APPLICATION FOR EQUIPMENT FREQUENCY ALLOCATION

CLASSIFICATION	DATE	FORM APPROVED OMB No. 0704-0188
UNCLASSIFIED		Page 1 of Pages

DOD GENERAL INFORMATION

TO	FROM

1. APPLICATION TITLE

2. SYSTEM NOMENCLATURE

3. STAGE OF ALLOCATION (X one) ☐ a. STAGE 1 CONCEPTUAL ☐ b. STAGE 2 EXPERIMENTAL ☐ c. STAGE 3 DEVELOPMENTAL ☐ d. STAGE 4 OPERATIONAL

4. FREQUENCY REQUIREMENTS
   a. FREQUENCY(IES)
   b. EMISSION DESIGNATOR(S)

5. TARGET STARTING DATE FOR SUBSEQUENT STAGES

a. STAGE 2	b. STAGE 3	c. STAGE 4

6. EXTENT OF USE

7. GEOGRAPHICAL AREA FOR
   a. STAGE 2
   b. STAGE 3
   c. STAGE 4

8. NUMBER OF UNITS

a. STAGE 2	b. STAGE 3	c. STAGE 4

9. NUMBER OF UNITS OPERATING SIMULTANEOUSLY IN THE SAME ENVIRONMENT

10 OTHER J/F 12 APPLICATION NUMBER(S) TO BE	11. IS THERE ANY OPERATIONAL REQUIREMENT AS DESCRIBED IN THE INSTRUCTIONS FOR PARAGRAPH 11?
☐ a. SUPERSEDED J/F 12/ ☐ b. RELATED J/F 12/	☐ a. YES X b. NO ☐ c. NAvail

12. NAMES AND TELEPHONE NUMBERS

a. PROGRAM MANAGER	(1) COMMERCIAL	(2) AUTOVON
b. PROJECT ENGINEER	(1) COMMERCIAL	(2) AUTOVON

13. REMARKS

DOWNGRADING INSTRUCTIONS	CLASSIFICATION	
N/A	UNCLASSIFIED	

DD Form 1494, AUG 09

CLASSIFICATION UNCLASSIFIED	PAGE of Pages

TRANSMITTER EQUIPMENT CHARACTERISTICS

1. NOMENCLATURE, MANUFACTURER'S MODEL NO. MHX-910A	**2. MANUFACTURER'S NAME** Microhard Systems Inc.
3. TRANSMITTER INSTALLATION	**4. TRANSMITTER TYPE**
5. TUNING RANGE 902-928 MHz	**6. METHOD OF TUNING** Synthesis PLL
7. RF CHANNELING CAPABILITY 902-928 MHz w/ 400 kHz increments	**8. EMISSION DESIGNATOR(S)** FM Modulated 350KF1D
9. FREQUENCY TOLERANCE <3 PPM	
10. FILTER EMPLOYED *(X one)* **X a. YES** ☐ **b. NO**	
11. SPREAD SPECTRUM *(X one)* **X a. YES** ☐ **b. NO**	**12. EMISSION BANDWIDTH** *(X and complete as applicable)* ☐ **CALCULATED** **X MEASURED**
13. MAXIMUM BIT RATE ~ 175 kbps	a. -3 dB 210 kHz b. -20 dB 350 kHz
14. MODULATION TECHNIQUES AND CODING Continuous Phase FSK;	c. -40 dB 695 kHz d. -60 dB 1220 kHz e. OC-BW 350 kHz
	15. MAXIMUM MODULATION FREQUENCY 87 kHz
16. PRE-EMPHASIS *(X one)* **X a. YES** ☐ **b. NO**	**17. DEVIATION RATIO** 2
	18. PULSE CHARACTERISTICS **N/A (frequency modulated)**
19. POWER	**a. RATE** **N/A**
a. MEAN up to 1W	**b. WIDTH** **N/A**
b. PEP up to 1W	**c. RISE TIME** **N/A**
20. OUTPUT DEVICE Advanced Gallium Arsenide HBT	**d. FALL TIME** **N/A** **e. COMP RATIO** **N/A**
	21. HARMONIC LEVEL
22. SPURIOUS LEVEL -60 dB	**a. 2nd** -27 dBm
23. FCC TYPE ACCEPTANCE NO. **Part 15.247 Rules NS 904P11**	**b. 3rd** -30 dBm **c. OTHER** N/A

24. REMARKS

Item 10: There is a filter employed between the final RF stage and the transmitter antenna. It is a Lowpass filter with less than 1dB of insertion loss.

Item 11: Frequency-hopping is employed using software controlling frequency synthesizer to select discrete channels within the tuning range. The hop rate is controlled by the modem software settings which the user is able to modify. The modem tuning range is 902.4MHz to 927.6 MHz.

Microhard Systems Inc.,
#17 2135-32nd Avenue NE
Calgary, AB, T2E 6Z3, Canada
Phone: (403) 248-0028
Fax: (403) 248-2762
Attn: Hany Shenouda

CLASSIFICATION UNCLASSIFIED	

CLASSIFICATION UNCLASSIFIED	PAGE of Pages

RECEIVER EQUIPMENT CHARACTERISTICS

1. NOMENCLATURE, MANUFACTURER'S MODEL NO. MHX-910A	**2. MANUFACTURER'S NAME** Microhard Systems Inc.
3. RECEIVER INSTALLATION	**4. RECEIVER TYPE** FM
5. TUNING RANGE 902 – 928 MHz	**6. METHOD OF TUNING** Synthesis PLL
7. RF CHANNELING CAPABILITY 902 – 928 MHz w/ 400 kHz increments	**8. EMISSION DESIGNATOR(S)** FM Modulated
9. FREQUENCY TOLERANCE <3 PPM	Receiver

10. IF SELECTIVITY	**1st**	**2nd**	**3rd**
a. -3 dB	**1.15 MHz**	**280 kHz**	**N/A**
b. -20 dB	**3.40 MHz**	**650 kHz**	**N/A**
c. -60 dB	**<16.0 MHz**	**1.25 MHz**	**N/A**

11. RF SELECTIVITY (X and complete as applicable)

☐ **CALCULATED** **X MEASURED**

a. -3 dB	400 kHz
b. -20 dB	600 kHz
c. -60 dB	2.4 MHz

12. IF FREQUENCY	**d. Preselection Type** Front end LC Filter
a. 1st 110.6 MHz	**13. MAXIMUM POST DETECTION FREQUENCY** 87 kHz
b. 2nd 10.7 MHz	**14. MINIMUM POST DETECTION FREQUENCY** 58 kHz
c. 3rd N/A	**16. MAXIMUM BIT RATE** 175 kbps

15. OSCILLATOR TUNED	**1st**	**2nd**	**3rd**
a. ABOVE TUNED FREQUENCY	**X**	**X**	
b. BELOW TUNED FREQUENCY			
c. EITHER ABOVE OR BELOW THE FREQUENCY			

17. SENSITIVITY	
a. SENSITIVITY	-105 dBm
b. CRITERIA	10^{-6} BER
c. NOISE FIG	< 5 dB
d. NOISE TEMP	- Kelvin

18. DE-EMPHASIS *(X one)* **X a. YES** ☐ **b. NO**	**20. SPURIOUS REJECTION** > 60 dBc
19. IMAGE REJECTION - 50 dBc	

21. REMARKS:

Item 16: Error detecting/correcting code: The MHX-910A unit comes standard with a register that allows the user to enable or disable Forward Error Correction (FEC) in the units. In general, FEC reduces the throughput, but in some environments will actually increase the throughput. FEC can reduce the number of bad data packets, and hence reduce the need to retransmit.

Microhard Systems Inc.,
#17 2135-32nd Avenue NE
Calgary, AB, T2E 6Z3, Canada
Phone: (403) 248-0028
Fax: (403) 248-2762
Attn: Hany Shenouda

CLASSIFICATION UNCLASSIFIED	PAGE of Pages

ANTENNA EQUIPMENT CHARACTERISTICS

1.
☐ a. TRANSMITTING ☐ b. RECEIVING ☐ c. TRANSMITTING AND RECEIVING

2. NOMENCLATURE, MANUFACTURER'S MODEL NO.	3. MANUFACTURER'S NAME
4. FREQUENCY RANGE	5. TYPE
6. POLARIZATION	7. SCAN CHARACTERISTICS
	a. TYPE
8. GAIN	b. VERTICAL SCAN
a. MAIN BEAM	(1) Max Elev
b. 1st MAJOR SIDE LOBE	(2) Min Elev
	(3) Scan Rate
9. BEAMWIDTH	c. HORIZONTAL SCAN
a. HORIZONTAL	(1) Sector Scanned
b. VERTICAL	(2) Scan Rate
	d. SECTOR BLANKING *(X one)* ☐ (1) YES ☐ (2) NO

10. REMARKS

CLASSIFICATION UNCLASSIFIED	

DD Form 1494, AUG 96

APPLICATION FOR SPECTRUM REVIEW	CLASSIFICATION: UNCLASSIFIED	PAGE of Pages

NTIA GENERAL INFORMATION

1. APPLICATION TITLE

2. SYSTEM NOMENCLATURE

3. STAGE OF ALLOCATION *(X one)*

☐ a. STAGE 1 CONCEPTUAL ☐ b. STAGE 2 EXPERIMENTAL ☐ c. STAGE 3 DEVELOPMENTAL ☐ d. STAGE 4 OPERATIONAL

4. FREQUENCY REQUIREMENTS

a. FREQUENCY(IES)

b. EMISSION DESIGNATOR(S)

5. PURPOSE OF SYSTEM, OPERATIONAL AND SYSTEM CONCEPTS (WARTIME USE) *(X one)* ☐ a. YES ☐ b. NO

6. INFORMATION TRANSFER REQUIREMENTS

7. ESTIMATED INITIAL COST OF THE SYSTEM

8. TARGET DATE FOR

a. APPLICATION APPROVAL	b. SYSTEM ACTIVATION	c. SYSTEM TERMINATION

9. SYSTEM RELATIONSHIP AND ESSENTIALITY

10. REPLACEMENT INFORMATION

11. RELATED ANALYSIS AND/OR TEST DATA

12. NUMBER OF MOBILE UNITS

13. GEOGRAPHICAL AREA FOR

a. STAGE 2

b. STAGE 3

c. STAGE 4

14. LINE DIAGRAM See page(s)	15. SPACE SYSTEMS See page(s)
16. TYPE OF SERVICE(S) FOR STAGE 4	17. STATION CLASS(ES) FOR STAGE 4

18. REMARKS

DOWNGRADING INSTRUCTIONS	CLASSIFICATION	
N/A	UNCLASSIFIED	

APPLICATION FOR FOREIGN SPECTRUM SUPPORT	CLASSIFICATION: UNCLASSIFIED	PAGE of Pages

FOREIGN COORDINATION GENERAL INFORMATION

1. APPLICATION TITLE

2. SYSTEM NOMENCLATURE

3. STAGE OF ALLOCATION *(X one)*

☐ a. STAGE 1 CONCEPTUAL ☐ b. STAGE 2 EXPERIMENTAL ☐ c. STAGE 3 DEVELOPMENTAL ☐ d. STAGE 4 OPERATIONAL

4. FREQUENCY REQUIREMENTS

a. FREQUENCY(IES)

b. EMISSION DESIGNATOR(S)

5. PROPOSED OPERATING LOCATIONS OUTSIDE US&P

6. PURPOSE OF SYSTEM, OPERATIONAL AND SYSTEM CONCEPTS

7. INFORMATION TRANSFER REQUIREMENTS

8. NUMBER OF UNITS OPERATING SIMULTANEOUSLY IN THE SAME ENVIRONMENT

9. REPLACEMENT INFORMATION

10. LINE DIAGRAM See page(s)	11. SPACE SYSTEMS See page(s)

12. PROJECTED OPERATIONAL DEPLOYMENT DATE

13. REMARKS

DOWNGRADING INSTRUCTIONS	CLASSIFICATION	
N/A	UNCLASSIFIED	

DD Form 1494, AUG 96