PANORAMIC HANDBOOK

FOR
PANADAPTOR
MODEL PR-1

Serial No. 157-100 A

PANORAMIC RADIO PRODUCTS, INC.

10 SOUTH SECOND AVE.
MOUNT VERNON, N. Y.

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SECTION IV

Circuit Details

The aural receiver used with the PR-1 must be s auperheterodyne having an I.F. between 450KC and 470KC. It is preferable that the receiver have at least one R.F. stage for adequate image rejection.

The circuit of the PANADAPTOR, Model PR-1, is basically a superheterodyne in which the R.F. section is fixed tuned to 455 KC and the local oscillator is tunable, through 200 KC, either manually or by frequency modulation at a definite rate. For certain receivers a R.F. section between 455 to 500 KC must be used and the local oscillator must be restricted to 100 KC.

1. R.F. Section

The input is connected through the isolating circuitry, see Section II, to the plate of the converter tube in the receiver. In

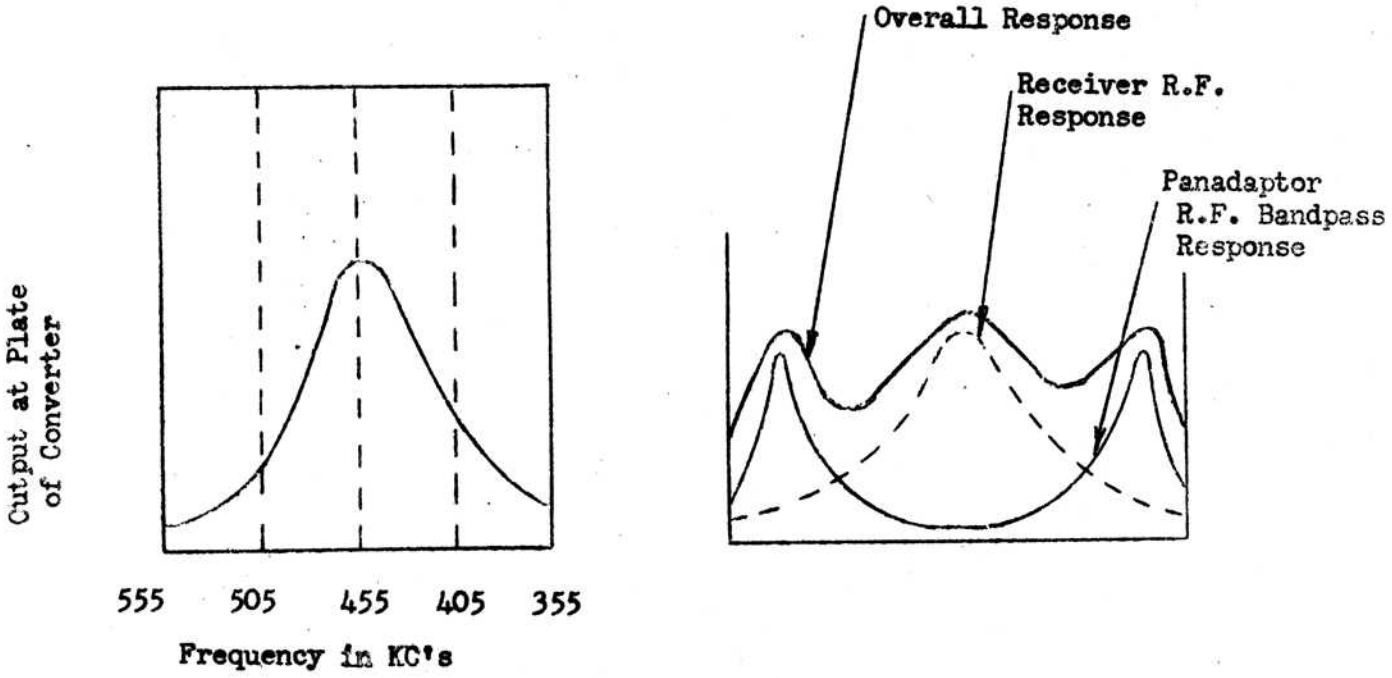

Figure 31. Overall Response of PANADAPTOR and Receiver

In the plate circuit of the converter there are many signals on either side of the I.F. due to the relatively poor selectivity of the receiver preselector.

In many modern receivers the opposite is true. The preselector is designed for high selectivity either by dual R.F. stages, dual conversion, or both. This has been done to reduce spurious responses with the receiver.

These receivers will require a modification of the R.F. amplifier known as high compensation.

The R.F. bandpass transformers, T1 and T2, of the PANADAPTOR are peaked on both sides of the receiver I.F. so that a relatively flat overall response of 200 KC is obtained. See Figure 31.

The peaking of the R.F. bandpass is controlled partially by the COMPENSATION control. As the resistance of the COMPENSATION control is varied, the double peaks become more or less pronounced and, therefore, the R.F. section of the PANADAPTOR compensates more or less for the receiver selectivity. This is desirable since the receiver front end selectivity varies with the frequency of operation. See Figure 32.

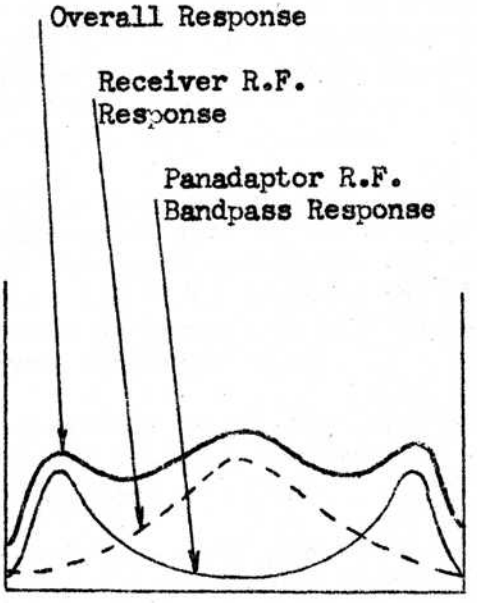

Figure 32. Overall Response at Reduced Preselector Selectivity and EQUALIZER Set for Minimum Equalization

The R.F. section is a straight bandpass amplifier employing a 6SG7. Manual gain control is provided by R1.

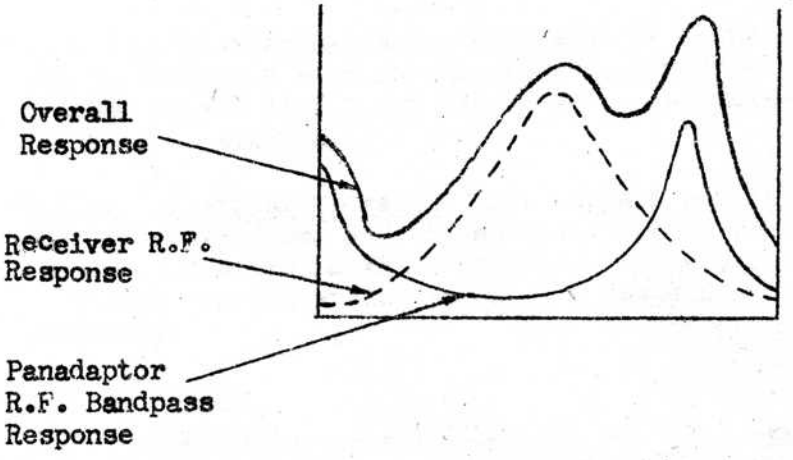

Figure 33. Distorted Overall Response Due to Mismatch Between PANADAPTOR Mean Input Frequency and Receiver I.F.

2. Converter, Local Oscillator and Reactor.

The output of the R.F. bandpass amplifier, which may contain signals up to 100 KC above and below the receiver I.F., is fed to the converter tube, V2, a 6SA7. The converter, also receives an R.F. voltage from the local oscillator.

The frequency of the local oscillator is determined by the tuned circuit in Z1 and the reactance modulator tube, V5, which acts as a variable inductance across the tuned circuit. The magnitude of this inductance is dependent, in part, upon the transconductance of the modulator tube.

The CENTER FREQ(uency) potentiometer, R22, controls the bias and therefore the transconductance of the modulator tube. Thus the frequency of the local oscillator can be varied within a range of up to 200 KC by means of the CENTER FREQ. Control. The oscillator frequency can also be varied through adjustment of a trimmer condenser in Z1.

The oscillator mean frequency is 681 KC, the sum of the PAN-ADAPTOR I.F., 226 KC, and the mean frequency is maintained at 681 KC by the CENTER FREQ. Control.

During Panoramic Operation, the oscillator is "rocked" through a band of frequencies by a linear sawtooth voltage taken off the SWEEPWIDTH control, R56, and applied to the control grid of the modulator tube. The oscillator is, thus, frequency modulated and the extent of deviation is proportional to the amplitude of the applied sawtooth voltage. The position of the SWEEPWIDTH Control contact arm determines the amount of sawtooth applied to the modulator grid.

Linear frequency calibrations on the Panoramic screen are obtained by having the oscillator frequency excursion follow the sawtooth voltage linearly. A special phase net made up of R14, R15, and C14 accomplished this. The construction of the net is extremely critical, but once it has been properly made, it is highly stable.

As the oscillator makes its excursion it beats progressively and periodically with one incoming signal after another to produce pulses of I.F. of 226 KC which are passed and amplified by the I.F. section.

During Uni-signal Operation the contact arm of the SWEEPWIDTH Control is grounded and the modulator receives no sawtooth voltage. The CENTER FREQ. Control then becomes a frequency or tuning control which can set the oscillator at one particular frequency.

3. I.F. Amplifier

The I.F. amplifier uses a 6SG7, V3, and is a typical stage as found in most receivers, except that its selectivity is made as high as is consistent with the sweepwidth and sweep rate.

4. Detector, Pulse AGC (LOG), and Video Amplifiers.

The detector is the diode section of a 6SQ7, V4. Its output is directly coupled to the grid of the triode section of the same tube so that the lowest possible frequency - in this case DC - appearing across the diode load resistor will be amplified by the triode video amplifier. One triode section of V7 is used as a video phase inverter.

The push-pull output of the video amplifiers is directly coupled to the vertical deflection plates of the Panoramic indicator so that a flat video response down to zero frequency with minimum distortion is possible.

During Panoramic operation, the pulses of I.F. fed to the detector appear rectified and filtered across the diode load resistors, R12 and R13. In LOG operation these negative voltage pulses are fed back through the filter, R9 and C6, to the control grid of the I.F. amplifier. Strong signals produce high negative voltage pulses which reduce the gain of the I.F. stage. In this way the amplitude of strong signals is automatically decreased, and it becomes possible to present simultaneously signals which differ considerably in strength. The time constant of the filter is sufficiently short so that a pulse of a strong signal does not reduce the gain for an adjacent weak signal. In LIN operation the AGC is disabled by switch S2 providing a linear indication for check modulation, etc.

The potentiometer, R33, varies the DC potential difference between the upper and lower vertical deflection plates, and, therefore, the vertical position of the electron beam.

The audio output is taken from the plate of the video amplifier, through a blocking condenser, to a PHONE jack on the panel. The audio level is more than adequate for headset operation. Crystal headphones are recommended because of their high impedance.

5. Sawtooth Generator and Amplifiers.

The sawtooth voltage applied to the modulator is obtained from a "blocking grid" oscillator.

As the grid of the 6SL7 oscillator tube V10, the half connected to T4, is driven positive, the grid blocking condenser, C25, is charged highly negative by grid current. As the grid makes its negative swing, the voltage across C25 keeps the grid at a high negative potential that blocks the tube. The blocking voltage gradually decays due to leakage of the condenser charge through the grid resistors, R50 and R51.

In the meantime, while the tube is blocked, the plate condenser, C23, charges slowly through the linear portion of the charging curve, until the charge on the grid condenser has decayed sufficiently to allow the tube to conduct. In the process of conduction the plate condenser is rapidly discharged and the

whole process is repeated so that a sawtooth voltage appears across the plate condenser.

The frequency of the sawtooth is dependent upon the rate at which the grid blocking condenser discharges through the grid resistor. R49 and C23 also affect the frequency. The values are chosen so as to produce a sawtooth frequency of approximately 25 to 30 cycles per second.

By introducing the power line frequency into the grid input circuit, the sawtooth is locked or synchronized to one-half the power line frequency.

The sawtooth voltage developed across C23 applied and amplified by the other half of the 6SL7. The output at the plate of this section is directly coupled to the horizontal deflection plate of the cathode-ray tube. One triode section of V7 is used as a phase inverter to supply sawtooth to the other horizontal plate of the cathode-ray tube. In this way, push-pull horizontal deflection is provided for the cathode-ray tube. The application of the sawtooth wave to the horizontal deflection plates causes the electron beam to sweep in one direction across the fluorescent face of the tube as the sawtooth voltage rises, and then snap back with the rapid decay of the sawtooth. Due to the persistence of vision, a horizontal baseline is apparent.

HORIZONTAL POSITIONING of the baseline is possible through the use of potentiometer, R26, which varies the D.C. potential difference between the left and right horizontal deflection plates.

Sawtooth output is taken off the cathode of V10 and applied through potentiometer R57, the SWEEPWIDTH LIMIT, and the SWEEPWIDTH control, R56, to the modulator tube. The function of the SWEEPWIDTH LIMIT is to proportion the proper amount of sawtooth across the sweepwidth control so that a 200 KC oscillator excursion is obtained when the SWEEPWIDTH control is set to maximum.

The fact that the same sawtooth voltage is used to swing both the electron beam and the oscillator frequency simultaneously is necessary for understanding the development of the Panoramic display.

Since a given instantaneous value of sawtooth voltage will correspond to one particular horizontal location on the tube face and to one particular frequency of the oscillator, signals across the band, being examined, will be spread across the face of the tube, in exactly the same manner that the signals would be spread across the range of a tuning dial.

6. Power Supply and Panoramic Indicator Circuit.

The power supply consists of a positive supply used for all of the tubes and to furnish part of the cathode-ray tube voltage, and a low-current high voltage negative supply makes up the rest of the cathode-ray tube supply. The BRILLIANCE control,

R47, varies the brightness of the trace and the FOCUSing control, R45, is necessary to set the beam to as small a spot as possible. An OC3 regulator tube is used to stabilize the screen voltage on the modulator tube and converter.

7. Schematic Diagram.

A complete schematic of the PANADAPTOR is shown in Figure 36.

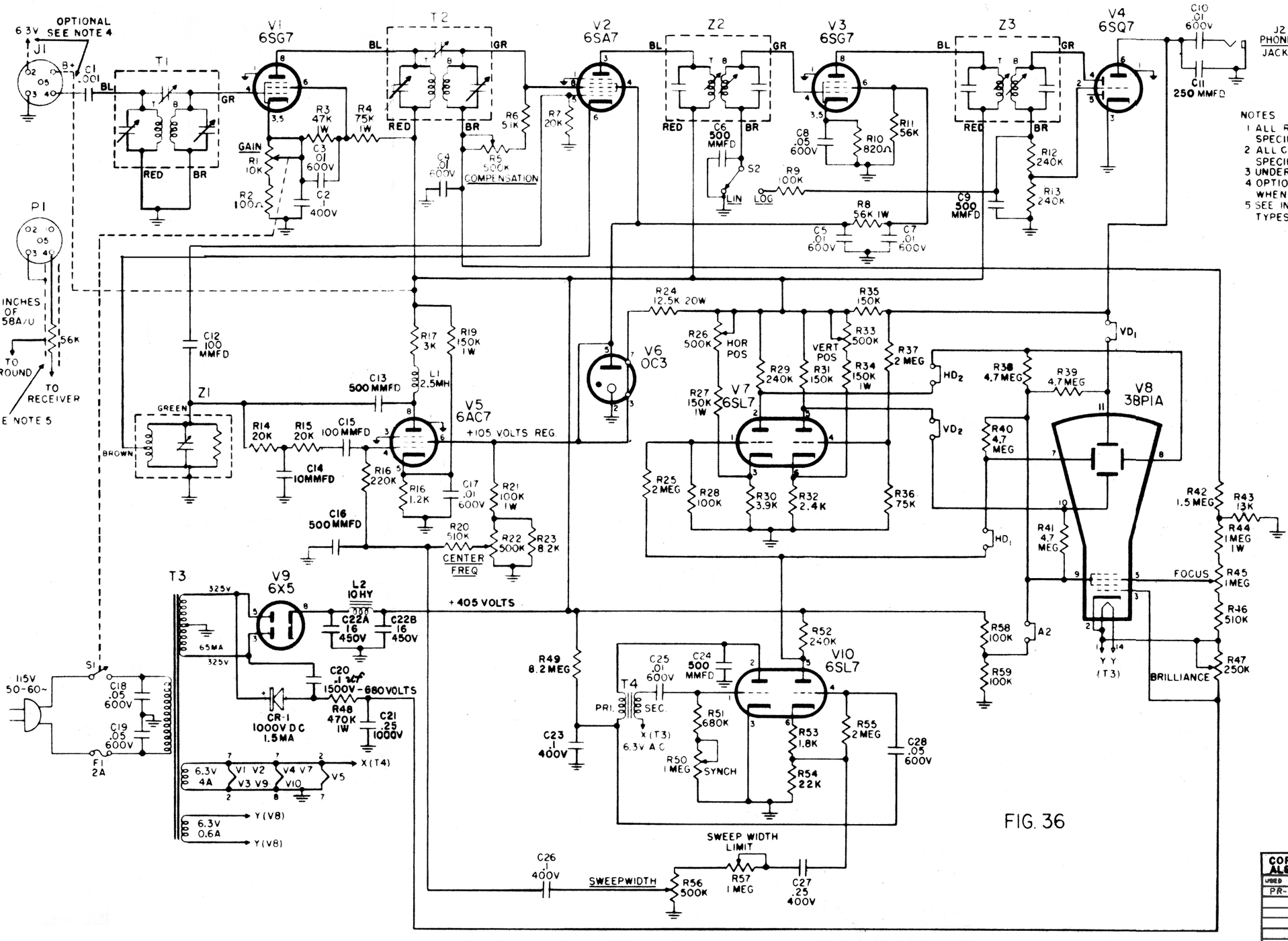

FIG. 36

COPIED FROM P5-15004B WITH CHANGES, SEE ALSO P1-15157

USED ON			
PR-1	DRAFTSMAN	LF	10-10-57
	CHECKER	FG	10-11-57
	ORIGINATOR	FG	10-11-57
	MECH	–	
	ELECT		
	SPEC		
	ENG	FG	10/11/57

PANORAMIC RADIO PRODUCTS INC
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SCHEMATIC DIAGRAM OF PR-1

P5-15157

SECTION V

Maintenance and Service

1. Removal of the Chassis from the Cabinet

   a. Remove the four screws from the bottom of the cabinet.

   b. Remove the two nuts at the top and bottom in the center rear of the cabinet. See Fig. 4.

   c. Pull set straight out about three-quarters of the way from the rear of the cabinet.

   d. Tilt and lift the chassis up so that the front panel clears the spade lugs on the top and bottom rear of the cabinet.

   e. Ease the chassis out of the cabinet.

2. Removal and Insertion of the Cathode Ray Tube

   a. BE SURE THAT POWER IS OFF.

   b. Remove the two screws on the Cathode Ray Tube base clamp.

   c. Remove the four screws holding the Cathode Ray Tube shield to the chassis. Remove shield. Be careful not to scratch the calibrated CRT scale.

   d. Replace the Cathode Ray Tube.

   e. Mount the Cathode Ray Tube shield on the chassis.

   f. Loosely mount the Cathode Ray Tube base clamp.

   g. Turn power ON.

   h. Adjust BRILLIANCE, FOCUS, VERTICAL POSITION, HORIZONTAL POSITION, semi-adjustable controls, in accordance with sub-section 4 of this section.

   i. Tighten the screws of the Cathode Ray Tube base clamp.

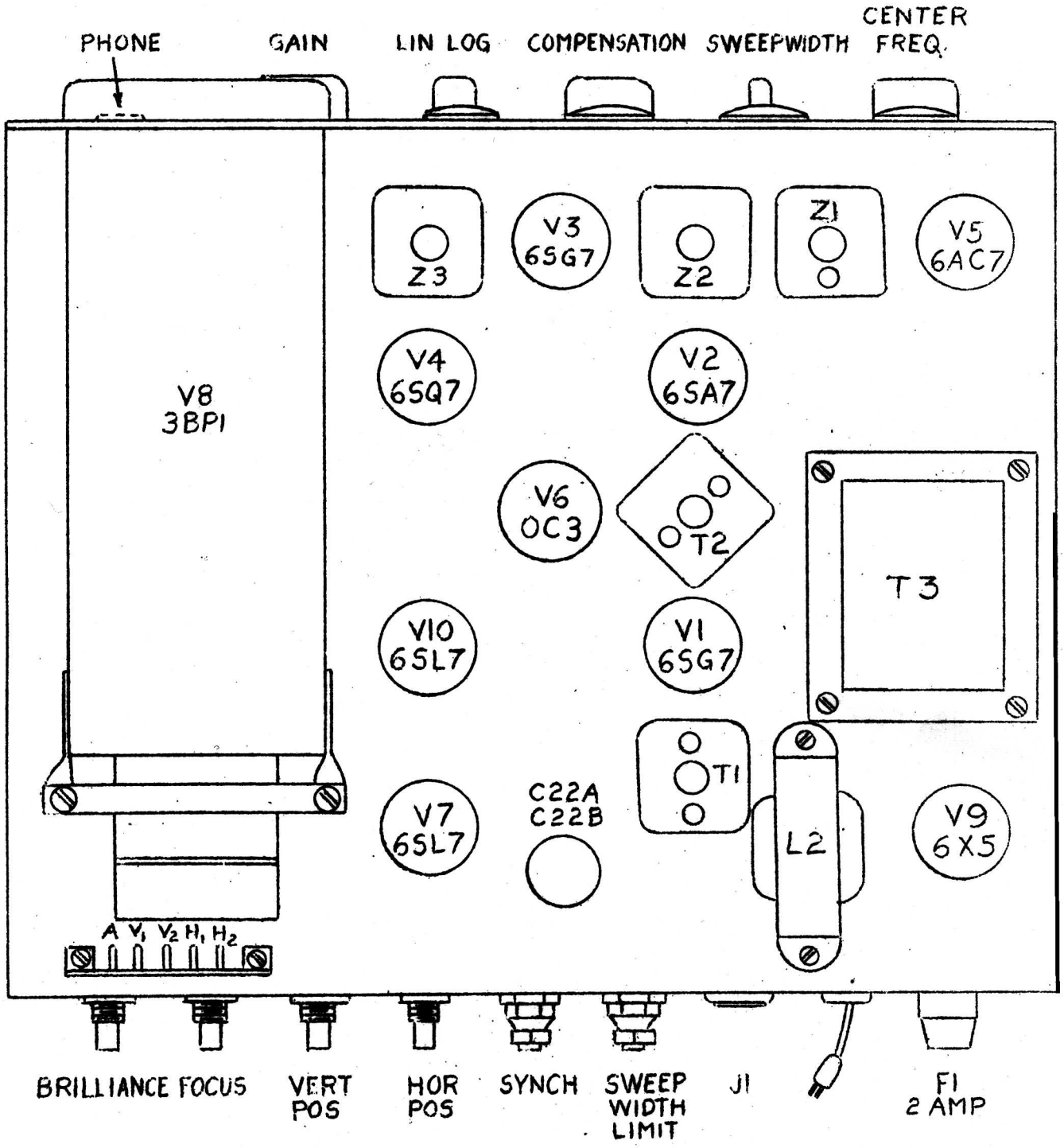


Figure 34

TOP VIEW OF CHASSIS

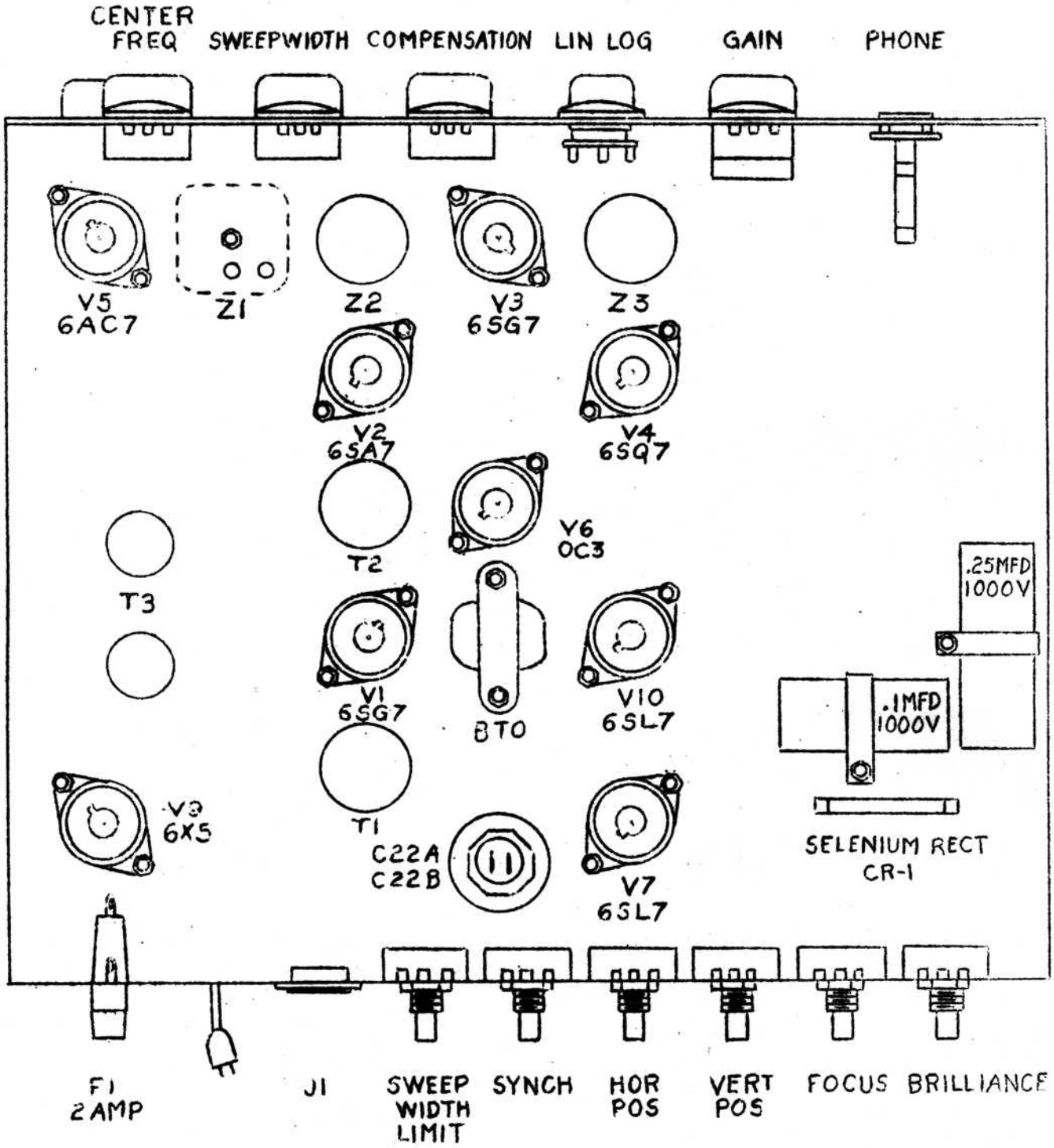


Figure 35

BOTTOM VIEW OF CHASSIS

3. Trouble Shooting Chart

Symptom	Causes and Cures
1. No illumination of the cathode ray tube, V8.	1. AC power is off. a. See if tubes are lit. b. Fuse rear of chassis burned out. c. Check ON-OFF switch. d. Tubes not seated properly in sockets.
	2. BRILLIANCE and FOCUS controls out of adjustment or defective.
	3. Defective cathode ray tube, or rectifiers V9, CR-1.
	4. Check high voltage power supply, and cathode ray tube voltages.
	5. Shorted filter condensers C20, C21.
	6. Check resistance of R48, R46, R44, R43.
2. Baseline trace cannot be made sharp and bright.	1. AC power input below 115V.
	2. Check high voltage power supply and cathode ray tube voltages.
	3. Defective cathode ray tube.
	4. Check condition of BRILLIANCE and FOCUS controls for possible opens.
	5. Check resistance of R48, R46, R44, R43.
3. Baseline trace cannot be made to coincide with screen baseline.	1. Check V4 if unable to get vertical position.
	2. Check high voltage power supply.
	3. Check the voltage on the cathode ray tube deflection plates against the voltages specified on the Voltage Chart.
4. Stationary spot on the screen.	1. Check V9, V10.
	2. Trace the sawtooth voltage with an oscilloscope from the blocking oscillator V10 to V8.
	3. Check R49, R50.

5. Jumpy baseline or flickering images.	1. Sawtooth Generator is not synchronized to half the line frequency. Feed AC from Pin No. 7 of V4 through a 500 mmf condenser to Pin No. 2 of the same tube. Adjust the Synchronization potentiometer on rear skirt until two stationary peaks appear on the screen. Remove the AC voltage after adjustment has been completed or see 4e.
6. No signals.	1. Check connection to receiver. 2. Check operation of the receiver. 3. Test PANADAPTOR for center deflection with a signal generator set at 455 KC (or I.F. of receiver) to the input (disconnected from the receiver.)
7. Whole baseline moves vertically when receiver is tuned.	1. F.M. sweep is not operating, and set behaves as though the SWEEP-WIDTH control is set at zero. Check V5. Use an oscilloscope to check sawtooth at pin #4 of V5. 2. Strong local stations coming through the receiver and beating against one another in the input stages of the PANADAPTOR to produce 226 KC. Remedy would be to align receiver or install wave traps.
8. Baseline remains at top of the screen regardless of tuning.	1. I.F. amplifier may be oscillating - Change V3, V6. Check C5, C7. Compare V3 voltage against Voltage Chart. 2. Video amplifiers V4 of V7 may be inoperative. Change V4 and/or V7. Compare V4 and V7 against Voltage Chart.
9. Low gain. Able to hear weak signals but cannot see them on PANADAPTOR screen.	1. Check all tubes. Most likely to be wear V3, V4. 2. Check voltages, especially screen voltage of V3. 3. Misaligned I.F. transformers.

10. Symptoms of misalignment.

a. Low gain.

b. "Pips" too wide.

c. The double peaked response of the band pass amplifier is not peaked at points 10KC from each end of the scale.

d. Frequency range of signals on the screen is other than 200KC at maximum sweepwidth.

e. Range of the CENTER FREQ. control is less than 200KC.

f. Pip generated by an unmodulated signal is non-symmetrical.

Note: Do not attempt alignment until absolutely certain that alignment is at fault.

1. Do not attempt alignment until the set has been thoroughly checked for faults. Be sure that the error limits, as given in the specifications, for the PANADAPTOR, are exceeded before concluding that alignment is necessary.

4. Semi-Adjustable Controls

These controls seldom require adjustment and they are therefore located at the rear of the chassis.

a. BRILLIANCE: the intensity of the screen presentation is set by this control. Avoid excessive brightness or blooming will result. Do not use this control to complete with external light. Instead shield the calibrated screen from objectionable external light.

b. FOCUS: the sharpness of the screen presentation is adjusted with this control.

c. VERT. POS.: if the baseline trace is not in line with the lowest horizontal grid line on the screen, adjust this control to obtain coincidence. If the baseline trace is not parallel with the grid line of the screen, the Cathode Ray Tube should be rotated. This requires loosening the clamp around the Cathode Ray Tube base. Turn power off and rotate the Cathode Ray Tube socket as required. Tighten clamp.

d. HOR. POS.: the position of the baseline trace along the horizontal axis is set by this control. The procedure for proper adjustment of this control will be found in Section III, sub-section 1.

e. SYNCH: the frequency of the horizontal trace is adjusted with this control. A slight adjustment is all that is necessary to stabilize the baseline at one-half the line frequency (30 cps). If doubt exists about the frequency of the baseline it can be checked by either of the following procedures. Note that this control has a shaft lock to prevent accidental rotation.

1) Introduce 60 cps hum into the grid (Pin #2) of the 6SQ7 (V4) (use finger or metal screwdriver). Two stationary sine waves should appear on the baseline if the SYNCH control has been adjusted properly.

2) Feed to the input cable of the PANADAPTOR a center frequency signal, modulated by the line frequency (60 cps). Adjust the PANADAPTOR controls for visible single-signal operation. Two stationary sine waves should appear on the baseline if the SYNCH control has been adjusted properly.

f. SWEEP WIDTH LIMIT: the upper limit of the sweepwidth obtainable with the sweepwidth control is set by this control. A simple procedure for setting this control will be found in the PRELIMINARY INSTALLATIONS INSTRUCTIONS, page 2. If greater accuracy is desired, follow the instructions given in the ALIGNMENT PROCEDURE for the F.M. OSCILLATOR. Note that this control has a shaft lock to prevent accidental rotation.

5. Alignment

a. NEED FOR ALIGNMENT. Unless it is definitely established that the alignment is incorrect, no adjustments of the tuned circuits should be made.

Provided that all the tubes are good and the voltages are as specified in the Voltage Chart, the following symptoms indicate misalignment.

(1) Low sensitivity. Indicated by the lack of "grass" on the screen, with the GAIN controls at maximum and the PANADAPTOR connected to a "live" receiver.

(2) Center Frequency Control Lacks Full Range. It cannot shift a center frequency signal through the entire screen baseline.

(3) Screen Calibration Error. A discrepancy of more than 15% exists between signal frequency and screen scale indication of frequency.

(4) Overall Response of Other Than Three Peaks. Signal deflection shows other than three peaks heights on all receiver bands as it moves across the screen when the receiver is tuned through the several bands. See Fig. 31.

Note: The R.F. stages in the receiver must be correctly aligned for proper PANADAPTOR operation.

(5) Non-Symmetrical Deflection Shape for an Unmodulated Signal. Usually due to incorrect alignment of the PANADAPTOR I.F. transformers.

b. ALIGNMENT PROCEDURE. After it definitely has been established that alignment is necessary, adjustments of the tuned circuits may be made. Since there are many different types of receivers on the market, the alignment procedure may differ for each different type. A table of receivers and the corresponding alignment procedure will be found in the INSTALLATION section of this book.

Transformers T1 and T2 are tuned by means of trimmer capacitors. Transformers Z2 and Z3 are tuned by means of iron cores. Top cores are used to tune the primary, and bottom cores are used to tune the secondary of these transformers. In addition T1 and T2 each have a trimmer that is used to vary the coupling between the primary and secondary. These trimmers are adjusted by means of a screwdriver which should be inserted through the hole on the side of the transformer can. A hole in the back plate allows access to the trimmer for T1. The oscillator coil, Z1, contains a trimmer which can be reached through the top of the can.

Allow the PANADAPTOR to reach operating temperature to assure stable operation. This may require twenty minutes. Adjust the baseline for proper position, focus, and brilliance.

The Panoramic screen is used a s the alignment indicator. Signals should be kept completely visable by controlling the signal generator output voltage.

Throughout the entire alignment procedure a .01 uf blocking capacitor should be used between the signal generator and the PANADAPTOR.

c. I. F. ALIGNMENT. The I.F. alignment procedure is independent of the receiver with which the PANADAPTOR is used. Set the LIN-LOG control to LIN.

Sig. Gen. Output	SWEEPWIDTH Control At	Signal Fed to	Procedure
226 KC	Minimum	V2, pin 8	Entire baseline will deflect upward. Tune the top and bottom cores of the I.F. transformers, Z2 and Z3, for maximum vertical deflection.

d. F.M. OSCILLATOR ALIGNMENT. This procedure is to a great extent dependent upon the characteristics of the receiver with which the PANADAPTOR is used. See tabulized list of receivers in INSTALLATION section.

Procedure (1) is normally followed in aligning the Model PR-1 PANADAPTOR at the factory. This procedure is used with receivers that have an I.F. of 455 KC and less than two stages of R.F. amplification. It allows for an observable bandwidth of up to 200 KC.

Procedure (2) is followed in aligning the PANADAPTOR when the receiver I.F. is 455 KC and contains two or more stages of R.F. amplification. Double conversation receivers with an I.F. of 455 KC also are aligned in this manner. Procedure (2) allows for an observable bandwidth of up to 100 KC.

Procedure (3) is followed in aligning the PANADAPTOR when the receiver I.F. is 500 KC and contains two or more stages of R.F. amplification. Double conversion receivers with an I.F. of 500 KC also are aligned in this manner. Procedure (3) allows for an observable bandwidth of up to 100 KC.

The following is a list of frequencies for the listed procedures:

Procedure	Input Center Frequency	High Freq. Alignment	Low Freq. Alignment
(1)	455 KC	555 KC	355 KC
(2)	455 KC	505 KC	405 KC
(3)	500 KC	550 KC	450 KC

Set LIN-LOG control to LIN. Set the CENTER FREQ. knob so that the pointer falls in the center of the panel calibration. When this is done the control should be in the center of its rotational range. If this is not the case, loosen the knob set-screw and adjust so that when the control is in the center of its rotational range, the knob pointer is in the center of the panel calibration. Tighten the knob set-screw.

Sig. Gen. Output	SWEEPWIDTH Control At	Signal Fed to	Procedure
Input Center Frequency	Maximum	V2, Pin 8	Adjust the signal generator output voltage so that a "pip" appears on the screen. Adjust the trimmer in the oscillator transformer Z1, to bring "pip" to the center of the screen. Turn the SWEEPWIDTH control to almost zero for more accurate indications of proper trimmer adjustment. Return the SWEEPWIDTH control to maximum and adjust the HOR. POS. control so that "pip" is directly over the zero mark on the screen.
High Frequency	Maximum	V2, Pin 8	Adjust the SWEEP WIDTH LIMIT control so that "pip" appears at left edge of screen calibration (-100).
Low Frequency	Maximum	V2, Pin 8	Vary the placement of the plate lead of V5 (Pin 8), so that "pip" appears at right edge of screen calibration (+100). Slight adjustment of the CENTER FREQ. control may be necessary.

Repeat the three steps above until the high and low frequency "pips" appear within 1/2 division of the edges of the screen calibration.

e. R.F. BANDPASS TRANSFORMER ALIGNMENT. - The procedure to be followed is to a great extent dependent upon the characteristics of the receiver with which the PANADAPTOR is to be used. The tabulized list of receivers in the INSTALLATION section of this book may be used as a guide in determining which procedure to follow.

Procedure (A) is normally used in aligning the Model PR-1 PANADAPTOR at the factory. This procedure is designed for receivers having an I.F. of 455 KC and less than two stages of R.F. amplification.

Procedure (B) should be used in aligning the PANADAPTOR when the receiver I.F. is 455 KC and contains two or more stages of R.F. amplification. Double conversion receivers with an I.F. of 455 KC also are aligned in this manner.

Procedure (C) should be used in aligning the PANADAPTOR when the receiver I.F. is 500 KC and contains two or more stages of R.F. amplification. Double conversion receivers with an I.F. of 500 KC also are aligned in this manner.

The following is a list of frequencies for the listed procedures:

Procedure	Input Center Frequency	High Peak Frequency	Low Peak Frequency
(A)	455 KC	545 KC	365 KC
(B)	455 KC	500 KC	410 KC
(C)	500 KC	545 KC	455 KC

The F.M. oscillator must be correctly aligned before attempting to align the R.F. section of the PANADAPTOR. The R.F. alignment procedure consists of a "cut and try" method. The method of alignment for Procedures (A), and (B) and (C) is the same except for the peaking frequencies.

To determine the response characteristics of the R.F. stages of the PANADAPTOR, the frequency of the signal generator is varied over the bandpass region of the PANADAPTOR while the signal generator output level is kept constant. The variation in the height of the deflection "pip" on the screen as it moves from one end to the other defines the characteristic.

Set the front panel controls as follows:

CENTER FREQ. - on center panel calibration

SWEEPWIDTH - maximum (1.0)

COMPENSATION - maximum

LIN-LOG - lin

GAIN - completely clockwise

(1) Method of alignment for Procedures (A), (B) and (C).

Sig. Gen. Output	Signal Fed To	Trans. Tuned	Procedure
High Peak Frequency	V1, Pin 4	T2	Adjust the signal generator output voltage so that a "pip" appears on the left side of the screen. Adjust the top trimmers of transformer T2 for a maximum "pip" deflection.
Low Peak Frequency	V1, Pin 4	T2	Adjust the signal generator output voltage so that a "pip" appears on the right side of the screen. Adjust the trimmer at side of T2 coil can for a maximum "pip" deflection.
Low Peak Frequency	V1, Pin 4	T2	Adjust the top trimmers of transformer T2 for a maximum "pip" deflection.

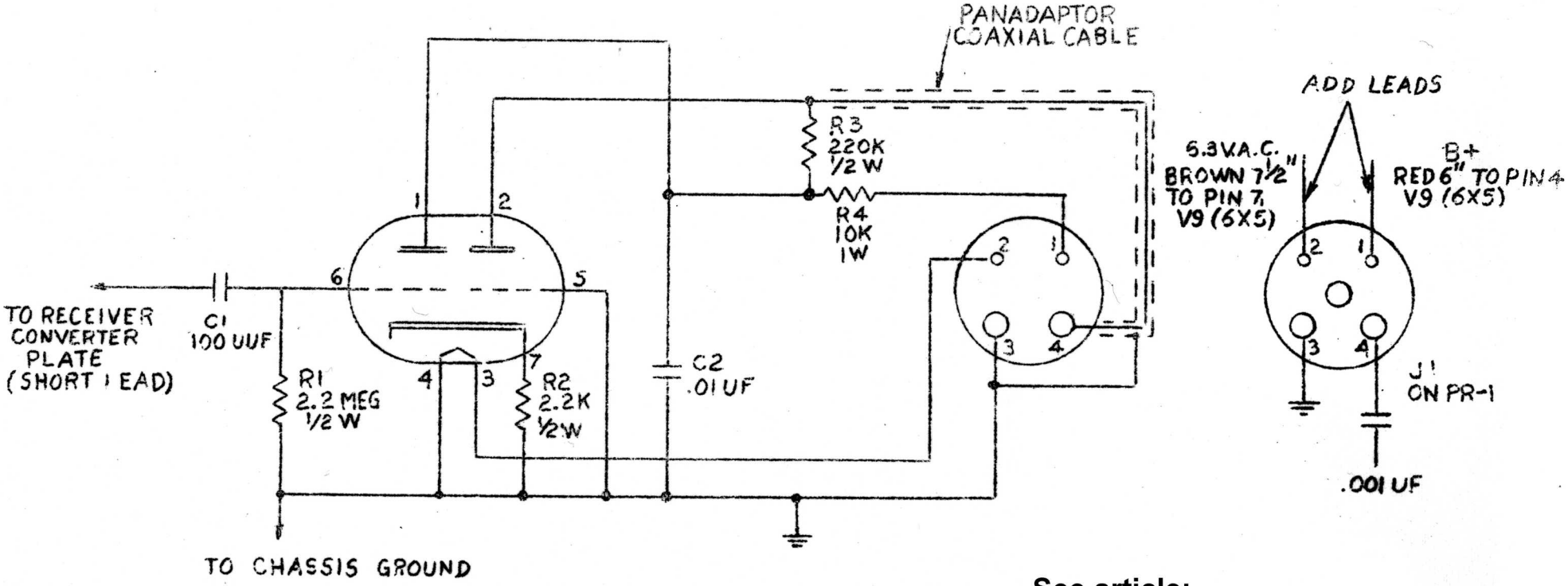
Repeat the above procedure until the maximum "pip" heights appear at the "high peak frequency" and the "low peak frequency" when the signal generator frequency is varied so that the "pip" goes from one end of the screen to the other. If the peaks do not occur at the correct frequency or differ in amplitude by a ratio of greater than three divisions to two divisions, the above procedure should be repeated.

Sig. Gen. Output	Signal Fed To	Trans. Tuned	Procedure
High Peak Frequency	*Input Cable through isolating element	T1	Adjust the signal generator output voltage so that a "pip" appears on the left side of the screen. Adjust the top trimmers of transformer T1 for a maximum "pip" deflection.

Sig. Gen. Output	Signal Fed To	Trans. Tuned	Procedure
Low Peak Frequency	*Input Cable through isolating element	T1	Adjust the signal generator output voltage so that a "pip" appears on the right side of the screen. Adjust the trimmer at side of T1 coil can for a maximum "pip" deflection.
Low Peak Frequency	*Input Cable through isolating element	T1	Adjust the top trimmers of transformer T1 for a maximum "pip" deflection.

Repeat the above procedure until the maximum "pip" heights appear at the "high peak frequency" and the "low peak frequency" when the signal generator frequency is varied so that the "pip" goes from one end of the screen to the other. The maximum "pip" heights should be approximately equal in amplitude. If the peaks do not occur at the correct frequency or differ in relative amplitude by a ratio of greater than three divisions to two divisions, the above procedure should be repeated.

* The input cable is supplied with an isolating element, a 56,000 ohm resistor. If the resistor is removed for installation purposes (that is, replaced by a tube shield or for attachment to a cathode follower) a 5 uuf. capacitor should be used in series with the generator as the isolating element.



See article:
"Cathode-coupled Amplifier for Panoramic Adaptors"
CQ Magazine August 1946 p19

CATHODYNE COUPLER
FOR PR-1
FIG 37

6. VOLTAGE CHART - all measurements taken with R.C.A. WV-77A V.T.V.M.

Circuit Symbol	Type	Function	Pin Numbers 1	2	3	4	5	6	7	8
RF V1	6SG7	R.F. Amp.	0	0	33*	0	33*	175	6.3AC	405
V2	6SA7	Converter	0	0	405	105	-75	0	6.3AC	-4.2
V3	6SG7	I.F. Amp.	0	0	1.15	0	1.15	42	6.3AC	405
V4	6SQ7	Detector,								
		1st Vert. Amp.	0	-.4	0	...	-.5	165	6.3AC	0
V5	6AC7	Reactor	0	6.3AC	0.9*	...	5.6	105	0	400
V6	OC3	Volt. Reg.	405	0	105	...	105	0	105	405
V7	6SL7	2nd Hor. Amp.								
		2nd Vert. Amp.	9	183	10.8	6	230	8.2	6.3AC	0
V9	6X5	Low Volt. Rect.	-	0	325AC	405	325AC	...	6.3AC	408
V10	6SL7	Sawtooth Gen.								
		1st Hor. Amp.	-22	46	0	10.8	176	21.5	6.3AC	0

CR1 High Volt. Rect. -850 V at minus terminal of rectifier

			Pin Numbers 1	2	3	4	5	6	7	8
V8	3BP1	CRT Indicator	-660*	-660*	-680*	...	420*	...	175	183
			9	10	11	12	13		14	
			190	230	165	-	-		-660*	

7. RESISTANCE CHART

Circuit Symbol	Type	Function	Pin Numbers 1	2	3	4	5	6	7	8
V1	6SG7	R.F. Amp.	0	0	10K*	15	10K*	38K	.05	23K
V2	6SA7	Converter	0	0	23K	26K	20K	2.6	.05	1.5M
V3	6SG7	I.F. Amp.	0	0	740	**	740	38K	.05	23K
V4	6SQ7	Detector,								
		1st Vert. Amp.	0	240K	0	-	480K	150K	.05	0
V5	6AC7	Reactor	0	.05	0	730K	1.1K	26K	0	26K
V6	OC3	Volt. Reg.	23K	0	26K	-	26K	500*K	26K	23K
V7	6SL7	2nd Hor. Amp.								
		2nd Vert. Amp.	900K	240K	3.9K	70K	160K	2.4K	.05	0
V9	6X5	Low Volt. Rect.	∞	0	150	23K	150	-	.05	23K
V10	6SL7	Sawtooth Gen.								
		1st Hor. Amp.	1.2M	820K	0	2M	220K	26K	.05	0

CR1 High Volt. Rect. 2.9 M* at minus terminal of rectifier

			Pin Numbers 1	2	3	4	5	6	7	8
V8	3BP1	CRT Indicator	2.4M*	2.4M*	-	2.4M*	1.6M*	-	220K	240K
			9	10	11	12	13		14	
			50K	150K	150K	-	-		2.4M*	

Note:- GAIN at min.; SWEEPWIDTH at max. All other controls normal position.
*Reading varies with control setting. **LIN Scale 19
K = 1000 ohms. M = megohms. LOG Scale 580K

SUPPLEMENT TO PR-1 INSTRUCTION MANUAL
(455kc CF, 200 kc Sweep Width)

If the PANADAPTOR is to be operated with a receiver having two or more stages of R. F., it may not be possible to observe up to 200kc of a band at one time. This will indicate need for the use of the High Compensation circuit outlined below.

Method of alignment for High Compensation -

The F. M. Oscillator must be correctly aligned before attempting to align the R. F. section of the PANADAPTOR. THE PANADAPTOR MUST BE REWIRED IN ACCORDANCE WITH THE INFORMATION GIVEN IN FIGURES A & B.

The R. F. alignment procedure consists of an "approximation" method. Refer to section "e" for front panel control settings.

SIG. GEN. OUTPUT	SIGNAL FED TO	TRANS. TUNED	PROCEDURE
High Peak Frequency (545kc)	V1, Pin 4	T2	Adjust the signal generator output voltage so that a "pip" appears on the left side of the screen. Adjust the top trimmer (adjacent to the side trimmer) of T2 for a maximum "pip" height.
Input Cent. Frequency (455kc)	V1, Pin 4	T2	Adjust the signal generator output voltage so that a "pip" appears on the center of the screen. Adjust the top trimmer (away from side trimmer) of T2 for a minimum "pip" height. If required, increase signal generator output in order to see the dip or null clearly.
Low Peak Frequency (365kc)	V1, Pin 4	T2	Adjust the signal generator output voltage so that a "pip" appears on the right side of the screen. Adjust the trimmer at side of T2 coil can for a maximum "pip" deflection.

Repeat the above procedure until the maximum "pip" heights appear at the "high peak frequency" and the "low peak frequency", and a minimum "pip" height occurs at the "input center frequency".

The method of alignment for transformer T1 is the same as that given for T1 under sub-section (1) of this section of the book.

FOR ANY OF THE ABOVE PROCEDURES THE SAME "HIGH PEAK FREQUENCY" AND "LOW PEAK FREQUENCY" SHOULD BE USED IN ALIGNING T1 AS WAS USED IN ALIGNING T2.

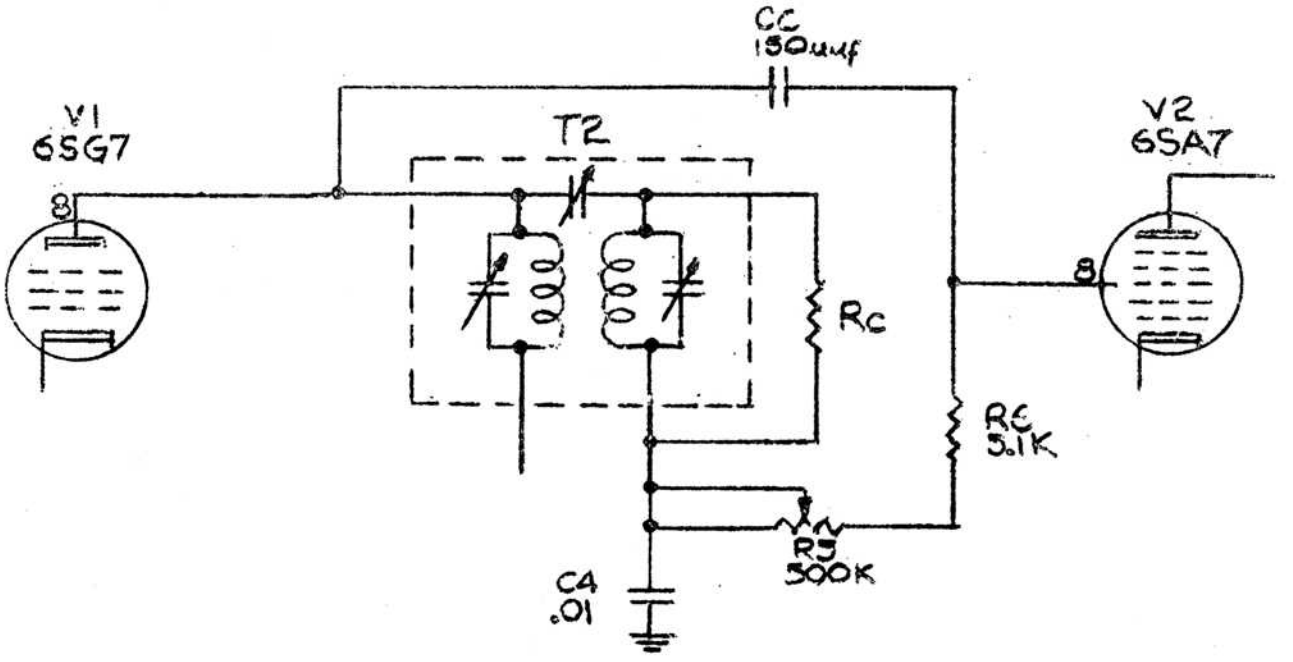


Figure B

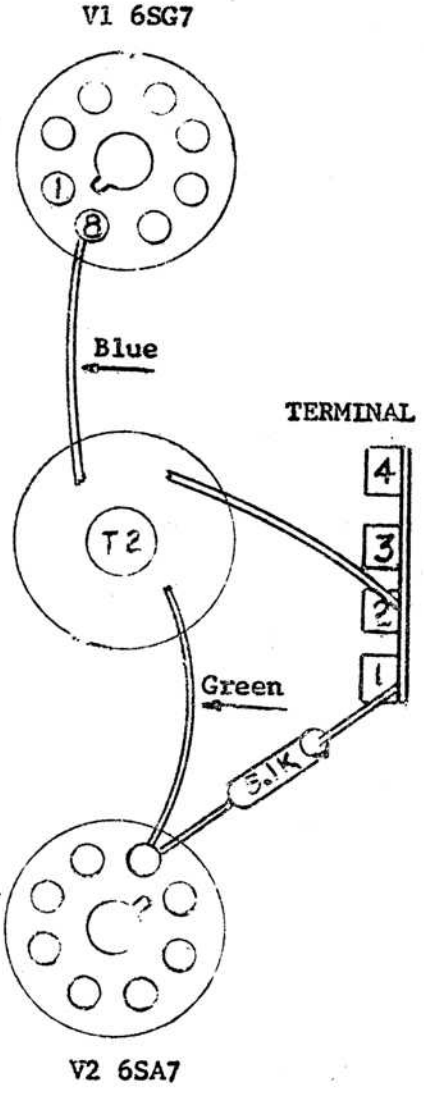
APPROXIMATE HIGH COMPENSATION RATIOS SWEEP WIDTH 200 KC	
MAX MIN	VALUE OF R_C
1600-1 : 400-1	NONE
1000-1 : 250-1	390K
450-1 : 120-1	100K
140-1 : 50-1	33K

Note: For intermediate values of compensation a suitable value of Rc may be approximated from this table.

For compensations smaller than these values use NORMAL COMPENSATION.

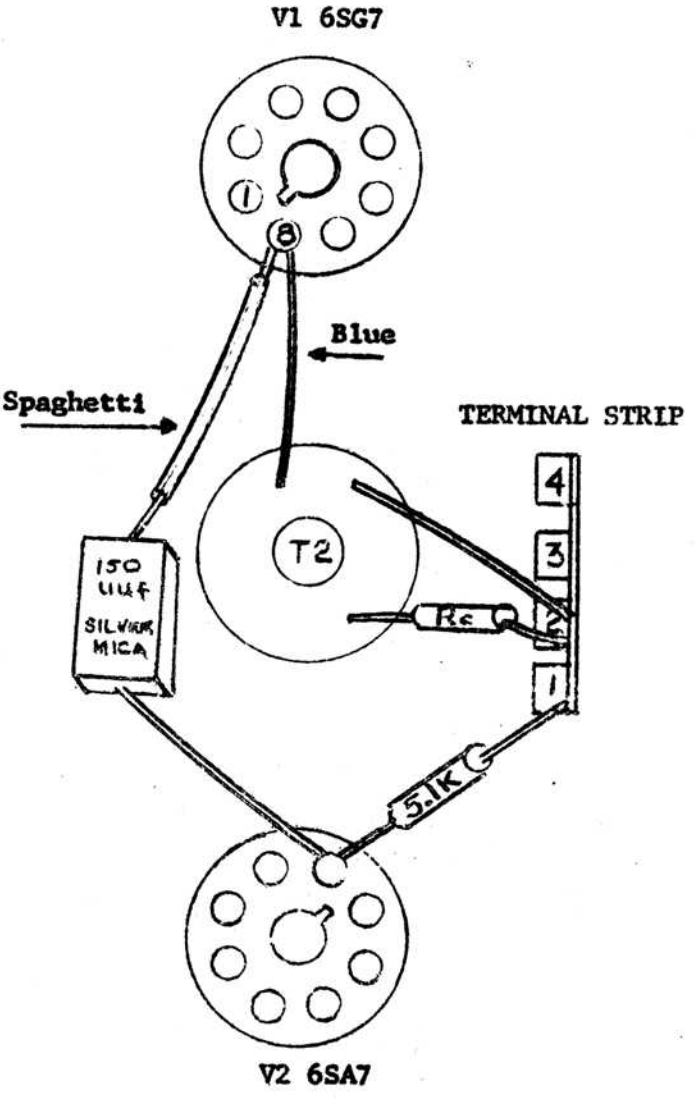
Some loss of sensitivity at center frequency is to be expected. This will range from 2:1 to 100:1, depending upon the degree of high compensation used.

INSTALLATION OF HIGH COMPENSATION



Remove green lead from T2 to V2 pin 8

NORMAL Compensation



Add 150 uuf from V1 pin 8 to V2 pin 8. Rc from green wire to lug 2 on terminal strip.

HIGH Compensation

Figure A