

FOLDER 1
SET 435

MOTOROLA MODELS Y21C9B, M, Y21K97B, M, Y21K99B, M, Y21T57BG, CH, MG, 21C9B, M, 21K97B, M, 21K99B, M, 21T57BG, CH, MG (Ch. TS-551, Y, WTS-551, Y)

PHOTOFACT* Folder

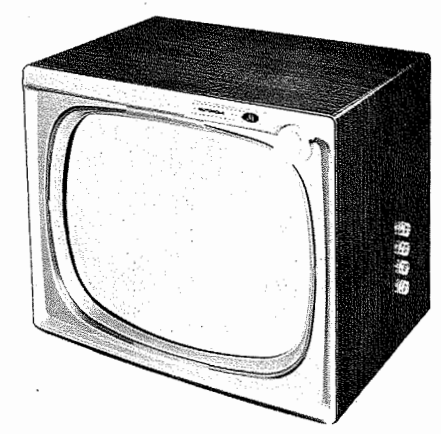




MOTOROLA MODELS Y21C9B, M, Y21K97B, M, Y21K99B, M, Y21T57BG, CH, MG, 21C9B, M, 21K97B, M, 21K99B, M, 21T57BG, CH, MG (Ch. TS-551, Y, WTS-551, Y)

DISASSEMBLY INSTRUCTIONS

- CHASSIS REMOVAL
1. Remove 2 front and 4 side push-on type knobs.
 2. Remove 1 metal screw holding rear cover. Release the clamps holding rear cover and remove cover.
 3. Remove speaker leads.
 4. Remove 4 bottom chassis bolts.
 5. Remove 2 metal screws holding top chassis brackets.
 6. Remove chassis.



MODEL 21T57MG (Ch. TS-551)

MOTOROLA MODELS Y21C9B, M, Y21K97B, M, Y21K99B, M, Y21T57BG, CH, MG, 21C9B, M, 21K97B, M, 21K99B, M, 21T57BG, CH, MG (Ch. TS-551, Y, WTS-551, Y)

CAUTION
ONE SIDE OF AC LINE CONNECTED TO CHASSIS.
Care should be exercised when connecting test equipment or physically contacting chassis. Isolation devices employed by manufacturer should be checked and properly connected before returning receiver to owner.

TRADE NAME	Motorola	MODELS		CHASSIS	
		21C9B, M, 21K99B, M, 21T57BG, CH, MG	TS-551	
		Y21C9B, M, Y21K99B, M, Y21T57BG, CH, MG	TS-551Y	
		21K97B, M	WTS-551	
		Y21K97B, M	WTS-551Y	
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois				
TYPE SET	Television Receiver				
TUBES	VHF - Sixteen, UHF - Seventeen				
POWER SUPPLY	110-120 Volts AC, 60 Cycle				
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)				

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF Oscillator is possible by removing the Channel Selector and Fine Tuning knobs. Set the Fine Tuning at the center of its range. The adjustments (located in a circle around the shaft) should be made in sequence from the highest to the lowest channel in the area. Channel 13 adjustment is located at 10 o'clock, proceed in a counterclockwise direction adjusting for best picture and sound.

SAFETY GLASS REMOVAL

Remove 3 metal screws holding safety glass retainer at the top. Remove safety glass.

SPECIAL ADJUSTMENTS

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

B. Focus
The focus may be varied by the position of a strap on the base of the picture tube. The strap can be connected between pins 6 and 10, or 6 and 1.

C. Width
The width may be varied by means of Horizontal Size control.

D. Noise Gate
Sync stability may be varied by means of the Noise Gate control. Tune in the strongest station in the area and adjust the control as far counterclockwise as possible consistent with picture stability. Check all channels operating in the area for a stable picture and make compromise adjustment if necessary.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

For adjustment of the Horizontal Multivibrator, it is necessary to remove the rear cover and supply power to set. Set the Horizontal Hold at the center of its range and adjust the Horizontal Frequency slug (B1) until the picture synchronizes horizontally. (For location, see tube placement chart.)

FUSE

One fuse is used for low voltage supply protection. (For location, see tube placement chart.)

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

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

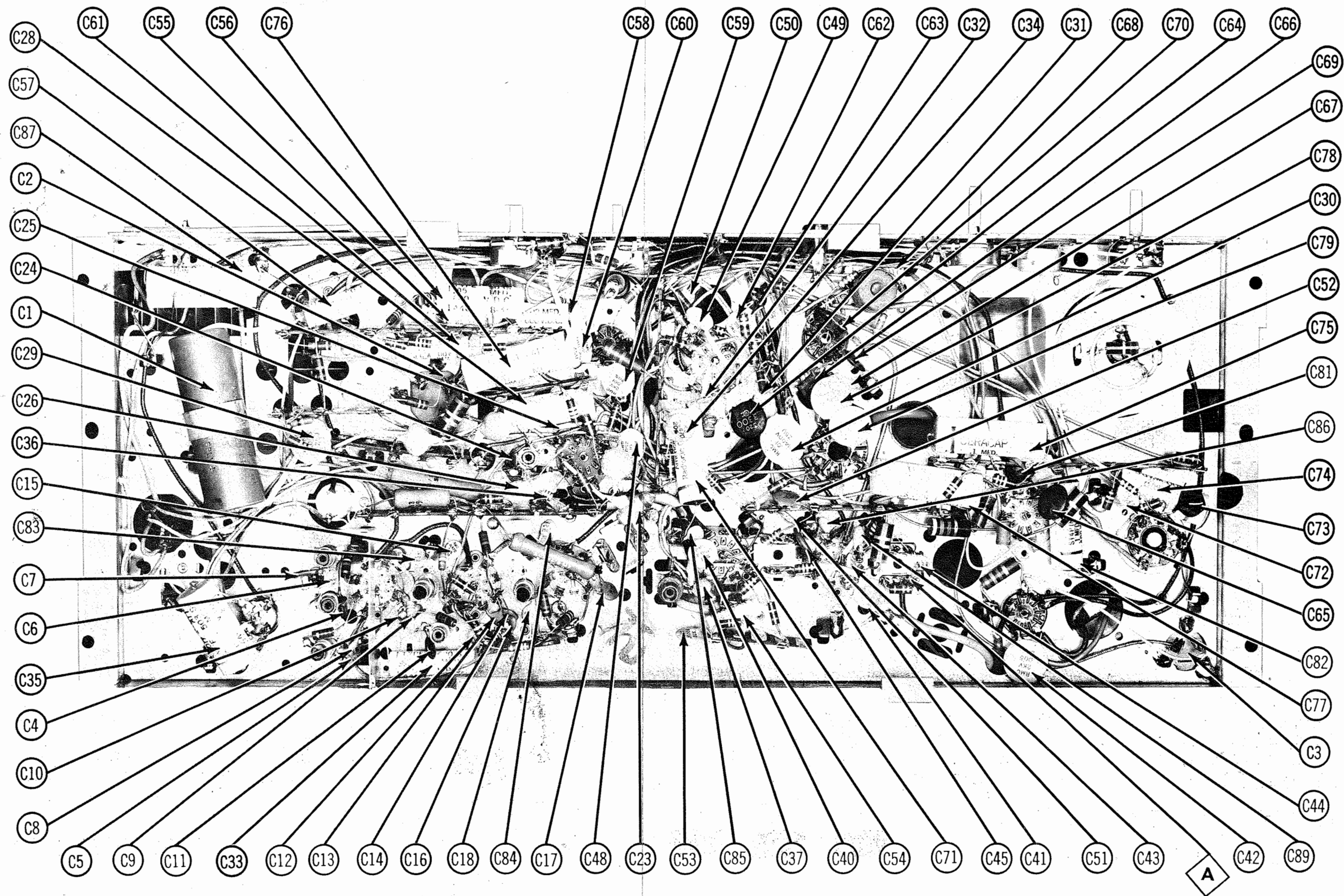
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VHF TUNER 1U747772 (VTT-104), 1U747784 (WTT-104)

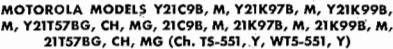
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CHASSIS-BOTTOM VIEW-CAPACITOR IDENTIFICATION



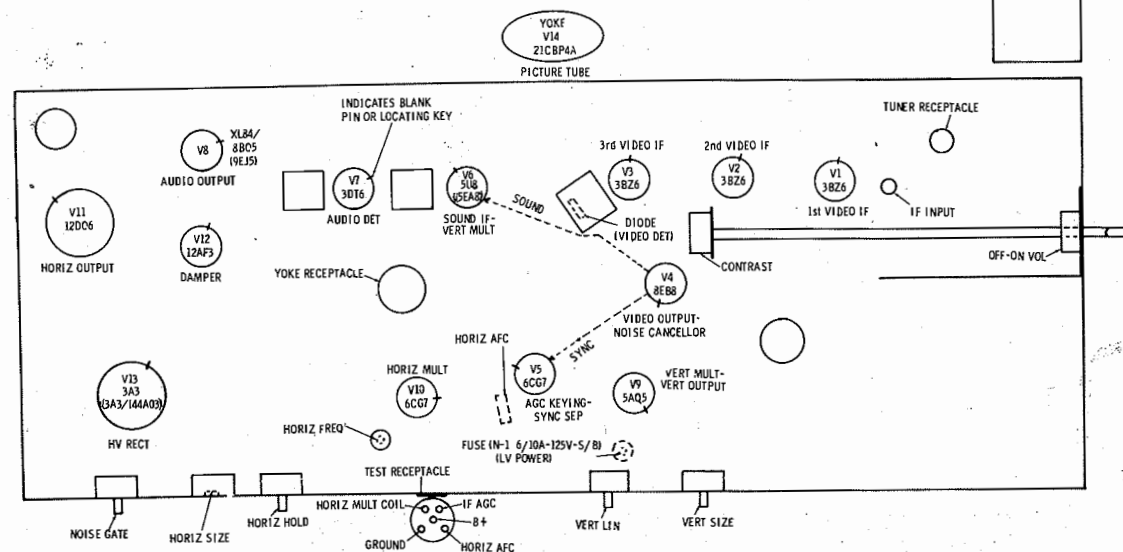
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3BZ6	330K	47Ω	16Ω	15Ω	††220Ω	††220Ω	0Ω		
V2	3BZ6	65K	††15Ω	15Ω	14Ω	†220Ω	†220Ω	1NF		
V3	3BZ6	1000Ω	120Ω	14Ω	13Ω	†8200Ω	†8200Ω	0Ω		
V4	8EB8	1800Ω	•480K	†29K	9.5Ω	11.5Ω	47Ω	4000Ω	†15K	†6200Ω
V5	6CG7	1.1meg	†39K	†4700Ω	5.5Ω	7Ω	†40K	3.2meg	0Ω	0Ω
V6	5U8	†1.2meg	100K	†33K	13Ω	11.5Ω	†33K	0Ω	0Ω	1.5meg
V7	3DT6	3.5Ω	560Ω	3Ω	4Ω	†390K	†15K	560K		
V8	XL84/8BQ5	0Ω	0Ω	180Ω	16Ω	18Ω	NC	†880Ω	NC	†470Ω
V9	5AQ5	1.1meg	0Ω	8.5Ω	9.5Ω	†600Ω	†150Ω	•1.1meg		
V10	6CG7	†60K	•110K	1000Ω	5.5Ω	4Ω	†13K	5meg	1000Ω	NC
V11	12DQ6	NC	20Ω	NC	•†10K	1meg	TP	18Ω	0Ω	TOP CAP †11.4Ω
V12	12AF3	TP	†2.4Ω	10Ω	22Ω	20Ω	NC	NC	NC	†2.4Ω TOP CAP 5meg
V13	3A3	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								
V14	21CBP4A	8.5Ω	79K	†360K	†360K	•260K	7Ω			
V201	5BK7A	†220Ω	1NF	1NF	0Ω	1.5Ω	1NF	2meg	0Ω	0Ω
V202	5U8	†13K	42K	†270K	1.5Ω	3Ω	†15K	0Ω	0Ω	15K

† 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 240V SOURCE.
 †† MEASURED FROM PIN 7 OF V2.
 † MEASURED FROM CAP OF V12.

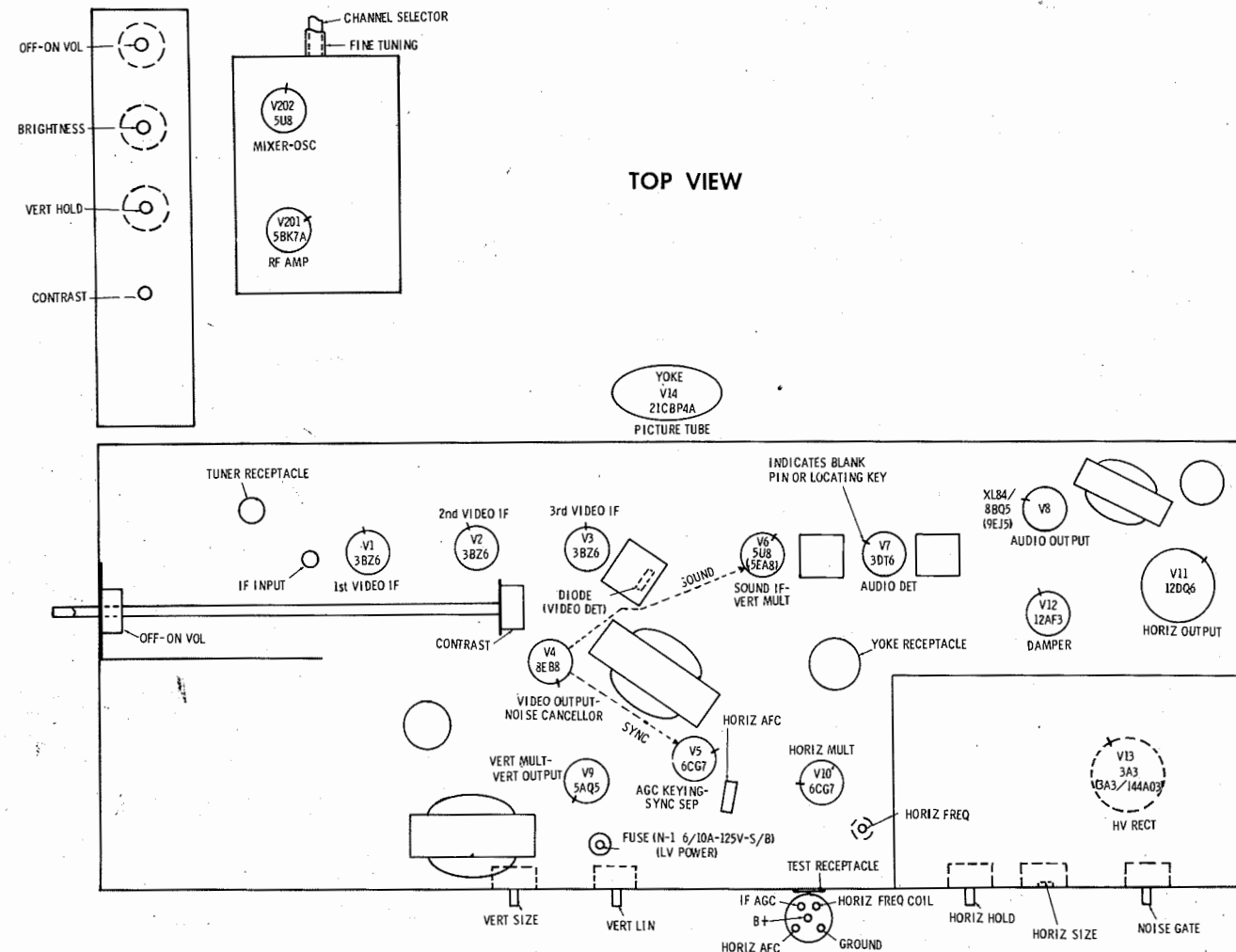
NC NO CONNECTION
 TP TIE POINT

BOTTOM VIEW



TUBE PLACEMENT CHART

TUBE PLACEMENT CHART



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.

POWER SUPPLY FAILURE

No raster, no sound Fuse (1 8/10A), Rectifier (B+)

SWEEP FAILURE

No raster, has sound Rectifier (Horiz. AFC), V10, V11, V12, V13, V14
 No vertical deflection V8, V9
 Poor vert. linearity or foldover V8, V9
 Poor horiz. linearity or foldover V10, V11, V12
 Narrow picture V10, V11, V12, Rectifier (B+)
 Vert. off freq. V6, V9
 Horiz. off freq. V10

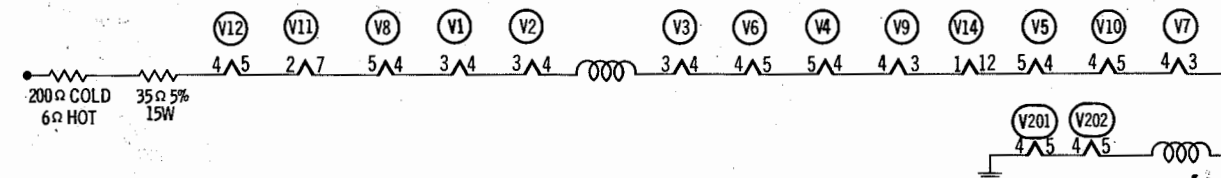
LOSS OF PICTURE OR SOUND

No pic, no sound, has raster V1, V2, V3, Diode (Video Det.), V4
 No pic, no sound, has snow V201, V202, V1
 No pic, has sound, has raster V4, V14
 Has pic, no sound V8, V7, V8
 Overloaded picture V5

SYNC FAILURE

No vert. sync V5
 No horiz. sync V5, Rectifier (Horiz. AFC)
 No vert. or horiz. sync V5

This receiver employs tubes used in a series filament network, an open filament in any tube will cause the set to be inoperative. (See circuit below.)



SET 435 FOLDER 1

MOTOROLA MODELS Y21C9B, M, Y21K97B, M, Y21K99B,
 M, Y21T57B, CH, MG, 21C9B, M, 21K97B, M, 21K99B, M,
 21T57B, CH, MG (Ch. 15-551, Y, WTS-551, Y)

FOLDER 1

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT:
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 #8282, 8606, 8606L or 9295
Walsco #2543, 2544 or 2545

VIDEO IF ALIGNMENT

Remove deflection yoke plug to eliminate RF interference from the horizontal sweep circuit. Connect a 1500Ω 50 watt resistor from TP-8 to TP-6. (CAUTION : TP-8 has B+ voltage on it.)
Disable the tuner oscillator by shorting the Mixer Grid (V202) to chassis.
Set the Contrast control fully counterclockwise.
Connect the synchronized sweep voltage from the sweep 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.
Maintain between 2 and 5 volts peak to peak on the scope, except where otherwise noted in the procedure.
Connect the negative lead of a 6 volt bias supply to TP-4. Positive to chassis.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001mfd	High side to TP-2. Low side to chassis.	44.0MC (10MC Swp)	42.5MC 45.75MC	13	Vert. Amp. thru 47K to TP-3. Low side to chassis.	A1, A2	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Peak with maximum core separation.
2.	Direct	High side to ungrounded tube shield floating over Mixer-Osc. tube (V202). Low side to chassis.	"	47.25MC	"	"	A3, A4	Adjust to place marker in trap notch as in Fig. 2. Tune slug at end of coil away from chassis.
3.	"	"	"	41.25MC	"	"	A5	Adjust to place marker in trap notch as in Fig. 2. Tune slug at end of coil nearest chassis.
4.	"	"	"	39.75MC	"	"	A6	Adjust to place marker in trap notch as in Fig. 2. Tune slug at end of coil away from chassis.
5.	"	"	"	39.75MC 41.25MC 44.0MC 45.75MC 47.25MC	"	Vert. Amp. to TP-1. Low side to chassis.	Mixer Plate Coil	Adjust for maximum gain and symmetry of response similar to Fig. 3 with markers as shown. The Mixer Plate Coil affects the center peak and A7 affect the two outside peaks. Tune slug at end of coils away from chassis. If a suckout (trap effect) occurs, detune A8.
6.	"	"	"	42.25MC 45.75MC	"	Vert. Amp. to TP-3. Low side to chassis.	A8, A9	Adjust A8 to place 42.25MC marker at 50% as in Fig. 4. Adjust A9 to place 45.75MC marker at 50% on other side. Tune slugs to end of coil nearest chassis. If necessary, retouch Mixer Plate Coil to correct tilt. Retouch A8 and A9 for correct response.

SOUND IF ALIGNMENT

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

4.5MC TRAP ALIGNMENT

Tune in a strong TV signal and turn the Contrast control 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 on the screen. Tune the slug to the center of these two points. (Use the MINIMUM amount of inductance that will result in no apparent beat pattern.)

TUNER ALIGNMENT INSTRUCTIONS LOCATED ON PAGE 6

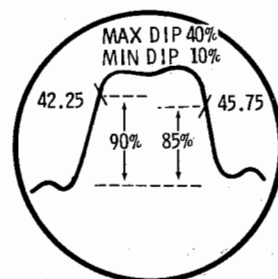


FIG. 1

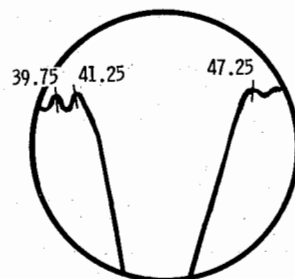


FIG. 2

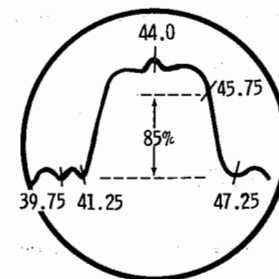


FIG. 3

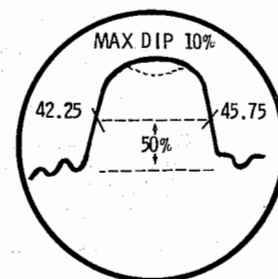
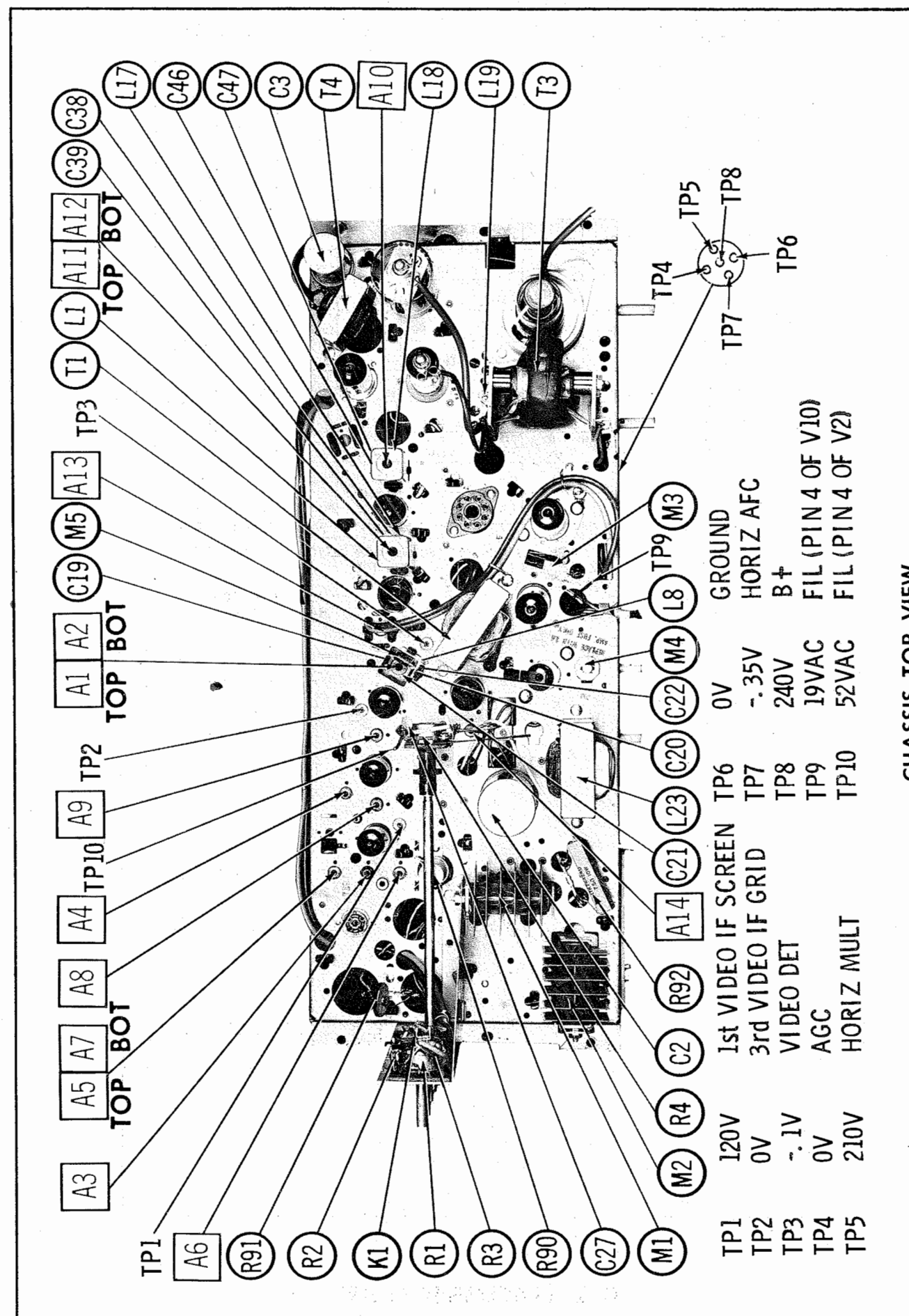


FIG. 4



MOTOROLA MODELS Y21C9B, M, Y21K97B, M, Y21K99B, M, Y21T57BG, CH, MG,
21C9B, M, 21K97B, M, 21K99B, M, 21T57BG, CH, MG (Ch. TS-551, Y, WTS-551, Y)
MELA DOL SISSVHC

CHASSIS TOP VIEW

FOLDER 1

1U747772 (VTT-104)

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amp.	5BK7A	

ITEM No.	USE	TYPE	NOTES
V202	Mixer-Osc.	5U8	

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		REPLACEMENT DATA						NOTES
	CAP.	VOLT	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C201	27		21R122050			C10Q27C	CNO-427	5TCCB-Q2TS 5%*	5%
C202	10		21R125698	NPO-DI 10	DTZ-10	C10Q1C	CNO-410	5TCC-Q1S 5%*	5% N750
C203	5.6		21R121154					5TCUB-V56S *	
C204	1000		21R115386	BPD-001	DD-102	BYA10DIM	B-210	5HK-D1	
C205	5-3		21K735985		829-3				
C206	4.7		21R115954	NPO-SI 4.7	TCZ-4R7	CTA6V47C	CNO-547	5TCBB-V4TS10%*	10%
C207	1000		21K739920	EF-001	MFT-1000			503C-D1	
C208	1000		21R115386	BPD-001	DD-102	BYA10DIM	B-210	5HK-D1	
C209	2.2		21R115948	NPO-SI 2.2	TCZ-2R2	CTA6V22C	CNO-522	5TCBB-V22S10%*	10%
C210	1000		21R115386	BPD-001	DD-102	BYA10DIM	B-210	5HK-D1	
C211	10		21R224579	NPO-DI 10	DTZ-10	C10Q1C	CNO-410	5TCC-Q1	NPO
C212	1		21R114071	NPO-SI 1.0	TCZ-1		CNO-510	5TCCB-V1	
C213	470		21R114554	BPD-00047	DD-471	L10T47	B-347	5GA-T47	
C214	470		21R114554	BPD-00047	DD-471	L10T47	B-347	5GA-T47	
C215A	800		21K747024	BPD-0008	DD-801	L10T8	B-210	5GA-T8	
C215B	800			BPD-0008	DD-801	L10T8	B-210	5GA-T8	
C216	15		21R128077	NPO-DI 15	DTZ-15	C10Q15C	CNO-415	5TCC-Q15S 5%*	5% NPO 5%
C217	15		21R125066	NPO-DI 15	DTZ-15	C10Q15C	CNO-415	5TCC-Q15S 5%*	N1500
C218	1		21R124552						N150 10%
C219	18		21R120578						
C220	1000		21K739920	EF-001	MFT-1000			503C-D1	
C221	1000		21K739920	EF-001	MFT-1000			503C-D1	
C222	1500		21K738752	BPD-0015	D-152	BYA10D15	B-215	5HK-D15	①

* Not normally in distributors stock. Available thru distributor on order to manufacturer
① Some versions may use 1000mmf in this application (Part #2IR115386).

RESISTORS

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

ITEM No.	RATING		MOTOROLA PART No.	NOTES
	OHMS	WATT		
R201	100K		6K122313	
R202	22K		6K119405	
R203	4700Ω		6K121847	
R204	39K		6K123535	
R205	270K		6R6414	
R206	15K		6K119934	

ITEM No.	RATING		MOTOROLA PART No.	NOTES
	OHMS	WATT		
R207	15K		6K119934	
R208	15K		6K119934	
R209	220Ω		6K125471	
R210	3300Ω		6K121725	
R211	6800Ω		6K119930	

COILS (RF-IF)

ITEM No.	USE	MOTOROLA PART No.	NOTES
L201	IF Trap Coil	24B747530 †	
L202	IF Trap Coil	24B747530	
L203	Ant. Trans.	24B747543 †	
L204	FM Trap Coil	24B747801 †	
L205	Ant. Coil	24B744031	Channel 13
L206	Ant. Coil	24K748043	Channel 2 - 6
L207	RF Choke	24A739397	
L208	RF Coil	24A739361	Channel 13
L209	RF Coil	24K740465	Channel 2 - 6

ITEM No.	USE	MOTOROLA PART No.	NOTES
L210	RF Choke	24K743529	
L211	Osc. Coil	24K746879	Channel 13
L212	Osc. Coil	24K739385	Channel 6
L213	Osc. Coil	24K739384	Channel 5
L214	Osc. Coil	24C739381	Channel 4
L215	Osc. Coil	24K739382	Channel 3
L216	Osc. Coil	24C739381	Channel 2
L217	Mixer Plate	24B747599	
L218	Flt. Choke	24K743530	

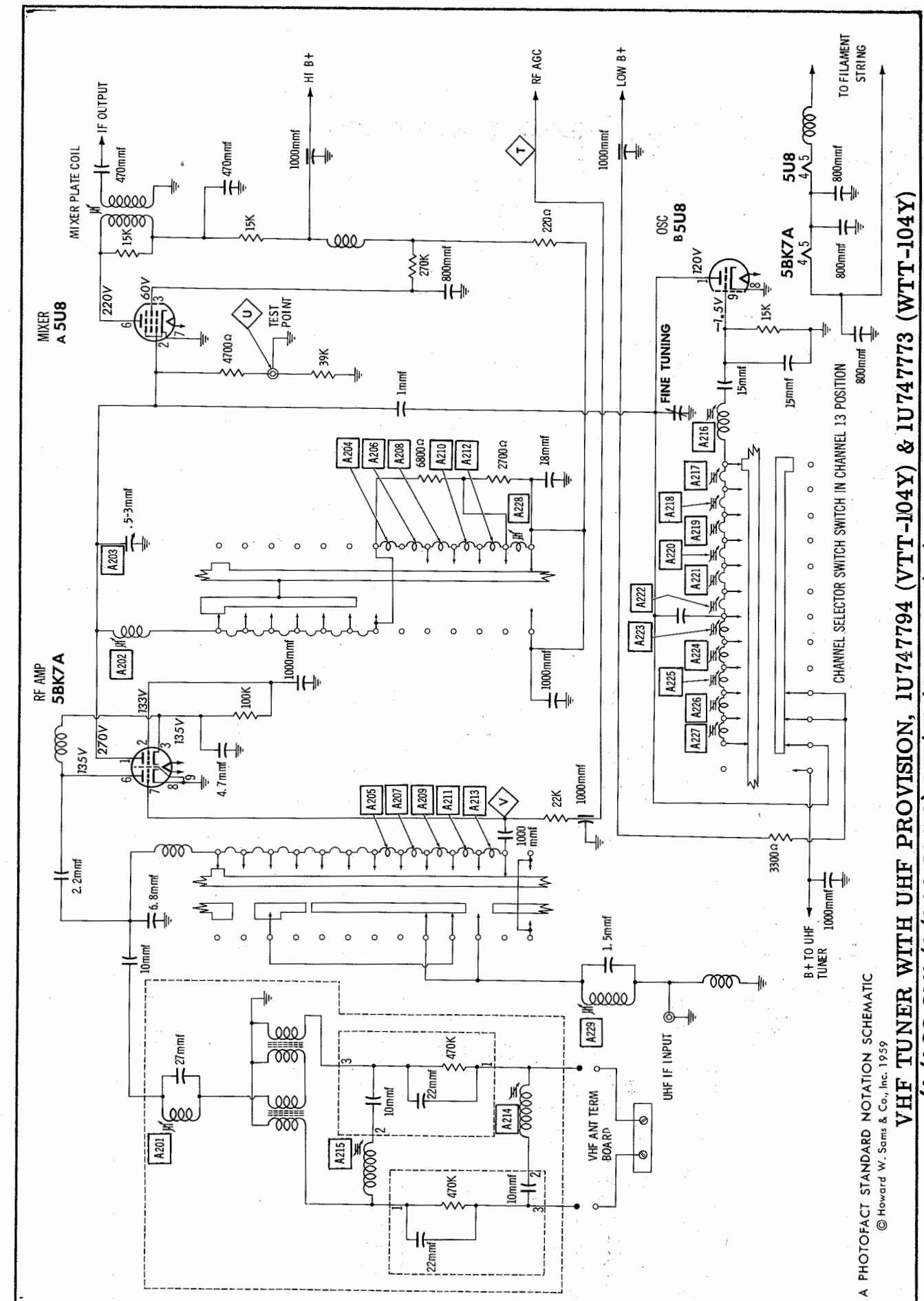
† Part of M201, Part #1V747644.

COMPONENT COMBINATIONS

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

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M201	Antenna Network	1V747644	High Pass Filter Assembly, Complete



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MOTOROLA MODELS Y21C9B, M, Y21K97B, M, Y21K99B, M, Y21T57BG, CH, MG, 21C9B, M, 21K97B, M, 21K99B, M, 21T57BG, CH, MG (Ch. TS-551, Y, WTS-551, Y) VHF TUNER WITH UHF PROVISION, 1U747L74 & 1U104Y (TTV) 1U747L74 & 1U104Y (TWL) 1U747L74 & 1U104Y (TWL)

FOLDER 1

PRE-ALIGNMENT INSTRUCTIONS: **TUNER ALIGNMENT INSTRUCTIONS**

Use an ISOLATION TRANSFORMER to PROTECT the Test Equipment.
Allow a 20 minute warm-up period for the receiver and test equipment.
Remove yoke plug to prevent interference radiation. Connect a 1500Ω 50 watt resistor from pin 1 of yoke socket to chassis.
Suggested Alignment Tools:

A201, A214, A215	GENERAL CEMENT #8296, 9297 WALSCO #2546, 2547
A202	GENERAL CEMENT #9050L, 9150 WALSCO #2521
A203	GENERAL CEMENT #5000, 5003, 5014, 5015, 5016, 8276, 8290 WALSCO #2512, 2515, 2522, 2523, 2525, 2537
A216 thru A227	GENERAL CEMENT #8291, 8294, 8607 WALSCO #2523, 2534, 2537, 2538
Mixer Plate Coil	GENERAL CEMENT #8282, 8606, 8606L, 9091 WALSCO #2526, 2541, 2543, 2544

VHF RF AND MIXER ALIGNMENT

Connect a clip lead from point \diamond to chassis. Remove the tuner shield.
Connect the synchronized sweep voltage from the sweep 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.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.

DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1. Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	94MC	94MC	6	Vert. Amp. thru 47K to point \diamond . Low side to chassis.	A201	Adjust for MINIMUM response at 94MC marker.
2. "	"	213MC	211. 25MC 215. 75MC	13	"	A202	Preset A202 and A203 to mid-range. Adjust A202 for maximum gain and symmetry similar to Fig. 201.
3. "	"	177MC	175. 25MC 179. 75MC	7	"	A203	Adjust for maximum gain and symmetry of response similar to Fig. 201, with markers as shown.
4. "	"	85MC	83. 25MC 87. 75MC	6	"	A204, A205	Adjust in numerical order for response similar to Fig. 202. A204 places the markers on curve, A205 is for maximum gain and symmetry.
5. "	"	"	"	"	"	A201	Readjust SLIGHTLY above point where it begins to affect response curve at sound marker.
6. "	"	79MC	77. 25MC 81. 75MC	5	"	A206, A207	Adjust in numerical order for response similar to Fig. 202. First adjustment places markers on curve, second adjustment is for maximum gain and symmetry.
7. "	"	69MC	67. 25MC 71. 75MC	4	"	A208, A209	"
8. "	"	63MC	61. 25MC 65. 75MC	3	"	A210, A211	"
9. "	"	57MC	55. 25MC 59. 75MC	2	"	A212, A213	"
10. "	"	57MC	43. 5MC 45. 5MC	"	"	A214, A215	Adjust A214 for MINIMUM response at 43. 5MC, and A215 for MINIMUM response at 45. 5MC. Retouch either or both for flat response with MINIMUM amplitude at marker.

VHF OSCILLATOR ALIGNMENT

The tuner shield must be in place when adjusting the oscillator.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
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
11. Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC	211. 25MC 215. 75MC	13	Vert. Amp. thru 47K across Video Det. load	A216	Adjust to place sound marker in trap notch as in Fig. 203. Video marker should fall at 50%.
		207MC	205. 25MC 209. 75MC	12		A217	
		201MC	199. 25MC 203. 75MC	11		A218	
		195MC	193. 25MC 197. 75MC	10		A219	
		189MC	187. 25MC 191. 75MC	9		A220	
		183MC	181. 25MC 185. 75MC	8		A221	
		177MC	175. 25MC 179. 75MC	7		A222	
		85MC	83. 25MC 87. 75MC	6		A223	
		79MC	77. 25MC 81. 75MC	5		A224	
		69MC	67. 25MC 71. 75MC	4		A225	
		63MC	61. 25MC 65. 75MC	3		A226	
		57MC	55. 25MC 59. 75MC	2		A227	

TUNER ALIGNMENT INSTRUCTIONS (cont)

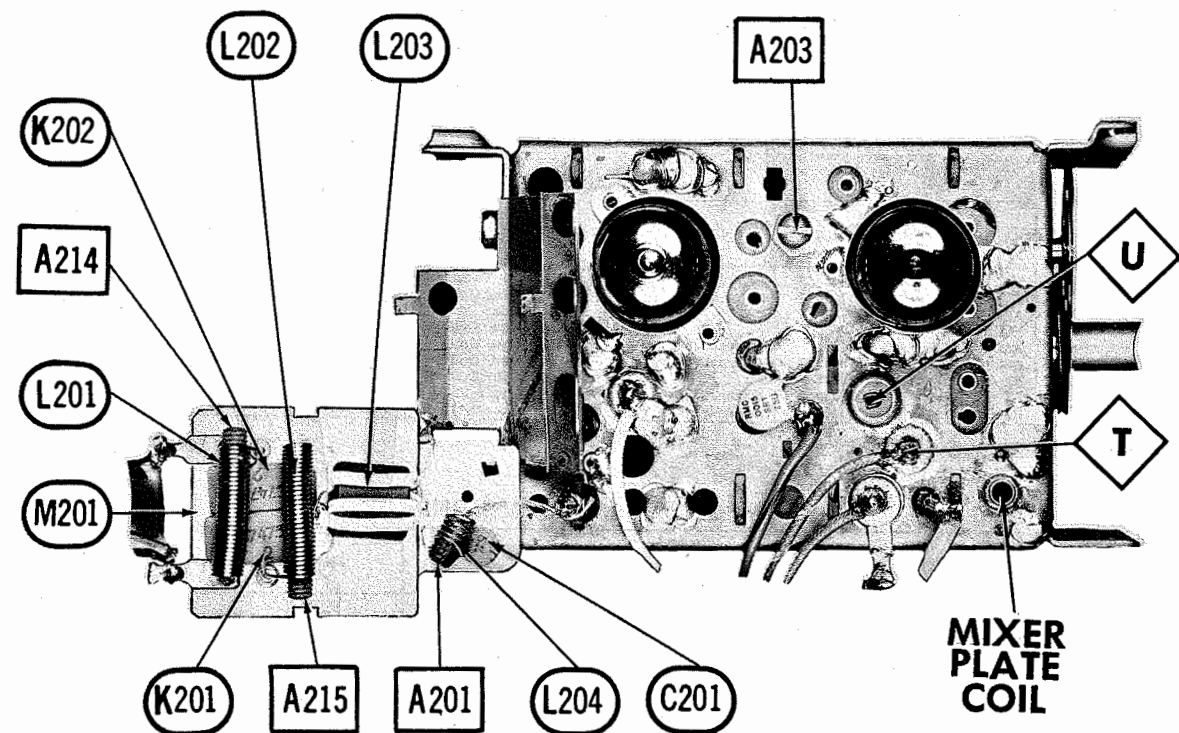
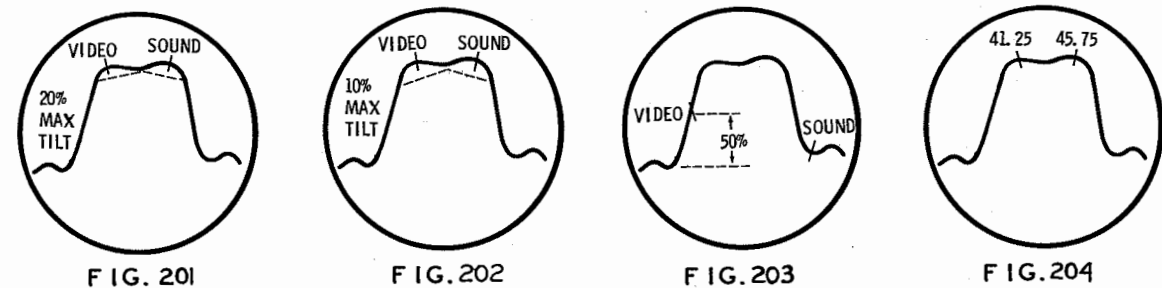
UHF IF ALIGNMENT FOR TUNERS VTT, VTT104Y

Connect the synchronized sweep voltage from the sweep 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.
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
12. 50Ω Carbon Resistor	High side to point \diamond . Low side to chassis.	44MC	41. 25MC 45. 75MC	UHF	Vert. Amp. thru 47K to point \diamond . Low side to chassis.	A228	Adjust for maximum gain and symmetry of response similar to Fig. 204 with markers as shown.
13. Disconnect sweep generator and short antenna terminals.				"	USE VTVM Across Video Det. load.	A229	Adjust for maximum DC noise voltage.

UHF ALIGNMENT FOR TUNER VT-89

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



TUNER 1U747772 (VTT-104) —TOP VIEW

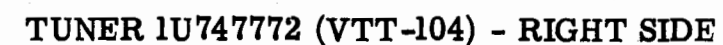
MOTOROLA MODELS Y21C9B, M, Y21K97B, M, Y21K99B, M, Y21S7B6, CH, MG, Y21C9B, M, Y21K97B, M, Y21K99B, M, Y21S7B6, CH, MG (Ch, TS-551, Y, WTS-551, Y)

FOLDER 1



A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1959

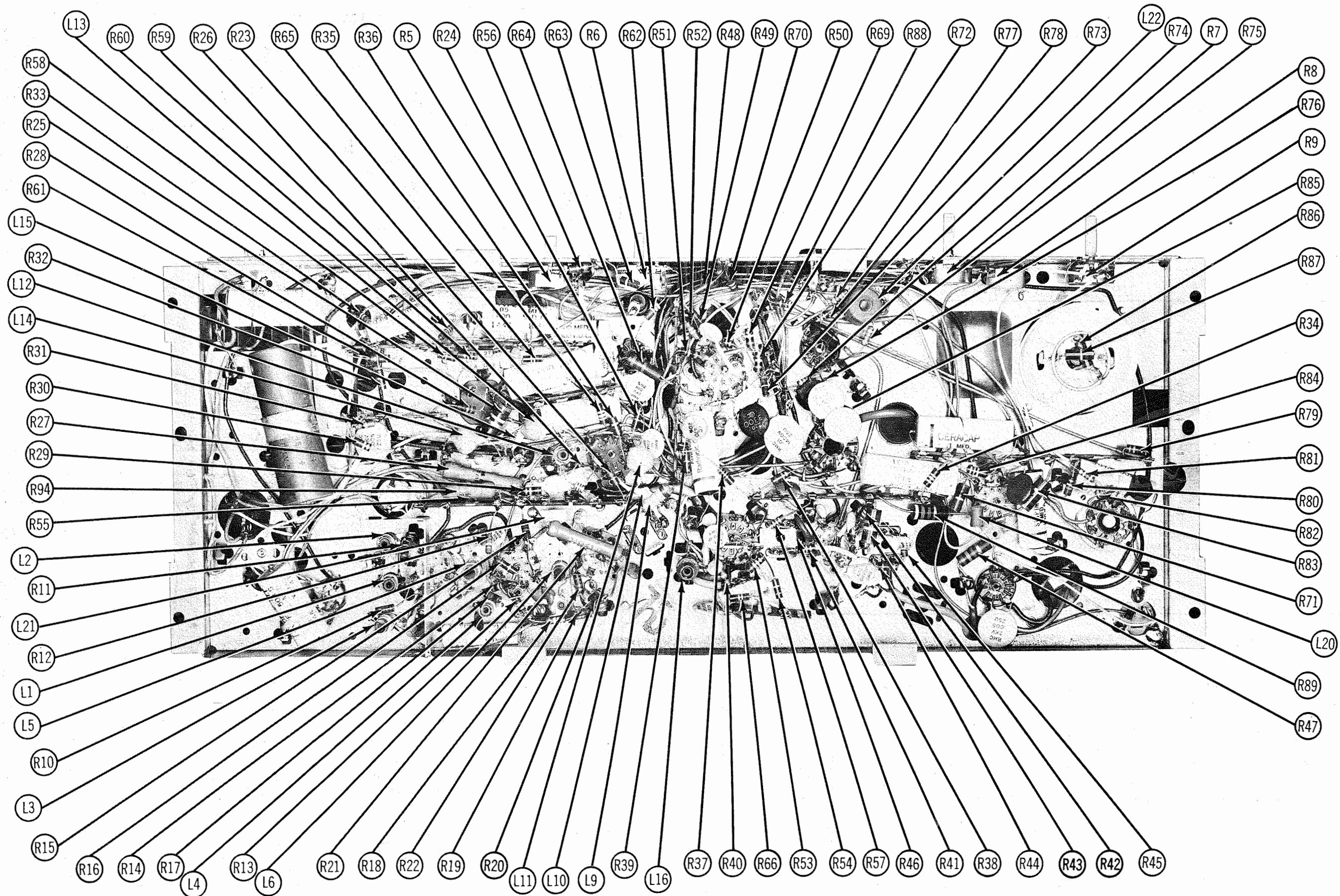
UHF TUNER VTT-89



SET 435 FOLDER 1

MOTOROLA MODELS Y21C9B, M, Y21K97B, M, Y21K99B, M, Y21T57BG, CH, MG, 21C9B, M, 21K97B, M, 21K99B, M, 21T57BG, CH, MG (Ch. TS-551, Y, WTS-551, Y)

FOLDER 1



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

MOTOROLA MODELS Y21C9B, M, Y21K97B, M, Y21K99B, M, Y21T57BG, CH, MG,
21C9B, M, 21K97B, M, 21K99B, M, 21T57BG, CH, MG (Ch. TS-551, Y, WTS-551, Y)

FOLDER 1

PARTS LIST AND DESCRIPTIONS (Continued)

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			MOTOROLA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M4	N	1 6/10A 125V S/B	65K744238		33301.6 (N-1 6/10A- 125V-S/B)	348016	N 1 6/10	HN 1 3/10 to 1 3/4

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		MOTOROLA PART No.	CBS PART No.	SYLVANIA PART No.	
M5		48K747548	1N60	1N295	Video Detector (Clip-in)

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M6	Tuner	1U747772	VHF (VTT-104) Ch. TS-551
	Tuner	1U747784	VHF (WTT-104) Ch. WTS-551
	Tuner	1U747794	VHF, With UHF Provisions (VTT-104Y) Ch. TS-551Y
	Tuner	1U747773	VHF, With UHF Provisions (WTT-104Y) Ch. WTS-551Y
	Tuner		UHF (VTT-89) Ch. TS-551Y, WTS-551Y

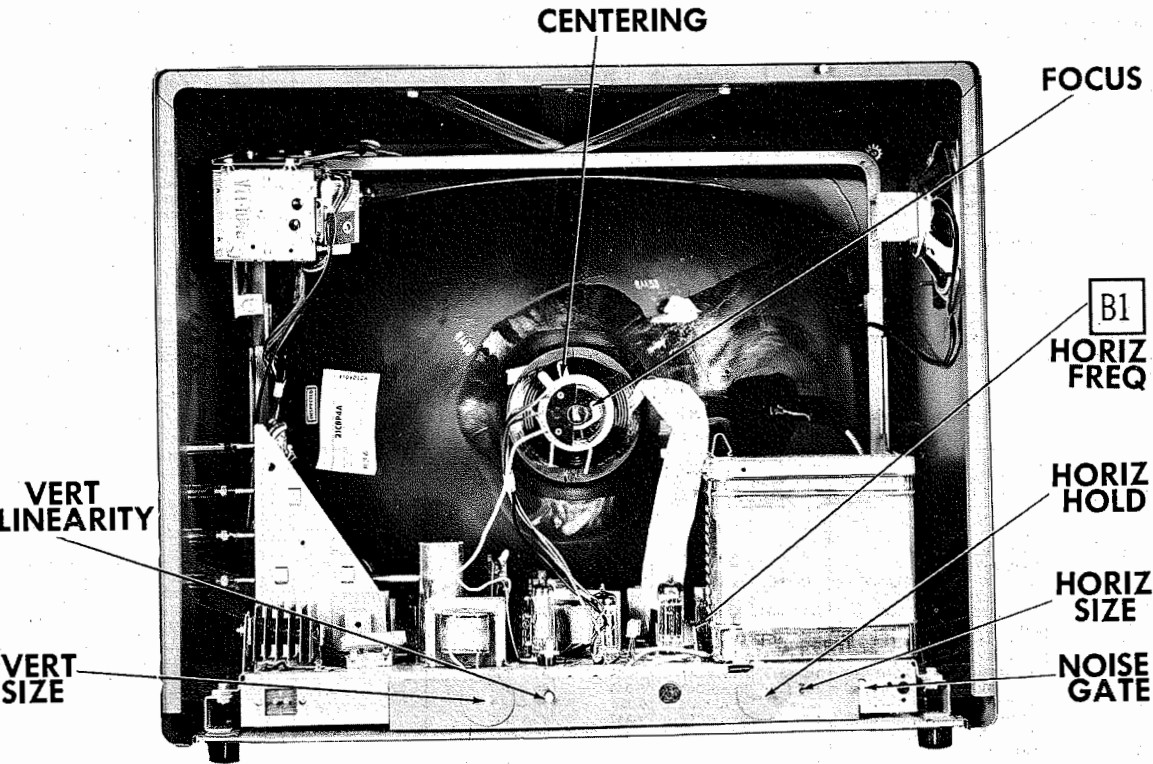
CABINETS & CABINET PARTS

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

NAME	PART NO.	DESCRIPTION
Safety Glass	61K743151	Models Y21T57BG, CH, MG, 21T57BG, CH, MG
Safety Glass	61K748025	Models Y21K97B, M, 21K97B, M
Safety Glass	61C743150	Models Y21K99B, M, 21K99B, M, Y21C9B, M, 21C9B, M
Bezel	13K747558	Models Y21T57BG, CH, MG, 21T57BG, CH, MG
Bezel	13K748448	Models Y21K99B, M, 21K99B, M, Y21C9B, M, 21C9B, M
Mask	13K743958	Models Y21K97B, M, 21K97B, M
Knob	36C743542	VHF Channel Selector, Models Y21T57BG, CH, MG, 21T57BG, CH, MG, Y21K99B, M, 21K99B, M, Y21C9B, M, 21C9B, M
Knob	36K747578	VHF Channel Selector, Models Y21K97B, M
Knob	36K747579	VHF Channel Selector, Models Y21K97B, M
Knob	36K743541	Fine Tuning, Models 21T57BG, CH, MG, 21K99B, M, 21C9B, M
Knob	36C743540	Fine Tuning, Models Y21T57BG, CH, MG, Y21C9B, M
Knob	36C738680	Fine Tuning, Models 21K97B, M
Dial Scale	34C743539	UHF, Models Y21T57BG, CH, MG, Y21C9B, M
Dial Scale	34K746597	UHF, Models Y21K97B, M
Knob	36K747576	Volume-On-Off, Models Y21T57BG, CH, MG, 21T57BG, CH, MG, Y21K97B, M, 21K97B, M
Knob	36K748444	Volume-On-Off, Models Y21K99B, M, 21K99B, M, Y21C9B, M, 21C9B, M
Knob	36C747573	Brightness, Models Y21T57BG, 21T57BG, CH, MG, Y21K97B, M, 21K97B, M
Knob	36K748441	Brightness, Models Y21K99B, M, 21K99B, M, Y21C9B, M, 21C9B, M
Knob	36K747575	Contrast, Models Y21T57BG, CH, MG, 21T57BG, CH, MG, Y21K97B, M, 21K97B, M
Knob	36K748443	Contrast, Models Y21K99B, M, 21K99B, M, Y21C9B, M, 21C9B, M
Knob	36K747574	Vert. Hold, Models Y21T57BG, CH, MG, 21T57BG, CH, MG, Y21K97B, M, 21T97B, M
Knob	36K748442	Vert. Hold, Models Y21K99B, M, 21K99B, M, Y21C9B, M, 21C9B, M
Cabinet	16K747553	Mahogany, Models Y21T57MG, 21T57MG
Cabinet	16K747554	Blond, Models Y21T57BG, 21T57BG
Cabinet	16K747545	Charcoal, Models Y21T57CH, 21T57CH
Cabinet	16K747480	Oak, Models Y21K97B, 21K97B
Cabinet	16E747478	Mahogany, Models Y21K97M, 21K97M
Cabinet	16K748054	Blond Oak, Models Y21K99B, 21K99B
Cabinet	16E748053	Mahogany, Models Y21K99M, 21K99M
Cabinet	16K749131	Blond Oak, Models Y21C9B, 21C9B
Cabinet	16E749130	Mahogany, Models Y21C9M, 21C9M
Legs	16K747483	Models Y21K97B, 21K97B, Y21K99B, 21K99B
Legs	16K748057	Models Y21K97M, 21K97M, Y21T99M, 21K99M
Legs	1K749117	Base, Includes Ferrule and Hanger Bolt, Models Y21C9B, 21C9B
Legs	1K749116	Base, Includes Ferrule and Hanger Bolt, Models Y21C9M, 21C9M
Sub-Base	1K749119	Assembly, Includes Criss-Cross Arms, Swivel and Legs, Models Y21C9B 21C9B
Sub-Base	1K749118	Assembly, Includes Criss-Cross Arms, Swivel and Legs, Models Y21C9M, 21C9M
Swivel	16K747298	Base, Models Y21C9B, M, 21C9B, M

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



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-7 to chassis. Connect a .1mfd, 400 volt capacitor from TP-5 to chassis.

Adjust the 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-7 and chassis. Adjust the Horizontal Hold control until the picture is synchronized horizontally.

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

MOTOROLA MODELS Y21C9B, M, Y21K97B, M, Y21K99B, M, Y21T57BG, CH, MG, 21C9B, M, 21K97B, M, 21K99B, M, 21T57BG, CH, MG (Ch. TS-551, Y, WTS-551, Y)

FOLDER 1

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES	ITEM No.	USE	TYPE	NOTES
V1	1st Video IF Amp.	3BZ6		V8	Audio Output	XL84/8BQ5	9EJ5 *
V2	2nd Video IF Amp.	3BZ6		V9	Vert. Mult. - Vert. Output	5A05	
V3	3rd Video IF Amp.	3BZ6		V10	Horiz. Mult.	6CG7	
V4	Video Output - Noise Canceller	8EB8		V11	Horiz. Output	12DQ6	
V5	AGC Keying - Sync Sep.	6CG7		V12	Damper	12A3	
V6	Sound IF Amp. - Vert. Mult.	5U6	5EA8 *	V13	HV Rect.	3A3	3A3/144A01 *
V7	Audio Det.	3DT6					

* Alternate.

PICTURE TUBE

ITEM No.	MOTOROLA PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SYLVANIA PART No.	NOTES
V14	2ICBP4A	2IBTP4 ①	2ICBP4-A ②	2ICBP4/2ICBP4A ③	① "Aluminized". Add Ion Trap. ② "Silverama" ③ "Silver Screen 85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP. VOLT.	MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	140 150	23B737820 ①	PR550V150	XA0261	TC496	TD-150-150		TVA-1422
C2A	150 300	23K743158	AFB54-02-75	D0025	FP419, 55			TVLS-3585, 8*
C2B	100 300							
C3A	10 300	23K748732 ②	AFB2-85	B0821	FPI35	TMD-71		TVL-2605
C3B	10 25				TT25X20			

① Alternate Part #23K737820.

② Some versions may use a 30-10-20mfd ③ 300-300-25 (Part #23K737820).

* Not normally in distributor stock. Available thru distributor on order to manufacturer.

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 CAP. VOLT.	MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C4	18	21R120578					N150 10%
C5	8.2	21R120547					N150 ±.5mmf
C6	5.6	21R129194					N150 ±.5mmf
C7	56	21R128698					N150 5%
C8	1000	21R15386	BPD-001	DD-102	BYA10DIM	B-210	
C9	75	21R135623					
C10	1000	21R137426	EF-001	MFT-1000			
C11	22	21R120539					N150 10%
C12	1000	21R15386	BPD-001	DD-102	BYA10DIM	B-210	
C13	1000	21R15386	BPD-001	DD-102	BYA10DIM	B-210	
C14	470	21C748761	BPD-00047	DD-471	BYA10T47	B-347	
C15	470	21C748761	BPD-00047	DD-471	BYA10T47	B-347	
C16	1000	21R15386	BPD-001	DD-102	BYA10DIM	B-210	
C17	470	21C748761	BPD-00047	DD-471	BYA10T47	B-347	
C18	470	21C748761	BPD-00047	DD-471	BYA10T47	B-347	
C19	5.6	21R124490					N3300 5%
C20	4.7	21R15954	NPO-SI 4.7	TCZ-4R7	C10V47C	CNO-547	5TCCB-V47S 10%*
C21	18	21R120578					N150 10%
C22	10	21R12114	N750-DI 10	DTN-10	C10QU	CN7-410	5TCCB-V38S 10%*
C23	3.9	21R15953					N150 10%
C24	27	21R15953					N150 10%
C25	5000	21K738298	BPD-005	DD-502	BYA10D5	B-250	20HK-D5
C26	.02 200	8K739257	P288N-02		CUB2S2	GEM-412	2TM-S2
C27	47	21R14207	N750-DI 47	DTZ-47	CTA6Q47U	CN7-447	5TCCB-V47S 10%*
C28	.1	21R12006	P488N-1	DD-104	CUB4P1	GEM-401	4TM-P1
C29	5000	21R120093		DD-502	HVC20D5		20HK-D5
C30	10000	21R124832	DAC-27	DD-103	BYA10D5	B-250	20HK-D5
C31	20000	21B741862	BPD-02	DD-203	BYB6S2	B-120	5GA-S2
C32	6.8	21R127024	NPO-DI 6.8	DTZ-6R8		CNO-568	5TCCB-V68S ±.5mmf *
C33	.25	8K124570	P288N-25	DF-303	CUB2P25	GEM-2025	2TM-P25
C34	470	21R121478	HVD-30-470	DD-30-470	HVB20T47	2HV-347	20GA-T47
C35	.25	8K124570	P288N-25	DF-303	CUB2P25	GEM-2025	2TM-P25
C36	3.9	21R15953					5TCCB-V38S 10%*
C37	47	21R14207	N750-DI 47	DTN-47	CTA6Q47U	CN7-447	5TCCB-V47S 10%*
C38	10	21R12114	N750-DI 10	DTN-10	C10QU	CN7-410	5TCCB-V47S 10%*
C39	5.6	21R12114					5TCCB-V68S ±.5mmf *
C40	1800	21K129183	BPD-0018	DD-102	LI0D18	JL-218	5GA-D18S 10%*
C41	5000	21K738298	HVD-15-5000	DD-502	BYA10D5	B-250	20HK-D5
C42	150	21K745777	BPD-00015	DD-151	LI0T15	B-315	5GA-T15
C43	18	21R125631					
C44	470	21R140121	BPD-00047	DD-471	BYA10T47	B-347	5GA-T47
C45	5000	21K738298	HVD-15-5000	DD-502	BYA10D5	B-250	20HK-D5
C46	10000	21K738700	BPD-01	DD-103	BYA10S1	B-110	5HK-S1
C47	10000	21K738700	BPD-01	DD-103	BYA10S1	B-110	5HK-S1
C48	10000	21R482726	BPD-01	DD-103	BYA10S1	B-110	5HK-S1
C49	5000	21R122871	BPD-005	DD-502	BYA10D5	B-250	5HK-D5
C50	470	21R14554	BPD-00047	DD-471	BYA10T47	B-347	5GA-T47
C51	1000	21R401027	BPD-001	DD-102	BYA10DIM	B-210	5GA-D1
C52	2000	21R121106	BPD-002	DD-202	BYA10D2	B-220	5HK-D2
C53	3000	21K741863	BPD-003	DD-302	BYA10D3		5GA-D3
C54	.007 200	8K124570					MB-D7S 10%*
C55	.01 600	8K128945					6TM-S5 10%*
C56	.05 600	8K122185	P688N-05		CUB6S5	GEM-1627	6TM-S5 10%*
C57	.05 200	8K121005	P288N-05		CUB4S5	GEM-415	2TM-S5
C58	.02 600	8K122079	P688N-02		CUB6S2	GEM-612	6TM-S2
C59	1000	21R124466	HVD-30-1000	DD-30-1000	HVB20D1	2HV-210	20GA-D1
C60	20000	21K741862	BPD-02	DD-203	BYA6S2	B-120	5GA-S2
C61	.015 200	8K735821					GEM-4115
C62	100	21R400336	N750-DI 100	DTN-100	C10TIU	CN7-310	5TCCB-T1S 10%*
C63	100	21R400336	N750-DI 100	DTN-100	C10TIU	CN7-310	5TCCB-T1S 10%*
C64	3300	21R120422	BPD-0033	DD-332	BYA10D33	B-233	5HK-D33
C65	3300	21R120422	BPD-0033	DD-332	BYA10D33	B-233	5HK-D33
C66	3300	21R120422	BPD-0033	DD-332	BYA10D33	B-233	5HK-D33
C67	10000	21R120422	BPD-0033	DD-332	BYA10D33	B-233	5HK-D33
C68	.0047 400	8K129169	P488N-0047	DD-472	CUB6D47	GEM-6247	6TM-D47

CAPACITORS (cont)

ITEM No.	RATING CAP. VOLT.	MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C69	90	21B735757					N150 10% ②
C70	390	8R121008	P488N-1	DF-104	5R5T39	MS-339	10%
C71	.1	400	8R121008	DI-470	CUB4P1	4TM-P1	
C72	470	21K749218	HVD-15-5000	DD-502	BYA10T47	5GA-T47S 10%*	
C73	5000	21K738298	P488N-1	DF-104	BYA10D5	20HK-D5	
C74	.1	400	8R121008	DI-470	CUB4P1	4TM-P1	
C75	.1	600	8R121008	DI-470	CUB4P1	4TM-P1	
C76	.1	600	8R121008	DI-470	CUB4P1	4TM-P1	
C77	.05	1000	8R121008	DI-470	CUB4P1	4TM-P1	
C78	150	3000	21R125422				N1500 10% ③
C79	150	3000	21R125422				N1500 10% ③
C80	82	2000	21R120150				10%
C81	1000	21R15386	BPD-001	DD-102	BYA10DIM	2DY-482	
C82	.1	400	8R121008	DI-470	CUB4P1	B-210	
C83	470	21R14554	BPD-00047	DD-471	BYA10T47	GEM-401	
C84	470	21R14554	BPD-00047	DD-471	BYA10T47	B-347	
C85	470	21R14554	BPD-00047	DD-471	BYA10T47	B-347	
C86	470	21R14554	BPD-00047	DD-471	BYA10T47	B-347	
C87	.15	400	8R122174				
C88	1500	2000	21R124121	HVD-30-1500	DD30-152	HVB20D15	
C89	5000	2000	21R120093		DD30-502	HVB20D5	
C90	1500	21K738752	BPD-0015	DD-152	BYA10D15	B-215	

① Not used in some versions.

② Some versions may use 82mmf in this application (Part #21R128698).

③ Chassis coded A01 and lower use 120mmf, 120mmf, 68K Component Combination in this application (Part #51K748204).

* Not normally in distributors stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING RESISTANCE WATTS	MOTOROLA PART No.	CORNELL-DUBILIER PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	18C747570	BT-74	A47F5-1meg	Q19-137X	UT-443	Volume, Tap @ 800K
R1B	82k		Not Req.	Not Req.	Not Req.	Not Req.	
R2A	100K	18K747593	KB-1 or KR-1*	SWB-12	Q11-128	U41	Brightness
R3A	2meg	18K747592	Not Req.	K8S-3	Q11-139	U56	Vert. Hold
R4	30K	18K748735	Not Req.	A47-2meg-S	Q11-139	Not Req.	Contrast, Tap @ 20K
R5A	4meg	18K743524	AB-86	A47-4meg-S	Q11-141	Not Req.	Vert. Size
R6A	2meg	18K743523	AK-19	B47-2meg-S	Q11-139	PTA26L	Vert. Linearity
R7A	70K	18K748235	AK-19	Not Req.	Q11-125	Not Req.	Horiz. Hold
R8A	5000Ω	17B746869	AB-35	AK-19	Q11-125	Not Req.	Horiz. Size
R9A	4meg	18K740694	AB-86	AK-19	Q11-141	Not Req.	Noise Gate

* Use KB with CRL "blue label" controls and KR with "red label" controls.

RESISTORS

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

ITEM No.	RATING		MOTOROLA PART No.	NOTES	ITEM No.	RATING		MOTOROLA PART No.	NOTES
	OHMS	WATT				OHMS	WATT		
R10	2200Ω		6R9069		R53	18K			
R11	47Ω		6K127542		R54	5.6meg		6K124761	
R12	120K		6K127540		R55	1meg		6K122324	
R13	100K		6K125534		R56	1meg		6K122324	
R14	10K		6K119932		R57	68K		6K124507	
R15	220Ω		6K127099		R58	15K		6K119934	
R16	15Ω		6R2034		R59	180K		6K125531	
R17	220Ω		6K127099		R60	18K		6K122848	
R18	330K		6K128227		R61	8200Ω		6K119931	
R19	1000Ω		6K127960		R62	470K		6K119406	
R20	6800Ω		6K119930		R63	220K		6R6015	
R21	8200Ω	3	17K738283		R64	150Ω		6K128232	
R22	120Ω		6K128226		R65	22K		6K119935	
R23	2200Ω		6R9069		R66	22K		6K119935	
R24	1800Ω		6K122445		R67	560Ω		6K122802	
R25	15K	2	6K121576		R68	560Ω		6K122802	
R26	47Ω		6K127542		R69	100K		6K125534	
R27	7500Ω	4	17K749494		R70	22K		6K119935	
R28	6800Ω		6R6001		R71	12Ω	1	6K127508	
R29	100K		6K125534		R72	100K		6K125534	
R30	220K		6R6015		R73	150K		6K122323	
R31	1000Ω		6K127960		R74	4.7meg		6K122326	
R32	10K		6R6054		R75	8200Ω		6K119931	
R33	68K		6K128229		R76	1000Ω		6K121301	
R34	33K		6R6014		R77	82K		6K125179	
R35	33K		6R6014		R78	56K		6K127005	
R36	22K		6R6015		R79	6800Ω		6K119930	
R37	680K 5%		6K129168		R80	560K		6K128228	
R38	12meg 5%		6R15128		R81	470K		6K121279	
R39	1meg		6K124494		R82	470Ω		6K127633	
R40	100K		6K122313		R83	8200Ω	2	6K120579	
R41	18K		6K122848		R84	330K		6R6014	
R42	390K		6R5646		R85	6800Ω	1	6K124699	Note 1
R43	15K	2	6K119934		R86	8.2Ω	1	6K128098	
R44	82K		6K125179		R87	22K	1		Note 2
R45	560K		6K128228		R88	4700Ω		6K121847	
R46	560Ω		6K122802		R89	470Ω	2	6K123146	
R47	18Ω	1	6R6990		R90	56Ω 5%	15	17K739319	
R48	2.2meg		6R3927		R91	200Ω Cold		6K746412	
R49	1meg		6K122324			60 Hot			
R50	47K		6K121299		R92	7.5Ω	10	17K744240	
R51	100K		6K125534		R93	2.2meg		6R3927	
R52	68K		6K124507		R94	10K	3	17K744464	