

Exhibit 4

General Information

General Information for Non-Broadcast Transmitter (Part 90) Device, §2.1033(c)(10)

(1) Manufacturer/Applicant:

Meteor Communications Corporation
22614 66th Avenue South
Kent, WA 98032

(2) FCC ID: BIB61201001

Equipment Class: Licensed Non-Broadcast Transmitter

(3) Installation and Instruction Manuals: See Exhibit 14.

(4) Types of Emission: see below

(5) Frequency Ranges: see below

(6) Operating Power Levels: see below

Item	FCC Rule part	Frequency range (MHz)	Output (W)	Frequency Tolerance	Emission Designator	Waveform/ Channel Sp
1	90	39-50 MHz	100	20 ppm	20K0F1D	19.2 GMSK 25kHz
2	90	39-50 MHz	100	20 ppm	14K4F1D	9.6 GMSK 25kHz
3	90	39-50 MHz	100	20 ppm	8K00G1D	4k BPSK 25kHz
4	90	151-162 MHz	33	2.5 ppm	20K0F1D	19.2 GMSK 25kHz
5	90	151-162 MHz	33	2.5 ppm	14K4F1D	9.6 GMSK 25kHz
6	90.210	151-162 MHz	33	2.5 ppm	11K0F1D	9.6 GMSK 12.5kHz
7	90	151-162 MHz	33	2.5 ppm	16K0F3E	Voice 25kHz
8	90.210	151-162 MHz	33	2.5 ppm	11K0F3E	Voice 12.5kHz
9	90	151-162 MHz	33	2.5 ppm	6K50F1D	4.8 GFSK 12.5kHz

Orange = line items on Grant

Yellow = emissions that are covered under a wider BW emission designator.

(7) Maximum power ratings for each band:

39-50 MHz	300W
151-162 MHz	500W

(8) DC voltages applied and current into final RF amplifier: see Test reports for respective bands, Exhibits 8LB and 8HB.

(9) Tune-up Procedure: See Exhibit 11.

(10) Schematic diagrams: See Exhibit 6B. Description of circuits: See Exhibit 12

(11) Photograph of FCC label: see Exhibit 1.

(12) External and internal photographs: See Exhibit 5.

(13) Description of Digital modulation techniques: see discussion below Digital Modulation Techniques.

(14) Data required by §§2.1046 through 2.1057: See Test Report, Exhibit 8.

(18) Software Defined Radio: See Exhibit 3.

Additional Information

Production Plans, per §2.1033: Quantity production is planned.

Application References, per §2.1061:

CKC Laboratories, Inc.
22116 23rd Drive S.E.
Bothell, WA 98021

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Data submittal procedure: per 47CFR2, Subpart J

Necessary Bandwidth Calculations for Applicable Emission Designators

Necessary Bandwidth and Emission Designators, Digital Modulation Types							From 47CFR2.202	
		4000 bps CE-BPSK	4800 bps 0.5 GFSK	4800 bps 0.5 GFSK	9600 bps .30 GMSK	9600 bps .33 GMSK	9600 bps 1.0 GMSK	19200 bps .22 GMSK
Channel spacing >>		20/25/ 30 kHz	12.5kHz	12.5kHz	12.5kHz	12.5kHz	25kHz	20/25/ 30kHz
		Mask C	160:Mask D	Mask J	160:Mask D	900:Mask J	Mask C	Mask C
Digital information rate	R	4000	4800	4800	9600	9600	9600	19200
Peak Deviation	D		1700	1700	2400	2400	2400	4800
Signaling States	S	2	2	2	2	2	2	2
Constant	K	1	0.5	0.5	0.3	0.33	1	0.22
Formula		$2RK/\log_2(S)$	$R/\log_2(S)+2DK$	$R/\log_2(S)+2DK$	$R/\log_2(S)+2DK$	$R/\log_2(S)+2DK$	$R/\log_2(S)+2DK$	$R/\log_2(S)+2DK$
Necessary BW	Bn	8000	6500	6500	11040	11184	14400	21312
Applicable Bands max authorized BW		39-50 20kHz	151-162,UHF 20kHz, 13.6kHz	151-162,UHF 20kHz, 13.6kHz	151-162,UHF 20kHz, 13.6kHz	UHF 13.6kHz	39-50,151-162 20kHz	39-50,151-162 20kHz
Emission Designator		8K00G1D	6K50F1D	6K50F1D	11K0F1D	11K2F1D	14K4F1D	20K0F1D

Necessary Bandwidths and Emission Designators, Voice			
		Analog FM	Analog FM
Channel spacing		25kHz	12.5kHz
Modulation BW, Hz	fm	3000	3000
Max Deviation, Hz	D	5000	2500
Constant	K	1	1
Formula		$2fm+2DK$	$2fm+2DK$
Necessary BW, Hz	Bn	16000	11000
Applicable Bands		151-162	151-162, UHF
Max Authorized BW		20kHz	20kHz, 13.6kHz
Emission Designator		16K0F3E	11K0F3E

Digital Modulation Techniques per §2.1033 (13)

The basis of the transmitter carrier generator and modulator is a direct digital synthesis (DDS) integrated circuit. The DDS contains a numerically controlled oscillator (NCO) that accumulates (integrates) carrier phase at a 230.4 MHz sample rate with a modulus of two Pi. The fixed part of the phase increment for the accumulator sets the carrier frequency of the NCO and a modulation increment added or subtracted from the fixed increment, at 384k samples per second, modulates the carrier phase relative to the fixed phase increment to produce phase shift keying (PSK) or frequency shift keying (FSK). The instantaneous phase samples output from the NCO are applied to a ROM look up table that outputs sinusoidal values. Finally, these values are applied to a 230.4 M sample/sec digital to analog converter (DAC). Analog filters farther along in the signal path remove DAC harmonic distortion and other spuri.

For the 39-50 MHz transmitter band, the DDS DAC output signal is generated directly on the assigned carrier frequency. For the 151-162 MHz transmitter band, the DDS outputs an intermediate frequency (I.F.) band from 61 to 68 MHz.

With one exception, the MCC-6101 digital data modulation waveforms are all Gaussian-filtered frequency shift keying (GFSK). The modulation pre-filters have Gaussian spectral characteristics with linear phase response. They are designed according to the selected bit rate, peak deviation and the spectral limits imposed by the FCC masks. When the peak-to-peak frequency deviation equals half the bit rate, the modulation is called Gaussian Minimum Shift Keying (GMSK).

For GFSK, the incoming data bits are converted to bipolar rectangular pulses with amplitude +1 or -1. These are then low pass filtered, amplitude scaled and interpolated to the modulation sample rate by the Gaussian filter. The result is added to the NCO carrier phase increment.

One additional data modulation waveform is constant envelope binary phase shift keying (CEBPSK). In this case, the original data bits are converted to bipolar impulses rather than rectangular pulses. When applied to the NCO at a prescribed amplitude, in the same manner previously described, the NCO integrates the impulses to linearly advance or retard the carrier phase exactly 180 degrees over the duration of the bit.

Voice modulation begins by digitizing the amplified microphone voice waveform. The samples are then passed through a digital pre-emphasis filter followed by a peak amplitude limiter. That result is filtered by a nominal 3 kHz low pass filter. The filter output samples are scaled to set the desired peak frequency deviation (either 5 kHz or 2.5 kHz) and added to the carrier frequency increment in the NCO.

Table of Pertinent Modulation Waveform Characteristics

Frequency	FCC Mask	Bit Rate	Gauss 3dB BW	Peak deviation
39-50,156-162 MHz	C	19200	4220 Hz (BT=0.22)	4800 Hz
39-50,156-162 MHz	C	9600	9600 Hz (BT=1)	2400 Hz
151-162 MHz	D	9600	2880 Hz (BT=0.30)	2400 Hz
151-162 MHz	D	4800	2400 Hz (BT=0.5)	1700 Hz
39-50 MHz	C	4000	3600 Hz (BT=0.9)	CEBPSK
<u>“Analog” Voice FM</u>				
151-162 MHz	B	N/A	N/A	5 kHz
151-162 MHz	D	N/A	N/A	2.5 kHz

Spectrum Efficiency Declaration per §90.203(j)(3), (j)(4) and (j)(5)

This equipment is designed to operate in the 150-174MHz band and has a transmitter power output of greater than 500mW. Per 47CFR §90.203(j)(3), this device meets the spectrum efficiency standard of one voice channel per 12.5kHz of channel bandwidth and is capable of transmitting data at a minimum data rate of 4800 bits per second per 6.25kHz of channel bandwidth.

The date of enforcement of the requirements in §90.203(j)(4) and (j)(5) was stayed by Order of the Commission in FCC Record 04-292 at paragraph 47. Paragraph 47 is repeated verbatim below for the convenience of the reader.

“In conclusion, we recognize that many PLMR systems are used for extremely important public safety or critical infrastructure purposes. We also are persuaded that there may not be enough time before January 1, 2005 for manufacturers to implement 6.25 kHz technology in a manner consistent with the public interest. As a result, based on the record before us, we are concerned that retaining such deadline would not further the public interest, because it would adversely affect public safety communications and critical infrastructure operations. We also believe that a temporary stay of the deadline would not injure any party. We therefore conclude that a stay of the January 1, 2005 date is appropriate. For the foregoing reasons, therefore, we will stay the January 1, 2005 deadline in Sections 90.203(j)(4) and (j)(5) for filing applications for approval of new 25 wideband equipment. We grant this stay pending resolution of the issues raised in the *Third Further Notice*, including the Petition to Defer.”