

ALIGNMENT INSTRUCTIONS--READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

no set pointer turn tuning cap. fully closed and set pointer to last reference mark at low freq. end of dial.
 Calibration marks referred to in Steps below are on outer edge of speaker and correspond directly to dial calibration markings.
 Do not use pressure when aligning IF transformers or threads in coil forms will be stripped and make alignment impossible.
 Use isolation transformer if available. If not connect a .1 MFD capacitor in series with low side of signal generator and B-.

AM ALIGNMENT

Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1 .05 MFD	High side to Pin 7 (grid) of 12BE6. Low side to chassis.	455KC	BC (fully counter clockwise)	Tuning control fully clockwise.	Across voice coil	A1, A2, A3, A4, A5, A6.	Adjust for maximum output. If isolation transformer is not used reduce dummy ant. to .001 MFD to reduce hum modulation.
2 "	Loop	1600KC	"	1600KC calibration mark	"	A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3 "	"	1400KC	"	Tune for maximum output.	"	A8, A9	Adjust for maximum output.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4 .05 MFD	High side to Pin 1 (grid) of 12AU6. Low side to chassis.	10.7MC (Unmodulated)	FM45 (fully clockwise)	Tuning control fully clockwise	DC probe to Point to chassis	A10	Adjust for maximum deflection.
5 .05 MFD	"	"	"	"	DC probe to Point to chassis	All	Use zero center scale VTVM if available. Use enough signal input to give good positive and negative deflection. Adjust All for zero deflection.
6 .05 MFD	High side to Pin 1 (grid) of 12BA6 2nd IF Tube (4). Low side to chassis.	"	"	"	DC probe to Point to chassis	A12, A13	Adjust for maximum deflection.
7 .05 MFD	High side to Pin 1 (grid) of 12BA6 1st IF Tube (3). Low side to chassis.	"	"	"	"	A14, A15	"
8 .05 MFD	High side to Pin 7 (grid) of 12BE6. Low side to chassis.	"	"	"	"	A16, A17	Adjust for maximum deflection. Continue with FM-RF Alignment in Step 9.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use freq. modulated signal with 60 Δ modulation and 450KC sweep. Use 120 Δ sawtooth voltage in scope for horizontal deflection.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	SCOPE CONNECT	ADJUST	REMARKS
4 .01 MFD	High side to Pin 1 (grid) of 12BA6 1st IF Tube (3). Low side to chassis.	10.7MC (Freq. Mod.)	FM45	Tuning control fully clockwise	Vertical input to Point to Ground to chassis.	A12, A13, A14, A15	Adjust for maximum amplitude, symmetry and coincidence of pattern per Fig. 1.
5 .01 MFD	Disconnect lead to Pin 7 of 12BE6. Connect 100K Ω resistor from Pin 7 to chassis. High side of sig. gen. to Pin 7. Low side to chassis.	"	"	"	"	A16, A17	Adjust for maximum amplitude, symmetry and coincidence of pattern per Fig. 1. Replace lead to Pin 7 of 12BE6.
6 .01 MFD	High side to Pin 1 (grid) of 12BA6 1st IF Tube (3). Low side to chassis.	"	"	"	Vertical input to Point to Ground to chassis.	A10, A11	Alternately adjust A10 for maximum amplitude & A11 for maximum straightness of crossover lines with crossover occurring at center of pattern per Fig. 2. Continue with FM-RF Alignment in Step 9.

FM RF ALIGNMENT

In Steps 9 & 10 slug adjustments should be loosened by applying a hot iron to the cement holding them fast.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
9 270 Ω carbon res.	High side to ant. terminal "F". Low side to chassis.	98MC (Unmodulated)	FM100 (center position)	98MC calibration mark.	DC probe to Point to chassis	A18	Adjust for maximum deflection.
10 "	"	"	"	Tune for maximum output.	"	A19, A20	Adjust for maximum deflection. Secure slugs with speaker cement.
11 "	"	45MC (Unmodulated)	FM45	45MC calibration mark	"	A21	Adjust for maximum deflection.
12 "	"	"	"	Tune for maximum output.	"	A22, A23	"

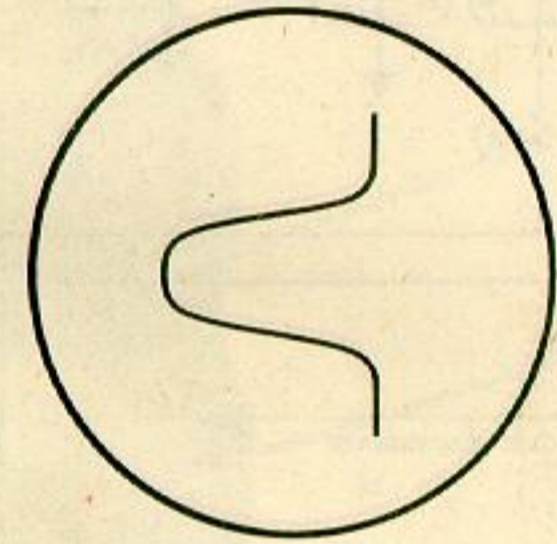


FIG. 1

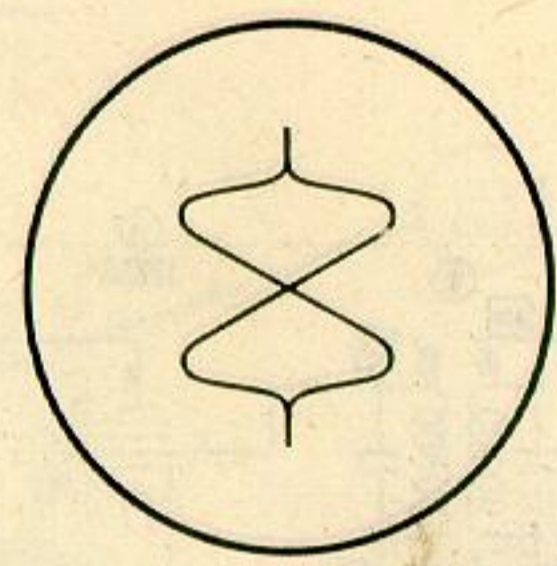


FIG. 2

PARTS LIST AND DESCRIPTIONS TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA			RMA BASE TYPE	INSTALLATION NOTES
		ZENITH PART No.	STANDARD REPLACEMENT	SPRAGUE PART No.		
1	RF Amp.	12BA6	12BA6	7BK		
2	Converter	12BE6	12BE6	7CH		
3	1st IF Amp.	12BA6	12BA6	7BK		
4	2nd IF Amp.	12BA6	12BA6	7BK		
5	Limiter	12AU6	12AU6	7BK		
6	Disc.-Det.-AVC-AF	19T8	19T8	7BZ		
7	Power Output	35B5	35B5	7BZ		

PARTS LIST AND DESCRIPTIONS (Continued) SPEAKER

ITEM No.	RATINGS	REPLACEMENT DATA			INSTALLATION NOTES
		ZENITH PART No.	JENSEN PART No.	QUAM PART No.	
81	FIELD PM CONE DIA. VC DIA. 7-3/8" 3/4"	49-608	ST-1171 Mod. P8-T	8A211	Drill and tap magnet frame.
82	VC IMP. 3.6Ω				

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA	
		PRI.	SEC.	ZENITH PART No.	MEISSNER PART No.
83	Loop Ant.	.1Ω	.1Ω	S-13977	
84	FM Ant. Coil	.0Ω	.0Ω	S-14192	
85	BC RF Coil	2.5Ω	1.0Ω	S-13974	
86	FM "	.0Ω	.0Ω	S-13871	
87	BC Osc. Coil	7.2Ω†	9.8Ω	S-11157	
88	FM "		.0Ω	S-12259	
89A	1st IF AM		8.2Ω†	S-13971	†Includes both primaries
89B	" FM		7.5Ω	S-13972	‡Includes both secondaries
90A	2nd IF AM		.8Ω	S-13973	
90B	" FM		.4Ω	S-13997	
91A	3rd IF AM		.8Ω	S-13997	
91B	" FM		.2Ω	S-14126	
92	FM Disc. Coil		.1Ω	S-12256	
93	RF Choke				
94	Fill. Choke				
95	Coil				
96	Line Choke				

DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	REPLACEMENT DATA		INSTALLATION NOTES
				BEAD COLOR	ZENITH PART No.	
97	Bayonet	115			100-97	Type C-7

MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
98	Switch	S-14168	
99	Rectifier	212-3	Band Selenium (212-4 Alternate)
100	Tuning Gang	22-1677	(24-410MMF, 16-213MMF, 18-92MMF)
A21	Trimmer	22-1686	FM Osc. Adj.
A22	"	22-1685	FM RF Adj.
A23	"	22-1685	FM Ant. Adj.
	Louvre Dial	26-389	
	Plastic Cabinet	14-848	Model 7H820M
	Bakelite Cabinet	14-1020	Model 7H820

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REPLACEMENT DATA				IDENTIFICATION CODES AND INSTALLATION NOTES
		ZENITH PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SPRAGUE PART No.	
8A	80 CAP.	22-1661	AF386D4A*	UP443150*	EL-443*	Filter
B	150 VOLT		FRS150/50	BR5015	UT-501	"
C	150 VOLT					"
D	20 VOLT					"
9	.05 CAP.	22-1017	484-05	DT455	TC-15	Cathode Bypass
10	.005 CAP.	22-1702	1684-005	MD16D5	TC-25	Line Filter
11	.05 CAP.	22-829	484-05	DT255	TC-15	Tone Compensation
12	.02 CAP.	22-830	684-02	DT6S2	TC-12	AF Plate Decoupling
13	.02 CAP.	22-1683	484-02	DT4S2	TC-12	Audio Coupling
14	.05 CAP.	22-829	484-05	DT2S5	TC-15	Volume Cont. Isolation
15	.1 CAP.	22-1418	484-1	DT2P1	TC-1	Tone Compensation
16	.1 CAP.	22-1418	484-1	DT2P1	TC-1	"
17	.01 CAP.	22-1385	484-01	DT2S1	TC-11	Audio Coupling
18	.002 CAP.	22-1220	684-002	DT6D2	TC-11	Limiter Plate Decoupl.
19	.01 CAP.	22-1385	484-01	DT2S1	TC-11	Limiter Screen Bypass
20	.002 CAP.	22-1220	684-002	DT6D2	TC-22	2nd IF Bypass
21	.01 CAP.	22-1385	484-01	DT2S1	TC-11	2nd IF Cathode Bypass
22	.002 CAP.	22-1220	684-002	DT6D2	TC-22	1st IF Decoupling
23	.05 CAP.	22-829	484-05	DT2S5	TC-15	AVC Filter
24	.05 CAP.	22-829	484-05	DT2S5	TC-15	"
25	.01 CAP.	22-1385	484-01	DT2S1	TC-11	Filament Bypass
26	.01 CAP.	22-1385	484-01	DT2S1	TC-11	"
27	100 CAP.	22-162	1468-0001	5W5T1	LFM-31	Line Ant. Coupling-Cer.
28	1000 CAP.	22-1676	1468-001	1W5D1	LFM-21	Filament Bypass-Cer.
29	1000 CAP.	22-1676	1468-001	1W5D1	LFM-21	"
30	500 CAP.	22-1138	1468-0005	5W5T5	LFM-35	Tone Compensation-Cer.
31	25 CAP.	22-1507	1468-00025	5W5Q25	MS-425	Limiter Grid Filter-Cer.
32	100 CAP.	22-365	1468-0001	5W5T1	LFM-31	Diode RF Filter-Cer.
33	55 CAP.	22-1691	1467-005	1D5D5	LFM-25	Fixed Trimmer-Cer.
34	5000 CAP.	22-1706	1468-00005	5W5G5	LFM-25	Conv. Plate Decoupl.-Cer.
35	50 CAP.	22-1367	1467-00005	1D5D5	LFM-45	Osc. Grid Cap.-Cer.
36	5000 CAP.	22-1706	1467-005	1D5D5	LFM-25	Osc. Screen Byp.-Cer.
37	48 CAP.	22-1689	1469-00005	SR5Q5	MS-45	Fixed Trimmer-Cer.
38	100 CAP.	22-162	1468-0001	5W5T1	LFM-31	RF Plate Decoupl.-Cer.
39	19 CAP.	22-1688	1468-0001	5W5T1	LFM-31	Fixed Trimmer-Cer.
40	100 CAP.	22-1689	1468-000044	5W5Q3	MS-43	RF Plate Decoupling-Cer.
41	30 CAP.	22-1705	1468-000044	1W5D1	MS-43	RF Cathode Bypass-Cer.
42	1000 CAP.	22-1676	1468-001	1W5D1	LFM-21	RF Screen Bypass-Cer.
43	300 CAP.	22-1506	1467-005	1D5D5	LFM-25	Fixed Trimmer-Cer.
44	5000 CAP.	22-1706	1467-005	1D5D5	LFM-25	Ext. Ant. Isolation-Cer.

*Parallel sections to obtain desired capacity.

PARTS LIST AND DESCRIPTIONS TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA			INSTALLATION NOTES
		ZENITH PART No.	STANDARD REPLACEMENT	RMA BASE TYPE	
1	RF Amp.	12BA6	12BA6	7BK	
2	Converter	12BE6	12BE6	7CH	
3	1st IF Amp.	12BA6	12BA6	7BK	
4	2nd IF Amp.	12BA6	12BA6	7BK	
5	Limiter	12AU6	12AU6	7BK	
6	Disc.-Det.-AVC-AF	19T8	19T8	7BZ	
7	Power Output	35B5	35B5	7BZ	

PARTS LIST AND DESCRIPTIONS (Continued) SPEAKER

ITEM No.	RATINGS	REPLACEMENT DATA			INSTALLATION NOTES
		ZENITH PART No.	JENSEN PART No.	QUAM PART No.	
81	FIELD PM CONE DIA. VC DIA. 7-3/8" 3/4"	49-608	ST-1171 Mod. P8-T	8A211	Drill and tap magnet frame.
82	VC IMP. 3.6Ω				

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA	
		PRI.	SEC.	ZENITH PART No.	MEISSNER PART No.
83	Loop Ant.	.1Ω	.1Ω	S-13977	
84	FM Ant. Coil	.0Ω	.0Ω	S-14192	
85	BC RF Coil	2.5Ω	1.0Ω	S-13974	
86	FM "	.0Ω	.0Ω	S-13871	
87	BC Osc. Coil	7.2Ω†	9.8Ω	S-11157	
88	FM "			S-12259	
89A	1st IF AM			S-13970	
89B	" FM				
90A	2nd IF AM	8.2Ω†	2.2Ω†	S-13971	
90B	" FM				
91A	3rd IF AM	8.5Ω†	7.5Ω	S-13972	
91B	" FM				
92	FM Disc. Coil	.4Ω	.8Ω	S-13973	
93	RF Choke			S-13997	
94	Fil. Choke			S-13997	
95	Coil			S-13997	
96	Line Choke			S-14126	
				S-12256	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REPLACEMENT DATA				IDENTIFICATION CODES AND INSTALLATION NOTES
		ZENITH PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SPRAGUE PART No.	
8A	80 CAP.	22-1661	AF886D4A*	UP443150*	EL-443*	Filter
B	150 VOLT		FRS150/50	BR5015	UT-501	"
C	150					"
D	20					"
9	.05	22-1017	484-05	DT4S5	TC-15	Cathode Bypass
10	.005	22-1702	1684-005	MD16D5	TC-15	Line Filter
11	.05	22-829	484-05	DT2S5	TC-15	Tone Compensation
12	.02	22-850	684-02	DT6S2	TC-12	AF Plate Decoupling
13	.02	22-1683	484-02	DT4S2	TC-12	Audio Coupling
14	.05	22-829	484-05	DT2S5	TC-15	Volume Cont. Isolation
15	.1	22-1418	484-1	DT2P1	TC-1	Tone Compensation
16	.1	22-1418	484-1	DT2P1	TC-1	"
17	.01	22-1385	484-01	DT2S1	TC-11	Audio Coupling
18	.002	22-1220	684-002	DT6D2	TC-22	Limiter Plate Decoupl.
19	.01	22-1385	484-01	DT2S1	TC-11	Limiter Screen Bypass
20	.002	22-1220	684-002	DT6D2	TC-22	2nd IF Bypass
21	.01	22-1385	484-01	DT2S1	TC-11	2nd IF Cathode Bypass
22	.002	22-1220	684-002	DT6D2	TC-22	1st IF Decoupling
23	.05	22-829	484-05	DT2S5	TC-15	AVC Filter
24	.05	22-829	484-05	DT2S5	TC-15	"
25	.01	22-1385	484-01	DT2S1	TC-11	Filament Bypass
26	.01	22-1385	484-01	DT2S1	TC-11	"
27	100	22-162	1468-0001	5W5T1	LFM-31	Line Ant. Coupling-Cer.
28	1000	22-1676	1468-001	1W5D1	LFM-21	Filament Bypass-Cer.
29	1000	22-1676	1468-001	1W5D1	LFM-21	"
30	500	22-1138	1468-0005	5W5T5	LFM-35	Tone Compensation-Cer.
31	25	22-1507	1468-00025	5W5Q25	MS-425	Limiter Grid Filter-Cer.
32	100	22-365	1468-0001	5W5T1	LFM-31	Diode RF Filter-Cer.
33	55	22-1691	1467-005	1D5D5	LFM-25	Fixed Trimmer-Cer.
34	5000	22-1706	1468-00005	5W5Q5	LFM-25	Conv. Plate Decoupl.-Cer.
35	50	22-1367	1467-00005	1D5D5	LFM-45	Osc. Grid Cap.-Cer.
36	5000	22-1706	1467-005	1D5D5	LFM-25	Conv. Screen Byp.-Cer.
37	48	22-1689	1468-00005	SR5Q5	MS-45	Fixed Trimmer-Cer.
38	100	22-162	1468-0001	5W5T1	LFM-31	RF Plate Decoupl.-Cer.
39	19	22-1688	1468-0001	5W5T1	LFM-31	Fixed Trimmer-Cer.
40	100	22-1689	1468-0001	5W5Q3	MS-43	RF Plate Decoupling-Cer.
41	30	22-1705	1468-000044	1W5D3	MS-43	RF Cathode Bypass-Cer.
42	1000	22-1676	1468-001	1W5D1	LFM-21	RF Screen Bypass-Cer.
43	300	22-1506	1467-005	1D5D5	LFM-25	Fixed Trimmer-Cer.
44	5000	22-1706	1467-005	1D5D5	LFM-25	Ext. Ant. Isolation-Cer.

*Parallel sections to obtain desired capacity.

DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		
					ZENITH PART No.	INSTALLATION NOTES	
97	Bayonet	115			ZENITH PART No.	100-97	Type C-7

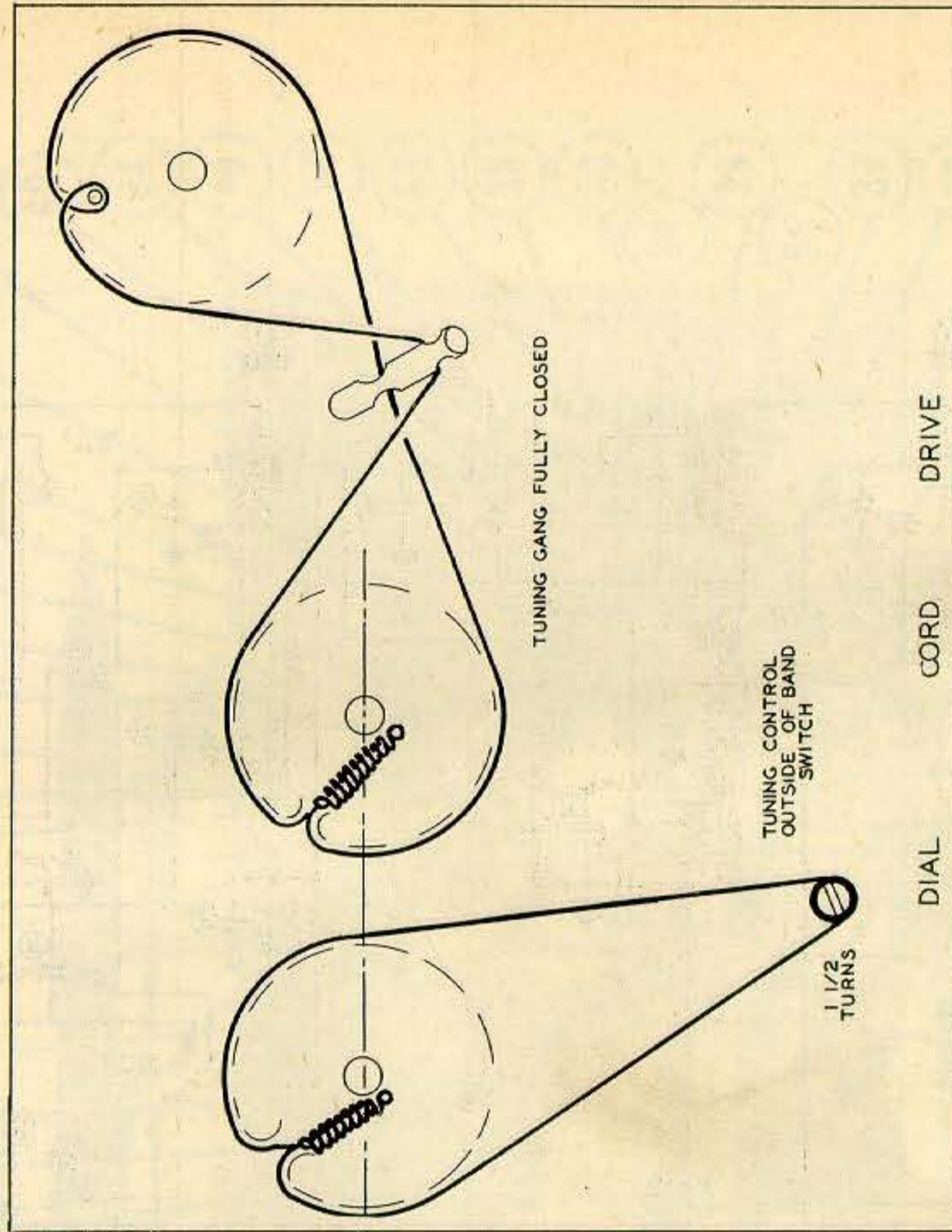
MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
98	Switch	S-14168	
99	Rectifier	212-3	Band Selenium (212-4 Alternate)
100	Tuning Gang	22-1677	(24-410MMF, 16-213MMF, 18-92MMF)
A21	Trimmer	22-1686	FM Osc. Adj.
A22	"	22-1685	FM RF Adj.
A23	"	22-1685	FM Ant. Adj.
	Louvre Dial	26-389	
	Plastic Cabinet	14-848	Model 7H820M
	Bakelite Cabinet	14-1020	Model 7H820

PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA			INSTALLATION NOTES
	RESISTANCE	WATTS	ZENITH PART No.	IRC PART No.	CLAROSTAT PART No.	
45A	2.5 Meg.	1/2	63-1584	D13-139	AM-66-Z	Volume Control Attach to 45A per instructions
B	Shaft		Not Req.	E	KSS-3	
C	Switch		63-1582	41	SW-A	
46A	50KΩ	1/2	63-1582	D11-123	AM-44-S	Tone Control Attach to 46A per instructions
B	Shaft		Not Req.	E	KSS-3	



RESISTORS

ITEM No.	RATING		REPLACEMENT DATA			IDENTIFICATION CODES
	RESISTANCE	WATTS	ZENITH PART No.	IRC PART No.		
47	68Ω	1/2	63-1737			Blue-Gray-Blk. RF Cathode
48	680Ω	1/2	63-1779	BTS-680		Blue-Gray-Br. RF Screen
49	470Ω	1/2	63-1772	BTS-470		Yl.-Vl.-Br. Decoupling
50	220KΩ	1/2	63-1884	BTS-220K		Red-Red-Yl. AVC Network
51	680Ω	1/2	63-1779	BTS-680		Blue-Gray-Br. Conv. Screen
52	22KΩ	1/2	63-1841	BTS-22K		Red-Red-Or. Osc. Grid
53	470Ω	1/2	63-1772	BTS-470		Yl.-Vl.-Br. Parasitic Supp.
54	680Ω	1/2	63-1779	BTS-680		Blue-Gray-Br. Conv. Decoup.
55	2.2 Meg.	1/2	63-1926	BTS-2.2 Meg.		Red-Red-Grn. AVC Network
56	680Ω	1/2	63-1779	BTS-680		Blue-Gray-Br. 1st IF Decoup.
57	1000Ω	1/2	63-1765	BTS-1000		Br.-Blk.-Red Tone Compensation
58	68Ω	1/2	63-1737			Blue-Gray-Blk. 2nd IF Cathode
59	680Ω	1/2	63-1779	BTS-680		Blue-Gray-Br. 2nd IF Decoup.
60	3300Ω	1/2	63-1806	BTS-3300		Or.-Or.-Red Limiter Screen Dropping
61	8200Ω	1/2	63-1824	BTS-8200		Gray-Red-Red Limiter Plate Decoupling
62	47KΩ	1/2	63-1856	BTS-47K		Yl.-Vl.-Or. Diode Filter
63	470KΩ	1/2	63-1898	BTS-470K		Yl.-Vl.-Yl. Diode Load
64	100KΩ	1/2	63-1870	BTS-100K		Br.-Blk.-Yl. Limiter Grid
65	100KΩ	1/2	63-1870	BTS-100K		Br.-Blk.-Yl. De-emphasis
66	3900Ω	1/2	63-1810	BTS-3900		Or.-White-Red Bleeder
67	150KΩ	1/2	63-1876	BTS-150K		Br.-Grn.-Yl. Diode Load
68	150KΩ	1/2	63-1876	BTS-150K		Br.-Grn.-Yl. Diode Load
69	4.7 Meg.	1/2	63-1840	BTS-4.7 Meg.		Yl.-Vl.-Grn. Audio Grid
70	470KΩ	1/2	63-1898	BTS-470K		Yl.-Vl.-Yl. Audio Plate Load
71	100KΩ	1/2	63-1870	BTS-100K		Br.-Blk.-Yl. Audio Plate Decoup.
72	470KΩ	1/2	63-1898	BTS-470K		Yl.-Vl.-Yl. Output Grid
73	120Ω	1/2	63-1747	BW-120		Br.-Red-Br. Output Cathode
74	5600Ω	1/2	63-1871	BTS-5600		Grn.-Blue-Red Tone Comp.
75	2200Ω	1/2	63-1799	BTS-2200		Red-Red-Red Tone Comp.
76	1000Ω	1/2	63-1765	BTS-1000		Br.-Blk.-Red "
77	270Ω	1/2	63-1452	BW-2-270		Red-Vl.-Br. Filter
78	330Ω	1/2	63-1202	BW-2-330		Or.-Or.-Br. "
79	22Ω	1	63-1450	BW-1-22		Red-Red-Blk. Surge Limiter

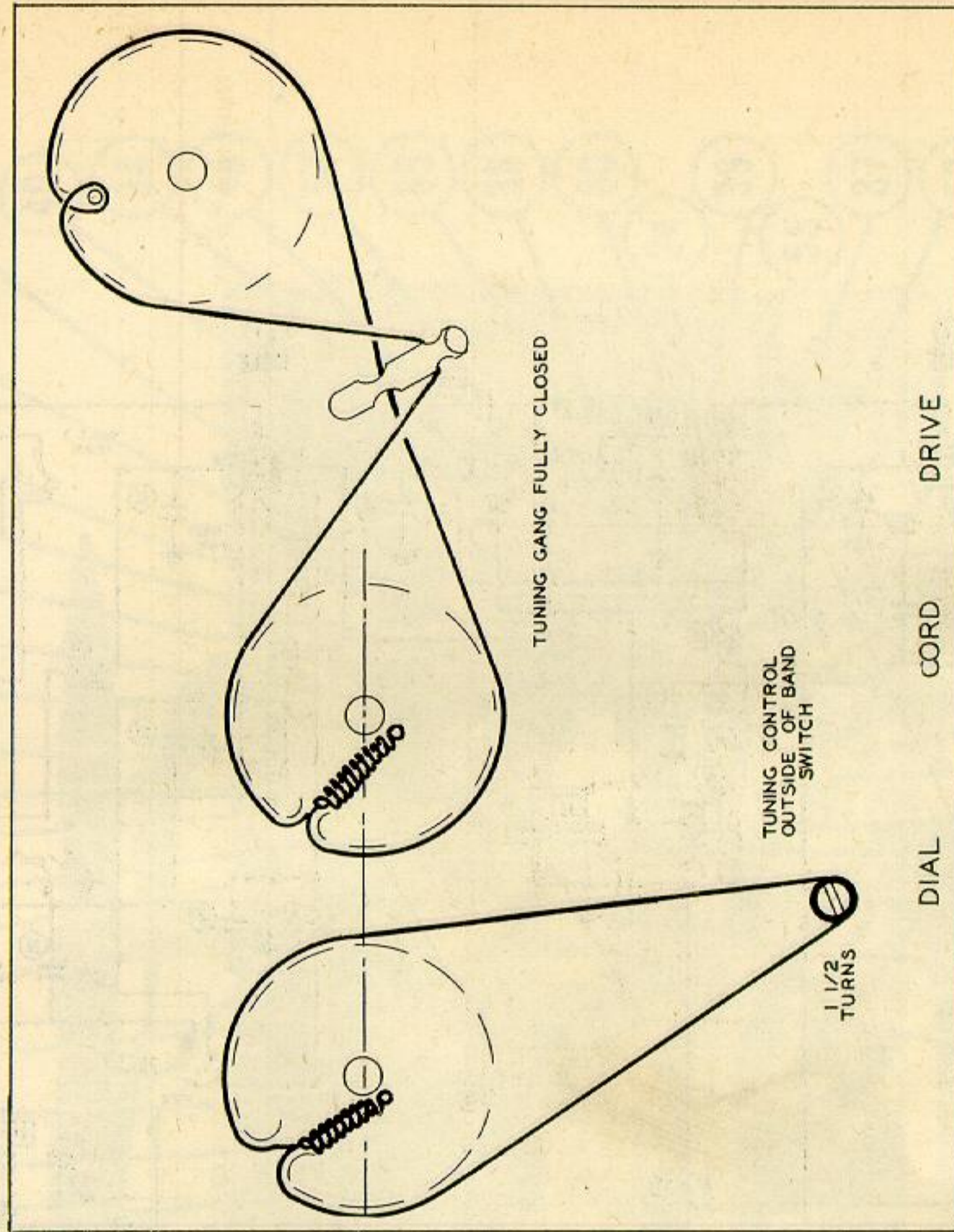
TRANSFORMER (OUTPUT)

ITEM No.	RATING		REPLACEMENT DATA			INSTALLATION NOTES
	IMPEDANCE	DC RES.	ZENITH PART No.	STANCOR PART No.	THORDAR'N PART No.	
80	2500Ω	5.6Ω	49-608			
		225Ω				
		tapped				
		2.7Ω				

PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA			INSTALLATION NOTES
	RESISTANCE	WATTS	ZENITH PART No.	IRC PART No.	CLAROSTAT PART No.	
45A	2.5 Meg.	1/2	63-1584	D13-139	AM-66-Z	Volume Control Attach to 45A per instructions
B	Shaft		Not Req.	E	KSS-3	
C	Switch		63-1582	41	SW-A	
46A	50KΩ	1/2	63-1582	D11-123	AM-44-S	Tone Control Attach to 46A per instructions
B	Shaft		Not Req.	E	KSS-3	

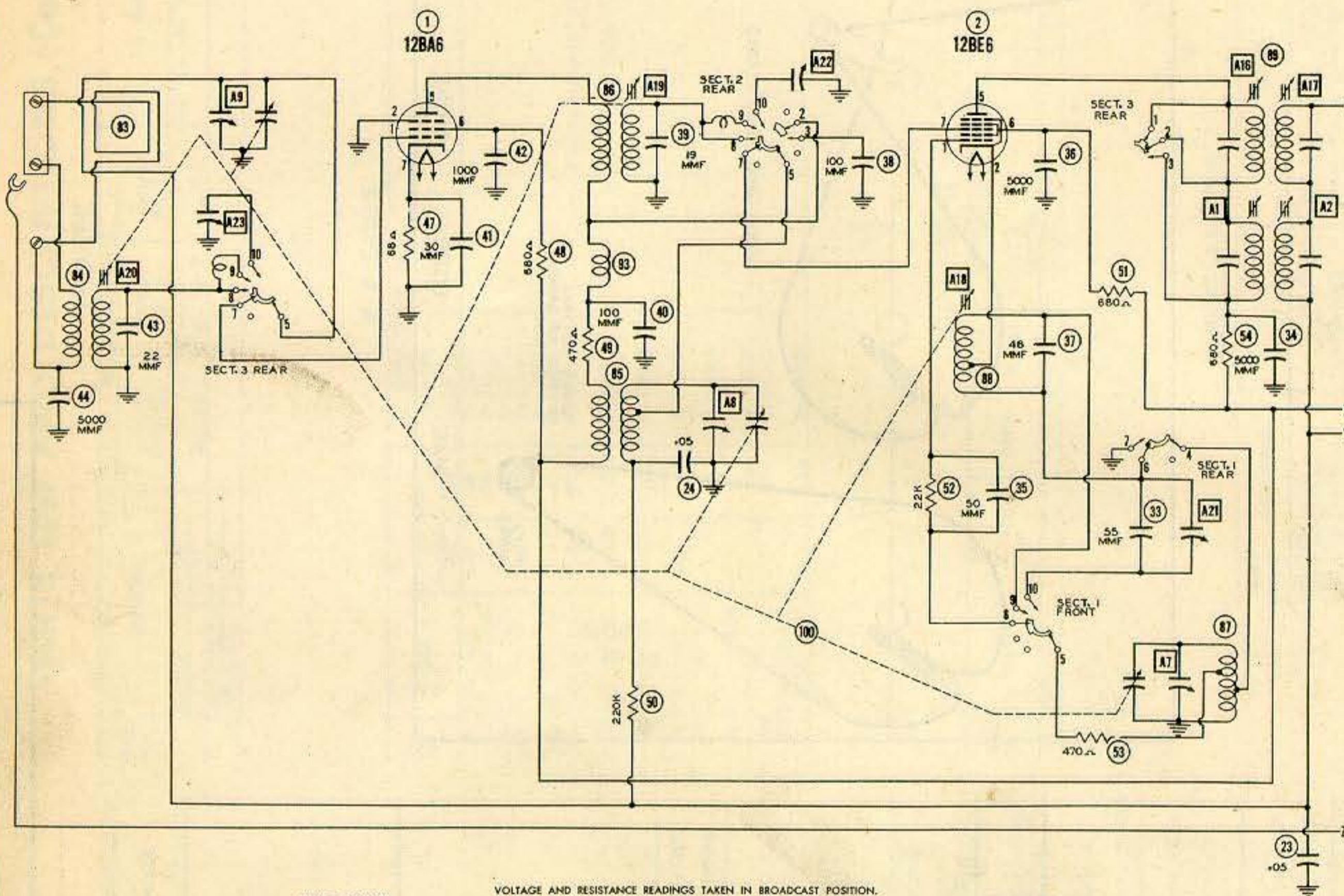


RESISTORS

ITEM No.	RATING		REPLACEMENT DATA			IDENTIFICATION CODES
	RESISTANCE	WATTS	ZENITH PART No.	IRC PART No.		
47	68Ω	1/2	63-1737	BTS-680	Blue-Gray-Blk. RF Cathode	
48	680Ω	1/2	63-1779	BTS-470	Blue-Gray-Br. RF Screen	
49	470Ω	1/2	63-1772	BTS-220K	Yl.-Vl.-Br. Decoupling	
50	220KΩ	1/2	63-1884	BTS-680	Red-Red-Yl. AVC Network	
51	680Ω	1/2	63-1779	BTS-680	Blue-Gray-Br. Conv. Screen	
52	22KΩ	1/2	63-1841	BTS-22K	Red-Red-Or. Osc. Grid	
53	470Ω	1/2	63-1772	BTS-470	Yl.-Vl.-Br. Parasitic Supp.	
54	680Ω	1/2	63-1779	BTS-680	Blue-Gray-Br. Conv. Decoup.	
55	2.2 Meg.	1/2	63-1926	BTS-2.2 Meg.	Red-Red-Grn. AVC Network	
56	680Ω	1/2	63-1779	BTS-680	Blue-Gray-Br. 1st IF Decoup.	
57	1000Ω	1/2	63-1765	BTS-1000	Br.-Blk.-Red Tone Compensation	
58	68Ω	1/2	63-1737	BTS-680	Blue-Gray-Blk. 2nd IF Cathode	
59	680Ω	1/2	63-1779	BTS-680	Blue-Gray-Br. 2nd IF Decoup.	
60	3300Ω	1/2	63-1806	BTS-3300	Or.-Or.-Red Limiter Screen Dropping	
61	8200Ω	1/2	63-1824	BTS-8200	Gray-Red-Red Limiter Plate Decoupling	
62	47KΩ	1/2	63-1856	BTS-47K	Yl.-Vl.-Or. Diode Filter	
63	470KΩ	1/2	63-1898	BTS-470K	Yl.-Vl.-Yl. Diode Load	
64	100KΩ	1/2	63-1870	BTS-100K	Br.-Blk.-Yl. Limiter Grid	
65	100KΩ	1/2	63-1870	BTS-100K	Br.-Blk.-Yl. De-emphasis	
66	3900Ω	1/2	63-1810	BTS-3900	Or.-White-Red Bleeder	
67	150KΩ	1/2	63-1876	BTS-150K	Br.-Grn.-Yl. Diode Load	
68	150KΩ	1/2	63-1876	BTS-150K	Br.-Grn.-Yl. Diode Load	
69	4.7 Meg.	1/2	63-1640	BTS-4.7 Meg.	Yl.-Vl.-Grn. Audio Grid	
70	470KΩ	1/2	63-1898	BTS-470K	Yl.-Vl.-Yl. Audio Plate Load	
71	100KΩ	1/2	63-1870	BTS-100K	Br.-Blk.-Yl. Audio Plate Decoup.	
72	470KΩ	1/2	63-1898	BTS-470K	Yl.-Vl.-Yl. Output Grid	
73	120Ω	1/2	63-1747	BW-1-120	Br.-Red-Br. Output Cathode	
74	5600Ω	1/2	63-1871	BTS-5600	Grn.-Blue-Red Tone Comp.	
75	2200Ω	1/2	63-1799	BTS-2200	Red-Red-Red Tone Comp.	
76	1000Ω	1/2	63-1765	BTS-1000	Br.-Blk.-Red "	
77	270Ω	1/2	63-1452	BW-2-270	Red-Vl.-Br. Filter	
78	330Ω	1/2	63-1202	BW-2-330	Or.-Or.-Br. "	
79	22Ω	1	63-1450	BW-1-22	Red-Red-Blk. Surge Limiter	

TRANSFORMER (OUTPUT)

ITEM No.	RATING		REPLACEMENT DATA			INSTALLATION NOTES
	IMPEDANCE PRI.	DC RES. SEC.	ZENITH PART No.	STANCOR PART No.	THORDAR'N PART No.	
80	2500Ω	5.6Ω	49-608			



VOLTAGE READINGS

VOLTAGE AND RESISTANCE READINGS TAKEN IN BROADCAST POSITION.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Cap.
1	12BA6	OV.	OV.	54VAC	65VAC	88VDC	51VDC	1VDC	-	-
2	12BE6	-2VDC	OV.	79VAC	66VAC	92VDC	90VDC	OV.	-	-
3	12BA6	OV.	OV.	54VAC	44VAC	82VDC	82VDC	OV.	-	-
4	12BA6	OV.	OV.	44VAC	30VAC	80VDC	80VDC	.8VDC	-	-
5	12AU6	OV.	OV.	30VAC	19VAC	11.5VDC	65VDC	OV.	-	-
6	19T8	-.5VDC	-.5VDC	-.1VDC	19VAC	OV.	-.5VDC	OV.	-.6VDC	83.5VDC
7	35B5	OV.	4.2VDC	117VAC	80VAC	122VDC	94VDC	OV.	-	-

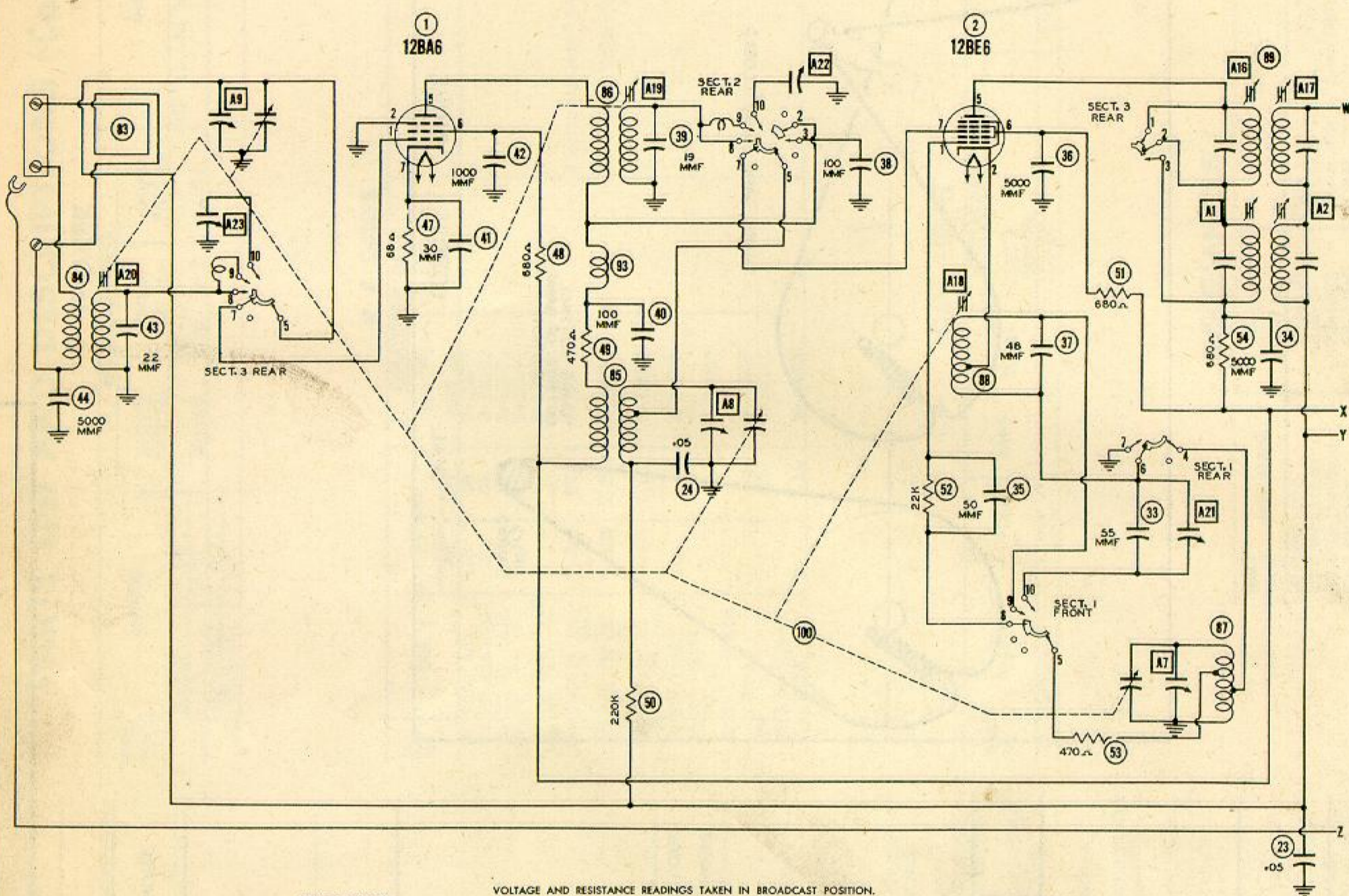
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Cap.
1	12BA6	2.7 Meg.	0Ω	40Ω	45Ω	15KΩ	15KΩ	68Ω	-	-
2	12BE6	22KΩ	.5Ω	53Ω	46Ω	15KΩ	15KΩ	5 Meg.	-	-
3	12BA6	2.7 Meg.	0Ω	40Ω	35Ω	15KΩ	15KΩ	0Ω	-	-
4	12BA6	2.2Ω	0Ω	33Ω	25Ω	15KΩ	15KΩ	68Ω	-	-
5	12AU6	100KΩ	0Ω	25Ω	16Ω	3000Ω	12KΩ	0Ω	-	-
6	19T8	150KΩ	150KΩ	300KΩ	16Ω	0Ω	510KΩ	0Ω	4.7 Meg.	580KΩ
7	35B5	470KΩ	1Ω	66Ω	54Ω	15KΩ	15KΩ	470KΩ	-	-

TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS.

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.



VOLTAGE READINGS

VOLTAGE AND RESISTANCE READINGS TAKEN IN BROADCAST POSITION.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Cap
1	12BA6	OV.	OV.	54VAC	65VAC	88VDC	51VDC	1VDC	-	-
2	12BE6	-2VDC	OV.	79VAC	86VAC	92VDC	90VDC	OV.	-	-
3	12BA6	OV.	OV.	54VAC	44VAC	82VDC	82VDC	OV.	-	-
4	12BA6	OV.	OV.	44VAC	30VAC	80VDC	80VDC	.8VDC	-	-
5	12AU6	OV.	OV.	30VAC	19VAC	11.5VDC	65VDC	OV.	-	-
6	19T8	-.5VDC	-.5VDC	-.1VDC	19VAC	OV.	-.5VDC	OV.	-.6VDC	33.5VDC
7	35B5	OV.	4.3VDC	117VAC	80VAC	122VDC	94VDC	OV.	-	-

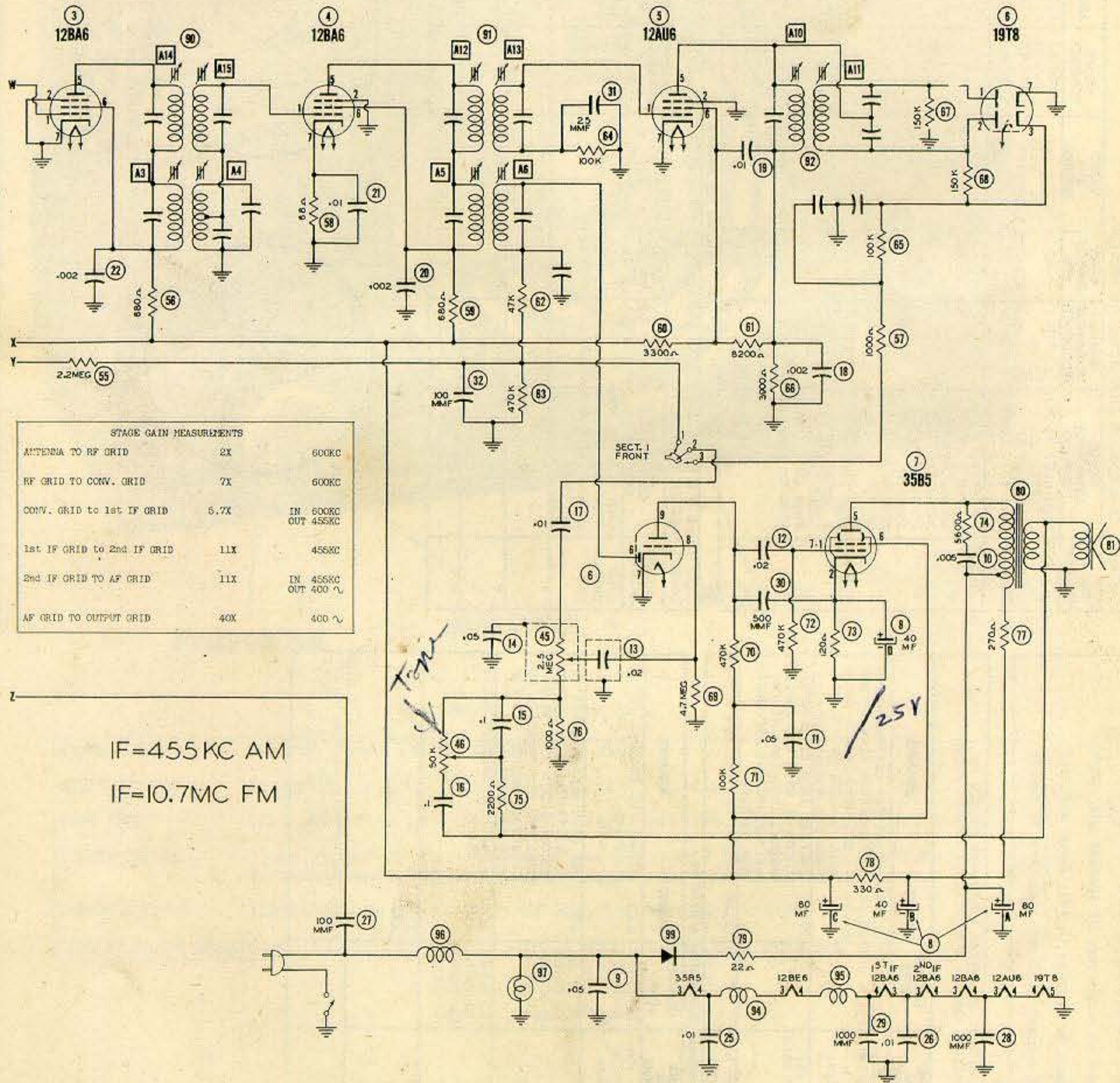
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Cap
1	12BA6	2.7 Meg.	0Ω	40Ω	45Ω	15KΩ	15KΩ	68Ω	-	-
2	12BE6	22KΩ	.5Ω	53Ω	46Ω	15KΩ	15KΩ	3 Meg.	-	-
3	12BA6	2.7 Meg.	0Ω	40Ω	33Ω	15KΩ	15KΩ	0Ω	-	-
4	12BA6	2.2Ω	0Ω	33Ω	25Ω	15KΩ	15KΩ	68Ω	-	-
5	12AU6	100KΩ	0Ω	25Ω	16Ω	3000Ω	12KΩ	0Ω	-	-
6	19T8	150KΩ	150KΩ	300KΩ	16Ω	0Ω	510KΩ	0Ω	4.7 Meg.	580KΩ
7	35B5	470KΩ	1Ω	66Ω	54Ω	15KΩ	15KΩ	470KΩ	-	-

TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS.

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

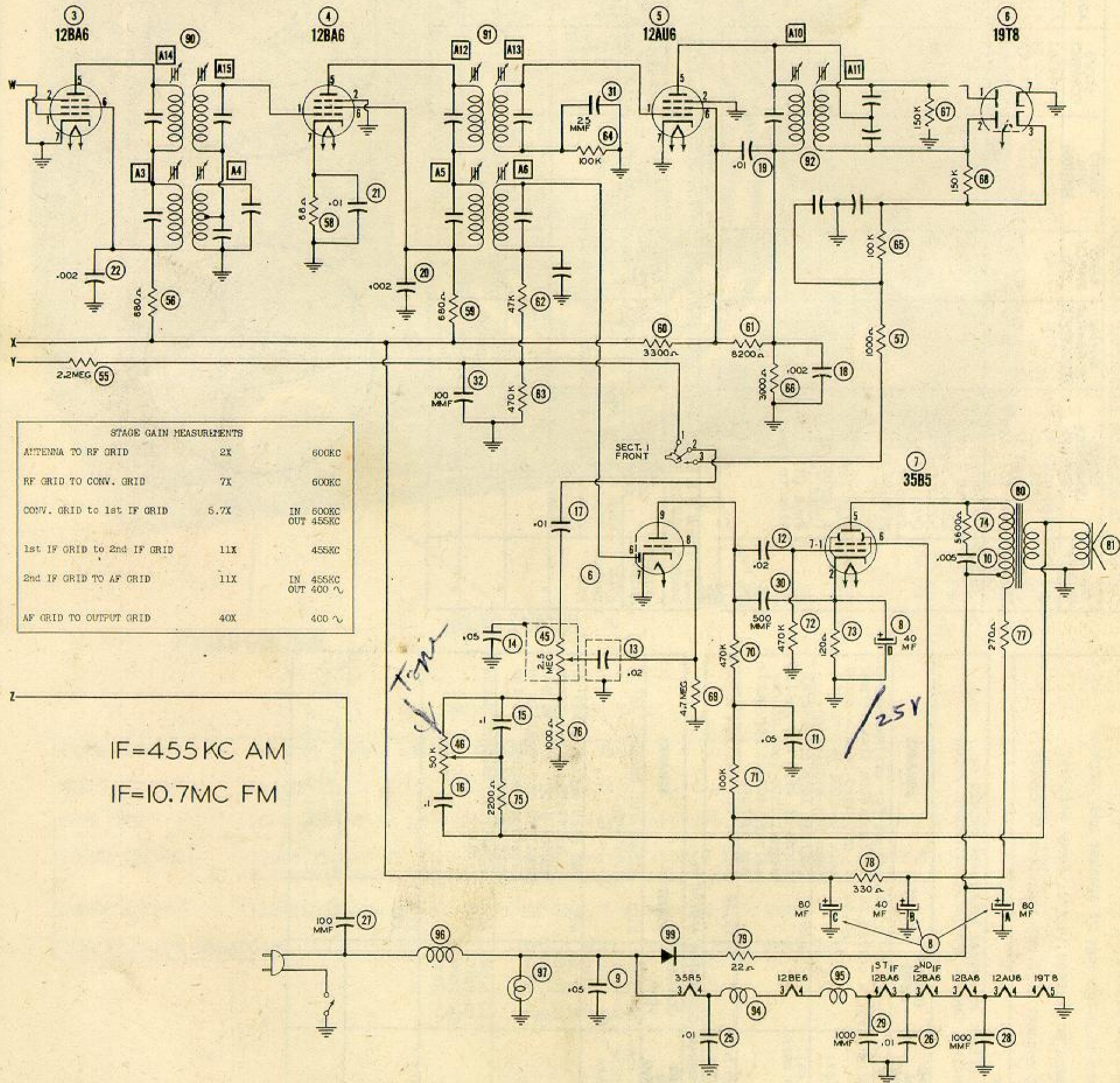


STAGE GAIN MEASUREMENTS

ANTENNA TO RF GRID	2X	600KC
RF GRID TO CONV. GRID	7X	600KC
CONV. GRID to 1st IF GRID	5.7X	IN 600KC OUT 455KC
1st IF GRID to 2nd IF GRID	11X	455KC
2nd IF GRID TO AF GRID	11X	IN 455KC OUT 400 ν
AF GRID TO OUTPUT GRID	40X	400 ν

IF=455 KC AM
IF=10.7MC FM

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of $\pm 10\%$ in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.



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4813-24

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning cap. fully closed and set pointer to last reference mark at low freq. end of dial.
 Calibration marks referred to in Steps below are on outer edge of speaker and correspond directly to dial calibration markings.
 Do not use pressure when aligning IF transformers or threads in coil forms will be stripped and make alignment impossible.
 Use isolation transformer if available. If not connect a .1 MFD capacitor in series with low side of signal generator and B-.

AM ALIGNMENT

Volume control should be at maximum position, output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
.05 MFD	High side to Pin 7 (grid) of 12BE6. Low side to chassis.	455KC	BC (fully counter clockwise)	Tuning control fully clockwise.	Across voice coil	A1, A2, A3, A4, A5, A6.	Adjust for maximum output. If isolation transformer is not used reduce dummy ant. to .001 MFD to reduce hum modulation.
	Loop	1600KC	"	1600KC calibration mark	"	A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
	"	1400KC	"	Tune for maximum output.	"	A8, A9	Adjust for maximum output.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
.05 MFD	High side to Pin 1 (grid) of 12A06. Low side to chassis.	10.7MC (Unmodulated)	FM45 (fully clockwise)	Tuning control fully clockwise	DC probe to Point to Common to chassis	A10	Adjust for maximum deflection.
.05 MFD	"	"	"	"	DC probe to Point to Common to chassis	A11	Use zero center scale VTVM if available. Use enough signal input to give good positive and negative deflection. Adjust All for zero deflection.
.05 MFD	High side to Pin 1 (grid) of 12BA6 2nd IF Tube (4). Low side to chassis.	"	"	"	DC probe to Point to Common to chassis	A12, A13	Adjust for maximum deflection.
.05 MFD	High side to Pin 1 (grid) of 12BA6 1st IF Tube (3). Low side to chassis.	"	"	"	"	A14, A15	"
.05 MFD	High side to pin 7 (grid) of 12BE6. Low side to chassis.	"	"	"	"	A16, A17	Adjust for maximum deflection. Continue with FM-RF Alignment in Step 9.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use freq. modulated signal with 60 Δ modulation and 450KC sweep. Use 120 Δ sawtooth voltage in scope for horizontal deflection.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	SCOPE CONNECT	ADJUST	REMARKS
.01 MFD	High side to Pin 1 (grid) of 12BA6 1st IF Tube (3). Low side to chassis.	10.7MC (Freq. Mod.)	FM45	Tuning control fully clockwise	Vertical input to Point to Common to chassis.	A12, A13, A14, A15	Adjust for maximum amplitude, symmetry and coincidence of pattern per Fig. 1.
.01 MFD	Disconnect lead to Pin 7 of 12BE6. Connect 100K Ω resistor from Pin 7 to chassis. High side of sig. gen. to Pin 7. Low side to chassis.	"	"	"	"	A16, A17	Adjust for maximum amplitude, symmetry and coincidence of pattern per Fig. 1. Replace lead to Pin 7 of 12BE6.
.01 MFD	High side to Pin 1 (grid) of 12BA6 1st IF Tube (3). Low side to chassis.	"	"	"	Vertical input to Point to Common to chassis.	A10, A11	Alternately adjust A10 for maximum amplitude & A11 for maximum straightness of crossover lines with crossover occurring at center of pattern per Fig. 2. Continue with FM-RF Alignment in Step 9.

FM RF ALIGNMENT

In Steps 9 & 10 slug adjustments should be loosened by applying a hot iron to the cement holding them fast.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
270 Ω carbon res.	High side to ant. terminal "F". Low side to chassis.	98MC (Unmodulated)	FM100 (center position)	98MC calibration mark.	DC probe to Point to Common to chassis	A18	Adjust for maximum deflection.
"	"	"	"	Tune for maximum output.	"	A19, A20	Adjust for maximum deflection. Secure slugs with speaker cement.
"	"	45MC (Unmodulated)	FM45	45MC calibration mark	"	A21	Adjust for maximum deflection.
"	"	"	"	Tune for maximum output.	"	A22, A23	"

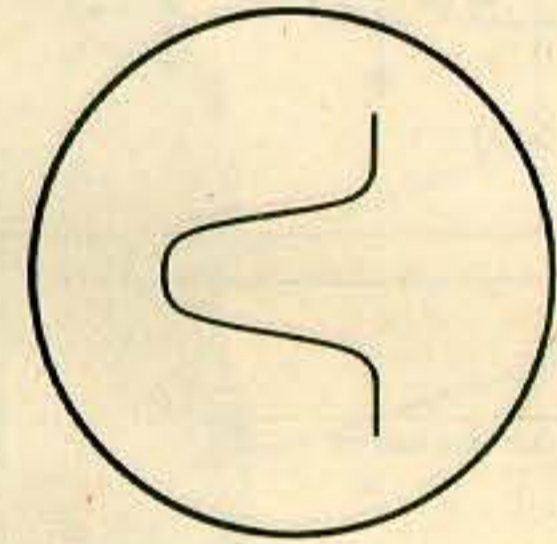


FIG. 1

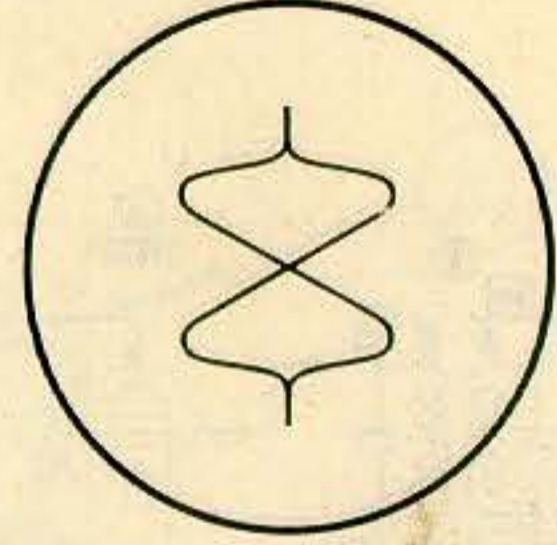


FIG. 2