

TRADE NAME National, Models NC-108R, NC-108T
MANUFACTURER National Co., Inc. 61 Sherman St., Malden, Mass.
TYPE SET AC Operated FM Superheterodyne Receiver with Power Supply
TUBES (ELEVEN) Types, 6BA6 RF Amp., 6AG5 Mixer, 6C4 Osc., 6SG7 1st IF Amp., 6SG7 2nd IF Amp., 6SG7 3rd IF Amp., 6H6 Ratio Det., 6U5/6G5 Tuning Eye, 6SJ7 AF Amp., 6V6GT Power Output, 5Y3GT Rectifier.
POWER SUPPLY 110-125 Volts AC
TUNING RANGE—FREQ. MOD. 88-108MC **RATING** .58 Amp. @ 117 Volts AC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Set monitor switch to "On" and tone control to 10. Use insulated alignment screwdriver for all adjustments.

IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1 Direct	High side to center stator of tuning cap. Low side to chassis.	10.7MC (Unmodulated)	Tuning cap. fully open.	DC probe to Point $\diamond$. A3, A4, Common to A5, A6, chassis. A7		Attenuate output of sig. gen. to maintain a meter reading of approximately 3 volts. Adjust A1 thru A7 for maximum deflection. Increase output of sig. gen. to obtain meter reading of 10 volts.
2 Direct	"	"	"	DC probe to Point $\diamond$. Common to chassis.	A8	Adjust for meter reading of 5 volts. Reconnect voltmeter to Point $\diamond$. Meter reading at $\diamond$ should be twice that of $\diamond$. If not, readjust A7 and A8 in Steps 1 & 2 and recheck voltages. Continue with RF alignment in Step 5.

IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

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

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
1 .01 MFD	High side to Pin 4 (grid) of 6SG7 2nd IF Tube (5). Low side to chassis.	10.7MC (Freq. modulated)	Tuning cap. fully open.	Vertical input to Point $\diamond$. Ground to chassis.	A1, A2, A3	Disconnect 10 MFD cap. (14) from Point $\diamond$. Adjust A1, A2, A3 for maximum amplitude, symmetry and coincidence of pattern per Fig. 1.
2 .01 MFD	High side to Pin 4 (grid) of 6SG7 1st IF Tube (4). Low side to chassis.	"	"	"	A4, A5	Adjust for maximum amplitude, symmetry and coincidence of pattern per Fig. 1.
3 .01 MFD	High side to center stator of tuning cap. Low side to chassis.	"	"	"	A6, A7	Adjust for maximum amplitude, symmetry and coincidence of pattern per Fig. 1. Reconnect 10 MFD cap. (14) to Point $\diamond$.
4 .01 MFD	High side to Pin 4 (grid) of 6SG7 2nd IF Tube (5). Low side to chassis.	"	"	Vertical input to Point $\diamond$. Ground to chassis.	A8	Adjust A8 for maximum straightness of crossover lines with crossover occurring at center of pattern per Fig. 2. Cont. with RF Alignment, Step 5.

RF ALIGNMENT

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
5 300 Ω carbon res.	High side to either ant. terminal. Low side to other terminal. (Link disconnected)	108MC (Unmodulated)	108MC		A9	Adjust for maximum indication on tuning indicator.
6 "	"	"	Tune for maximum indication.		A10, A11	"

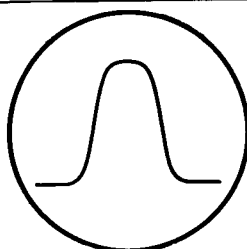


FIG. 1

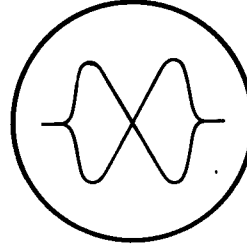


FIG. 2

HOWARD W. SAMS & CO., INC. • 2924 East Washington Street • Indianapolis 7, Indiana

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PARTS LIST AND DESCRIPTIONS TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA			INSTALLATION NOTES
		NATIONAL PART No.	STANDARD REPLACEMENT	DMA BASE TYPE	
1	RF Amp.	63A6	63A6	7BK	
2	Mixer	6AG5	6AG5	7BD	
3	Osc.	6C4	6C4	6AG5	
4	1st IF Amp.	6SG7	6SG7	8BK	
5	2nd IF Amp.	6SG7	6SG7	8BK	
6	3rd IF Amp.	6SG7	6SG7	8BK	
7	Ratio Det.	6H6	6H6	7Q	
8	Audio Eye	6U5/6G5	6U5/6G5	6R	
9	AF Amp.	6BS7	6BS7	8N	
10	Power Output	6V6GT	6V6GT	7AC	
11	Rectifier	5Y3GT	5Y3GT	5T	

Used on NC-108T only

CAPACITORS

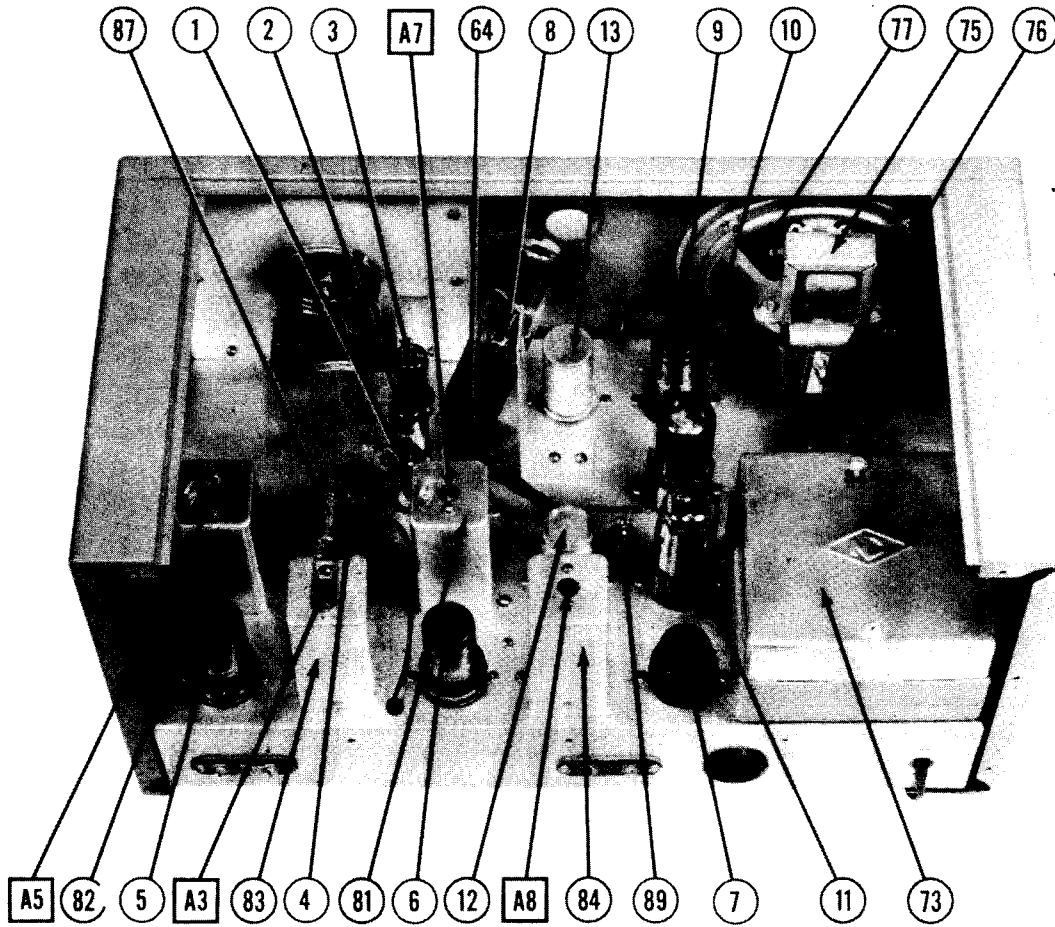
Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REPLACEMENT DATA				IDENTIFICATION CODES
		NATIONAL PART No.	AEROVOX PART No.	CORNELL DUBILIER PART No.	SOLAR PART No.	
12A	10 450		AF22J	UP1145	DY-2X10-450	EL-210
13A	10 450		AF44D	UP1045	DY-10-450/25	5Q
14	10 50		PR50/10	BRD2215	NY-25-50	TA-510
15	10 50		484-01	BR105	NY-25-50	TC-11
16	10 50		684-005	DT481	DT481	TC-11
17	10 400		484-01	DT481	DT481	TC-11
18	10 400		484-01	DT481	DT481	TC-11
19	10 400		484-01	DT481	DT481	TC-11
20	10 400		484-01	DT481	DT481	TC-11
21	10 400		484-01	DT481	DT481	TC-11
22	10 400		484-01	DT481	DT481	TC-11
23	10 400		484-01	DT481	DT481	TC-11
24	10 400		484-01	DT481	DT481	TC-11
25	10 400		484-01	DT481	DT481	TC-11
26	10 400		484-01	DT481	DT481	TC-11
27	10 400		484-01	DT481	DT481	TC-11
28	10 400		484-01	DT481	DT481	TC-11
29	10 400		484-01	DT481	DT481	TC-11
30	10 400		484-01	DT481	DT481	TC-11
31	100 500		1467-001	1467-001	1467-001	1467-001
32	100 500		1467-001	1467-001	1467-001	1467-001
33	100 500		1468-0001	1468-0001	1468-0001	1468-0001
34	100 500		1468-0001	1468-0001	1468-0001	1468-0001
35	100 500		1468-0001	1468-0001	1468-0001	1468-0001
36	100 500		1468-0001	1468-0001	1468-0001	1468-0001
37	100 500		1468-0001	1468-0001	1468-0001	1468-0001
38	100 500		1468-0001	1468-0001	1468-0001	1468-0001
39	100 500		1468-0001	1468-0001	1468-0001	1468-0001
40	100 500		1468-0001	1468-0001	1468-0001	1468-0001
41	100 500		1468-0001	1468-0001	1468-0001	1468-0001

CONTROLS

ITEM No.	RATING	REPLACEMENT DATA			INSTALLATION NOTES
		NATIONAL PART No.	IRC PART No.	CLAROSTAT PART No.	
42A	500KΩ		D13-133	X-60-2	Volume Control
43A	500KΩ		D13-133	X-60-2	Tone Control
44	Switch		42	SW-A2	Attach to 42A per instructions

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	NATIONAL PART No.	IRC PART No.	
44	100K2	1/2	BTS-100K		Br.-Blk.-Yl. RF Grid
45	47K2	1/2	BTS-47K		Yl.-Vi.-Or. RF Screen
46	33K2	1/2	BTA-33K		Or.-Grn.-Or. Osc. Plate Decoupling
47	47K2	1/2	BTS-47K		Yl.-Vi.-Or. Osc. Grid
48	22002	1/2	BTS-2200		Red-Red-Red Mixer Cathode
49	100K2	1/2	BTS-100K		Br.-Blk.-Yl. Mixer Screen
50	22002	1/2	BTS-2200		Red-Red-Red 1st IF Plate Decoupling
51	220K2	1/2	BTS-220K		Or.-Or.-Or. 1st IF Screen
52	33K2	1/2	BTS-33K		Red-Red-Yl. AVC Network
53	22002	1/2	BTS-2200		Red-Red-Yl. AVC Network
54	220K2	1/2	BTS-220K		Or.-Or.-Or. 2nd IF Plate Decoupling
55	33K2	1/2	BTS-33K		Red-Red-Red 2nd IF Plate Decoupling
56	22002	1/2	BTS-2200		Br.-Blk.-Br. 3rd IF Cathode
57	100K2	1/2	BTS-100K		Or.-Or.-Or. 3rd IF Screen
58	33K2	1/2	BTS-33K		Yl.-Vi.-Or. 3rd IF Plate Decoupling
59	47002	1/2	BTS-4700		Br.-Grn.-Or. Ratio Det. Load
60	15K2	1/2	BTS-15K		Yl.-Vi.-Red Radio Det. Load
61	47002	1/2	BTS-4700		Or.-Or.-Or. De-emphasis
62	33K2	1/2	BTS-33K		Red-Red-Grn. AVC Network
63	2.2 Meg.	1/2	BTS-2.2 Meg.		Br.-Blk.-Grn. Tuning Eye Plate Load-See Note 1
64	1 Meg.	1/2	BTS-1 Meg.		Gray-Red-Red Series Tuning Ind. -See Note 3
65	82002	1/2	BTS-8200		Red-Red-Red AF Cathode
66	42002	1/2	BTS-4200		Br.-Blk.-Grn. AF Screen
67	1 Meg.	1/2	BTS-1 Meg.		Red-Red-Yl. AF Plate Load
68	22K2	1/2	BTS-22K		Red-Red-Or. AF Decoupling
69	470K2	1/2	BTS-470K		Yl.-Vi.-Yl. Output Grid
70	470K2	1/2	BTS-470K		Yl.-Vi.-Yl. Tone Compensation
71	470K2	1/2	BTS-470K		Or.-Or.-Br. Output Cathode
72	330K2	1/2	33K-2-330		

Note 1-Used on Model NC-108T only.
 Note 2-Used on Model NC-108T only.
 Note 3-Used on Model NC-108R only.

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA		
	PRI.	SEC. 1	SEC. 2	NATIONAL PART No.	STANCOR PART No.	MERIT PART No.
73	117V AC 520V CT 5.0V AC 6.6V AC @ 58A 1.0824DC @ 2.0A @ 3.1A	SEC. 3			P-949#	T22R04# P-2552#

#Drill new mounting holes and add series resistor to reduce plate voltage.

FILTER CHOKE

ITEM No.	RATINGS		REPLACEMENT DATA		INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (10 CURRENT 1000V)	NATIONAL PART No.	
74	.08A	2852	8 Henries	K317	C-1709 T20053 C-2890# t Drill new mtg. hole

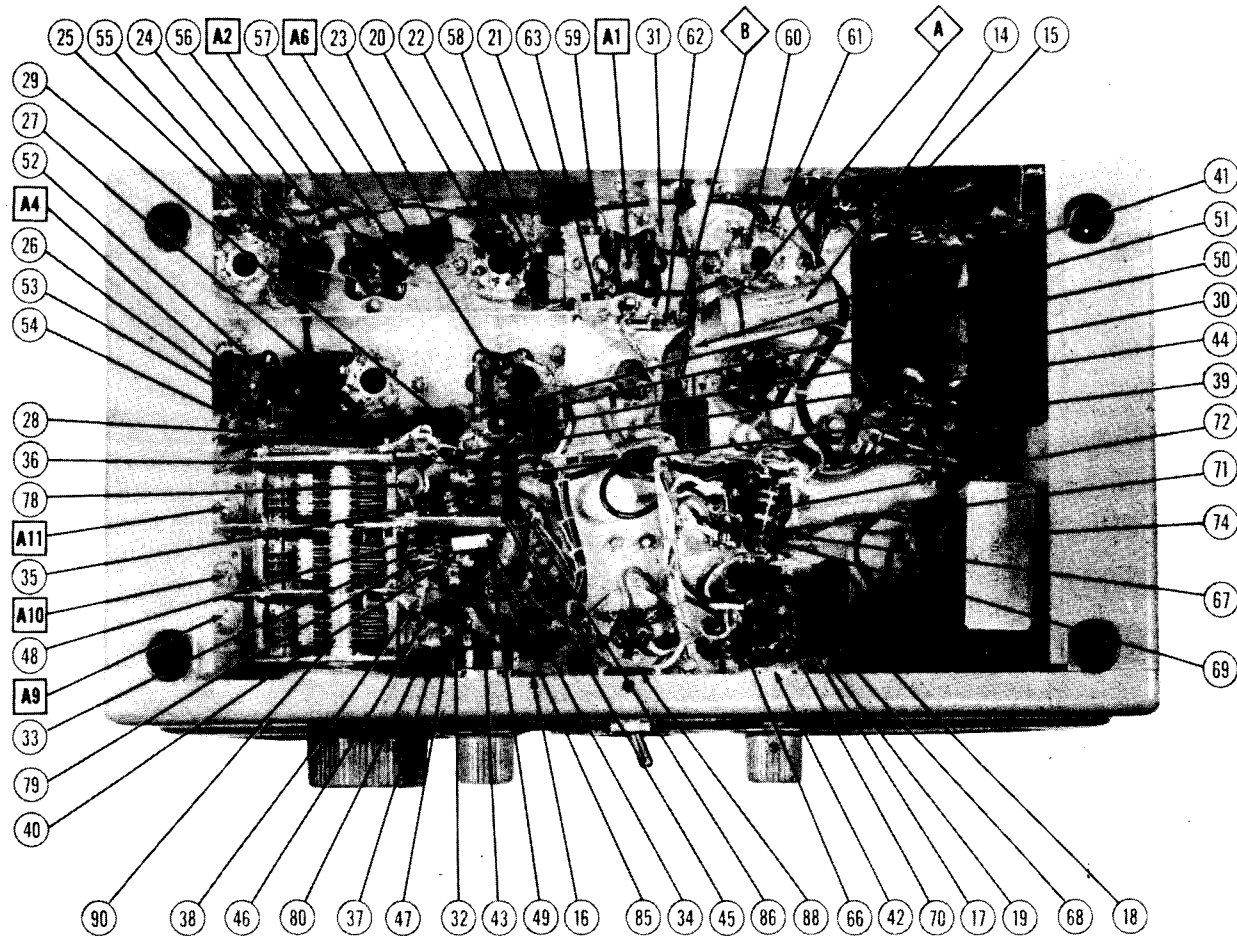
TRANSFORMER (OUTPUT)

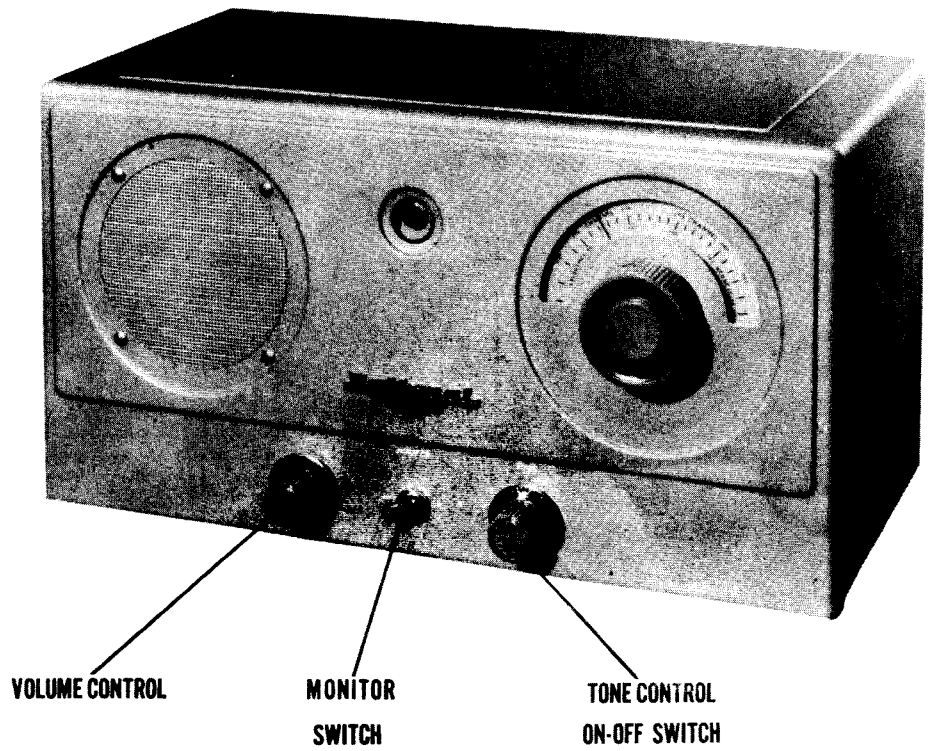
ITEM No.	RATING			REPLACEMENT DATA		
	IMPEDANCE	DC RES.		NATIONAL PART No.	STANCOR PART No.	MERIT PART No.
75	43002	3.42	1.742		A-3650 T22S46	A-2930

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA		INSTALLATION NOTES
	FIELD	VC IMP.	NATIONAL PART No.	JENSEN PART No.	
76	8	3.49		ST-107	
77	8	3.49		Mod. PS-V	5A15

CHASSIS—BOTTOM VIEW





NATIONAL MODEL NC-108T

PARTS LIST AND DESCRIPTIONS (Continued) **R F COILS**

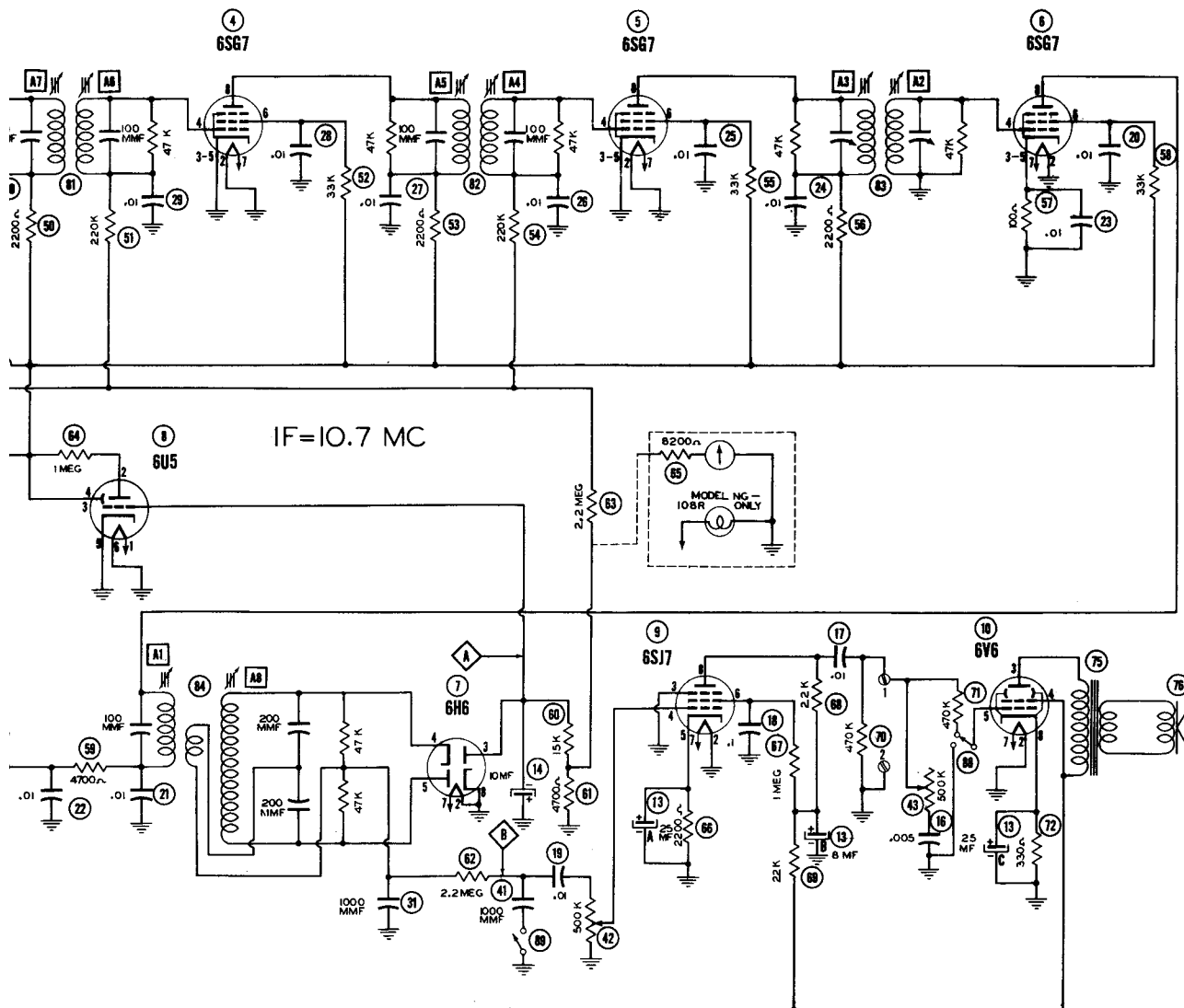
ITEM No.	USE	REPLACEMENT DATA		
		DC RES.	NATIONAL PART No.	MEISSNER PART No.
78	Ant. Coil	PH .00		
79	RF Coil	SEC .00		
80	Osc. Coil	.00		
81	1st IF	.10		
82	2nd IF	.10		
83	3rd IF	.10		
84	Det. Trans.	.20		
85	RF Plate	.20		
86	Choke	.20		
87	B+ Choke	.20		

DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	REPLACEMENT DATA		INSTALLATION NOTES
				BEAD COLOR	NATIONAL PART No.	
87	Bayonet	6-8	0.15	Brown		Type 47

MISCELLANEOUS

ITEM No.	PART NAME	NATIONAL PART No.	NOTES
88	Switch		Monitoring
89			De-emphasis
90	3 Gang Var. Cap.		



VOLTAGE READINGS

Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
0V.	6.6VAC	205VDC	70VDC	0V.	-
0V.	6.6VAC	200VDC	170VDC	4VDC	-
0V.	6.6VAC	60VDC	-5.6VDC	0V.	-
0V.	-7VDC	0V.	115VDC	6.6VAC	200VDC
0V.	-7VDC	0V.	115VDC	6.6VAC	200VDC
11VDC	0V.	11VDC	115VDC	6.6VAC	1.0VDC
-1VDC	-2VDC	-3VDC	-3VDC	6.6VAC	0V.
-	-	-	-	-	-
0V.	0V.	1.6VDC	35VDC	6.6VAC	75VDC
15VDC	205VDC	0V.	0V.	6.6VAC	11VDC
0V.	200VAC	0V.	250VAC	0V.	227VDC

WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	6BA6	2.3 Meg.	0Ω	0Ω	.1Ω	70KΩ	120KΩ	0Ω	-
2	6AU6	0Ω	2.2KΩ	0Ω	.1Ω	72KΩ	170KΩ	2.2KΩ	-
3	6CA	110KΩ	70KΩ	0Ω	.1Ω	110KΩ	47KΩ	0Ω	-
4	6SG7	0Ω	0Ω	0Ω	2.5 Meg.	0Ω	100KΩ	.1Ω	72KΩ
5	6SG7	0Ω	0Ω	0Ω	2.5 Meg.	0Ω	100KΩ	.1Ω	72KΩ
6	6SG7	0Ω	0Ω	100Ω	.1Ω	100Ω	100KΩ	.1Ω	75KΩ
7	6H6	0Ω	0Ω	20KΩ	INF.	INF.	4.7KΩ	.1Ω	0Ω
8	6U5/6U5	-	-	-	-	-	-	-	-
9	6SJ7	0Ω	0Ω	0Ω	500KΩ	2.2KΩ	1.1 Meg.	.1Ω	300KΩ
10	6V6GT	0Ω	0Ω	70KΩ	70KΩ	940KΩ	INF.	.1Ω	230Ω
11	5Y3GT	INF.	70KΩ	INF.	105Ω	INF.	100Ω	INF.	70KΩ

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

Measurements are at 20,000 ohms per volt; AC Voltages
10 ohms per volt.
Resistances are shown as bottom views.
Measurements are from socket pin to common negative.
Maintained at 117 volts for voltage readings.
Variation in component values makes possible a variation of
resistance readings.
At maximum, no signal applied for voltage measure-