

VERT LIN VERT HOLD HEIGHT HORIZ HOLD PINCUSHION CORRECTION

CABINET-REAR VIEW

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 6 screws holding cabinet back. Disconnect antenna leads and remove back.
2. Remove all knobs, picture tube socket, high-voltage anode lead, yoke, and speaker leads.
3. Remove 2 nuts and 4 screws holding tuners and chassis. Slide chassis and tuners out of the cabinet.

PICTURE TUBE REMOVAL

1. Follow "Chassis Removal" procedure. Lay set face down on a soft protective surface.
2. Remove 2 screws holding picture tube retaining wire. Release wire and lift picture tube out. Do not lift tube by the neck.

CENTERING

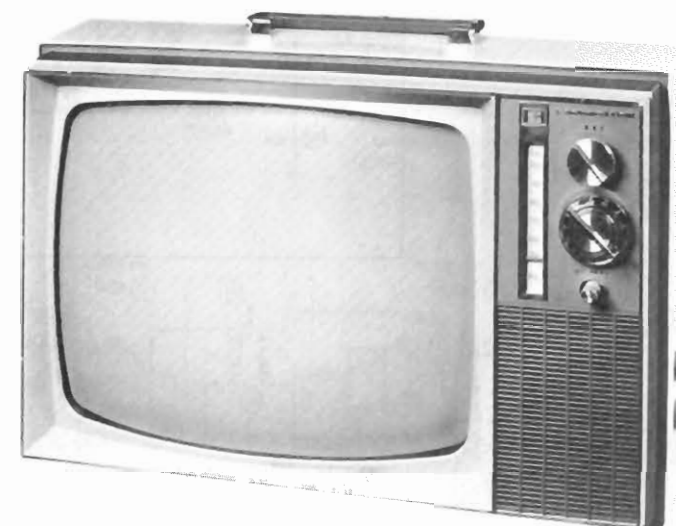
PACKARD BELL MODELS MR-323BGE,
MR-325WAL/MOD, MR-523BGE/-525WAL,
MSM-202A/-204A

SET 969 FOLDER 1

PHOTOFACT® Folder

with CIRCUITRACE™

For Supplier Address See PHOTOFACT Index



Models

Chassis

MR-323BGE, MR-325WAL, MR-325MOD ..	T31-14
MR-523BGE, MR-525WAL	T40-21
MSM-202A, MSM-204A	T40-21

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

SAFETY GLASS

For picture tube and safety glass cleaning, it is necessary to remove the chassis. (See "Disassembly Instructions".)

VHF OSCILLATOR ADJUSTMENT

The fine tuning mechanically engages oscillator slug for adjustment (one slug for each channel). It may be necessary to adjust overall oscillator trimmer for best results.

AGC

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

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

The Horizontal Oscillator coil is used for the horizontal hold. (See photo "Cabinet - Rear View" for location.)

FOCUS

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

CENTERING

Centering is accomplished by 2 magnetic rings located on yoke rear cover.

PINCUSHION CORRECTION

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

REMEMBER TO ASK— "What else needs fixing?"

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



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. SK780 109876543210

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DATE 7-68

SET 969 FOLDER 1

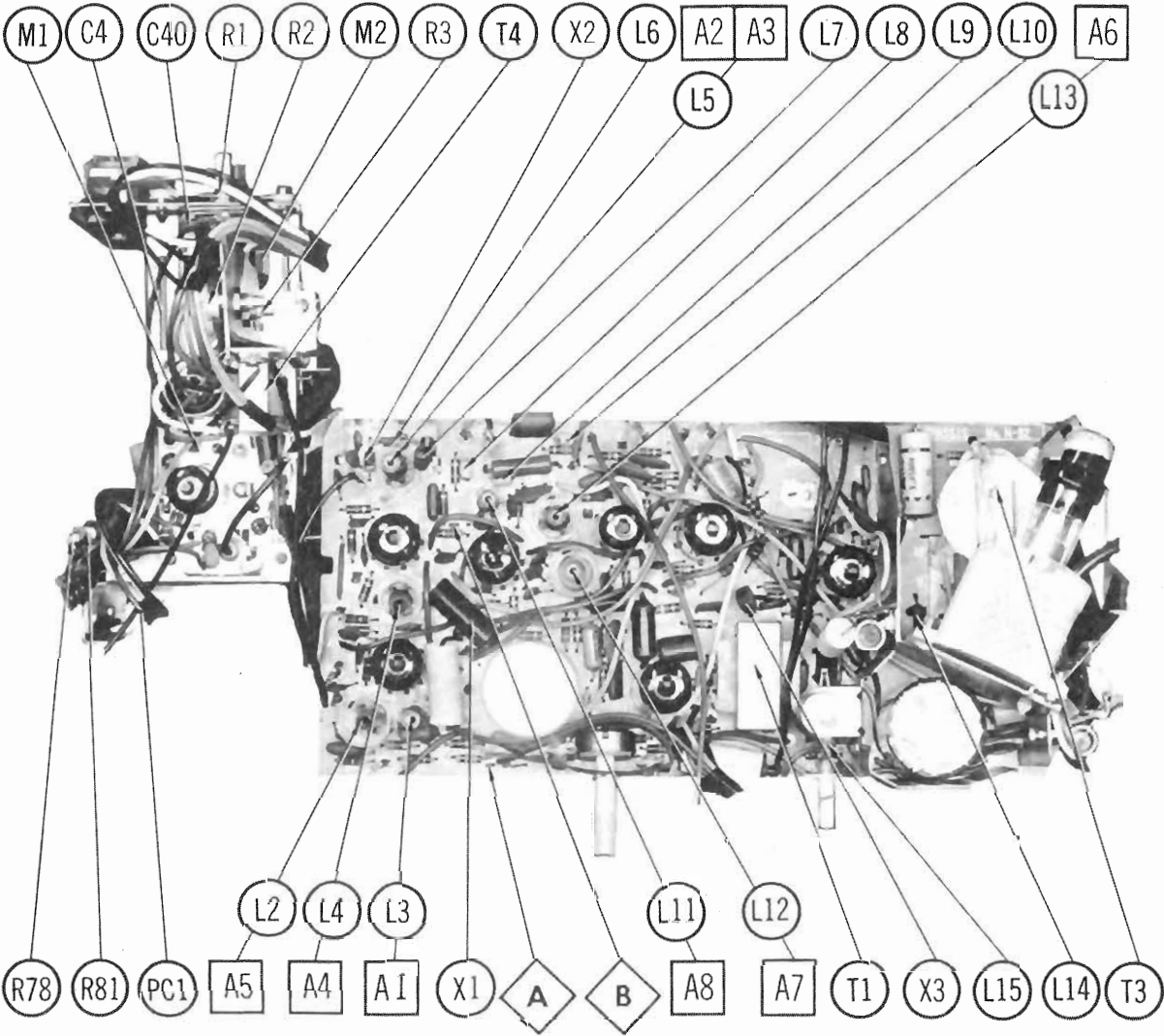
PACKARD BELL MODELS MR-323BGE,
MR-325WAL/MOD, MR-523BGE/-525WAL,
MSM-202A/-204A

SET 969 FOLDER 1

RESISTANCE MEASUREMENTS

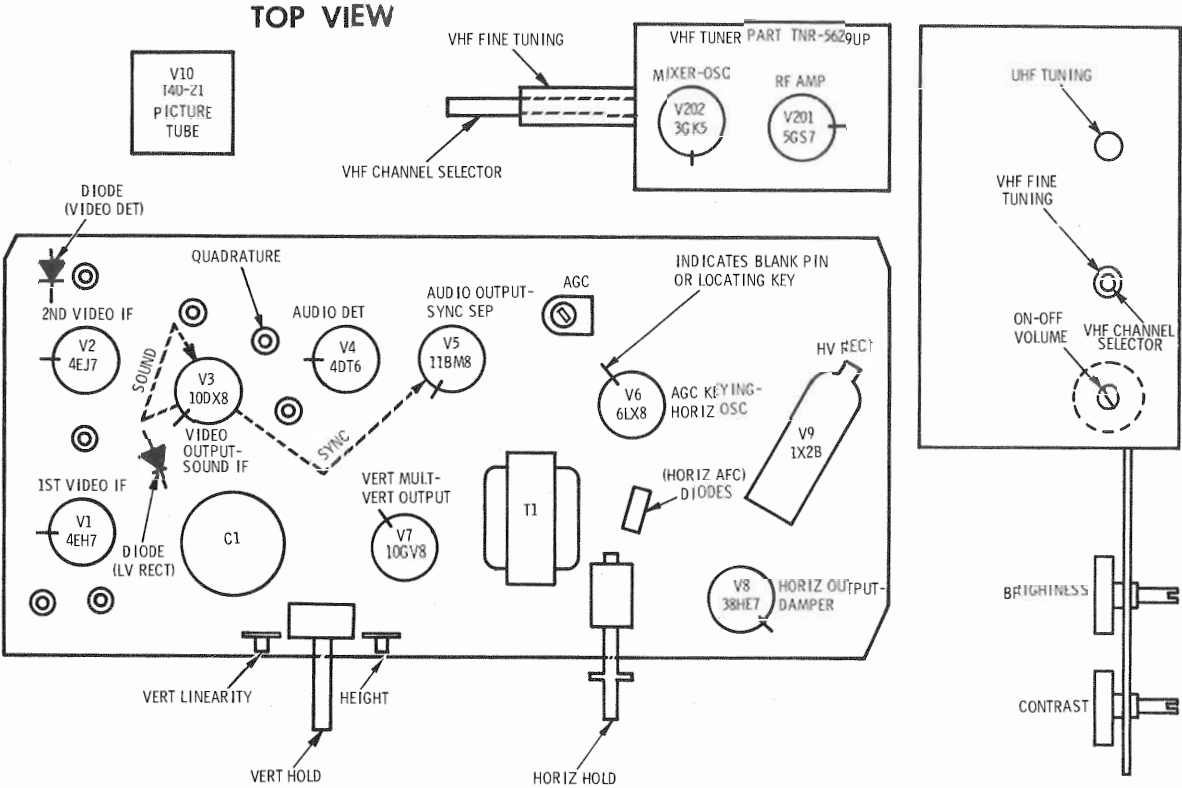
ITEM	TUBE	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6	PIN 7	PIN 8	PIN 9	PIN 10	PIN 11	PIN 12	TOP CAP
V1	4EH7	27Ω	220K	27Ω	9.5Ω	10.5Ω	0Ω	950Ω †	22K †	0Ω				
V2	4EJ7	82Ω	.1Ω	82Ω	10.5Ω	11.5Ω	0Ω	320Ω †	320Ω †	0Ω				
V3	10DX8	680K	100K	0Ω	16.5Ω	11.5Ω	4800Ω †	0Ω	440K	3400Ω †				
V4	4DT6	20Ω	560Ω	16.5Ω	18Ω	330K †	8300Ω †	560K						
V5	11BM8/LCL82	10meg †	150Ω	310K	18Ω	22Ω	260Ω †	10K †	0Ω	25K †				
V6	6LX8	2meg	800K	100Ω †	22Ω	24Ω	270K †	2200Ω	100Ω †	400Ω †				
V7	10GV8	4.6meg	750K	0Ω	0Ω	5.5Ω	400Ω †	200Ω †	0Ω	1.1meg				
V8	38HE7	35Ω	68Ω †	NC	1.9meg #	4.2Ω †	NC	NC	0Ω	1meg	NC	1900Ω †	24Ω	
V9	1X2B			PINS 1 THRU 9 HAVE INFINITE RESISTANCE										320Ω †
V10	T40-21	0Ω	120K	6Ω	5.5Ω	NC	220K †	220K †						
V201	3GK5	0Ω	2.2meg	8Ω	9.5Ω	1220Ω †	0Ω	0Ω						
V202	5GS7	10K	8920Ω †	0Ω	8Ω	6Ω	1000Ω †	100Ω †	0Ω	220K				
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	TOP CAP

THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM CATHODE OF X1. NC NO CONNECTION † MEASURED FROM PIN 4 OF V8.



CHASSIS—TOP VIEW

TUBE PLACEMENT CHART



PACKARD BELL MODELS MR-323BGE,
MR-325WAL/MOD, MR-523BGE/-525WAL,
MSM-202A/-204A

TUBE FAILURE CHECK CHART

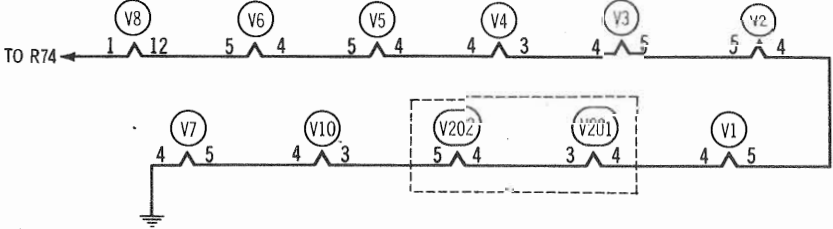
The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

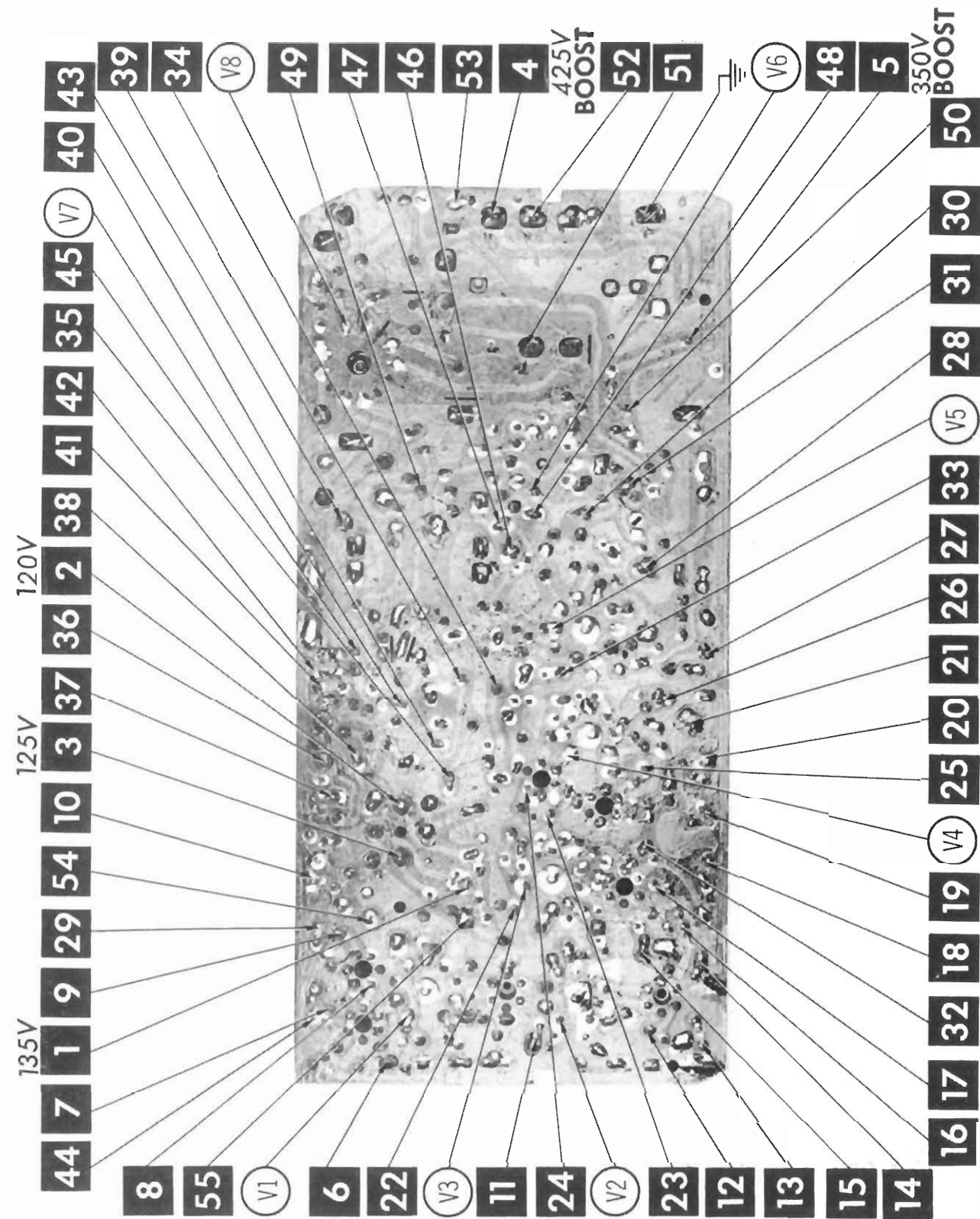
- POWER SUPPLY FAILURE**
No raster, no sound X1, Fusible Resistor R75

SWEEP FAILURE
No raster, has sound V6, V8, V9, V10
No vertical deflection V7
Poor vert. linearity or foldover V7
Poor horiz. linearity or foldover V6, V8
Narrow picture V8, V8, X1
Vert. off freq. V7
Horiz. off freq. V6, X3 (Horiz. AFC Diode)
- LOSS OF PICTURE OR SOUND**
No pic, no sound, has raster V1, V2, V3, X2 (Video Detector Diode)
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V3, V10
Has pic, no sound V3, V4, V5
Overloaded picture V8

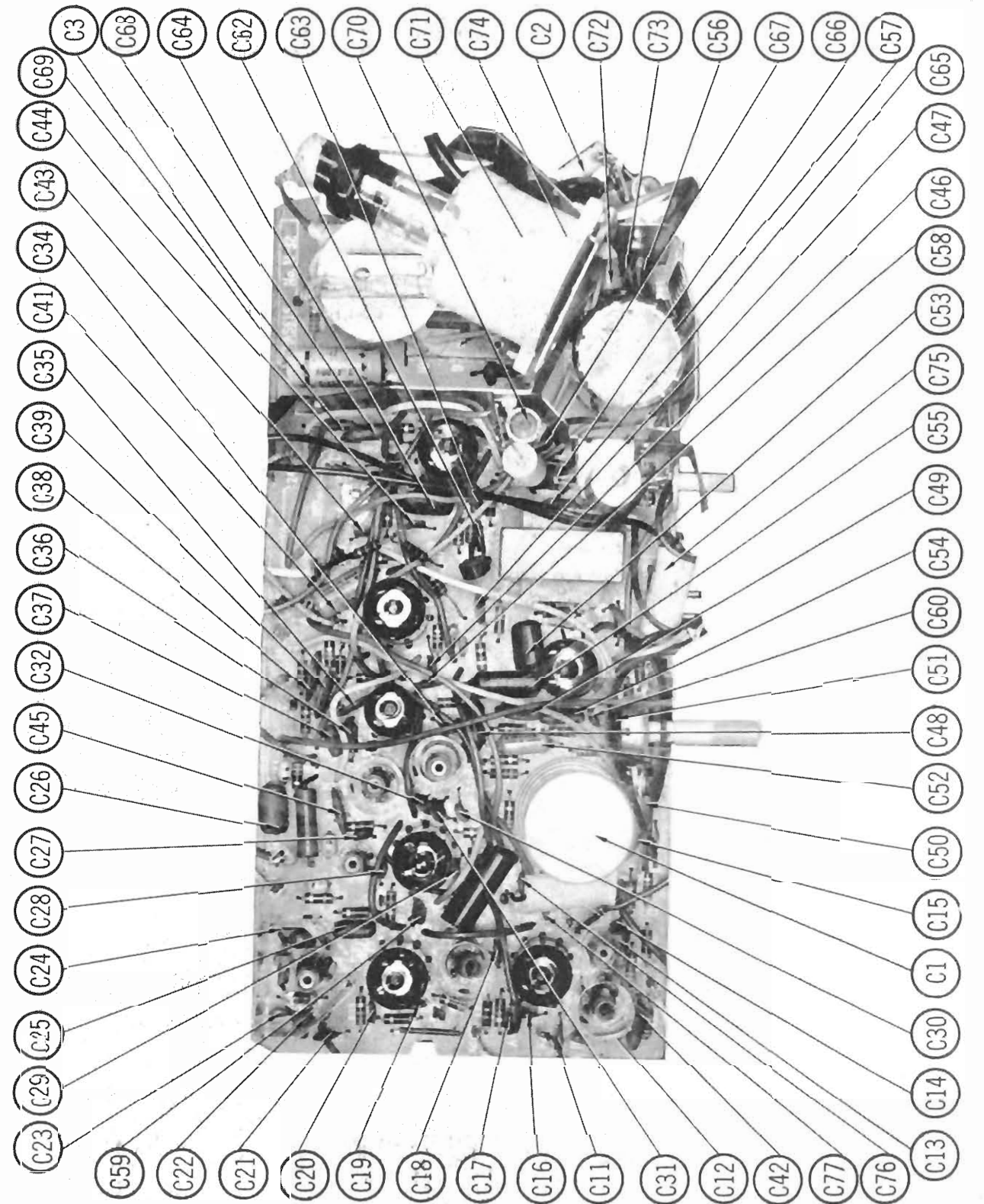
SYNC FAILURE
No vert. sync V5
No horiz. sync V5
No vert. or horiz. sync V5

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.)





PRINTED BOARD



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 A8..... GENERAL CEMENT #8309, 8606L, 8809... WALSCO #2343, 2344, 2588
Mixer Plate Coil..... GENERAL CEMENT #9296, 9297, 9300.... WALSCO #2510, 2546, 2547

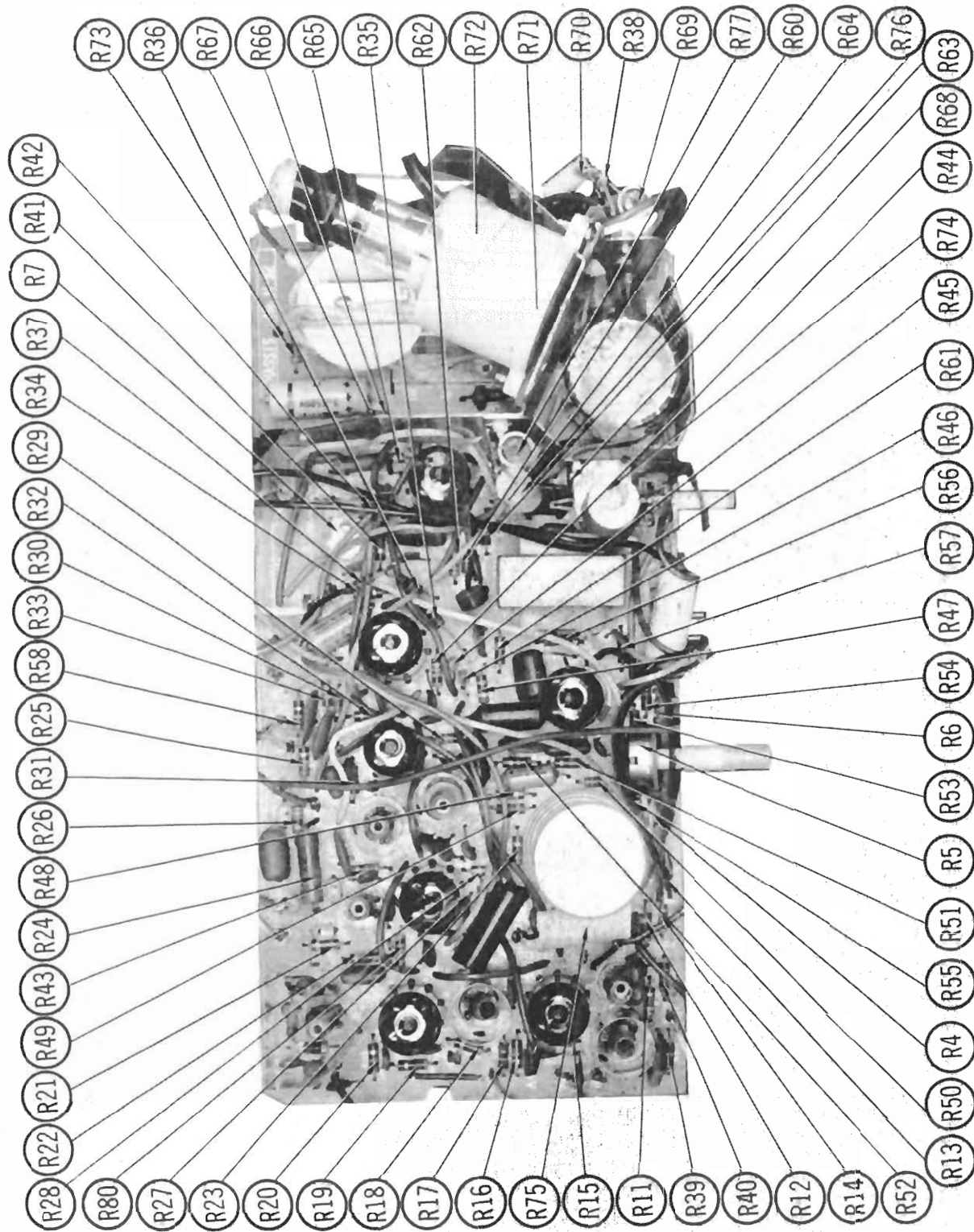
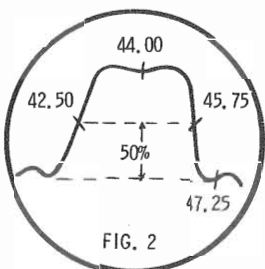
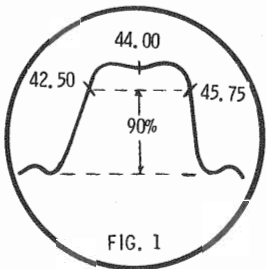
VIDEO IF ALIGNMENT

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 those shown. Connect a variable bias supply to the IF AGC line (point B) 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 B. Common to ground.	High side to ungrounded tube shield over osc-mixer tube. Low side to ground.		47.25MC	A1	Adjust for MINIMUM.
2. Connect vertical input of a 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)	42.5MC 44.0MC 45.75MC	A2, A3	Adjust for maximum amplitude and MINIMUM tilt with markers as shown in Figure 1.
3. Connect vertical input of a scope to point B. Low side to ground.	High side to ungrounded tube shield over osc.-mixer tube. Low side to ground.	44MC (10MC Sweep)	42.75MC 44.0MC 45.75MC 47.25MC	A4, A5, Mixer Plate Coil	Adjust for maximum gain and symmetry of response with markers as shown in Figure 2. In order to obtain a proper response, it may be necessary to slightly retouch A 2, A3.

SOUND IF ALIGNMENT

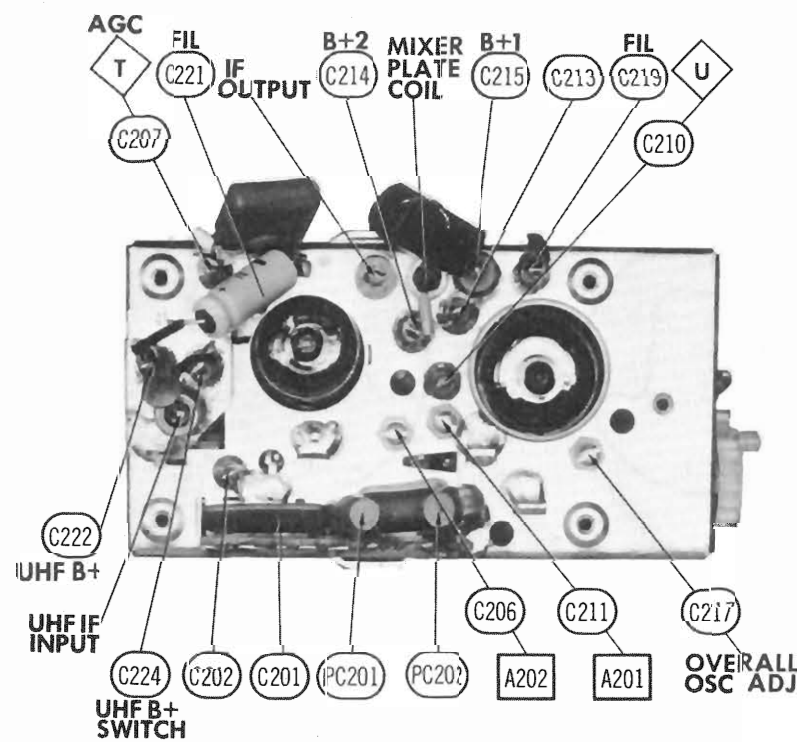
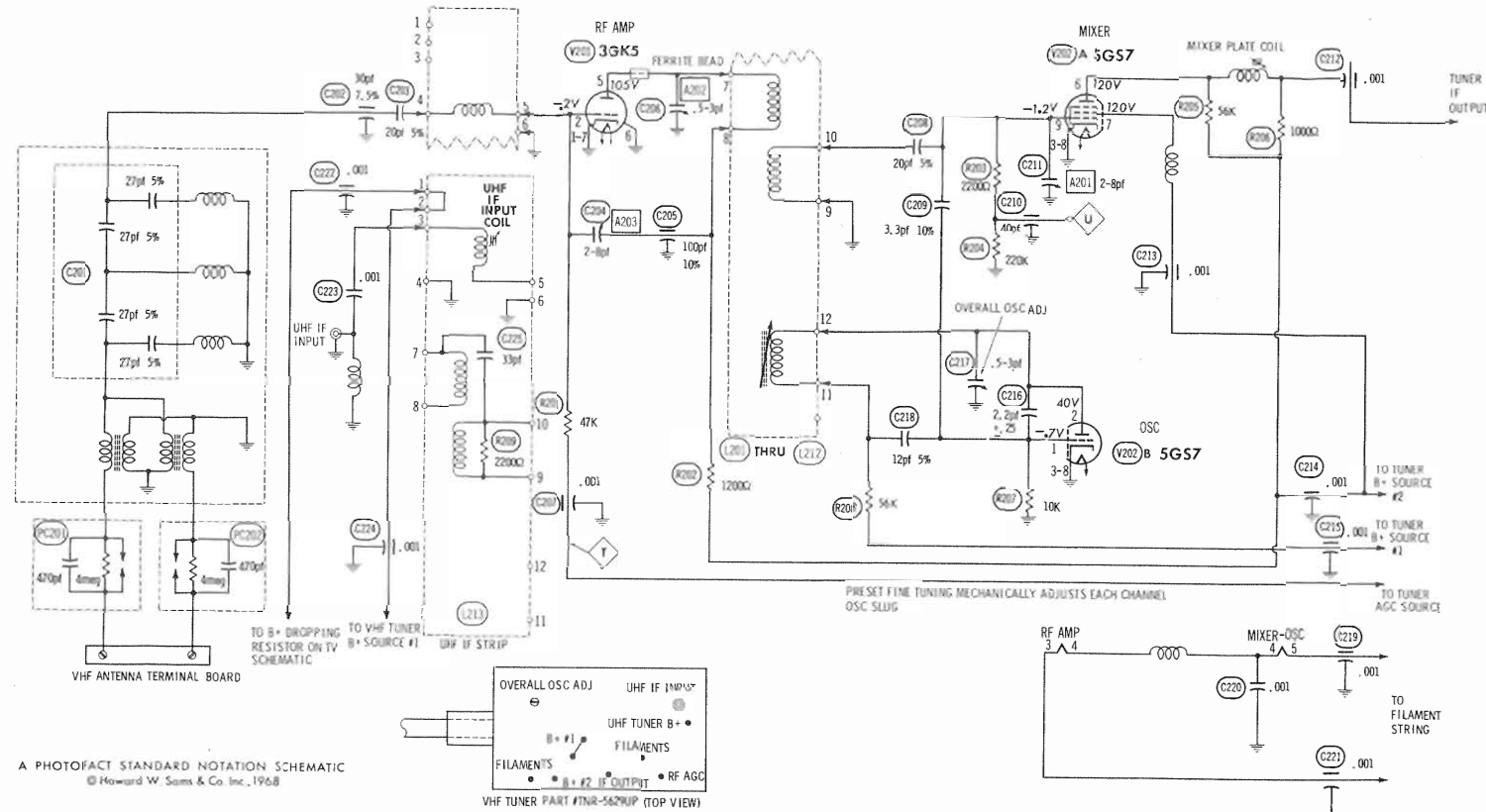
Tune in a station and adjust A6 for maximum sound. Reduce signal strength at the antenna terminals until distortion appears. Continue to reduce signal while aligning for undistorted output by adjusting A7, A8.



PRINTED BOARD

PACKARD BELL MODELS MR-323BGE,
MR-325WAL/MOD, MR-523BGE/-525WAL,
MSM-202A/-204A

FOLDER 1



VHF TUNER

VHF TUNER ALIGNMENT INSTRUCTIONS

OSCILLATOR ADJUSTMENTS

The oscillator for each channel is preset by means of the fine tuning control. Adjust fine tuning for best picture and sound on each channel. If any channel cannot be properly tuned in with the fine tuning, adjust overall oscillator adjustment and recheck all available channels.

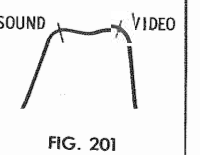
RF AND MIXER ALIGNMENT

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 a variable bias to the RF AGC line at point (U). Adjust bias to obtain response curve which shows no indication of overloading.

SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT POINT	ADJUST	REMARKS
1. Across antenna terminals with 1200 in each lead.	213MC	211.25MC 215.75MC	13	Vert. Input to Point (U), low side to ground.	A201, A202	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.	A203	Increase bias to .15 volts and adjust for minimum amplitude of response.
3. "	See Chart	See Chart	12 thru 2	Vert. Input to Point (U), low side to ground.		Reduce bias. Check all channels for response similar to Fig. 201. Make compromise adjustments of A201 and A202.

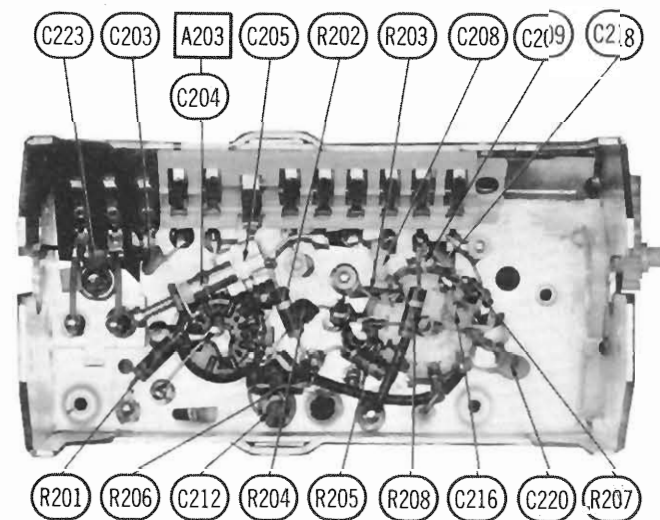
CHANNEL & FREQUENCY CHART

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



UHF TUNER ALIGNMENT INSTRUCTIONS

Tune to a UHF station and adjust UHF IF Input coil for best picture and sound.



VHF TUNER PARTS LIST

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V201	RF Amp.	3GK5	V202	Mixer - Osc.	5GS7

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.
C201A	27 500V 5%			TCZ-27			CNO427	10TCC-Q27
B	27 500V 5%			TCZ-27			CNO427	10TCC-Q27
C	27 500V 5%			TCZ-27			CNO427	10TCC-Q27
D	27 500V 5%			TCZ-27			CNO427	10TCC-Q27
C202	30 500V 7.5%							
C203	20 500V 5%			DTZ-20			CNO420	10TCC-Q20
C204	2-8							
C205	100 500V 10%							
C206	.5-3							
C207	.001 500V		EF-001	MFT-1000		CCF-102	CT280A	10TCC-Q20
C208	20 500V 5%			DTZ-20			CNO420	10TCC-Q20
C209	3.3 10%		NPO-DI 3.0	DTZ-3R3		CCF-102	CNO420	10TCC-Q20
C210	40 500V							
C211	2-8							
C212	.001		EF-001	MFT-1000		CCF-102	CT280A	10TCC-Q20
C213	.001 500V		EF-001	MFT-1000		CCF-102	CT280A	10TCC-Q20
C214	.001 500V		EF-001	MFT-1000		CCF-102	CT280A	10TCC-Q20
C215	.001 500V		EF-001	MFT-1000		CCF-102	CT280A	10TCC-Q20
C216	2.2 500V ±.25		NPO-DI 2.2	DTZ-2R2	CZ601CJ2R2D	CCF-102	CNO422	10TCC-V22
C217	.5-3							
C218	12 500V 5%			TCZ-12	CZ601CG120J	CCF-102	CNO412	10TCC-Q12
C219	.001 500V		EF-001	MFT-1000		CCF-102	CT280A	10TCC-Q12
C220	.001 500V		DI-1000	DD-102	JBS601YP102K	CCF-102	GP210	10TS-D10
C221	.001 500V		EF-001	MFT-1000		CCF-102	CT280A	10TCC-Q12
C222	.001 500V		DI-1000	DD-102	JBS601YP102K	CCF-102	GP210	10TS-D10
C223	.001		DI-1000	DD-102	JBS601YP102K	CCF-102	GP210	10TS-D10
C224	.001 500V		EF-001	MFT-1000		CCF-102	CT280A	10TCC-Q12
C225	33		NPO-DI 33	DTZ-33	CS601CG330K	CCF-102	CNO433	10TCC-Q33

COILS (RF-IF)

ITEM No.	USE	Packard Bell PART No.	NOTES	ITEM No.	USE	Packard Bell PART No.	NOTES
L201	Ant., RF, Mixer, Osc.	2PA4A	Channel 2 Strip	L208	Ant., RF, Mixer, Osc.	9PA4A	Channel 9 Strip
L202	"	3PA4A	" 3 "	L209	"	10PA4A	" 10 "
L203	"	4PA4A	" 4 "	L210	"	11PA4A	" 11 "
L204	"	5PA4A	" 5 "	L211	"	12PA4A	" 12 "
L205	"	6PA4A	" 6 "	L212	"	13PA4A	" 13 "
L206	"	7PA4A	" 7 "	L213	RF, Mixer, Osc.	1A01	Channel 1 Strip
L207	"	8PA4A	" 8 "				

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Packard Bell PART No.	REPLACEMENT DATA
PC201	Antenna Isolation	4meg, 470pf, Spark Gap		
PC202	Antenna Isolation	4meg, 470pf, Spark Gap		

UHF TUNER PARTS LIST

TRANSISTORS

ITEM No.	TYPE No.	FUNCTION	REPLACEMENT DATA					
			MFGR. PART No.	DELCO PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL RECTIFIER PART No.	RCA PART No.	SYLVANIA PART No.
Q301	TIS-18	UHF Oscillator			GE-11	TR-24	SK-3019	ECG 108

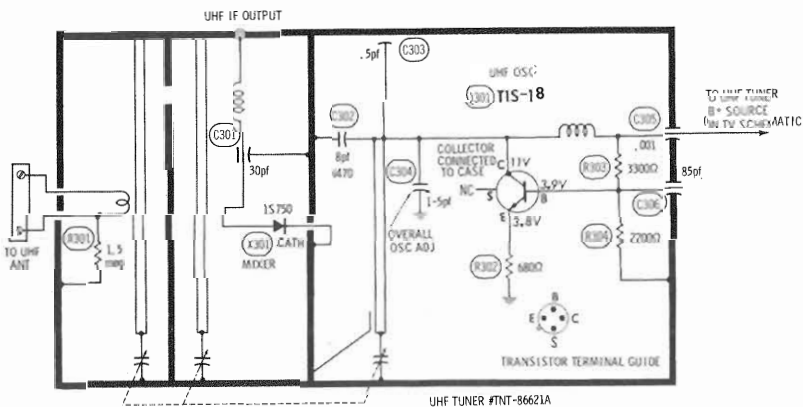
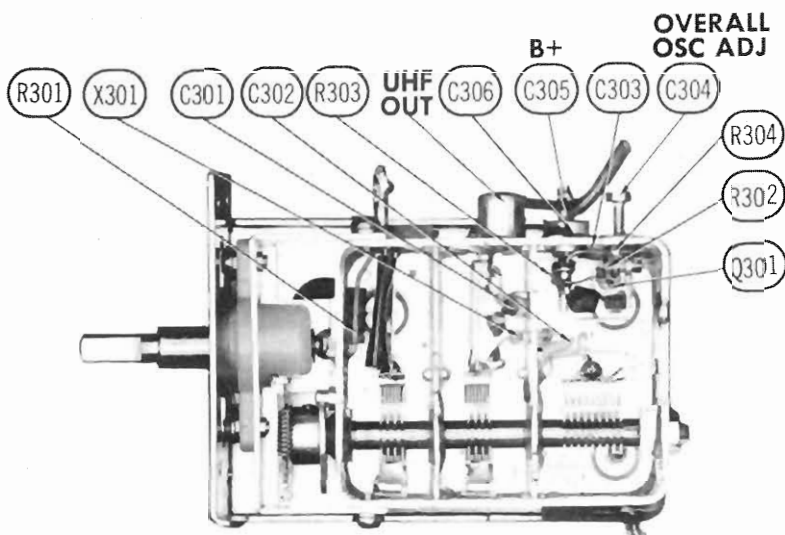
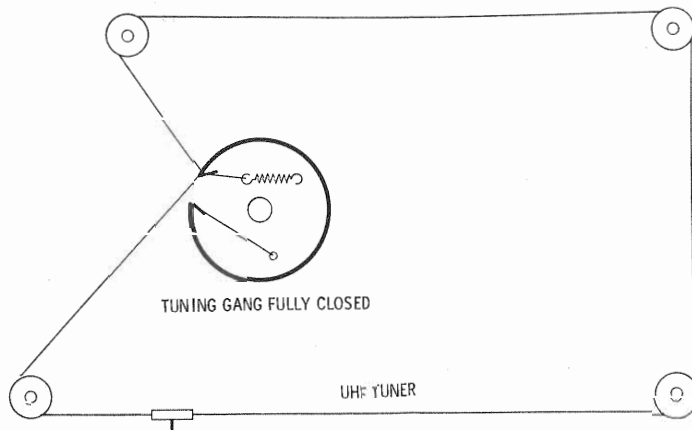
POWER RECTIFIERS & SIGNAL DIODES

ITEM No.	MFGR. PART OR TYPE No.	REPLACEMENT RECTIFIERS & DIODES		REPLACEMENT RECTIFIERS		NOTES
		GENERAL ELECTRIC PART No.	INTERNATIONAL RECTIFIER PART No.	SYLVANIA PART No.	SARKES TARZIAN PART No.	
X301	1S750	1N82A	1N82AG	ECG 112		

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.
C301	30							
C302	8 N470							
C303	.5pf ±.5							
C304	1-5							
C305	.001							
C306	85							

DIAL CORD STRINGING



A PHOTOFACT STANDARD NOTATION SCHEMATIC
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UHF TUNER

PARTS LIST AND DESCRIPTION

(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.

WIRING DATA

High Voltage Lead	Use BELDEN No. 8869 (17KV)
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8738 (Two Conductor)
3000 Tuner Input Lead	Use BELDEN No. 8530 (Solid) Available in 12 Colors
3000 Antenna Lead-in	Use BELDEN No. 8524 (Stranded) Available in 12 Colors
Antenna Rotor Cable	Use BELDEN No. 8230 or 8275
	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor
	Use BELDEN No. 8485 (Round) - 5 Conductor
	Use BELDEN No. 8488 (Round) - 8 Conductor

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
Q301	UHF Oscillator (Transistor)	TIS-18	V4	Audio Detector	4DT6
V201	RF Amp.	3GK5	V5	Audio Output - Sync Sep.	11BM8
V202	Mixer - Oscillator	5GS7	V6	Keyed AGC - Horiz. Osc.	6LX8
V1	1st Video IF	4E17	V7	Vert. Mult. - Vert. Output	10GV8
V2	2nd Video IF	4E17	V8	Horiz. Output - Damper	381E7
V3	Video Output - Sound IF	10TX8	V9	HTV Rectifier	1X20

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	Packard Bell PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SYLVANIA PART No.	
V10	T40-21 ① T31-14 ②				

① Used in Models MR-523BGE/WAL and MSM-202A/204A. ② Used in Models MR-523BGE and MR-325MOD/WAL.

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.	
X1	TYS-D6-1M	GE-504A	8D4 or 5A4-D	ECG 117 or ECG 118	SK-3031 or SK-3017A	F-4 or 40C
X2	TYS-OA70	1N80	1N80	ECG 119		
X3	TVM-K-112C	6GC1	DD04	ECG 113		

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.
C1A	300 180V	ECE-Q180 HBX1A					
B	300 180V						
C	100 180V						
D	10 180V						
C2	1 250V	ECE-B250V14					
C3	3 500V	ECE-B500V3	PR51800		BRI-470		T250X1B
C4	20 25V	ECE-B25V20	CR5111A	EA30-25	BR4-5/40	MT1-9	TVA-150C
					NLW20-25		TVA-193C
							TK-130S

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.
C11	47	10%	DI-47	DD-470	JBX601YP470K	CCD-470	GP447	10TS-Q47
C12	10	10%	DI-10	DD-100		CCD-100	GP410	10TS-Q10
C13	150	10%	DI-150	DD-151		CCD-151	GP315	10TS-T15
C14	.002		DI-2000	DD-202	JBX601YP202K	CCD-202	GP220	10TS-D20
C15	.1				DMF1P1	IDP-2-104	PVC101	225 P10491
C16	47	10%			JBX601YP470K	CCD-470	GP447	10TS-Q47
C17	.002		DI-47	DD-202	JBX601YP202K	CCD-202	GP220	10TS-D20
C18	.002		DI-2000	DD-202	JBX601YP202K	CCD-202	GP220	10TS-D20
C19	.002		DI-2000	DD-202	JBX601YP202K	CCD-202	GP220	10TS-D20
C20	.002		DI-2000	DD-202	JBX601YP202K	CCD-202	GP220	10TS-D20
C21	.002		DI-2000	DD-202	JBX601YP202K	CCD-202	GP220	10TS-D20
C22	.5	a.s.	DI-5	DD-050		CCD-050	GP368	10TS-T68
C23	.5	a.s.	DI-5	DD-050		CCD-050	GP368	10TS-T68
C24	.5	a.s.	DI-5	DD-050		CCD-050	GP368	10TS-T68
C25	.1	50V	DI-5	DD-050	DMF1P1	IDP-2-104	PVC101	225 P10491
C26	.1	400V						

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.

CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA							
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL- DUBILIER PART No.	ELMENCOR PART No.	MALLORY PART No.	SPRAGUE PART No.		
C27	7 N470 ±.5		DI-6,8	DD-6R8		3CCD-6R8	GP568	10TS-V68		
C28	10 N470 10%		DI-10	DD-100		CCD-100	GP410	10TS-Q10		
C29	18 10%		DI-18	DD-100		CCD-180	GP410	10TS-Q18		
C30	4 .001 ±.25		HY-P-15-4.7	DD30-R		3CCD-3R7				
C31	.001 10%		DI-1000	DD-102	JBS601Y P102K	CCD-102	GP210	10TS-D10		
C32	.001 10%		DI-82	DD-820	JBS601Y P820K	CCD-820	GP482	10TS-Q82		
C33	.001 10%		DI-1000	DD-102	JBS601Y P102K	CCD-102	GP210	10TS-D10		
C34	.005 10%		TTD-005	CK-502	HOY101ZVS02P	CCD-502	TA250	TG-D50		
C35	18 N470 10%		DI-18	DD-180		CCD-180	GP417	10TS-Q18		
C36	.047 10%		DBE4S47		DMF4S47	4DP-3-473	PVC4147	4PS-S47		
C37	250 10%		DI-250	DD-251		CCD-251	GP325	10TS-T25		
C38	.0047 10%		DI-4700	DD-472	JBX601Y P472K	CCD-472	GP247	10TS-D47		
C39	.680 10%		DI-680	DD-681	JBX601Y P681K	CCD-681	GP368	10TS-T68		
C40	.015 1KV 50V		DBE6S15		DMF6S15	6DP-2-153	PVC6115	6PS-S15		
C41	.1 1KV 50V		DBE6S15		DMF6S15	1DP-2-104	PVC101	225P10491		
C42	820 10%		DI-820	DD-821	JBX601Y P821K	CCD-821	GP382	10TS-T82		
C43	820 10%		DI-820	DD-821	JBX601Y P821K	CCD-821	GP382	10TS-T82		
C44	.0047 10%		DI-4700	DD-472	JBX601Y P472K	CCD-472	GP247	10TS-D47		
C45	470 10%		DI-470	DD-471	JBX601Y P471K	CCD-471	GP347	10TS-T47		
C46	100 10%		DI-100	DD-101	JBX601Y P101K	CCD-101	GP310	10TS-T10		
C47	.001 400V 10%		BE10D1		DPMS16D1	16DP-2-103		16PS-D10		
C48	.0039 10%		DI-250	DD-251		CCD-251	GP239	10TS-D39		
C49	.0039 10%		DI-250	DD-251		CCD-251	GP325	10TS-T25		
C50	.0047 400V 10%		DBE6D47		DMF6D47	6DP-1-172	PVC6247	6PS-D47		
C51	.001 1KV 10%		BE10D1		DPMS16D1	16DP-2-103		16PS-D10		
C52	.001 400V 10%		DBE4P1		DMF4P1	4DP-3-104	PVC601	4PS-P10		
C53	.1 400V 10%		DBE4S22		DMF4S22	4DP-2-223	PVC6122	4PS-S22		
C54	.022 400V 10%		DBE4S22		DMF4S22	4DP-2-223	PVC6122	4PS-S22		
C55	.022 400V 10%		DBE4S22		DMF4S22	4DP-2-223	PVC6122	4PS-S22		
C56	.01 10%		DI-10000	DD-103	BYX601Z U103M	CCD-103	GP110	10TS-S10		
C57	.01 10%		DI-10000	DD-103	BYX601Z U103M	CCD-103	GP110	10TS-S10		
C58	.002 10%		DI-2000	DD-202	JBX601Y P202K	CCD-202	GP220	10TS-D20		
C59	.002 10%		DI-2000	DD-202	JBX601Y P202K	CCD-202	GP220	10TS-D20		
C60	.1 400V 10%		DI-470	DD-471	JBX601Y P471K	CCD-471	GP347	10TS-T47		
C61	100 10%		DI-100	DD-101	JBX601Y P101K	CCD-101	GP310	10TS-T10		
C62	47 1KV 10%		DI-4.7	DD-470	JBX601Y P470K	CCD-470	GP447	10TS-Q47		
C63	.22 50V 10%		DBE2P22		DMF2P22	2DP-4-224	PVC2022	2PS-P22		
C64	.0047 400V 10%		DBE6D47		DMF6D47	6DP-1-472	PVC6247	6PS-D47		
C65	.0047 400V 10%		DBE6D47		DMF6D47	6DP-1-472	PVC6247	6PS-D47		
C66	.0068 400V 10%		DBE6D68		DMF6D68	6DP-1-682	PVC6268	6PS-D682		
C67	.001 10%		ADM-20-102	CPR-1000J	CD19F102J500	DM-19-102J	SX210	MS-21		
C68	.001 10%		ADM-20-102	CPR-1000J	CD19F102J500	DM-19-102J	SX210	MS-21		
C69	.001 10%		HVD-60-100	DD60-101	HVX602X P101M	6CCD-202	6HV310	60GA-T10		
C70	100 5KV 10%		3E10S22		3PMS16D22	16DP-2-222		16PS-D22		
C71	.022 1KV		DI-5000	DD-502	JBX601Y P502K	CCD-502	GP250	10TS-D50		
C72	.005 1KV		HVD-60-100	DD60-101	HVX602X P101M	6CCD-101	6HV310	60GA-T10		
C73	100 4.5KV		DBE6P1		DMF6P1	6DP-4-104	PVC601	6PS-P10		
C74	.1 600V		DI-2000	DD-202	JBX601Y P202K	CCD-202	GP220	10TS-D20		
C75	.002 10%		DI-2000	DD-202	JBX601Y P202K	CCD-202	GP220	10TS-D20		
C76	.002 10%		DI-2000	DD-202	JBX601Y P202K	CCD-202	GP220	10TS-D20		
C77	.002 10%		DI-2000	DD-202	JBX601Y P202K	CCD-202	GP220	10TS-D20		

CONTROLS

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

ITEM No.	USE	RESISTANCE	REPLACEMENT DATA					
			Packard Bell PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	Volume/Switch	1meg	EVC-B08L25A16	F2-1meg ①, SSK100, KR-2	A47-1meg-2; ①, KSS-3, SWE-20 or (NP-1meg-2; ①, UP-C-400), NWE-20)	Q13-137 ①, 76-2 or (BU1 ①), CF26, SSI, W7)	RU16A, SL36, SL3250, U542 or (UA16A ①), SK1000, U542) or (U53 ①, U527)	
R2	Contrast	20K	EYV-M0AL25B24	F1-.25K ①, SSK100	A47-20K-S ①, KSS-3 or (NP-20K-S ①, UP-C-400)	Q11-119 ① or (BU1 ①, CF62, SSI, DC1) *	UA24L ①, SK1000 or (RU253L, SL36, SL3250) or (U26 ①)	
R3	Brightness	200K	EYV-M0AL25C25	F3-250K ①, SSK100	NP-200K-V ①, UP-C-400	B17-129, SK1 ① or (BU1 ①), (CF51, SSI, DC1)	RU254R, SL36, SL3250 or (UA254R ①, SK1000) or (U45 ①)	
R4	Vert. Linearity	500K	EVT-VOA400B55	T-500K		X201R504B	MTC55L1	
R5	Vert. Hold	1.2meg	EVD-06A220B16	TT-74Z or (F1-1.5meg, SNK014)	B47-1.1meg-S or (NP-1.1meg-S, NML-A-300)	B11-138, TM4 or (BU11, CF18, S86) *	PTA1254L or (RU155L, SL37, SN1000) or (UA155L, SN1000)	
R6	Height	2meg	EVT-VOA400B26	T-2meg			MTC26L1	
R7	AGC	500Ω	EVL-S2AA00B52	T-500 ②		X201R501B ②	MTC52L1 ②	

① Enlarge mounting hole. ② 1meg may be used in some versions.
③ For horizontal mounting, bend terminals to fabricate mounting to "PC" board.

RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN PART No.	Packard Bell PART No.			IRC PART No.	WORKMAN PART No.	Packard Bell PART No.
R24	5600Ω 3W	PW5-6000	3G-5.6K	ERG-3PSK562	R75	4.7Ω 4W		F-4.7	ERU-4P4R7
R59	Thermistor (3.7Ω Cold)		FS-101		R76	100Ω 4W	PW5-100	WR-100	ERM-4P101
R74	42Ω 20W	PW20-40	148	ERM-20H420	R77	68Ω 4W	5W-SQ-67.5		ERM-4P680

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.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				
		PART No.	MEISSNER PART No.	MILLER PART No.	WORKMAN PART No.	
L1	Balun	TLR-9305-1 * †				
L2	1st Video IF	TLI-1155				
L3	47.25MC Trap	TLI-9154				
L4	2nd Video IF	TLI-1156				
L5	3rd Video IF	TLI-5157				
L6	RF Choke (10uh)	TLQ-100-999	19-2016	72F105AP	T823	
L7	RF Choke (5.3uh)	TLM-053-999	19-1008	4609	T959	
L8	Peaking (560uh)	TLT-569-999	19-2029	72F564AP	T325	
L9	Peaking (220uh)	TLT-351-999	19-3330	6134	T319	
L10	Sound Takeoff	TLT-221-999	19-4201	72F224AP	T312	
L11	Sound Interstage	TLI-1157				
L12	Quadrature	TLI-1158				
L13	Quadrature	TLI-1159				
L14	Damper Choke (8uh)	TLM-080-999	19-2015	4611	T822	

* Used in Models MR-523BGE, MSM-202A, MR-323BGE, MR-325WAL, MR-325MOD.
† Part #TLR-9313 is used in Models MR-525WAL and MSM-204A.

COILS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA						
		Packard Bell PART No.	MERIT PART No.	MILLER PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	WORKMAN PART No.
L15	Horiz. Oscillator	TLH-315						

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		Packard Bell PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
T1	Vert. Output	TLV-234(-1) (TLV-41A2B)					
T2	Yoke (Horiz. 12.2uh)	TLV-468(-T)					
T3	Horiz. Output	TLV-468(-D)					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PR1	SEC.	Packard Bell PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
T4	1900Ω	6-8Ω	ETA-28A36A	A-4097		24578 ①	S-33X ①	① Drill new mounting hole(s).

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA			NOTES
		Packard Bell PART No.	JENSEN PART No.	QUAM PART No.	
SP1	3 1/2" PM 8Ω	EAS-9 P63SA	T35K78	3A05Z8	

MISCELLANEOUS

ITEM No.	PART NAME	Packard Bell PART No.	NOTES
M1	VHF Tuner	TNR-5629UP	
M2	UHF Tuner	TNT-86621	
M3	VHF Antenna	TSR-965-1	Models MR-523BGE, MSM-202A.
M4	VHF Antenna	TSR-965-3	Models MR-323BGE, MR-323WAL, MR-325MOD.
	VHF Antenna	TSR-317	Models MR-525WAL, MSM-204A.
	VHF Antenna	TSR-323	Models MR-523BGE, MR-525WAL, MSM-202A, MSM-204A -
PC1	UHF Antenna		IFD Replacement TA-544.
	Antenna Isolation	EXA-3Z P03B	Models MR-323BGE, MR-323WAL, MR-325MOD -
	Printed Circuit Board	TNP-2141	IFD Replacement TA-544.
	Printed Circuit Board	TNP-2141-9	Centralab RC-471, Sprague AC1-1.
			With Components, less tubes

CABINETS & CABINET PARTS

(When Ordering Specify Model, Chassis & Color)

ITEM	MODELS	PART No.	MODELS	PART No.
Cabinet	MR-523BGE, MSM-202A	TKY-2001-1	VHF Channel Selector	TRX-747-3
Cabinet	MR-525WAL, MSM-204A	TKY-2002-1	Fine Tuning	TRX-454-1
Cabinet	MR-323BGE	TKY-1901-1	UHF Tuning	TRX-763-1
Cabinet	MR-325WAL	TKY-1902-1	On-Off-Volume	TRX-665-1
Cabinet	MR-325MOD	TKY-1904-1	Contrast, Brightness	TRX-688-1
Cabinet Back	MR-523BGE, MSM-202A	TKU-22701-1	Contrast, Brightness - All except "	TRX-607-1
Cabinet Back	MR-525WAL, MSM-204A	TKU-22702-1		
Cabinet Back	MR-323BGE, MR-325WAL	TKU-22306	Front Glass	MR-525BGE, MR-525WAL, MSM-202A, MSM-204A
Cabinet Back	MR-325MOD	TKU-22310	Front Glass	MR-323BGE, MR-325WAL, MR-325MOD
Handle	MR-325MOD	TKK-204-6		
Handle	All except	TKK-204-4		

PACKARD BELL MODELS MR-323BGE,
MR-325WAL/MOD, MR-523BGE/-525WAL,
MSM-202A/-204A