GENERAL INFORMATION

FCC Reference Pursuant

1. Production Plans 2.983 (c)
   Quantity production is planned.

2. Data Submittal Procedure
   Data is supplied in accordance with Part 2, Sub-part J of the Commissions rules.

3. Similar currently Type Accepted Transmitter, FCC ID: LX697FT4004.

DESCRIPTION

1. Transmitter Technical Characteristics – Pursuant 2.983 (d)

A. RF Power Out	2	Watts
B. Frequency Range		
Receiver	929-941	MHz
Transmitter	896-902	MHz
C. Frequency Stability	1	PPM
D. Emissions	10KOFID	
E. Spurious Emissions	-46 dBc	
F. DC Voltage and Current into the	4.5	Volts
final RF Power Amplifier stage/stages	1.1	Amps

Note: The following is the necessary bandwidth calculation.

Personal Messaging Unit Specifications:
Deviation = 2400 Hz maximum
Maximum modulating frequency = 4800 symbols/2 symbols per cycle = 2400 Hz
(Note: 9600 bits per second/2 bits per symbol = 4800 symbols per second)

Bn = Necessary bandwidth, Hz
M = Max modulating frequency, Hz
D = Peak frequency deviation, Hz

Bn = 2M + 2D
= 2(2400) + 2(2400)
= 9600 Hz

2. Transmitter Application

This transmitter use is for the transmission of data only at 800, 1600, 6400, and 9600 bits per second to provide four level FSK modulation.

A. Power Supplies

CreataLink™2 XT is powered by an external 5 - 12 V DC power supply. The transmitter circuitry is powered from a 4.5 volt regulator and a 3.3 volt regulator. The receiver circuitry is powered from 4.5 volt regulator and a 3.3 volt regulator. The controller is powered from a 5 volt regulator and a 3.3 volt regulator.

DESCRIPTION – CONTINUED

B. Antenna Available

1. Transmit
   No antenna will be supplied with CreataLink2 XT. An external antenna is connected to the personal messaging unit's RF connector. Motorola's optional external antenna meets e.r.p. limits. Integrators will be advised of e.r.p. limits imposed on them in selecting an antenna.

2. Receive
   No antenna will be supplied with theCreataLink2 XT. An external antenna is connected to the personal messaging unit's RF connector.

C. Squelch Types (not applicable)

D. Microphone (not applicable)

E. Maximum Transmit Channel Capability
The product is capable of a maximum of 1023 transmit channels.

F. Housing (not applicable - the transmitter is sold as a bare board with shielding.)

G. Other Options

1. External Antenna Kit
   The external antenna kit consists of a low-profile monopole antenna with a radome and six feet of RG58/U coax with an RF connector.

CIRCUIT DESCRIPTION

This section provides the description of circuits required by subpart 2.983 of the Commissions' rules.

The following are included:

	Circuit Name	Exhibit Number
1.	Carrier Frequency Generation and Stabilization	7A
2.	Modulation Limiting	7B
3.	Means for Attenuating Spurious Emissions	7C
4.	Means for Limiting Power to Two Watts	7D
5.	Means for Limiting Impact of Externally Connected Signals	7E

CIRCUIT DESCRIPTION – CARRIER FREQ. GENERATION & STABILIZATION

1. Carrier Frequency Generation and Stabilization

Reference Oscillator and Fractional N Synthesizer

The factors which have a direct impact on the frequency generating stability of the carrier are the stability of the reference oscillator, the ability of the charge pump to hold its voltage, and the phase lock loop's ability to track out changes in the system while keeping the system phase-locked during operation. The reference oscillator used is a voltage-controlled 16.8 MHz quartz crystal (VCXO), which once locked to a forward channel is digitally compensated to guarantee that the output frequency variation is within 0.5PPM over the temperature range of -40 to +85C. Temperature compensation is performed by sending a digital word to an external voltage digital-to-analog converter (DAC), which adjusts the VCXO control voltage to adjust the frequency. The DAC has a tuning range of 0.1 to 3.5 VDC. This allows precise frequency adjustment using small linear steps. The adjustment range allows for a 60 PPM frequency shift.

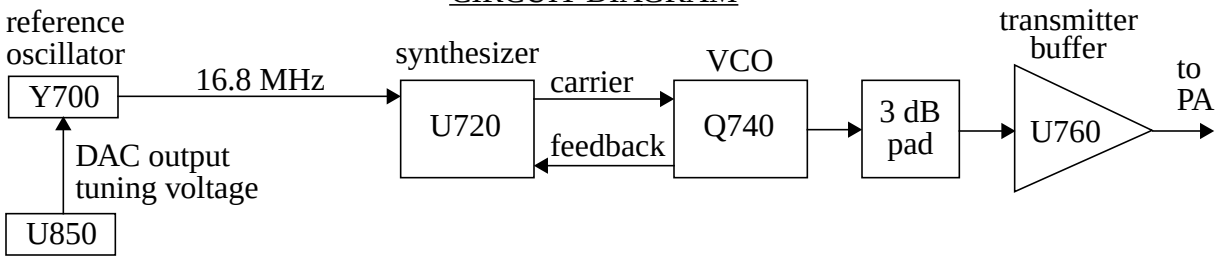
The charge pump voltage multiplier, which supplies the transmitter voltage controlled oscillator (VCO) steering voltage, uses a buffered and divided sample of the 16.8 MHz VCXO signal from which the voltage multiplier diodes are clocked. This allows the demands of the control line voltage required to keep the loop locked to be met. The 16.8 MHz signal is also further divided to supply the reference frequency to the phase comparator, which in turn makes adjustments based on the phase difference of the reference frequency and the sampled VCO output frequency. All these circuits, along with the AFC (Automatic Frequency Control) algorithm, are tied back to the VCXO, allowing for 1 PPM frequency stability to be maintained.

Transmit Voltage Controlled Oscillator

The transmitter VCO consists of a buffer amplifier and a varactor-tuned tank circuit. The output impedance of the VCO is fixed with R742. This minimizes frequency shifting due to impedance changes at the output of the transmitter buffer and its corresponding input and output pads. The transmitter buffer also serves to isolate the VCO from the power supplies in order to minimize loading effects of the power amplifier on the VCO and thus maintain frequency stability.

Exhibits 5C contain the schematics for the above described circuitry.

CIRCUIT DIAGRAM



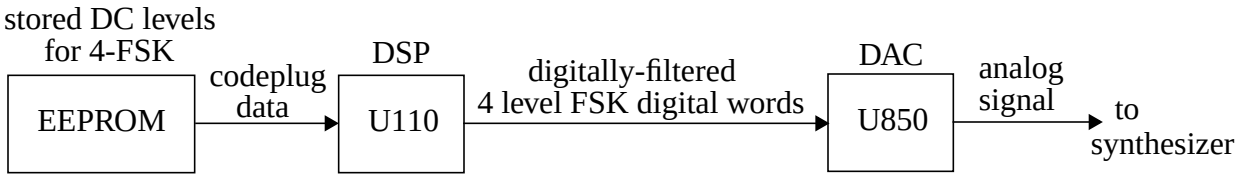
CIRCUIT DESCRIPTION – MODULATION LIMITING

2. Modulation Limiting

The CreataLink2 XT has a modulation scheme which prevents overmodulation by utilizing a digital signal processor (DSP). The DSP controls the DC levels for FSK modulation while applying a digital splatter filter. The four DC levels are determined at the controller system level by measuring the frequency deviation level for each of the four symbol choices. Unique values based on this determination are stored in the codeplug EEPROM (Electrically Erasable Programmable Read Only Memory) which when recalled represent the DC levels governing the deviation limits. The DAC (Digital-to-Analog Converter) creates the analog 4 level FSK signal. The transmitter's deviation is then measured later at the radio system level.

Exhibits 5 and 5C contain the schematics for the above described circuitry.

CIRCUIT DIAGRAM



CIRCUIT DESCRIPTION – MEANS FOR ATTENUATING SPURIOUS EMISSIONS

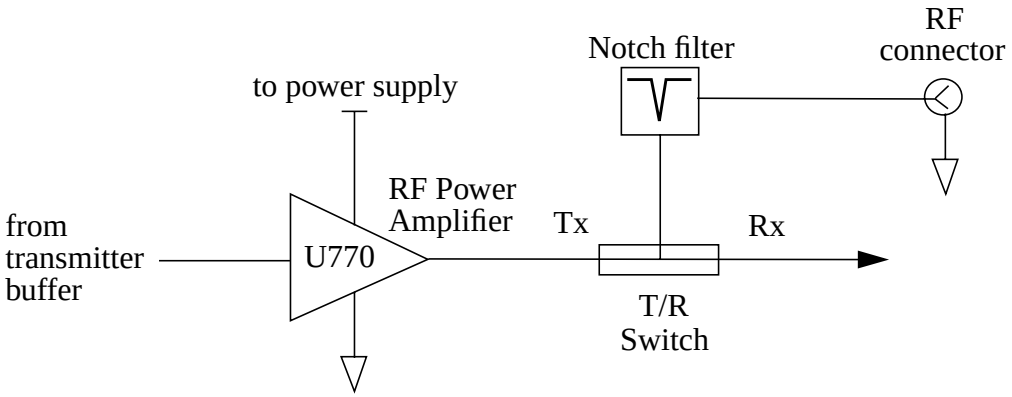
3. Means for Attenuating Spurious Emissions

The RF connector J830 is connected to the output of the power amplifier via a T/R switch. Conducted spurious and conducted harmonic protection is provided by filtering characteristics of the discrete antenna switch circuit, which is optimized for 900 MHz. The second harmonic is further attenuated 15 dB by a notch filter after the antenna switch. The power amplifier's second and third harmonic content does not exceed -35 dBc and -45 dBc, respectively. At the RF connector the total conducted second harmonic level is -63 dBc, the third harmonic level is -50 dBc, and the fifth harmonic level is -58dBc. There are no other detectable conducted components above -70 dBc.

When the Creatalink2 XT is used with the optional external antenna, the total radiated second harmonic level is -60.2 dBc and -62.2 dBc for third harmonic. There are no other detectable radiated components above -70 dBc.

Exhibit 5B and 5C contains the schematics for the above described circuitry.

CIRCUIT DIAGRAM



CIRCUIT DESCRIPTION – MEANS FOR LIMITING POWER AT TWO WATTS

4. Means for Limiting Power at Two Watts

Thermal protection, forward power level control, reverse power protection, and overcurrent protection considerations are discussed below:

The CreataLink2 XT transmitter has no provisions for thermal protection or forward or reverse power control. The transmit duration is fragmented over a 1.875 second frame length and ranges from 16 to 550 milliseconds, which is too small a time for the use of any forward or reverse power control and will not pose any thermal problems. Current-limiting is provided by the 4.5 volt regulator.

Note: At time of manufacture, the CreataLink2 XT's conducted output power will be tuned to a maximum output of 2 watts via the ouput power tuning value in the codeplug. This tuning value will never be able to be exceeded once the product is in the field, thereby limiting the output power to a maximum of two watts.

CIRCUIT DESCRIPTION – MEANS FOR LIMITING IMPACT OF EXTERNALLY CONNECTED SIGNALS

5. Means for Limiting Impact of Externally Connected Signals

Power Supply Connections

Noise reduction in the power supply is taken care of by filtering. The regulators provide natural rejection to the power supply ripple, and bypassing of the output of each regulator provides additional noise suppression. Zener diodes are used for transient and electrostatic discharge (ESD) protection.

Externally Supplied Analog and Digital Signals

These signals are not electrically related to the transmitter, but rather are connected to switching transistors or to inputs of CMOS ICs. Transient and ESD protection is taken care of by way of zener diodes.