PARTS LIST AND TUNE UP PROCEDURES

(CONFIDENTIALITY REQUESTED)

This exhibit contains a list of the semiconductor devices used in the transceiver and the test equipment and tuning procedures for maintaining the transceiver.

EXHIBIT 10A	Function of RF Semiconductors and Other Active Devices
EXHIBIT 10B	List of Recommended Test Equipment for Servicing
EXHIBIT 10C	Tune Up Information

Exhibit 10A - Function of RF Semiconductors & Other Active Devices

Pursuant to 47 CFR 2.10339(c)(10)

REF NO	Circuit Application	INDUSTRY EQUIVALENT
CD501	Discriminator	IFD0455C24E03
F402	Filter	45N12A5 (45.1MHz) UM-5J-SMD
F501	Filter	BLFYM455D
F502	Filter	ALFYM455G
Q201	DC Switch	2SB798-T1 DK
Q202	DC Switch	UMW1N TL
Q203	Protect	1SR154-400 TE25
Q204	DC Regulator	XC62HR5002PR
Q208	TX/RX Switch	RN2102
Q209	TX/RX Switch	RN1102
Q210	Save Switch	2SA1362-GR TE85L
Q211	RX Save Switch	RN2110
Q308	VCO Buffer	2SC5086-Y TE85L
Q309	TX/RX VCO Switch	2SJ243-T1
Q310	TX/RX VCO Switch	UMC4N TR
Q311	RX VCO	1SV228-TPH3
Q314	PLL Loop Filter	2SA1586-GR TE85L
Q315	PLL Loop Filter	2SC4116-GR TE85L
Q316	PLL Loop Filter	UDZ S 7.5B TE-17
Q319	PLL Unlock detect	1SS355 TE-17
Q323	PLL IC	MB15A02PFV1-ER
Q324	RX VCO	2SC4226-T1 R24
Q325	TX VCO	2SC4226-T1 R24
Q326	TX VCO	1SV228-TPH3
Q329	Modulation	1SV279-TPH3
Q330	DC Filter	2SC4116-GR TE85L
Q331	Filter Switch	2SC4116-GR TE85L
Q332	DC/DC Rectification	RB521S-30 TE61
Q333	DC/DC Converter	TK11850LTL
Q334	Reference Voltage	TAR5S33
Q401	RF BPF Filter	1SV225-TPH3
Q403	RF Protect	1SS362-TE85L
Q404	RF Amplifier	2SC5086-Y TE85L
Q405	RF BPF Filter	1SV225-TPH3
Q407	Mixer Diode	HSMS-2817 (B7)

Exhibit 10A - Function of RF Semiconductors & Other Active Devices (cont'd)

Q408	1st IF Amplifier	2SC4215-Y TE85L
Q409	ANT Switch	HVU131TRF
Q410	ANT Switch	MA4PH262
Q411	TX Filnal Amplifier	2SK3476
Q412	TX Driver Amplifier	2SK3475
Q413	TX Pre-driver	2SC3356-T1B R24
Q414	TX Buffer	2SC5086-Y TE85L
Q415	VCO Switch	HSC277TRF
Q416	RX Local Buffer	2SC5086-Y TE85L
Q417	PA Switch	RN1102
Q418	PA Switch	RN1104
Q419	PA Controle	LM2904PW
Q501	Discriminator Switch	UMC4N TR
Q502	RX HPF	LM2902DTB
Q503	SQ Switch	2SJ144Y-TE85L
Q504	N/W Switch	RN1104
Q505	RX LPF	LM2902DTB
Q506	IF IC	TA31136FN-TP1
Q507	RX N/W Switch	DAN235ETL
Q508	RX N/W Switch	DAN235ETL
Q509	RX N/W Switch	RN2104
Q510	RX HPF	NJM2107F (TE1)
Q511	RX N/W Switch	RB521S-30 TE61
Q512	Audio Switch	HSC277TRF
Q513	Audio Switch	RB521S-30 TE61
Q601	TX N/W Switch	RN1104
Q602	Mic Amplifier	LM2902DTB
Q604	Audio Switch	RB521S-30 TE61
Q605	N/W Audio Switch	RN1104
Q608	N/W Audio Switch	RN1104
Q609	Audio Switch	UMG2N TR
Q610	VOX Amplifier	LM2902DTB
Q613	DTMF Switch	RN2104
Q615	TX Audio Mute	1SS361
Q616	TX Audio Mute	SSM3K03FE-TE85L
Q617	Sub Audio Amplifier	NJM2107F (TE1)
Q701	Audio Mute Switch	RN1104
Q702	Audio Amplifer	TDA8541T/N1
Q703	PTT Switch	RN1104
Q704	PTT Switch	2SA1586-GR TE85L

Exhibit 10A - Function of RF Semiconductors & Other Active Devices (cont'd)

Q705	Battery Protect	1SR154-400 TE25
Q706	Protect	UDZ S 6.8B TE-17
Q713	Battery Protect	2SC2859
Q714	Battery Protect	2SC4116-GR TE85L
Q715	Battery Protect	UDZ S 20B TE-17
RV601	TX Deviaton Adj	VG025CHXTB103
RV602	DTMF Deviation	VG025CHXTB103
RV603	Sub Audio Dev Adj	VG025CHXTB103
X301	Reference TCXO	HKE3065B
X501	2nd Local Crystal	HU-816-106

Exhibit 10B - List of Recommended Test Equipment for Servicing

Instrument	Recommended Type	Application
RF Signal Generator *	HP 8656B or equivalent	Receiver Measurements
Modulation Analyzer *	HP 8901B or equivalent	Frequency and Deviation Measurements
Audio Analyzer *	HP 8903A or equivalent	Receiver Measurements
Power Meter *	HP 438A or equivalent	Transmitter Power Output
Power Sensor *	HP 8482A or equivalent	Transmitter Power Output
DC Power Supply	0-20 volts at 15 amps	Power Supply
Attenuator Pad *	50 Ω, 20 Watts, 30 dB	Transmitter Measurements
DC Ammeter	30 mA to 20 A	Current Drain Measurements
Computer	IBM PC, PC/XT or PC/AT	Radio Alignment
IF Test Box	DSK001C702	Radio Interface to Test Equipment
Programming Cable	DSK001C706	From Radio to Computer
Test Cable	DSK001C704	From Test Box to Radio
Battery Eliminator	DSK001C705	From Radio to Power Supply

* These items can be replaced by a Motorola 2000 Series Communications System Analyzer or equivalent piece of integrated communications test equipment.

Exhibit 10C - Tune Up Information

Pursuant to 47 CFR 2.10339(c)(9)

Only 2 parameters are adjustable, transmit power adjustments is performed by electronic means and modulation limiting is performed by by adjusting the potentiometer.

The tuning elements that are used for transmitter adjustment are:

Location	Type of Element	Function
Q101	Microprocessor	Supplies data to Audio Filter IC, Fractional-N Synthesizer, Temperature Compensated Crystal Oscillator, and Power Control IC for Transmitter Modulation, Frequency and Power Adjustment
Q121	Digital to Analog Converter	Transmitter Power Adjustment
RV601	Potentiometer	Modulation Limiting Adjustment

For TX power adjustment the value of a particular tuning element is determined by data sent to that tuning element by microprocessor Q101. This data is generated by the microprocessor based on tuning information that is stored in the EEPROM (Electrically Erasable Programmable Read Only Memory).

Tuning information is stored in the EEPROM during factory adjustment or by qualified field service facilities, using the attached procedure and recommended test equipment.

Tuning Procedure

1. Transmitter Power Adjustment

a. Select TX Power tab to open up the TX Power window.
b. Press NiMH/NiCD or Alkaline tab to select the type of battery in use.
c. Press the button that contains the frequency to be tuned.
d. Press PTT ON. This will key up the radio at the frequency chosen at step (3).
e. Adjust the high power level as defined by country power level specifications by moving the slider control.
f. Press PTT OFF to dekey the radio.
g. Repeat steps 3-6 for the other frequencies.
h. Press Program to store the softpot values into the radio's codeplug.
i. Exit the TX Power window.

Radio	Power Level	Target Power	Lower Limit	Upper Limit
VHF	High	4.30 W	4.0 W	4.7 W
	Low	2.1 W	2.0 W	2.30 W

Table 1: Tuning Power

2. Modulation Limiting Adjustment

a. Set the radio to transmit at the appropriate tuning frequency (see Table 2) with low power. Set Channel Spacing to "CS-25.0" for 25kHz (see "*RADIO PROGRAMMING*" on page 4-1).
b. On the test equipment, set it to receive at the appropriate tuning frequency (see "*Tuning Frequency*" on page 3-4) and with the following configurations :
Audio bandwidth: 0.25Hz to 15,000Hz.
De-emphasis: OFF
c. Inject a 60mV 1kHz tone to the radio through the extenal mic connector.
d. Key up the radio.
e. Using the ceramic tuning tool, adjust RV601 to tune the audio modulation deviation to settle between 4.3kHz to 4.5kHz.

Band	Frequency (MHz)
UHF 435-480 MHz	457.025

Table 2: Tuning Frequency