

**Williams Aerospace Man Portable Day and Night Surveillance System
Component Breakdown and Narrative**

The attached DD 1494 Applications are submitted with the best information WA has at present. The Application Designation J/F 1, and 2 was used because of uncertainty of the correct numbering system and will be changed accordingly.

The system is divided into two main communication links: 1) Video and 2) Telemetry. The NightStalker II, NanoShrike III MUAUV's and the Devastator I MALE UAV have identical transmitters and receivers that are comprised of the following components: 1) Telemetry Modem MaxStream 9XTend 900MHZ, Dipole Omni Ant. DD1494 *JIF* 12???1 Application Pg 2/3 . (Up & Down Link) and 2) Primary Analog Video Transmitter GMS NT3-L with PAL2 2W PA 1700-1850 MHZ, Dipole Omni Ant. DD1494 *JIF* 127773 Application Pg 2.

The Portable Ground station is comprised of the following components: 1) Telemetry Modem MaxStream 9XTend 900MHZ, Dipole Omni Ant. DD1494 *JIF* 127771 Application Pg 2/3. (Up & Down Link). 2) Primary Analog Video Receiver GMS XRL 1710-1850 MHZ, Vagi Ant. DD1494 J/F 12???73 Pg 3. Any questions please call Jeff Williams at (808) 626-5259 or email [REDACTED]

APPLICATION FOR EQUIPMENT FREQUENCY ALLOCATION	CLASSIFICATION	DATE	<i>Form Approved OMB No. 0704-0188</i>	
	UNCLASSIFIED	20101026	PAGE 1 OF	6 PAGES

The public reporting burden for this collection of information is estimated to average 24 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

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DOD GENERAL INFORMATION				
TO CWO Arthur R. DeLeon Spectrum Management Officer COMMARFORPAC G6 Operations		FROM U.S. Marine Corps Forces, Pacific Experimentation Center (MEC)		
1. APPLICATION TITLE Williams Aerospace UAS Telemetry Up and Downlink				
2. SYSTEM NOMENCLATURE Williams Aerospace Man Portable Day and Night Surveillance System				
3. STAGE OF ALLOCATION (X one) <input type="checkbox"/> a. STAGE 1 - CONCEPTUAL <input checked="" type="checkbox"/> b. STAGE 2 - EXPERIMENTAL <input type="checkbox"/> c. STAGE 3 - DEVELOPMENTAL <input type="checkbox"/> d. STAGE 4 - OPERATIONAL				
4. FREQUENCY REQUIREMENTS a. FREQUENCY(IES) C2 Link: 900Mhz b. EMISSION DESIGNATOR(S) C2 Link: 350KOFID (auto frequency hop)				
5. TARGET STARTING DATE FOR SUBSEQUENT STAGES a. STAGE 2 20100101 to 20131231 b. STAGE 3 c. STAGE 4				
6. EXTENT OF USE Approximately 100 hours of testing; (See Remarks)				
7. GEOGRAPHICAL AREA FOR a. STAGE 2 Dugway Proving Ground, UT, Makua Valley, HI, Pohakuloa Training Area, HI, Thailand, Philippines, Australia b. STAGE 3 c. STAGE 4				
8. NUMBER OF UNITS a. STAGE 2 2 Units b. STAGE 3 c. STAGE 4				
9. NUMBER OF UNITS OPERATING SIMULTANEOUSLY IN THE SAME ENVIRONMENT 2 Units				
10. OTHER J/F 12 APPLICATION NUMBER(S) TO BE <input type="checkbox"/> a. SUPERSEDED J/F 12/ <input checked="" type="checkbox"/> b. RELATED J/F 12/		11. IS THERE ANY OPERATIONAL REQUIREMENT AS DESCRIBED IN THE INSTRUCTIONS FOR PARAGRAPH 11? <input type="checkbox"/> a. YES <input checked="" type="checkbox"/> b. NO <input type="checkbox"/> c. N/Avail		
12. NAMES AND TELEPHONE NUMBERS a. PROGRAM MANAGER Jeffrey L. Williams (1) COMMERCIAL (808) 626-5259 (2) AUTOVON b. PROJECT ENGINEER Jeffrey L. Williams (1) COMMERCIAL (808) 675-1650 (2) AUTOVON				
13. REMARKS The U.S. Marine Corps Forces, Pacific Experimentation Center (MEC) will conduct an Operational User Assessment (OUA) of the Nano Shrike III, NightStalker II and Devastator I Unmanned Aerial Systems (UAS) to provide operational user feedback from various military units to the technology developers. One UAS consists of One (1) Ground Control Station (Mobile), Two (2) NightStalker II MUAV's, Two (2) Devastator I MUAV's and Three (3) NanoShrike III MAV's. Multiple aircraft may fly simultaneously from one ground station. This Application is for the Primary Video Downlink that is used to provide video data from the UAV to the Ground Station. J/F 12????1 is for the Telemetry Up and Downlink. ITEM 6: Two Hours per Test. Intermittently over One Year.				
DOWNGRADING INSTRUCTIONS		CLASSIFICATION UNCLASSIFIED	J/F 12????1	

CLASSIFICATION	PAGE
UNCLASSIFIED	2
TRANSMITTER EQUIPMENT CHARACTERISTICS	
1. NOMENCLATURE, MANUFACTURER'S MODEL NO. MaxStream 9XTend-PKG Wireless Modem, Model XT09-PKI-R or-U, XT09-MI or SILO	2. MANUFACTURER'S NAME Maxstream Inc
3. TRANSMITTER INSTALLATION Fixed antenna on aircraft winglet	4. TRANSMITTER TYPE Digital communication (FM)
5. TUNING RANGE 905 -925 MHz	6. METHOD OF TUNING Synthesizer
7. RF CHANNELING CAPABILITY 50 channels, 905 - 925 MHz, 350 KHz spacing, auto freq hop	8. EMISSION DESIGNATOR(S) 350KOFID
9. FREQUENCY TOLERANCE Max +/- 20 PPM	
10. FILTER EMPLOYED (X one) <input checked="" type="checkbox"/> a. YES <input type="checkbox"/> b. NO	
11. SPREAD SPECTRUM (X one) <input checked="" type="checkbox"/> a. YES <input type="checkbox"/> b. NO	
13. MAXIMUM BIT RATE 120 kbps	12. EMISSION BANDWIDTH (X and complete as applicable) <input type="checkbox"/> CALCULATED <input checked="" type="checkbox"/> MEASURED
14. MODULATION TECHNIQUES AND CODING FSK modulation	a. -3 dB 17.5kHz
	b. -20 dB 263 kHz
	c. -40 dB 3.6 MHz
	d. -60 dB 29.5 MHz
	e. OC-BW 265 kHz; See Remarks
16. PRE-EMPHASIS (X one) <input type="checkbox"/> a. YES <input checked="" type="checkbox"/> b. NO	15. MAXIMUM MODULATION FREQUENCY
19. POWER a. MEAN 1W b. PEP	17. DEVIATION RATIO
20. OUTPUT DEVICE Transistor	18. PULSE CHARACTERISTICS a. RATE b. WIDTH c. RISE TIME d. FALL TIME e. COMP RATIO
22. SPURIOUS LEVEL -60 dBm @ 1.8 GHz, -53.48 dBm @ 4.5GHz, -56.53 dBm @ 5.4GHz	21. HARMONIC LEVEL a. 2ND -85dB b. 3RD -86dB c. OTHER -90dB
23. FCC TYPE ACCEPTANCE NO. OUR-9XTend	
24. REMARKS For question 10, Filters Employed include: 1. 10.7 MHz, 330kHz bandwidth These are monolithic-type ceramic filters. The in band insertion loss at 3dB bandwidth is 330 KHz. The out-of-band spurious attenuation is 30dB minimum. 2.915 MHz, 30 MHz bandwidth Image rejection SAW filter For questions 11: Spread Spectrum Frequency hopping - hopping time on each channel is at most 400ms before hopping to the next channel in a pseudorandom fashion For question 12e, OC-BW (occupied bandwidth is defined as the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5% of the total mean power radiated).	
CLASSIFICATION	J/F 12???
UNCLASSIFIED	

CLASSIFICATION UNCLASSIFIED				PAGE 3
RECEIVER EQUIPMENT CHARACTERISTICS				
1. NOMENCLATURE, MANUFACTURER'S MODEL NO. MaxStream 9XTend-PKG Wireless Modem, Model XT09-PKI-R or U, XT09-MI or SI				2. MANUFACTURER'S NAME Maxstream Inc
3. RECEIVER INSTALLATION Portable antenna via RSC-232 serial to a PC/laptop, outside				4. RECEIVER TYPE Superheterodyne
5. TUNING RANGE 902-928 MHz				6. METHOD OF TUNING Synthesizer
7. RF CHANNELING CAPABILITY 902-928 MHz, 350 kHz channel spacing				8. EMISSION DESIGNATOR(S) 350KOFID
9. FREQUENCY TOLERANCE Max +/- 20 PPM				
10. IF SELECTIVITY	1ST	2ND	3RD	11. RF SELECTIVITY (<i>X and complete as applicable</i>)
a. -3 dB	338 kHz			<input type="checkbox"/> CALCULATED <input checked="" type="checkbox"/> MEASURED
b. -20 dB	480 kHz			a. -3 dB 42 MHz
c. -60 dB	815 kHz			b. -20 dB 45 MHz
				c. -60 dB 144 MHz
12. IF FREQUENCY				d. PRESELECTION TYPE SAW Filter
a. 1ST 10.7 MHz				13. MAXIMUM POST DETECTION FREQUENCY 125 kHz
b. 2ND				14. MINIMUM POST DETECTION FREQUENCY 10kHz
c. 3RD				
15. OSCILLATOR TUNED	1ST	2ND	3RD	16. MAXIMUM BIT RATE 125kbpd
a. ABOVE TUNED FREQUENCY				17. SENSITIVITY
b. BELOW TUNED FREQUENCY	X			a. SENSITIVITY -110.0 dBm
c. EITHER ABOVE OR BELOW TUNED FREQUENCY				b. CRITERIA 90% packet throughput
18. DE-EMPHASIS (<i>X one</i>)				c. NOISE FIG 5 dB
<input type="checkbox"/> a. YES <input checked="" type="checkbox"/> b. NO				d. NOISE TEMP Kelvin
19. IMAGE REJECTION 52 dB				20. SPURIOUS REJECTION 80 dB
21. REMARKS <p>For question 10, Filters Employed include:</p> <p>1. 10.7 MHz, 330kHz bandwidth These are monolithic-type ceramic filters. The in band insertion loss at 3dB bandwidth is 330 KHz. The out-of-band spurious attenuation is 30dB minimum. 2.915 MHz, 30 MHz bandwidth Image rejection SAW filter</p> <p>For questions 11: Spread Spectrum</p> <p>Frequency hopping - hopping time on each channel is at most 400ms before hopping to the next channel in a pseudorandom fashion</p> <p>For question 12e, OC-BW (occupied bandwidth is defined as the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5% of the total mean power radiated).</p>				
CLASSIFICATION UNCLASSIFIED				J/F 12????1

APPLICATION FOR SPECTRUM REVIEW	CLASSIFICATION UNCLASSIFIED	PAGE 5
NTIA GENERAL INFORMATION		
1. APPLICATION TITLE Williams Aerospace UAS Telemetry Up and Downlink		
2. SYSTEM NOMENCLATURE Williams Aerospace Man Portable Day and Night Surveillance System		
3. STAGE OF ALLOCATION (X one) <input type="checkbox"/> a. STAGE 1 - CONCEPTUAL <input checked="" type="checkbox"/> b. STAGE 2 - EXPERIMENTAL <input type="checkbox"/> c. STAGE 3 - DEVELOPMENTAL <input type="checkbox"/> d. STAGE 4 - OPERATIONAL		
4. FREQUENCY REQUIREMENTS a. FREQUENCY(IES) 900Mhz b. EMISSION DESIGNATOR(S) 350KOF1D (auto frequency hop)		
5. PURPOSE OF SYSTEM, OPERATIONAL AND SYSTEM CONCEPTS (WARTIME USE) (X one) <input type="checkbox"/> a. YES <input checked="" type="checkbox"/> b. NO Telemetry System Downlinks UAV position, Speed, Heading, Altitude, Angle of Attack, Timing Pulse, Pitch Rate, Yaw Rate and Auto Pilot Mode to Ground Station. (See Remarks)		
6. INFORMATION TRANSFER REQUIREMENTS N/A		
7. ESTIMATED INITIAL COST OF THE SYSTEM \$306,000 for One NightStalker II System, \$159,000 for One Nano Shrike III System and \$185,000 for One Devastator I System		
8. TARGET DATE FOR		
a. APPLICATION APPROVAL 20100101 to 20131231	b. SYSTEM ACTIVATION N/A	c. SYSTEM TERMINATION N/A
9. SYSTEM RELATIONSHIP AND ESSENTIALITY The Williams Aerospace UAS is an Unmanned Aerial Vehicle used for gathering intelligence via Airborne Reconnaissance.		
10. REPLACEMENT INFORMATION N/A		
11. RELATED ANALYSIS AND TEST DATA N/A		
12. NUMBER OF MOBILE UNITS 2 Units		
13. GEOGRAPHICAL AREA FOR		
a. STAGE 2 Dugway Proving Ground, UT, Makua Valley, HI, Pohakuloa Training Area, HI, Thailand, Philippines, Australia		
b. STAGE 3		
c. STAGE 4		
14. LINE DIAGRAM (See Page(s))	15. SPACE SYSTEMS (See Page(s))	
16. TYPE OF SERVICE(S) FOR STAGE 4 Mobile	17. STATION CLASS(ES) FOR STAGE 4 N/A	
18. REMARKS Continue from question 5: Virtual Pilot is an existing commercial system for control of Unmanned Aerial Vehicles (UAVs) developed by Procerus Technologies, Vineyard , UT, as part of the HTDV/ONR sponsored NightStalker II, Nano Shrike III and Devastator I UAS ground station. In order to perform final end-to-end testing and demonstration of the integrated product it is our intention to launch, control and recover a minimum of two UAV airframes with different autopilots. The frequencies will be used for command control between the UAV's and the ground station.		
DOWNGRADING INSTRUCTIONS	CLASSIFICATION UNCLASSIFIED	J/F 12???1

APPLICATION FOR FOREIGN SPECTRUM SUPPORT	CLASSIFICATION UNCLASSIFIED	PAGE 6
FOREIGN COORDINATION GENERAL INFORMATION		
1. APPLICATION TITLE Williams Aerospace UAS Telemetry Up and Downlink		
2. SYSTEM NOMENCLATURE Williams Aerospace Man Portable Day and Night Surveillance System		
3. STAGE OF ALLOCATION (X one) <input type="checkbox"/> a. STAGE 1 - CONCEPTUAL <input checked="" type="checkbox"/> b. STAGE 2 - EXPERIMENTAL <input type="checkbox"/> c. STAGE 3 - DEVELOPMENTAL <input type="checkbox"/> d. STAGE 4 - OPERATIONAL		
4. FREQUENCY REQUIREMENTS a. FREQUENCY(IES) 900Mhz b. EMISSION DESIGNATOR(S) 350KOFID (auto frequency hop)		
5. PROPOSED OPERATING LOCATIONS OUTSIDE US&P Philippines, Australia		
6. PURPOSE OF SYSTEM, OPERATIONAL AND SYSTEM CONCEPTS Telemetry System Downlinks UAV position, Speed, Heading, Altitude, Angle of Attack, Timing Pulse, Pitch Rate, Yaw Rate and Auto Pilot Mode to Ground Station. (See Remarks)		
7. INFORMATION TRANSFER REQUIREMENTS N/A		
8. NUMBER OF UNITS OPERATING SIMULTANEOUSLY IN THE SAME ENVIRONMENT 2 Units		
9. REPLACEMENT INFORMATION		
10. LINE DIAGRAM (See Page(s))	11. SPACE SYSTEMS (See Page(s))	
12. PROJECTED OPERATIONAL DEPLOYMENT DATE Apr 11 (Philippines)		
13. REMARKS <p>The U.S. Marine Corps Forces, Pacific Experimentation Center (MEC) will conduct an Operational User Assessment (OUA) of the Nano Shrike III, Devastator I and NightStalker II Unmanned Aerial Vehicles (UAV) to provide operational user feedback from various military units to the technology developers. The assessment is planned to occur during FY10/11 involving assessment plan development, concurrent UAV development, UAV on board systems integration, technical demonstration and culminating with unit training and employment during at least one major Field Training Exercise (FTX). Foreign Exercises will include Balikatan (BK) which is an annual bilateral U.S./Republic of the Philippines exercise that consists of a STAFFEX/CPX, Humanitarian and Civic Assistance / Civil Military Operations (HCA/CMO), and Field Training Exercise (FTX). Balikatan is scheduled for Apr 11.</p> <p>Continue from question 5: Virtual Pilot Software is an existing commercial system for control of Unmanned Aerial Vehicles (UAVs) developed by Procerus Technologies, Vineyard , UT, as part of the HTDV/ONR sponsored NightStalker II, Nano Shrike III and Devastator I UAS ground station. In order to perform final end-to-end testing and demonstration of the integrated product it is our intention to launch, control and recover a minimum of two UAV airframes with different autopilots. The frequencies will be used for command control between the UAV's and the ground station.</p>		
DOWNGRADING INSTRUCTIONS	CLASSIFICATION UNCLASSIFIED	J/F 12???1

APPLICATION FOR EQUIPMENT FREQUENCY ALLOCATION	CLASSIFICATION	DATE	<i>Form Approved OMB No. 0704-0188</i>
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DOD GENERAL INFORMATION									
TO CWO Arthur R. DeLeon Spectrum Management Officer COMMARFORPAC G6 Operations		FROM U.S. Marine Corps Forces, Pacific Experimentation Center (MEC)							
1. APPLICATION TITLE Williams Aerospace UAS Primary Video Downlink									
2. SYSTEM NOMENCLATURE Williams Aerospace Mobile Day and Night Surveillance System									
3. STAGE OF ALLOCATION (X one) <input type="checkbox"/> a. STAGE 1 - CONCEPTUAL <input checked="" type="checkbox"/> b. STAGE 2 - EXPERIMENTAL <input type="checkbox"/> c. STAGE 3 - DEVELOPMENTAL <input type="checkbox"/> d. STAGE 4 - OPERATIONAL									
4. FREQUENCY REQUIREMENTS a. FREQUENCY(IES) Video Link: 1700 - 1850 MHz b. EMISSION DESIGNATOR(S) 17M8F8W 18M8F8W									
5. TARGET STARTING DATE FOR SUBSEQUENT STAGES a. STAGE 2 20100101 to 20131231 b. STAGE 3 c. STAGE 4									
6. EXTENT OF USE Approximately 100 hours of testing; (See Remarks)									
7. GEOGRAPHICAL AREA FOR a. STAGE 2 Dugway Proving Ground, UT, Makua Valley, HI, Pohakuloa Training Area, HI, Thailand, Philippines, Australia b. STAGE 3 c. STAGE 4									
8. NUMBER OF UNITS a. STAGE 2 2 Units b. STAGE 3 c. STAGE 4									
9. NUMBER OF UNITS OPERATING SIMULTANEOUSLY IN THE SAME ENVIRONMENT 2 Units									
10. OTHER J/F 12 APPLICATION NUMBER(S) TO BE <input type="checkbox"/> a. SUPERSEDED J/F 12/ <input checked="" type="checkbox"/> b. RELATED J/F 12/		11. IS THERE ANY OPERATIONAL REQUIREMENT AS DESCRIBED IN THE INSTRUCTIONS FOR PARAGRAPH 11? <input type="checkbox"/> a. YES <input checked="" type="checkbox"/> b. NO <input type="checkbox"/> c. N/Avail							
12. NAMES AND TELEPHONE NUMBERS <table border="1"> <tr> <td>a. PROGRAM MANAGER Jeffrey L. Williams</td> <td>(1) COMMERCIAL (808) 626-5259</td> <td>(2) AUTOVON</td> </tr> <tr> <td>b. PROJECT ENGINEER Jeffrey L. Williams</td> <td>(1) COMMERCIAL (808) 675-1650</td> <td>(2) AUTOVON</td> </tr> </table>				a. PROGRAM MANAGER Jeffrey L. Williams	(1) COMMERCIAL (808) 626-5259	(2) AUTOVON	b. PROJECT ENGINEER Jeffrey L. Williams	(1) COMMERCIAL (808) 675-1650	(2) AUTOVON
a. PROGRAM MANAGER Jeffrey L. Williams	(1) COMMERCIAL (808) 626-5259	(2) AUTOVON							
b. PROJECT ENGINEER Jeffrey L. Williams	(1) COMMERCIAL (808) 675-1650	(2) AUTOVON							
13. REMARKS The U.S. Marine Corps Forces, Pacific Experimentation Center (MEC) will conduct an Operational User Assessment (OUA) of the Nano Shrike III, NightStalker II and Devastator I Unmanned Aerial Systems (UAS) to provide operational user feedback from various military units to the technology developers. One UAS consists of One (1) Ground Control Station (Mobile), Two (2) NightStalker II MUAV's, Two (2) Devastator I MUAV's and Three (3) NanoShrike III MAV's. Multiple aircraft may fly simultaneously from one ground station. This Application is for the Primary Video Downlink that is used to provide video data from the UAV to the Ground Station. J/F 12????1 is for the Telemetry Up and Downlink. ITEM 6: Two Hours per Test. Intermittently over One Year.									
DOWNGRADING INSTRUCTIONS		CLASSIFICATION UNCLASSIFIED	J/F 12????2						

CLASSIFICATION UNCLASSIFIED		PAGE 2
TRANSMITTER EQUIPMENT CHARACTERISTICS		
1. NOMENCLATURE, MANUFACTURER'S MODEL NO. NT3-L with PAL2 2W PA	2. MANUFACTURER'S NAME Global Microwave Systems, Inc.	
3. TRANSMITTER INSTALLATION NightStalker II, NanoShrike III, Devastator I UAV's	4. TRANSMITTER TYPE FM, Analog Video/Audio	
5. TUNING RANGE 1700-1850 MHZ	6. METHOD OF TUNING PLL Synthesizer	
7. RF CHANNELING CAPABILITY From 1700 mHz in 250 kHz steps Up to 16 channels	8. EMISSION DESIGNATOR(S) 17M8F8W	
9. FREQUENCY TOLERANCE 5 parts per million	12. EMISSION BANDWIDTH (X and complete as applicable) <input type="checkbox"/> CALCULATED <input checked="" type="checkbox"/> MEASURED	
10. FILTER EMPLOYED (X one) <input type="checkbox"/> a. YES <input checked="" type="checkbox"/> b. NO		
11. SPREAD SPECTRUM (X one) <input type="checkbox"/> a. YES <input checked="" type="checkbox"/> b. NO		
13. MAXIMUM BIT RATE N/A	15. MAXIMUM MODULATION FREQUENCY 17 mHz	
14. MODULATION TECHNIQUES AND CODING Direct FM for video, FM/FM for audio sub-carriers	17. DEVIATION RATIO 2./5	
16. PRE-EMPHASIS (X one) <input checked="" type="checkbox"/> a. YES <input type="checkbox"/> b. NO	18. PULSE CHARACTERISTICS	
19. POWER a. MEAN 2W b. PEP	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 Solid state amplifier transistor.	21. HARMONIC LEVEL	
22. SPURIOUS LEVEL Less than -25 dBm	a. 2ND -68dB b. 3RD -66dB	
23. FCC TYPE ACCEPTANCE NO. N/A (NTIA freq band)	c. OTHER -62dB	
24. REMARKS 17. The video channel is summed with audio sub-carrier channels and the composite signal is the input to the VCO operating at the transmitter center frequency. The video channel (max. frequency of 4.4 MHz) is subjected to deviation.		
CLASSIFICATION UNCLASSIFIED		J/F 12????2

CLASSIFICATION UNCLASSIFIED					PAGE 3	
RECEIVER EQUIPMENT CHARACTERISTICS						
1. NOMENCLATURE, MANUFACTURER'S MODEL NO. MR L-band				2. MANUFACTURER'S NAME Global Microwave Systems, Inc.		
3. RECEIVER INSTALLATION Mobile Ground Station				4. RECEIVER TYPE Single Stage Superheterodyne, FM Video/Audio		
5. TUNING RANGE 1710 -1850 MHz				6. METHOD OF TUNING PLL Synthesizer		
7. RF CHANNELING CAPABILITY 1710 MHz- 250 kHz increments				8. EMISSION DESIGNATOR(S) 18M8F8W		
9. FREQUENCY TOLERANCE 5 PPM						
10. IF SELECTIVITY		1ST	2ND	3RD	11. RF SELECTIVITY (X and complete as applicable)	
a. -3 dB		18 MHz			<input type="checkbox"/> CALCULATED <input checked="" type="checkbox"/> MEASURED	
b. -20 dB		27 MHz			a. -3 dB 200 mHz	
					b. -20 dB 260 mHz	
c. -60 dB		42 MHz			c. -60 dB 760 mHz	
					d. PRESELECTION TYPE Lumped Element BPF	
12. IF FREQUENCY				13. MAXIMUM POST DETECTION FREQUENCY 10 MHz		
a. 1ST 480 MHZ						
b. 2ND N/A				14. MINIMUM POST DETECTION FREQUENCY 4 mHz		
c. 3RD N/A						
15. OSCILLATOR TUNED		1ST	2ND	3RD	16. MAXIMUM BIT RATE N/A	
a. ABOVE TUNED FREQUENCY					17. SENSITIVITY	
b. BELOW TUNED FREQUENCY		X			a. SENSITIVITY -83.0 dBm	
c. EITHER ABOVE OR BELOW TUNED FREQUENCY					b. CRITERIA 40 dB, SNR	
18. DE-EMPHASIS (X one)				c. NOISE FIG 5 dB		
<input checked="" type="checkbox"/> a. YES <input type="checkbox"/> b. NO				d. NOISE TEMP Kelvin		
19. IMAGE REJECTION 60 dB				20. SPURIOUS REJECTION 70 dB		
21. REMARKS 18. De-emphasis for TIA.EIA RS-170 video plus audio.						
CLASSIFICATION UNCLASSIFIED					J/F 12????	

CLASSIFICATION <div style="text-align: center; margin-top: 10px;">UNCLASSIFIED</div>		PAGE <div style="text-align: center; margin-top: 10px;">4</div>
ANTENNA EQUIPMENT CHARACTERISTICS		
1. <input type="checkbox"/> a. TRANSMITTING <input checked="" type="checkbox"/> b. RECEIVING <input type="checkbox"/> c. TRANSMITTING AND RECEIVING		
2. NOMENCLATURE, MANUFACTURER'S MODEL NO. APLSV09S060X7	3. MANUFACTURER'S NAME Global Microwave Systems	
4. FREQUENCY RANGE 1700 - 2500 MHZ	5. TYPE 6.2" X 4.2" Patch Antenna	
6. POLARIZATION <div style="text-align: center;">Linear</div>	7. SCAN CHARACTERISTICS a. TYPE Fixed	
8. GAIN a. MAIN BEAM <div style="text-align: center;">-9 dB</div>	b. VERTICAL SCAN (1) MAX ELEV N/A (2) MIN ELEV N/A (3) SCAN RATE N/A	
b. 1ST MAJOR SIDE LOBE <div style="text-align: center;">N/A</div>	c. HORIZONTAL SCAN (1) SECTOR SCANNED N/A (2) SCAN RATE N/A	
9. BEAMWIDTH a. HORIZONTAL <div style="text-align: center;">60 deg</div>	d. SECTOR BLANKING (X one) <input type="checkbox"/> (1) YES <input checked="" type="checkbox"/> (2) NO	
b. VERTICAL <div style="text-align: center;">60 deg</div>		
10. REMARKS SMA Connector		
CLASSIFICATION <div style="text-align: center; margin-top: 10px;">UNCLASSIFIED</div>		J/F 12????

APPLICATION FOR SPECTRUM REVIEW	CLASSIFICATION UNCLASSIFIED	PAGE 5
NTIA GENERAL INFORMATION		
1. APPLICATION TITLE Williams Aerospace UAS Primary Video Downlink		
2. SYSTEM NOMENCLATURE Williams Aerospace Mobile Day and Night Surveillance System		
3. STAGE OF ALLOCATION (X one) <input type="checkbox"/> a. STAGE 1 - CONCEPTUAL <input checked="" type="checkbox"/> b. STAGE 2 - EXPERIMENTAL <input type="checkbox"/> c. STAGE 3 - DEVELOPMENTAL <input type="checkbox"/> d. STAGE 4 - OPERATIONAL		
4. FREQUENCY REQUIREMENTS a. FREQUENCY(IES) 1700 - 1850 MHZ b. EMISSION DESIGNATOR(S) 17M8F8W 18M8F8W		
5. PURPOSE OF SYSTEM, OPERATIONAL AND SYSTEM CONCEPTS (WARTIME USE) (X one) <input type="checkbox"/> a. YES <input checked="" type="checkbox"/> b. NO The Williams Aerospace Video Downlink carries 4.4 MHZ Bandwidth, FM Video Intelligence from the NightStalker II, NanoShrike III and Devastator I MUAV Payloads consisting of Infra-Red Imager and a Daylight Color Video Camera System. The Imagery and Camera Video are Transmitted in Real Time to the Ground Control Station.		
6. INFORMATION TRANSFER REQUIREMENTS 5 MHZ Video Signal		
7. ESTIMATED INITIAL COST OF THE SYSTEM \$306,000 for One NightStalker II System, \$159,000 for One Nano Shrike III System and \$185,000 for One Devastator I System		
8. TARGET DATE FOR		
a. APPLICATION APPROVAL 20100101 to 20131231	b. SYSTEM ACTIVATION N/A	c. SYSTEM TERMINATION N/A
9. SYSTEM RELATIONSHIP AND ESSENTIALITY The Williams Aerospace UAS is an Unmanned Aerial Vehicle used for gathering intelligence via Airborne Reconnaissance.		
10. REPLACEMENT INFORMATION N/A		
11. RELATED ANALYSIS AND TEST DATA N/A		
12. NUMBER OF MOBILE UNITS 2 Units		
13. GEOGRAPHICAL AREA FOR		
a. STAGE 2 Dugway Proving Ground, UT, Makua Valley, HI, PohakuIoa Training Area, HI, Thailand, Philippines, Australia		
b. STAGE 3		
c. STAGE 4		
14. LINE DIAGRAM (See Page(s))	15. SPACE SYSTEMS (See Page(s))	
16. TYPE OF SERVICE(S) FOR STAGE 4 Mobile	17. STATION CLASS(ES) FOR STAGE 4 N/A	
18. REMARKS		
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FOREIGN COORDINATION GENERAL INFORMATION			
1. APPLICATION TITLE Williams Aerospace UAS Primary Video Downlink			
2. SYSTEM NOMENCLATURE Williams Aerospace Mobile Day and Night Surveillance System			
3. STAGE OF ALLOCATION (X one) <input type="checkbox"/> a. STAGE 1 - CONCEPTUAL <input checked="" type="checkbox"/> b. STAGE 2 - EXPERIMENTAL <input type="checkbox"/> c. STAGE 3 - DEVELOPMENTAL <input type="checkbox"/> d. STAGE 4 - OPERATIONAL			
4. FREQUENCY REQUIREMENTS a. FREQUENCY(IES) 1700 - 1850 MHZ b. EMISSION DESIGNATOR(S) 17M8F8W 18M8F8W			
5. PROPOSED OPERATING LOCATIONS OUTSIDE US&P Philippines, Australia			
6. PURPOSE OF SYSTEM, OPERATIONAL AND SYSTEM CONCEPTS The Williams Aerospace Video Downlink carries 4.4 MHZ Bandwidth, FM Video Intelligence from the NightStalker II, Nano Shrike III and Devastator I MUAV Payloads consisting of Infra-Red Imager and a Daylight Color Video Camera System. The Imagery and Camera Video are Transmitted in Real Time to the Ground Control Station.			
7. INFORMATION TRANSFER REQUIREMENTS 4.4 MHZ Video Signal			
8. NUMBER OF UNITS OPERATING SIMULTANEOUSLY IN THE SAME ENVIRONMENT 2 Units			
9. REPLACEMENT INFORMATION			
10. LINE DIAGRAM (See Page(s))		11. SPACE SYSTEMS (See Page(s))	
12. PROJECTED OPERATIONAL DEPLOYMENT DATE Apr 2011 (Philippines)			
13. REMARKS The U.S. Marine Corps Forces, Pacific Experimentation Center (MEC) will conduct an Operational User Assessment (OUA) of the Nano Shrike III, Devastator I and NightStalker II Unmanned Aerial Vehicles (UAV) to provide operational user feedback from various military units to the technology developers. The assessment is planned to occur during FY10/11 involving assessment plan development, concurrent UAV development, UAV on board systems integration, technical demonstration and culminating with unit training and employment during at least one major Field Training Exercise (FTX). Foreign Exercises will include Balikatan (BK) which is an annual bilateral U.S./Republic of the Philippines exercise that consists of a STAFFEX/CPX, Humanitarian and Civic Assistance / Civil Military Operations (HCA/CMO), and Field Training Exercise (FTX). Balikatan is scheduled for Apr 11.			
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