

APPLICATION FOR EQUIPMENT FREQUENCY ALLOCATION	CLASSIFICATION	DATE	Form Approved OMB No. 0704-0188
	UNCLASSIFIED	March 5, 2010	PAGE 1 OF 9 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 Ground Control Station			
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 Systems		b. STAGE 3 2 Systems	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a. SUPERSEDED J/F 12/		a. YES ☐ b. NO ☒ c. N/A ☐	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	

CLASSIFICATION UNCLASSIFIED		PAGE 2
TRANSMITTER EQUIPMENT CHARACTERISTICS		
1. NOMENCLATURE, MANUFACTURER'S MODEL NO. UHF Tx-Part	2. MANUFACTURER'S NAME Ing. Horst Becker	
3. TRANSMITTER INSTALLATION Orbiter Ground Control Station	4. TRANSMITTER TYPE FM Communication	
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) 420K0F3D	
9. FREQUENCY TOLERANCE ±10 ppm	12. EMISSION BANDWIDTH (X and complete as applicable) ☒ CALCULATED ☒ MEASURED	
10. FILTER EMPLOYED (X one) ☐ a. YES ☒ b. NO		
11. SPREAD SPECTRUM (X one) ☐ a. YES ☒ b. NO		
13. MAXIMUM BIT RATE 4800 bps	15. MAXIMUM MODULATION FREQUENCY	
14. MODULATION TECHNIQUES AND CODING FM	a. -3 dB 20 kHz b. -20 dB 40 kHz c. -40 dB (at -50 dB) 70 kHz d. -60 dB 128 MHz e. OC-BW	
16. PRE-EMPHASIS (X one) ☐ a. YES ☒ b. NO	17. DEVIATION RATIO 4 MHz	
19. POWER a. MEAN 23 dBm 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 Transistor BFG 135	21. HARMONIC LEVEL a. 2ND -50 dBm b. 3RD -60 dBm c. OTHER -60 dBm	
22. SPURIOUS LEVEL	a. 2ND -50 dBm b. 3RD -60 dBm c. OTHER -60 dBm	
23. FCC TYPE ACCEPTANCE NO. N/A	a. 2ND -50 dBm b. 3RD -60 dBm c. OTHER -60 dBm	
24. REMARKS None		
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RECEIVER EQUIPMENT CHARACTERISTICS				
1. NOMENCLATURE, MANUFACTURER'S MODEL NO. Ground S Band Digital RX			2. MANUFACTURER'S NAME Commfact Ltd.	
3. RECEIVER INSTALLATION Ground Control Station			4. RECEIVER TYPE Digital FM Communications	
5. TUNING RANGE 2000 - 2400 MHz			6. METHOD OF TUNING Synthesized Rotary Switches - Internal or External Comms	
7. RF CHANNELING CAPABILITY 1 MHz Increments			8. EMISSION DESIGNATOR(S) N/A	
9. FREQUENCY TOLERANCE ±65 ppm				
10. IF SELECTIVITY	1ST	2ND	3RD	11. RF SELECTIVITY (X and complete as applicable)
a. -3 dB	16 MHz			☐ CALCULATED ☐ MEASURED
b. -20 dB	17 MHz			a. -3 dB
c. -60 dB	18 MHz			b. -20 dB
				c. -60 dB
				d. PRESELECTION TYPE
12. IF FREQUENCY				13. MAXIMUM POST DETECTION FREQUENCY
a. 1ST 470 MHz				5.5 MHz
b. 2ND				14. MINIMUM POST DETECTION FREQUENCY
c. 3RD				20 Hz
15. OSCILLATOR TUNED	1ST	2ND	3RD	16. MAXIMUM BIT RATE
a. ABOVE TUNED FREQUENCY				17. SENSITIVITY
b. BELOW TUNED FREQUENCY				a. SENSITIVITY -86 dBm
c. EITHER ABOVE OR BELOW TUNED FREQUENCY				b. CRITERIA
18. DE-EMPHASIS (X one)				c. NOISE FIG dB
☒ a. YES ☐ b. NO				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. UHF Trimmable Antenna	3. MANUFACTURER'S NAME Commfact Ltd.	
4. FREQUENCY RANGE 400 - 450 MHz	5. TYPE FM Communication	
6. POLARIZATION	7. SCAN CHARACTERISTICS	
8. GAIN	a. TYPE N/A	
a. MAIN BEAM 1 dBi	b. VERTICAL SCAN	
b. 1ST MAJOR SIDE LOBE NA	(1) MAX ELEV NA	
9. BEAMWIDTH	(2) MIN ELEV NA	
a. HORIZONTAL	(3) SCAN RATE NA	
b. VERTICAL	c. HORIZONTAL SCAN	
(1) SECTOR SCANNED NA		(2) SCAN RATE NA
d. SECTOR BLANKING (X one)		
☐ (1) YES ☒ (2) NO		
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. Ground Omni	3. MANUFACTURER'S NAME Commfact Ltd.	
4. FREQUENCY RANGE 2000 - 2400 MHz	5. TYPE Omni	
6. POLARIZATION Circular	7. SCAN CHARACTERISTICS	
8. GAIN a. TYPE		
a. MAIN BEAM 2 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 360 degrees	(1) SECTOR SCANNED NA	
b. VERTICAL 60 degrees	(2) SCAN RATE NA	
d. SECTOR BLANKING (X one)		
☐ (1) YES ☒ (2) NO		
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. Ground Directional	3. MANUFACTURER'S NAME BA	
4. FREQUENCY RANGE 2000 - 2400 MHz	5. TYPE Directional	
6. POLARIZATION Linear Vertical	7. SCAN CHARACTERISTICS	
8. GAIN	a. TYPE	
a. MAIN BEAM 8 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 30 degrees	(1) SECTOR SCANNED NA	
b. VERTICAL 30 degrees	(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 7
NTIA GENERAL INFORMATION		
1. APPLICATION TITLE Frequency Clearance for Orbiter Unmanned Air Vehicle System		
2. SYSTEM NOMENCLATURE Orbiter Ground Control Station		
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 b. SYSTEM ACTIVATION c. SYSTEM TERMINATION FEBRUARY 2009 FEBRUARY 2010 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)) 9	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 8
FOREIGN COORDINATION GENERAL INFORMATION			
1. APPLICATION TITLE Frequency Clearance for Orbiter Unmanned Air Vehicle System			
2. SYSTEM NOMENCLATURE Orbiter Ground Control Station			
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 2MOF3F			
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)) 9		11. SPACE SYSTEMS (See Page(s)) N/A	
12. PROJECTED OPERATIONAL DEPLOYMENT DATE TBD			
13. REMARKS The Orbiter UAV is a joint program between AM 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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