EXHIBIT 2

TECHNICAL DESCRIPTION, Part 2.983(d)

TYPE OF EMISSION, Parts 2.983(d)(1) and 80.207(d): 16K0G3E

Note: The necessary bandwidth was determined from the table in Part 2.202(g) based on highest modulation frequency of 3000 Hz and peak frequency deviation of 5000 Hz.

FREQUENCY RANGE, Part 2.983(d)(2):

Transmit: 156.0 to 157.5 MHz
Receive: 155.0 to 164.0 MHz

RANGE OF OPERATING POWER LEVELS, Part 2.983(d)(3):

Two carrier power levels are provided: 25 watts and 1 watt.

MAXIMUM POWER LEVEL, Part 2.983(d)(4): 25 watts carrier.

The transmitter complies with 80.215(c)(1),(e) and (g) concerning allowable maximum power, manual and automatic power reduction and manual power override.

DC VOLTAGES AND CURRENTS APPLIED TO FINAL AMPLIFIER,

Part 2.983(d)(5):

Test conditions:

DC voltage measured at pin 3 (Hi dc) of rf power amplifier module U8 which is the dc power input point to final power amplifier stage (See transmitter printed wiring board schematic diagram in Instruction Manual). DC current measured into same pin as above. Transmitter operated on a frequency in the middle of its range and set to 25 watts average output power.

DC Voltage: 13.1 Volts DC Current: 4.5 Amps

FUNCTION OF EACH ACTIVE DEVICE, Part 2.983(d)(6)
RF Mainboard Assembly, ASY-7157-01:

Reference	Type	Function
Q1	J310	CH 70 RX VCO
Q2	MMBR5179	CH 70 RX VCO Buffer Amp

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Q3	MMBR5179	CH 70 RX LO doubler
Q4	J310	CH 70 2nd LO Buffer Amp
Q5	MMUN2213T1	Lock Detect Buffer
Q6	J310	45 MHz IF Amp
Q7	MMBR5179	45 MHz IF Amp
Q8	MMBR5179	45 MHz IF Amp
Q9	J310	Main RX 2nd LO Buffer Amp
Q10	MBT2222	Main VCO Bandswitch
Q11	J310	Main VCO
Q12	MMBR5179	Main VCO Buffer Amp
Q13	BFS17	Main VCO Buffer Amp
Q14	MRF3866R2	Pre-pre-driver RF amplifier
Q15	2N3866	Pre-driver RF amplifier
Q16	2N7002	DC amp for RF power control
Q17	MJF6107	DC pwr amp for RF power control
Q18	MMBT2222	RF output logic buffer
Q19	2N7002	TX modulation shunt gate
Q20	MMBTA42	Ant relay control switch
Q21	MMBT2907	+8 VRX switch
Q22	MMBT2907	+8 VTX switch
Q23	MMBT2907	+13 VRX switch
Q24	MMBT2907	+13 VTX switch
RT1	PTC	Master osc. crystal heater
U1	NE602D	CH 70 RX 1st mixer
U2	MC3371D	CH70 RX 2nd mixer/IF/detector
U3	MC145162D	CH70 RX dual synthesizer
U4	78L05	CH70 RX +5 Volt regulator
U5	NE5200D	Main RX RF amplifier
U6	MC3371D	Main RX 2nd mixer/IF/detector
U7	MC145162D	Main RX 2nd osc synthesizer
U8	S-AV6	TX power amp module
U9	LM358D	TX pwr control/RF comparator
U10	MB1505D	Main VCO synthesizer
U11	.....not used.....	
U12	MC34074D	Mic amp/limiter/RX AF amps
U13	LTC1083	TX audio low pass filter
U14	74HC589D	Parallel/serial interface
U15	74HC595D	Serial/parallel interface
U16	74HC00D	TX keyline interlock
U17	ULN2003	Hex darlington buffer
U18	78M05	+5 V regulator
U19	78M08	+8 V regulator

CPU/DSC Assembly, ASY-7157-02:

Q1	2N7002	Real time clock access protect
Q2	MBT2222	Backlight level control
Q3	IRFZ48N	DC/DC converter switch FET
Q4	IRFZ48N	DC/DC converter switch FET
Q5	MBT2222	Keypad backlight drive

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Q6	MBT2222	LCD backlight drive
Q7	2N7002	Microphone input mute
Q8	2N7002	Speaker output squelch gate
Q9	FMMT720PNP	DC/DC converter output driver
Q10	FMMT619NPN	DC/DC converter output driver
Q11	LM50	Temperature sensor
Q12	2N7002	External mute circuit
Q13	2N7002	External mute circuit
Q14	2N7002	External mute circuit
U1	MC68HC812A4PV8	Microprocessor (CPU)
U2	M29F200T-70N1	128x16 flashROM (program memory)
U3	TC551664AJ-25	Static RAM (data memory)
U4	DS1283S	Real Time Clock
U5	28C65	8Kx8 EEPROM (scratchpad memory)
U6	74HC373	CPU port expansion latch
U7	74HC595	serial/parallel printer driver
U8	DS1267S	Squelch and LCD contrast control
U9	75176	NMEA 0183 output driver
U10	ADM232	RS-232 driver
U11	74HC00	CPU "glue" quad NAND gate
U12	73M223-CL	V.23 MODEM (working channel DSC)
U13	73M223-CL	V.23 MODEM (CH 70 DSC)
U14	TDA2002	Audio power amplifier
U15	7815	+15 V regulator for DC/DC con
U16	7805	+5 V regulator for CPU
U17	LM358D	LCD bias drive amplifier
U18	LTC1339	DC/DC converter controller
U19	74HC373	CPU port expansion latch
U20	PC353T	NMEA 0183 RX port isolator
U21	TL7705	Microprocessor reset generator

COMPLETE CIRCUIT DIAGRAM, Part 2.983(d)(7):

See Chapter 7, SEA 7157 Instruction Manual (Enclosed).

INSTRUCTION BOOKS, Part 2.983(d)(8)

See Preliminary SEA 7157 Instruction Manual (Enclosed).

TUNE-UP PROCEDURE, Part 2.983(d)(9)

See Preliminary SEA 7157 Instruction Manual (Enclosed), Chapter 4, "Installation" and Chapter 6, "Maintenance".

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FREQUENCY DETERMINING AND STABLILIZATION CIRCUITS,
Part 2.983(d)(10)

Please refer to the following diagrams for this discussion:

SEA 7157 Functional Block Diagram, Figure 7.1 and Mainboard Schematic Diagram, Sheet 1 in the Preliminary SEA 7157 Instruction Manual (Enclosed).

General: The frequency determining circuits perform within ± 5 ppm frequency stability limits over the temperature range of at least -20 to +50 C

Detailed discussion: The SEA 7157 uses a 12.800 MHz master crystal oscillator (part of U10 located on RF Mainboard) as the master transmitter frequency reference. This oscillator, with its associated components, is the sole source of both transmitter and receiver frequency stability. It's frequency is divided by 1024 to provide the 12.5 kHz reference for the VHF frequency synthesizer.

The single loop synthesizer uses LSI circuit synthesizer chip (U10) which contains a dual modulus prescaler, frequency dividers and a phase detector with tri-state output. Phase pulses from the phase detector are integrated by the loop filter and the resulting voltage provides the tuning control for the voltage controlled oscillator (VCO, Q11).

During transmission, the VCO operates directly at the transmitter output frequency in the 156 MHz band and is phase and frequency locked to an integer multiple of the master oscillator frequency divided by 1024 (12.5 kHz). The frequency of the synthesizer is equal to (N/1024)x12.800 MHz; e.g., the value of N is 12,544 for a synthesizer output frequency of 156.800 MHz. The VCO changes frequency in exact proportion to any change in the 12.8 MHz master oscillator frequency. A one ppm change in master oscillator frequency would result in a one ppm change in transmitter output frequency.

Any circuit failure which causes the VCO to depart from a stable phase-locked condition results in lengthening of the phase pulses on pin 7 of U10. These pulses are detected as a logic level change by an input port on the microcomputer. The microcomputer then disables transmission.

The master oscillator (part of U10) is a Colpitts type which uses a 12.800 MHz, high stability AT-cut fundamental mode crystal (Y1) tightly bound to a positive temperature

coefficient thermistor (PTC) which is used as a crystal heater at temperatures below zero degrees C.

The crystal oscillator components include a negative temperature coefficient capacitor (C153) to compensate for capacity variations in U10 with temperature. Without the PTC installed, the oscillator holds within ± 5 ppm frequency stability limits over -10 to +60 degrees C. The crystal itself, as opposed to the other oscillator circuitry, dominates the frequency stability at extreme temperatures. The PTC has a sharp knee in its temperature characteristic curve so that its power dissipation increases dramatically below zero degrees C ambient. The PTC delivers an adequate amount of heat to the crystal to keep the crystal case temperature above -10 degrees C for ambient temperatures down to -30 degrees C. Thus the crystal is maintained above the lowest temperature beyond which it would otherwise exceed the 5 ppm limit. At normal room temperatures or above, the PTC has negligible effect on the oscillator frequency.

DESCRIPTION OF MODULATION LIMITING, POWER LIMITING AND SPURIOUS RADIATION SUPPRESSION CIRCUITRY, Part 2.983(d)(11)

Several circuits in the transmitter play a significant role in reducing unwanted emissions, limiting output power and limiting peak frequency deviation. These circuits are described below beginning at the audio section and progressing through to the RF output port. Please refer to the transmitter-receiver-synthesizer schematics in the Instruction Manual for specific circuits.

1. Audio Preemphasis: C171, C171, CR14 and R118 form a combinational preemphasis and two-sided clamper/clipper network. The frequency response is +6 dB per octave over the voice frequency range of 300-3000 Hz.

2. Audio Limiting/Clipping: Operational amplifier U12C amplifies audio processed by the previous network. At low input levels it is linear. As the input level rises it begins to symetrically clip the wave due to the output amplitude attaining voltage peaks equal to the power supply rails. As the microphone input audio level increases even further, CR14 "clips" the inner portions of the incoming wave. The net effect at the output of the limiting ampifier, U12C, is that the duty ratio of the clipped waves first approaches a square wave shape and then the duty ratio decreases as mic input level continues to rise.

A Fourier analysis will show that as the audio input wave amplitude is varied from a low level to a very high level, the

fundamental frequency of the wave (which is the highest amplitude Fourier component of the complex wave) at the limiter output will rise to a certain peak amplitude and then actually begin to decrease in amplitude because of the duty ratio reduction. This type of amplitude response is quite effective in assuring that audio overdrive will not overdeviate the transmitter frequency.

3. Audio Lowpass Filter: U13 is a five-pole switched capacitor audio lowpass filter which attenuates audio components above approximately 3000 Hertz and thereby is significant in limiting the occupied bandwidth of the transmitter.

4. RF Amplifier Chain: This chain uses tuned narrowband amplifiers so that unwanted frequencies are not amplified.

5. RF Output Lowpass Filter: This five-pole low pass filter which is just prior to the antenna terminals attenuates harmonics of the transmitter output frequency.

6. Automatic Power Control (APC) System: This is a negative feedback control system which continuously monitors and if necessary corrects the output power at the antenna terminals. C141 samples the RF voltage RF powert amplifier output terminals. This is rectified into a dc level and fed to the differential amplifier (U9B) which drives the dc amplifier (Q16 and Q17) to provide the correct dc supply voltage to Q15 and the first stage of U8. This in turn creates the proper RF drive to the final amplifier stage. Two reference comparison levels are used at the differential amplifier input for 1 watt and 25 watt output levels. When adjusted according to the alignment instructions, the APC system will closely maintain the 1 w or 25 w output level (as selected) over a wide range of power supply voltages and ambient temperatures. The final RF power amplifier stage cannot produce more than about 30 watts even in the unlikely event that the automatic power control system should fail.