

CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern. Adjust the Brightness and Contrast controls for a normal picture.

Short out the AFC voltage by connecting a clip lead from TP-8 to chassis. Connect a .1mfd, 400 volt capacitor from TP-5 to chassis.

Adjust Horizontal Hold to the point where the picture is almost stable horizontally.

Remove the capacitor from TP-5 and adjust the Horizontal Frequency slug (B1) to the point where the picture is almost stable horizontally.

Remove the clip lead from TP-8 and chassis. Adjust the Horizontal Hold control until the picture is synchronized horizontally.

Adjust the Horizontal Size (R8) for a picture slightly wider than necessary to fill the picture mask horizontally.

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL FOR MODEL 21C10CW

1. Remove 1 push-on type knob from the rear of the cabinet. Remove 1 metal and 7 wood screws holding rear cover. Remove antenna lead. Remove rear cover.
2. Remove front control lead plug, tuner lead plugs, yoke plug, HV lead, picture tube socket, and speaker leads.
3. Remove 4 chassis bolts holding chassis to metal frame-work.
4. Remove chassis.
5. Remove 4 push-on type knobs from the front of cabinet.
6. Turn the vertical hold and Brightness control bracket 1/4 turn counterclockwise from the rear of the cabinet.

7. Remove 3 metal screws holding the front control bracket.
8. Remove front control bracket.

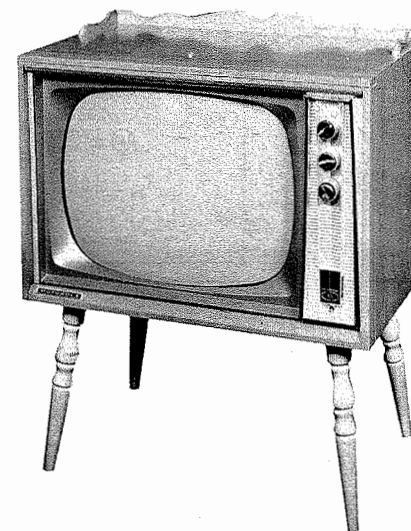
PICTURE TUBE REMOVAL

1. Remove chassis.
2. Remove 4 bolts holding picture tube mounting bracket to cabinet.
3. Remove picture tube and mounting bracket.
4. Loosen 2 picture tube mounting strap bolts.
5. Remove picture tube.

FOLDER 1
SET 481

MOTOROLA CHASSIS
TS-564, TS-564Y, WTS-564

PHOTOFACT® Folder



MODEL 21C10CW (Ch. TS-564)

TRADE NAME	Motorola	MODELS	CHASSIS
		A21C11B, M, A21K138M, A21K139B, M, W, A21K140B, M, A21K141CW (With Remote Control TR-6)	WTS-564
		Y21C10CW, Y21K125B, M, Y21K126B, M, W, Y21K127CW, Y21K129B, M, MC, Y21K130CW, Y21T67BG, MG, Y21T68B, M, W	TS-564Y
		21C10CW, 21K125B, M, 21K126B, M, W, 21K127CW, 21K129B, M, MC, 21K130CW, 21T67BG, MG, 21T68B, M, W	TS-564
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois		
TYPE SET	Television Receiver		
TUBES	VHF-Nineteen, UHF-Twenty, Remote Control-Seven		
POWER SUPPLY	110-120 Volts AC, 60 Cycle	RATING	195 Watts, 1.75 Amp. @ 117 Volts AC (VHF Models, less Remote Control)
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

Remove 5 screws holding the trim strip at the top edge of the safety glass. Tilt glass out and remove.

FUSE

One fuse is used for low voltage power supply protection and one for B+ protection. (For location see "Tube Placement Chart".)

A fuse wire is used for filament protection. (For location, see M3 in photo "Chassis Bottom View".)

TUNER OSCILLATOR ADJUSTMENTS

To touch-up VHF Oscillator, it is necessary to remove the complete control bracket assembly.

AGC

No provision is made to vary the AGC on this receiver.

FOCUS

The focus may be varied by the position of a strap on the

base of the picture tube.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

Coarse adjustment of the Horizontal Hold is accomplished by the proper setting of the Horizontal Frequency Slug (B1). (For location, see "Tube Placement Chart".)

WIDTH

The width may be varied by a Size control. (For location, see "Tube Placement Chart".)

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

PIN CUSHION CORRECTION

Reduce the picture size so that the sides of the raster are visible. Position the 2 magnets so that all sides are straight.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana



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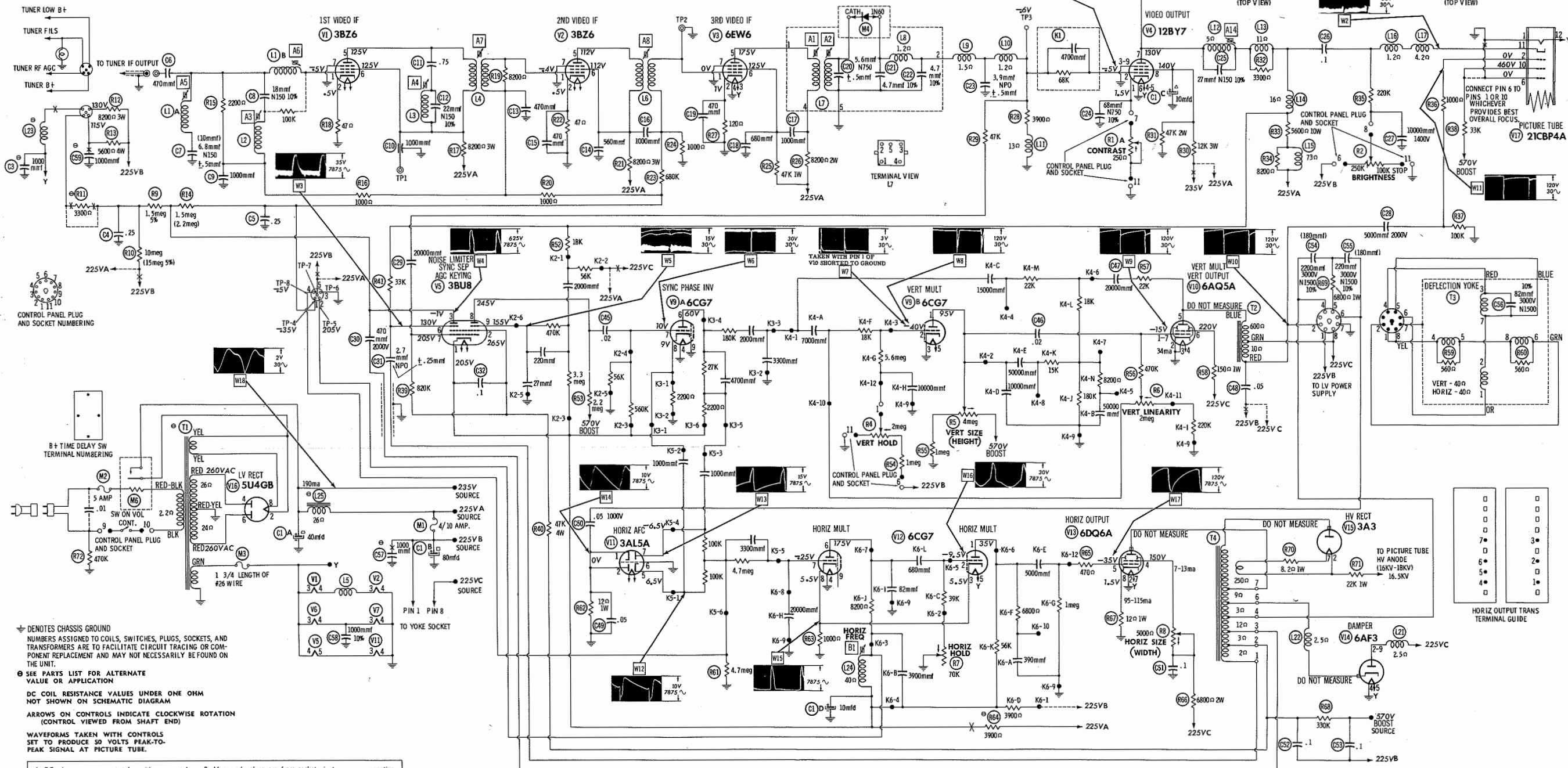
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MOTOROLA CHASSIS
TS-564, TS-564Y, WTS-564

SET 481
FOLDER 1

ADDITIONAL SCHEMATICS

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VHF TUNER WITH UHF PROVISIONS 1U751709 (OPT-123Y).....	9
REMOTE CABLE WIRING.....	10
REMOTE CONTROL TR-6.....	11
UHF TUNER TT-111.....	15
COMPONENT COMBINATION LAYOUT.....	15



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1000 ohms per volt.
2. Pin numbers are counted in 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. All controls set for normal operation; no signal applied.

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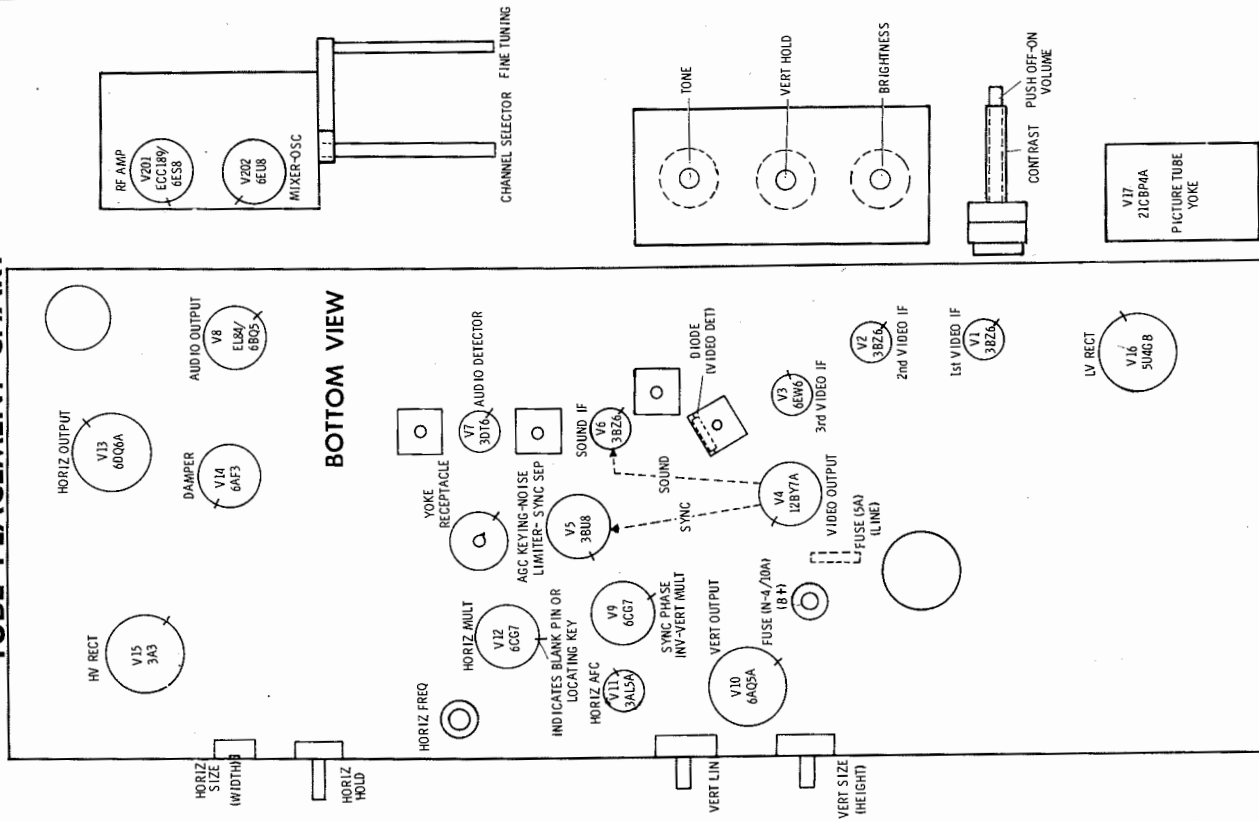
MOTOROLA CHASSIS
TS-564, TS-564Y, WTS-564

FOLDER 1

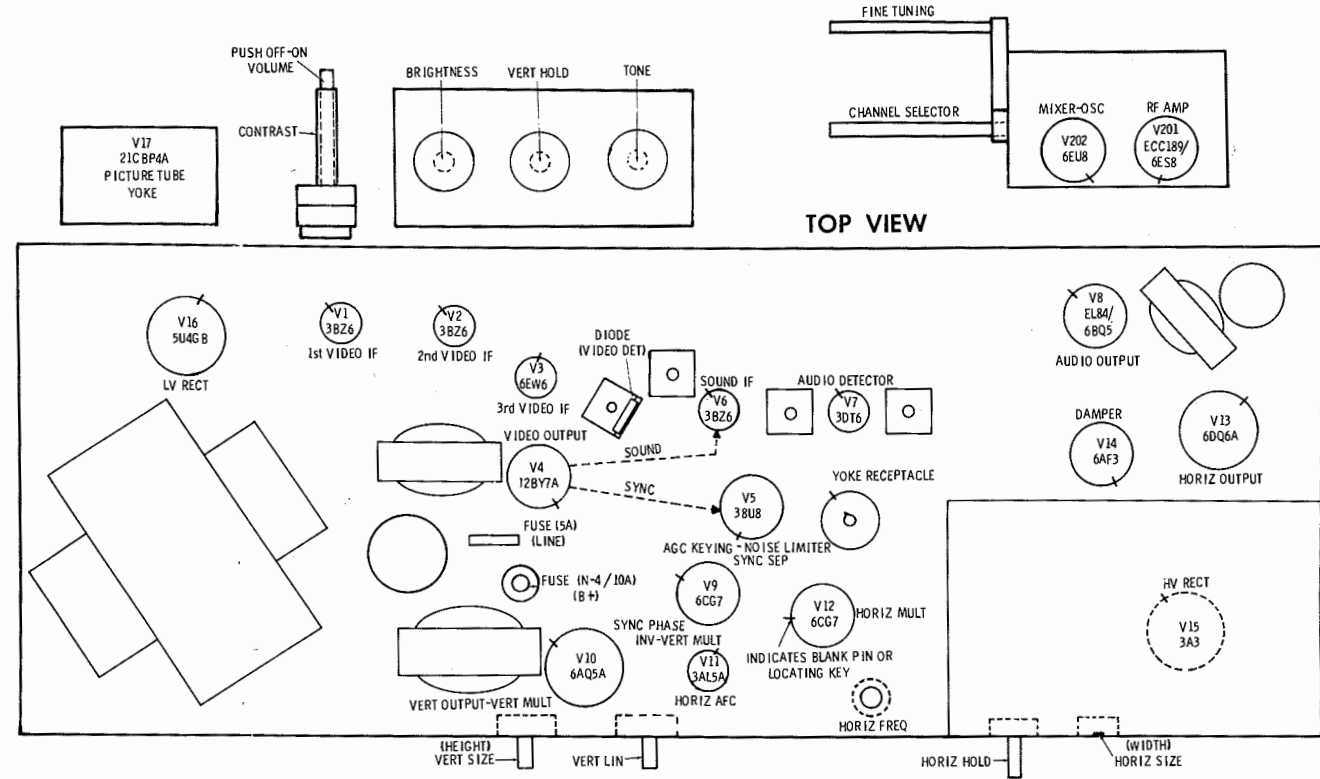
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3BZ6	680K	47Ω	.1Ω	.5Ω	†8200Ω	†8200Ω	0Ω		
V2	3BZ6	680K	47Ω	.5Ω	0Ω	†8200Ω	†8200Ω	0Ω		
V3	6EW6	1000Ω	120Ω	.1Ω	0Ω	†8200Ω	†47K	0Ω		
V4	12BY7A	● 20Ω	72K	0Ω	.1Ω	.1Ω	0Ω	†5600Ω	†11K	0Ω
V5	3BU8	† 3900Ω	†47K	2.3meg	.1Ω	.9Ω	†40K	†870K	†2.5meg	†3.8meg
V6	3BZ6	100K	0Ω	.1Ω	.5Ω	†12K	†57K	0Ω		
V7	3DT6	3.3Ω	560Ω	.1Ω	0Ω	†390K	†11K	560K		
V8	EL84/ 6BD5	0Ω	0Ω	180Ω	.1Ω	0Ω	NC	†1000Ω	NC	†470Ω
V9	6CG7	● +1.7meg	● 1.6meg	0Ω	0Ω	.1Ω	†34K	56K	2200Ω	0Ω
V10	6AQ5A	● 1.3meg	0Ω	0Ω	.1Ω	† 625Ω	†175Ω	● 1.3meg		
V11	3AL5A	12Ω	12Ω	.9Ω	0Ω	4.8meg	0Ω	4.8meg		
V12	6CG7	†60K	● 80K	1000Ω	0Ω	.1Ω	†12K	9.4meg	1000Ω	NC
V13	6D06A	TP	0Ω	NC	●†7300Ω	1meg	NC	.1Ω	12Ω	TOP CAP †11.9Ω
V14	6AF3	NC	†2.5Ω	NC	0Ω	.1Ω	NC	TP	NC	†2.5Ω
V15	3A3									TOP CAP †262Ω
		PINS			1 THRU 8 HAVE INFINITE RESISTANCE					
V16	5U4GB	TP	†	TP	26Ω	NC	24Ω	NC	†	
V17	21CBP4A	0Ω	100K	Pin 6 0Ω	Pin 10 †360K	Pin 11 ● 280K	Pin 12 .1Ω			
V201	ECC189/ 6ES8	†5900Ω	900K	INF	0Ω	.1Ω	INF	370K	0Ω	0Ω
V202	6EU8	†8200Ω	15K	†2200Ω	0Ω	.1Ω	0Ω	100K	0Ω	†55K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

4	THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.	
●	THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.	
†	MEASURED FROM CAP. LEAD OF V14.	NC NO CONNECTION
‡	MEASURED FROM 255V SOURCE.	TP TIE POINT



TUBE FAILURE CHECK CHART



The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

LOSS OF PICTURE OR SOUND

6 No pic, no sound, has raster V1, V2, V3, Diode (Video Det), V4

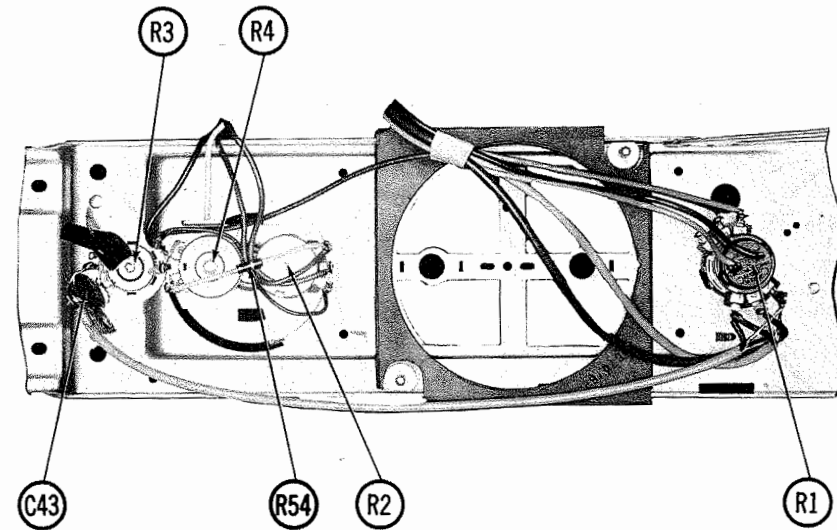
No pic, has sound

Has pic, no sound V6, V7, V8
Overloaded picture V5

SYNC FAILURE
No vert. sync V5, V9
No horiz. sync V5, V9, V11
No vert. or horiz. sync V5, V9

No vert. sync

No horiz. sync V5, V9, V11
No vert. or horiz. sync V5, V9



CONTROL PANEL

FOLDER 1

FOLDER 1

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS


The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545

VIDEO IF ALIGNMENT

Short grid (pin 2) of V202 to chassis. Remove deflection yoke plug and connect a 1500Ω 50W resistor from TP7 to TP6. CAUTION: TP7 has B+ voltage on it.
Set Contrast control fully counterclockwise.
Short antenna terminals together but not to chassis.
Connect the negative lead of a 4.5 volt bias supply to TP4. Positive to chassis.
Connect synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.

DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1. .001mfd	High side to TP2. Low side to chassis.	44.0MC (10MC Swp)	45.75MC	13	Vert. Amp. thru 47K to TP3. Low side to chassis. (Across Video Det. load)	A1, A2	Adjust for maximum gain and symmetry of response similar to Fig. 1. with markers as shown.
2. Direct	Place a thin insulated metal strip between the Mixer-Osc. tube (V202), and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis.	"	47.25MC	"	"	A3, A4	Adjust to place marker in trap notch. (Slug away from chassis).
3. "	"	"	41.25MC	"	"	A5	Adjust to place marker in trap notch. (Slug toward chassis).
4. "	"	"	44.0MC	"	Vert. Amp. to TP1. Low side to chassis.	Mixer Plate Coil & A6	Set generator output for 3 volts peak to peak on scope. Adjust for maximum gain and symmetry of response similar to Fig. 2 with markers as shown. Mixer Plate Coil affects center peak and A6 affects outside peaks. (Slugs away from chassis).
5. "	"	"	42.25MC 45.75MC	"	Vert. Amp. thru 47K to TP3. Low side to chassis.	A7, A8	Adjust for maximum gain and symmetry of response similar to Fig. 3 with markers as shown. Adjust A7 to place 42.25MC marker and A8 to place 45.75MC marker. If necessary, retouch Mixer Plate coil to correct for tilt.

SOUND IF ALIGNMENT

Tune in a strong TV signal and adjust controls for normal picture and sound. Connect the DC probe of a VTVM to point . Common to chassis. Adjust A9 for maximum deflection choosing the one of two peaks which produces the highest voltage. While listening to the sound, retouch A9 for maximum volume with MINIMUM distortion. The top slug (A10) is a preset slug which is set near the top of the coil form and left there. Change to a very weak signal (this may be done by loosely coupling the antenna lead to the antenna terminals) that produces a hiss in the sound. Adjust A11 and A12 for maximum sound and MINIMUM distortion. Adjust A13 for maximum undistorted sound. If sound is not clear at this point, repeat the above procedure.

4.5MC TRAP ALIGNMENT

Tune in a strong TV signal and turn the Contrast fully clockwise. Adjust the Fine Tuning until a strong 4.5MC beat pattern is visible. Adjust A14 to find the two points at which the beat pattern is just noticeable. Tune the slug to the center of these two points. (Use MINIMUM inductance which will result in no apparent beat pattern).

TUNER ALIGNMENT INSTRUCTIONS LOCATED ON PAGES 8 & 17

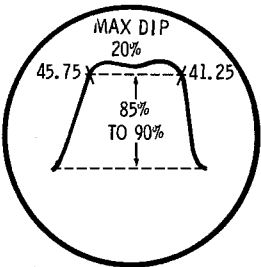


FIG. 1

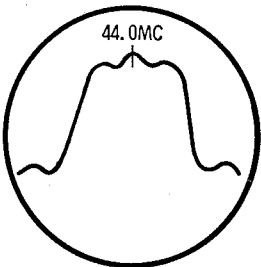


FIG. 2

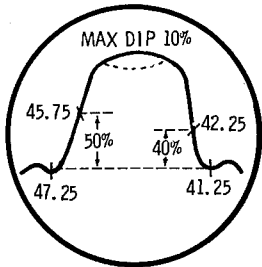
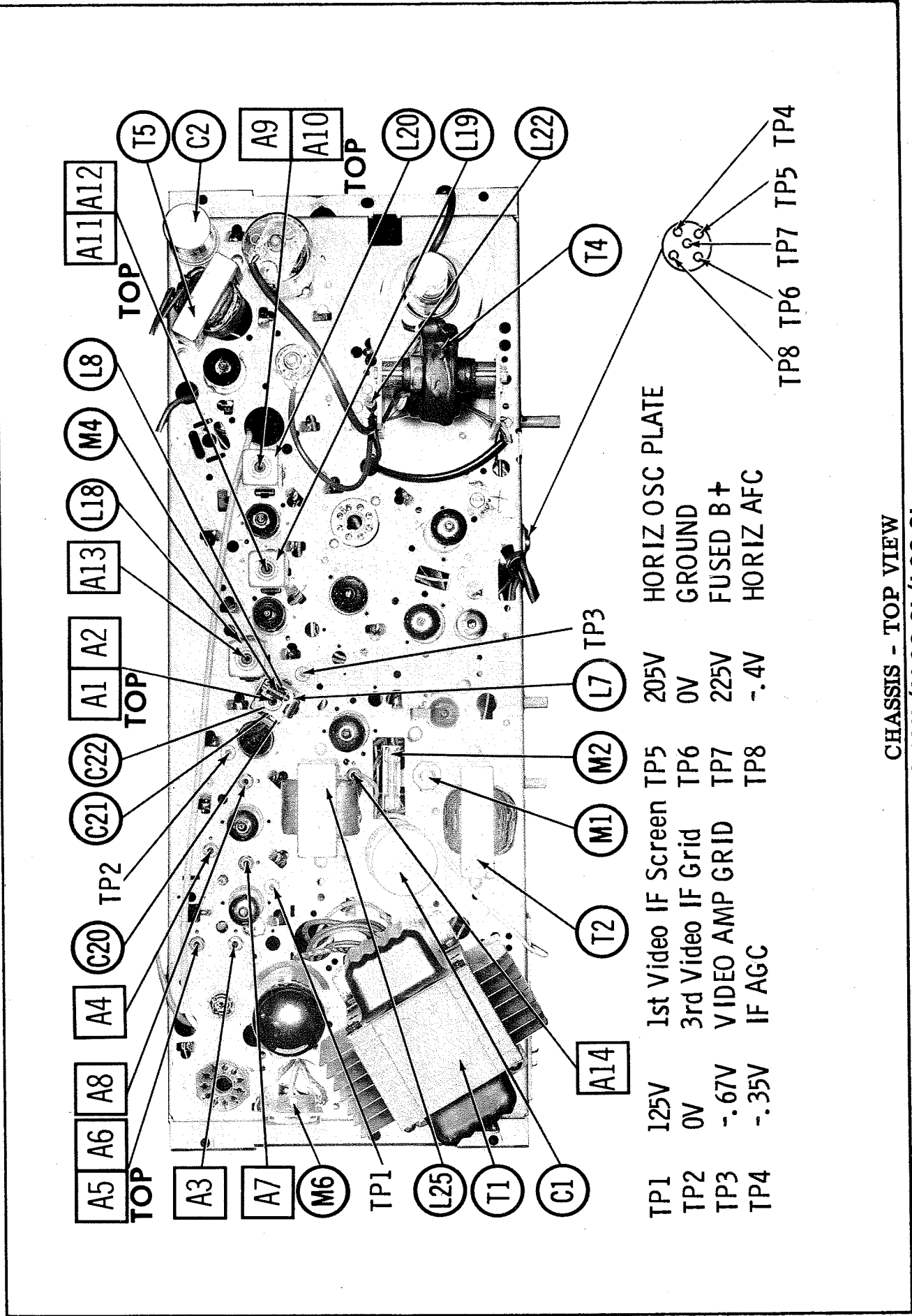
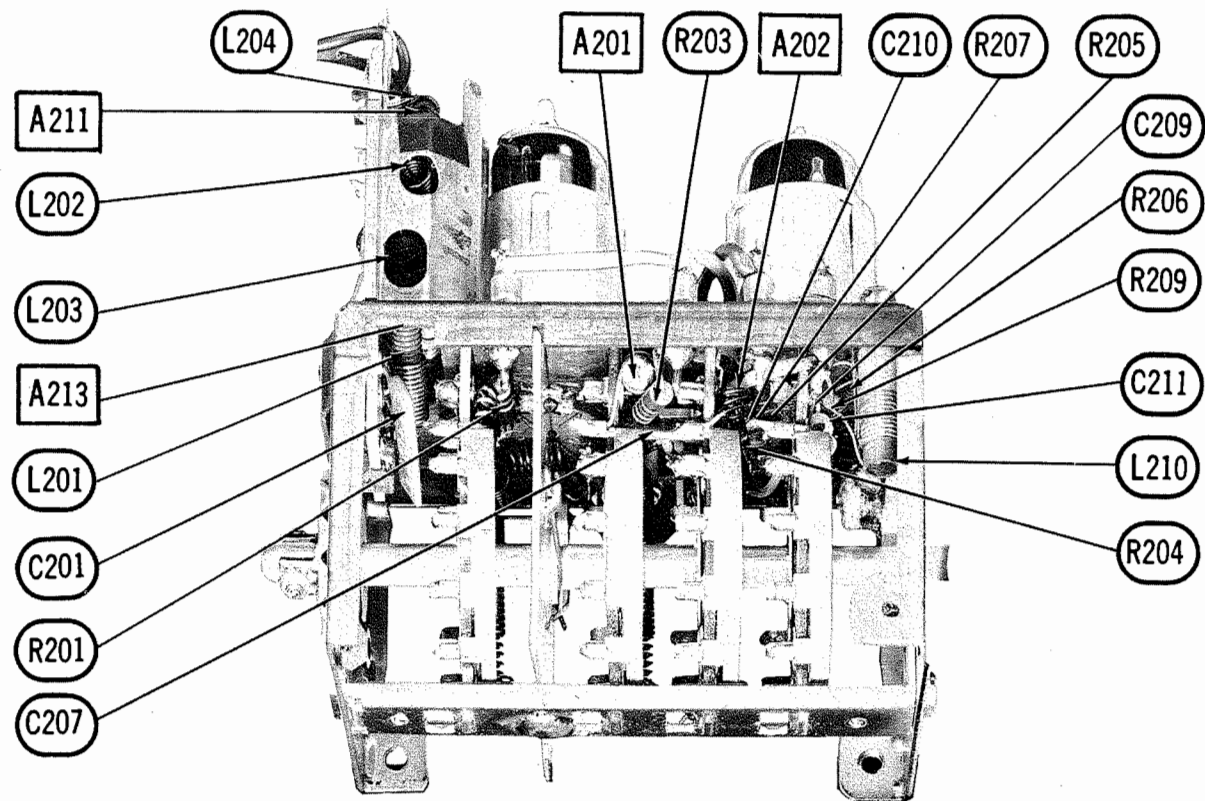


FIG. 3

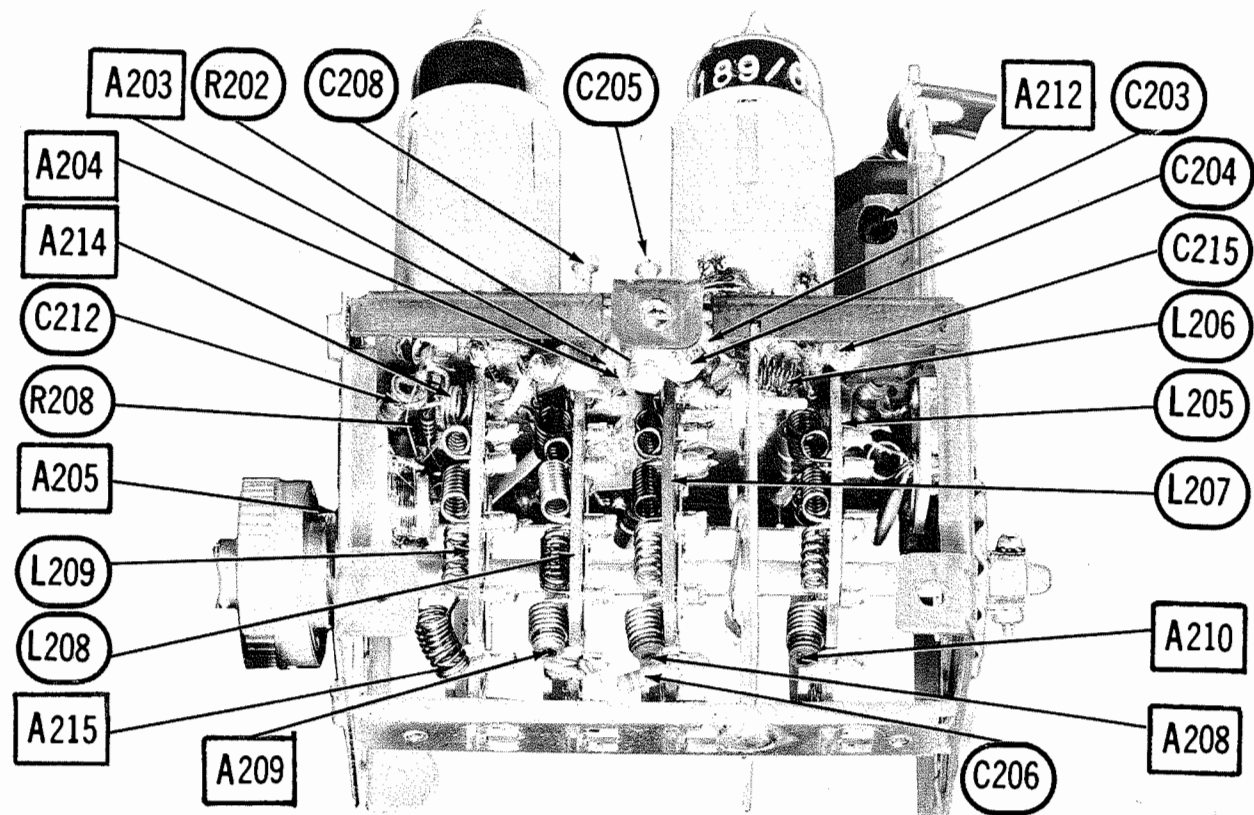


MOTOROLA CHASSIS
TS-564, TS-564Y, WTS-564
CHASSIS VIEW - POLAR VIEW

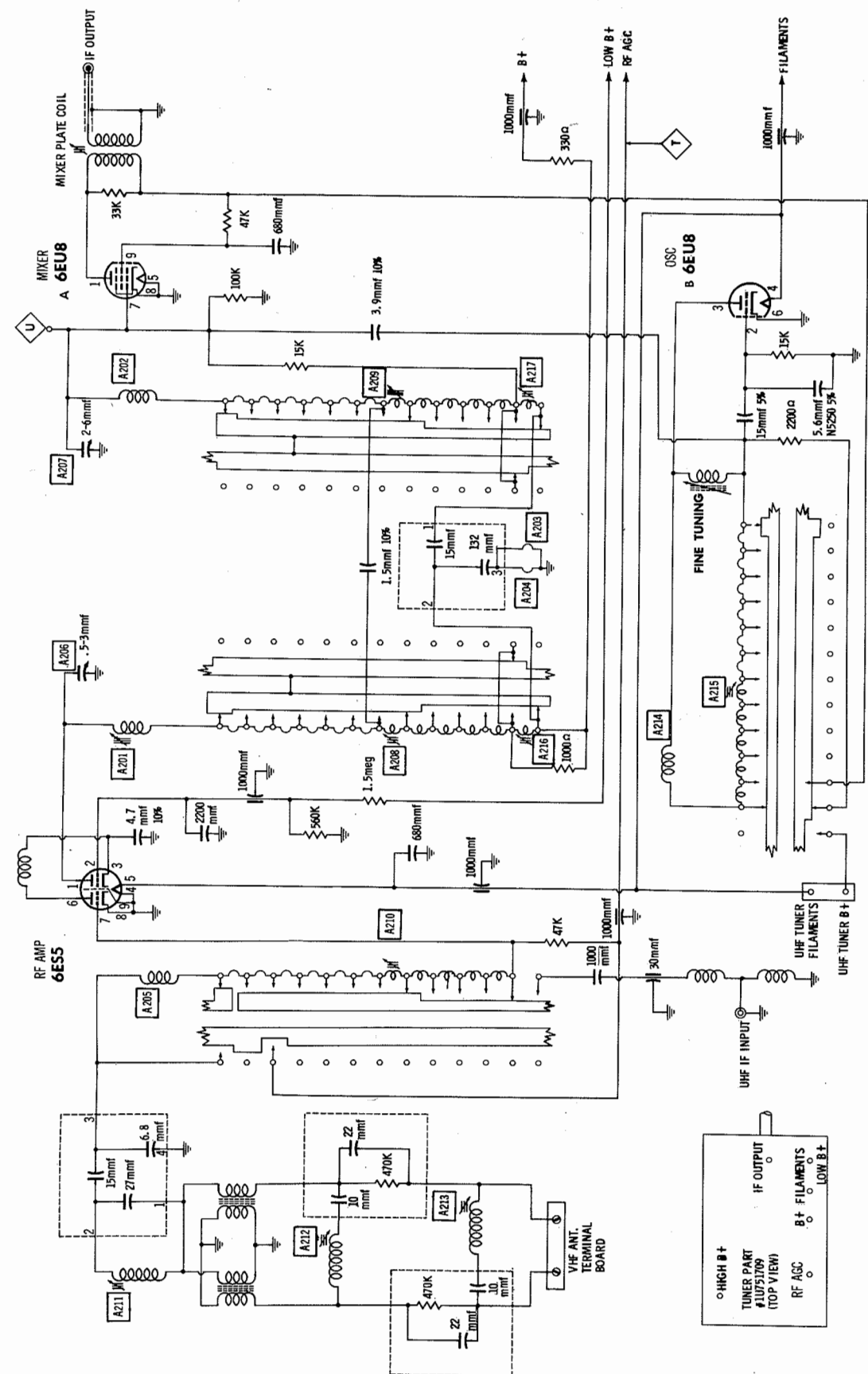
FOLDER 1



TUNER 1U751700 (OPTT-123) - LEFT SIDE



TUNER 1U751700 (OPTT-123) - RIGHT SIDE








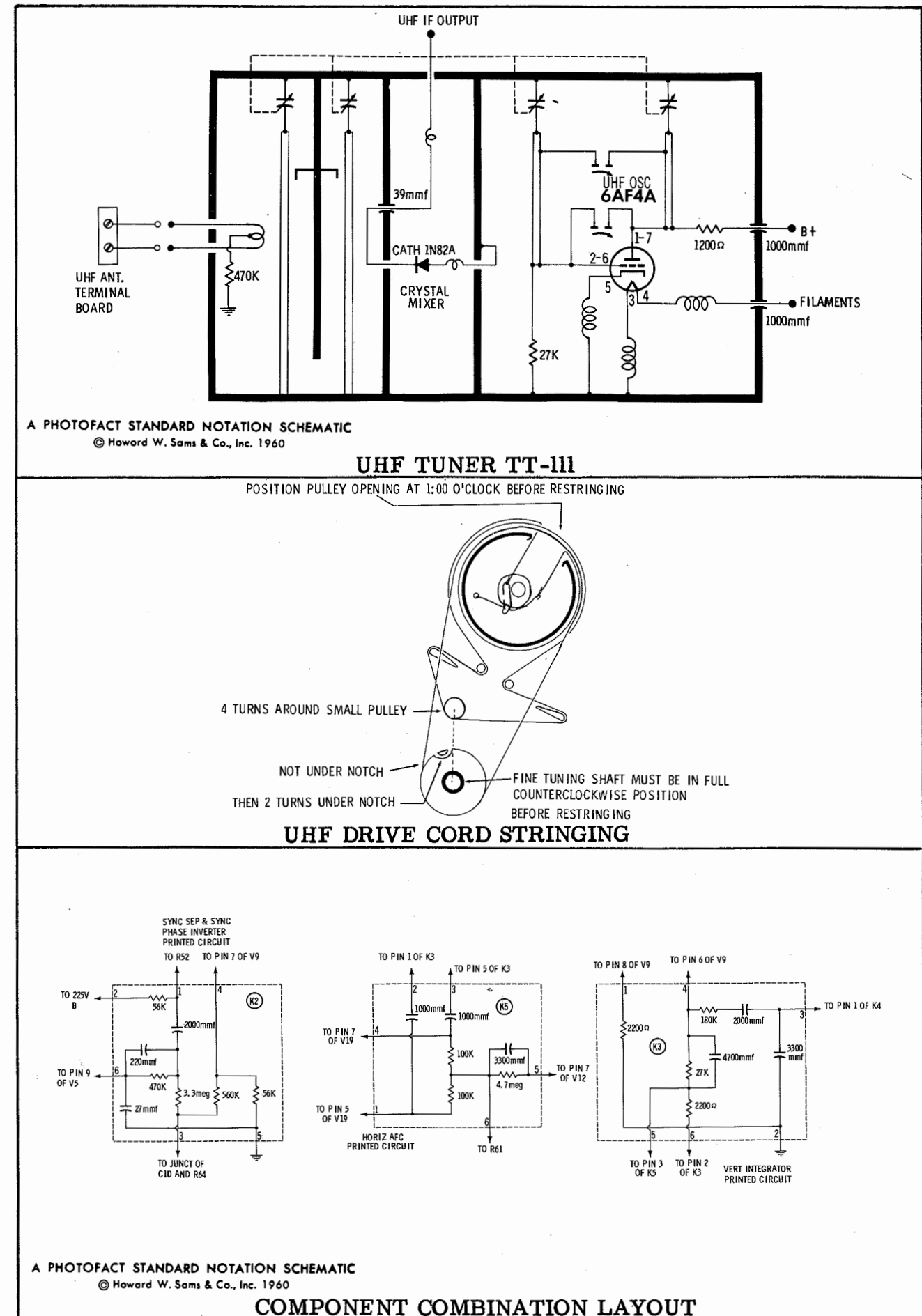
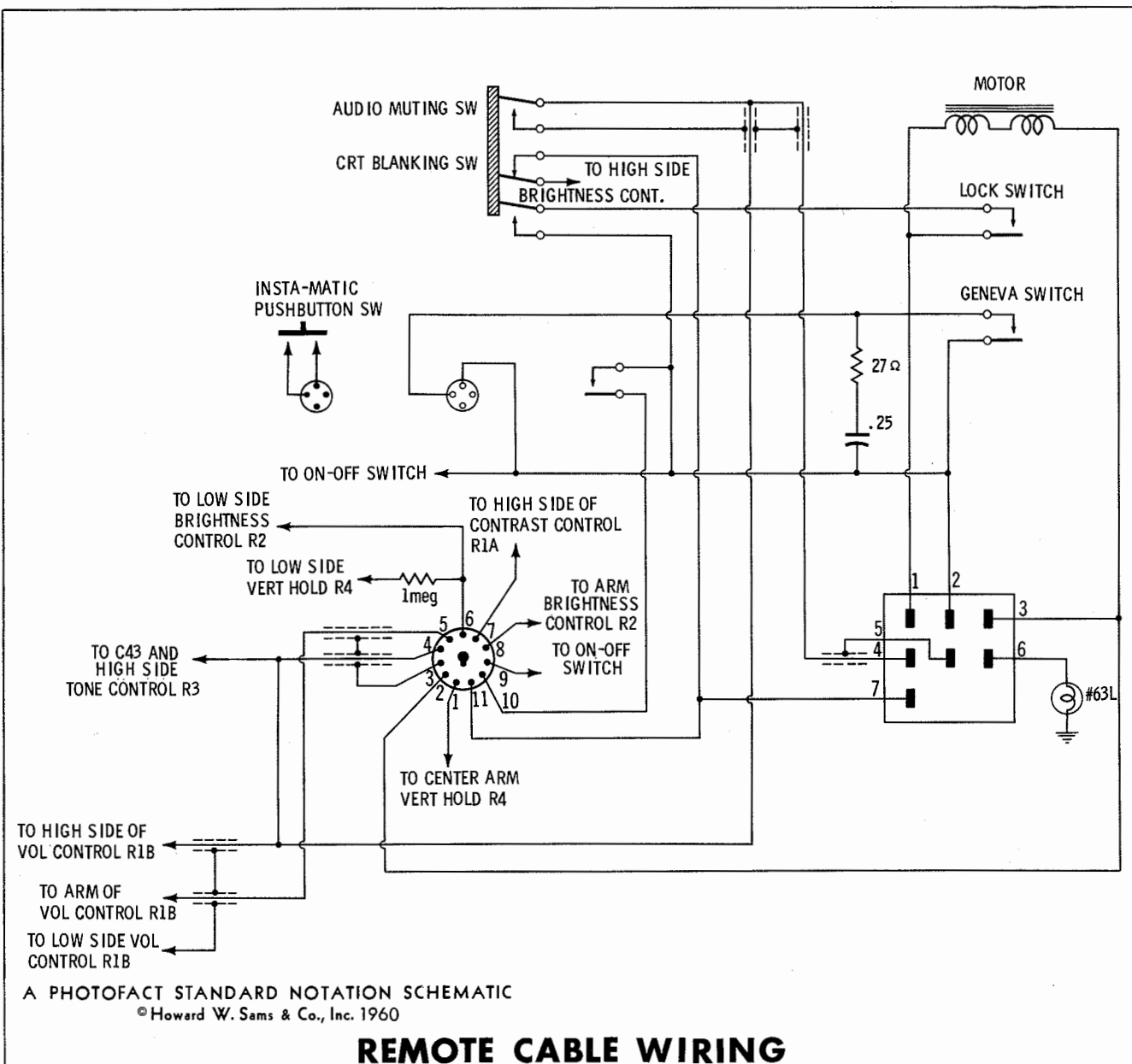
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION

MOTOROLA CHASSIS
TS-564, TS-564Y, WTS-564
VHF TUNER with UHF Provisions 1U751709 (OPT-123Y)

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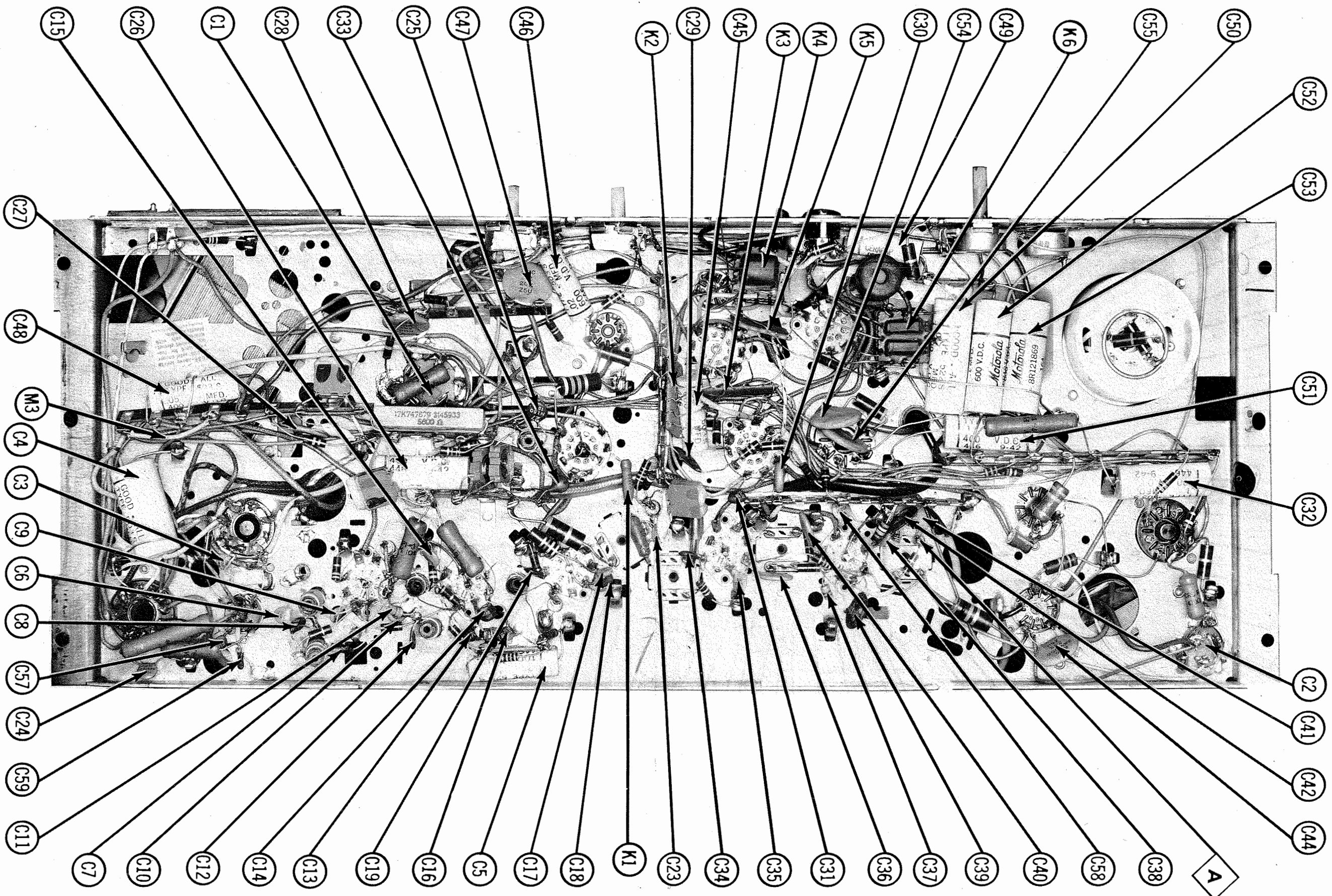
TR- 6

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Audio generator across microphone input	39.0 KC		DC probe thru 100K to point  . Common to chassis.	A1	Detune A2 by turning counterclockwise several turns. Adjust A1 for maximum deflection. Use only enough generator output to provide a usable indication on VTVM.
2.	"	"		DC probe thru 100K to point  . Common to point  .	A2	Increase generator output to cause overload. Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
3.	"	40KC		DC probe thru 100K to point  . Common to chassis.	A3	Reduce generator output below overload. Adjust for maximum deflection. Peak core away from chassis.
4.	"	41.5 KC		DC probe to point  . Common to chassis.	A4	Adjust for MINIMUM deflection. Keep adjusting generator output during this adjustment so that meter reading remains between 3 and 5 volts.



MOTOROLA CHASSIS
TS-564, TS-564Y, WTS-564

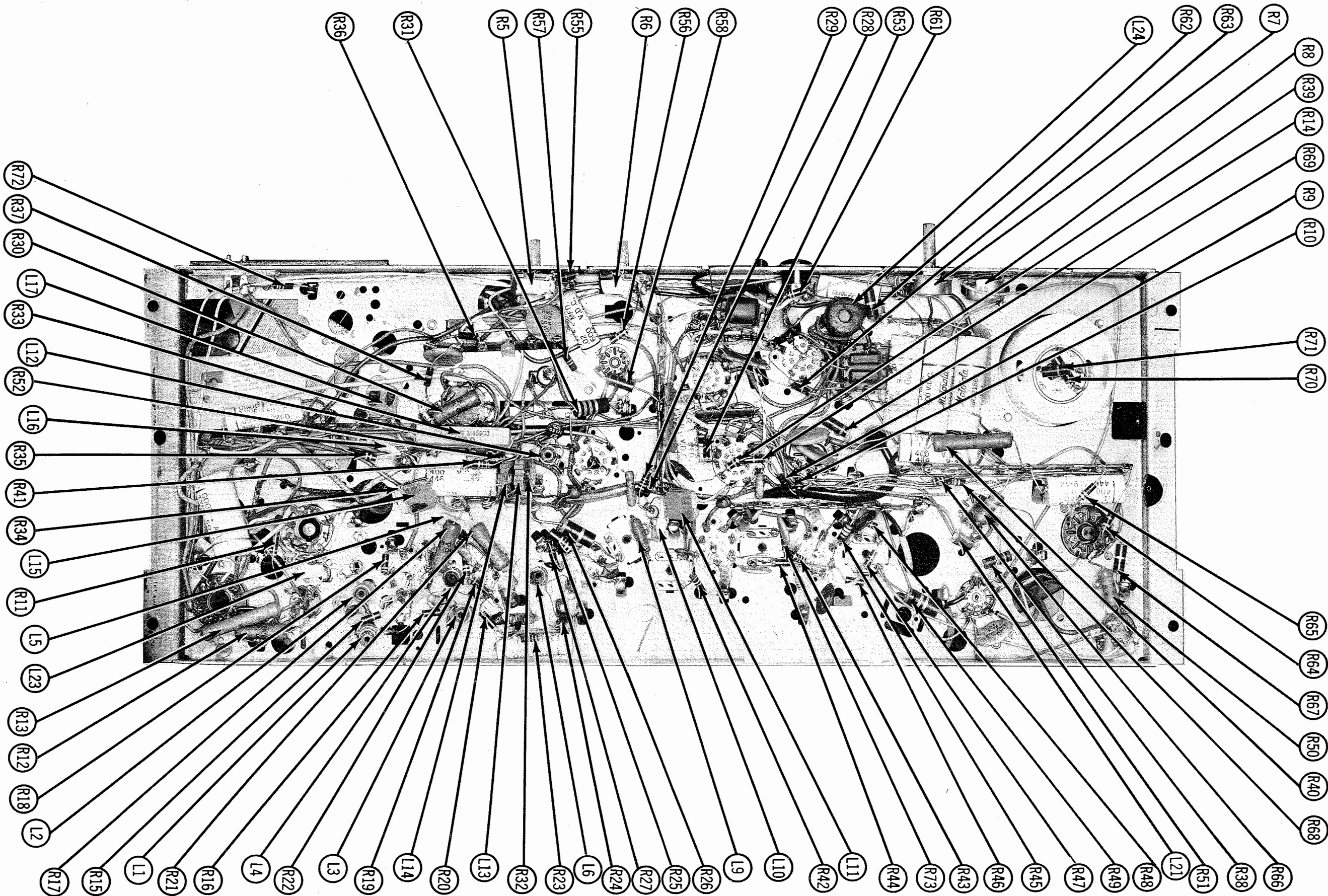
FOLDER 1



CHASSIS BOTTOM VIEW - CAPACITOR & MISC. IDENT.

TS-564, TS-564Y, WTS-564

MOTOROLA CHASSIS

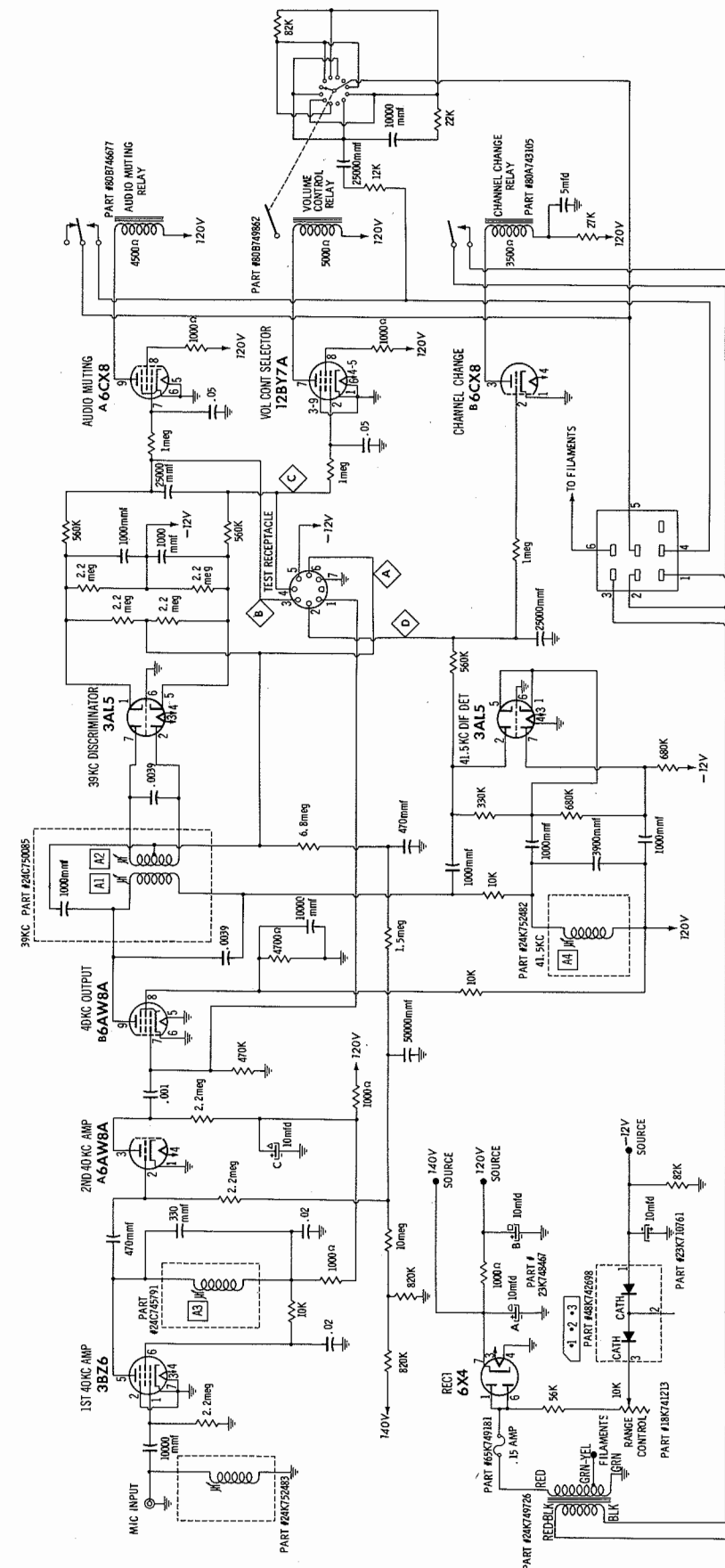


CHASSIS BOTTOM VIEW - RESISTOR & INDUCTOR IDENT.

CABINETS & CABINET PARTS (cont)

WIRING DATA

High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor)
	8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors
	8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor
	8485 (Round) - 5 Conductor
	8488 (Round) - 8 Conductor



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**MOTOROLA CHASSIS
TS-564, TS-564Y, WTS-564
REMOTE CONTROL TR 9-6**

FOLDER T

PARTS LIST AND DESCRIPTIONS

CONTROLS (cont)

ITEM No.	RATING	REPLACEMENT DATA					INSTALLATION NOTES
		MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R5A	4meg	18K743524			B11-240	PTA56L	Vert. Size
B	Shaft				TM4	Not Req.	
R6A	2meg	18K743523		B47-2meg-S	B11-139	PTA26L	Vert. Lin.
B	Shaft			Not Req.	TM4	Not Req.	
R7A	70K	18K748235			B11-125	PTA15L	Horiz. Hold
B	Shaft				TM4	Not Req.	
R8A	5000Ω	17B746869	WN-502	A43-5000	WRS-5000	PFL5K	Horiz. Size
B	Shaft		Not Req.	FKS-1/4	Not Req.	Not Req.	

Note 1. Some versions may use 1meg Tone control (Part #8K752021).
 ■ "STA-LOC" Equivalent: FB251L, RUP255L, OS1375.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS	ITEM No.	RATING	REMARKS	ITEM No.	RATING	REMARKS
R9	1.5meg 5%		R31	47K 2W		R53	2.2meg	
R10	10meg	(15meg 5%) *	R32	3300Ω		R54	1meg	
R11	3300Ω	Note 1	R33	5600Ω 10W	#17K747879	R55	1meg	
R12	8200Ω 3W		R34	8200Ω		R56	470K	
R13	5800Ω 4W		R35	220K		R57	22K	
R14	1.5meg	(2.2meg) *	R36	1000Ω		R58	150Ω 1W	
R15	2200Ω		R37	100K		R59	560Ω	
R16	1000Ω		R38	33K		R60	560Ω	
R17	8200Ω 3W		R39	820K		R61	4.7meg	
R18	47Ω		R40	47K 4W		R62	12Ω 1W	
R19	8200Ω		R41	33K		R63	1000Ω	
R20	1000Ω		R42	100K		R64	3900Ω	
R21	8200Ω 3W		R43	47K	(10K) *	R65	470Ω	
R22	47Ω		R44	1000Ω	Note 1	R66	6800Ω 2W	
R23	680K		R45	390K		R67	12Ω 1W	
R24	1000Ω		R46	220Ω		R68	330K	
R25	47K 1W		R47	82K		R69	6800Ω 1W	
R26	8200Ω 2W		R48	560K		R70	8.2Ω 1W	
R27	120Ω		R49	10K 2W		R71	22K 1W	
R28	3900Ω		R50	470Ω 2W		R72	470K	
R29	47K		R51	180Ω 1W		R73	560Ω	
R30	12K 3W		R52	18K				

Motorola Part No.

* Alternate value.

Note 1. Not used in some versions.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	MOTOROLA PART No.	REPLACEMENT DATA
K1	Video Output Grid	470mmf, 68K	51K744975	
K2	Sync Sep. & Sync Phase Inv.	27mmf, 220mmf, 2000mmf, 56K, 470K, 560K, 3.3meg	51B747693	Sprague HN-5
K3	Vert. Integrator	2000mmf, 3300mmf, 4700mmf, 2200Ω, 2200Ω, 27K, 180K	51B747379	Sprague VF-3
K4	Vert. Sweep	7000mmf, 10000mmf, 10000mmf, 15000mmf, 50000mmf, 50000mmf, 8200Ω, 15K, 18K, 18K, 22K, 180K, 220K, 5.6meg	51C745219	
K5	Horiz. AFC	1000mmf, 1000mmf, 3300mmf, 100K, 100K, 4.7meg	51B747561	Sprague F-4
K6	Horiz. Sweep	82mmf, 390mmf, 680mmf, 3900mmf, 5000mmf, 20000mmf, 3900Ω, 6800Ω, 8200Ω, 39K, 56K, 1meg	51C749191	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		MOTOROLA PART No.	Gromer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	
L1A	41.25MC Trap	24K747586					
L2	47.25MC Trap	24K750578	17-4538	17-4538	TV-153	6225	
L3	47.25MC Trap	24K747585	20-1049	20-1049	TV-153	6225	
L4	2nd Video IF	24K747587	17-4522	17-4522	TV-130	6219	
L5	Fl. Choke	24K743675	19-1001	19-1001	BC-562	4604	
L6	3rd Video IF	24K751248	17-4522	17-4522	TV-130	6219	
L7	4th Video IF	24K750722					
L8	Resonant Choke	24R119869					8.5uh
L9	Resonant Choke	24A733225					10uh
L10	Resonant Choke	24R119869					8.5uh
L11	Shunt Peaking Coil	24K749669	19-3330	19-3330	TV-200	6132	330uh
L12	4.5MC Trap	24K759290	20-1004	20-1004	TV-151	1469	
L13	Series Peaking Coil	24K752351	19-3275	19-3275	TV-198	6130	
L14	Shunt Peaking Coil	24C749508	19-3500	19-3500	TV-203	6174	
L15	Shunt Peaking Coil	24K752352	19-1050	19-1050	BC-549	6302	
L16	Resonant Choke	24R119869					270uh
L17	Series Peaking Coil	24K750458	19-3100	19-3100	TV-194	6112	500uh
L18	1st Sound IF	24K751499					2.5MH
L19	2nd Sound IF	24K753234	17-3495	17-3495	TV-113	6203	8.5uh
L20	Quadrature Coil	24K751492					104uh
L21	RF Choke	24B747171					7.5uh
L22	RF Choke	24B747171					7.5uh
L23	Fl. Choke	24K743675	19-1001	19-1001	BC-562	4604	1.5uh

† Includes M4.

▲ Disregard tap.

◆ Parallel with 8200Ω resistor.

* Alternate Part #24K751498.
 ① Includes 3300Ω Resistor (R32).
 ② Includes 8200Ω Resistor (R34).
 ③ Not used in some versions.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.	REPLACEMENT DATA					NOTES
		MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Miller PART No.	Rom PART No.	
L24	40Ω	24K743426	HS-5	TV-165	6210	H-102	Horiz. Stabilizer ① Enlarge mtg. hole. ② Disregard tap.

FILTER CHOKE

ITEM No.	RATINGS		REPLACEMENT DATA					
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 Hz)	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Rom PART No.	Stancor PART No.
L25	.275A	28Ω	.92 Hy.	25K751752AY	26C93	C-2996	F-801	C-2326

① Alternate Part #25K751752.

TRANSFORMER (POWER)

ITEM No.	RATING		REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Rom PART No.	Stancor PART No.
T1	117V @ 1.75A	520VCT @ .280A	5V @ 3A	25K752869N	①			

① Alternate Part #25D745778.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA							
		MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Rom PART No.	Rogers PART No.	Stancor PART No.	Thordorson PART No.	Triad PART No.
T2	Vert. Output	25K744974	26S73 ①	A-2855	V316 ②	VO38	VO-108	26S73 ①	A-133X
T3	Yoke-Horiz. (23MH) (90°)-Vert. (39MH) Rear Cover & Centering Device Yoke Retainer & Clamp	24D743785 59C721145 42A736175	Y-45 ③ ④ ⑤	MDF-97 ⑤ ⑥	MO-8		DY-32A	Y-45-2 ③ ④ ⑤	A-133X Y-45-2 YC-1 CL-1
T4	Horiz. Output Primary Coll Secondary Coll	24K746397 ⑦ 24K748398 24K745108		HVO-142⑧	MOC-2	MT-3			D-176

① Drill new mounting hole(s).

② Cut and tape green lead.

③ Remove jumper from yoke terminals #3 and #6.

④ Remove horizontal damping capacitor from yoke terminals #1 and #2 and install across #3 and #7.

⑤ Use original leads, plug, rear cover & core clamp assembly. Connect same as original.

⑥ Remove jumper from yoke terminals #1 and #4.

⑦ Complete transformer assembly.

⑧ Exact replacement.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE	REPLACEMENT DATA								NOTES
		MOTOROLA PART No.	Holderson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thorderson PART No.	Triod PART No.		
T5	5100Ω	6-8Ω	25K749230-Y ①	24S07	A-2901	AU-600	A-3823	24S07	S-53X	① Alternate Part #25K749230.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	QUAM PART No.	
SP1	4" 8" 6" x 9" 6" x 9" 4"	PM PM PM PM PM	6-8Ω	50K749193 ① 50K749188 ② 50K749188 ③ 50K749196 ④ 50K749195 ⑤ 50K749190 ⑥		① ZC and 2IT Series Models ② 2IK125B, M, 2IK127CW, A2IK138M, A2IK140B, M, Y2IK125B, M, Y2IK127CW Models ③ 2IK129B, M, MC, 2IK130CW, Y2IK129B, M, MC, Y2IK130CW Models ④ 2IK126B, M, W, Y2IK126B, M, W Models ⑤ 2IK139B, M, W, A2IK141CW Models ⑥ Not used in ZC and 2IT Series Models

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			MOTOROLA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	N	4/10A S/B	65K750576	9K750575	333.400 (N 4/10A 250V S/B)		346009	N 4/10
M2	3AG	5A	65A742612	31A737466	312005 (3AG 5A 250V)		357001	MTH5
M3		1 3/4" Length #26 Wire						HN 3/10 to 1/2

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		MOTOROLA PART No.	©CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M4	1N80	48K747548	*			Video Detector (Clip-in) * Selected component

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M5	Tuner	1U751700	VHF (OPTT-123) Ch. TS-564
	Tuner	1U751709	VHF with UHF Provisions (OPTT-123Y), Ch. TS-564Y
	Tuner	1V753414	VHF (4ATT-117), Motorized version of OPTT-123, Ch. TS-564
	Tuner		UHF (TT-111), Ch. TS-564Y
M6	Thermostat Assy.	6CT49855	Includes Time Delay Resistor & Thermal Switch
M7	Magnet	48B737365	Pincushion correction (Not used on some models)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Mask, Picture Tube	13F751413	Models 2IC10CW, Y2IC10CW, 2IT67BG, MG, Y2IT67BG, M, W, Y2IT68B, M, W
Mask, Picture Tube	13K751907	Models A2IC11B, M
Mask, Picture Tube	13K751507	Models 2IK125B, M, Y2IK125B, M, 2IK126B, M, W, 2IK127CW, Y2IK127CW, 2IK129B, M, MC, Y2IK129B, M, MC, 2IK130CW, Y2IK130CW

TUBES

CBS			GENERAL ELECTRIC			RAYTHEON			SYLVANIA		
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE	ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	1st Video IF Amp.	3B26	V9	Vert. Mult. - Sync Phase Inverter	6CG7						
V2	2nd Video IF Amp.	3B26	V10	Vert. Mult. - Vert. Output	6AQ5A						
V3	3rd Video IF Amp.	6EW6	V11	Horiz. AFC	3AL5A						
V4	Video Output	12BY7A	V12	Horiz. Mult.	6CG7						
V5	AGC Keying-Noise Limiter-Sync Sep.	3BU8	V13	Horiz. Output	6DQ6A						
V6	Sound IF	3B26	V14	Damper	6AF3						
V7	Audio Detector	3DT6	V15	HV Rectifier	3A3						
V8	Audio Output	EL84/6BQ5	V16	LV Rectifier	5U4GB						

PICTURE TUBE

ITEM No.	REPLACEMENT DATA					NOTES
	MOTOROLA PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
V17	2ICBP4A	2ICBP4A ①	2ICBP4A-A ①	2ICBP4/2ICBP4A ①	2ICBP4/2ICBP4A ②	① Aluminized ② "Silver Screen 85"

ELECTROLYTIC CAPACITORS

ITEM No.

TUNER PARTS LIST AND DESCRIPTIONS
1U751700(OP TT-123)
TUBES

CBS			GENERAL ELECTRIC			RAYTHEON			SYLVANIA		
ITEM No.	USE		TYPE			ITEM No.	USE		TYPE		
V201	RF Amplifier		ECC189/6ES8			V202	Mixer-Oscillator		6EU8		

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

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ELMenco PART No.	MALLORY PART No.	SPRAGUE PART No.
C201A	27	#51K751641	EF-001 NPO-SI 4.7 BPD-0022	TCZ-27	C10Q27C	CCTO-270	CNO-427	10TCC-Q27
C201B	15			TCZ-15	C10Q15C	CCTO-150	CNO-415	10TCC-Q15
C202	1000			TCZ-6R8	C10V68C	CCTO-6R8	CNO-568	10TCC-V68
C203	4.7 10%			MFT-1000		CCF-102	CT280A	
C204	2200	#51K752032	NPO-SI 1.5	TCZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47
C205	.5-3			829-3	BYA10D22	CCD-222	B-222	5HK-D22
C206	1.5 10%			TCZ-1R5	C10V15C	CV-1	CT565	10TCC-V15
C207A	132			TCZ-130	L10T13			
C207B	15	#21R128917	DI-680 NPO-SI 15	TCZ-15	C10Q15C	CCTO-15	CNO-415	10TCC-Q15
C208	2-6			829.6		CV-3	CT552	
C209	3.9 10%				C10V4C	CCS-681	GP368	10TCC-V39
C210	680 10%			DD-681		CCTO-150	CNO-415	10TS-T68
C211	15 5%	#21K749376	EF-001 EF-001 DI-680 EF-001	TCZ-15	C10Q15C	CCF-102	CT280A	10TCC-Q15
C212	5.6 N5250 5%			MFT-1000		CCF-102	CT280A	
C213	1000			DD-681		CCF-102	CT280A	
C214	1000			MFT-1000		CCF-102	CT280A	
C215	680 10%							
C216	1000							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
Motorola Part Number.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS	ITEM No.	RATING	REMARKS	ITEM No.	RATING	REMARKS
R201	47K		R204	15K		R207	47K	
R202	1meg		R205	100K		R208	15K	
R203	330Ω		R206	33K		R209	2200Ω	

COMPONENT COMBINATIONS

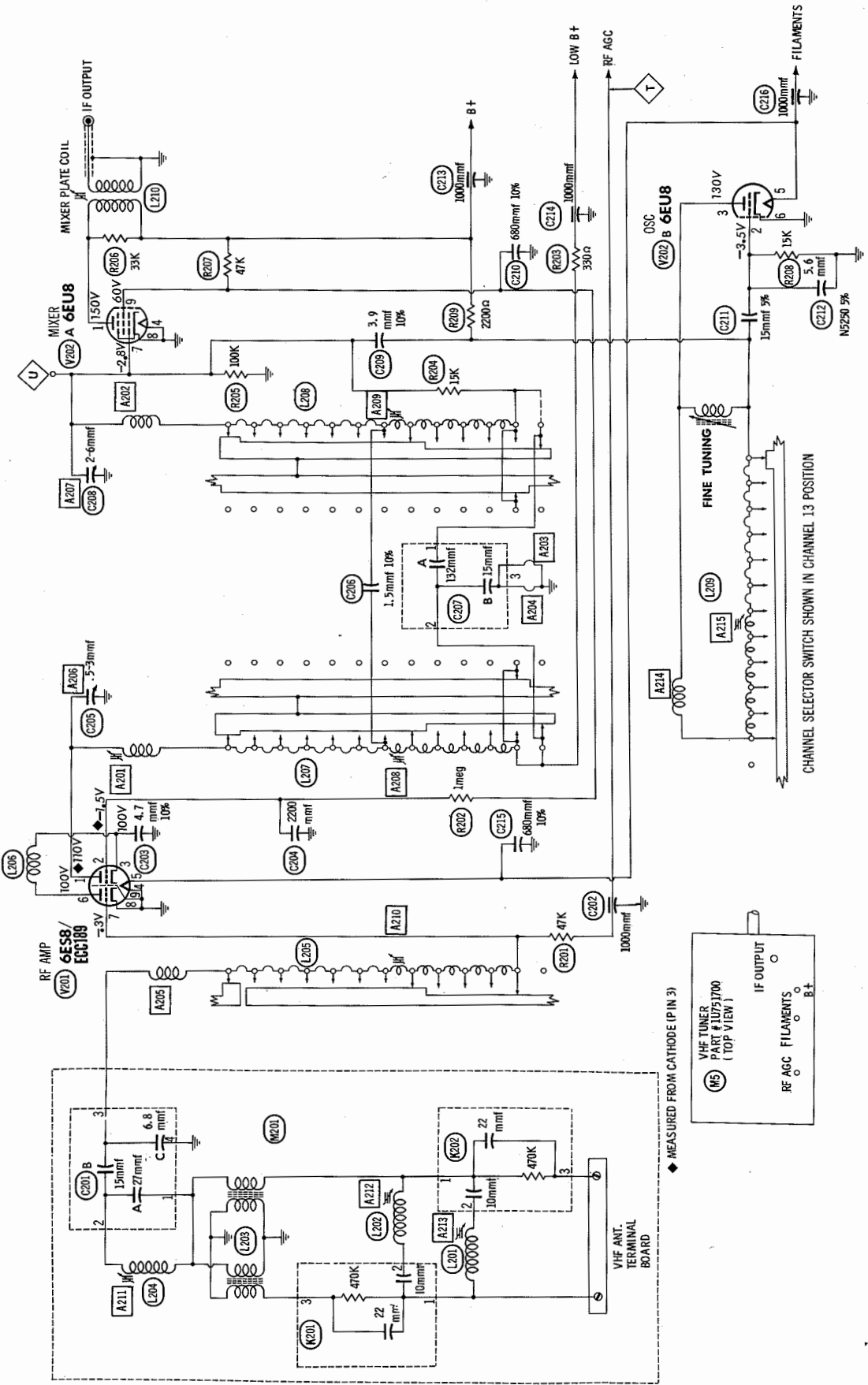
ITEM No.	USE	DESCRIPTION	MOTOROLA PART No.	REPLACEMENT DATA
K201	40MC Filter	10mmf, 22mmf, 470K	51C747535	
K202	40MC Filter	10mmf, 22mmf, 470K	51C747535	

COILS (RF-IF)

ITEM No.	USE	MOTOROLA PART No.	NOTES	ITEM No.	USE	MOTOROLA PART No.	NOTES
L201	IF Trap Coil	24K751655 †	† Part of M201.	L207	RF Coils	1V751663	Channels 2-13 Includes Wafer Assy.
L202	IF Trap Coil	24K751655 †		L208	Mixer Grid Coils	1V751662	Channel 2-13 Includes Wafer Assy.
L203	Ant. Trans.	24B749398 †		L209	Osc. Coils	1V748991	Channel 2-13 Includes Wafer Assy.
L204	FM Trap Coil	24K752270 †		L210	Mixer Plate Coil	24B747838	
L205	Ant. Coils	1V752397					
L206	RF Choke	24K752261					

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M201	H1 Pass Filter Shaft Shaft Shaft Shaft Shaft	1V751664 1B752100 47K752075 1A752394	Assembly Fine Tuning, Includes Driver Gear VHF Channel Selector Assembly



VHF TUNER 1U751700 (OPT-123)

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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MOTOROLA CHASSIS

TS-564, TS-564Y, WTS-564

FOLDER 1

TUNER ALIGNMENT INSTRUCTIONS

OPTT-123, OPTT-123Y

PRE-ALIGNMENT INSTRUCTIONS

Remove the deflection yoke plug to prevent interference radiation. Connect a 1500Ω 50 watt resistor from pin 3 to pin 5 of the Service Test Receptacle.

DO NOT remove the tuner cover.

Suggested Alignment Tools: A206, A207 GENERAL CEMENT #5000, 5003, 8276, 8290
WALSCO #2512, 2525
A208 thru A213... GENERAL CEMENT #9296, 9297
WALSCO #2546, 2547

VHF RF AND MIXER ALIGNMENT

Connect a clip lead from point ① to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.
Preset A206 and A207 so top of screw is .35" above tuner chassis.
Use 10MC sweep unless otherwise noted.

DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1. Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47K to point U. Low side to chassis.	A201, A202	Adjust for maximum gain and symmetry of response similar to Fig. 201 with markers as shown.
2. "	"	"	"	"	"	A203, A204	Adjust for proper bandwidth as in Fig. 201.
3. "	"	"	"	"	"	A205	Adjust for maximum amplitude and MINIMUM tilt.
4. "	"	177MC	175.25MC 179.75MC	7	"	A206, A207	Adjust A206 for proper marker position. Adjust A207 for MINIMUM tilt.
5. "	"	85MC	83.25MC 87.75MC	6	"	A208, A209, A210	Adjust A208 to place 83.25MC marker on or near peak, A209 to place 87.75MC marker on or near other peak and A210 for maximum gain and MINIMUM tilt.
6. "	"	"	94MC	"	"	A211	Adjust for MINIMUM response at marker or until it just starts to affect the high frequency side of response curve. NOTE: A211 may be adjusted to trap out interference between 85 and 108MC. However, make certain that no part of a desired channel is trapped out.
7. "	"	79MC	77.25MC 81.75MC	5	"		Check for response similar to Fig. 201. If necessary make compromise adjustment of A208, A209 and A210 for proper curve on each channel.
		69MC	67.25MC 71.75MC	4			
		63MC	61.25MC 65.75MC	3			
		57MC	55.25MC 59.75MC	2			
8. "	"	57MC	43.5MC 45.5MC	2	"	A212, A213	Adjust A212 for MINIMUM response at 43.5MC marker and A213 for MINIMUM response at 45.5MC marker. Retouch either or both for flat response consistent with MINIMUM amplitude at trap frequencies.

VHF OSCILLATOR ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the Fine Tuning to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.

DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9. Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC	215.75MC	13	Vert. Amp. thru 47K across Video Det. load	A214	Adjust to place marker in trap notch as in Fig. 202.
10. "	"	207MC	209.75MC	12	"		Marker must fall into trap notch on each channel within plus or minus 750KC of specified marker frequency. If not, make compromise adjustment of A214 for all high band channels.
		201MC	203.75MC	11			
		195MC	197.75MC	10			
		189MC	191.75MC	9			
		183MC	185.75MC	8			
11. "	"	177MC	179.75MC	7	"		
		85MC	87.75MC	6			
12. "	"	79MC	81.75MC	5	"		Marker must fall into trap notch on each channel within plus or minus 750KC of specified marker frequency. If not, make compromise adjustment of A215 for all low band channels.
		69MC	71.75MC	4			
		63MC	65.75MC	3			
		57MC	59.75MC	2			

TUNER ALIGNMENT INSTRUCTIONS (cont)

UHF IF ALIGNMENT

Remove the UHF Tuner from the side of the VHF Tuner so that UHF input receptacle of VHF Tuner is accessible. Coils are accessible thru opening in the side of tuner.
Connect the synchronized sweep voltage from the sweep 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
13. Fig. 203	High side thru matching network to UHF input receptacle. Low side to chassis.	44MC (10MC Swp)	41.25MC 45.75MC	UHF	Vert. Amp. thru 47K to point ①. Low side to chassis.	A216, A217	Adjust for maximum gain and symmetry of response similar to Fig. 204 with markers as shown.

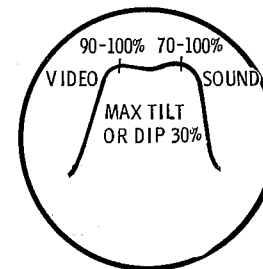


FIG. 201

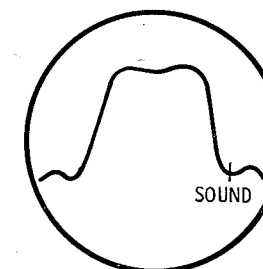


FIG. 202

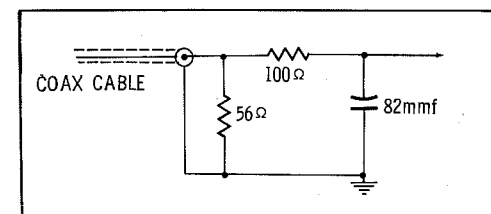


FIG. 203

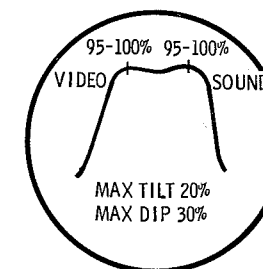
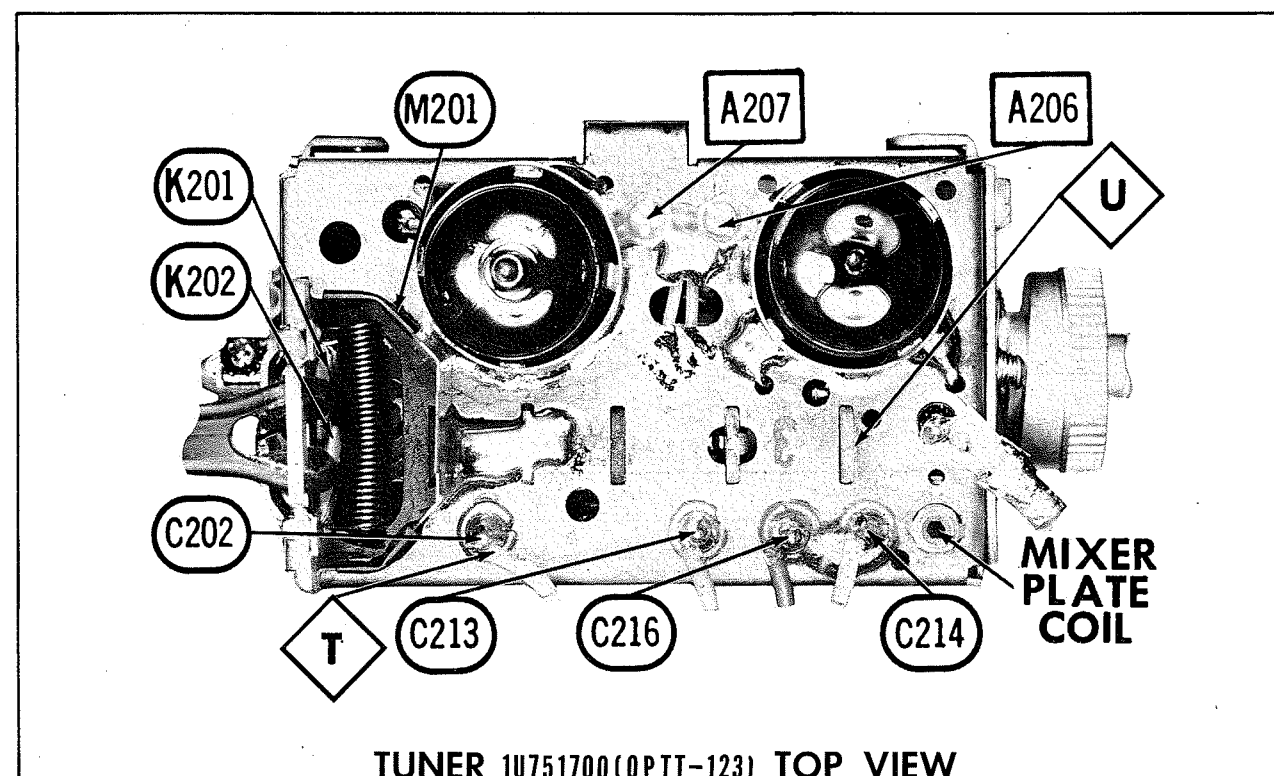


FIG. 204



TUNER 1U751700 (OPTT-123) TOP VIEW

MOTOROLA CHASSIS
TS-564, TS-564Y, WTS-564

FOLDER 1

Continued PAGE 17