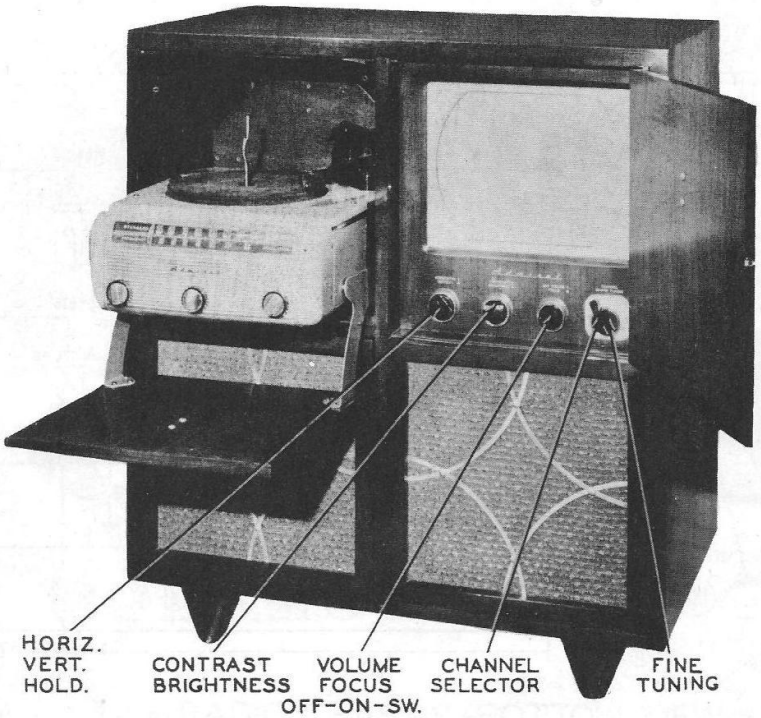
PHOTOFACT* Folder

*TRADE MARK

ADMIRAL CHASSIS 20A1, 20B1, 21A1, RADIO CHASSIS 4J1, 4K1



TRADE NAME	Admiral, Models 4H15 A or B, 4H16 A or B, 4H17 A or B, 4H126 A,B,C, or CN, 4H137 A or B, 4H146 A or B, 4H147 A or B, 4H155 A or B, 4H156 A or B, 4H157 A or B, 4H165 A or B, 4H166 A or B, 4H167 A or B, 24A11, 24A12, 24A125, 24A126, 24A127, 24C15, 24C16, 24C17, 25A15, 25A16, 25A17, 30F15, 30F15A, 30F16, 30F16A, 30F17, 30F17A. (Chassis Models 20A1, 20B1, 21A1, and radio chassis 4J1 and 4K1).
MANUFACTURER	Admiral Corp., 3800 Cortland St., Chicago 47, Illinois
TYPE SET	FM-AM-TV-Phono Combination Receiver (Some Models TV Only).
TUBES	Thirty (Combination Receivers) Twenty Three (TV Only Receivers)
POWER SUPPLY	110-120 Volts AC, 60 Cycle
TUNING RANGE	AM 540-1620KC, FM 88-108MC, TV Channels 2 thru 13
RATING	1.9 Amp. @ 117 Volts AC

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ADMIRAL CHASSIS 20A1, 20B1, 21A1, RADIO CHASSIS 4J1, 4K1

HOWARD W. SAMS & CO., INC. • Indianapolis Indiana

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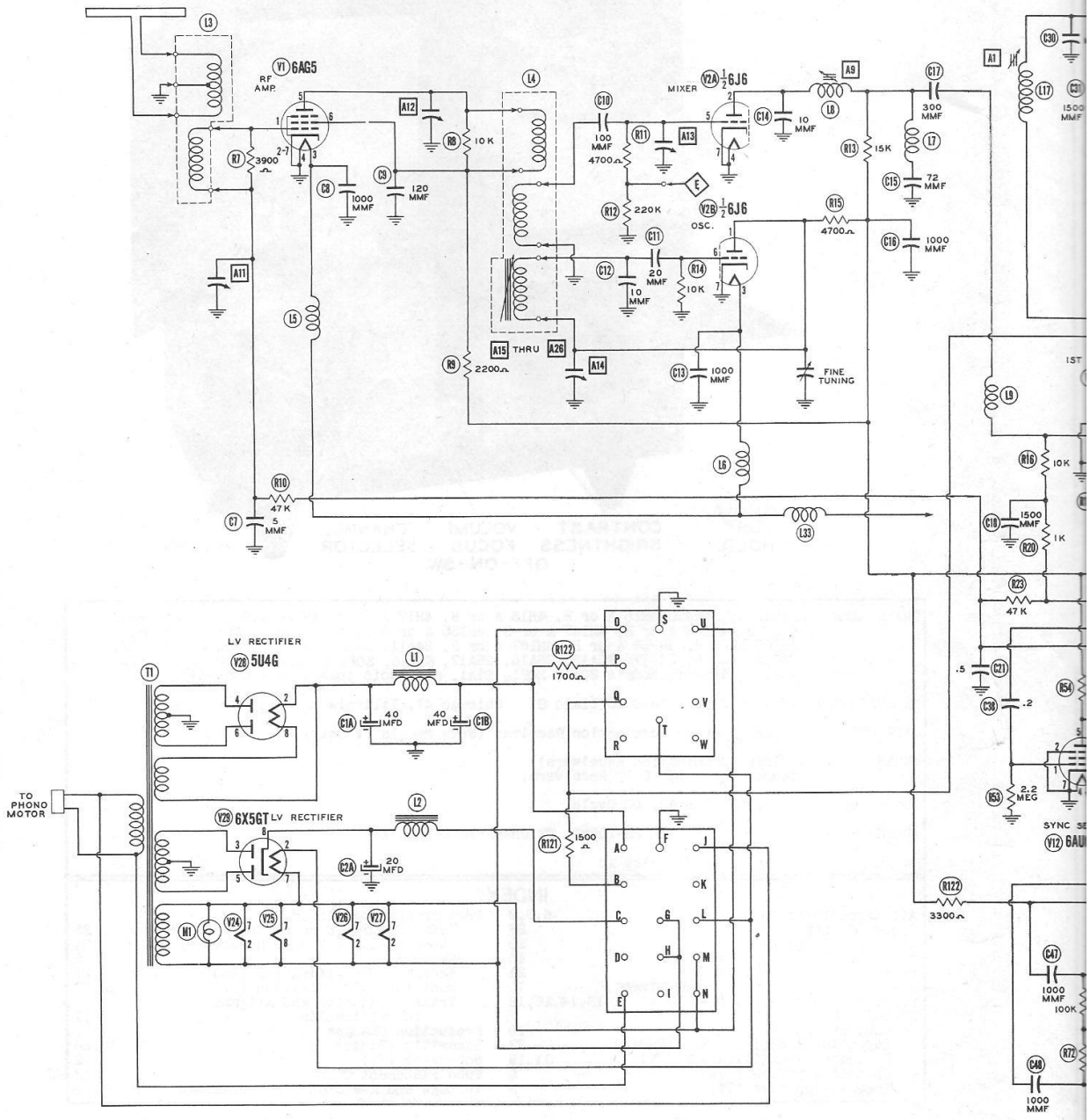
DATE 11/49 SET #77 FOLDER #1



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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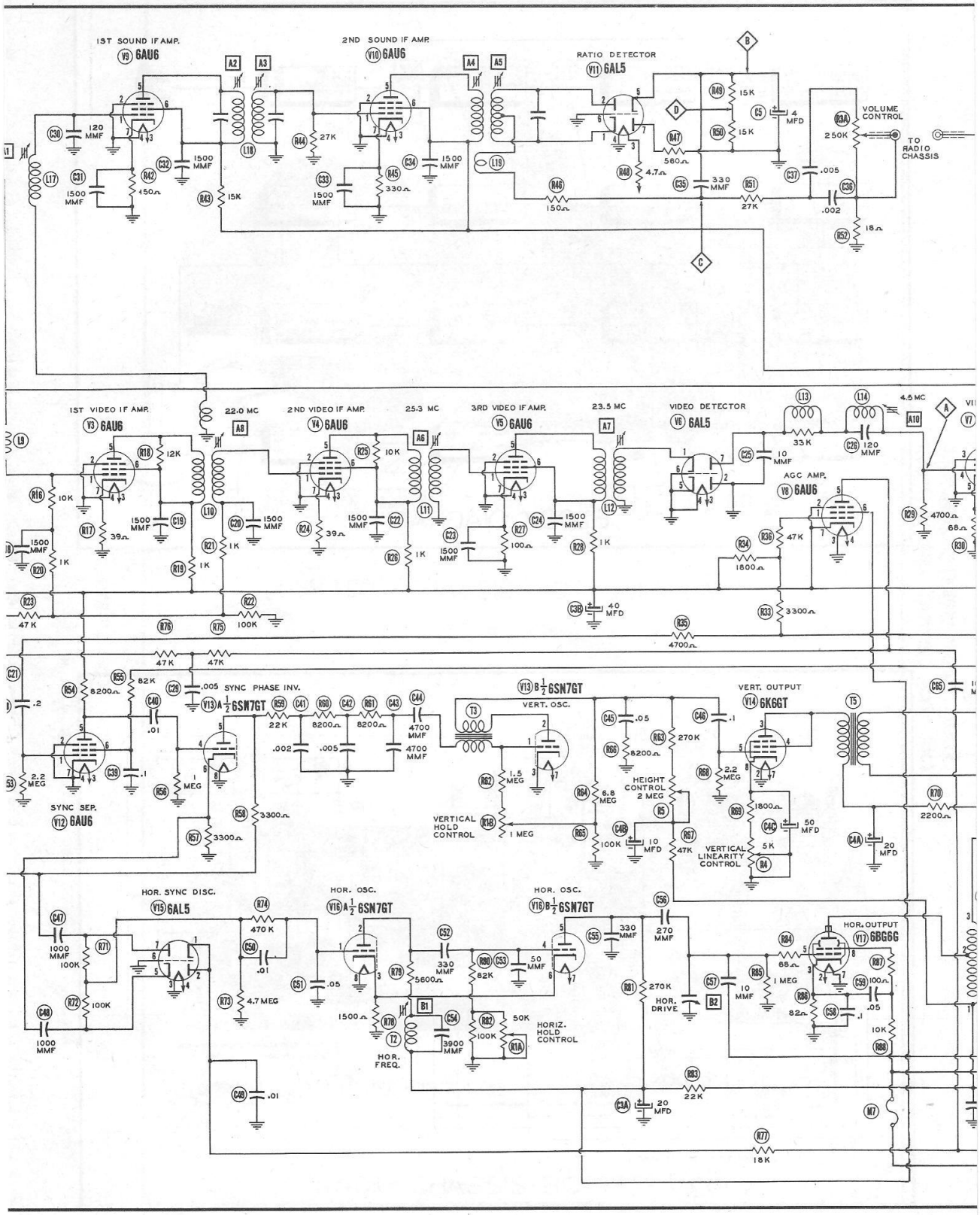
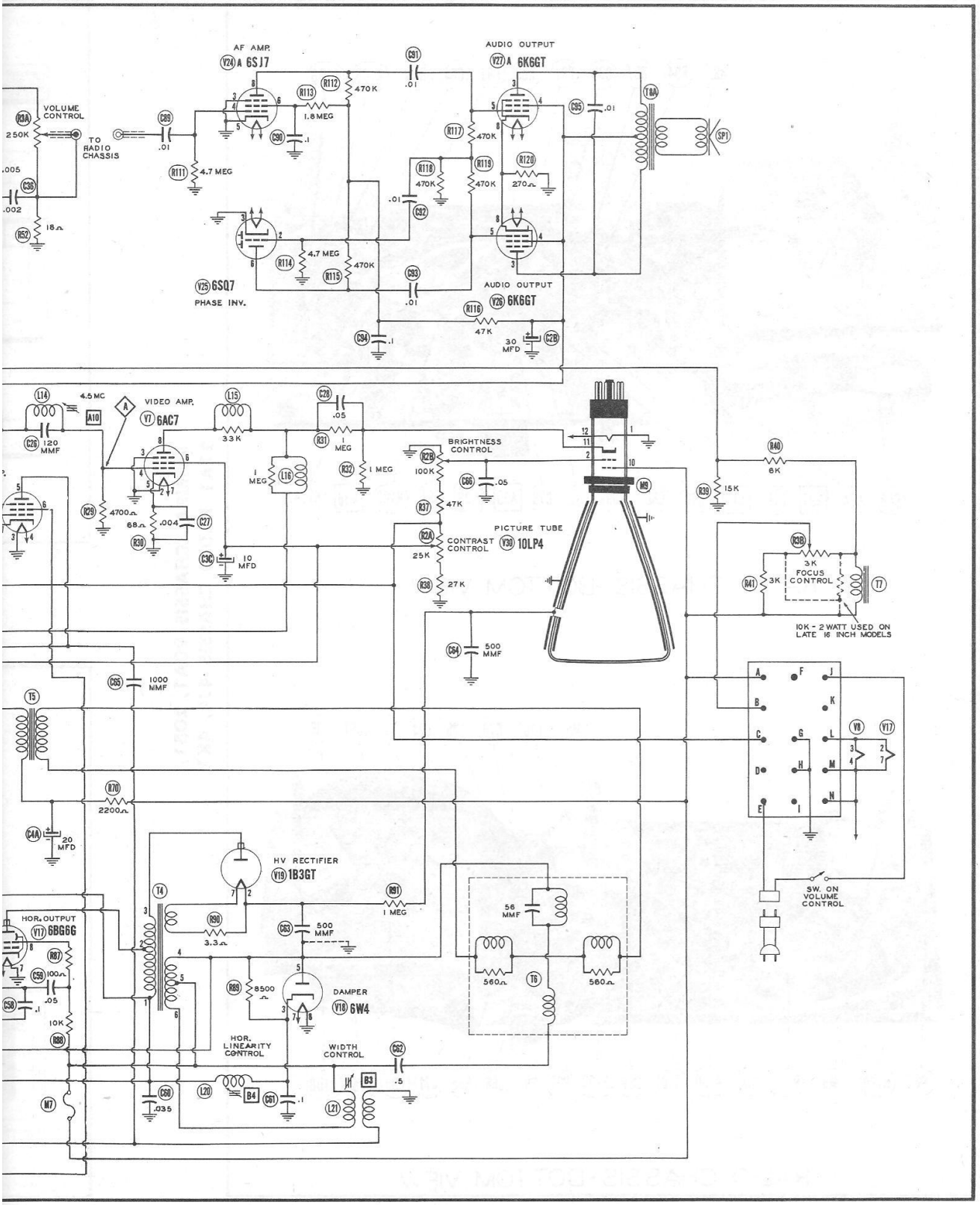
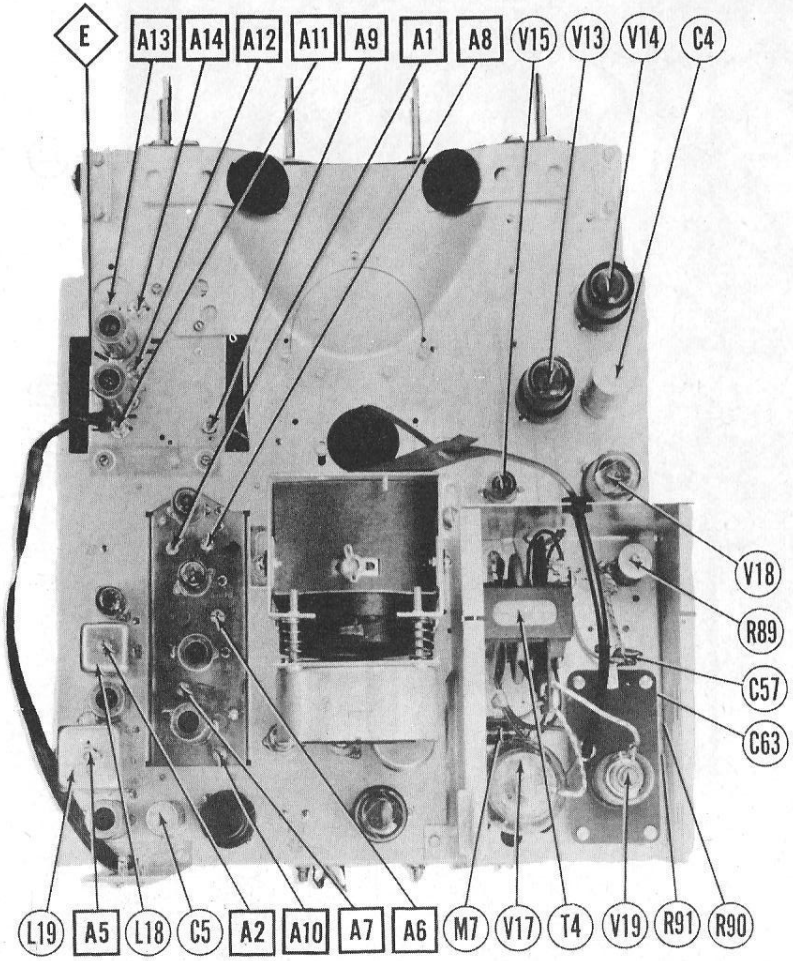
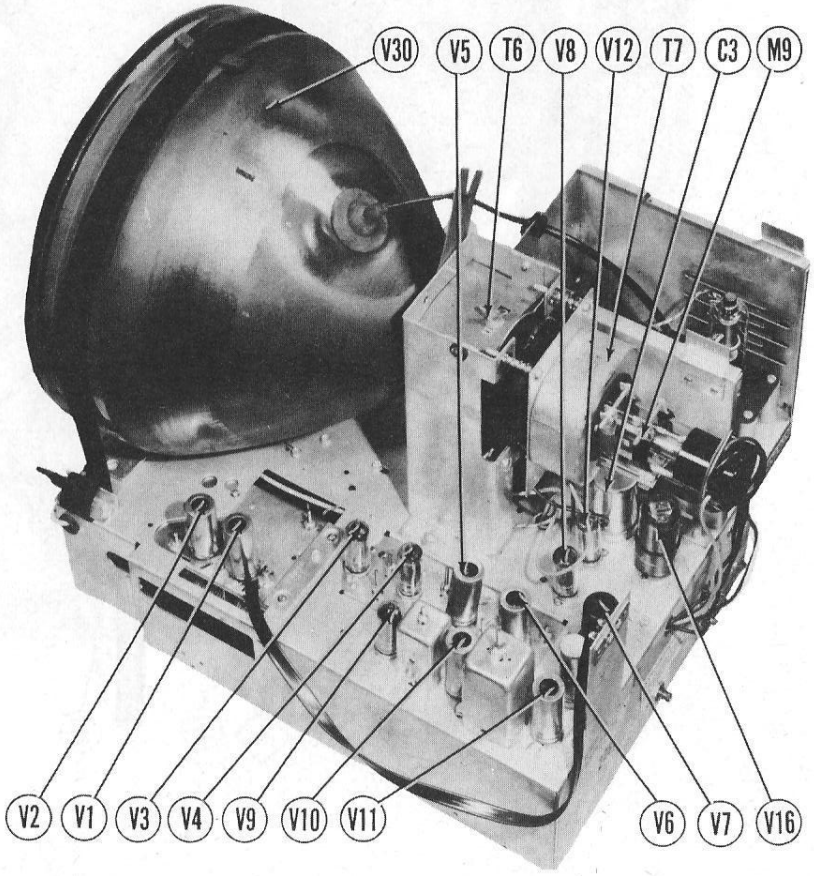

1ST SOUND IF AMP.
V9 6AU6
2ND SOUND IF AMP.
V10 6AU6
RATIO DETECTOR
V11 6AL5
VOLUME CONTROL
TO RADIO CHASSIS
1ST VIDEO IF AMP.
V3 6AU6
22.0 MC
2ND VIDEO IF AMP.
V4 6AU6
25.3 MC
3RD VIDEO IF AMP.
V5 6AU6
23.5 MC
VIDEO DETECTOR
V6 6AL5
4.5 MC
AGC AMP.
V8 6AU6
SYNC PHASE INV.
V13 A 1/2 6SN7GT
SYNC SEP.
V12 6AU6
V13 B 1/2 6SN7GT
VERT. OSC.
VERT. OUTPUT
V14 6K6GT
HEIGHT CONTROL 2 MEG
VERTICAL HOLD CONTROL
VERTICAL LINEARITY CONTROL
HOR. SYNC DISC.
V15 6AL5
HOR. OSC.
V16 A 1/2 6SN7GT
HOR. OSC.
V16 B 1/2 6SN7GT
HOR. OUTPUT
V17 6BG6G
HOR. DRIVE
HOR. FREQ.
HORIZ. HOLD CONTROL

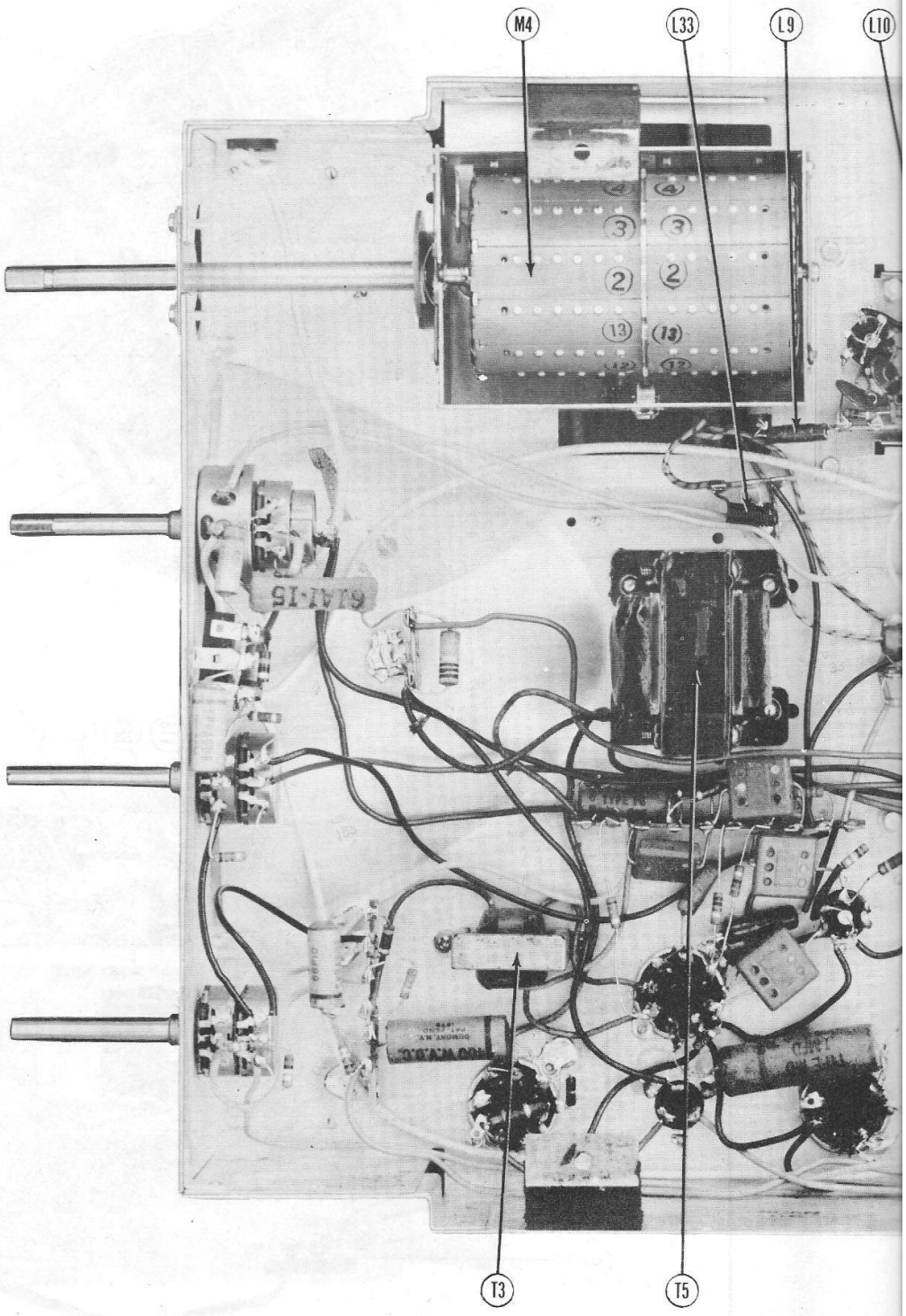
ADMIRAL CHASSIS 20A1, 20B1, 21A1, RADIO CHASSIS 4J1, 4K1



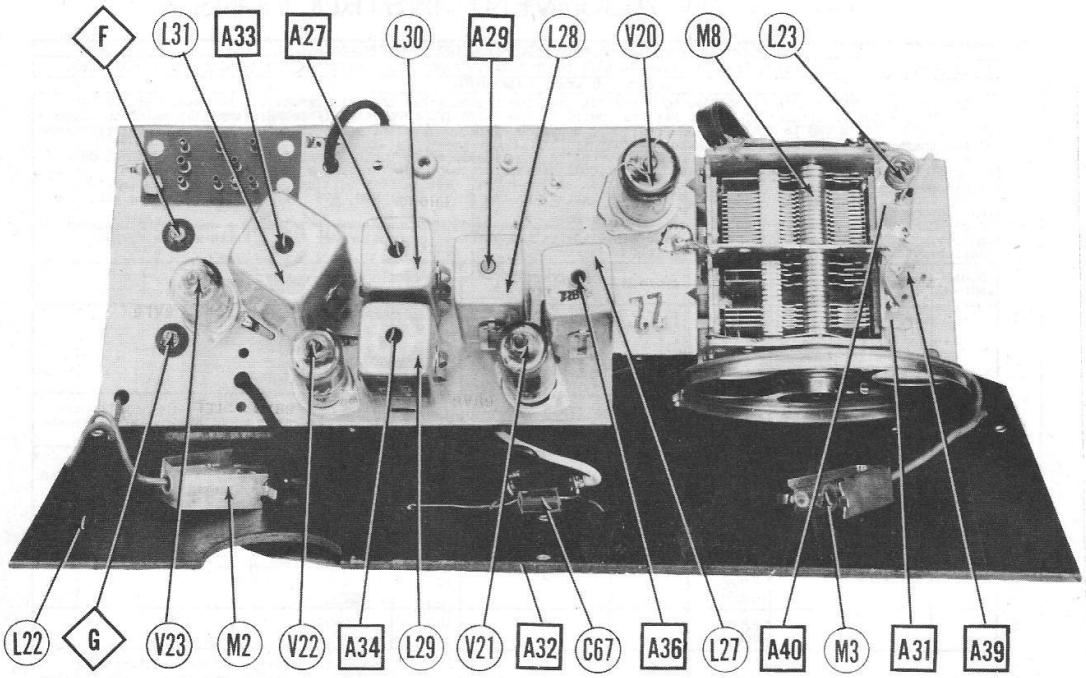




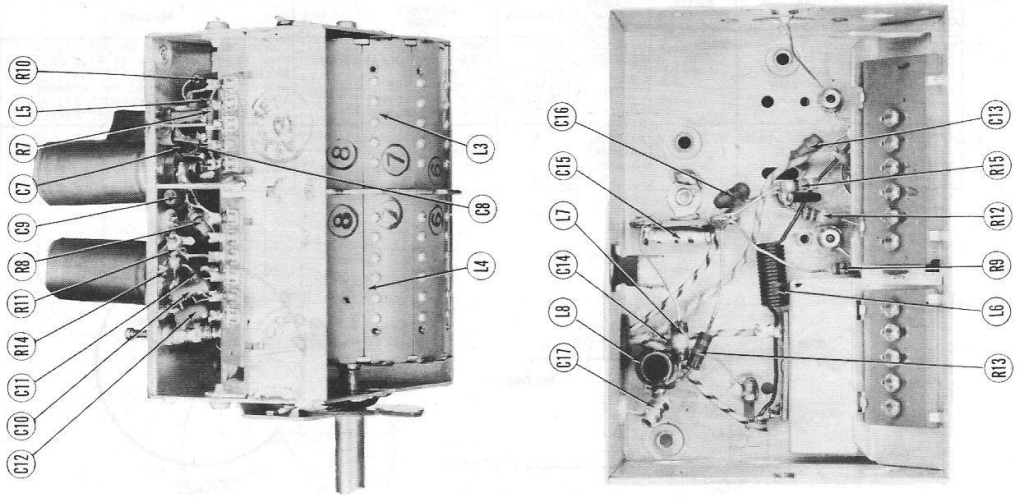
CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR A



RADIO CHASSIS-TOP VIEW



RF TUNER

TV ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To eliminate the shock hazard from the high voltage power supply, remove the horizontal oscillator tube (6SN7-V16).

SOUND AND VIDEO IF ALIGNMENT

On early production sets identified by a red dot near the second video IF amplifier (V4), the second IF transformer L10, which is aligned at 22MC., has been moved to the third IF. The third IF transformer L11, which is aligned at 25.3MC., is moved to the position previously occupied by L10. That is, these transformers have been interchanged and these receivers should be aligned accordingly.

a) Remove the channel 13 oscillator and mixer coils from the turret. During IF alignment, set the channel selector switch to channel 13; this will disable the local oscillator to prevent erroneous indications.

b) Set the contrast control to the mid-position of its range. Retain this setting during all IF adjustments.

c) Connect the negative lead of a 4 1/2 volt battery to the junction of R23, R76, and C21. Connect the positive lead to chassis.

d) Connect one end of a 10KΩ resistor to Point A. Connect a 330MMF capacitor from the free end of the resistor to chassis. The junction of this resistor and capacitor is the point of connection for the DC Probe of the VTVM or oscilloscope.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.		High side to ungrounded tube shield floating over mixer tube (V2). Low side to chassis.	21.25MC (Unmod.)	13 (See note "a" above).	DC Probe thru filter to Point A. Common to chassis. (See note "d" above).	A1	Adjust for MINIMUM deflection.
2.		"	"	"	DC Probe to Point B. Common to chassis.	A2,A3, A4	Adjust for maximum deflection. Attenuate signal generator to maintain 1.5 volts output.
3.		"	"	"	DC Probe to Point C. Common to Point D.	A5	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
4.		"	25.3MC (Unmod.)	"	DC Probe to Point A. Common to chassis. (See note "d" above.)	A6	Adjust for maximum deflection. Attenuate signal generator to maintain 1 volt reading.
5.		"	23.5MC (Unmod.)	"	"	A7	"
6.		"	22.0MC (Unmod.)	"	"	A8	"
7.		"	22.3MC (Unmod.)	"	"	A9	Adjust for maximum deflection. Attenuate signal generator to maintain 1 volt reading. Repeat step 1. If A1 is off, readjust A1 and repeat step 6.
8.		"	4.5MC (400~ Mod.)	"	DC Probe thru detector to pin 8 (plate) of 6AC7 (V7). Use the detector probe designed for VTVM in use, or construct one as per Fig 1.	A10	Adjust for MINIMUM deflection.

OVERALL IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.		High side to ungrounded tube shield floating over mixer tube (V2). Low side to chassis.	24MC (10MC Sweep)	21.25MC 25.75MC	13 (See note "a" above IF alignment)	Vert. Amp. thru 10KΩ to Point A. Low side to chassis. (See note "d" above IF alignment).		Check for response as per Fig 2. When checking traps at 21.25MC. use maximum marker output. The dip between peaks should not exceed 30%. If necessary retouch A1, A6, A7, A8, and A9 for proper response.
10.	500MMF	High side to pin 1 (Grid) of 6AU6 (V9). Low side to chassis.	21.25MC (450KC Sweep)	21.05MC 21.25MC 21.45MC	"	Vert. Amp. to Point C. Low side to chassis.		Check for response as per Fig 3. If necessary retouch A2, A3, A4, and A5 for proper response.

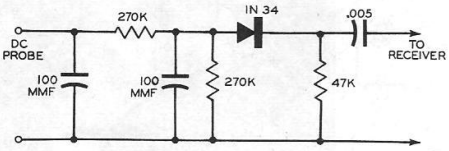


FIG. 1

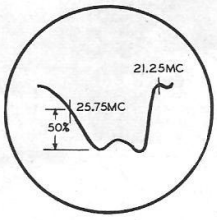


FIG. 2

TV ALIGNMENT INSTRUCTIONS (CONT.)

RF ALIGNMENT

Disconnect the 4 1/2 volt battery used during IF alignment and connect a short piece of wire from where the negative lead of the battery was removed, to chassis.
Set the contrast control to the mid-point of its range.
Connect the oscilloscope vertical amplifier input thru 10KΩ to Point (E). Connect the low side to chassis.
Replace the channel 13 oscillator and mixer coils.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Two 120Ω	Across antenna terminals with 120Ω in each lead.	207MC (10MC Sweep)	205.25MC 209.75MC	12	Vert. Amp. thru 10KΩ to Point (E). Low side to chassis.	A11, A12, A13	Adjust for response curve similar to Fig 4 with markers as shown.
12.	"	"	213MC (10MC Sweep)	211.25MC 215.75MC	13	"		Check for response similar to Fig 4. If optimum results are desired for any channel, retouch A11, A12, and A13 with channel selector set for that channel. Recheck all other channels to see that they have not been seriously effected.
			201MC (10MC Sweep)	199.25MC 203.75MC	11			
			195MC (10MC Sweep)	193.25MC 197.75MC	10			
			189MC (10MC Sweep)	187.25MC 191.75MC	9			
			183MC (10MC Sweep)	181.25MC 185.75MC	8			
			177MC (10MC Sweep)	175.25MC 179.75MC	7			
			85MC (10MC Sweep)	83.25MC 87.75MC	6			
			79MC (10MC Sweep)	77.25MC 81.75MC	5			
			69MC (10MC Sweep)	67.25MC 71.75MC	4			
			63MC (10MC Sweep)	61.25MC 65.75MC	3			
			57MC (10MC Sweep)	55.25MC 59.75MC	2			

OSCILLATOR ALIGNMENT

Overall oscillator alignment may not be necessary. If a majority of the channels are off, adjustment of A14 may correct the alignment error. A14 is an overall oscillator adjustment and should not be adjusted for individual channels.

The sound IF channel must be accurately aligned before attempting oscillator alignment. If IF alignment has not been performed, step 10 of IF response check should be performed, or steps 1, 2, and 3 of IF alignment should be performed.

Adjustments A15 thru A26 are the individual channel oscillator slugs, and are accessible thru a hole just to the right of the fine tuning and channel selector shafts. They appear as the channel selector is turned to each channel.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
13.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	215.75MC (Unmod.)	13	DC Probe to Point (C). Common to Point (D)	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
14.	"	"	209.75MC (Unmod.)	12	"	A16	"
			203.75MC (Unmod.)	11		A17	
			197.75MC (Unmod.)	10		A18	
			191.75MC (Unmod.)	9		A19	
			185.75MC (Unmod.)	8		A20	
			179.75MC (Unmod.)	7		A21	
			87.75MC (Unmod.)	6		A22	
			81.75MC (Unmod.)	5		A23	
			71.75MC (Unmod.)	4		A24	
			65.75MC (Unmod.)	3		A25	
			59.75MC (Unmod.)	2		A26	

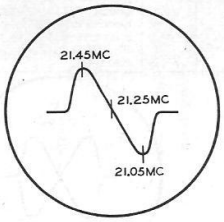


FIG. 3

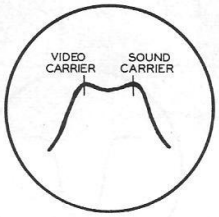


FIG. 4

RADIO ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

When complete alignment is to be performed the order outlined should be followed.
If any of the AM IF transformers, or any other part of the AM IF circuits are replaced, the FM IF alignment should be checked.
Turn the function selector switch to "Radio" and turn the tone control fully clockwise.

AM ALIGNMENT

Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
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.
To set pointer turn tuning cap. fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
15	.1MFD	High side to AM antenna stator of tuning gang. Low side to chassis.	455KC (400~ Mod.)	AM	Tuning gang fully open	Across voice coil	A27, A28, A29, A30	Adjust for maximum output.
16	.1MFD	"	1620KC (400~ Mod.)	"	"	"	A31	Adjust for maximum output.
17		Loop	1400KC (400~ Mod.)	"	Tune for maximum signal.	"	A32	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. Readjust A32 after set is installed in cabinet.

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
18	.001MFD	High side to pin 1 (Grid) of 6BA6 (V22) Low side to chassis.	10.7MC (Unmod.)	FM	Tuning gang fully open	DC Probe to Point F. Common to chassis.	A33	Adjust for maximum deflection. Attenuate signal generator to maintain 1.5 volt reading.
19	.001MFD	High side to pin 1 (Grid) of 6BA6 (V21). Low side to chassis.	"	"	"	"	A34, A35	"
20	Direct	Across FM ant. leads.	"	"	"	"	A36, A37	"
21	Reduce signal generator output until VTVM reads exactly 1.5 volts.							
22	Tune the signal generator above 10.7MC until VTVM reads 1 volt-Note exact frequency setting.							
23	Tune the signal generator below 10.7MC until VTVM reads 1 volt-Note exact frequency setting.							
24	Add the frequencies obtained in steps 22 and 23 and divide their sum by 2. This is the center frequency of the IF response curve.							
25	Tune the signal generator above and below 10.7MC and note VTVM readings at different frequency points until you have a good impression of the shape of the selectivity curve. If two peaks are obtained, note the readings of both peaks on VTVM. If one peak exceeds 20% of the other, realignment of the IF's is necessary.							
26	Direct	Across FM antenna terminals.	Set to mid-frequency obtained in step 24.	FM	Tuning gang fully open	DC Probe to Point G. Common to chassis.	A38	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

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

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
18	Direct	Across FM antenna terminals.	10.7MC (450KC Sweep)	FM	Tuning gang fully open	Vert. Amp. to Point F. Low side to chassis.	A34, A35, A36, A37	Adjust for maximum amplitude and symmetry as per Fig 5.
19	Direct	"	"	"	"	Vert. Amp. to Point G. Low side to chassis.	A33, A38	Adjust A38 so crossover point occurs at the center of the pattern as per Fig 6. Adjust A33 for maximum amplitude and straightness of crossover lines. Continue with step 27.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
27	Two 120Ω carbon res.	Across FM antenna leads with 120Ω in each lead.	109MC (Unmod.)	FM	Tuning gang fully open	DC Probe to Point F. Common to chassis.	A39, A40	Adjust for maximum deflection. Attenuate signal generator to maintain 1.5 volt reading.
28	"	"	87MC (Unmod.)	"	Tune for maximum signal	"		If the signals in steps 27 and 28 do not tune near the extremes of the tuning capacitor, expand or compress turns of the oscillator coil and repeat steps 27 and 28.
29	"	"	106MC	"	"	"	A40	Readjust for maximum deflection. Check calibration at 90MC. If necessary, expand or compress antenna coil turns. Repeat steps 27, 28 and 29 if antenna coil was changed.

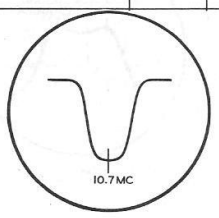


FIG. 5

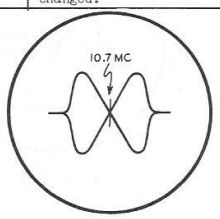
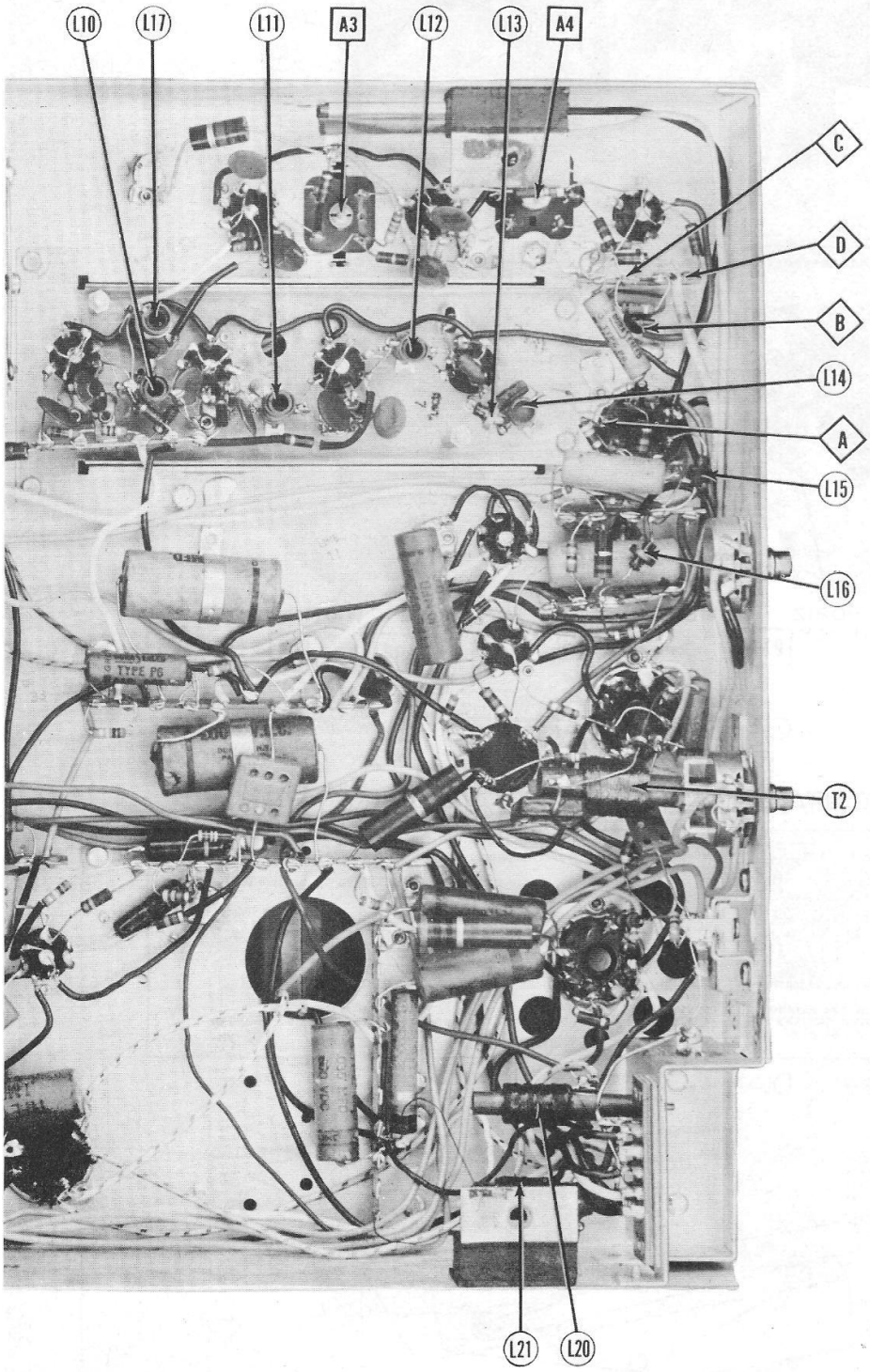
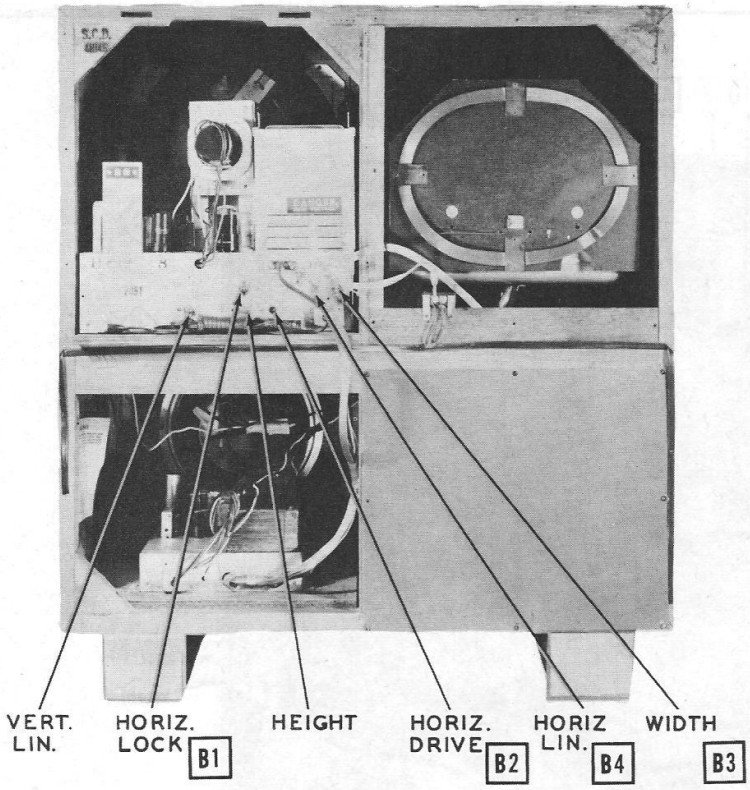


FIG. 6



CTOR AND ALIGNMENT IDENTIFICATION



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

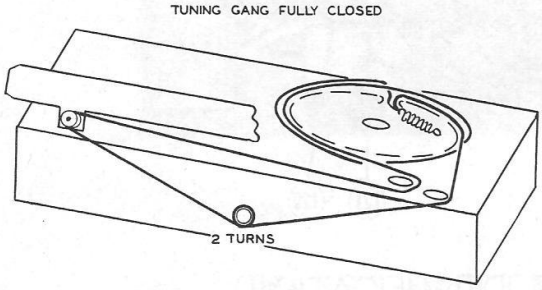
HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

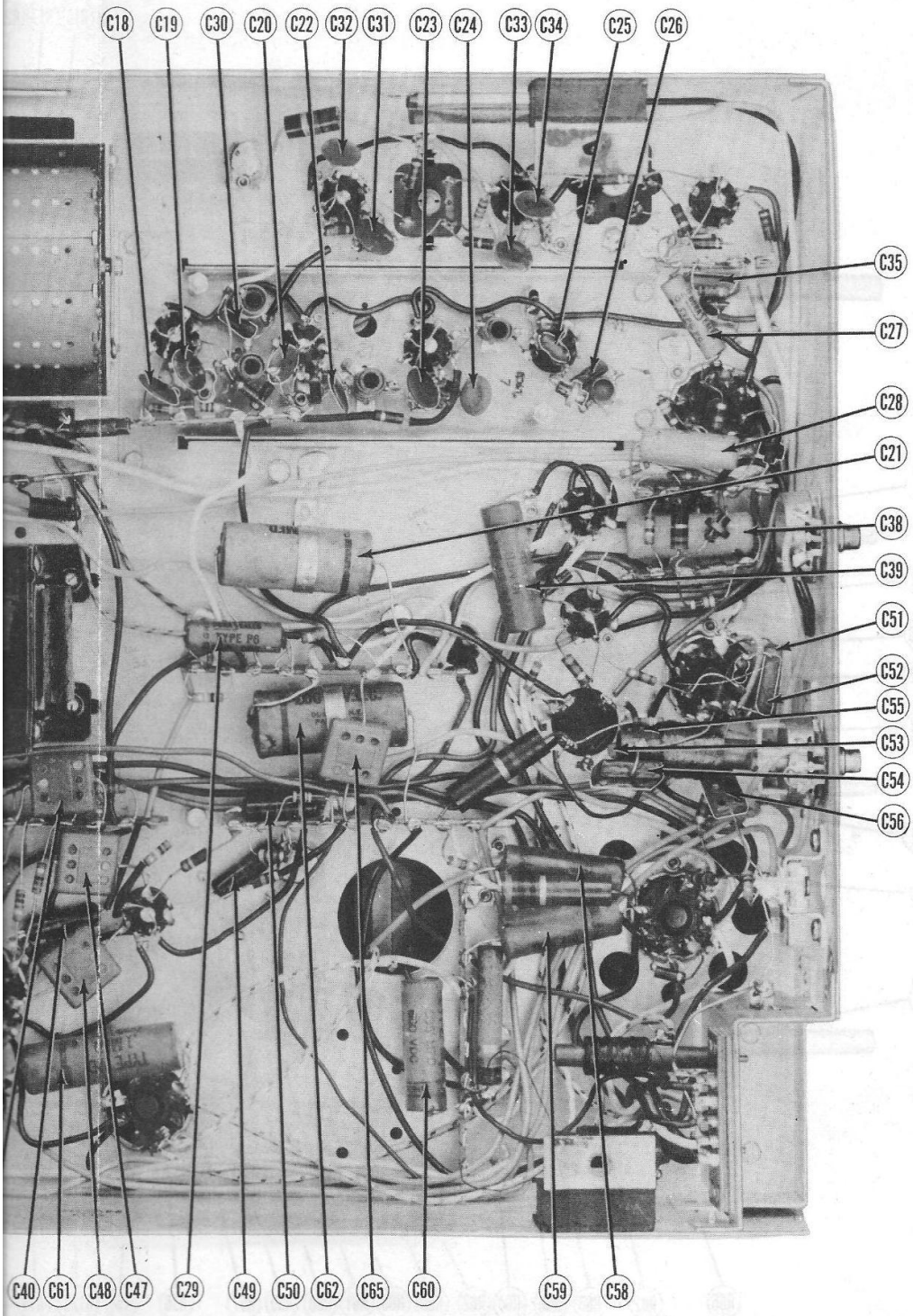
a) Turn the set on and properly tune in a TV station, (preferably a test pattern), and turn the vertical hold control to lock the picture vertically.
b) Turn the contrast and horizontal hold controls fully clockwise. If the picture is not locked in horizontally, adjust the horizontal lock adjustment (B1) until picture falls into sync.
c) Slowly turn B1 clockwise until the picture falls out of sync.
d) Slowly turn B1 counter-clockwise until the picture just falls into sync. B1 is now properly adjusted.
e) Rotate the horizontal hold control in both directions. The picture should remain in sync for approximately 3/4 of the total rotation.

HORIZONTAL LINEARITY ADJUSTMENTS

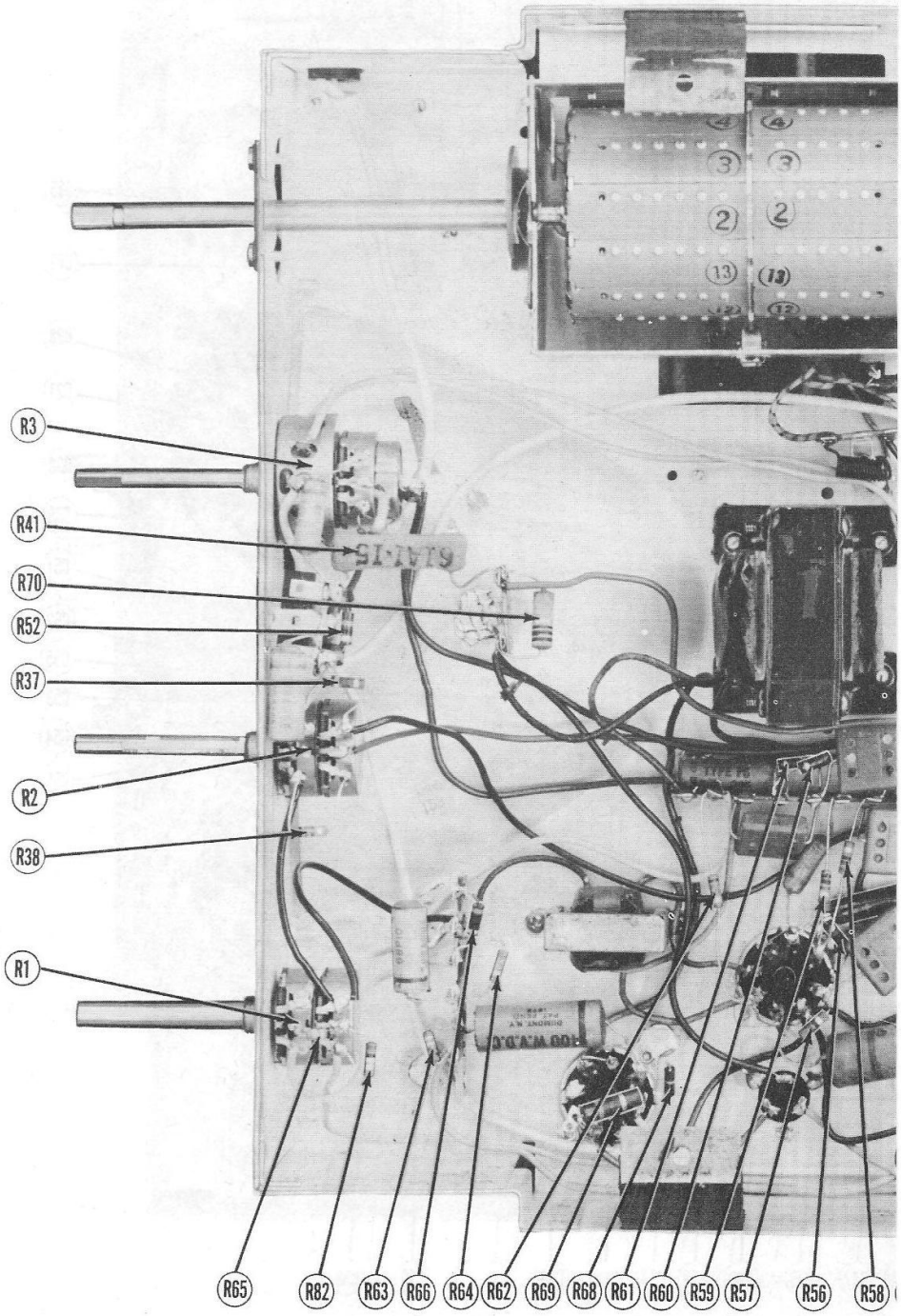
1. Adjust the horizontal driver adjustment (B2) clockwise as far as possible without severe loss of horizontal linearity.
2. Alternately adjust B2 and the horizontal linearity adjustment (B4) to obtain best horizontal linearity.
3. Adjust the width adjustment (B3) so the picture properly fills the mask horizontally. After B3 is adjusted it may be necessary to repeat step 2.

DIAL CORD STRINGING





EW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-R

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: ADMIRAL PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amp.	6AG5	6AG5	7BD	
V2	Converter	6J6	6J6	7BF	
V3	1st Video IF	6AU6	6AU6	7BK	
V4A	2nd Video IF	6AU6	6AU6	7BK	
B	2nd Video IF	6AG5	6AG5	7BD	Used in some early production models.
V5	3rd Video IF	6AU6	6AU6	7BK	
V6	Video Det.	6AL5	6AL5	6BT	
V7	Video Output	6AC7	6AC7	8N	
V8	AGC Amp.	6AU6	6AU6	7BK	
V9	1st Sound IF	6AU6	6AU6	7BK	
V10	2nd Sound IF	6AU6	6AU6	7BK	
V11	Ratio Det.	6AL5	6AL5	6BT	
V12	Sync. Sep.	6AU6	6AU6	7BK	
V13	Sync. Phase Inv. Vert. Osc.	6SN7GT	6SN7GT	8BD	
V14	Vert. Output	6K6GT	6K6GT	7S	
V15	Hor. Sync. Disc.	6AL5	6AL5	6BT	
V16	Hor. Osc.	6SN7GT	6SN7GT	8BD	
V17	Hor. Output	6BG6G	6BG6G	5BT	
V18	Damper	6W4GT	6W4GT	4CG	
V19	HV Rectifier	1B3GT	1B3GT	3C	Two used in chassis 21A1 receivers.
V20	Converter	12AT7	12AT7	9A	
V21	1st IF Amp.	6BA6	6BA6	7BK	
V22	FM 2nd IF Amp.-AM Det.	6BA6	6BA6	7BK	
V23	Ratio Det.	6AL5	6AL5	6BT	
V24A	AF Amp.	6SJ7	6SJ7	8N	
B	AF Amp.	6SQ7	6SQ7	8Q	"Television Only" receivers.
V25	Phase Inv.	6SQ7GT	6SQ7GT	8Q	
V26	Audio Output	6K6GT	6K6GT	7S	
V27A	Audio Output	6K6GT	6K6GT	7S	
B	Audio Output	6V6GT	6V6GT	7AC	"Television Only" receivers.
V28	LV Rectifier	5U4G	5U4G	5T	
V29	LV Rectifier	6X5GT	6X5GT	6S	
V30A	Picture Tube	10LP4	10LP4	12D	
B	Picture Tube	10BP4	10BP4	12D	
C	Picture Tube	12KP4	12KP4	12D	
D	Picture Tube	12LP4	12LP4	12D	
E	Picture Tube	12QP4	12QP4	12D	
F	Picture Tube	12TP4	12TP4	12D	
G	Picture Tube	16AP4	16AP4		Used in 21A1 chassis 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: CAP.	RATING: VOLT	REPLACEMENT DATA: ADMIRAL PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	450	67C 15-1	AFH88J	UP4445		TVL-64	◓ Filter
B	40	450						▲ Filter
C2A	20	350	67C 15-8	AF64H	UP3335		D10506	▲ Filter
B	30	250						■ Decoupling
C2A	30	250	67C 15-6	AF64H4A	UP6CJ 1089		D10509	▲ Filter ♦
B	20	350						■ Decoupling
C	20	25						Output Cath. Bypass
C3A	20	450	67C 15-7					◓ Decoupling
B	40	250						■ Filter
C	10	250						▲ Decoupling
C4A	20	450	67C 15-3	AFH42J8B	UP6CJ123		TVL-67	■ Vert. Output Dec.
B	10	450						▲ Vert. Osc. Dec.
C	50	50						Vert. Output Cath. Bypass
C5	4	50	67B 16-1	PRS150/4	BR550		TVA-13	Stabilizing Cap.
C6	4	150	67A 4-2	PRS150/4	BR415		UT-41	Stabilizing Cap.
C7	5		98A 45-22			NPOK-5		Fixed Trimmer
C8	1000		98A 45-24			GP2L-001		RF Fil. Bypass
C9	120		98A 45-25			GP2K-120		RF Decoupling
C10	100		98A 45-26			GP2K-120		RF Coupling
C11	20		98A 45-27			NPOK-20		Osc. Grid Cap.
C12	10		65B 6-33			N750K-10		Fixed Trimmer
C13	1000		98A 45-24			GP2L-001		Conv. Fil. Bypass
C14	10		98A 45-64			NPOK-10		Fixed Trimmer
C15	72		98A 45-65					Fixed Trimmer
C16	1000		98A 45-24			GP2L-001		RF Bypass
C17	300		98A 45-66			GP2K-300		IF Coupling
C18	1500		65A 10-4	1467-0015	1W5D15	GP2L-0015	29C3	AGC Filter
C19	1500		65A 10-4	1467-0015	1W5D15	GP2L-0015	29C3	1st V. IF Decoupling
C20	1500		65A 10-4	1467-0015	1W5D15	GP2L-0015	29C3	AGC Filter
C21	.5	200	64B 6-27	P288-5	GT2P5		TC-5	AGC Filter
C22	1500		65A 10-4	1467-0015	1W5D15	GP2L-0015	29C3	2nd V. IF Decoupling
C23	1500		65A 10-4	1467-0015	1W5D15	GP2L-0015	29C3	3rd V. IF Cath. Bypass
C24	1500		65A 10-4	1467-0015	1W5D15	GP2L-0015	29C3	3rd V. IF Decoupling
C25	10		65B 6-69	1468-00001	5W5Q1	GP1K-10	MS-41	V. Diode Filter
C26	120	300	65B 1-10					Fixed Trimmer
C27	.004	600	64B 5-33	P688-004	GT6D4	GP2M-005	TM-24	V. Amp. Cath. Bypass
C28	.05	400	64B 5-22	P488-05	GT4S5		TM-15	Video Coupling
C29	.005	600	64B 5-12	P688-005	GT6D5	GP2M-005	TM-25	AGC Filter
C30	120	300	65B 1-10					Fixed Trimmer
C31	1500		65A 10-4	1467-0015	1W5D15	GP2L-0015	29C3	1st S. IF Cath. Bypass
C32	1500		65A 10-4	1467-0015	1W5D15	GP2L-0015	29C3	1st S. IF Decoupling
C33	1500		65A 10-4	1467-0015	1W5D15	GP2L-0015	29C3	2nd S. IF Cath. Byp.
C34	1500		65A 10-4	1467-0015	1W5D15	GP2L-0015	29C3	Decoupling
C35	330	500	65B 21-331	1468-0003	5W5T3	GP2K-330	1FM-335	Diode Load Cap.
C36	.002	600	64B 5-14	P688-002	GT6D2	GP2M-002	TM-22	De-emphasis
C37	.005	600	64B 5-12	P688-005	GT6D5	GP2M-005	TM-25	Audio Coupling
C38	.2	200	64B 5-29	P488-22	GT4P2		68P18	Sync. Coupling
C39	.1	200	64B 5-30	P288-1	GT2P1		TM-1	Sync. Sep. Screen Byp.
C40	.01	400	64B 5-25	P488-01	GT4S1	GP2-335-01	TM-11	Sync. Coupling
C41	.002	600	64B 5-14	P688-002	GT6D2	GP2M-002	TM-22	Integrator Net.
C42	.005	600	64B 5-12	P688-005	GT6D5	GP2M-005	TM-25	Integrator Net.
C43	4700	500	64B 21-472	1467-005	1D5D5	GP2M-005	1FM-25	Integrator Net.
C44	4700	500	64B 21-472	1467-005	1D5D5	GP2M-005	1FM-25	Sync. Coupling
C45	.05	400	64A 2-4	P488-05	GT4S5		TM-15	Vert. Discharge
C46	.1	400	64B 5-20	P488-1	GT4P1		TM-1	Vert. Sweep Coupling

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA ADMIRAL PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C47	1000	500	65B 20-102	1468-001	1W5D1	GP2L-001	1FM-21	Hor. Sync. Coupling
C48	1000	500	65B 20-102	1468-001	1W5D1	GP2L-001	1FM-21	Hor. Sync. Coupling
C49	.01	400	64B 5-25	P488-01	GT4S1	GP2-335-01	TM-11	AFC Feedback
C50	.01	400	64B 5-25	P488-01	GT4S1	GP2-335-01	TM-11	AFC Filter
C51	.05	200	64B 5-32	P288-05	GT2S5		TM-15	AFC Filter
C52	330	500	65B 21-331			GP2K-330		Hor. MV Feedback
C53	50	500	65B 7-11	1468-00005	5W5Q5	GP1K-50	1FM-45	Hor. MV Grid Cap. *
C54	3900	500	65B 20-392					Fixed Trimmer
C55	330	500	65B 21-391			GP2K-330		Hor. Discharge ‡
C56	270	500	65B 21-271	1468-00025	5W5T25	GP2K-270	1FM-325	Hor. Sweep Coupling
C57	10	1500	65A 23-1					Hor. Feedback §
C58	.1	200	64B 5-30	P288-1	GT2P1		TM-1	Hor. Output Cath. Byp.
C59	.05	600	64B 5-7	P688-05	GT6S5		TM-15	Hor. Output Screen Byp.
C60	.035	600	64A 2-5	P688-033				Damper Filter
C61	.1	600	64A 2-6	P688-1	GT6P1		TM-1	Damper Filter
C62	.5	200	64B 6-27	P288-5	GT2P5		TC-5	Hor. Sweep Coupling
C63	500	10000	65A 11-1					HV Filter
C64	500	10000	65A 11-1					HV Filter #
C65	1000	500	65B 20-102	1468-001	1W5D1	GP2L-001	1FM-21	Hor. Sweep Feedback
C66	.05	400	64B 5-22	P488-05	GT4S5		TM-15	Brightness Cont. Byp. *
C67	5	300		1468-000005	5W5V5	NPOK-5	MS-55	Ext. Ant. Coupling
C68	1000		65B 6-41	1468-001	1W5D1	GP2L-001	1FM-21	RF Coupling
C69	10000		65A 10-3	P488-01	GT4S1	821-01	36C1	RF Cath. Bypass
C70	40		65B 6-67	1468-00004	5W5Q4	GP1K-39	1FM-44	Osc. Grid Cap.
C71	.68		65A 16-1					Osc. Coupling
C72	1000		65B 6-41	1468-001	1W5D1	GP2L-001	1FM-21	Osc. Plate Bypass
C73	10000		65A 10-3	P488-01	GT4S1	821-01	36C1	Conv. Decoupling *
C74	50	300	65B 1-60	1469-00005	5R5Q5	NPOM-50	MS-45	Fixed Trimmer
C75	10000		65A 10-3	P488-01	GT4S1	821-01	36C1	AVC Filter
C76	10000		65A 10-3	P488-01	GT4S1	821-01	36C1	Decoupling *
C77	10000		65A 10-3	P488-01	GT4S1	821-01	36C1	RF Bypass
C78	250		65B 6-5	1468-00025	5W5T25	GP2K-250	1FM-325	Diode RF Filter
C79	5000		65A 10-1	1467-005	1D5D5	811-005	29C1	1st IF Screen Bypass
C80	5000		65A 10-1	1467-005	1D5D5	811-005	29C1	Filament Bypass
C81	5000		65A 10-1	1467-005	1D5D5	811-005	29C1	2nd IF Screen Bypass
C82	10000		65A 10-3	P488-01	GT4S1	821-01	36C1	2nd IF Decoupling
C83A	100		63A 7-1	1468-0001	5W5T1	GP1K-100	1FM-21	Diode Load Cap. ♣
B	100			1468-0001	5W5T1	GP1K-100	1FM-21	Diode Load Cap. ♣
C84	1000		65B 6-41	1468-001	1W5D1	GP2L-001	1FM-21	De-emphasis
C85	5000		65A 10-1	1467-005	1D5D5	811-005	29C1	Audio Coupling
C86	100		65B 6-68	1468-0001	5W5T1	GP1K-100	1FM-31	Tone Comp.
C87	1000		65B 6-41	1468-001	1W5D1	GP2L-001	1FM-21	Tone Comp.
C88	2000		65B 9-39	1467-002	1W5D2	GP2M-002	1FM-22	Tone Comp.
C89	.01	400	64B 5-25	P488-01	GT4S1	GP2-335-01	TM-11	Audio Coupling
C90	.1	400	64B 5-20	P488-1	GT4P1		TM-1	1st AF Screen Bypass
C91	.01	400	64B 5-25	P488-01	GT4S1	GP2-335-01	TM-11	Audio Coupling
C92	.01	400	64B 5-25	P488-01	GT4S1	GP2-335-01	TM-11	Audio Coupling
C93	.01	400	64B 5-25	P488-01	GT4S1	GP2-335-01	TM-11	Audio Coupling
C94	.1	400	64B 5-20	P488-1	GT4P1		TM-1	Decoupling
C95	.01	600	64B 5-14	P688-01	GT6S1		TM-11	Output Plate Bypass †
C96	.01	400	64B 5-25	P488-01	GT4S1	GP2-335-01	TM-11	Audio Coupling ♦
C97	.1	400	64B 5-20	P488-1	GT4P1		TM-1	AF Plate Decoupling ♦
C98	.01	400	64B 5-25	P488-01	GT4S1	GP2-335-01	TM-11	Audio Coupling ♦
C99	.01	600	64B 5-14	P688-01	GT6S1		TM-11	Output Plate Bypass ♦

* Not used in all models.
† Some models use .002MFD in this application.
‡ Chassis 20A1 uses 39OMMF in this application.
§ Chassis 20A1 uses 15MMF, chassis 21A1 uses 7.5MMF in this application.
♦ Used only in power supply chassis for Television only sets.
\# Used only when 12" tube has no outer coating.
♣ When either item C83A or C83B are replaced, replace both with capacitors of equal value.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA ADMIRAL PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
R1A	50KΩ	½	75B 11-5			Horiz. hold control (Dual Concentric)
B	1 Meg.	½				Vert. hold control
R2A	25KΩ	½	75A 11-4			Contrast control (Dual Concentric)
B	100KΩ	½				Brightness control
R3A	250KΩ	¼	75B 12-3			Volume control and switch (Dual Concentric)
B	3000Ω	¼				Focus control, wire wound
R4	5000Ω	½	75A 13-1	Q11-114	M-19-S	Vert. linearity control
R5	2 Meg.	½	75A 13-3	Q11-139	M-83-S	Height control
R6A	2 Meg.	½	75B 11-7			Volume control (Dual Concentric)
B	2 Meg.	½				Tone control

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA ADMIRAL PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORE ARE ± 10% UNLESS OTHERWISE STATED
R7	3900Ω 20%	½	98A 45-16	BTS-3900	Ant. Coil Shunt
R8	10KΩ 20%	½	98A 45-18	BTS-10K	RF Plate Coil Shunt
R9	2200Ω 20%	½	98A 45-19	BTS-2200	RF Decoupling
R10	47KΩ 20%	½	98A 45-17	BTS-47K	AGC Network
R11	4700Ω	½	98A 45-20	BTS-4700	Conv. Grid
R12	220KΩ 20%	½	98A 45-21	BTS-220K	Conv. Grid
R13	15KΩ 20%	½	98A 45-67	BTS-15K	Conv. Plate
R14	10KΩ	½	98A 45-18	BTS-10K	Osc. Grid
R15	4700Ω	½	98A 45-20	BTS-4700	Osc. Plate
R16	10KΩ	½	60B 8-103	BTS-10K	1st Video IF Grid
R17	39Ω	½	60B 8-390		1st Video IF Cathode
R18	12KΩ	½	60B 8-123	BTS-12K	1st Video IF Transformer Shunt See Note 6
R19	1000Ω	½	60B 8-102	BTS-1000	1st Video IF Decoupling
R20	1000Ω	½	60B 8-102	BTS-1000	AGC Network
R21	1000Ω	½	60B 8-102	BTS-1000	AGC Network
R22	100KΩ	½	60B 8-104	BTS-100K	Voltage Divider
R23	47KΩ	½	60B 8-473	BTS-47K	AGC Network
R24	39Ω	½	60B 8-390		2nd Video IF Cathode
R25	10KΩ	½	60B 8-103	BTS-10K	2nd Video IF Transformer Shunt See Note 7

RESISTORS (CONT.)

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA ADMIRAL PART No.	IRC PART No.	
R26	1000Ω	½	60B 8-102	BTS-1000	2nd Video IF Dec
R27	100Ω	½	60B 8-101		3rd Video IF Cat
R28	1000Ω	½	60B 8-102	BTS-1000	3rd Video IF Dec
R29	4700Ω	½	60B 8-472	BTS-4700	Video Det. Diode
R30	68Ω	½	60B 8-680	BW-½-68	Video Output Cat
R31	1 Meg.	½	60B 8-105	BTS-1 Meg.	Voltage Divider
R32	1 Meg.	½	60B 8-105	BTS-1 Meg.	Picture Tube Cat
R33	3300Ω	1	60B 14-332	BTA-3300	Video Output Pla
R34	1800Ω	½	60B 8-182	BTS-1800	Video Output Pla
R35	4700Ω	½	60B 8-472	BTS-4700	Sync. Coupling
R36	47KΩ	½	60B 8-473	BTS-47K	AGC Amp. Grid
R37	47KΩ	½	60B 8-473	BTS-47K	Voltage Divider
R38	27KΩ	½	60B 8-273	BTS-27K	Voltage Divider
R39	15KΩ	2	60B 20-153	BT-2-15K	Bleeder
R40	6000Ω	5	61A 3-11	AB-6000	Series Focus Coi
R41	3000Ω	5	61A 1-15	AB-3000	Focus Coil Shunt
R42	150Ω	½	60B 8-151		1st Sound IF Cat
R43	15KΩ	½	60B 8-153		1st Sound IF Dec
R44	27KΩ	½	60B 8-273	BTS-27K	2nd Sound IF Gri
R45	330Ω	½	60B 8-330		2nd Sound IF Cat
R46	150Ω	½	60B 8-151		Balancing
R47	560Ω	½	60B 8-561	BTS-560	Balancing See No
R48	4.7Ω	½	60B 28-11	BW-½-4.7	Ratio Det. Filam
R49	15KΩ	½	60B 8-153	BTS-15K	Ratio Det. Diode
R50	15KΩ	½	60B 8-153	BTS-15K	Ratio Det. Diode
R51	27KΩ	½	60B 8-273	BTS-27K	De-emphasis
R52	18Ω	½	60B 8-180	BW-½-18	Isolation
R53	2.2 Meg.	½	60B 8-225	BTS-2.2 Meg.	Sync. Sep. Grid
R54	8200Ω	½	60B 8-822	BTS-8200	Sync. Sep. Plate
R55	82KΩ	½	60B 8-823	BTS-82K	Sync. Sep. Scree
R56	1 Meg.	½	60B 8-105	BTS-1 Meg.	Sync. Phase Inv.
R57	3300Ω	½	60B 8-332	BTS-3300	Sync. Phase Inv.
R58	3300Ω	½	60B 8-332	BTS-3300	Sync. Phase Inv.
R59	22KΩ	½	60B 8-223	BTS-22K	Integrator
R60	8200Ω	½	60B 8-822	BTS-8200	Integrator
R61	8200Ω	½	60B 8-822	BTS-8200	Integrator
R62	1.5 Meg.	½	60B 8-155	BTS-1.5 Meg.	Vert. Osc. Grid
R63	270KΩ	½	60B 8-274	BTS-270K	Vert. Osc. Plate
R64	6.8 Meg.	½	60B 8-685	BTS-6.8 Meg.	Voltage Divider
R65	100KΩ	½	60B 8-104	BTS-100K	Voltage Divider
R66	8200Ω	½	60B 8-822	BTS-8200	Vert. Peaking
R67	47KΩ	½	60B 8-473	BTS-47K	Filter
R68	2.2 Meg.	½	60B 8-225	BTS-2.2 Meg.	Vert. Output Gri
R69	1800Ω	1	60B 14-182	BTA-1800	Vert. Output Cat
R70	2200Ω	1	60B 14-222	BTA-2200	Filter
R71	100KΩ 5%	½	60B 7-104	BTS-100K-5%	Horiz. Sync. Dis
R72	100KΩ 5%	½	60B 7-104	BTS-100K-5%	Horiz. Sync. Dis
R73	4.7 Meg.	½	60B 8-475	BTS-4.7 Meg.	Horiz. Sync. Dis
R74	470KΩ	½	60B 8-474	BTS-470K	Horiz. AFC Filte
R75	47KΩ	½	60B 8-473	BTS-47K	AGC Network
R76	47KΩ	½	60B 8-473	BTS-47K	AGC Network
R77	18KΩ	½	60B 8-183	BTS-18K	Feedback Network
R78	1500Ω	½	60B 8-152	BTS-1500	Horiz. Osc. Cat
R79	5600Ω	½	60B 8-562	BTS-5600	Horiz. Osc. Pla
R80	82KΩ	½	60B 8-823	BTS-82K	Horiz. Osc. Gri
R81	270KΩ	½	60B 8-274	BTS-270K	Horiz. Osc. Pla
R82	100KΩ	½	60B 8-104	BTS-100K	Horiz. Hold Con
R83	22KΩ	2	60B 20-223	BT-2-22K	Filter
R84	68Ω	½	60B 8-680		Parasitic Supp.
R85	1 Meg.	½	60B 8-105	BTS-1 Meg.	Horiz. Output Gr
R86	82Ω	2	60B 20-820	BW-2-82	Horiz. Output Ca
R87	100Ω	½	60B 8-101		Parasitic Supp.
R88	10KΩ	2	60B 20-103	BT-2-10K	Horiz. Output Sc
R89	8500Ω	25	61A 12-1		Damper Filter (W
R90	3.3Ω	½	60B 28-10		HV Rect. Filame
R91	1 Meg.	1	60B 28-33		HV Filter
R92	1.5 Meg.	½	60B 8-155	BTS-1.5 Meg.	Conv. Grid
R93	390Ω	½	60B 8-391	BW-½-390	Conv. Cathode (W
R94	1000Ω	½	60B 8-102	BTS-1000	Conv. Plate
R95	22KΩ	½	60B 8-223	BTS-22K	Osc. Grid
R96	1000Ω	½	60B 8-102	BTS-1000	Osc. Plate Decou
R97	1000Ω	½	60B 8-102	BTS-1000	Decoupling
R98	1 Meg.	½	60B 8-105	BTS-1 Meg.	AVC Network
R99	27KΩ	1	60B 14-273	BTA-27K	1st IF Screen
R100	470KΩ	½	60B 8-474	BTS-470K	Diode Load
R101	47KΩ	½	60B 8-473	BTS-47K	Diode Filter
R102	27KΩ	1	60B 14-273	BTA-27K	2nd FM IF Screen
R103	1000Ω	½	60B 8-102	BTS-1000	2nd FM IF Decoup
R104	390Ω	½	60B 8-391	BW-½-390	Balancing
R105	27KΩ	½	60B 8-273	BTS-27K	De-emphasis
R106	15KΩ	½	60B 8-153	BTS-15K	Ratio Det. Diode
R107	15KΩ	½	60B 8-153	BTS-15K	Ratio Det. Diode
R108	100KΩ	½	60B 8-104	BTS-100K	Tone Compensatio
R109	18Ω	½	60B 8-180	BW-½-18	Isolation
R110	22Ω	½	60B 8-220	BW-½-22	Pilot Lamp Shunt
R111	4.7 Meg.	½	60B 8-475	BTS-4.7 Meg.	AF Grid
R112	470KΩ	½	60B 8-474	BTS-470K	AF Plate
R113	1.8 Meg.	½	60B 8-185	BTS-1.8 Meg.	AF Screen
R114	4.7 Meg.	½	60B 8-475	BTS-4.7 Meg.	Phase Inv. Grid
R115	470KΩ	½	60B 8-474	BTS-470K	Phase Inv. Plate
R116	47KΩ	½	60B 8-473	BTS-47K	Decoupling
R117	470KΩ	½	60B 8-474	BTS-470K	Output Grid
R118	470KΩ	½	60B 8-474	BTS-470K	Output Grid
R119	470KΩ	½	60B 8-474	BTS-470K	Output Grid
R120	270Ω	2	60B 20-271	BW-2-270	Output Cathode
R121	1500Ω	5	61A 3-10	AB-1500	Filter (Wire Wou
R122	1700Ω	20	61A 3-9	DG-1750	Filter (Wire Wou
R123	4.7 Meg.	½	60B 8-475	BTS-4.7 Meg.	AF Grid See Note
R124	470KΩ	½	60B 8-474	BTS-470K	AF Plate See Not
R125	47KΩ	½	60B 8-473	BTS-47K	AF Plate Decoupl
R126	470KΩ	½	60B 8-474	BTS-470K	Output Grid See

PARTS LIST AND DESCRIPTIONS (Continued)

(CONT.)

SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
1FM-21	Hor. Sync. Coupling
1FM-21	Hor. Sync. Coupling
TM-11	AFC Feedback
TM-11	AFC Filter
TM-15	AFC Filter
	Hor. MV Feedback
1FM-45	Hor. MV Grid Cap. *
	Fixed Trimmer
	Hor. Discharge ‡
1FM-325	Hor. Sweep Coupling
	Hor. Feedback §
TM-1	Hor. Output Cath. Byp.
TM-15	Hor. Output Screen Byp.
	Damper Filter
TM-1	Damper Filter
TC-5	Hor. Sweep Coupling
	HV Filter
	HV Filter #
1FM-21	Hor. Sweep Feedback
TM-15	Brightness Cont. Byp. *
MS-55	Ext. Ant. Coupling
1FM-21	RF Coupling
56C1	RF Cath. Bypass
1FM-44	Osc. Grid Cap.
	Osc. Coupling
1FM-21	Osc. Plate Bypass
56C1	Conv. Decoupling *
MS-45	Fixed Trimmer
56C1	AVC Filter
56C1	Decoupling *
56C1	RF Bypass
1FM-325	Diode RF Filter
29C1	1st IF Screen Bypass
29C1	Filament Bypass
29C1	2nd IF Screen Bypass
56C1	2nd IF Decoupling
1FM-21	Diode Load Cap. ♠
1FM-21	Diode Load Cap. ♠
1FM-21	De-emphasis
29C1	Audio Coupling
1FM-31	Tone Comp.
1FM-21	Tone Comp.
1FM-22	Tone Comp.
TM-11	Audio Coupling
TM-1	1st AF Screen Bypass
TM-11	Audio Coupling
TM-11	Audio Coupling
TM-11	Audio Coupling
TM-1	Decoupling
TM-11	Output Plate Bypass †
TM-11	Audio Coupling ♦
TM-1	AF Plate Decoupling ♦
TM-11	Audio Coupling ♦
TM-11	Output Plate Bypass ♦

… in this application.
… only sets.
… both with capacitors of equal value.

INSTALLATION NOTES

… (Dual Concentric)
… (Dual Concentric)
… control and switch
… control, wire wound (Dual Concentric)
… linearity control
… (Dual Concentric)

IDENTIFICATION CODES
… ± 10% UNLESS OTHERWISE STATED
… Transformer Shunt See Note 6
… Transformer Shunt See Note 7

RESISTORS (CONT.)

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	ADMIRAL PART No.	IRC PART No.	
R26	1000Ω	½	60B 8-102	BTS-1000	2nd Video IF Decoupling
R27	100Ω	½	60B 8-101		3rd Video IF Cathode
R28	1000Ω	½	60B 8-102	BTS-1000	3rd Video IF Decoupling
R29	4700Ω	½	60B 8-472	BTS-4700	Video Det. Diode Load
R30	68Ω	½	60B 8-680	BW-½-68	Video Output Cathode
R31	1 Meg.	½	60B 8-105	BTS-1 Meg.	Voltage Divider
R32	1 Meg.	½	60B 8-105	BTS-1 Meg.	Picture Tube Cathode
R33	3300Ω	1	60B 14-332	BTA-3300	Video Output Plate
R34	1800Ω	½	60B 8-182	BTS-1800	Video Output Plate
R35	4700Ω	½	60B 8-472	BTS-4700	Sync. Coupling
R36	47KΩ	½	60B 8-473	BTS-47K	AGC Amp. Grid
R37	47KΩ	½	60B 8-473	BTS-47K	Voltage Divider
R38	27KΩ	½	60B 8-273	BTS-27K	Voltage Divider
R39	15KΩ	2	60B 20-153	BT-2-15K	Bleeder
R40	6000Ω	5	61A 3-11	AB-6000	Series Focus Coil (Wire Wound)
R41	3000Ω	5	61A 1-15	AB-3000	Focus Coil Shunt (Wire Wound)
R42	150Ω	½	60B 8-151		1st Sound IF Cathode See Note 8
R43	15KΩ	½	60B 8-153		1st Sound IF Decoupling See Note 9
R44	27KΩ	½	60B 8-273	BTS-27K	2nd Sound IF Grid
R45	330Ω	½	60B 8-330		2nd Sound IF Cathode
R46	150Ω	½	60B 8-151		Balancing
R47	560Ω	½	60B 8-561	BTS-560	Balancing See Note 1
R48	4.7Ω	½	60B 28-11	BW-½-4.7	Ratio Det. Filament (Wire Wound)
R49	15KΩ	½	60B 8-153	BTS-15K	Ratio Det. Diode Load
R50	15KΩ	½	60B 8-153	BTS-15K	Ratio Det. Diode Load
R51	27KΩ	½	60B 8-273	BTS-27K	De-emphasis
R52	18Ω	½	60B 8-180	BW-½-18	Isolation
R53	2.2 Meg.	½	60B 8-225	BTS-2.2 Meg.	Sync. Sep. Grid
R54	8200Ω	½	60B 8-822	BTS-8200	Sync. Sep. Plate
R55	82KΩ	½	60B 8-823	BTS-82K	Sync. Sep. Screen
R56	1 Meg.	½	60B 8-105	BTS-1 Meg.	Sync. Phase Inv. Grid
R57	3300Ω	½	60B 8-332	BTS-3300	Sync. Phase Inv. Cathode
R58	3300Ω	½	60B 8-332	BTS-3300	Sync. Phase Inv. Plate
R59	22KΩ	½	60B 8-223	BTS-22K	Integrator
R60	8200Ω	½	60B 8-822	BTS-8200	Integrator
R61	8200Ω	½	60B 8-822	BTS-8200	Integrator
R62	1.5 Meg.	½	60B 8-155	BTS-1.5 Meg.	Vert. Osc. Grid See Note 4
R63	270KΩ	½	60B 8-274	BTS-270K	Vert. Osc. Plate
R64	6.8 Meg.	½	60B 8-685	BTS-6.8 Meg.	Voltage Divider
R65	100KΩ	½	60B 8-104	BTS-100K	Voltage Divider
R66	8200Ω	½	60B 8-822	BTS-8200	Vert. Peaking
R67	47KΩ	½	60B 8-473	BTS-47K	Filter
R68	2.2 Meg.	½	60B 8-225	BTS-2.2 Meg.	Vert. Output Grid
R69	1800Ω	1	60B 14-182	BTA-1800	Vert. Output Cathode
R70	2200Ω	1	60B 14-222	BTA-2200	Filter
R71	100KΩ 5%	½	60B 7-104	BTS-100K-5%	Horiz. Sync. Disc. Load
R72	100KΩ 5%	½	60B 7-104	BTS-100K-5%	Horiz. Sync. Disc. Load
R73	4.7 Meg.	½	60B 8-475	BTS-4.7 Meg.	Horiz. Sync. Disc. Load
R74	470KΩ	½	60B 8-474	BTS-470K	Horiz. AFC Filter Network
R75	47KΩ	½	60B 8-473	BTS-47K	AGC Network
R76	47KΩ	½	60B 8-473	BTS-47K	AGC Network
R77	18KΩ	½	60B 8-183	BTS-18K	Feedback Network
R78	1500Ω	½	60B 8-152	BTS-1500	Horiz. Osc. Cathode
R79	5600Ω	½	60B 8-562	BTS-5600	Horiz. Osc. Plate
R80	82KΩ	½	60B 8-823	BTS-82K	Horiz. Osc. Grid
R81	270KΩ	½	60B 8-274	BTS-270K	Horiz. Osc. Plate
R82	100KΩ	½	60B 8-104	BTS-100K	Horiz. Hold Control Shunt
R83	22KΩ	2	60B 20-223	BT-2-22K	Filter
R84	68Ω	½	60B 8-680		Parasitic Supp.
R85	1 Meg.	½	60B 8-105	BTS-1 Meg.	Horiz. Output Grid
R86	82Ω	2	60B 20-820	BW-2-82	Horiz. Output Cathode
R87	100Ω	½	60B 8-101		Parasitic Supp.
R88	10KΩ	2	60B 20-103	BT-2-10K	Horiz. Output Screen See Note 2
R89	8500Ω	25	61A 12-1		Damper Filter (Wire Wound) See Note 3
R90	3.3Ω	½	60B 28-10		HV Rect. Filament
R91	1 Meg.	1	60B 28-33		HV Filter
R92	1.5 Meg.	½	60B 8-155	BTS-1.5 Meg.	Conv. Grid
R93	390Ω	½	60B 8-391	BW-½-390	Conv. Cathode (Wire Wound)
R94	1000Ω	½	60B 8-102	BTS-1000	Conv. Plate
R95	22KΩ	½	60B 8-223	BTS-22K	Osc. Grid
R96	1000Ω	½	60B 8-102	BTS-1000	Osc. Plate Decoupling
R97	1000Ω	½	60B 8-102	BTS-1000	Decoupling
R98	1 Meg.	½	60B 8-105	BTS-1 Meg.	AVC Network
R99	27KΩ	1	60B 14-273	BTA-27K	1st IF Screen
R100	470KΩ	½	60B 8-474	BTS-470K	Diode Load
R101	47KΩ	½	60B 8-473	BTS-47K	Diode Filter
R102	27KΩ	1	60B 14-273	BTA-27K	2nd FM IF Screen
R103	1000Ω	½	60B 8-102	BTS-1000	2nd FM IF Decoupling
R104	390Ω	½	60B 8-391	BW-½-390	Balancing
R105	27KΩ	½	60B 8-273	BTS-27K	De-emphasis
R106	15KΩ	½	60B 8-153	BTS-15K	Ratio Det. Diode Load
R107	15KΩ	½	60B 8-153	BTS-15K	Ratio Det. Diode Load
R108	100KΩ	½	60B 8-104	BTS-100K	Tone Compensation
R109	18Ω	½	60B 8-180	BW-½-18	Isolation
R110	22Ω	½	60B 8-220	BW-½-22	Pilot Lamp Shunt
R111	4.7 Meg.	½	60B 8-475	BTS-4.7 Meg.	AF Grid
R112	470KΩ	½	60B 8-474	BTS-470K	AF Plate
R113	1.8 Meg.	½	60B 8-185	BTS-1.8 Meg.	AF Screen
R114	4.7 Meg.	½	60B 8-475	BTS-4.7 Meg.	Phase Inv. Grid
R115	470KΩ	½	60B 8-474	BTS-470K	Phase Inv. Plate
R116	47KΩ	½	60B 8-473	BTS-47K	Decoupling
R117	470KΩ	½	60B 8-474	BTS-470K	Output Grid
R118	470KΩ	½	60B 8-474	BTS-470K	Output Grid
R119	470KΩ	½	60B 8-474	BTS-470K	Output Grid
R120	270Ω	2	60B 20-271	BW-2-270	Output Cathode
R121	1500Ω	5	61A 3-10	AB-1500	Filter (Wire Wound) See Note 10
R122	1700Ω	20	61A 3-9	DG-1750	Filter (Wire Wound)
R123	4.7 Meg.	½	60B 8-475	BTS-4.7 Meg.	AF Grid See Note 5
R124	470KΩ	½	60B 8-474	BTS-470K	AF Plate See Note 5
R125	47KΩ	½	60B 8-473	BTS-47K	AF Plate Decoupling See Note 5
R126	470KΩ	½	60B 8-474	BTS-470K	Output Grid See Note 5

ITEM No.	RESISTANCE	WATTS	ADMIRAL PART No.
R127	270Ω	2	60B 20-…

Note 1. Some models use 82…
Note 2. Models using chass…
Note 3. Models using chass…
Note 4. Early productions …
Note 5. Used only on power…
Note 6. Early productions …
Note 7. Early productions …
Note 8. Early productions …
Note 9. Early productions …
Note 10. Not used in chassi…
Note 11. Models using chass…

ITEM No.	RATING PRI.	SEC. 1	SEC. 2
T1	117VAC @ 1.9A	700VCT .20ADC; SEC. 4 6.3VAC @ 11.4A	820VCT .083ADC

TRA…

ITEM No.	DC RESISTANCE PRI.	SEC.	ADMIRAL PART No.
T2	51		94A17
T3	162Ω	920Ω	79A18-1
T4A	508Ω Tap @ 162Ω	SEC. 1 11Ω Tap. @ .6Ω; SEC. 2 0Ω	79C23
B			79C19-2
C			79C17-2
T5	660Ω	10Ω	79B20
T6A	14Ω		94B2-2
B	68Ω		
T7	1600Ω		69B35-1

▲▲ Drill new mounting holes…
Drill one new mounting h…

TRA…

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	DC RES. PRI.	DC RES. SEC.
T8A	10.5KΩ CT	3.6Ω	490Ω	.5Ω
B	5000Ω	3.6Ω	280Ω	.4Ω

ITEM No.	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCT… @ CUR… 1000…
L1	.200A	55Ω	2 Henr…
L2	.083A	142Ω	2.5Hen…

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.
L3	Ant. Trans. and RF Grid	0Ω	
L4	RF Plate, Mixer Grid and Osc.	0Ω	
L5	Fil. Choke	0Ω	
L6	Fil. Choke	0Ω	
L7	RF Choke	0Ω	
L8	1st Video IF	.1Ω	
L9	RF Choke	.8Ω	
L10	2nd Video IF and Sound Take-Off	.5Ω	.5Ω
L11	3rd Video IF	.5Ω	.5Ω
L12	4th Video IF	.5Ω	.5Ω
L13	Peaking	8.8Ω	
L14	4.5MC Trap	1Ω	
L15	Peaking	16Ω	
L16	Peaking	11Ω	
L17	1st Sound IF	.1Ω	
L18	2nd Sound IF	.2Ω	.2Ω
L19	Ratio Det. Trans.	.1Ω	.1Ω

IPTIONS (Continued)

CONT.)

IDENTIFICATION CODES
d Video IF Decoupling
d Video IF Cathode
d Video IF Decoupling
deo Det. Diode Load
deo Output Cathode
ltage Divider
cture Tube Cathode
deo Output Plate
deo Output Plate
nc. Coupling
C Amp. Grid
ltage Divider
ltage Divider
eeder
ries Focus Coil (Wire Wound)
cus Coil Shunt (Wire Wound)
t Sound IF Cathode See Note 8
t Sound IF Decoupling See Note 9
d Sound IF Grid
d Sound IF Cathode
lancing
lancing See Note 1
tio Det. Filament (Wire Wound)
tio Det. Diode Load
tio Det. Diode Load
-emphasis
olation
nc. Sep. Grid
nc. Sep. Plate
nc. Sep. Screen
nc. Phase Inv. Grid
nc. Phase Inv. Cathode
nc. Phase Inv. Plate
tegrator
tegrator
tegrator
rt. Osc. Grid See Note 4
rt. Osc. Plate
ltage Divider
ltage Divider
rt. Peaking
lter
rt. Output Grid
rt. Output Cathode
lter
riz. Sync. Disc. Load
riz. Sync. Disc. Load
riz. Sync. Disc. Load
riz. AFC Filter Network
C Network
C Network
edback Network
riz. Osc. Cathode
riz. Osc. Plate
riz. Osc. Grid
riz. Osc. Plate
riz. Hold Control Shunt
lter
rasitic Supp.
riz. Output Grid
riz. Output Cathode
rasitic Supp.
riz. Output Screen See Note 2
mper Filter (Wire Wound) See Note 3
Rect. Filament
Filter
nv. Grid
nv. Cathode (Wire Wound)
nv. Plate
c. Grid
c. Plate Decoupling
coupling
C Network
t IF Screen
ode Load
ode Filter
d FM IF Screen
d FM IF Decoupling
lancing
-emphasis
tio Det. Diode Load
tio Det. Diode Load
ne Compensation
olation
lot Lamp Shunt
Grid
Plate
Screen
ise Inv. Grid
ise Inv. Plate
coupling
put Grid
put Grid
put Grid
put Cathode
ter (Wire Wound) See Note 10
ter (Wire Wound)
Grid See Note 5
Plate See Note 5
Plate Decoupling See Note 5
put Grid See Note 5

RESISTORS (CONT.)

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	ADMIRAL PART No.	IRC PART No.	
R127	270Ω	2	60B 20-271	BW-2-270	Output Cathode See Note 5 and 11

Note 1. Some models use 820Ω resistor in this application.
Note 2. Models using chassis No. 20A1 use 8200Ω, 2 watt resistor in this application.
Note 3. Models using chassis No. 20A1 use 6300Ω, 50 watt resistor in this application.
Note 4. Early productions use 1 Meg. resistor in this application.
Note 5. Used only on power supply chassis for television only sets.
Note 6. Early productions used 10KΩ resistor in this application.
Note 7. Early productions used 12KΩ resistor in this application.
Note 8. Early productions used 1000Ω resistor in this application.
Note 9. Early productions used 47KΩ resistor in this application.
Note 10. Not used in chassis 21A1.
Note 11. Models using chassis 21A1 use 150Ω in this application.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	ADMIRAL PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC @ 1.9A	700VCT .20ADC SEC. 4 6.3VAC @ 11.4A	320VCT .083ADC	5VAC @ 3A	80B17	P-8160		TP-450

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING		REPLACEMENT DATA					NOTES
	DC RESISTANCE PRI.	DC RESISTANCE SEC.	ADMIRAL PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.		
T2	51		94A17					Hor. AFC Coil
T3	162Ω	920Ω	79A18-1	A-8111	A-3000 ‡‡	TB0-1 ‡‡		Vert.Block Osc.Trans.
T4A	508Ω Tap @ 162Ω	SEC. 1 11Ω Tap. @ .6Ω SEC. 2 0Ω	79C23	A-8117		TFB-1		Hor.Output Trans.for 20B1 chassis.
B			79C19-2					Hor.Output Trans.for 20A1.
C			79C17-2					Hor.Output Trans.for 21A1 chassis.
T5	660Ω	10Ω	79B20	A-8116	A-3035 ▲▲	TS0-4		Vert.Output Trans.
T6A	14Ω		94B2-2	DY-1				Hor.Deflection Coil
B	68Ω							Vert.Deflection Coil
T7	1600Ω		69B35-1					Focus Coil

▲▲ Drill new mounting holes.
‡‡ Drill one new mounting hole.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE PRI.	IMPEDANCE SEC.	DC RES. PRI.	DC RES. SEC.	ADMIRAL PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
T8A	10.5KΩ CT	3.6Ω	490Ω	.5Ω	79A16 **	A-3823	A-2936	R0-110	** Used in 6 tube power supply.
B	5000Ω	3.6Ω	280Ω	.4Ω	79A9 ††	A-3825	A-2902‡‡	R0-9	†† Used in 4 tube power supply. ‡‡ Drill one new mounting hole.

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	ADMIRAL PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
L1	.200A	55Ω	2 Henries	74A12	C-2325	C-2991	TR-4200	
L2	.083A	142Ω	2.8Henries	74A17	C-2303 ▲▲	C-2974 ▲▲	R-885 ▲▲	▲▲ Drill new mounting holes.

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	ADMIRAL PART No.	MEISSNER PART No.	
L3	Ant. Trans. and RF Grid	0Ω		98A 58		Add channel number as suffix to part number.
L4	RF Plate, Mixer Grid and Osc.	0Ω		98A 59		Add channel number as suffix to part number.
L5	Fil. Choke	0Ω		98A 45-13		
L6	Fil. Choke	0Ω		98A 45-13		
L7	RF Choke	0Ω		98A 45-68		
L8	1st Video IF	.1Ω		98A 45-69		
L9	RF Choke	.8Ω		73A 6-1		
L10	2nd Video IF and Sound Take-Off	.5Ω	.5Ω	72A 84		72A 83-1 in early production sets (See note 1)
L11	3rd Video IF	.5Ω	.5Ω	72A 83-2		72A 84 in early production sets (See note 1)
L12	4th Video IF	.5Ω	.5Ω	72A 83-1		
L13	Peaking	8.8Ω		73A 5-4		90 microhenries, wound on 33KΩ resistor.
L14	4.5MC Trap	1Ω		73A 4-1		7.3 microhenries.
L15	Peaking	16Ω		73A 5-1		250 microhenries, wound on 33KΩ resistor.
L16	Peaking	11Ω		73A 5-2		150 microhenries, wound on 1 Meg. resistor.
L17	1st Sound IF	.1Ω		72A 88-1		
L18	2nd Sound IF	.2Ω	.2Ω	72B 86-1		
L19	Ratio Det. Trans.	.1Ω	.1Ω	72B 87-1		

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF) CONT.

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA ADMIRAL PART No.	REPLACEMENT DATA MEISSNER PART No.	NOTES
L20	Hor. Linearity	38Ω		72B 20		
L21	Width Cont.	80Ω	.5Ω	94A 16		
L22	AM Loop Ant	1Ω		69C 100		Includes 2-20MMF trimmer condenser.
L23	FM Ant.	0Ω		69A 85		
L24	FM Osc.	0Ω		69A 87		
L25	AM Osc.	7.5Ω		69A 86		
L26	FM Peaking	18.5Ω		73A 5-3		Wound on 15KΩ resistor.
L27	FM 1st IF	.2Ω	.6Ω	72B 93		
L28	AM 1st IF	5.5Ω	2.5Ω	72B 92		
L29	FM 2nd IF	3Ω	0Ω	72B 76		
L30	AM 2nd IF	8.5Ω	8.5Ω	72B 94		
L31	Ratio Det.	2Ω	.2Ω	72B 39		
L32	Fil. Choke	0Ω		73A 2-4		
L33	Fil. Choke	0Ω				

Note 1. Early production sets are identified by a red dot near the 2nd Video IF Amp. (V4) on top of chassis.

SPEAKER

ITEM No.	RATINGS FIELD	RATINGS V. C. IMP.	REPLACEMENT DATA ADMIRAL PART No.	REPLACEMENT DATA JENSEN PART No.	REPLACEMENT DATA QUAM PART No.	INSTALLATION NOTES
SP1A	PM	3.6Ω	78B41	ST-120 MOD.P10-S##	10A6A	## Replace output transformer to match 6-8Ω voice coil.
B	PM		78B46			
C	PM		78B47			
D	PM		78B44-2			
E	PM		78B44-1			
	CONE DIA.	V. C. DIA.				
SP2A	9 3/4"	1"				
B	6"					
C	10"					
D	12"					
E	12"					

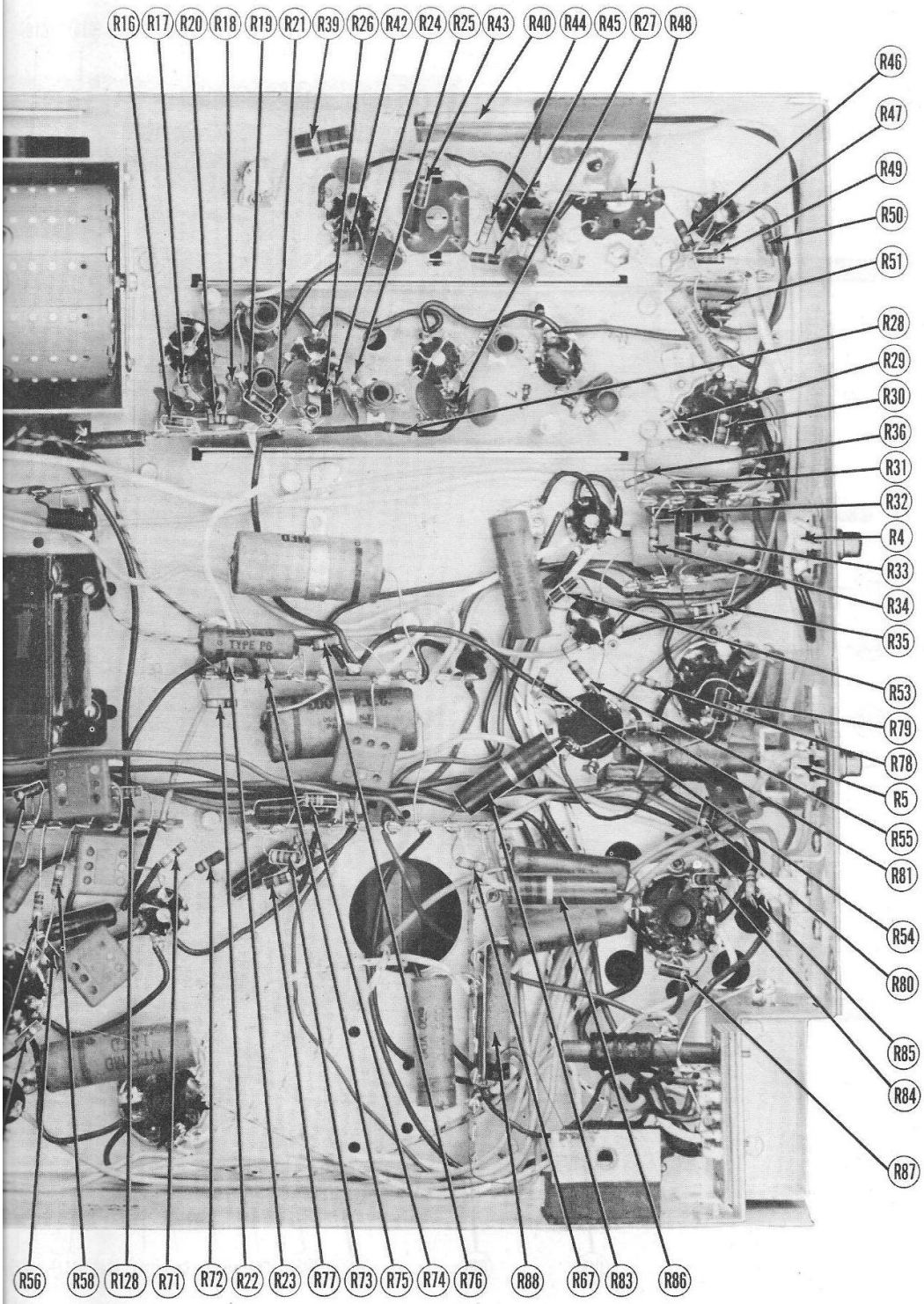
DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA ADMIRAL PART No.		NOTES
M1	Bayonet	6-8	.15	Brown	81A 1-8		Type #47
M2	Bayonet	6-8	.15	Brown	81A 1-8		Type #47
M3	Bayonet	6-8	.15	Brown	81A 1-8		Type #47

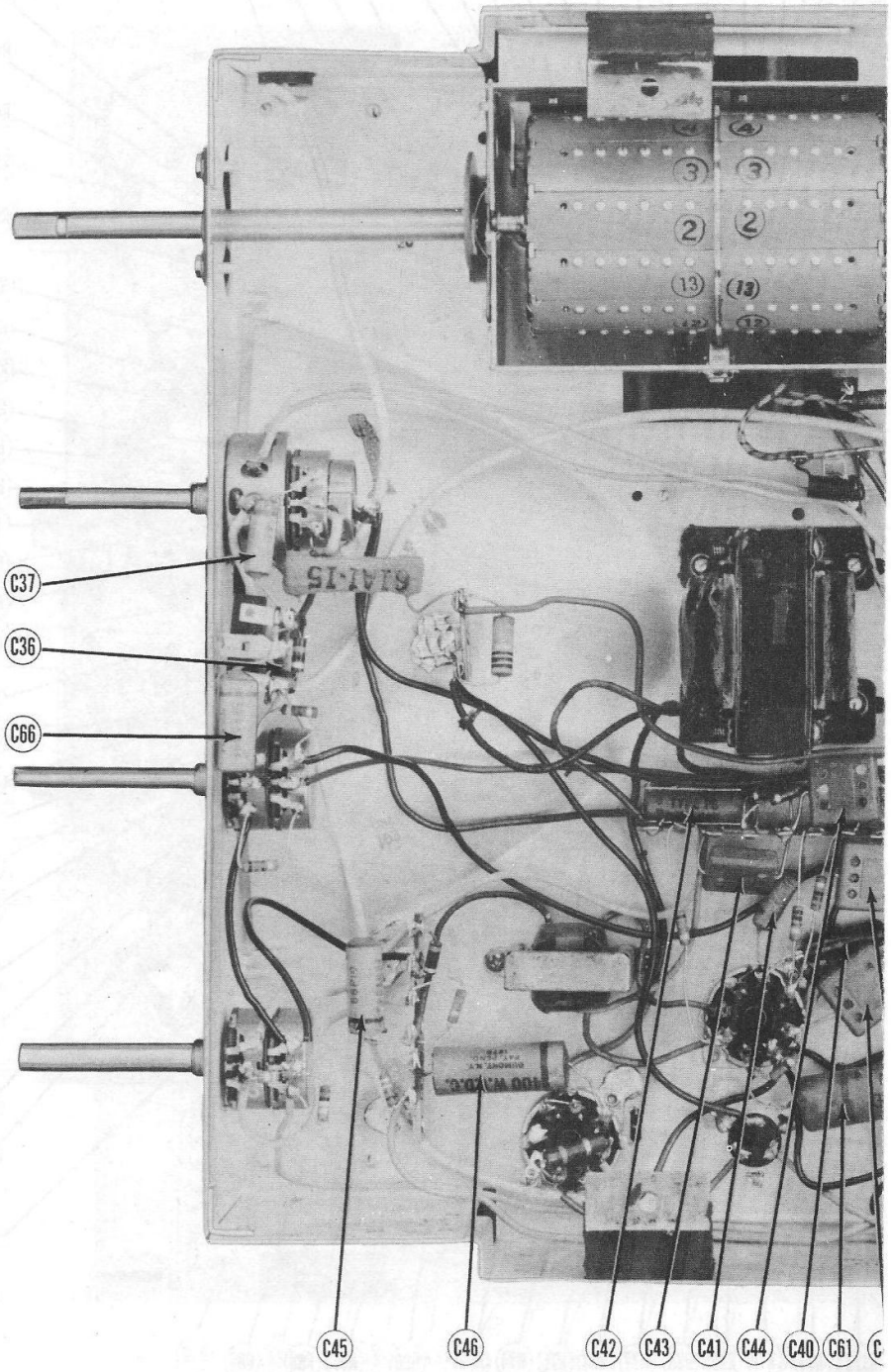
MISCELLANEOUS

ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M4	Tuner	94C18-1	Includes turret and shaft assy. (Less coils)
M5	Switch	76B 18	AM-FM
M6	Switch	76B 19	TV-Phono-Radio
M7	Fuse	84A 4-2	Type AGX .25A
M8	Tuning Cap.	68B 24	(14-517MMF, 14-130MMF) W/T
M9A	Ion Trap	94B 6	10BP4, 12LP4 and 12TP4 Picture Tube
B	Ion Trap	94A 15-2	12QP4 Picture Tube.
	Cabinet	34E 24-1	Model 24A11 (Plastic) Ebony
	Cabinet	34E 24-2	Model 24A12 (Plastic) Mahogany
	Cabinet *	35E 93-4	Model 24C15 (Wood) Walnut
	Cabinet *	35E 93-5	Model 24C16 (Wood) Mahogany
	Cabinet *	35E 93-6	Model 24C17 (Wood) Blonde
	Cabinet *	35E 89-1	Model 4H15A or B with rectangular picture window (Walnut)
	Cabinet *	35E 89-2	Model 4H16A or B with rectangular picture window (Mahogany)
	Cabinet *	35E 89-3	Model 4H17A or B with rectangular picture window (Blonde)
	Cabinet *	35E 89-4	Model 4H15A or B with rounded-end picture window (Walnut)
	Cabinet *	35E 89-5	Model 4H16A or B with rounded-end picture window (Mahogany)
	Cabinet *	35E 89-6	Model 4H17A or B with rounded-end picture window (Blonde)
	Cabinet *	35E 98-4	Model 4H145A or B with rounded-end picture window (Walnut)
	Cabinet *	35E 98-5	Model 4H146A or B with rounded-end picture window (Mahogany)
	Cabinet *	35E 98-6	Model 4H147A or B with rounded-end picture window (Blonde)
	Cabinet *	35E 92-10	Model 4H155A or B with rounded-end picture window (Walnut)
	Cabinet *	35E 92-11	Model 4H156A or B with rounded-end picture window (Mahogany)
	Cabinet *	35E 92-12	Model 4H157A or B with rounded- end picture window (Blonde)
	Cabinet *	35E 91-5	Model 4H165A or B with rounded-end picture window (Walnut)
	Cabinet *	35E 91-6	Model 4H166A or B with rounded-end picture window (Mahogany)
	Cabinet *	35E 91-7	Model 4H167A or B with rounded-end picture window (Blonde)
	Cabinet *	35E 103-1	Model 30F15 with wood television panel (Walnut)
	Cabinet *	35E 103-2	Model 30F16 with wood television panel (Mahogany)
	Cabinet *	35E 103-3	Model 30F17 with wood television panel (Blonde)
	Cabinet *	35E 103-4	Model 30F15 with all plastic television panel (Walnut)
	Cabinet *	35E 103-5	Model 30F16 with all plastic television panel (Mahogany)
	Cabinet *	35E 103-6	Model 30F17 with all plastic television panel (Walnut)
	Plug	88A 20-1	14 pin rectangular
	Plug	88A 20-9	9 pin, power

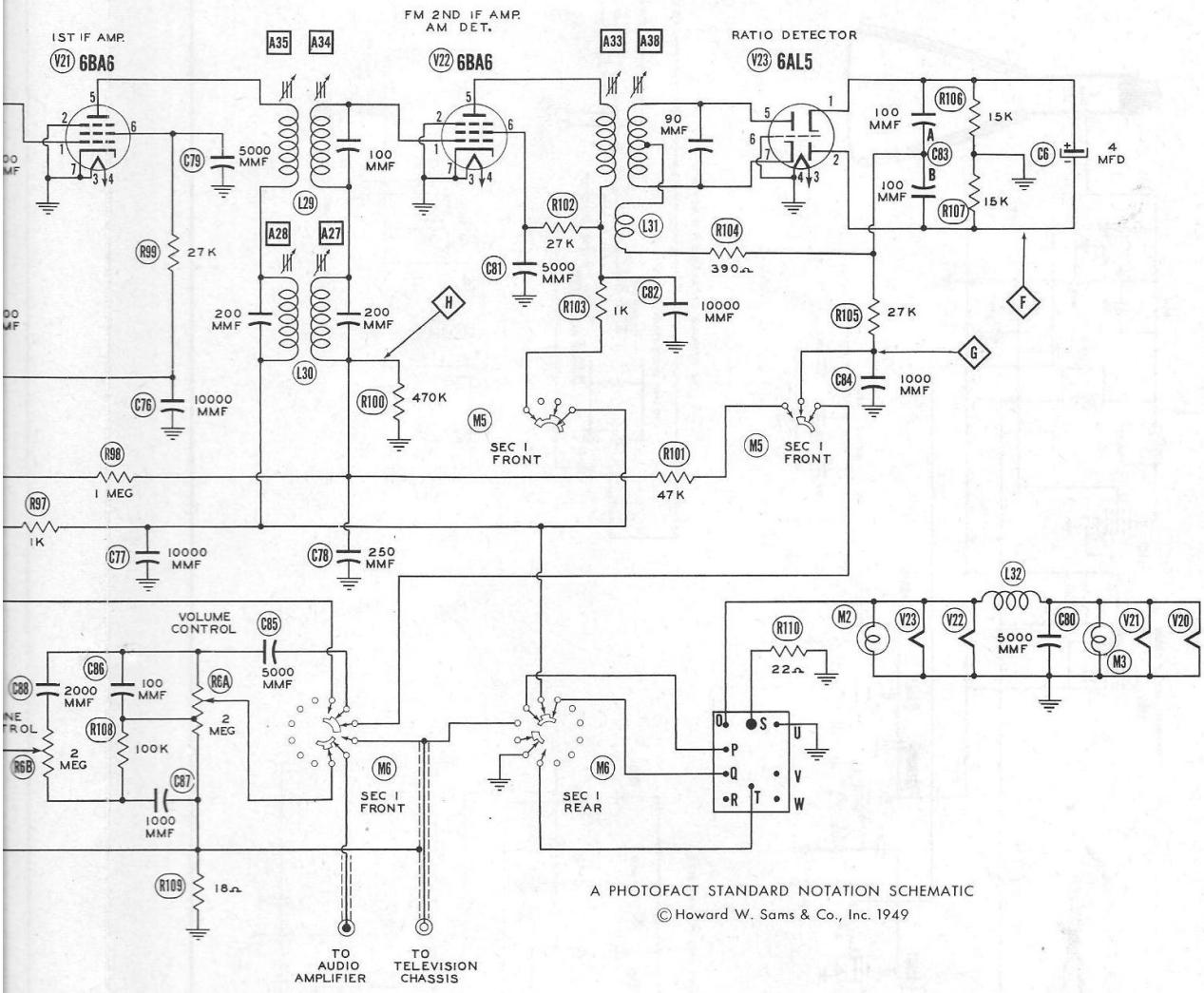
* Supplied only if old part cannot be repaired. When ordering, describe condition of old part in detail.



VIEW-RESISTOR IDENTIFICATION



CHASSIS BOTTOM VIEW-CA



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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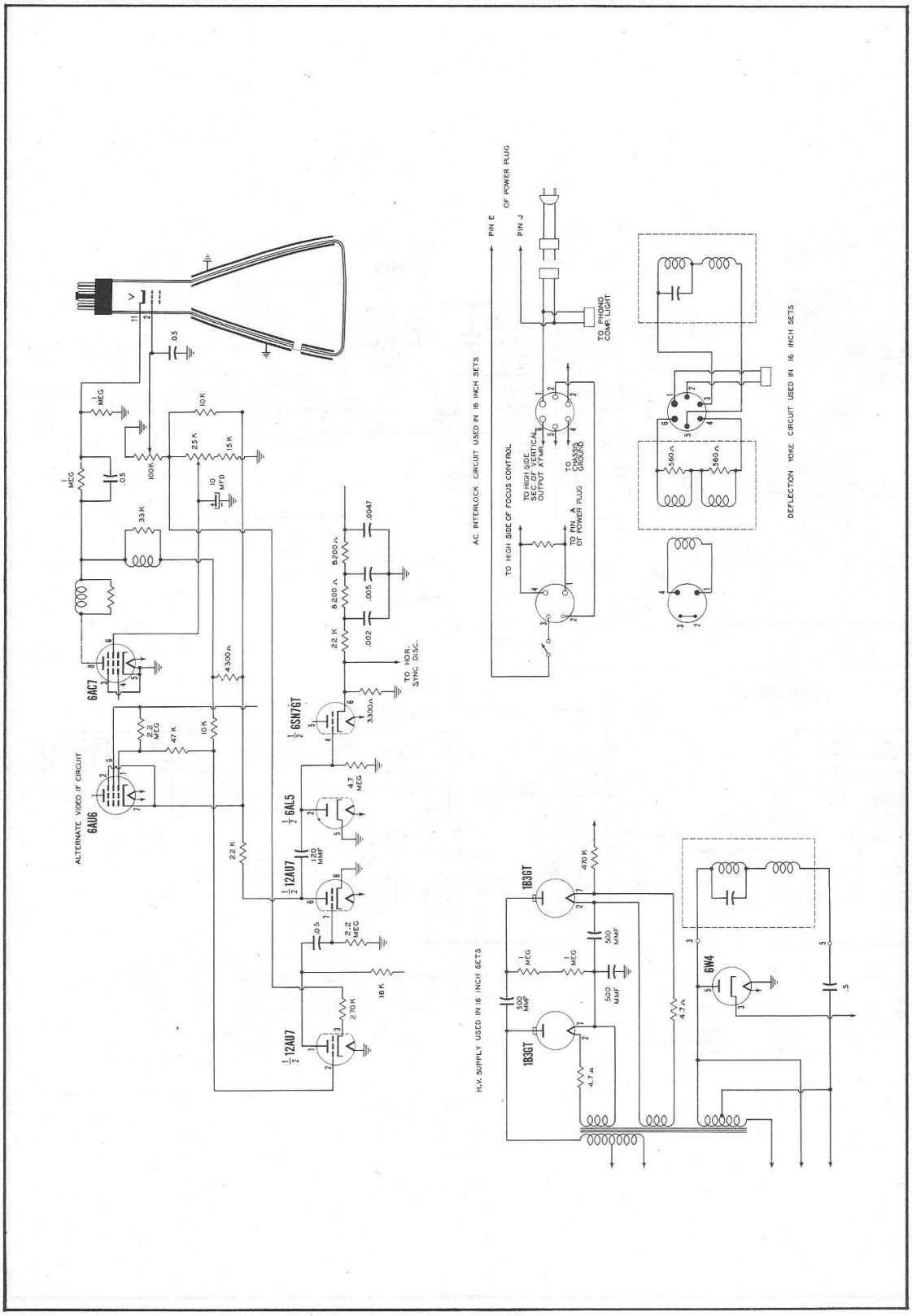

ALTERNATE VIDEO IF CIRCUIT
6AU6
6AC7
1/2 12AU7
1/2 12AU7
1/2 6AL5
1/2 6SN7GT
TO HOR. SYNC. DISC.
AC INTERLOCK CIRCUIT USED IN 16 INCH SETS
TO HIGH SIDE OF FOCUS CONTROL
TO HIGH SIDE SEC. OF VERTICAL OUTPUT XFMR.
TO PIN A OF POWER PLUG
TO CHASSIS GROUND
PIN E
PIN J
OF POWER PLUG
TO PHONO COMP. LIGHT
DEFLECTION YOKE CIRCUIT USED IN 16 INCH SETS
H.V. SUPPLY USED IN 16 INCH SETS
1B3GT
1B3GT
6W4

PRODUCTION CHANGES

CHANGE TO ELIMINATE INTERFERENCE FROM HARMONICS OF THE SOUND IF STRIP IN EARLY 20A1, 20B1 21A1 CHASSIS

In early production sets, the tenth harmonic of the sound IF channel can cause interference in the form of a herringbone pattern on channel 13. (Other harmonics may cause interference on channels 3, 6 and 9.)

A check, for early production sets, to determine whether the interference is actually due to harmonics of the sound IF, is made by removing the second sound IF tube (V10) and noting if the interference pattern disappears. If the interference pattern remains, the trouble is due to some other cause.

Circuit changes (made in later production sets) to eliminate this interference are given below. Changes in early production sets to eliminate this interference can be made in the following sequence:

1. Replace the wire lead between pin 6 of V10 (6AU6) tube and R40 (6000 ohms) resistor with a 1000 ohm, 1/2 watt resistor. The resistor lead to pin 6 of V10 tube must be as short as possible.

2. Connect a 1500mmfd. min. ceramic condenser from the junction of R40 resistor and terminal of R3B focus control to the ground lug next to the socket of V10 (6AU6) tube.

3. Mount a terminal board under the mounting nut of L19 (sound IF transformer) near the video IF shield. Locate the lead between pin 7 of V7 (6AC7) tube and pin 3 of V10 (6AU6) tube, remove this lead from pin 3 of V10 (6AU6) tube and connect it to the insulated lug on the terminal board. Connect a filament RF choke from the insulated lug on the terminal board to pin 3 of V10 (6AU6) tube.

4. Locate the ground lead wired from the socket of V11 (6AL5) tube to a terminal board, clip this lead at the terminal board and solder it to the chassis near to the socket of V11 (6AL5) tube. This connection must be as short as possible.

Material Required For The Above Change

1 1000 ohm, 1/2 watt resistor....60B8-102
1 1500 mmfd. min. cer. condenser...65A10-4
1 Terminal board, 1 insulated lug...10B1-43
1 Filament RF choke.....73A2-1

CHANGE TO INCREASE TV SOUND (AUDIO) LEVEL

The changes listed below were made in later production sets to increase the TV sound (audio) level.

a. Choke coil L7 (part #98A45-68) located in TV tuner 94C18-1, has been replaced with choke coil #98A45-72. TV tuners having new coil L7 (part #98A45-72) are coded with a blue dot located on top of the tuner chassis adjacent to IF coil L8. IMPORTANT: When replacing 98A45-68 coil with 98A45-72 coil, it will also be necessary to make changes "b" and "c" below.

b. 1st video IF grid resistor R16 changed from 10,000 ohms to 4700 ohms, 1/2 watt, part #60B8-472.

c. AGC voltage divider resistor R23 changed from 47,000 ohms to 27,000 ohms, 1/2 watt, part #60B8-273.

d. 2nd sound IF transformer L18 has been changed from part #72B86-1 to part #72B86-2. IMPORTANT: When replacing 72B86-1 IF transformer with 72B86-2 IF transformer, it will also be necessary to make change "e" below.

e. Damping Resistor R44 (27,000 ohms) removed from across secondary terminals of IF transformer L18; not required with 72B86-2 IF transformer.

CHANGE IN 10" (20A1) SETS FOR INCREASED SWEEP WIDTH

The changes listed below were made in later production 20A1 (10") sets for increased sweep width without loss of horizontal linearity.

a. Horizontal damping resistor R89, has been changed from 6,300 ohms, 50 watt to 7,500 ohms, 25 watt (part #61A12-2). IMPORTANT: When replacing 6,300 ohms resistor with 7,500 ohms, 25 watt resistor (part #61A12-2) it will also be necessary to make change "b" below.

b. Cathode by-pass C58 has been changed from .1mfd., 200 volts to .2mfd., 200 volts (part #64B5-29).

CENTERING OPERATING RANGE OF FOCUS CONTROL (R212B) IN 21A1 (16") SETS.

In later 21A1 (16") sets a 10,000 ohms, 2 watt resistor (part #60B20-103) has been wired across the terminals of focus coil T7; also, one terminal of C63 (500mmfd.) is grounded instead of connecting to pin 5 of V18. See schematic.

This change was made in order to shift the operating point of focus control R3B reasonably close to the center point of rotation.

CENTERING OPERATING POINT OF VERTICAL HOLD CONTROL (R1B)

Grid resistor R62 of V13B (6SN7GT) vertical oscillator is generally 1.2 meg., 1/2 watt, (part #60B8-125). However, when vertical hold control R1B will not operate reasonably close to the center of its range, resistance value of R62 may be 1 meg., 1/2 watt (part #60B8-105) or 1.5 meg., 1/2 watt (part #60B8-155).

R41 WATTAGE RATING INCREASE IN 16" (21A1) SETS

In early 21A1 (16") sets, R41 focus coil shunt resistor was 3000 ohms, 5 watts. In later 21A1 (16") sets R41 was changed to 3000 ohms, 7.5 watts (61A1-16). This change was made to allow for greater heat disipation under certain operating conditions.

DISASSEMBLY INSTRUCTIONS

1. Remove four push-on type knobs from TV controls.
2. Remove 6 screws holding metal cover over rear of TV compartment.
3. Remove 7 screws holding fiber cover over rear of phono compartment.
4. Remove one 1/4" hex head bolt holding clamp over plug on right rear of TV chassis.
5. Remove one 1/4" hex head bolt holding ground strap to right rear corner of TV chassis.
6. Remove plug from right rear of TV chassis.
7. Remove TV audio bayonet plug from socket in lead connecting TV chassis to AM-FM chassis.
8. Remove three 7/16" hex head bolts holding TV chassis to cabinet.
9. Remove TV chassis.
10. Remove plug from left rear of power supply chassis.
11. Remove phono motor power plug under record changer and feed wires back to power supply chassis.
12. Remove AM-FM chassis audio plug from front left corner of power supply chassis.
13. Remove panel lamp from bottom front center of cabinet.
14. Remove four screws holding power supply chassis to cabinet and slide chassis approximately four inches to rear.
15. Remove four 11/32" hex nuts holding speaker to cabinet.
16. Remove speaker and power supply chassis together. (If so desired, speaker wires may be unsoldered at speaker enabling speaker and power supply chassis to be removed separately.)
17. Remove 3 push-on type knobs from AM-FM chassis controls.
18. Remove 3 screws holding record changer to mounting rack.
19. Lift record changer and remove phono audio plug from AM-FM chassis.
20. Remove record changer.
21. Remove FM antenna from screw terminals on rear of cabinet.
22. Remove ground strap from left FM antenna terminal.
23. Remove 2 phillips head screws holding antenna terminal strip to rear of cabinet.
24. Remove two 5/16" hex head bolts holding loop antenna to rear of record changer rack. (Note: Wooden spacers are between loop and rack).
25. Unsolder loop antenna leads at loop.
26. Remove loop antenna.
27. Remove five screws holding AM-FM chassis to mounting.
28. Remove AM-FM chassis.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	-.4VDC	0V	6.3VAC	0V	110VDC	110VDC	0V		
V 2	6J6	95VDC	75VDC	6.3VAC	0V	-1.7VDC	§-4.9VDC	0V		
V 3	6AU6	-.3VDC	0V	6.3VAC	0V	130VDC	130VDC	.5VDC		
V 4	6AU6	-.4VDC	0V	6.3VAC	0V	130VDC	130VDC	.5VDC		
V 5	6AU6	0V	0V	6.3VAC	0V	132VDC	132VDC	1.3VDC		
V 6	6AL5	0V	0V	6.3VAC	0V	0V	0V	-.4VDC		
V 7	6AC7	0V	0V	0V	-.5VDC	.3VDC	62VDC	6.3VAC	120VDC	
V 8	6AU6	◓-6.8VDC	0V	0V	6.3VAC	◓-140VDC	◓115VDC	◓0V		
V 9	6AU6	0V	0V	6.3VAC	0V	75VDC	75VDC	.8VDC		
V 10	6AU6	0V	0V	6.3VAC	0V	155VDC	155VDC	2.2VDC		
V 11	6AL5	.1VDC	.1VDC	6.3VAC	0V	.1VDC	0V	0V		
V 12	6AU6	-2.2VDC	0V	6.3VAC	0V	145VDC	57VDC	0V		
V 13	6SN7GT	-87VDC	100VDC 310VDC	0V	0V	130VDC	6VDC	6.3VAC	0V	
V 14	6K6GT	0V	0V	280VDC	280VDC	0V	.1VDC 40VDC	6.3VAC	31VDC 55VDC	
V 15	6AL5	.4VDC	.4VDC	0V	6.3VAC	4VDC	0V	-2.4VDC		
V 16	6SN7GT	.2VDC	225VDC	10VDC	-1.9VDC	80VDC	10VDC	6.3VAC	0V	
V 17	6BG6G	235VDC	6.3VAC	6.8VDC	0V	-.1VDC	0V	0V	235VDC	TOP CAP *
V 18	6W4	0V	0V	415VDC	0V	330VDC	0V	6.3VAC	0V	
V 19	1B3GT	* DO NOT MEASURE								
V20A	12AT7	200VDC	§-.5VDC	0V	0V	0V	210VDC	-.3VDC	3.2VDC	6.3VAC
‡ V20B	12AT7	200VDC	§-.8VDC	0V	0V	0V	210VDC	0V	4.8VDC	6.3VAC ‡
V21	6BA6	-.6VDC	0V	0V	6.3VAC	250VDC	100VDC	0V		
V22A	6BA6	-.4VDC	0V	0V	6.3VAC	0V	0V	0V		
‡ V22B	6BA6	-.3VDC	0V	0V	6.3VAC	225VDC	90VDC	0V		‡
‡ V23	6AL5	1.5VDC	-.4VDC	6.3VAC	0V	0V	0V	0V		‡
V24A	6SJ7GT	0V	0V	0V	-.8VDC	0V	15VDC	6.3VAC	20VDC	
V24B	6SQ7	0V	-.8VDC	0V	0V	0V	87VDC	6.3VAC	0V	
V25	6SQ7GT	0V	-.8VDC	0V	0V	0V	65VDC	6.3VAC	0V	
V26	6K6GT	0V	0V	185VDC	187VDC	0V	0V	6.3VAC	12.5VDC	
V27A	6K6GT	0V	0V	185VDC	187VDC	0V	0V	6.3VAC	12.5VDC	
V27B	6V6GT	0V	0V	250VDC	260VDC	0V	0V	6.3VAC	12.5VDC	
V28	5U4G	0V	350VDC	0V	300VAC	0V	300VAC	0V	350VDC	
V29	6X5GT	0V	0V	155VAC	0V	155VAC	0V	6.3VAC	155VDC	
V30	10LP4	0V	0V	PIN 10 350VDC	PIN 11 57VDC	PIN 12 6.3VAC				

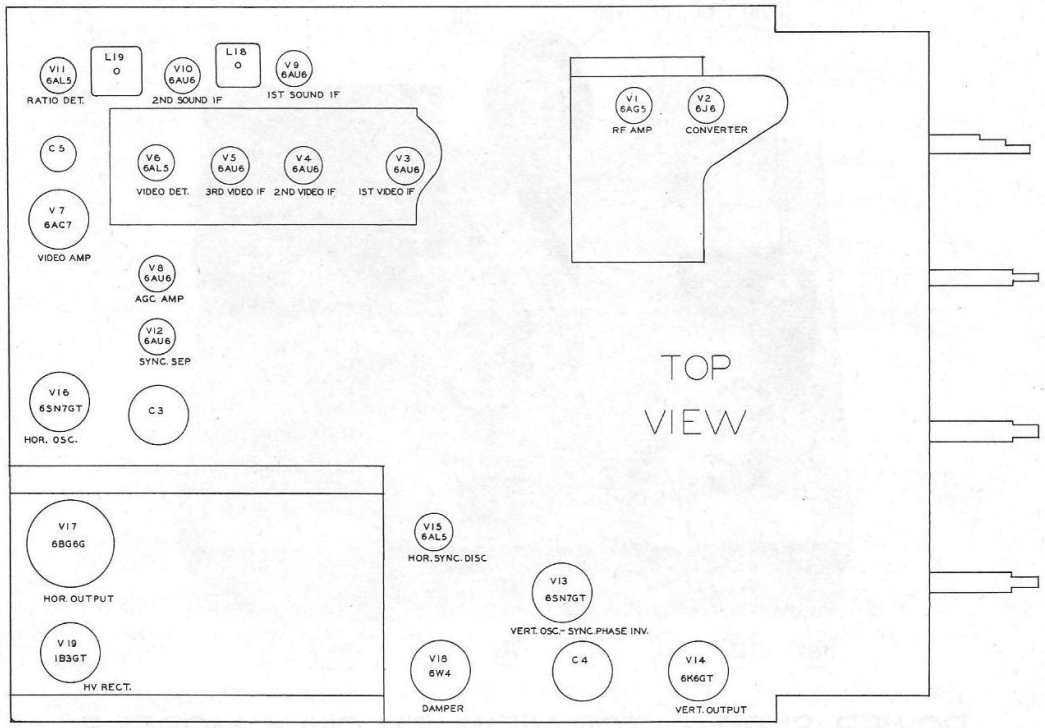
§ Taken with vacuum tube voltmeter.
‡ Taken in FM position.
◓ Measured from pin 7 of V8.
* Do not measure.

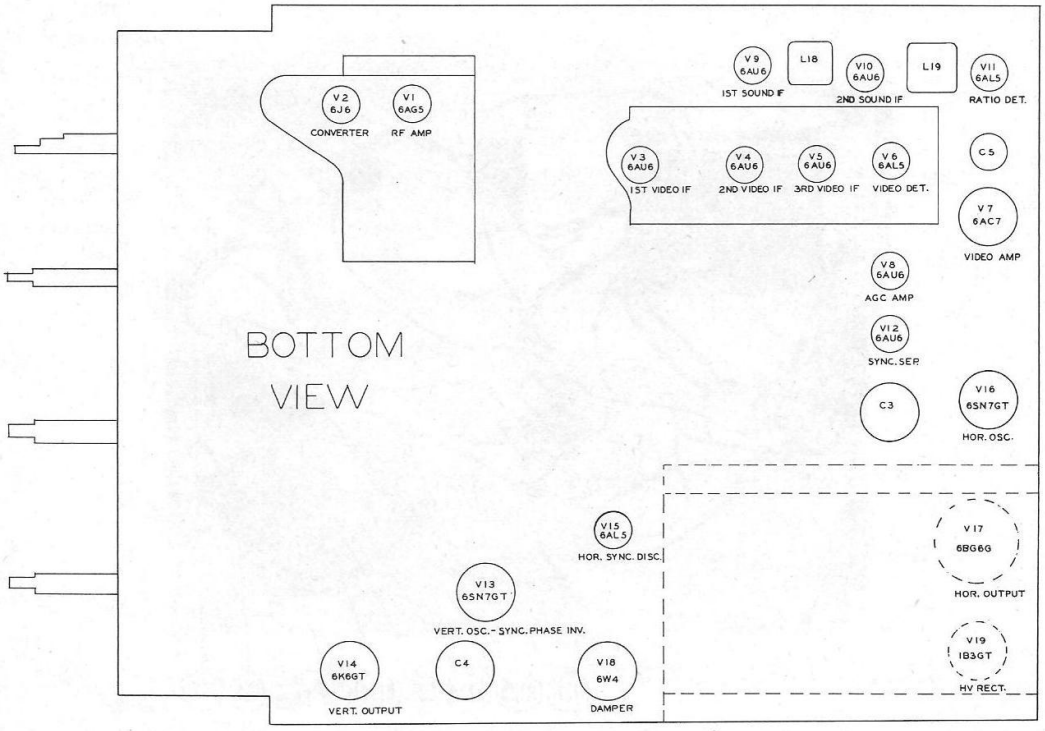
RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	200KΩ	0Ω	.1Ω	0Ω	†2.5KΩ	†2.5KΩ	0Ω		
V 2	6J6	†5KΩ	†15KΩ	.1Ω	0Ω	220KΩ	10KΩ	0Ω		
V 3	6AU6	110KΩ	0Ω	.1Ω	0Ω	†1000Ω	†1000Ω	39Ω		
V 4	6AU6	100KΩ	0Ω	.1Ω	0Ω	†1000Ω	†1000Ω	39Ω		
V 5	6AU6	0Ω	0Ω	.1Ω	0Ω	†1000Ω	†1000Ω	100Ω		
V 6	6AL5	0Ω	0Ω	.1Ω	0Ω	0Ω	0Ω	4.7KΩ		
V 7	6AC7	0Ω	0Ω	0Ω	4.7KΩ	68Ω	†20KΩ	.1Ω	†5KΩ	
V 8	6AU6	†50KΩ	†140Ω	0Ω	.1Ω	250KΩ	#30KΩ	†140Ω		
V 9	6AU6	0Ω	0Ω	.1Ω	0Ω	#20KΩ	#20KΩ	150Ω		
V 10	6AU6	0Ω	0Ω	.1Ω	0Ω	#6KΩ	#6KΩ	330Ω		
V 11	6AL5	Inf.	Inf.	.1Ω	0Ω	30KΩ	0Ω	560Ω		
V 12	6AU6	2.2 Meg.	0Ω	.1Ω	0Ω	†8.2KΩ	†100KΩ	0Ω		
V 13	6SN7GT	2.5 Meg.	#2 Meg. #300KΩ	0Ω	1 Meg.	†6.5KΩ	3.3KΩ	.1Ω	0Ω	
V 14	6K6GT	Inf.	0Ω	#2.5KΩ	#2.5KΩ	2.2 Meg.	4.5KΩ 7Ω	.1Ω	6KΩ 1.8KΩ	
V 15	6AL5	18KΩ	18KΩ	0Ω	.1Ω	4.8 Meg.	0Ω	4.8 Meg.		
V 16	6SN7GT	5 Meg.	#30KΩ	1.5KΩ	85KΩ	#300KΩ	1.5KΩ	.1Ω	0Ω	
V 17	6BG6G	#10KΩ	.1Ω	82Ω	Inf.	1 Meg.	19Ω	0Ω	#10KΩ	TOP CAP #6KΩ
V 18	6W4	Inf.	Inf.	#6KΩ	Inf.	#75Ω	Inf.	.1Ω	0Ω	
V 19	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP #6KΩ
V20A	12AT7	#3KΩ	22KΩ	0Ω	0Ω	0Ω	#3KΩ	3 Meg.	390Ω	.1Ω
‡ V20B	12AT7	#3KΩ	22KΩ	0Ω	0Ω	0Ω	#3KΩ	0Ω	390Ω	.1Ω ‡
V21	6BA6	1.5 Meg.	0Ω	0Ω	.1Ω	#1.5KΩ	#30KΩ	0Ω		
V22A	6BA6	470KΩ	0Ω	0Ω	.1Ω	Inf.	Inf.	0Ω		
‡ V22B	6BA6	470KΩ	0Ω	0Ω	.1Ω	#2.5KΩ	#30KΩ	0Ω		‡
‡ V23	6AL5	15KΩ	15KΩ	.1Ω	0Ω	Inf.	0Ω	Inf.		‡
V24A	6SJ7GT	0Ω	0Ω	0Ω	4.7 Meg.	0Ω	#1.8Meg.	.1Ω	#500KΩ	
V24B	6SQ7	0Ω	4.7 Meg.	0Ω	0Ω	0Ω	#500KΩ	.1Ω	0Ω	
V25	6SQ7GT	0Ω	4.7 Meg.	0Ω	Inf.	Inf.	#500KΩ	.1Ω	0Ω	
V26	6K6GT	Inf.	0Ω	#1.2KΩ	#1000Ω	1 Meg.	0Ω	.1Ω	270Ω	
V27A	6K6GT	Inf.	0Ω	#1.2KΩ	#1000Ω	1 Meg.	0Ω	.1Ω	270Ω	
V27B	6V6GT	Inf.	0Ω	#2KΩ	#2KΩ	470KΩ	Inf.	.1Ω	270Ω	
V28	5U4G	Inf.	20KΩ	Inf.	44Ω	Inf.	42Ω	Inf.	20KΩ	
V29	6X5GT	Inf.	0Ω	52Ω	Inf.	54Ω	Inf.	.1Ω	35KΩ	
V30	10LP4	0Ω	20Ω	PIN 10 #60Ω	PIN 11 500KΩ	PIN 12 .1Ω				

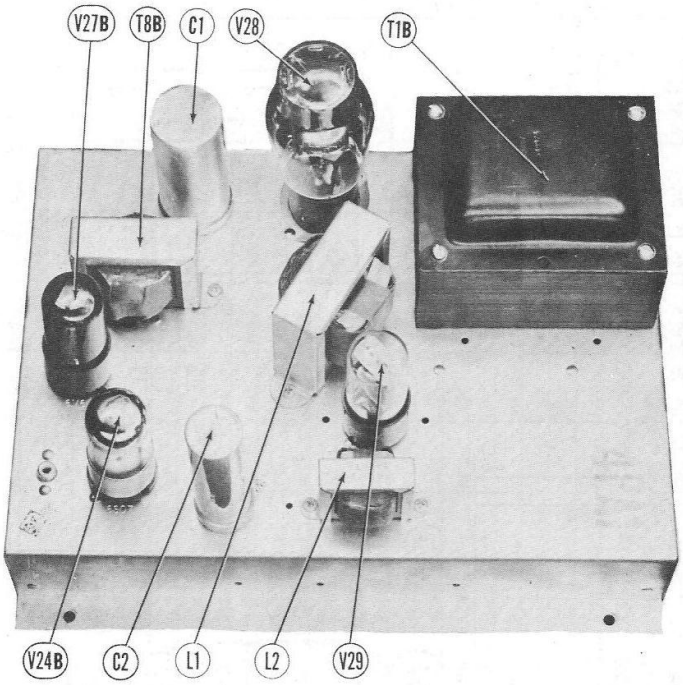
† Measured from pin 8 of V29.
# Measured from pin 8 of V28.
‡ Taken in FM position.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.

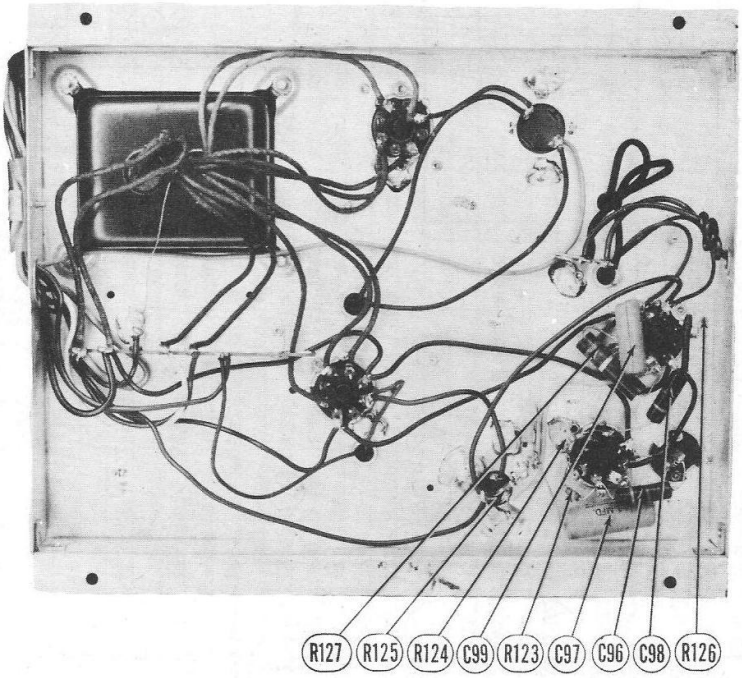




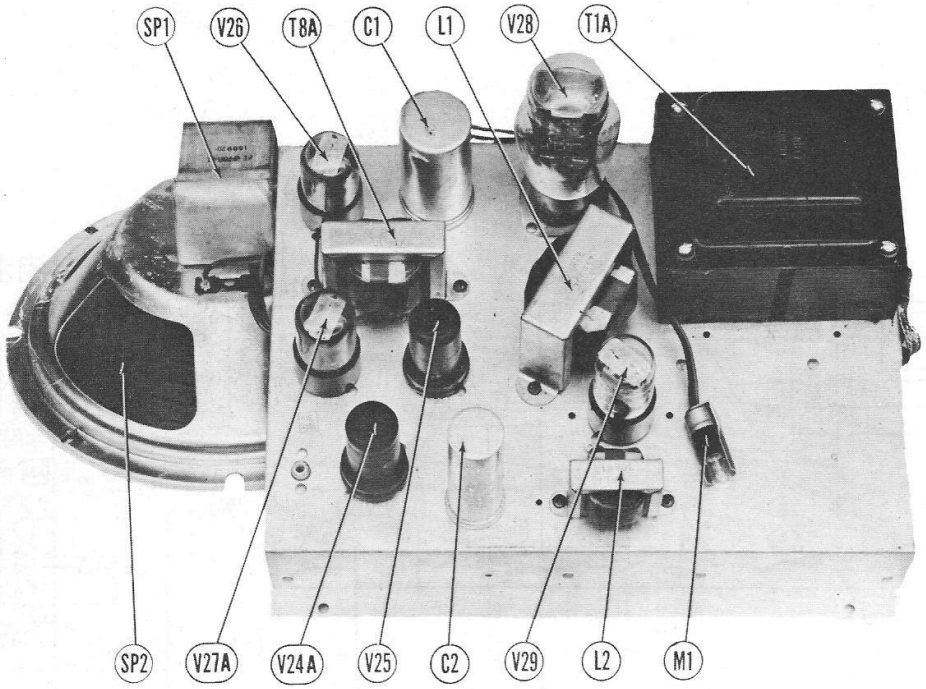
TUBE PLACEMENT CHART



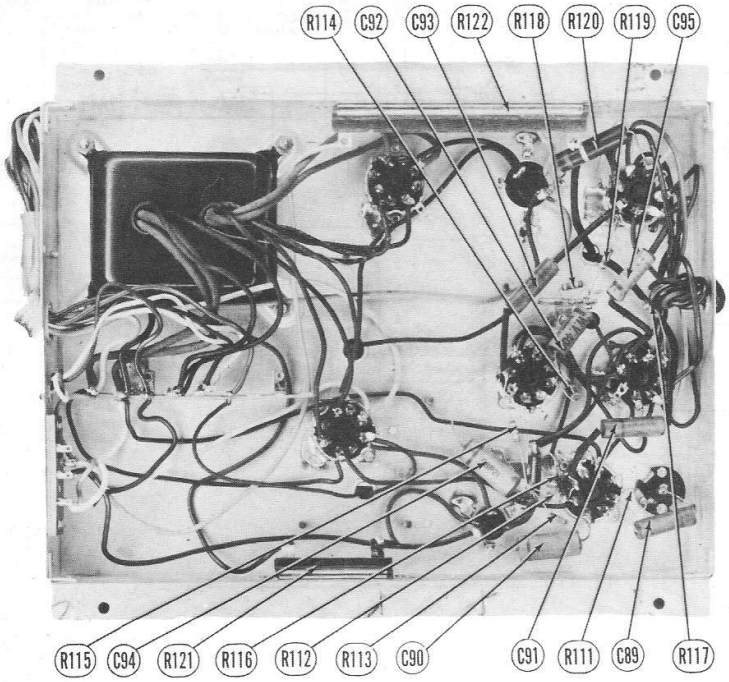
POWER SUPPLY-TOP VIEW-TV ONLY MODELS



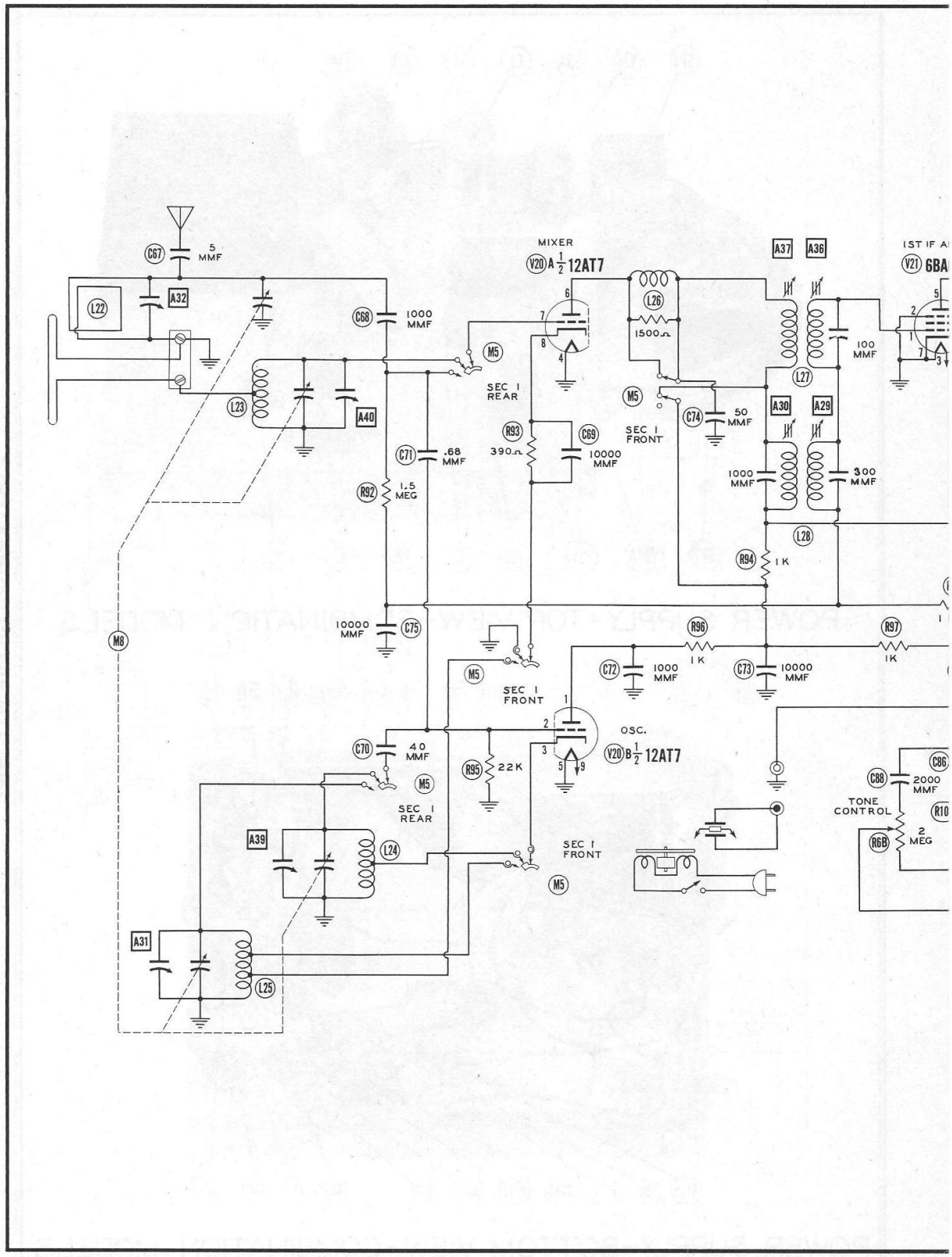
POWER SUPPLY-BOTTOM VIEW-TV ONLY MODELS



POWER SUPPLY-TOP VIEW-COMBINATION MODELS



POWER SUPPLY-BOTTOM VIEW-COMBINATION MODELS


C67
5 MMF
A32
L22
C68
1000 MMF
L23
A40
C71
.68 MMF
R92
1.5 MEG
M8
10000 MMF
C75
MIXER
V20 A 1/2 12AT7
M5
SEC I REAR
R93
390Ω
C69
10000 MMF
L26
1500Ω
SEC I FRONT
C74
50 MMF
A37
A36
L27
100 MMF
A30
A29
1000 MMF
300 MMF
L28
R94
1 K
R96
1 K
R97
1K
C72
1000 MMF
C73
10000 MMF
OSC.
V20 B 1/2 12AT7
C70
40 MMF
R95
22K
A39
L24
A31
L25
C68
2000 MMF
TONE CONTROL
R68
2 MEG
V21
6BA