

UNCLASSIFIED		
SECURITY SUMMARY & SPECIAL HANDLING REQUIREMENTS		
<p>The title of this application is : MICROHARD SYSTEMS, INC. MODEL N1320F TRANSCEIVER</p> <p>The overall classification of this application is : UNCLASSIFIED</p>		
<p>Refer to your Security Manual for further guidance.</p>		
<p>The Application Level Special Handling is : A</p> <p>Approved for public release; distribution is unlimited (DoD Directive 5230.24)</p>		
DOWNGRADING INSTRUCTIONS		
<p>Special Handling Instruction : A</p>		
CLASSIFICATION		
UNCLASSIFIED		

## FULL RECORD PRINT FOR Microhard Systems, Inc. Model n1320F Transceiver

**Selected Frequencies**

(U) 1350.0 MHz - (U) 1390.0 MHz

**System Name** : (U) Microhard Systems, Inc. Model n1320F Transceiver**(Nomenclature)****Coord.ID/JF12 Num.** : (U)/(U) J/F 12/9684**Stage** : (U) 4 - Operational**Agency** : (U) AR - Department of the Army**NTIA Certified** : (U) No**Overall Security** : Unclassified**Date/Time Last Mod.** : 12/1/2009 7:57:01 PM (GMT)**System Description** : (U) The MARCbot IV version 5 is a small robotic platform used as a remote inspection platform to achieve stand-off when trying to identify suspicious objects. Land Warrior soldier can command and control the MACRbot using this link.**Target Date(s)****System Approval** : (U) 2/15/2010**System Activation** : (U) 3/15/2010**NSEP Use** : (U) Yes**ITU Waiver** : (U) No**Control Numbers**

SPS- 17241/1

**Source Documents**

•(U) SPS - 17241/1 Microhard Systems, Inc. Model n1320F Transceiver Certification Application 12/1/2009

**Geographic Areas for Stage 4****City, State/Country** : (U) Phoenix, (U) Arizona**Location Type** : (U) Single Point**Lat/Lon** : (U) 333233N1120420W**City, State/Country** : (U) Fort Lewis Military Reservatio, (U) WA**Location Type** : (U) Polygon of 102 points**City, State/Country** : (U) Iraq**Location Type** : (U) Polygon of 346 points**City, State/Country** : (U) Afghanistan**Location Type** : (U) Polygon of 708 points**Number Of Units** : (U) 68**Estimated Initial Cost of the System** : (U) \$14000**Information Transfer Requirement**

(U) 230.4 kbps CPFSK signal

**System Essentiality**

(U) The MARCbot IV version 5 is a small robotic platform used as a remote inspection platform to achieve stand-off when trying to identify suspicious objects. Land Warrior soldier can command and control the MACRbot using this link.

## FULL RECORD PRINT FOR Microhard Systems, Inc. Model n1320F Transceiver

**Replacement Information**

(U) Not Applicable

**Stations****Station Name** : (U) Hand-held Unit**Transmitters**

(U) n1320F

**Receivers**

(U) n1320F

**Antennas**

(U) ADP1375FXSM

**Station Name** : (U) MARCbot Robot**Transmitters**

(U) n1320F

**Receivers**

(U) n1320F

**Antennas**

(U) ADP1375FXSM

**Links - Selected Modes****Link****Transmitting Station**

(U) Hand-held Unit

**Receiving Station**

(U) MARCbot Robot

**Radio Service** : Land Mobile**Station Class** : MLP**Equipment Combination****Transmitter** : (U) n1320F**Tx Antenna** : (U) ADP1375FXSM**Receiver** : (U) n1320F**Rx Antenna** : (U) ADP1375FXSM**Coupling Loss** : (U) 0.000 dB**Selected Modes****Frequency**

(U) 1350.0 MHz - (U) 1390.0 MHz

**Em. Des**

(U) 286KF1D

**Power**

Mean (U) 1.00 W

**Notes**

PRI

**Link****Transmitting Station**

(U) MARCbot Robot

**Receiving Station**

(U) Hand-held Unit

## FULL RECORD PRINT FOR Microhard Systems, Inc. Model n1320F Transceiver

**Radio Service** : Land Mobile

**Station Class** : ML

**Equipment Combination**

**Transmitter** : (U) n1320F

**Tx Antenna** : (U) ADP1375FXSM

**Receiver** : (U) n1320F

**Rx Antenna** : (U) ADP1375FXSM

**Selected Modes**

**Frequency**

(U) 1350.0 MHz - (U) 1390.0 MHz

**Em. Des**

(U) 286KF1D

**Power**

Mean (U) 1.00 W

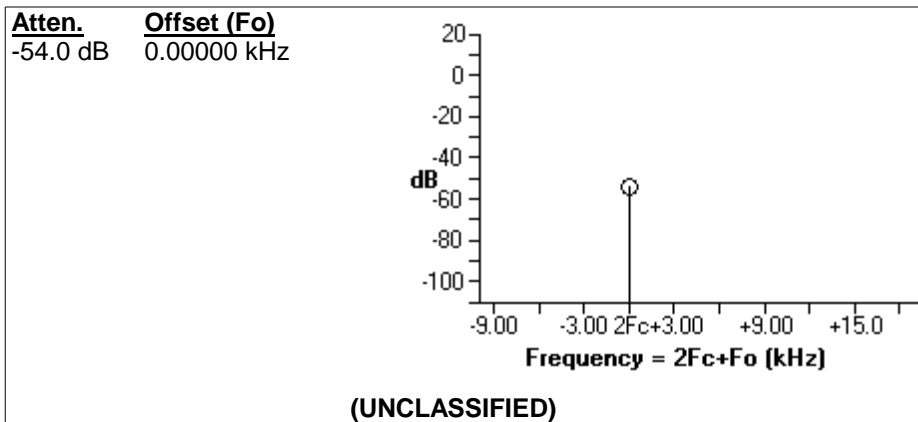
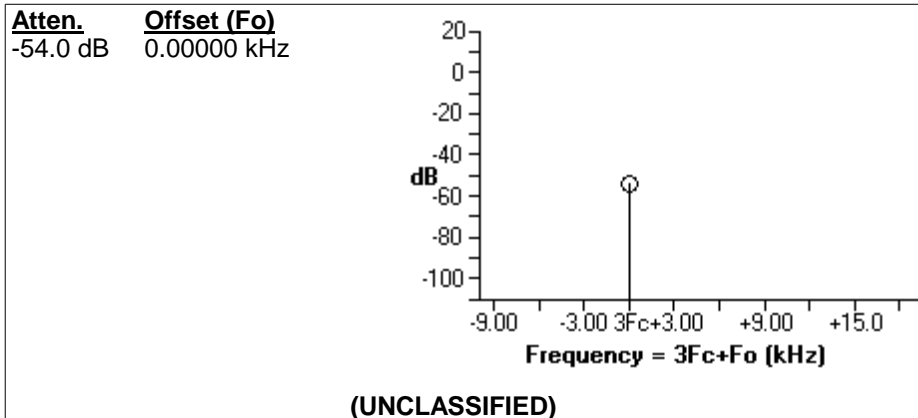
**Notes**

PRI

## FULL RECORD PRINT FOR Microhard Systems, Inc. Model n1320F Transceiver

**TRANSMITTER n1320F**

Nomenclature : (U) n1320F  
Manufacturer : (U) MICROHARD SYSTEM, INC.  
Model Name : (U) n1320F  
NTIA Approval Status : (U) Unapproved  
Date/Time Last Mod. : 11/18/2009 10:25:25 PM (GMT)  
Coordination ID : (U) J/F 12  
Freq. Stability : (U) 2 ppm  
Output Device : (U) Transistor  
Tuning Method : (U) PLL Synthesizer  
Radar/Comm : (U) Communications  
Supp. of Harmonics : (U) Yes

**Figure 1 - 2nd Harmonic Curve (U)****Figure 2 - 3rd Harmonic Curve (U)**

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Figure 3 - Other Harmonic Curve (U)

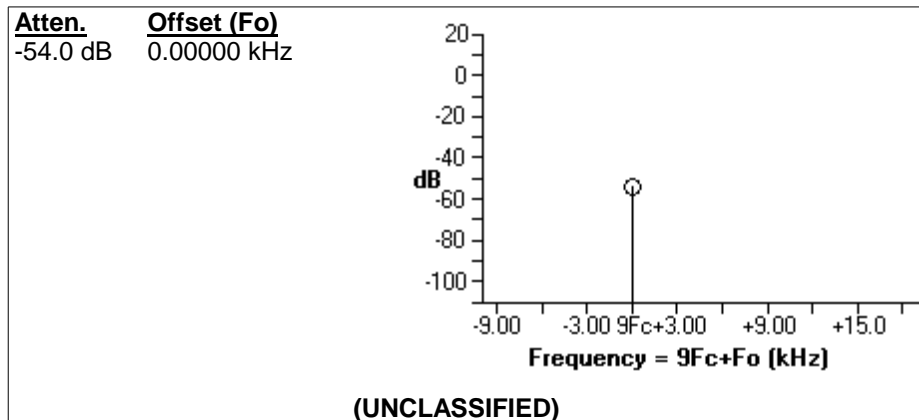
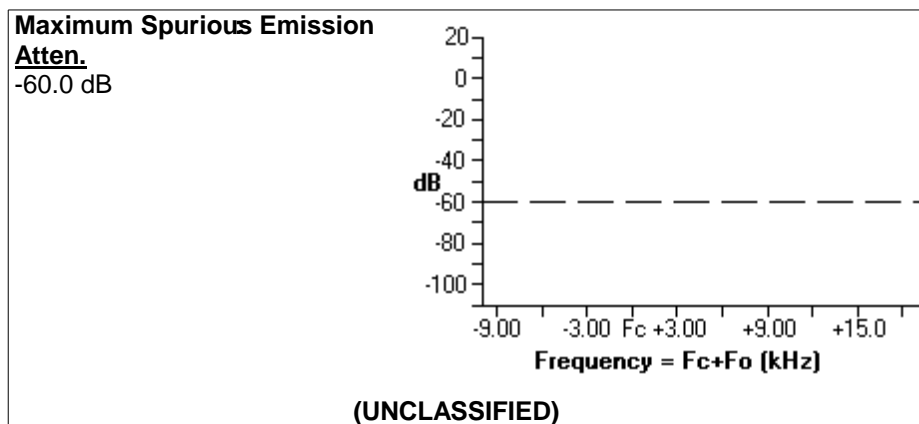


Figure 4 - Spurious Emission Curve (U)

Frequencies

Tuned Frequency : (U) 1350.0 MHz - 1390.0 MHz  
 Tuning Increment : (U) 0.10000 kHz  
 # Freq Req. : (U) 1  
 Min. Separation : (U) 0.30000 MHz  
 Em. Designator : (U) 286KF1D  
 Necessary BW : (U) 286.00 kHz

Modulation - 286KF1D

Occupied Bandwidth : (U) 286.00 kHz  
 Measured/Calculated : (U) Measured  
 Radar/Communications : (U) Communications  
 Modulation Type : (U) Digital Modulation  
 Max. Modulation Frequency : (U) 116.00 kHz  
 Low Freq. Hop : (U) 1350.0 MHz  
 High Frequency Hop : (U) 1390.0 MHz  
 Spread Spectrum : Yes

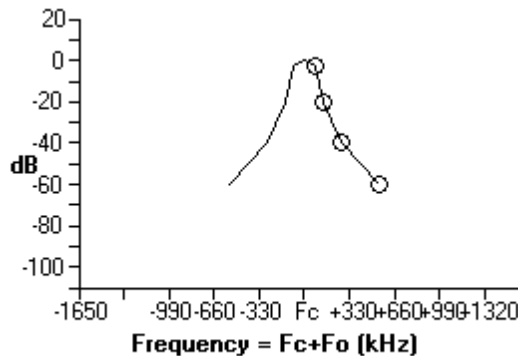
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Spread Spectrum Type : (U) Frequency Hopped  
 SS Processing Gain : (U) 22.4 dB  
 Dig. Modulation Type : (U) CPFSK - Continuous Phase Frequency Shift Keying  
 Number of Digital States : (U) 2  
 Digital Bit Rate : (U) 230400 bps  
 Deviation Ratio : (U) 0.500  
 Digital Peak Deviation : (U) 58.000 kHz  
 Digital Pulse Format : (U) Other  
 Number Freq. Hop Sets : (U) 1  
 Number Freq. Per Hop : (U) 50  
 Number of Freq. Hops : (U) 50  
 Pulses Per Dwell : (U) 1  
 Lowest Frequency in Hop : (U) 1350.0 MHz  
 Highest Frequency in Hop : (U) 1390.0 MHz  
 Frequency Hop Rate : (U) 2.00 /sec  
 Frequency Hop Dwell Time : (U) 400 ms  
 SS Processing Gain : (U) 22.4 dB

Figure 5 - Fundamental Curve (U)

Meas/Calc : Measured

Level	Offset (Fo)
-3.00 dB	75.000 kHz
-20.0 dB	140.00 kHz
-40.0 dB	270.00 kHz
-60.0 dB	550.00 kHz



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Powers

Power Type : Mean

Upper Limit : (U) 1.00 W

## FULL RECORD PRINT FOR Microhard Systems, Inc. Model n1320F Transceiver

RECEIVER n1320F

**Nomenclature** : (U) n1320F  
**Manufacturer** : (U) MICROHARD SYSTEM, INC.  
**Model Name** : (U) n1320F  
**NTIA Approval Status** : (U) Unapproved  
**Date/Time Last Mod.** : 11/18/2009 6:40:36 PM (GMT)  
**Coordination ID** : (U) J/F 12  
**Freq. Stability** : (U) 2 ppm  
**Image Reject** : (U) 60.0dB  
**Oscillator Tuned** : (U) Either  
**Tuning Method** : (U) PLL Synthesizer  
**Cond. Undesired Em.** : (U) -60.0dBm

Frequencies

**Tuned Frequency** : (U) 1350.0 MHz - 1390.0 MHz

**Tuning Increment** : (U) 0.10000 kHz

Sensitivities

**Em. Designator** : (U) 286KF1D  
**Necessary BW** : (U) 286.00 kHz  
**Perf. Crit.** : (U) S/N - Signal to Noise Ratio (dB)  
**Perf. Value** : (U) 11.5  
**Sensitivity** : (U) -108 dBm  
**Noise Fig.** : (U) 3.00 dB  
**Noise Temp.** : (U) 289 K  
**Spur. Reject** : (U) 60.0 dB

Figure 6 - IF Selectivity Curve (U)

**IF Freq. (Fk)** : 243.95 MHz

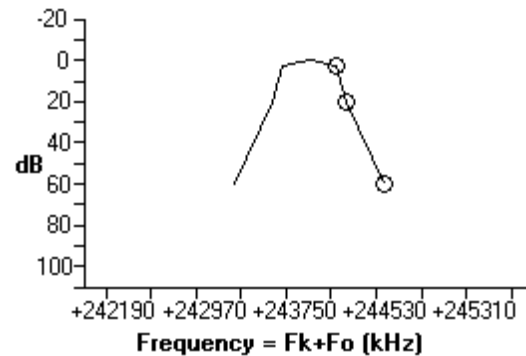
**Meas/Calc** : Measured

**Atten.**      **Offset (Fo)**

3.00 dB      225.00 kHz

20.0 dB      325.00 kHz

60.0 dB      650.00 kHz

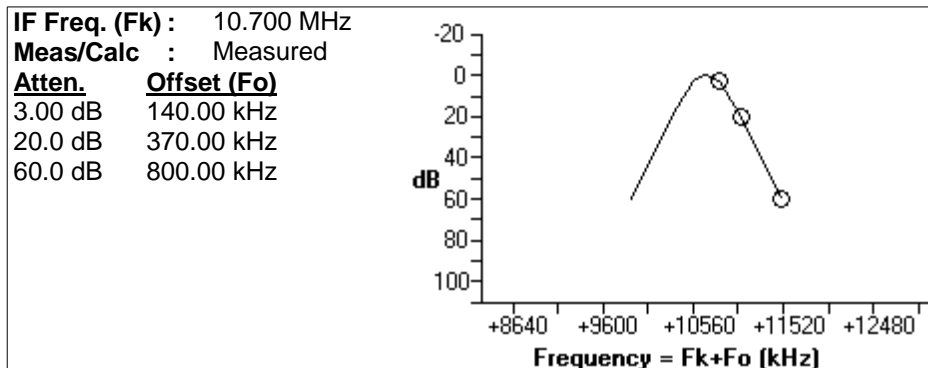


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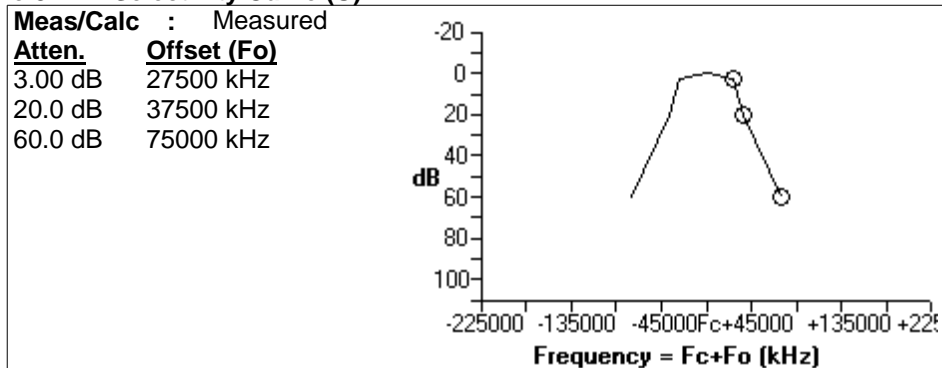
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Figure 7 - IF Selectivity Curve (U)



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Figure 8 - RF Selectivity Curve (U)



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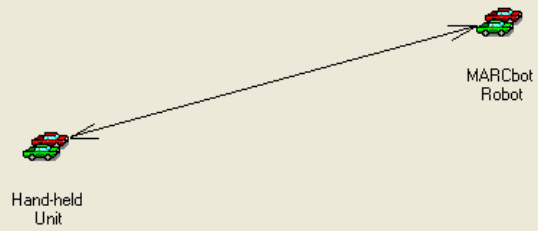
## FULL RECORD PRINT FOR Microhard Systems, Inc. Model n1320F Transceiver

ANTENNA ADP1375FXSM

Nomenclature : (U) ADP1375FXSM  
Antenna Code : Linear  
Manufacturer : (U) ASTRON WIRELESS TECHNOLOGIES  
Model Name : (U) ADP1375FXSM  
NTIA Approval Status : (U) Unapproved  
Date/Time Last Mod. : 11/18/2009 7:14:29 PM (GMT)  
Coordination ID : (U) J/F 12  
Lower Freq. Limit : (U) 1350.0 MHz  
Upper Freq. Limit : (U) 1400.0 MHz  
Polarization : (U) Vertical  
Main Beam Gain : (U) 2.00 dBi  
1st Horz. Sidelobe Atten. : (U) 0.000 dB  
1st Vert. Sidelobe Atten. : (U) 0.000 dB  
Atten. Rel/Act : (U) Relative dB  
Horz. Beamwidth : (U) 360 degrees  
Vert. Beamwidth : (U) 65.0 degrees

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**Line Diagram: Microhard Systems, Inc. Model n1320F Transceiver**



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