

**ARTONE MODELS** MST12, MST14, 14TR, 16TR, 17CD (1st. Prod.), 17CRR (1st. Prod.), 17ROG (1st. Prod.), 20CD (1st. Prod.), 20TR, 112X, 203D (1st. Prod.), 312, 819, 3163CR, 8163CR, 8193CM

<b>TRADE NAME</b> Artone Models MST12, MST14, 14TR, 16TR, 17CD (1st. Prod.), 17CRR (1st. Prod.), 17ROG (1st. Prod.), 20CD (1st. Prod.), 20TR, 112X, 203D (1st. Prod.), 312, 819, 3163CR, 8163CR, 8193CM.	
<b>SUPPLIER</b>	Affiliated Retailers, 855 Ave. of America, New York, N. Y.
<b>TYPE SET</b>	Television Receiver
<b>TUBES</b>	Twenty One
<b>POWER SUPPLY</b>	110-120 Volts AC-60 Cycle
<b>TUNING RANGE - CHANNELS</b>	2 thru 13
<b>RATING</b> 1.85 Amp. @ 117 Volts AC	
<b>INDEX</b>	
Alignment Instructions.....	6, 7
FM Trap Adjustment.....	11
Horizontal Sweep Circuit Adjustments.....	11
Parts List and Description.....	12, 13, 14
Photographs	
Capacitor and Alignment Identification.....	4, 9
Chassis-Top View.....	3, 11
Photographs (cont.)	
RF Tuner.....	10
Resistor and Inductor Identification.....	15, 16
Schematic (Main).....	2
Schematic (3 Tube Tuner).....	7
Tube Placement Charts.....	5
Voltage and Resistance Measurements.....	8

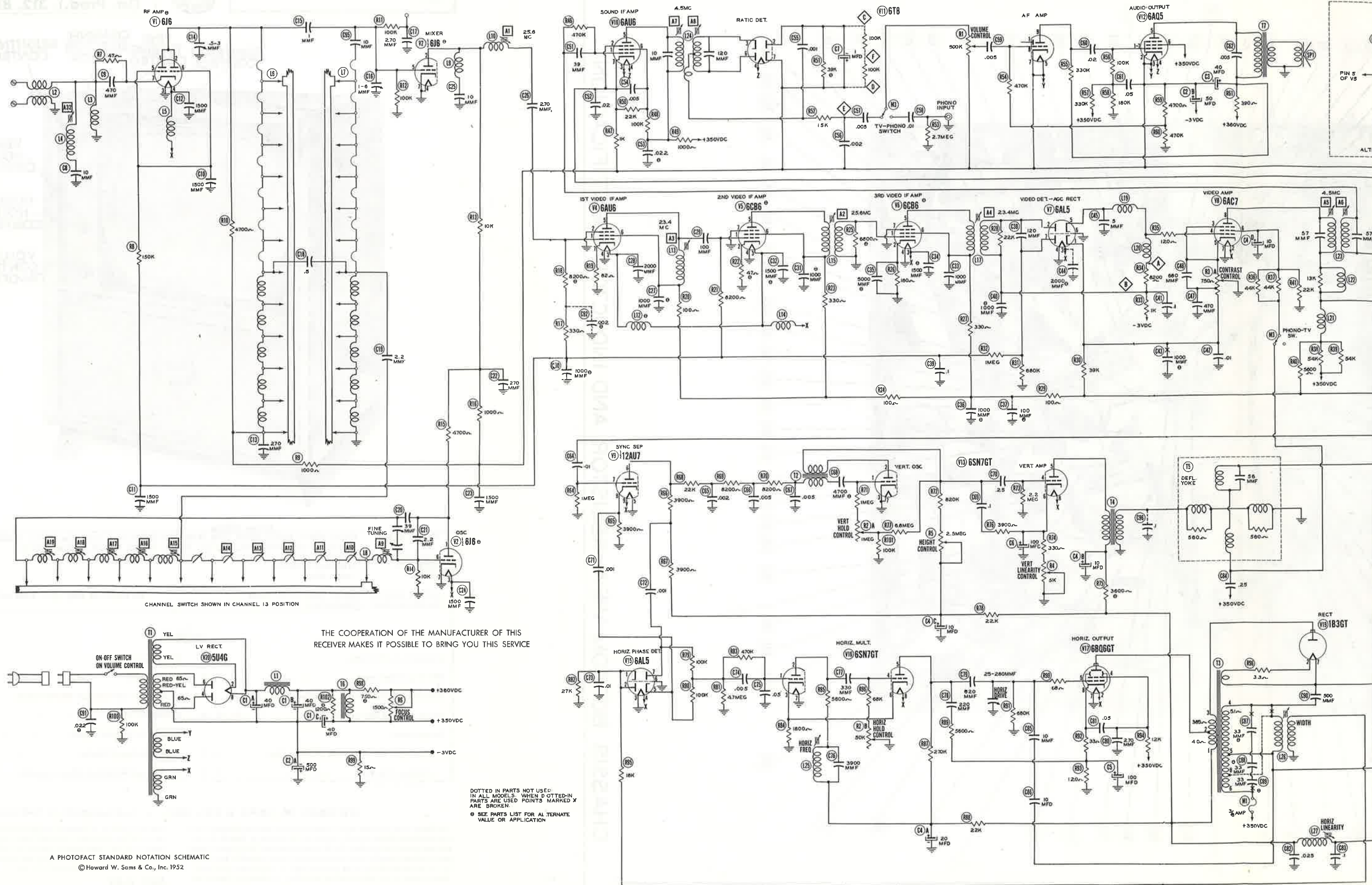
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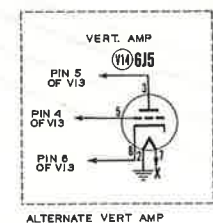
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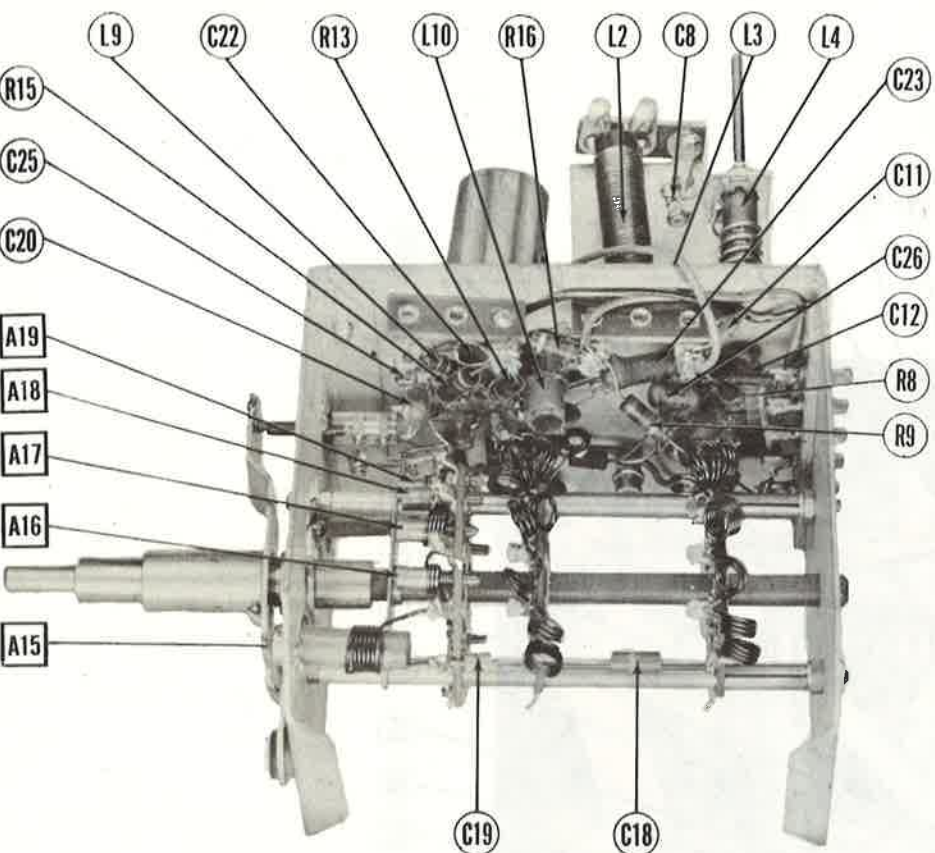




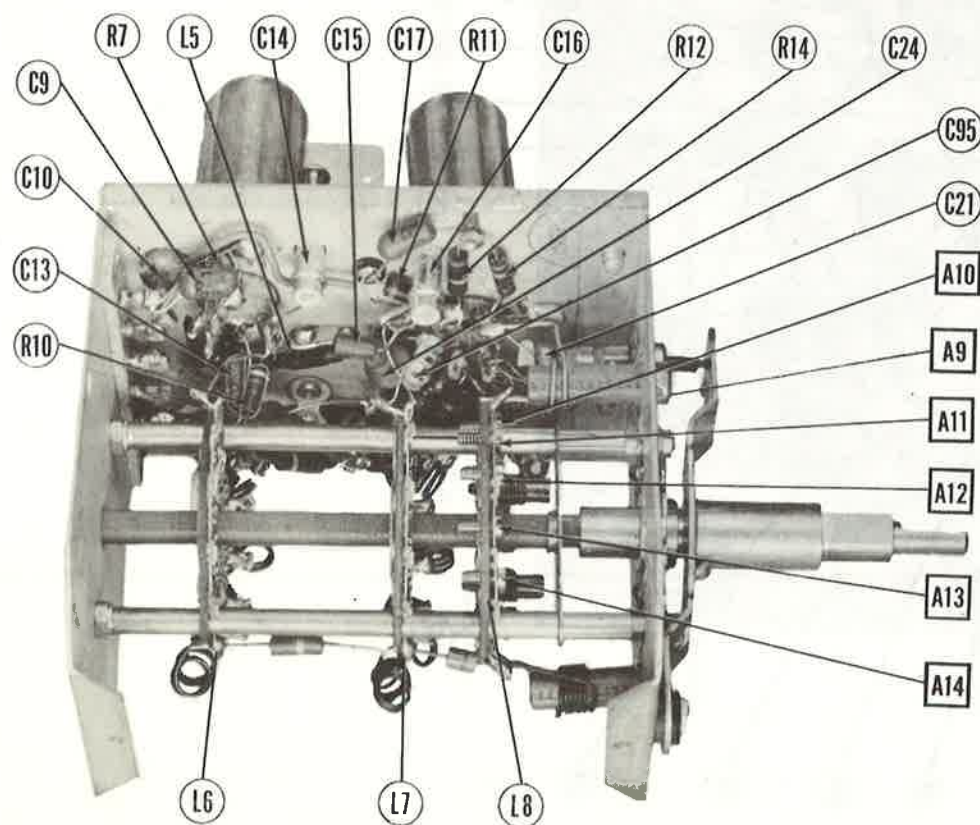
DOTTED IN PARTS NOT USED  
IN ALL MODELS. WHEN DOTTED-IN  
PARTS ARE USED POINTS MARKED X  
ARE BROKEN.

⊗ SEE PARTS LIST FOR ALTERNATE  
VALUE OR APPLICATION

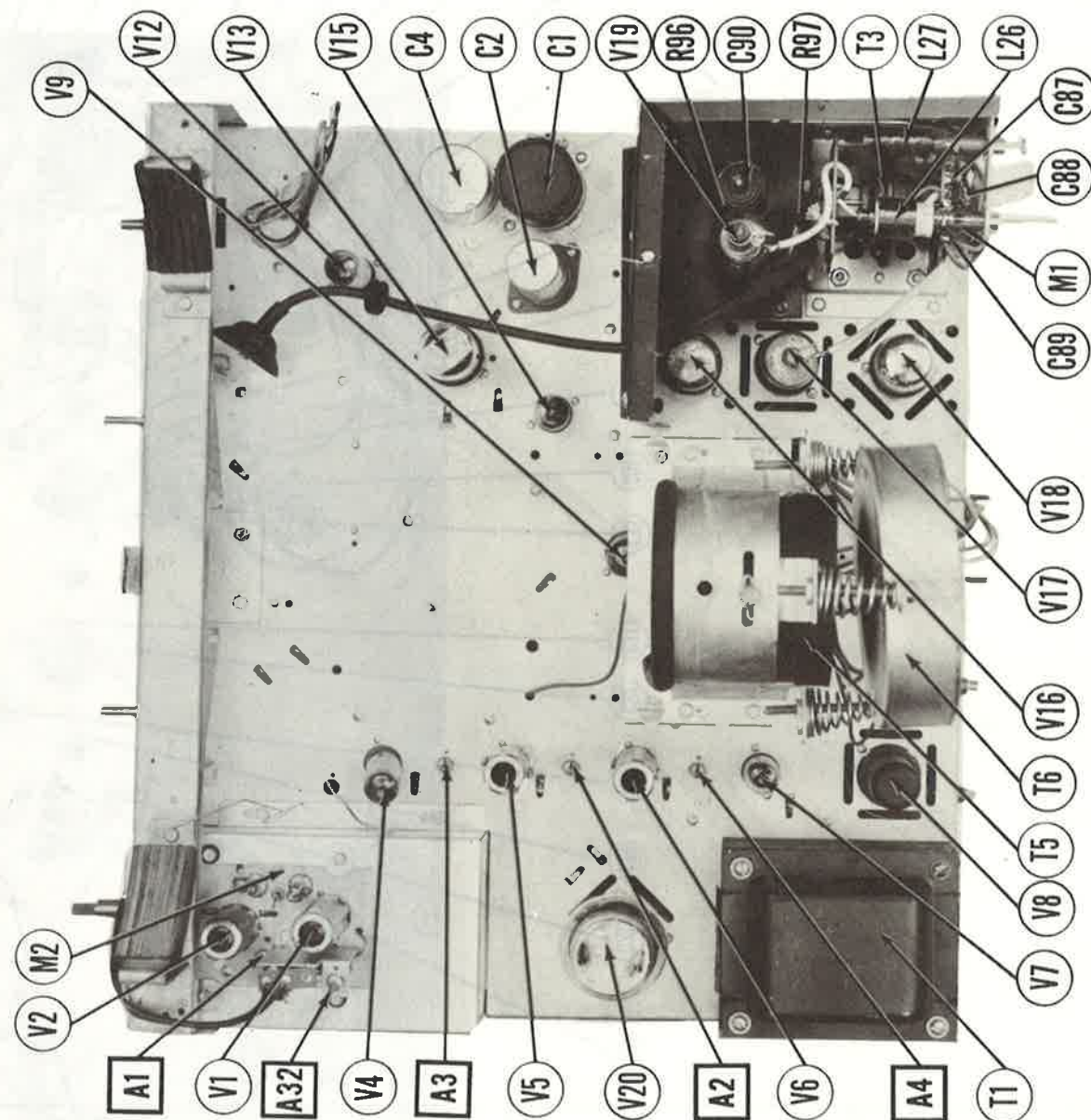
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2 TUBE RF TUNER-RIGHT SIDE



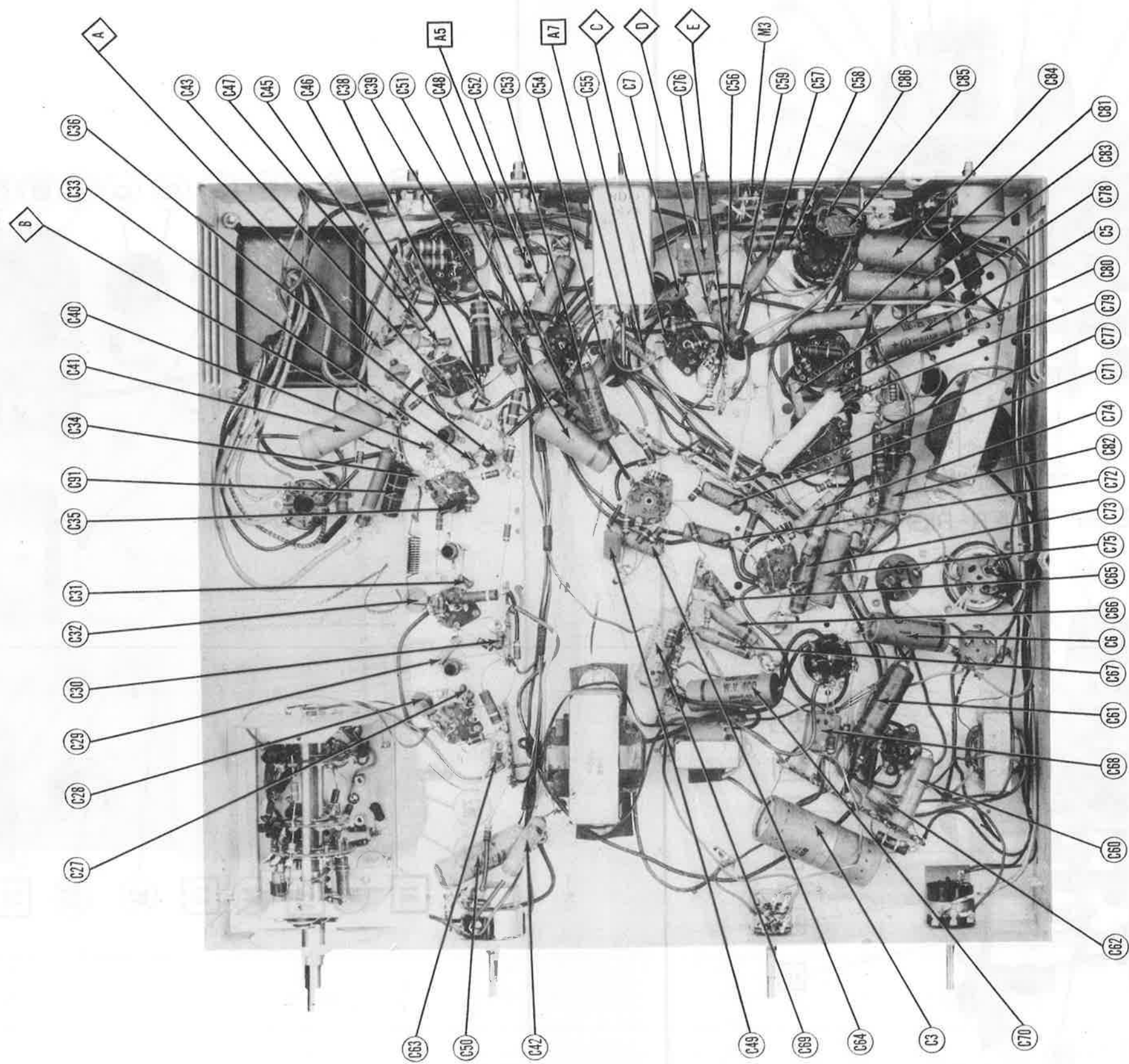
2 TUBE RF TUNER-LEFT SIDE



CHASSIS TOP VIEW

ARTONE MODELS MST-12, MST14, 14TR, 16TR, 17CD (1st. Prod.), 17CRR (1st. Prod.), 17ROG (1st. Prod.), 20CD (1st. Prod.), 20TR, 112X, 203D (1st. Prod.), 312, 819, 3163CR, 8163CR, 8193CM

# CHASSIS BOTTOM-VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS											RESISTANCE READINGS										
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9	Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6J6	115VDC	115VDC	0V	6.2VAC	-1.1VDC	-1.1VDC	.4VDC			V 1	6J6	Δ1KΩ	Δ1KΩ	0Ω	.1Ω	1.8Meg	1.8Meg	47Ω		
V 2	6J6	90VDC	80VDC	6.3VAC	0V	-1.2VDC	8-7.5VDC	0V			V 2	6J6	Δ5.7KΩ	Δ11KΩ	.1Ω	0Ω	100KΩ	10KΩ	0Ω		
V 3	6J6	NOT USED IN ALL MODELS									V 3	6J6	NOT USED IN ALL MODELS								
V 4	6AU6	-1.1VDC	0V	6.3VAC	0V	125VDC	125VDC	.5VDC			V 4	6AU6	1.7Meg	0Ω	.1Ω	0Ω	Δ300Ω	Δ300Ω	82Ω		
V 5	6CB6	-1.1VDC	.5VDC	6.3VAC	0V	125VDC	125VDC	0V			V 5	6CB6	1.7Meg	47Ω	.1Ω	0Ω	Δ530Ω	Δ530Ω	0Ω		
V 6	6CB6	0V	1.7VDC	6.2VAC	0V	125VDC	125VDC	0V			V 6	6CB6	.3Ω	180Ω	.1Ω	0Ω	Δ430Ω	Δ430Ω	0Ω		
V 7	6AL5	0V	-3VDC	6.3VAC	0V	-2.4VDC	0V	-7VDC			V 7	6AL5	0Ω	11KΩ	.1Ω	0Ω	19.2KΩ	0Ω	680KΩ		
V 8	6AC7	0V	6.3VAC	2.2VDC	-2.4VDC	2.2VDC	165VDC	0V	180VDC		V 8	6AC7	0Ω	.1Ω	750Ω	19.3KΩ	750Ω	11KΩ	0Ω	116KΩ	.1Ω
V 9	12AU7	6.4VDC	0V	1.2VDC	0V	360VDC	0V	20VDC	6.3VAC		V 9	12AU7	47KΩ	0Ω	270KΩ	0Ω	0Ω	Δ30KΩ	1Meg	3.9KΩ	.1Ω
V 10	6AU6	Δ.8VDC	Δ3.2VDC	Δ0V	Δ6.3VAC	Δ200VDC	Δ36VDC	Δ3.2VDC			V 10	6AU6	Δ470KΩ	Δ1KΩ	Δ.0Ω	Δ.1Ω	11KΩ	Δ23KΩ	Δ1KΩ		
V 11	616	Δ-.3VDC	Δ-.8VDC	Δ-.3VDC	Δ6.3VAC	Δ0V	Δ-1VDC	Δ0V	Δ-7VDC	95VDC	V 11	616	Inf.	Δ39KΩ	Inf.	Δ.1Ω	Δ.0Ω	Inf.	Δ.0Ω	1Meg	Δ330KΩ
V 12	6AQ5	Δ-6.8VDC	Δ0V	Δ0V	Δ6.3VAC	Δ200VDC	Δ205VDC	Δ-6.8VDC			V 12	6AQ5	280KΩ	Δ.0Ω	Δ.0Ω	Δ.1Ω	Δ1.6KΩ	Δ.0Ω	280KΩ		
V 13	6SN7GT	8-45VDC	185VDC	0V	8-2VDC	460VDC	25VDC	0V	6.3VAC		V 13	6SN7GT	2.1Meg	#3.3Meg	#640KΩ	0Ω	2.2Meg	5.3KΩ	330Ω	0Ω	.1Ω
V 14	6J5	NOT USED IN ALL MODELS									V 14	6J5	NOT USED IN ALL MODELS								
V 15	6AL5	0V	0V	6.3VAC	4.8VDC	0V	-3.8VAC				V 15	6AL5	11KΩ	11KΩ	0Ω	.1Ω	4.8Meg	0Ω	4.8Meg		
V 16	6SN7GT	8.8VDC	330VDC	13VDC	180VDC	13VDC	0V	6.3VAC			V 16	6SN7GT	5.1Meg	Δ28KΩ	1.8KΩ	68KΩ	Δ290KΩ	1.8KΩ	0Ω	.1Ω	Top Cap #68Ω
V 17	6BQ6GT	0V	6.3VAC	13VDC	175VDC	-7.1VDC	0V	17VDC			V 17	6BQ6GT	Inf.	.1Ω	0Ω	12KΩ	680KΩ	5.6KΩ	0Ω	150Ω	
V 18	6W4GT	0V	0V	510VDC	0V	350VDC	130VDC	Δ6.3VAC	Δ0V		V 18	6W4GT	Inf.	Inf.	500KΩ	Inf.	120Ω	22KΩ	Δ.1Ω	Δ.0Ω	Top Cap #450Ω
V 19	1B3GT	* DO NOT MEASURE									V 19	1B3GT	PINS 1 THRU 8 HAVE INF. RESISTANCE								
V 20	5U4GT	0V	410VDC	0V	380VAC	-3VDC	380VAC	0V	410VDC		V 20	5U4G	Inf.	20KΩ	Inf.	165Ω	15Ω	165Ω	Inf.	20KΩ	
V 21	17BP4	6.3VAC	1.2VDC	350VDC	140VDC	0V					V 21	17BP4	.1Ω	270KΩ	10Ω	PIN 11 100KΩ	PIN 12 0Ω				

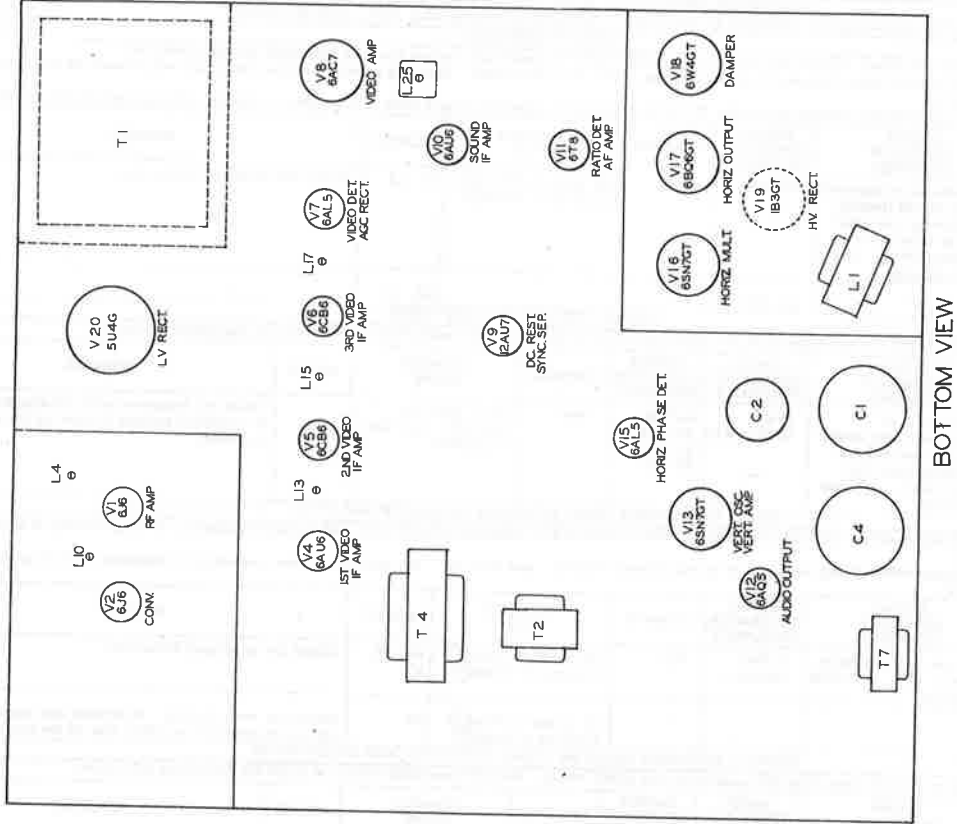
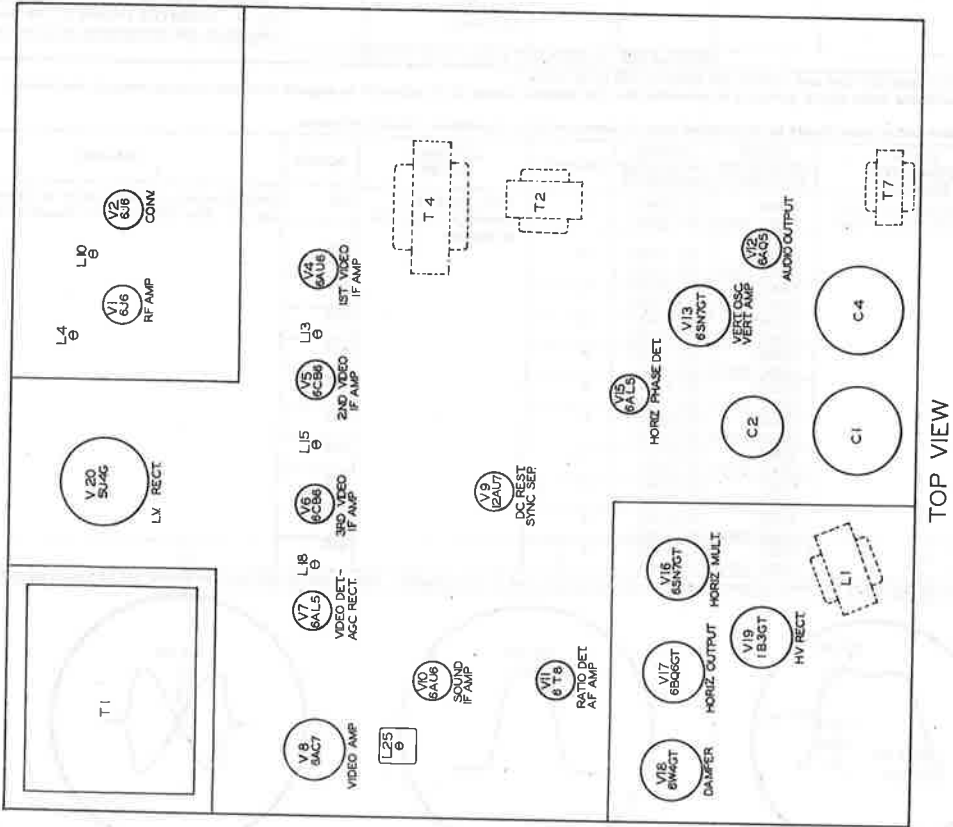
ALL MEASUREMENTS TAKEN WITH PICTURE TUBE REMOVED  
Δ MEASURED FROM PIN 2 OF V12  
\* DO NOT MEASURE  
§ TAKEN WITH VACUUM TUBE VOLTMETER

ALL MEASUREMENTS TAKEN WITH PICTURE TUBE REMOVED  
† MEASURED FROM 56Ω VDC LINE  
# MEASURED FROM PIN 3 OF V18  
Δ MEASURED FROM PIN 2 OF V12  
■ MEASURED FROM PIN 6 OF V20  
† MEASURED FROM -3 VDC LINE

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

ARTONE MODELS MST-12, MST14, 14TR, 16TR, 17CD (1st. Prod.), 17CRR (1st. Prod.), 17ROG (1st. Prod.), 20CD (1st. Prod.), 20TR, 112X, 203D (1st. Prod.), 312, 819, 3163CR, 8163CR, 8193CM



# ALIGNMENT INSTRUCTIONS

**ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT**  
The high voltage shock hazard may be eliminated by removing the horizontal oscillator tube, (V16), from its socket.

## VIDEO IF ALIGNMENT

If the set has a two tube tuner, remove the converter tube, (V2) from its socket and replace it with a 6J6 which has pin 1 removed.  
If the set has a three tube tuner, remove the oscillator tube, (V3), from its socket. This will disable the local oscillator and prevent the possibility of erroneous indications.  
During video IF alignment the common lead of the VTVM is connected to approximately 3 volts with respect to chassis, avoid grounding the VTVM case.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1. Direct	High side to an ungrounded tube shield floating over dummy converter tube, or mixer tube, (see note above). Low side to chassis.	25.6MC	Any	DC probe to Point A, Common to Point B.	A1, A2	Adjust for maximum deflection.
2. "	"	23.4MC	"	"	A3, A4	"

## OVERALL VIDEO 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
3. Direct	High side to an ungrounded tube shield floating over dummy converter tube, (or mixer tube). Low side to chassis.	24MC (10MC SWP)	21.6MC 22.6MC 25.6MC 28.1MC	Any	Vert. Amp. to Point A, Low side to chassis.		Check for response curve similar to fig. 1. If necessary retouch A1 thru A4 for proper response.

## SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

During sound IF alignment the common lead of the VTVM is connected to approximately 135 volts with respect to chassis, avoid grounding or touching the VTVM case.  
Connect two matched 100KΩ (± 1%) resistors in series between Point C and Point D. The junction of these resistors is alignment Point F as shown on the schematic.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
4. .001MFD.	High side to pin 4 (Grid) of 6AC7, (V8). Low side to chassis.	4.5MC (unmod.)	Any	DC probe to Point C, Common to Point D.	A5, A6, A7	Adjust for maximum deflection.
5. "	"	"	"	DC probe to Point E, Common to Point F.	A8	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.

DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4. .001MFD.	High side to pin 4 (Grid) of 6AC7, (V8). Low side to chassis.	4.5MC (450KC SWP)	4.5MC	Any	Vert. Amp. to Point C, Low side to chassis.	A5, A6, A7	Disconnect stabilizer capacitor C7. Adjust for maximum amplitude and symmetry as per fig. 2.
5. "	"	"	"	"	Vert. Amp. to Point E, Low side to chassis.	A8	Reconnect capacitor C7. Adjust A8 so 4.5MC occurs at center of crossover lines as per fig. 3. SLIGHTLY retouch A7 for maximum amplitude and straightness of crossover lines.

## OSCILLATOR ALIGNMENT (TWO TUBE TUNER)

Remove the dummy converter tube and replace the original 6J6 in its socket.  
Since all of the oscillator coils are in series it is essential that the highest channel to be adjusted is aligned first and progress towards the lowest channel.  
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6. Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC SWP)	211.25MC 215.75MC	19	Vert. Amp. to Point A, Low side to chassis.	A9	Adjust to place sound marker as shown in fig. 4. The video marker should be at 50%.
		207MC (10MC SWP)	205.25MC 209.75MC	12		A10	
		201MC (10MC SWP)	199.25MC 203.75MC	11		A11	
		195MC (10MC SWP)	193.25MC 197.75MC	10		A12	
		189MC (10MC SWP)	187.25MC 191.75MC	9		A13	
		183MC (10MC SWP)	181.25MC 185.75MC	8		A14	
		177MC (10MC SWP)	175.25MC 179.75MC	7		A15	
		171MC (10MC SWP)	169.25MC 173.75MC	6		A16	
		165MC (10MC SWP)	163.25MC 167.75MC	5		A17	
		159MC (10MC SWP)	157.25MC 161.75MC	4		A18	
		153MC (10MC SWP)	151.25MC 155.75MC	3		A19	
		147MC (10MC SWP)	145.25MC 149.75MC	2			

The RF portion of this tuner has been properly adjusted at the factory and is very stable. Alignment of this portion should not be required in the field.

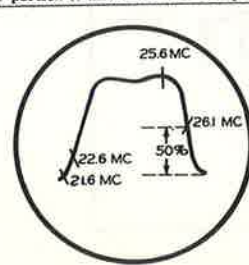


FIG. 1

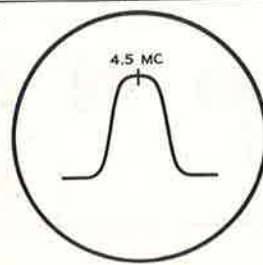


FIG. 2

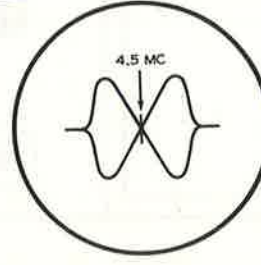


FIG. 3

# ALIGNMENT INSTRUCTIONS (CONT.)

## OSCILLATOR ALIGNMENT (THREE TUBE TUNER)

Replace the oscillator tube in its socket.  
Since the channel two oscillator is in parallel with each of the other coils, it is essential that channel 2 be aligned first. The order of alignment for the remaining channels is not important.  
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7. Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	57MC (10MC SWP)	55.25MC 59.75MC	2	Vert. Amp. to Point A, Low side to chassis.	A20	Adjust to place sound marker as shown in fig. 4. The video marker should be at 50%.
		63MC (10MC SWP)	61.25MC 65.75MC	3		A21	
		69MC (10MC SWP)	67.25MC 71.75MC	4		A22	
		75MC (10MC SWP)	73.25MC 77.75MC	5		A23	
		81MC (10MC SWP)	79.25MC 83.75MC	6		A24	
		87MC (10MC SWP)	85.25MC 89.75MC	7		A25	
		93MC (10MC SWP)	91.25MC 95.75MC	8		A26	
		99MC (10MC SWP)	97.25MC 101.75MC	9		A27	
		105MC (10MC SWP)	103.25MC 107.75MC	10		A28	
		111MC (10MC SWP)	109.25MC 113.75MC	11		A29	
		117MC (10MC SWP)	115.25MC 119.75MC	12		A30	
		123MC (10MC SWP)	121.25MC 125.75MC	13		A31	

The RF portion of this receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

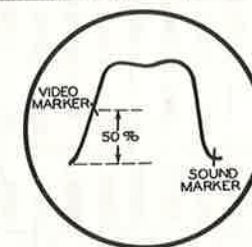
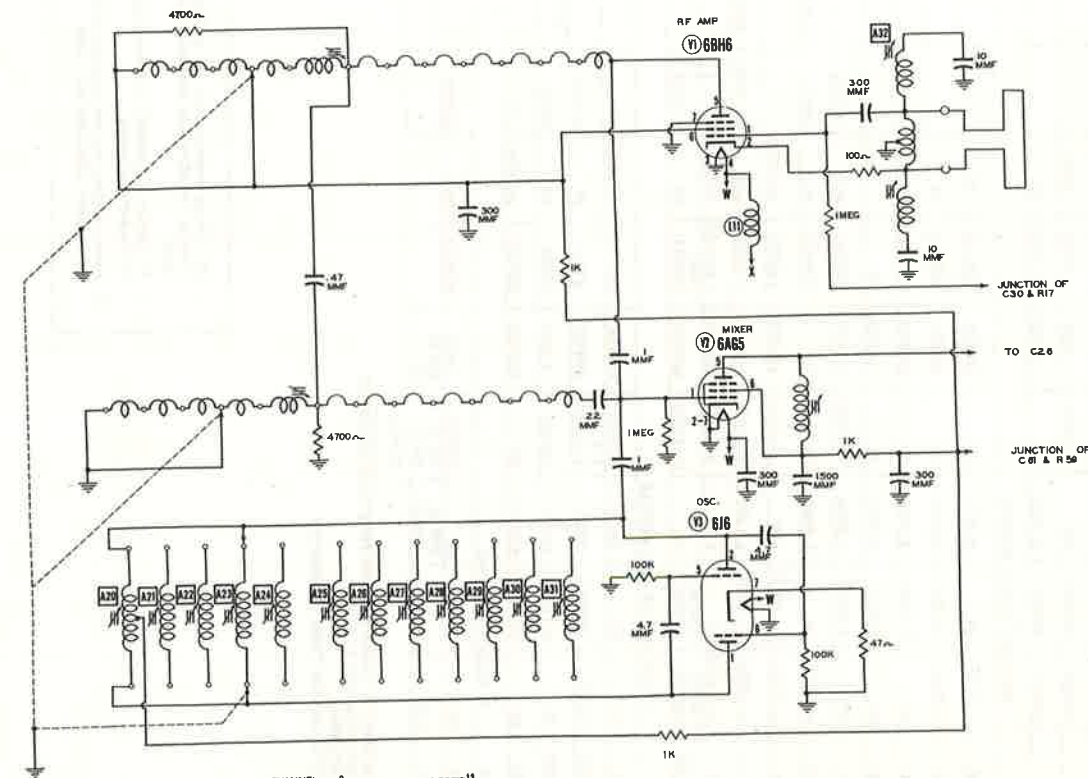


FIG. 4



CHANNEL 2 — 13

CHANNEL SW. SHOWN IN CHANNEL 5 POSITION

## 3 TUBE TUNER SCHEMATIC

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PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING		REPLACEMENT DATA				NOTES
	DC RESISTANCE		ARTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.					
T2 T3	170Ω 425Ω Tap 40Ω	970Ω 23Ω Tap 17.5Ω SEC. 2	T-104 T-111	A-8111 ①	A-3000 HV0-6	TB0-3 ①	Vert. Block Osc. Trans. Horiz. Output Trans.
T4 T5A B T6	670Ω 19Ω 64Ω 350Ω	0Ω 6Ω	T-112 DY-6	A-8112 ① DY-7	A-3038 ① MDF-70 MF-2	TS0-5 ①	Vert. Output Trans. Horiz. Deflection Coils. Vert. Deflection Coils. Focus Coil

① Drill one new mounting hole.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		ARTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T7	5.6KΩ	3.2Ω	420Ω	.72Ω	T-102	A-3878	A-2930	R0-9 ①	① Drill one new mounting hole.

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 $\mu$ H)	ARTONE	STANCOR	MERIT	CHICAGO	
				PART No.	PART No.	PART No.	PART No.	
L1	.200A	64 $\Omega$	4H $\Omega$	LC-3	C-2325 ①	C-2991 ①	TR4200①	① Drill one new mounting hole.

COILS (RF-IF)

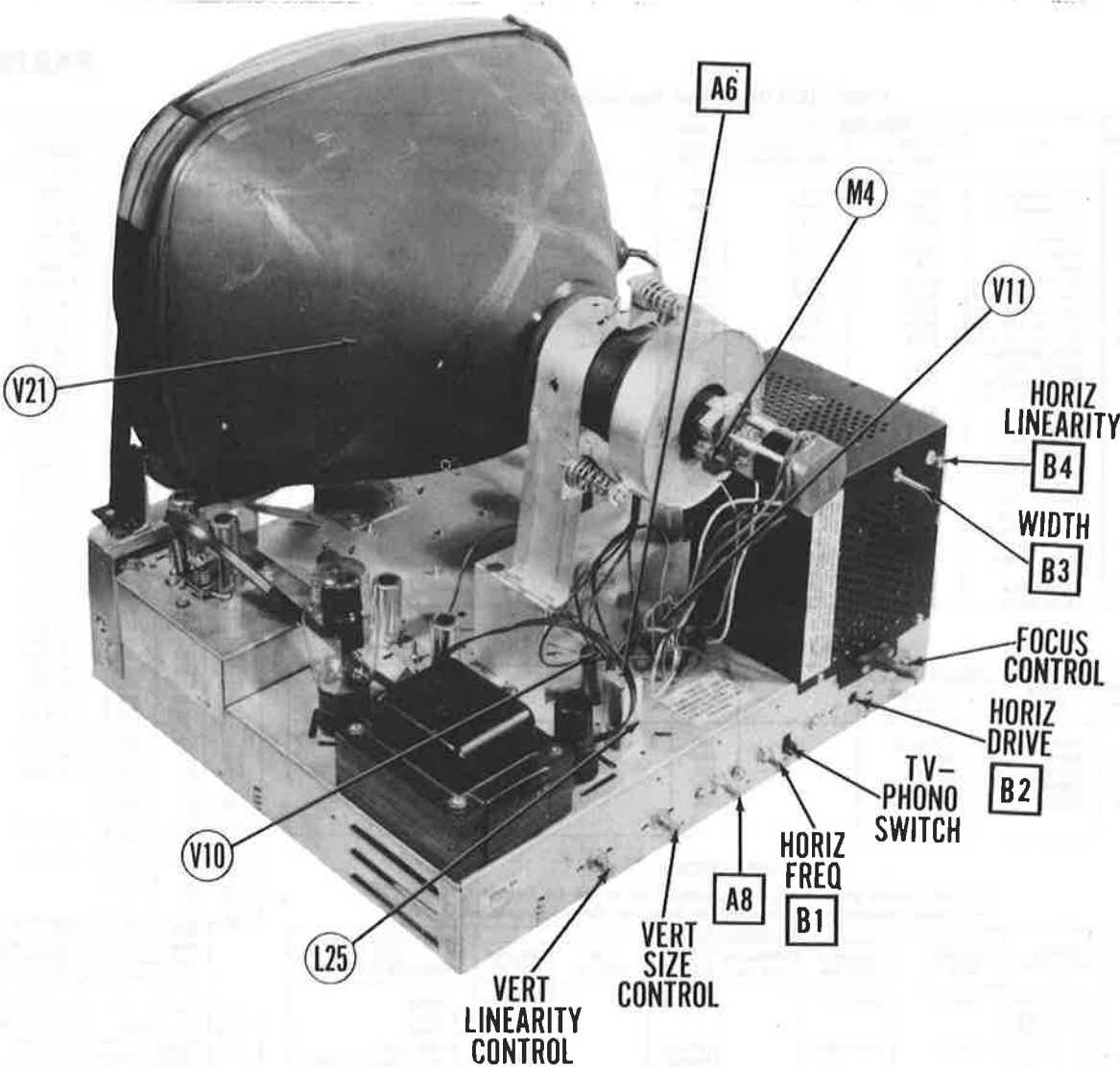
ITEM No.	USE	DC RES.		REPLACEMENT DATA			NOTES
		PRI.	SEC.	ARTONE PART No.	MERIT PART No.	IRC PART No.	
L2	Ant. Trans.	1.3Ω	1.3Ω			CLA	.82 Microhenry
L3	RF Choke	.59Ω					
L4	Ant. Coil	0Ω					
L5	Fil. Choke	0Ω					
L6	RF Coils	0Ω					
L7	Mixer Grid Coils	0Ω					
L8	Osc. Coils	0Ω					
L9	RF Choke	0Ω					
L10	1st Video IF	.6Ω					
L11	Fil. Choke	0Ω		LC-1			Not used in all models.
L12	Fil. Choke	0Ω		LC-1			Not used in all models.
L13	2nd Video IF	.2Ω		LV-6			
L14	Fil. Choke	0Ω		LC-1			
L15	3rd Video IF	.3Ω	.3Ω				
L16 (A)	RF Choke	.2Ω		LC-4			Some models use L16 (A) and (B) in lieu of L15.
L16 (B)	3rd Video IF	.3Ω	.3Ω	LV-6			
L17	4th Video IF	.3Ω	.3Ω				
L18 (A)	RF Choke	.2Ω		LC-4			Some models use L18 (A) and (B) in lieu of L17.
L18 (B)	4th Video IF	.2Ω		LV-6			
L19	Peaking	6Ω		LP-5			Green Dot
L20	Peaking	11Ω		LP-6			Red Dot
L21	Peaking	12Ω		LP-8			Blue Dot
L22	Peaking	7Ω		LP-7			Coil wound on 13KΩ resistor (yellow dot).
L23	1st Sound IF	2.5Ω	2.5Ω	LTO-3			Tap .6Ω
L24	Disc. Trans.	6Ω	.6Ω	LRD-1			
L25	Horiz. Freq.	50Ω		LHO-2			
L26	Width Coil	29Ω	30Ω	L-M77J4-3			
L27	Horiz. Lin.	28Ω		L-M77J-4			

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			ARTONE PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG Pigtail	.375A			318.375		GJV-3/8	

MISCELLANEOUS

ITEM No.	PART NAME	ARTONE PART No.	NOTES
M2A B	RF Tuner RF Tuner	TT-6 TT-3	Used in some models
M3	Switch		TV-Phono
M4	Ion Trap	IT-1	
B2	Trimmer	CT-1	25-280 MFD (Horiz. Drive)



CHASSIS – TOP VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern, and turn the horizontal hold control to the mid position of its range. Adjust the horizontal frequency slug, (B1), to the center of the range over which the picture synchronizes horizontally. The picture should remain in synchronization over at least 1/4 rotation of the hold control. Adjust the horizontal drive trimmer, (B2), counter-clockwise as far as possible without crowding or vertical lines appearing in the picture. Adjust the width slug, (B3), until the picture is slightly wider than necessary to fill the mask. Adjust the horizontal linearity slug, (B4), until the picture is symmetrical from left to right. Slight readjustment of B2 may be necessary to obtain optimum results.

FM TRAP ADJUSTMENT

If interference from a FM station is encountered, A32 may be adjusted to eliminate, or minimize, the interference. A32 requires no adjustment if no interference is present.

ARTONE MODELS MST-12, MST14, 14TR, 16TR, 17CD (1st. Prod.), 17CRR (1st. Prod.), 17ROG (1st. Prod.), 20CD (1st. Prod.), 20TR, 112X, 203D (1st. Prod.), 312, 819, 3163CR, 8163CR, 8193CM

## PARTS LIST AND DESCRIPTIONS

## CAPACITORS (CONT.)

TUBES (SYLVANIA or Equivalent)				
ITEM No.	USE	REPLACEMENT DATA		NOTES
		ARTONE PART No.	STANDARD REPLACEMENT	
V1A	RF Amplifier	6J6	6J6	7BF
B	RF Amplifier	6BH6	6BH6	7BF
V2A	Converter	6AQ5	6AQ5	7BF
B	Converter	6BC5	6BC5	7BD
C	Mixer	6J6	6J6	7BF
V3	Oscillator	6AU6	6AU6	7BK
V4	1st Video IF Amp.	6CB6	6CB6	6CK
V5A	2nd Video IF Amp.	6AU6	6AU6	7BK
B	2nd Video IF Amp.	6CB6	6CB6	6CK
V6A	3rd Video IF Amp.	6AU6	6AU6	7BK
B	3rd Video IF Amp.	6CB6	6CB6	7BK
V7	Video Detector-AGC Rectifier	6AL5	6AL5	8BT
V8	Video Amplifier	6AC7	6AC7	8N
V9	DC Restorer-Sync Separator	12AU7	12AU7	9A
V10	Sound IF Amp.	6AU6	6AU6	7BK
V11	Ratio Detector-AF Amplifier	6T8	6T8	9E
V12	Audio Output	6AQ5	6AQ5	7BZ
V13	Vert. Oscillator-Vertical Amp.	6SN7GT	6SN7GT	8BD
V14	Vertical Amp.	6AL5	6AL5	9Q
V15	Horiz. Phase Det.	6SN7GT	6SN7GT	8BT
V16	Horiz. Mult.	6SN7GT	6SN7GT	8BD
V17	Horiz. Output	6BQ6GT	6BQ6GT	6AM
V18	Damper	6W4GT	6W4GT	4CG
V19	HV Rectifier	1B3GT	1B3GT	3C
V20	LV Rectifier	5U4G	5U4G	5T

## CATHODE-RAY TUBE

ITEM No.	ARTONE PART No.	REPLACEMENT DATA		RTMA BASE TYPE	NOTES
		SYLVANIA PART No.	STANDARD REPLACEMENT		
V21A	17BP4	17BP4A	17BP4A	12D	① Outer coating must be grounded.
B	16RP4	16RP4	16RP4	12D	
C	16TP4	16TP4	16TP4	12D	
D	16BP4	16BP4	16BP4	12D	
E	18AP4	18AP4A	18AP4A	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
		ARTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	
C1A	40	CEM-5	AFH 3-31	UP44445	UP44445	TVL-3787	▲ Filter
B	40	CEM-5	AFH 3-31	UP44445	UP44445	TVL-3787	▲ Filter
C	40	CEM-5	AFH 3-31	UP44445	UP44445	TVL-3787	▲ Filter
C2A	500	CEM-7	AF180T10D	UPT5015	UPT5015	TVA-1415	▲ Bias Filter
B	500	CEM-7	AF180T10D	UPT5015	UPT5015	TVA-1415	▲ Audio Output Cathode
C3	40	CET-4	PR8450/40	BRH605	BRH605	TVA-1703	Audio Output Dec.
C4A	20	CET-6	AFH422T2D	UPT21145	UPT21145	TVA-1712	▲ Decoupling
B	10	CET-6	AFH422T2D	UPT21145	UPT21145	TVA-1712	▲ Decoupling
C	10	CET-6	AFH422T2D	UPT21145	UPT21145	TVA-1712	▲ Decoupling
D	10	CET-6	AFH422T2D	UPT21145	UPT21145	TVA-1712	▲ Decoupling
C5	100	CET-5	PR825/100	BRH251A	BRH251A	TVA-1207	Horiz. Output Cathode
C6	100	CET-5	PR825/100	BRH251A	BRH251A	TVA-1207	Horiz. Output Cathode
C7	1	CET-6	E28E42	TCZ-10	TCZ-10	TVA-1300	Stabilizing Cap.
C8	10	SI0NPO	SI0NPO	TCZ-10	TCZ-10	TVA-1300	Fixed Trimmer
C9	470	SI0NPO	SI0NPO	TCZ-10	TCZ-10	TVA-1300	Fixed Trimmer
C10	1500	BPD-0015	BPD-0015	DD-152	DD-152	5GA-T27	RF Coupling
C11	1500	BPD-0015	BPD-0015	DD-152	DD-152	5GA-T27	RF Amp. Grid
C12	1500	BPD-0015	BPD-0015	DD-152	DD-152	5GA-T27	AGC Filter
C13	270	SI270	SI270	820-3	820-3	5GA-T27	RF Amp. Filter
C14	5-3	TCZ-1	TCZ-1	820-3	820-3	5GA-T27	Variable Trimmer
C15	1	TCZ-1	TCZ-1	820-3	820-3	5GA-T27	Variable Trimmer
C16	1-6	TCZ-1	TCZ-1	820-3	820-3	5GA-T27	Variable Trimmer
C17	270	SI270	SI270	820-3	820-3	5GA-T27	Variable Trimmer
C18	5	TCZ-1	TCZ-1	820-3	820-3	5GA-T27	Variable Trimmer
C19	2.2	TCZ-1	TCZ-1	820-3	820-3	5GA-T27	Variable Trimmer
C20	39	SI39	SI39	820-3	820-3	5GA-T27	Variable Trimmer
C21	2.2	TCZ-1	TCZ-1	820-3	820-3	5GA-T27	Variable Trimmer
C22	270	SI270	SI270	820-3	820-3	5GA-T27	Variable Trimmer
C23	1500	SI0NPO	SI0NPO	DD-152	DD-152	5GA-T27	RF Coupling
C24	1500	BPD-0015	BPD-0015	DD-152	DD-152	5GA-T27	RF Amp. Grid
C25	10	SI0NPO	SI0NPO	TCZ-10	TCZ-10	5GA-T27	AGC Filter
C26	270	SI270	SI270	820-3	820-3	5GA-T27	RF Amp. Filter
C27	1000	SI0NPO	SI0NPO	TCZ-10	TCZ-10	5GA-T27	Variable Trimmer
C28	2000	BPD-002	BPD-002	DD-152	DD-152	5GA-T27	Variable Trimmer
C29	100	SI0NPO	SI0NPO	TCZ-10	TCZ-10	5GA-T27	Variable Trimmer
C30	1000	SI0NPO	SI0NPO	TCZ-10	TCZ-10	5GA-T27	Variable Trimmer
C31	1000	SI0NPO	SI0NPO	TCZ-10	TCZ-10	5GA-T27	Variable Trimmer
C32	1500	BPD-0015	BPD-0015	DD-152	DD-152	5GA-T27	RF Coupling
C33	1000	SI0NPO	SI0NPO	TCZ-10	TCZ-10	5GA-T27	RF Amp. Grid
C34	1500	BPD-0015	BPD-0015	DD-152	DD-152	5GA-T27	AGC Filter
C35	5000	BPD-0015	BPD-0015	DD-152	DD-152	5GA-T27	RF Amp. Filter
C36	1000	SI0NPO	SI0NPO	TCZ-10	TCZ-10	5GA-T27	Variable Trimmer
C37	100	SI0NPO	SI0NPO	TCZ-10	TCZ-10	5GA-T27	Variable Trimmer
C38	120	CC-31	CC-31	DD-152	DD-152	5GA-T27	Variable Trimmer
C39	1	CC-31	CC-31	DD-152	DD-152	5GA-T27	Variable Trimmer
C40	1000	CP-8-01	CP-8-01	DD-152	DD-152	5GA-T27	Variable Trimmer
C41	1	CP-8-01	CP-8-01	DD-152	DD-152	5GA-T27	Variable Trimmer
C42	101	CP-8-11	CP-8-11	DD-152	DD-152	5GA-T27	Variable Trimmer
C43	1000	SI0NPO	SI0NPO	TCZ-10	TCZ-10	5GA-T27	Variable Trimmer
C44	2000	CC-22	CC-22	DD-152	DD-152	5GA-T27	Variable Trimmer

ITEM No.	RATING	REPLACEMENT DATA					IDENTIFICATION CODES AND INSTALLATION NOTES
		ARTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	
C45	5	CC-55	SI5	D6-681	5W5V5	GP1K-050	Video Diode Filter
C46	880	CC-368	SI0880	D6-471	5R5T7	GP2K-081	Video Amp. Cathode
C47	470	CC-347	SI470	D6-471	5R5T7	GP2K-471	Video Amp. Cathode
C48	1	CP-6-01	P668-1	DF-104	PTE6P1	GP1K-220	Video Coupling
C49	22	CM-422	1468-000025	D6-220	5R5Q25	IFM-42	DC Rest. Plate
C50	1	CP-6-01	P668-1	DF-104	PTE6P1	IFM-42	Picture Tube Cathode
C51	39	CC-439	1468-000004	D6-390	5W5Q4	GP1K-390	Sound IF Coupling
C52	0.2	CPM-6-12	P668-02	DF-203	PTE6S2	IFM-44	Sound IF Cathode
C53	0.22	CPM-6-12	P1088-022	DF-203	PTE6S2	IFM-44	Sound IF Cathode
C54	0.005	CP-6-25	P668-005	D6-502	PTE6D5	GP2-333-502	Sound IF Plate
C55	0.001	CP-6-21	P668-001	D6-101	PTE6D1	GP2L-101	Sound IF Screen
C56	0.002	CP-6-22	P668-002	D6-202	PTE6D2	GP2-333-202	De-Emphasis
C57	0.005	CP-6-25	P668-005	D6-502	PTE6D5	GP2-333-502	Audio Coupling
C58	0.01	CP-6-11	P668-01	D6-103	PTE6S1	GP2-333-103	Audio Coupling
C59	0.005	CP-6-25	P668-005	D6-502	PTE6D5	GP2-333-502	Audio Coupling
C60	0.2	CPM-6-12	P668-02	DF-203	PTE6S2	IFM-44	Audio Coupling
C61	0.5	CP-6-15	P668-05	DF-503	PTE6S5	GP2-333-502	Audio Output Grid
C62	0.005	CP-6-25	P668-005	D6-502	PTE6D5	GP2-333-502	Audio Output Plate
C63	1000	CP-6-11	SI0000	D6-102	IFW5D1	GP2L-102	RF Bypass
C64	0.1	CP-6-11	P668-01	D6-103	PTE6S1	GP2-333-103	Sync. Coupling
C65	0.002	CP-6-22	P668-002	D6-202	PTE6D2	GP2-333-202	Integrator Net.
C66	0.005	CP-6-25	P668-005	D6-502	PTE6D5	GP2-333-502	Integrator Net.
C67	0.005	CP-6-25	P668-005	D6-502	PTE6D5	GP2-333-502	Integrator Net.
C68	4700	CP-8-01	P668-1	DF-104	IFW5D1	GP2-333-472	Vert. Sync. Coupling
C69	1	CP-4-025	P488-25	DF-104	IFW5D1	GP2-333-472	Vert. Discharge
C70	25	CP-4-025	P488-25	DF-104	IFW5D1	GP2-333-472	Vert. Sweep Coupling
C71	0.001	CP-6-21	P668-001	D6-102	PTE6D1	GP2L-102	Horiz. Sync. Coupling
C72	0.001	CP-6-21	P668-001	D6-102	PTE6D1	GP2L-102	Horiz. Sync. Coupling
C73	0.1	CP-6-11	P668-01	D6-103	PTE6S1	GP2-333-103	Integrator Net.
C74	0.005	CP-6-25	P668-005	D6-502	PTE6D5	GP2-333-502	AFC Filter
C75	0.5	CP-6-15	P668-05	DF-503	PTE6S5	GP2-333-502	AFC Filter
C76	3900	CM-239	1464-004	D6-402	IFW5D1	GP2-333-402	Fixed Trimmer
C77	330	CM-332A	1469HV-00003	D6-402	IFW5D1	GP2-333-402	Fixed Trimmer
C78	220	CM-332A	1469HV-00002	D6-402	IFW5D1	GP2-333-402	Fixed Trimmer
C79	820	CM-362	1464-0008	D6-271	2R5T8	MS-38	Horiz. Sweep Coupling
C80	270	CM-327	1469-0003	D6-271	2R5T8	MS-38	Horiz. Output Screen
C81	0.5	CP-6-15	P668-05	DF-503	PTE6S5	GP2K-271	Horiz. Output Screen
C82	0.25	CP-6-125	P668-025	DF-503	PTE6S5	GP2K-271	Damper Filter
C83	1	CP-6-01	P668-1	DF-104	PTE6P1	GP2K-271	Damper Filter
C84	25	CP-4-025	P488-25	DF-104	PTE6P1	GP2K-271	Damper Filter
C85	10	CM-410A	1469HV-00001	DF-104	IFW5D1	GP2K-271	Horiz. Feedback
C86	10	CM-410A	1469HV-00001	DF-104	IFW5D1	GP2K-271	Horiz. Feedback
C87	33	CM-410A	1469HV-00001	DF-104	IFW5D1	GP2K-271	Fixed Trimmer
C88	33	CM-410A	1469HV-00001	DF-104	IFW5D1	GP2K-271	Fixed Trimmer
C89	33	CM-410A	1469HV-00001	DF-104	IFW5D1	GP2K-271	Fixed Trimmer
C90	500	CHV-35-15	HY20C	TV3-502	PTE6S2	GP2K-271	HV Filter
C91	0.22	CP-6-22	P668-002	D6-202	PTE6D2	GP2-333-202	Line Filter
C92	0.002	CP-6-22	P668-002	D6-202	PTE6D2	GP2-333-202	AGC Filter
C93	100	CP-6-22	P668-002	D6-202	PTE6D2	GP2-333-202	AGC Filter
C94	100	CP-6-22	P668-002	D6-202	PTE6D2	GP2-333-202	AGC Filter
C95	10	CP-6-01	P668-1	DF-104	PTE6P1	GP2K-271	IF Coupling
C96	1	CP-6-01	P668-1	DF-104	PTE6P1	GP2K-271	IF Coupling

\* Not used in all models.  
† Some models use .02MFD 600V in this application. (Mfgs. part No. CP-6-12)  
‡ Some models use .005MFD 600V in this application. (Mfgs. part No. CP-6-25)  
§ Some models use 2000MMF in this application. (Mfgs. part No. CC-22)

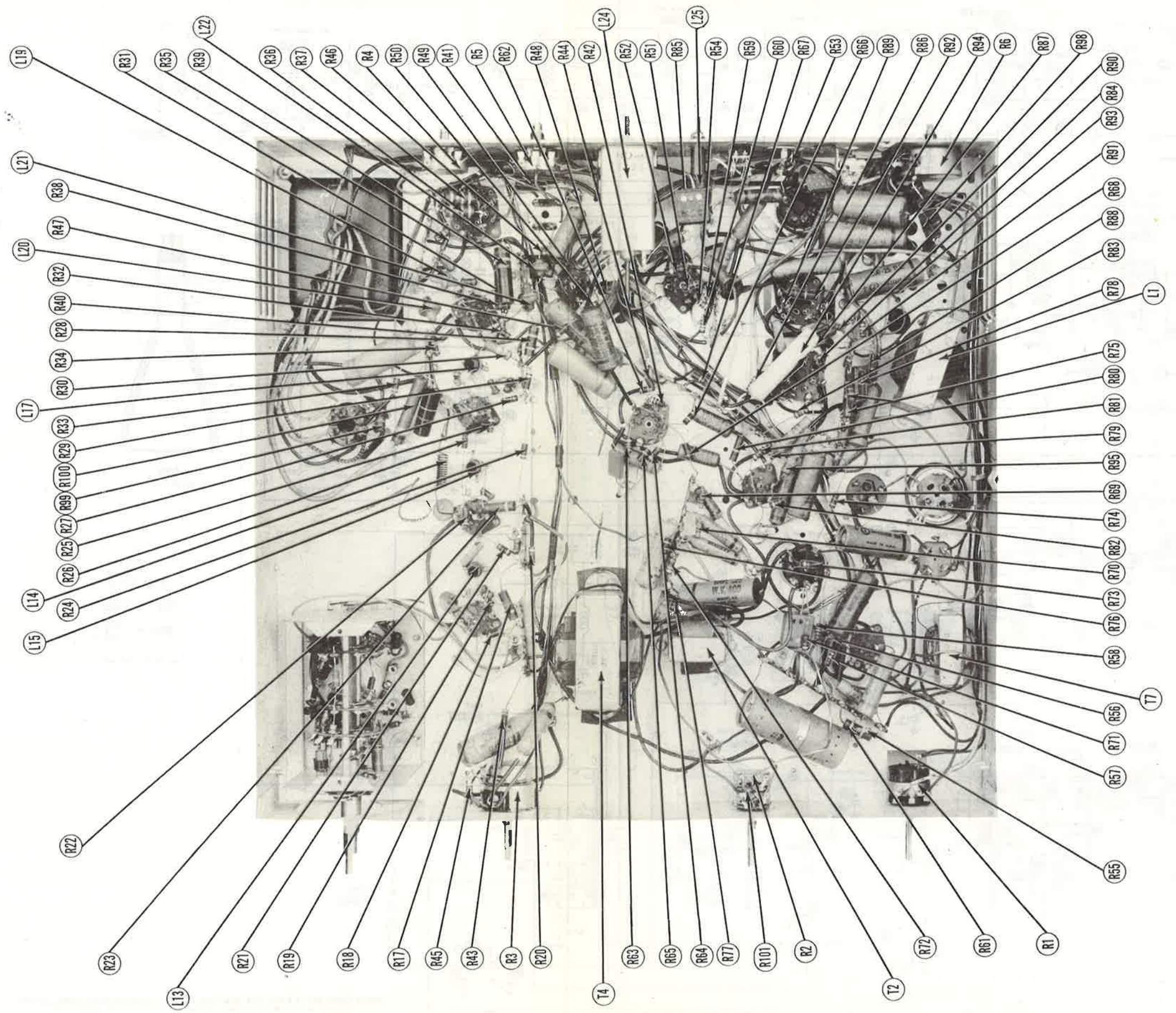
## CONTROLS

ITEM No.	RATING	REPLACEMENT DATA				INSTALLATION NOTES
		ARTONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	
R1A	500KΩ	P-7	Q13-133	AG-60-Z	B-60-S	Volume Control
B	500KΩ	Not req.	Not req.	FS-3	Not req.	Attach to R1A per instructions
C	500KΩ	Not req.	Not req.	SWB	Not req.	Attach to R1A per instructions
R2A	1Meg	PD-5	Q11-137	RTV-146	SBB-584	Vert. Hold Control - Front
B	50KΩ	PD-5	Q11-123	RTV-146	SBB-584	Horiz. Hold Control - Rear
C	50KΩ	PD-5	Q11-123	RTV-146	SBB-584	Attach per instructions in Concentrik
R3A	750Ω	PD-4	Q11-14	RTV-145		Contrast Control - Wire Wound - Front
B	100KΩ	PD-4	Q11-14	RTV-145		Brightness Control - Rear
R4A	500Ω	P-2	Q11-14	AM-19-S	AN-10	Vert. Linearity Control
B	500Ω	Not req.	Not req.	FKS-1/4	AK-1	Attach to R4A per instructions
R5A	2.5Meg	P-5	Q11-239	AM-84-S	AN-03	Height Control
B	1500Ω	Not req.	Not req.	FKS-1/4	AK-1	Attach to R5A per instructions
R6	1500Ω	P-6	Q11-239	RTV-6	SVP-994	Focus Control - Wire Wound

## RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	ARTONE PART No.	IRC PART No.	
R7	47Ω	20%			Parasitic Suppressor
R8	150KΩ	20%			RF Amp. Grid
R9	1000Ω			BTS-1000	RF Amp. Decoupling
R10	4700Ω	20%		BTS-4700	RF Coil Shunt
R11	100KΩ	20%		BTS-100K	Series Test Point
R12	100KΩ	20%			Mixer Grid
R13	10KΩ				Mixer Plate
R14	10KΩ				Osc. Grid
R15	4700Ω	20%		BTS-4700	Osc. Plate
R16	1000Ω			BTS-1000	Decoupling
R17	330Ω	20%	RC-331-2	BTS-330	AGC Network
R18	8200Ω		RC-822-2	BTS-8200	1st. Video IF Amp. Grid - See Note 2
R19	82Ω		RC-820-2	BTS-82	1st. Video IF Amp. Cathode
R20	100Ω		RC-101-2	BTS-100	1st. Video IF Amp. Decoupling
R21	8200Ω		RC-822-2	BTS-8200	2nd. Video IF Amp. Grid
R22	47Ω	20%	RC-470-2		2nd. Video IF Amp. Cathode - See Note 3
R23	330Ω	20%	RC-331-2	BTS-330	2nd. Video IF Amp. Decoupling
R24	100Ω		RC-101-2	BTS-100	Decoupling
R25	6800Ω		RC-682-2	BTS-180	3rd. Video IF Transformer Shunt - See Note 7
R26	180Ω	20%	RC-181-2	BTS-180	3rd. Video IF Amp. Cathode
R27	330Ω		RC-331-2	BTS-330	3rd. Video IF Amp. Decoupling
R28	22KΩ	20%	RC-223-2		4th. Video IF Transformer Shunt
R29	100Ω		RC-101-2	BTS-100	Decoupling
R30	39KΩ		RC-393-5	ETA-39K	Voltage Divider

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