

### CABINET-REAR VIEW DISASSEMBLY INSTRUCTIONS

#### CHASSIS REMOVAL

Remove five screws holding cabinet back and disconnect antenna leads. Remove all knobs from set. Remove the rear cover by pulling it away from the chassis.

Note: Most components may be serviced without removing chassis.

Remove picture-tube socket, high-voltage anode lead, and yoke. Unsolder ground wire and speaker leads.

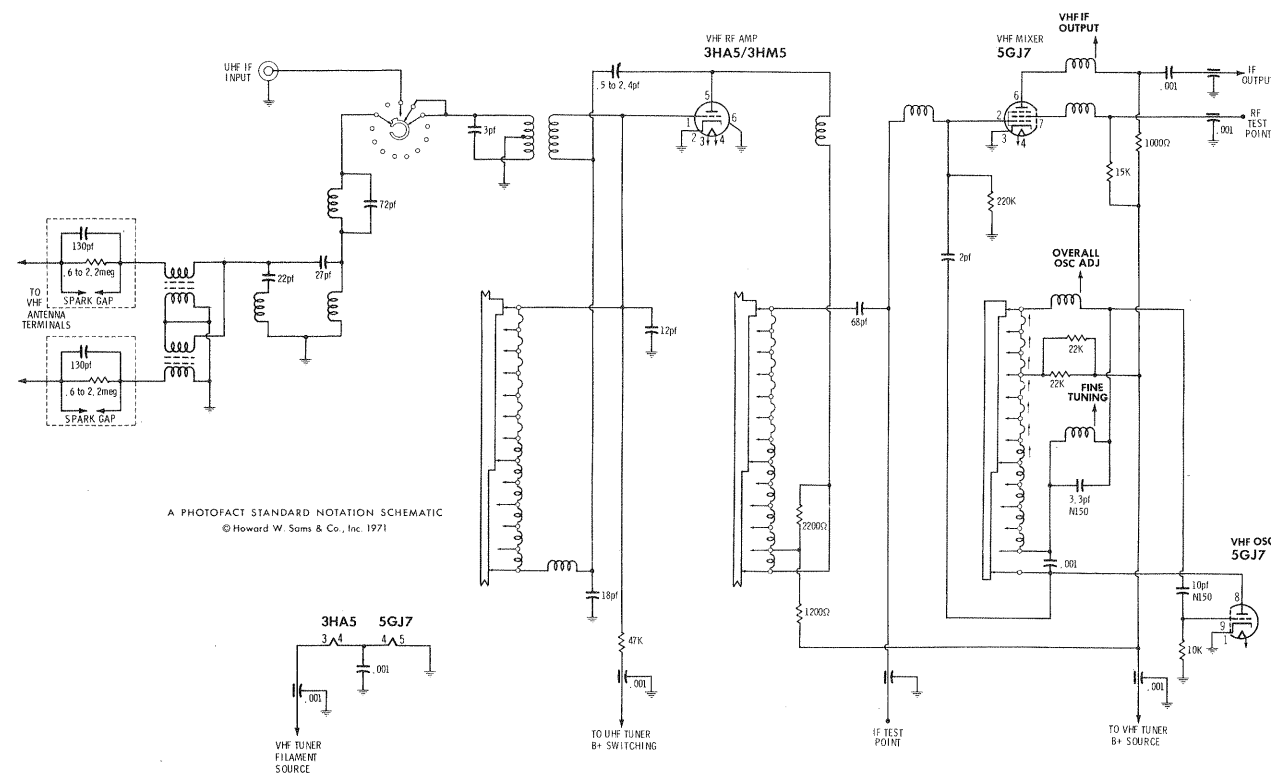
Remove three screws holding controls and on/off switch.

Remove seven screws securing tuner assembly and chassis. Chassis may now be removed.

#### PICTURE TUBE REMOVAL

Follow "Chassis Removal" procedure and lay set face down on a soft protective surface.

Disconnect picture-tube grounding strap and remove four screws holding picture-tube mounting brackets. Do not lift picture tube by the neck.



VHF TUNER #TNR-9612

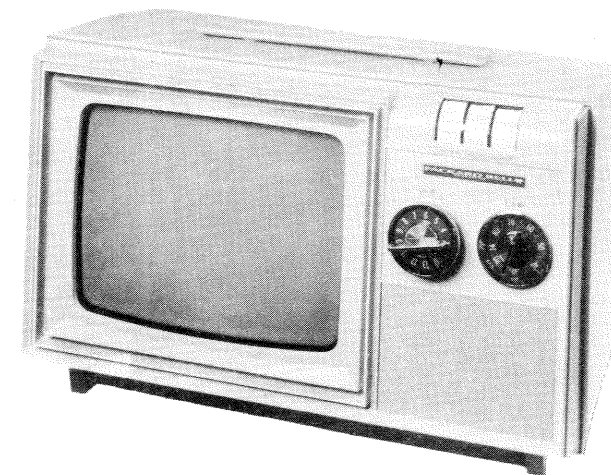
SET 1172 FOLDER 1

PHOTOFACT® Folder with CIRCUITRACE®



For Supplier Address See PHOTOFACT Index

PACKARD BELL MODELS M91231BGE/34KQT/  
35GRN/52BLK, M93231BGE/54RED/57GLD/76WAL



MODEL M91231BGE

### SAFETY PRECAUTIONS

Make sure line voltage does not exceed rating of set. Check high-voltage regulation and adjust to correct value. Be sure shields and rear cover are in place and secure.

Beware of shock from high voltage or AC line. Discharge high voltage to HV cage only.

Use extreme care when handling picture tube. Do not bump, scratch, or exert undue strain.

CAUTION: One side of AC line connected to chassis. Use isolation transformer for servicing. Make certain isolation networks are in place and exposed metal is safe to touch before returning set to customer.

### SERVICING IN THE FIELD

#### CRT IMPLOSION PROTECTION AND CLEANING

Implosion protection is an integral part of the picture tube, cleaning accomplished without CRT removal.

#### FUSE OR FUSE DEVICE

A 2-amp fuse is used for low-voltage power-supply protection. (See photo "Cabinet - Rear View" for location.)

#### VHF TUNER

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

#### HORIZONTAL OSCILLATOR

Adjustment of the horizontal hold is accomplished by the proper setting of

the horizontal oscillator coil (hold). (See photo "Cabinet - Rear View" for location.)

#### WIDTH

The width may be varied by connecting the lead from Point W1 to Points W2 and W3. (See "Tube Placement Chart".)

#### AGC

The AGC may be varied by means of an AGC control. (See photo "Chassis - Top View" for location.)

#### CENTERING

Centering is accomplished by proper adjustment of two magnetic rings located on the yoke rear cover.

REMEMBER TO ASK— "What else needs fixing?"

HOWARD W. SAMS & CO., INC. Indianapolis, Indiana 46206



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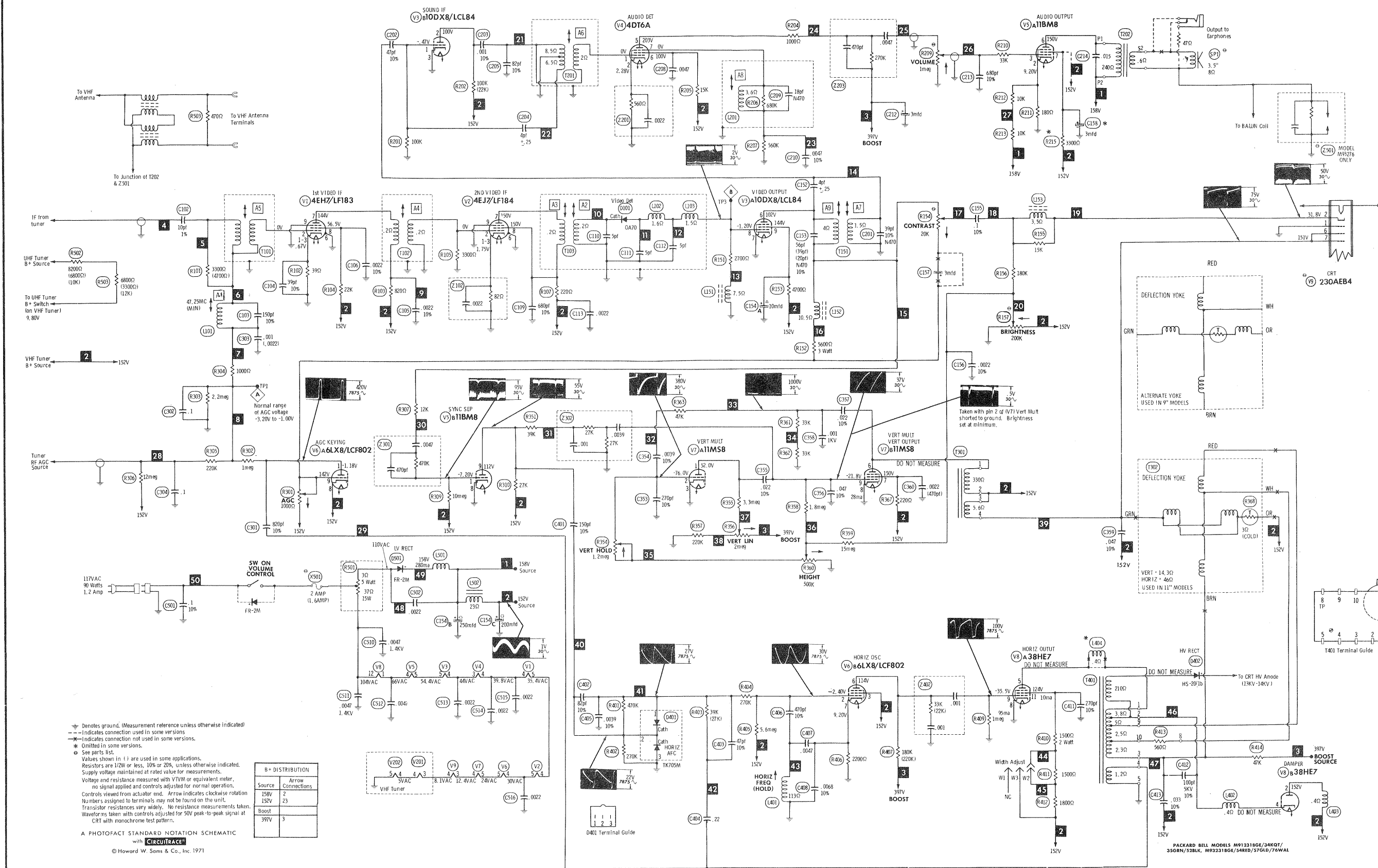
DATE 5 -71

SET 1172 FOLDER 1

1PA101 10 9 8 7 6 5 4 3 2 1 0

PACKARD BELL MODELS M91231BGE/34KQT/  
35GRN/52BLK, M93231BGE/54RED/57GLD/76WAL

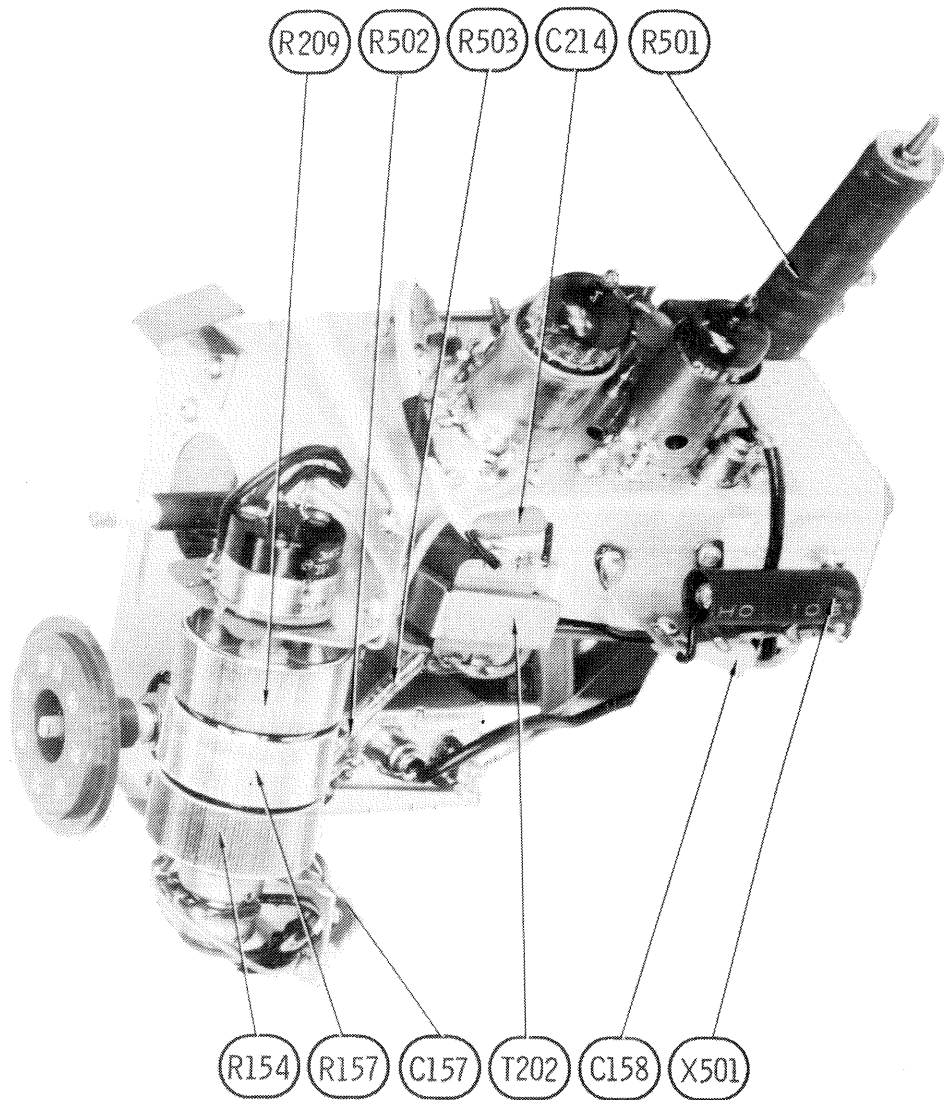
SET 1172 FOLDER 1



RESISTANCE MEASUREMENTS

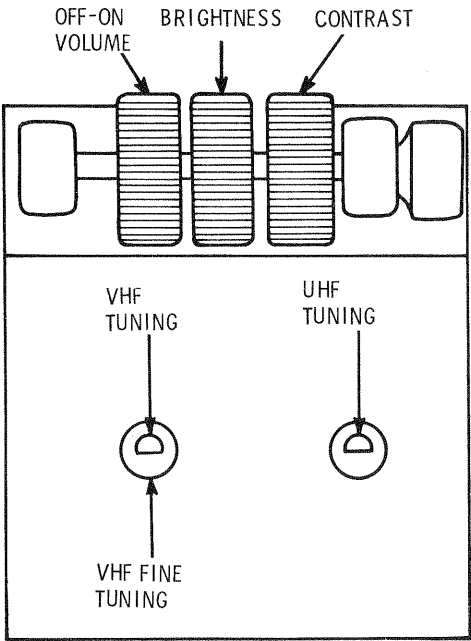
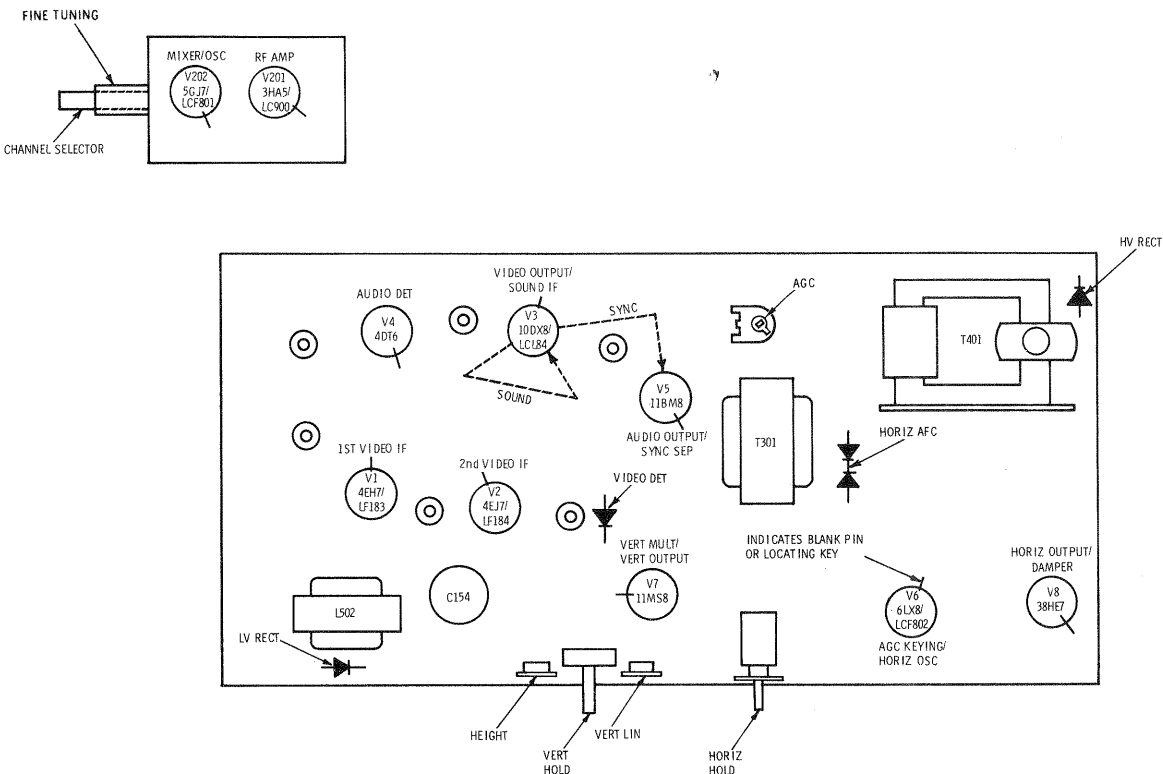
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9	Pin 10	Pin 11	Pin 12
V1	4EH7/ LF183	39Ω	2.2meg	39Ω	14Ω	12Ω	0Ω	843Ω †	22K †	0Ω			
V2	4EJ7/ LF184	82Ω	.1Ω	82Ω	12Ω	10Ω	0Ω	243Ω †	243Ω †	0Ω			
V3	10DX8/ LC184	100K	22K †	0Ω	15Ω	18Ω	6000Ω †	0Ω	1500Ω *	3300Ω †			
V4	4DT6A	10.5Ω	560Ω	16Ω	14Ω	320K †	15K †	560K					
V5	11BM8	10meg †	180Ω	140K	21Ω	18Ω	240Ω †	3300Ω†	0Ω	27K †			
V6	6LX8/ LCF802	3meg	1.5meg	23Ω †	10Ω	8Ω	230K †	2200Ω	23Ω †	485Ω †			
V7	11MS8	4meg	1.2meg	0Ω	4Ω	8Ω	290Ω †	240Ω †	0Ω	2meg			
V8	38HE7	21Ω	24Ω †	NC	2meg	5.6Ω †	NC	NC	0Ω	1meg	NC	4800Ω †	37Ω
V9	230AEB4	0Ω	210K	4Ω	3Ω	NC	28Ω †	28Ω †					
V201	3HA5/ LC900	2meg	0Ω	3Ω	1Ω	1200Ω †	0Ω	0Ω					
V202	5GJ7/ LCF801	0Ω	220K	0Ω	1Ω	0Ω	1000Ω †	15K †	15K†	10K			
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

† MEASURED FROM CATHODE OF D501.  
‡ MEASURED FROM PIN 4 OF V8.  
\* READING DEPENDS ON POLARITY OF METER CONNECTIONS.



TUNER ASSEMBLY

TUBE PLACEMENT CHART



TV ALIGNMENT INSTRUCTIONS

Use an isolation transformer, or observe polarity, and maintain line voltage at 117VAC.  
Allow a 20-minute warm-up period for the receiver and test equipment.  
Suggested Alignment Tools: GENERAL CEMENT WALSCO  
A1 thru A9 ..... 8606, 8606L, 8869 ..... 2543, 2544, 2588  
Mixer Plate Coil ..... 9296, 9297, 9300 ..... 2510, 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 that shown. Connect a variable bias supply to the IF AGC line (Point A) and adjust to obtain a response curve which shows no indication of overload. Disable oscillator section of mixer-oscillator. Set the channel selector to any non-interfering channel.

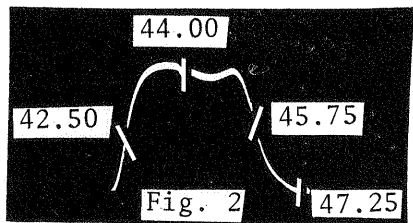
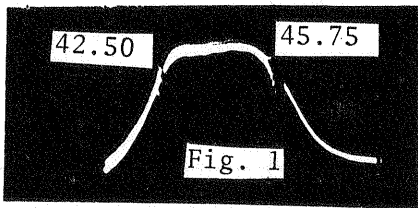
INDICATOR	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	ADJUST	REMARKS
DC probe of VTVM thru 47K to Point B, common to ground.	High side to ungrounded tube shield over Mixer-Osc., low side to ground.		47.25MC	A1	Adjust for MINIMUM.
Vertical input of scope to Point B, low side to ground.	High side thru a .002mfd capacitor to Pin 2 of V2, low side to ground.	44MC (10MC Sweep)	42.50MC 45.75MC	A2 A3	Adjust for maximum amplitude and MINIMUM tilt with markers as shown in Figure 1.
Vertical input of scope to Point B, low side to ground.	High side to ungrounded tube shield over Mixer-Osc., low side to ground.	44MC (10MC Sweep)	42.50MC 44.00MC 45.75MC 47.25MC	A4,A5, Mixer Plate Coil	Adjust for maximum gain and symmetry of response with markers as shown in Figure 2. To obtain a proper response, it may be necessary to slightly retouch A2 and A3.

SOUND IF ALIGNMENT

Tune in a station and adjust A8 for maximum sound. Reduce signal strength at the antenna terminals until distortion appears. Continue to reduce the signal while aligning for undistorted output by adjusting A6 and A7.

4.5MC 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 A9 for MINIMUM beat interference.



TROUBLESHOOTING CHECK CHART

The following chart lists component failures most likely to produce the indicated symptoms.

SWEEP

No raster, has sound V6, V8, D402, V9  
No vert. deflection V7  
Poor vert. lin. or foldover V7  
Poor horiz. lin. or foldover V6, V8  
Narrow picture V6, V8  
Vert. off freq. V7  
Horiz. off freq. D401, V6

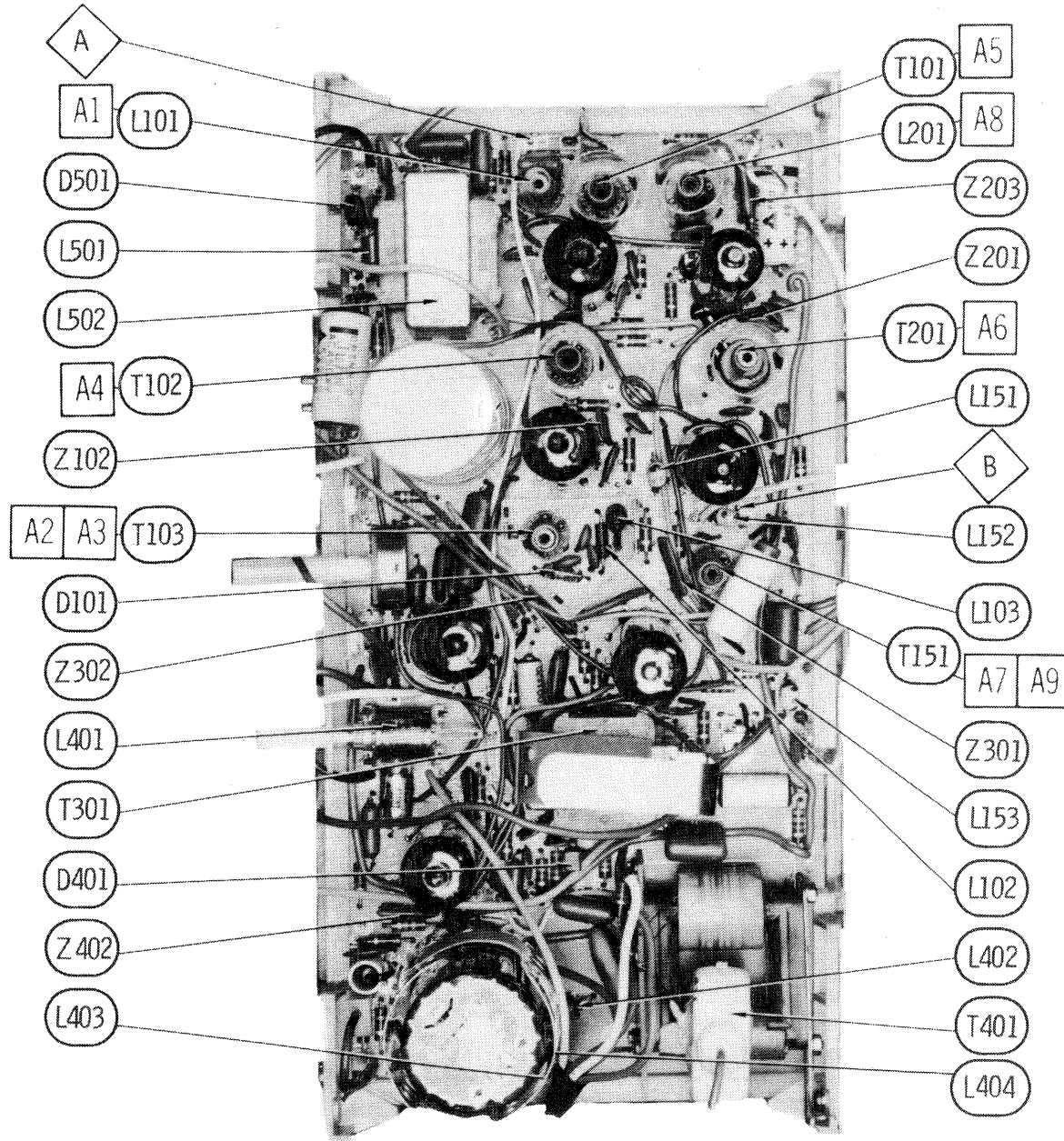
PICTURE or SOUND

No pic, no sound, no raster F1, D501  
No pic, no sound, has raster V1, V2, V3  
No pic, no sound, has snow V201, V202  
No pic, has sound, has raster V3  
Has pic, no sound V3, V4, V5  
Overloaded picture V6

SYNC

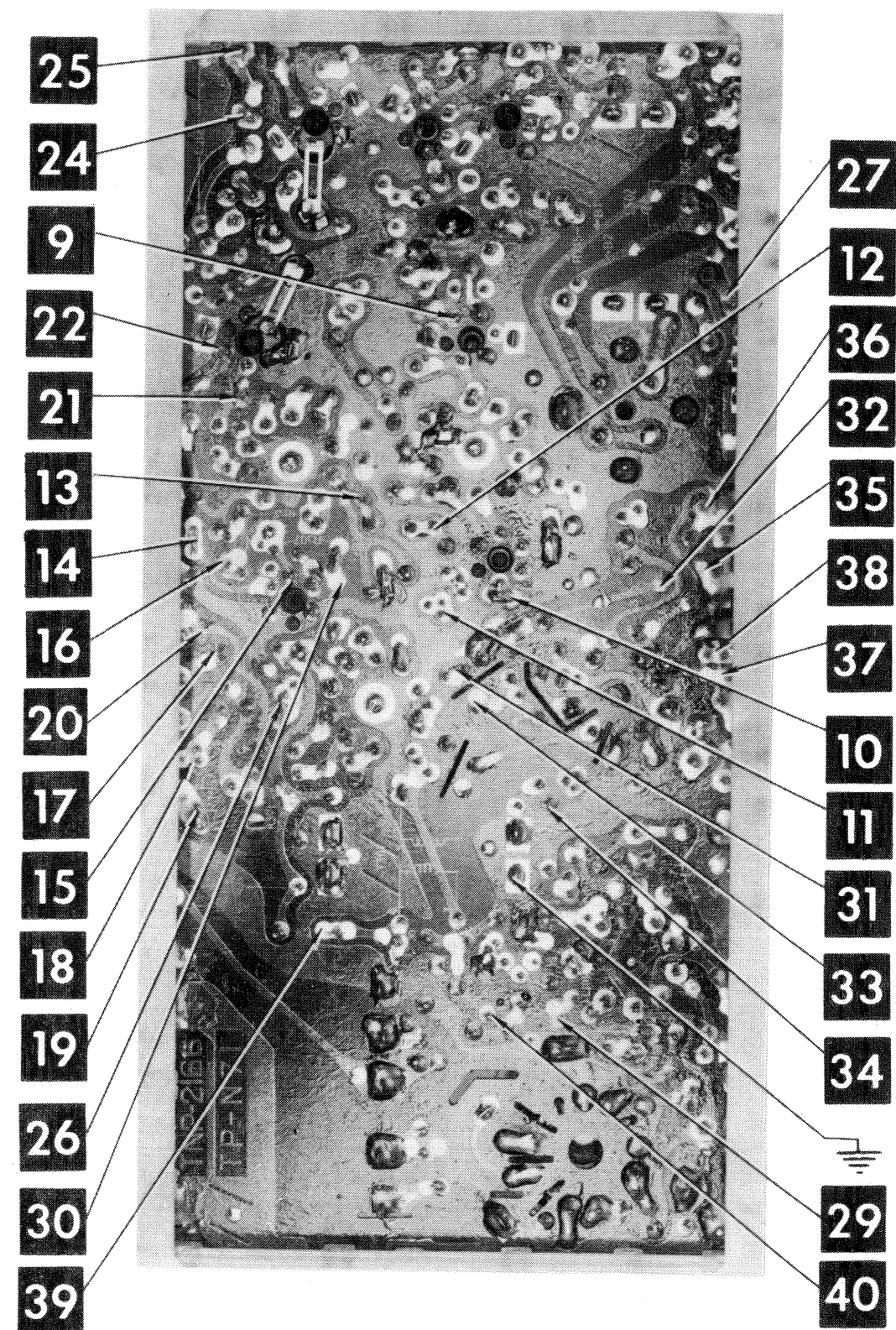
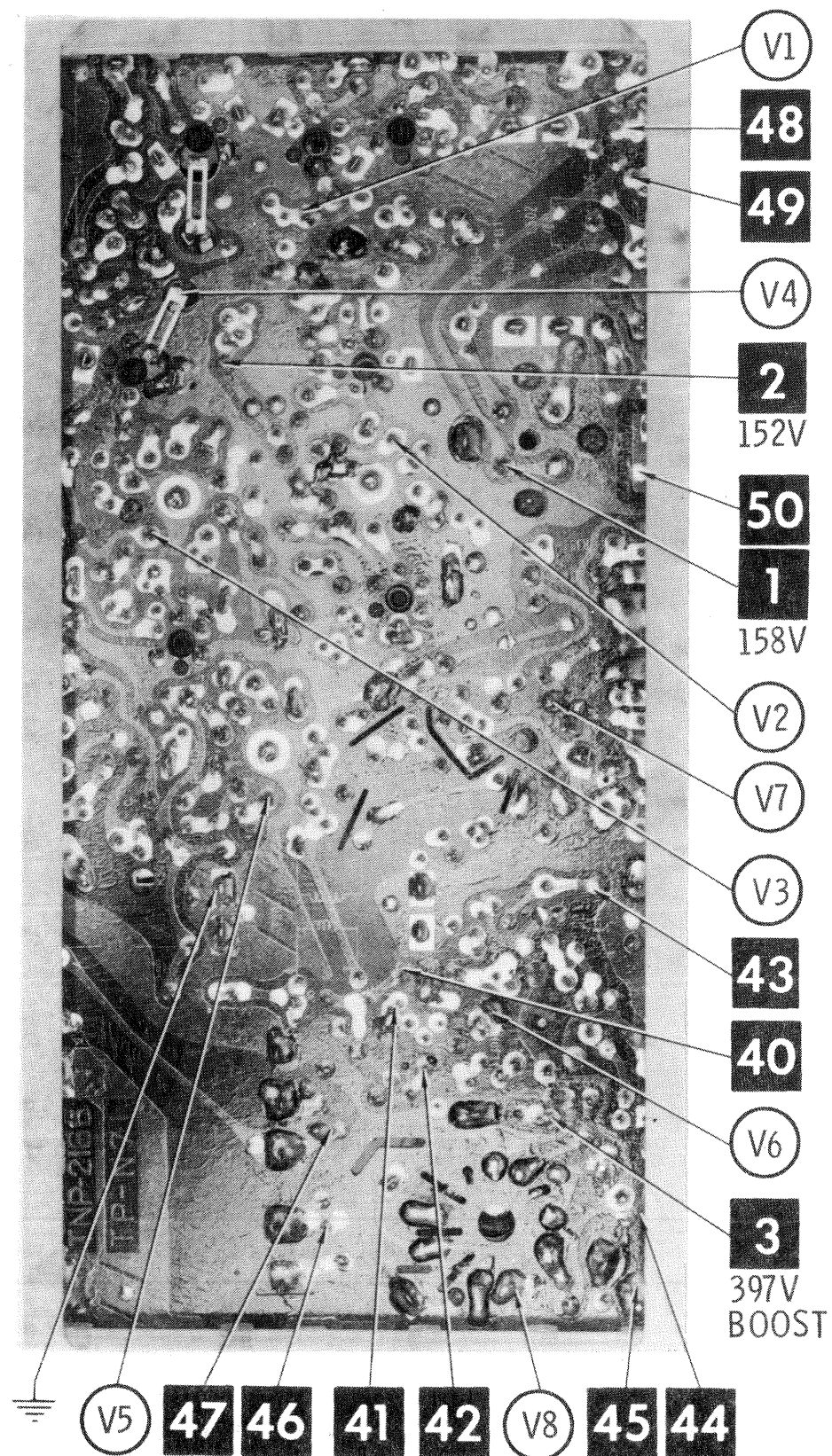
No vert. sync V7  
No horiz. sync D401, V6  
No vert. or horiz. sync V5

This receiver employs a series filament circuit; an open filament in any tube will cause the set to be inoperative.

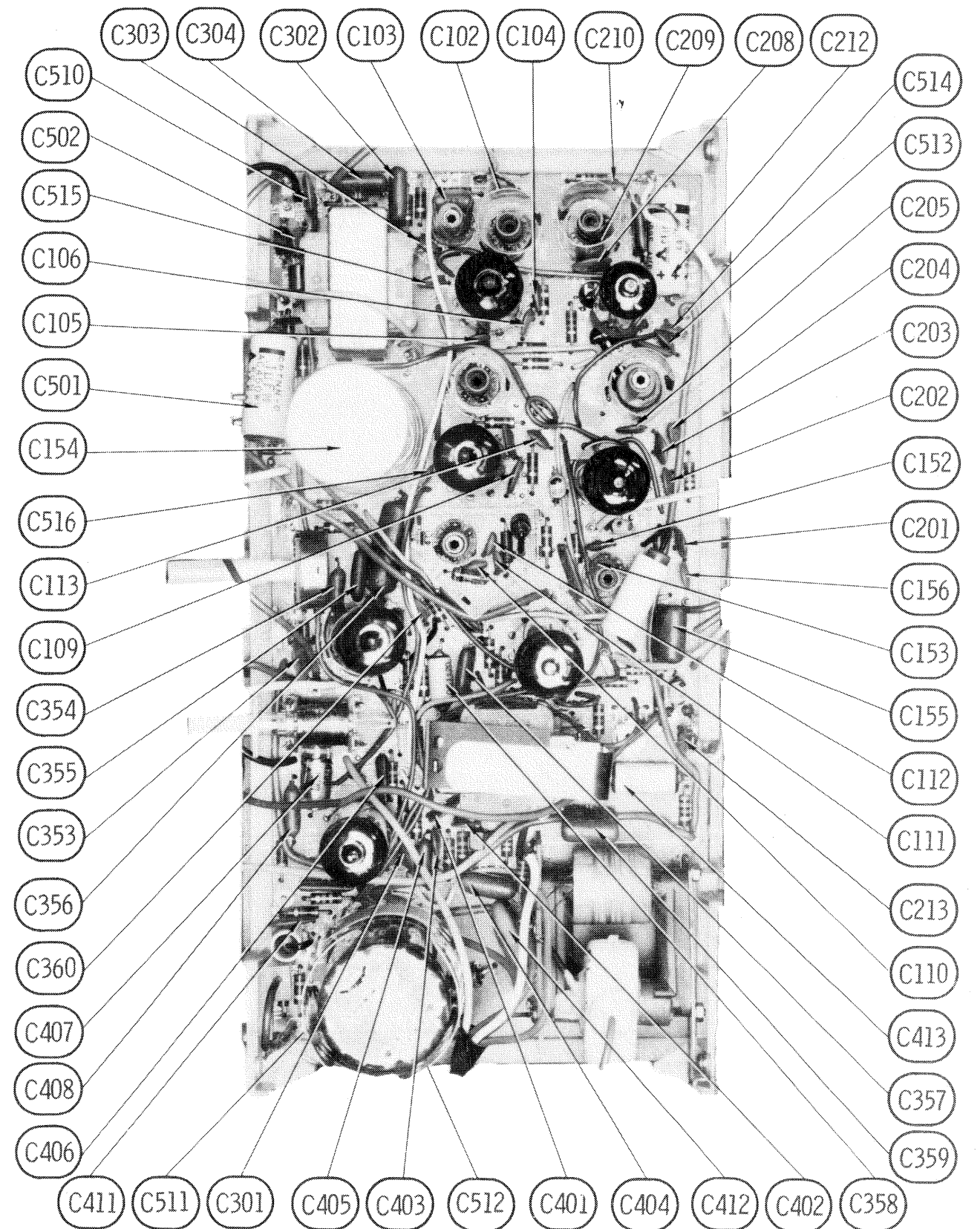
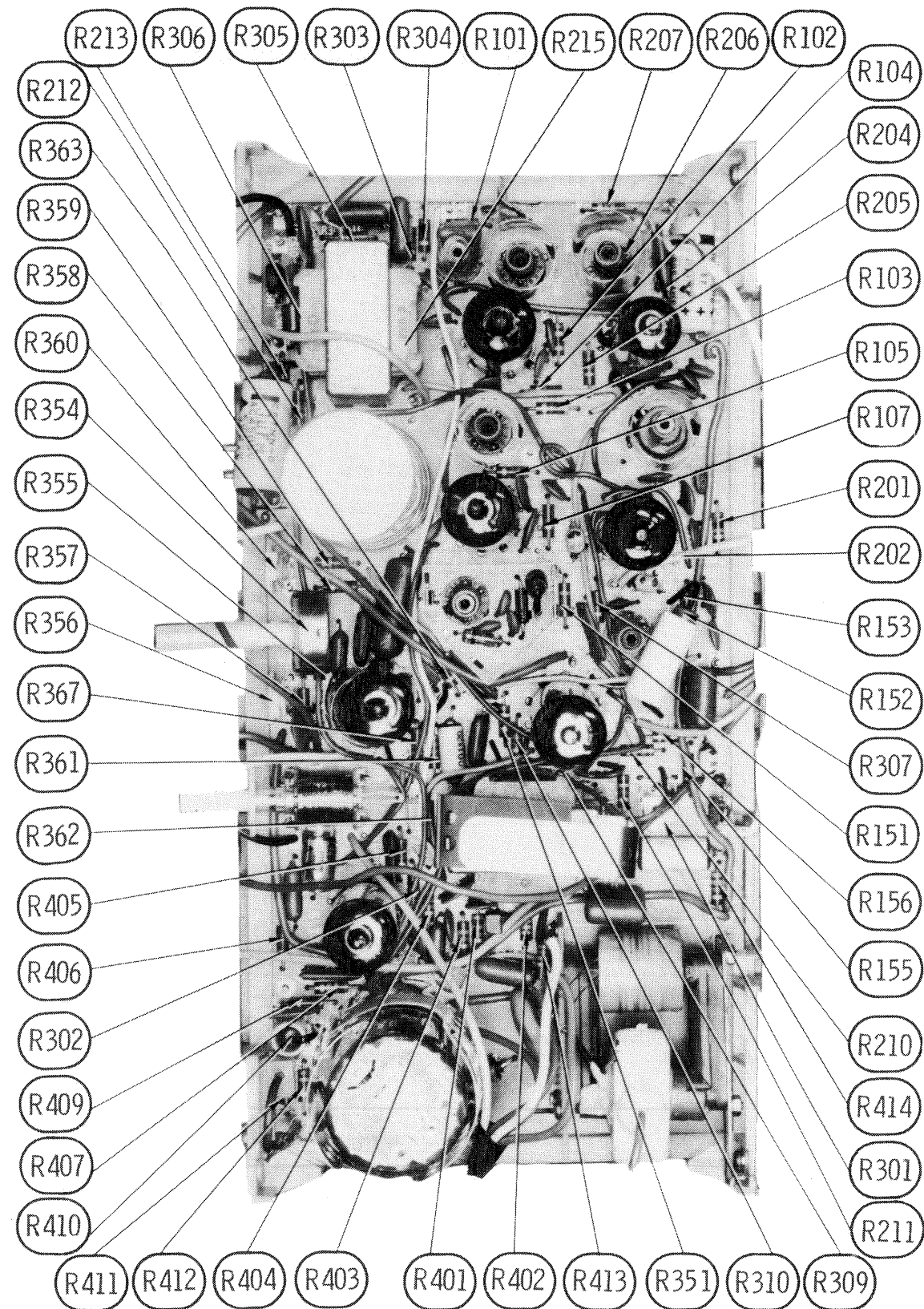


PRINTED BOARD-TOP VIEW









PRINTED BOARD-TOP VIEW

(When ordering parts, state Model, Part Number, and Description.)

AMPEREX			GENERAL ELECTRIC			RCA			SYLVANIA		
ITEM No.	USE	TYPE		ITEM No.	USE	TYPE		ITEM No.	USE	TYPE	
V201	RF Amp	3HA5/LC900 (3HM5)*		V202	Mixer - Oscillator	5GJ7/LCF801					

\* Alternate

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201A	27pf			DD-270		CCD-270	GP427	10TS-Q27
B	27pf			DD-270		CCD-270	GP427	10TS-Q27
C	27pf			DD-270		CCD-270	GP427	10TS-Q27
D	27pf			DD-270		CCD-270	GP427	10TS-Q27
C202	25pf			DD-250		CCD-250	GP425	10TS-Q25
C203	1pf		NP0-DI 1.0	TCA-1			CN0510	10TCC-V10
C204	30pf							
C205	.5-4.5pf							
C206	18pf							
C207	.001							
C208	1pf		NP0-DI 1.0	TCA-1			CN0510	10TCC-V10
C209	.5pf							
C210	.5-3pf							
C211	.001							
C212	.001							
C213	.5-4.5pf							
C214	1.8pf							
C215	8.2pf		GPD C0H8R2K					10TCC-V18
C216	.001		GPD X5F102K	DD-102	GP1000	CCD-102	GP210	10TS-V82
C217	.001							10TS-D10
C218	.001							
C219	.001		GPD X5F102K	DD-102	GP1000	CCD-102	GP210	10TS-D10
C220	.001							
C222	30pf							

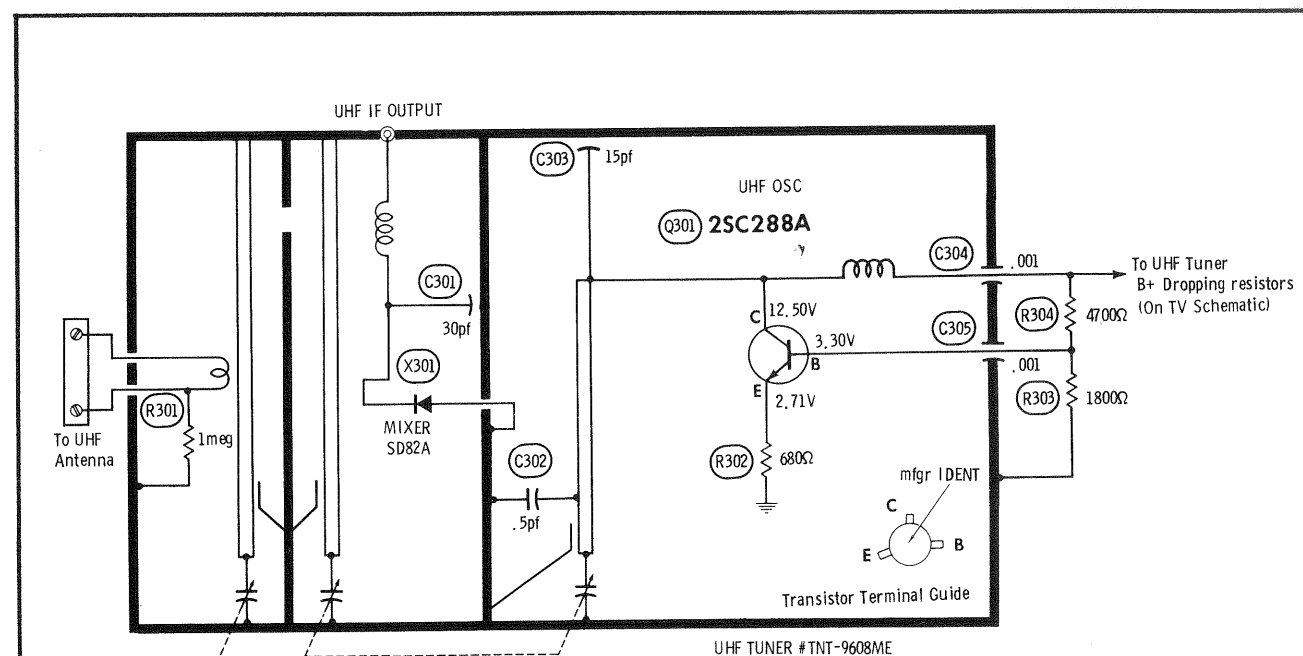
ITEM No.	PART NAME	PART No.	NOTES
PC201	Component Combination		Antenna Isolation (.6-2.2meg, 130pf, Spark Gap)
PC202	Component Combination		CENTRALAB Replacement DA661Z5R.
			Antenna Isolation (.6-2.2meg, 130pf, Spark Gap)
			CENTRALAB Replacement DA661Z5R.

(When ordering parts, state Model, Part Number, and Description.)

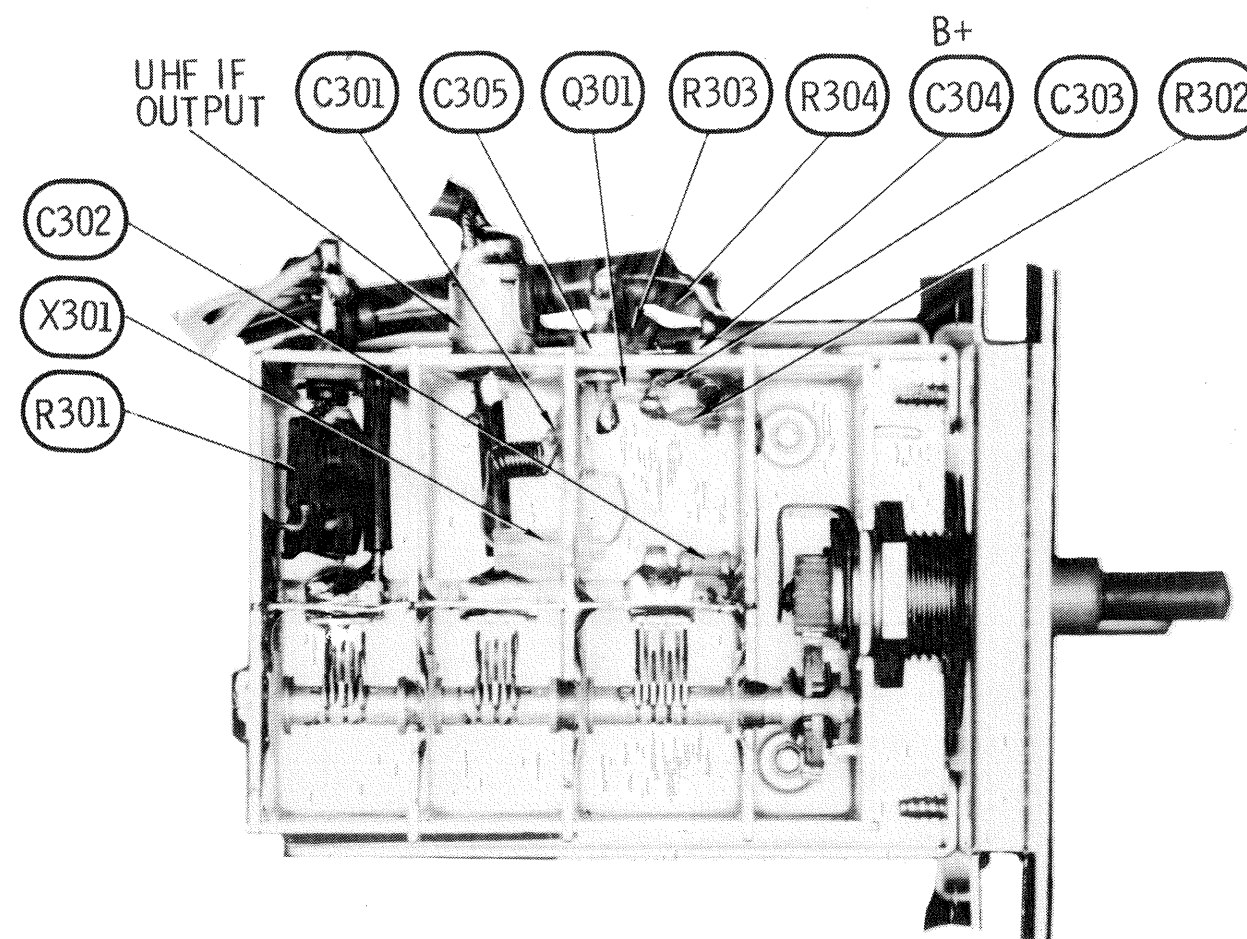
ITEM No.	TYPE No.	FUNCTION	REPLACEMENT DATA					
			MFGR. PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL RECTIFIER PART No.	MOTOROLA PART No.	RCA PART No.	SYLVANIA PART No.
Q301	2SC288A	UHF Oscillator		GE-11	TR-22	HEP56	SK3019	ECG 108

ITEM No.	MFR. PART OR TYPE No.	REPLACEMENT DATA				NOTES
		GENERAL ELECTRIC PART No.	INTERNATIONAL RECTIFIER PART No.	RCA PART No.	SYLVANIA PART No.	
X301	SD82A	1N82A	1N82AG	1N82A	ECG 112	

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	30pf							
C302	.5pf							
C303	8pf							
C304	.001							
C305	85pf							



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## UHF TUNER

**SET 1172 FOLDER 1**

**PACKARD BELL MODELS M91231BGE/34KQT/  
35GRN/52BLK, M93231BGE/54RED/57GLD/76WAL**

**FOLDER 1**


## VHF TUNER ALIGNMENT INSTRUCTIONS



Suggested Alignment Tools: GENERAL CEMENT WALSCO  
A201, A202 ... 8868, 8987, 9089 ..... 2531X, 2541, 2587

## OSCILLATOR ADJUSTMENTS

The oscillator slug for each channel is preset with the fine tuning control. Adjust the fine tuning for best picture and sound. If necessary, adjust the overall oscillator adjustment. Recheck.

## RF AND MIXER ADJUSTMENTS

Connect the sweep generator across antenna terminals with 120-ohm carbon resistor in each lead. Refer to chart below for generator frequencies. Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the scope for horizontal deflection. Use 10MC sweep unless otherwise noted. Connect a variable bias to the RF AGC line at Point . Adjust bias to obtain response curve which shows no overloading.

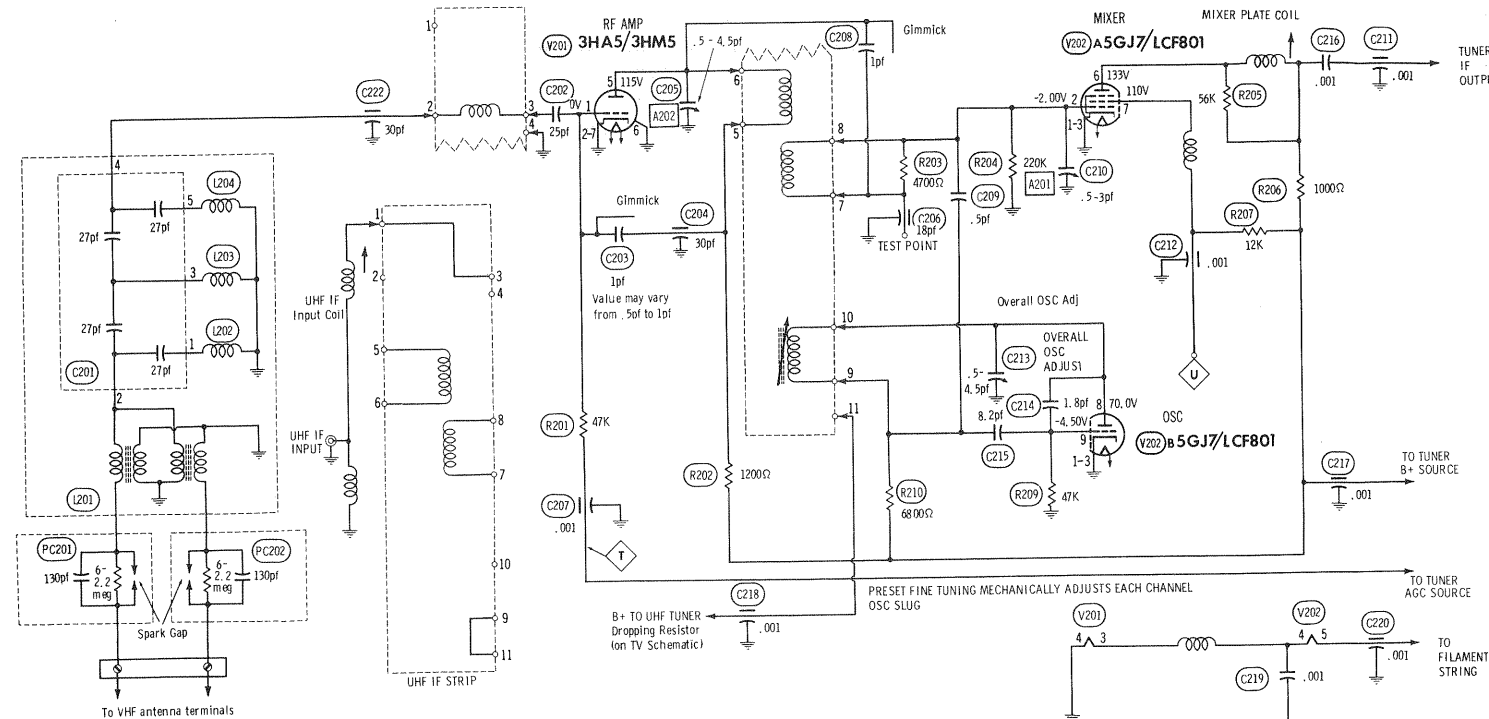
CHANNEL	CONNECT SCOPE	REMARKS
13	Vertical input to Point  , low side to ground.	Adjust A201 and A202 for maximum gain and symmetry of response similar to Fig. 201 with markers as shown.
12 thru 2	Vertical input to Point  , low side to ground.	Check response on all channels. Make compromise adjustments of A201 and A202 if necessary.

GENERATOR FREQUENCY  
Numbers in ( ) indicate channel number

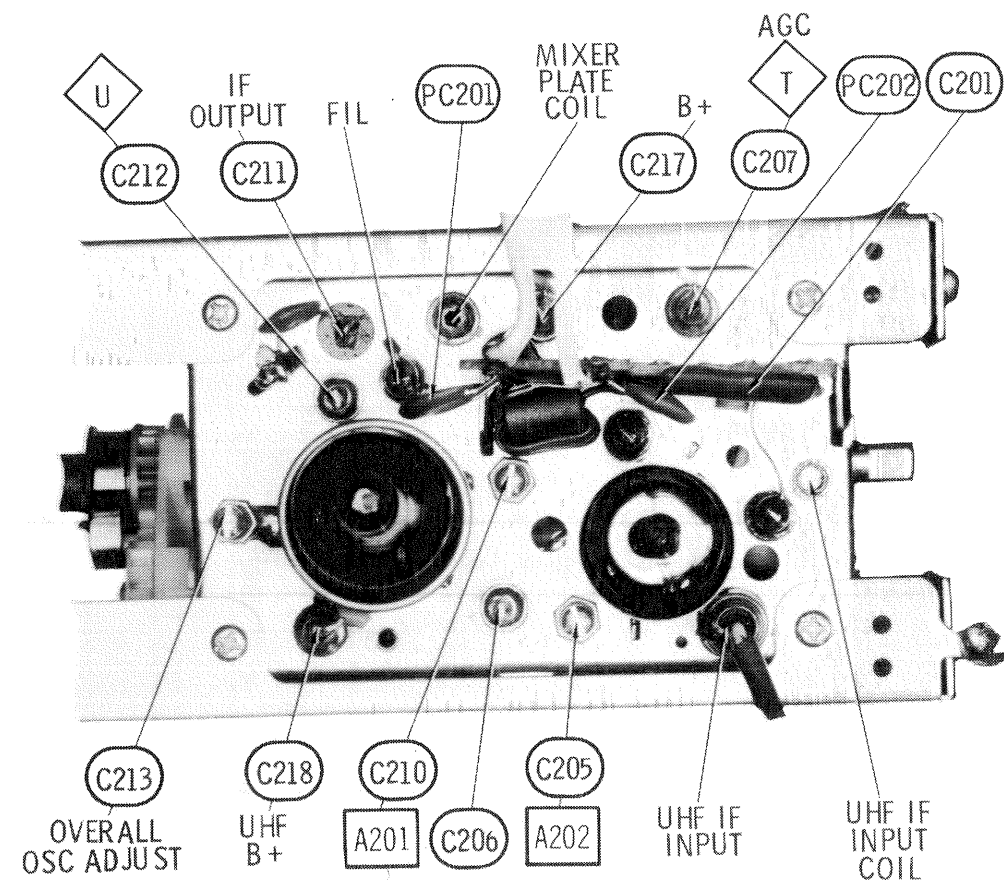
SWEEP	MARKER	SWEEP	MARKER	SWEEP	MARKER
(2) 57MC	55.25MC 59.75MC	(6) 85MC	83.25MC 87.75MC	(10) 195MC	193.25MC 197.75MC
(3) 63MC	61.25MC 65.75MC	(7) 177MC	175.25MC 179.75MC	(11) 201MC	199.25MC 203.75MC
(4) 69MC	67.25MC 71.75MC	(8) 183MC	181.25MC 185.75MC	(12) 207MC	205.25MC 209.75MC
(5) 79MC	77.25MC 81.75MC	(9) 189MC	187.25MC 191.75MC	(13) 213MC	211.25MC 215.75MC

FIG. 201

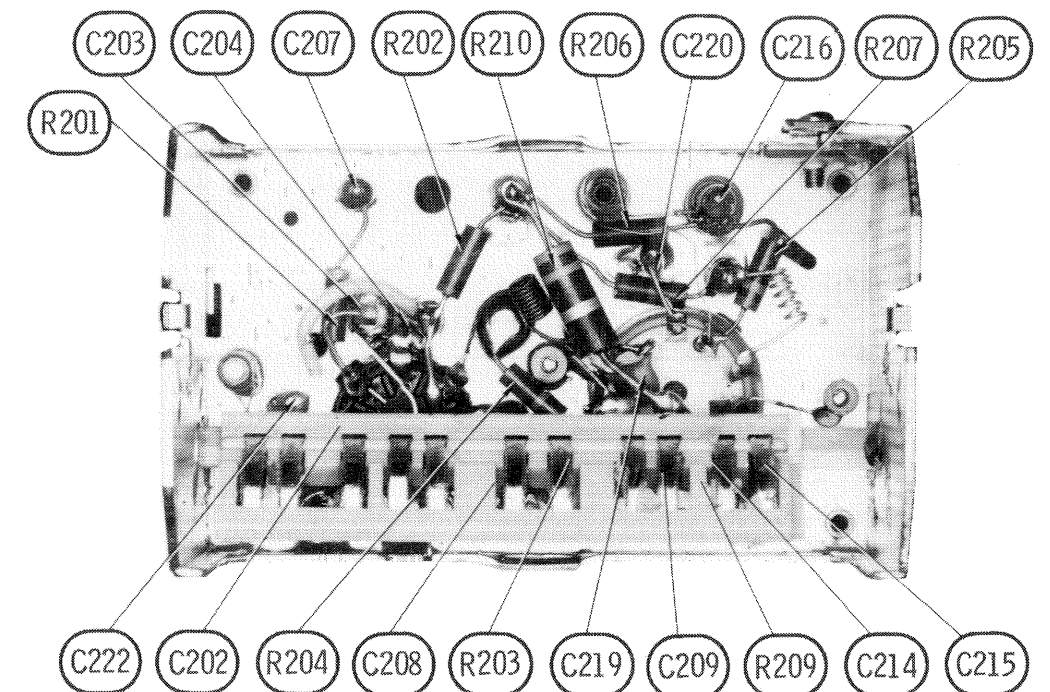
SOUND VIDEO



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VHF TUNER TNR-6604KLE





PARTS LIST AND DESCRIPTION (CONTINUED)

(When ordering parts, state Model, Part Number, 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.

TRANSFORMER (Audio Output)

ITEM No.	IMPEDANCE		REPLACEMENT DATA				NOTES
	PRI.	SEC.	MFGR. PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
T202	2000	8	ETA-28A36A		22S61 (1)	S-62X (1)	(1) Drill new mounting holes.

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFGR. PART No.	QUAM PART No.	
SP1	3" PM 8 ohms	EAS8P795C (1)	30A05Z8	(1) Used in Models: M91231BGE, M91234KQT, M91235GRN, M91252BLK.
	3 1/2" PM 8 ohms	EAS9P63SA (2)	30A05Z8	(2) Used in Models: M93231BGE, M93254RED, M93257GLD, M93276WAL.

FUSE DEVICES

ITEM No.	DESCRIPTION	REPLACEMENT DATA						
		PART No.		BUSS PART No.		LITTELFUSE PART No.		WORKMAN PART No.
		DEVICE	HOLDER	DEVICE	HOLDER	DEVICE	HOLDER	
X501	2 Amp, 125V 1.6 Amp, 125V	TSF-35202 (1) TSF-35162 (2)		MDV 2		318002		

(1) Models M9231BGE, M93257GLD, M93254RED, M93276WAL. (2) Models M91231BGE, M91234KQT, M91235GRN, M91252BLK.

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
	VHF Antenna	TSA-327S	JFD Replacement PAN13, Used in Models M91231BGE, M91234KQT, M91235GRN, M91252BLK.
	VHF Antenna	TSA-965-3	JFD Replacement PAN15, Used in Models M93231BGE, M93257GLD, M93254RED, M93276WAL.
	UHF Antenna	TSA-325B	JFD Replacement TA545, Used in Models M9123BGE, M91234KQT, M91235GRN, M91252BLK.
	UHF Antenna	TSA-323	JFD Replacement TA545, Used in Models M93231BGE, M93257GLD, M93254RED, M93276WAL.
	VHF Tuner	TNR-6604KLE	
	VHF Tuner	TNR-9612R	
	UHF Tuner	TNT-9608ME	
Z102	Component Combination	EXAP222Z820	2nd Video Cathode
Z201	Component Combination	EXAP222K561	Detector Cathode
Z203	Component Combination	EXA3WK09	Audio Coupling
Z301	Component Combination	EXA3WK11	Sync Separator Coupling
Z302	Component Combination	EXA4FD12	Vertical Integrator
Z402	Component Combination	EXA3SK01C	Horizontal Coupling
Z501	Component Combination	EXA3ZP10B	Antenna Isolation (Not used in some versions)

CABINETS & CABINET PARTS (When ordering specify model, chassis & color)

ITEM	PART No.	ITEM	PART No.
Cabinet Complete MODEL: M93276WAL	TKB18301-1	Escutcheon Complete MODEL: M91231BGE	TKE11701-1
Cabinet Complete M93257GLD	TKA4801-1	Escutcheon Complete M91235GRN	TKE11702-1
Cabinet Complete M93254RED	TKA4802-1	Escutcheon Complete M91252BLK	TKE11704-1
Cabinet Complete M93231BGE	TKA4803-1	Escutcheon Complete M91234KQT	TKE11703-1
Rear Cover M93276WAL	TKU24308	Rear Cover M91231BGE	TKU24801-1
Rear Cover M93257GLD, M93254RED	TKU24302	Rear Cover M91235GRN	TKU24802-1
Front Glass M93276WAL	TKG632-8	Rear Cover M91252BLK	TKU24804-1
Front Glass M93257GLD, M93254RED	TKG632-2	Rear Cover M91234KQT	TKU24803-1
Handle Complete M93276WAL	TKK30218-2S	Handle Complete M91231BGE	TKK225-7
Handle Complete M93257GLD	TKK229-1S	Handle Complete M91235GRN	TKK225-8
Handle Complete M93254RED, M93231BGE	TKK229-3S	Handle Complete M91252BLK	TKK217-5
UHF Indicator M93276WAL	TKK1309-1	Handle Complete M91234KQT	TKK225-9
Escutcheon Complete M93276WAL	TKE11601-1	KNOB: VHF Channel Selector M91231BGE	TBX1706-3
Escutcheon Complete M93257GLD, M93254RED	TKE11601-2	VHF Channel Selector M91235GRN	TBX1706-4
Escutcheon Complete M93231BGE	TKE11602-1	VHF Channel Selector M91252BLK	TBX1706-6
KNOB: VHF Channel Selector M93276WAL, M93257GLD, M93254RED	TBX1706-1	VHF Channel Selector M91234KQT	TBX1706-5
VHF Channel Selector M93231BGE	TBX1706-2	VHF Fine Tuning M91231BGE	TBX1707-3
VHF Fine Tuning M93276WAL, M93257GLD, M93254RED	TBX481-1	VHF Fine Tuning M91235GRN, M91252BLK, M91234KQT	TBX481-1
VHF Fine Tuning M93231BGE	TBX481-2	UHF Channel Selector M91231BGE	TBX481-2
UHF Channel Selector M93276WAL, M93257GLD, M93254RED	TBX1707-1	UHF Channel Selector M91235GRN	TBX1707-4
UHF Channel Selector M93231BGE	TBX1707-2	UHF Channel Selector M91252BLK	TBX1707-1
On-Off-Volume M93231BGE	TBX1535-1	UHF Channel Selector M91234KQT	TBX1707-5
Brightness M91231BGE	TBX1536-1	On-Off-Volume M91231BGE	TBX1535-2
Contrast M91231BGE	TBX1537-1	On-Off-Volume M91235GRN, M91252BLK, M91234KQT	TBX1535-1
		Brightness M91231BGE	TBX1536-2
		Brightness M91235GRN, M91252BLK, M91234KQT	TBX1536-1
		Contrast M91231BGE	TBX1537-2
		Contrast M91235GRN, M91252BLK, M91234KQT	TBX1537-1

WIRING DATA

High Voltage Lead .....	Use BELDEN No. 8869 (17KV)
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 12 Colors 8524 (Stranded) Available in 12 Colors
300-Ohm Tuner Input Lead .....	Use BELDEN No. 8225
300-Ohm 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

PARTS LIST AND DESCRIPTION

(When ordering parts, state Model, Part Number, and Description.)

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Have your local distributor check Sams COUNTER FACTS\* for the most up-to-date replacement.

TUBES

AMPEREX		GENERAL ELECTRIC		RCA		SYLVANIA	
ITEM No.	USE	TYPE		ITEM No.	USE	TYPE	
V1	1st Video IF	4EH7/LF183		V5	Audio Output - Sync Separator	11BM8/LCL82	
V2	2nd Video IF	4EJ7/LF184		V6	AGC Keying - Horiz. Osc.	6LX8/LCF802	
V3	Video Output - Sound IF	10DX8/LCF84		V7	Vert. Mult.- Vert. Output	11MS8	
V4	Audio Detector	4DT6A		V8	Horiz. Output - Damper	38HE7	

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	MFGR. PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SYLVANIA PART No.	
V9	310EDB4 (1) 230AEB4 (2)				(1) Used in 11" Models. (2) Used in 9" Models.

POWER RECTIFIERS & SIGNAL DIODES

ITEM No.	MFGR. PART OR TYPE No.	REPLACEMENT RECTIFIERS & DIODES			REPLACEMENT RECTIFIERS	NOTES
		GENERAL ELECTRIC PART No.	INTERNATIONAL RECTIFIER PART No.	SYLVANIA PART No.	RCA PART No.	
D101	TVS-0A70 (0A70)	1N60	1N60	ECG 109	1N60	
D401	TVM-TK705M (TK705M)	6GC1	DD04	ECG 113		
D402	TVM-HS20/1B					
D501	TVS-FR2M (FR2M)	GE-504A	8D4 or 5A4-D	ECG 116 or ECG 117	SK3030 or SK3031	
	TVS-FR2M (FR2M) (1)	GE-504A	8D4 or 5A4-D	ECG 116 or ECG 117	SK3030 or SK3031	(1) May be used in Model M93276WAL.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING	REPLACEMENT DATA						
		PACKARD BELL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	SPRAGUE PART No.
C154A B C	10 180V 250 180V 200 180V	ECE-Q180HBX2Z	AFH3-13-90 (1)		CC0129.5A (1)		FP318.8A	PCL-4479.7
C157	3 150V	ECE-B150V3	CRE952A		AL3-150	MT1-4	TC40A	TE-1502
C158	3 150V	ECE-B150V3 (2)	CRE952A		AL3-150	MT1-4	TC40A	TE-1502
C212	3 500V	ECE-B500V3	PRS1800		BR3-500		TC811	TVA-1930

(1) Use printed circuit adapter kit.

(2) Not used in some versions.

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.
C102	10		GPD C0H100K	DD-100	CZ601CG100K	CCD-100	GP410	10TS-Q20
C103	150	10%	GPD X5F151K	DD-151	GP150	CCD-151	GP315	10TS-T15
C104	39	10%		DD-390		CCD-390	GP439	10TS-Q39
C105	.0022	10%	GPD X5F222K	DD-222	GP2200	CCD-222	GP222	10TS-Q22
C106	.0022	10%	GPD X5F222K	DD-222	GP2200	CCD-222	GP222	10TS-Q22
C109	680	10%	GPD X5F681K	DD-681	JBY601YP681K	CCD-681	GP368	10TS-T68
C110	5			DD-050	CZ601CH5R0D	CCD-050	GP550	10TS-V50
C111	5			DD-050	CZ601CH5R0D	CCD-050	GP550	10TS-V50
C112	5			DD-050	CZ601CH5R0D	CCD-050	GP550	10TS-V50
C113	.0022	10%	GPD X5F222K	DD-222	GP2200	CCD-222	GP222	10TS-Q22
C152	4		GPD C0J3R3K	DD-3R3		CCD-3R3	GP533	10TS-V33
C153	39 N470	10%		TCN-39		CCTN-390	GP7439	10TCU-Q39
C155	.1 400V	10%	DBE4P1		DPMS4P1	4DP-3-104	PVC401	4PS-P10
C156	.0022	10%	GPD X5F222K	DD-222	GP2200	CCD-222	GP222	10TS-Q22
C201	39 N470	10%		TCN-39		CCTN-390	GP7439	10TCU-Q39
C202	47	10%	GPD X5F470K	DD-470	JBZ501YP470K	CCD-470	GP447	10TS-Q47
C203	.001	10%	GPD X5F102K	DD-102	GP1000	CCD-102	GP210	10TS-D10

PARTS LIST AND DESCRIPTION (CONTINUED)

(When ordering parts, state Model, Part Number, and Description.)

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

CAPACITORS (cont)

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.
C204	4		GPD COH100K	DD-3R3		CCTO-3R3	GP533	10TS-V33
C205	82		GPD X5F820K	DD-820	J8Z601YP820K	CCD-820	GP482	10TS-Q82
C208	.0047	10%	GPD X5R472K	DD-472G	J8T601YP472K	CCD-472	JF247	10TS-D47
C209	18	N470		TCN-18	CZ601UJ180J		CN7418	10TCU-Q18
C210	.047	10%	DBE6S5		DPMS6S5	6DP-3-503	PVC615	6PS-S50
C213	820	10%	GPD X5F821K	DD-821	GP820	CCD-821	GP382	10TS-T82
C214	.015	400V	DBE6S15		DPMS6S15	4DP-1-153	PVC6115	4PS-S15
C301	820	10%	GPD X5F821K	DD-821	GP820	CCD-821	GP382	10TS-T82
C302	.1	50V	TTP-1	CK-104			TA010	TG-P10
C303	.0022	10%	GPD X5F222K	DD-222	GP2200	CCD-222	GP222	10TS-D22
C304	.1	50V	TTP-1	CK-104			TA010	TG-P10
C353	270	10%	GPD X5F271K	DD-271		CCD-271	GP327	10TS-T27
C354	.0039	400V	DBE6D39	CPR-3900J	PXM4D39	6DP-392	PVC6239	6PS-D39
C355	.022	400V	DBE6S22		DPMS6S22	4DP-2-223	PVC6122	4PS-S22
C356	.047	10%	DBE6S47		DPMS6S47	4DP-3-473	PVC4147	4PS-S47
C357	.022	400V	DBE6S22		DPMS6S22	4DP-2-223	PVC6122	4PS-S22
C358	.001	1KV	GPD X5F102K	DD-102	GP1000	CCD-102	GP210	10TS-D10
C359	.1	400V	DBE4P1		DPMS4P1	4DP-3-104	PVC401	4PS-P10
C360	.0022		GPD X5F222K	DD-222	GP2200	CCD-222	GP222	10TS-D22
C401	150	10%	GPD X5F151K	DD-151	GP150	CCD-151	GP315	10TS-T15
C402	82	10%	GPD X5F820K	DD-820	J8Z601YP820K	CCD-820	GP482	10TS-Q82
C403	47	10%	GPD X5F470K	DD-470	J8Z601YP470K	CCD-470	GP447	10TS-Q47
C404	.22	50V	V1612P22		DMF1P22	1DP-3-224	PVC1022	225P2249R75
C405	.0039	10%	V1614D33	CPR-3300J	WMF4D33	6DP-1-332	PVC6233	6PS-D33
C406	470	10%	GPD X5F471K	DD-471	GP470	CCD-471	GP347	10TS-T47
C407	.0047	400V	V1614D47	CPR-4700J	DMF4D47	6DP-1-472	PVC6247	6PS-D47
C408	.0068	400V	V1614D68	CPR-6800J	DMF4D68	6DP-1-682	PVC6268	6PS-D68
C411	270	10%	GPD X5F271K	DD-271		CCD-271	GP327	10TS-T27
C412	100	5KV	HVD-60-100	DD-10-101	HVX602XP101M	6CCD-101	6HV310	60GA-T10
C413	.033	600V	DBE6S33		DPMS6S33	6DP-3-333	PVC6133	6PS-S33
C501	.1	450V	DBE6P1		DMF6P1	6DP-4-104	PVC601	6PS-P10
C502	.0022		GPD X5F222K	DD-222	GP2200	CCD-222	GP222	10TS-D22
C510	.0047	1.4KV	HVD-154700	DD30-472	HV162ZV472P		2HV247	30GAD47
C511	.0047	1.4KV	HVD-154700	DD30-472	HV162ZV472P		2HV247	30GAD47
C512	.0047		GPD X5R472K	DD-472G	J8T601YP472K	CCD-272	JF247	10TS-D47
C513	.0022		GPD X5F222K	DD-222	GP2200	CCD-222	GP222	10TS-D22
C514	.0022		GPD X5F222K	DD-222	GP2200	CCD-222	GP222	10TS-D22
C515	.0022		GPD X5F222K	DD-222	GP2200	CCD-222	GP222	10TS-D22
C516	.0022		GPD X5F222K	DD-222	GP2200	CCD-222	GP222	10TS-D22

CONTROLS (All wattages 1/2 watt, or less, unless listed)

ITEM No.	FUNCTION	RESIST-ANCE	REPLACEMENT DATA				
			MFGR. PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.
R154	Contrast	20K	EVK- KBAS15707 <sup>(3)</sup>				
R157	Brightness	200K	EVC- B05L18A16	F2-1meg (1), SSK012,KR-1	A47-1meg-Z (1), KSS-3,SWE-12 or [NP-1meg-Z (1), UP-C-400,NWE-12]	Q13-137 (1),76-2 or [BU1 (1), CF26,SS6,GC] *	RU16A,SL36, SL3250,US41 or [UA16A (1), SK750,US41] or [U53 (1),US26]
R209	Volume/Switch	1meg	EVC- B05L18S16 <sup>(4)</sup>	F2-1meg (1), SSK012,KR-1	A47-1meg-Z (1), KSS-3,SWE-12 or [NP-1meg-Z (1), UP-C-400,NWE-12]	Q13-137 (1),76-2 or [BU1 (1), CF26,SS6,GC] *	RU16A,SL36, SL3250,US41 or [UA16A (1), SK750,US41] or [U53 (1),US26]
R301	AGC	1000	EVT- 38AA00B13	TSV-1K (2) or T-1000 (2)		X201R102B (2)	MTC13L1 (2)
R354	Vert. Hold	1.2meg	EVD- D6AS20BA6	TT-742 or [F1-1.5meg, SNK014]	B47-1.5meg-S or [NP-1.5meg-S, NML-A-300]	B11-138,TM4 or [BU11,CF18,SS6]*	PTA1254L or [RU155L,SL37, SN1000] or [UA155L,SN1000]
R356	Vert. Linearity	2meg	EVT- V8A00MB26	T-2meg or TSV-2.2M		X201R205B	MTC26L1
R360	Height	500K	EVL- 32A00MB55	TSV-500K or T-500K		X201R504B	MTC55L1

- (1) Enlarge mounting hole.  
(2) For horizontal mounting, bend terminals to fabricate wiring to "PC" board.  
(3) Includes R154 and R157.  
(4) Alternate Part, used in Models: M93231BGE, M93254RED, M93257GLD and M93276WAL.

\* "SNAPTROL"

PARTS LIST AND DESCRIPTION (CONTINUED)

(When ordering parts, state Model, Part Number, and Description.)

Replacement parts shown may be superseded by the availability of newly introduced replacements.  
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RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
			WORKMAN PART No.	MFGR. PART No.				WORKMAN PART No.	MFGR. PART No.
R152	5600 3W		3G-5.6K	ERG-3PSK562	R501	40 20W		5W-SQ-3 & 20W-SQ-37.5	ERM-20G400A
R368	Thermistor (3 Cold)		FR 3.5			Tapped @ 3 5W			

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA			
		PART No.	MEISSNER PART No.	MILLER PART No.	WORKMAN PART No.
L101	47.25MC Trap	TL1-9154			
L102	RF Choke (10uh)	TLQ-100-999	19-2016	72F105AP	T823
L103	RF Choke (5.3uh)	TLM-053-999	19-1008	4609	T959
L151	Peaking (560uh)	TLT-561-999	19-2029	72F564AP	T325
L152	Peaking (820uh)	TLT-821-999		72F824AP	
L153	Peaking (300uh)	TLT-301-999 (1)		72F224AP	
L201	Quadrature	TLS-1176	19-2027		T312
L402	RF Choke (8uh)	TLM-080-999			
L403	RF Choke (8uh)	TLM-080-999	19-2015	4611	T822
L501	Choke (12 Turns)	TLP-408	19-2015	4611	T822
T101	1st Video IF	TL1-1155			
T102	2nd Video IF	TL1-1156			
T103	3rd Video IF	TL1-5157			
T151	Sound Take-off - 4.5MC Trap	TLS-2153			
T201	Sound IF	TLS-1158			

(1) Some versions may use 220uh, Part #TLT-221-999 in this application.

COILS (Sweep Circuits)

ITEM No.	FUNCTION	REPLACEMENT DATA					
		MFGR. PART No.		MILLER PART No.	STANCOR PART No.	THORDARSON MEISSNER PART No.	TRIAD PART No.
L401	Horiz. Osc. (Hold)	TLH-318					

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (O CURRENT 1000~)	MFGR. PART No.		STANCOR PART No.	THORDARSON PART No.	
L502	.25A DC	23	.4 H	TLP-112-1				

TRANSFORMERS (Sweep Circuits)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		MFGR. PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
T301	Vert. Output	TLV-238-1 (1)				(1) Used in Models: M91231BGE, M91234KQT, M912356RN, M91252BLK.
T302	Vert. Output	TLV-234-2 (2)				
	Yoke (Horiz. 19.5mh)	TLV-306(S) (1)				(2) Used in Models: M93231BGE, M93254RED, M93257GLD, M93276WAL.
	114° (Vert. 17.2mh)					
	Yoke (Horiz. 12.2mh)	TLV-468(TS)(2)				
	114° (Vert. 26.5mh)					
T401	Horiz. Output	TLF-607S (1)				
	Horiz. Output	TLF-60BS (2)				

PACKARD BELL MODELS M91231BGE/34KQT/  
356RN/52BLK, M93231BGE/54RED/576LD/76WAL