## APPLICATION FOR EQUIPMENT FREQUENCY ALLOCATION

### DOD GENERAL INFORMATION

<table>
<thead>
<tr>
<th>TO</th>
<th>FROM</th>
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</table>

1. **APPLICATION TITLE**

2. **SYSTEM NOMENCLATURE**

3. **STAGE OF ALLOCATION**
   - [ ] 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**
    - a. SUPERSEDED J/F 12/
    - b. RELATED J/F 12/

11. **IS THERE ANY OPERATIONAL REQUIREMENT AS DESCRIBED IN THE INSTRUCTIONS FOR PARAGRAPH 11?**
    - [ ] a. YES
    - [ ] b. NO
    - [ ] c. NA

12. **NAMES AND TELEPHONE NUMBERS**
    - a. PROGRAM MANAGER
      - (1) COMMERCIAL
      - (2) AUTOVON
    - b. PROJECT ENGINEER
      - (1) COMMERCIAL
      - (2) AUTOVON

13. **REMARKS**

### DOWNGRADING INSTRUCTIONS

| N/A | CLASSIFICATION | UNCLASSIFIED |

**DD Form 1494, AUG 96**
# TRANSMITTER EQUIPMENT CHARACTERISTICS

1. **NOMENCLATURE, MANUFACTURER’S MODEL NO.**
   - n1720F (Serial Version)
   - IPn1720F (Ethernet / USB Version)

2. **MANUFACTURER’S NAME**
   - Microhard Systems Inc.

3. **TRANSMITTER INSTALLATION**

4. **TRANSMITTER TYPE**
   - FM

5. **TUNING RANGE**
   - 1670 to 1700 MHz

6. **METHOD OF TUNING**
   - Synthesis PLL

7. **RF CHANNELING CAPABILITY**
   - 1670 to 1700 MHz w/ <100 Hertz increments

8. **EMISSION DESIGNATOR(S)**
   - FM Modulated
   - 280kF1D @ 230kbps
   - 480kF1D @ 345kbps

9. **FREQUENCY TOLERANCE**
   - 2.5 PPM

10. **FILTER EMPLOYED (X one)**
    - a. YES
    - b. NO

11. **SPREAD SPECTRUM (X one)**
    - a. YES
    - b. NO

12. **EMISSION BANDWIDTH (X and complete as applicable)**
    - Calculated
    - Measured
    - a. -3 dB 150 kHz (230kbps) 225kHz (345kbps)
    - b. -20 dB 280 kHz (230kbps) 375kHz (345kbps)
    - c. -40 dB 540 kHz (230kbps) 775kHz (345kbps)
    - d. -60 dB 1100 kHz (230kbps) 1.25MHz (345kbps)
    - e. OC-BW 290 kHz (230kbps) 485kHz (345kbps)

13. **MAXIMUM BIT RATE**
    - 230.4 kbps / 345 kbps –NT (option)

14. **MODULATION TECHNIQUES AND CODING**
    - CPFSK

15. **MAXIMUM MODULATION FREQUENCY**
    - 116kHz

16. **PRE-EMPHASIS (X one)**
    - a. YES
    - b. NO

17. **DEVIATION RATIO**
    - 0.5 to 1

18. **PULSE CHARACTERISTICS**
    - N/A (frequency modulated)

19. **POWER (X one)**
    - a. MEAN up to 1 Watt (optional higher power available 2W)
    - b. PEP up to 1Watt

20. **OUTPUT DEVICE**
    - HBT

21. **HARMONIC LEVEL**
    - a. 2nd
      - < -54 dBc
    - b. 3rd
      - < -54 dBc
    - c. OTHER

22. **SPURIOUS LEVEL**
    - -60 dBc

23. **FCC TYPE ACCEPTANCE NO.**
    - N/A

24. **REMARKS**
    - BOX 19. 2W order Option available for Government Users “-2W”

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**Microhard Systems Inc.**

#17, 2135 – 32nd Avenue NE

Calgary, AB, Canada

T2E 6Z3

Phone: (403) 248-0028

Fax: (403) 248-2762

Attn: Hany Shenouda

This radio can be used in a fixed frequency mode or a frequency hopping mode where 50 frequency can be program into the radio in less than 100Hertz resolution between 1670 to 1700 MHz.
## RECEIVER EQUIPMENT CHARACTERISTICS

### 1. NOMENCLATURE, MANUFACTURER'S MODEL NO.
- n1720F (Serial Version)
- IPn1720F (Ethernet / USB Version)

### 2. MANUFACTURER'S NAME
- Microhard Systems Inc.

### 3. RECEIVER INSTALLATION

### 4. RECEIVER TYPE
- Dual Conversion Superheterodyne

### 5. TUNING RANGE
- 1670 to 1700 MHz

### 6. METHOD OF TUNING
- Synthesis PLL

### 7. RF CHANNELING CAPABILITY
- 1670 to 1700 MHz w/ <100 Hertz increments

### 8. EMISSION DESIGNATOR(S)
- FM Modulated

### 9. FREQUENCY TOLERANCE
- 2.5 PPM

### 10. IF SELECTIVITY

<table>
<thead>
<tr>
<th>Type</th>
<th>1st</th>
<th>2nd</th>
<th>3rd</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3 dB</td>
<td>450 kHz</td>
<td>280kHz / 500kHz</td>
<td></td>
</tr>
<tr>
<td>-20 dB</td>
<td>650 kHz</td>
<td>740 kHz / 850 kHz</td>
<td>50 MHz</td>
</tr>
<tr>
<td>-60 dB</td>
<td>1.3 MHz</td>
<td>1600 kHz / 2000 kHz</td>
<td>90 MHz</td>
</tr>
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</table>

### 11. RF SELECTIVITY

- **CALCULATED**
- **MEASURED**

<table>
<thead>
<tr>
<th>Type</th>
<th>1st</th>
<th>2nd</th>
<th>3rd</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3 dB</td>
<td></td>
<td>50 MHz</td>
<td></td>
</tr>
<tr>
<td>-20 dB</td>
<td></td>
<td>90 MHz</td>
<td></td>
</tr>
<tr>
<td>-60 dB</td>
<td></td>
<td>150 MHz</td>
<td></td>
</tr>
</tbody>
</table>

### 12. IF FREQUENCY

<table>
<thead>
<tr>
<th>Type</th>
<th>1st</th>
<th>2nd</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>243.95MHz</td>
<td></td>
</tr>
<tr>
<td>2nd</td>
<td>10.7MHz</td>
<td></td>
</tr>
<tr>
<td>3rd</td>
<td></td>
<td></td>
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</tbody>
</table>

### 13. MAXIMUM POST DETECTION FREQUENCY
- 120kHz @ 230.4kbps
- 175 kHz @ 345kbps

### 14. MINIMUM POST DETECTION FREQUENCY
- N/A

### 15. OSCILLATOR TUNED

<table>
<thead>
<tr>
<th>Type</th>
<th>1st</th>
<th>2nd</th>
<th>3rd</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABOVE TUNED FREQUENCY</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BELOW TUNED FREQUENCY</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>EITHER ABOVE OR BELOW THE FREQUENCY</td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

### 16. MAXIMUM BIT RATE
- 230.4 kbps

### 17. SENSITIVITY

<table>
<thead>
<tr>
<th>Type</th>
<th>1st</th>
<th>2nd</th>
<th>3rd</th>
</tr>
</thead>
<tbody>
<tr>
<td>SENSITIVITY</td>
<td></td>
<td></td>
<td>-105 dBm</td>
</tr>
<tr>
<td>CRITERIA</td>
<td></td>
<td></td>
<td>10^4 BER</td>
</tr>
<tr>
<td>NOISE FIG</td>
<td></td>
<td></td>
<td>≥ 4.3 dB</td>
</tr>
</tbody>
</table>

### 18. DE-EMPHASIS (X one)
- a. YES
- b. NO

### 19. IMAGE REJECTION
- - 60 dBc

### 20. SPURIOUS REJECTION
- > 60 dBc

### 21. REMARKS

Item 10. IF Selectivity (230.4kbps / 345kbps)
# Antenna Equipment Characteristics

1. | a. Transmitting | b. Receiving | c. Transmitting and Receiving |
---|---|---|---|

2. **Nomencature, Manufacturer's Model No.**

3. **Manufacturer's Name**

4. **Frequency Range**

5. **Type**

6. **Polarization**

7. **Scan Characteristics**
   - a. **Type**
   - b. **Vertical Scan**
     - 1. Main Beam - Max Elev
     - 2. 1st Major Side Lobe - Min Elev
     - 3. Scan Rate
   - c. **Horizontal Scan**
     - 1. Horizontal - Sector Scanned
     - 2. Vertical - Scan Rate
     - d. **Sector Blankings**
       - 1. YES
       - 2. NO

8. **Gain**

9. **Beamwidth**

10. **Remarks**
This entire system is configured to operate within warehouse buildings. Some internal antennae may be necessary to allow uninterrupted communication between the bar code scanners and the base station within the building. The base station transceiver will be networked to directly to the server. Data will be transferred via RF between bar code scanners and the base station. The server will also be networked to other Family Housing terminals.
### 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
N/A

### CLASSIFICATION
UNCLASSIFIED

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1. APPLICATION TITLE

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3. STAGE OF ALLOCATION (X one)
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   - [ ] 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
N/A

CLASSIFICATION
UNCLASSIFIED

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