

**OPERATIONAL AND SERVICE**

**D A T A**

*for*

**SS-75 SINGLE BAND**

**TRANSMITTER-EXCITER**

## To Unpack the SS-75

Remove the box containing the SS-75 by cutting edge seams and removing box from the unit. Be careful not to cut through the box into the paint. Remove the two hook bolts from the chassis that appear at the rear of the cabinet. Examine the unit for damage in shipment. If the unit is damaged, contact the Express Co. immediately. Your SS-75 was shipped in perfect condition, and was given an on-the-air check before shipment. Assemble louvres into sides of cabinet.

### Operational Instructions

Connect microphone to the amphenol connector at the rear of the chassis. Connect a 15 watt lamp across 807 plate tank. Use receiver with antenna shorted to make tuning adjustments, using the S meter with receiver tuned to the operating frequency. Since it is possible to align the final to the 3550 Kc VFO frequency instead of the sideband frequency of 4 Mc., it is desirable to use the receiver to avoid possible tuning error. Another check to make sure that the circuits following the second mixer are tuned to the sideband frequency: output from the 807 should be obtained when the transmit carrier control is advanced. With the transmit carrier at zero, there should be no output from the 807.

The unit is lined up to use on the high end of the band and will work over a 50 Kc range. If operation lower in the band is desired, it may be necessary to touch up the trimmers on the 4 Mc transformer, which is to the right of the black shield box containing the 807. Again be sure to tune the 4 Mc frequency and not the VFO frequency. The trimmer closest to the black box tunes the plate of the 6AC7 second mixer, and the other tunes the grid circuit of the 807. Connect the 110 line and turn the main control switch to transmit or monitor position. After tube warmup, advance the transmit carrier control until power is indicated in the dummy load. Tune the output control to resonance. With audio gain control about 3/4 advanced, and the transmit carrier control off, speak into the microphone. The dummy lamp should light as you talk. Now tune the signal in on the receiver and, listening to it on the phones, adjust the audio gain for good quality. Do not crowd the audio. After making the standby and carrier insertion connections to the receiver, connect the antenna to the coax connector on the right side of the 807 plate tank. Use a low reading RF ammeter or field strength meter in the antenna coax line. Set the transmit carrier control to the position that you obtained maximum output with the dummy load (this will not be full on). Adjust the coupling link and resonate the output control for maximum line current or field strength. Remove the carrier. The unit is now ready to transmit single sideband.

### Voice Control

If a separate receiving antenna is used, and the recommended method of silencing is used, it is only necessary to connect three wires to the receiver from the exciter: one for carrier insertion to the receiver, from pin 3 on SO-2; and the standby connection, from pin 8 on SO-2 to the cathode resistors of the RF stages in the receiver. If another method of receiver silencing is used, it will be necessary to remove the exciter from the cabinet and make the connections desired to the spare contacts on the standby switch and the voice control relay. These may be terminated on the spare pins on either SO-1 or SO-2. To remove the exciter from the cabinet simply remove the front panel screws and the unit slides out. To actuate voice control, turn voice control toggle switch on with main control switch in transmit position. If speaker operation is desired, using voice control, it should be placed so that the speaker pickup on the microphone will be at the absolute minimum to keep the speaker from triggering the voice control. The voice control threshold control is the slotted shaft on the



back of the chassis. This should be adjusted to suit the individual requirements.

### Receiver Carrier Insertion

To tune in a SSSC signal, set up the receiver in the regular AM position. Tune the sideband signal for maximum deflection on the S meter. Turn the receiver carrier control up to about 3/4 on. Adjust VFO to the frequency. Readjust the carrier insertion level to approximate strength of the SSSC signal, then tune the VFO carefully until the voice clears up. The report on the SSSC signal is at the carrier insertion point that the S meter indicator is stable with modulation. If the receiver has been tuned properly, no further adjustments on the receiver are required. It is desirable, in case of interference, to run more carrier into the receiver than is ordinarily necessary. The carrier insertion control may also be used as the audio level control. Once the signal is tuned in on the receiver, the transmitter is automatically "on frequency". Receiver carrier insertion is an exclusively patented feature of the SS-75. To match receiver line, adjust slug at rear of chassis next to power transformer, for maximum output to receiver.

### CW Operation

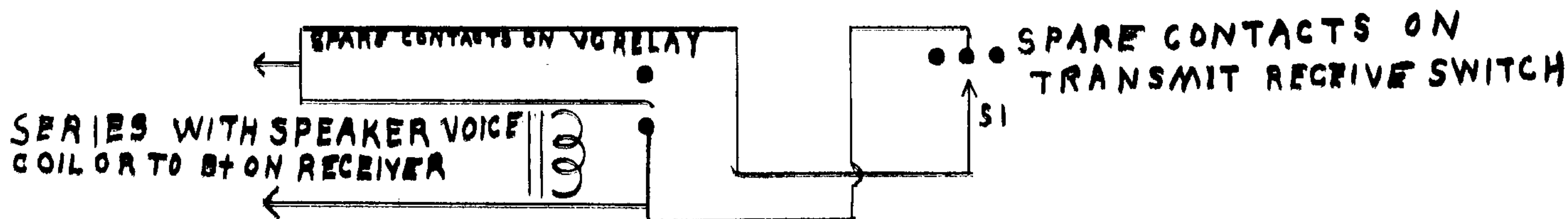
It is necessary with this type of CW operation, where the voice control is keyed, to either; reverse key connections so that the key down, opens circuit; or use a keying relay. The key jack is on the rear of the chassis. To operate CW, insert carrier to the exciter. Turn audio gain off, voice control on. This will permit breakin CW operation.

### Warmup Period

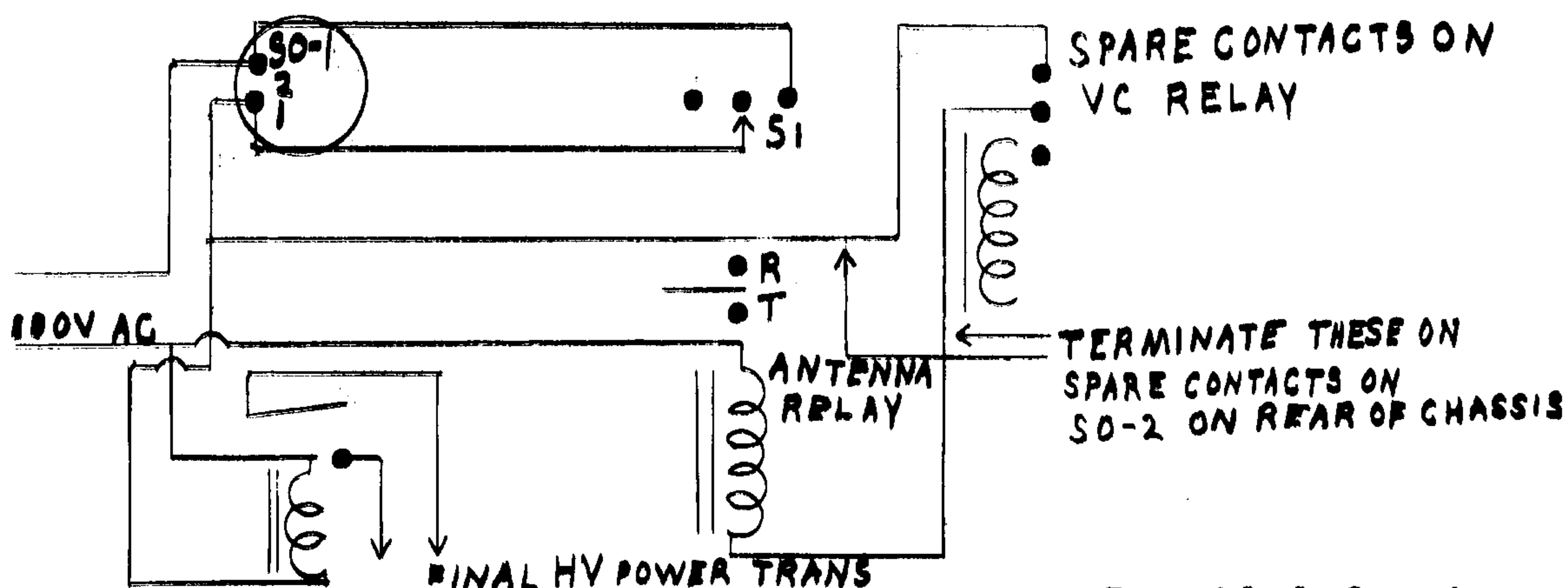
The unit can be put in operation from a cold start. However some frequency drift will occur until the unit has reached operating temperature.

### Voice Control Circuits

Voice control circuit to open speaker voice coil circuit or receiver B+ during transmit periods:-



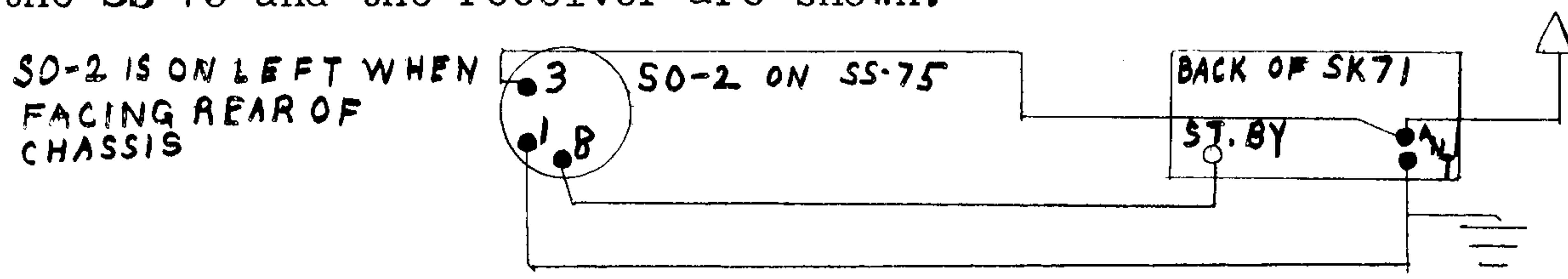
Relay circuit using voice control relay to switch antenna relay:-



To Use Voice Control Relay to Control Receiver as Provided for in the Exciter

Some receivers, such as the SX 72, 75A2, etc. use the standby method of silencing the receiver by applying a high positive bias on the

cathodes of the RF and IF stages. The standby receiver switch merely shorts this bias to ground and grounds the ground end of the cathode resistors. The SS-75 provides the high positive bias to silence the receiver in the standby position. A connection is brought out to the socket on the rear of the SX71 to provide external silencing. With a set using this system of silencing, the connections required between the SS-75 and the receiver are shown:-



The connections for carrier insertion to the receiver are also shown. It is possible to use this very efficient method of receiver silencing on any receiver if not provided for, by removing the ground end of the RF and IF cathode resistors from ground. Terminate them all in a common lead and connect them to pin 8 on SO-2 on the SS-75. The high positive cutoff bias is provided for in the SS-75. If this arrangement is used, the spare set of relay contacts may be used to switch the antenna relay.

### Power amplifier

When a power amplifier is used, resistor loading should be used across the output tank of the 807 and the grid circuit of the final. The amount of loading required will vary depending on the final tubes used and the class of operation. The loading should be equally divided between the 807 plate and the final grid. In general, use the lowest value of resistance that will provide the required drive to the final. This will provide maximum stability and minimum overall distortion. For class A or AB-1, use just enough loading to maintain stability in the 807 and the final. For AB-2 or B, use all the loading possible and still maintain drive. The single 807 will drive tubes such as 813s to a KW in class B, 304TLs to a KW in AB-1. 10,000 ohms on each end is a good starting value.

### Using External Power Supply and Extra 807

Remove cover on 807 shield box, attach plate cap and parasitic choke, plug in the second 807. Retune grid and plate circuit of 807 stage to compensate for added capacity of the second 807. Be sure to retune to signal frequency and not VFO frequency. Pull plug from SO-1. Remove jumpers from pins 3, 4, and 5. Connect 300 volts regulated to pin 5, 600-800 volts to pin 3, and a 5000 ohm 20 watt resistor between pins 1 and 4. Common negative to ground, pin 1. (See notes). **PAGE IV**

### 450 Kc Filter

Highest quality slug tuned IF transformers are used in the filter. The filter should remain in alignment indefinitely. Any tampering with the filter will be at the owner's risk.

### VFO Calibration

The frequency scale on the VFO is to serve as a reference point only, when adjusting the VFO to the receiver frequency. If calibration is desired, the points may be marked off on the dial scale, or a new scale can be made up from the back side, which is scaled off in four bands.



## Key to Chassis Layout

V 1	6J5	450 Kc crystal oscillator
V 2	6SA	first mixer
V 3	6SL7	speech amplifier
V 4	6SN7	voice control
V 5	6SJ7	transmit carrier amplifier
V 6	6SK7	Receiver carrier amplifier
V 7	5Y3	rectifier
V 8	6SA7	receiver carrier mixer
V 9	6AC7	second transmit mixer
V 10	807	power amplifier
V 11	VR-150	voltage regulator
V 12	6SJ7	VFO

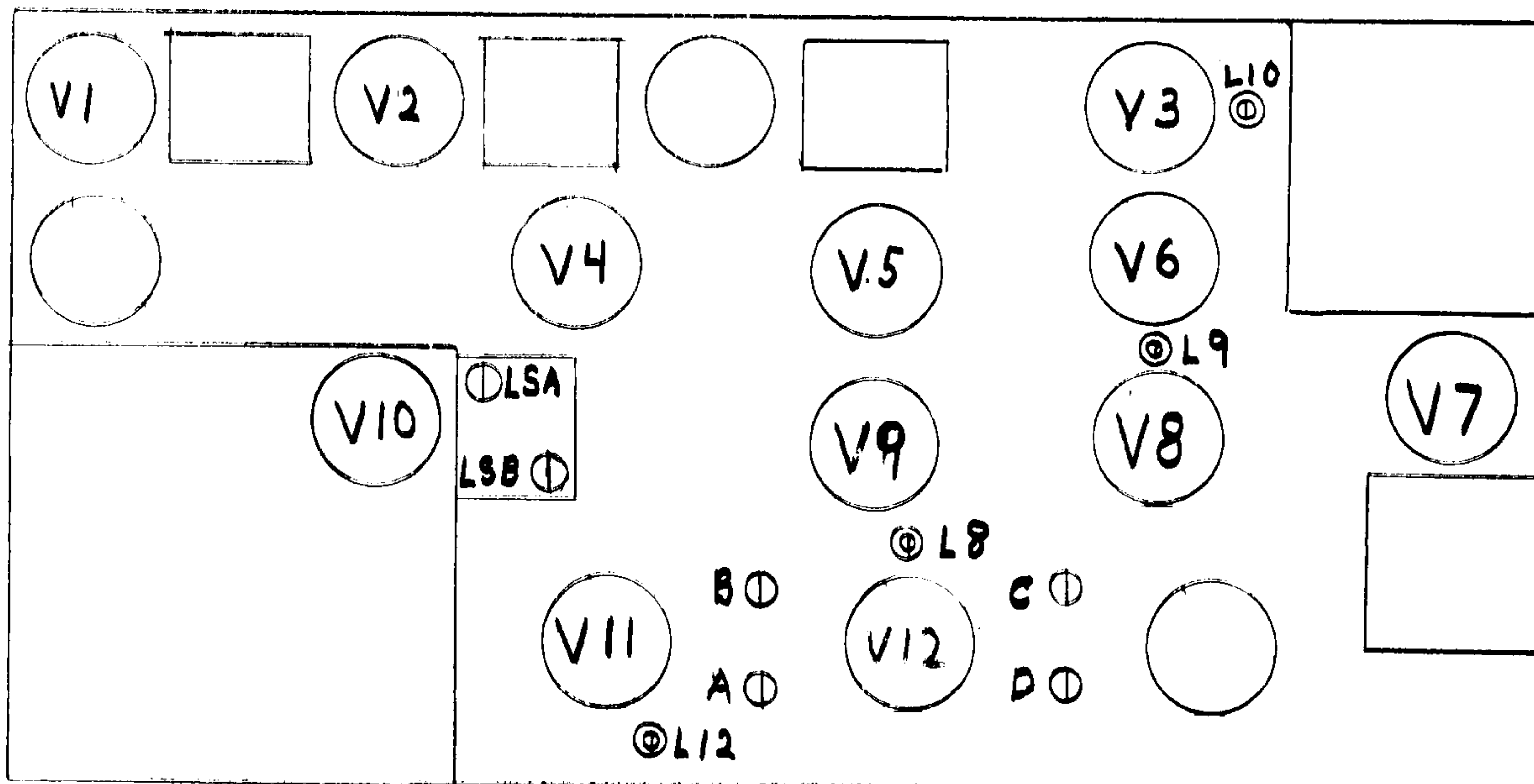
### Trimmers

A----	band set 4 Mc
B----	band set 3.95 Mc
C----	band set 3.9 Mc
D----	band set 3.85 Mc

### Slug Tuned Inductances

L 12	VFO osc. grid
L 8	VFO osc. plate
L 9	receiver carrier mixer plate
L 10	receiver carrier amplifier plate
L 5A	second transmit mixer plate trimmer
L 5B	807 grid trimmer

### SS-75 Chassis Layout



### NOTES

In some of the earlier units the 807 may show a tendency to oscillate when the load is removed from the plate tank. This may be cured by removing the ground return in the 807 grid circuit tank from ground and inserting a 100 ohm 1/2 watt resistor in parallel with a 500 uuf mica condenser in series with this lead to ground. If the unit is used to drive an amplifier, the resistive load on the tank circuit of the 807 will stabilize the 807, making the above change unnecessary.

The unit will provide approximately 100 watts output using two 807s, a 750 volt plate supply, 300 volts regulated screen supply and 33 volts battery bias. For this class service, short 807 cathodes to ground. Remove ground return on 807 grid tank from ground. Insert bias battery, by-pass bias battery with .01 mica.

### Resistor Values

R1, R9, R10, R35, R44, R47 --- 100M  
R2, R3, --- 22M  
R4, R30, 250M pot  
R5, R12, R39, R43, --- 470  
R6 --- 22M 2 watt  
R7, R8, R17, R37, R41, R45 --- 1M  
R11, R48 000 25M pot  
R14, R27, R38, R42 --- 1 meg  
R15 --- 220  
R16 --- 56M 1 watt  
R18, R19, R21 --- 150  
R20 --- 300 10 watt  
R22 --- 18M 2 watt  
R23 --- 2.2 meg  
R24, R28, R31 --- 4700  
R25, R29, R32 --- 270M  
R26, R33 --- 10M  
R34 --- 10 meg  
R36 --- 39M  
R40 --- 22M 1 watt  
R46 --- 20M 10 watt

### Condenser Values

C1, C6, C7, C8, C9, C10, C13, C14, C15, C16, C21, C23, C26, C27, C31,  
C34, C43, C44, C46, C49, C50, C51, C53 --- .01 ufd mica  
C2, C30 --- 500 uuf mica  
C3, C4 --- 3-30 uuf trimmer  
C5 --- .1 paper  
C11, C12, C45, C48, C52 --- 50 uuf mica  
C17, C18, C36, C37, C38, C39, C50 --- uuf air  
C19, C20, C35 --- .1 uf oil filled  
C25 --- 365 uuf air  
C28, C33 --- 8 uf 25wv electrolytic  
C29 --- 10 uf 475 wv electrolytic  
C32 --- 20 uf 475 wv electrolytic  
C54 --- 10 uf 475 wv electrolytic  
C55 --- 40 uf 475 wv electrolytic  
C40 --- 600 uuf silver mica  
C41 --- 35 uuf air  
C42 --- 50 uuf silver mica

TUBE SOCKET VOLTAGES ON SS-75

TUBE	PIN							
	1	2	3	4	5	6	7	8
V1-6J5	0	0	75	75	0	150	6.3 <sup>2</sup>	0
V2-6SA7	0	6.3 <sup>2</sup>	300	100	0	5	0	0
V3-6SL7	0	115	2	0	115	2	6.3 <sup>2</sup>	0
V4-6SN7	0	70	3.4	-.4	110 <sup>1</sup> 0	0	6.3 <sup>2</sup>	0
V5-6SJ7	0	6.3 <sup>2</sup>	4.3 <sup>4</sup> 60	0	4.3 <sup>4</sup> 60	150 <sup>4</sup> 250	0	300
V6-6SK7	0	0	5 <sup>3</sup> 250	0	5 <sup>3</sup> 250	140 <sup>3</sup> 250	6.3 <sup>2</sup>	300
V7-5Y3	0	312	0	375 <sup>2</sup>	0	375 <sup>2</sup>	0	312
V8-6SA7	0	0	300	115 <sup>3</sup> 290	0	5.4 <sup>3</sup> 240	6.3 <sup>2</sup>	0
V9-6AC7	0	6.3 <sup>2</sup>	225 <sup>3</sup> 3.2	0	225 <sup>3</sup> 3.2	275 170	0	300
V10-807	6.3 <sup>2</sup>	0	300	0	30 <sup>4</sup> 23			
V11-VR150	0	0	0	85	150	0	0	0
V12-6SJ7	0	6.3 <sup>2</sup>	0	0	0	85	0	300

KEY

1. Voice control on
2. AC voltage
3. Main control switch in standby position, Receive carrier control full on
4. Transmit carrier full on, 807 loaded

Voltages to be taken with transmit carrier off, audio off, voice control off. Measured from chassis with 1000 OPV meter all voltages are DV and taken with the main control switch in transmit position unless otherwise noted.

The following guarantee applies to the SS-75

All components except tubes are guaranteed by the manufacturer, for a period of 90 days from date of sale.

We will replace free of charge, any components found to be defective due to faulty manufacture, within the 90 day period. Provided the defective component is first returned to us postpaid.

ELECTRONIC ENGINEERING COMPANY

Wabash, Indiana



