

JOHNSON VIKING SSB ADAPTER

MODEL 240-305-2

OPERATING MANUAL CONTENTS

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JOHNSON SSB ADAPTER OPERATING MANUAL

A. DESCRIPTION AND SPECIFICATIONS

1. Electrical Description

The SSB Adapter is a filter type SSB generator capable of operating on all amateur band SSB frequencies between 3.8 to 29.7 megacycles with an approximate output of 2 watts. The equipment is designed for use with the Valiant I and II utilizing the Valiant's VFO for frequency control and last two stages for power amplification.

All the Adapter R.F. stages are bandswitched and pretuned except for the amplifier tank circuit. The 1st and 2nd mixer stages utilize the 7360 tube capable of long term stability and suppression of at least 40 db. The 7360 tube is also used as a combined crystal oscillator and balanced modulator providing a high degree of stable carrier suppression. The crystal filter is the same as used in the Viking Invader transmitters with the same stable operation and sharp response. The output stage consists of a "Pi" network with a fixed 50 ohm output impedance.

The audio system includes a fixed audio oscillator for use during tuning adjustments. The two stage audio amplifier has an excellent response and is designed for use with a high impedance microphone. The control circuits provide for MANUAL, VOX and P.T.T. operation of the Adapter and the Valiant transmitters.

The filament and plate voltages to operate the Adapter are provided by a separate power supply. All the cables necessary to connect the Adapter to the power supply and to the Valiant transmitter are furnished with the Adapter.

2. Mechanical Description

The SSB Adapter is housed in a desk top cabinet designed to match the Valiant II in color and appearance. In addition to the cabinet shielding, the balanced modulator-oscillator, filter and amplifier circuits are enclosed in separate shielded compartments. Each of the multiplier, mixer and final amplifier stages is also enclosed in separate shielded compartments. The perforated sides, top and bottom of the cabinet provide adequate ventilation.

The power supply is built on a compact nickel plated chassis with a bottom plate equipped with rubber mounting feet. The primary fuse, VR tubes and rectifier tube are readily accessible. Adequate ventilation is provided by means of air holes in the top of the chassis and bottom cover.

3. Specifications

Frequency Coverage	3.8 to 4.0 mcs. 21.25 to 21.45 mcs. 7.2 to 7.3 mcs. 28.5 to 29.7 mcs. 14.2 to 14.35 mcs.
Emission	Single sideband, suppressed carrier
Suppression	1. Unwanted sideband, 50 db. or better 2. Carrier, 45 db. or better 3. Spurious, 50 db. or better
Distortion Products	Better than 40 db. down
R. F. Power Output	Approximately 2 watts on all bands
R. F. Output Impedance	50 ohms
Primary Voltage	115 volt, 2 wire, 50/60 cycle, single phase
Primary Power Demand	100 watts
Dimensions	Adapter 8" wide, 11 1/2" high, 14" deep Power supply 3 3/16" wide, 6 13/16" high, 7 9/16" deep
Weights	Adapter 15 pounds Power supply 10 pounds

B. FUNCTIONAL DESCRIPTION OF SYSTEM

The block diagram of SKETCH A indicates the frequency conversion system and how the SSB signal is generated and fed into the system. The diagram also shows the paths taken by the V.O.X. and A.T. signals to the amplifier controlling the relay. SKETCH A TABLE shows the frequency conversion system used in the adapter.

As shown in SKETCH A, the VFO input is fed into a multiplier stage where the frequency (f_0) is changed to the operating frequency (f_1). The f_1 signal is mixed in the 1st mixer with the 9 mc. SSB signal from the SSB generator amplifier to produce an SSB signal of f_1 plus or minus 9 mc. SSB (plus or minus depending upon band). The output of the 1st mixer is mixed in the 2nd mixer with the 9 mc. signal from the crystal oscillator thus converting back to f_1 . The output of the 2nd mixer is, therefore, a SSB signal at the operating frequency (f_1). Note that, if the 9 mc. SSB signal is added to the f_1 signal in the 1st mixer, the 9 mc. is subtracted in the 2nd mixer to convert back to the operating frequency (SKETCH A TABLE). The 12BY7A amplifier amplifies the output of the 2nd mixer to approximately 2 watts.

The SSB generator section consist of a 7360 tube used as a combined crystal oscillator and balanced modulator. The crystal output is applied to the grid of the 7360 tube and the audio is applied to one of the deflecting plates. The push pull output of the modulator tube permits cancellation of the carrier signal and the generation of two sidebands. The output of modulator is fed into the crystal filter which further attenuates the carrier and removes one of the sidebands. The amplifier increases the output of the filter to a suitable level to be applied to the 1st mixer.

The VOX amplifier receives its input signal from the audio amplifier through the VOX gain control. The audio output voltage of the VOX amplifier is rectified by the VOX rectifier and the rectified voltage is applied to the relay control tube which closes the control relay. The relay turns the transmitter on and mutes the receiver. Audio voltage is fed from the receiver output transformer (which also feeds the speaker) through the anti-trip (AT) gain control and AT amplifier to the AT rectifier, where the anti-trip audio voltage is rectified. The AT and VOX rectifiers are connected to cancel, that is, equal signals through the two rectifiers produce zero output and the relay tube and relay are not actuated.

A 1300 cycle audio oscillator provides a signal into the grid of the 2nd section of the audio amplifier. The 1300 cycle tone is used for adjustment of the Adapter and may be used in observing the wave shape of the overall system on an oscilloscope.

C. UNPACKING AND INSPECTION

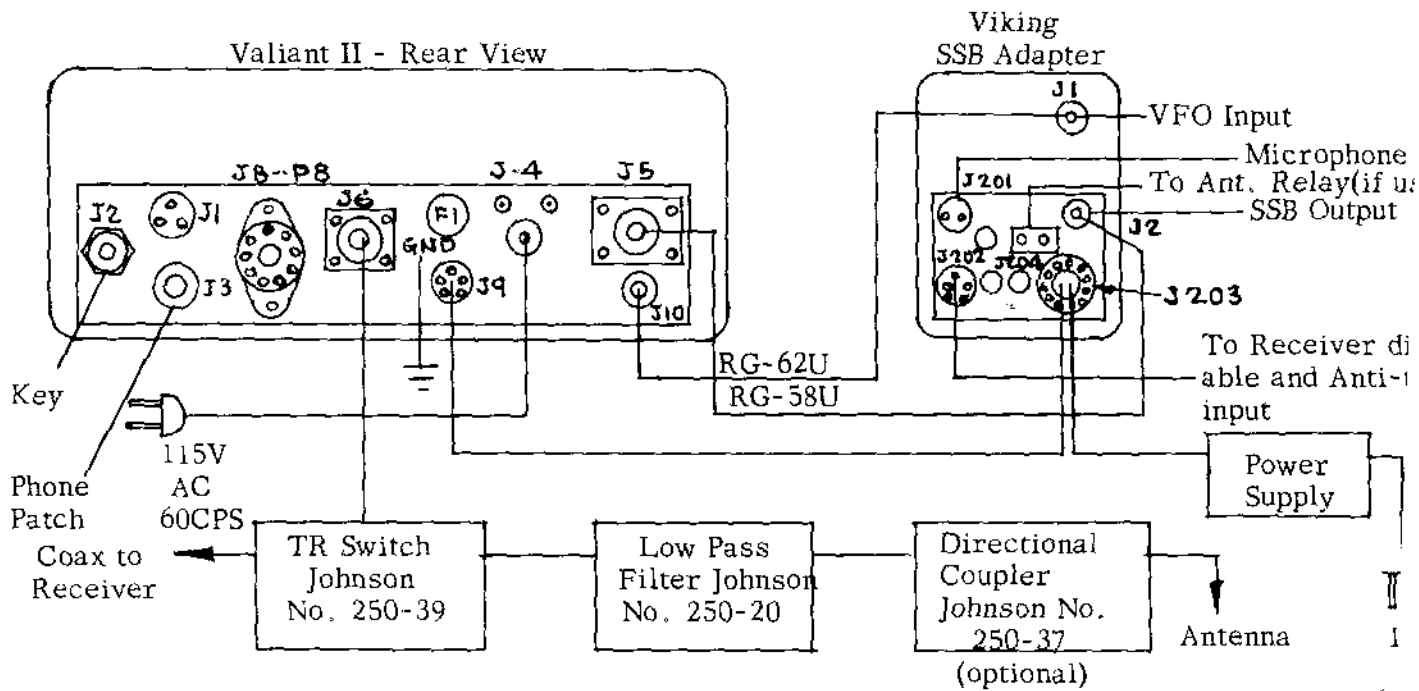
The Johnson Viking SSB Adapter is shipped in a single carton containing the Adapter, power supply, power supply cable, R.F. input cable, R.F. output cable, parts envelope and the Operating Manual.

Carefully remove all packing material and inspect the equipment for any damage and missing parts. Report all claims for transportation damage immediately to the carrier and not to the E. F. Johnson Company. Report all missing parts immediately to the distributor from whom the equipment was purchased.

D. INSTALLATION

1. Adapter with Valiant

The following instructions apply to the installation of the Adapter with the Valiant II or a Valiant I which has been modified by the Valiant I Conversion Kit, part no. 250-47 See SKETCH B.



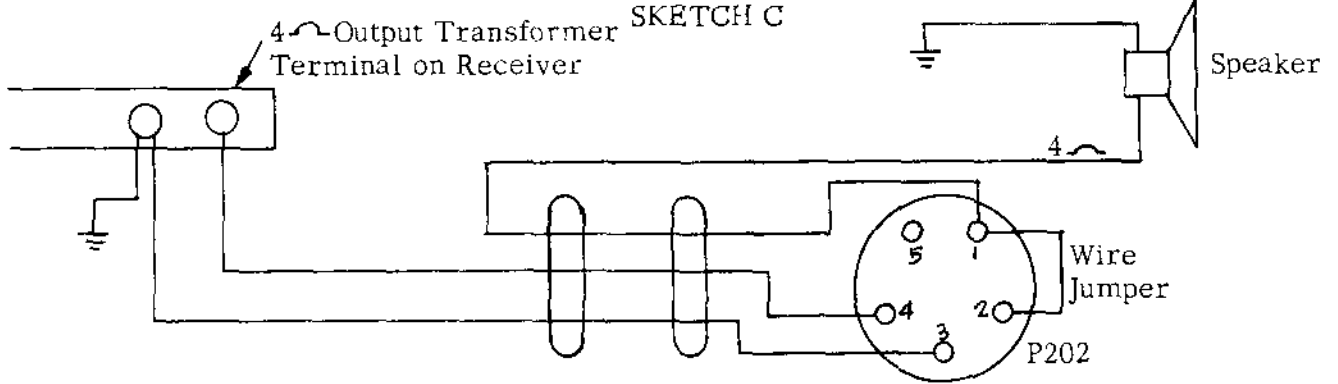
SKETCH B

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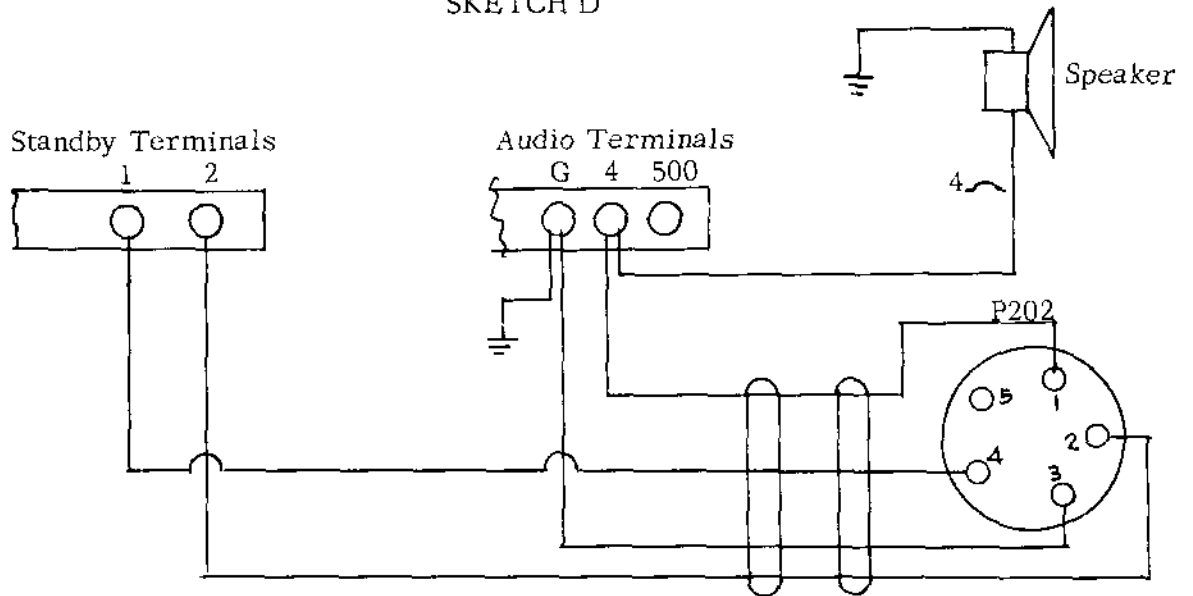
- a. Remove P10 from J9 at the rear of the Valiant since it is not required when using the Valiant with the Adapter. The plug is required when the Valiant is used by itself. Some earlier Valiant II equipments did not have a R22 (150K resistor 1/2 watt) connected between terminals 1 and 5 of J9. Install this resistor if it is not in the circuit as it will apply cut off bias if P10 is inadvertently left out of the socket.
- b. Insert the 5 prong male plug of the Adapter power cable into the Valiant J9.
- c. Insert the 11 pin female plug into J203 at the rear of the Adapter.
- d. Insert the 9 pin male plug into J301 located on the Adapter power supply.
- e. Use the VFO output cable (RG62/U) as supplied. Insert the phono plug into the phono jack, J10, at the rear of the Valiant and connect the other end to the Adapter input jack, J1.
- f. Use the SSB input cable (RG58/U) as supplied. Connect one end to J5 at the rear of the Valiant and connect the other end to the Adapter output jack, J2.
- g. Anti-Trip Circuit External Connections

The anti-trip connections to the receiver are secured at jack, J202, located on rear of the Adapter chassis. The connections can be made using the 5 pin plug and cable as shown in the examples on the next page:

TYPICAL RECEIVER CONNECTIONS (Also 75A1 and early 75A2 receivers)

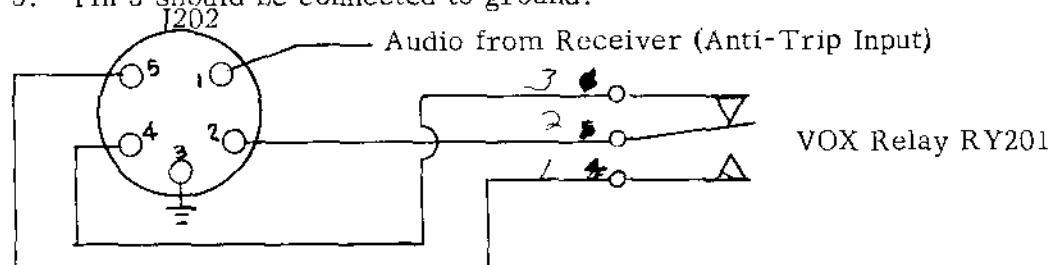


COLLINS 75A2, 3, 4 RECEIVER CONNECTIONS SKETCH D



These two typical examples should cover most receivers. However, if the station receiver is unique, the following general procedure should be followed:

1. Pin 1 of J202 must connect to the 4 ohm audio output terminal of the receiver either directly or through relay contacts in the receive condition.
2. Pin 2 is the common arm of a set of double throw relay contacts and is connected to pin 4 in receive and pin 5 in transmit. This set of contacts may be used in any manner to disable the receiver when transmitting.
3. Pin 3 should be connected to ground.

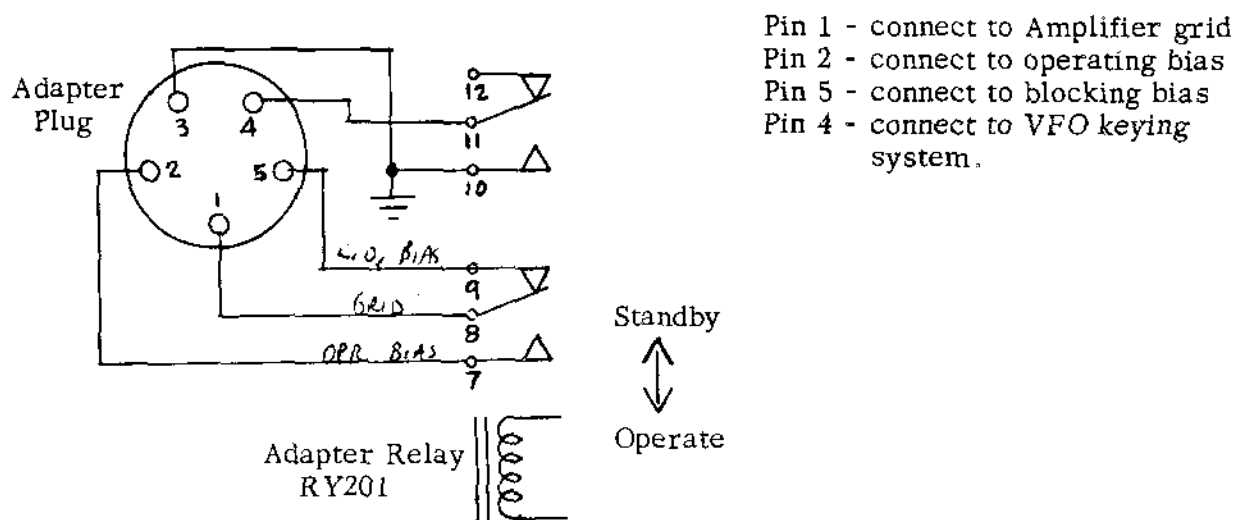


- h. Connect a high impedance microphone to J201 on the Adapter.
- i. Provision is made to operate an antenna relay by connecting the relay into jack, J204 on the Adapter using the two terminal plug supplied. For smoother antenna change use the Viking T-R switch, part no. 250-39, is recommended.

- j. Place the Adapter Operate Switch at OFF position and plug the power supply power cord into a receptacle having 115 V. 50/60 cycle power. (REFER NOW TO SECTION F. OPERATION).

2. Adapter with other equipment.

- a. Provision must be made to provide a signal input to the Adapter from an external VFO covering 3.5 to 4.0 megacycles and 7.0 to 7.5 megacycle ranges. The VFO must have sufficient output to develop approximately 3 volts at the Adapter end of the RG62/U coaxial cable when the cable is connected between the VFO and the Adapter.
- b. Provision must be made to switch the external power amplifier bias from operating to standby values. See SKETCH E for details of connecting an external amplifier to the Adapter 5 pin plug and relay.



SKETCH E

- c. Provision must be made to key the external VFO so it operates when the Adapter is in operation and is not operating when the Adapter is in standby. As shown in SKETCH E a termination is provided for grounding the VFO circuit to permit it to operate.
- d. When an external transmitter is used which contains the VFO, driver stages and final amplifier, provision must be made to prevent leakage from the VFO to the amplifier driver stage. CAUTION: The carrier suppression of the Adapter when used with the external equipment will be no better than the VFO leakage through the various following stages in the external equipment.
- e. A separate SSB input connection must be provided to apply the Adapter SSB output to amplifier driver grid. Two 100 ohm 2 watt carbon resistors connected in parallel should be connected between the input connection and ground.
- f. The external driver stage and amplifier must be adjusted so they operate as linear amplifiers. This will require means of adjusting the bias values for proper idling plate current. Amplifiers using screen grid tubes should have regulated screen voltage. Regulated grid bias should be used if grid current is drawn (class AB₂ or B operation).

E. FUNCTION AND LOCATION OF CONTROLS AND METER

1. The front panel controls and meter are shown on FIGURE 1.
 - a. BAND switch (SW1) - switches all stages from the multiplier through the output amplifier.
 - b. TUNING control - adjusts the final amplifier tank capacitor from fully meshed at 0 position to minimum capacity at 100.
 - c. OPERATE SWITCH (SW202) - selects the various voltages and operating conditions for the indicated types of operation. The TUNE position is used only when adjusting the Adapter and connects the audio oscillator to the audio system. The MAN (Manual) position is used for manual operation of the Adapter. STBY (Standby) position makes the VFO and other circuits inoperative. The VOX-PTT position should be used when either push-to-talk or voice operation is used.
 - d. SIDEBAND switch (SW101) - selects the upper or lower sideband as desired by changing the carrier frequency crystals. Note that the selection of upper and lower sidebands is reversed when operating in the 10 meter band.
 - e. AUDIO control (R208) - adjusts the level of audio into the balanced modulator tube V101. Zero level is at the 0 dial position and increases to maximum at the 10 position.
 - f. LEVEL control (R3) - adjusts the gain of the multiplier tube V1 and the level of signal applied to the 1st mixer tube, V2.
 - g. INDICATOR meter (M1) - measures the Adapter output level and is used only to indicate the peak output.
2. The three controls located at the rear of the chassis, as shown in FIGURE 2, are used in adjusting for proper VOX operation.
 - a. VOX GAIN control (R211) is the upper potentiometer located to the right of the microphone jack. This knob controls the amount of audio into the VOX amplifier and rectifier.
 - b. TIME DELAY control (R215) is located next to the 11 pin jack and is used to set the desired time delay in VOX operation.
 - c. ANTI-TRIP GAIN control (R224) is the lower left potentiometer and is used for adjusting the proper audio level from the receiver into the VOX control system.

F. OPERATION OF ADAPTER AND VALIANT

1. SSB OPERATION (MANUAL)

- a. With the Adapter OPERATE switch in the OFF position, place the Valiant MAN-PTT switch in the PTT position and then the FIL. switch in the ON position. Allow the Valiant to warm up.
- b. Place the Valiant MAN-PTT switch in MAN and tune the Valiant, in the CW mode, to its full power input (450 ma plate current) on the desired frequency. Use the tuning procedure as outlined in the Valiant Operating Manual, *WITH ANTENNA CONNECTED TO THE VALIANT*.
- c. Return the Valiant MAN-PTT switch to the PTT position.

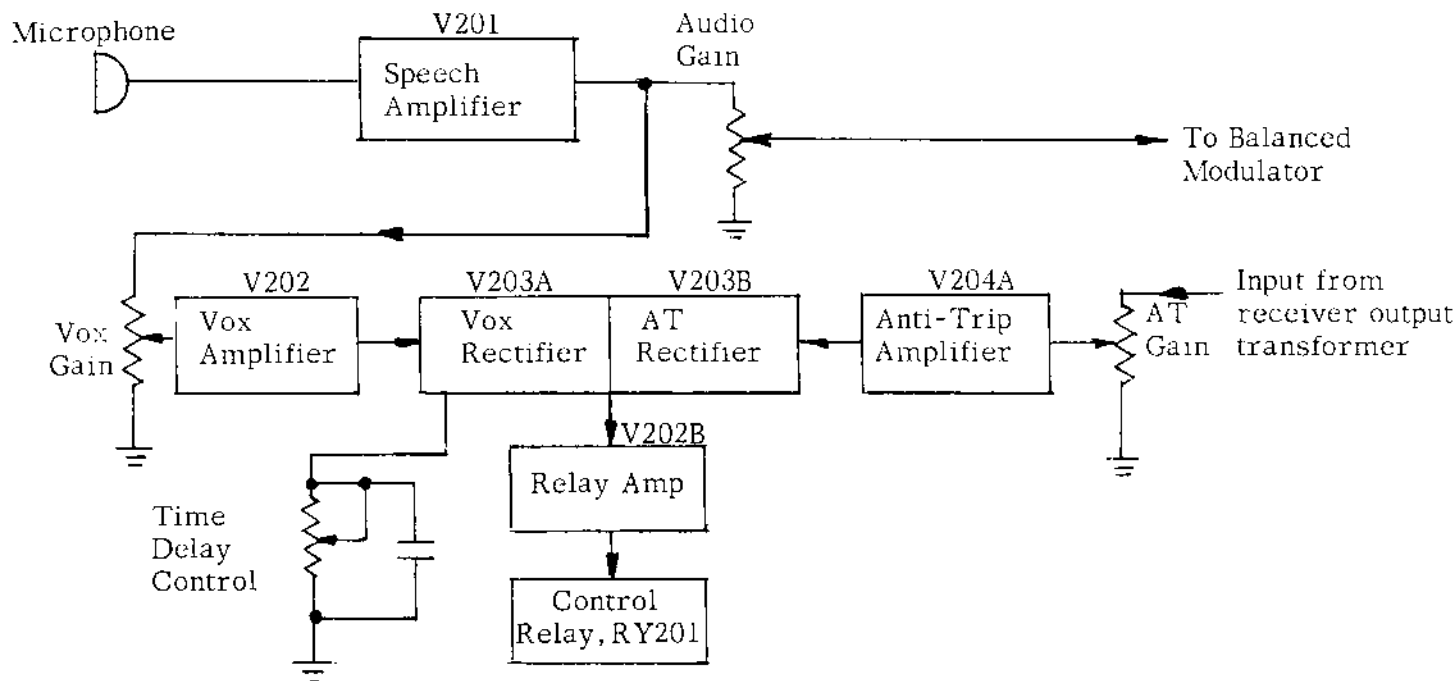
- d. Turn the Adapter BAND switch to the same frequency band as the Valiant. OPERATE switch to TUNE, AUDIO gain to position 10 and LEVEL control to position 2. Allow the Adapter to warm up.
 - e. Turn the Adapter TUNING knob for maximum indication on the output meter. If the meter reads off scale, reduce the LEVEL control.
 - f. Turn the Valiant MODE switch to SSB, METER switch to GRID and adjust EXCITER knob for peak grid current.
 - g. Turn the Valiant METER switch to BUFF position and adjust the DRIVE control to 30 ma. (lower meter scale multiplied by 2). Return the METER switch to PLATE
 - h. Place the Valiant MAN-PTT switch on the MAN position and adjust the Adapter LEVEL control until the Valiant's final amplifier draws 300 ma. of plate current. On the 80 meter band, with the LEVEL control at 0, the Valiant may draw over 300 ma. - this is acceptable on this band.
 - i. Turn the Adapter AUDIO knob to 0 position and then turn the OPERATE switch to the MAN position. While speaking into the microphone, turn the AUDIO knob toward position 10 until the Valiant final plate current fluctuates from approximately 100 ma. idle current, to 250 ma. on voice peaks. The setting of the Adapter LEVEL and AUDIO controls will vary at individual installations depending upon the microphone, voice characteristics of the operator, etc.
2. SSB OPERATION (PTT).

The initial tuning of the Adapter in push-to-talk (PTT) is the same as for MANUAL operation as described in the preceding section. Push-to-talk operation is accomplished by placing the OPERATE switch in VOX-PTT and turning the VOX gain and ANTI-TRIP GAIN controls located on the rear of the Adapter to their most counter-clockwise position. A push-to-talk type microphone which will ground pin 2 of the microphone jack, J201, may be used. The transmitter is placed in operation by depressing the push-to-talk switch and is shut off (for receiving period) when the switch is released.

3. SSB OPERATION (VOX).

The Adapter may be used as a voice operated unit with the OPERATE switch in the VOX-PTT position and the VOICE OPERATE (VOX), ANTI-TRIP (AT), and TIME DELAY (TD) controls adjusted properly for the individual installation conditions and operator's operating technique.

A basic understanding of voice actuated transmitter operation (VOX) and anti-trip control (AT) will help the operator to obtain satisfactory VOX and AT operation of the equipment. The block diagram on the next page shows the VOX and AT system.



SKETCH F

Speaking into the microphone is all that is necessary to place the transmitter on the air and mute the receiver when using VOX operation. The microphone output is amplified by the speech amplifier where the signal is split -- one path through the transmitter AUDIO gain control to the balanced modulator and the other path through the VOX gain control and VOX amplifier. The audio output voltage of the VOX amplifier is rectified by the VOX rectifier and the rectified voltage is applied to the relay control tube which closes the control relay. The relay turns the transmitter on and mutes the receiver.

Anti-trip circuitry is necessary when a speaker is used for receiving and VOX operation is desired. The sound from the speaker will enter the microphone and actuate the VOX circuit unless AT is used to prevent such undesirable action. Audio voltage is fed from the receiver output transformer (which also feeds the speaker) through the AT gain control and AT amplifier to the AT rectifier, where the anti-trip audio voltage is rectified. The AT rectifier and VOX rectifier are connected to cancel, that is, equal signals through the two rectifiers produce zero output and the relay tube and relay are not actuated. Thus, the speaker sound fed through the microphone is cancelled by the anti-trip voltage and the transmitter is not placed on the air. The operator's voice level at the microphone must be higher than the speaker level if the VOX amplifier is to develop enough output to overcome the AT voltage and actuate the relay tube.

A time delay or holding circuit is provided by the adjustable time constant R215, R214 and C209 (cathode of V203A). The time delay control, TD, can be adjusted to provide a delay from a fraction of a second to 2 seconds before the transmitter goes off after a word or group of words. This prevents dropout in the middle of a word or sentence. TD should be adjusted to suit the preference of the individual operator.

The most frequent cause of improper VOX-AT operation is improper speaker placement in respect to microphone. When the speaker is too close to the microphone, normal, comfortable speaker volume will produce such a high level at the microphone that the AT voltage necessary to keep the unit off the air cannot be overcome by the operator's voice level. The speaker should be placed a few feet "behind" the microphone so any directional characteristic of the microphone will discriminate against the speaker sound. Close talking will help to provide a more favorable voice-to-speaker sound level.

Other difficulties and their causes are:

<u>Difficulty</u>	<u>Cause</u>
VOX inoperative; VOX gain on	VOX gain too low; AT gain too high; defective microphone or low output, speaking too far from microphone, improper microphone connection, defective tube; speaker level too high
AT inoperative	AT gain too low; improper connection to receiver; speaker too close to microphone; defective tube
Equipment chatters on and off or erratic operation	Improper settings on VOX and AT gain; receiver produces click or thump in speaker when turned on (must be muted differently); speaker too close to microphone to permit correct adjustment; noisy antenna relay (must be quieted); receiver volume too high; high acoustic background noise.

Once the VOX-AT system is properly adjusted care should be exercised not to turn the receiver volume above the level used to obtain satisfactory operation. Otherwise either the speaker level will trip the VOX or the AT level will prevent voice control of VOX. The greater the separation between microphone and speaker, the greater the volume level tolerance of the system.

VOX and Anti-Trip Adjustment

To set the VOX gain and Anti-trip gain controls for satisfactory voice operation, adjust the VOX, AT and TD (time delay) controls as follows:

- a. The Adapter, Valiant and station receiver must be connected as specified in Section D-1. A microphone which is always active must be used (no open switches in microphone leads--some push-to-talk microphone stands open the microphone lead and must be reversed to prevent this).
- b. Tune the Valiant and Adapter and place in operation in SSB in the MAN position. Turn radio gain of receiver off.
- c. Turn VOX, AT and TD controls on rear of cabinet to their maximum CCW position (Figure 2).
- d. OPERATE switch to VOX/PIT.
- e. Speak into microphone in normal voice and advance (clockwise rotation) the VC control until transmitter is energized. Advance the control until reliable operation is obtained.
- f. When reliable operation is obtained, advance the Time Delay control to obtain desired length of hold-in time. This is strictly a matter of personal preference.
- g. OPERATE switch to SSB.

- i. Advance receiver audio and tune in a signal, such as a QSO. Adjust receiver audio for normal listening volume.
- j. OPERATE switch to VOX-PTT.
- k. At this point the audio from the receiver speaker, entering the microphone, may tend to energize the Adapter.
- l. Advance the AT control until the speaker audio no longer activates the Adapter.
- m. The VOX and AT circuits are now adjusted and unless the microphone or operator are changed, these controls will normally require little or no adjustment.
- n. It is desirable to place the speaker in such a position and at such a distance from the microphone as to reduce the receiver audio level at the microphone compared to the audio level from the operator's voice. This reduces the tendency of the receiver audio to trigger the VOX through the microphone.

4. AM and CW OPERATION

Operation in the AM and CW modes is performed using only the Valiant and the Adapter is shut off by placing its OPERATE switch in the OFF position. It will be necessary to transfer the microphone from the Adapter to the Valiant microphone jack. The operating procedure for AM and CW operation is that outlined in the Valiant Operating Manual.

Some of the earlier models of the Valiant do not have a contact on mode switch SW4B which connects the final grids to the operating bias in the AM and CW positions. In these earlier models, P10 of the Valiant must be placed in its jack J9 before turning the Valiant on.

3. ALIGNMENT PROCEDURE

WARNING - Alignment should be made only by a well qualified technician using good equipment. Tampering should be avoided! Align only when absolutely necessary and then only when area of difficulty has been determined.

Equipment Required.

1. A good general coverage communications receiver.
2. An audio generator capable of supplying .005 volts r.m.s. at 250 and 1300 cycles.
3. A Volt-ohm meter of 20K ohms per volt.
4. An audio output meter.
5. An R.F. vacuum tube voltmeter.
6. A 50 ohm non-inductive load capable of handling the power output of the Valiant.
7. A 50 ohm load of 4 watt rating to be used at the output of the Adapter (two 100 ohms 2 watt resistors connected in parallel).
8. Miscellaneous alignment tools.

Refer to the photographs and schematic diagram for identification of controls, inductors, capacitors, etc.

1. Sideband generator alignment.

- a. Turn the Adapter OPERATE switch to STANDBY position and allow at least 15 minutes for the equipment to warm up.
- b. Turn the SIDE BAND switch to LSB or U10 (9001.5 KC)
- c. Loosely couple the antenna of a receiver, capable of receiving 9 mcs., near the crystal oscillator-balanced modulator tube, V101. Adjust the slug of L101 until the crystal starts to oscillate. Adjust the slug until the crystal oscillates at 9001.5 KC.
- d. Turn the SIDE BAND selector switch USB L10 (8998.5 KC). Adjust C101 until the signal is heard on the receiver at 8998.5 KC.
- e. Connect a R. F. VTVM to the test jack J103. Adjust L102 for maximum output on the VTVM. Next adjust L103 for maximum output.
- f. Connect the R. F. VTVM to the test jack J104 and adjust L104 for maximum output indication. Retune L103, with the VTVM probe still in J104, for peak output.
- g. Connect the receiver to J103 by means of a coaxial cable. Disable the AVC of the receiver, turn the receiver BFO on and connect an AUDIO voltmeter across the receiver audio output terminals. Turn the Adapter's SIDE BAND switch to USB and tune the receiver to 8998.5 KC for a peak reading on the AUDIO voltmeter.
- h. Adjust R112 for a minimum reading on the audio output meter. Adjust R109 to further reduce the reading. Repeat the adjustments of R112 and R109 until no further reduction on the output meter is obtained.
- i. Turn the SIDE BAND switch to LSB and tune the receiver for peak audio output indication at 9001.5 KC. Readjust R112 and R109 as in the proceeding step until it is possible to switch sidebands and obtain approximately the same output indications. Remove the receiver coax from J103.
- j. Connect an R.F. VTVM capable of reading 1 to 1 1/2 volts full scale between J104 and ground. Connect an audio generator to the microphone jack, J201.
- k. Set the Adapter AUDIO control at maximum, SIDE BAND switch to LSB, and the OPERATE switch to MAN. Temporarily retune L104 to compensate for the detuning caused by the R.F. VTVM. Apply an audio signal of 1300 c.p.s. of sufficient level to deliver a scale reading of 1 to 1 1/2 volts on the R. F. VTVM.
- l. Change the audio frequency to 250 c.p.s. (keep the audio generator output constant) and adjust the slug of L101 to obtain 1/2 voltage secured at 1300 c.p.s. Return to 1300 c.p.s. and then to 250 c.p.s. to determine if the voltage at 250 c.p.s. is still 1/2 the value secured at 1300 c.p.s. If not, readjust L101 until 1/2 voltage is secured at 250 c.p.s.
- m. Turn the SIDE BAND switch to USB. Adjust the audio generator for 1 or 1 1/2 volts output at 1300 c.p.s. Set the audio at 250 c.p.s. and adjust C101 to obtain 1/2 the voltage secured at 1300 c.p.s. Return to 1300 c.p.s. and then to 250 c.p.s. to determine if the voltage at 250 c.p.s. is still 1/2 the value secured at 1300 c.p.s. If not, readjust C101 until 1/2 voltage is secured at 250 c.p.s.

- n. Remove the R.F. VTVM connection to J104 and loosely couple the receiver to the output of the sideband generator. With full audio applied, tune the receiver to 8998.5 KC and readjust the slug of L104 for maximum reading.

This completes the Sideband Generator alignment.

2. Multiplier Alignment.

- a. Apply a VFO signal at 7.25 mcs. to J1. Turn the BAND switch to 10 meters.
- b. Connect an R.F. VTVM to terminal 3 of XV2. Set the R.F. LEVEL at position 5.
- c. Adjust L2 for peak reading on the R.F. VTVM.
- d. Set the BAND switch to 15 and VFO to 7.1 mcs. Adjust C9 for peak reading on the R.F. VTVM.
- e. Turn the BAND switch to 20 and the VFO to 7.125 mcs. Adjust C10 for peak reading on the R.F. VTVM.
- f. No tuning of the multiplier stage is required on 40 and 80 meters.

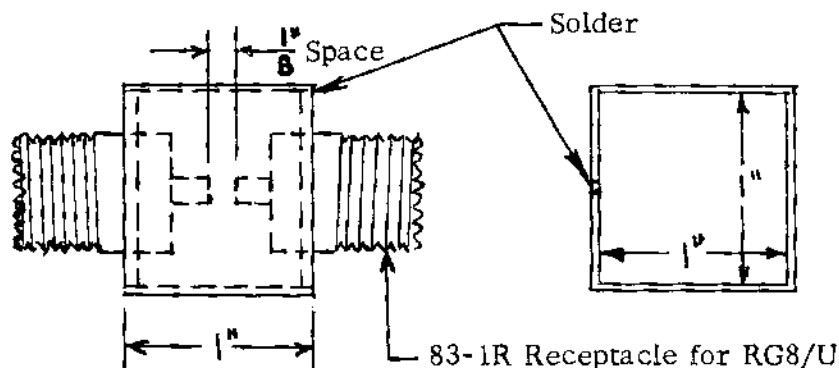
3. Alignment of the 1st and 2nd mixers.

- a. Set the OPERATE switch to TUNE. Make sure the small coax cables P101 and P102 are plugged into J101 and J102.
- b. Set the differential capacitor C40, located in the 1st mixer, so the rotor is approximately 3/4 meshed on the side which is connected to terminal 6 of SW1-B.
- c. Connect the R.F. VTVM between the stator terminal of C52, located in the final amplifier, and ground. Turn the AUDIO control to the 10 position and the LEVEL control to the 5 position.
- d. With the BAND switch on 80 and the VFO frequency set at 3.9 mcs., adjust both cores of T1-A (80 meter, 1st mixer) for maximum indication. Change the VFO frequency to 4.0 mcs. and adjust the primary of T2-A (80 meter 2nd mixer) for maximum indication. Change the VFO frequency to 3.8 and adjust the secondary of T2-A (80 meter 2nd mixer) for maximum indication. Moving the VFO frequency from 3.8 to 4.0 mcs. should result in a fairly uniform output if the amplifier tuning capacitor C52 is adjusted at each frequency.
- e. With the BAND switch on 40 and the VFO frequency at 7.25 mcs., adjust both cores of T1-B (40 meter 1st mixer) for maximum indication. Adjust both cores of T2-B (40 meter 2nd mixer) for maximum indication.
- f. Turn the BAND switch to 20 and the VFO frequency to 7.125 mcs. (14.25 mcs. at output of multiplier), adjust both cores of T1-C (20 meter 1st mixer) and then both cores of T2-C (20 meter 2nd mixer) for maximum indication on the R.F. VTVM.
- g. Turn the BAND switch to 15 and the VFO frequency to 7.1 mcs. (21.3 mcs.) and adjust both cores of T1-D (15 meter 1st mixer) and then both cores of T2-D (15 meter 2nd mixer) for maximum indication.

- h. With the BAND switch on 10 and the VFO frequency set at 7.15 mcs. (28.6 mcs.) adjust the primary core of T1-E (10 meter 1st mixer) for maximum indication. The primary cores are at the left end of the coils in both mixers. Change the VFO frequency to 7.25 mcs. (29.0 mcs.) and adjust both cores of T2-E (10 meter 2nd mixer) for maximum indication. Change the VFO to 7.35 mcs. (29.4 mcs.) and adjust the secondary core of T1-E (10 meter 1st mixer) for maximum indication. Return the VFO to 7.15 mcs. and recheck the tuning of the primary of T1-E (10 meter 1st mixer) and then recheck the secondary of T1-E with the VFO at 7.35 mcs. The voltage output should show a rise in the vicinity of 7.15 mcs. (28.6 mcs.) and 7.35 mcs. (29.4 mcs.) and a dip around 7.25 mcs. (29.0 mcs.) with the TUNING capacitor, C52, adjusted at each frequency.
- i. Note: On all bands, the output should fall to minimum when either the AUDIO or LEVEL controls are turned to 0 position.

4. Adjustment of C40 for first mixer balance.

- a. With the Adapter connected to the Valiant as described in Section D.1., tune the Valiant by itself to full CW output (450 ma. plate current) on 21.3 mcs. Use only a dummy 50 ohm load connected directly to j6 of the Valiant using a short length of coaxial line and a coaxial "T" type connector.
- b. Adjust the Adapter to 21.3 mcs. in the SSB mode as described in Section F.1.
- c. Connect a 70 db attenuation pad to the remaining terminal of the coaxial "T" connector. Refer to SKETCH G for construction of the 70 db pad.



SKETCH G

Bend a 1" wide strip of thin brass or copper of about .020" thickness around a 1" square piece of wood so the ends meet as shown above. Solder receptacles to cover and solder slot in cover closed.

- d. Connect a receiver to the 70 db pad using a coaxial line and tune the receiver to 21.3 mcs. Connect an audio VTVM to the audio output terminals of the receiver. With the Adapter AUDIO knob turned to position 10 and the receiver BFO on, adjust the audio beat note level to some convenient value on the meter.
- e. Turn the Adapter AUDIO knob to 0 position. Shift the VTVM to a lower voltage scale to obtain the new reduced reading and adjust C40 for reduction of the meter

reading. Then adjust R9 for further reduction and continue repeating the adjustments of C40 and R9 until no further reduction in the meter reading is secured.

- f. Repeat the adjustments in steps G 3d, e, f, g, and h concerning the 1st mixer coils to compensate for any changes caused by the adjustment of the differential capacitor, C40.
5. Adjustment of 27 mcs. harmonic trap.
 - a. Adjust the Adapter to full output at 29.0 mcs. into a 50 ohm 4 watt resistor load using LSB.
 - b. Couple the receiver antenna to the output of the adapter and tune it to 27 mcs. Verify the frequency (the frequency should change when the sidebands are changed). Adjust the receiver antenna coupling for approximately 3/4 scale on the receiver S meter and then adjust the tuning core of L5 for minimum indication.
 6. Reneutralization of final amplifier.
 - a. Connect the 50 ohm 4 watt resistor load to J2.
 - b. Turn the AUDIO knob to O position.
 - c. Remove the VFO coaxial cable from J1.
 - d. Turn the BAND switch from 80 through 10 meters and, at each band, rotate the TUNING knob from position O to 10. If an output is indicated on the OUTPUT meter, adjust C48 (the neutralizing capacitor) until the meter drops to zero. Continue the proceeding procedure until it is possible to adjust the TUNING capacitor on all bands without observing any indication on the OUTPUT meter.

TABLE 1

SSB ADAPTER RESISTANCE MEASUREMENTS

	TUBE TYPE	PIN NUMBER								
		1	2	3	4	5	6	7	8	9
V1	6EJ7	3300	560	3300	---	0.3	---	36K	50K	---
V2	7360	1200	135K	470K	---	0.3	100K	100K	42K	42K
V3	7360	1200	135K	470K	---	0.3	100K	100K	12K	12K
V4	12BY7	82	47K	82	---	---	0.3	85K	115K	82
V101	7360	330	125K	470K	---	0.3	90K	90K	56K	56K
V102	6AH6	560	150	0.3	---	33K	70K	150		
V201	12AX7	300K	470K	4.7K	---	---	300K	1M	2.2K	0.3
V202	12AT7	96K	.47M	1.4K	---	---	400K	1.50M	1.2K	0.3
V203	6AL5	100K	1.2M	---	0.3	470K	NC	1M		
V204	6U8	230K	3.0K	135K	---	0.3	330K	1.8K	270 †	1M
V303	0A2	---						---		
V302	0B2	26K						---		
V301	5U4		26K		100		100			

Measurements made with 20,000 ohms/volt multimeter
 RF Level control at max., AF gain at max.
 VOX-A.T. gain at max, TD at min.
 Operate switch at VOX

TABLE 2
SSB ADAPTER DC VOLTAGE MEASUREMENTS

TUBE TYPE	PIN NUMBER								
	1	2	3	4	5	6	7	8	9
V1 Mult 6EJ7	2.8Max*	-0.25 †	2.6Max*	---	6.3AC	---	255	3.0*	---
V2 1st Mix 7360	4.1	185	0	---	6.3AC	160	165	28.5	29.0
V2 2nd Mix 7360	4.7	160	0	---	6.3AC	127	148	30	27.0
V4 Output Amp 12BY7	2.6	0	2.6	---	---	6.3AC	330	175	---
V101 Bal Mod 7360	1.3	175	-8.2 †	---	6.3AC	145	150	30	32
V102 S.B. Amp 6AH6	0	2.2	6.3AC	---	255	150	2.2		
V201 A.F. Amp 12AX7	210	0	2.0	---	---	165	0	1.4	6.3AC
V202 Vox and Ry. 12AT7	255	0	2.5	---	---	43	0	0.9	6.3AC
V203 Vox Rect 6AL5	0	39.0	---	6.3AC	0	---	-35.0		
V204 A.F. OSC 6U8	120	---	230	---	0	130	6.2	0.4	0
V303 Reg OA2	255	150			255		150		
V302 Reg OB2	150	---			150		---		
V301 Rect 5U4		350		420AC		420AC		350	

Measurements made with 20,000 ohms/volt multimeter
 14.25 mcs., level control set at "nine o'clock"
 Audio gain at max., operate switch at Man., vox gain at max.
 Audio input - .005 Volts RMS at 1300 CPS into J101
 Readings may vary ± 20% due to tolerances
 *varies with setting of drive control.
 † Read with RF choke on Voltmeter lead.
 OPERATE switch in TIME

TABLE 3

SSB ADAPTER R. F. AND AUDIO VOLTAGE MEASUREMENTS

	TUBE TYPE	PIN NUMBER									
		1	2	3	4	5	6	7	8	9	
V1	6EJ7		1.95					1.8			
1st Mixer V2	7360			1.8		2.85		2.42	3.8		
2nd Mixer V3	7360			4.9		3.5		3.6	1.6		
V4	12BY7		1.0					170 \int			
Mod V5	7360			8.2		.6		.6		2.7*	5.3 †
V6	6AH6	.17									
V201	12AX7	4.7* 9.0 †	.11* .23 †			.13* .21 †		.0044			
V202	12AT7							8.7 †			
V203	6AL5		45 †								
V204	6U8	.25 †							1.0 †		.003 †

Measurements made with R. F. voltmeter and audio VTVM
 Freq. at 14,250 KC., R. F. level control set at "twelve o'clock".
 Operate Switch at Tune, Audio Control at max. adjust adapter for max. output
 Audio input - .005 volts at 1.3KC.
 Readings may vary \pm 20% due to tolerances
 * Mode Switch at Man., VOX at max.
 † Mode Switch at Tune
 \int C52 Retuned to Peak

VIKING SSB ADAPTER

Parts List

Part No. or Drawing No.	Item No.	Qty.	Description
22.4175-10	CI, 121	2	Capacitor, .001 mf. ±10% dipped mica
22.1097	C2, 4, 8, 71, 12, 13, 14, 30, 31, 32, 49, 50, 103, 105, 118, 119, 120, 206, 223, 224, 225, 226, 72	23	Capacitor, .01 mf. ±10% ceramic disc
22.827	C3, 61, 117, 201, 214, 215, 216, 217, 221, 205, 68	11	Capacitor, .005 mf. ceramic disc
22.1300	C5, 7, 113, 204, 227, 228	6	Capacitor, .002 mf. ceramic disc
22.4025-5	C6, 55, 69, 127, 22, 23, 70, 45, 46	9	Capacitor, 10 uuf. ±5% dipped mica
160-130-52	C9, 10	2	Capacitor, 3-30 uuf. variable
22.1645	C15, 16, 33, 34, 107, 110	6	Capacitor, .003 mf. ceramic disc
22.4047-5	C11	1	Capacitor, 82 uuf. ±5% dipped mica
22.4049-2	C17, 18	2	Capacitor, 100 uuf. ±2% dipped mica
22.4039-2	C19, 38, 39	3	Capacitor, 39 uuf. ±2% dipped mica
22.4033-2	C20, 21, 37, 41, 42, 43, 44	7	Capacitor, 22 uuf. ±2% dipped mica
160-104	C48	1	Capacitor, 1.8-8.7 uufd, variable
22.4018-10	C26, 24, 25	3	Capacitor, 5.1 uuf. ±.5 uufd dipped mica
22.4049-10	C115	1	Capacitor, 100 uuf. ±10% dipped mica
22.4035-2	C27, 28	2	Capacitor, 27 uuf. ±2% dipped mica
22.4029-2	C116	1	Capacitor, 15 uuf. ±2% dipped mica
22.4045-2	C35, 36	2	Capacitor, 68 uuf. ±2% dipped mica
22.4169-10	C47	1	Capacitor, 560 uuf. ±10% dipped mica
160-107	C101	1	Capacitor, 2.3 - 14.2 uuf. variable
22.956	C51	1	Capacitor, .002 mf. 1.5 KV ceramic disc
149-5-9	C52	1	Capacitor, 8.5 - 102 uuf. variable
22.4041-5	C54	1	Capacitor, 47 uuf. ±5% dipped mica
22.4169-5	C57	1	Capacitor, 560 uuf. ±5% dipped mica
22.4061-5	C56, 202	2	Capacitor, 330 uuf. ±5% dipped mica
22.4055-5	C58	1	Capacitor, 180 uuf. ±5% dipped mica
160-311-1	C40	1	Capacitor, differential 19MA11
22.1587	C60, 62, 63, 64, 65, 66, 67, 106, 123, 124, 125, 126	12	Capacitor, .001 mf. ceramic feed-thru
22.1915	C102	1	Capacitor, 36 uuf. ±5% N220 ceramic
22.4043-5	C104	1	Capacitor, 56 uuf. ±5% dipped mica
22.4059-5	C108, 109, 59, 53,	4	Capacitor, 270 uuf. ±5% dipped mica
22.1916	C111, 112	2	Capacitor, .02 mf. ceramic disc
22.1917	C114	1	Capacitor, .6 mf. 50 WV tubular capacitor
22.4035-10	C122	1	Capacitor, 27 uuf. ±10% dipped mica
22.1189	C203	1	Capacitor, 8 mf. 450 WV electrolytic
22.1709	C208, 210, 211	3	Capacitor, .1 mf. 200 WV paper
22.768	C212	1	Capacitor, .1 mf. 400 WV paper
22.1026	C209	1	Capacitor, .22 mf. 400 WV paper
22.1521	C207	1	Capacitor, 10 mf. 25 WV electrolytic
22.1484	C213	1	Capacitor, 2 mf. 200 WV paper
22.4018-5	C222	1	Capacitor, 5 uufd. ±5% dipped mica
23.1129-2	CH1	1	Cabinet
23.1584-4	CH2	1	Panel, front
22.1413	CR1, 101	2	Diode, 1N294A
23.1603-3	D5, 6, 7, 8, 9, 10	6	Knob, 3/4" diameter aluminum with point
22.920-1	D11, 12, 13	3	Knob, black plastic

VIKING SSB ADAPTER

Parts List

Part No. or Drawing No.	Item No.	Qty.	Description
23.1614	E2	1	Suppressor, parasitic
22.1772	FL101	1	Filter, crystal
23.1585	H	1	Harness
22.746	J1	1	Connector, coaxial, 83R1
22.1096	J101,102	2	Jack, phono
22.979	J201	1	Jack, microphone, 2 pin
22.1585	J202	1	Jack, 5 pin Amphenol
22.1676	J203	1	Jack, 11 pin male with mounting ring
22.1830	J204	1	Jack, antenna relay
105-810-3	J103	1	Tip jack, test point, blue
105-809-3	J104	1	Tip jack, test point, green
22.1193	L1	1	Choke, RF, 2.4 MH, 3 pi.
23.1175-18	L2	1	Coil, .51 uh multiplier
22.951-11	L3	1	Choke, RF, 2.5 MH 4 pi.
16.1521	L4A	1	Coil, 10 meter P.A.
16.1522	L4B	1	Coil, 15 meter P.A.
23.1583	L4C	1	Coil, 80,40, 20 meter P.A.
23.1175-15	L5	1	Coil, 2.65 uh., 27 MC trap
22.844-1	L6	1	Choke, RF, 200 uh.
23.1175-41	L101	1	Coil, oscillator
22.1902	L102	1	Coil, balanced modulator output
23.1175-40	L103	1	Coil, 2.65 uh., filter input matching with 2 turn link
23.1175-16	L104	1	Coil, SB generator amp.
22.1907	M1	1	Meter, 500 uA.
22.1736	P3	1	Plug, antenna relay
22.1941	P.E.C.	1	P.E.C. phase shift oscillator
22.5113-10	R5,19,4,103,205,214	6	Resistor, 470K ohms $\pm 10\%$ 1/2 watt
22.5061-10	R2	1	Resistor, 3300 ohms $\pm 10\%$ 1/2 watt
22.1349	R3	1	Potentiometer, 50K ohms
22.5051-10	R6,16,213	3	Resistor, 1200 ohms $\pm 10\%$ 1/2 watt
22.5075-10	R7,21	2	Resistor, 12K ohms $\pm 10\%$ 1/2 watt
22.6075-10	R116	1	Resistor, 12K ohms $\pm 10\%$ 1 watt
22.5083-10	R8,37	2	Resistor, 27K ohms $\pm 10\%$ 1/2 watt
22.1395	R9,22,112	3	Potentiometer, 5000 ohms 2 watt
22.5059-10	R10,11,23,24,108,110	6	Resistor, 2700 ohms $\pm 10\%$ 1/2 watt
22.6059-10	R113,114	2	Resistor, 2700 ohms $\pm 10\%$ 1 watt
22.6097-10	R12,15,20,25	4	Resistor, 100K ohms $\pm 10\%$ 1 watt
22.6093-10	R13,14,17,18	4	Resistor, 68K ohms $\pm 10\%$ 1 watt
22.7093-10	R106,107	2	Resistor, 68K ohms $\pm 10\%$ 2 watt
22.5089-10	R26,27,121,221	4	Resistor, 47K ohms $\pm 10\%$ 1/2 watt
22.5043-10	R1	1	Resistor, 560 ohms $\pm 10\%$ 1/2 watt
22.6023-10	R29	1	Resistor, 82 ohms $\pm 10\%$ 1 watt
22.5029-10	R120	1	Resistor, 150 ohms $\pm 10\%$ 1/2 watt
22.7081-10	R30	1	Resistor, 22K ohms $\pm 10\%$ 2 watt
22.5069-10	R31	1	Resistor, 6800 ohms $\pm 10\%$ 1/2 watt
22.5057-10	R32,204	2	Resistor, 2200 ohms $\pm 10\%$ 1/2 watt
22.5097-10	R105,216,220	3	Resistor, 100K ohms $\pm 10\%$ 1/2 watt
22.5067-10	R35	1	Resistor, 5600 ohms $\pm 10\%$ 1/2 watt
22.5037-10	R104	1	Resistor, 330 ohms $\pm 10\%$ 1/2 watt

VIKING SSB ADAPTER

Parts List

Part No. or Drawing No.	Item No.	Qty.	Description
22.1576	R109	1	Potentiometer, 2000 ohms
22.6089-10	R111,115	2	Resistor, 47K ohms $\pm 10\%$ 1 watt
22.7095-10	R117,218	2	Resistor, 82K ohms $\pm 10\%$ 2 watt
22.5043-10	R118,119	2	Resistor, 560 ohms $\pm 10\%$ 1/2 watt
22.5065-10	R201	1	Resistor, 4700 ohms $\pm 10\%$ 1/2 watt
22.5121-10	R202,217,227	3	Resistor, 1 megohm $\pm 10\%$ 1/2 watt
22.5105-10	R203,206,222	3	Resistor, 220K ohms $\pm 10\%$ 1/2 watt
22.5065-10	R207	1	Resistor, 4700 ohm $\pm 10\%$ 1/2 watt
22.1195	R208,211	2	Potentiometer, 1 megohm 1/4 watt, log taper
22.5109-10	R212	1	Resistor, 330K ohms $\pm 10\%$ 1/2 watt
22.1693	R215	1	Potentiometer, 5 megohm $\pm 30\%$
22.5107-10	R210	1	Resistor, 270K ohm $\pm 10\%$ 1/2 watt
22.5053-10	R219	1	Resistor, 1500 ohm $\pm 10\%$ 1/2 watt
22.1720	R224	1	Potentiometer, 200 ohms 1/4 watt
22.5101-10	R225	1	Resistor, 150K ohms $\pm 10\%$ 1/2 watt
22.5035-10	R226	1	Resistor, 270 ohms $\pm 10\%$ 1/2 watt
22.5045-10	R28	1	Resistor, 680 ohms $\pm 10\%$ 1/2 watt
22.5037-10	R228	1	Resistor, 330 ohm $\pm 10\%$ 1/2 watt
22.5049-10	R33	1	Resistor, 1000 ohm $\pm 10\%$ 1/2 watt
22.5073-10	R34,36,209	3	Resistor, 10K ohm $\pm 10\%$ 1/2 watt
22.5055-10	R223	1	Resistor, 1800 ohms $\pm 10\%$ 1/2 watt
23.1627	RY201	1	Relay, 4 pole double throw, sensitive assembly
22.1853-7	SW1A	1	Switch wafer, multiplier output, single section, 5 pos.
22.1853-6	SW1B	1	Switch wafer, 1st mixer output, 2 section, 5 pos.
22.1853-5	SW1C	1	Switch wafer, 2nd mixer input, single section, 5 pos.
22.1853-4	SW1D	1	Switch wafer, 2nd mixer output, 2 section, 5 pos.
22.1853-3	SW1E	1	Switch wafer, amplifier input, single section, 5 pos.
22.1853-2	SW1F	1	Switch wafer, amplifier loading, single section, shorting
22.1853-1	SW1G	1	Switch wafer, amplifier band-change, single section
22.1437-2	SW101	1	Switch, DPDT wafer
22.1852	SW202	1	Switch, Operate
22.1882-1	T1-A	1	Transformer, 1st mixer, 80 meter
22.1882-2	T1-B	1	Transformer, 1st mixer, 40 meter
22.1882-3	T1-C	1	Transformer, 1st mixer, 20 meter
22.1882-4	T1-D	1	Transformer, 1st mixer, 15 meter
22.1882-5	T1-E	1	Transformer, 1st mixer, 10 meter
22.1885	T2-A	1	Transformer, 2nd mixer, 80 meter
22.1882-6	T2-B	1	Transformer, 2nd mixer, 40 meter
22.1882-2	T2-C	1	Transformer, 2nd mixer, 20 meter
22.1882-7	T2-D	1	Transformer, 2nd mixer, 15 meter
22.1882-8	T2-E	1	Transformer, 2nd mixer, 10 meter
22.1723	T201	1	Transformer, anti-trip
22.1119	V1	1	Tube, electron type 6EJ7

VIKING SSB ADAPTER

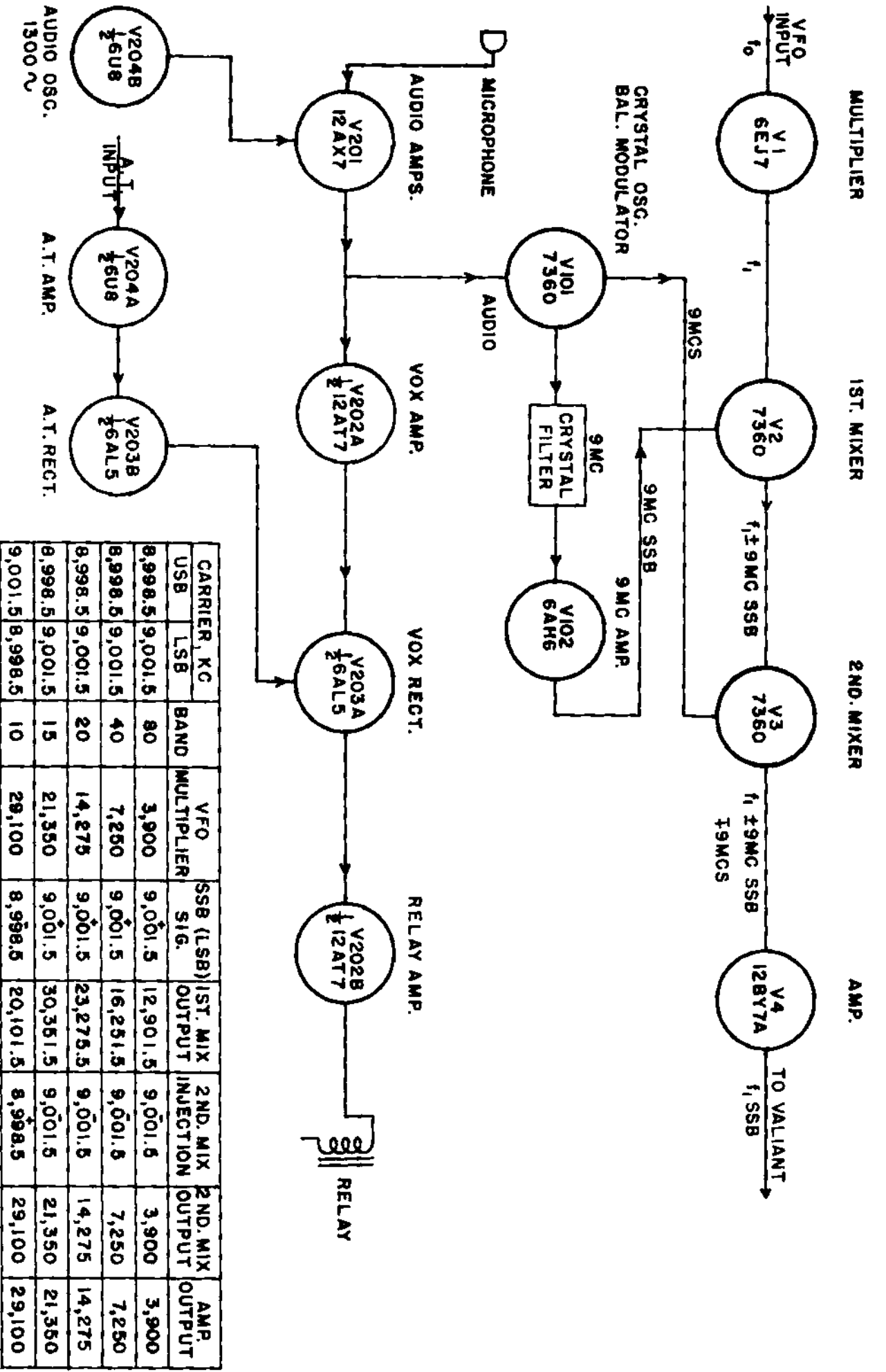
Parts List

<u>Part No. or Drawing No.</u>	<u>Item No.</u>	<u>Qty.</u>	<u>Description</u>
22.1120	V2,3,101	3	Tube, electron type 7360
22.1567	V4	1	Tube, electron type 12BY7A
22.1724	V102	1	Tube, electron type 6AH6
22.915	V201	1	Tube, electron type 12AX7
22.1203-1	V202	1	Tube, electron type 12AT7
22.786	V203	1	Tube, electron type 6AL5
22.1323	V204	1	Tube, electron type 6U8
23.1590	W15	1	Cable assembly with plugs
23.1628	W21	1	Output coax. cable assembly
23.1629	W22	1	VFO coax. cable assembly
22.1533-001	XV1,2,3,4,101	5	Socket, 9 pin steatite miniature
22.976	XV201,202,204	3	Socket, 9 pin miniature
22.975	XV203	1	Socket, 7 pin miniature
22.1913	XV102	1	Socket, 7 pin mica filled miniature
22.1884	Y101	1	Crystal, quartz 8998.5 KC
22.1883	Y102	1	Crystal, quartz 9001.5 KC

VIKING SSB ADAPTER POWER SUPPLY

Parts List

<u>Part No. or Drawing No.</u>	<u>Item No.</u>	<u>Qty.</u>	<u>Description</u>
22.1298	C301	1	Capacitor, 80 MF 450 WV
17.1197	CH301	1	Chassis
22.1397	F301	2	Fuse, MDL 1.6 ampere
22.739-2	FH301	1	Holder, fuse
22.977	J301	1	Jack, 9 pin female, mica filled
22.1717	J301	1	Choke, filter, 10 henry, 150 ma.
22.8914-10	R301	1	Resistor, 25K ohms $\pm 10\%$ IRC PW10
22.8882-10	R302	1	Resistor, 1250 ohms $\pm 10\%$ IRC PW10
22.1716	T301	1	Transformer, plate
22.1104	V301	1	Tube, electron, 5U4GB
22.1206	V302	1	Tube, electron OB2
22.787	V303	1	Tube, electron, OA2
22.1274	XV301	1	Socket, 8 pin octal
22.975	XV302,303	2	Socket, 7 pin mica filled miniature



SKETCH A
SSB ADAPTER BLOCK DIAGRAM
AND FREQUENCY SCHEME

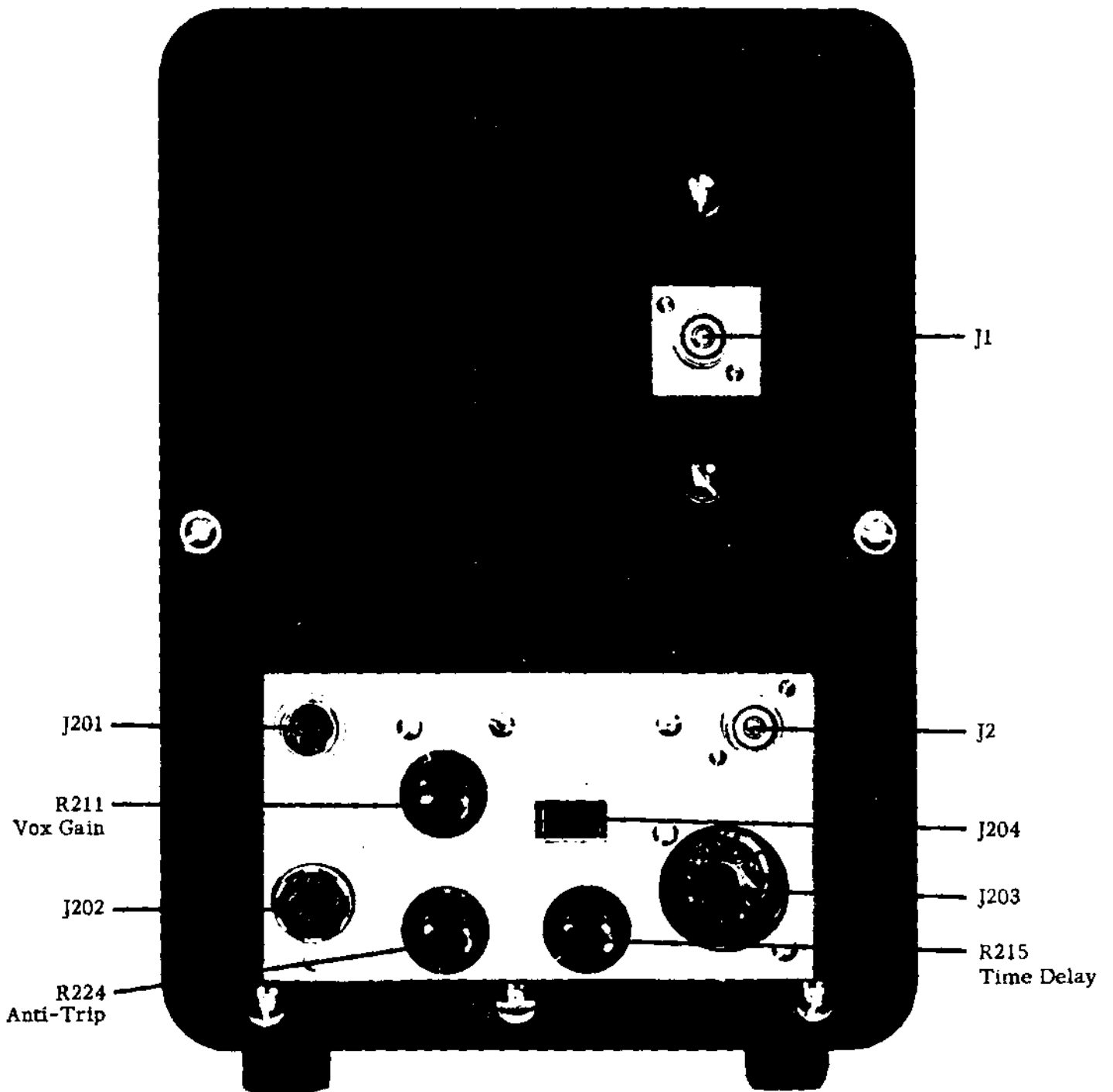


FIG. 2
ADAPTER REAR VIEW

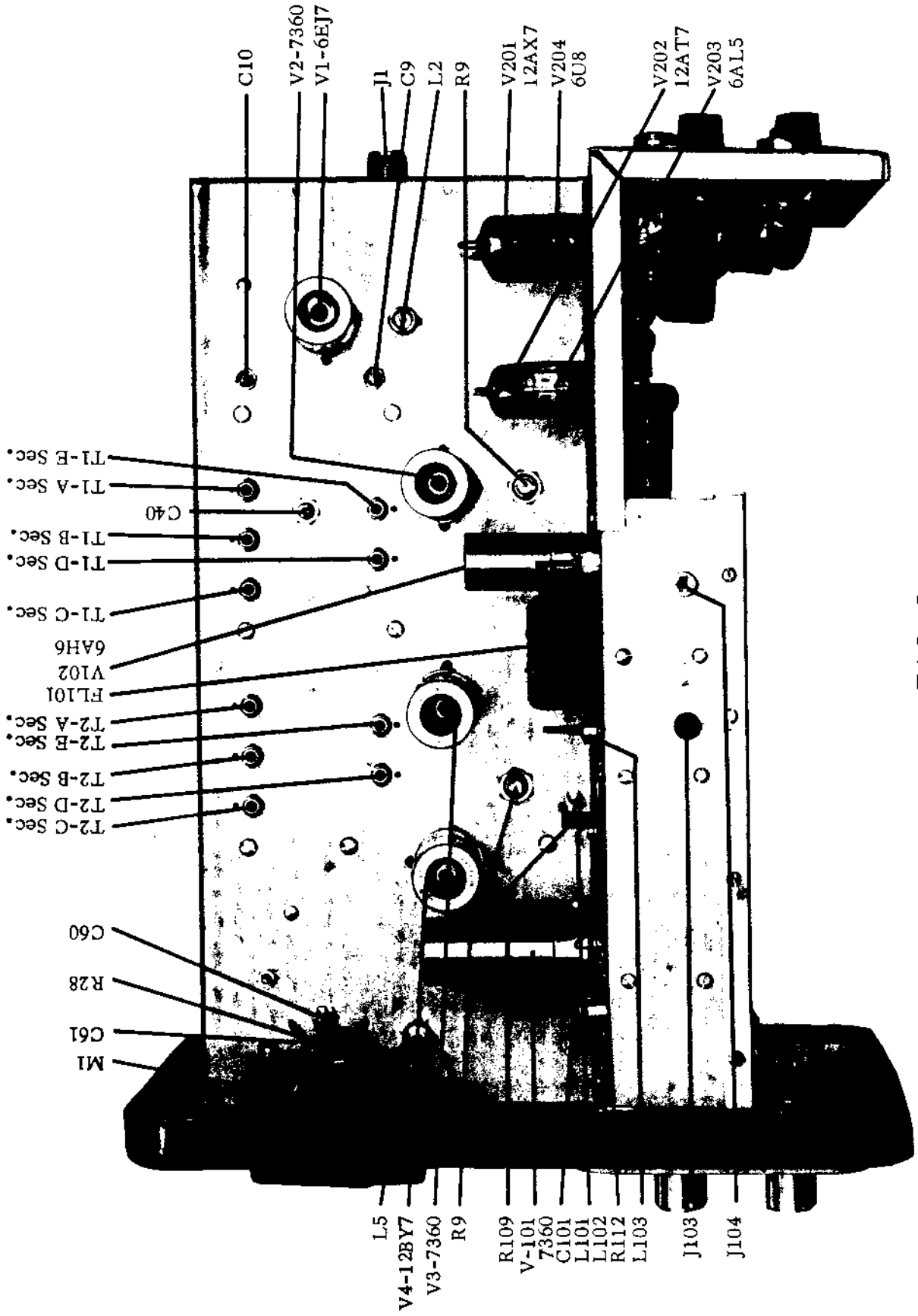
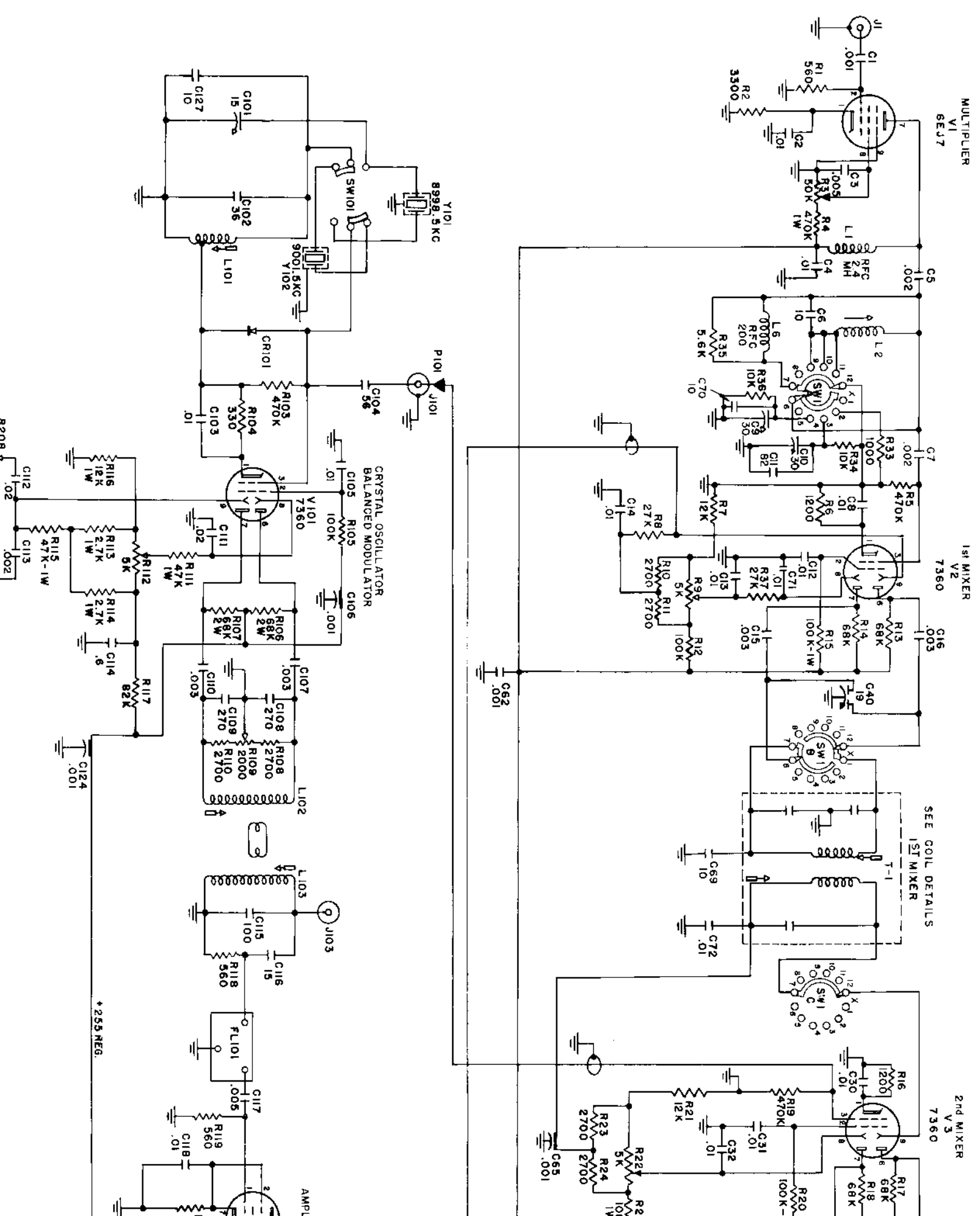
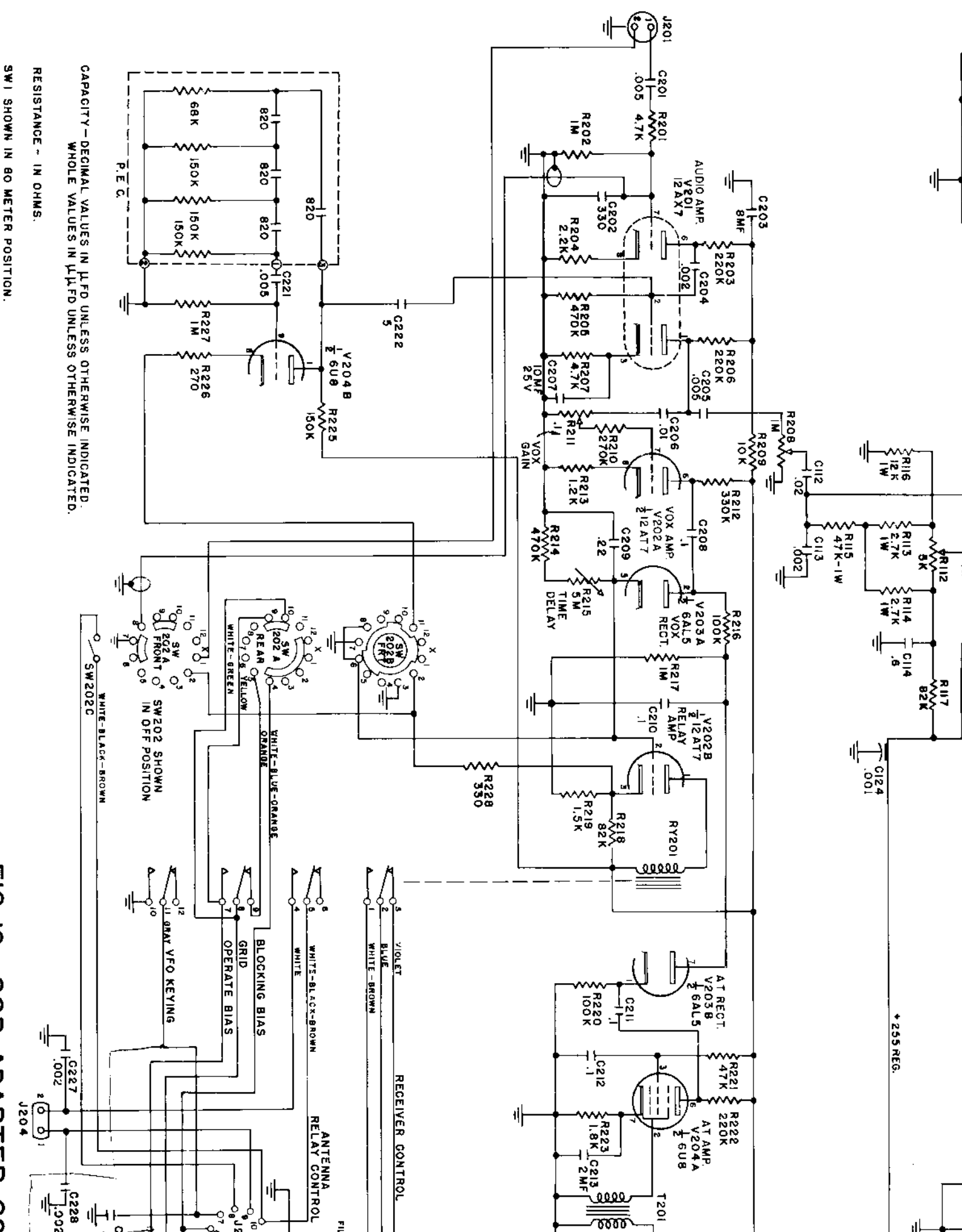


FIG. 3
RIGHT SIDE VIEW





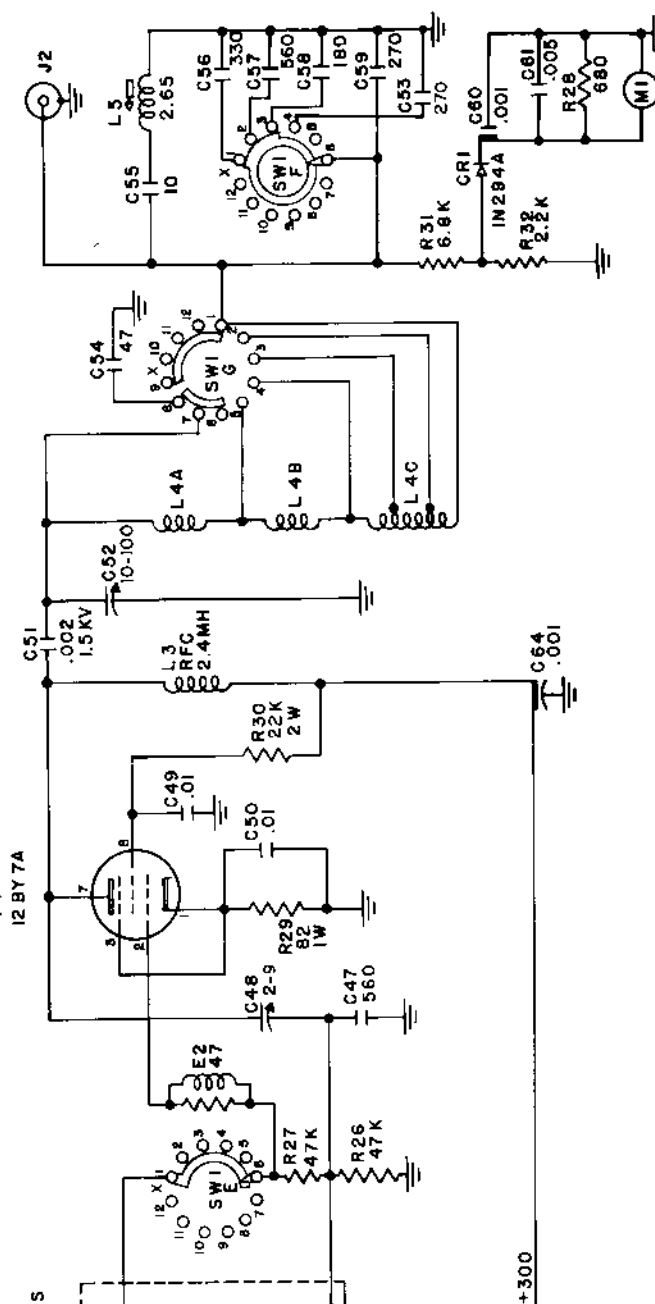
CAPACITY - DECIMAL VALUES IN μ F D UNLESS OTHERWISE INDICATED.
 WHOLE VALUES IN μ F D UNLESS OTHERWISE INDICATED.

RESISTANCE - IN OHMS.

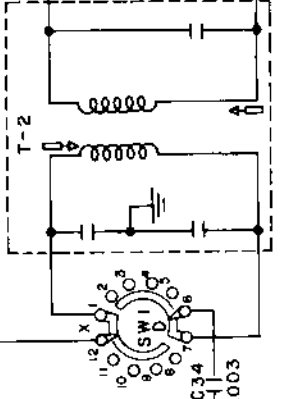
SW1 SHOWN IN 80 METER POSITION.

FIG. 12, SSB ADAPTER SCHEMATIC

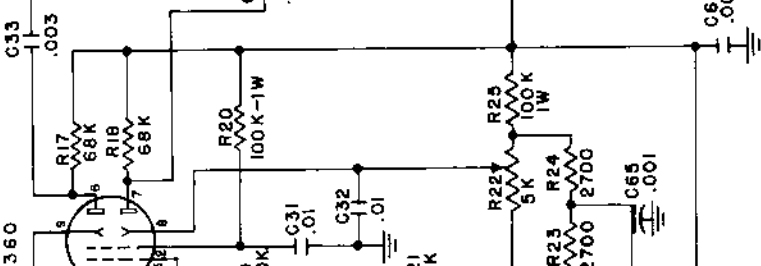
FINAL AMPLIFIER
V 4



SEE COIL DETAILS
2ND MIXER

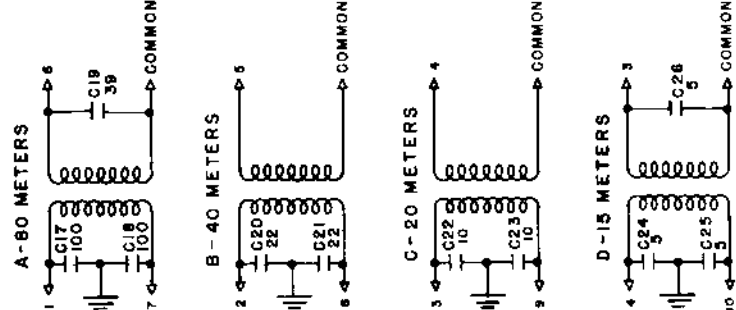


MIXER
V 3



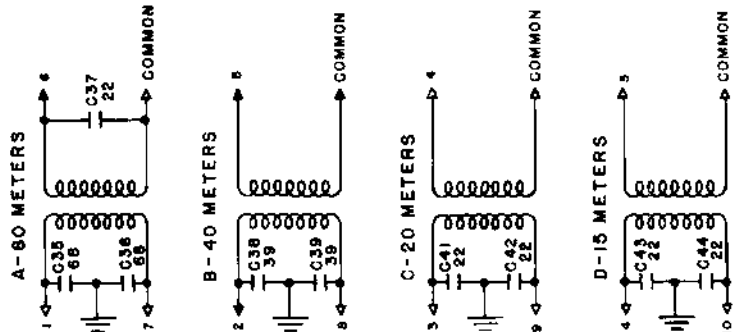
T-1

1ST MIXER TRANS.

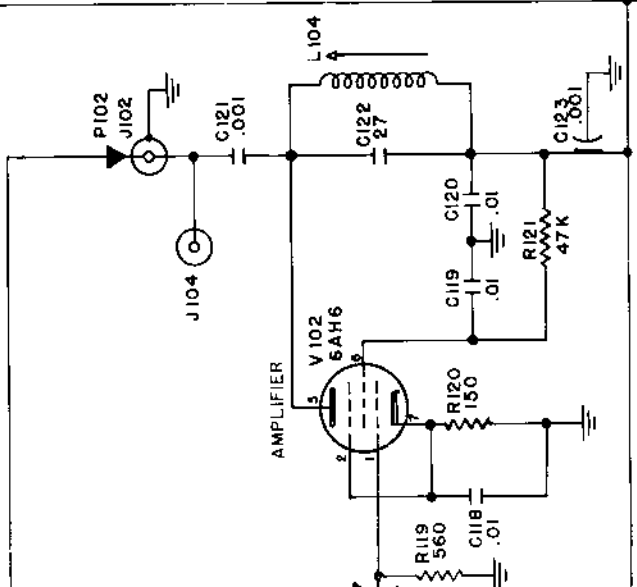


T-2

2ND MIXER TRANS.



AMPLIFIER
V 102



VIKING SSB ADAPTER OPERATING MANUAL

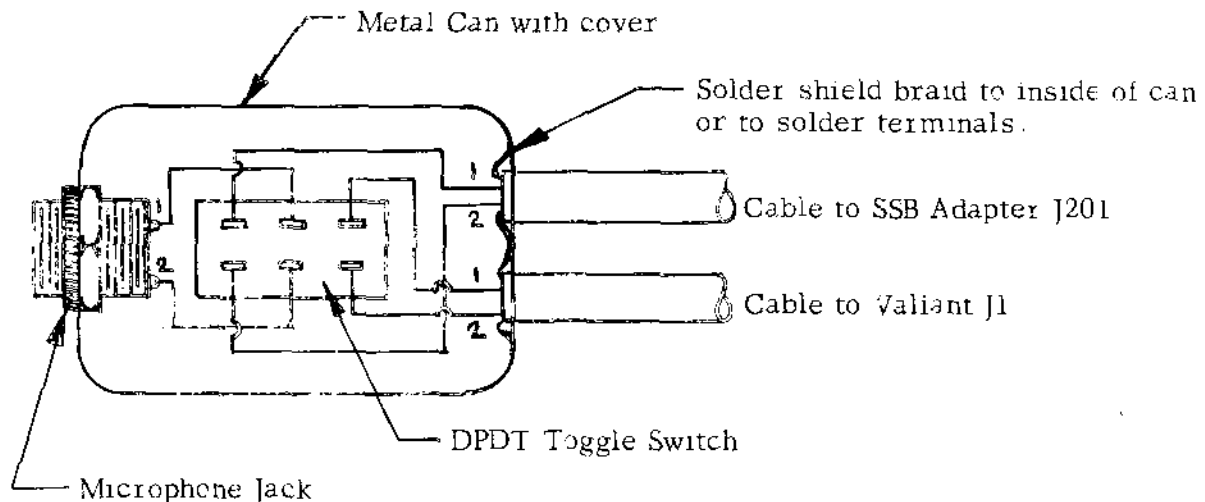
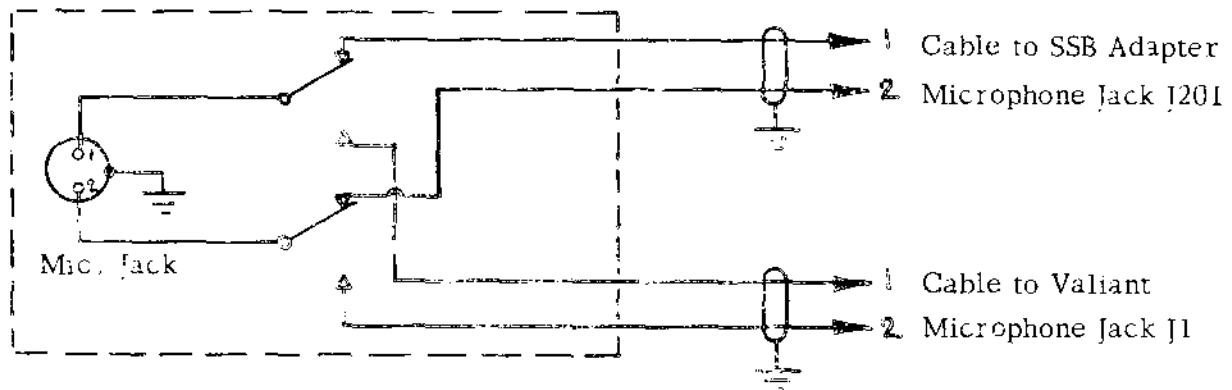
ADDENDUM SHEET

Page 6 Step F1b.

The last sentence should read "Use the tuning procedure as outlined in the Valiant Operating Manual with the antenna connected to the Valiant".

SWITCHING MICROPHONE

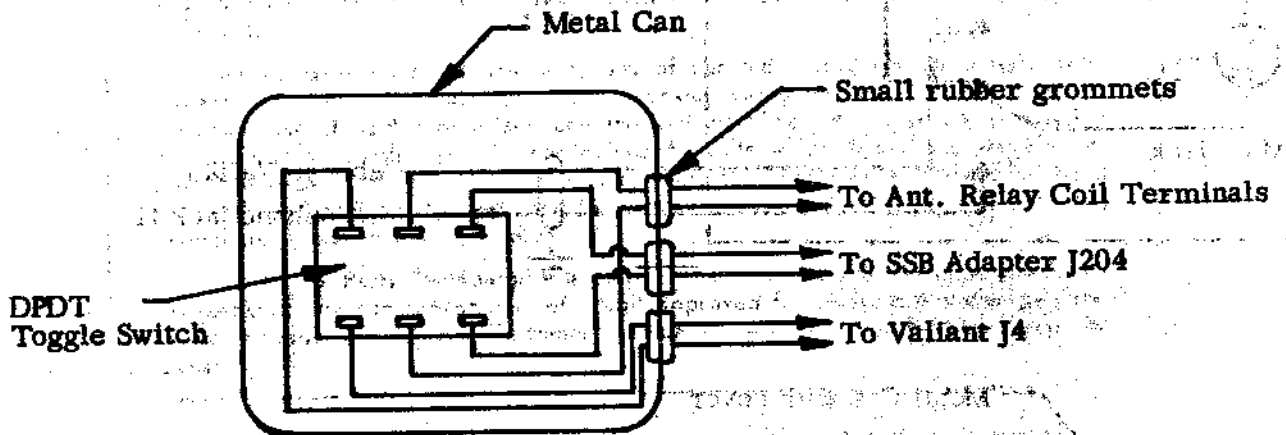
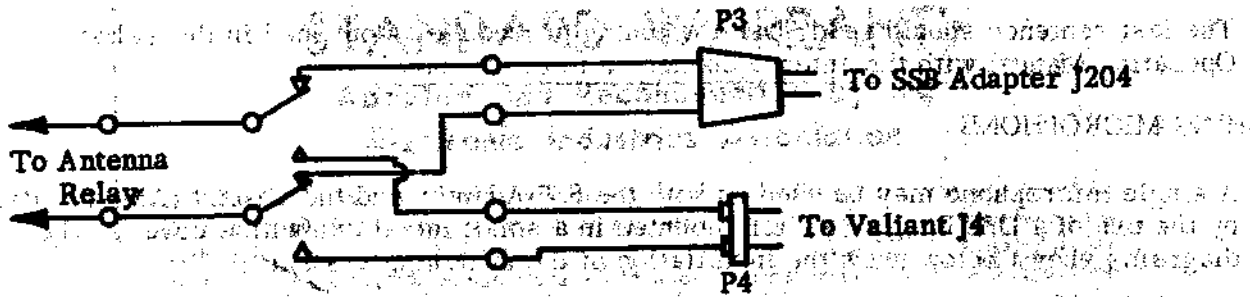
A single microphone may be used on both the SSB Adapter and the Valiant (AM operation) by the use of a DPDT toggle switch mounted in a small metal can with a cover. The diagrams shown below show the installation of the switching system.



ANTENNA TRANSMIT-RECEIVE RELAY

The control of the antenna relay must be transferred from the SSB Adapter (SSB operation) to the Valiant (AM and CW operation). This transfer may be accomplished by removing the relay control line plug from the Valiant and plugging it into the SSB Adapter jack, J204. A short adapter line (part no. 23.1655) which has a plug that fits to the Adapter jack and a jack which fits the Valiant antenna plug is supplied with each unit.

The transfer of the antenna relay control can also be accomplished by the use of a DPDT switch enclosed in a small metal can with a cover as illustrated below.



METHODS OF ZERO BEAT TUNING

The SSB Adapter - Valiant II installation may be tuned to zero beat a frequency by using the following methods. The SSB Adapter and Valiant should have previously adjusted as described in their respective operating manuals.

Method A.

Zeroing when using the muting system for 75A4 receiver as shown at Sketch D, page 4 of the SSB Adapter Operating Manual.

1. Turn the Adapter Audio Control to ZERO and the Operate Control to MAN.
2. Switch the receiver from the normal STDBY position to ON. All the Valiant controls should be in SSB operating positions.
3. Adjust the Valiant VFO for zero beat. Note - it may be necessary to provide some extra pick up for the receiver depending upon the shielding of the receiver and antenna line.

Method B.

Zeroing when using the muting system for 75A1 or early 75A2 receivers as shown at Sketch C, page 4, of the SSB Adapter Operating Manual.

1. Turn the Adapter Audio Control to ZERO and the Operate Control to MAN.
2. The receiver should be in the normal ON position and the Valiant controls should all be in the SSB operating positions.
3. Connect terminal 4 to terminal 5 of P202 (see sketch C of Adapter Manual) for zero beating only. Use a SPST switch which can be opened for normal muting of the receiver.
4. Adjust the Valiant VFO for zero beat.

Method C.

Zeroing when no muting system is used but the receiver is switched between STDBY and RECEIVE and separate antennas are employed.

1. Turn the Adapter Audio Control to ZERO and the Operate Control to MAN.
2. Turn the receiver to ON position and the Valiant controls all in the SSB operating positions.
3. Adjust the Valiant VFO for zero beat.

Method D.

Zeroing when using an antenna relay.

1. Turn the Adapter Audio Control to ZERO and the Operate Control to MAN.
2. Open the relay ground on receiver antenna lead by using a SPST switch and place the receiver in the ON position. The Valiant should have all its controls in the SSB operating positions.
3. Adjust the Valiant VFO for zero beat.
4. Close the SPST switch to ground the receiver antenna for normal operation.

Method E.

Normal Valiant Zeroing for AM and CW operation. Use the procedure described in the Valiant Operating Manual.

ADAPTER ASSEMBLY FOR J204

This assembly consists of a short length of two conductor cable with a AC power plug at one end and ceramic two pin socket at the other end. The AC plug should be inserted in J204 at the rear of the SSB Adapter thus enabling the Valiant antenna relay plug to be switched from the Valiant to the SSB Adapter. A J204 adapter assembly shipped with each unit.