1. After performing the SSB RECEIVER SENSITIVITY CHECK, leave connections and controls as at the conclusion of that check.

2. Select the USB mode of operation on the receiver being checked.

3. Set the RF generator to the CW mode.

4. Set the RF generator to the 10 dB (S+N)/N sensitivity level for the receiver being checked.

5. Tune the RF generator frequency for maximum meter reading on audio meter (1).

6. Turn off the RF generator.

7. Adjust AUDIO GAIN control (10) so noise is heard from speaker (12). Noise will also be displayed on the oscilloscope.

8. Adjust receiver squelch control to squelch threshold, that is, to the point where the noise is just squelched.

9. Set the RF generator output level to minimum.

10. Return RF generator to CW mode.

11. Increase RF generator output level until receiver unsquelches. There should be at least a 20 dB difference in the audio meter (1) reading between the squelched and unsquelched condition. In the unsquelched condition, audio output should be at least 1/10 of the receiver's rated maximum audio output.

12. Read the RF generator output level in microvolts from the attenuator of the RF generator. This is the SSB squelch threshold sensitivity of the receiver. The reading in microvolts should be equal to or less than the receiver manufacturer's specification for SSB squelch threshold. Typically, this value is 0.5 microvolt or less.

13. Adjust the receiver squelch control for tight squelch (fully clockwise).

14. Increase the output level of the RF generator until the receiver unsquelches. To make sure that the RF generator remains on frequency when the output level is increased, temporarily reduce the squelch setting and retune the RF generator for peak meter reading, then return the squelch control to tight squelch.

15. Read the RF generator output level in microvolts from the attenuator of the RF generator. This is the tight squelch sensitivity. The reading should be equal to or lower than the manufacturer's specification, which is typically in the range of 30 microvolts to 500 microvolts.

16. Switch the receiver to the LSB mode and repeat steps 3 thru 15.

ANTENNA CHECK AND SWR MEASUREMENT (Refer to Fig. 19)

The antenna check is one of the most important performance checks that can be made. A low SWR (standing wave ratio) measurement is essential for good radio performance. A low SWR allows the transmitter to operate at maximum effectiveness, and also gives optimum receiver performance. A low SWR results when the antenna is properly tuned to the operating frequency and there is a close match of impedance between the transmitter output, antenna cable, and antenna (all are 50 ohms). In this condition, all of the transmitter energy is radiated by the antenna. If the transmitter output and antenna or antenna cable impedances are mismatched, part of the energy is reflected back to the transmitter instead of being radiated. This reflected or reverse power can be measured on the RF meter of the CB ServiceMaster. The CB ServiceMaster also compares forward power to reverse power for a direct SWR measurement. A greater degree of impedance mismatch causes a higher reverse power and higher SWR. The ideal condition would be zero reverse current and an SWR reading of 1 (standing wave ratio of 1:1). Satisfactory performance can be expected if the SWR reading is 2 or less (standing wave ratio of 2:1) on all channels. The antenna is normally tuned for minimum SWR on its center frequency. SWR will be somewhat higher at lower and higher operating frequencies. A damaged antenna, a damaged antenna cable, corroded connectors, etc. can cause a very high SWR. A high SWR often causes premature failure of final RF amplifier transistors of solid state transceivers.

The SWR measurement must be made using the antenna and antenna cable that are normally used with the radio. For a mobile installation, the check must be performed in the vehicle with the CB ServiceMaster connected between the radio set and the antenna. The CB ServiceMaster can be operated from 12 volts DC for convenience in making such vehicular checks. For a base station installation, the check must be performed at the base station site with the CB ServiceMaster connected between the base station and its antenna. Be sure the test includes all the antenna cable and connectors that are normally used.

An SWR measurement is essential at the time of installation and should always be performed after repairs to the radio are completed. The check also is needed if damage to the antenna or antenna cable is suspected. A periodic SWR measurement will detect any gradual deterioration and assure continued high performance.

The antenna check can be made for any transmitter or transceiver in the approximate 27 MHz band with RF power output of up to 100 watts. For units with both AM and SSB capabilities, the check is made in the AM mode and need not be repeated in the SSB mode. The check is also applicable to SSB only and FM transmitters.

1. a. For checking a vehicle antenna, connect a DC power cord from the EXT 12V INPUT terminals (27) of the CB ServiceMaster to a source of 12 volts DC in the vehicle. Refer to the OPERATION FROM DC POWER procedure for more details.

   b. For checking a base station antenna, connect the AC power cord (29) of the CB ServiceMaster to a 120 volt AC outlet.