10.0 MAINTENANCE

CMOS Integrated Circuit devices used in this equipment can be destroyed by static discharges. Before handling one of these devices, the service person should discharge himself by touching the case of a bench test instrument that has a 3-prong power cord connected to an outlet with a known good earth ground. When soldering or de-soldering a CMOS device, the soldering iron should also have a 3-prong power cord connected to an outlet with a known good earth ground. A battery-operated soldering iron may be used in place of the regular soldering iron.

10.1 STATION METERING

The MASTR III station monitors certain DC voltages in the station and displays them. These voltages are used as follows:

PWR - Circular voltage which is proportional to the Reflected power at the output of the optional MASTR III Circulator.

RX - Receiver RSSI (DC voltage proportional to the strength of the signal into the receiver).

TX - Transmitter forward power (DC voltage proportional to the power output of the station). This feature available only on MASTR III Stations with UHF PA's (19D902797G3, 7, 9, 11) or the 800 MHz M3 PA (19D902797G5). The T/R shelf must have the new CB101126V1 Backplane or the old 19D902947G1, Rev C Backplane and the 19D902975G1, Rev C Interface Board. Refer to section 4.0 DESCRIPTION.

EXT - VCO tuning voltage (also can be used to monitor an external DC level).

EXT - VCO Tuning voltage from the 2nd slot from the left on the T/R shelf (also can be used to monitor an external DC voltage by removing jumper J13 on the backplane). This feature requires the CB101126V1 Backplane. Note: To use the EXT metering function to tune the station VCO's requires the 19D902590G6 System modules 19D902590G3-4, remove R184 (19B800607P104, 100KΩ) on the 19D903771 board.

10.2 RETUNING THE MASTR III STATION

NOTE

The following procedures may be used in the field to retune a station if a plug in module has been repaired or replaced or the station frequency has been changed. The preferred method is to use the RF Test fixture and the module alignment found in the specific RF module maintenance manual.

Tx and RX Synthesizers can be tuned using the metering functions available with the Utility handset SPK9024, MASTRUTL (TQ-0619), or MSEDIT (TQ-0653). The VCO tune voltage from the RX Synthesizer slot in the T/R shelf is connected to the external metering jack (EXT_JCK) in the system module. The synthesizers can be tuned using the Ext Metering function of the Utility handset, MASTRUTL, or MSEDIT. If one desires to use the EXT_JCK input on P4 pin 3 of the Metering plug on the station backplane to monitor an external voltage, jumper JMP3 on the backplane must be cut and the signal to be measured must be connected to P4 pin 3.

10.2.1 800 MHz stations

Synthesizers:

1) Program the station for the desired RX and TX frequencies or a frequency pair that is in the center of the desired frequencies. Programmable bandwidth is (500 kHz.

2) Place the RX Synthesizer on an extender card. Alternately, one can remove RX FE and RX IF modules from the T/R shelf gain access to the trimmer slug on the Synthesizer module.

3) Adjust the RX Synthesizer trimmer until the LED on the front of the module goes "out".

4) Monitor the EXT metering field and adjust the trimmer slug for a reading of 5 VDC on the EXT meter. Alternately, adjust the trimmer slug for a reading of 5 VDC on J3 pin 23A.

5) Remove the RX Synthesizer module and the TX Synthesizer module and place the RX Synthesizer module in the slot farthest to the left. Place the TX Synthesizer module in the next slot to the right. Connect the Ref In/Out U-link.

6) Key the station with the REM PTT switch on the System module (or by grounding the DPTT output from the SITEPRO on Simulcast stations).

7) Monitor the EXT metering field and adjust the trimmer slug on the TX Synthesizer for a reading of 5 VDC on the EXT meter. Alternately, adjust the trimmer slug for a reading of 5 VDC on J3 pin 23A.

Front End:

No Tuning required for Front End or IF.

10.2.2 UHF stations

Synthesizers:

TX Synthesizer: No tuning is required for the TX Synthesizer.

RX Synthesizer: Same as 800 MHz for the RX Synthesizer with one addition. The cover must be removed and two slugs (FL1) must be tuned for peak output level using a spectrum analyzer or RF voltmeter. Programmable bandwidth is 2 MHz.
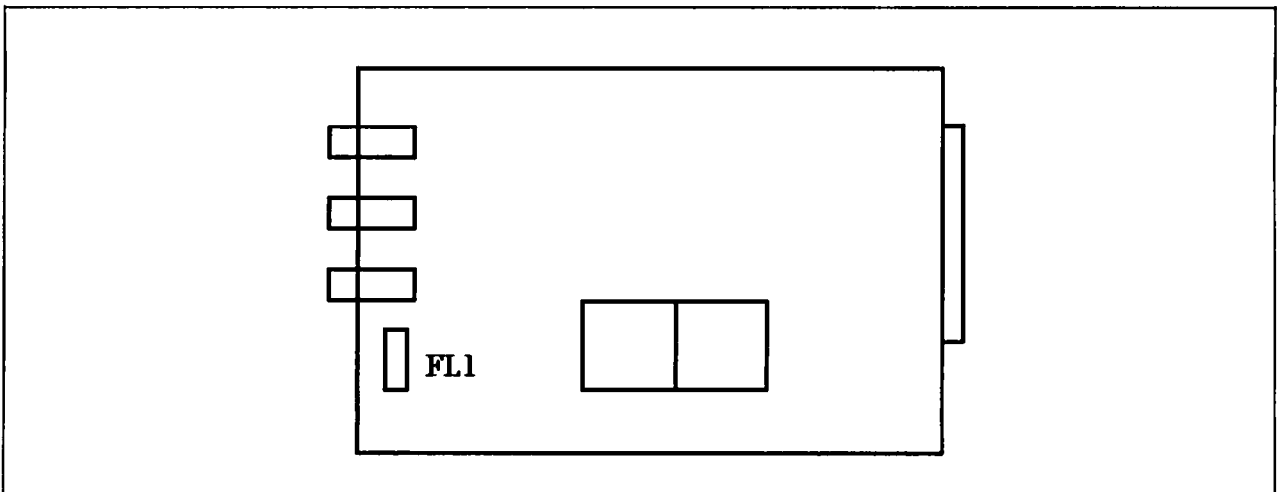

Figure 7 - RX Synthesizer FL1

<u>Front End</u>:

The preferred method of tuning for the RX Front End is using the MASTR III module test fixture and associated procedures. This is required to sweep tune stations for more than one RX frequency. However, when using one frequency, one can peak tune the RX Front End as follows (reference alignment procedure in LBI-38673):

1) Place the RX FE on an extender card and connect the LO out of the RX Synthesizer and the IF out of the Front End to the IF module with 50Ω coax.

2) Preset the Front End tuning slugs per the appropriate RX FE maintenance manual.

3) Using an RF signal generator, put in an "on channel" RF signal into the RF In on the Front End module.

4) While monitoring the RSSI metering function, adjust the RF level of the generator to the responsive range of the meter.

5) Tune the Front End tuning slugs for a peak on the RSSI meter, reduce the input signal level as necessary to keep the meter in the responsive reading range.

6) The IF requires no tuning.

10.2.3 VHF stations

<u>Synthesizers</u>:

TX Synthesizer: Tuning is not required for the TX Synthesizer but the Dip switches must be set as follows:

Freq. Range (MHz)	SW1A	SW1B	SW1C	SW1D
160-174	OPEN	OPEN	OPEN	OPEN
150-162	CLOSED	OPEN	CLOSED	OPEN
142-152	OPEN	CLOSED	OPEN	CLOSED
136-144	CLOSED	CLOSED	CLOSED	CLOSED

RX Synthesizer: Same as 800 MHz for the RX Synthesizer. Programmable bandwidth is ±1 MHz.

<u>Front End</u>:

Same as UHF.