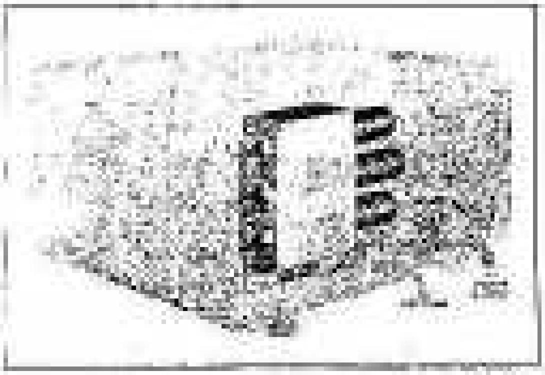
INSTRUCTION SHEET

MODEL HA-16 VOX CONTROL UNIT



Hallicrafters' Model HA-16 VOX Control Unit

DESCRIPTION

Hallicrafters Model HA-16 VOX Control Unit is an accessory unit for the Model SR-160 Transceiver. Installation of this unit on the SR-160 Transceiver will permit voice-controlled, single-sideband operation in addition to the normal push-to-talk control. The control unit may be attached or removed from the transceiver in a matter of minutes. With the accessory unit mounted and connected, the operator may select either mode of control as desired.

INSTALLATION

1. Remove the jumper plug [illegible] presently installed in the VOX ACCESSORY socket located on the rear chassis apron of the transceiver. Save the jumper plug for it must be replaced if the control unit is disconnected.

2. Loosen the ground bolt nut at the rear of the transceiver and space the flat washers about 1/4 inch apart.

3. Hook the Model HA-16 VOX Control Unit onto the two key holes in the rear cabinet wall just above the ground bolt and insert the notched flange between the flat washers of the ground bolt. Tighten the ground bolt nut.

4. Plug the inter-connecting cable of the control unit into the VOX ACCESSORY socket. The unit is now ready for adjustment and operation.

OPERATION

Set the PTT-VOX switch on the control unit to PTT and check the transceiver for normal push-to-talk control. With the switch in this position, the transceiver should continue to operate as before from the microphone switch.

Before proceeding with VOX operation, a word of caution is in order. Some microphones equipped for push-to-talk control have shorting contacts in the switch to disable the microphone element when the pushbutton is released. VOX operation will not be possible unless this circuitry is disconnected within the microphone.

To set up the VOX Control Unit for voice control operation, proceed as follows:

1. Set the three controls (SENS., DELAY, and ANTI-TRIP) at their full counterclockwise positions.

2. Set the AF GAIN control on the transceiver fully counterclockwise.

3. To prevent modulation of the transmitter during the following adjustments, set the MIC GAIN control fully counterclockwise.

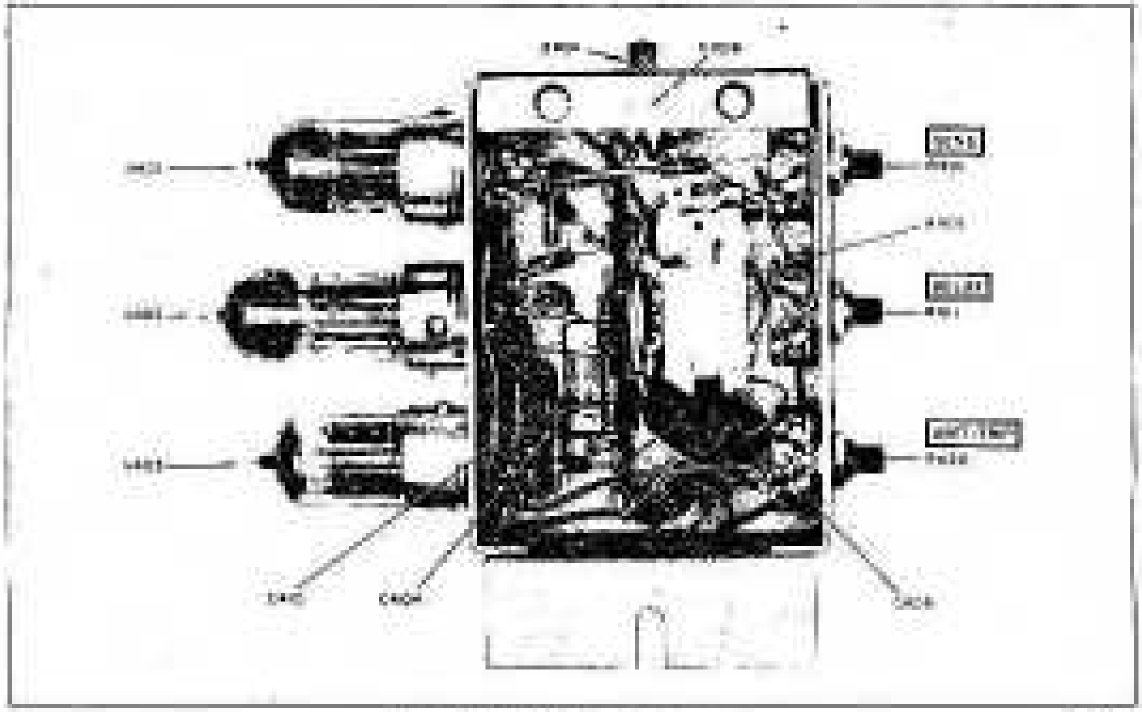
4. With the OPERATION control on the transceiver set at SSB, set the PTT-VOX selector switch on the control unit at VOX and set the remaining control unit controls as follows:

a. Advance the SENS. control (clockwise) while talking into the microphone, until the VOX relay closes on the first syllable of speech. VOX operation will be the smoothest when no more VOX gain than necessary is used.

b. Adjust the DELAY control for the desired drop-out delay. The delay period increases as the DELAY control is turned clockwise. The delay period should be long enough to prevent chopping between words but not long enough to miss the other operator's quick reply.

c. Set the transceiver AF GAIN control for the desired listening level and advance the ANTI-TRIP sensitivity control (clockwise) until the received signals do not actuate the VOX relay. Excessive anti-trip gain or a sudden increase in the established listening level may lock out the voice-control system. To obtain the greatest margin of anti-trip control range, the following rules apply:

(1) Avoid setting the microphone close to and directly in front of the speaker.



Internal View of [illegible], Showing Components

(3) Turn the active side of the microphone away from the speaker and select a communication type microphone with a high front-to-back sensitivity ratio.

With the VOX Control Unit adjusted, either method of control may be selected by simply setting the selector switch for either PTT or VOX. Do not forget to reset the MIC GAIN control after setting up the voice control circuits. The VOX SENS. and the MIC GAIN controls are entirely independent of each other, and may be adjusted accordingly.

CHASSIS COVER REMOVAL

The VOX Control Unit must be disconnected from the transceiver and to gain access to the internal circuitry. Remove two Phillips head screws, located at the base of the unit, and lift the cover plate clear of the housing.

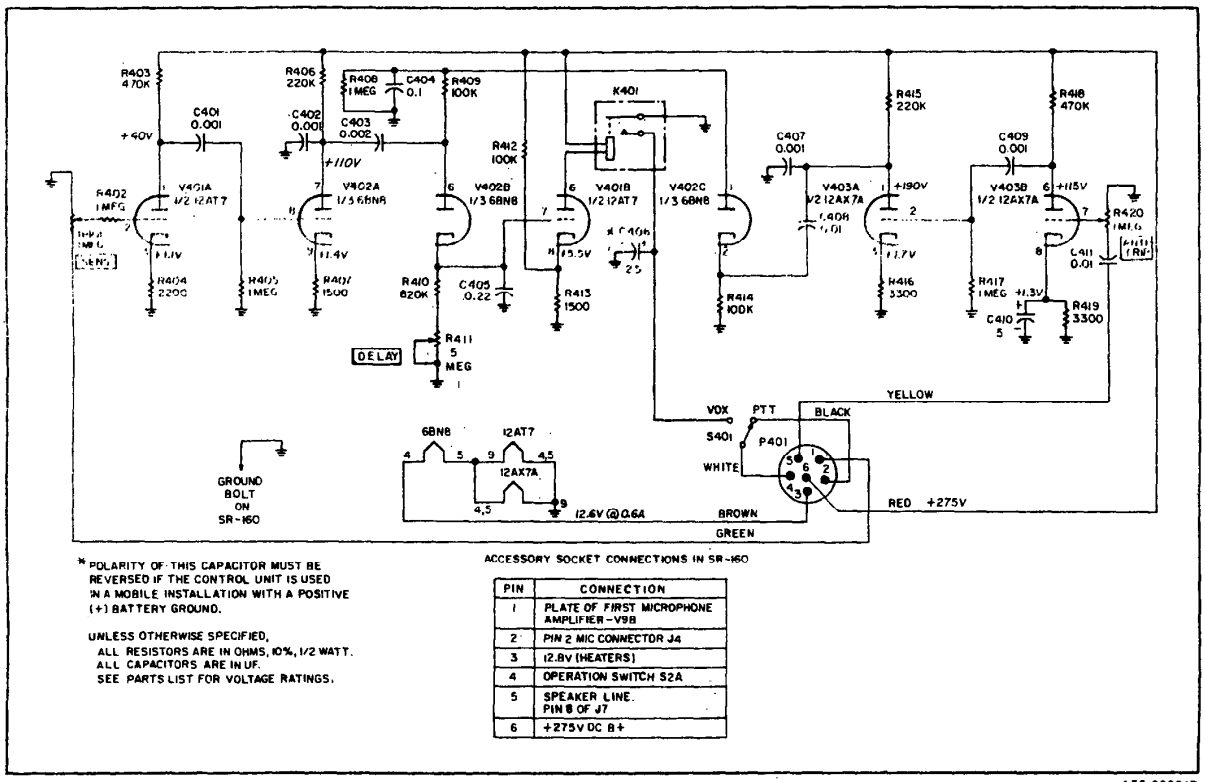
If line circuit testing must be done on the control unit, a clip lead is connected between the VOX unit and the transceiver ground bolt to provide the required ground return for both power and signal circuits.

MOBILE OPERATION

The VOX Control Unit operates without modification in mobile installations in which the negative battery terminal is connected to ground. If the VOX Control Unit is used in a mobile installation having a positive battery ground, reverse the polarity of the electrolytic capacitor C408.

CAUTION

If the control unit required modification to operate in a mobile and the transceiver is taken out of the car and operated from the PS-150-120 AC Power Supply, be sure to reconnect the capacitor for normal operation.



* POLARITY OF THIS CAPACITOR MUST BE REVERSED IF THE CONTROL UNIT IS USED IN A MOBILE INSTALLATION WITH A POSITIVE (+) BATTERY GROUND.

UNLESS OTHERWISE SPECIFIED,
ALL RESISTORS ARE IN OHMS, 10%, 1/2 WATT.
ALL CAPACITORS ARE IN UF.
SEE PARTS LIST FOR VOLTAGE RATINGS.

ACCESSORY SOCKET CONNECTIONS IN SR-160

PIN	CONNECTION
1	PLATE OF FIRST MICROPHONE AMPLIFIER - V9B
2	PIN 2 MIC CONNECTOR J4
3	12.8V (HEATERS)
4	OPERATION SWITCH S2A
5	SPEAKER LINE. PIN 8 OF J7
6	+275V DC B+

155-000067

Schematic Diagram of Model HA-16 VOX Control Unit

PARTS LIST

Schematic Symbol	Description	Hallicrafters Part Number
C401,402, 407,409	Capacitor, Ceramic, 0.001 μF, 20%, 500V	047-001671
C403	Capacitor, Ceramic, 0.002 μF, 20%, 500V	047-100395
C404	Capacitor, Molded Paper, 0.1 μF, 10%, 200V	046-001294-004
C405	Capacitor, Molded Paper, 0.22 μF, 10%, 200V	046-001298-004
C406	Capacitor, Electrolytic, 25 μF, 25V	045-000883
C408,411	Capacitor, Ceramic, 0.01 μF, 20%, 500V	047-100354
C410	Capacitor, Electrolytic, 5 μF, 25V	045-000938
K401	Relay, VOX	021-000754
P401	Plug, 6-Pin Interconnecting	035-000088
R401,420	Resistor, Variable, 1 Megohm, 30%, 1/4 watt, SENSitivity and ANTI-TRIP	025-002359
R402,405, 408,417	Resistor, Carbon, 1 Megohm, 10%, 1/2 watt	451-252105
R403,418	Resistor, Carbon, 470K ohm, 10%, 1/2 watt	451-252474
R404	Resistor, Carbon, 2200 ohm, 10%, 1/2 watt	451-252222
R406,415	Resistor, Carbon, 220K ohm, 10%, 1/2 watt	451-252224
R407,413	Resistor, Carbon, 1500 ohm, 10%, 1/2 watt	451-252152
R409,412, 414	Resistor, Carbon, 100K ohm, 10%, 1/2 watt	451-252104
R410	Resistor, Carbon, 820K ohm, 10%, 1/2 watt	451-252824
R411	Resistor, Variable, 5 Megohm, 30%, 1/4 watt, DELAY	025-002360
R416,419	Resistor, Carbon, 3300 ohm, 10%, 1/2 watt	451-252332
S401	Switch, Slide, SPDT VOX-PTT	060-002463
V401	Tube, Type 12AT7	090-900034
V402	Tube, Type 6BN8	090-001465
V403	Tube, Type 12AX7A	090-001458
	Cover	066-004196
	Shield, Tube (V401,403)	069-201190
	Shield, Tube (V402)	069-201189