

better. This detected voltage is connected to the base of Q110 an emitter follower buffer which feeds E106, the Deviation Meter output, through current limiting trim pot R163. R163 is used to calibrate the deviation meter. Q111 is used as a voltage regulator stage, and supplies regulated 9VDC to all of the appropriate points on the board. Zener diode CR114 sets the 10V reference voltage on the base of Q111.

5.0 ALIGNMENT

5.1 RECEIVER ALIGNMENT - Alignment should not be required unless an RF transistor, IF IC101, or the receive frequency is changed. Even in this case, only a slight "touch up" should be required.

5.1.1 FRONT-END ALIGNMENT - Connect a good quality FM signal generator to the receiver antenna jack and an AC voltmeter (or "Sinnader" Meter) from the 'hot' speaker lead to chassis ground. With the signal generator set for minimum (0) output, note the average AC voltmeter reading. (Squelch full CCW). Increase the generator's output level and tune it for best receiver quieting, (or best SINAD with 5KHz deviation). Alternately tune the 8 RF Amp trimmer caps (C102, 4, 9, 10, 12, 16, 17, 19) for best quieting (or SINAD), keeping the generator set for about 10dB of quieting (or 10-12dB SINAD). With the generator tuned for the best quieting point in the receiver passband, it should be possible to achieve 0.4uV or less for 20dB of quieting (1/10 the original noise reading). Typical 12dB SINAD point is 0.3uV.

5.1.2 OSCILLATOR/MULTIPLIER ALIGNMENT - Apply a modulated test signal to the antenna jack (about 10uV). Using a standard hex alignment tool, tune the L110 oscillator slug in (CW) until the oscillator stops oscillating. (Received signal disappears.) Slowly turn the slug out (CCW) until the oscillator just starts, then turn the slug out 1 to 1½ turns past this point. The multiplier coils L111 through L114, (and caps C143, C145, C147 for 406-512MHz only), may be roughly tuned for best reception of an extremely weak signal; but for optimum alignment, a sensitive RF detector (RF voltmeter, Spectrum Analyzer, -10dBm power meter, etc.) should be connected to the L.O. Output TP1 shown on the Layout Drawing. The above coils and caps should then be peaked for maximum output.

5.1.3 21.4MHz IF ADJUSTMENT - Set the RF panel meter switch to the "Rx Signal" function. Apply an unmodulated signal to the receiver RF input at the proper frequency and increase the signal level until the front panel meter reads approximately 1/3 scale. Adjust L120 for maximum meter reading. Alternately, L120 may be adjusted for best SINAD on a weak signal, (appx. 0.25uV). (This adjustment is very non-critical.)

5.1.4 QUADRATURE COIL AND DISCRIMINATOR METER ADJUSTMENT - Remove the input signal from the receiver. Set the RF panel meter switch to the "Disc." function. Adjust L122 to center the meter with no signal input. Apply a 100uV (nom.) unmodulated signal to the receiver at exactly 3KHz above the proper receive frequency. Adjust R133 so that the meter reads +3 on the green scale. Remove the signal, and readjust L122 to center the meter. Repeat this process until the proper meter calibration and centering is obtained. (Check calibration at -3KHz.) Then apply a small drop of cement to the coil slug and