

**TRANSMITTER EQUIPMENT CHARACTERISTICS**

<b>1. NOMENCLATURE, MANUFACTURER'S MODEL NO.</b> n1320F (Serial Version) IPn1320F (Ethernet / USB Version)	<b>2. MANUFACTURER'S NAME</b> Microhard Systems Inc.															
<b>3. TRANSMITTER INSTALLATION</b>	<b>4. TRANSMITTER TYPE</b> FM															
<b>5. TUNING RANGE</b> 1350 to 1390 MHz	<b>6. METHOD OF TUNING</b> Synthesis PLL															
<b>7. RF CHANNELING CAPABILITY</b> 1350 to 1390 MHz w/ <100 Hertz increments	<b>8. EMISSION DESIGNATOR(S)</b>  FM Modulated 280kF1D @ 230kbps 480kF1D @ 345kbps															
<b>9. FREQUENCY TOLERANCE</b> 2 PPM																
<b>10. FILTER EMPLOYED</b> ( <i>X one</i> ) <input checked="" type="checkbox"/> a. YES <input type="checkbox"/> b. NO																
<b>11. SPREAD SPECTRUM</b> ( <i>X one</i> ) <input checked="" type="checkbox"/> a. YES <input type="checkbox"/> b. NO	<b>12. EMISSION BANDWIDTH</b> ( <i>X and complete as applicable</i> ) <input type="checkbox"/> CALCULATED <input checked="" type="checkbox"/> MEASURED															
<b>13. MAXIMUM BIT RATE</b> 230.4 kbps / 345 kbps -NT (option)	<table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:15%;"><b>a. -3 dB</b></td> <td style="width:35%;">150 kHz (230kbps)</td> <td style="width:50%;">225kHz (345kbps)</td> </tr> <tr> <td><b>b. -20 dB</b></td> <td>280 kHz (230kbps)</td> <td>375kHz (345kbps)</td> </tr> <tr> <td><b>c. -40 db</b></td> <td>540 kHz (230kbps)</td> <td>775kHz (345kbps)</td> </tr> <tr> <td><b>d. -60 dB</b></td> <td>1100 kHz (230kbps)</td> <td>1.25MHz (345kbps)</td> </tr> <tr> <td><b>e. OC-BW</b></td> <td>290 kHz (230kbps)</td> <td>485kHz (345kbps)</td> </tr> </table>	<b>a. -3 dB</b>	150 kHz (230kbps)	225kHz (345kbps)	<b>b. -20 dB</b>	280 kHz (230kbps)	375kHz (345kbps)	<b>c. -40 db</b>	540 kHz (230kbps)	775kHz (345kbps)	<b>d. -60 dB</b>	1100 kHz (230kbps)	1.25MHz (345kbps)	<b>e. OC-BW</b>	290 kHz (230kbps)	485kHz (345kbps)
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<b>14. MODULATION TECHNIQUES AND CODING</b> CPFSK	<b>15. MAXIMUM MODULATION FREQUENCY</b> 116kHz															
<b>16. PRE-EMPHASIS</b> ( <i>X one</i> ) <input type="checkbox"/> a. YES <input checked="" type="checkbox"/> b. NO	<b>17. DEVIATION RATIO</b> 0.5 to 1															
<b>19. POWER</b>	<b>18. PULSE CHARACTERISTICS</b> N/A (frequency modulated)															
<table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%;"><b>a. MEAN</b>    up to 1 Watt (optional higher power available 2W)</td> <td style="width:50%;"><b>a. RATE</b></td> </tr> <tr> <td><b>b. PEP</b>    up to 1Watt</td> <td><b>b. WIDTH</b></td> </tr> <tr> <td></td> <td><b>c. RISE TIME</b></td> </tr> <tr> <td></td> <td><b>d. FALL TIME</b></td> </tr> <tr> <td></td> <td><b>e. COMP RATIO</b></td> </tr> </table>	<b>a. MEAN</b> up to 1 Watt (optional higher power available 2W)	<b>a. RATE</b>	<b>b. PEP</b> up to 1Watt	<b>b. WIDTH</b>		<b>c. RISE TIME</b>		<b>d. FALL TIME</b>		<b>e. COMP RATIO</b>	<b>21. HARMONIC LEVEL</b>					
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	<b>d. FALL TIME</b>															
	<b>e. COMP RATIO</b>															
<b>20. OUTPUT DEVICE</b> HBT	<table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%;"><b>a. 2<sup>nd</sup></b> -54 dBc</td> <td style="width:50%;"></td> </tr> <tr> <td><b>b. 3<sup>rd</sup></b> -54 dBc</td> <td></td> </tr> <tr> <td><b>c. OTHER</b></td> <td></td> </tr> </table>	<b>a. 2<sup>nd</sup></b> -54 dBc		<b>b. 3<sup>rd</sup></b> -54 dBc		<b>c. OTHER</b>										
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<b>22. SPURIOUS LEVEL</b> -60 dBc																
<b>23. FCC TYPE ACCEPTANCE NO.</b>  N/A																

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

**Microhard Systems Inc.**  
 #17, 2135 – 32<sup>nd</sup> 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 1350 to 1390 MHz

**RECEIVER EQUIPMENT CHARACTERISTICS**

<b>1. NOMENCLATURE, MANUFACTURER'S MODEL NO.</b> N1320F (Serial Version)      IPn1320F (Ethernet / USB Version)				<b>2. MANUFACTURER'S NAME</b> Microhard Systems Inc.	
<b>3. RECEIVER INSTALLATION</b>				<b>4. RECEIVER TYPE</b> Dual Conversion Superheterodyne	
<b>5. TUNING RANGE</b> 1350 to 1390 MHz				<b>6. METHOD OF TUNING</b> Synthesis PLL	
<b>7. RF CHANNELING CAPABILITY</b> 1350 to 1390 MHz w/ <100 Hertz increments				<b>8. EMISSION DESIGNATOR(S)</b> FM Modulated  Receiver	
<b>9. FREQUENCY TOLERANCE</b> 2 PPM				<b>11. RF SELECTIVITY (X and complete as applicable)</b> <input type="checkbox"/> CALCULATED      X MEASURED  <b>a. -3 dB</b> 55MHz  <b>b. -20 dB</b> 75 MHz  <b>c. -60 dB</b> 150 MHz  <b>d. Preselection Type</b> <p style="text-align: center;">SAW Bandpass Filter</p>	
<b>10. IF SELECTIVITY</b>	<b>1st</b>	<b>2nd</b>	<b>3rd</b>		
<b>a. -3 dB</b>	450 kHz	280kHz / 500kHz			
<b>b. -20 dB</b>	650kHz	740 kHz / 850 kHz			
<b>c. -60 dB</b>	1.3MHz	1600 kHz / 2000 kHz		<b>12. IF FREQUENCY</b>	
<b>a. 1st</b> 243.95MHz				<b>13. MAXIMUM POST DETECTION FREQUENCY</b> 120kHz @ 230.4kpbs      175 kHz @ 345kbps	
<b>b. 2nd</b> 10.7MHz				<b>14. MINIMUM POST DETECTION FREQUENCY</b> N/A	
<b>c. 3rd</b>				<b>16. MAXIMUM BIT RATE</b> 230.4 kbps	
<b>15. OSCILLATOR TUNED</b>				<b>17. SENSITIVITY</b>	
<b>a. ABOVE TUNED FREQUENCY</b>				<b>a. SENSITIVITY</b> -108 dBm	
<b>b. BELOW TUNED FREQUENCY</b>				<b>b. CRITERIA</b> 10 <sup>-4</sup> BER	
<b>c. EITHER ABOVE OR BELOW THE FREQUENCY</b>				<b>c. NOISE FIG</b> ≈ 3 dB	
<b>18. DE-EMPHASIS (X one)</b> <input type="checkbox"/> a. YES      X b. NO				<b>d. NOISE TEMP</b> N/A	
<b>19. IMAGE REJECTION</b> - 60 dBc				<b>20. SPURIOUS REJECTION</b> > 60 dBc	

**21. REMARKS**

Item 10. IF Selectivity (230.4kbps / 345kbps)

**ANTENNA EQUIPMENT CHARACTERISTICS**

1. <input type="checkbox"/> a. TRANSMITTING <input type="checkbox"/> b. RECEIVING <input type="checkbox"/> c. TRANSMITTING AND RECEIVING	
2. NOMENCLATURE, MANUFACTURER'S MODEL NO.	3. MANUFACTURER'S NAME
4. FREQUENCY RANGE	5. TYPE
6. POLARIZATION	7. SCAN CHARACTERISTICS
8. GAIN	a. TYPE
a. MAIN BEAM	b. VERTICAL SCAN
b. 1st MAJOR SIDE LOBE	(1) Max Elev
	(2) Min Elev
	(3) Scan Rate
9. BEAMWIDTH	c. HORIZONTAL SCAN
a. HORIZONTAL	(1) Sector Scanned
b. VERTICAL	(2) Scan Rate
	d. SECTOR BLANKING ( <i>X one</i> ) <input type="checkbox"/> (1) YES <input type="checkbox"/> (2) NO

10. REMARKS	
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