TYPE OF EXHIBIT:	TUNE-UP PROCEDURE
FCC PART:	2.1033 (c)(9)
MANUFACTURER:	RITRON, INC. 505 West Carmel Drive Carmel, IN 46032
MODEL:	DTX-142
TYPE OF UNIT:	VHF-FM Two Way Radio Transceiver Module
FCC ID:	AIERIT17-142
DATE:	May 30, 2003

DTX-142 ALIGNMENT PROCEDURE

TRANSMITTER VOICE & DATA DEVIATION

If the transmitter voice deviation needs adjustment perform the following.

1) Set the RF communications test set to the transmit mode.
2) Set audio filtering from <20 Hz to 15 kHz.
3) Set to FM demodulation with +/- peak deviation.
4) Connect oscilloscope to the demodulated output.
5) Select low edge channel on channel select inputs CS2, CS1 and CS0.
6) Connect sinusoidal 400 Hz audio source to pin 4 microphone input and set to 1 kHz and 100 mV peak-peak .
7) Ground /PTT (pin 14) to transmit.
8) Adjust deviation pot R388 for peak deviation of 4250 +/- 50 Hz.*
9) Adjust the balance pot R304 to give a flat sloop on the demodulated output oscilloscope waveform.
10) Readjust R388 as needed to maintain 4250 Hz deviation.
11) Stop transmitting by releasing the /PTT line on pin 14.
12) Check the upper channel to confirm similar performance.
13) Readjust both channel band edges as needed for the best compromised performance.

*NOTE: Sub audible tone deviation is automatically set to be within 600 to 900 Hz after this adjustment on wide band tone channels. Maximum voice and tone deviation on wide band channels will then be 4850 to 5150 Hz. Narrow band tone deviation will be 350 to 500 Hz with overall deviation of 2450 to 2600 Hz.

Having set up voice deviation, connect a data source to pin 7 of J301. Adjust R375 to obtain needed data deviation. Typically this will be +/- 3 kHz for a wideband channel and +/- 1.5 kHz for a narrowband channel.

RECEIVER FRONT END TUNNING

The DTX-142 receiver is factory tuned for a frequency range of 136 to 156 MHz (low split) or 154 to 174 MHz (high split). If receiver appears to be less sensitive on one of the band edges the front end tuning coils may need readjustment. Connect a SINAD meter to the SPEAKER output (pin 12). Unsquelch the audio amp by grounding pin 11. Set the generator to the upper band edge frequency programmed at –121 dBm with +/- 2.5 kHz deviation. Adjust coil cores L101 and L102 in until SINAD starts to drop. Back off slightly to maintain best SINAD. Now, set generator to the lowest frequency programmed at –121 dBm. Similar SINAD readings as the high band edge frequency should be obtained. If not, adjust coils slightly. Recheck high end and balance performance.

RECEIVER SQUELCH

The DTX-142 is capable of two squelch operating modes. Also, both can operate simultaneously. See the theory above. The units can be configured as the user requires. When the noise squelch is used the radio unsquelches when the carrier SINAD exceeds 12 db. If this is not happening or the squelch opening level needs to be changed perform the following.

1) Select a channel.
2) Adjust squelch pot R144 fully counter clockwise.
3) Ground the MONITOR pin 11 to unsquelch the radio.

4) Adjust the communications test set generator on frequency with an output level to yield a 12 dB SINAD. The deviation should be +/- 1.5 kHz for narrow or 3 kHz for wide with a 1 kHz tone.
5) Release pin 11 from ground to allow squelch to operate.
6) Slowly adjust squelch pot R123 clockwise until squelch opens.
7) Reduce generator level until radio squelches.
8) Increase generator level until audio opens. Confirm squelch hysteresis is between 0.5 and 4 dB.

Set up for the RSSI squelch is similar except a fixed level, typically –110 dBm, is set on the generator and the RSSI squelch pot R123 is rotated clockwise until it opens. Ambient noise will affect the level at which the RSSI should be set. The squelch level ideally should be done on the desired frequency, in the actual location the radio will be used and connected to the desired antenna. The level should be set high enough to reject most false signals.