

Integra Tune-Up Procedure

The Integra RF board is initially paired with a production loader board which provides the necessary interface connections to tune the various parameters and store the results in the RF board microcontroller's non-volatile memory. An Integra production tuning software program is run from a PC connected, via serial port, to the loader board.

The production tuning program first puts the unit into transmit mode and instructs the technician to tune the TCXO manually to the proper frequency if required.

The tuning procedure then becomes automated and adjusts the following transmit and receive parameters for three RF frequencies; low, mid, and high channels. The synthesizer Phase Detector current, Modulation Balance, Receive Data DC Bias, and Receive Data Level are adjusted by digital potentiometers. The other tuned parameters are adjusted by a digital to analog converter (DAC). These devices are controlled by the micro controller on the RF board.

Transmit parameters:

- TX Synthesizer Phase Detector current
- TX Modulation Balance
- Max RF Power

Receive parameters:

- RX Synthesizer Phase Detector current
- Front End filter alignment
- Receive Data DC Bias & Level (Values are tuned independently for 12.5 kHz and 6.25 kHz bandwidth options.)
- RSSI DC level (Values are tuned independently for 12.5 kHz and 6.25 kHz bandwidth options.)

Once the values are set properly, they are stored in the non-volatile memory of the RF board's micro controller.

The RF Board is then paired with a Modem Board and the final unit is assembled. The radio will be connected to an automatic testing station where a software program will tune all the remaining radio parameters controlled by the modem.

Transmit parameters:

- TCXO final adjustment
- Transmit RF Power Calibration and final adjustment
- Transmit Deviation adjustment

Receive parameters:

- Receiver final data level adjustment
- Receiver RSSI Calibration

For transmit parameters, the tuning program will key up the radio at three points across the band and sets the power to 5W. Power control is achieved by controlling the voltage on pin 2 of the PA module, which controls the RF drive to internal gain stages. The power output is programmable by using a digital to analog converter (DAC) on the RF board. This DAC is controlled by the on-board microprocessor.

Once the DAC value is determined for these three frequencies the modem's processor interpolates the DAC value for frequencies in between the calibrated frequencies. This ensures equal power output across the entire RF band.

Once the values are set properly, they are stored in the non-volatile memory of the Modem board.