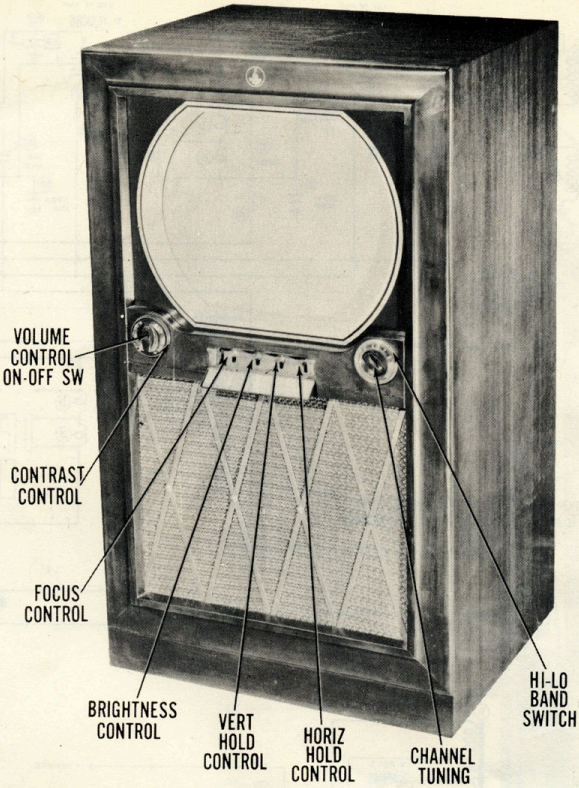
PHOTOFACT* Folder

*TRADE MARK

EMERSON MODELS 661B, 667B, 668B, 674B, 677B, 678B, 684B, 685B



EMERSON MODELS 661B, 667B, 668B, 674B, 677B, 678B, 684B, 685B

EMERSON MODEL 668B

TRADE NAME	Emerson, Models 661B, 667B, 668B, 674B, 677B, 678B, 684B, 685B (Ch. 120134B, G, H)
MANUFACTURER	Emerson Radio & Phono Corp., 111 Eighth Ave., New York, N. Y.
TYPE SET	Television Receiver
TUBES	Twenty-three
POWER SUPPLY	110-120 Volts AC-60Cycle — RATING 1.82 Amp. @ 117 Volts AC
TUNING RANGE—CHANNELS	2 thru 13

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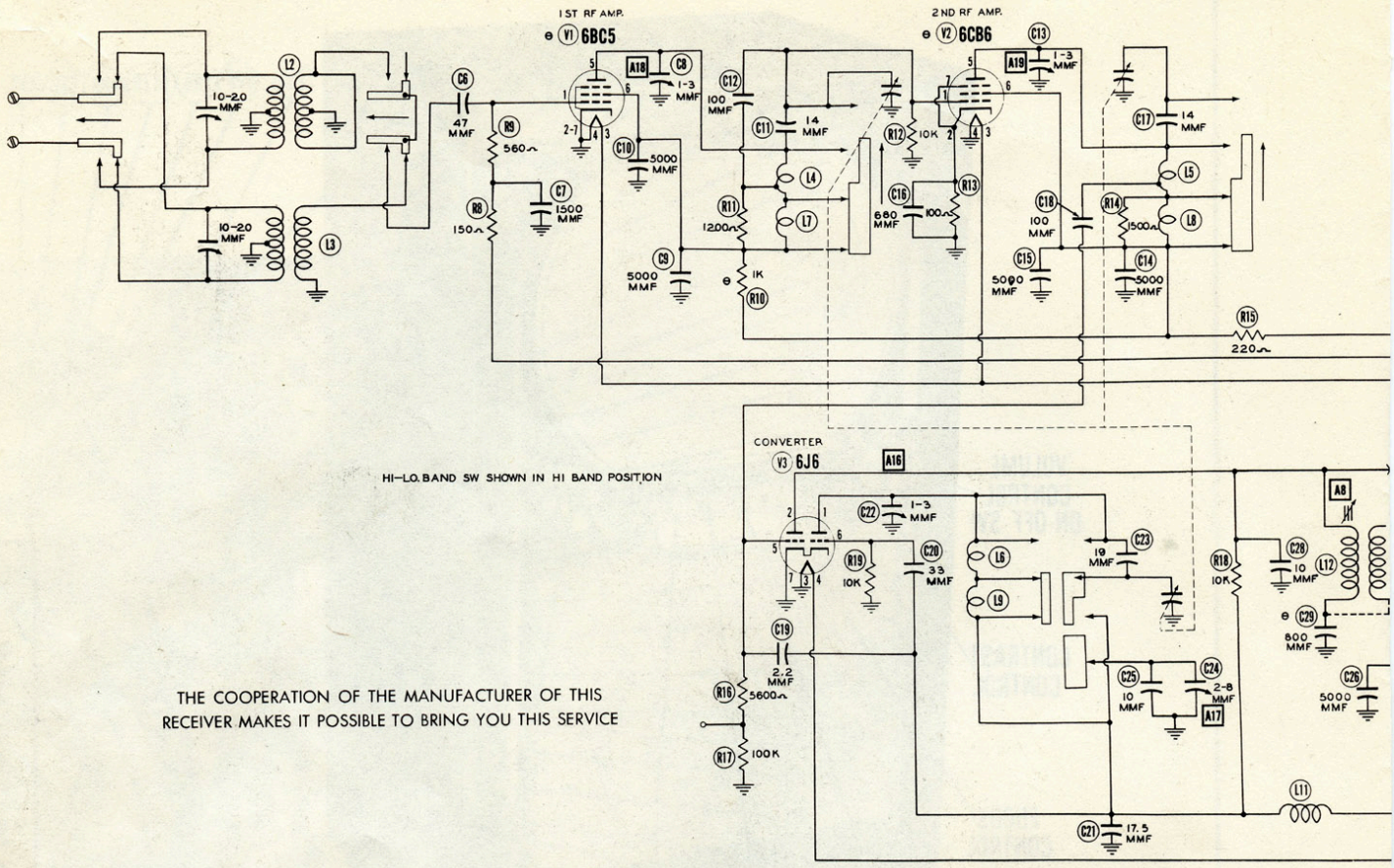
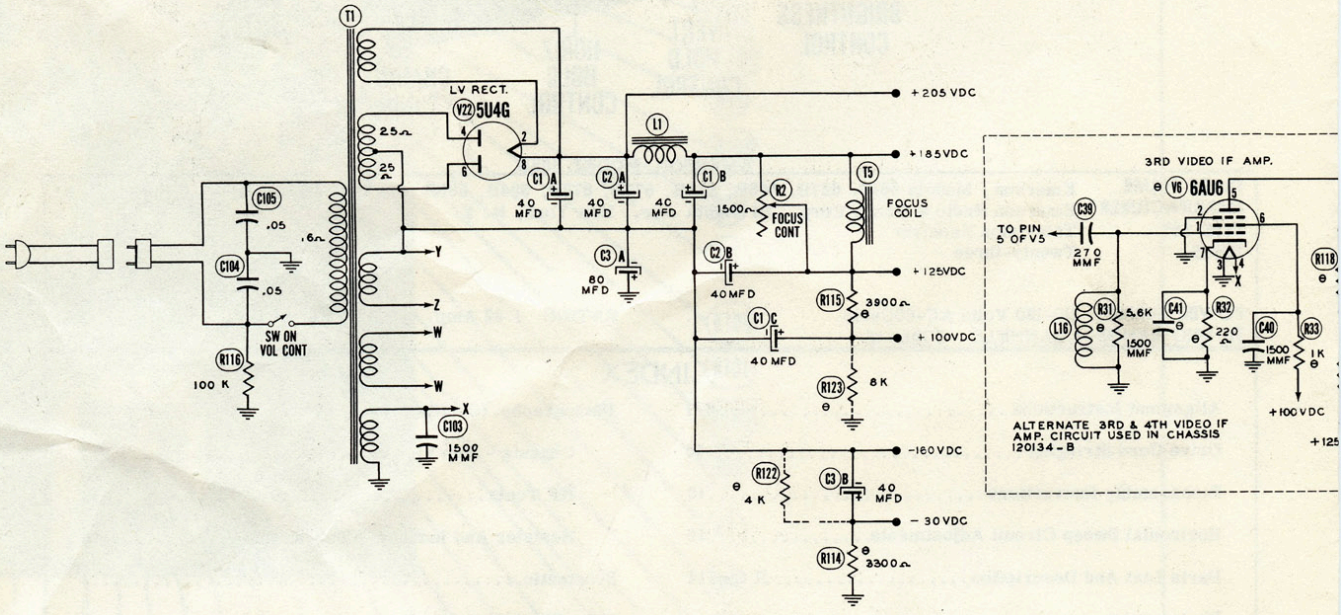
"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1951 by Howard W. Sams & Co., Inc., Indianapolis, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America



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



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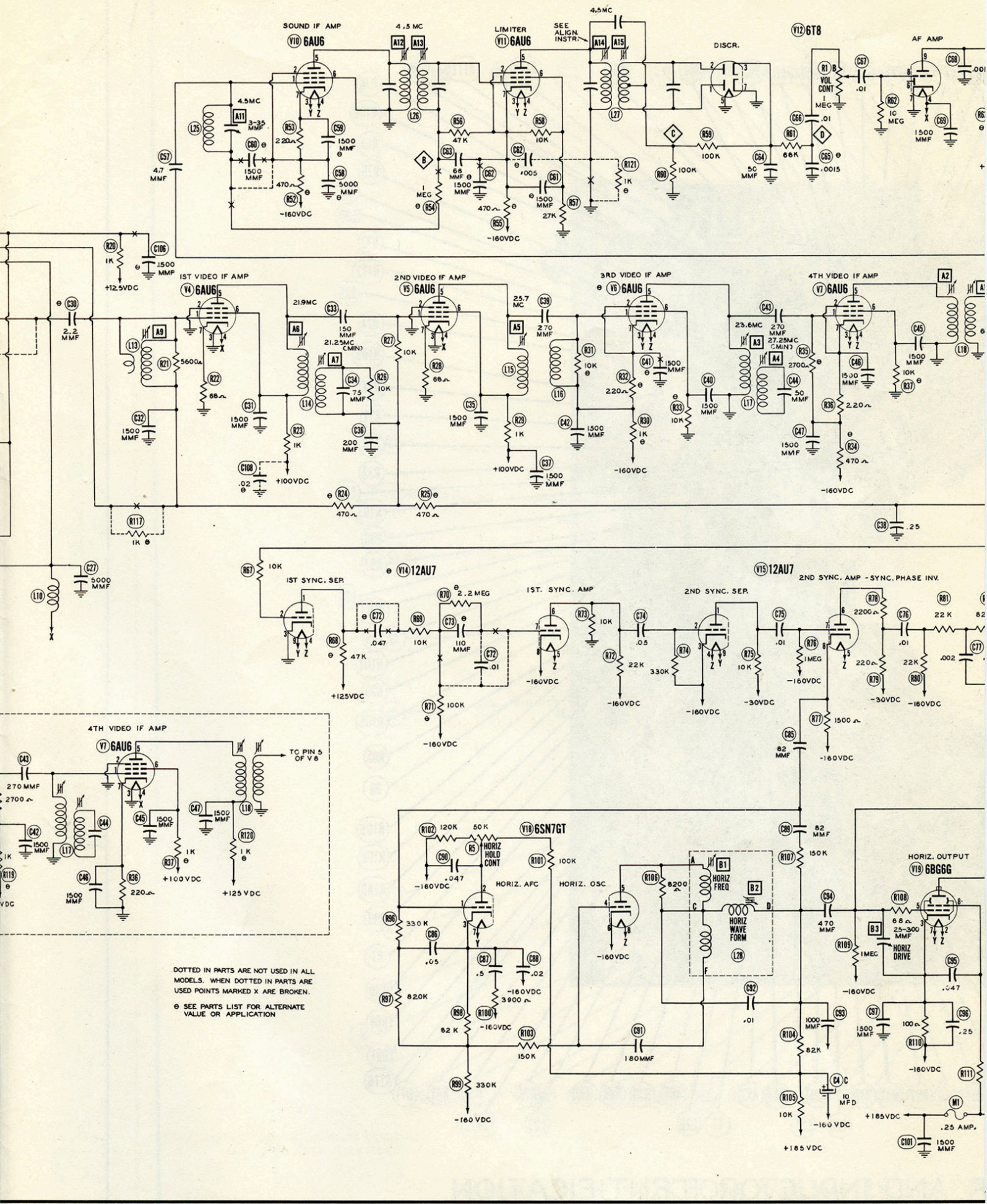
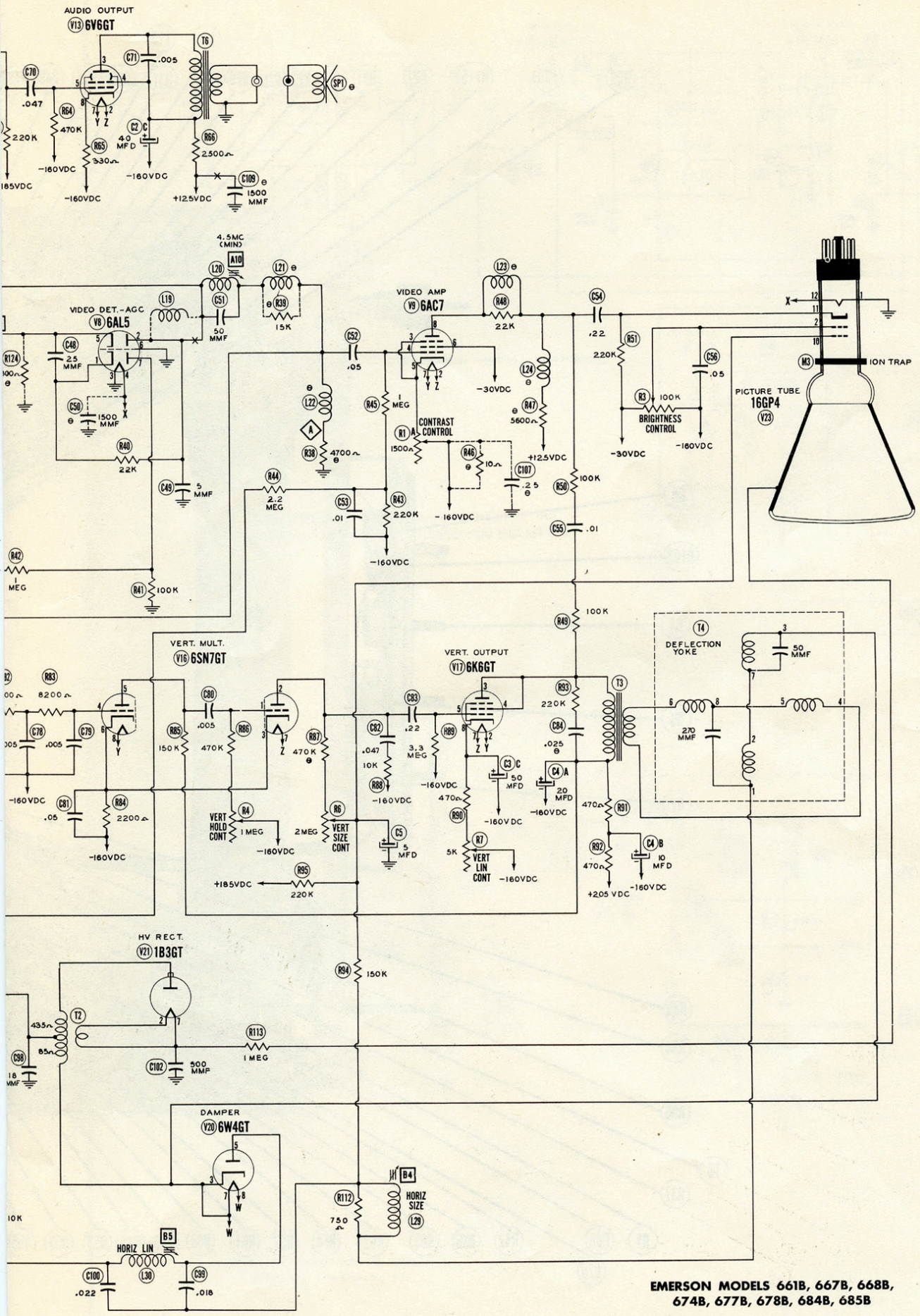
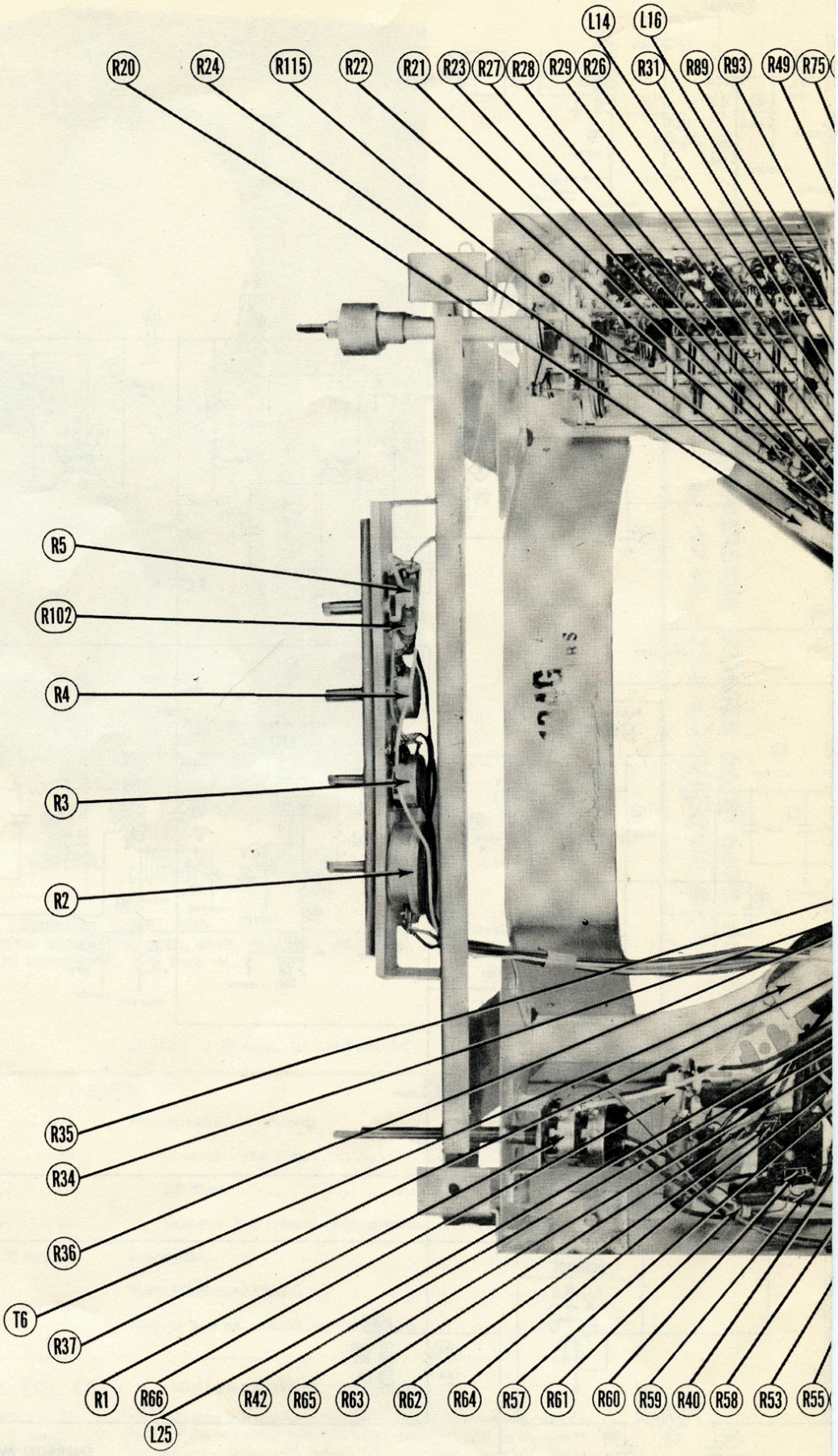
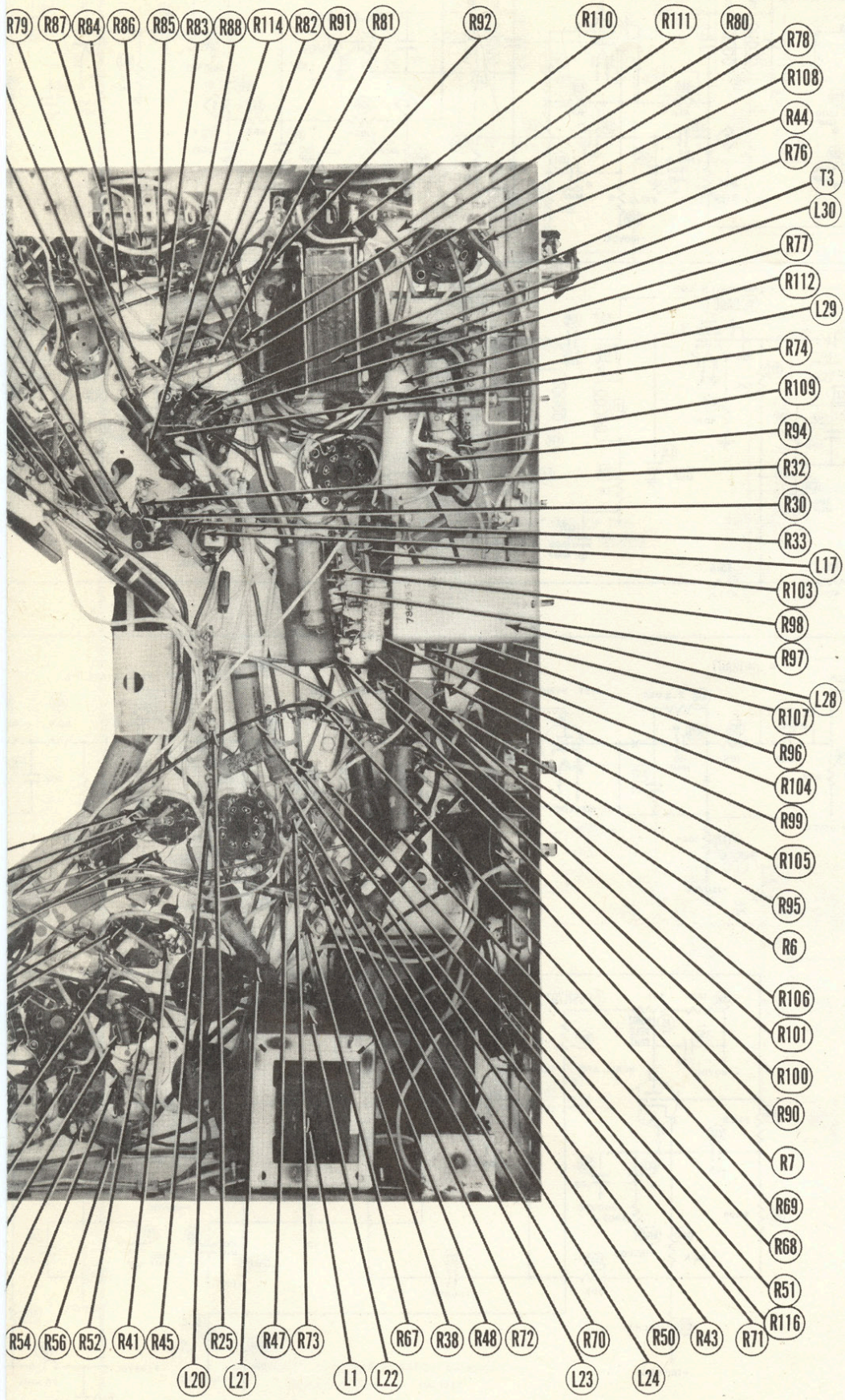

SOUND IF AMP
V10 6AU6
4.5 MC
LIMITER
V11 6AU6
SEE ALIGN. INSTR.
DISCR.
V12 6T8
AF AMP
VOL CONT
1 MEG
1 MEG
10 MEG
1500 MMF
-160VDC
+12.5VDC
1ST VIDEO IF AMP
V4 6AU6
21.9MC
2ND VIDEO IF AMP
V5 6AU6
25.7 MC
3RD VIDEO IF AMP
V6 6AU6
23.6MC
27.25MC (MIND)
4TH VIDEO IF AMP
V7 6AU6
21.25MC (MIND)
+100VDC
1ST SYNC. SEP.
V14 12AU7
1ST. SYNC. AMP
2ND SYNC. SEP.
V15 12AU7
2ND SYNC. AMP - SYNC. PHASE INV.
+125VDC
TO PIN 5 OF V8
V18 6SN7GT
HORIZ HOLD CONT
HORIZ. AFC
HORIZ. OSC
HORIZ FREQ
HORIZ WAVE FORM
HORIZ. OUTPUT
V19 6BG6G
HORIZ DRIVE
+185VDC
.25 AMP.
DOTTED IN PARTS ARE NOT USED IN ALL MODELS. WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN.
⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION



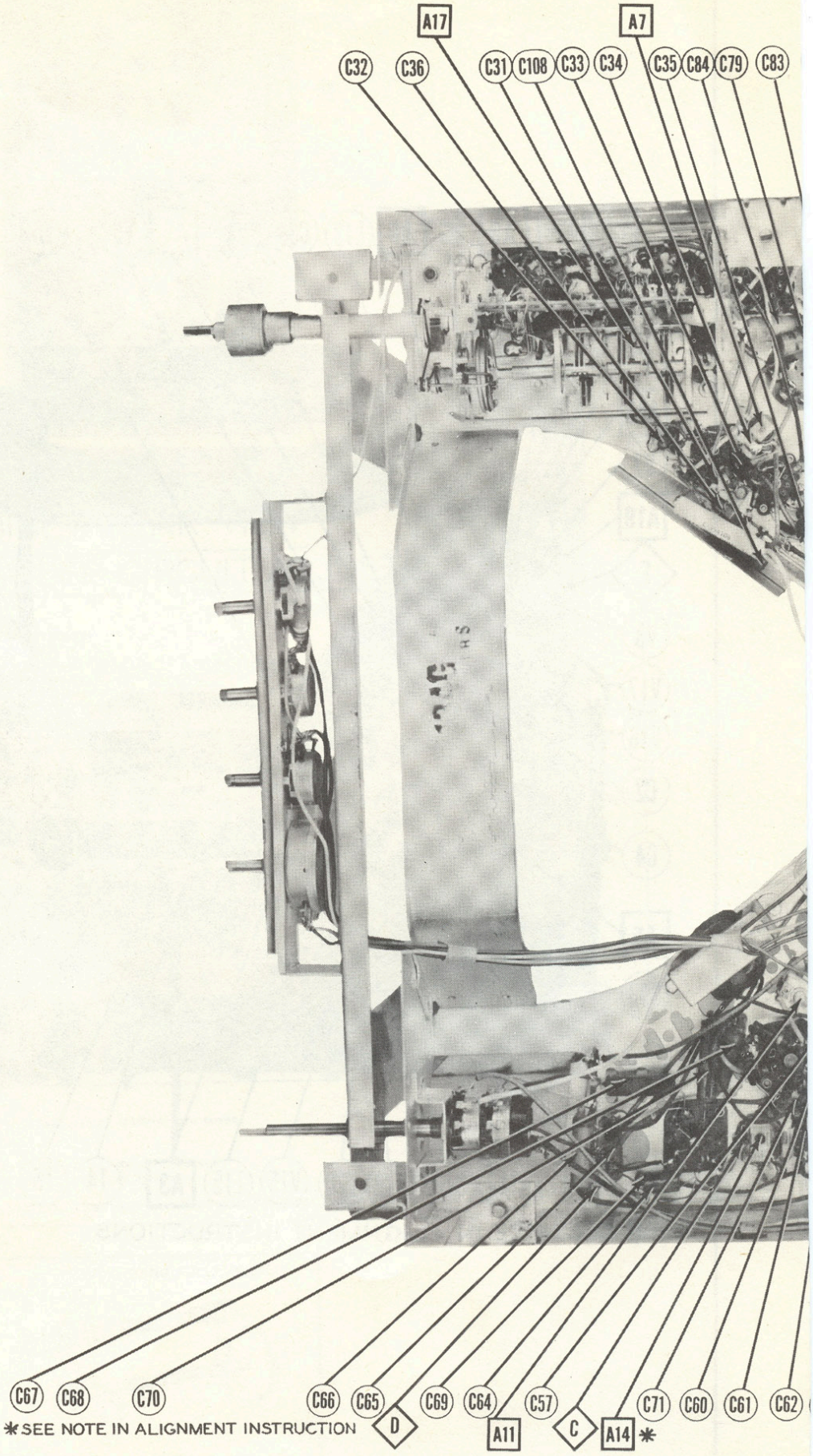
EMERSON MODELS 661B, 667B, 668B, 674B, 677B, 678B, 684B, 685B



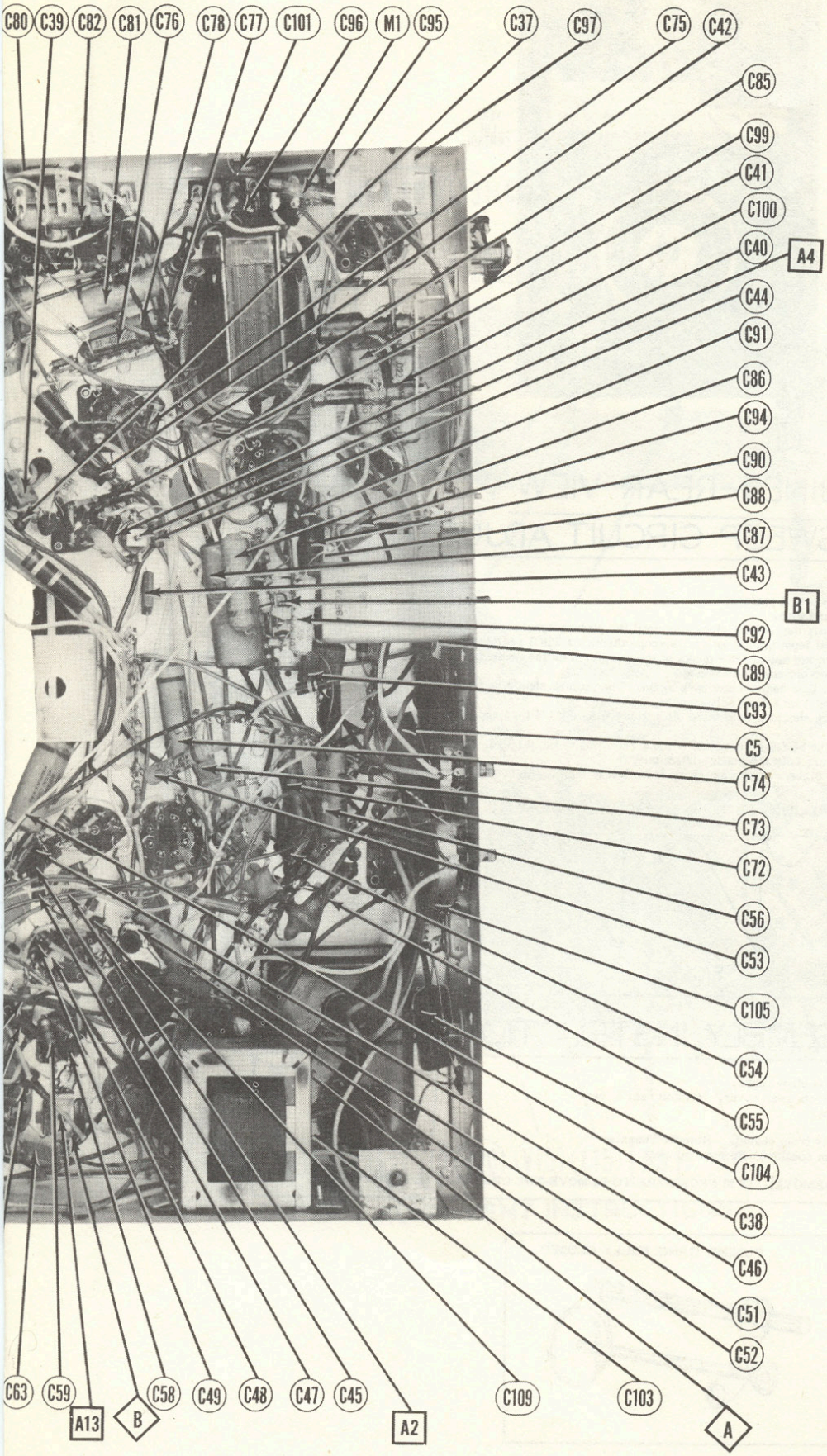
CHASSIS BOTTOM VIEW-RESISTO



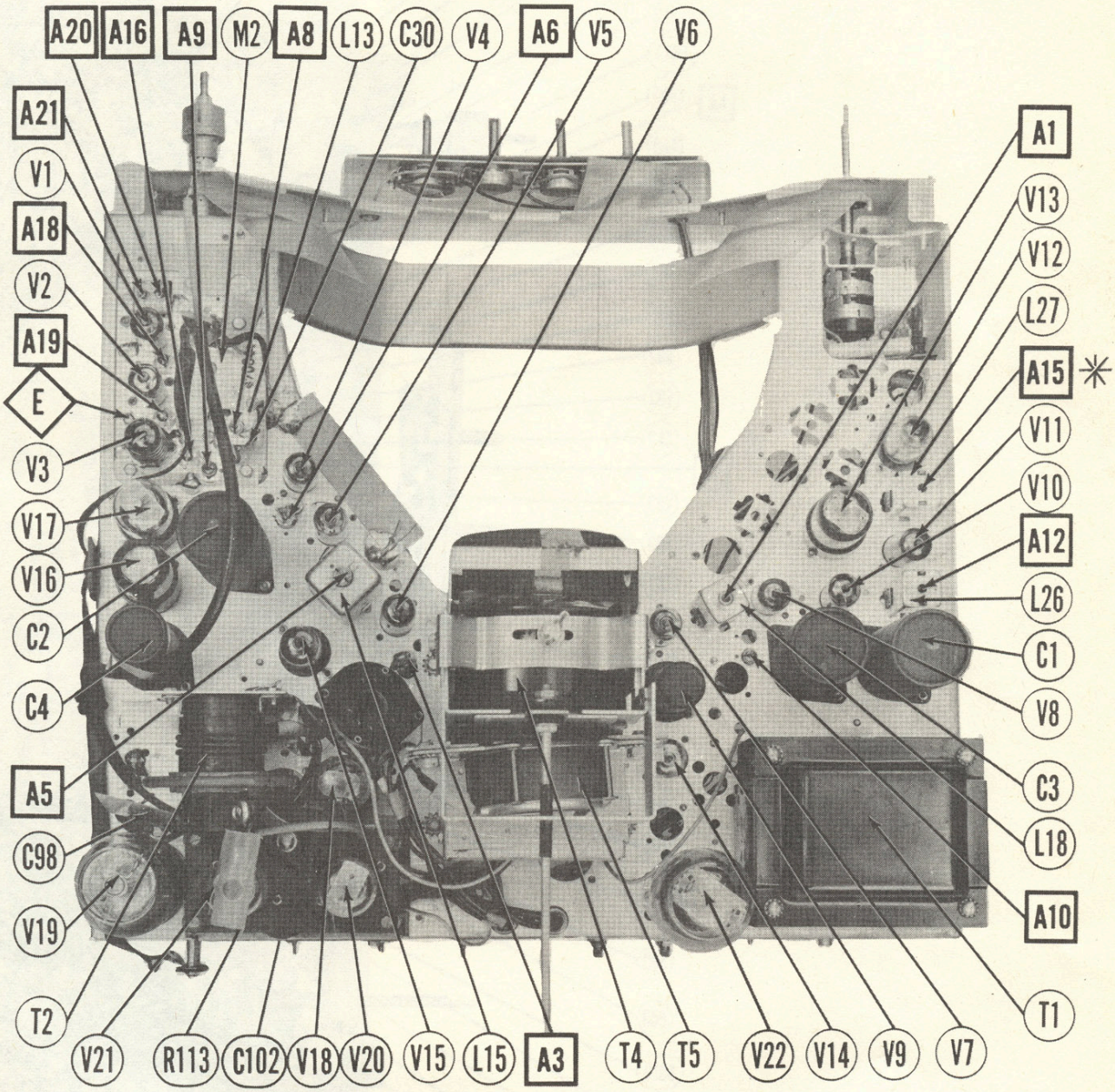
R AND INDUCTOR IDENTIFICATION



CHASSIS BOTTOM VIEW-CAPACITOR

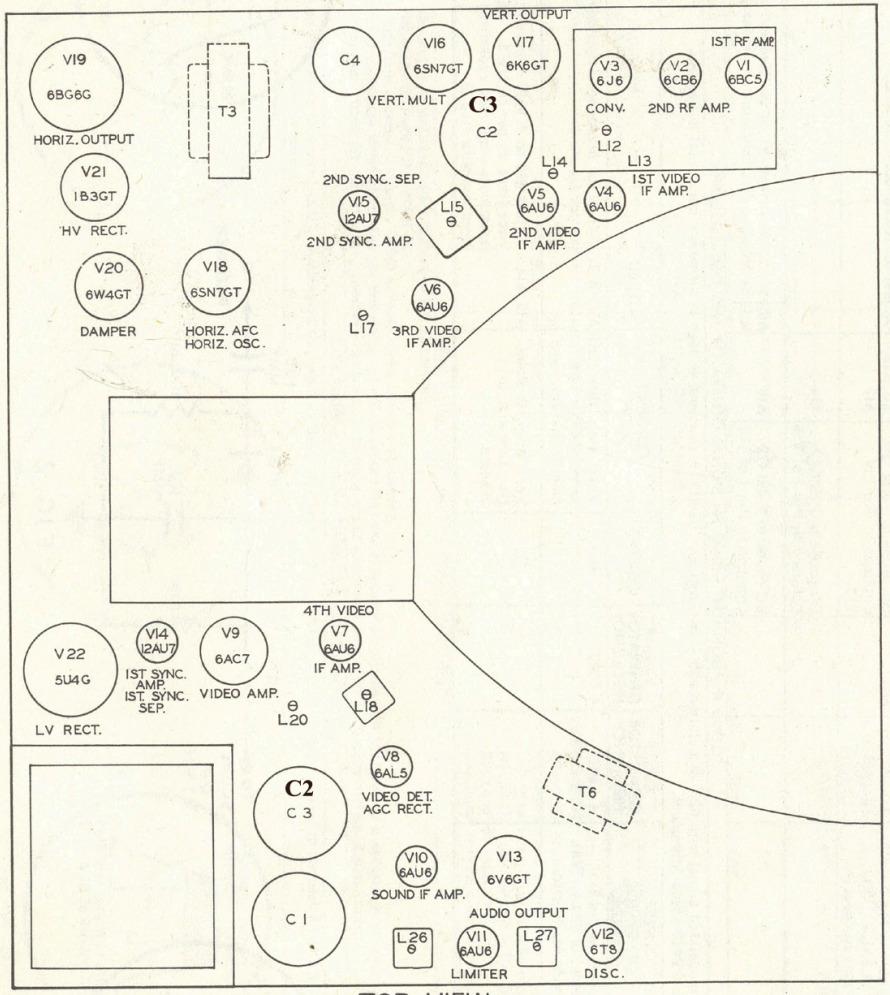


AND ALIGNMENT IDENTIFICATION

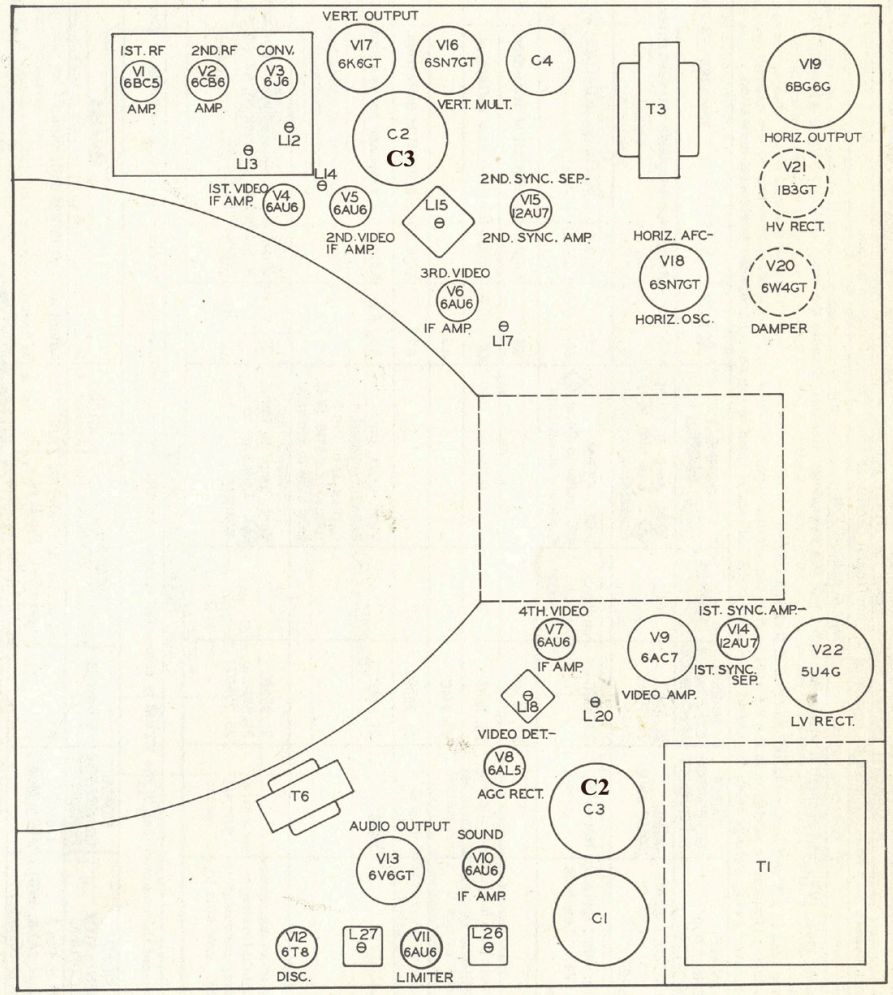


✳ SEE NOTE IN ALIGNMENT INSTRUCTIONS

CHASSIS TOP VIEW



TOP VIEW



BOTTOM VIEW

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BC5	-.5VDC	0V	6.3VAC	0V	80VDC	80VDC	0V		
V 2	6CB6	0V	1VDC	6.3VAC	0V	85VDC	85VDC	1VDC		
V 3	6J6	■100VDC ▲80VDC	■65VDC ▲60VDC	0V	6.3VAC	■-2.4VDC ▲-2VDC	§■-6.6VDC §▲-3.2VDC	0V		
V 4	6AU6	-.6VDC	0V	0V	6.3VAC	90VDC	90VDC	.2VDC		
V 5	6AU6	-.6VDC	0V	0V	6.3VAC	90VDC	90VDC	.3VDC		
V 6	6AU6	▲6.5VDC	▲8.3VDC	▲0V	▲6.3VAC	▲160VDC	▲140VDC	▲8.3VDC		
V 7	6AU6	▲3VDC	▲4.8VDC	▲0V	▲6.3VAC	▲160VDC	▲140VDC	▲4.8VDC		
V 8	6AL5	-.1VDC	-.2VDC	0V	6.3VAC	0V	0V	-.6VDC		
V 9	6AC7	▲160VDC	▲6.3VAC	▲2.2VDC	▲-.1VDC	▲2.2VDC	▲125VDC	▲0V	▲280VDC	
V 10	6AU6	▲.3VDC	▲3.1VDC	▲0Ω	▲6.3VAC	▲160VDC	▲160VDC	▲4.5VDC		
V 11	6AU6	▲2.1VDC	▲3VDC	▲0Ω	▲6.3VAC	▲160VDC	▲41VDC	▲3VDC		
V 12	6T8	-.5VDC	-.5VDC	0V	6.3VAC	0V	-1VDC	0V	-.2VDC	60VDC
V 13	6V6GT	▲0V	▲6.3VAC	▲190VDC	▲200VDC	▲0V	▲0V	▲0V	▲11.2VDC	
V 14	12AU7	▲185VDC	▲160VDC	▲160VDC	▲6.3VAC	▲6.3VAC	▲31VDC	▲-.8VDC	▲0V	▲0V
V 15	12AU7	▲70VDC	▲-.7VDC	▲0V	▲6.3VAC	▲6.3VAC	▲120VDC	▲-1.2VDC	▲3.2VDC	▲0V
V 16	6SN7GT	▲-26VDC ▲-19VDC	▲115VDC	▲4VDC	▲0V	▲90VDC	▲4VDC	▲6.3VAC	▲0V	
V 17	6K6GT	▲0V	▲6.3VAC	▲340VDC	▲340VDC	▲-15VDC	▲320VDC	▲0V	▲52VDC ▲12VDC	
V 18	6SN7GT	▲-2.7VDC	▲175VDC ▲125VDC	▲-16VDC	▲-70VDC	▲185VDC	▲0V	▲0V	▲6.3VAC	
V 19	6BG6G	▲0V	▲6.3VAC	▲10.4VDC	▲-6.4VDC	▲-6.4VDC	▲-.4VDC	▲0V	▲275VDC	TOP CAP *
V 20	6W4GT	0V	0V	380VDC	0V	155VDC	0V	380VDC	380VDC	
V 21	1B3GT	* DO NOT MEASURE								
V 22	5U4G	0V	205VDC	0V	▲350VAC	0V	▲350VAC	0V	205VDC	
V 23	16GP4	0V	-160VDC -30VDC	PIN 10 270VDC	PIN 11 -27VDC	PIN 12 6.3VAC				

ALL MEASUREMENTS TAKEN WITH PICTURE TUBE REMOVED.
▲ MEASURED FROM -160VDC LINE
* DO NOT MEASURE
§ TAKEN WITH VACUUM TUBE VOLTMETER
▲ HIGH BAND MEASUREMENT
■ LOW BAND MEASUREMENT
FOCUS CONTROL FULL COUNTER CLOCKWISE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BC5	1.1Meg	0Ω	.1Ω	0Ω	†3KΩ	†3KΩ	0Ω		
V 2	6CB6	10KΩ	100Ω	.1Ω	0Ω	†2KΩ	†2KΩ	100Ω		
V 3	6J6	†1.8KΩ	†12KΩ	0Ω	.1Ω	100KΩ	10KΩ	0Ω		
V 4	6AU6	1.1Meg	0Ω	0Ω	.1Ω	†5.8KΩ	†5.8KΩ	68Ω		
V 5	6AU6	1.1Meg	0Ω	0Ω	.1Ω	†5.8KΩ	†5.8KΩ	68Ω		
V 6	6AU6	▲1KΩ	▲1.2KΩ	▲0Ω	▲.1Ω	.2Ω	10KΩ	▲1.2KΩ		
V 7	6AU6	▲3.2KΩ	▲700Ω	▲0Ω	▲.1Ω	1.2Ω	10KΩ	▲700Ω		
V 8	6AL5	27KΩ	4.7KΩ	0Ω	.1Ω	1.4Ω	0Ω	100KΩ		
V 9	6AC7	0Ω	▲.1Ω	▲1.5KΩ	▲1.2Meg	▲1.5KΩ	3.3KΩ	▲0Ω	†6.4KΩ	
V 10	6AU6	▲1Meg	▲470Ω	▲0Ω	▲.1Ω	2.3Ω	0Ω	▲800Ω		
V 11	6AU6	▲47KΩ	▲470Ω	▲0Ω	▲.1Ω	1.8Ω	▲8.5KΩ	▲470Ω		
V 12	6T8	100KΩ	100KΩ	200KΩ	.1Ω	0Ω	Inf.	0Ω	10Meg	†220KΩ
V 13	6V6GT	Inf.	▲.1Ω	†3.6KΩ	†3.3KΩ	▲470KΩ	▲0Ω	▲0Ω	▲330Ω	
V 14	12AU7	†47KΩ	15KΩ	0Ω	▲.1Ω	▲.1Ω	▲8KΩ	▲2.3Meg	▲0Ω	▲0Ω
V 15	12AU7	13KΩ	▲330KΩ	▲0Ω	▲.1Ω	▲.1Ω	5.8KΩ	▲1Meg	▲1.5KΩ	▲0Ω
V 16	6SN7GT	▲470KΩ ▲1.5Meg	#700KΩ #2.5Meg	▲2.2KΩ	▲60KΩ	†150KΩ	▲2.2KΩ	▲.1Ω	▲0Ω	
V 17	6K6GT	Inf.	▲0Ω	†1.5KΩ	†1.5KΩ	▲3.3Meg	†220KΩ	▲.1Ω	▲470Ω ▲5.5KΩ	
V 18	6SN7GT	▲1.5Meg	†85KΩ	▲415KΩ	▲480KΩ	†92KΩ	▲0Ω	▲0Ω	▲.1Ω	
V 19	6BG6G	Inf.	▲.1Ω	▲100Ω	▲700KΩ	▲700KΩ	▲240KΩ	▲0Ω	†10KΩ	TOP CAP #85Ω
V 20	6W4GT	Inf.	Inf.	275KΩ	Inf.	†145Ω	Inf.	#0Ω	#.1Ω	
V 21	1B3GT	PINS 1 THRU 8 INFINITE RESISTANCE								TOP CAP #600Ω
V 22	5U4G	Inf.	55KΩ	Inf.	▲25Ω	Inf.	▲25Ω	Inf.	55KΩ	
V 23	16GP4	0Ω	▲0Ω ▲15KΩ	PIN 10 #150KΩ	PIN 11 223KΩ	PIN 12 .1Ω				

ALL MEASUREMENTS TAKEN WITH PICTURE TUBE REMOVED.
† MEASURED FROM PIN 8 OF V22
# MEASURED FROM PIN 3 OF V20
▲ MEASURED FROM -160VDC LINE
FOCUS COIL TURNED FULLY COUNTER CLOCKWISE

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.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1A	1st RF Amplifier	800052	6BC5	7BD	
B	1st RF Amplifier	800055	6CB6	6CK	
C	1st RF Amplifier	800535	6AG5	7BD	
V2A	2nd RF Amplifier	80055	6CB6	6CK	
B	2nd RF Amplifier	80052	6BC5	7BD	
C	2nd RF Amplifier	800535	6AG5	7BD	
V3	Converter	800536	6J6	7BF	
V4	1st Video IF Amp.	800533	6AU6	7BK	
V5	2nd Video IF Amp.	800533	6AU6	7BK	
V6A	3rd Video IF Amp.	800533	6AU6	7BK	
B	3rd Video IF Amp.	800535	6AG5	7BD	
V7	4th Video IF Amp.	800533	6AU6	7BK	
V8	Video Detector - AGC Rectifier	800541	6AL5	6BT	
V9	Video Amplifier	800390	6AC7	8N	
V10	Sound IF Amplifier	800533	6AU6	7BK	
V11	Limiter	800533	6AU6	7BK	
V12	Discriminator - AF Amplifier	800035	6T8	9E	Sets coded triangle seven contains a 6AL5 with a 6AV6 in place of the 6T8.
V13	Audio Output	800270	6V6GT	7AC	
V14 A	1st Sync. Sep. -1st Sync. Amplifier	800026	12AU7	9A	
B	1st Sync. Sep. -1st Sync. Amplifier	800380	6SN7GT	8BD	
V15	2nd Sync. Amp. -1st Sync. Separator - Sync. Phase Inv.	800026	12AU7	9A	
V16	Vertical Mult.	800380	6SN7GT	8BD	
V17	Vertical Output	800016	6K6GT	7S	
V18	Horiz. AFC - Horiz. Oscillator	800380	6SN7GT	8BD	
V19	Horiz. Output	800004	6BG6G	5BT	
V20	Damper	800037	6W4GT	4CG	
V21	H.V. Rectifier	800450	1B3GT	3C	
V22	L.V. Rectifier	800290	5U4G	5T	
V23	Picture Tube	810011	16GP4	12D	

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: EMERSON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	450	925148	AFH888J		UPT44445		TVL-3787	▲ Filter
B	40	450							■ Filter
C	40	450							▲ Filter
C2 A	40	450	925148	AFH888J		UPT44445		TVL-3787	▲ Filter
B	40	450							■ Filter
C	40	450							▲ Output Decoupling
C3A	80	250	925149	AFH161612F		UPT825-415V5		TVL-3525	▲ Filter
B	40	150							■ Filter
C	50	50							▲ Vertical Output Cathode
D	8	250							Not used
C4A	20	450	925184	AFH333J		UP21145		TVL-3778	▲ Decoupling
B	10	450							■ Filter
C	10	450							▲ Decoupling
C5	5	450	925185	PRS450/4		BR445		TVA-1702	Decoupling
C6	47			SI47	D6-470		GP1K-470	19C25	1st RF Coupling
C7	1500			SI1500	D6-152		GP2L-152	29C8	AGC Filter
C8	1-3				829-3				Variable Trimmer
C9	5000			BPD-005	DD-502		811-005	29C1	1st RF Amp. Decoupling
C10	5000			BPD-005	DD-502		811-005	29C1	1st RF Amp. Decoupling
C11	14								Fixed Padder
C12	100			SI100	D6-101		GP1K-101	19C11	2nd RF Amp. Coupling
C13	1-3				829-3				Variable Trimmer
C14	5000			BPD-005	DD-502		811-005	29C1	2nd RF Amp. Decoupling
C15	5000			BPD-005	DD-502		811-005	29C1	2nd RF Amp. Decoupling
C16	680			SI680	D6-681		GP2K-681	19C17	2nd RF Amp. Cathode
C17	14								Fixed Padder
C18	100			SI100	D6-101		GP1K-101	19C11	RF Coupling
C19	2.2				TCZ-2.2				Osc. Coupling
C20	33			SI33	D6-330		GP1K-330	19C24	Osc. Grid Cap
C21	17.5								Fixed Trimmer
C22	1-3				829-3				Variable Trimmer
C23	19								Fixed Padder
C24	2-8				829-10				Variable Trimmer
C25	10			SI10N750	TCN-10		N750K-100	19C4	Fixed Trimmer
C26	5000			BPD-005	DD-502		811-005	29C1	RF Bypass
C27	5000			BPD-005	DD-502		811-005	29C1	Fil. Bypass
C28	10	500		1469-00001	TCZ-10	5R5Q1	NPOK-100	MS-41	Fixed Trimmer
C29	800			BPD-0008	DD-801		801-001	19C1	Isolation ††
C30	2.2				TCZ-2.2				IF Coupling **
C31	1500		928006	SI1500	D6-152	1W5D15	GP2L-152	29C8	1st Video IF Decoupling
C32	1500		928006	SI1500	D6-152	1W5D15	GP2L-152	29C8	AGC Filter
C33	150	500	910215	1468-00015	D6-151	5W5T15	GP2K-151	1FM-315	IF Coupling
C34	75			SI75N750	TCN-75		N750L-750		Fixed Trimmer
C35	1500		928006	SI1500	D6-152	1W5D15	GP2L-152	29C8	2nd Video IF Amp. Dec
C36	200	500	910225	1468-0002	D6-201	5W5T2	GP2K-201	1FM-32	AGC Filter
C37	1500		928006	SI1500	D6-152	1W5D15	GP2L-152	29C8	Decoupling
C38	.25	200	923080	P488-25		GT2P25		2TM-P25	AGC Filter
C39	270	500	910214	SI270	D6-271	5W5T25	GP2K-271	19C31	IF Coupling
C40	1500		928006	SI1500	D6-152	1W5D15	GP2L-152	29C8	3rd Video IF Amp. Screen
C41	1500		928006	SI1500	D6-152	1W5D15	GP2L-152	29C8	3rd Video IF Amp. Cathode *
C42	1500		928006	SI1500	D6-152	1W5D15	GP2L-152	29C8	Decoupling
C43	270	500	910214	SI270	D6-271	5W5T25	GP2K-271	19C31	IF Coupling
C44	50			SI50NPO	TCZ-51		NPO-333-500		Fixed Trimmer
C45	1500		928006	SI1500	D6-152	1W5D15	GP2L-152	29C8	4th Video IF Amp. Screen
C46	1500		928006	SI1500	D6-152	1W5D15	GP2L-152	29C8	4th Video IF Amp. Cath.
C47	1500		928006	SI1500	D6-152	1W5D15	GP2L-152	29C8	Decoupling
C48	25		928110	SI25	D6-250	5W5Q25	GP1K-250	19C27	IF Coupling
C49	5		928017	SI5	TCZ-4.7	5W5V5	GP1K-050	MS-55	Video Det. Filter
C50	1500		928006	SI1500	D6-152	1W5D15	GP2L-152	29C8	Video Det. Fil. *
C51	50			SI50NPO	TCZ-51		NPO-333-50		Fixed Trimme

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA EMERSON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C52	.05	400	923105	P488-05	DF-503	PTE4S5		4TM-S5	Video Coupling
C53	.01	400	923104	P488-01	D6-103	PTE4S1	821-01	4TM-S1	Bias Filter
C54	.22	400	922018	P488-22		GT4P25		4TM-P22	Video Coupling
C55	.01	400	923104	P488-01	D6-103	PTE4S1	821-01	4TM-S1	Vert. Sweep Coupling
C56	.05	400	923105	P488-05	DF-503	PTE4S5		4TM-S5	Picture Tube Grid
C57	4.7		928017	SI4.7NPO	TCZ-4.7	5R5V5	NPOK-4R7	MS-55	Sound IF Coupling
C58	5000		922025	BPD-005	DD-502	1D5D5	811-005	29C1	Sound IF Decoupling ♦
C59	1500		922025	SI1500	D6-152	1W5D15	GP2L-152	29C8	Sound IF Amp. Cath. *
C60	1500		922025	SI1500	D6-152	1W5D15	GP2L-152	29C8	AVC Filter *
C61	1500		923108	SI1500	D6-152	1W5D15	GP2L-152	29C8	Limiter Screen *
C62	1500		928006	SI1500	D6-152	1W5D15	GP2L-152	29C8	Limiter Decoupling *
C63	68	500	910221	SI68	D6-680	5W5Q7	GP1K-680	19C10	AVC Filter
C64	50	500	910222	1468-00005	D6-500	5W5Q5	GP2K-500	1FM-45	RF Bypass
C65	.0015	400	923109	P688-0015	D6-152	1W5D15	GP2L-152	6TM-D15	De-emphasis #
C66	.01	400	923104	P488-01	D6-103	PTE4S1	821-.01	4TM-S1	Audio Coupling
C67	.01	400	923104	P488-01	D6-103	PTE4S1	821-.01	4TM-S1	Audio Coupling
C68	.001	600	923109	P688-001	D6-102	PTE6D1	801-.001	6TM-D1	De-emphasis
C69	1500		928006	SI1500	D6-152	1W5D15	GP2L-152	29C8	Disc. - AF Amp. Fil.
C70	.047	400	922025	P488-047	DF-503	PTE6S5		4TM-S47	Audio Coupling
C71	.005	600	923110	P688-005	D6-502	PTE6D5	811-.005	6TM-D5	Output Plate
C72	.047	400	922015	P488-047	DF-503	PTE4S5		4TM-S47	Sync. Coupling ¶
C73	110	500	910028	1468-0001	D6-121	5W5T1	GP2K-121	1FM-31	Sync. Coupling ‡
C74	.05	400	923105	P488-05	DF-503	PTE4S5		4TM-S5	Sync. Coupling
C75	.01	400	922015	P488-01	D6-103	PTE4S1	821-.01	4TM-S1	Sync. Coupling
C76	.01	400	922015	P488-01	D6-103	PTE4S1	821-.01	4TM-S1	Vert. Sync. Coupling
C77	.002	400	923107	P688-002	D6-202	PTE6D2	801-.002	6TM-D2	Integrator Net
C78	.005	400	923108	P688-005	D6-502	PTE6D5	811-.005	6TM-D5	Integrator Net
C79	.005	400	923108	P688-005	D6-502	PTE6D5	811-.005	6TM-D5	Integrator Net
C80	.005	600	923110	P688-005	D6-502	PTE6D5	811-.005	6TM-D5	Vert. MV Feedback
C81	.05	400	923105	P488-05	DF-503	PTE4S5		4TM-S5	Vert. MV Cathode
C82	.047	400	922037	P488-047	DF-503	PTE4S5		4TM-S47	Vert. Discharge Cap
C83	.22	400	922018	P488-22		GT4P25		4TM-P22	Vert. Sweep Coupling
C84	.025	600	923084	P688-025	DF-203	PTE6S2		6TM-S22	Vertical Shaping †
C85	82	500	910022	SI82	TCZ-82	5W5T1	GP1K-820	1FM-31	Horizontal Sync. Coupling
C86	.05	400	923105	P488-05	DF-503	PTE4S5		4TM-S5	AFC Filter
C87	.5	200	923102	P288-5		GT2P5		2TM-P5	AFC Filter
C88	.02	600	923084	P688-02	DF-203	PTE6S2		6TM-S2	AFC Filter
C89	82	500	910022	SI82	TCZ-82	5W5T1	GP1K-820	1FM-31	Horiz. Feedback
C90	.047	400	922025	P488-047	DF-503	PTE6S5		4TM-S47	Horiz. AFC Plate
C91	180	500	910042	SI180	D6-181	5R5T2	GP2K-181	MS-32	Horiz. Osc. Grid
C92	.01	600	922041	P688-01	D6-103	PTE6S1		6TM-S1	Fixed Trimmer
C93	1000	500	910211	1467-001	D6-102	1W5D1	GP2K-102	1FM-21	Horiz. Discharge
C94	470	500	910017	5W5T5	D6-471	5W5T5	GP2K-471	1FM-35	Horiz. Sweep Coupling
C95	.047	600	922023	P688-047	DF-503	PTE6S5		6TM-S47	Horiz. Output Screen
C96	.25	200	923080	P488-25		GT2P25		2TM-P25	Horiz. Output Cathode
C97	1500		928006	SI1500	DD-152	1W5D15	GP2L-152	29C8	Horiz. Output Cathode
C98	18	6000	928052						Horizontal Plate
C99	.018	1000	922051						Damper Filter
C100	.022	1000	922052	P1088-022				MB-S22	Damper Filter
C101	1500		928006	SI1500	D6-152	1W5D15	GP2L-152	29C8	RF Bypass
C102	500	20000	923016	HV20B	TV2-502				HV Filter
C103	1500		928006	SI1500	D6-152	1W5D15	GP2L-152	29C8	Fil. Bypass
C104	.05	600	922101	P688-05	DF-503	PTE6S5		6TM-S5	Line Filter
C105	.05	600	922101	P688-05	DF-503	PTE6S5		6TM-S5	Line Filter
C106	1500		928006	SI1500	D6-152	1W5D15	GP2L-152	29C8	RF Bypass *
C107	.25	400	922018	P488-22		GT4P25		4TM-P22	Video Amp. Cathode *
C108	.02	400	923084	P688-025	DF-203	PTE4S2		4TM-S2	RF Bypass *
C109	1500		928006	SI1500	D6-152	1W5D15	GP2L-152	29C8	RF Bypass *

†† Some models use 91MFD in this application.
** Some models use 270MFD in this application.
♦ Some models use .047MFD in this application.
Some models use .001MFD in this application.
¶ Some models use .01MFD in this application.
‡ Some models use 220MFD in this application.
† Some models use .02MFD in this application.
* Not used in all models.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA EMERSON PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	1500Ω	½	390167			SBB-654-S	Contrast Control - Front
B	1Meg	½					Volume Control And SW - Rear
R2	1500Ω	4	390176		RTV-199	SVP-994	Focus Control - Wire Wound
R3A	100KΩ	½	390162	Q11-128	AG-49-S	AN-40	Brightness Control
B	Shaft		Not req.	Not req.	RS-2	AK-4	Attach to R3A Per Instructions
R4A	1Meg	½	390163	Q11-137	AG-61-S	AN-69	Vertical Hold Control
B	Shaft		Not req.	Not req.	RS-2	AK-4	Attach to R4A Per Instructions
R5A	50KΩ	½	390164	Q11-123	AG-44-S	AN-31	Horizontal Hold Control
B	Shaft		Not req.	Not req.	RS-2	AK-4	Attach to R5A Per Instructions
R6A	2 Meg	½	390142	Q11-139	AG-83-S	AN-75	Vertical Size Control
B	Shaft		Not req.	Not req.	FKS-1/4	AK-1	Attach to R6A Per Instructions
R7	5000Ω	2	390143	W-5000	43-5000	VK-135	Vertical Linearity Control - Wire Wound

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA EMERSON PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ± 10% UNLESS OTHERWISE SPECIFIED
R8	150Ω 20%	½		BTS-150	AGC Network
R9	560Ω	½		BTS-560	1st RF Amp. Grid
R10	1000Ω 20%	½		BTS-1000	1st RF Amp. Decoupling - See Note 2
R11	1200Ω	½		BTS-1200	1st RF Coil Shunt
R12	10KΩ	½			2nd RF Amp. Grid
R13	100Ω 20%	½		BTS-100	2nd RF Amp. Cathode
R14	1500Ω	½		BTS-1500	2nd RF Coil Shunt
R15	220Ω 20%	½		BTS-220	Decoupling
R16	5600Ω	½			Mixer Grid
R17	100KΩ 20%	½			Mixer Grid
R18	10KΩ 20%	½			Mixer Plate
R19	10KΩ	½			Oscillator Grid
R20	1000Ω	½	350492	BTS-1000	Decoupling
R21	5600Ω	½	340672	BTS-5600	1st Video IF Transformer Shunt
R22	68Ω 20%	½	340212		1st Video IF Amp. Cathode
R23	1000Ω 20%	½	350492	BTS-1000	1st Video IF Amp. Decoupling
R24	470Ω 20%	½	340412	BTS-470	AGC Network - See Note 3
R25	470Ω 20%	½	340412	BTS-470	AGC Network - See Note 3
R26	10KΩ 20%	½	340732		2nd Video IF Transformer Shunt
R27	10KΩ 20%	½	340732		2nd Video IF Amp. Grid

RESIST

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA EMERSON PART No.	IRC PART N
R28	68Ω 20%	½	340212	
R29	1000Ω 20%	½	350492	BTS-1000
R30	1000Ω 20%	½	350492	BTS-1000
R31	10KΩ	½	340732	BTS-10K
R32	220Ω	½	340332	BTS-220
R33	10KΩ	½	340732	BTS-10K
R34	470KΩ 20%	½	351132	BTS-470K
R35	2700Ω	½	340592	BTS-2700
R36	220Ω 20%	½	350332	BTS-220
R37	10KΩ	½	340732	BTS-10K
R38	4700Ω	½		BTS-4700
R39	15KΩ	½		BTS-15K
R40	22KΩ	½	340812	BTS-22K
R41	100KΩ	½	340972	BTS-100K
R42	1Meg 20%	½	351212	BTS-1Meg
R43	220KΩ	½	341052	BTS-220K
R44	2.2Meg 20%	½	341292	BTS-2.2M
R45	1Meg	½	341212	BTS-1Meg
R46	10Ω	½	340012	BW-½-10
R47	5600Ω 5%	2	397065	BTB-5600
R48	22KΩ	½	340812	BTS-22K
R49	100KΩ	½	340972	BTS-100K
R50	100KΩ	½	340972	BTS-100K
R51	220KΩ	½	341052	BTS-220K
R52	470Ω 20%	½	340412	BTS-470
R53	220Ω	½	340332	BTS-220
R54	1Meg	½	341212	BTS-1Meg
R55	470Ω	½	340412	BTS-470
R56	47KΩ	½	340892	BTS-47K
R57	27KΩ	1	370832	BTA-27K
R58	10KΩ	½	340732	BTS-10K
R59	100KΩ	½	340972	BTS-100K
R60	100KΩ	½	340972	BTS-100K
R61	68KΩ	½	340932	BTS-68K
R62	10Meg	½	351452	BTS-10Me
R63	220KΩ	½	341052	BTS-220K
R64	470KΩ	½	341132	BTS-470K
R65	330Ω	1	370372	BTA-330
R66	2500Ω	5	394107	1 3/4A-25
R67	10KΩ 20%	½	350732	BTS-10K
R68	47KΩ	½	340892	BTS-47K
R69	10KΩ 20%	½	350732	BTS-10K
R70	2.2Meg 20%	½	351292	BTS-2.2M
R71	100KΩ	½	340972	BTS-100K
R72	22KΩ	½	340812	BTS-22K
R73	10KΩ 20%	½	350732	BTS-10K
R74	330KΩ	½	341092	BTS-330K
R75	10KΩ	2	370732	BTB-10K
R76	1Meg 20%	½	351212	BTS-1Meg
R77	1500Ω	½	340532	BTS-1500
R78	2200Ω	½	340572	BTS-2200
R79	220Ω 20%	½	350332	BTS-220
R80	22KΩ	½	340812	BTS-22K
R81	22KΩ	½	340812	BTS-22K
R82	8200Ω	½	340712	BTS-8200
R83	8200Ω	½	340712	BTS-8200
R84	2200Ω	½	340572	BTS-2200
R85	150KΩ	1	371012	BTA-150K
R86	470KΩ	½	341132	BTS-470K
R87	470KΩ	½	341132	BTS-470K
R88	10KΩ 20%	½	350732	BTS-10K
R89	3.3Meg	½	341332	BTS-3.3M
R90	470Ω	½	340412	BTS-470
R91	470Ω	1	370412	BTA-470
R92	470Ω	1	370412	BTA-470
R93	220KΩ	½	341052	BTS-220K
R94	150KΩ	½	341012	BTS-150K
R95	220KΩ	½	341052	BTS-220K
R96	330KΩ	½	341092	BTS-330K
R97	820KΩ	½	341192	BTS-820K
R98	82KΩ 5%	1	360952	BTA-82K
R99	330KΩ 5%	1	361092	BTA-330K
R100	3900Ω	½	340632	BTS-3900
R101	100KΩ	1	370972	BTA-100K
R102	120KΩ	1	370992	BTA-120K
R103	150KΩ 5%	1	3601012	BTA-150K
R104	82KΩ	1	370952	BTA-82K
R105	10KΩ	½	340732	BTS-10K
R106	8200Ω	½	340712	BTS-8200
R107	150KΩ	½	3401012	BTS-150K
R108	68Ω 20%	½	340212	
R109	1Meg 20%	½	351212	BTS-1Meg
R110	100Ω	2	397027	BW-2-100
R111	10KΩ	5	394104	1 3/4A-10
R112	750Ω	10	394108	1 3/4A-75
R113	1Meg 20%	1	381212	
R114	3300Ω	2		BTB-1000
R115	3900Ω	2		BTB-3900
R116	100KΩ	1	370972	BTA-100K
R117	1000Ω	½	350492	BTS-1000
R118	2700Ω	½	340592	BTS-2700
R119	1000Ω	½	350492	BTS-1000
R120	1000Ω	½	350492	BTS-1000
R121	1000Ω	½	350492	BTS-1000
R122	4000Ω	5	394108	1 3/4A-40
R123	8000Ω	10	394060-6	1 3/4A-80
R124	6800Ω	½		BTS-6800

Note 1. Not used in all models.
Note 2. Some models use 220Ω resistor in this applica
Note 3. Some models use 1000Ω resistor in this applic
Note 4. Some models use 5600Ω resistor in this applic
Note 5. Some models use 100Ω resistor in this applicat
Note 6. Some models use 3900Ω resistor in this applic
Note 7. Some models use 10Ω resistor in this applicati
Note 8. Some models use 470KΩ resistor in this applic
Note 9. Some models use 10KΩ resistor in this applica
Note 10. Some models use 330KΩ resistor in this applic
Note 11. Some models use 3.3 meg resistor in this appl
Note 12. Some models use 680KΩ resistor in this applic
Note 13. Some models use parallel resistors in this app

SCRIPTIONS (Continued)

ORS (CONT.)

	IDENTIFICATION CODES
	2nd Video IF Amp. Cathode
	2nd Video IF Amp. Decoupling
	Bias Network - See Note 1
	3rd Video IF Transformer Shunt - See Note 4
	3rd Video IF Amp. Cathode - See Note 5
	3rd Video IF Amp. Screen - See Note 3
	Bias Network - See Note 1 and 3
	4th Video IF Amp. Grid - See Note 1
	4th Video IF Amp. Cathode
	4th Video IF Amp. Screen - See Note 3
	Video Det. Diode Load - See Note 6
	Video Peaking Coil Shunt - See Note 1
	AGC Network
	AGC Load
	AGC Network
	Bias Network
eg	Bias Network
	Video Amp. Grid
	Video Amp. Cathode - See Note 1
-5%	Video Amp. Plate - See Note 6
	Video Peaking Coil Shunt
	Vertical Retrace Blanking Network
	Vertical Retrace Blanking Network
	Picture Tube Cathode
	Bias Network - See Notes 3 and 7
	Sound IF Amp. Cathode
	AVC Network - See Notes 2 and 13
	Bias Network - See Note 3
	Limiter Grid
	Limiter Screen
	Voltage Divider
	Disc. Diode Load
	Disc. Diode Load
	De-emphasis
g	AF Amp. Grid
	AF Amp. Plate - See Note 8
	Output Grid
	Output Cathode
00	Output Decoupling - Wire Wound
	Isolation
	Sync. Amp. Plate - See Note 9
	Isolation
leg	1st Sync Sep. Grid - See Note 10
	1st Sync. Sep. Grid - See Note 11
	1st Sync. Sep. Plate
	Voltage Divider
	2nd Sync. Sep. Grid
	2nd Sync. Sep. Plate
	Sync. Phase Inv. Grid
	Sync. Phase Inv. Cathode
	Sync. Phase Inv. Plate
	Sync. Phase Inv. Plate
	Voltage Divider
	Integrator
	Integrator
	Integrator
	Vertical MV Cathode
	Vertical MV Plate
	Vertical MV Grid
	Vertical MV Plate - See Note 12
	Vertical Peaking
leg	Vertical Output Grid
	Vertical Output Cathode
	Decoupling
	Decoupling
	Damping
	Voltage Divider
	Voltage Divider
	Horizontal AFC Grid
	Horizontal AFC Grid
-5%	Horizontal AFC Cathode
-5%	Horizontal AFC Cathode
	Horizontal AFC Filter
	Horizontal AFC Plate
	Voltage Divider
-5%	Horizontal Oscillator Grid
	Horizontal Oscillator Plate
	Decoupling
	Horizontal Oscillator Coil Shunt
	Horizontal Feedback
	Parasitic Suppressor
	Horizontal Output Grid
	Horizontal Output Cathode - Wire Wound
	Horizontal Output Screen - Wire Wound
)	Horizontal Size Coil Shunt - Wire Wound
	HV Filter
	Voltage Divider - See Note 3
	Filter - See Note 3
	Isolation
	AGC Network - See Note 1
	3rd Video IF Amp. Plate - See Note 1
	3rd Video IF Amp. Plate Decoupling - See Note 1
	4th Video IF Amp. Plate Decoupling - See Note 1
	Limiter Plate - See Note 1
)0	Voltage Divider - Wire Wound - See Note 1
)0	Bleeder - Wire Wound - See Note 1
	5th Video IF Transformer Shunt - See Note 1

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lication to obtain desired value.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	RATING SEC. 4	RATING SEC. 5	REPLACEMENT DATA EMERSON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC @ 1.82A	780VCT .210ADC	5VAC @ 3A	6.3VAC @ 1.2A	6.3VAC @ 3A	6.3VAC @ 5A	730026 Or 730027 And 730028 ⑥			TP-392 And F633 ③④

③ Used for Sec. #4
④ Mount separately above or below chassis where space permits.
⑥ Filament transformer used in some models.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA EMERSON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T2	520Ω Tap 85Ω		738047 Or 738048				Horizontal Output Trans.
T3	440Ω	.4Ω	738044		A-3039		Vertical Output Trans.
T4A	43Ω		708047		MDF-70		Horizontal Deflection Coil
B	3.3Ω						Vertical Deflection Coil
T5	1.56KΩ		705014				Focus Coil

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA EMERSON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T6	5.2KΩ	4Ω	330Ω	.7Ω	734051	A-3849	A-3019	R0-9 ⑤	⑤ Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS FIELD RES.	RATINGS V. C. IMP.	REPLACEMENT DATA EMERSON PART No.	VIKING PART No.	QUAM PART No.	NOTES
SP1A	PM	4Ω	180050 ①	12J12	12A31	① Used in Console Models
B	PM	4Ω	180041 ②	6J4	6A15	② Used in Table Models
	CONE DIA.	V. C. DIA.				
SP2A	11 7/8"	1"				
	5 7/8"	9/16"				

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA EMERSON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
L1	.200A	110Ω	4.8 Henries	737011	C-1410 ⑤	C-2991 ⑤	TR-4200⑤	⑤ Drill one new mounting hole.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA EMERSON PART No.	MEISSNER PART No.	NOTES
L2	Low-Band Ant. Coil	0Ω	0Ω	*		* Tuner Part # 470606
L3	High-Band Antenna Coil	0Ω	0Ω	*		
L4	1st RF Coil	0Ω		*		High-Band
L5	2nd RF Coil	0Ω		*		High-Band
L6	High-Band Osc. Coil	0Ω		*		
L7	1st RF Coil	0Ω		*		Low-Band
L8	2nd RF Coil	0Ω		*		Low-Band
L9	Low-Band Osc. Coil	0Ω		*		
L10	Fil. Choke	0Ω		*		
L11	RF Choke	0Ω		*		
L12	Conv. Plate Coil	.1Ω		*		
L13	1st Video IF	.6Ω		*		
L14	2nd Video IF	.4Ω	0Ω	720105		
L15	3rd Video IF	.3Ω		720088		
L16	RF Choke	3Ω		705014		
L17	4th Video IF	.2Ω	0Ω	720091		
L18	5th Video IF	1.2Ω	1.4Ω	720089		
L19	RF Choke			705014		20 Microhenries (Used in Chassis 120134-B)
L20	4.5MC Trap	2Ω		708032		
L21A	RF Choke	3Ω		705014		20 Microhenries (Used in Chassis 120134-G)
B	RF Choke			708109		225 Microhenries (All Later Models)
L22A	Peaking	17Ω				1000 Microhenries (Yellow and Blue Dot)
B	Peaking			708115		660 Microhenries (Used in Some Models)
C	Peaking			708099		330 Microhenries (Used in Late Models Only)
L23A	Peaking	15Ω		708099		330 Microhenries (White Dot)
B	Peaking			708109		225 Microhenries (Used in Some Models)
C	Peaking			708095		180 Microhenries (Used in Late Models Only)
L24A	Peaking	19Ω		708115		660 Microhenries (Yellow Dot)
B	Peaking			708099		330 Microhenries (Used in Late Models Only)
L25	1st Sound IF	4Ω		708093		35 Microhenries (Red Dot) 3-35MMF Trimmer
L26	2nd Sound IF	2.3Ω	2.3Ω	720081		
L27	Sound Disc.	1.7Ω	1.5Ω	708018		
L28	Horiz. Osc. Trans.	125Ω	40Ω	738035		
L29	Horiz. Size	6Ω		708058		
L30	Horiz. Lin.	35Ω		708003		

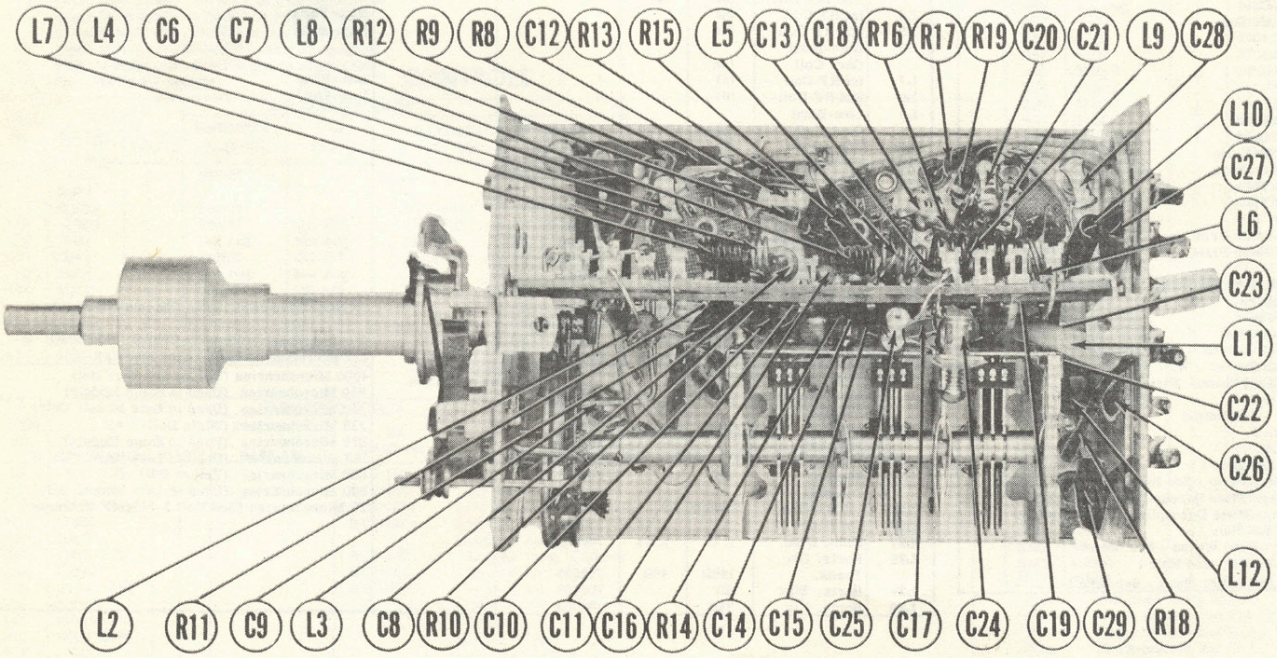
PARTS LIST AND DESCRIPTIONS (Continued)

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA				REMARKS
			EMERSON PART No.		LITTELFUSE PART No.		
			FUSE	HOLDER	FUSE	HOLDER	
M1	3AG Pigtail	.250	808170		318.250		

MISCELLANEOUS

ITEM No.	PART NAME	EMERSON PART No.	NOTES
M2A	RF Tuner	470606	
B	RF Tuner	470651	
C	RF Tuner	470644	
M3	Ion Trap	708061	
	Glass	520148	Models-684B, 685B (Chassis 120134B)
	Glass	635035	Models-674B, 677B, 678B (Chassis 120134B)
	Knob	460175	Contrast (Models 674B, 677B, 678B, 684B, 685B.)
	Knob	460176	Off/On Volume (Models-674B, 677B, 678B, 684B, 685B)
	Knob	460177	Selector (Models-674B, 677B, 678B, 684B, 685B.)
	Knob	460178	Fine Tuning (Models-674B, 677B, 678B, 684B, 685B.)
	Spring	542279	Compression (For Part 460175)
	Spring	542278	Compression (For Part 460178)
A11	Trimmer	900064	3-35MMF (1st Sound IF Trans.)
B3	Trimmer	900054	25-300MMF (Horiz. Drive)



RF TUNER

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard may be eliminated by removing the horizontal oscillator tube, (V18), from its socket.

VIDEO IF ALIGNMENT

Remove the converter tube, (V3), and replace it with a 6J6 which has Pin 1 removed, this will disable the local oscillator and prevent the possibility of erroneous indications.

Connect the negative lead of a 3 volt battery to the junction of R42 and C38.

Connect a 10KΩ isolating resistor in series with the vertical lead of the oscilloscope.

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
1.	.001MFD	High side to Pin 1 (grid) of 6AU6, (V7). Low side to chassis.	24MC (10MC SWP)	21.9MC 25.75MC	Any	Vert. amp. to Point A. Low side to chassis.	A1, A2	Adjust for response curve similar to figure 1.
2.	"	High side to Pin 1 (grid) of 6AU6, (V4). Low side to chassis.	Not used	23.6MC	"	USE VTVM DC probe to Point A Common to chassis.	A3	Adjust for maximum deflection.
3.	"	"	"	27.25MC	"	"	A4	Adjust for MINIMUM deflection.
4.	"	"	"	25.7MC	"	"	A5	Adjust for maximum deflection.
5.	"	"	"	21.9MC	"	"	A6	"
6.	"	"	"	21.25MC	"	"	A7	Adjust for MINIMUM deflection.
7.	"	"	24MC	21.9MC	"	Vert. amp. thru detector circuit (figure 2) to Pin 5 (plate) of 6AU6, (V4). Low side to chassis.	A8, A9	Adjust for response curve similar to figure 1.
8.	Direct	High side to an ungrounded tube shield floating over dummy converter tube, (V3). Low side to chassis.	"	21.25MC 21.9MC 25.75MC	"	Vert. amp. to Point A. Low side to chassis.		Check for response curve similar to figure 3. If necessary retouch A1, A2, A3, A5 and A6 for proper response.

4.5MC TRAP ADJUSTMENT

During this adjustment the common lead of the VTVM is connected to approximately 160 volts with respect to chassis. Avoid touching or grounding the VTVM case.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	.001MFD	High side to Pin 5 (cathode) of 6AL5, (V8). Low side to chassis.	4.5MC (400 ∿ Mod.)	Any	DC probe thru detector (figure 2) to Pin 11 of picture tube.	A10	Adjust for MINIMUM deflection.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

During sound IF alignment the common lead of the VTVM is connected to approximately 160 volts with respect to chassis. Avoid touching or grounding the VTVM case

Two ratio detector transformers are used in these receivers. On transformer # 708031 (Sickles), the secondary is on the bottom. On transformer #708031B (Automatic) the secondary is on top.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	.001MFD	High side to Pin 5 (cathode) of 6AL5, (V8). Low side to chassis.	4.5MC (Unmod.)	Any	DC probe to Point B. Common to Pin 7 of V13.	A11, A12, A13	Adjust for maximum deflection.
11.	"	"	"	"	DC probe to Point C. Common to Pin 7 of V13.	A14	"
12.	"	"	"	"	DC probe to Point D. Common to Pin 7 of V13	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND 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. See notes under VTVM Sound Alignment.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	.001MFD	High side to Pin 5 (cathode) of 6AL5, (V8). Low side to chassis.	4.5MC (450KC SWP)	4.5MC	Any	Vert. amp. thru 10KΩ to Point B. Low side to chassis.	A11, A12, A13	Adjust for maximum amplitude and symmetry as per figure 4.
11.	"	"	"	"	"	Vert. amp. to Point D. Low side to chassis.	A15, A14	Adjust A15 so 4.5MC occurs at center of cross-over lines as per figure 5. Adjust A14 for maximum amplitude crossover lines. Continue with step 13.

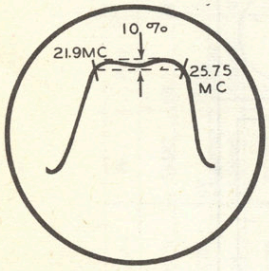


FIG. 1

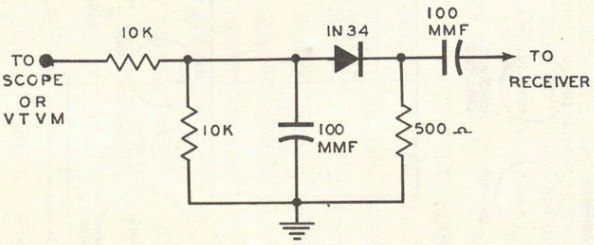


FIG. 2

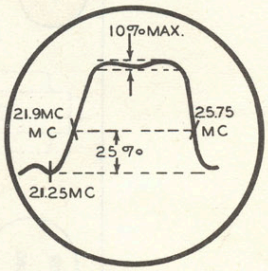


FIG. 3

ALIGNMENT INSTRUCTIONS (CONT.)

TUNER ALIGNMENT

Remove the dummy converter and replace the original 6J6 in its socket.
The use of two marker generators is recommended to align this tuner, (two generators are not absolutely necessary as will be explained later).
Marker generator #1 is connected thru a 2 or 3 MMF capacitor across the sweep generator at the antenna terminals.
If the sweep generator has a built in marker generator, it will be used for marker generator No. 1. Marker generator No. 2 is connected to an ungrounded tube shield slipped over the converter tube, V3. Marker generator No. 2 is used to supply a reference marker at the video IF frequency, (25.75MC). If, at the beginning of each step, 25.75MC is fed into the antenna terminals by means of marker generator No.1, and the position of the marker on the response curve carefully noted for future reference, marker generator No. 2 will not be needed.
The reference marker will be indicated in the table by an asterisk (*).
Connect a short across the trap winding of L14.
Remove the second video IF amp. to prevent IF feedback.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

HIGH BAND OSCILLATOR ALIGNMENT

Turn the band switch to "high band" (counter-clockwise).

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC SWP)	212.75MC *25.75MC	Tuning gang fully open.	Vert. amp. thru detector (figure 2) to Pin 1 (grid) of V4. Low side to chassis.	A16	Adjust A16 until markers coincide on response curve.
14.	"	"	177MC (10MC SWP)	172.75MC *25.75MC	Tuning gang fully closed.	"	L6	Remove tuner bottom cover. With a non-metallic tool adjust turn spacing of L6 until markers coincide on response curve. Replace bottom cover. If markers separate make compensating adjustment of L6 so markers coincide with bottom cover in place. Repeat steps 13 and 14 until high band oscillator covers the proper range.

LOW BAND OSCILLATOR ALIGNMENT

Turn the band switch to "low band" (clockwise).
Remove the tuner bottom cover.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
15.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	85MC (10MC SWP)	84.75MC *25.75MC	Tuning gang fully open	Vert. amp. thru detector (figure 2) to Pin 1 (grid) of V4. Low side to chassis.	L9	With a non-metallic tool adjust L9 turn spacing until markers coincide on response curve.
16.	"	"	57MC (10MC SWP)	54.25MC *25.75MC	Tuning gang fully closed.	"	A17	Adjust A17 until markes coincide on response curve.

HIGH BAND RF ALIGNMENT

For step 17 tune to channel 13 by feeding the channel 13 video carrier frequency, (211.25MC), unto the antenna and turn the tuning control until the marker coincides with the 25.75MC reference marker, on the response curve obtained at the tuner output as during oscillator alignment. Leave the tuning control at this position during step 17.
For step 18 tune to channel 7 in a similar manner using the channel 7 video marker (175.25MC). Leave tuning at this position during step 18.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
17.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC SWP)	211.25MC 215.75MC	13 (See note above)	Vert. amp. thru 10KΩ to Point (E). Low side to chassis.	A18, A19	Adjust A18 for maximum amplitude in the vicinity of the video marker and A19 for maximum amplitude in the vicinity of the sound marker.
18.	"	"	177MC (10MC SWP)	175.25MC 179.75MC	7	"	L4, L5	With a non-metallic tool adjust turn spacing of L4 for maximum amplitude in the vicinity of the video marker and L5 for maximum amplitude in the vicinity of the sound marker. Repeat steps 17 and 18 until both channels 7 and 13 fall within the limits of figure 6.

LOW BAND RF ALIGNMENT

For step 19 tune to channel 6 by feeding the channel 6 video carrier frequency, (83.25MC) into the antenna and adjust the tuning control until the marker coincides with the 25.75MC reference marker on the response curve at the tuner output.
Leave the tuning at this position during step 19.
For step 20 tune to channel 2 by coincidence of the channel 2 video marker, (55.25MC), and the 25.75MC reference marker.
Leave tuning at this position during step 20.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
19.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	85MC (10MC SWP)	83.25MC 87.75MC	6	Vert. amp. thru 10KΩ to Point (E). Low side to chassis.	L7, L8	With a non-metallic tool adjust L7 turn spacing for maximum amplitude in the vicinity of the video marker and L8 for maximum amplitude in the vicinity of the sound marker.
20.	"	"	57MC (10MC SWP)	55.25MC 59.75MC	2	"		Check the channel 2 response. If necessary retouch L7 and L8 for best compromise which will give a response on both channels 6 and 2 within the limits shown in figure 6. Recheck high and low band channels for proper oscillator coverage and acceptable response.

HIGH BAND ANTENNA TRIMMER ADJUSTMENT

Tune to channel 13 as outlined under high band RF alignment.
Connect the scope through 10KΩ Point E.
Turn the high band antenna trimmer, (A20) several turns counter-clockwise.
Then turn A19 clockwise while observing the response. It will be noted that the response amplitude will increase to a certain point, and then the response will begin to narrow. Back off the trimmer, (counter-clockwise), to the point of maximum bandwidth without reduction of amplitude.

LOW BAND ANTENNA TRIMMER ADJUSTMENT

The low band antenna trimmer, (A21), is adjusted the same as the high band trimmer, except that the tuner is tuned to channel 6 and A21 adjusted while observing the channel 6 response.

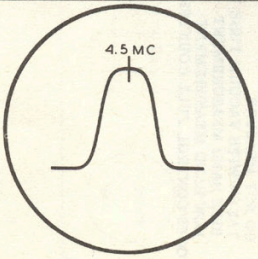


FIG. 4

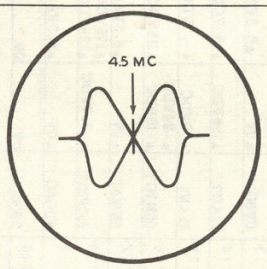
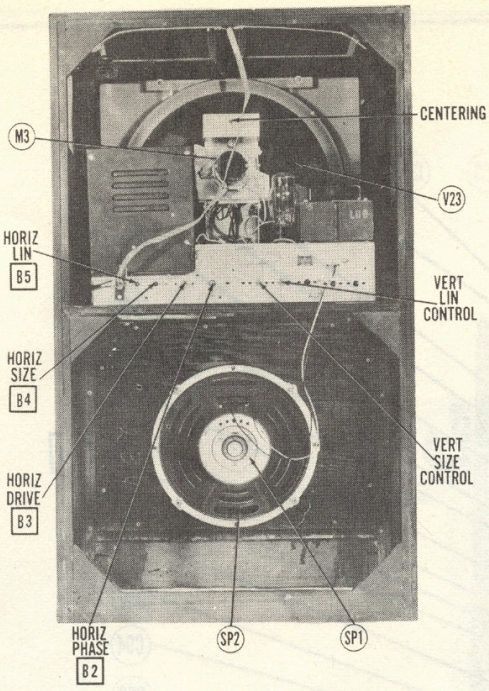


FIG. 5

FIG. 6



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Connect a short across terminals C and D of L28.
Turn the set on and tune in a TV station, preferably a test pattern.
Turn the horizontal hold control to fully counter-clockwise.
Starting with the horizontal frequency slug, (B1), fully out, adjust clockwise until the picture synchronizes horizontally.
Remove the short from L28 and connect the vertical input lead of an oscilloscope through a 22KΩ resistor to terminal C of L28.
Adjust the horizontal phasing slug, (B2), until the broad and narrow peaks of the waveform on the scope are of equal height as shown in figure 7. If necessary, during adjustment of B2, adjust B1 to keep picture synchronized.
Momentarily interrupt the signal by switching to another channel and back again. The picture should be out of sync and show 4 or 5 sloping bars, if more than 5 or less than 4 bars are present, adjust B1 until 4 or 5 bars are present.
Turn the hold control slowly clockwise. The picture should synchronize after approximately 1/4 turn and, there after, remain in sync over the entire range of the hold control.
Adjust the horizontal drive trimmer, (B3), clockwise as far as possible without crowding in the picture, or vertical lines appearing.
Adjust the horizontal size slug, (B4), until the picture fills the mask horizontally.
Adjust the horizontal linearity slug, (B5), until the picture is symmetrical from left to right. Slight readjustment of B3 may be necessary for optimum results.

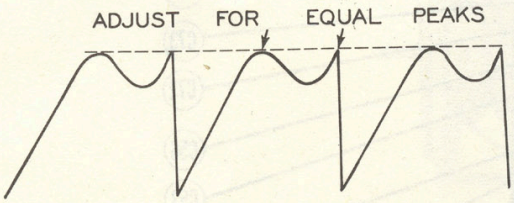
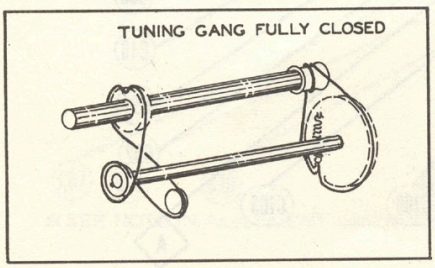


FIG. 7

DISASSEMBLY INSTRUCTIONS

1. Remove five push-on type control knobs.
2. Remove six wood screws from rear cover. Remove rear cover.
3. Disconnect built-in antenna.
4. Disconnect speaker.
5. Remove four hex head bolts from chassis. Remove chassis.
6. Remove four hex nuts from speaker. Remove speaker.

NOTE: FOR PICTURE TUBE REMOVAL, IT IS NECESSARY TO REMOVE THE CHASSIS AS OUTLINED ABOVE.



DIAL CORD STRINGING