RPL-2 (RECEIVER 160 MHz and 450 MHz) CHECKOUT PROCEDURE

TEST DESCRIPTION

The first part of this procedure is usually performed immediately after assembly. The second part, "SETTING FREQUENCY" is done after the operating frequency is known and the crystal is made.

TEST EQUIPMENT REQUIRED

1. Oscilloscope with RF probe
2. VOM (Simpson 260)
3. IF Generator ~ 70 MHz
4. RF Generator ~ 100 MHz or 450 MHz
5. Distortion analyzer - (HP 332A) or VTVM

MECHANICAL INSPECTION

1. Check $\frac{1}{2}$ A fuse on rear panel.

2. Transistors in sockets.

3. Inter-board BNC cables.

ELECTRICAL TESTS

Pre-test set up:
11.155 MHz crystal out of socket
Squelch transistor out of socket.

1. Plug unit into 117 VAC, verify pilot light on.

2. Check power supply, +12 volts DC and -12 V DC (Red wires at front right side).

3. Disconnect BNC coupler between RF and IF boards.

4. Inject 455 kHz (exactly) into J101. Use high level.

5. Connect VOM, -10 volt scale, to blue wire on IF board.

6. Connect oscilloscope to T.P. 201, 0.1 V scale DC, center scope trace FIRST.

7. Using the VOM peak all IF cans while reducing the injected signal to show 3-4 volts on VOM. IF cans adjusted are: L207-L215.

8. Make sure generator is still at exactly 455 kHz.

9. Set disc. to center line on scope.

10. Plug 11.155 MHz crystal in socket.

11. Switch generator to 10.7 MHz exactly.

12. Tune osc. coils for maximum indication on VOM, ~ 1-2 volts.

    NOTE: If oscillator will not start:

    1. Use RF probe coupled to L206 and set for max.
    2. After removing probe, proceed as before.

13. Tune L204, L203, L202, L201 for maximum, in that order. Carefully repeak and lower drive to maintain ~3-4 volts on VOM. (Always observe scope to stay at 10.7 MHz exactly.)

14. Reduce generator gain to zero.

15. Connect VTVM to audio output terminal with ~600Ω resistor in parallel. Use the distortion analyzer instead of VTVM when available.

16. Set volume control for ~+10 dB.

SETTING FREQUENCY

150 MHz Receivers

1. Reconnect cable from 150 MHz board to IF board.

2. Install crystal. Make sure crystal switch (SW101) is in proper position.

3. Connect scope to top at L105 using RF probe. Start at max. sensitivity

4. Adjust L104 for max. scope indication.

5. Peak L105.

6. Move SW101 (crystal switch) to blank position. Verify that oscilloscope stops. Move back to crystal position to insure a start.

7. Connect signal generator to J1 (Ant.) set for ~operating freq. and max. output.

8. Observing VOM, adjust L109, L108 for maximum indication. Reduce generator output to maintain 3-4 volts on VOM as needed.

9. Peak L107, L106, L103, L102, L101 for maximum indication on VOM. Again reduce gain of generator as needed to maintain 3-4 volts on VOM.

10. At this point the generator should be at 10 mV, or less, output with 1 volt on VOM.

11. Set the generator for <u>exact</u> operating frequency.

12. Observe VTVM or distribution analyzer, set coils L109 → L101 for best quieting.

13. Set L105 for best quieting.

14. Alternate between last two steps for best quieting.

15. Repeak L108, L109, L201 → L204 for maximum VOM indication. Always keep VOM approximately 3-4 volts by reducing generator gain.

16. Go back over all 455 kHz IF coils.

17. Sensitivity should be 2 mV for 20 dB quieting (or better).

18. Apply an on frequency signal strong enough for full quieting.

19. Verify that scope trace is centered. If not adjust disc. If the disc was far off, repeak IF and other coils for best quieting.

    NOTE: Always adjust 10.7 MHz and 455 kHz coils for maximum VOM reading.
    Always adjust front end for best quieting.

20. Replace squelch transistor and turn control CCW. Inject 5 μV of signal at antenna.

21. Advance control CW until meter (output, VTVM) indicates output. Note reading. Move control CCW until meter indicates 1 dB below previous reading.

450 MHz Receivers

1. Reconnect cable from 150 MHz board to IF board.

2. Install 70 MHz crystal in one of the sockets. Make sure switch is in proper position.

3. Connect ~ 74 MHz signal to output of 450 MHz converter. Use high level injection.

4. Peak L102, L101, L103, L106, L107 for maximum VOM indication. (VOM is connected to blue wire as before, scope to T.P. 201.) Make sure scope trace is still centered.

5. Preset C130 at half-way point.

6. Apply an on frequency signal (possibly a transmitter).

7. Tune L104 and C130 for scope indication.

8. Remove signal to verify that the proper frequency has been tuned.

   NOTE: If the scope shows no change with the signal off, retune L104 and C130 for new peak. Repeat until the operating frequency is found and the scope indicates when the signal is removed.

9. Remove transmitter and connect signal generator Ant. terminal. Adjust generator for zero disc reading on scope.

10. Peak C1, C2, C4, C9, C12 for best quieting as seen on distortion analyzer (or VTVM) to audio output with 600Ω termination (resistor).

11. Tune L4 for best quieting.

12. Replace squelch transistor, turn squelch control CCW. Inject 5 μV of signal at Ant.

13. Advance control CW until meter indicates output and note reading. Use distortion analyzer or VTVM. Move control CCW until meter indicates 1 dB below previous level.

This completes tune-up.