5 PRESELECTOR FIELD TUNING PROCEDURES

Depending on the configuration, the station may have an external preselector assembly, an internal preselector, or both. The external preselector assembly is a 3-pole bandpass filter equipped with tuning slugs to adjust the passband corresponding to the operating frequency(s) of the station. For the internal preselector, circuitry in the Receiver Module provides a varactor-tuned bandpass filter which adapts to the required frequency range under the control of the Station Control Module.

The external preselector must be retuned if the preselector assembly or Receiver Module are replaced in the field, or if the station operating frequency(s) are modified. The internal varactor-tuned preselector is factory-tuned to cover the relevant frequency band in its entirety, and is retuned only if the Receiver Module is replaced in the field or if there is a suspected problem with the Receiver alignment. The tuning procedures follows.

IMPORTANT

If the station has both an external preselector assembly and an internal varactor-tuned preselector which must be retuned, you must bypass the external preselector and retune the varactor-tuned preselector first, then reconnect the external preselector and retune it. Also, since this is a non-standard configuration, you can expect a slight degradation in the receiver sensitivity (approximately 1.5 dB) due to preselector insertion losses.

External Preselector Tuning Procedure

IMPORTANT

Tuning for best SINAD response DOES NOT result in optimum tuning of the preselector assembly. You must use this field tuning procedure to obtain optimum preselector performance.

Required Test Equipment

The following test equipment is required to properly tune the external preselector assembly:

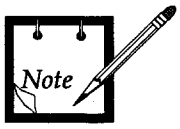
- RF signal generator – Motorola R2600 or R2001 Communications Analyzer (see note below), or HP8656A signal generator (or equivalent)
- Dip/Peak Monitor – HP435B Power Meter (or equivalent) with HP8484A sensitive power head, Boonton Model 92E with BNC input, or R2001/R2600 using the spectrum analyzer function
- Torque driver capable of delivering 1.36Nm (12 in-lb) of torque and 10 mm deep well socket
- Tuning probe – Motorola Part No. 0180763D22, p/o TRN7799A (See Note)
- Flat-blade screwdriver

The R2600 Communications Analyzer can both generate and measure simultaneously. The R2001 may be used for either the generator or the monitor function, but not both simultaneously. When using R2001 as the signal generator, the RF signal **must** be taken from the Antenna port.

Note: Tuning Probe 0180763D22 is NLA. The Tuning Kit TRN7799A has been replaced by 3082059X01, $ 12.54 in June 2011, and includes the tuning probe.

Calculating Proper Alignment Frequency

Use one of the following two methods to calculate the alignment frequency to be generated by the signal generator.



For stations which are equipped with both an external preselector and an internal varactor-tuned preselector, always tune the external preselector to an **actual receive frequency** after first tuning the varactor-tuned preselector (if required).

For stations with a **single receive frequency**, calculate the alignment frequency as follows:

1. From the site documentation or the RSS, determine the station receive frequency. **Add 200 kHz.**
2. If the receive frequency is in the range of 403 to 435 MHz, determine the alignment frequency as follows:
   - If frequency (from Step 1) is > 433 MHz, then alignment frequency = 433 MHz
   - If frequency (from Step 1) is < 405 MHz, then alignment frequency = 405 MHz
   - Otherwise, use actual frequency from Step 1 (see above note).
3. If the receive frequency is in the range of 435 to 470 MHz, determine the alignment frequency as follows:
   - If frequency (from Step 1) is > 468 MHz, then alignment frequency = 468 MHz
   - If frequency (from Step 1) is < 437 MHz, then alignment frequency = 437 MHz
   - Otherwise, use actual frequency from Step 1 (see above note).

For stations with **multiple receive frequencies**, calculate the alignment frequency as follows:

1. From the site documentation or the RSS, note the receive frequency for each channel supported by the station.
2. Calculate a midpoint frequency as follows:

   $$F_{mid} = (F_{highest} + F_{lowest}) \div 2$$

3. Using F_{mid} in place of the station receive frequency, perform Step 1 through Step 3 from previous procedure (i.e., calculation of alignment for single receive frequency).

Preparing Equipment

1. Make sure the preselector assembly is connected to a functional Receiver Module.
2. Using the torque driver and deep well socket, loosen the three tension nuts on the adjustment screws.
3. Detune the preselector by turning tuning screws (see Figure 9) 3 and 4 clockwise until they bottom out. Be careful not to apply more than 0.34Nm (3 in-lb) of torque to prevent warping preselector cover and housing.
4. Tighten the tension nuts to 0.68Nm (6 in-lb).
5. Connect the test equipment as shown in Figure 8.

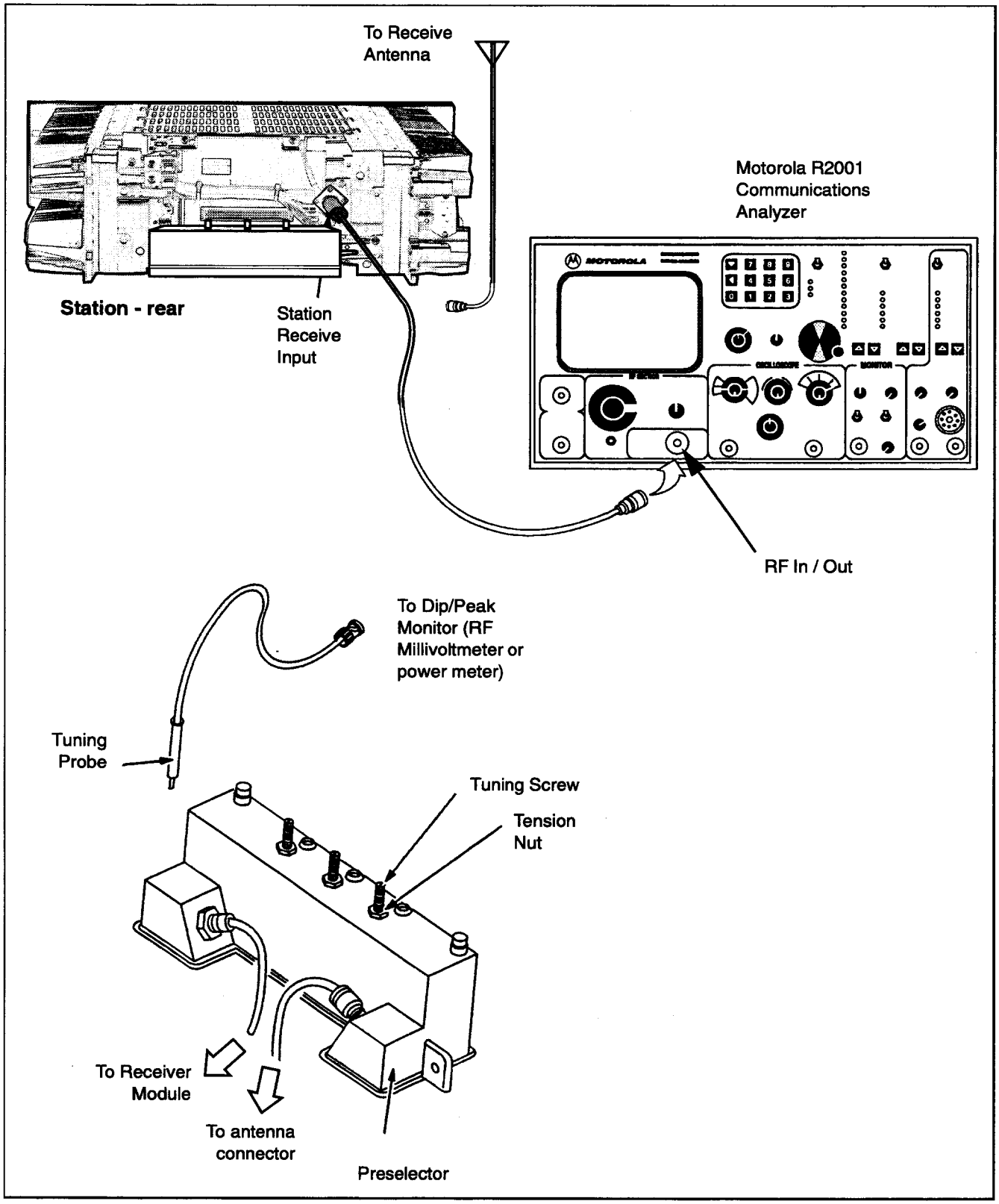


Figure 8. Test Equipment Setup for External Preselector Field Tuning

Tuning Procedure

1. Apply ac power to the station power supply (to provide an active 50 Ω termination).
2. Adjust the signal generator to the frequency calculated in the previous steps. Set the level to +5 dBm.
3. Insert tuning probe into cavity U2 (refer to Figure 9) and adjust tuning screw 2 for a **PEAK**.
4. Tighten tension nut on tuning screw 2 to at least 1.36Nm (12 in-lb) and fine tune tuning screw 2 for a **PEAK**.
5. Keep tuning probe in cavity U2 and adjust tuning screw 3 for a **DIP**.
6. Tighten tension nut on tuning screw 3 to at least 1.36Nm (12 in-lb) and fine tune tuning screw 3 for a **DIP**.
7. Insert tuning probe into cavity U3. Decrease output from signal generator to –5 dBm.
8. Adjust tuning screw 4 for a **DIP**.
9. Tighten tension nut on tuning screw 4 to at least 1.36Nm (12 in-lb) and fine tune tuning screw 4 for a **DIP**.

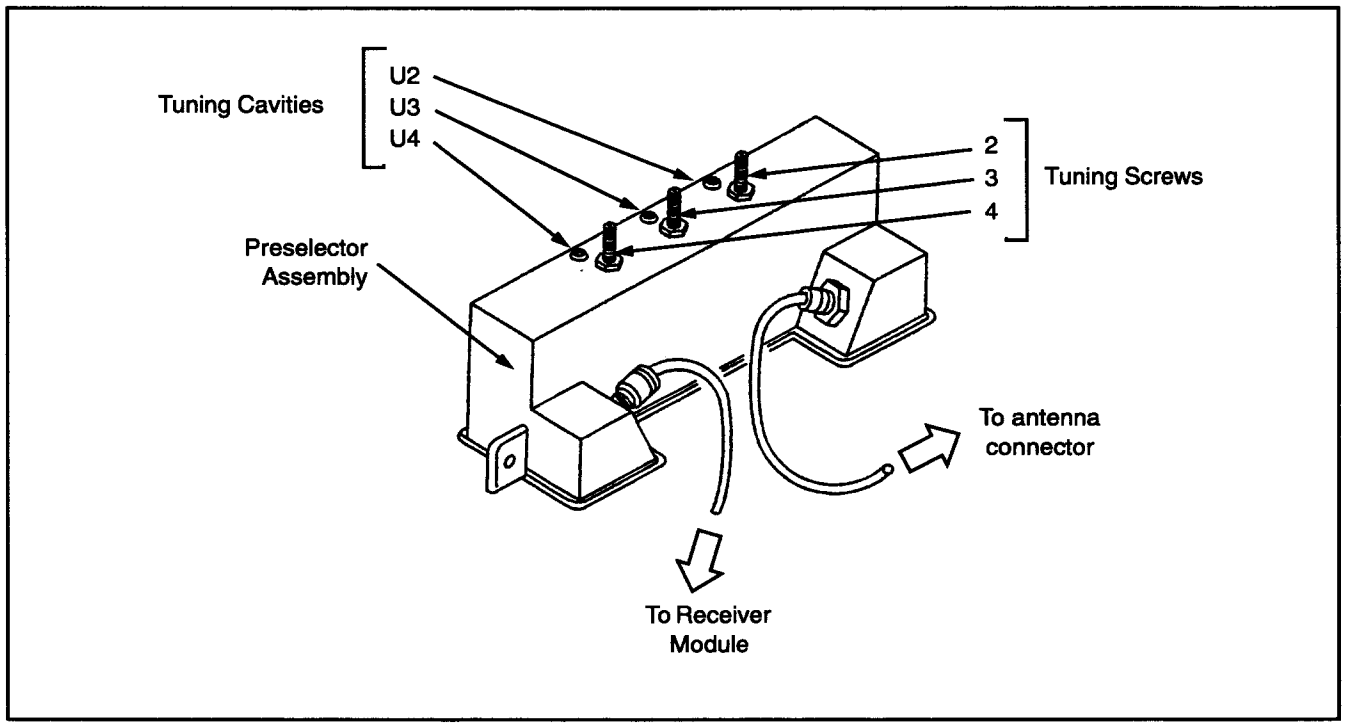
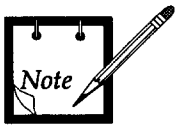


Figure 9. Location of Tuning Screws and Cavity Probe Holes

Varactor-Tuned Preselector Tuning Procedure

The Receiver Module may contain a varactor-tuned preselector which must be retuned whenever the Receiver Module is replaced in the field. The tuning procedure requires application of an RF signal into the receiver and use of the RSS **Service** menu to set the high and low alignment values of the varactor-tuned preselector. Either the Received Signal Strength Indicator (RSSI) value (if available) or SINAD is read and peaked by changing the preselector alignment values via the RSS. The alignment values are determined for 403 to 435 MHz and 433 to 470 MHz and stored in memory (within the Station Control Module).

These two alignment values are the only information required to interpolate the tuning voltage of the preselector to any frequency within the 403 to 470 MHz band. To retune this preselector, perform the Varactor-Tuned Preselector alignment procedure located in the RSS **Service** menu Online Help facility.



The RSSI can be monitored at pin C11 of the Systems connector (J5) on the station backplane (refer to Figure 10 for the location).

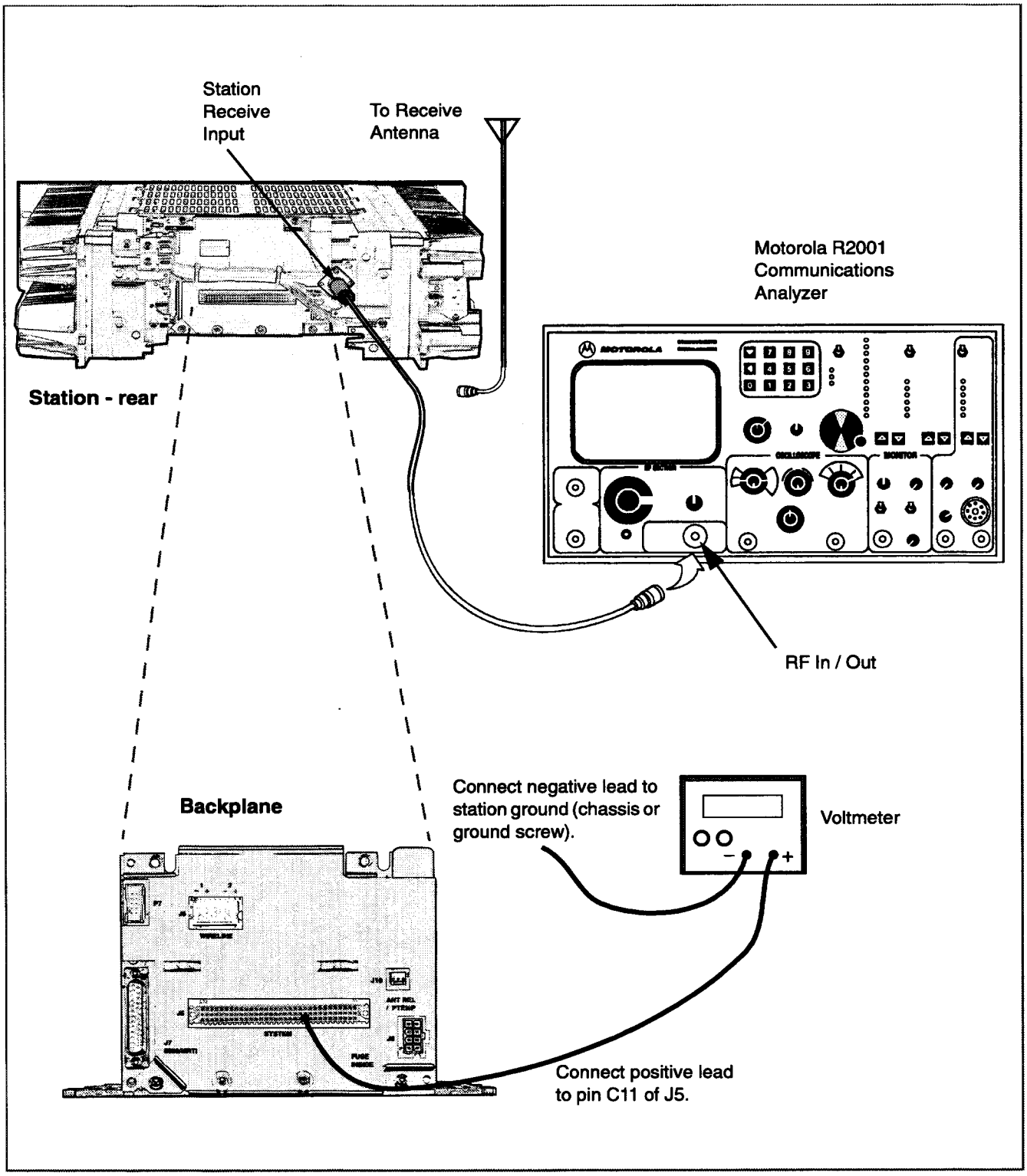


Figure 10. Location of RSSI Monitoring Point (Trunking Stations Only)

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