

FIG. 1 — CABINET

SPECIFICATIONS

Overall Dimensions:
 Height 41 3/4"
 Width 42 1/2"
 Depth 24"
 Weight 284 Lbs.

Electrical Ratings:
 Line Voltage 110-120 volts, 60 cycle A.C.
 Power Consumption 460 watts

Tuning Frequency Range:
 Standard Broadcast 540 to 1620 KC
 Frequency Modulation 88 to 108 MC
 Television Channels All 12 of assigned by F.C.C.

Intermediate Frequency:
 Standard Broadcast 455 KC
 Frequency Modulation 10.7 MC
 Television Refer to Television servicing section

Loudspeakers:
 Low Frequency Range:
 Type Electrodynamic
 Outside Cone Diameter 12"
 Voice Coil Impedance 60 ohms at 400 cycles
 Field Coil 450 ohms D.C.
 High Frequency Range (2 speakers)
 Type Permanent Magnet
 Outside Cone Diameter 5"
 Voice Coil Impedance 3.2 ohms at 400 cycles

Electrical Power Output:
 Maximum 24 watts
 Undistorted 18 watts

Tube Complement:

Tube	No.	Function
6B6	V-1	R.F. Amplifier
6B6	V-2	Converter
6B6	V-3	Oscillator, R.F.
6BA6	V-4	1st Sound I.F.
6BA6	V-5	2nd Sound I.F.
6AU6	V-6	Sound Discriminator
6AL5	V-7	1st Picture I.F.
6AG5	V-8	2nd Picture I.F.
6AG5	V-9	3rd Picture I.F.
6AG5	V-10	4th Picture I.F.
6AL5	V-11	2nd Detector, Automatic Gain Control
6AU6	V-12 A, B	1st Video Amplifier
6X6-GT	V-14	2nd Video Amplifier
6AL5	V-15	D.C. Restorer
6AL5	V-16	Horizontal Sync. Discriminator
6K6-GT	V-17	Horizontal Oscillator
6SK7	V-18	1st Sync. Amplifier
6SH7	V-19	Sync. Separator
6SN7-GT	V-20 A, B	2nd Sync. Amp. & Horiz. Discharge
6J5	V-21	Vertical Osc. & Discharge
6K6-GT	V-22	Vertical Output
6AC7	V-23	Horiz. Sweep Oscillator Control

Power Supply and Audio Amplifier

Channel Number	Picture Carrier Freq. Mc.	Picture Carrier Freq. Mc.	Sound Carrier Freq. Mc.	Receiver R.F. Osc. Freq. Mc.
1	44.50	45.25	49.75	71
2	54.50	55.25	59.75	81
3	60.56	61.25	65.75	87
4	66.72	67.25	71.75	93
5	76.82	77.25	81.75	103
6	82.88	83.25	87.75	109
7	174.180	175.25	179.75	201
8	180.185	181.25	185.75	207
9	186.192	187.25	191.75	213
10	192.198	193.25	197.75	219
11	198.204	199.25	203.75	225
12	204.210	205.25	209.75	231
13	210.216	211.25	215.75	237

Receiver I.F. Frequencies:

Picture Carrier Frequency	Adjacent Channel Sound Trap	Accompanying Sound Traps	Adjacent Channel Picture Carrier Trap
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Sound I.F. Frequencies:

Sound Carrier Frequency	Sound Discriminator Band Width	Video Response	Focus	Scanning	Horizontal Scanning Frequency	Vertical Scanning Frequency	Frame Frequency (picture repetition rate)
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Non-Operating Controls:

R.F., I.F. alignment adjustments and traps are not included in this list.

GENERAL INFORMATION

Packard-Bell Model 4580 TV provides:

- AM reception in the Standard Broadcast Band.
- FM reception in the Frequency Modulation Band.
- Television reception on all 12 channels allocated to this service.
- Automatic Record Player.

- Auxiliary Turntable for Home Recordings and Playback.
- Three speaker combination to provide full frequency response over the audio range.
- Push-pull low distortion audio system.
- Twelve inch picture tube providing a 75 Sq. inch picture. In order to properly present these features, the model is divided into the following units: (See Figure 5).
- The Television Tuner Chassis.
- The Power Supply and Audio Amplifier Chassis.
- The AM-FM Tuner Chassis.
- The Automatic Record Player.
- The Auxiliary Turntable with Playback and Recording.
- The Picture Tube Assembly.
- The Three Speaker Combination.

TELEVISION

General Description
 The Television Portion of the Model 4580 TV receiver is composed of a 23 tube television chassis, a 12 inch television picture tube, and a Power Supply, Audio Amplifier Chassis which is also used for the AM-FM and Phonograph operation when desired. It is operated by means of four front panel controls, and the volume and tone controls on the radio chassis.

Listed below are some of the important features.

- Coverage of all thirteen channels.
- Improved brilliance, high quality 12" picture tube.
- Illuminated channel indicator.
- Automatic Gain Control.
- A high voltage supply designed to reduce shock hazard.

Electrical & Mechanical Specifications:

Picture Size	Channel Number	Picture Carrier Freq. Mc.	Sound Carrier Freq. Mc.	Receiver R.F. Osc. Freq. Mc.
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R.F. Frequency Ranges:

Channel Number	Picture Carrier Freq. Mc.	Sound Carrier Freq. Mc.	Receiver R.F. Osc. Freq. Mc.
1	44.50	45.25	49.75
2	54.50	55.25	59.75
3	60.56	61.25	65.75
4	66.72	67.25	71.75
5	76.82	77.25	81.75
6	82.88	83.25	87.75
7	174.180	175.25	179.75
8	180.185	181.25	185.75
9	186.192	187.25	191.75
10	192.198	193.25	197.75
11	198.204	199.25	203.75
12	204.210	205.25	209.75
13	210.216	211.25	215.75

Receiver Antenna Input Impedance:

Picture Carrier Frequency	Adjacent Channel Sound Trap	Accompanying Sound Traps	Adjacent Channel Picture Carrier Trap
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Antenna:

To insure the best in FM and TV reception, an antenna system has been designed for use with this instrument. This unit will give good signal pickup on all bands (FM and TV), and may be purchased from any Packard-Bell dealer.

Operating Instructions, Television:

Controls:
 The operation of the Television section of the Model 4580TV is accomplished by the use of the controls listed and shown below.

Brilliance Control—For varying the brightness of the picture.

Contrast Control—For varying the contrast of the picture; gradations of black and white.

Channel Selector—For selecting the desired TV channel.

Fine Tuning Control—For obtaining the best in picture and sound quality by permitting a close adjustment to the proper frequency.

- Horizontal Hold Television Chassis, rear.
- Vertical Hold Television Chassis, rear.
- Height Television Chassis, rear.
- Vertical Linearity Television Chassis, rear.
- Horizontal Drive Power Supply & Audio Chassis, rear.
- Horizontal Centering Power Supply & Audio Chassis, rear.
- Focus Power Supply & Audio Chassis, rear.
- Width Power Supply & Audio Chassis, top, left, rear.
- Horizontal Linearity Power Supply & Audio Chassis, top, left, rear.
- Focus Coil Picture Tube Assy.
- Deflection Coil Picture Tube Assy.
- Phase Adjustment Television Chassis, bottom.
- Frequency Adjustment Television Chassis, top.

HIGH VOLTAGE WARNING

OPERATION OF THIS RECEIVER OUTSIDE THE CABINET OR WITH THE COVER REMOVED PRESENTS A SHOCK HAZARD FROM THE RECEIVER POWER SUPPLIES. WORK ON THE RECEIVER SHOULD NOT BE ATTEMPTED BY ANYONE WHO IS NOT THOROUGHLY FAMILIAR WITH THE PRECAUTIONS NECESSARY WHEN WORKING ON HIGH VOLTAGE EQUIPMENT. DO NOT OPERATE THE RECEIVER WITH THE HIGH VOLTAGE COMPARTMENT COVER REMOVED.

TELEVISION TUBE INSTALLATION

- Remove television tube shell held by screws.
- Remove television tube from carton. CAUTION! USE GOGGLES OR MASK, AND GLOVES TO HANDLE TUBE. DO NOT SCRATCH, STRIKE, OR EXERT ANY PRESSURE ON TUBE.
- Mount tube on shell and slide into compartment flush with front panel. Secure shell with screws.
- The two lower tube support bumper brackets are adjusted when shipped to properly position tube.
- Clamp tube securely with top brackets.
- Connect cables and socket.

Installation Instructions:

- To dismantle for shipment, reverse the above procedure.
- Before this receiver is installed in the customer's home, the following rules should be observed:
- The Model 4580TV should be situated so that light does not fall directly on the picture tube thus causing annoying reflections from the safety glass panel.
 - The cabinet should be no less than two inches from the wall so that proper ventilation will take place.
 - Care should be taken in the type, location, and orientation of the antenna so that the best possible results will be obtained.

MODEL 4580 TV

- 170 to 225 MC., 10 MC sweep.
- Output adjustable with at least one volt output.
- Output constant on all ranges and all attenuator positions.
- Sweep width, preferably variable.
- Cathode Ray Oscilloscope, preferably one with the following characteristics:
- Wide range vertical deflection.
- An input calibration source.
- A low capacitance probe.

- 2. R.F. Signal Generator with the following ranges:
 - 19.75 MC. adjacent channel picture trap.
 - 21.25 MC. sound I.F. and sound traps.
 - 21.8 MC. converter transformer.
 - 22.3 MC. second picture I.F. transformer.
 - 23.4 MC. fourth picture I.F. coil.
 - 25.2 MC. third picture I.F. coil.
 - 25.3 MC. first picture I.F. transformer.
 - 25.75 MC. picture carrier.
 - 27.25 MC. adjacent channel sound trap.

R.F. Frequencies:

Channel Number	Picture Carrier	Sound Carrier
1	45.25	49.75
2	55.25	59.75
3	61.25	65.75
4	67.25	71.75
5	77.25	81.75
6	83.25	87.75
7	175.25	179.75
8	181.25	185.75
9	187.25	191.75
10	193.25	197.75
11	199.25	203.75
12	205.25	209.75
13	211.25	215.75

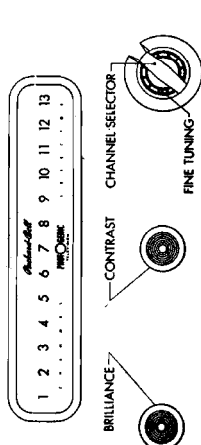


FIG. 2 — TELEVISION CONTROLS

The following controls, also used for Television operation, are located on the AM-FM Radio instrument panel.

- Volume Control**—For adjusting the sound volume.
- Tone Controls, Bass and Treble**—For obtaining the desired balance between high and low frequency response of the sound. The Bass control also serves as the master power switch to the entire instrument.
- Selector Switch**—For selecting Radio, Television, or Phonorecord operation.

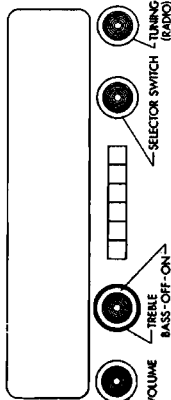


FIG. 3 — RADIO CONTROLS

SERVICE INSTRUCTIONS — GENERAL

- Equipment Requirements:**
- 1. R.F. Sweep Generator with the following ranges:
 - 18 to 30 MC, 10 MC sweep width.
 - 40 to 100 MC, 10 MC sweep.

FIG. 4 — TELEVISION BLOCK DIAGRAM

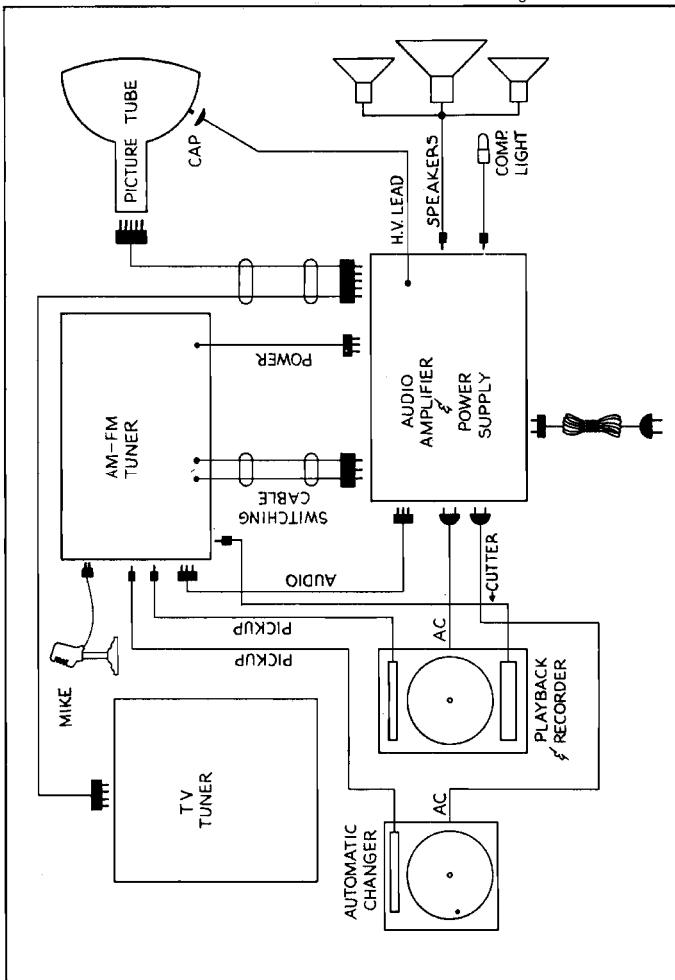
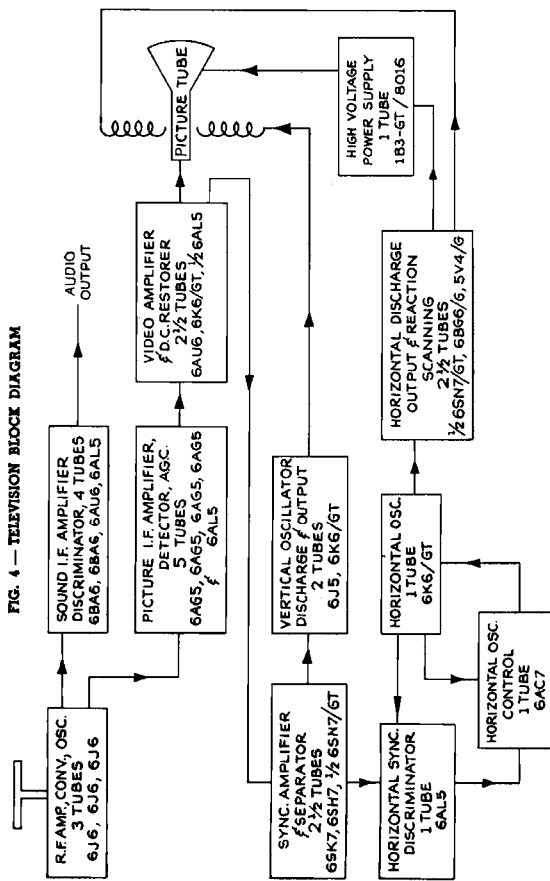


FIG. 5 — 4580TV BLOCK DIAGRAM

- 4. Heterodyne Frequency Meter with a crystal calibrator if the signal generator is not crystal controlled.
- 5. Electronic Voltmeter similar either to the RCA "Voltohmyl" or the Sylvania Polymerizer.

Most service failures in TV receivers are from component breakdown rather than misalignment difficulties. The technician should check carefully through the chassis referring to the voltage charts and observing the appearance of the raster. Alignment should only be attempted when it is established that all circuits are functioning properly. Inasmuch as most circuits tune quite broadly, a considerable degree of misalignment will not noticeably affect the picture quality.

In order to properly service the Model 4580TV it is necessary to remove from the cabinet and arrange on the service bench:

1. The Television Chassis
2. The AM-FM Chassis
3. The Picture Tube Assembly
4. The Power Supply and Audio Chassis
5. Speakers and Baffle Board
6. Interconnecting Cables

Interconnecting Cables:

Check all cables for breaks or shorts making certain that connections are made when each plug is inserted in proper socket.

Further Installation Instructions:

After the Model 4580TV has been unpacked and properly installed in the desired location, certain adjustments may be necessary.

1. Focus Coil Adjustment

Turn Vertical and Horizontal controls to approximately their mid-position, observing the appearance of the raster. If a corner appears dark, this indicates that the electron beam is striking the neck of the tube. Loosen the Focus Coil wing nuts and rotate coil around horizontal and vertical axis until entire raster is visible on face of tube. The raster should be centered and there should be no dark corners visible. Tighten Focus Coil wing nuts with coil in this position.

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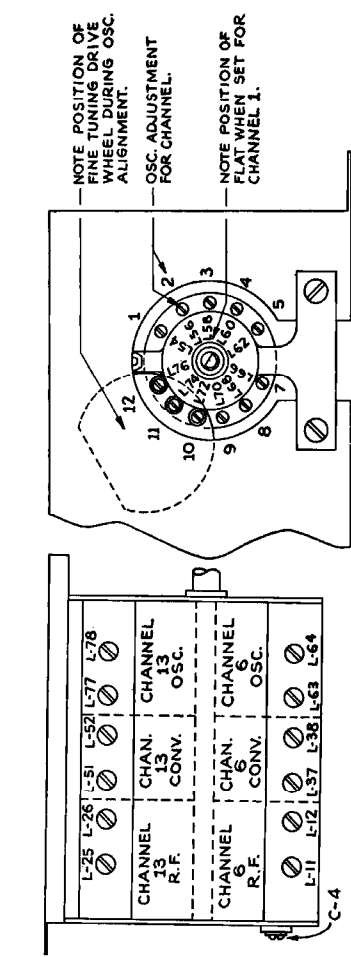


FIG. 9 - TV R.F. TUNER

- (c) Turn Horizontal Hold control to extreme counter-clockwise position.
- (d) Remove signal momentarily.
- (e) When signal is restored, picture should fall into sync.
- 5. Vertical Sync.
 - (a) If picture fails to sync vertically, adjust the Vertical Hold control.
- 6. Height and Vertical Linearity Adjustment.
 - (a) Adjust Height control (rear TV chassis) until picture fills the frame vertically.
 - (b) Adjust Vertical Linearity control (rear TV chassis) until picture is symmetrical from top to bottom. Note that any adjustment of either control requires a readjustment of the other.
 - (c) Adjust Vertical Centering control (rear TV chassis) to align the picture in the frame.
 - 7. Width and Horizontal Linearity Adjustment.
 - (a) Turn the Horizontal Drive (rear Power Supply chassis) clockwise as far as possible without crowding right side of picture. This position provides maximum voltage to the picture tube.
 - (b) Adjust Width control (top, Power Supply chassis) until picture just fills the frame horizontally.
 - (c) Adjust the Horizontal Linearity control (top, Power Supply chassis) until pattern is symmetrical from left to right. A slight readjustment of the Horizontal Drive control may be necessary when the Linearity control is used.
 - (d) Adjust the Horizontal Centering control (rear, Power Supply chassis) to center picture in frame.
 - 8. R.F. Oscillator Adjustment.
 - (a) Check all bands for oscillator adjustment, preferably by method outlined under Alignment Instructions.
 - 9. Picture Observation.
 - 1. Picture Detail
 - 2. Proper Interlace
 - 3. Interference
 - 4. Reflections

- (a) Obtain, as before, a picture of test pattern on the picture tube.
 - (b) Adjust Fine Tuning control for best sound quality.
 - (c) Adjust the Contrast control for slightly less than normal contrast.
 - (d) Turn Horizontal Hold to extreme position in which the oscillator fails to hold or pull in.
 - (e) Momentarily remove the signal by throwing Band Switch.
 - (f) Turn the Horizontal Frequency adjustment (if top of TV chassis, rear, near Jones plug) until the oscillator pulls into sync.
 - (g) Check hold, and pull in, for the other extreme positions of the Hold control.
- If the picture still fails to hold sync, a complete realignment of the horizontal oscillator is necessary.

4. Horizontal Oscillator, Complete Alignment

- (a) Obtain a picture or test pattern on picture tube.
- (b) Adjust the Fine Tuning control for best sound quality.
- (c) Adjust Contrast control until picture is slightly below average contrast level.
- (d) Turn the Horizontal Phase adjustment ("Q" Fig. 8) until the blanking bar which may appear in the picture moves to the right and off the raster.
- (e) The range of this adjustment is such that it is possible to hit an unstable condition, as indicated by a ripple in the raster. Turn screw clockwise from the unstable condition.
- (f) Turn Horizontal Hold control to extreme counter-clockwise position.
- (g) Turn Frequency adjustment (P) until picture falls out of sync.

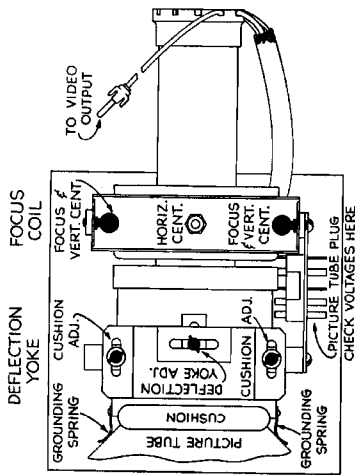


FIG. 8 - PICTURE TUBE YOKE

- 2. Deflection Yoke Adjustment.
 - If the lines of the raster are not straight and square with the picture frame, the magnetic yoke must be reset. Loosen Yoke wing nut (see Fig. 6) and rotate yoke until desired condition is observed. Tighten wing nut.
- 3. Horizontal Oscillator Alignment.
 - (a) Obtain either a picture or test pattern on the screen, preferably the latter.
 - (b) Turn Horizontal Hold control to full counter-clockwise position, and turn Band Switch, momentarily, to another channel. Picture should remain in sync.
 - (c) Turn Horizontal Hold control to full clockwise position, and switch as before. Picture should stay in sync. If after making the above test, the picture fails to stay in sync, the following procedure is recommended.

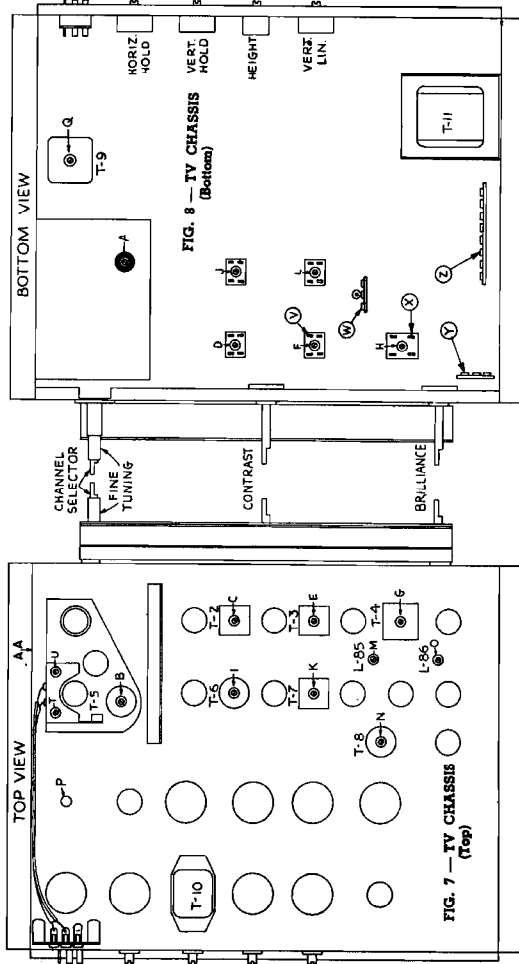
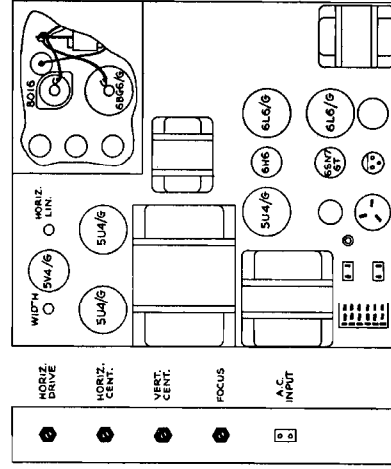


FIG. 7 - TV CHASSIS (Top)

FIG. 8 - TV CHASSIS (Bottom)

FIG. 10 - POWER SUPPLY (End and Top)



- (a) If it does not, turn Frequency adjustment counter-clockwise until the picture falls into sync.

ALIGNMENT CHART—MODEL 4880TV

Step No.	Connect Signal Generator To	Signal Gen. Freq. MC.	Connect Sweep Gen. To	Connect Oscilloscope To	Connect Voltmeter To	Miscellaneous Connection and Instructions	Adjust	Refer To
1	2nd. Sound IF grid, pin 1 (V-6)	21.25 mc. output	Not used.	Not used.	In series with one meg. to junc. R-24 & R-27 Point X.	Adjust for maximum output.	Adjust G (T-4 top) for maximum output.	Fig. 7, Fig. 32
2	"	"	"	"	Junc. of R-26 & C-38. Point Y.	Meter on 3.0 volt scale.	Adjust H (T-4, bottom) for zero output on meter.	Fig. 8, Fig. 32, Fig. 26F
3	3rd. Sound IF grid, pin 1 (V-6, pin 1) (V-1)	21.25 mc. output	21.25 mc. sweep generator	Junc. of R-26 and C-38. Point Y.	Not used.	Adjust for symmetry of G (T-4, top).	Adjust for symmetry of G (T-4, top).	Fig. 7, Fig. 26E, Fig. 26B
4	Loosely couple to converter grid (V-2)	21.25 mc.	Loosely couple to converter grid (V-2)	Terminal V (T-3) in series with 33,000 ohms. (See schematic).	"	Sweep output reduced to give 0.3 volts peak to peak on scope.	C, D, E, & F (T-2, T-3 top & bottom) for maximum gain necessary at 21.25 mc.	Fig. 7, Fig. 8, Fig. 26G

(1) DISCRIMINATOR AND SOUND IF ALIGNMENT

(2) PICTURE IF AND TRAP ADJUSTMENT

Step No.	Connect Signal Generator To	Signal Gen. Freq. MC.	Connect Sweep Gen. To	Connect Oscilloscope To	Connect Voltmeter To	Miscellaneous Connection and Instructions	Adjust	Refer To
1	Not used.	Not used.	Not used.	Not used.	Junction of R-61 & R-62 on schematic Fig. 32.	Connect jumper from top of coil to terminal W.	Adjust to -3.0 volts.	Fig. 8, Fig. 32
2	Loosely couple to converter.	19.75 mc.	Not used.	Not used.	Junc. L-89 & R-39. Point Z.	Meter on 3.0 volt scale.	K (T-7, top) for min. output.	Fig. 7, Fig. 32
3	"	21.25 mc.	"	"	"	"	B (T-5, top) for min. output.	Fig. 7, Fig. 32
4	"	21.25 mc.	"	"	"	"	N (T-8, top) for min. output.	Fig. 7, Fig. 32
5	"	27.25 mc.	"	"	"	"	I (T-6, top) for min. output.	Fig. 7, Fig. 32
6	"	21.8 mc.	"	"	"	"	A (T-5, bot.) for max. output.	Fig. 8, Fig. 32
7	"	25.3 mc.	"	"	"	"	J (T-6, bot.) for max. output.	Fig. 8, Fig. 32
8	"	20.3 mc.	"	"	"	"	L (T-7, bot.) for max. output.	Fig. 8, Fig. 32
9	"	22.2 mc.	"	"	"	"	M (U-85, top) for max. output.	Fig. 7, Fig. 32
10	"	22.4 mc.	"	"	"	"	O (U-85, top) for max. output.	Fig. 7, Fig. 32

(3) FINAL PICTURE IF ADJUSTMENT

Step No.	Connect Signal Generator To	Signal Gen. Freq. MC.	Connect Sweep Gen. To	Connect Oscilloscope To	Connect Voltmeter To	Miscellaneous Connection and Instructions	Adjust	Refer To
1	Loosely couple to Converter.	25.75 mc.	Picture IF Center 10 MC. Sweep.	Junc. L-89 & R-39. Point Z.	Junc. R-61 & C-67. Point W.	3.0 volts at meter as in (2)-1 above.	"	Fig. 32, Fig. 8
2	"	"	"	"	"	"	J (T-6, bottom) to top of coil down on side of curve.	Fig. 7, Fig. 8, Fig. 32
3	"	21.3 mc.	"	"	"	"	L (T-7, bottom) marker on top edge of curve. Curve should fall inside of curve on low freq. side.	Fig. 27, Fig. 8, Fig. 32
4	"	"	"	"	"	"	A (T-5, bottom) to well above of 22.3 MC. side of 22.3 MC. side.	Fig. 27, Fig. 8, Fig. 32
5	"	25.2 mc.	"	"	"	"	M (L-85) to buildup or round off curve near 25.2 MC.	Fig. 27, Fig. 7, Fig. 32
6	"	21.3 mc.	"	"	"	"	O (L-86) to level top of curve.	Fig. 27, Fig. 7, Fig. 32

NOTE: Whenever an LF transformer is adjusted, the associated trap must be reset. There is an intersection which requires going back and forth between adjustments until no further change is apparent.

(4) R-F AND CONVERTER ADJUSTMENT

Step No.	Connect Signal Generator To	Signal Gen. Freq. MC.	Connect Sweep Gen. To	Connect Oscilloscope To	Connect Voltmeter To	Miscellaneous Connection and Instructions	Adjust	Refer To
1	Not used.	Not used.	Not used.	Not used.	Junc. R-61 & C-67. Point W.	"	-3.0 volts on meter as in (2)-1 above. Set IF to ground thru 1000 ohms.	Fig. 8, Fig. 32

ALIGNMENT CHART—MODEL 4880TV

Step No.	Connect Signal Generator To	Signal Gen. Freq. MC.	Connect Sweep Gen. To	Connect Oscilloscope To	Connect Voltmeter To	Miscellaneous Connection and Instructions	Adjust	Refer To
2	Antenna terminal loosely.	211.25 mc.	Antenna loosely.	Junc. L-80 & R-4 Point AA.	Not used.	Receiver on Channel 13.	L-25, L-26, L-51, & L-52 for minimum top response mark above 70%.	Fig. 32, Fig. 26B
3	"	205.25 mc.	"	"	"	Channel 12.	Check for same response as above.	"
4	"	199.25 mc.	"	"	"	Channel 11.	"	"
5	"	193.25 mc.	"	"	"	Channel 10.	"	"
6	Antenna loosely.	187.25 mc.	Antenna loosely.	"	"	Receiver on channel 9.	"	"
7	"	181.25 mc.	"	"	"	Receiver on channel 8.	"	"
8	"	175.25 mc.	Switch channel 7.	"	"	Channel 7.	"	"
9	"	169.25 mc.	"	"	"	Channel 6.	L-11, L-12, L-37, L-38. Approx. flat top response, markers along 70%.	"
10	"	163.25 mc.	"	"	"	Channel 5.	"	"
11	"	157.25 mc.	"	"	"	Channel 4.	"	"
12	"	151.25 mc.	"	"	"	Channel 3.	"	"
13	"	145.25 mc.	"	"	"	Channel 2.	"	"
14	"	139.25 mc.	"	"	"	Channel 1.	"	"

(5) R-F OSCILLATOR ALIGNMENT

Step No.	Connect Signal Generator To	Signal Gen. Freq. MC.	Connect Heterodyne Freq. Meter To	Connect Oscilloscope To	Connect Voltmeter To	Miscellaneous Connection and Instructions	Adjust	Refer To
1	Antenna terminal.	211.75 mc.	Loosely couple to RF oscillator.	Not used.	Junc. R-65 & C-68 for frequency method only. (Point Y)	Receiver on Channel 13.	L-77 & L-78 for best on meter, or best on Hef. Freq. Meter	Fig. 32, Fig. 9, Fig. 8
2	"	206.75 mc.	"	"	"	Receiver on Channel 12.	L-76, as above.	"
3	"	201.75 mc.	"	"	"	Receiver on Channel 11.	L-74 as above.	"
4	"	196.75 mc.	"	"	"	Receiver on Channel 10.	L-72 as above.	"
5	Antenna terminal.	191.75 mc.	"	Not used.	"	Receiver on Channel 9.	L-70 as above.	"
6	"	186.75 mc.	"	"	"	Receiver on Channel 8.	L-68 as above.	"
7	"	181.75 mc.	"	"	"	Channel 7.	L-66 as above.	"
8	"	176.75 mc.	"	"	"	Channel 6.	L-63 & L-64 as above.	"
9	"	171.75 mc.	"	"	"	Channel 5.	L-62 as above.	"
10	"	166.75 mc.	"	"	"	Channel 4.	L-60 as above.	"
11	"	161.75 mc.	"	"	"	Channel 3.	L-58 as above.	"
12	"	156.75 mc.	"	"	"	Channel 2.	L-56 as above.	"
13	"	151.75 mc.	"	"	"	Channel 1.	L-54 as above.	"

NOTE: Repeat steps 1 thru 13 as a check.

(6) F.M. TRAP ADJUSTMENT

Step No.	Connect Signal Generator To	Signal Gen. Freq. MC.	Connect Sweep Gen. To	Connect Oscilloscope To	Connect Voltmeter To	Miscellaneous Connection and Instructions	Adjust	Refer To
1	Between one antenna terminal & ground.	Interfering FM	"	"	Junction of R-61 & C-67. Point W.	"	T or U for minimum output which is more effective.	Fig. 7, Fig. 32
2	Between other antenna terminal and ground.	"	"	"	"	"	T or U for minimum output which is more effective.	"

MODEL 4580 TV

SERVICE SUGGESTIONS

- No Raster on Picture Tube**
- V-29 and V-30 inoperative — check voltage at fuse. Check continuity of T-14.
 - No high voltage. If horizontal deflection is operating, the trouble can be isolated to the 8016 circuit. Check:
 - The 8016 tube, V-30.
 - C-116 for short circuit.
 - R-133 & R-134 for open circuit.
 - V-17 and V-20B circuits inoperative. Check:
 - For sine wave on terminal 5 (grid) of V-17 (6K6-GT Hor. Osc.).
 - For pulse on terminal 4 (grid) of V-20B (6SN7-GT Hor. Discharge).
 - For sawtooth on terminal 5 (grid) of V-29 (6BG6-G Hor. Output). See schematic diagram.
 - Reaction Scanning Tube inoperative (V-31, 5V4-G).
 - Defective Picture Tube.
 - Brightness control open.
 - No receiver plate voltage. Check:
 - Filler condensers for short circuit.
 - Speaker field for open circuit.

No Vertical Deflection

- V-21 and V-22 inoperative. Check:
 - Voltagess and waveforms on grids (terminals 5, 6J5 & 6K6-GT) and plates (terminal 3).

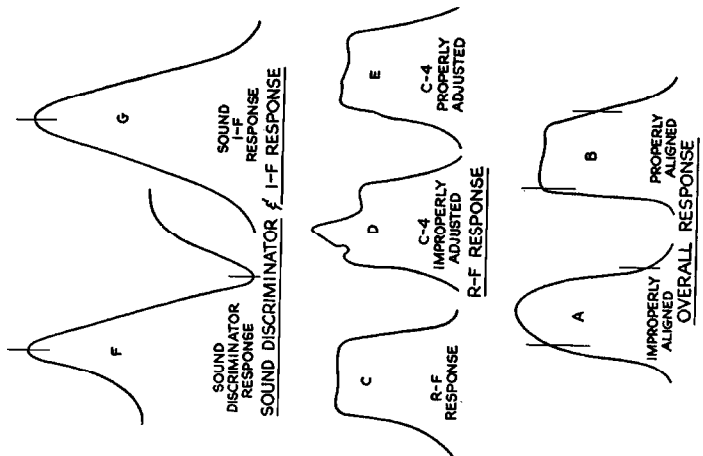


FIG. 26 — WAVE FORMS

Poor Vertical Linearity

- If adjustments will not correct, change V-22.
- Vertical Output Transformer defective.
- V-21 inoperative. Check voltages and waveforms on grid and plate.

Poor Horizontal Linearity

- If adjustments do not correct, change V-29 or V-31.
- T-9 or L-95 defective.
- C-117, C-118, or R-135 defective.
- C-113, R-127, or R-128 defective.

Dark Vertical Lines on Left of Picture

- Reduce Horizontal Drive and readjust Width and Horizontal Linearity.
- Replace V-29.

Light Vertical Line on Left of Picture

- C-210 defective.
- V-31 defective.

Wrinkles on Left Side of Raster

- R-217, R-218, or C-210 defective.
- Defective Yoke.

Trapezoidal or Non-Symmetrical Raster

- Improper adjustment of Focus Coil.
- Defective Yoke.

Picture Smear

- Video Amplifier overloaded by excessive input. Reduce Contrast Control setting.
- Insufficient bias on V-13, and V-14, resulting in grid current on video signal. Check bias and possible grid current.
- Defective coupling condenser or grid loading resistor. Check all grid circuit components in Video Amplifier.

Critical Lead Dress

- Dress leads on Discriminator Transformer T-4 to V-7, approximately 3/16 inch above chassis.
- Dress Video Capacitors C-59 and C-60 up and away from the chassis.
- Dress Video Peaking Coils up and away from chassis.
- Contact between the R-F Oscillator frequency adjustment screws and the oscillator coils or channel switch eyelets must be avoided.
- Dress T-14 winding leads away from chassis and other components. If replacement of parts in high voltage supply becomes necessary, watch lead dress and take extreme care in soldering joints, keep them all rounded and free from sharp corners.

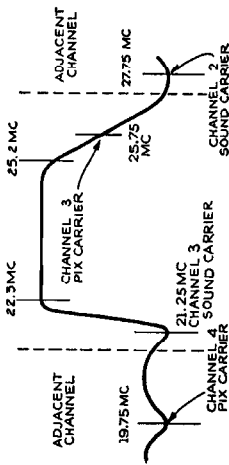


FIG. 27 — I-F RESPONSE CURVE

Raster, But No Sound, Picture or Sync.

- Defective antenna, or transmission line.
- R-F Oscillator off frequency.
- R-F unit inoperative. Check tubes and their voltages.

Small Raster

- Low plus B or low line voltage.

Picture Jitter

- Contrast Control operated at excessive level.
- If regular sections on left side of picture are displaced, change V-29.
- Vertical instability may be due to loose connections or noise.

Picture Stable, But Poor Resolution

- V-12-A, V-13, or V-14 defective.
- Peaking Coils defective. Check for specified resistance.
- C-57, C-59, C-60, or C-61 defective.
- R-F or I-F circuits misaligned.

Signal at Picture Tube Grid, But No Sync.

- Brilliance control advanced too far.
- V-15, V-16, V-19, or V-20-A inoperative. Check voltages and waveforms at their respective grids and plates.
- C-61 defective.

Signal on Picture Tube Grid But No Vertical Sync.

- Check V-21 and associated circuits.
- Integrating network inoperative. Check C-69, C-91, C-92, C-93, R-95, R-96, R-97 & R-98.

Signal on Picture Tube Grid, But No Horizontal Sync.

- T-9 misaligned—readjust as instructed on page 5.
- V-16 or V-23 inoperative. Check socket voltages and waveforms.

Poor Horizontal Linearity

- If adjustments will not correct, change V-22.
- Vertical Output Transformer defective.
- V-21 inoperative. Check voltages and waveforms on grid and plate.

Poor Horizontal Linearity

- If adjustments do not correct, change V-29 or V-31.
- T-9 or L-95 defective.
- C-117, C-118, or R-135 defective.
- C-113, R-127, or R-128 defective.

Dark Vertical Lines on Left of Picture

- Reduce Horizontal Drive and readjust Width and Horizontal Linearity.
- Replace V-29.

Light Vertical Line on Left of Picture

- C-210 defective.
- V-31 defective.

Wrinkles on Left Side of Raster

- R-217, R-218, or C-210 defective.
- Defective Yoke.

Trapezoidal or Non-Symmetrical Raster

- Improper adjustment of Focus Coil.
- Defective Yoke.

Picture Smear

- Video Amplifier overloaded by excessive input. Reduce Contrast Control setting.
- Insufficient bias on V-13, and V-14, resulting in grid current on video signal. Check bias and possible grid current.
- Defective coupling condenser or grid loading resistor. Check all grid circuit components in Video Amplifier.

Critical Lead Dress

- Dress leads on Discriminator Transformer T-4 to V-7, approximately 3/16 inch above chassis.
- Dress Video Capacitors C-59 and C-60 up and away from the chassis.
- Dress Video Peaking Coils up and away from chassis.
- Contact between the R-F Oscillator frequency adjustment screws and the oscillator coils or channel switch eyelets must be avoided.
- Dress T-14 winding leads away from chassis and other components. If replacement of parts in high voltage supply becomes necessary, watch lead dress and take extreme care in soldering joints, keep them all rounded and free from sharp corners.

- Ratio Detector on FM, resulting in improved sensitivity and low noise level.
- Push-button. Automatic Home Recording.
- Automatic record changer.
- Additional turntable for copying recordings.

RADIO SERVICING INFORMATION

Stage Gain Measurements: AM

- Measurements taken with volume and tone controls maximum. Band Switch in Standard Broadcast position. AVC shorted out.
- Standard Output 50 milliwatts
- Dummy Antenna 200 Mmf.
- Antenna Post to R-F Grid 12X at 1000 KC.
- R-F Grid to Converter Grid 6X at 1000 KC.
- Converter Grid to 1st I-F grid 30X at 455 KC.
- 1st I-F Grid to 2nd Detector 100X at 455 KC.
- Overall Audio Gain 0.1 volt into phono socket for 1.0 watt output at 400 cycles.

Stage Gain Measurements: FM

- Measurements taken with volume and tone controls maximum. Band Switch in Frequency Modulation position. AVC shorted out.
- Dummy Antenna 270 ohms
- Dipole Terminal to R-F Grid 1.0X at 98 MC.
- R-F Grid to Converter Grid 7X at 98 MC.
- Converter Grid to 1st I-F Grid 49X at 10.7 MC.
- 1st I-F Grid to Driver Grid 35X at 10.7 MC.

Oscillator Cathode Voltages:

- Measured at 117 volts AC line voltage with an AC vacuum tube voltmeter, input impedances above 10 megohms.
- 1620 KC 3.8 volts, AC
- 1300 KC 3.6 volts, AC
- 750 KC 2.8 volts, AC
- 550 KC 2.5 volts, AC

Oscillator Grid Current: FM

- Measured at 117 volts AC line voltage with a DC microammeter connected in series with ground end of the 22,000 ohm grid resistor.
- 108 MC 200 Microamps
- 98 MC 300 Microamps
- 88 MC 480 Microamps

D.C. Resistance Measurements:

- A.M. :F Coils
- 1st I-F 9.0 ohms
- Primary 9.0 ohms
- Secondary 9.0 ohms
- 2nd I-F 9.0 ohms
- Primary 9.0 ohms
- Secondary 9.0 ohms
- A.M. Oscillator Coil 1.0 ohms
- Primary 6.0 ohms
- Secondary 6.0 ohms
- A.M. Antenna Coil 12.2 ohms
- Start to Finish 10.5 ohms
- Start to Top 10.5 ohms
- A.M. F-F Coil 5.8 ohms
- Primary 4.2 ohms
- Secondary 4.2 ohms

NOTE: Due to the variation in winding methods, the D.C. resistance on all coils is subject to a 20% tolerance.

Alignment Procedure:

Alignment procedure consists of the steps outlined in the two alignment charts. AM alignment is carried out with minimum signal input. FM alignment signal should be strong enough to produce 3 volts AVC.

RADIO AND PHONOCORD

General Description

The AM-FM portion of the Model 4580TV is a 12 tube, plus recifier and tuning indicator, radio receiver. As on TV it employs push-pull, a high output, low distortion audio system, with three speakers to give wide range frequency response. Some of the salient features are:

- Standard Broadcast coverage—540 to 1620 KC.
- Frequency Modulation—88 to 108 MC.

ALIGNMENT CHART — AM

STEP	CONNECT TEST OSC. TO	TEST OSC. SETTING	POINTER SETTING	ADJUST FOR MAX. OUTPUT
1	Mixer Grid & Ground	455 KC	540 KC	Trimmers R, L, P, K
2	R.F. Grid & Ground	1500 KC	1500 KC	Trimmers I & H
3	R.F. Grid & Ground	600 KC	600 KC	Trimmer J
4	Repeat Step Standard Test Loop	No. 2 1500 KC	1500 KC	Trimmer G
6	Check stationizing. Slide pointer on string if stations are uniformly off in one direction.			

NOTE: 1. Reck variable condenser for step 3.
 2. Standard Test Loop is Hazeltine No. 1150 or a resonable substitute.

Equipment Required for FM Alignment:

- Signal generator capable of generating signals at 10.7 MC and from 88 to 108 MC.

ALIGNMENT CHART — FM

STEP	CONNECT TEST OSC. TO	TEST OSC. SETTING	POINTER SETTING	ADJUST FOR MAX. AVC
1	R.F. Grid & Ground	10.7 MC	88 MC	O, S, N, Q, M
2	Adjust T for zero on zero-center meter.			
3	Repeat Steps 1 and 2			
4	Doublet Terminals thru 270 ohms	88 MC	88 MC	Trimmers F, E, D
5	Doublet Terminals thru 270 ohms	108 MC	108 MC	Trimmers C, B, A
6	Repeat Step No. 4.			

NOTE: Reck variable condenser for step No. 4.

- Vacuum tube type voltmeter connected to point "A" on schematic.
- Center-zero D.C. voltmeter connected to point "B" on schematic.

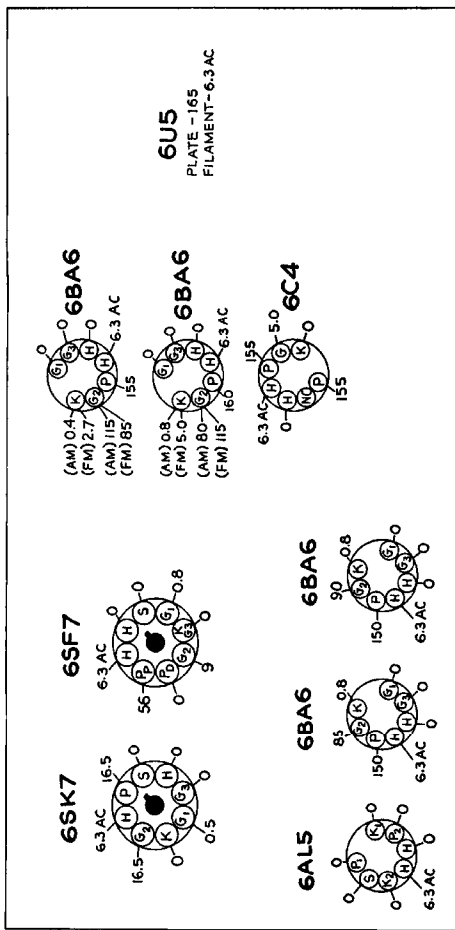


FIG. 29 — AM-FM CHASSIS SOCKET VOLTAGES

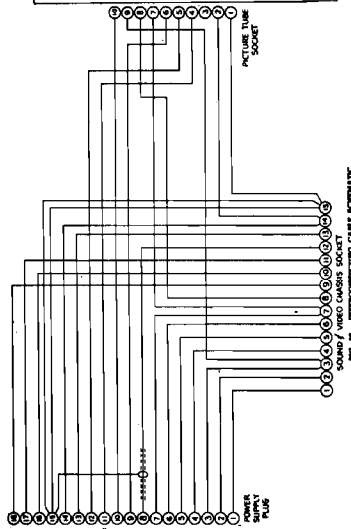


FIG. 30 — INTERCONNECTING CABLE SCHEMATIC

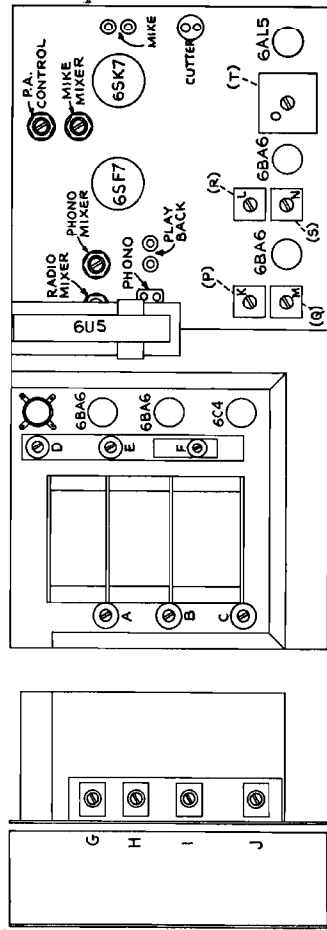


FIG. 28 — AM-FM CHASSIS (End and Top)

- Trimmer Locations**
- A—FM Antenna High Frequency Trimmer
 - B—FM R.F. High Frequency Trimmer
 - C—FM Oscillator High Frequency Trimmer
 - D—FM Antenna Low Frequency Trimmer
 - E—FM R.F. Low Frequency Trimmer
 - F—FM Oscillator Low Frequency Trimmer
 - G—AM Antenna Trimmer
 - H—AM R.F. Trimmer
 - I—AM Oscillator High Frequency Trimmer
 - J—AM Oscillator Low Frequency Trimmer

Socket Voltages:

All voltages shown are positive D.C. unless otherwise noted. Heater voltages are 6.3 volts A.C. D.C. voltages measured with a vacuum tube voltmeter from socket contacts to chassis. Volume and tone controls maximum.

Recording Head Pressure:

The proper recording head pressure is 1 1/4 ounces. In the event this has varied due to shipping vibrations, it may be re-set with the aid of an ordinary pocket type postal scale.

TO INCREASE PRESSURE TURN ADJUSTING SCREW CLOCKWISE.

TO DECREASE PRESSURE TURN ADJUSTING SCREW COUNTER-CLOCKWISE.

Brief Description of Compression Circuit:

One diode section of the 6B6 serves as the compressor rectifier. Delay is accomplished by applying a positive potential to the cathode of the 6B6. A portion of the output voltage is rectified by the 6B6 and varies the grid bias of the 1st audio tube, 6SF7.

How to Check Compression Voltage:

Turn the Selector Switch to BC position and press the push-button labeled Record Program. Feed a 2 volt (RMS) 1000 cycle signal into the 2nd detector diode return between the 56K and

SPECIAL RECORDING SERVICE INFORMATION

220K ohm resistors. Connect a V.T.V.M. to the termination of the 4.7 megohm resistor and 0.1 Mid. condenser in the control grid circuit of the 6SF7. This should read between 2.5 and 3.5 volts negative.

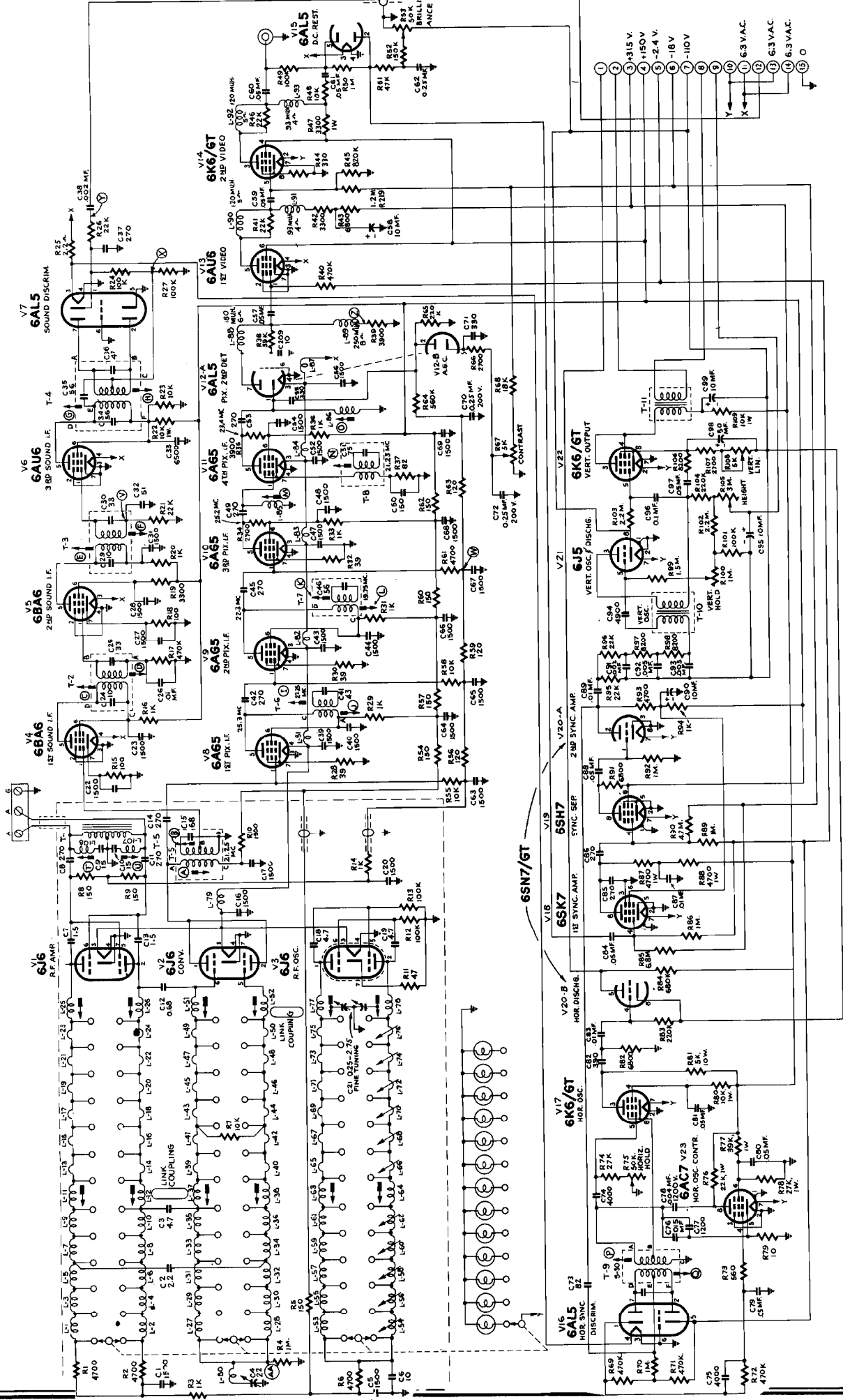
How to Check Recording Level (Radio Record):

Substitute a 3 ohm resistor in place of the cutting head and with the same test setup as outlined in the preceding paragraph, the voltages across this resistor should be between 1.1 and 1.5 volts A.C.

How to Check Record: g Level (Record Phono):

Turn the Selector Switch to Phono position, press Record Program push-button and feed a 1000 cycle signal of 0.8 volts into the phono input socket. Substitute a 3 ohm resistor in place of the cutting head. The voltage across the cutter should read between 1.1 and 1.5 volts A.C.

MODEL 4580 TV



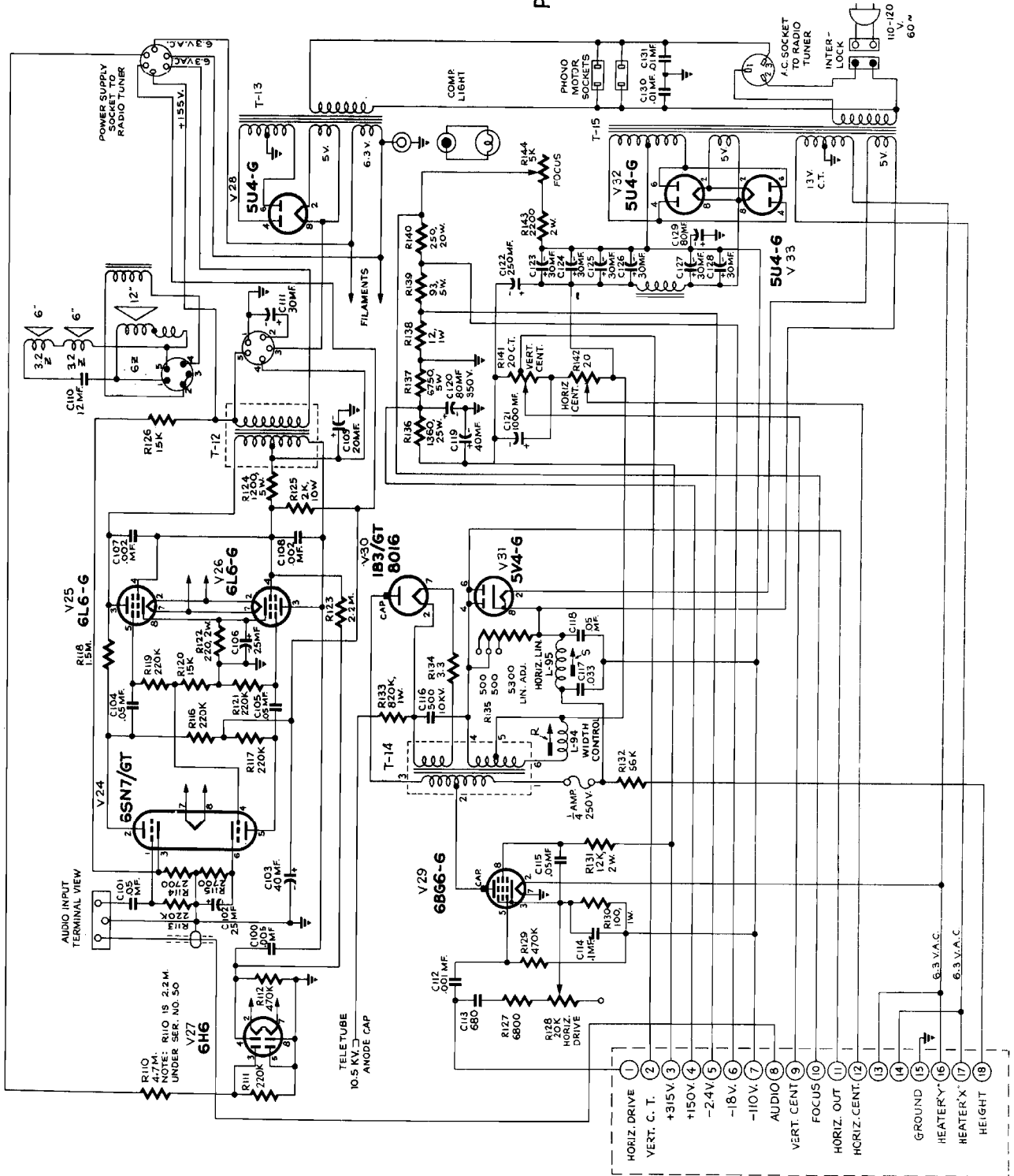
TELEVISION TUNER
PACKARD-BELL MODEL 4580TV - FIG. 32

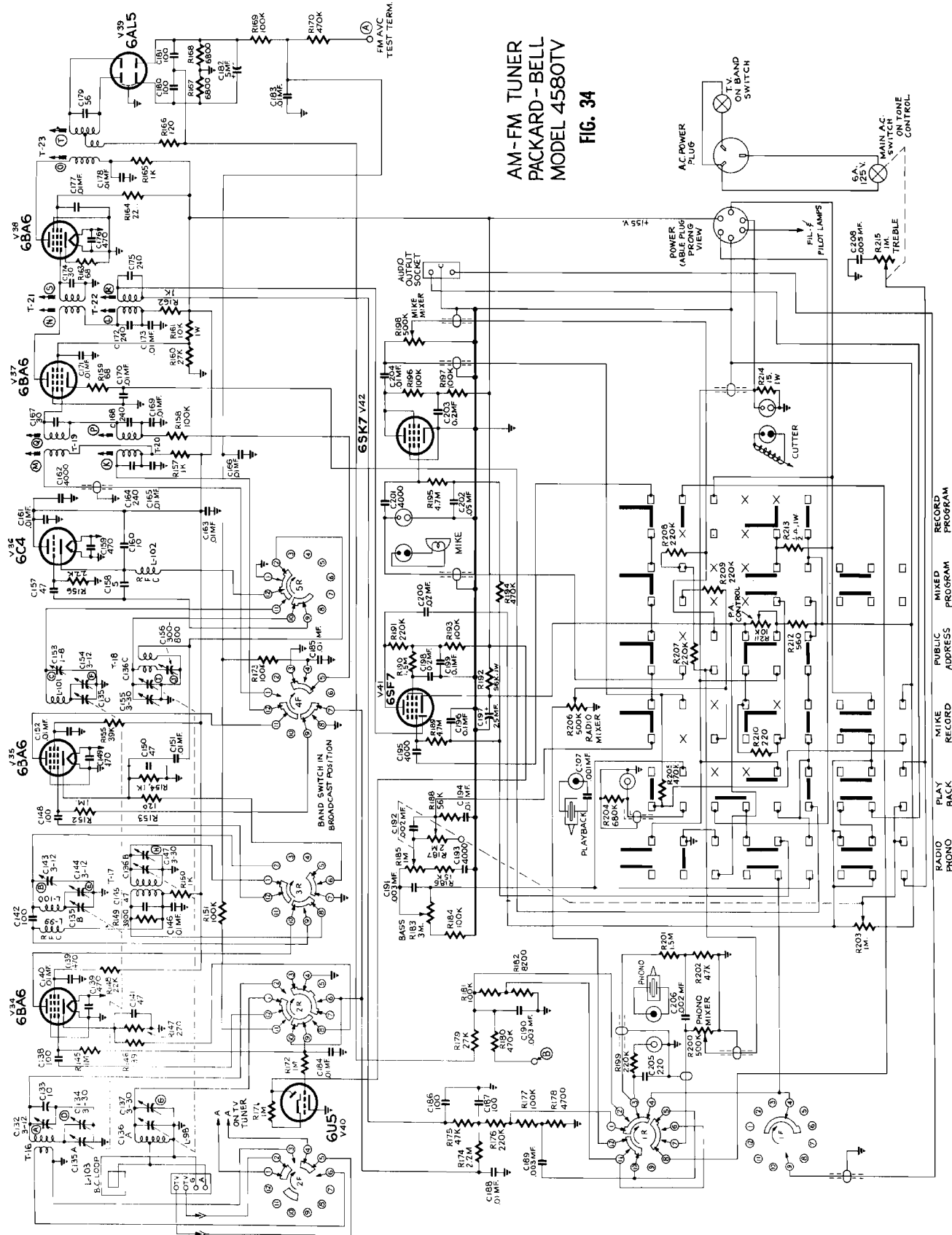
RECORD CHANGER: Webster Chicago Model 156,
Page 19-1 to 19-11.

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MODEL 4580 TV

POWER SUPPLY & AUDIO
PACKARD-BELL MODEL
4580 TV — FIG. 33





AM-FM TUNER
PACKARD-BELL
MODEL 4580TV
FIG. 34