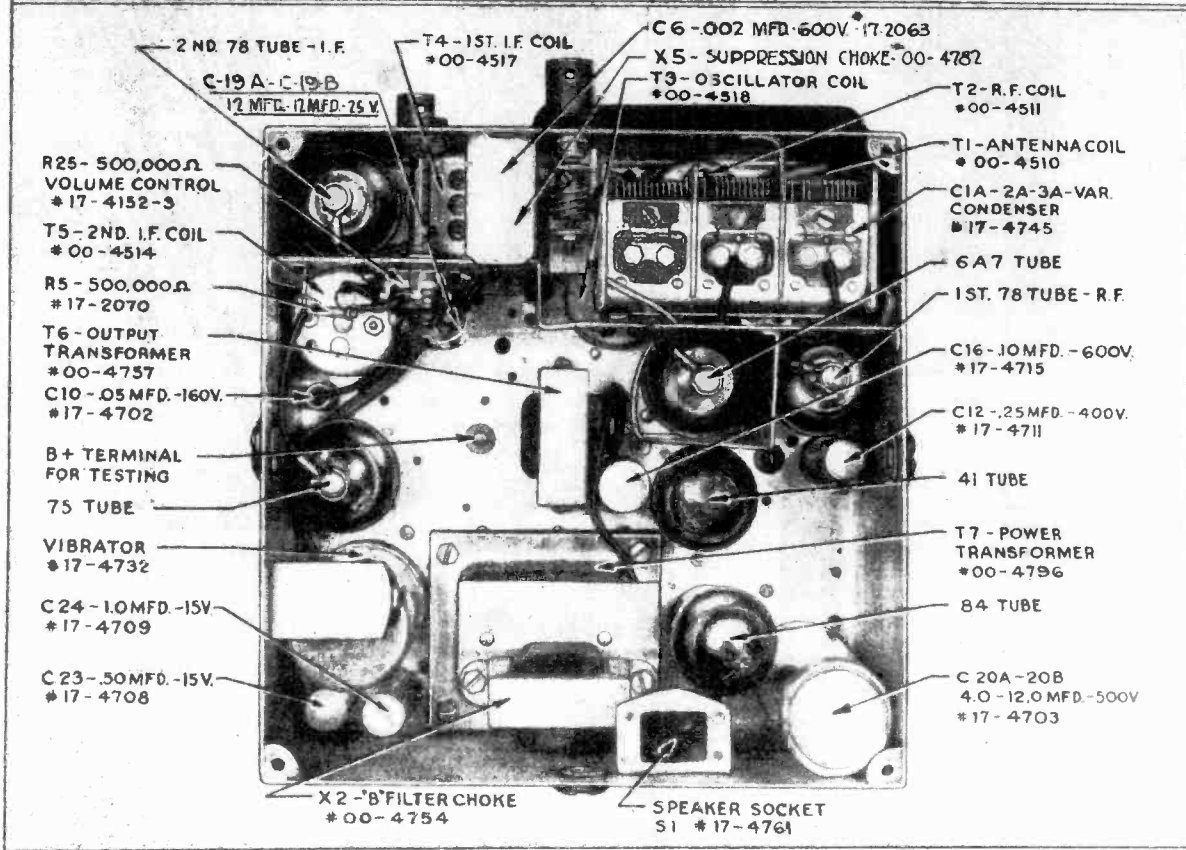
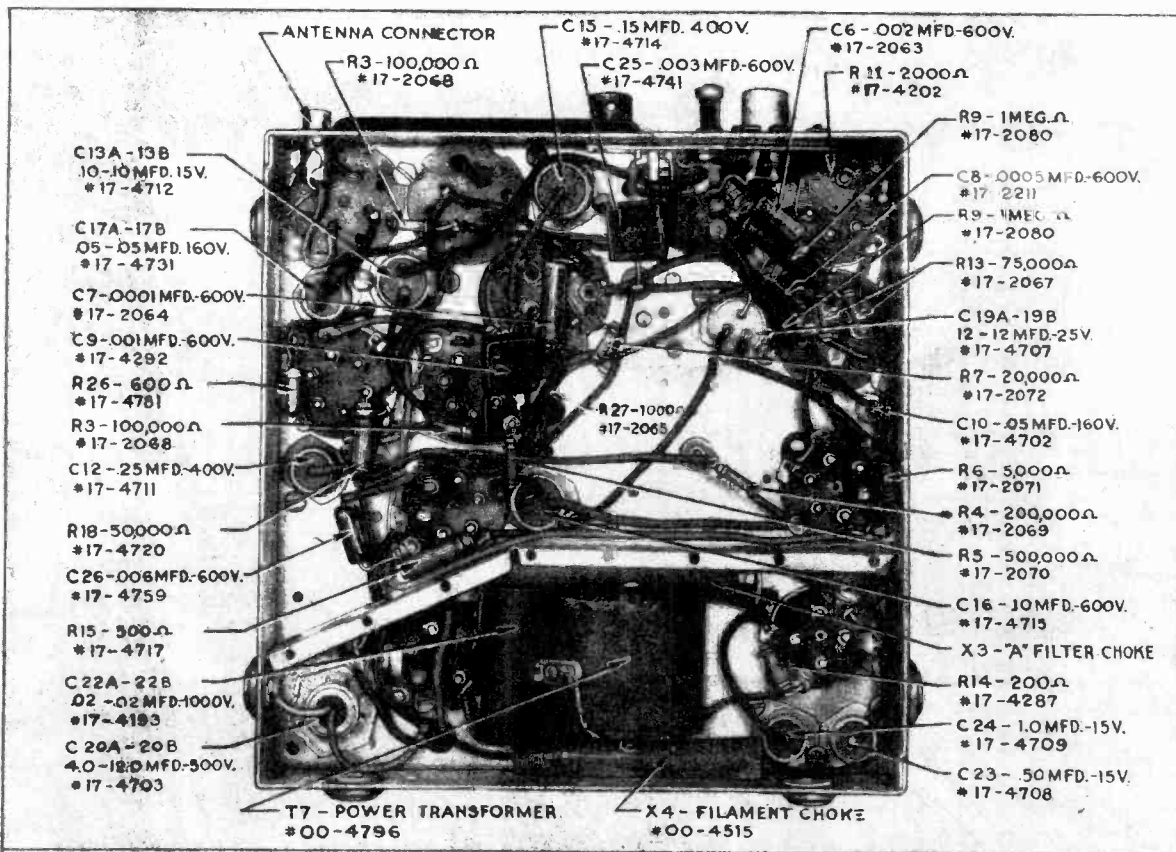
Ant. Primary	120	Oscillator Primary	3.0	Second I. F. Primary	85.0	Power Transformer Secondary {165} 361
Ant. Secondary	4.0	Oscillator Secondary	1.5	Second I. F. Secondary	85.0	{196} 361
R. F. Primary	113.0	First I. F. Primary	115.0	Output Transformer Primary	625	Speaker Field Coil
R. F. Secondary	4.0	First I. F. Secondary	115.0	Output Transformer Secondary	0.5	5.0
						Speaker Voice Coil
						3.0
						"B" Filter Choke
						165

‡ 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

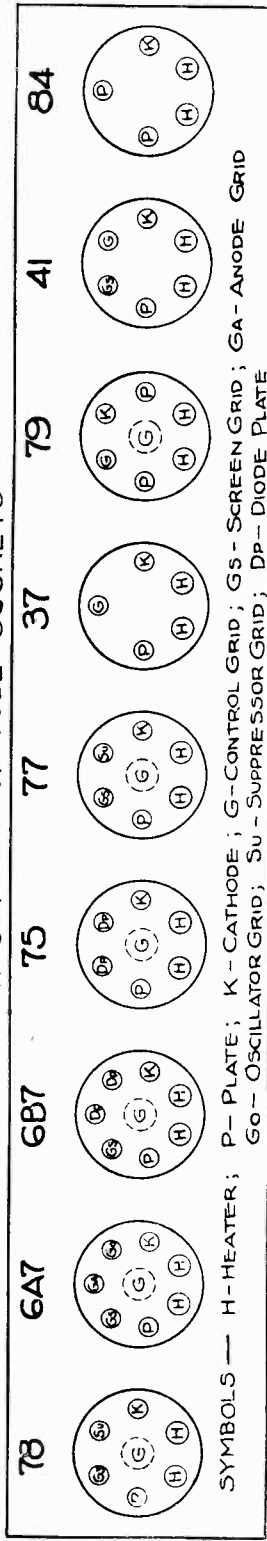
All readings to ground unless otherwise specified. Readings taken with all tubes, vibrator and speaker removed from set and R. F. chassis disconnected from power pack unit.

Tube	Heater	Plate	Screen	Cathode	Control Grid	Suppressor	Control
78	Inf.	0	100	25,000	500	500,000	—
77	Inf.	0	100	25,000	500	500,000	—
6B7	Inf.	0	100	25,000	500	500,000	—
79	Inf.	0	100	25,000	500	500,000	—
41	Inf.	0	100	25,000	500	500,000	—
41	Inf.	0	100	25,000	500	500,000	—
37	Inf.	0	100	25,000	500	500,000	—
84	Inf.	0	100	25,000	500	500,000	—

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

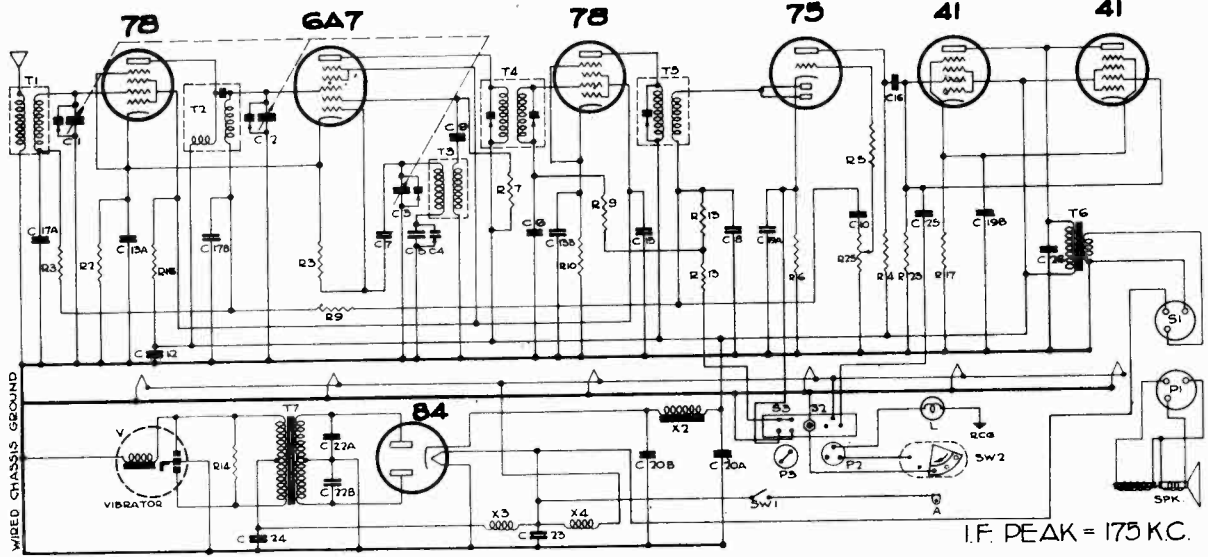


SYMBOLS — H-HEATER; P- PLATE; K- CATHODE; G- CONTROL GRID; GS- SCREEN GRID; GA- ANODE GRID; Gs- SUPPRESSOR GRID; Su- OSCILLATOR GRID; Dp- DIODE PLATE

NOBLITT SPARKS INDUSTRIES

MODEL 27
Schematic, Voltage
Resistances, Parts

ARVIN CAR RADIO — MODEL 27



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			7	3 GANG TUNING	17-4735	450	16	17A	05	10	800	17-4715	40	1	ANTENNA	00-4810	50	SPK	SPEAKER	17-4731	4.00			
3	1000	1/4	17-2065	20	20			3	00012 PAD	17-4726	40	15A	05	TWIN	180	17-4713	85	2	RADIO FREQUENCY	00-4811	1.00	V	VIBRATOR						
4	2000	1/4	17-2069	20	21			4	00011	600	17-4100	30	18B				3	OSCILLATOR	00-4812	85	RCD	REMOTE CONTROL GROUP	001 R23						
5	5000	1/4	17-2070	20	22			6	00012	600	17-2069	20	19A	170	TWIN	75	17-4707	180	4	FIRST I.F.	00-4813	1.75	SW1	VOLUME CONTROL SWITCH					
6	5000	1/4	17-2071	20	23	150M	1/4	17-3011	20	0001	600	17-3064	20	19B	170	TWIN	75	17-4707	180	7	SECOND I.F.	00-4814	1.75	SW2	TONE CONTROL SWITCH				
7	20M	1/4	17-2072	20	24	250M	1/4	17-4057-3	100	0005	600	17-2211	20	20A	40	DUAL	900	17-4705	240	8	OUTPUT POWER	00-4706	1.00	31	SPEAKER SOCKET	17-4761	15		
8	1M6	1/4	17-2080	20	26			9	0001	600	17-4292	20	20B	170	DUAL	900	17-4705	240	9	1M6	00-4747	3.00	33	DIAL LITE - TONE SOCKET	17-4910	30			
9	500	1/4	17-2088	20	27			10	05	160	17-4701	30	21A				10	1M6	00-4747	3.00	33	LOC-DIST CONTROL SOCKET	17-4915	30					
10	500	1/4	17-2088	20	28			11	.75	400	17-4711	55	22A	07	TWIN	1000	17-4193	60	X-1	B	00-4754	1.50	P1	SPEAKER PLUG	17-4766	15			
11	75M	1/4	17-2087	20	29			12	200 Ω TO 800 Ω TO CONTROL SENSITIVITY	15A	10	TWIN	15	17-4712	75	22B	07	TWIN	1000	17-4193	60	X-2	B	00-4754	1.50	P2	DIAL LITE - TONE PLUG	17-4767	15
12	75M	1/4	17-2087	20	30			13		24	1.0		15	17-4708	45	23	.50	15	17-4708	45	X-3	A	00-4816	40	P3	LOC-DIST CONTROL PLUG	17-4760	15	
13	200	1/4	17-4287	20	31			14		24	1.0		15	17-4708	45	24	1.0	15	17-4708	45	X-4	FILAMENT CHOKE	00-4816	40	P4	DIAL LITE 6-B VOLT AMPMETER CONNECTION	17-4760	15	
14	200	1/4	17-4287	20	32			15		28	0.05		200	17-4759	25	25	0.05	200	17-4759	25									
15	80M	1	17-4785	50	33			16		28	0.05		200	17-4759	25	26	0.05	200	17-4759	25									
16	250	1/2	17-4719	50	34			17		28	0.05		200	17-4759	25	27	0.05	200	17-4759	25									

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 Secondary05	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
.01 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.

- 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.

- 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.

- 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
.00022 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

- 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

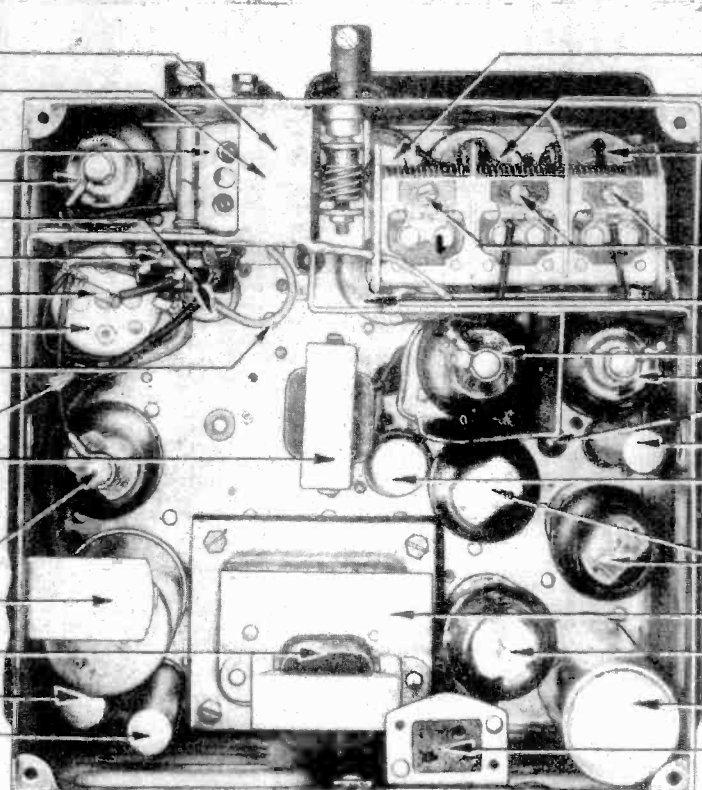
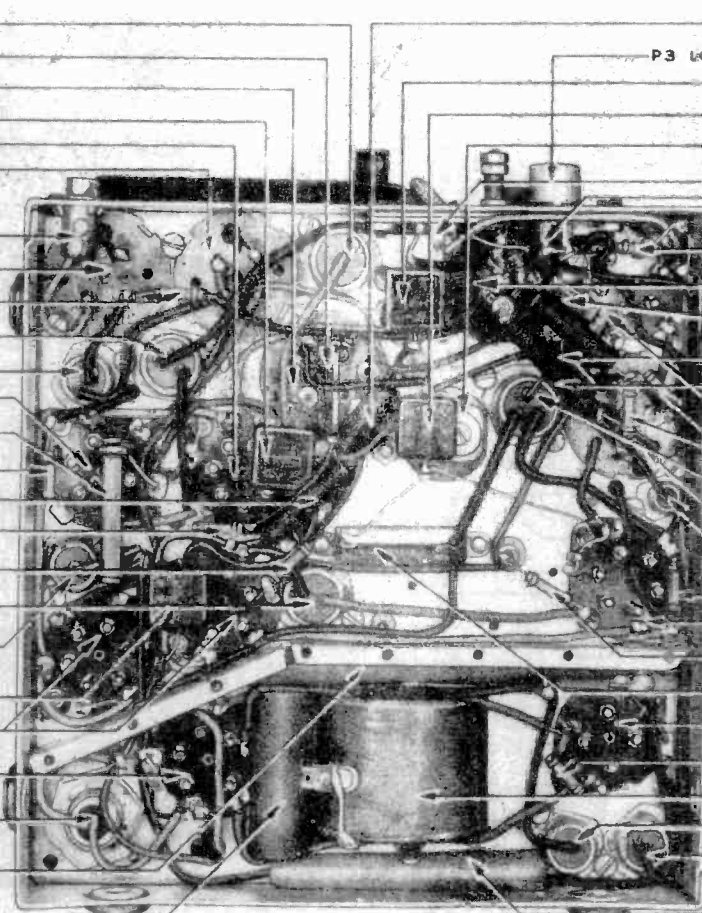
- TEST +B HERE
- C12 #17-4711
25 MFD. 400V.
- C16 #17-4715
1 MFD. 600V.

- 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

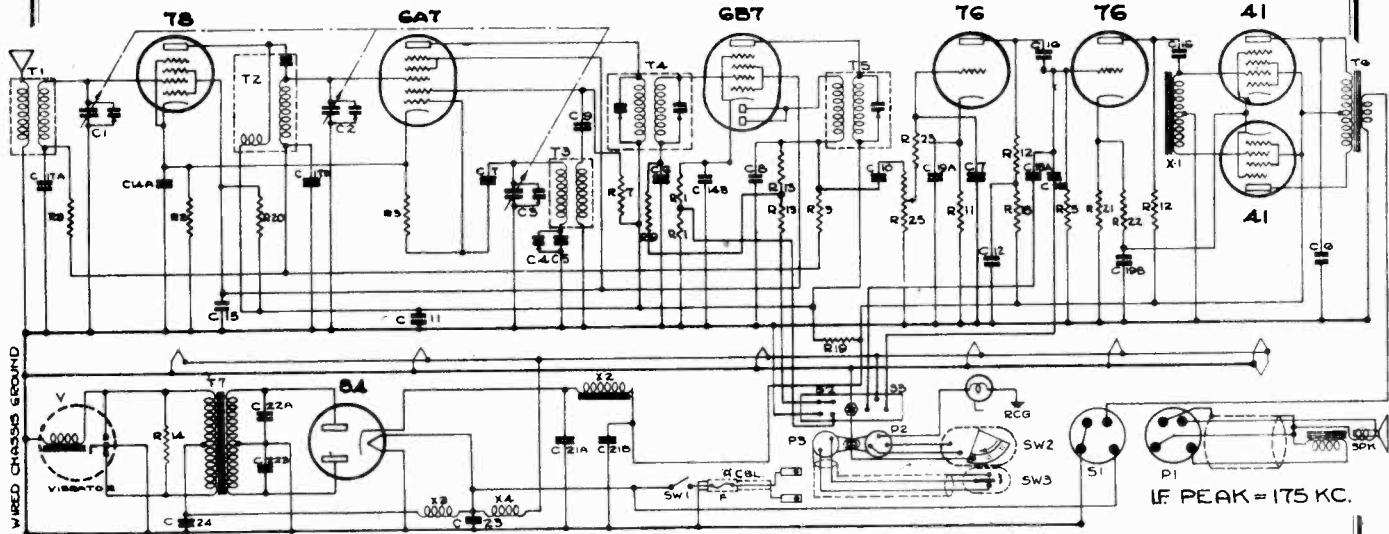


NOBLITT SPARKS INDUSTRIES

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	
2	100M	1T-2068	20	20	25M	1T-4722	25	3	4	00-022	20	25	4	00-4512	85	RCG	REMOTE CONTROL GROUND	SEE R25	
3	500M	1T-2070	20	22	300	1T-4724	30	4	6	00-011	600	1T-4700	30	05	00-4513	1.75	SW 1	VOLUME CONTROL SWITCH	SEE R25
3	20M	1T-2072	20	24	2500M	1T-5011	30	5	8	00-001	600	1T-2064	20	05	00-4514	1.75	SW 2	TOPE CONTROL SWITCH	SEE R25
3	1M5	1T-2000	20	24	2500M	1T-4804	1.00	6	9	00-005	600	1T-2111	20	05	00-4750	1.85	SW 3	LOCAL-DISTANCE SWITCH	SEE R25
3	500	1T-2006	20	27	10	05	10	7	10	00-001	600	1T-2064	20	05	00-4751	1.75	SW 2	TOPE CONTROL SWITCH	SEE R25
3	1M5	1T-2000	20	24	2500M	1T-4804	1.00	8	11	00-005	600	1T-2111	20	05	00-4750	1.85	SW 3	LOCAL-DISTANCE SWITCH	SEE R25
3	500	1T-2006	20	27	10	05	10	9	11	00-001	600	1T-2064	20	05	00-4751	1.75	SW 2	TOPE CONTROL SWITCH	SEE R25
3	1M5	1T-2000	20	24	2500M	1T-4804	1.00	10	11	00-005	600	1T-2111	20	05	00-4750	1.85	SW 3	LOCAL-DISTANCE SWITCH	SEE R25
3	10M	1T-4275	20	28	10	05	10	11	12	00-001	600	1T-2064	20	05	00-4751	1.75	SW 2	TOPE CONTROL SWITCH	SEE R25
3	75M	1T-2081	20	30	100M	1T-5002	1.00	12	12	00-005	600	1T-2111	20	05	00-4750	1.85	SW 3	LOCAL-DISTANCE SWITCH	SEE R25
3	200	1T-4267	20	32	10	05	10	13	13	00-001	600	1T-2064	20	05	00-4751	1.75	SW 2	TOPE CONTROL SWITCH	SEE R25
3	10	10	20	33	10	05	10	14	14	00-005	600	1T-2111	20	05	00-4750	1.85	SW 3	LOCAL-DISTANCE SWITCH	SEE R25
3	10	10	20	33	10	05	10	15	15	00-001	600	1T-2064	20	05	00-4751	1.75	SW 2	TOPE CONTROL SWITCH	SEE R25
3	10	10	20	33	10	05	10	16	16	00-005	600	1T-2111	20	05	00-4750	1.85	SW 3	LOCAL-DISTANCE SWITCH	SEE R25
3	10	10	20	33	10	05	10	17	17	00-001	600	1T-2064	20	05	00-4751	1.75	SW 2	TOPE CONTROL SWITCH	SEE R25

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	170	75	2.0	—	—	—
1st 76	5.8	100	—	4.7	—	—	—
2nd 76	5.8	165	—	5.3	—	—	—
41	5.8	230	235	18.0	—	—	—
41	5.8	230	235	18.0	—	—	—
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	6A7	6B7	1st 76
+ 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		
2nd 76	41	41	84
+ 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.

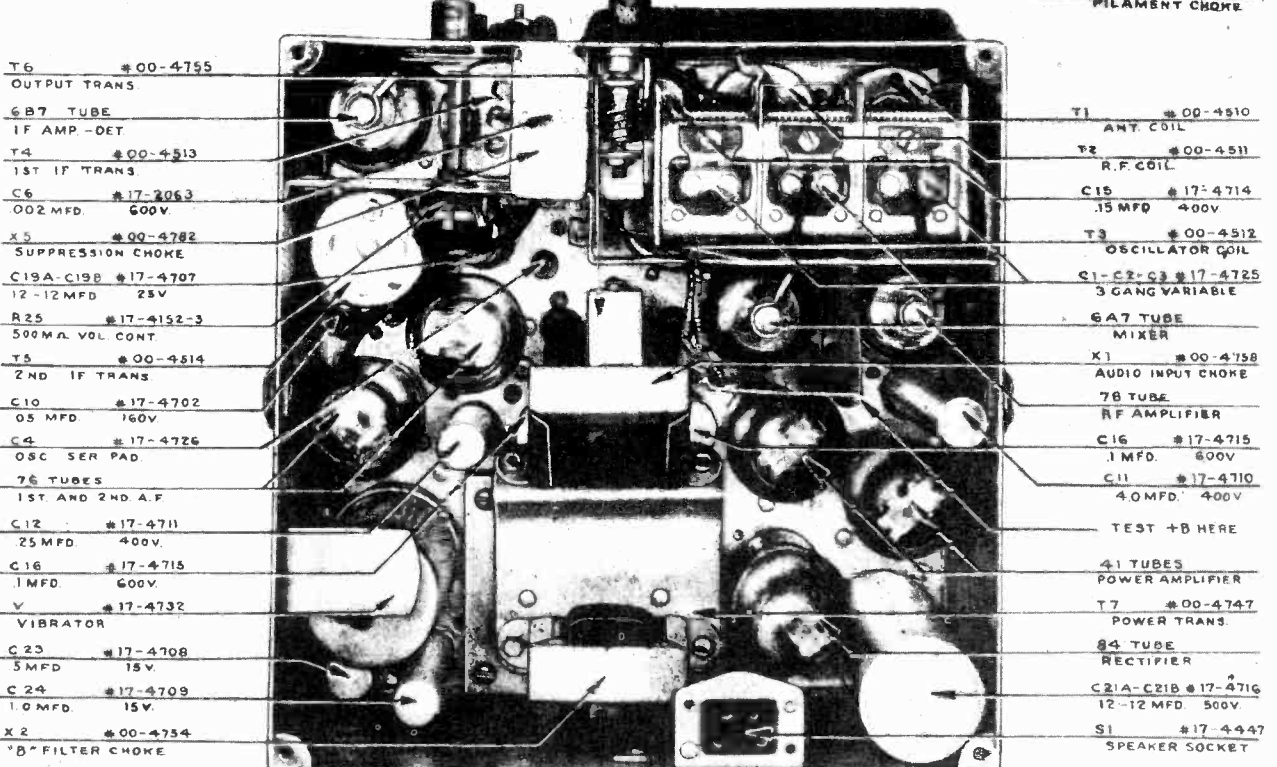
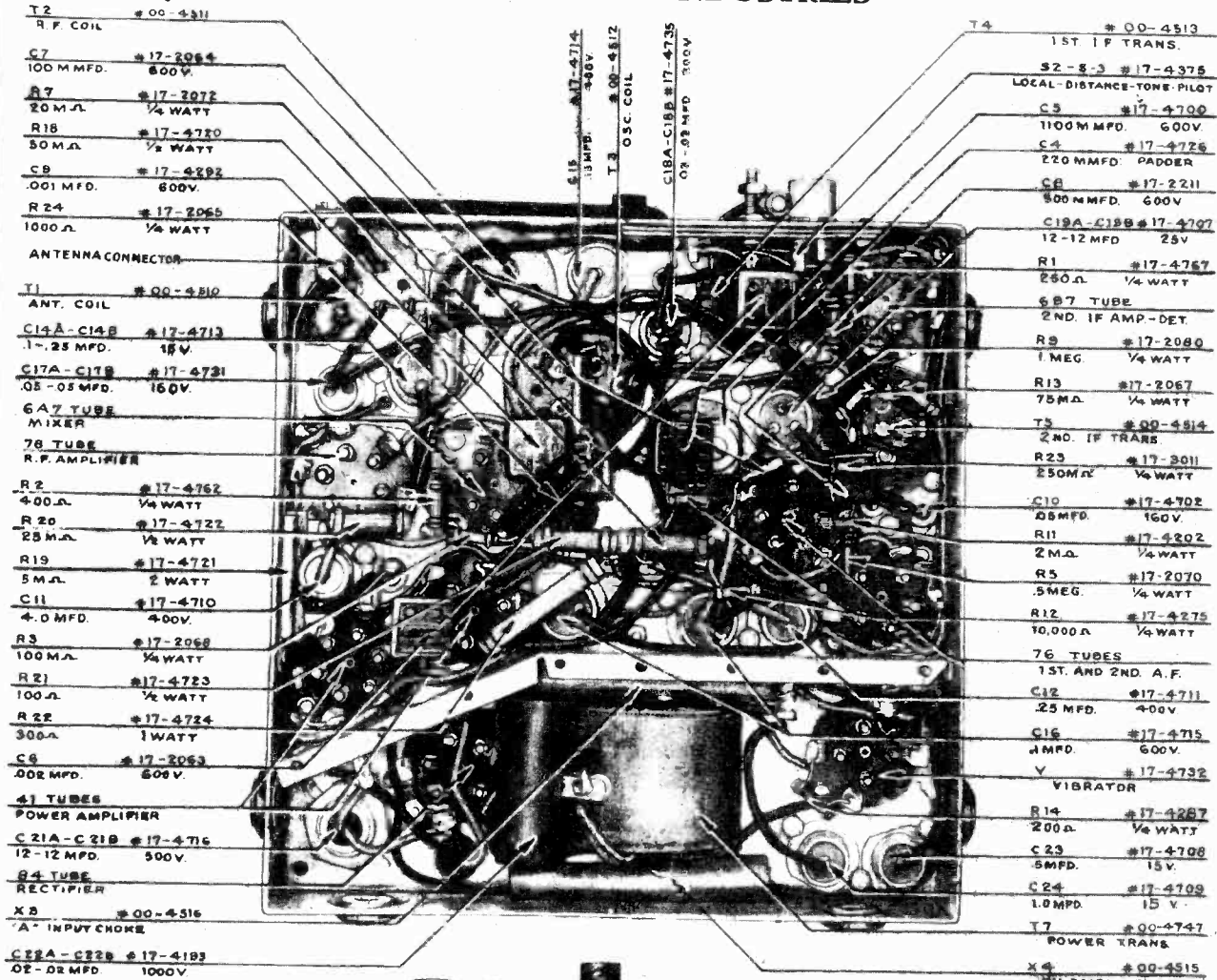
COIL RESISTANCES

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
		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
17-4234	Speaker Assembly (37)	8.50
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 Taupie Tenite Tuning Knob (17A)	.10

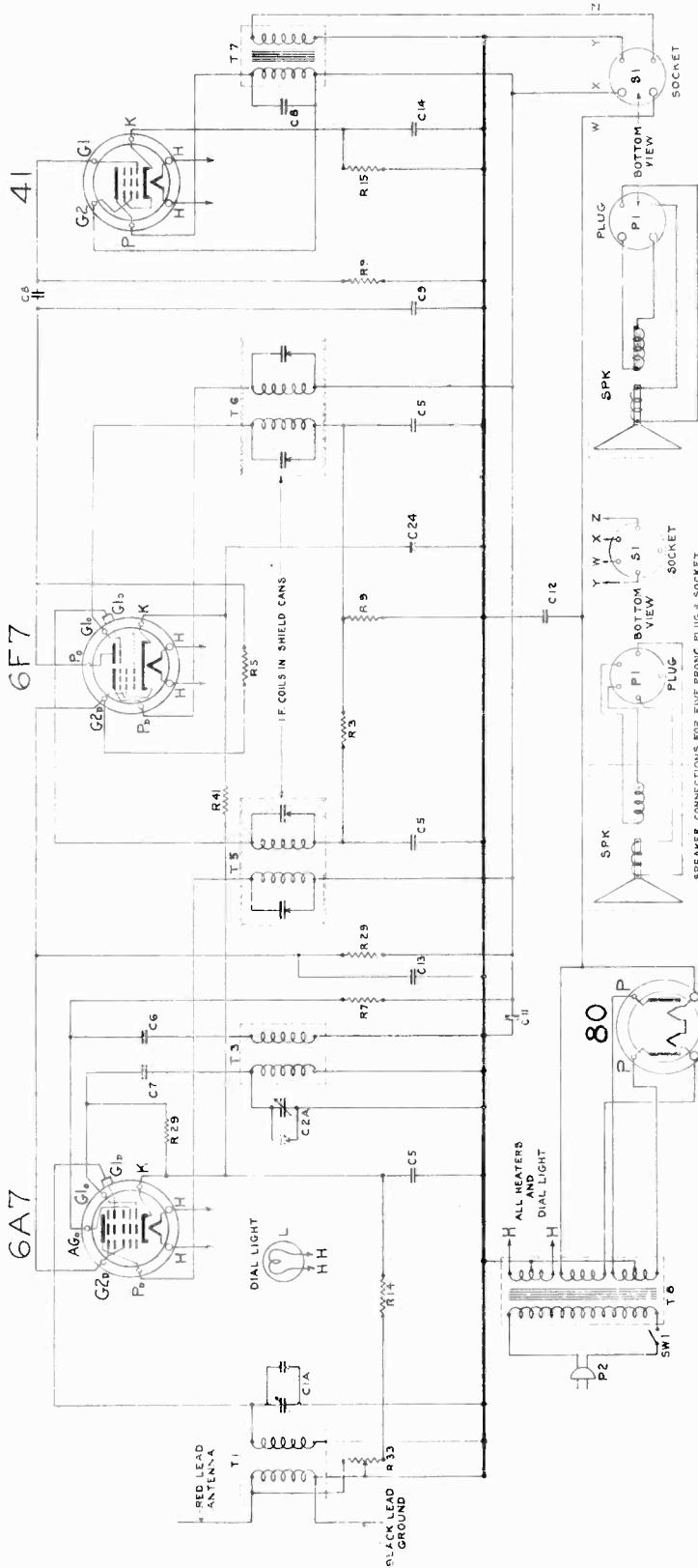
FLEXIBLE SHAFTS

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 15" length	.70
00-4645	Condenser Drive 18" length	.85
00-4646	Condenser Drive 21" length	.95
00-4647	Condenser Drive 24" length	1.00
00-4648	Condenser Drive 30" length	1.20
00-4649	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	.95
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 PART NO PRICE	C	CAPACITY/VOLT PART NO PRICE	T	TYPE PART NO PRICE	S	DESCRIPTION PART NO PRICE
1	100 M 1/4 17-2068	2A	TUNING 17-13000	1	ANTENNA COIL 29-13017	SW 1	DYNAMIC SPEAKER 17-13038
2	22	3A	50 TINY 17-14015	2	OSCILLATOR 29-13018	S1	VOLUME CONTROL SWITCH (SEE R 33) 17-13906
3	23	4	5 160 17-14015	3	FIRST I.F. COIL 00-13800	P1	SPEAKER SOCKET 17-13904
4	24	5	5 160 17-14015	4	SECOND I.F. COIL 00-13801	P2	DIAL LIGHT POWER CORD PLUG 17-13613
5	500 M 1/4 17-2070	6	0.001 MICA 600 17-44016	5	POWER TRANSF 00-13608		
6	20 M 1/4 17-2072	7	0.001 MICA 600 17-44016	6	CHOKES		
7	20 M 1/4 17-2072	8	0.01 MICA 600 17-4292	7	CHOKES		
8	1 MEG 1/4 17-2080	9	0.001 MICA 600 17-4292	8	CHOKES		
9	1 MEG 1/4 17-2080	10	16 ELECT 475 17-14002	9	CHOKES		
10	10 M 1/4 17-2060	11	16 ELECT 475 17-14002				
11	300	12	16 ELECT 475 17-14002				
12	300	13	16 ELECT 475 17-14002				
13	300	14	16 ELECT 475 17-14002				
14	200 1/4 17-4287	15	10 M VC 17-13906				
15	300 1/2 17-4717	16	10 M VC 17-13906				
16	16	17	10 M VC 17-13906				
17	16	18	10 M VC 17-13906				
18	16	19	10 M VC 17-13906				
19	16	20	10 M VC 17-13906				
20	41						

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

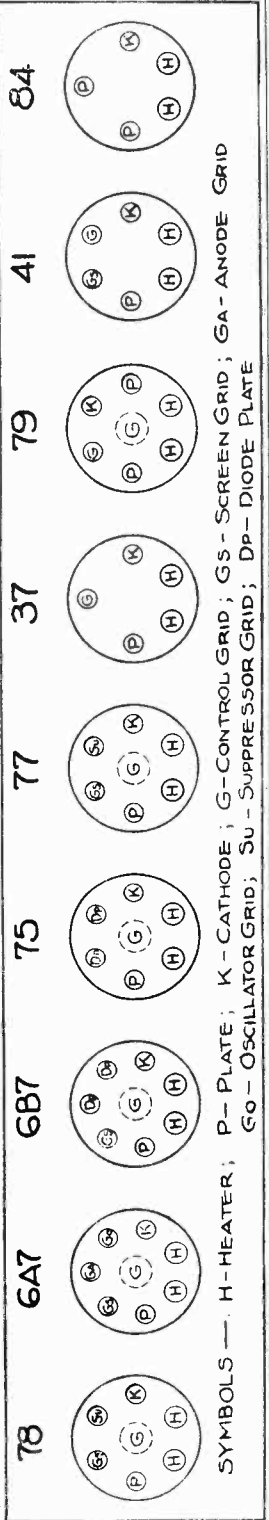
All readings to ground unless otherwise specified. Readings taken with all tubes, vibrator and speaker removed from set and R. F. chassis disconnected from power pack unit.

1st 78	Heater	Inf.	2nd 78	Heater	Inf.	37	Heater	Inf.
+	Heater	0	+	Heater	0	+	Heater	0
—	Heater	0	—	Heater	0	—	Heater	0
Plate to B+	50	100	Plate to B+	100	100	Plate to B+	60,000	60,000
Screen Grid to B+	25,000	60,000	Screen Grid to B+	25,000	25,000	Control Grid	50,000	50,000
Suppressor Grid	500	3,000	Suppressor Grid	500	500	Cathode	—	—
Cathode	500	3,000	Cathode	500	500			
Control Grid	1,600,000	5	Control Grid	1,500,000	5			
75	Heater	Inf.	41	Heater	Inf.	75	Heater	Inf.
+	Heater	0	+	Heater	0	+	Heater	0
—	Heater	0	—	Heater	0	—	Heater	0
Plate to B+	250,000	Inf.	Plate to B+	250,000	250,000	Plate to B+	508,000	508,000
Screen Grid to B+	500,000	508,000	Screen Grid to B+	500,000	508,000	Control Grid	508,000	508,000
Diode	2500	2500	Diode	2500	2500	Cathode	400	400
Control Grid	8000	8000	Control Grid	500,000	500,000			
			V. C. on	250,000	250,000			
			V. C. off	—	—			

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

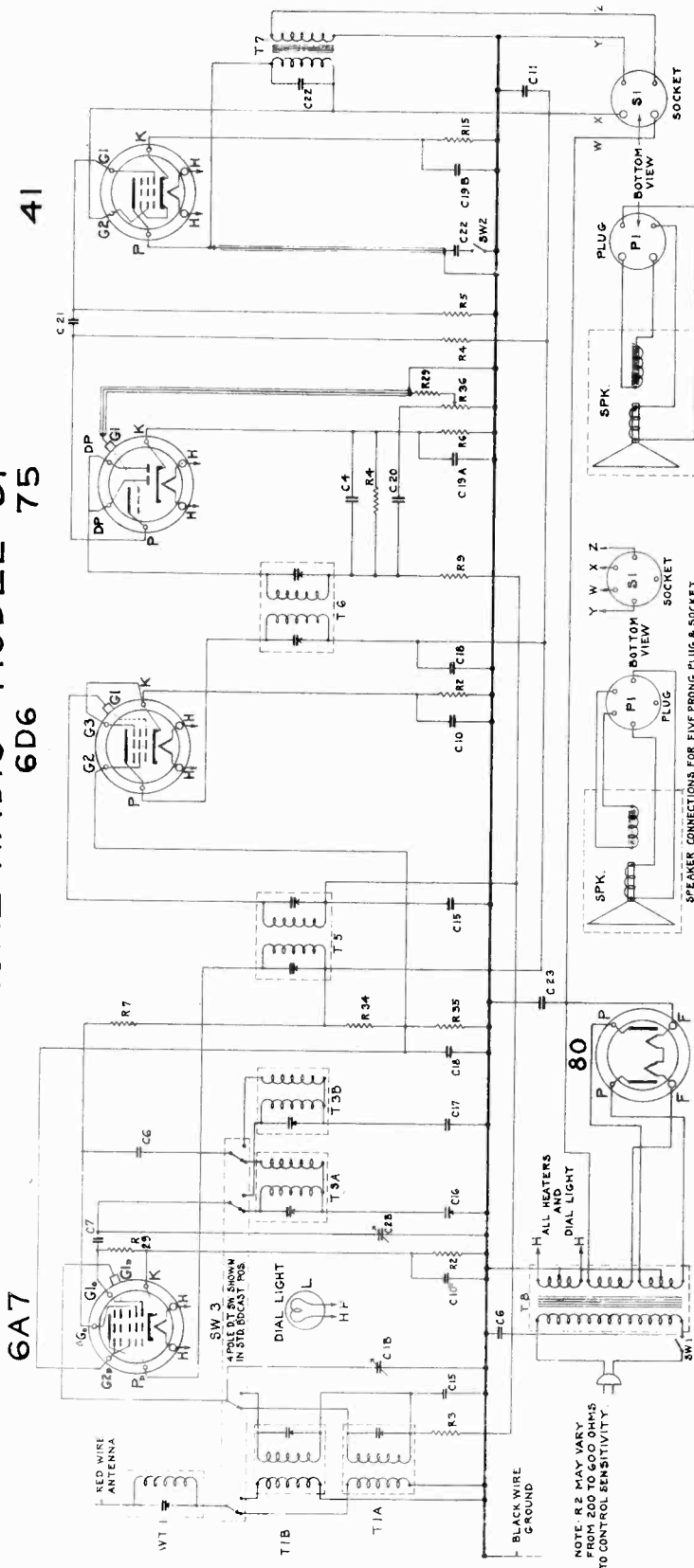


SYMBOLS — H - HEATER; K - CATHODE; G - CONTROL GRID; GS - SCREEN GRID; GA - ANODE GRID; G0 - OSCILLATOR GRID; Su - SUPPRESSOR GRID; DP - DIODE PLATE

MODEL 51
Schematic, Parts

NOBLITT SPARKS INDUSTRIES

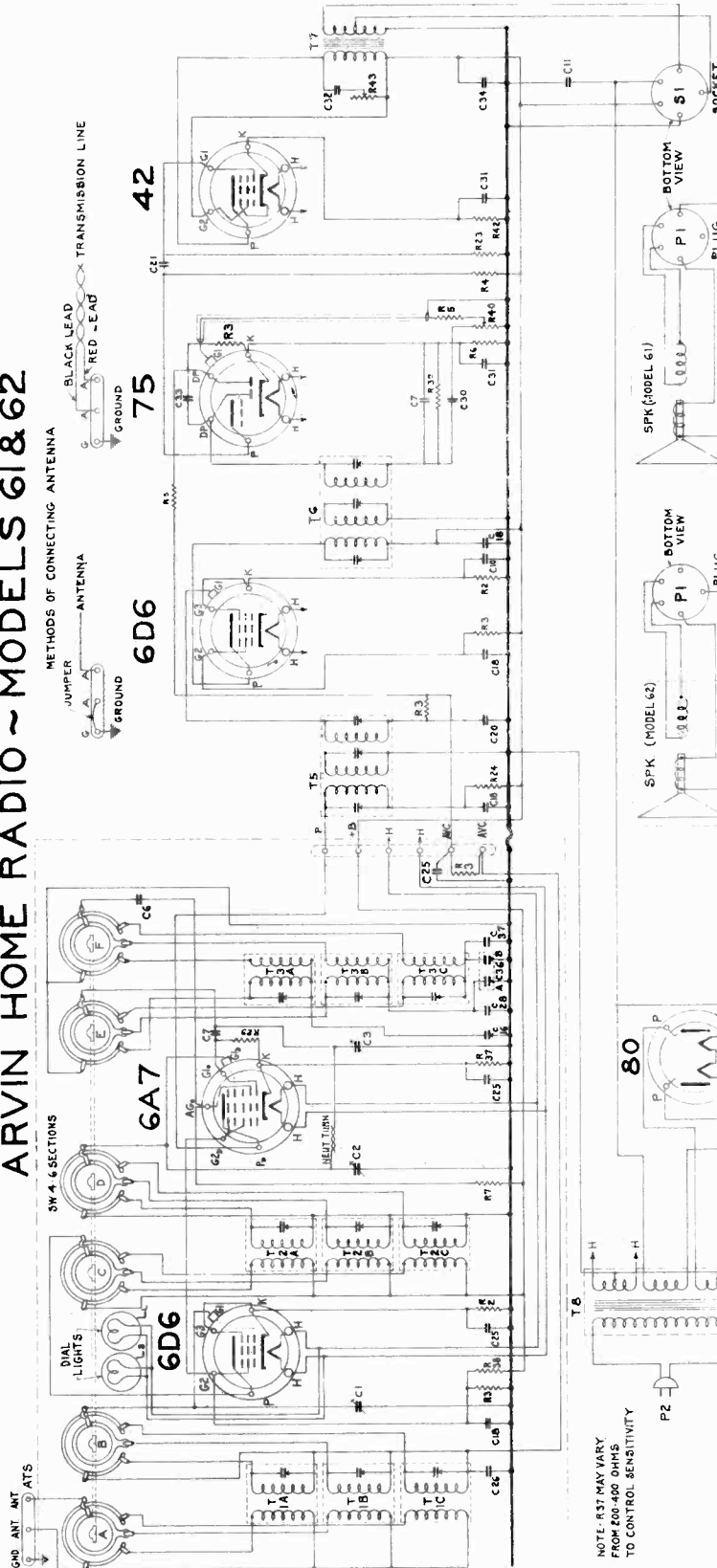
SCHEMATIC CIRCUIT DIAGRAM
ARVIN HOME RADIO ~ MODEL 51
6D6



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	500 OHM STAP 200 17-14027	SW1	VOLUME CONTROL SWITCH (SEE P. 34)
2	200 M 1/4 17-5065	2B	TUNING	21	500 OHM MICA 600 17-14006	SW2	SPEAKER PLUG (FURNISHED WITH SPK.)
3	500 M 1/4 17-2070	3B	.0005 MICA	22	0 12 WET LECT. 475 17-14003	P1	DIAL LIGHT PLUG
4	500 M 1/4 17-2071	5	.002 MICA	23	12 WET LECT. 475 17-14000	P2	500 OHM TONE CONTROL SWITCH
5	500 M 1/4 17-2072	6	.002 MICA	2	ANT. COIL 00-13219	SW3	BAND SWITCH
6	500 M 1/4 17-2073	7	.001 MICA	3A	STD. BROADCAST OSCILLATOR 00-13220		
7	20 M 1/4 17-2074	8	.001 MICA	3B	500 OHM W. 00-13222		
8	1 MEG 1/4 17-2080	9	1 CAN	4	500 OHM W. 00-13222		
9	1 MEG 1/4 17-2080	10	1 CAN	5	500 OHM W. 00-13222		
10	1 MEG 1/4 17-2080	11	1 CAN	6	500 OHM W. 00-13222		
11	50 M 1/4 17-2060	12	1 CAN	7	500 OHM W. 00-13222		
12	50 M 1/4 17-2060	13	1 CAN	8	500 OHM W. 00-13222		
13	50 M 1/4 17-2060	14	1 CAN	9	500 OHM W. 00-13222		
14	50 M 1/4 17-2060	15	1 CAN	10	500 OHM W. 00-13222		
15	500 1/2 17-4717	16	1 CAN	11	500 OHM W. 00-13222		
16	500 1/2 17-4717	17	1 CAN	12	500 OHM W. 00-13222		
17	500 1/2 17-4717	18	1 CAN	13	500 OHM W. 00-13222		
18	500 1/2 17-4717	19	1 CAN	14	500 OHM W. 00-13222		
19	500 1/2 17-4717	20	1 CAN	15	500 OHM W. 00-13222		
20	500 1/2 17-4717						

NOBLITT SPARKS INDUSTRIES

SCHEMATIC CIRCUIT DIAGRAM
ARVIN HOME RADIO ~ MODELS 61 & 62

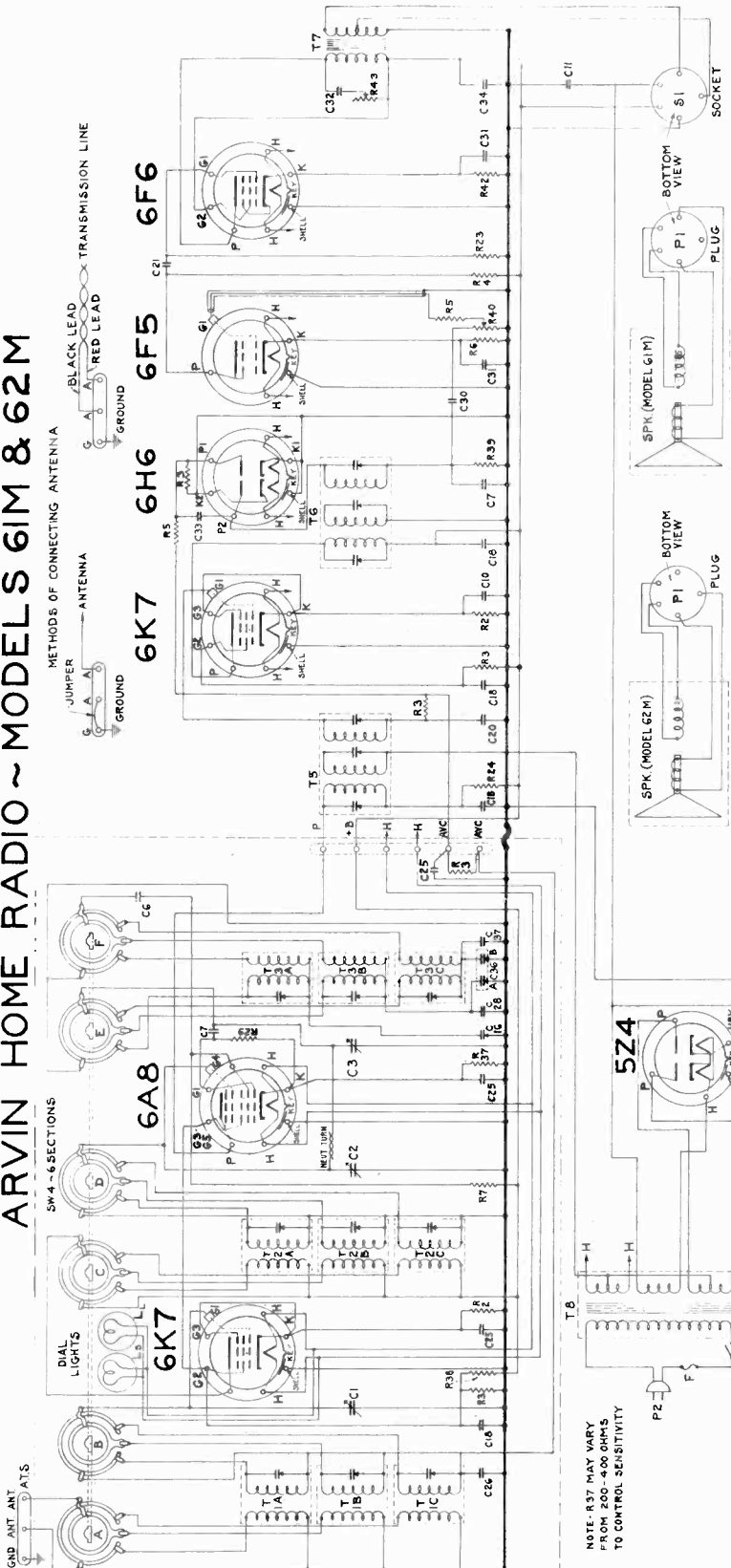


RESISTORS		CONDENSERS		CHOKES & TRANSFORMERS		MISCELLANEOUS UNITS	
R	OHMS/W	C	CAPACITY/MULT	T	TYPE	SYMBOL	DESCRIPTION
1	400	1	3 GANG TUNING	1A	55.18 M.C. ANT. COIL	SPK	DYNAMIC SPEAKER - MODEL G1
2	100 M	2	02 CAN	1B	18.55 M.C. ANT. COIL	SW 1	DYNAMIC SPEAKER - MODEL G2
3	100 M	3	02 CAN	1C	55.18 M.C. ANT. COIL	SW 1	TOUCH CONTROL & POWER SWITCH (SEE R43)
4	200 M	4	02 MICA	2A	18.55 M.C. R.F. COIL	P1	TOUCH CONTROL & POWER SWITCH (SEE R43)
5	500 M	5	02 MICA	2B	55.18 M.C. R.F. COIL	P1	SPEAKER SOCKET
6	20 M	6	02 MICA	3A	18.55 M.C. OSCILL.	P2	SPEAKER PLUG - FURNISHED WITH SPK
7	20 M	7	02 MICA	3B	55.18 M.C. OSCILL.	P2	TOUCH CONTROL PLUG
8	100 M	8	02 MICA	3C	18.55 M.C. OSCILL.	SW 4-F	6 SECTION WAVE BAND SWITCH WAFER
9	100 M	9	02 MICA	4	18.55 M.C. OSCILL.	LL	DIAL LIGHT
10	100 M	10	02 MICA	5	55.18 M.C. OSCILL.	ATS	ANTENNA TERMINAL STRIP
11	100 M	11	02 MICA	6	18.55 M.C. OSCILL.		
12	100 M	12	02 MICA	7	55.18 M.C. OSCILL.		
13	100 M	13	02 MICA	8	18.55 M.C. OSCILL.		
14	100 M	14	02 MICA				
15	100 M	15	02 MICA				
16	100 M	16	02 MICA				
17	100 M	17	02 MICA				
18	100 M	18	02 MICA				
19	100 M	19	02 MICA				
20	100 M	20	02 MICA				
21	100 M	21	02 MICA				
22	100 M	22	02 MICA				
23	250 M	23	02 MICA				

MODELS 61M, 62M
Schematic, Parts

NOBLITT SPARKS INDUSTRIES

SCHEMATIC CIRCUIT DIAGRAM
ARVIN HOME RADIO ~ MODELS 61M & 62M



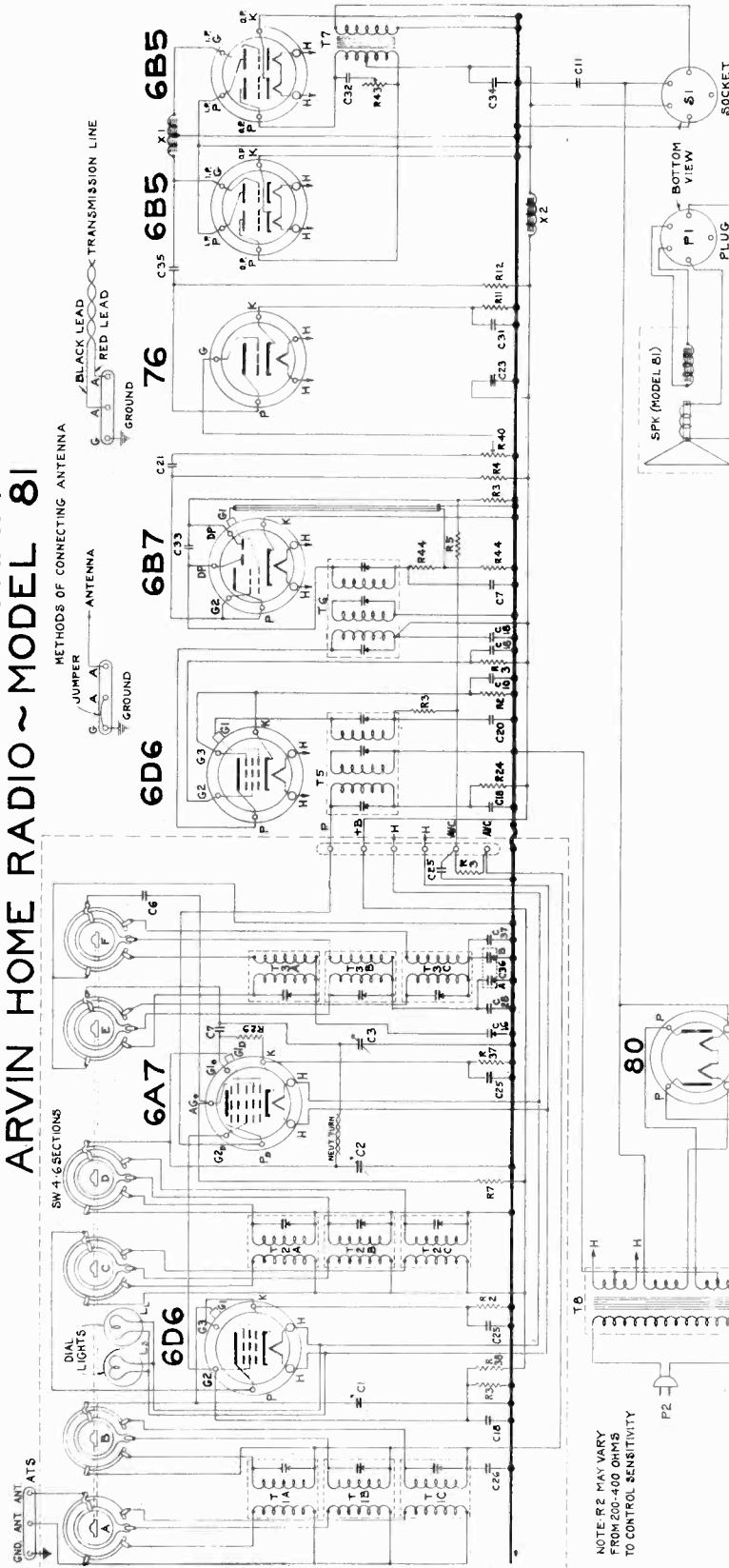
RESISTORS		CONDENSERS		CHOKES & TRANSFORMERS		MISCELLANEOUS UNITS	
R	OHMS/W PART NO/PRICE	C	CAPACITY/W PART NO/PRICE	T	TYPE	SYMBOL	DESCRIPTION
1	400 1/4 17-4762	24	3 GANG TUNING 17-13000	1A	25-18 M.C. ANT. COIL	SPK	DYNAMIC SPEAKER - MODEL G1M
2	100M 1/4 17-2069	25	.05 CAN 600 17-2063	1B	18-18 M.C. ANT. COIL	SPK	DYNAMIC SPEAKER - MODEL G2M
3	500M 1/4 17-2070	26	.02 CAN 600 17-2064	1C	15-15 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	0.02 MICA 600 17-14023	2B	18-18 M.C. RF COIL	L5	DIAL LIGHT
6	50M 1/4 17-2060	29	0.0001 MICA 600 17-14010	2C	15-15 M.C. RF COIL	P2	POWER CORD PLUG
7	5M 1/4 17-2071	30	12 LARGE CAN 600 17-14010	3A	11-11 M.C. OSC. COIL	SW2	ANTENNA WAVEBAND SWITCH WAFER
8	20M 1/4 17-2072	31	0.0001 MICA 600 17-14010	3B	11-11 M.C. OSC. COIL	SW3	FUSE
9	50M 1/4 17-2060	32	0.3 STRAP 600 17-14044	3C	5.5-18 M.C. OSC. COIL	ATS	ANTENNA TERMINAL STRIP
10	100M 1/4 17-2060	33	0.0005 MICA 600 17-14044	4	FIRST I.F. COIL	LL	DIAL LIGHT
11	200M 1/4 17-2060	34	16 ELECT 475 17-14003	5	SECOND I.F. COIL		
12	500M 1/4 17-2060	35	16 ELECT 475 17-14002	6	OUTPUT TRANSF		
13	1M 1/4 17-14023	36	100 MICA 600 17-14054	7	POWER TRANSF		
14	5M 1/4 17-14023	37	0.04 MICA 600 17-14053	8			
15	10M 1/4 17-14023						
16	50M 1/4 17-14023						
17	100M 1/4 17-14023						
18	500M 1/4 17-14023						
19	1M 1/4 17-14023						
20	5M 1/4 17-14023						
21	10M 1/4 17-14023						
22	50M 1/4 17-14023						
23	100M 1/4 17-14023						

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



NOTE: R 2 MAY VARY FROM 200-400 OHMS TO CONTROL SENSITIVITY

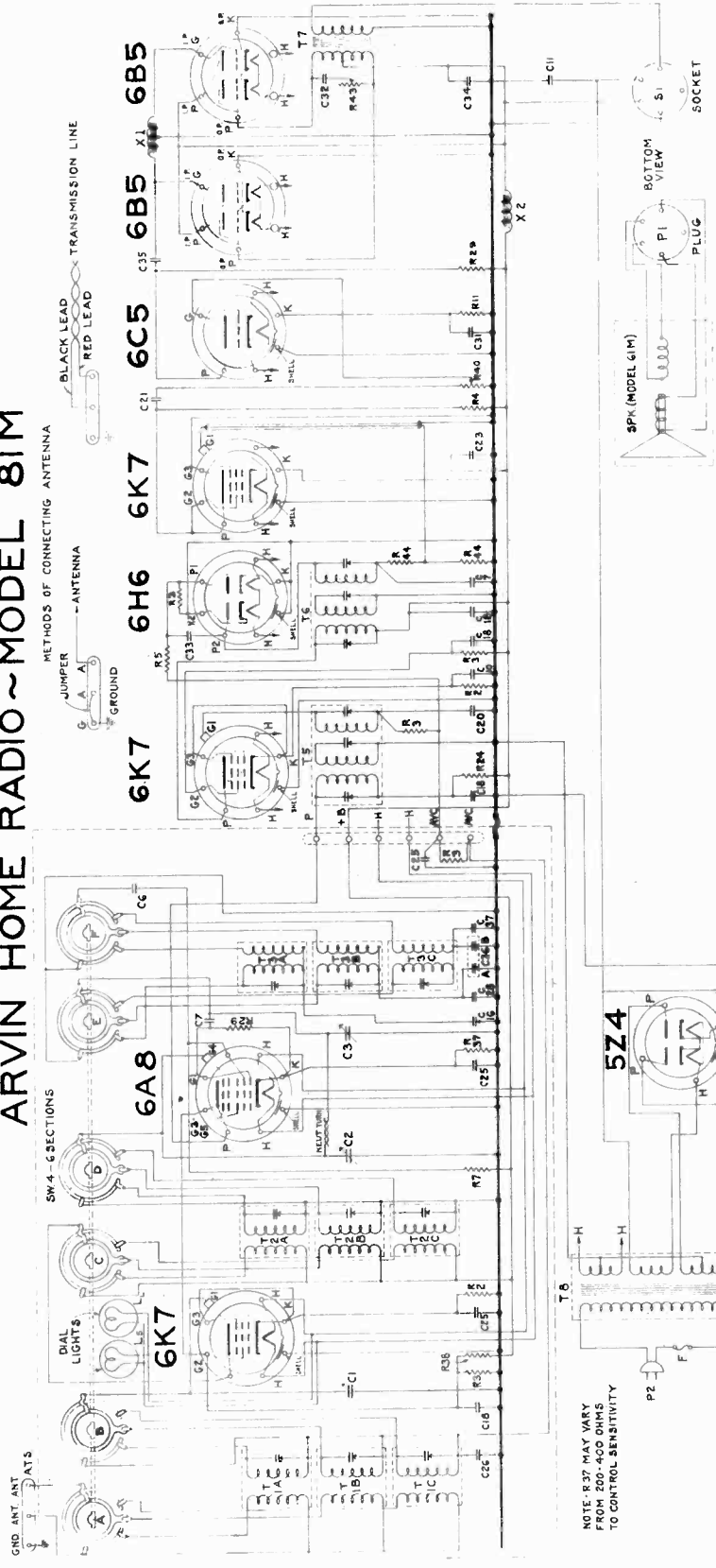
RESISTORS		CONDENSERS		CHOKES & TRANSFORMERS		MISCELLANEOUS UNITS	
R	OHMS/W	C	CAPACITY/VOLT	T	TYPE	SYMBOL	DESCRIPTION
1	450 1/4 W	1	3 GANG TUNING	T	TRANSFORMERS	SPK	DYNAMIC SPEAKER - MODEL 81
2	100 M	2	1000 MICA	TA	55-18 M.C. ANT. COIL	SW 1	17-1306-4
3	500 M	3	1000 MICA	TC	55-18 M.C. ANT. COIL	SW 1	17-1310-1
4	500 M	4	1000 MICA	TC	55-18 M.C. ANT. COIL	SW 1	17-1301-4
5	500 M	5	1000 MICA	TC	55-18 M.C. ANT. COIL	SW 1	17-1301-4
6	20 M	6	1000 MICA	TC	55-18 M.C. ANT. COIL	SW 1	17-1301-4
7	10 M	7	1000 MICA	TC	55-18 M.C. ANT. COIL	SW 1	17-1301-4
8	10 M	8	1000 MICA	TC	55-18 M.C. ANT. COIL	SW 1	17-1301-4
9	10 M	9	1000 MICA	TC	55-18 M.C. ANT. COIL	SW 1	17-1301-4
10	10 M	10	1000 MICA	TC	55-18 M.C. ANT. COIL	SW 1	17-1301-4
11	10 M	11	1000 MICA	TC	55-18 M.C. ANT. COIL	SW 1	17-1301-4
12	10 M	12	1000 MICA	TC	55-18 M.C. ANT. COIL	SW 1	17-1301-4
13	10 M	13	1000 MICA	TC	55-18 M.C. ANT. COIL	SW 1	17-1301-4
14	10 M	14	1000 MICA	TC	55-18 M.C. ANT. COIL	SW 1	17-1301-4
15	10 M	15	1000 MICA	TC	55-18 M.C. ANT. COIL	SW 1	17-1301-4
16	10 M	16	1000 MICA	TC	55-18 M.C. ANT. COIL	SW 1	17-1301-4
17	10 M	17	1000 MICA	TC	55-18 M.C. ANT. COIL	SW 1	17-1301-4
18	10 M	18	1000 MICA	TC	55-18 M.C. ANT. COIL	SW 1	17-1301-4
19	10 M	19	1000 MICA	TC	55-18 M.C. ANT. COIL	SW 1	17-1301-4
20	10 M	20	1000 MICA	TC	55-18 M.C. ANT. COIL	SW 1	17-1301-4
21	10 M	21	1000 MICA	TC	55-18 M.C. ANT. COIL	SW 1	17-1301-4
22	10 M	22	1000 MICA	TC	55-18 M.C. ANT. COIL	SW 1	17-1301-4
23	10 M	23	1000 MICA	TC	55-18 M.C. ANT. COIL	SW 1	17-1301-4
24	1000	24	1000	24	1000	24	1000
25	1000	25	1000	25	1000	25	1000
26	1000	26	1000	26	1000	26	1000
27	1000	27	1000	27	1000	27	1000
28	1000	28	1000	28	1000	28	1000
29	1000	29	1000	29	1000	29	1000
30	1000	30	1000	30	1000	30	1000
31	1000	31	1000	31	1000	31	1000
32	1000	32	1000	32	1000	32	1000
33	1000	33	1000	33	1000	33	1000
34	1000	34	1000	34	1000	34	1000
35	1000	35	1000	35	1000	35	1000
36	1000	36	1000	36	1000	36	1000
37	1000	37	1000	37	1000	37	1000
38	1000	38	1000	38	1000	38	1000
39	1000	39	1000	39	1000	39	1000
40	1000	40	1000	40	1000	40	1000
41	1000	41	1000	41	1000	41	1000
42	1000	42	1000	42	1000	42	1000
43	1000	43	1000	43	1000	43	1000
44	1000	44	1000	44	1000	44	1000
45	1000	45	1000	45	1000	45	1000

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 G.O.M.C.

MODEL 81M
Schematic, Parts

NOBLITT SPARKS INDUSTRIES

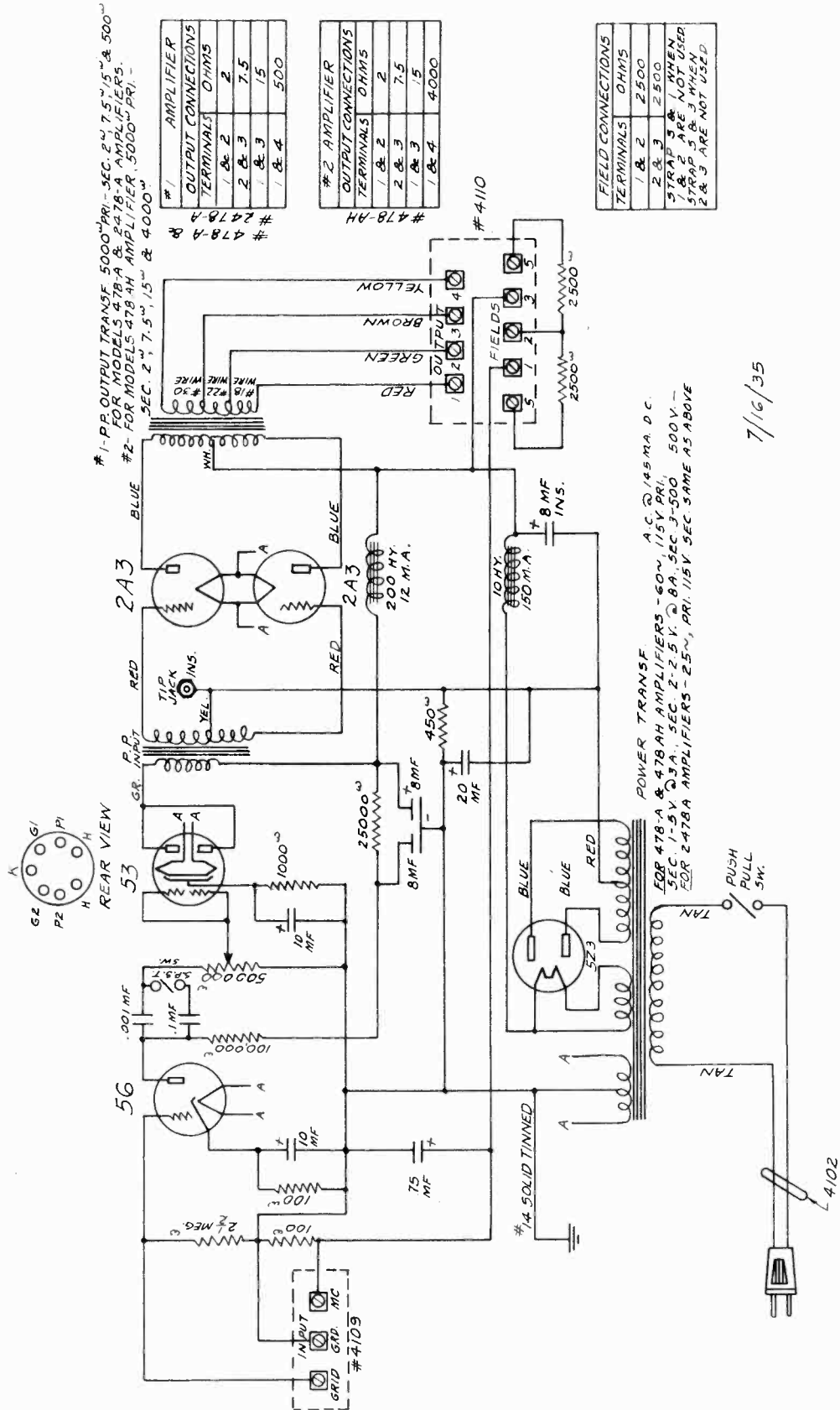
SCHEMATIC CIRCUIT DIAGRAM
ARVIN HOME RADIO ~ MODEL 81M



RESISTORS			CONDENSERS			CHOKES & TRANSFORMERS			MISCELLANEOUS UNITS			
R	OHMS	W	PRICE	C	CAPACITY	PRICE	T	TYPE	PRICE	SYMBOL	DESCRIPTION	PRICE
2	400	1/4	17-4722	1	3 GANG	17-13000	1A	55-18 MC ANT COIL	\$9.13910	SPK	DYNAMIC SPEAKER - MODEL 81M	17-13064
3	100 M	1/4	17-2065	2	TUNING	17-14012	1B	18.55 MC ANT COIL	\$9.13913	SW 1	TOUCH CONTROL & POWER SWITCH (SEE R43)	17-13101
4	200 M	1/4	17-2069	3	10000 ± 0%	17-14023	1C	35-16 MC R.F. COIL	\$9.13916	SW 4	SECTION WIDE BAND SWITCH WAFER	17-14153
5	500 M	1/4	17-2070	4	.002 MICA	17-2063	2A	35-16 MC R.F. COIL	\$9.13916	P1	SPEAKER PLUG - FURNISHED WITH SPK	-
6	100 M	1/4	17-2072	5	.001 MICA	17-2064	2B	18.55 MC R.F. COIL	\$9.13914	L1	DIAL LIGHT PLUS	17-13904
7	20 M	1/4	17-2072	6	10000 MICA	17-14004	2C	55-18 MC R.F. COIL	\$9.13917	L2	DIAL LIGHT	17-13927
8	100 M	1/4	17-2072	7	10000 MICA	17-14004	2D	18.55 MC OSCIL.	\$9.13915	AL	ANTENNA TERMINAL STRIP	17-13905
9	100 M	1/4	17-2072	8	10000 MICA	17-14004	2E	55-18 MC OSCIL.	\$9.13916	L3	DIAL LIGHT	17-13905
10	100 M	1/4	17-2072	9	10000 MICA	17-14004	2F	35-16 MC OSCIL.	\$9.13916	F	FUSE	17-13905
11	2000	1/4	17-4202	10	1 CAN	400 17-14034	3	FIRST I.F. COIL	\$6.13079			
12	1000	1/4	17-4202	11	16 ELECT	475 17-14002	4	SECOND I.F. COIL	\$6.13080			
13	1000	1/4	17-4202	12	33 CAN	475 17-14002	5	OUTPUT TRANSF.	\$6.13080			
14	1000	1/4	17-4202	13	33 CAN	475 17-14002	6	POWER TRANSF.	\$6.13080			
15	1000	1/4	17-4202	14	33 CAN	475 17-14002	7	CHOKES	\$6.13080			
16	1000	1/4	17-4202	15	T.G. PADDER	400 17-14024	8	CHOKES	\$6.13080			
17	1000	1/4	17-4202	16	15 CAN	400 17-14009	9	CHOKES	\$6.13080			
18	1000	1/4	17-4202	17	15 CAN	400 17-14009	10	CHOKES	\$6.13080			
19	1000	1/4	17-4202	18	15 CAN	400 17-14009	11	CHOKES	\$6.13080			
20	1000	1/4	17-4202	19	15 CAN	400 17-14009	12	CHOKES	\$6.13080			
21	1000	1/4	17-4202	20	15 CAN	400 17-14009	13	CHOKES	\$6.13080			
22	1000	1/4	17-4202	21	15 CAN	400 17-14009	14	CHOKES	\$6.13080			
23	1000	1/4	17-4202	22	15 CAN	400 17-14009	15	CHOKES	\$6.13080			
24	1000	1/4	17-4202	23	15 CAN	400 17-14009	16	CHOKES	\$6.13080			
25	1000	1/4	17-4202	24	15 CAN	400 17-14009	17	CHOKES	\$6.13080			
26	1000	1/4	17-4202	25	15 CAN	400 17-14009	18	CHOKES	\$6.13080			
27	1000	1/4	17-4202	26	15 CAN	400 17-14009	19	CHOKES	\$6.13080			
28	1000	1/4	17-4202	27	15 CAN	400 17-14009	20	CHOKES	\$6.13080			
29	1000	1/4	17-4202	28	15 CAN	400 17-14009	21	CHOKES	\$6.13080			
30	1000	1/4	17-4202	29	15 CAN	400 17-14009	22	CHOKES	\$6.13080			
31	1000	1/4	17-4202	30	15 CAN	400 17-14009	23	CHOKES	\$6.13080			
32	1000	1/4	17-4202	31	15 CAN	400 17-14009	24	CHOKES	\$6.13080			
33	1000	1/4	17-4202	32	15 CAN	400 17-14009	25	CHOKES	\$6.13080			
34	1000	1/4	17-4202	33	15 CAN	400 17-14009	26	CHOKES	\$6.13080			
35	1000	1/4	17-4202	34	15 CAN	400 17-14009	27	CHOKES	\$6.13080			
36	1000	1/4	17-4202	35	15 CAN	400 17-14009	28	CHOKES	\$6.13080			
37	1000	1/4	17-4202	36	15 CAN	400 17-14009	29	CHOKES	\$6.13080			
38	1000	1/4	17-4202	37	15 CAN	400 17-14009	30	CHOKES	\$6.13080			
39	1000	1/4	17-4202	38	15 CAN	400 17-14009	31	CHOKES	\$6.13080			
40	1000	1/4	17-4202	39	15 CAN	400 17-14009	32	CHOKES	\$6.13080			
41	1000	1/4	17-4202	40	15 CAN	400 17-14009	33	CHOKES	\$6.13080			
42	1000	1/4	17-4202	41	15 CAN	400 17-14009	34	CHOKES	\$6.13080			
43	1000	1/4	17-4202	42	15 CAN	400 17-14009	35	CHOKES	\$6.13080			
44	1000	1/4	17-4202	43	15 CAN	400 17-14009	36	CHOKES	\$6.13080			
45	1000	1/4	17-4202	44	15 CAN	400 17-14009	37	CHOKES	\$6.13080			
46	1000	1/4	17-4202	45	15 CAN	400 17-14009	38	CHOKES	\$6.13080			
47	1000	1/4	17-4202	46	15 CAN	400 17-14009	39	CHOKES	\$6.13080			
48	1000	1/4	17-4202	47	15 CAN	400 17-14009	40	CHOKES	\$6.13080			
49	1000	1/4	17-4202	48	15 CAN	400 17-14009	41	CHOKES	\$6.13080			
50	1000	1/4	17-4202	49	15 CAN	400 17-14009	42	CHOKES	\$6.13080			
51	1000	1/4	17-4202	50	15 CAN	400 17-14009	43	CHOKES	\$6.13080			
52	1000	1/4	17-4202	51	15 CAN	400 17-14009	44	CHOKES	\$6.13080			
53	1000	1/4	17-4202	52	15 CAN	400 17-14009	45	CHOKES	\$6.13080			
54	1000	1/4	17-4202	53	15 CAN	400 17-14009	46	CHOKES	\$6.13080			
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56	1000	1/4	17-4202	55	15 CAN	400 17-14009	48	CHOKES	\$6.13080			
57	1000	1/4	17-4202	56	15 CAN	400 17-14009	49	CHOKES	\$6.13080			
58	1000	1/4	17-4202	57	15 CAN	400 17-14009	50	CHOKES	\$6.13080			
59	1000	1/4	17-4202	58	15 CAN	400 17-14009	51	CHOKES	\$6.13080			
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61	1000	1/4	17-4202	60	15 CAN	400 17-14009	53	CHOKES	\$6.13080			
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65	1000	1/4	17-4202	64	15 CAN	400 17-14009	57	CHOKES	\$6.13080			
66	1000	1/4	17-4202	65	15 CAN	400 17-14009	58	CHOKES	\$6.13080			
67	1000	1/4	17-4202	66	15 CAN	400 17-14009	59	CHOKES	\$6.13080			
68	1000	1/4	17-4202	67	15 CAN	400 17-14009	60	CHOKES	\$6.13080			
69	1000	1/4	17-4202	68	15 CAN	400 17-14009	61	CHOKES	\$6.13080			
70	1000	1/4	17-4202	69	15 CAN	400 17-14009	62	CHOKES	\$6.13080			
71	1000	1/4	17-4202	70	15 CAN	400 17-14009	63	CHOKES	\$6.13080			
72	1000	1/4	17-4202	71	15 CAN	400 17-14009	64	CHOKES	\$6.13080			
73	1000	1/4	17-4202	72	15 CAN	400 17-14009	65	CHOKES	\$6.13080			
74	1000	1/4	17-4202	73	15 CAN	400 17-14009	66	CHOKES	\$6.13080			
75	1000	1/4	17-4202	74	15 CAN	400 17-14009	67	CHOKES	\$6.13080			
76	1000	1/4	17-4202	75	15 CAN	400 17-14009	68	CHOKES	\$6.13080			
77	1000	1/4	17-4202	76	15 CAN	400 17-14009	69	CHOKES	\$6.13080			
78	1000	1/4	17-4202	77	15 CAN	400 17-14009	70	CHOKES	\$6.13080			
79	1000	1/4	17-4202	78	15 CAN	400 17-14009	71	CHOKES	\$6.13080			
80	1000	1/4	17-4202	79	15 CAN	400 17-14009	72	CHOKES	\$6.13080			
81	1000	1/4	17-4202	80	15 CAN	400 17-14009	73	CHOKES	\$6.13080			
82	1000	1/4	17-4202	81	15 CAN	400 17-14009	74	CHOKES	\$6.13080			
83	1000	1/4	17-4202	82	15 CAN	400 17-14009	75	CHOKES	\$6.13080			
84	1000	1/4	17-4202	83	15 CAN	400 17-14009	76	CHOKES	\$6.13080			
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90	1000	1/4	17-4202	89	15 CAN	400 17-14009	82	CHOKES	\$6.13080			
91	1000	1/4	17-4202	90	15 CAN	400 17-14009	83	CHOKES	\$6.13080			
92	1000	1/4	17-4202	91	15 CAN	400 17						

MODELS 478-A, 478-AH
2478-A
Schematic

OPERADIO MFG. CO.



#1 AMPLIFIER	
OUTPUT CONNECTIONS	OHMS
1 & 2	2
2 & 3	7.5
1 & 3	15
1 & 4	500

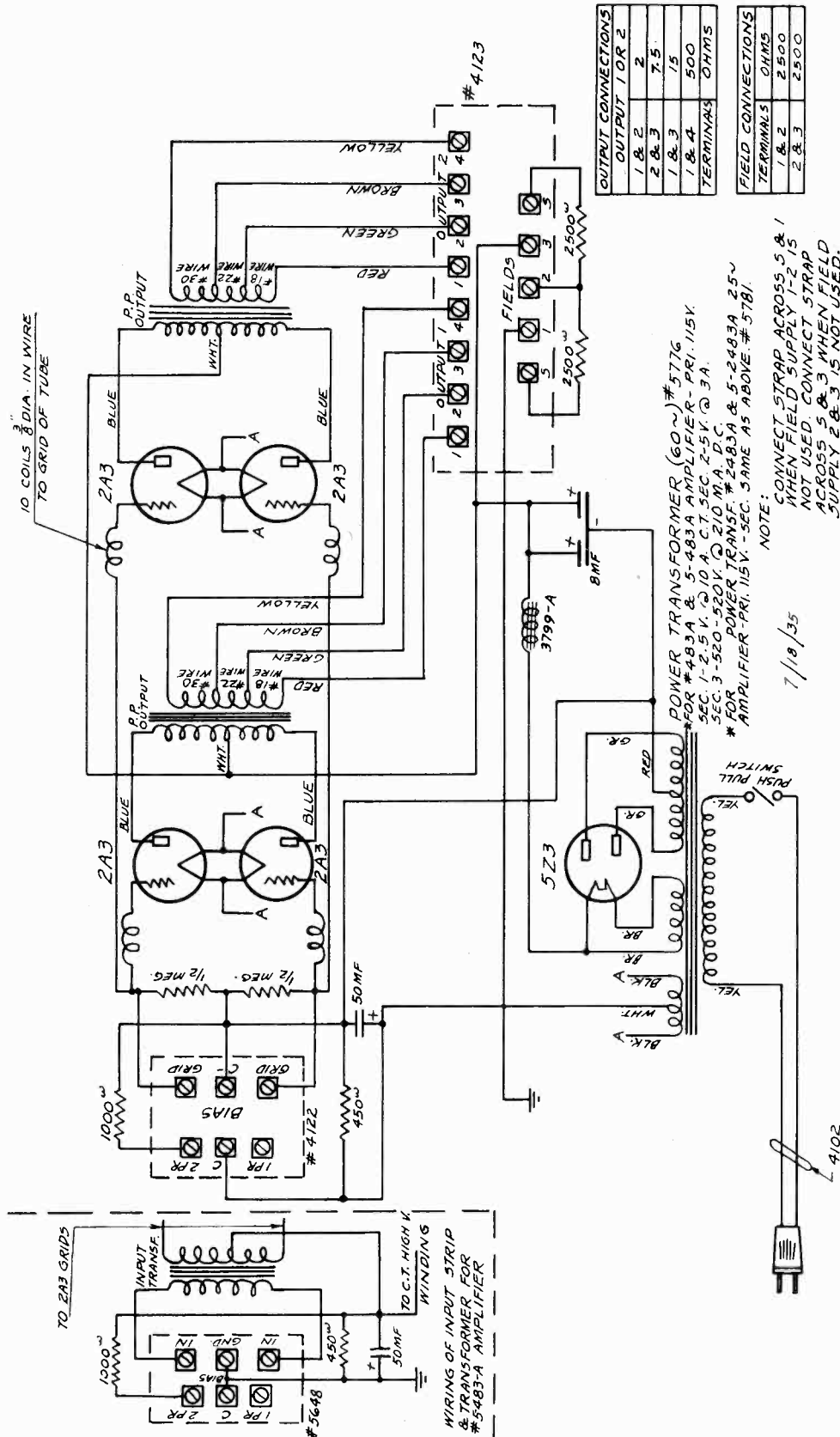
#2 AMPLIFIER	
OUTPUT CONNECTIONS	OHMS
1 & 2	2
2 & 3	7.5
1 & 3	15
1 & 4	4000

FIELD CONNECTIONS	
TERMINALS	OHMS
1 & 2	2500
2 & 3	2500
STRAP 3 & 1, WHEN STRAP 5 & 3 WHEN 2 & 3 ARE NOT USED	

7/16/35

MODEL 483-A, 2483-A,
5-483-A, 5-2483-A
Schematic

OPERADIO MFG. CO.



OUTPUT CONNECTIONS	
OUTPUT 1 OR 2	2
1 & 2	7.5
1 & 3	15
1 & 4	500
TERMINALS	OHMS

FIELD CONNECTIONS	
TERMINALS	OHMS
1 & 2	2500
2 & 3	2500

