

SECURITY SUMMARY & SPECIAL HANDLING REQUIREMENTS

The title of this application is: Enerdyne Technologies Enerlinks2 Data Uplink

The overall classification of this application is: UNCLASSIFIED

The following Special Handling summary lists the applicable markings for the printed page(s). It is your responsibility to place all Special Handling markings on the cover page of the application.

If an Entire Application was printed, the following Special Handling summary lists the applicable markings for the Entire Application.

If an Individual Page (TX, RX, ANT, etc.) was printed, the following Special Handling summary lists the applicable markings for the printed page. It is your responsibility to make certain that any Special Handling markings that are unique to the Individual Page are also reflected on the cover of the Entire Application.

If the "!" code is shown below, the "SEE REMARKS" refers to the REMARKS block on the applicable page.

Refer to your Security Manual for further guidance.

No Application Level Special Handling
No Page Level Special Handling

UNCLASSIFIED

J/F 12/09179

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If the "!" code is shown below, the "SEE REMARKS" refers to the REMARKS block on the applicable page.

Page Type:	Page #:	Classification:	Special Handling Requirement:
DoD Page	1	UNCLASSIFIED	
Transmitter Page 1	2	UNCLASSIFIED	
Receiver Page 1	3	UNCLASSIFIED	
Antenna Page 1	4	UNCLASSIFIED	
Antenna Page 2	5	UNCLASSIFIED	
General Continuation 1	6	UNCLASSIFIED	
NTIA Page	7	UNCLASSIFIED	

UNCLASSIFIED

J/F 12/09179

APPLICATION FOR EQUIPMENT FREQUENCY ALLOCATION		CLASSIFICATION UNCLASSIFIED		DATE 04/28/2007		J/F 12/09179 Page 1 of 7 Pages	
DOD GENERAL INFORMATION							
TO Navy Marine Corps Spectrum Center 2461 Eisenhower Ave., Suite 1202 Alexandria, VA 22331-1400				FROM PMS NSW-SP Room 301, Bldg. 22 1244 Patterson Ave SE Washington Navy Yard, DC 20374			
1. APPLICATION TITLE (U) Enerdyne Technologies Enerlinks2 Data Uplink							
2. SYSTEM NOMENCLATURE (U) UAV Data Uplink							
3. STAGE OF ALLOCATION (U) ☐ a. STAGE 1 CONCEPTUAL ☐ b. STAGE 2 EXPERIMENTAL ☒ c. STAGE 3 DEVELOPMENTAL ☐ d. STAGE 4 OPERATIONAL							
4. FREQUENCY REQUIREMENTS a. FREQUENCY(IES) (U) 2200 MHz - 2290 MHz b. EMISSION DESIGNATORS (U) 8M11F1D							
5. TARGET STARTING DATE FOR SUBSEQUENT STAGES							
a. STAGE 2 (U) NA		b. STAGE 3 (U) NA		c. STAGE 4 (U) 2008			
6. EXTENT OF USE (U) Intermittent							
7. GEOGRAPHICAL AREA FOR							
a. STAGE 2 (U) NA							
b. STAGE 3 (U) US&P Test and Training Ranges							
c. STAGE 4 (U) (See Remarks)							
8. NUMBER OF UNITS							
a. STAGE 2 (U) NA		b. STAGE 3 (U) 19		c. STAGE 4 (U) 200			
9. NUMBER OF UNITS OPERATING SIMULTANEOUSLY IN THE SAME ENVIRONMENT(U) 1							
10. OTHER J/F 12 APPLICATION ID(S) TO BE (U) ☐ a. SUPERSEDED ☐ b. RELATED				11. IS THERE ANY OPERATIONAL REQUIREMENT AS DESCRIBED IN THE INSTRUCTIONS FOR PARAGRAPH 11? (U) ☐ a. YES ☒ b. NO ☐ c. NAVAIL			
12. NAMES AND TELEPHONE NUMBERS (U)							
a. PROGRAM MANAGER Robert Murray				(1) COMMERCIAL 202-781-5782		(2) DSN 326-5782	
b. PROJECT ENGINEER Bruce Venanzi				(1) COMMERCIAL 757-492-7960		(2) DSN 537-2505	
13. REMARKS (U) Item 7c. US&P, NATO Countries, Japan, Korea, Australia and Contingency Areas Worldwide							
DOWNGRADING INSTRUCTIONS						J/F 12/09179 CLASSIFICATION UNCLASSIFIED	

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TRANSMITTER EQUIPMENT CHARACTERISTICS			
1. NOMENCLATURE, MANUFACTURER'S MODEL NO. (U) Enerlinks2 Data Link		2. MANUFACTURER'S NAME (U) Enerdyne Technologies, Inc.	
3. TRANSMITTER INSTALLATION (U) Ground Control Station		4. TRANSMITTER TYPE (U) FSK Digital Data	
5. TUNING RANGE (U) 2200 MHz - 2400 MHz		6. METHOD OF TUNING (U) PLL Synthesizer	
7. RF CHANNELING CAPABILITY (U) 2200 MHz @ 500 kHz increments		8. EMISSION DESIGNATORS (U) 8M11F1D (U) (U)	
9. FREQUENCY TOLERANCE (U) 20 ppm		12. EMISSION BANDWIDTH ☐ CALCULATED ☒ MEASURED	
10. FILTER EMPLOYED (U) ☒ a. YES ☐ b. NO		a. -3 dB (U) 5.75 MHz (U) (U)	
		b. -20 dB (U) 6.5 MHz (U) (U)	
		c. -40 dB (U) 14.0 MHz (U) (U)	
11. SPREAD SPECTRUM (U) ☐ a. YES ☒ b. NO		d. -60 dB (U) 20.0 MHz (U) (U)	
		e. OC-BW (U) 8.11 MHz (U) (U)	
13. MAXIMUM BIT RATE (U) 5 Mbps		15. MAXIMUM MODULATION FREQUENCY (U) 2.75 MHz	
14. MODULATION TECHNIQUES AND CODING (U) FSK (See Remarks)		17. DEVIATION RATIO (U) 0.175	
		18. PULSE CHARACTERISTICS	
16. PRE-EMPHASIS (U) ☐ a. YES ☒ b. NO		a. RATE (U) NA (U) (U)	
		b. WIDTH (U) NA (U) (U)	
19. POWER		c. RISE TIME (U) NA (U) (U)	
a. MEAN (U) 20 W (U) (U)		d. FALL TIME (U) NA (U) (U)	
b. PEP (U) NA (U) (U)		e. COMP RATIO (U) NA (U) (U)	
20. OUTPUT DEVICE (U) FET		21. HARMONIC LEVEL	
		a. 2nd (U) -70 dB	
22. SPURIOUS LEVEL (U) -70 dB		b. 3rd (U) -80 dB	
23. FCC TYPE ACCEPTANCE NO. (U) NA		c. OTHER (U) -95 dB	
24. REMARKS (U) Item 10: Gaussian pre-modulation filter, bandwidth scales with bit rate Item 14: Gaussian filtered FSK, turbo product coding with selectable rates approximately 1/2, 2/3, 4/5 and uncoded The DRS data link incorporates a network capability. This capability allows the UAV and the Ground station to have network transfer data connection from one ground station to another.			
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CLASSIFICATION UNCLASSIFIED				PAGE 3																	
RECEIVER EQUIPMENT CHARACTERISTICS																					
1. NOMENCLATURE, MANUFACTURER'S MODEL NO. (U) Enerlinks2 Data Link			2. MANUFACTURER'S NAME (U) Enerdyne Technologies, Inc.																		
3. RECEIVER INSTALLATION (U) Aircraft/UAV			4. RECEIVER TYPE (U) Dual Conversion Superheterodyne																		
5. TUNING RANGE (U) 2200 MHz - 2400 MHz			6. METHOD OF TUNING (U) PLL Synthesizer																		
7. RF CHANNELING CAPABILITY (U) 2200 MHz @ 500 kHz increments			8. EMISSION DESIGNATORS (U) 8M11F1D																		
9. FREQUENCY TOLERANCE (U) 20 ppm			11. RF SELECTIVITY ☒ CALCULATED ☐ MEASURED																		
10. IF SELECTIVITY <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <thead> <tr> <th></th> <th>1st (U)</th> <th>2nd (U)</th> <th>3rd (U)</th> </tr> </thead> <tbody> <tr> <td>a. -3 dB</td> <td>37 MHz</td> <td>(See Remarks)</td> <td>NA</td> </tr> <tr> <td>b. -20 dB</td> <td>50 MHz</td> <td>(See Remarks)</td> <td>NA</td> </tr> <tr> <td>c. -60 dB</td> <td>77.5 MHz</td> <td>(See Remarks)</td> <td>NA</td> </tr> </tbody> </table>				1st (U)	2nd (U)	3rd (U)	a. -3 dB	37 MHz	(See Remarks)	NA	b. -20 dB	50 MHz	(See Remarks)	NA	c. -60 dB	77.5 MHz	(See Remarks)	NA	a. -3 dB (U) 476 MHz b. -20 dB (U) 634 MHz c. -60 dB (U) 1093 MHz d. Preselection Type (U) Bandpass		
	1st (U)	2nd (U)	3rd (U)																		
a. -3 dB	37 MHz	(See Remarks)	NA																		
b. -20 dB	50 MHz	(See Remarks)	NA																		
c. -60 dB	77.5 MHz	(See Remarks)	NA																		
12. IF FREQUENCY <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <tbody> <tr> <td>a. 1st (U) 400 MHz</td> </tr> <tr> <td>b. 2nd (U) 70 MHz</td> </tr> <tr> <td>c. 3rd (U) NA</td> </tr> </tbody> </table>			a. 1st (U) 400 MHz	b. 2nd (U) 70 MHz	c. 3rd (U) NA	13. MAXIMUM POST DETECTION FREQUENCY (U) 6 MHz															
a. 1st (U) 400 MHz																					
b. 2nd (U) 70 MHz																					
c. 3rd (U) NA																					
15. OSCILLATOR TUNED <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <thead> <tr> <th></th> <th>1st (U)</th> <th>2nd (U)</th> <th>3rd (U)</th> </tr> </thead> <tbody> <tr> <td>a. ABOVE TUNED FREQUENCY</td> <td style="text-align: center;">X</td> <td></td> <td></td> </tr> <tr> <td>b. BELOW TUNED FREQUENCY</td> <td></td> <td style="text-align: center;">X</td> <td></td> </tr> <tr> <td>c. EITHER ABOVE OR BELOW THE FREQUENCY</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>				1st (U)	2nd (U)	3rd (U)	a. ABOVE TUNED FREQUENCY	X			b. BELOW TUNED FREQUENCY		X		c. EITHER ABOVE OR BELOW THE FREQUENCY				14. MINIMUM POST DETECTION FREQUENCY (U) NA		
	1st (U)	2nd (U)	3rd (U)																		
a. ABOVE TUNED FREQUENCY	X																				
b. BELOW TUNED FREQUENCY		X																			
c. EITHER ABOVE OR BELOW THE FREQUENCY																					
18. DE-EMPHASIS (U) ☐ a. YES ☒ b. NO			16. MAXIMUM BIT RATE (U) 5 Mbps																		
19. IMAGE REJECTION (U) 79 dB			17. SENSITIVITY <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <tbody> <tr> <td>a. SENSITIVITY (U) (See Remarks)</td> </tr> <tr> <td>b. CRITERIA (U) BER 1E-07</td> </tr> <tr> <td>c. NOISE FIG (U) 6 dB</td> </tr> <tr> <td>d. NOISE TEMP (U) NA</td> </tr> </tbody> </table>			a. SENSITIVITY (U) (See Remarks)	b. CRITERIA (U) BER 1E-07	c. NOISE FIG (U) 6 dB	d. NOISE TEMP (U) NA												
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b. CRITERIA (U) BER 1E-07																					
c. NOISE FIG (U) 6 dB																					
d. NOISE TEMP (U) NA																					
20. SPURIOUS REJECTION (U) 84 dB																					
21. REMARKS (U) Item 10: 2nd IF Selectivity <table style="width: 100%; margin-left: 20px;"> <thead> <tr> <th></th> <th>Narrow</th> <th>Medium</th> <th>Wide</th> </tr> </thead> <tbody> <tr> <td>-3 dB</td> <td>2.1 MHz</td> <td>4.9 MHz</td> <td>9.4 MHz</td> </tr> <tr> <td>-20 dB</td> <td>3.2 MHz</td> <td>7.5 MHz</td> <td>12.0 MHz</td> </tr> <tr> <td>-60 dB</td> <td>4.0 MHz</td> <td>9.0 MHz</td> <td>14.0 MHz</td> </tr> </tbody> </table> Item 17a. Sensitivity Rate 1/2 FEC: -94 dBm Rate 2/3 FEC: -93 dBm Rate 4/5 FEC: -92 dBm Uncoded: -82 dBm							Narrow	Medium	Wide	-3 dB	2.1 MHz	4.9 MHz	9.4 MHz	-20 dB	3.2 MHz	7.5 MHz	12.0 MHz	-60 dB	4.0 MHz	9.0 MHz	14.0 MHz
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ANTENNA EQUIPMENT CHARACTERISTICS

1. (U) ☒ a. TRANSMITTING ☐ b. RECEIVING ☐ c. TRANSMITTING AND RECEIVING

2. NOMENCLATURE, MANUFACTURER'S MODEL NO.

(U) RF2200-2400-HN-01

3. MANUFACTURER'S NAME

(U) RF Concepts Inc.

4. FREQUENCY RANGE

(U) 2200 MHz - 2400 MHz

5. TYPE (U) Horn

(U) Horn

7. SCAN CHARACTERISTICS

a. TYPE (U) FIXED

b. VERTICAL SCAN	(U)	NA
------------------	-----	----

(1) Max Elev (U)

(2) Min Elev	(U)
--------------	-----

(3) Scan Rate (U)

6. POLARIZATION

(U) Vertical

8. GAIN

a. MAIN BEAM

(U) 12 dBi

b. 1st MAJOR SIDE LOBE

(U) NAvail

9. BEAMWIDTH

a. HORIZONTAL

(U) 60 deg

b. VERTICAL

(U) 40 deg

d. SECTOR BLANKING (U) ☐ (1) YES ☒ (2) NO

11

(1) YES

	X
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(2) NO

10. REMARKS (U)

ANTENNA EQUIPMENT CHARACTERISTICS

(U) 78 deg

10. REMARKS (U)

GENERAL CONTINUATION PAGE

APPLICATION FOR SPECTRUM REVIEW	CLASSIFICATION UNCLASSIFIED	PAGE 7
NTIA GENERAL INFORMATION		
1. APPLICATION TITLE (U) Enerdyne Technologies Enerlinks2 Data Uplink		
2. SYSTEM NOMENCLATURE (U) UAV Data Uplink		
3. STAGE OF ALLOCATION (U) ☐ a. STAGE 1 CONCEPTUAL ☐ b. STAGE 2 EXPERIMENTAL ☒ c. STAGE 3 DEVELOPMENTAL ☐ d. STAGE 4 OPERATIONAL		
4. FREQUENCY REQUIREMENTS a. FREQUENCY(IES) (U) 2200 MHz - 2290 MHz b. EMISSION DESIGNATORS (U) 8M11F1D		
5. PURPOSE OF SYSTEM, OPERATIONAL AND SYSTEM CONCEPTS (U) Provide data, command and control uplink to the UAV. (WARTIME USE) ☒ a. YES ☐ b. NO		
6. INFORMATION TRANSFER REQUIREMENTS (U) 5 Mbps, FSK digital data		
7. ESTIMATED INITIAL COST OF THE SYSTEM (U) \$76,000 per unit		
8. TARGET DATE FOR		
a. APPLICATION APPROVAL (U) ASAP	b. SYSTEM ACTIVATION (U) ASAP	c. SYSTEM TERMINATION (U) UNKNOWN
9. SYSTEM RELATIONSHIP AND ESSENTIALITY (U) None		
10. REPLACEMENT INFORMATION (U) None		
11. RELATED ANALYSIS AND/OR TEST DATA (U) None		
12. NUMBER OF MOBILE UNITS (U) 19		
13. GEOGRAPHICAL AREA FOR		
a. STAGE 2 (U) NA		
b. STAGE 3 (U) US&P Test and Training Ranges		
c. STAGE 4 (U) US&P		
14. LINE DIAGRAM (U) See Page(s) 6		15. SPACE SYSTEMS (U) See Page(s) NA
16. TYPE OF SERVICE(S) FOR STAGE 4 (U) Aeronautical Mobile		17. STATION CLASS(ES) FOR STAGE 4 (U) FA FAD
18. REMARKS (U)		
DOWNGRADING INSTRUCTIONS		J/F 12/09179 CLASSIFICATION UNCLASSIFIED