

CABINET-REAR VIEW

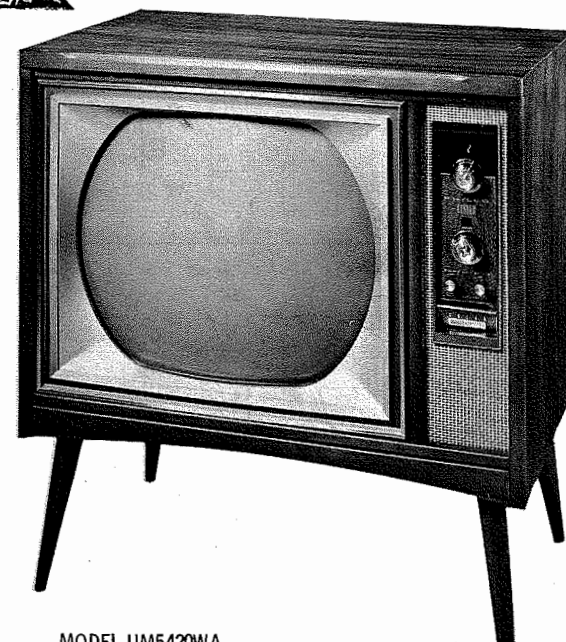
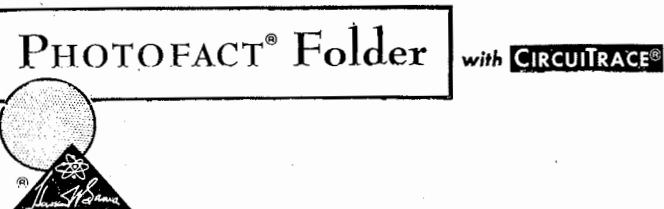
DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove all knobs, disconnect antenna leads, and remove cabinet back held by 5 screws and 2 clips.
2. Disconnect antenna terminal board, speaker leads, convergence yoke plug, yoke leads at the yoke, picture tube socket, and high voltage lead.
3. Loosen 4 screws holding tuner assemblies. Remove 4 chassis bolts, lift tuner assemblies and remove chassis.

PICTURE TUBE REMOVAL

1. Follow "Chassis Removal" instructions.
2. Place cabinet face down on a soft protective surface. Remove blue lateral magnet, purity ring magnet assembly, and convergence magnet assembly from picture tube neck.
3. Loosen yoke clamp and remove yoke.
4. Remove 8 bolts from picture tube mounting brackets. Use brackets as handles and lift picture tube out and place on soft protective surface.



MODEL UM5420WA

TRADE NAME	PHILCO	Models	Chassis
		M5214MR/WA, M5420MB/MA/WA, M5422MB/WA, M5424MA/WA, M5426MB/MA/WA, M5902MA/WA	14M91
		UM5214MR/WA, UM5420MB/MA/WA, UM5422MB/WA, UM5424MA/WA, UM5426MB/MA/WA, UM5902MA/WA	14M91U
SUPPLIER	Philco Corp., Subsidiary of Ford Motor Co., Tioga & "C" Streets, Philadelphia, Pennsylvania		
TYPE SET	Color Television Receiver		
TUBES	VHF - Twenty-Six, UHF - Twenty-Seven		
POWER SUPPLY	110-120 Volts AC, 60 Cycles		
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Inter-carrier)		

FOR SERVICE INFORMATION ON PHILCO RECORD CHANGER MODEL CM-3 DELUXE - SEE SIMILAR V-M IN PHOTOFACT SET 646 FOLDER 10

MISC ADJUSTMENT..... PAGE 7

BLOCK DIAGRAM..... PAGE 22

SERVICING IN THE FIELD

SAFETY GLASS

The safety glass is an integral part of the picture tube.

FUSE OR FUSE DEVICE

A 1½" #26 fuse wire is used for filament protection. (For location, see M1 in photo "Chassis - Bottom View".)

A Circuit Breaker is used for low voltage power supply protection, and may be reset by depressing the reset button. (See "Tube Placement Chart" for location.)

VHF OSCILLATOR ADJUSTMENT

The fine tuning mechanically engages osc. slug for adjustment (one slug for each channel).

AGC

The AGC may be varied by means of an AGC control. (See "Tube Placement Chart" for location.)

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Coarse adjustment of the horizontal hold is accomplished by the proper setting of the Horiz. Osc. Coil (waveform slug B1). (See "Tube Placement Chart" for location.)

HORIZONTAL LINEARITY

The linearity may be varied by a Horizontal Efficiency Coil.

FOCUS

The focus may be varied by means of a Focus Coil. (See "Tube Placement Chart" for location.)

CENTERING

Horizontal and Vertical centering is accomplished by 2 controls located at rear of chassis.

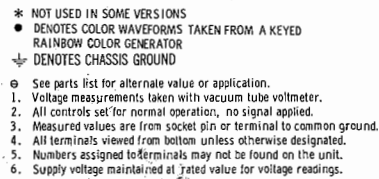
HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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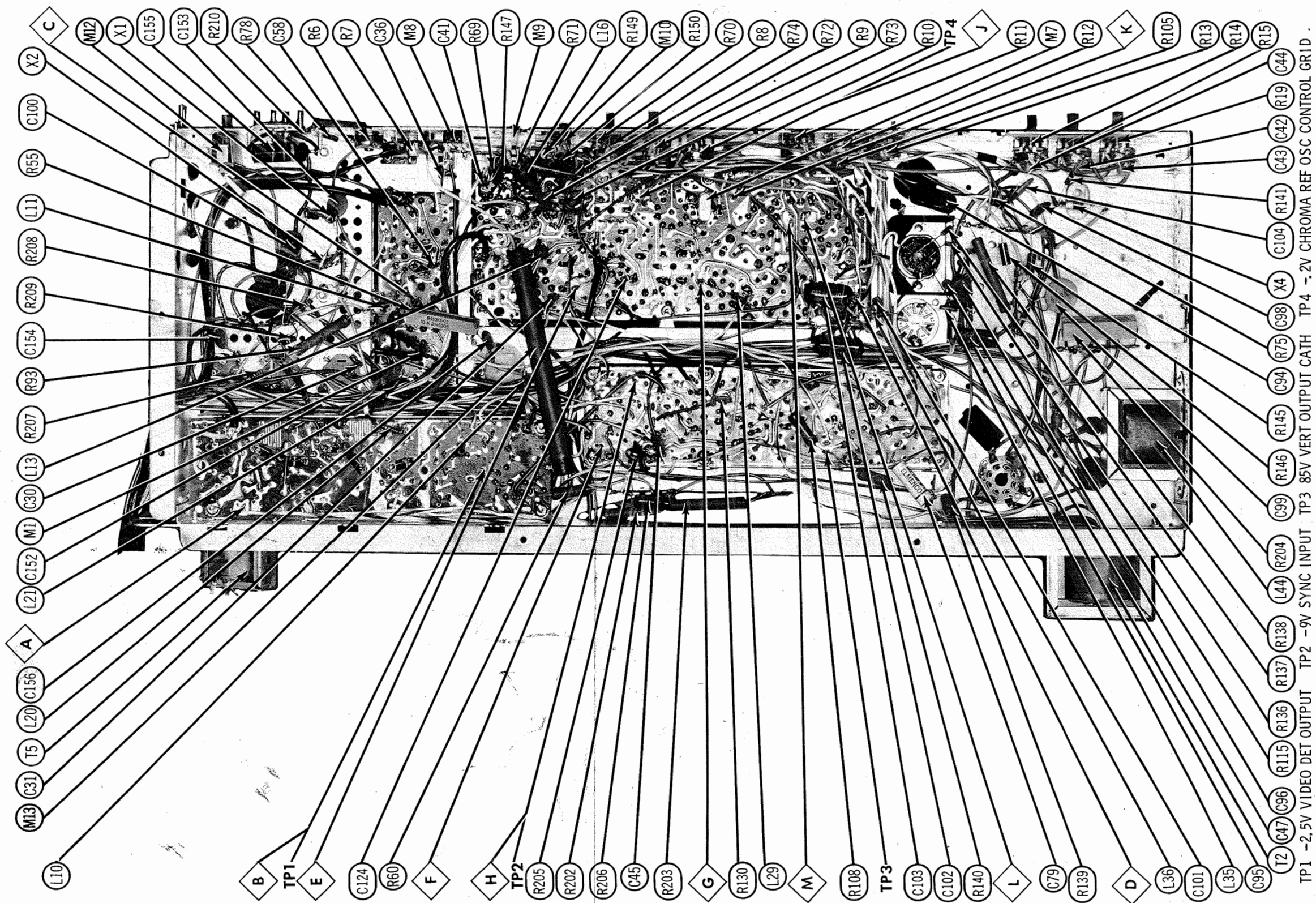
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DATE 6-64

SET 698 FOLDER 4



PAGE 2

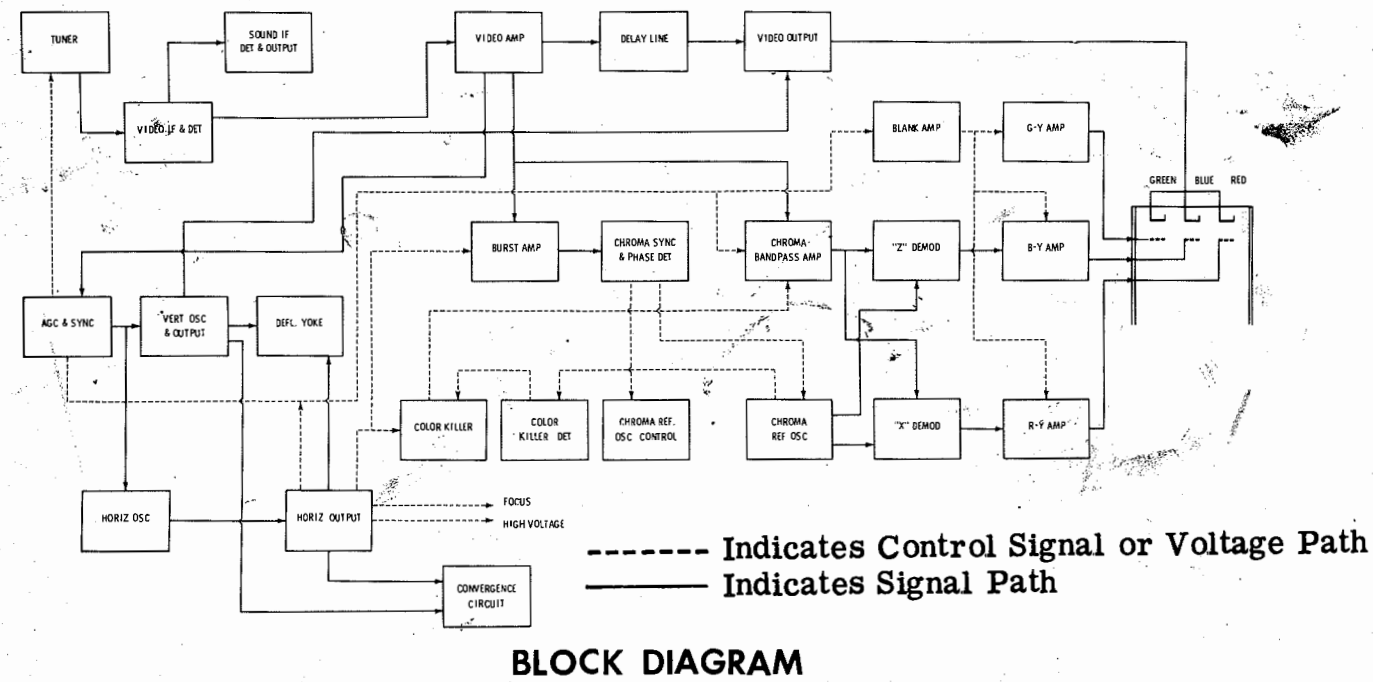
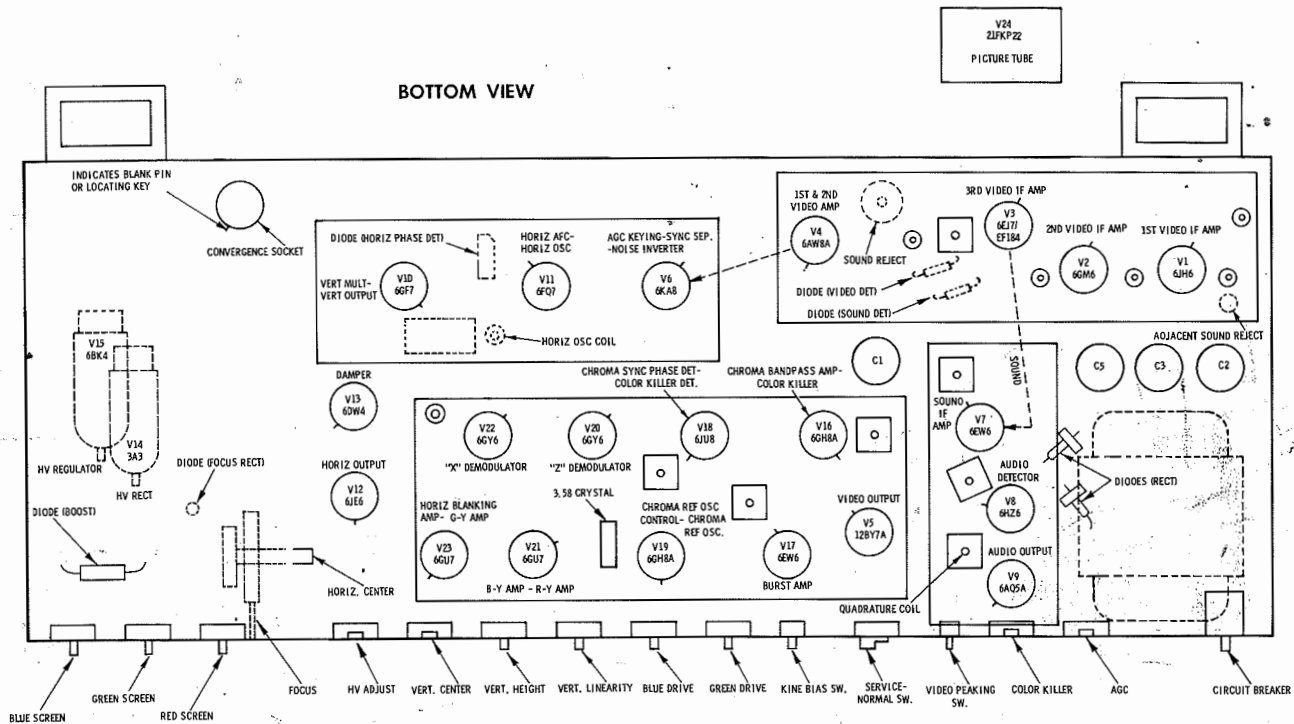


TP1 -2.5V VIDEO DET OUTPUT TP2 -9V SYNC INPUT TP3 85V VERT OUTPUT CATH TP4 -2V CHROMA REF OSC CONTROL GRID

CHASSIS-BOTTOM VIEW

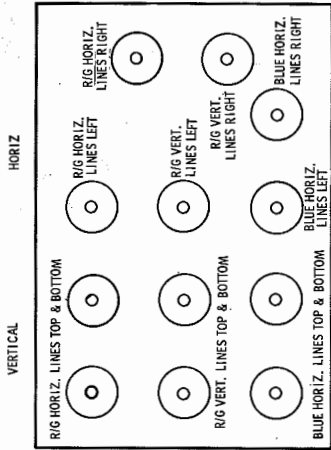
PHILCO
CHASSIS 14M91/U

TUBE PLACEMENT CHART

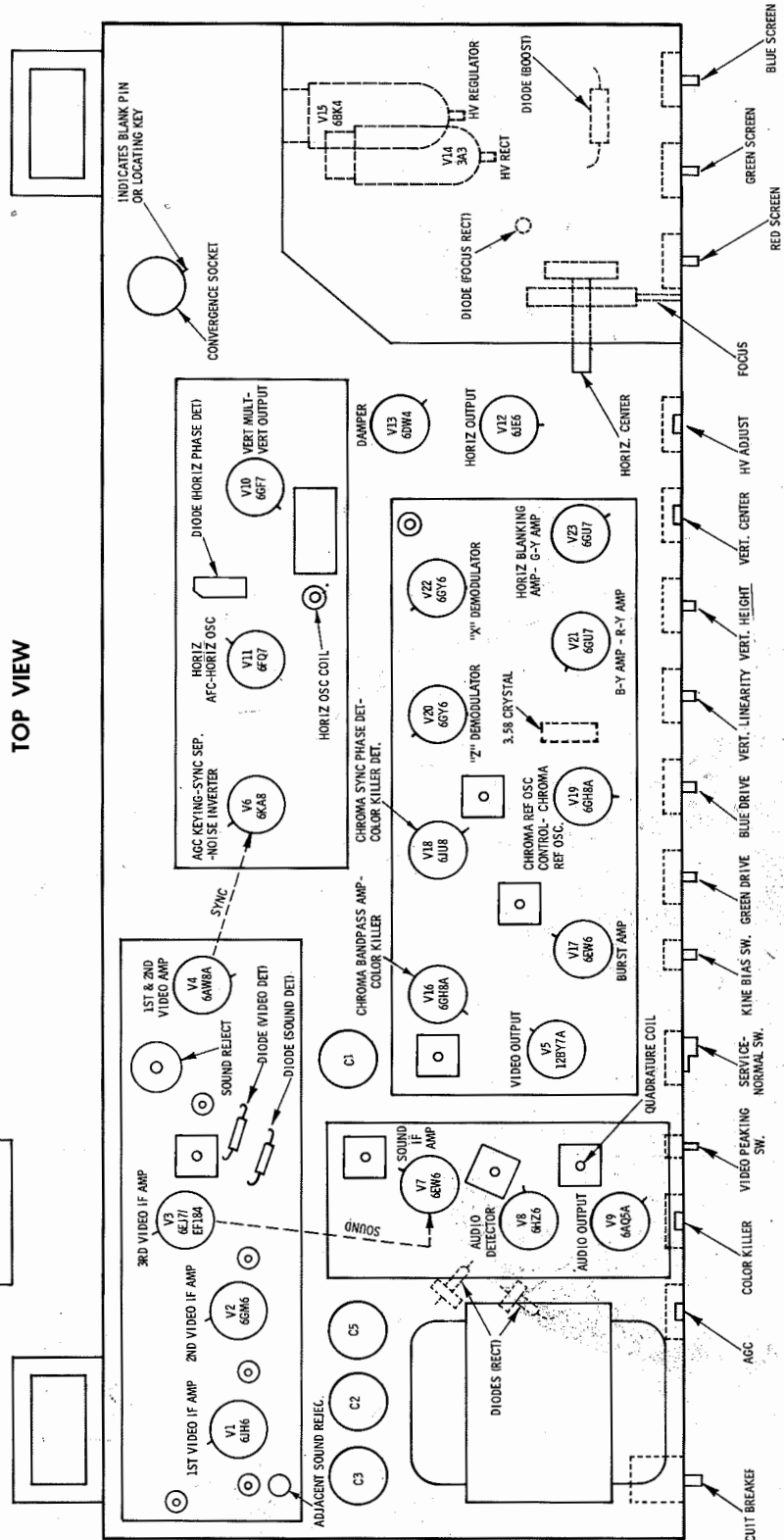


BLOCK DIAGRAM

TUBE PLACEMENT CHART

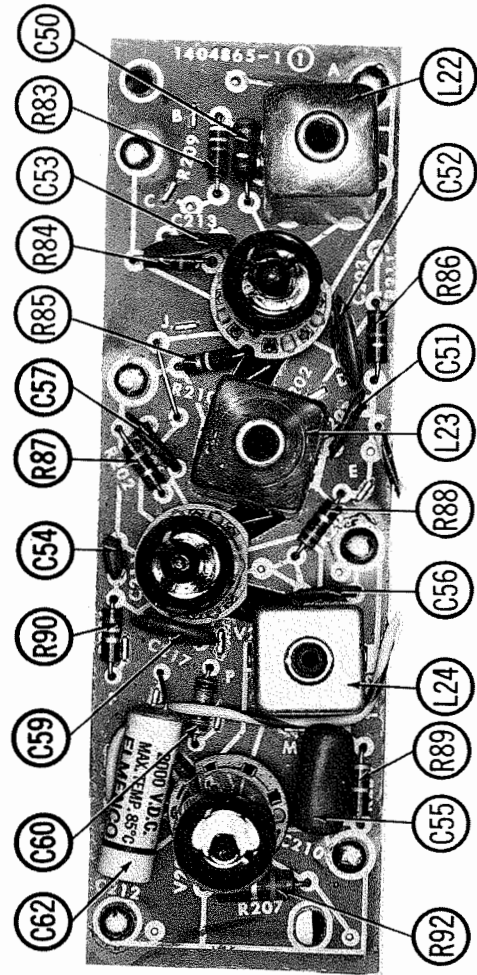


TOP VIEW



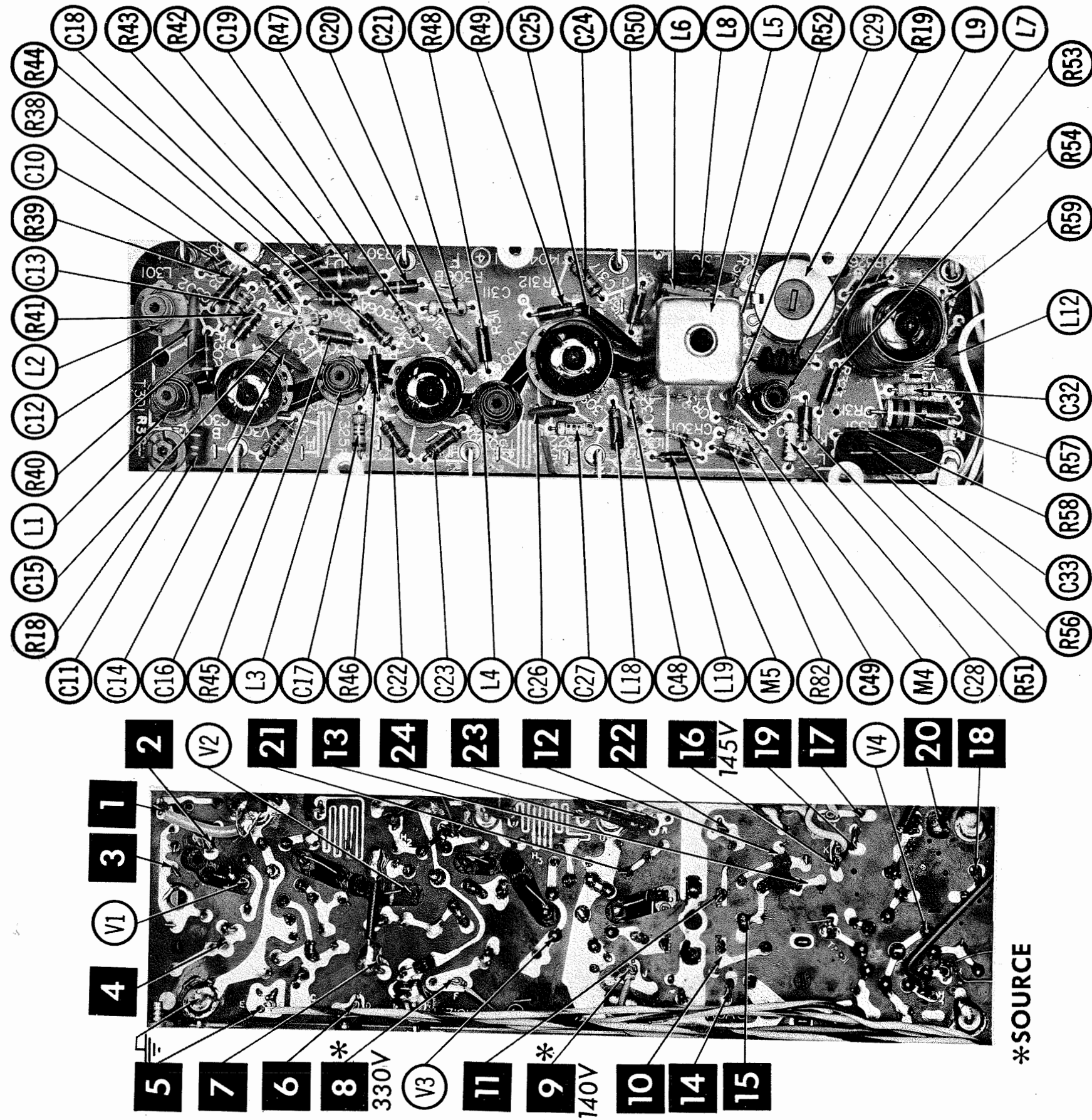
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FOLDER 4



SOUND PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



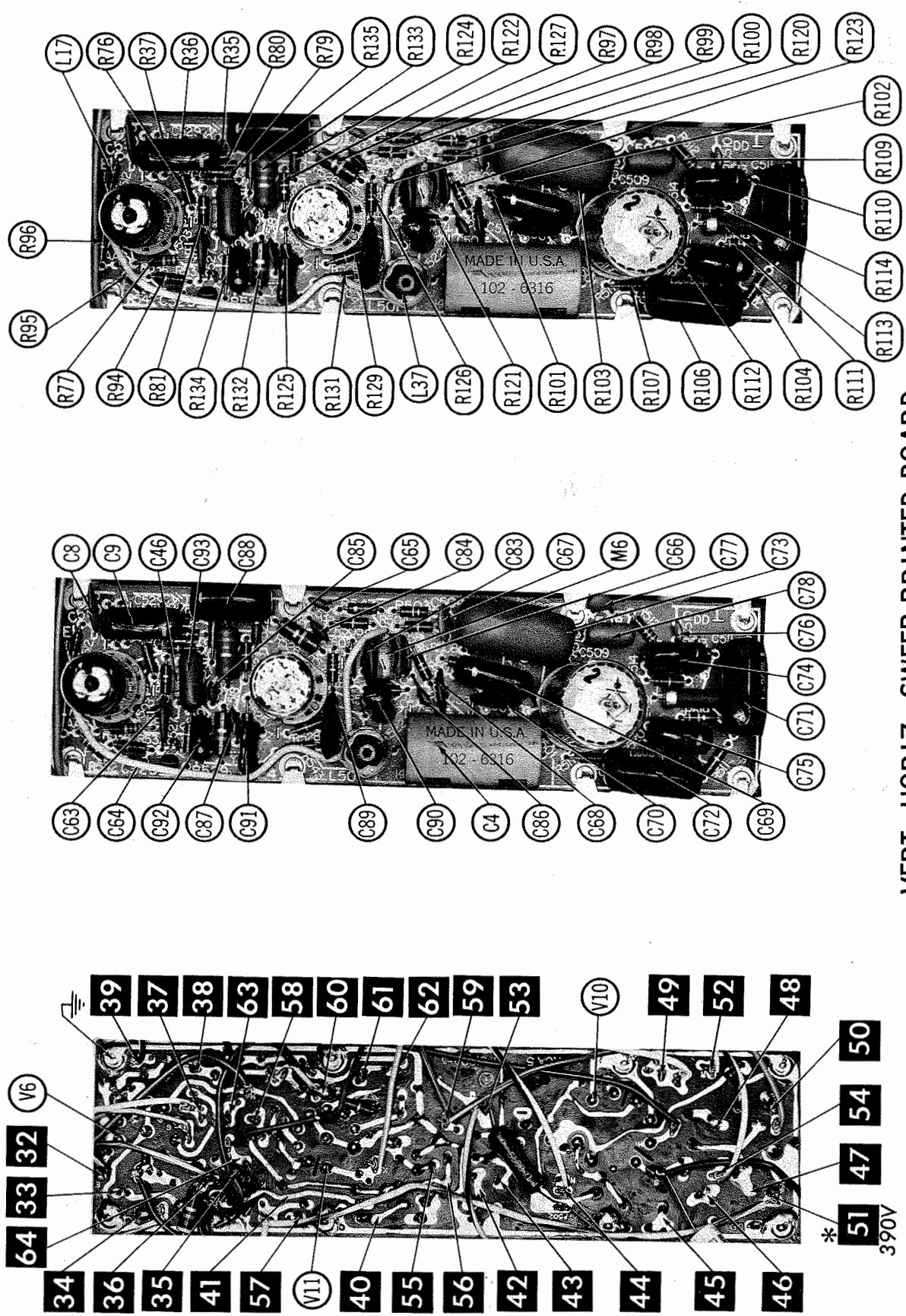
VIDEO IF PRINTED BOARD

PHILCO
CHASSIS 14M91/U

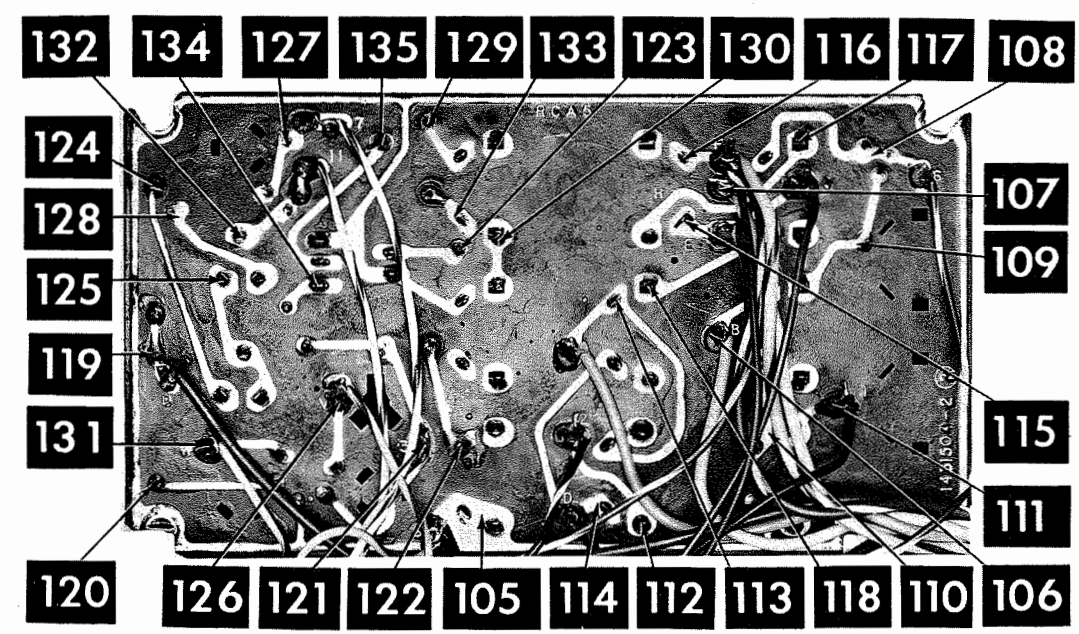
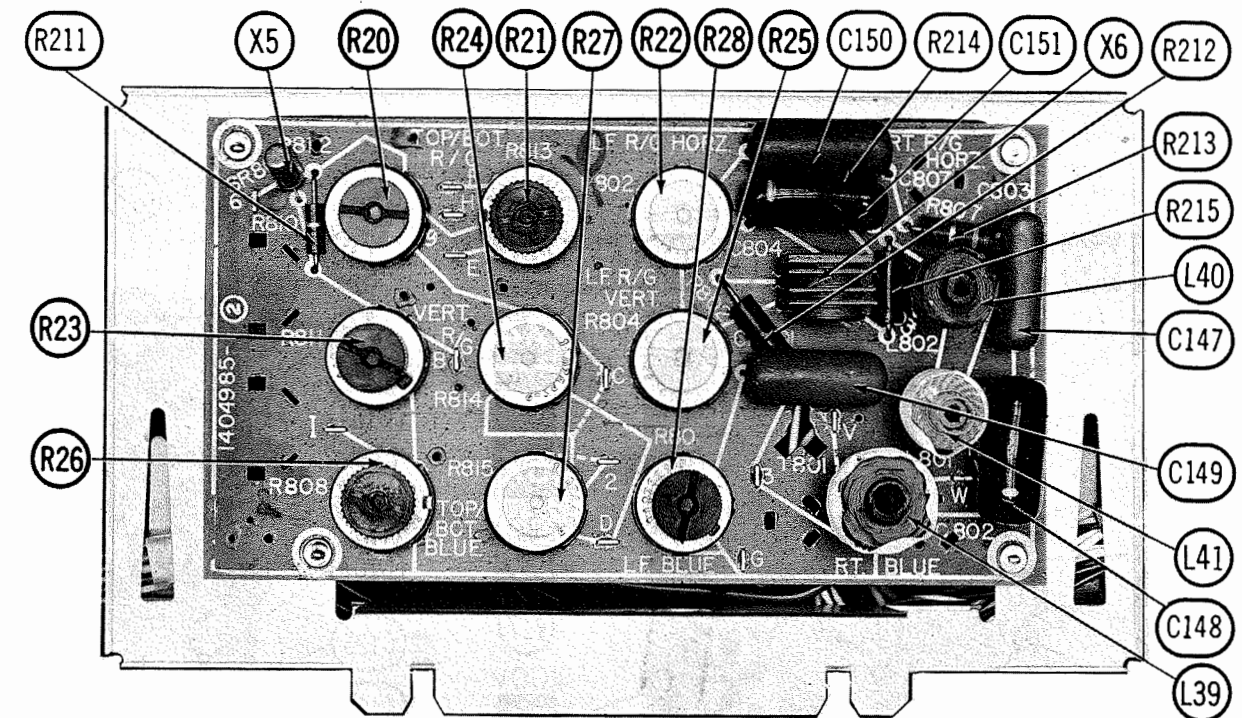
ARROWS INDICATING TUBE LOCATIONS ARE
POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

* SOURCE

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VERT, HORIZ, SWEEP PRINTED BOARD



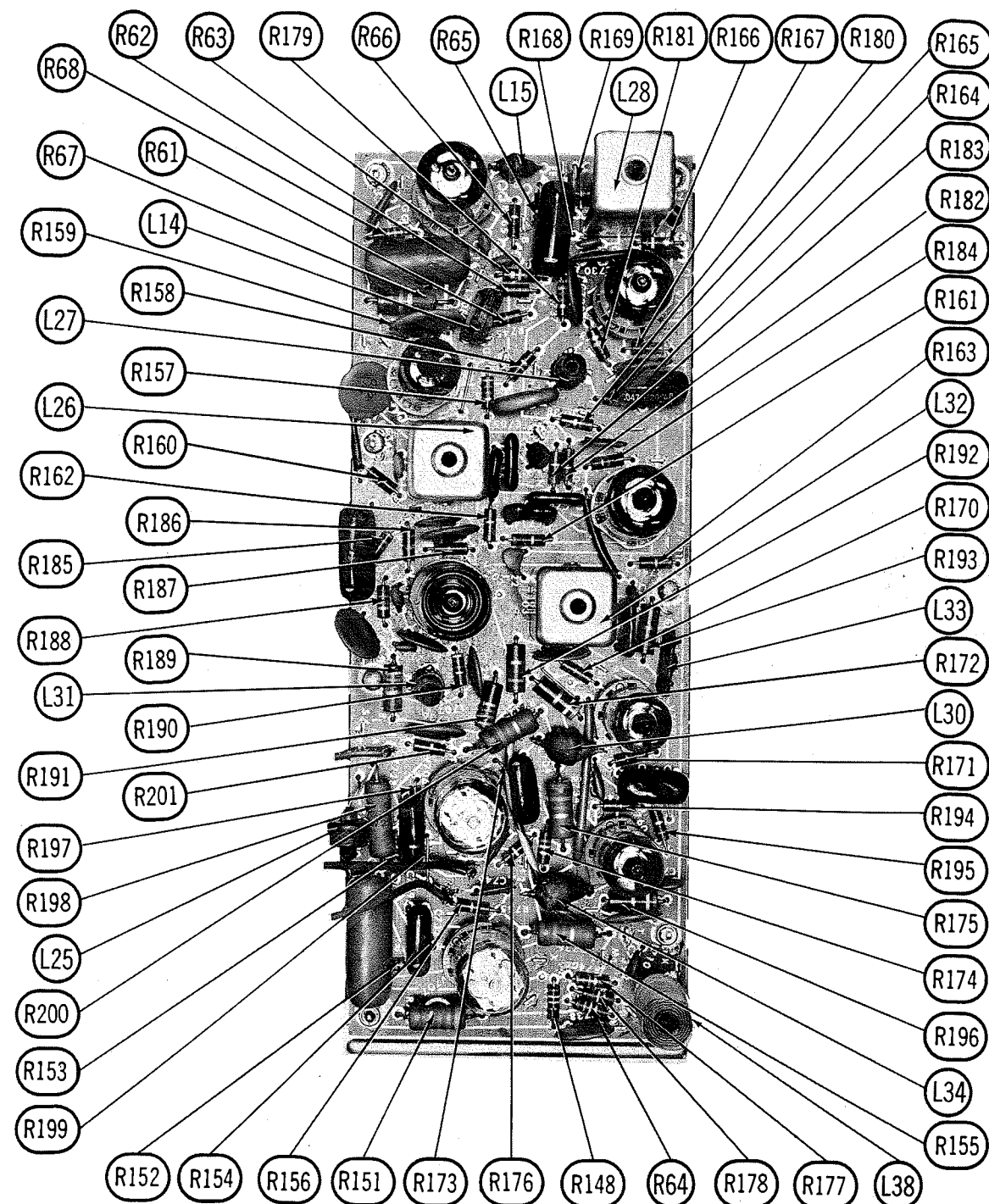
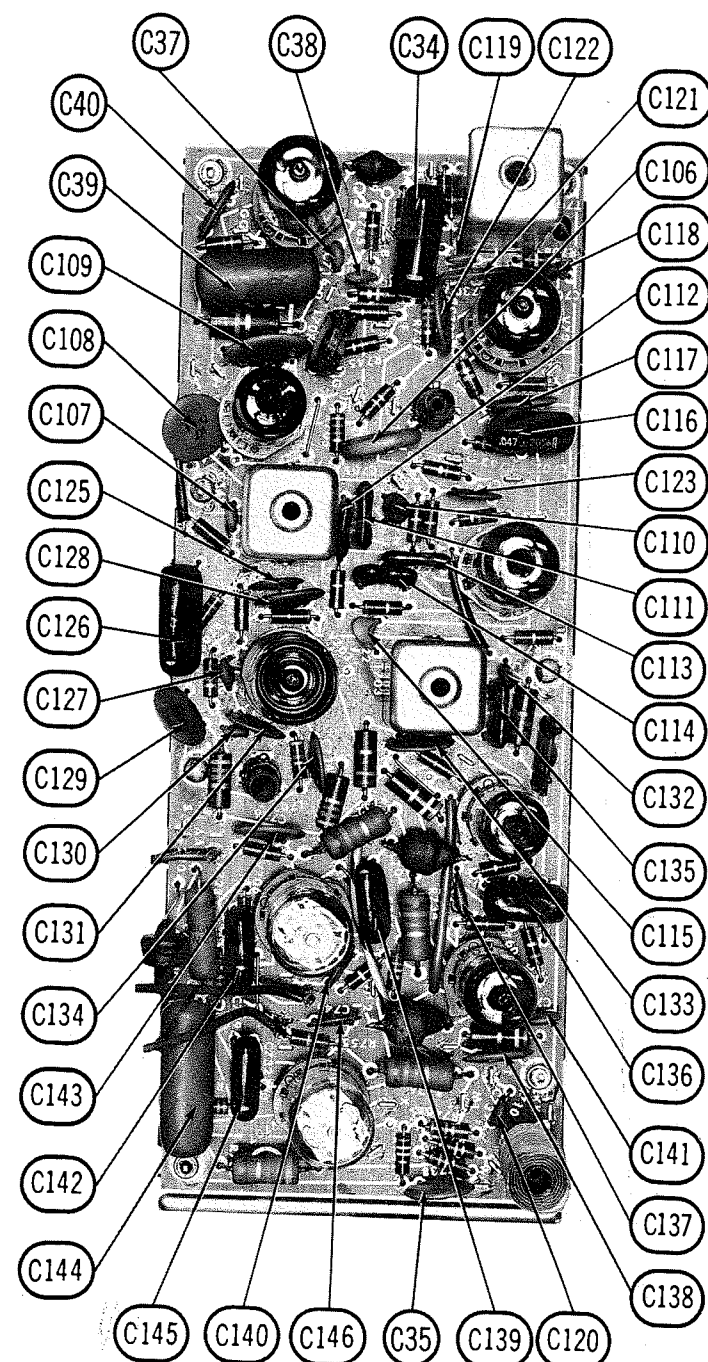
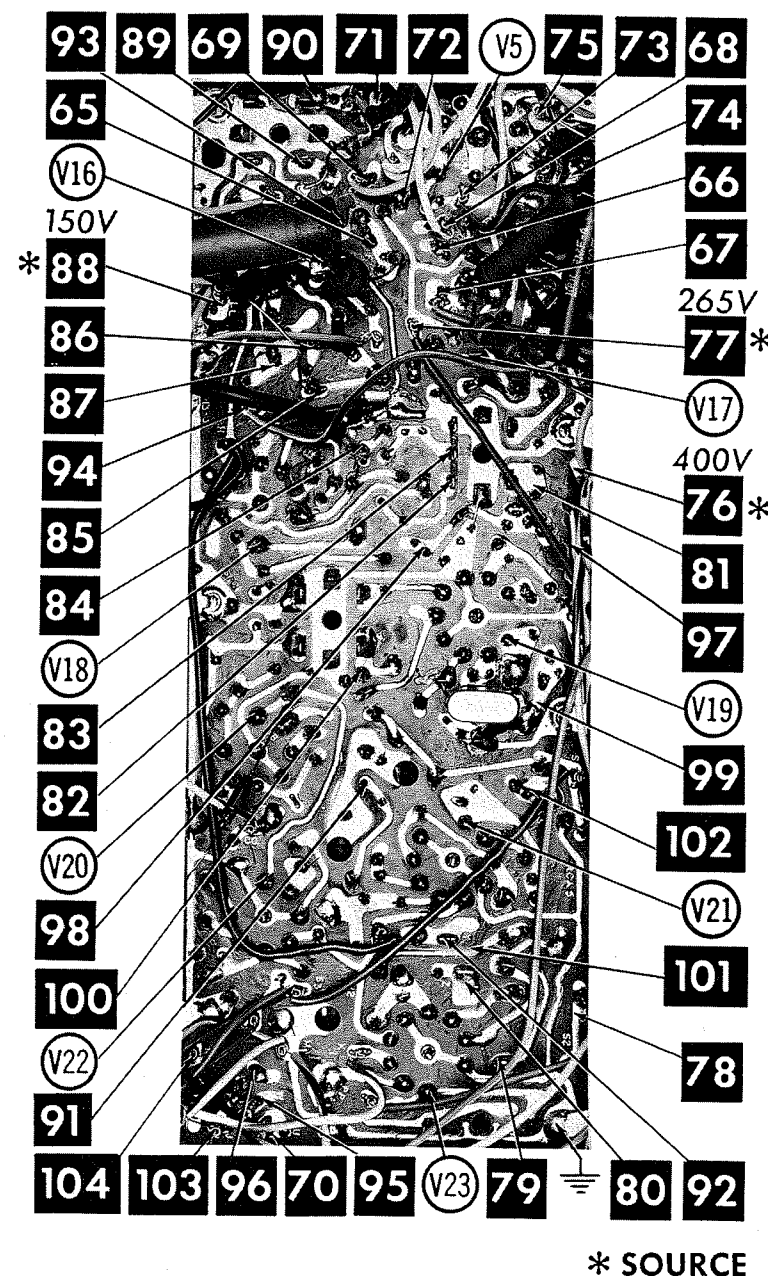
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CONVERGENCE PRINTED BOARD

SET 698 FOLDER 4

PHILCO
CHASSIS 14M91/U

FOLDER 4



PRINTED BOARD (COLOR CIRCUIT)

PHILCO
CHASSIS 14M91/U

FOLDER 4

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9	Pin 10	Pin 11	Pin 12	Pin 13	Pin 14
V1	6JH6	220K	1450Ω	FIL	FIL	● 216Ω	● 216Ω	1400Ω							
V2	6GM6	75K	1N	FIL	FIL	† 3400Ω	† 3400Ω	● 56Ω							
V3	6EJ7/EF184	180Ω	0Ω	180Ω	FIL	FIL	0Ω	† 3100Ω	3100Ω	0Ω					
V4	6AW8A	0Ω	# 22K	† 7500Ω	FIL	FIL	22Ω	● 1000Ω	† 32K	† 10K					
V5	12BY7A	320Ω	650K	0Ω	FIL	FIL	FIL	† 6500Ω	† 23K	0Ω					
V6	6KA8	† 60K	4meg	3000Ω	FIL	FIL	55K	470K	† 30K	† 700K					
V7	6EW6	5Ω	270Ω	FIL	FIL	† 14K	† 14K	0Ω							
V8	6HZ6	4.5Ω	270Ω	FIL	FIL	† 560K	† 7100Ω	470K							
V9	6AQ5A	60K	270Ω	FIL	FIL	† 4700Ω	† 3800Ω	NC							
V10	6GF7	0Ω	2.7meg	2100Ω	FIL	FIL	† 1370Ω	NC	† 3.2meg	280K					
V11	6FQ7	# † 20K	670K	1000Ω	FIL	FIL	† 60K	215K	45Ω	0Ω					
V12	6JE6	† 13K	9.5meg	0Ω	FIL	FIL	9.5meg	† 13K	1600Ω	NC					TOP CAP † 6.9Ω
V13	6DW4	NC	† 26Ω	NC	FIL	FIL	NC	† 26Ω	NC	2.9meg					
V14	3A3	PINS 1 THRU 8 HAVE INFINITE RESISTANCE													TOP CAP † 582Ω
V15	6BK4	† 22Ω	FIL	NC	NC	† 1.5meg	NC	FIL	NC						TOP CAP INF
V16	6GH8A	370K	220K	† 4800Ω	FIL	FIL	† 2900Ω	390Ω	0Ω	11meg					
V17	6EW6	32K	38K	FIL	FIL	† 1000Ω	† 1400Ω	38K							
V18	6JU8	▲ 1meg	220Ω	▲ 1meg	FIL	FIL	0Ω	12meg	22K	12meg					
V19	6GH8A	† 20K	47K	† 48K	FIL	FIL	† 8600Ω	0Ω	680Ω	1N					
V20	6GY6	135Ω	100Ω	FIL	FIL	† 5300Ω	† 3900Ω	2.2Ω							
V21	6GU7	† 22K	1meg	270Ω	FIL	FIL	† 22K	1meg	270Ω	0Ω					
V22	6GY6	135Ω	150Ω	FIL	FIL	† 5300Ω	† 3900Ω	.6Ω							
V23	6GU7	† 47K	260K	390Ω	FIL	FIL	† 22K	1meg	270Ω	0Ω					
V24	21FJP22	FIL	127K	■ 420K	† 6400Ω	† 4500Ω	† 127K	■ 420K	NC	† 70meg	NC	■ 420K	† 127K	† 4500Ω	FIL
V201	6HA5	1.2meg	0Ω	FIL	FIL	† 9K	0Ω	0Ω							
V202	6HG8	0Ω	220K	0Ω	FIL	FIL	10K	† 45K	† 10K	† 9K					
V301	6AF4A	† 12K	5600Ω	FIL	FIL	0Ω	5600Ω	† 12K							
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9	Pin 10	Pin 11	Pin 12	Pin 13	Pin 14

- # THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
 ● READING DEPENDS ON POLARITY OF METER CONNECTIONS.
 † MEASURED FROM PIN 9 OF V13.
 ▲ MEASURED FROM PIN 9 OF V19.
 ● MEASURED FROM PIN 2 OF V2.
 ■ MEASURED FROM CATHODE OF X4.
 † MEASURED FROM OUTPUT OF X2.
 * VHF TUNER TT-128D AND TT-138D.
 NC NO CONNECTION

MISCELLANEOUS ADJUSTMENTS

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Connect:
 A 0-500MA meter in series with cathode lead of horizontal output tube.
 A .47mfd capacitor across meter.
 A 0-1500 microammeter in series with the cathode lead of the HV regulator tube.
 A VTVM thru a high voltage probe to picture tube anode connector.
 Point Ⓢ to ground.
 A short across horizontal oscillator cathode coil (pin 8 to ground).
 Tune in a TV station and set all controls for normal operation.
 Adjust the Horizontal Hold control until the picture "floats" with the blanking bars vertical. Remove the short from the Horizontal Oscillator Cathode and adjust B1 until the picture "floats" horizontally. Remove the short from point Ⓢ. Adjust the Horizontal Linearity Coil for MINIMUM current in the horizontal output tube (should not exceed 210MA).

Adjust the High Voltage control for 23KV on picture tube anode with normal brightness. Check the High Voltage Regulator current. The current should not be less than 850 microamperes. If current is less than 850 microamperes, turn the Horizontal Linearity slug one-half turn clockwise. Check to see that horizontal output current does not exceed 210MA. If foldover occurs in picture, adjust Horizontal Linearity clockwise to eliminate foldover while checking to make sure horizontal output current does not exceed 210MA.
 Adjust Focus, Height and Vertical Linearity controls.

AGC ADJUSTMENT

Tune in a strong TV station and advance the AGC control until instability appears in the picture (pulling, jitter, overload, etc.). Reduce the control to the point just below the instability and check all available stations for proper AGC action.

COLOR AFC ALIGNMENT

Set the Killer Threshold control to fully counterclockwise. Set the Tint control to the center of its range.
 Connect a color bar generator to the antenna terminals. Adjust receiver for normal color reception. Short pin 1 of Burst Amp. (V17) to ground.
 Connect DC probe of VTVM thru 470K to pin 1 of Phase Detector (V19). Adjust A15 for maximum deflection on VTVM. If no reading is obtained, oscillator is not operating. Adjust A16 to start oscillator, then adjust A15 for maximum. Remove the short from pin 1 of Burst Amp. Adjust A17 for maximum deflection on VTVM. Make sure the oscillator is running and locked in.
 Short point Ⓢ to ground. Remove VTVM. Adjust A18 until color bars stand still or drift slowly. Remove the short from point Ⓢ and check to see that the color bars will "sync" with a low level input signal. If necessary, retouch A16 for best hold.
 Connect the Vertical Input of a Scope to point Ⓢ. Check for proper waveform with the color bar generator being used. See waveform on schematic for pattern obtained from a standard NTSC signal. Check the range of the Tint control. The bars should move 30° either side of proper signal. If necessary, retouch A17 for proper range of control.
 Check for proper waveform at G-Y, and B-Y outputs (points Ⓢ and Ⓢ). Tune in a weak signal, or reduce the signal at the antenna terminals to obtain a snowy picture. Adjust the Killer Threshold control to eliminate the color in the snow. Check with a color signal to make sure the killer is not eliminating picture coloring.

PURITY ADJUSTMENTS

Perform step one of Convergence Adjustments. If the picture tube appears to be magnetized, use a degaussing coil to demagnetize tube and mounting brackets.
 Connect the blue and green grids of the picture tube through individual 100K resistors to ground. Loosen the deflection yoke and move it rearward until it is against the convergence yoke assembly.
 Adjust the tabs on the purity magnet, and rotate the assembly until a red spot appears at the center of the picture tube. Slide the deflection yoke forward to obtain a uniform red over entire picture tube face. A low power microscope is useful to observe the beam landings.

GRAY SCALE ADJUSTMENTS

Tune in a black and white picture or a color picture with the Color control set to MINIMUM. Switch the Kine bias switch to the "Up" position. Turn the red, blue and green screen controls fully counterclockwise. Move the "Normal-Service" switch to "Service". Advance the screen controls one at a time until each produces a barely visible line on the screen.

If one or more controls fail to produce a line, change the Kine bias switch to the center or possibly "Down" position and begin again. Return the Normal-Service switch to "Normal". Adjust the blue and green drive controls to eliminate coloring in the dark and bright areas of the picture.

CONVERGENCE ADJUSTMENTS

Step	Control	Use to Converge (or straighten)	Remarks
1.			Perform center dot convergence using convergence magnets. If more range is needed, reverse magnet holder in clip. See Fig. A.
2.	R-G Vert. lines, Top and Bottom	Red and Green vertical bars at top and bottom of screen.	Touch up both controls for best convergence from top to bottom along vertical centerline (Fig. B).
3.	R-G Horiz. lines, Top and Bottom	Red and Green horizontal bars at top and bottom of screen.	Touch up both controls for best convergence of horizontal bars along vertical center line (Fig. C).
4.	Blue Horiz. lines, Top and Bottom	Blue horizontal bars at top and bottom of screen.	Touch up both controls for best convergence of horizontal bars along vertical center line (Fig. C).
5.			Perform center dot static convergence (Fig. A).
6.	Blue Horiz. lines, Right	Blue horizontal bars at right side of screen.	Touch up both controls for best convergence along horizontal center line (Fig. D).
7.	Blue Horiz. lines, Left	Blue horizontal bars at left side of screen.	
8.	R-G Vert. lines, Right	Red and Green vertical lines at right side of screen.	(Fig. E)
9.	R-G Horiz. lines, Right	Red and Green horizontal bars at right side of screen.	Use control to converge blue bar with red and green bars on right side of screen (Fig. E).
10.	R-G Vert. lines, Left	Red and Green vertical bars at left side of screen.	(Fig. E)
11.	R-G Horiz. lines, Left	Red and Green horizontal bars at left side of screen.	Use control to converge blue bar with red and green bars at left side of screen (Fig. E).

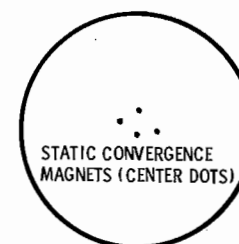


FIG. A

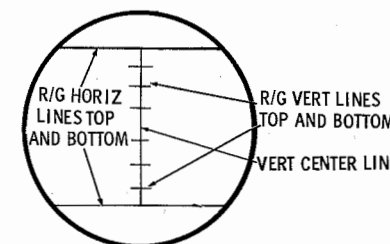


FIG. B
(RED & GREEN ONLY)

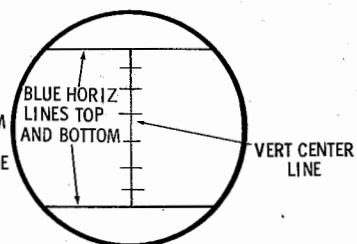


FIG. C
(BLUE BARS)

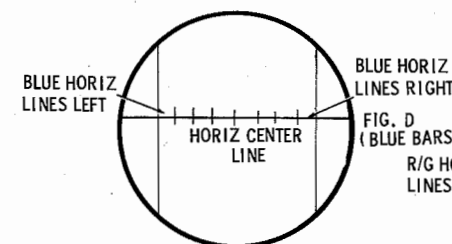


FIG. D
(BLUE BARS)

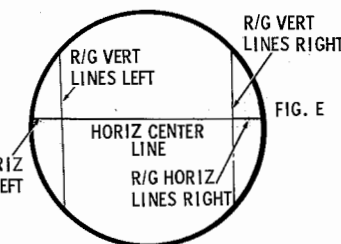


FIG. E

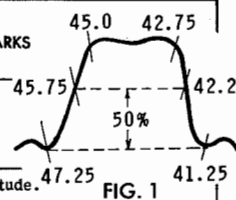
ALIGNMENT INSTRUCTIONS

Use an isolation transformer and maintain voltage at 117 volts. Allow a 20-minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: A1 thru A10 GENERAL CEMENT #9302, 8606L, 8869 ... WALSCO #2511, 2544, 2588
Mixer Plate Coil .. GENERAL CEMENT #9302, 9298, 9297 WALSCO #2511, 2546, 2547

VIDEO IF ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection. Use only enough generator output to provide a usable indication. Note: Response may vary slightly from those shown. Connect a variable bias supply to the IF AGC line (point ④) and adjust to obtain a response curve which shows no indication of overload. Disable Oscillator section of Mixer-Osc. Set the Channel Selector to any non-interfering channel.

INDICATOR	GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	ADJUST	REMARKS
1. Connect DC probe of a VTVM thru a 47K resistor to point ⑤. Common to ground.	Connect high side to ungrounded tube shield over Mixer-Osc. Low side to ground.		41.25MC 47.25MC	A1, A2, R22 (Sound Reject Control)	Adjust for MINIMUM.
2. Connect DC probe of a VTVM thru a 47K resistor to point ⑥. Common to ground.	Connect high side to ungrounded tube shield over Mixer-Osc. Low side to ground.	44MC (10MC Sweep)	43.8MC 42.5MC 45.75MC 44.0MC	A3, A4, A5, A6, Mixer Plate Coil	Adjust for maximum amplitude.
3. Connect vertical input of a scope to point ⑦. Low side to ground.	Connect high side to ungrounded tube shield over Mixer-Osc. Low side to ground.	44MC (10MC Sweep)	41.25MC 42.2MC 45.75MC 45.0MC 45.75MC 47.25MC		Adjust for maximum gain and symmetry of response with markers as shown in Figure 1. In order to obtain a proper response, it may be necessary to slightly retouch A3, A4, A5, A6 and Mixer Plate Coil for optimum response.



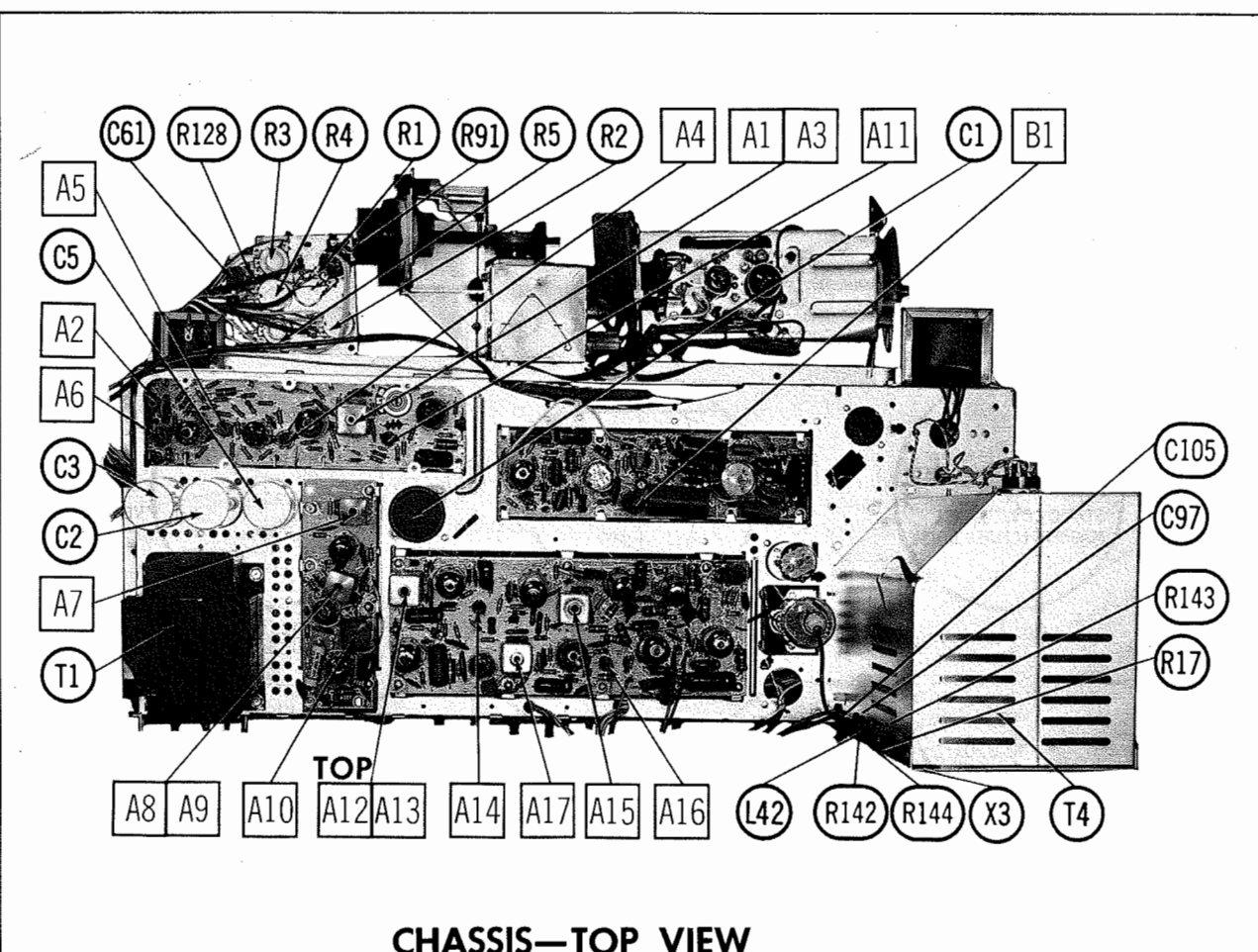
SOUND ALIGNMENT

Connect a VTVM thru a detector probe to point ④. Tune in a TV station and adjust A7, A8, and A9 for maximum deflection. Remove the VTVM. Reduce the signal at the antenna terminals until distortion occurs in the sound. Adjust A10 clockwise from the fully out position to the second peak. Continue to reduce the signal and adjust A10 for MINIMUM distortion until no further improvement can be made.

4.5 MC TRAP ALIGNMENT

Tune in a strong TV signal and set the Contrast at maximum. Adjust the Fine Tuning until a beat pattern is visible on the screen. Adjust A11 for MINIMUM beat interference.

ALIGNMENT CONTINUED ON PAGE 17



CHASSIS—TOP VIEW

ALIGNMENT INSTRUCTIONS (cont)

CHROMA BANDPASS ALIGNMENT

The following alignment will require the use of an RF Modulator (RCA WG304A or equivalent). Connect a -15 volt supply to point ⑤. Connect a -2 volt supply to point ⑥. Connect a -15 volt supply to point ⑦. Positive of all supplies to ground. Connect a jumper from point ④ to ground. Turn the color intensity to maximum. Remove the Horizontal Output tube and connect a 2000Ω 100W resistor from Source "B" to ground.

SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4. High side thru .1mf to grid of Bandpass Amp. (V17). Low side to ground.	3.58MC (3-5MC Sweep)	3.08MC 4.08MC		Vert. Amp. to pin 1 of demodulators, point ④. Low side to ground.	A12, A13	Adjust for response curve similar to Fig. 2.
5. High side of sweep gen. to Video Sweep Input of RF demodulator. High side of signal gen. to picture carrier input. Output of RF modulator to mixer grid test point on tuner. Low side to ground.	Sweep generator to 3MC (6MC Sweep)	45.75MC		"	A14	Adjust for response curve similar to Fig. 3. If necessary retouch A12 to flatten top of response.

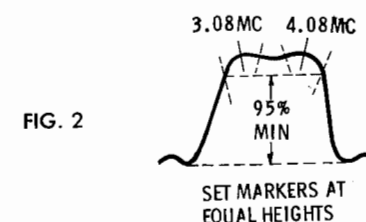


FIG. 2

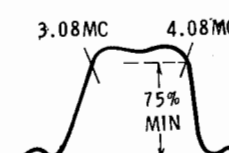


FIG. 3

VHF TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Suggested Alignment Tools: A201 thru A209 GENERAL CEMENT 8868, 9087, 9089 ... WALSCO #2528, 2541, 2587
A210 GENERAL CEMENT 8606, 8606L, 8869 ... WALSCO #2543, 2544, 2588

OSCILLATOR ALIGNMENT

The oscillator on each channel is preset by means of Fine Tuning control. Adjust Fine Tuning for best picture and sound on each active channel.

RF AND MIXER ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection. Use 10MC sweep unless otherwise noted. Connect variable bias to RF AGC line at point ④. Adjust bias to obtain response curve which shows no indication of overloading.

SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1. Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. input to point ④, low side to ground.	A201 thru A205	Decrease bias. Adjust for maximum gain and symmetry of response similar to Fig. 201 with markers as shown.
2. "	195MC	193.25MC 197.75MC	10	Across Video Det. load resistor	A206	Increase bias to -15 volts and adjust for MINIMUM.
3. "	207MC	205.25MC 209.75MC	12	Vert. input to point ④, low side to ground.		Check response on all high band channels and make compromise adjustments of A203 thru A205 if required.
	201MC	199.25MC 203.75MC	11			
	189MC	187.25MC 191.75MC	9			
	183MC	181.25MC 185.75MC	8			
	177MC	175.25MC 179.75MC	7			
4. "	85MC	83.25MC 87.75MC	6		A207 thru A209	Adjust for maximum gain and symmetry of response similar to Fig. 201 with markers as shown.
5. "	79MC	77.25MC 81.75MC	5			Check response on all low band channels and make compromise adjustments of A207 thru A209 if required.
	69MC	67.25MC 71.75MC	4			
	63MC	61.25MC 65.75MC	3			
	57MC	55.25MC 59.75MC	2			

If interference is encountered from nearby FM station, adjust A210 for MINIMUM interference.

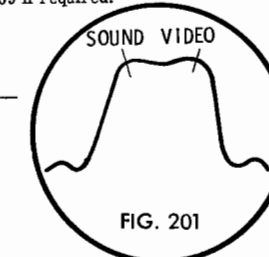
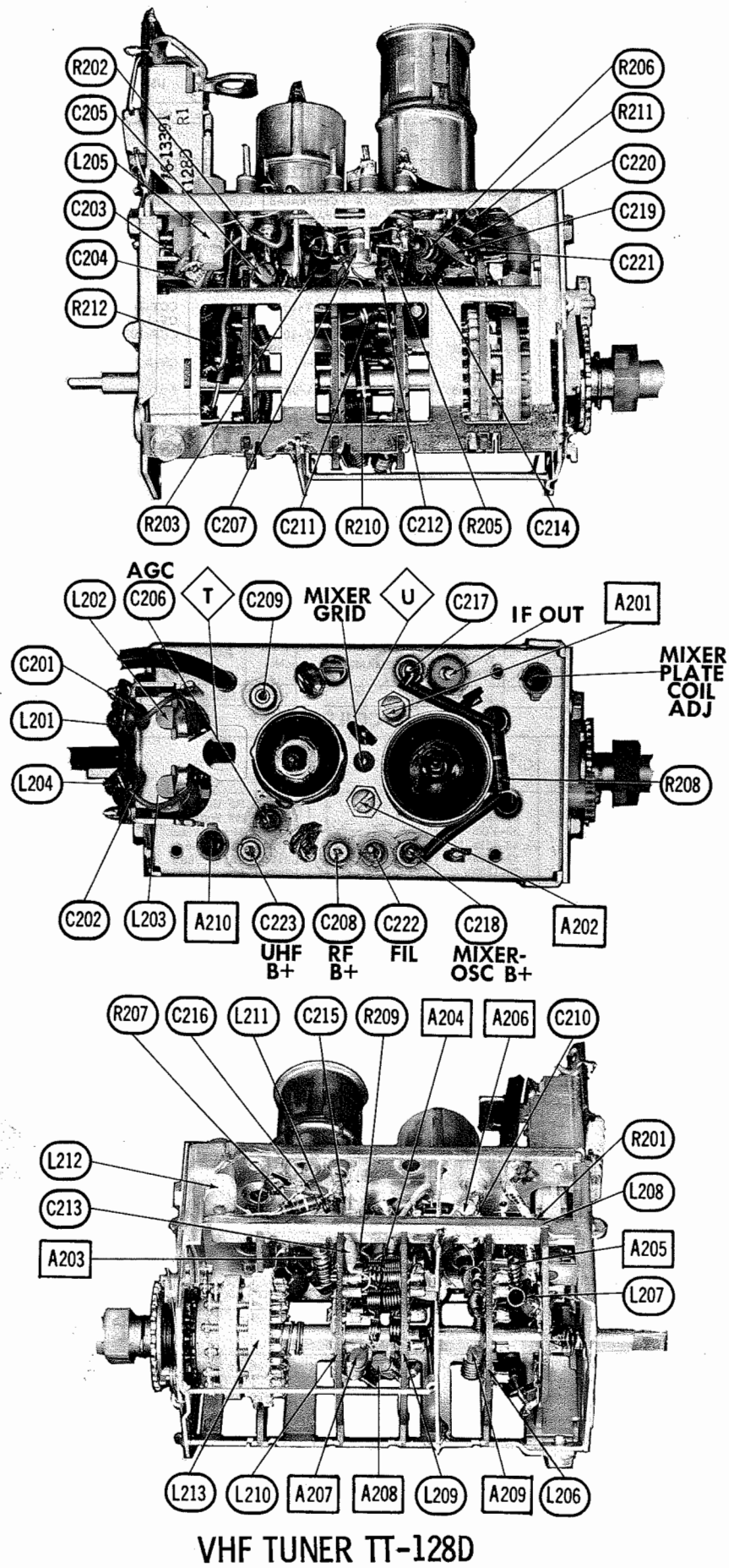


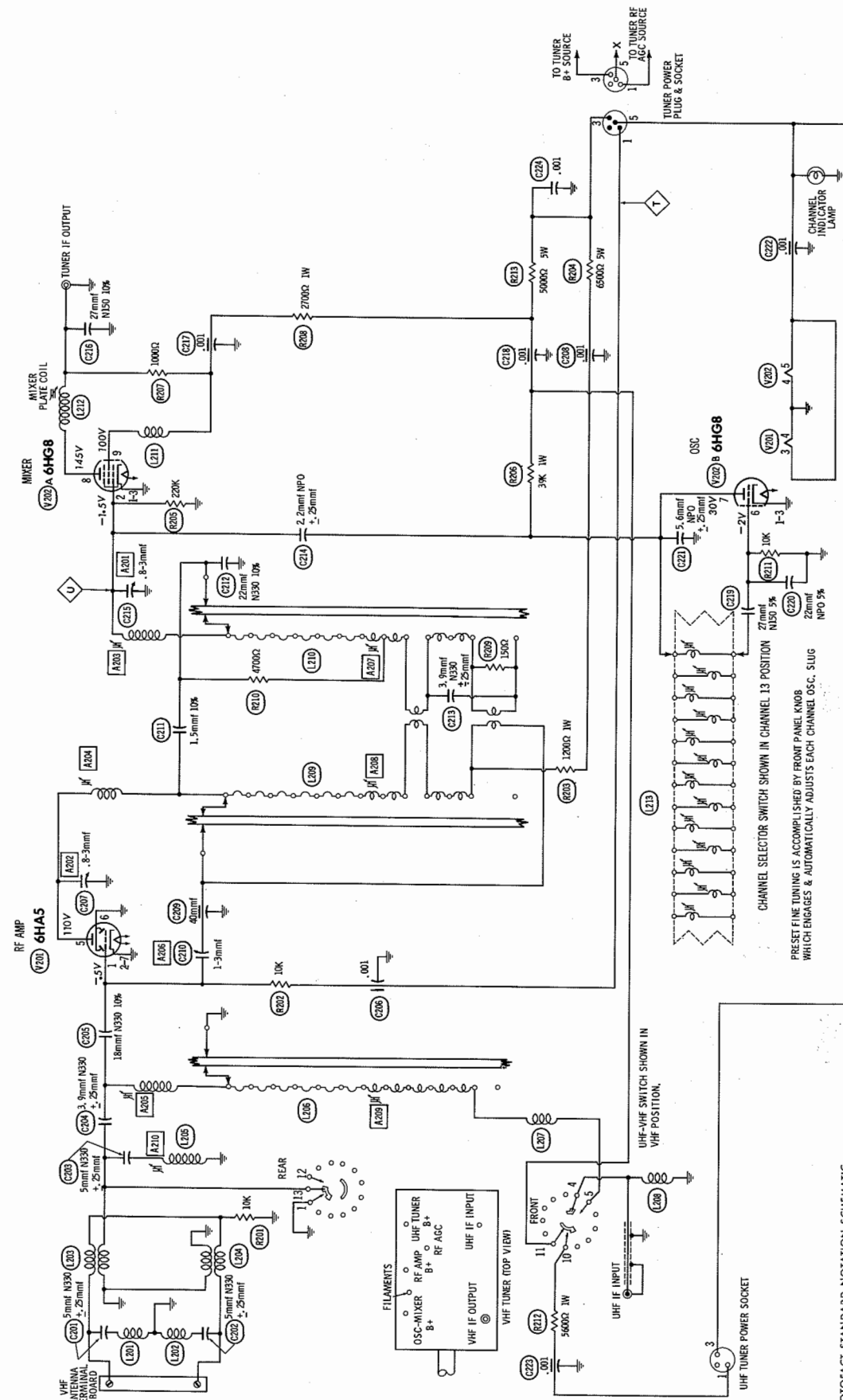
FIG. 201

PHILCO
CHASSIS 14M91/U

FOLDER 4

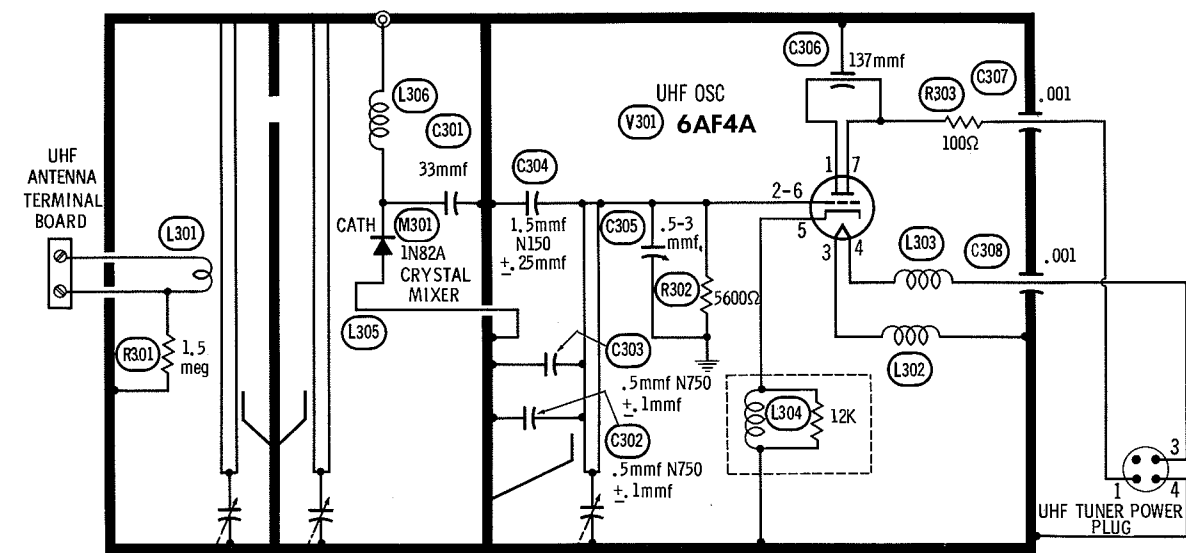


VHF TUNER TT-128D



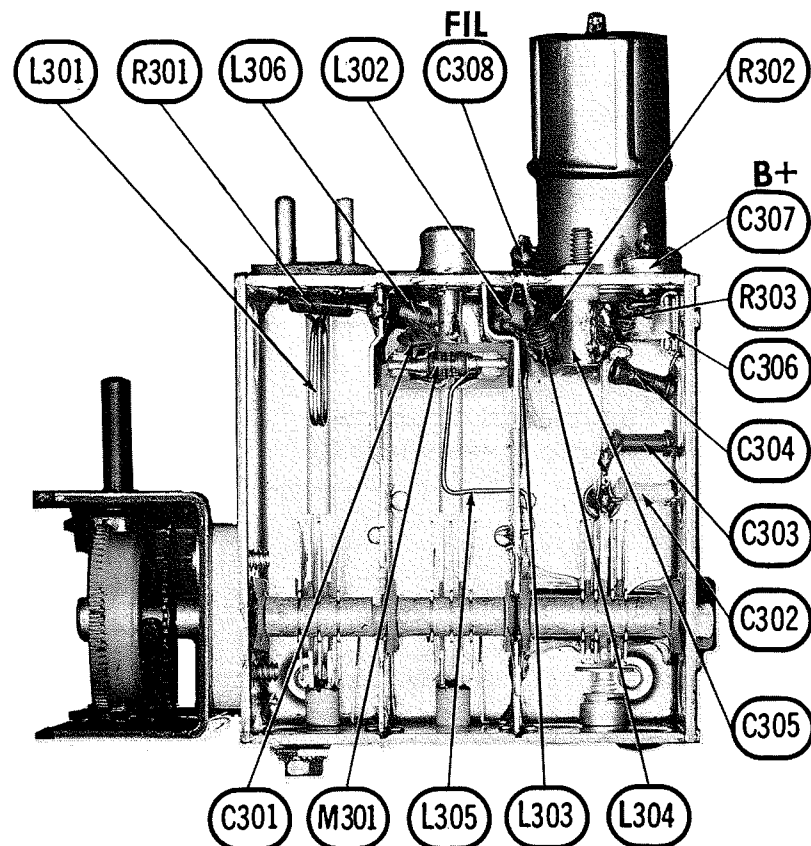
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PHILCO CHASSIS 14M91/U 13 POSITION WAFER-TYPE VHF TUNER TT-128D



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UHF TUNER TT-138D



UHF TUNER TT-138D

VHF TUNER PARTS LIST AND DESCRIPTION TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V201	RF Amp.	6HA5	V202	Mixer - Osc.	6HG8

FIXED 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.
C201	5 N330 ±.25mmf	#30-1251-32						10TCS-V50
C202	5 N330 ±.25mmf	#30-1251-32						10TCS-V50
C203	5 N330 ±.25mmf	#30-1251-32						10TCS-V50
C204	3.9 N330 ±.25mmf	#30-1251-14						10TCS-V39
C205	18 N330 10%	#30-1251-7						10TCS-Q18
C206	.001		EF-001	MFT-1000		CCF-102	CT280A	
C207	.8-3			829-3		CV-1	CT565	
C208	.001		EF-001	MFT-1000		CCF-102	CT280A	
C209	40	#30-1268-21						
C210	1-3			829-4		CV-2	CT551	
C211	1.5 10%	#30-1221-8						
C212	22 N330 10%	#30-1251-56		TCA-22		*		10TCS-Q22
C213	3.9 N330 ±.25mmf	#30-1221-14						10TCS-V39
C214	2.2 NPO ±.25mmf			TCZ-2R2			CNO-522	10TCC-V22
C215	.8-3			829-3		CV-1	CT565	
C216	27 N150 5%	#30-1251-87						10TCP-Q27
C217	.001		EF-001	MFT-1000		CCF-102	CT280A	
C218	.001		EF-001	MFT-1000		CCF-102	CT280A	
C219	27 N150 5%	#30-1251-87						10TCP-Q27
C220	22 NPO 5%			DTZ-22	C10Q22C		CNO-422	10TCC-Q22
C221	5.6 NPO ±.25mmf	#30-1251-16						10TCC-V56
C222	.001		EF-001	MFT-1000		CCF-102	CT280A	
C223	.001		EF-001	MFT-1000		CCF-102	CT280A	
C224	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10

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

Philco Part Number

RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN PART No.	REMARKS			IRC PART No.	WORKMAN PART No.	REMARKS
R204	6500Ω 5W		5G-6500		R213	5000Ω 5W	PW5-5000	5W-SQ-5000	

COILS (RF-IF)

ITEM No.	USE	PHILCO PART No.	NOTES	ITEM No.	USE	PHILCO PART No.	NOTES
L201	RF Choke	32-4645-31		L208	RF Choke		
L202	RF Choke	32-4645-31		L209	RF Wafer	76-13022	Channels 2 - 13
L203	Ant. Balun	32-4725-10		L210	Mixer Wafer	76-13265	Channels 2 - 13
L204	Ant. Balun	32-4725-11		L211	RF Choke	32-4652-71	
L205	IF Trap	32-4645-55		L212	Mixer Plate	32-4822-5	
L206	Ant. Wafer	76-13021	Channels 2 - 13	L213	Osc. Wafer	76-12755-2	Channels 2 - 13
L207	RF Choke						

UHF TUNER PARTS LIST

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V301	UHF Osc.	6AF4A (6DZ4) †			

† Alternate

FIXED 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.
C301	33	#76-12482-10						
C302	.5mmf N750 ±.1mmf	#76-12762-61						
C303	.5mmf N750 ±.1mmf	#76-12762-62						
C304	1.5 N150 ±.25mmf	#76-12762-63						
C305	.5-3.0							
C306	137	#76-12482-6	829-3	829-3		CV-1	CT565	
C307	.001		EF-001	MFT-1000		CCF-102	CT280A	
C308	.001		EF-001	MFT-1000		CCF-102	CT280A	

Philco Part Number

MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	NOTES
M301	Diode	34-8027	Crystal Mixer (1N82A)

COILS (RF-IF)

ITEM No.	USE	PHILCO PART No.	NOTES	ITEM No.	USE	PHILCO PART No.	NOTES
L301	Ant. Input	76-12482-14		L304	RF Choke	76-12482-13	Wound on 12K resistor.
L302	Fil. Choke	76-12482-15		L305	RF Choke	76-12482-41	
L303	Fil. Choke	76-12482-15		L306	UHF IF Output	76-12762-47	

PHILCO
CHASSIS 14M91/U

FOLDER 4

PARTS LIST AND DESCRIPTION (CONTINUED)

Replacement parts shown may be superseded by the availability of newly introduced replacements.
Have your local distributor check Sams COUNTER FACTS for the most up-to-date replacement.

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	SEC. 2	PHILCO PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
T1	128VAC Tap @ 117VAC @ 3.1A	180VAC @ .44A DC	8.3VAC @ 2.3A	32-10019-2					
		SEC. 3							
		6.3VAC @ 12A							

* TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		PHILCO PART No.	Merit PART No.	Stancor PART No.	Thordorson PART No.	Triad PART No.	
T2	Vert. Output (981415-3)	32-10017-2					
T3	Yoke (Horiz. 12.4MH) 70° (Vert. 40MH)	322-0106 (903562-507)				YC-300-1	
T4	Horiz. Output	32-10023-1 (906152-501)					

* COMPONENT CONNECTION DATA

ORIGINAL→	HV TRANSFORMER							VERTICAL OUTPUT					YOKE					YOKE PLUG								
REPLACEMENT ↓	Original Connections							Original Connections					Original Connections					1	2	3	4	5	6	7	8	
	1	2	3	4	5	6							1	3	4	5	10	11	12	TO YOKE TERMINAL						
MERIT																										
STANCOR																										
THORDARSON																										
TRIAD													1	3	4	5	10	11	12							

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	PHILCO PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
T5	16000Ω	3-4Ω	32-10016-1 (322-0162)	A-2902	A-3823	24806	S-53X	

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		PHILCO PART No.	QUAM PART No.	
SP1	5 1/4" PM 3-4Ω	36-1669-27 36-1673-32 ①	52A1	① Used in Models UM/M5214MR, WA.
	5 1/4" PM 6-8Ω	36-1669-15 ②	52A1Z8	② Used in Models UM/M5422MB, WA, UM/M5424MA, WA, UM/M5426MB, MA, WA.
	4" PM 6-8Ω	36-1673-30 ③	4A07Z8	③ Used in Models UM/M5902MA, WA.
	6" PM	36-1680-13 ③		
	10" PM 6-8Ω	36-1653-11 ③	10A4PA	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA			
			PHILCO PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER
M1	1 1/2" #26 Wire		324-0013			

PARTS LIST AND DESCRIPTION

Replacement parts shown may be superseded by the availability of newly introduced replacements.
Have your local distributor check Sams COUNTER FACTS for the most up-to-date replacement.

TUBES

* AMPEREX *		GENERAL ELECTRIC		RCA		RAYTHEON		SYLVANIA	
ITEM No.	USE	TYPE		ITEM No.	USE	TYPE		ITEM No.	USE
V1	1st Video IF Amp.	6JH8		V14	HV Rectifier	3A3			
V2	2nd Video IF Amp.	6GM6		V15	HV Regulator	6BK4			
V3	3rd Video IF Amp.	6EJ7/EF184		V16	Chroma Bandpass Amp. - Color Killer	6GH8A			
V4	1st & 2nd Video Amp.	6AW8A		V17	Burst Amp.	6EW6			
V5	Video Output	12BY7A		V18	Chroma Sync Phase Det. - Color Killer Det.	6JU8			
V6	AGC Keying - Sync Sep. - Noise Inverter	6KA8		V19	Chroma Ref. Osc. Control - Chroma Ref. Osc.	6GH8A			
V7	Sound IF	6EW6		V20	"Z" Demodulator	6GY6			
V8	Audio Detector	6HZ6		V21	B-Y Amp. - R-Y Amp.	6GU7			
V9	Audio Output	6AQ5A		V22	"X" Demodulator	6GY6			
V10	Vert. Mult. - Vert. Output	6F7		V23	Horiz. Blanking Amp. - G-Y Amp.	6GU7			
V11	Horiz. AFC - Horiz. Osc.	6FQ7							
V12	Horiz. Output	6JB6							
V13	Damper	6DW4							

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	PHILCO PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SYLVANIA PART No.	
V24	21FJP22	21FJP22 ①	21FJP22 ①	21FJP22 ②	① Aluminized ② Silver Screen "85"

POWER RECTIFIERS

ITEM No.	MEASURED CURRENT	ORIGINAL Part or Type No.	RECTIFIERS		
			MALLORY PART No.	RCA PART No.	SARKIS TARZIAN PART No.
X1	.44A	34-8048-2	1N540 or 1N2070 ①	1N1764 or 1N2854 or 1N3195	60H or F-6
X2	.44A	34-8048-2	1N540 or 1N2070 ①	1N1764 or 1N2854 or 1N3195	60H or F-6
X3		34-8053-2		CR208	PG33-140H-Q
X4	.0015A	34-8056-1		CR203	PG33-18H-Q
X5	.005A	34-8055-3	1N2091 or A100	1N2855 or 1N3754	20H or F-2
X6A	.025A	34-8055-2	A50 or D50	1N2858	S-648
B	.013A		A50 or D50	1N2858	
C	.021A		A50 or D50	1N2858	

① A single unit may be used for X1 and X2 - VB600.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA					
	CAP.	VOLT.	PHILCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	GENERAL INSTRUMENT PART No.	MALLORY PART No.
C1	160	250	320-0028 (30-2568-84)	AFH1-31-75 ①	XA0315 ①	XC1-19 ①	TMS-1480 ①	WP131.5 ①
C2A	160	250	320-0063 (30-2601-30)	AFH4-108-38	C0330	XC3-28	TMT-3739	FFP427.69
B	80	450			BR200-250	QT1-26	TD-200-300	TVLS94714.4*
C	20	450						
D	40	150						
C3A	80	450	320-0064 (30-2601-31)	AFH4-108-35	C0370	XC3-30	TMT-3783	FP427.67
B	80	450			BR50-50	BR50-50	TD-50-50	TVLS94714.6*
C	20	250						
D	50	50						
C4	50	150	320-0008 (442901-61)	PR51480	BR50-150	QT1-17	TD-50-150	TC49
C5A	80	450	30-2601-32	AFH2-98 ②	A0510	XC1-8	TMS-1800	FP230.7
B	2	350			BR2-450	QT1-1	TD-2-450	TVLS2738.5*

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
① Use insulating sleeve and mounting wafer.
② Use MW-4 Mounting Plate.

FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENDO PART No.	MALLORY PART No.	SPRAGUE PART No.
C7	.001 (.15) †		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C8	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C9	.1 200V		P288N-1	DF-104	PKM2P1	2DP-3-104	GEM-201	2TM-P10
C10	.001		SI 1000	D6-102	LA10D1-C4	CCD-102	B-210	5HK-D10
C11	9 NPO			TC2-10	C10Q1C	CCD-100	CNO-410	10TCC-V82
C12	150 NPO 5%			DT2-150	C10T15C	CCTO-100	CNO-315	10TCC-T15
C13	.001		SI 1000	D6-102	LA10D1-C4	CCD-102	B-210	5HK-D10
C14	680 N2200 10%	#320-0017				*		
C15	.001		SI 1000	D6-102	LA10D1-C4	CCD-102	B-210	5HK-D10
C16	.001		SI 1000	D6-102	LA10D1-C4	CCD-102	B-210	5HK-D10
C17	.001		SI 1000	D6-102	LA10D1-C4	CCD-102	B-210	5HK-D10
C18	.001		SI 1000	D6-102	LA10D1-C4	CCD-102	B-210	5HK-D10
C19	.001		SI 1000	D6-102	LA10D1-C4	CCD-102	B-210	5HK-D10
C20	220 N1500 10%	#30-1262-23				*		
C21	.001		SI 1000	D6-102	LA10D1-C4	CCD-102	B-210	5HK-D10
C22	.001		SI 1000	D6-102	LA10D1-C4	CCD-102	B-210	5HK-D10
C23	.001		SI 1000	D6-102	LA10D1-C4	CCD-102	B-210	5HK-D10

PARTS LIST AND DESCRIPTION (CONTINUED)

Replacement parts shown may be superseded by the availability of newly introduced replacements.
Have your local distributor check Sams COUNTER FACTS for the most up-to-date replacement.

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C24	.001	#320-0035	SI 1000	D6-102	LA10D1-C4	CCD-102	B-210	5HK-D10
C25	560 N1500 5%		DI-2200	CF-222	JB6D22	CCD-222	GP222	10TS-D22
C26	.0022 10%		SI 1000	D6-102	LA10D1-C4	CCD-102	B-210	5HK-D10
C27	.001			TCZ-10	C10Q1C	*	CNO-410	10TCC-Q10
C28	10 NPO 5%			TCZ-10	C10Q1C	*	CNO-410	10TCC-Q10
C29	100 N330 10%			TCZ-10	C10Q1C	*	CNO-410	10TCC-Q10
C30	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C31	7 NPO 5%			TCZ-6R7	C10V88C	CNO-568	CNO-568	10TCC-V88
C32	3.5 NPO			TCZ-3R3	C10V33C	CNO-533	CNO-533	10TCC-V33
C33	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C34	.1 200V		P288N-1	DF-104	PKM2P1	2DP-3-104	GEM-201	2TM-P10
C35	.01	Note 1 (3.3) †	BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C36	.0022 10%		DI-2200	CF-222	JB6D22	CCD-222	GP222	10TS-D22
C37	380 10%		DI-390	DD-391	LA10T39-C4	CCD-391	GP339	10TS-T39
C38	380 10%		DI-390	DD-391	LA10T39-C4	CCD-391	GP339	10TS-T39
C39	.22 200V		P288N-22	DD-103	PM2P22	2DP-4-224	GEM-202	2TM-P10
C40	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C41	.01		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C42	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C43	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C44	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C45	.220 10%	#320-0018	DI-220	DD-221	LA10T22-S3	CCD-221	GP322	10TS-T22
C46	.001		SI 1000	D6-102	LA10D1-C4	CCD-102	B-210	5HK-D10
C47	180 1KV 10%		DI-180	DD-181	LA10T18-S3	CCD-181	GP318	10TS-T18
C48	1.5 N3300			TCZ-10	C10Q1C	*	CNO-410	10TCC-Q10
C49	10 NPO 5%			DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C50	5 N1500 5%		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C51	.01			DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C52	750 N2200 5%		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C53	.01		DI-560	DD-561	LA10T56-C4	CCD-561	B-356	5GA-T56
C54	560		P288N-047	DD-503	CUB3S47	4DP-3-473	GEM-2147	4TM-P10
C55	.01	#30-1225-5	BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C56	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C57	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C58	.47 N750 10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CNT-447	10TCU-Q47
C59	.0068		BPD-0068	DD-882	BYA10D68	CCD-682	B-268	5HK-D88
C60	.001		SI 1000	D6-102	LA10D1-C4	CCD-102	B-210	5HK-D10
C61	.0047		BPD-0047	DD-472	BYA10D47	CCD-472	B-247	5HK-D47
C62	.001 2KV 10%		BPD-0033	DD-332	BYA10D33	CCD-332	B-233	5HK-D33
C63	.0033 10%		DI-380	DD-381	LA10T38-C4	CCD-381	GP338	10TS-T38
C64	.390 10%		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C65	.47 NPO 10%	#320-0083	BPD-0022	DD-222	C10Q47C	CCTO-470	CNO-447	10TCC-Q47
C66	.0015		BPD-0015	DD-152	LA10D15-C4	CCD-152	B-215	10TS-D15
C67	.0022		BPD-0022	DD-222	LA10D22-C4	CCD-222	B-222	10TS-D22
C68	.0015		BPD-0015	DD-152	LA10D15-C4	CCD-152	B-215	10TS-D15
C69	.036 600V 10%		BE6S39		PM6S39	6DP-3-393	PVC6139	6PS-S35
C70	.0027 N5600 10%			DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P10
C71	.1 600V		P488N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P10
C72	.1 600V		P488N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P10
C73	.47 200V		P288N-47	DD-822	PKM16D82	2DP-5-474	GEM-2047	2PS-P47
C74	.0082 1KV		P1088N-008	DD-503	CUB3S47	4DP-3-473	GEM-2147	4TM-P10
C75	.047 200V	#30-1239-7	BPD-0068	DD-681	BYA10T68	CCD-681	B-368	10TS-T68
C76	.680		BPD-0068	DD-681	BYA10T68	CCD-681	B-368	10TS-T68
C77	.680		BPD-0068	DD-681	BYA10T68	CCD-681	B-368	10TS-T68
C78	.0068 400V 10%		BE6D68		WMF4D68	6DP-1-682	PVC4268	6PS-D68
C79	.001 2KV 10%			DF-104	PKM60D1			TYM-216
C80	100 N1500 3KV 5%			DTZ-68	C10Q68C	CCTO-680	CNO-468	10TCC-Q68
C81	560 N3300 2.5KV 10%			DD-821	JB6T8	CCD-821	GP382	10TS-T82
C82	560 N3300 2.5KV 10%			DD-821	JB6T8	CCD-821	GP382	10TS-T82
C83	68 NPO 10%		NPO-DI 68	TCN-27	C10Q25U	CCTN-270	CNT-427	10TCU-Q27
C84	820 10%		DI-820	DD-102	PM2P15	2DP-3-154	GEM-2015	2PS-P15
C85	820 10%	#320-0082	DI-820	DD-102	PM2P15	2DP-3-154	GEM-2015	2PS-P15
C86	27 N750 10%		P288N-15	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C87	.15 200V			DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C88	390 1.5KV 5%			DD-152	PM6D15	6DP-1-152	PVC6215	6PS-D15
C89	.01 400V		ADM-19-681	DD-103	PM6S1	6DP-2-103	GEM-611	6PS-S10
C90	.005 600V 10%		BE6D15	DD-103	PM6S1	6DP-2-103	GEM-611	6PS-S10
C91	.01 600V		P488N-01	DD-103	CUB6P1	6DP-4-104	GEM-601	6TM-P10
C92	.01 600V		P488N-01	DD-103	CUB6P1	6DP-4-104	GEM-601	6TM-P10
C93	.1 600V		P488N-1	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C94	.047 600V	#320-0010	P488N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C95	.68 4KV 10%			DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C96	130 N2200 6KV		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C97	.01		DAC-27	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C98	.01		P488N-1	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C99	.01 1.4KV		BPD-000022	DD-220	LA10Q22-SL	CCD-220	GP422	10TCC-Q22
C100	.1 600V			DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C101	22 1KV			DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C102	.088 600V 10%	#30-4700-273		DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C103	.082 600V 10%			DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C104	.01 1.4KV			DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C105	27 N750			DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C106	120 N1500 4KV 10%			DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C107	.001		BPD-001	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C108	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C109	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C110	.120 10%		ADM-15-331	DD-120	LA10T12-S3	CCD-121	GP312	10TS-T12
C111	.330 5%		ADM-15-331	DD-120	LA10T12-S3	CCD-121	GP312	10TS-T12
C112	.330 5%	#320-0085	ADM-15-331	DD-120	LA10T12-S3	CCD-121	GP312	10TS-T12
C113	.330 5%		ADM-15-331	DD-120	LA10T12-S3	CCD-121	GP312	10TS-T12
C114	.330 5%		ADM-15-331	DD-120	LA10T12-S3	CCD-121	GP312	10TS-T12
C115	.10 NPO 10%		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C116	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-2147	4TM-P10
C117	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C118	.820 10%		DI-820	DD-821	JB6T8	CCD-821	GP382	10TS-T82
C119	.001		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C120	150 10%		DI-150	DD-151	LA10T15-S3	CCD-151	GP315	10TS-T15
C121	.470 N750 5%			TCN-470	C10Q47U	CCTN-470	CNT-447	10TCU-Q47
C122	.01	#320-0085	BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C123	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C124	.1 10%			DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C125	.01			DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C126	.1 200V			DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C127	.4 NPO ±.5mmf			DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C128	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C129	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C130	10 NPO 10%		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C131	220 N750 10%			DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C132	6 NPO 5%			DD-103	BYA10S1	CCD-103	B-110	5HK-S10

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA						
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELEMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.	
C133	.01	#30-1251-54	BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10	
C134	.82 NPO 10%		ADM-15-151	DD-103	BYA10S1	CCD-103	B-110	5HK-S10	
C135	.150 5%		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-2147	4TM-P10	
C136	.047 200V			DD-103	BYA10S1	CCD-103	B-110	5HK-S10	
C137	.33 N150			DD-103	BYA10S1	CCD-103	B-110	5HK-S10	
C138	.01			DD-103	BYA10S1	CCD-103	B-110	5HK-S10	
C139	.01 600V			DD-103	BYA10S1	CCD-103	B-110	5HK-S10	
C140	.01			DD-103	BYA10S1	CCD-103	B-110	5HK-S10	
C141	.33 N150			DD-103	BYA10S1	CCD-103	B-110	5HK-S10	
C142	.01 600V			DD-103	BYA10S1	CCD-103	B-110	5HK-S10	
C143	.01	#30-1251-54	BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10	
C144	.22 400V		P488N-22	DD-103	BYA10S1	CCD-103	B-110	5HK-S10	
C145	.01 600V		P688N-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10	
C146	.01		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10	
C147	.056 400V 10%		BE6S56	DF-104	CUB4P1	4DP-3-563	PVC4156	4TM-P10	
C148	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10	
C149	.1 200V		P288N-1	DF-104	PKM2P1	2DP-3-104	GEM-201	2TM-P10	
C150	.12 200V 10%			DD-	PM4P12				
C151	.082 200V 10%				PM4S82	6DP-4-823	PVC6182	6PS-S82	
C152	.01			BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C153	.01	#320-0011	BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10	
C154	.47 2KV 10%					4DP-3-473	GEM-417	4TM-P10	
C155	.047 600V			P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C156	.220 10%		Note 1	DI-220	DD-221	LA10T22-S3	CCD-221	GP322	10TS-T22

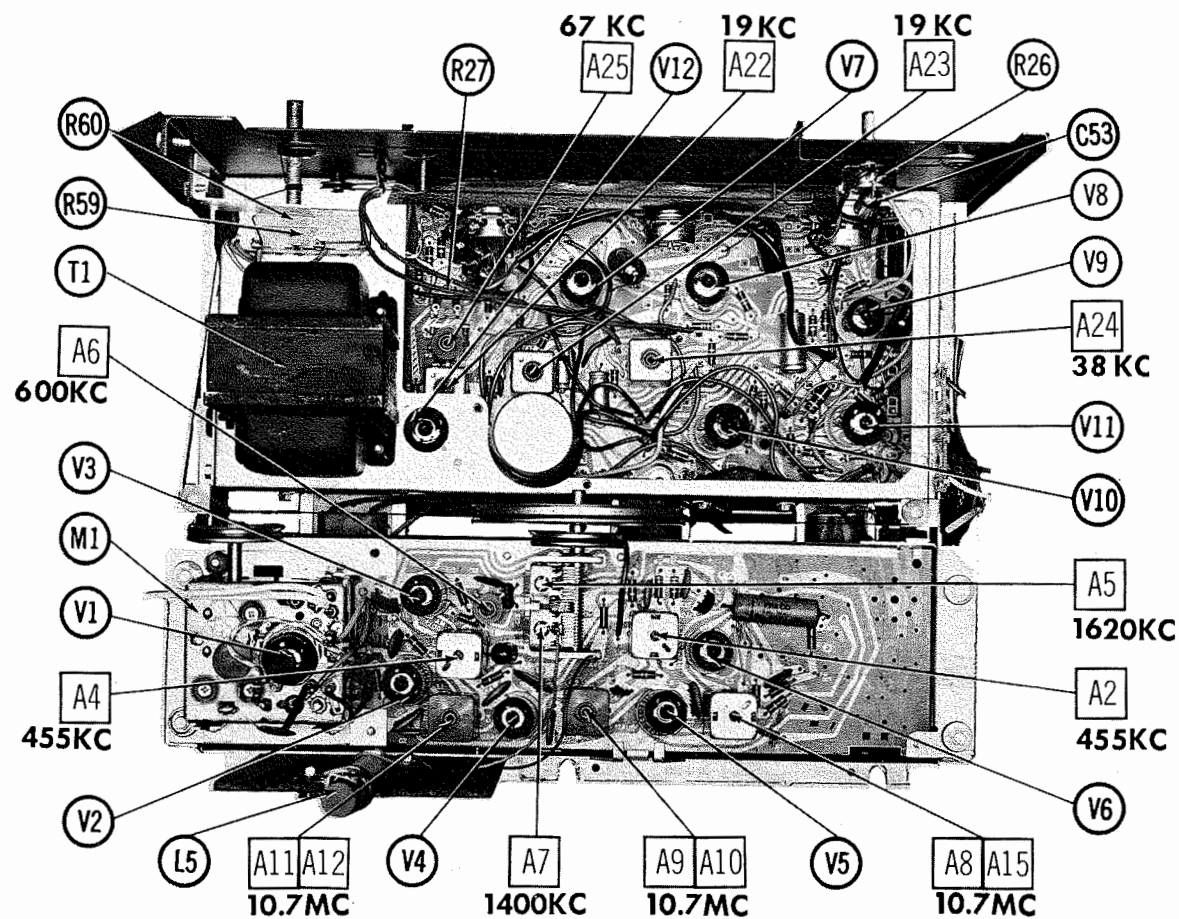
PHOTOFACT® Folder

with CIRCUITRACE®

PHILCO AM-FM-FM STEREO
used in MODELS M & UM5902MA/WA

IMPORTANT FILING NOTICE

This PHOTOFACT Folder covers equipment used with the TV chassis covered in PHOTOFACT SET 698 FOLDER 4. File this Folder with the TV Folder in the yellow filing jacket provided.



PHILCO AM-FM-FM STEREO
used in MODELS M & UM5902MA/WA

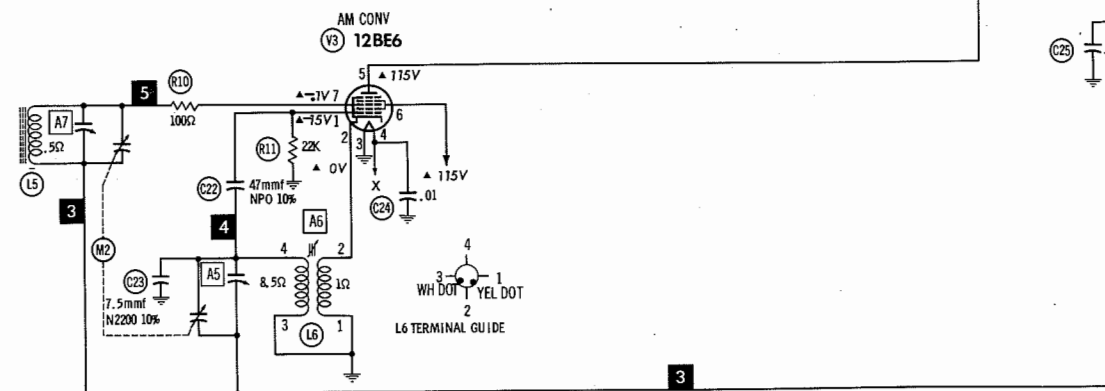
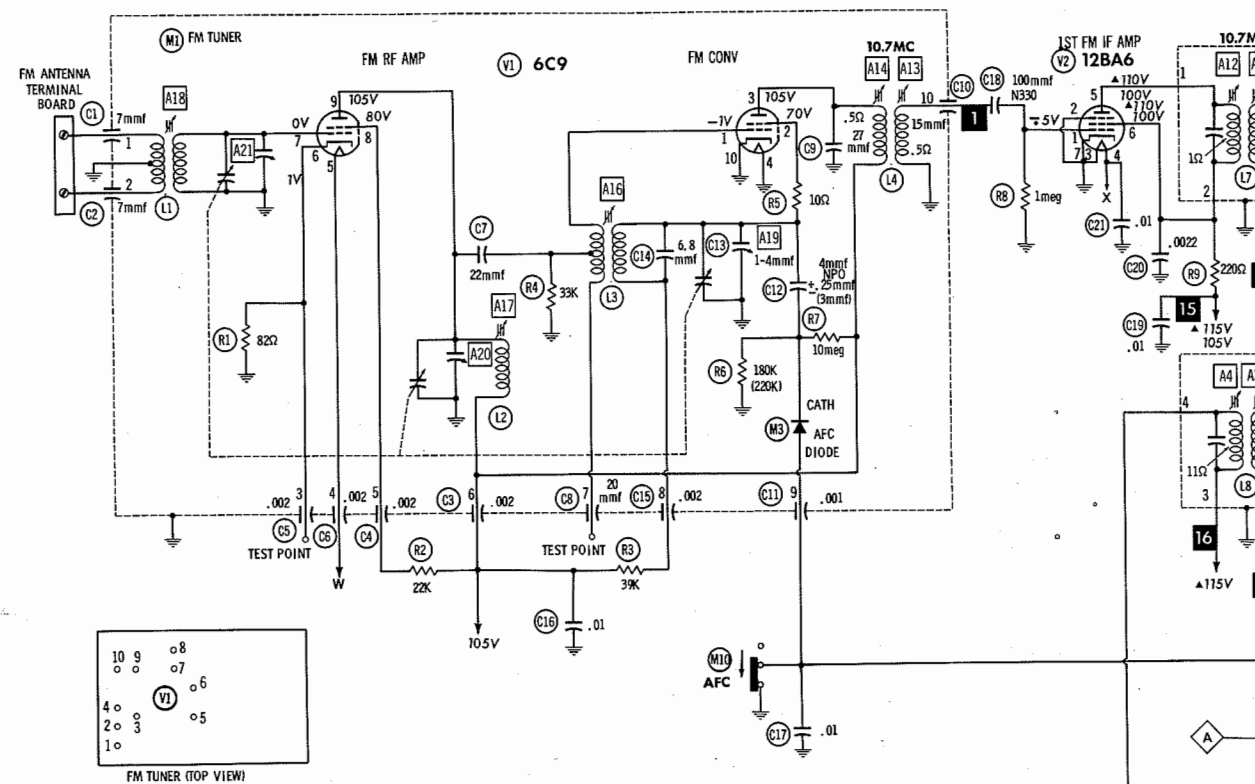
TRADE NAME	Philco
MANUFACTURER	Philco Corp., A Subsidiary of Ford Motor Co., Tioga & "C" Streets, Philadelphia, Pennsylvania
TYPE SET	AC Operated 6 Tube AM-FM Tuner, and FM Multiplex with 6 Tube Stereo Amplifier and 4 Speed Automatic Record Changer
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 100 Watts, .95 Amp. @ 117 Volts AC
TUNING RANGE	BROADCAST 535 - 1620KC FREQ. MOD. 88 - 108MC

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

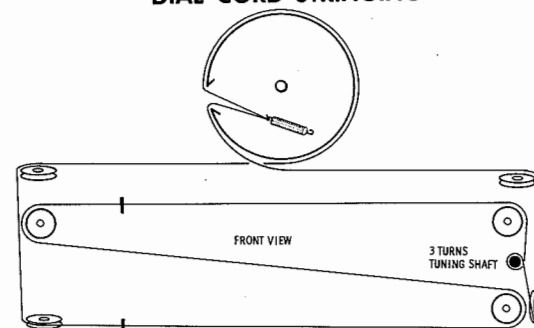
The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. MN534

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DATE 6-64 SET 698 FOLDER 4-A



DIAL CORD STRINGING



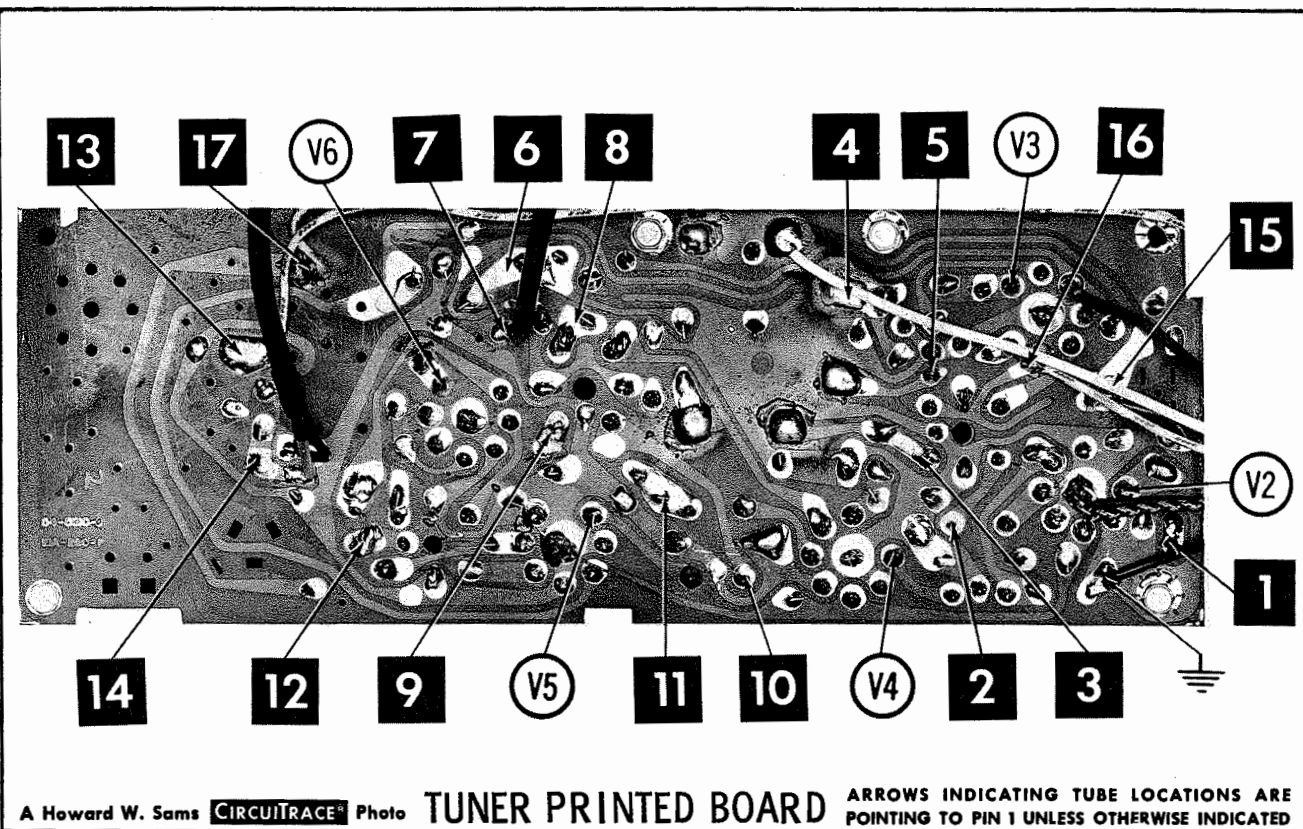
- See parts list for alternate value or application.
 1. Voltage measurements taken with vacuum tube voltmeter.
 2. All controls set for normal operation, no signal applied.
 3. Measured values are from socket pin or terminal to common ground.
 4. All terminals viewed from bottom unless otherwise designated.
 5. Numbers assigned to terminals may not be found on the unit.
 6. Supply voltage maintained at rated value for voltage readings.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

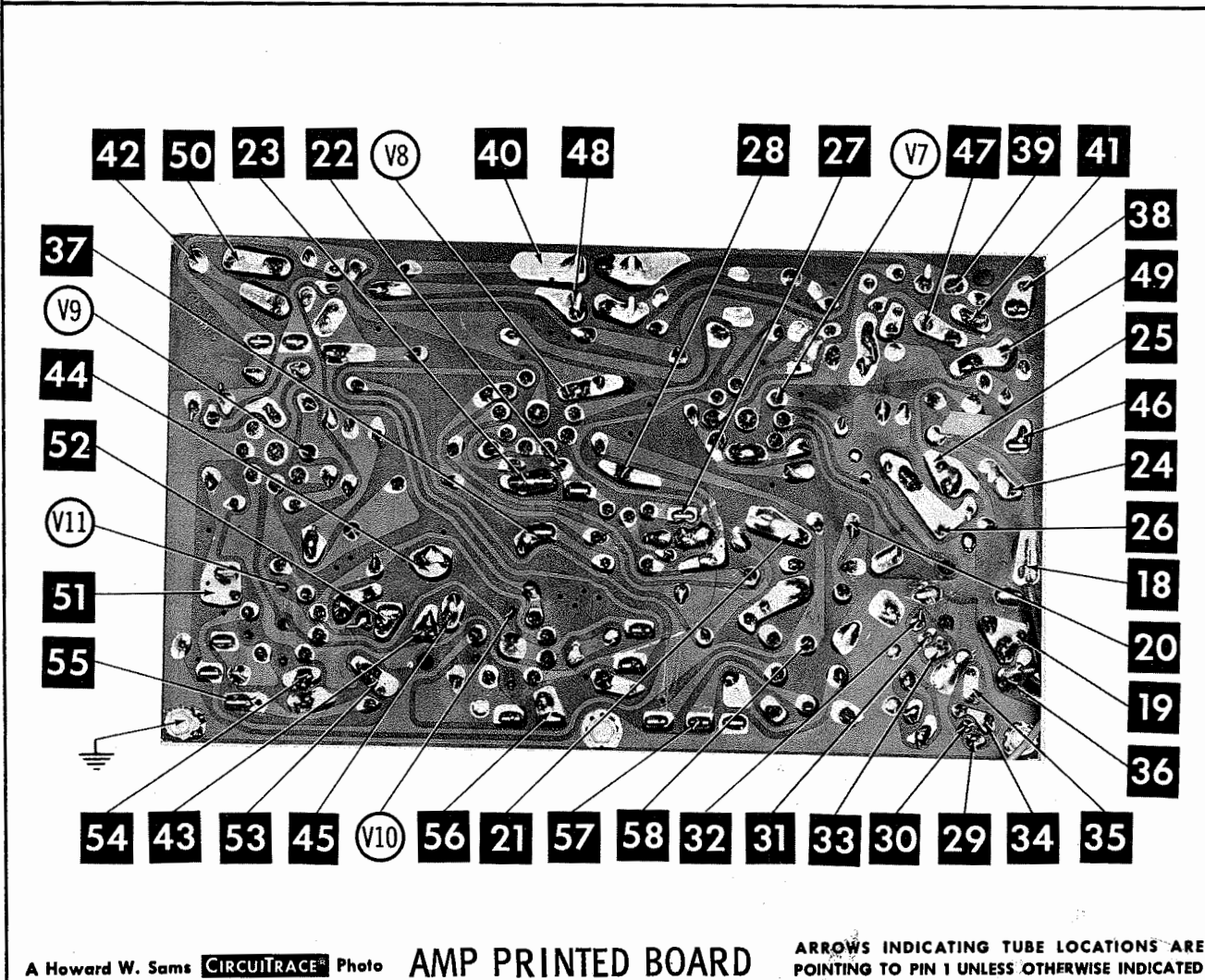
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RESISTANCE				
ITEM	TUBE	Pin 1	Pin 2	Pin 3
V1	6C9	33K	† 43K	† 4200Ω
V2	12BA6	1meg	0Ω	FIL
V3	12BE6	▲ 22K	▲ 1Ω	FIL
V4	12BA6	10Ω	0Ω	FIL
V5	12AU6	100K	0Ω	FIL
V6	12AL5	76K	50K	FIL
V7	12AX7A	● † 3200Ω	● 20Ω	● 470Ω
V8	12AX7A	† 100K	500K	2700Ω
V9	6AV6	200K	2200Ω	FIL
V10	6BQ5	NC	500K	68Ω
V11	6BQ5	NC	400K	68Ω
V12	6CA4	57Ω	NC	† 300K

ALL MEASUREMENTS TAKEN IN "FM" POSITION.
 # THIS READING WILL VARY DEPENDING UPON
 † MEASURED FROM PIN 3 OF V12
 NC NO CONNECTION



A Howard W. Sams CIRCUITRACE® Photo TUNER PRINTED BOARD ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



A Howard W. Sams CIRCUITRACE® Photo AMP PRINTED BOARD ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

ALIGNMENT INSTRUCTIONS

Maintain line voltage at rated value. Allow a 15 minute warmup for receiver and equipment.
Use only enough generator output to obtain a suitable indication.
Suggested Alignment Tools:
A1 thru A5, A7, A19, A20, A21 GENERAL CEMENT #9089, 8868, 9087 ... WALSCO #2541, 2528, 2587
A6, A8 thru A17, A22 thru A25 GENERAL CEMENT #9302, 8806, 8869 ... WALSCO #2511, 2544, 2588
A18 GENERAL CEMENT #9302, 9296, 9297 ... WALSCO #2511, 2546, 2547

AM ALIGNMENT - SELECTOR IN AM POSITION

Fashion loop of several turns of wire and connect generator across loop.

GENERATOR FREQUENCY	DIAL SETTING	INDICATOR	ADJUST	REMARKS
1. 455KC (Unmod.)	Tuning gang fully open.	DC probe of VTVM to point \diamond ; common to ground.	A1, A2, A3, A4	Adjust for maximum.
2. 1620KC	"	"	A5	"
3. 600KC	600KC	"	A8	Rock tuning gang and adjust for maximum. Repeat steps 2 and 3.
4. 1400KC	Tune to signal	"	A7	Adjust for maximum.

FM ALIGNMENT USING AM SIGNAL GENERATOR - SELECTOR IN FM POSITION

High side to ungrounded shield over FM converter tube, low side to ground; OR across FM antenna terminals with 120 Ω carbon resistor in series with each lead.

GENERATOR FREQUENCY	DIAL SETTING	INDICATOR	ADJUST	REMARKS
5. 10.7MC (Unmod.)	Point of non-interference.	DC probe of VTVM to point \diamond ; common to ground.	A8, A9, A10, A11, A12, A13, A14	Adjust for maximum.
6. "	"	DC probe to point \diamond ; common to ground.	A15	Adjust for zero reading. A positive or negative reading will be obtained on either side of the correct setting.
7. 90MC (Unmod.)	90MC	DC probe of VTVM to point \diamond ; common to ground.	A16, A17, A18	Adjust for maximum.
8. 108MC	108MC	"	A19, A20, A21	"

FM IF ALIGNMENT USING FM SIGNAL GENERATOR - SELECTOR IN FM POSITION

High side to ungrounded shield over FM converter, low side to ground.
Use 60 μ frequency modulated signal with 450KC sweep. Use 120 μ sawtooth voltage in scope for horizontal deflection.

GENERATOR FREQUENCY	DIAL SETTING	INDICATOR	ADJUST	REMARKS
5. 10.7MC (450KC Swp.)	Point of non-interference.	Vert. amp. of scope to point \diamond ; low side to ground.	A8, A9, A10, A11, A12, A13, A14	Adjust for maximum gain and symmetry of response similar to Fig. 1 with marker as shown.
6. "	"	Vert. amp. to point \diamond ; low side to ground.	A15	Adjust to place marker at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A8 for maximum amplitude and straightness of crossover lines.

FM STEREO MULTIPLEX ALIGNMENT USING FM STEREO SIGNAL GENERATOR (\pm .0001%) ACCURACY)

High side to point \diamond , low side to ground.
Suggested Alignment Tools:

GENERATOR FREQUENCY	INDICATOR	ADJUST	REMARKS
9. 19KC	Vert. Amp. of scope thru 47K to point \diamond , low side to ground.	A22, A23, A24	Adjust for maximum.
10. 67KC	Vert. Amp. thru 47K to point \diamond , low side to ground.	A25	Use Audio Oscillator if necessary. Adjust for MINIMUM.
11. Modulated Left channel	Vert. Amp. to point \diamond , low side to ground.	A22, A23	Check for maximum output. It may be necessary to slightly retouch A22 and A23.
12. Modulated Right channel	Vert. Amp. to point \diamond , low side to ground.	R27	Adjust for maximum output.

To align multiplex section using an air signal, first make sure FM section is properly aligned. Tune in a strong FM stereo signal. Follow steps 9 thru 12 above except in step 10 adjust to eliminate whistle or interference.

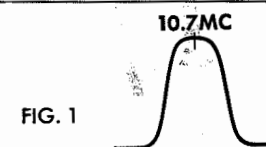


FIG. 1

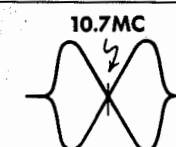
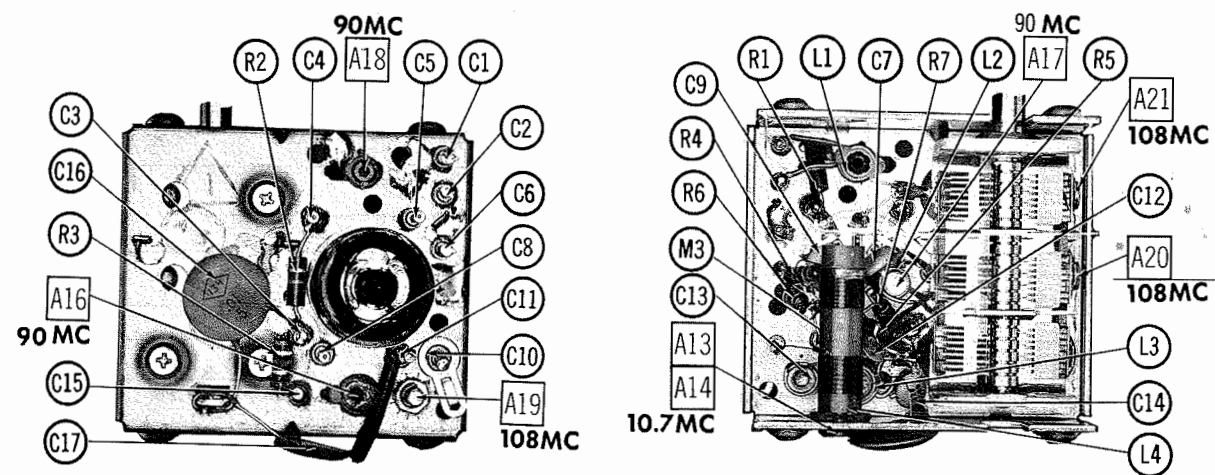


FIG. 2

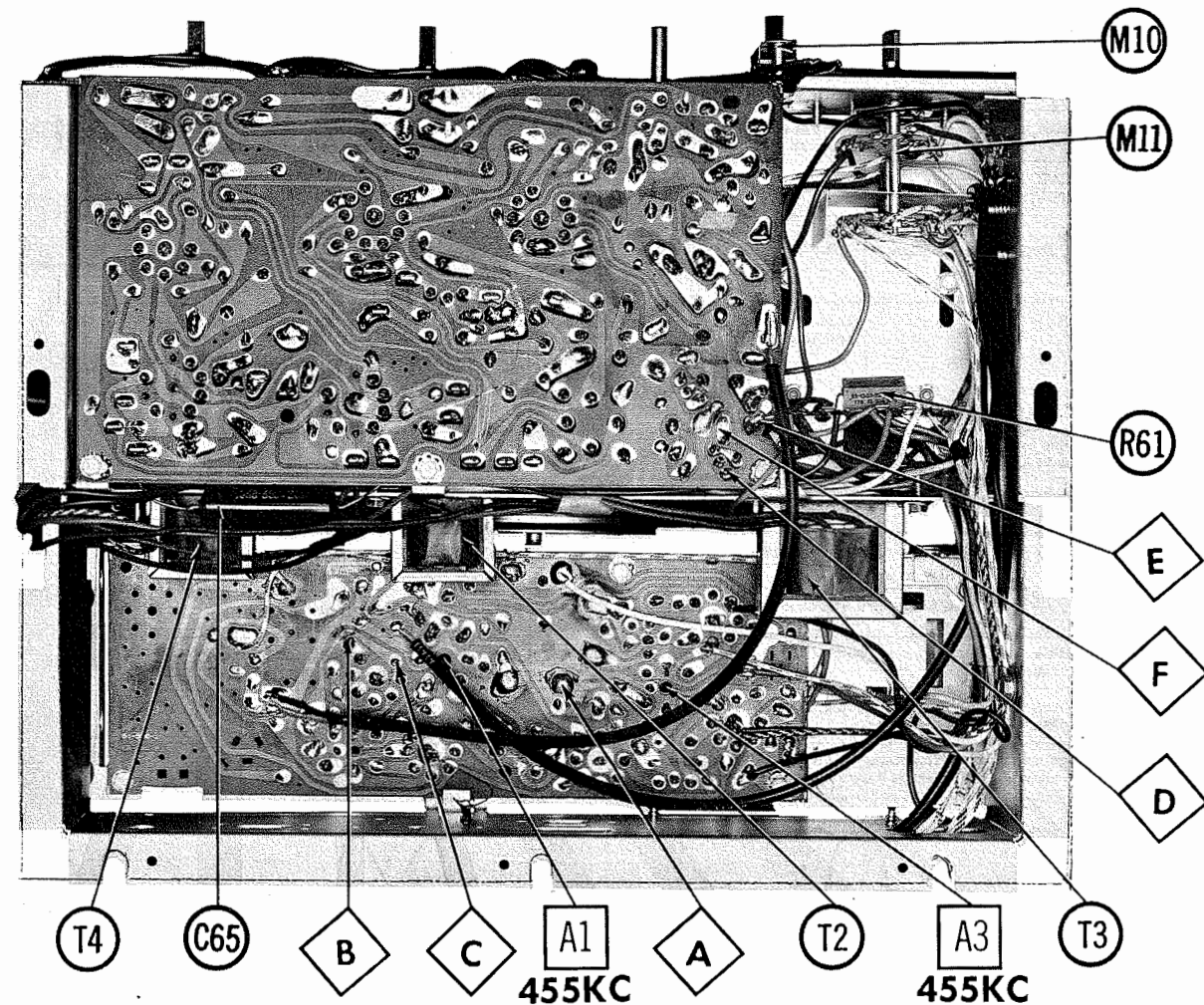
PHILCO AM-FM-FM STEREO
used in MODELS M & UM5902MA/WA

FOLDER 4-A

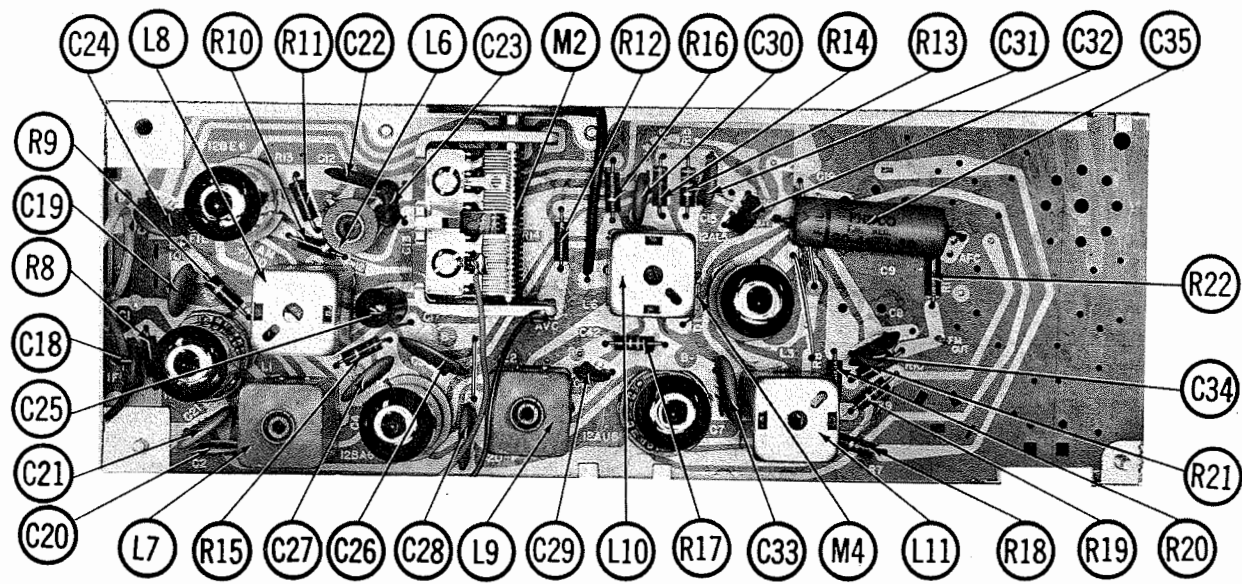
SET 698 FOLDER 4-A



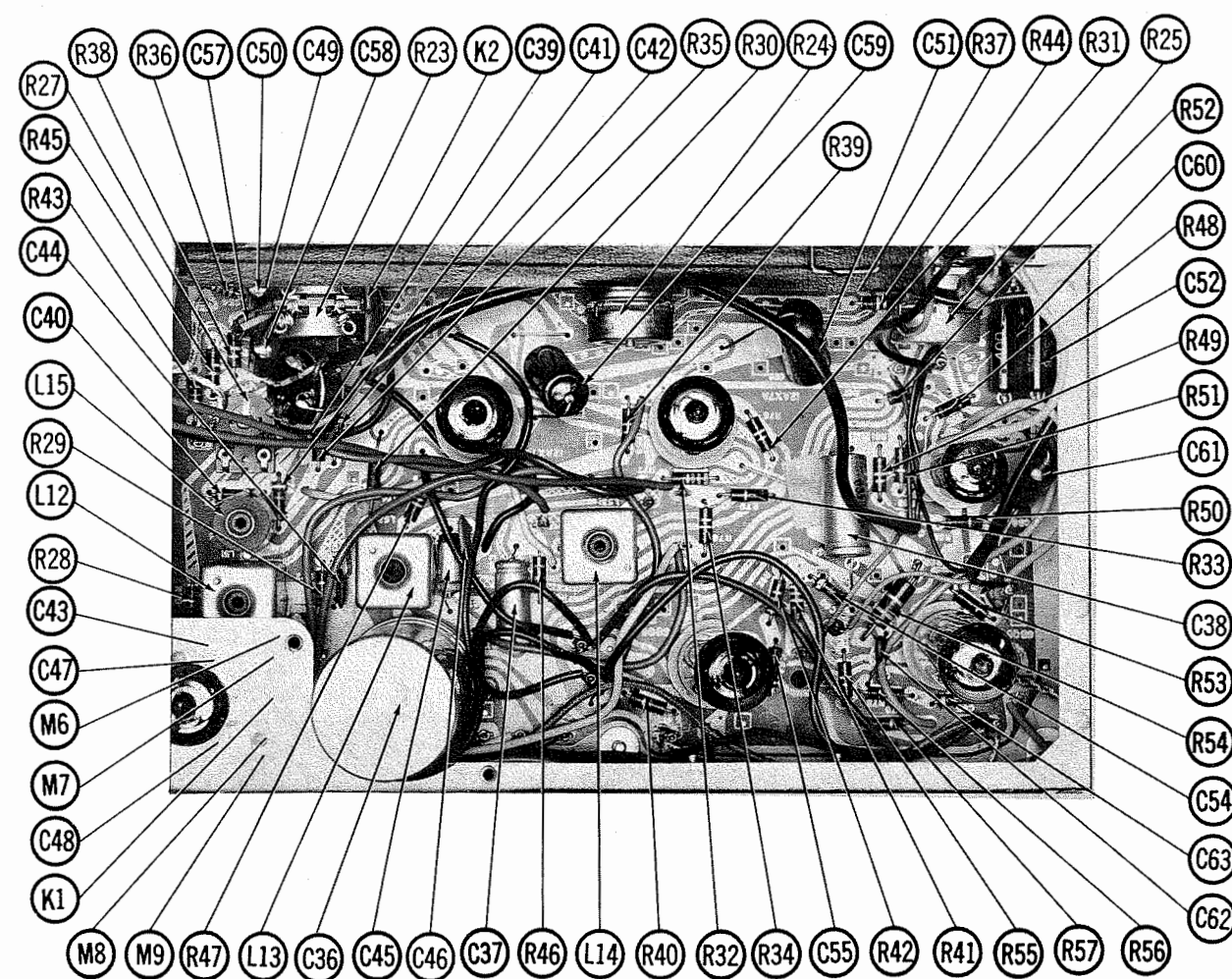
FM RF SUBCHASSIS



CHASSIS BOTTOM VIEW



TUNER PRINTED BOARD TOP VIEW



AMP PRINTED BOARD TOP VIEW

RADIO PARTS LIST AND DESCRIPTION

TUBES

ITEM No.	• AMPEREX •		• GENERAL ELECTRIC •		• RCA •		• RAYTHEON •		• SYLVANIA •	
	ITEM No.	TYPE	ITEM No.	TYPE	ITEM No.	USE	ITEM No.	USE	ITEM No.	TYPE
V1	FM RF Amp. - FM Conv.	6C9			V4	AM - 2nd FM IF Amp. Limiter				12BA6
V2	1st FM IF Amp.	12BA6			V5	Discriminator				12AU6
V3	AM Converter	12BE6			V6					12AL5

FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA				SPRAGUE PART No.
			AEROVOX PART No.	CORNELL DUBILIER PART No.	ELENCO PART No.	MALLORY PART No.	
C1	7	#78-12965-25					
C2	.002	#78-12965-30					
C3	.002	#78-12965-19					
C4	.002	#78-12965-19					
C5	.002	#78-12965-19					
C6	.002	#78-12965-19					
C7	.002	#78-12965-19					
C8	.002	#78-12965-19					
C9	.002	#78-12965-19					
C10	.002	#78-12965-19					
C11	.002	#78-12965-19					
C12	.002	#78-12965-19					
C13	.002	#78-12965-19					
C14	.002	#78-12965-19					
C15	.002	#78-12965-19					
C16	.002	#78-12965-19					
C17	.002	#78-12965-19					
C18	.002	#78-12965-19					
C19	.002	#78-12965-19					
C20	.002	#78-12965-19					
C21	.002	#78-12965-19					
C22	.002	#78-12965-19					
C23	.002	#78-12965-19					
C24	.002	#78-12965-19					
C25	.002	#78-12965-19					
C26	.002	#78-12965-19					
C27	.002	#78-12965-19					
C28	.002	#78-12965-19					
C29	.002	#78-12965-19					
C30	.002	#78-12965-19					
C31	.002	#78-12965-19					
C32	.002	#78-12965-19					
C33	.002	#78-12965-19					
C34	.002	#78-12965-19					
C35	.002	#78-12965-19					

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

Philco Part Number

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		PHILCO PART No.	MERIT PART No.	STANCOR PART No.	WORKMAN PART No.	
L1	FM Ant.	78-12965-27				
L2	FM RF	78-12965-30				
L3	FM IF	78-12965-28				
L4	1st FM IF	78-12965-28				
L5	Loopstick	32-4822-16				
L6	AM Osc.	32-4822-16				
L7	2nd FM IF	32-4822-16				
L8	3rd FM IF	32-4822-16				
L9	3rd FM IF	32-4822-16				
L10	2nd AM IF	32-4822-16				
L11	Discriminator	32-4822-16				

MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	NOTES
M1	FM Tuner	78-12756-2	
M2	AM Tuning Cap.	31-2790-28	
M3	Diode	78-12965-28	
M4	Printed Board	54-5810-6	

AMP & MPX PARTS LIST AND DESCRIPTION

TUBES

ITEM No.	• AMPEREX •		• RCA •		• RAYTHEON •		• SYLVANIA •	
	ITEM No.	TYPE	ITEM No.	TYPE	ITEM No.	USE	ITEM No.	TYPE
V7	19KC Amp. - AF Amp.	12AX7A			V10	Output Rectifier		6BQ5
V8	Phase Inverter	12AX7A			V11	Output Rectifier		6BQ5
V9		6AV8			V12	Rectifier		6CA4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING	CAP.	VOLT.	REPLACEMENT DATA				SPRAGUE PART No.
				PHILCO PART No.	AEROVOX PART No.	CORNELL DUBILIER PART No.	ELENCO PART No.	
C36A	30	450	450	30-2594-4	AFH3-45-50			
C37	100	450	450	30-2594-17	PRSI740			
C38	20	25	25	30-2594-15	CRE323A	NLW100-12		

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

† Use Printed Circuit Board Adapters.

FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA				SPRAGUE PART No.
			AEROVOX PART No.	CORNELL DUBILIER PART No.	ELENCO PART No.	MALLORY PART No.	
C39	2	10V					
C40	330	10V					
C41	82	10V					
C42	82	10V					
C43	.0015	10V					
C44	.0015	10V					
C45	.0015	10V					
C46	.0015	10V					
C47	.0015	10V					
C48	.0015	10V					
C49	.0015	10V					
C50	.0022	400V					
C51	.0047	600V					
C52	.0033	400V					
C53	.0022	400V					
C54	150	10V					
C55	150	10V					
C56	150	10V					
C57	47	50V					
C58	.0022	400V					
C59	.0047	600V					

AMP & MPX PARTS LIST AND DESCRIPTION (CONTINUED)

FIXED CAPACITORS(cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA				SPRAGUE PART No.
			AEROVOX PART No.	CORNELL DUBILIER PART No.	ELENCO PART No.	MALLORY PART No.	
C60	.0033	400V 10%					
C61	.022	400V					
C62	.022	400V					
C63	.022	400V					
C64	.022	400V					
C65	.022	400V					

CONTROLS

Philco Part Number

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

ITEM No.	USE	RESISTANCE	REPLACEMENT DATA				MALLORY PART No.
			PHILCO PART No.	CORNELL DUBILIER PART No.	ELENCO PART No.	MALLORY PART No.	
R22A	Loudness, Left	2meg, 1meg Tap					
R23B	Loudness, Right, Switch	2meg, 1meg Tap					
R24A	Bass, Left	2meg, 1meg Tap					
R24B	Bass, Right	2meg, 1meg Tap					
R25A	Treble, Right	2meg, 1meg Tap					
R25B	Treble, Left	2meg, 1meg Tap					
R26	Balance	2meg, 1meg Tap					
R27	Separation	2meg, 1meg Tap					

1. Use Base Element with "PC" Terminals.

2. Use QCB1 instead of Tap Mount Plate in TMS.

RESISTORS (Power and Special)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA				REMARKS
			PHILCO PART No.	CORNELL DUBILIER PART No.	ELENCO PART No.	MALLORY PART No.	
R27	1750 5W	5W-90-175					
R28	20000 10W	10W-20000					

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		PHILCO PART No.	MERIT PART No.	STANCOR PART No.	WORKMAN PART No.	
L12	19KC Input	32-4828-1				
L13	19KC Interstage	32-4828-2				
L14	38KC Output	32-4828-3				
L15	67KC Tap	32-4754-6				

TRANSFORMER (POWER)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA				NOTES
			PHILCO PART No.	CORNELL DUBILIER PART No.	ELENCO PART No.	MALLORY PART No.	
T1	117VAC	600VCT					
T2	600VCT	12.5VCT					
T3	600VCT	12.5VCT					
T4	600VCT	12.5VCT					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE	REMARKS	REPLACEMENT DATA				NOTES
			PHILCO PART No.	CORNELL DUBILIER PART No.	ELENCO PART No.	MALLORY PART No.	
T2	67000	8-100					
T3	116000	CT 14-180					
T4	67000	8-100					

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	PHILCO PART No.	REPLACEMENT DATA
K1	MPX Detector Network	100K, 100K, 100K, 100K, 470K, 470K, 470K, 56mmf, 820mmf, 820mmf, 47K, 47K, .0022mfd, .0022mfd	30-0043-2	
K2	Tone Comp.		30-0044-1	

PHONO CARTRIDGE & NEEDLES

*NEEDLE LISTINGS SHOWN ARE FOR RESPECTIVE REPLACEMENT CARTRIDGES ONLY.

ITEM No.	PHILCO PART No.	REMARKS	REPLACEMENT DATA				NOTES
			PHILCO PART No.	CORNELL DUBILIER PART No.	ELENCO PART No.	MALLORY PART No.	
M5	325-8068	17D					
M6	325-8068	17D					

MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	REPLACEMENT DATA				REMARKS
			PHILCO PART No.	CORNELL DUBILIER PART No.	ELENCO PART No.	MALLORY PART No.	
M6	Diode MPX Detector	34-8022-6					
M7	Diode MPX Detector	34-8022-6					
M8	Diode MPX Detector	34-8022-6					
M9	Diode MPX Detector	34-8022-6					
M10	Switch AFC	27-10481-6					
M11	Switch Board	27-10481-6					

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in 12 Colors
Power Cord	8524 (Stranded) Available in 12 Colors
Power Cord (Interlock Type)	Use BELDEN No. 1706 (Plastic) or 1726 (Rubber) - 6 Ft.
Low-Loss Shielded Lead (Interconnecting)	1709 (Plastic) or 1729 (Rubber) - 9 Ft.
Phono Pick-up Arm Cable	Use BELDEN No. 8874 (Rubber) or 8895 (Plastic)
	Use BELDEN No. 8401 or 8421
	Use BELDEN No. 8430 (Two Conductor-Unshielded)
	8429 (Two Conductor-Shielded)
	8419 (Three Conductor-Shielded)

