Notes on Use of dB Scale

The dB scale is used when comparing two readings, such as the 10 dB signal-to-noise ratio measurement in steps 5 and 7 of the receiver sensitivity check. If both readings are taken on the same meter range, readings are simply taken directly from the scale; for example, if the step 5 reading is +2 dB and the step 7 reading is −8 dB with both readings taken on the 1 WATT range, the difference is 10 dB.

However, for low meter readings (below about −7 dB on the dB scale) a more sensitive range should be selected to obtain more accurate readings. Each range represents a 10 dB change in meter sensitivity. A signal that measures −10 dB on the 10 WATTS range will read 0 dB on the 1 WATT range, a signal that measures −7 dB on the 1 WATT range will read +3 dB on the .1 WATT range, etc. If the step 5 reading is −3 dB on the 1 WATT range and the step 7 reading is −3 dB on the .1 WATT range, the difference is 10 dB.

One easy way to check for a 10 dB difference between steps 5 and 7 is to adjust the step 5 meter reading to 0 dB, regardless of its value in watts. The desired step 7 reading will then always be −10 dB. This is possible by placing the RECEIVER FUNCTION switch (4) in the ADJUST FULL SCALE position and setting the ADJUST FULL SCALE control (5) for 0 dB meter reading for step 5. This may not be possible if the step 5 audio output is low, below about ¾ watt. RECEIVER FUNCTION switch (4) must remain in the ADJUST FULL SCALE position for the step 7 reading.

ADJACENT-CHANNEL REJECTION CHECK

Rejection of adjacent-channel signals is very important to prevent strong signals on adjacent channels from causing interference. This check is comparable to a receiver selectivity measurement, it measures the ability of the receiver to reject adjacent channel signals.

This check can be performed on AM or AM/SSB transceivers or receivers. For AM/SSB units, the check is performed in the AM mode and need not be repeated for the SSB mode (However, the SSB ADJACENT SIDEBAND REJECTION CHECK should be performed).

Typically, adjacent-channel rejection is the same for all channels, and need be checked for only one channel. However, certain component failures can cause low adjacent channel rejection only on specific channels. The check should be repeated for each channel exhibiting adjacent channel interference. On CB transceivers and receivers, most channels are separated by 10 kHz, but some are separated by 20 kHz or more. The check should be performed on channels where both the upper and lower adjacent channels are only 10 kHz from the reference channel, specifically channels 2, 5, 6, 10, 13, 14, 17, 18 or 21.

1. Perform the RECEIVER SENSITIVITY CHECK and leave connections and controls as at the conclusion of that check.

2. Set the transceiver or receiver to channel 13 or the desired channel.

3. Leave the RF generator set for 30% internal modulation.

4. Tune the RF generator to the receiver frequency.

5. Set the RF generator output level to the 10 dB (S+N)/N level, which should be 1 microvolt or less. Use the lowest possible signal level. Note the level for reference.

6. Adjust receiver volume for a convenient reference level on the audio meter, such as ½ watt. Use a relatively low volume with respect to maximum rated audio.

7. Switch the transceiver or receiver to the adjacent higher channel, but leave the RF generator tuned to the reference channel selected in step 2. (If the transceiver was set to channel 13 in step 2, switch to channel 14).

8. Increase the RF generator output level until the audio meter reads the same as the reference level selected in step 6. To be sure that the RF generator remains precisely on the reference frequency, temporarily switch the transceiver or receiver back to the reference channel (step 2) after the attenuator is readjusted and retune the RF generator if necessary. After tuning the RF generator, switch back to the adjacent higher channel. Do not change the receiver volume or other controls.

9. Read the RF generator output level from the attenuator and compare the reading with step 5. The difference between the readings, in dB, is the adjacent-channel rejection figure. This figure should be at least 30 db for all transceivers and receivers. A high-quality receiver may measure 60 dB or more. This figure should exceed the manufacturer's selectivity specification which is usually stated for 20 kHz bandwidth. If the adjacent-channel rejection measures in the vicinity of 100 dB, receiver desensitization is probably the cause and the results are invalid. Using the lowest possible reference level in step 5 reduces the probability of receiver desensitization.

10. Switch the transceiver or receiver to the adjacent lower channel. (If the transceiver was set to channel 13 in step 2, switch to channel 12).

11. a. Normally, the audio meter should read the same as in step 8, which indicates that lower adjacent channel rejection equals higher adjacent channel rejection.

    b. If the audio meter reading is different from step 8, readjust the RF generator level until the audio meter reading does equal step 8. Read the RF generator level from the attenuator and compare it with step 5. The difference between the readings in dB is the lower adjacent channel rejection figure.

SQUELCH THRESHOLD SENSITIVITY CHECK (Refer to Fig. 11)

NOTE: This test requires an extremely stable signal generator, preferably crystal-controlled.