

**CABINET—REAR VIEW**

## HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Tune to a TV station and get all controls for normal operation. Connect a clip lead from point  $\diamond$  to ground. Set the Horizontal Hold Control (Fine), R4, to the center of its range. Connect a clip lead across the Horizontal Stabilizer Coil, L15. Adjust Horizontal Hold Control, R8

(Coarse), until the picture tends to float slowly across the screen. Remove the clip lead from Horizontal Stabilizer Coil and adjust B1 until the picture tends to float slowly across the screen. Remove clip lead from point  $\diamond$ .

## DISASSEMBLY INSTRUCTIONS

### CHASSIS REMOVAL

1. Remove rear cover and control knobs from front of cabinet.
2. Disconnect picture tube socket, mounting wires, HV anode lead, yoke power plug, and speaker leads.
3. Remove screws from secondary control mounting, remove 5 chassis screws securing chassis to cabinet, and remove chassis.

### PICTURE TUBE REMOVAL

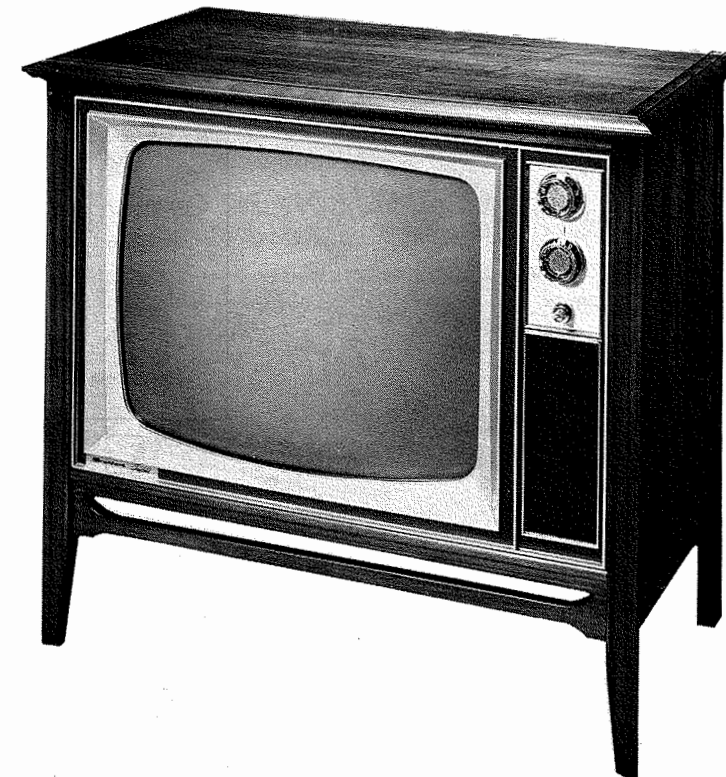
1. Lay cabinet face down on a soft protective surface and disconnect picture tube socket, yoke power plug, and HV anode lead.
2. Remove nut and bolt from picture tube mounting clamp and remove picture tube.

SET 770 FOLDER 1

BRADFORD MODELS WGEC-61580A/-61598A/-61606A/-61614A

PHOTOFACT® Folder

with CIRCUITRACE™



MODEL WGEC-61580A

## CAUTION

ONE SIDE OF AC LINE CONNECTED TO CHASSIS

TRADE NAME	Bradford Models WGEC-61580A/-61598A/-61606A/-61614A		
SUPPLIER	For current address, see Master Index.		
TYPE SET	Television Receiver		
TUBES	VHF - Fifteen, UHF - One Transistor		
POWER SUPPLY	110-120 Volts AC, 60 Cycles	RATING	135 Watts, 1.5 Amps. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

## SERVICING IN THE FIELD

### SAFETY GLASS

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

### FUSE OR FUSE DEVICE

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 Horizontal Stabilizer Coil, L15. (See "Tube Placement Chart" for location.)

### WIDTH

The width may be varied by adjusting a metallic sleeve, located between the yoke and the picture tube neck.

### 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.

**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. NA437 10 9 8 7 6 5 4 3 2 1 0

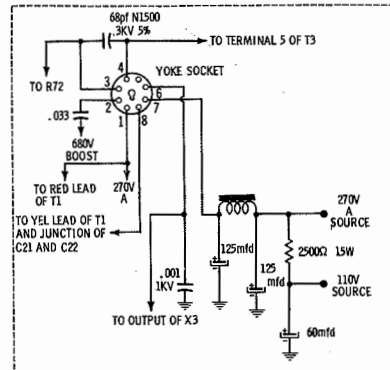
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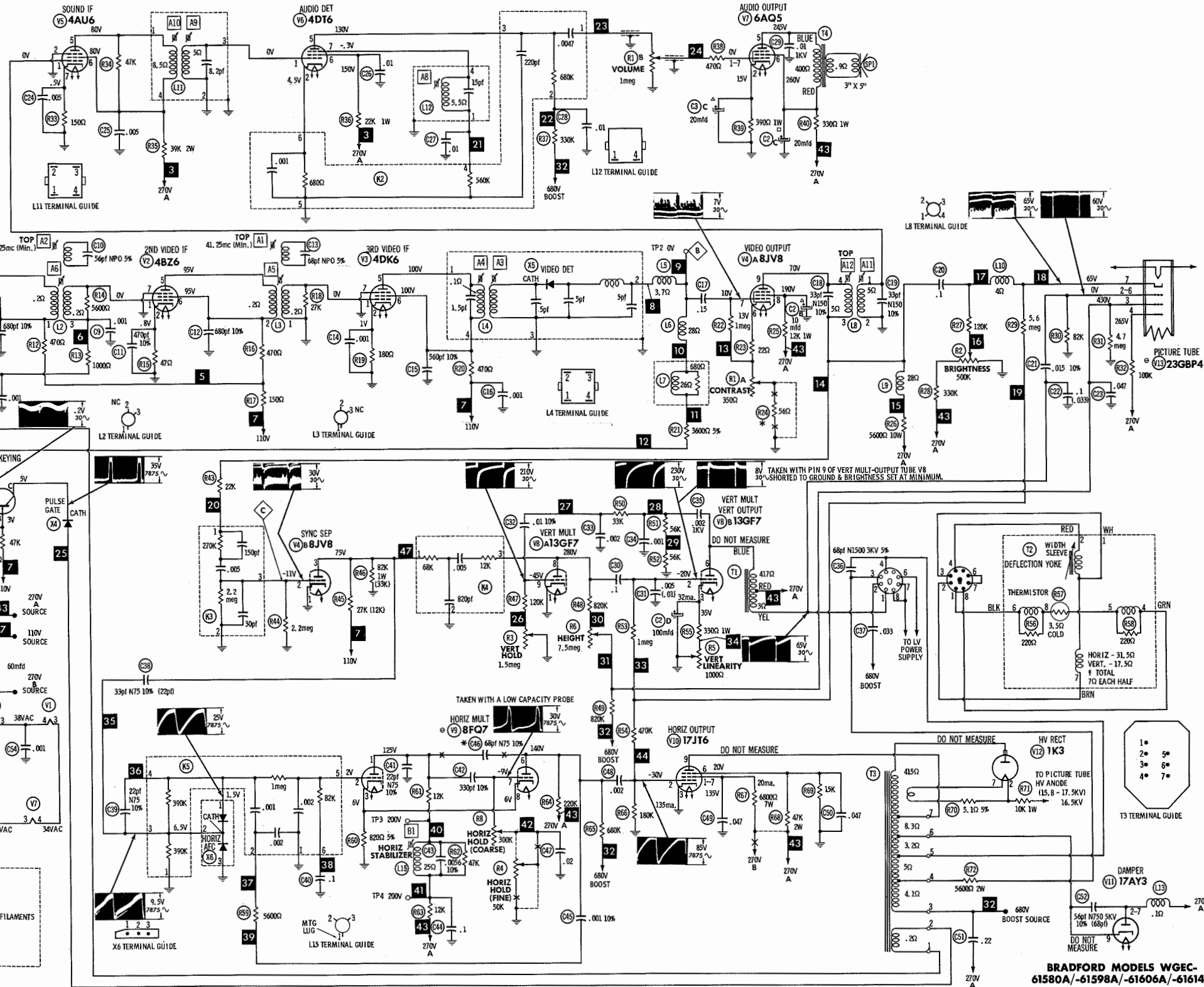
SET 770 FOLDER 1

BRADFORD MODELS WGEC-61580A/-61598A/-61606A/-61614A

SET 770 FOLDER 1



ALTERNATE POWER SUPPLY AND YOKE SOCKET CONNECTIONS USED IN SOME VERSIONS.



- \* NOT USED IN SOME VERSIONS  
Resistors are 1/2 watt or less and rated 10% or 20% unless otherwise indicated.  
⊕ DENOTES CHASSIS GROUND
- 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.
  7. Resistance measurements not given because of the wide variation in internal resistance of transistor.
  8. Waveforms taken with controls set to produce 65 volts peak-to-peak signal at picture tube.

A PHOTOFACT STANDARD NOTATION SCHEMATIC  
with CIRCUITRACE  
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BRADFORD MODELS WGEC-  
61580A/-61598A/-61606A/-61614A

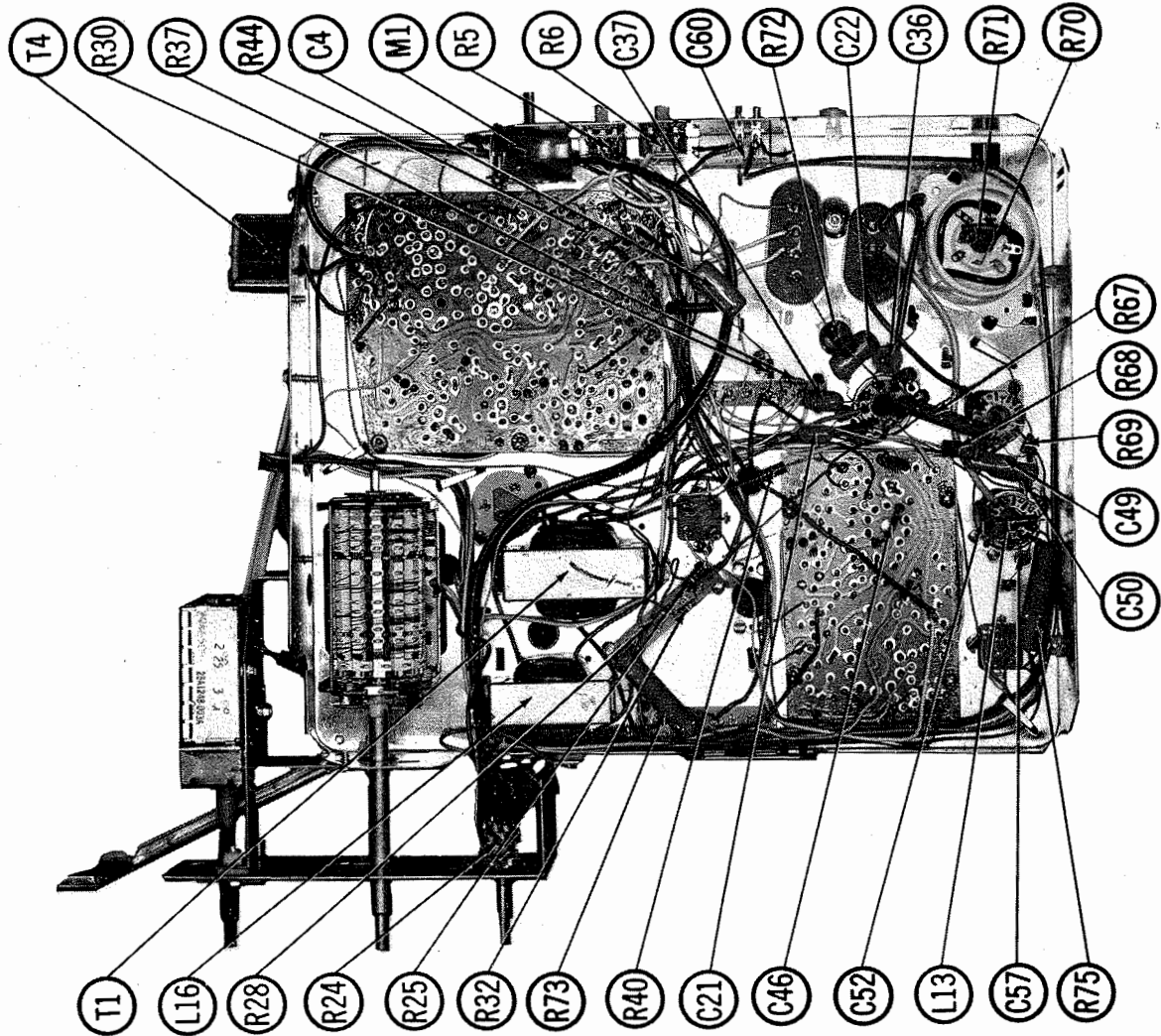
FOLDER 1

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	4BZ6	320K	47Ω	14Ω	15Ω	3145Ω †	3145Ω †	0Ω		
V2	4BZ6	320K	47Ω	15Ω	17Ω	3145Ω †	3145Ω †	0Ω		
V3	4DT6	.2Ω	180Ω	17Ω	19Ω	3000Ω †	3000Ω †	0Ω		
V4	8JV8	0Ω	1.1meg	27K †	5Ω	8Ω	340Ω	1meg	12K †	5600Ω †
V5	4AU6	5Ω	0Ω	8Ω	10Ω	39K †	39K †	150Ω		
V6	4DT6	5Ω	680Ω	10Ω	12Ω	1meg †	22K †	560K		
V7	6AQ5	NC	390Ω	12Ω	14Ω	800Ω †	355Ω †	50K		
V8	13GF7	0Ω	1.3meg	1200Ω	28Ω	22Ω	443Ω †	NC	2.4meg †	700K
V9	8FQ7	24K †	1.8meg	820Ω	19Ω	22Ω	220K †	80K	820Ω	0Ω
V10	17JT6	NC	170K	0Ω	28Ω	32Ω	12K †	6800Ω †	NC	8.3Ω †
V11	17AY3	NC	NC	TP	38Ω	32Ω	NC	25Ω †	NC	850K
V12	1K3	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP 423Ω †
V13	23GBP4	5Ω	82K	850K †	100K †	NC	NC	300K	3Ω	
V201	3GK5	0Ω	1.9meg	0Ω	1Ω	3700Ω †	0Ω	0Ω		
V202	5L18	15K	7300Ω †	0Ω	3Ω	1Ω	3500Ω †	20K †	0Ω	47K

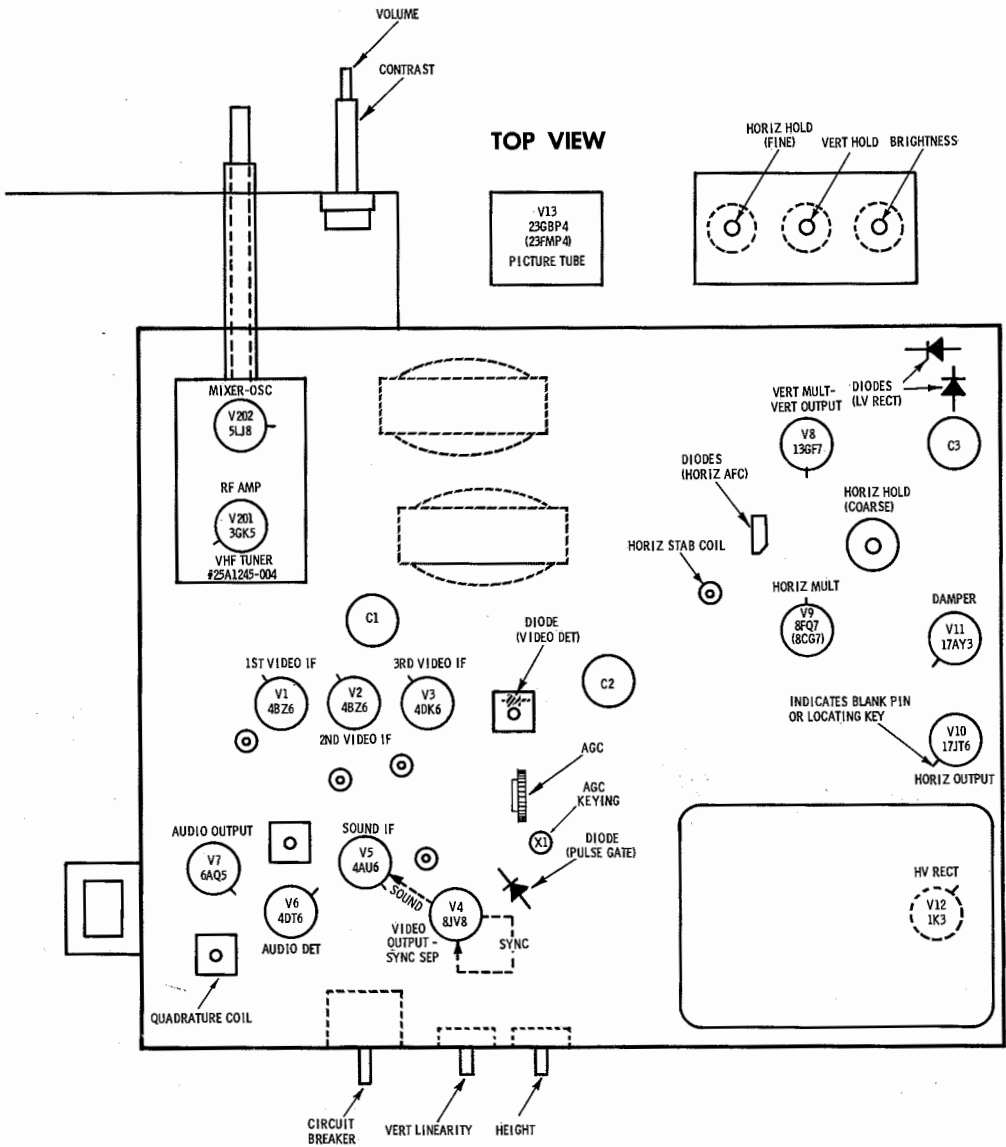
# THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.  
† MEASURED FROM OUTPUT OF X3.  
‡ MEASURED FROM PIN 9 OF V11.

NC NO CONNECTION  
TP TIE POINT



CHASSIS—BOTTOM VIEW

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

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

POWER SUPPLY FAILURE

No raster, no sound M1 (Circuit Breaker), X2, X3

SWEEP FAILURE

No raster, has sound V9, V10, V11, V12  
No vertical deflection V8  
Poor vert. linearity or foldover V8  
Poor horiz. linearity or foldover V9, V10, V11  
Narrow picture V8, V10, V11, X2, X3  
Vert. off freq. V8  
Horiz. off freq. X8 (Horiz. AFC Diode), V9

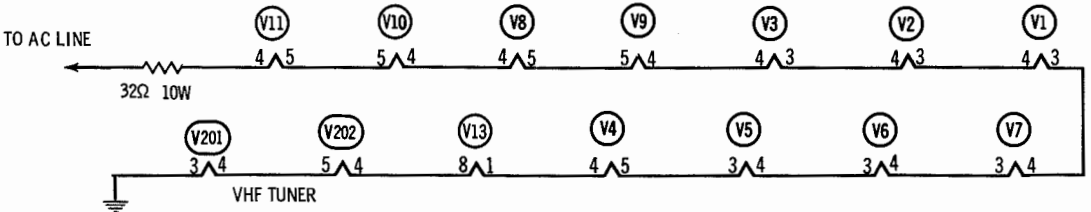
LOSS OF PICTURE OR SOUND

No pic, no sound, has raster V1, V2, V3, X5 (Video Det. Diode), V4  
No pic, no sound, has snow V201, V202, V1  
No pic, has sound, has raster V4, V13  
Has pic, no sound. V5, V6, V7  
Overloaded picture X1

SYNC FAILURE

No vert. sync V4  
No horiz. sync V4  
No vert. or horiz. sync V4

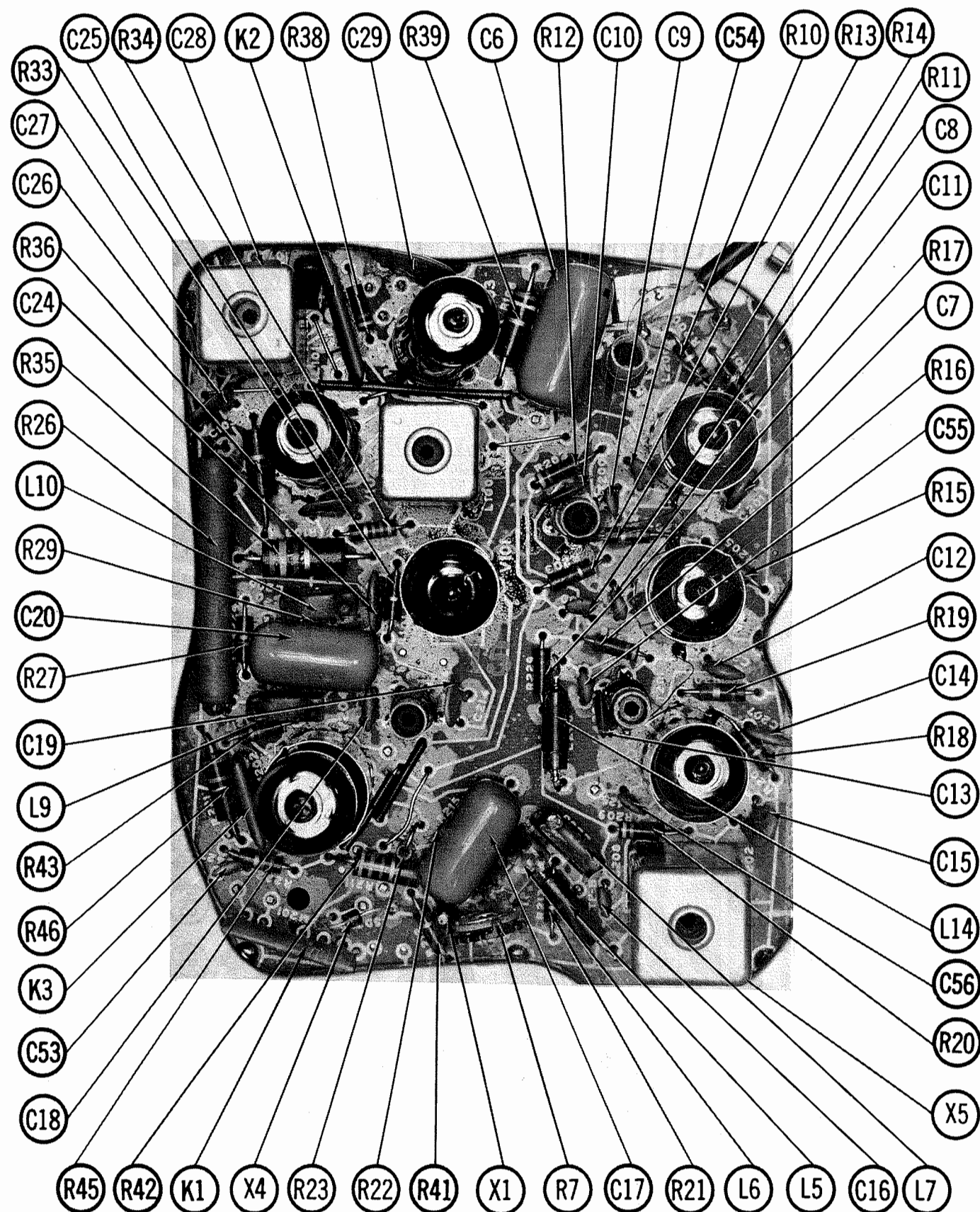
This receiver employs tubes used in a series filament network, an open filament in any tube will cause the set to be inoperative. (See circuit below.)



BRADFORD MODELS WGEC-  
61580A/-61598A/-61606A/-61614A

FOLDER 1

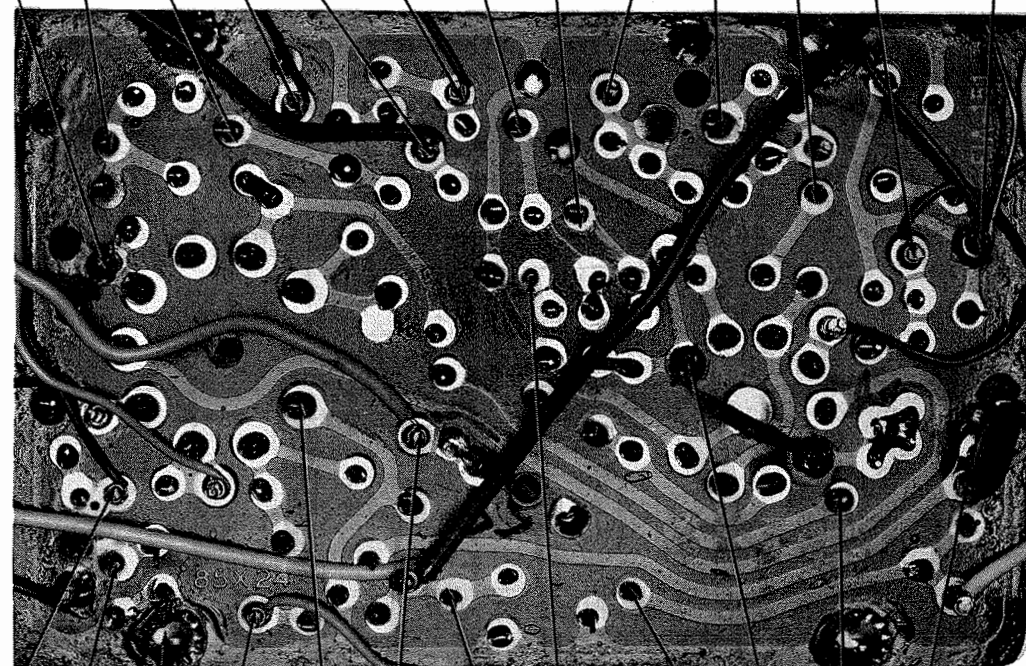




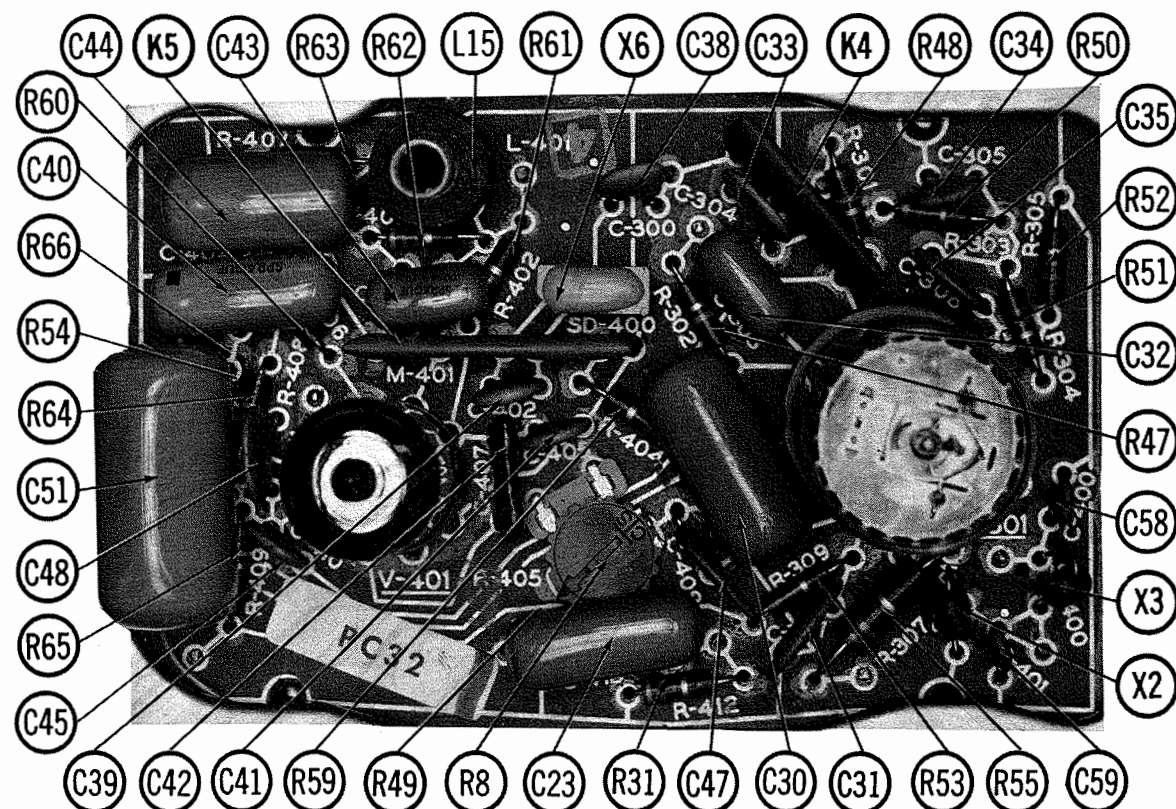
# VIDEO, SOUND IF, AGC, SYNC SEP PRINTED BOARD

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

29 28 27 30 26 47 35 36 40 41 38 44 \* 43 270V



46 45 34 V8 42 31 37 \* 32 V9 39 33 680V  
\* SOURCE



SWEEP 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 A12 ..... GENERAL CEMENT #8606, 8869, 9302 ... WALSCO #2511, 2543, 2588  
Mixer Plate Coil ... GENERAL CEMENT #9296, 9300, 9302 ... WALSCO #2510, 2511, 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  $\diamond$ ) 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.

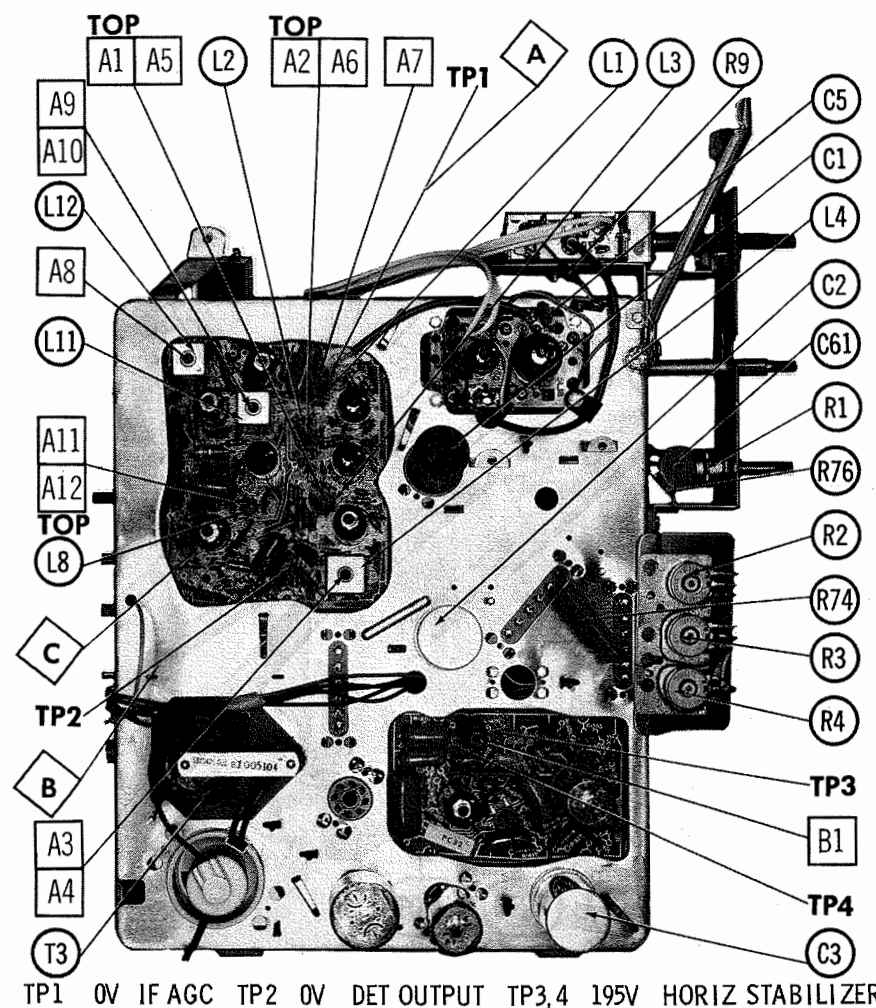
INDICATOR	GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	ADJUST	REMARKS
1. Connect DC probe of a VTVM thru a 47K resistor to point $\diamond$ . Common to ground.	Connect high side to ungrounded tube shield over Mixer-Osc. Low side to ground.		41.25MC 47.25MC	A1 A2	Adjust for MINIMUM.
2. Connect vertical input of a scope to point $\diamond$ . Low side to ground.	Connect high side to pin 1 (grid) of V3. Low side to ground.	44MC (10MC Sweep)	42.75MC 45.75MC	A3, A4	Adjust for maximum amplitude and MINIMUM tilt with markers as shown in Figure 1.
3. Connect vertical input of a scope to point $\diamond$ . Low side to ground.	Connect high side to ungrounded tube shield over Mixer-Osc. Low side to ground.	44MC (10MC Sweep)	41.25MC 42.75MC 44.25MC 45.75MC 47.25MC	A5, A6, A7, 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 A3 and A4.

### 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 A12 for MINIMUM beat interference.

### 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 signal while aligning for undistorted output by adjusting A9, A10, and A11.



TP1 0V IF AGC TP2 0V DET OUTPUT TP3,4 195V HORIZ STABILIZER

CHASSIS—TOP VIEW

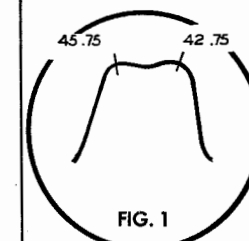


FIG. 1

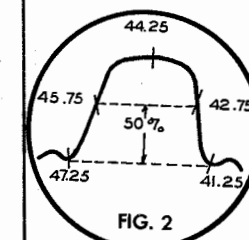


FIG. 2

BRADFORD MODELS WGEC-  
61580A/-61598A/-61606A/-61614A

FOLDER 1





VHF TUNER PARTS LIST AND DESCRIPTION

TUBES

* AMPEREX * GENERAL ELECTRIC * RCA * SYLVANIA *					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V201	RF Amp.	3GK5	V202	Mixer-Osc.	5LJ8

FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA				
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.
C201	8.2pf N330						
C202	3.3pf 47						
C203	.001						
C204	8.2pf N260						
C205	2.2pf						
C206	.001						
C207	.0015						
C208	.001						
C209	.001						
C210	.001						
C211	.001						
C212	.001						
C213	.001						
C214	.001						
C215	.001						

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

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	BRADFORD PART No.	REPLACEMENT DATA
K201	Antenna Isolation	.6-2.2meg, 130pf		
K202	Antenna Isolation	.6-2.2meg, 130pf		
K203	Antenna Network	27pf, 27pf, 27pf, 27pf		

UHF TUNER PARTS LIST AND DESCRIPTION

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			DELCO PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	
X301	SE-3002	UHF Oscillator				NPN

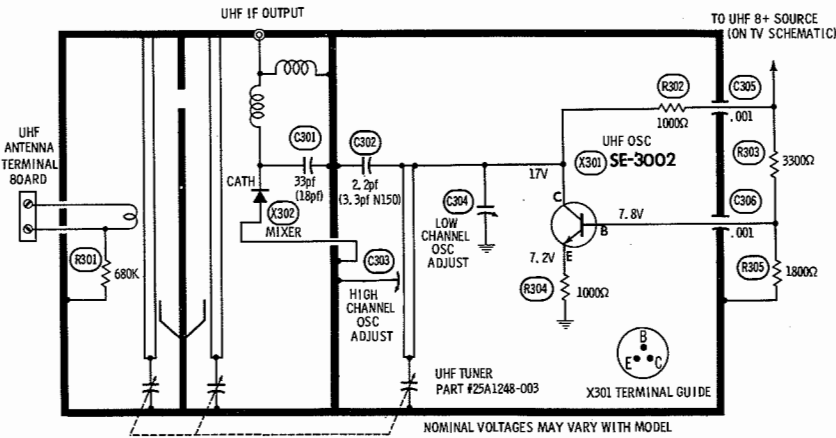
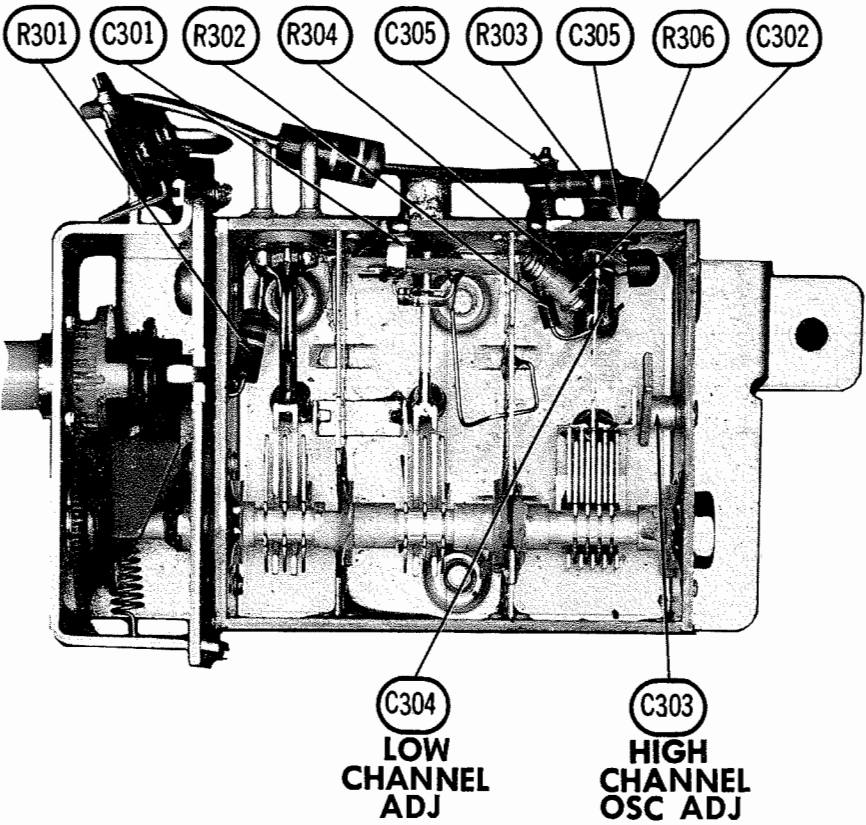
POWER RECTIFIERS & SIGNAL DIODES

ITEM No.	MEASURED CURRENT	ORIGINAL Part or Type No.	RECTIFIERS				DIODES
			GENERAL ELECTRIC PART No.	MALLORY PART No.	RCA PART No.	SARKES TARZIAN PART No.	
X302							1N82A

FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA				
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.
C301	33	(18pf)*	DI-33	DD-330	LA10Q33-S3	CCD-330	GP433
C302	2.2pf	(3.3pf N150)*	DD-330	TCZ-2R2	C10V22C	CCTO-2R2	GP433
C303	.001						
C304	.001						
C305	.001						
C306	.001						

\* Alternate Value



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UHF TUNER 25A1248-003

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 * SYLVANIA *					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	1st Video IF	4B26	V7	Audio Output	6AQ5
V2	2nd Video IF	4B26	V8	Vert. Mult. - Vert. Output	13GF7
V3	3rd Video IF	4DK5	V9	Horiz. Mult.	8FQ7 (8CG7) *
V4	Video Output - Sync Sep.	8JVB	V10	Horiz. Output	17J76
V5	Sound IF	4AU6	V11	Damper	17AY3
V6	Audio Detector	4DT6	V12	HV Rectifier	1K3

\* Alternate

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	BRADFORD PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SYLVANIA PART No.	
V13	23GBP4 23FMP4	23GBP4 ①	23FMP4 ① 23FMP4 ②	23GBP4 ② 23GBP4 ②	① Aluminized ② Silver Screen "85"

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			DELCO PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	
X1	86X0008-001	AGC Keying	DS46	GE-10		NPN

POWER RECTIFIERS & SIGNAL DIODES

ITEM No.	MEASURED CURRENT	ORIGINAL Part or Type No.	RECTIFIERS				DIODES
			GENERAL ELECTRIC PART No.	MALLORY PART No.	RCA PART No.	SARKES TARZIAN PART No.	
X2	.29A	66X0023-001	GE-504 or 1N1695	1N540 or 1N2070 ①	SK-3016 or SK-3017	40H or F-4 ②	
X3	.29A	66X0023-001	GE-504 or 1N1695	1N540 or 1N2070 ①	SK-3016 or SK-3017	40H or F04 ②	
X4		66X0038-001					
X5		66X0020-001					
X6		66X0025-001					1N60 6GC1

① A dual unit, VB600, may be used for X2 and X3.

② A dual unit, STFD40, may be used for X2 and X3.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA				
	CAP.	VOLT.	BRADFORD PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.
C1	140	150	45X0500-001	AFH51-31-80	AA0261 ①	XC1-16.1 ①	WP125.5A ①
C2A	125	300	45X0521-001	AFH4-56-85	DD0473	XC4-37	FP420.28A
B	10	300					
C	20	300					
D	100	50					
C3A	125	300	45X0520-001	AFH3-101-40	CC0875	XC3-34	FP330.26A
B	80	300					
C	20	50					

① Use insulating sleeve and mounting wafer.

② Use insulated mounting wafer.

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

FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA				
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.
C4	.22	200V	P288N-22	DTZ-68	PM2P22	2DP-4-224	PVC2022
C5	68	NPO			C10Q68C		CNO466
C6	.22	200V	P288N-22	DTZ-68	PM2P22	2DP-4-224	PVC2022
C7	680	10%	DL-680	DD-681	JB8T68	CCD-681	GP368
C8	.001		BPD-001	DD-102	BYA10D1	CCD-102	B210
C9	.001		BPD-001	DD-102	BYA10D1	CCD-102	B210
C10	56	NPO		TCZ-56			CNO456
C11	470	10%	DI-470	DD-471	JB8T47	CCD-471	GP347
C12	680	10%	DI-680	DD-681	JB8T68	CCD-681	GP368
C13	68	NPO		DTZ-68	C10Q68C		CNO466
C14	.001	10%	DI-1000	DD-102	JB6D1	CCD-102	GP210
C15	560	10%	DI-560	DD-561	JB6T56	CCD-561	JF356

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.

\* Not normally in distributor's stock. Available thru distributor on order to manufacturer. † Alternate Value  
① Not used in some versions. # Bradford Part Number

† "CONCENTRIKIT" Equivalent: K-16 Kit with Base Elements and Shafts: B17-103, P22-100 (Panel),  
 "SNAPTROL" Equivalent: BU5, CF50, CR12, SF6, SR81, K. B11-137, R23-114 (Rear).  
 ① File flat. ② Use portion of original shaft to obtain desired length.