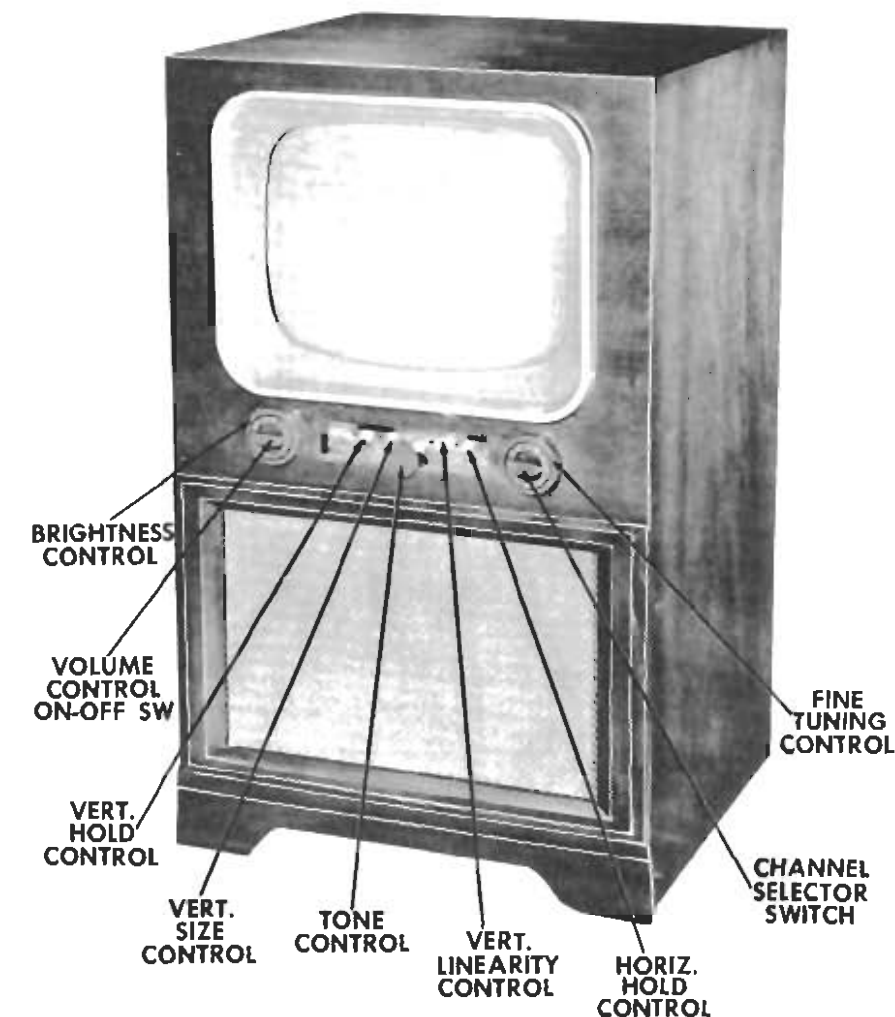


## RESISTOR AND INDUCTOR IDENTIFICATION



SENTINEL 1U439

TRADE NAME	Sentinel Models 1U438, 1U439, 1U440, 1U441, 1U443, 1U444, 438, 439, 440, 441, 443, 444. Series XD, XXD, 2XD.
MANUFACTURER	Sentinel Radio Corp., 2100 W. Dempster, Evanston, Ill.
TYPE SET	Television Receiver
TUBES	Twenty Three

POWER SUPPLY 110-120 Volts AC-60 Cycle  
TUNING RANGE- Channel 2 thru 13

RATING 1.65 Amp. @ 117 Volts AC

### INDEX

Alignment Instructions .....	6, 7	Photos (Cont.)	
Drive Cord Stripping .....	14	Capacitor and Alignment Identification.....	4, 9
Disassembly Instructions .....	8	Chassis- Top View .....	3
Horizontal Sweep Circuit Adjustments .....	10	Resistor and Inductor Identification .....	15, 16
Parts List and Descriptions .....	11, thru 14	Resistance Measurements .....	8
Photographs		Schematic .....	2
Cabinet- Rear View .....	10	Tube Placement Charts .....	5

### HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"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."

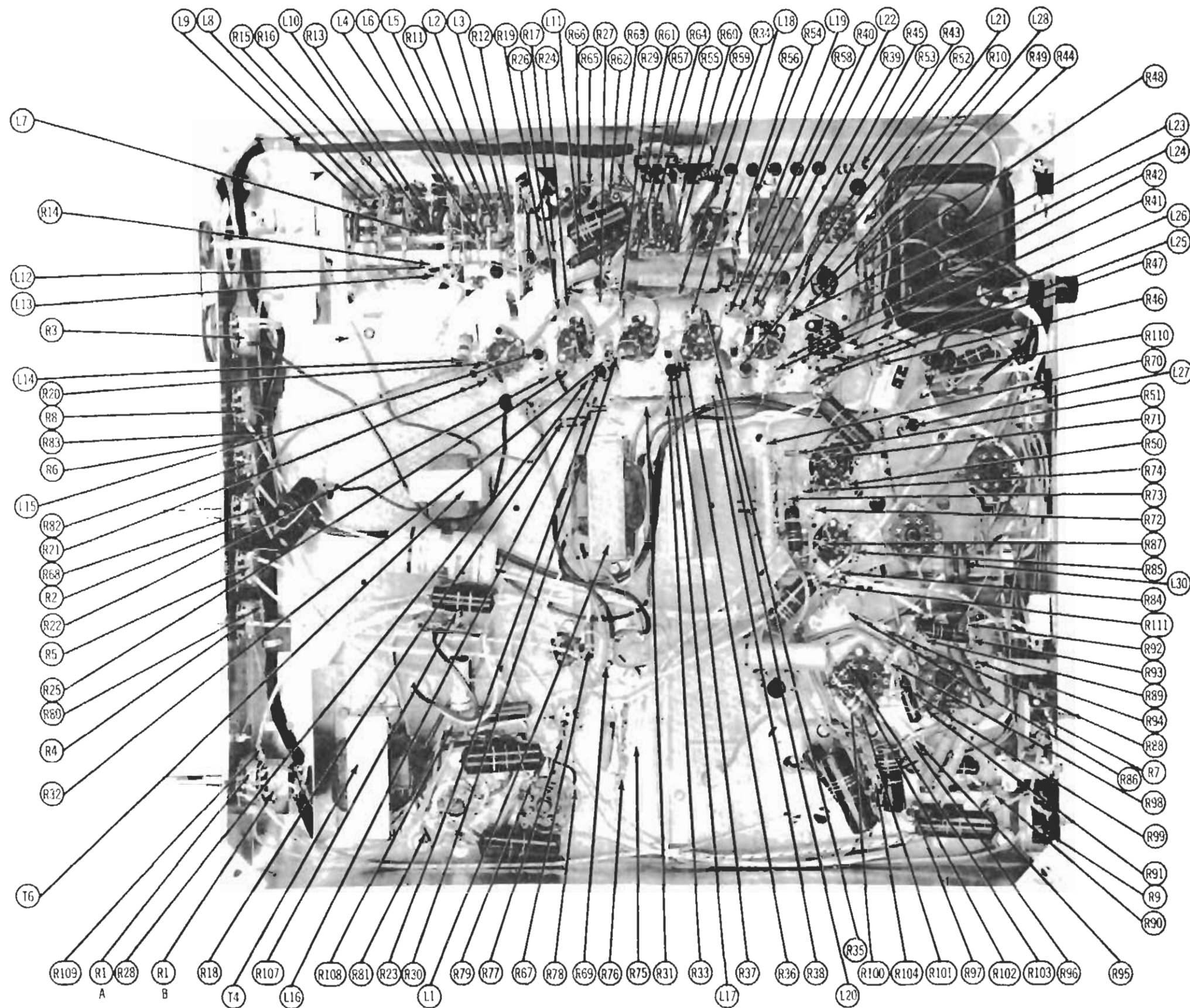
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1952 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright 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

DATE 1-52

SET 157

FOLDER 9

SENTINEL MODELS 1U438, 1U439, 1U440, 1U441, 1U443, 1U444, 438, 439, 440, 441, 443, 444 (Series 2XD, XD, XXD)



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

BRIGHT-  
CON

VOL-  
CON-  
ON-O

VE-  
HC-  
CON

TRADE NAME	Sentir
MANUFACTURER	Sentir
TYPE SET	Telev
TUBES	Twent

POWER SUPPLY	110-12
TUNING RANGE	Chan

Alignment Instruction
Drive Cord Strapping
Disassembly Instruction
Horizontal Sweep Circuit
Parts List and Description
Photographs
Cabinet - Rear

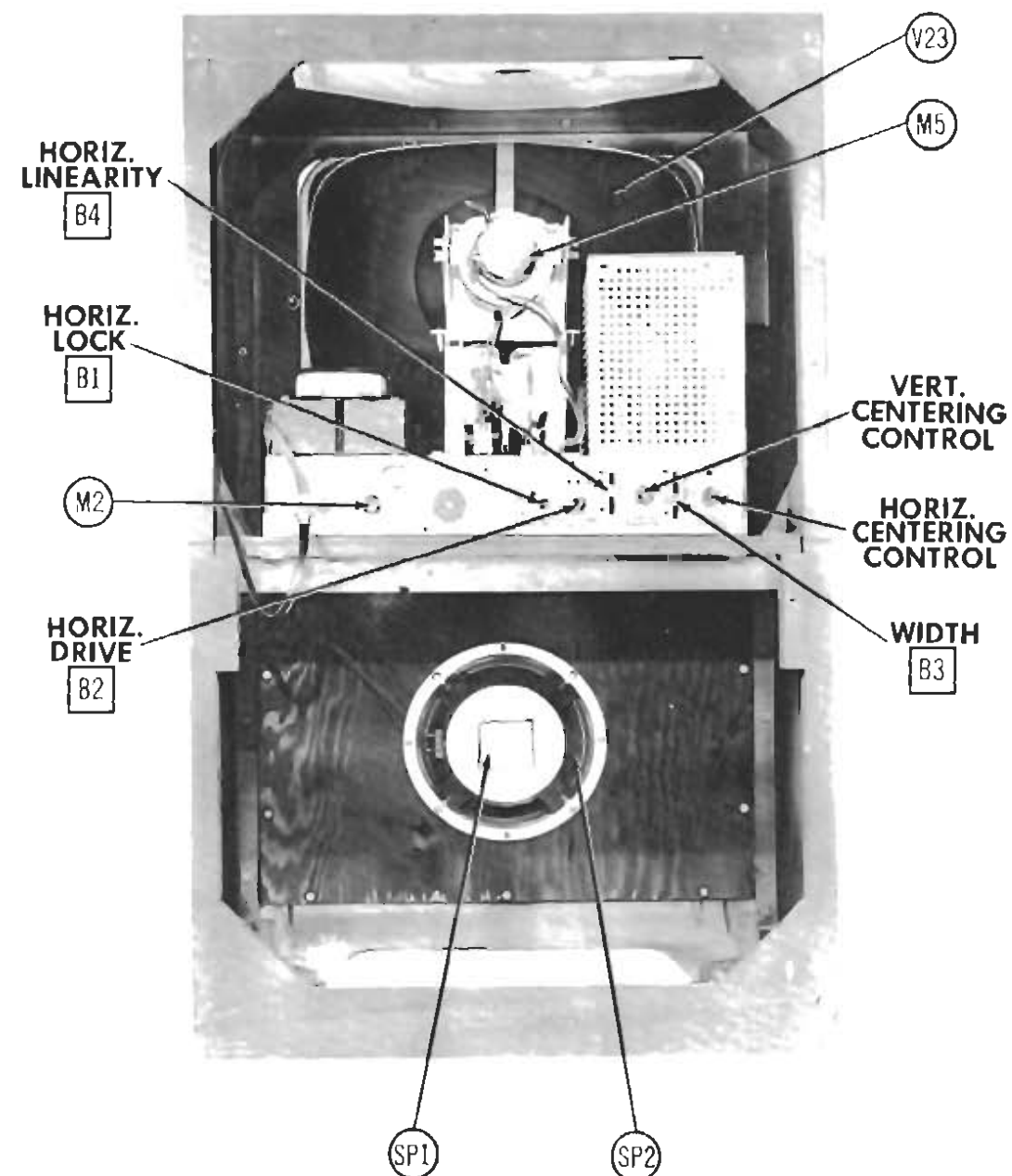
HO

"The listing of any available replacement parts is made as a recommendation, warranty as to the quality and suitability of parts have been compiled from information furnished by the manufacturers of the parts. Reproduction or use, without ex-









CABINET-REAR VIEW

## HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Turn the horizontal hold control to the mid-position of its range.

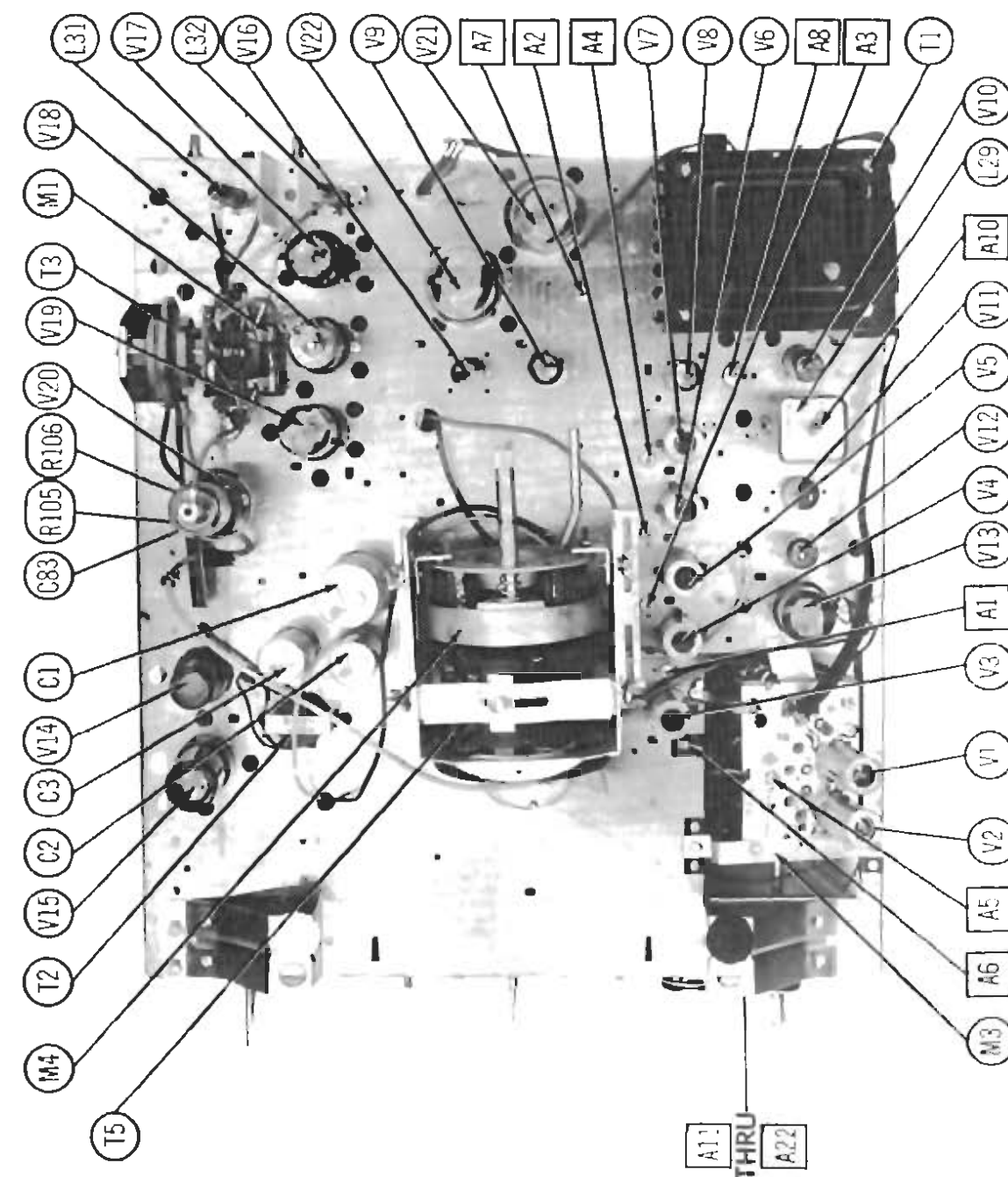
Adjust the horizontal frequency slug, (B1), to the center of its range over which the picture synchronizes horizontally.

Adjust the horizontal drive trimmer, (B2), counter-clockwise as far as possible without crowding or bright vertical lines appearing in the picture.

Adjust the width slug, (B3), until the picture is slightly wider than necessary to fill the mask horizontally.

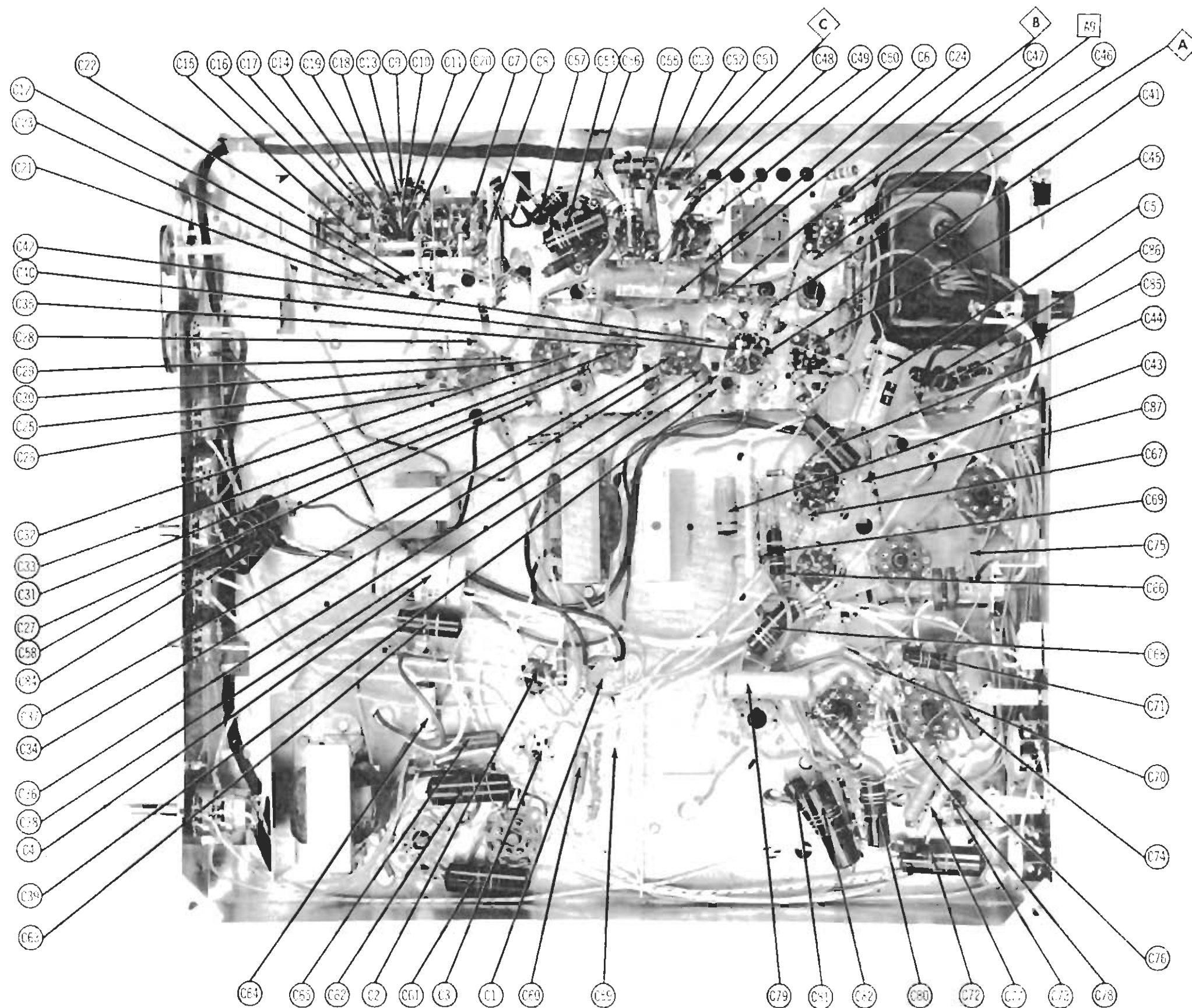
Adjust the horizontal linearity slug, (B4), until the picture is symmetrical from left to right.

Since both width and horizontal linearity are affected by the drive trimmer, it may be necessary to adjust them alternately to obtain optimum results.



MEIA POL SISSEHCH

SENTINEL MODELS 1U438, 1U439, 1U440, 1U441, 1U443, 1U444, 438, 439, 440, 441, 443, 444 (Series 2XD, XD, XXD)



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

SENTINEL MODELS 1U438, 1U439, 1U440, 1U441, 1U443,  
1U444, 438, 439, 440, 441, 443, 444 (Series 2XD, XD, XXD)

## RESISTANCE MEASUREMENTS

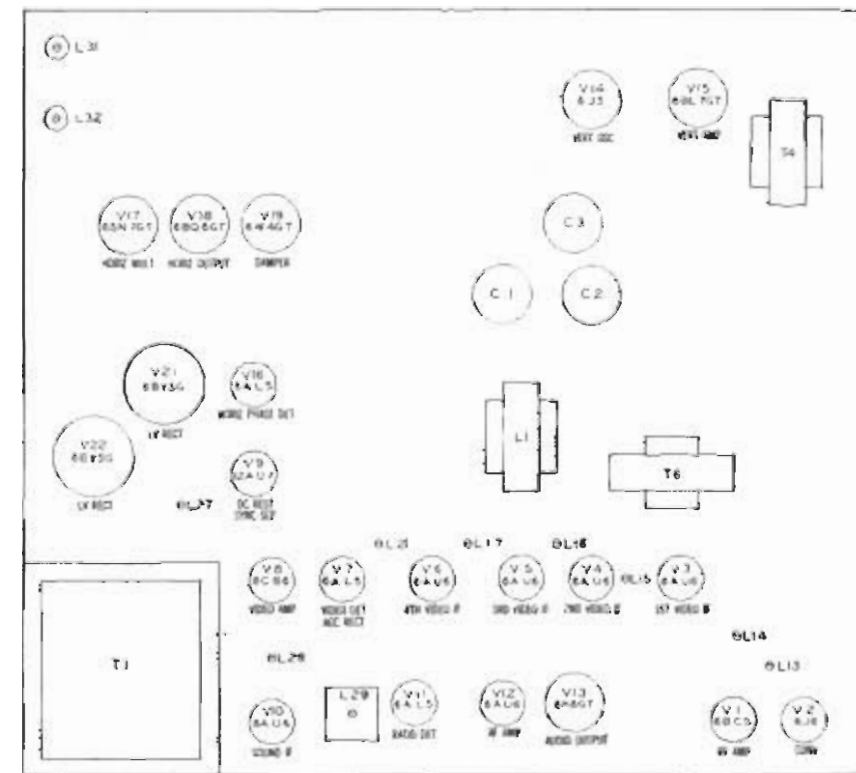
RESISTANCE READINGS										
Item	Table	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	80C5	50KΩ	0Ω	10Ω	0Ω	15.5KΩ	15.5KΩ	0Ω		
V 2	87B	12TKΩ	12.5KΩ	0Ω	.2Ω	220KΩ	10KΩ	0Ω		
V 3	8AU6	550KΩ	0Ω	0Ω	1Ω	11.5KΩ	12.5KΩ	0Ω		
V 4	8AU6	550KΩ	0Ω	0Ω	1Ω	1400Ω	12.5KΩ	0Ω		
V 5	8AU6	550KΩ	0Ω	0Ω	1Ω	1400Ω	12.5KΩ	100Ω		
V 6	8AU6	1.5Ω	0Ω	0Ω	0Ω	11.5KΩ	12.5KΩ	100Ω		
V 7	8A15	3.6KΩ	320KΩ	0Ω	1.5Ω	500Ω	0Ω	.2Ω		
V 8	8CB6	5.4KΩ	1KΩ	0Ω	.1Ω	13.2KΩ	12.5KΩ	0Ω		
V 9	12AU7	11.2Meg	0Ω	270KΩ	0Ω	0Ω	12.5KΩ	11.2Meg	2.1KΩ	.1Ω
V 10	8AD6	0Ω	0Ω	0Ω	.1Ω	132KΩ	132KΩ	270Ω		
V 11	8A15	Inf.	Inf.	0Ω	.1Ω	10KΩ	0Ω	1.5KΩ		
V 12	8AU6	10Meg	0Ω	0Ω	.1Ω	1270KΩ	2.3Meg	6.8Ω		
V 13	8K6GT	Inf.	0Ω	12KΩ	450Ω	570KΩ	100KΩ	.1Ω	470Ω	
V 14	87B	0Ω	1Ω	560KΩ	560KΩ	2.2Meg	560KΩ	0Ω	0Ω	
V 15	8BL7GT	2.3Meg	1000Ω	92Ω	2.2Meg	1000Ω	92Ω	.1Ω	0Ω	
V 16	8A15	100KΩ	100KΩ	0Ω	.1Ω	570KΩ	0Ω	570KΩ		
V 17	8B7GT	840KΩ	16.2KΩ	820Ω	120KΩ	810KΩ	820Ω	0Ω	.1Ω	
V 18	8BQ6GT	Inf.	.1Ω	17.5KΩ	17.5KΩ	560KΩ	560KΩ	0Ω	0Ω	TOP CAP #420
V 19	8W1GT	Inf.	Inf.	200KΩ	Inf.	150Ω	Inf.	10Ω	1.1Ω	
V 20	1B3GT	PINS 1 THROUGH 8 HAVE INF RESISTANCE								TOP CAP #7000
V 21	8BY5G	25KΩ	10Ω	Inf.	10Ω	10Ω	Inf.	1.1Ω	25KΩ	
V 22	8BY5G	25KΩ	10Ω	Inf.	10Ω	10Ω	Inf.	1.1Ω	25KΩ	
V 23	17BP4A	0Ω	270KΩ	PIN 10 #17KΩ	PIN 11 #23KΩ	PIN 12 #10Ω				

ALL CONTROLS SET FOR NORMAL OPERATION, NO SIGNAL APPLIED  
 † MEASURED FROM PINS 1 AND 6 OF V21 AND V22  
 \* MEASURED FROM PIN 3 OF V19

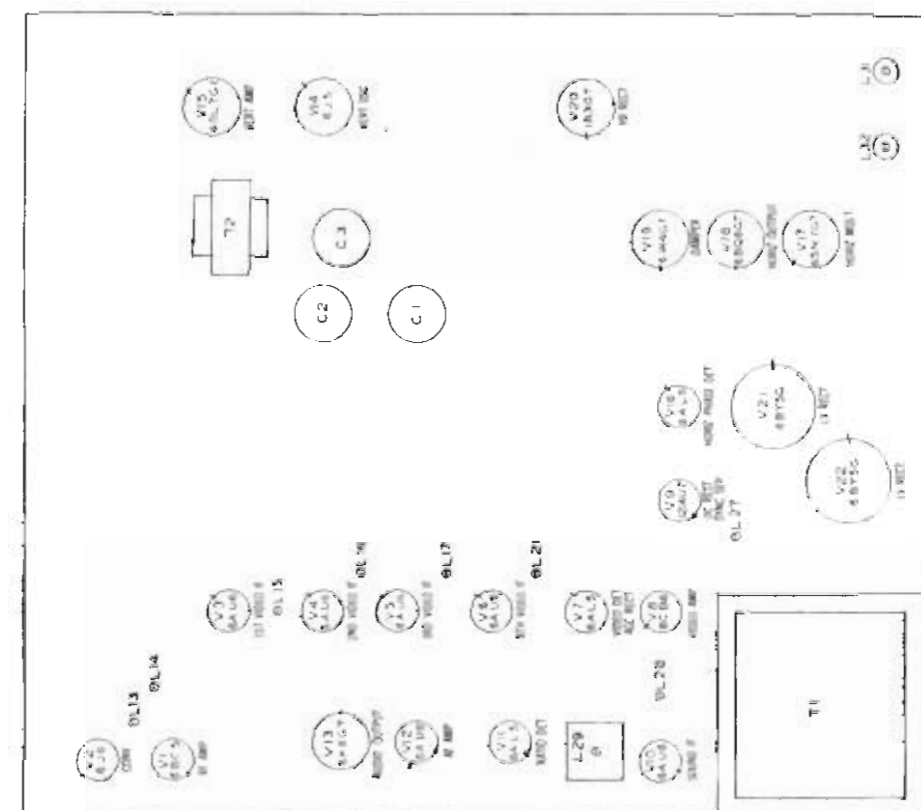
## DISASSEMBLY INSTRUCTIONS

1. Remove 5 push on type control knobs from front panel.
2. Remove 9 wood screws from back cover. Remove cover.
3. Disconnect built-in antenna.
4. Disconnect speaker.
5. Remove 5 chassis bolts. Remove chassis.

Note: For picture tube removal, it is necessary to remove chassis as outlined above.



BOTTOM VIEW



TUBE PLACEMENT CHART

WIA POL

SENTINEL MODELS 1U438, 1U439, 1U440, 1U441, 1U443, 1U444, 438, 439, 440, 441, 443, 444 (Series 2XD, XD, XPD)



## ALIGNMENT INSTRUCTIONS

**ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT**  
The end of the high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator to disable the high voltage.

### VIDEO IF ALIGNMENT

Remove the converter tube (V2) and replace it with a 6T6 which has Pin 1 removed, this will disable the local oscillator and prevent the possibility of erroneous indications.  
Connect the negative lead of a 4.5 volt battery to the ungrounded lead of C25, connect the positive lead to chassis.  
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1. Direct	High side to an ungrounded tube shield floating over dummy converter tube, (V2). Low side to chassis.	Not used	22.5 MC	Any	USE VTVM DC probe to point $\odot$ Common to chassis.	A1, A2	Adjust for maximum deflection.
2. "	"	"	24.5 MC	Any	"	A3	"
3. "	"	"	25.5 MC	"	"	A4	"
4. "	"	24 MC (10 MC swp.)	22 MC 23 MC 25.5 MC	"	Vert. Amp. to point $\odot$ Low side to chassis.	A5, A6	Adjust for response curve similar to fig. 1. If necessary retouch A1 thru A4 for proper response.

### 4.5 MC TRAP ADJUSTMENT

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5. 0.1 MF	High side to pin 1, (grid) of 6CB6, (V8). Low side to chassis.	Not used	4.5 MC (400 AM mod)	Any	Vert. Amp. Thru 33K $\Omega$ to pin 2 of picture tube. Low side to chassis.	A7	Adjust for MINIMUM 60% indication on scope. After alignment is completed tune in a strong signal and examine the picture for 4.5 MC beat interference. (Grain appearance in horizontal lines.) If necessary retouch A7 to minimize the interference.

### SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
6. 0.1 MF	High side to pin 1, (grid) of 6CB6, (V8). Low side to chassis.	4.5 MC (unmod)	Any	DC probe to point $\odot$ Common to chassis.	A8, A9	Adjust for maximum deflection.
7. "	"	"	"	DC probe to point $\odot$ Common to chassis.	A10	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 450 KC sweep. Use (20-10) sawtooth voltage on scope for horizontal deflection.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6. 0.1 MF	High side to pin 1, (grid) of 6CB6, (V8). Low side to chassis.	4.5 MC (450 KC swp.)	4.5 MC	Any	Vert. Amp. to point $\odot$ Low side to chassis.	A8, A9	Disconnect stabilizer capacitor C6. Adjust A10 so 4.5 MC occurs at center of a crossover line as per fig. 3. SLIGHTLY retouch A9 for maximum amplitude and straightness of crossover lines.
7. "	"	"	"	"	Vert. Amp. to point $\odot$ Low side to chassis.	A10	

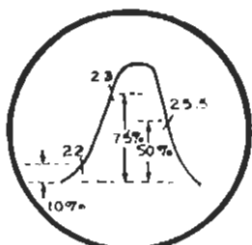


FIG. 1



FIG. 2

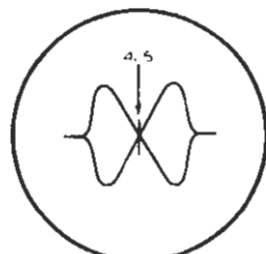


FIG. 3

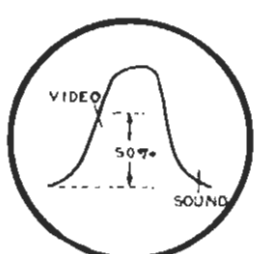


FIG. 4

## ALIGNMENT INSTRUCTIONS (CONT.)

### OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6T6 in its socket.  
Leave the 4.5 volt bias connected.  
The oscillator padder adjustment, (A10), may require adjustment if the oscillator tube has been replaced and all channels are off an equal amount. If adjustment of A10 will not render correct oscillator operation on all active channels the individual channel adjustment for each active channel must be adjusted. It is essential that the highest channel be adjusted first and progress towards the lowest channel.  
Notice that channels 12 and 13 have a common adjustment. This adjustment should be made on whichever channel is active in the area.  
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.  
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8. Two (250 carbon resistors)	Across antenna terminals with (250K in each lead.	212 MC (10 MC swp.) 217 MC (10 MC swp.) 220 MC (10 MC swp.) 225 MC (10 MC swp.) 230 MC (10 MC swp.) 235 MC (10 MC swp.) 240 MC (10 MC swp.) 245 MC (10 MC swp.) 250 MC (10 MC swp.) 255 MC (10 MC swp.) 260 MC (10 MC swp.) 265 MC (10 MC swp.) 270 MC (10 MC swp.) 275 MC (10 MC swp.) 280 MC (10 MC swp.) 285 MC (10 MC swp.) 290 MC (10 MC swp.) 295 MC (10 MC swp.) 300 MC (10 MC swp.) 305 MC (10 MC swp.) 310 MC (10 MC swp.) 315 MC (10 MC swp.) 320 MC (10 MC swp.) 325 MC (10 MC swp.) 330 MC (10 MC swp.) 335 MC (10 MC swp.) 340 MC (10 MC swp.) 345 MC (10 MC swp.) 350 MC (10 MC swp.) 355 MC (10 MC swp.) 360 MC (10 MC swp.) 365 MC (10 MC swp.) 370 MC (10 MC swp.) 375 MC (10 MC swp.) 380 MC (10 MC swp.) 385 MC (10 MC swp.) 390 MC (10 MC swp.) 395 MC (10 MC swp.) 400 MC (10 MC swp.) 405 MC (10 MC swp.) 410 MC (10 MC swp.) 415 MC (10 MC swp.) 420 MC (10 MC swp.) 425 MC (10 MC swp.) 430 MC (10 MC swp.) 435 MC (10 MC swp.) 440 MC (10 MC swp.) 445 MC (10 MC swp.) 450 MC (10 MC swp.) 455 MC (10 MC swp.) 460 MC (10 MC swp.) 465 MC (10 MC swp.) 470 MC (10 MC swp.) 475 MC (10 MC swp.) 480 MC (10 MC swp.) 485 MC (10 MC swp.) 490 MC (10 MC swp.) 495 MC (10 MC swp.) 500 MC (10 MC swp.)	210.25 MC 215.75 MC 220.25 MC 225.75 MC 230.25 MC 235.75 MC 240.25 MC 245.75 MC 250.25 MC 255.75 MC 260.25 MC 265.75 MC 270.25 MC 275.75 MC 280.25 MC 285.75 MC 290.25 MC 295.75 MC 300.25 MC 305.75 MC 310.25 MC 315.75 MC 320.25 MC 325.75 MC 330.25 MC 335.75 MC 340.25 MC 345.75 MC 350.25 MC 355.75 MC 360.25 MC 365.75 MC 370.25 MC 375.75 MC 380.25 MC 385.75 MC 390.25 MC 395.75 MC 400.25 MC 405.75 MC 410.25 MC 415.75 MC 420.25 MC 425.75 MC 430.25 MC 435.75 MC 440.25 MC 445.75 MC 450.25 MC 455.75 MC 460.25 MC 465.75 MC 470.25 MC 475.75 MC 480.25 MC 485.75 MC 490.25 MC 495.75 MC 500.25 MC	13 12 11 10 9 8 7 6 5 4 3 2 1 0 -1 -2 -3 -4 -5 -6 -7 -8 -9 -10 -11 -12 -13 -14 -15 -16 -17 -18 -19 -20 -21 -22	Vert. amp. to point $\odot$ . Low side to chassis.	A12 A13 A14 A15 A16 A17 A18 A19 A20 A21 A22	Adjust to place video marker at 50% as shown in Fig. 4. See note above concerning channels 12 and 13.

THE RF AND MIXER PORTION OF THIS TUNER HAS BEEN PROPERLY ALIGNED AT THE FACTORY AND IS VERY STABLE.  
ALIGNMENT OF THIS PORTION SHOULD NOT BE REQUIRED IN THE FIELD.

SENTINEL MODELS TU438, TU439, TU440, TU441, TU443,  
TU444, 438, 439, 440, 441, 443, 444 (Series 2XD, XD, XXD)

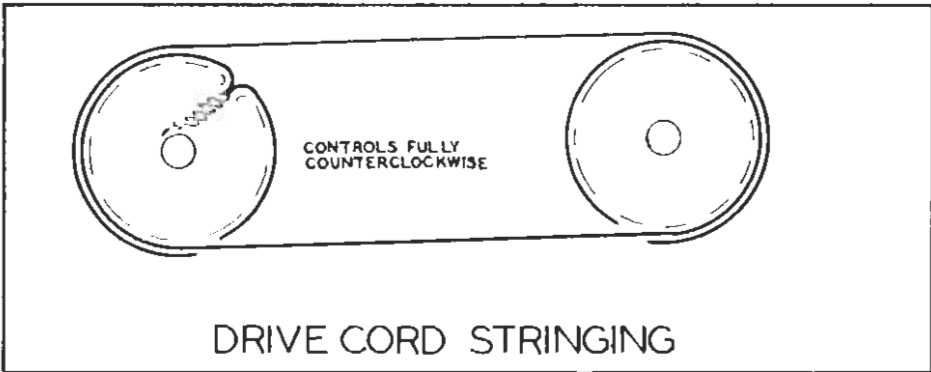


**PARTS LIST AND DESCRIPTIONS (Continued)**  
**FUSES**

ITEM No.	TYPE	RATING	REPLACEMENT DATA				REMARKS
			SENTINEL PART No.		LITTELFUSE PART No.		
			FUSE	HOLDER	FUSE	HOLDER	
M1	3AG	2 1/2 A	40ES-9		3302-5	342001	
M2	3AG	2/10 A	40ES-8		331-200	357001	

**MISCELLANEOUS**

ITEM No.	PART NAME	SENTINEL PART No.	NOTES
M3A	RF Tuner	20E7H	Complete with tubes.
B	RF Tuner	20E6B2	Complete with tubes (alternate)
M4A	Focus Magnet	62E4	
B	Focus Magnet	42E2-2	Alternate
M5	Ion Trap	15E174-4	
B2	Trimmer	24E16-2	Horiz. Drive (030-300MMF)
	Knob	37E71	Brightness (Mahogany)
	Knob	37E71-3	Brightness (Blonde)
	Knob	37E71-2	Contrast (Mahogany)
	Knob	37E71-4	Contrast (Blonde)
	Knob	37E72	Channel Selector (Mahogany)
	Knob	37E72-3	Channel Selector (Blonde)
	Knob	37E72-2	Volume (Mahogany)
	Knob	37E72-4	Volume (Blonde)
	Knob	37E73	Tone (Mahogany)
	Knob	37E73-2	Tone (Blonde)
	Front Plate Assembly	20E693	(Mahogany)
	Front Plate Assembly	20E693-1	(Blonde)



**PARTS LIST AND DESCRIPTIONS**  
**TUBES (SYLVANIA or Equivalent)**

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		SENTINEL PART No.	STANDARD REPLACEMENT		
V1	RF Amp.	6BC5	6BC5	7BD	
V2	Converter	6JS	6JS	7BF	
V3	1st Video IF Amp.	6AU6	6AU6	7BK	
V4	2nd Video IF Amp.	6AU6	6AU6	7BK	
V5	3rd Video IF Amp.	6AU6	6AU6	7BK	
V6	4th Video IF Amp.	6AU6	6AU6	7BK	
V7	Video Det. -AGC				
	Rect.	6AL5	6AL5	6BT	
V8	Video Amp.	6CD6	6CD6	7CM	
V9	DC. Rest. -Sync.				
	Sep.	12AU7	12AU7	9A	
V10	Sound IF Amp.	6AU6	6AU6	7BK	
V11	Ratio Det.	6AL5	6AL5	6BT	
V12	A.F. Amp.	6AU6	6AU6	7BK	
V13	Audio Output	6X5GT	6X5GT	7S	
V14	Vert. Osc.	6JS	6JS	6Q	
V15	Vert. Amp.	6BL7GT	6BL7GT	8BD	
V16	Horiz. Phase Det.	6AL5	6AL5	6BT	
V17	Horiz. Matt.	6SN7GT	6SN7GT	8BD	
V18	Horiz. Output	6X5GT	6X5GT	8AM	
V19	Damper	6W6GT	6W6GT	4CG	
V20	RV Rect.	103GT	103GT	5C	
V21A	LV Rect.	6BY5G	6BY5G	6CN	
B	LV Rect.	5U4G	5U4G	5T	
V22A	LV Rect.	6BY5G	6BY5G	6CN	
B	LV Rect.	5U4G	5U4G	5T	

**CATHODE-RAY TUBE**

ITEM No.	REPLACEMENT DATA			RMA BASE TYPE	NOTES
	SENTINEL PART No.	SYLVANIA PART No.	THOMAS PART No.		
22A	17BP4A	17BP4A	17BP4	12D	
C	21EP4A	21EP4A	21EP4	12D	
C	20CP4	20CP4	20CP4	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	REPLACEMENT DATA					IDENTIFICATION CODES AND INSTALLATION NOTES
		SENTINEL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNEILL-CABILLER PART No.	ERIE PART No.	
C1A	60	25E59	AFR 2-01		UPF64339		TYL-2770
B	40		AFR 2-01				TYA-101
C	40						TYL-2770
C2A	50	25E69			UPF64339		TYL-2770
B	100						TYA-1210
C	10						TYL-2770
C3A	10	25E61	AFR 3-21		UPF64339		TYL-2770
B	10						TYL-2770
C	10						TYL-2770
C4	1000	25E59	PR55/1000		BRH610		TYA-1009
C5	100	25E12	PR512/100		BRH221A		TYA-1130
C6	10	25E8	PR525/10		BR102A		TYA-1204
C7	15	ST-214	ST-214				SGA-Q15
C8	1000	23E2012	BPD-001	DD-102	NP0K-100	GP1K-150	SGA-Q15
C9	1000	23E2012	BPD-001	DD-102	NP0K-100	GP1K-150	SGA-Q15
C10	1000	23E2012	BPD-001	DD-102	NP0K-100	GP1K-150	SGA-Q15
C11	89						SGA-Q15
C12	1.5						SGA-Q15
C13	1.5	ST-209	ST-209	TCZ-1.5	NP0K-100	GP1K-150	SGA-Q15
C14	470	ST-432	ST-432	TCZ-1.5	NP0K-100	GP1K-150	SGA-Q15
C15	1.5						SGA-Q15
C16	2.2	ST-207	ST-207	TCZ-1.5	NP0K-100	GP1K-150	SGA-Q15
C17	10	ST-228	ST-228	TCZ-1.5	NP0K-100	GP1K-150	SGA-Q15
C18	1000	23E2012	BPD-001	DD-102	NP0K-100	GP1K-150	SGA-Q15
C19	5000	ST-211	BPD-001	DD-102	NP0K-100	GP1K-150	SGA-Q15
C20	470	ST-232	ST-232	DD-102	NP0K-100	GP1K-150	SGA-Q15
C21	15	ST-214	ST-214	DD-102	NP0K-100	GP1K-150	SGA-Q15
C22	5000	23E2012	BPD-001	DD-102	NP0K-100	GP1K-150	SGA-Q15
C23	75						SGA-Q15
C24	1.0	23E2221	485-1.0	DD-102	NP0K-100	GP1K-150	SGA-Q15
C25	100	23E2012-2	81100	DD-102	NP0K-100	GP1K-150	SGA-Q15
C26A	1500	23E2012-5	BPD-2X0015	DD-2-152	NP0K-100	GP1K-150	SGA-Q15
B	1500						SGA-Q15
C27	1000	23E2012	BPD-001	DD-102	NP0K-100	GP1K-150	SGA-Q15
C28	1000	23E2012	BPD-001	DD-102	NP0K-100	GP1K-150	SGA-Q15
C29	100	23E2012-2	81100	DD-102	NP0K-100	GP1K-150	SGA-Q15
C30A	1500	23E2012-5	BPD-2X0015	DD-2-152	NP0K-100	GP1K-150	SGA-Q15
B	1500						SGA-Q15
C31	1000	23E2012	BPD-001	DD-102	NP0K-100	GP1K-150	SGA-Q15
C32	100	23E2012-2	81100	DD-102	NP0K-100	GP1K-150	SGA-Q15
C33A	1500	23E2012-5	BPD-2X0015	DD-2-152	NP0K-100	GP1K-150	SGA-Q15
B	1500						SGA-Q15
C34	1000	23E2012	BPD-001	DD-102	NP0K-100	GP1K-150	SGA-Q15
C35	100	23E2012-2	81100	DD-102	NP0K-100	GP1K-150	SGA-Q15
C36	1000	23E2012	BPD-001	DD-102	NP0K-100	GP1K-150	SGA-Q15
C37A	1500	23E2012-5	BPD-2X0015	DD-2-152	NP0K-100	GP1K-150	SGA-Q15
B	1500						SGA-Q15
C38	100	23E2012-2	81100	DD-102	NP0K-100	GP1K-150	SGA-Q15
C39	100	23E2012-2	81100	DD-102	NP0K-100	GP1K-150	SGA-Q15
C40	10	23E25	8110N750	TCN-10	NP0K-100	GP1K-150	SGA-Q15
C41	1000	23E2012	BPD-001	DD-102	NP0K-100	GP1K-150	SGA-Q15
C42	10	23E25	8110N750	TCN-10	NP0K-100	GP1K-150	SGA-Q15
C43	.022	23E2412					SGA-Q15
C44	1	23E2412					SGA-Q15
C45	2	23E21					SGA-Q15
C46	2	23E13					SGA-Q15

SENTINEL MODELS 1U438, 1U439, 1U440, 1U441, 1U443, 1U444, 438, 439, 440, 441, 443, 444 (Series 2XD, XD, XXD)

## PARTS LIST AND DESCRIPTIONS (Continued)

## RESISTORS (CONT.)

ITEM No.	RATING	REPLACEMENT DATA				IDENTIFICATION CODES AND INSTALLATION NOTES
		SENTINEL PART No.	AEROVOX PART No.	CENTRALAB PART No.	SPRAGUE PART No.	
C47A	5000	23E2037	BPD-2X004	D4-402	422-004	Sound IF De-Coupling
C48	500	23E45-10	1468-0005	D4-501	5W575	Sound IF Cathode
C49	500	23E45-10	1468-0005	D4-501	5W575	Diode Load Cap.
C50	500	23E45-10	1468-0005	D4-501	5W575	Diode Load Cap.
C51	.002	23E3406	P488-002	D4-202	PTE402	De-emphasis
C52	.047	23E3224	P488-047	DF-503	PTE403	Audio Coupling
C53	.0047	23E3608	P488-0047	D4-472	PTE405	Audio Coupling
C54	.047	23E3604	P488-047	DF-503	PTE405	RF Bypass
C55	.01	23E3410	P488-01	D4-103	PTE401	AF Amp. Screen
C56	.01	23E3608	P488-01	D4-103	PTE401	Audio Coupling
C57	.0047	23E3608	P488-0047	D4-472	PTE405	Audio Output Plate
C58	.047	23E3604	P488-047	DF-503	PTE405	Tone Comp.
C58A	.002	23E3608	P488-002	D4-202	PTE402	Vert. Integrator Net.
C58B	.005	23E3608	P488-005	D4-202	PTE402	Vert. Integrator Net.
C58C	.005	23E3608	P488-005	D4-202	PTE402	Vert. Integrator Net.
C60	.0033	23E3407	P488-0033	D4-332	PTE403	Vert. Disc. Grad. Cap.
C61	.1	23E3616	P488-01	DF-504	PTE404	Vert. Discharge
C62	.1	23E3616	P488-01	DF-504	PTE404	Vert. Sweep Coupling
C63	.1	23E3416	P488-01	DF-504	PTE404	Fixed Trimmer
C64	.01	23E3410	P488-01	D4-103	PTE401	Vert. Feedback
C65	.047	23E3224	P488-047	DF-503	PTE403	Picture Tube Cathode
C66	1000	23E3202	S2000	D4-102	5HK-D1	Horiz. Sync. Coupling
C67	1000	23E3202	S2000	D4-102	5HK-D1	Horiz. Sync. Coupling
C68	.047	23E3604	P488-047	DF-503	PTE403	Horiz. Feedback
C69	.0047	23E3608	P488-0047	D4-472	PTE405	Voltage Divider
C70	.0047	23E3608	P488-0047	D4-472	PTE405	Horiz. AFC Coupling
C71	.047	23E3224	P488-047	DF-503	PTE403	AFC Filter
C72	.22	23E3218	P488-22	GTP25	2TM-122	Feedback Net.
C73	.01	23E3410	P488-01	D4-103	PTE401	Feedback Net.
C74	500	23E3608	P488-0047	D4-472	PTE405	Horiz. MV Feedback
C75	500	23E3608	P488-0047	D4-472	PTE405	Horiz. Discharge
C76	500	23E3608	P488-0047	D4-472	PTE405	Horiz. Discharge
C77	250	23E3608	P488-0047	D4-472	PTE405	Horiz. Discharge
C78	.001	23E3604	P488-001	D4-102	PTE401	Horiz. Sweep Coupling
C79	.2	23E3418	P488-22	GTP25	2TM-122	RF Bypass
C80	.047	23E3604	P488-047	DF-503	PTE403	Damper Filter
C81	.047	23E3604	P488-047	DF-503	PTE403	Damper Filter
C82	.47	23E3220	P488-47	GTP25	2TM-147	Horiz. Sweep Coupling
C83	500	23E3608	P488-0047	D4-472	PTE405	RV Filter
C84	.047	23E3604	P488-047	DF-503	PTE403	RF Bypass
C85	.01	23E3410	P488-01	D4-103	PTE401	Line Filter
C86	.01	23E3410	P488-01	D4-103	PTE401	Line Filter
C87	1	23E3608	P488-01	D4-103	PTE401	Fixed Trimmer
C88	1	23E3608	P488-01	D4-103	PTE401	RF Bypass

\* Not used in all Models.  
 † Items C64A, C64B, C64C, R75A, R75B, R75C are combined in one unit.  
 ‡ Some Models use .47 MFD in this application (Part No. 23E3207-6).  
 § Some Models use 220MMF in this application (Part No. 23E3207-6).  
 ¶ Some Models use 600MMF in this application (Part No. 23E3207-6).

## CONTROLS

ITEM No.	RATING	REPLACEMENT DATA				INSTALLATION NOTES
		SENTINEL PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	
R1A	250K	23E34	Concentrator	HTY-213	58B-602-S	Brightness Control-Panet
R1B	500K	23E34	Concentrator	HTY-213	58B-602-S	Volume Control Switch-Rear
R1C	500K	23E34	Concentrator	HTY-213	58B-602-S	Volume Control Switch-Rear
R2A	150K	23E75	Not Req.	AG-52-S		Tone Control
R2B	150K	23E75	Not Req.	AG-52-S		Attach to R2A per instructions.
R3A	100K	23E75	Not Req.	AG-52-S		Contrast Control
R3B	100K	23E75	Not Req.	AG-52-S		Attach to R3A per instructions.
R4A	2Meg	23E72	Not Req.	AG-52-S		Vertical Hold Control.
R4B	2Meg	23E72	Not Req.	AG-52-S		Attach to R4A per instructions.
R5A	250K	23E45	Not Req.	AG-52-S		Vertical Size Control
R5B	250K	23E45	Not Req.	AG-52-S		Attach to R5A per instructions.
R6A	200K	23E47	Not Req.	AG-52-S		Vertical Linearity - See Note.
R6B	200K	23E47	Not Req.	AG-52-S		Attach to R6A per instructions.
R7	50K	23E79	Not Req.	AG-52-S		Vertical Centering Control Wire Wound
R8A	50K	23E43	Not Req.	AG-52-S		Horizontal Hold Control
R8B	50K	23E43	Not Req.	AG-52-S		Attach to R8A per instructions.
R9	50K	23E34	Not Req.	AG-52-S		Horizontal Centering Control Wire Wound
R10	100K	23E34	Not Req.	AG-52-S		Video Output Plate Load

\* Additional parts to be used with "Concentrator".  
 † Connect 100K resistor from center terminal to low side of brightness control.  
 ‡ Some Models use this alternate vertical linearity control. PT. No. 23E79.  
 § Models Employing Electrostatic Focus use a 2 Meg Focus Control Part #23E77.

## RESISTORS

ITEM No.	RATING	REPLACEMENT DATA				IDENTIFICATION CODES
		SENTINEL PART No.	IRC PART No.	ALL resistors 10% unless otherwise specified		
R11	4700K	23E472-2	BTS-4700			Antenna Loading
R12	15K	23E007-5	BTS-2200			RF Amplifier Grid
R13	220K	23E222-2	BTS-220K			RF Amplifier Decoupling
R14	220K	23E222-2	BTS-220K			Mixer Grid
R15	15K	23E007-5	BTS-2200			Oscillator Grid
R16	4700K	23E472-2	BTS-4700			Oscillator Plate
R17	330K	23E332-2	BTS-330			AGC Network
R18	500K		BTS-500			Voltage Dropping
R19	22K		BTS-22K			Voltage Dropping
R20	200K	23E202-2	BTS-200			1st Video IF Grid
R21	82K	23E820-2	BTS-82			1st Video IF Cathode
R22	330K	23E332-2	BTS-330			1st Video IF Screen
R23	100K	23E102-2	BTS-100K			1st Video IF Plate Decoupling

## RESISTORS (CONT.)

ITEM No.	RATING	REPLACEMENT DATA				IDENTIFICATION CODES
		SENTINEL PART No.	IRC PART No.			
R24	4700K	23E472-2	BTS-4700			2nd Video IF Grid
R25	82K	23E820-2	BTS-82			2nd Video IF Cathode
R26	330K	23E332-2	BTS-330			AGC Network
R27	330K	23E332-2	BTS-330			AGC Network
R28	330K	23E332-2	BTS-330			Decoupling
R29	5000K	23E5000-8	BTS-5000			3rd Video IF Grid
R30	100K	23E102-2	BTS-100			3rd Video IF Cathode
R31	330K	23E332-2	BTS-330			Decoupling
R32	330K	23E332-2	BTS-330			Decoupling
R33	330K	23E332-2	BTS-330			Decoupling
R34	330K	23E332-2	BTS-330			AGC Network
R35	6000K	23E6000-13	BTS-6000			4th Video IF Grid
R36	150K	23E150-2	BTS-150			4th Video IF Cathode
R37	330K	23E332-2	BTS-330			4th Video IF Screen
R38	1000K	23E1000-2	BTS-1000			4th Video IF Plate Decoupling
R39	330K	23E332-2	BTS-330K			AGC Diode Load
R40	220K	23E220-2	BTS-220K			AGC Network
R41	100K	23E102-2	BTS-100			Voltage Divider
R42	220K	23E220-2	BTS-220K			Voltage Divider
R43	2.2K	23E220-2	BW-1-2.2			Series Filament Wire-Wound
R44	4700K	23E472-2	BTS-4700			Peaking Coil Shunt
R45	500K	23E500-8	BTS-5000			Video Detector Diode Load
R46	470K	23E470-2	BTS-470			Video Output Cathode
R47	330K	23E332-2	BTS-330			Peaking Coil Shunt
R48	500K	23E500-8	BTS-5000			Video Output Plate
R49	10K	23E102-2	BTS-10K			Video Output Plate
R50	270K	23E270-2	BTS-270K			Picture Tube Grid
R51	1.2Meg	23E1200-4	BTS-1.2Meg			D.C. Resistor Cathode
R52	270K	23E270-2	BTS-270			Sound IF Cathode
R53	220K	23E220-2	BTS-220			Sound IF Decoupling
R54	270K	23E270-2	BTS-270			Balancing
R55	330K	23E332-2	BTS-330K			Balancing
R56	270K	23E270-2	BTS-270K			Balancing
R57	600K	23E600-13	BTS-6000			Ratio Detector Diode Load
R58	600K	23E600-13	BTS-6000			Ratio Detector Diode Load
R59	30K	23E30-2	BTS-30K			De-emphasis
R60	10Meg	23E100-2	BTS-10Meg			Audio Amplifier Grid
R61	470K	23E470-2	BTS-470K			Audio Amplifier Plate
R62	100K	23E102-2	BTS-100K			Audio Amplifier Decoupling
R63	2.2Meg	23E220-2	BTS-2.2Meg			Audio Amplifier Screen
R64	6.8K	23E68-2	BW-1-6.8			Audio Amplifier Cathode
R65	150K	23E150-2	BTS-150			Audio Feedback
R66	470K	23E470-2	BTS-470K			Audio Output Grid
R67	470K	23E470-2	BTS-470			Audio Output Cathode
R68	220K	23E220-2	BTS-220			Tone Control Shunt
R69	470K	23E470-2	BTS-470			Decoupling
R70	250K	23E250-19	1/2AA-2500			Voltage Divider Wire-Wound
R71	270K	23E270-2	BTS-270K			Sync. Separator Cathode
R72	200K	23E200-2	BTS-200			Sync. Separator Plate
R73	330K	23E332-2	BTS-330K			Sync. Separator Plate
R74	10K	23E102-2	BTS-1000			Integrator Network
R75A	22K	23E220-2	BTS-22K			Integrator Network
R75B	22K	23E220-2	BTS-22K			Integrator Network
R75C	22K	23E220-2	BTS-22K			Integrator Network
R76	1.2Meg	23E1200-4	BTS-1.2Meg			Vertical Oscillator Grid
R77	470K	23E470-2	BTS-470K			Vertical Oscillator Plate
R78	400K	23E400-2	BTS-400			Vertical Peaking
R79	4.7Meg	23E470-2	BTS-4.7Meg			Feedback Network
R80	220K	23E220-2	BTS-220K			Voltage Divider
R81	2.2Meg	23E220-2	BTS-2.2Meg			Vertical Output Grid
R82	470K	23E470-2	BTS-470			Vertical Output Cathode
R83	220K	23E220-2	BTS-220K			Vertical Output Cathode
R84	100K	23E102-2	BTS-100K			Phase Detector Diode Load
R85	100K	23E102-2	BTS-100K			Phase Detector Diode Load
R86	470K	23E470-2	BTS-470K			Phase Detector Diode Load
R87	100K	23E102-2	BTS-100K			AFC Diode Load
R88	470K	23E470-2	BTS-470K			AFC Filter
R89	27K	23E270-2	BTS-27K			Feedback Network
R90	600K	23E600-13	BTS-6000			Feedback Network
R91	820K	23E820-13	BTS-820-13			Horizontal MV Cathode
R92	600K	23E600-13	BTS-6000			Horizontal MV Plate
R93	82K	23E82-2	BTS-82K			Horizontal MV Grid
R94	47K	23E47-2	BTS-47K			Horizontal MV Grid
R95	330K	23E332-2	BTS-330K			Horizontal MV Plate
R96	300K	23E300-40	BTS-300K			Horizontal MV Plate
R97	820K	23E820-13	BTS-820			Horizontal Peaking
R98	100K	23E102-2	BTS-100K			Parasitic Suppressor
R99	300K	23E300-40	BTS-300K			Horizontal Output Grid
R100	22K	23E22-2	BTS-22K			Horizontal Output Screen
R101	22K	23E22-2	BTS-22K			Horizontal Output Screen
R102	22K	23E22-2	BTS-22K			Horizontal Output Screen
R103	100K	23E102-2	BTS-100K			Parasitic Suppressor
R104	47K	23E47-2	BTS-47K			Filter
R105	2.2K	23E220-2	BTS-2.2K			RV Rectifier Filament Wire-Wound
R106	1.2Meg	23E1200-4	BTS-1.2Meg			RV Filter
R107	500K	23E500-8	BTS-500			Integration
R108	220K	23E220-2	BTS-220K			Picture Tube Cathode
R109	600K	23E600-13	BTS-6000			Voltage Divider
R110	330K	23E332-2	BTS-330K			Line Isolation
R111	22K	23E22-2	BTS-22K			Phase Det. Plate
R112	47K	23E47-2	BTS-47K			Voltage Divider See Note 7

Note 1: Some models may use a 600K resistor in this application.  
 Note 2: Some models may use a 300K resistor in this application.  
 Note 3: Not used in all models.  
 Note 4: Some models may use a 100K resistor in this application.  
 Note 5: Some models may use two resistors in series to total 43K.  
 Note 6: Some models may use a 750K-5W resistor in this application.  
 Note 7: Used in Models Employing Electrostatic Focus.  
 † Items C64A, C64B, C64C, R75A, R75B, and R75C are combined in one unit.