

APPLICATION FOR EQUIPMENT FREQUENCY ALLOCATION	CLASSIFICATION	DATE	Form Approved OMB No. 0704-0188
	UNCLASSIFIED	March 5, 2010	PAGE 1 OF 8 PAGES

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DOD GENERAL INFORMATION			
TO UAVPRO 873 West Parade Avenue Blackstone, Va 23824		FROM AAI Corporation 124 Industry Lane Hunt Valley MD 21030	
1. APPLICATION TITLE Frequency Clearance for the Orbiter Unmanned Air Vehicle System			
2. SYSTEM NOMENCLATURE Orbiter Air Vehicle			
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) 400 - 450 MHz; 2000 - 2400 MHz			
b. EMISSION DESIGNATOR(S) 420K0F3D 2MOF3F			
5. TARGET STARTING DATE FOR SUBSEQUENT STAGES			
a. STAGE 2 December 2008		b. STAGE 3 March 2010	
		c. STAGE 4 1QFY10	
6. EXTENT OF USE The Orbiter System is being demonstrated by AAI Corporation for evaluation by NAVAIR 4.5X			
7. GEOGRAPHICAL AREA FOR			
a. STAGE 2 Fort Pickett, Va; Yuma Proving Grounds, Az; Fort Dix, Nj; MCB Quantico, Va; NASA Wallops FF, Va			
b. STAGE 3 Fort Pickett, Va; Yuma Proving Grounds, Az; Fort Dix, Nj; MCB Quantico, Va; NASA Wallops FF, Va			
c. STAGE 4 OCONUS Site TBD			
8. NUMBER OF UNITS			
a. STAGE 2 2		b. STAGE 3 2	
		c. STAGE 4 TBD	
9. NUMBER OF UNITS OPERATING SIMULTANEOUSLY IN THE SAME ENVIRONMENT Up to two (2) unmanned air vehicles per one (1) ground control station (GCS).			
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a. SUPERSEDED J/F 12/		a. YES ☐ b. NO ☒ c. N/A ☐	
b. RELATED J/F 12/			
12. NAMES AND TELEPHONE NUMBERS			
a. PROGRAM MANAGER Steve Yeager		(1) COMMERCIAL (410) 382-4991	(2) AUTOVON N/A
b. PROJECT ENGINEER Michael H. Mercado		(1) COMMERCIAL (240) 925-4158	(2) AUTOVON N/A
13. REMARKS The Orbiter UAV is a joint program between AAI Corporation and Aeronautics. The system will be demonstrated at Yuma for consideration of further interest by NAVAIR 4.5X for USSOCOM.			
DOWNGRADING INSTRUCTIONS N/A		CLASSIFICATION UNCLASSIFIED	

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TRANSMITTER EQUIPMENT CHARACTERISTICS		
1. NOMENCLATURE, MANUFACTURER'S MODEL NO. Mini RF Digital Transmitter	2. MANUFACTURER'S NAME Comm tact	
3. TRANSMITTER INSTALLATION Orbiter Air Vehicle	4. TRANSMITTER TYPE Digital FM Communication	
5. TUNING RANGE 2000 - 2400 MHz	6. METHOD OF TUNING Synthesized via MDM 9 pin Connector	
7. RF CHANNELING CAPABILITY 5 MHz steps	8. EMISSION DESIGNATOR(S) 2M0F3F	
9. FREQUENCY TOLERANCE ±1 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	
13. MAXIMUM BIT RATE 19200 bps	a. -3 dB 12 MHz b. -20 dB 32 MHz c. -40 dB 66 MHz d. -60 dB 128 MHz e. OC-BW	
14. MODULATION TECHNIQUES AND CODING True digital FM Continuous Phase (Coherent)	15. MAXIMUM MODULATION FREQUENCY 5.5 MHz	
16. PRE-EMPHASIS (X one) ☐ a. YES ☒ b. NO	17. DEVIATION RATIO 4 MHz	
19. POWER a. MEAN 2 Watts b. PEP	18. PULSE CHARACTERISTICS a. RATE N/A b. WIDTH N/A c. RISE TIME N/A d. FALL TIME N/A e. COMP RATIO N/A	
20. OUTPUT DEVICE	21. HARMONIC LEVEL a. 2ND -45 dB max b. 3RD - 45 dB max c. OTHER	
22. SPURIOUS LEVEL -45 dB	23. FCC TYPE ACCEPTANCE NO. N/A	
24. REMARKS None		
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RECEIVER EQUIPMENT CHARACTERISTICS				
1. NOMENCLATURE, MANUFACTURER'S MODEL NO. UHF Rx-Part			2. MANUFACTURER'S NAME Ing. Horst Becker	
3. RECEIVER INSTALLATION Orbiter Air Vehicle			4. RECEIVER TYPE FM Communications	
5. TUNING RANGE 420 - 450 MHz			6. METHOD OF TUNING Crystal Fix	
7. RF CHANNELING CAPABILITY First channel 420 MHz, 100 KHz increments			8. EMISSION DESIGNATOR(S) N/A	
9. FREQUENCY TOLERANCE ±10 ppm				
10. IF SELECTIVITY	1ST	2ND	3RD	11. RF SELECTIVITY (X and complete as applicable)
a. -3 dB	1kHz	30 kHz		☐ CALCULATED ☒ MEASURED
b. -20 dB	5kHz	40kHz		a. -3 dB 30kHz
c. -60 dB		50kHz		b. -20 dB 40kHz
				c. -60 dB 50kHz
				d. PRESELECTION TYPE
12. IF FREQUENCY				13. MAXIMUM POST DETECTION FREQUENCY
a. 1ST 31.5 MHz				N/A
b. 2ND 455 kHz				14. MINIMUM POST DETECTION FREQUENCY
c. 3RD				N/A
15. OSCILLATOR TUNED	1ST	2ND	3RD	16. MAXIMUM BIT RATE
a. ABOVE TUNED FREQUENCY				4800 bps
b. BELOW TUNED FREQUENCY				17. SENSITIVITY
c. EITHER ABOVE OR BELOW TUNED FREQUENCY				a. SENSITIVITY -110 dBm
18. DE-EMPHASIS (X one)				b. CRITERIA 10 dB S/N
☐ a. YES ☒ b. NO				c. NOISE FIG dB
				d. NOISE TEMP Kelvin
19. IMAGE REJECTION			20. SPURIOUS REJECTION	
21. REMARKS N/A				
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ANTENNA EQUIPMENT CHARACTERISTICS		
1. ☒ a. TRANSMITTING ☐ b. RECEIVING ☐ c. TRANSMITTING AND RECEIVING		
2. NOMENCLATURE, MANUFACTURER'S MODEL NO. Omni Directional Antenna	3. MANUFACTURER'S NAME Commfact	
4. FREQUENCY RANGE 2000 - 2400 MHz	5. TYPE Omni	
6. POLARIZATION Circular	7. SCAN CHARACTERISTICS	
a. TYPE N/A		
b. VERTICAL SCAN		
(1) MAX ELEV NA		
(2) MIN ELEV NA		
(3) SCAN RATE NA		
c. HORIZONTAL SCAN		
(1) SECTOR SCANNED NA		
(2) SCAN RATE NA		
d. SECTOR BLANKING (X one)		
☐ (1) YES ☒ (2) NO		
8. GAIN		
a. MAIN BEAM 2 dBi		
b. 1ST MAJOR SIDE LOBE NA		
9. BEAMWIDTH		
a. HORIZONTAL 360 degree		
b. VERTICAL 30 degree		
10. REMARKS None		
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ANTENNA EQUIPMENT CHARACTERISTICS		
1. ☐ a. TRANSMITTING ☒ b. RECEIVING ☐ c. TRANSMITTING AND RECEIVING		
2. NOMENCLATURE, MANUFACTURER'S MODEL NO. UHF Omni Antenna	3. MANUFACTURER'S NAME Commfact Ltd.	
4. FREQUENCY RANGE 400 - 450 MHz	5. TYPE FM Communication	
6. POLARIZATION Circular	7. SCAN CHARACTERISTICS	
8. GAIN	a. TYPE	
a. MAIN BEAM 0 dBi	b. VERTICAL SCAN	
b. 1ST MAJOR SIDE LOBE NA	(1) MAX ELEV NA	
	(2) MIN ELEV NA	
	(3) SCAN RATE NA	
9. BEAMWIDTH	c. HORIZONTAL SCAN	
a. HORIZONTAL N/A	(1) SECTOR SCANNED NA	
b. VERTICAL N/A	(2) SCAN RATE NA	
d. SECTOR BLANKING (X one)		
☐ (1) YES ☒ (2) NO		
10. REMARKS None		
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APPLICATION FOR SPECTRUM REVIEW	CLASSIFICATION UNCLASSIFIED	PAGE 6
NTIA GENERAL INFORMATION		
1. APPLICATION TITLE Frequency Clearance for Orbiter Unmanned Air Vehicle System		
2. SYSTEM NOMENCLATURE Orbiter Air Vehicle		
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) 400 - 450 MHz; 2000 - 2400 MHz b. EMISSION DESIGNATOR(S) 420K0F3D 2MOF3F		
5. PURPOSE OF SYSTEM, OPERATIONAL AND SYSTEM CONCEPTS (WARTIME USE) (X one) ☒ a. YES ☐ b. NO The Orbiter is being demonstrated for NAVAIR 4.5X.		
6. INFORMATION TRANSFER REQUIREMENTS N/A		
7. ESTIMATED INITIAL COST OF THE SYSTEM \$150,000 with aircraft		
8. TARGET DATE FOR		
a. APPLICATION APPROVAL February 2009	b. SYSTEM ACTIVATION February 2010	c. SYSTEM TERMINATION N/A
9. SYSTEM RELATIONSHIP AND ESSENTIALITY The Orbiter system is a small fixed winged UAV that can be launched from rough terrain using a small launcher and is recovered via a self contained parachute. The system is suited for use with forward deployed troops since it is small in size. The system offers both EO and IR cameras in separate payload packages.		
10. REPLACEMENT INFORMATION The Orbiter system is only be demonstrated at this point for possible further interest by NAVAIR 4.5X.		
11. RELATED ANALYSIS AND TEST DATA Flight test data from Aeronautics can be made available upon request.		
12. NUMBER OF MOBILE UNITS N/A		
13. GEOGRAPHICAL AREA FOR		
a. STAGE 2 Fort Pickett, Va; Yuma Proving Grounds, Az; Fort Dix, Nj; MCB Quantico, Va; NASA Wallops FF. Va		
b. STAGE 3 Fort Pickett, Va; Yuma Proving Grounds, Az; Fort Dix, Nj; MCB Quantico, Va; NASA Wallops FF. Va		
c. STAGE 4 OCONUS Site TBD		
14. LINE DIAGRAM (See Page(s)) 8	15. SPACE SYSTEMS (See Page(s)) N/A	
16. TYPE OF SERVICE(S) FOR STAGE 4 N/A	17. STATION CLASS(ES) FOR STAGE 4 N/A	
18. REMARKS The Orbiter UAV is a joint program between AAI Corporation and Aeronautics. The system will be demonstrated at Yuma for consideration of further interest by NAVAIR 4.5X for USSOCOM.		
DOWNGRADING INSTRUCTIONS N/A	CLASSIFICATION UNCLASSIFIED	

APPLICATION FOR FOREIGN SPECTRUM SUPPORT		CLASSIFICATION UNCLASSIFIED	PAGE 7
FOREIGN COORDINATION GENERAL INFORMATION			
1. APPLICATION TITLE Frequency Clearance for Orbiter Unmanned Air Vehicle System			
2. SYSTEM NOMENCLATURE Orbiter Air Vehicle			
3. STAGE OF ALLOCATION (<i>X one</i>) ☐ a. STAGE 1 - CONCEPTUAL ☒ b. STAGE 2 - EXPERIMENTAL ☐ c. STAGE 3 - DEVELOPMENTAL ☐ d. STAGE 4 - OPERATIONAL			
4. FREQUENCY REQUIREMENTS a. FREQUENCY(IES) 400 - 450 MHz, 2000 - 2400 MHz b. EMISSION DESIGNATOR(S) 420K0F3D, 2M0F3F			
5. PROPOSED OPERATING LOCATIONS OUTSIDE US&P None			
6. PURPOSE OF SYSTEM, OPERATIONAL AND SYSTEM CONCEPTS The Orbiter is being demonstrated for NAVAIR 4.5X.			
7. INFORMATION TRANSFER REQUIREMENTS N/A			
8. NUMBER OF UNITS OPERATING SIMULTANEOUSLY IN THE SAME ENVIRONMENT Up to 2 maximum.			
9. REPLACEMENT INFORMATION The Orbiter system is only be demonstrated at this point for possible further interest by NAVAIR 4.5X.			
10. LINE DIAGRAM (See Page(s)) 8		11. SPACE SYSTEMS (See Page(s)) N/A	
12. PROJECTED OPERATIONAL DEPLOYMENT DATE N/A			
13. REMARKS The Orbiter UAV is a joint program between AAI Corporation and Aeronautics. The system will be demonstrated at Yuma for consideration of further interest by NAVAIR 4.5X for USSOCOM.			
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