

SECTION II

INSTALLATION AND INITIAL ADJUSTMENT

2.1. INSTALLATION.

2.1.1. UNPACKING.

The KWS-1 Transmitter is packed in two separate cases. The smaller case contains the Exciter/Power Amplifier. The larger case is the cabinet containing the Power Supply. Remove the two cabinets from the packing cases, using care to prevent damage to the units. Retain the packing material, for if shipping damage is evident, the units should be returned to their cases and the transportation company notified immediately.

The oscillator ballast tube, Type 3TF4A, the 4X250B tubes, the lamp chimneys, the plate connectors, and the antenna relay kit parts are all packed separately and placed in the power supply crate. These items must be unpacked and installed. The order of installation of the 4X250B tubes, the lamp chimney and connectors is shown in figure 2-2. Be sure the chimney is installed correct side up.

Make a thorough visual inspection of the outside and inside of each unit. Do not make adjustments or external connections at this time, but look for broken parts and connections, or any other evidence of shipping damage. Reference to figure 1-1 and to the photographs in section VI will be helpful in making the visual check.

2.1.2. PLACEMENT OF UNITS.

The Exciter/Power Amplifier is designed for table mounting or may be mounted on top the power supply cabinet alongside the operator's table. This choice and the accessibility of the local power outlet will determine the actual placement of units.

Allow enough space at the rear of the units for making external connections, replacement of fuses and to provide adequate circulation of air.

2.2. EXTERNAL CONNECTIONS.

Assembling the KWS-1 into an operating station is quite simple and consists briefly as follows:

- a. Plug microphone into the MIC jack (J101) located at lower right-hand corner of front panel. (See figure 3-1.)
- b. Plug the high voltage cable plug into the 2000 V dc jack J402 at rear of the PA. (See figure 6-1.)
- c. Plug the power supply interconnecting cable plug into the rear of the transmitter. See figure 2-1.
- d. Plug the pendent cable plug into CONTROL CIRCUITS at the rear of the transmitter. See figure 2-1.
- e. Connect the pendent cable to the receiver circuits, key line, antenna relay, etc. (See figure 2-3.)
- f. Install blower hose. Be sure clamps are tight. (See figure 6-1.)
- g. Plug antenna coax line into J401 on rear of PA unit. It is recommended that either an r-f ammeter or a power indicating device be used between the KWS-1 and the antenna. It is also recommended that a coaxial antenna change-over relay be used. This relay must have an extra set of normally open contacts for use in grounding the key line interlock. A source of 115 V dc, switched by the break-in relay is provided by the Power Supply for operating the 115 V dc antenna relay coil. (See figure 2-3.)
- h. Calibrate signal for the receiver can be secured by running a coax line from the receiver antenna post to the 6CL6 PLATE test point (J201). Run coax through large hole in rear of transmitter. (See figure 2-3.)

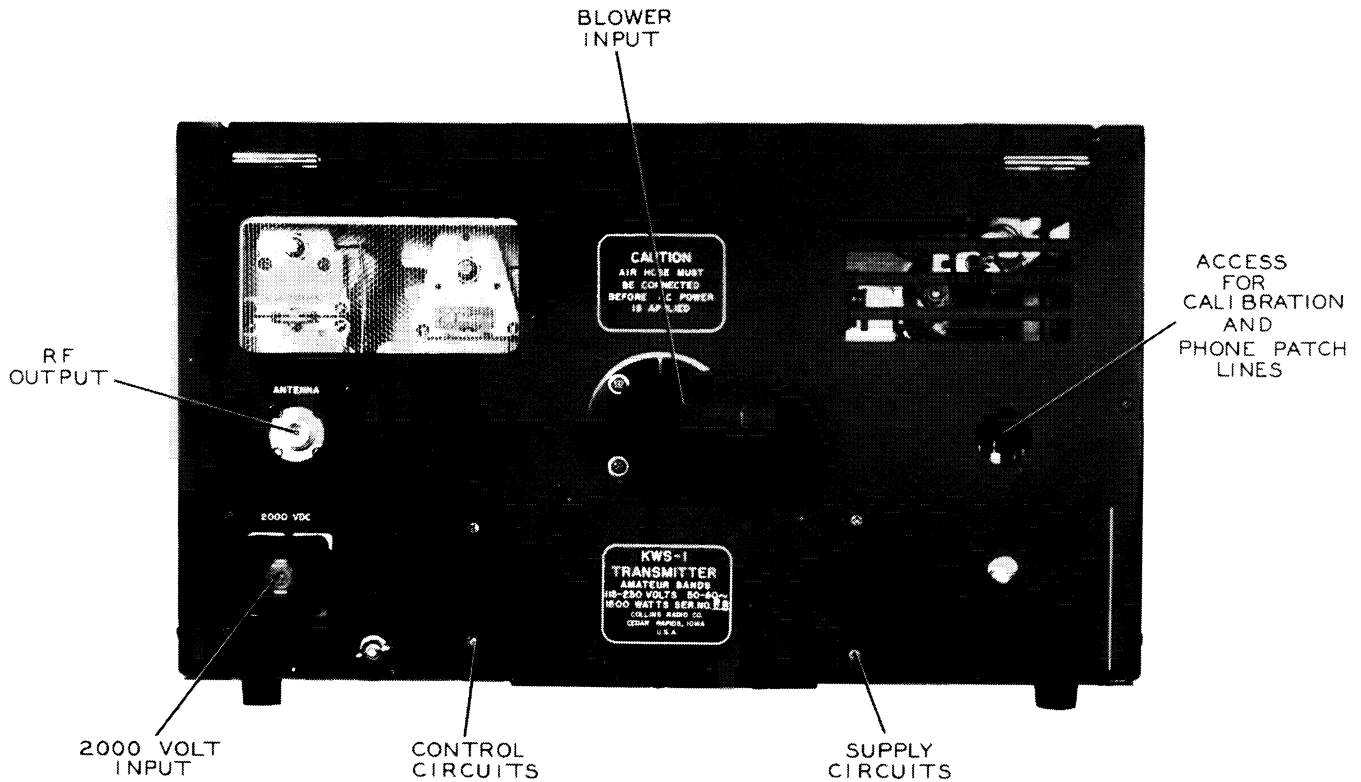


Figure 2-1. Exciter/Power Amplifier Rear Panel

i. Connect the Power Supply to a-c source by means of cable supplied.

The power supply is shipped ready for 230 volts ac operation. Connect power cord as follows: White wire = neutral; white and red = 230 V; white and black = 230 V.

NOTES

1. If 115 V operation is desired, consult figure 7-2.
2. If further information on external connections is desired, read paragraph 4.2.5. of section IV of this book.

j. Tune up the transmitter as outlined in section III of this book.

k. Check the value of power amplifier screen voltage as outlined in paragraph 4.2.4.6.f. This value must be 350 V (300 V Canada). The KWS-1 is now ready for operation.

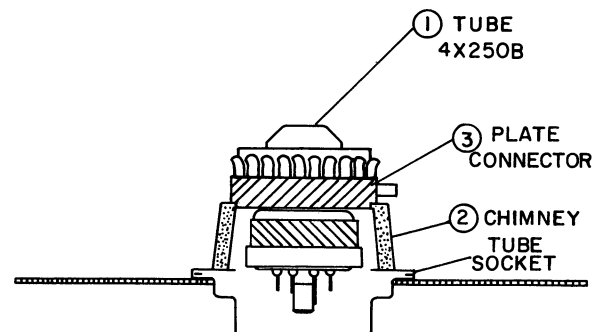


Figure 2-2. Installation of PA Tubes

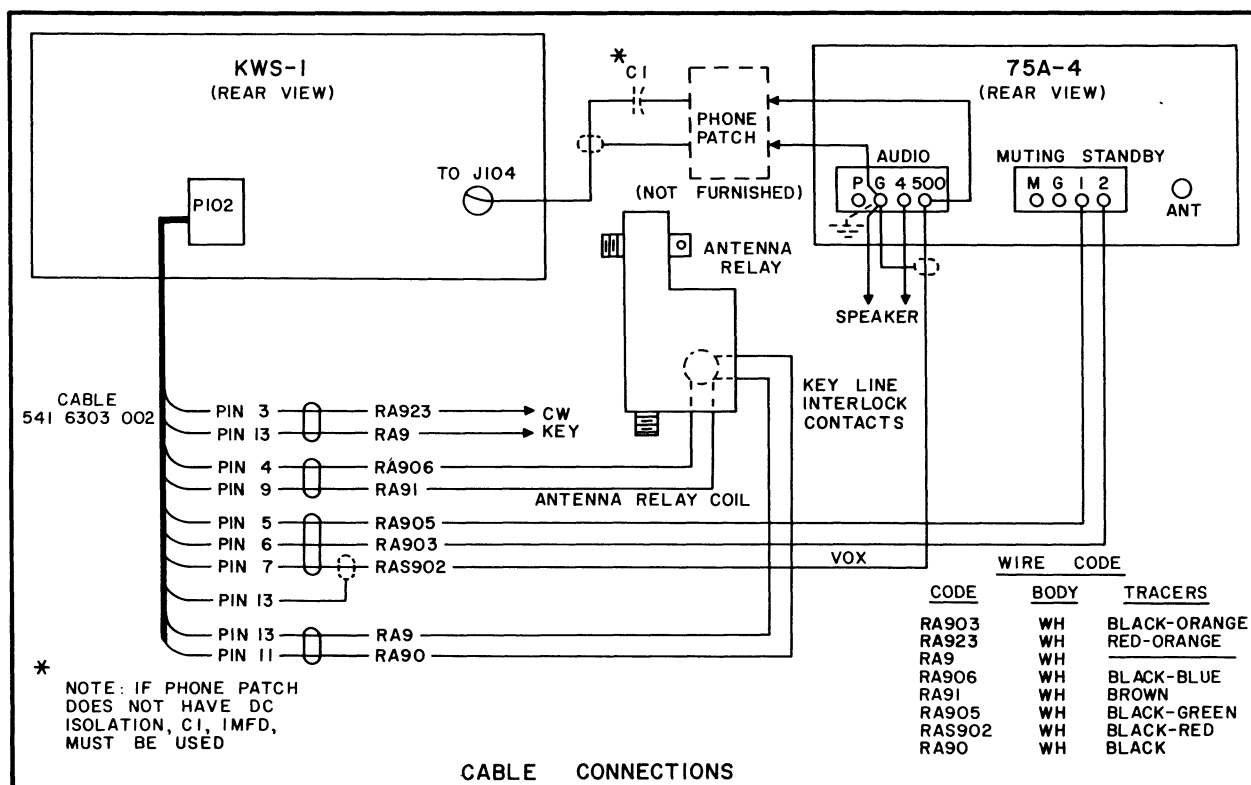
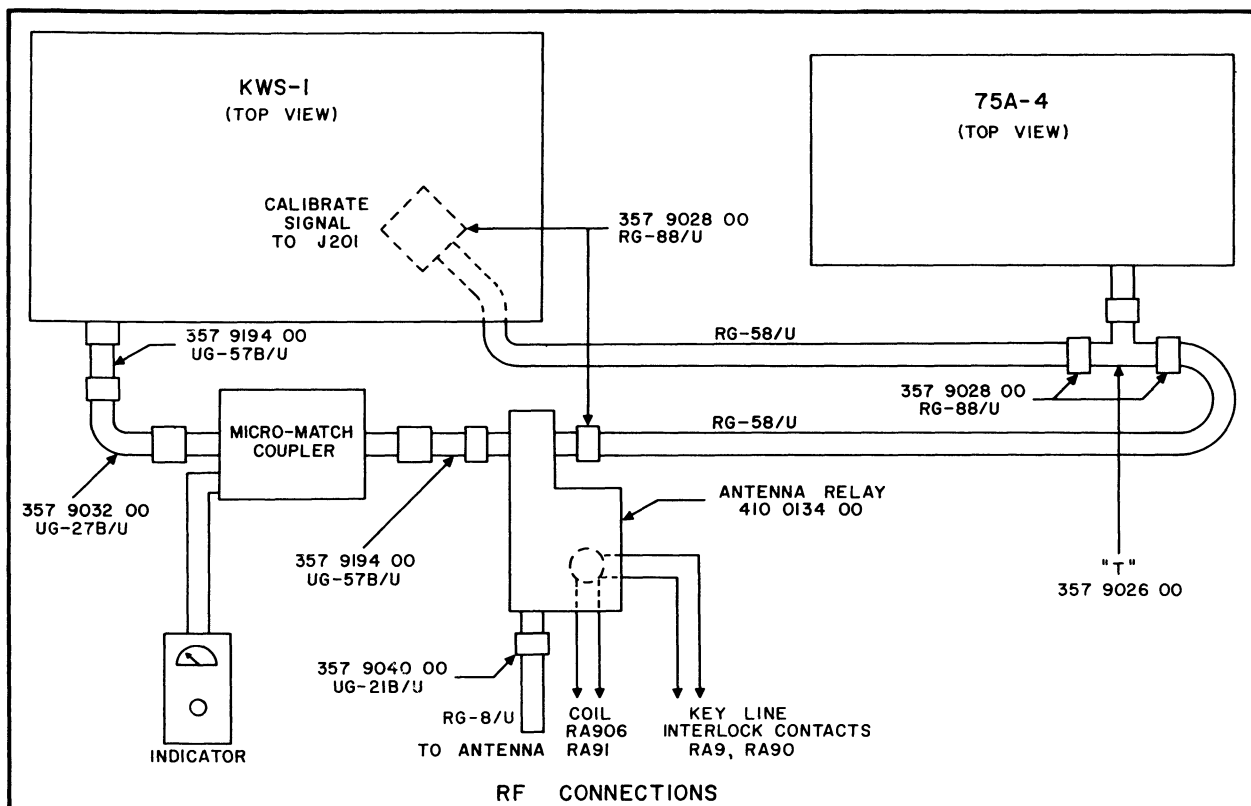


Figure 2-3. KWS-1 Connections to Associated Apparatus

SECTION III OPERATION

3. 1. INITIAL ADJUSTMENTS.

a. Turn FILAMENT switch ON. Blower should start. Adjust PA FILAMENT control on Power Supply for 6 volts on MULTIMETER.

CAUTION

Do not attempt to operate with blower in-operative or air hose disconnected as serious damage will result to the PA tubes.

b. Set EMISSION switch to CW, CARRIER LEVEL to zero, TUNE-OPERATE to OPERATE and BIAS control (on power supply) to "O".

c. Turn PA PLATE voltage ON. Advance PA BIAS ADJUST control until PA idling current is 100 ma.

d. Turn PA PLATE voltage OFF.

NOTE

A complete description of the functions of the operating controls appears in paragraph 4.2.4. of section IV.

3. 2. TUNING PROCEDURE.

3.2.1. CW OPERATION.

a. Turn the FILAMENT switch ON.

b. Select the desired band and set the main tuning dial to the frequency desired. (See paragraph 5.1.3.3. of section V for dial calibration procedure). Turn CARRIER LEVEL control full off (CCW).

c. Select CW on the EMISSION switch.

d. Place the TUNE-OPERATE switch in TUNE position.

e. Set the PA TUNING and LOADING controls several turns counterclockwise from the settings indicated in table 3-1.

f. Turn PA PLATE voltage switch ON.

g. Close TEST KEY. Advance the CARRIER LEVEL control until grid meter reads about midscale.

h. IMMEDIATELY RESONATE THE PA TUNING CONTROL for a dip in plate current.

i. Rotate the LOADING control clockwise to increase loading.

j. Load and resonate simultaneously (use both hands) until the transmitter is loaded to about 150 milliamperes in TUNE position.

k. During the loading and tuning process, the grid drive will tend to increase. This effect is caused by the action of the PA inverse feedback. Keep reducing the CARRIER LEVEL control so that grid current stays at near midscale.

l. Switch the TUNE-OPERATE switch to OPERATE. Again adjust grid current for midscale.

m. Continue loading to about 400 ma. Note antenna current or power output.

n. Continue loading to 500 ma (465 ma Canada) at resonance while watching both output and PA current. However, if the output ceases to rise as loading is increased, back off the LOADING control slightly and do not try to load beyond this point.

o. The transmitter is now ready to use on cw. Reduced input can be had by simply backing off the CARRIER LEVEL control until the desired plate input is reached. No grid current will show under these conditions as the PA will be operating class AB₁. If full output is desired, run the grid current to about 1/2 to 3/4 meter scale.

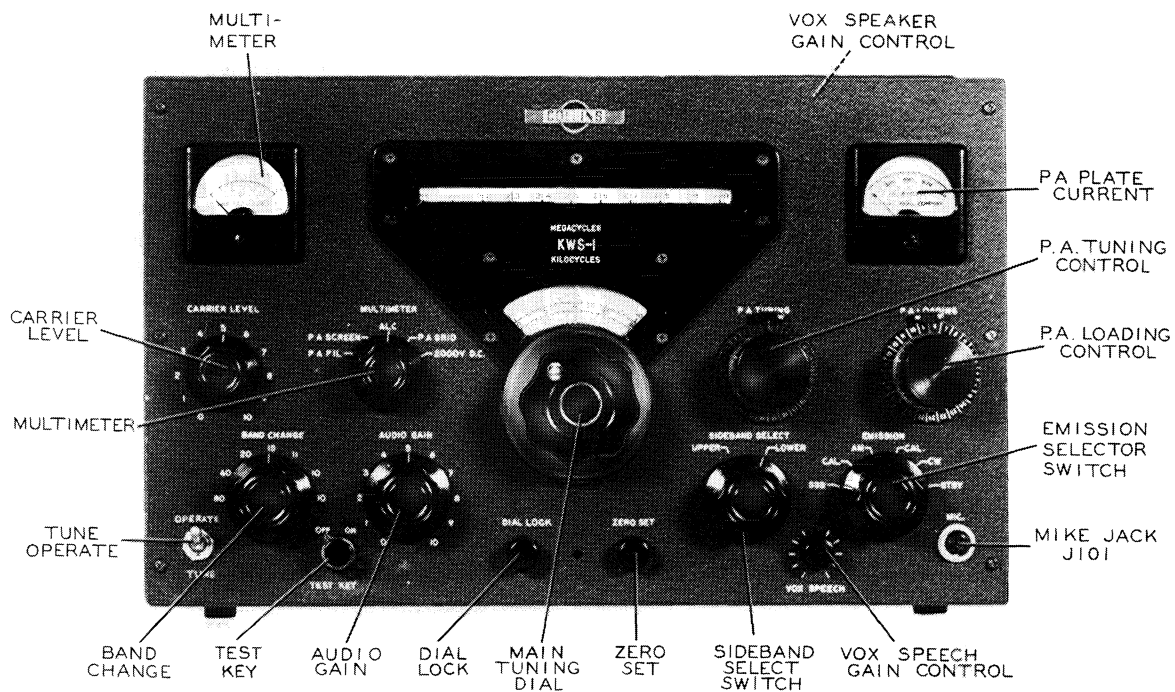


Figure 3-1. Exciter Front Panel

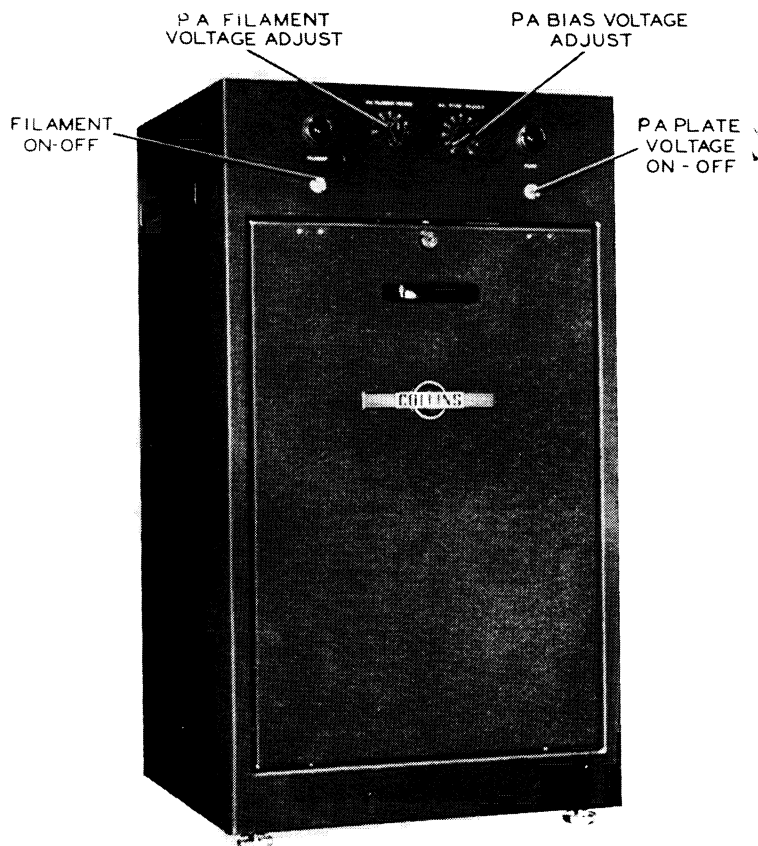


Figure 3-2. Power Supply Front Panel

Section III

Paragraphs 3.2.1. - 3.2.3.

p. Switch to STANDBY during reception because receiver is disabled when switch is in CW position.

3.2.2. SSB OPERATION.

a. Tune the transmitter exactly as for cw ("a" through "n" above).

b. Switch to SSB.

c. Set AUDIO GAIN at zero and speaker quieting control (inside unit above PA plate meter) to counterclockwise stop.

d. Speak into microphone while advancing the VOX SPEECH control. Set control for a pleasing action of the carrier control relay.

e. Advance AUDIO GAIN until ALC meter kicks to about midscale on voice peaks.

CAUTION

Under no circumstances should PA GRID current show during SSB operation or distortion will be generated.

f. Advance speaker quieting control for minimum feedback.

g. The transmitter is now ready to use on SSB. Choice of sidebands is available at the SIDEBAND SELECT switch. If there appears to be an objectionable amount of carrier present, the balanced modulator can be checked. Refer to paragraph 5.1.4.3. b.(10) of section V.

3.2.3. AM OPERATION.

a. Tune the transmitter exactly as for cw ("a" through "n" of paragraph 3.2.1.). Note antenna current or power output at threshold of grid current. (Use auxiliary r-f current meter or power output indicator.)

b. Switch to AM. operation.

c. Back OFF CARRIER LEVEL control until the power drops to 1/4 the cw value (1/2 antenna current). This corresponds to a plate current of about 275 ma (255 ma Canada).

d. Advance AUDIO GAIN control until voice peaks just start to show a trace of ALC. This trace of ALC indicates 100% modulation and should not be exceeded or distortion will result.

TABLE 3-1

APPROXIMATE PA TUNING AND LOADING DIAL SETTING
(With 52-ohm Load)

BAND	FREQUENCY IN KILOCYCLES	PA TUNE		PA LOAD	
		APPROX. SETTINGS	ACTUAL SETTINGS	APPROX. SETTINGS	ACTUAL SETTINGS
80M	3,500	262		237	
	3,750	390		353	
75M	4,000	505		435	
40M	7,000	1282		1080	
	7,150	1300		1095	
	7,300	1325		1100	
20M	14,000	1795		1545	
	14,150	1800		1570	
	14,300	1810		1595	
15M	21,000	2000		1765	
	21,450	2015		1767	
11M	27,000	2080		1875	
10M	28,000	2094		1880	
	29,000	2108		1895	
	29,700	2121		1907	