

UNCLASSIFIED

J/F 12/08252

SECURITY SUMMARY & SPECIAL HANDLING REQUIREMENTS

The title of this application is: AeroVironment Video Link

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 "I" 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

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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	
Foreign Coord. Page	8	UNCLASSIFIED	
MCEB Guidance Page	9	UNCLASSIFIED	
MCEB Overflow	10	UNCLASSIFIED	
NTIA Admin Page	11	UNCLASSIFIED	
Administrative Page		UNCLASSIFIED	

TRANSMITTER EQUIPMENT CHARACTERISTICS

1. NOMENCLATURE, MANUFACTURER'S MODEL NO. (U) VNTXL-2A/SC232 Video/Telemetry Tx		2. MANUFACTURER'S NAME (U) L3 Communications	
3. TRANSMITTER INSTALLATION (U) Aircraft		4. TRANSMITTER TYPE (U) FM Video and Telemetry	
5. TUNING RANGE (U) 1710 MHz - 1850 MHz		6. METHOD OF TUNING (U) Synthesizer	
7. RF CHANNELING CAPABILITY (U) 1710 MHz, 57 channels in 2.5 MHz steps		8. EMISSION DESIGNATORS (U) 14M8F9W (U) (U)	
9. FREQUENCY TOLERANCE (U) 30 ppm		12. EMISSION BANDWIDTH <input type="checkbox"/> CALCULATED <input checked="" type="checkbox"/> MEASURED	
10. FILTER EMPLOYED (U) <input checked="" type="checkbox"/> a. YES <input type="checkbox"/> b. NO		a. -3 dB (U) 2.4 MHz (U) (U)	
11. SPREAD SPECTRUM (U) <input type="checkbox"/> a. YES <input checked="" type="checkbox"/> b. NO		b. -20 dB (U) 14.8 MHz (U) (U)	
13. MAXIMUM BIT RATE (U) 9600 bps		c. -40 dB (U) 26 MHz (U) (U)	
14. MODULATION TECHNIQUES AND CODING (U) NTSC video and telemetry subcarrier using FSK modulation.		d. -60 dB (U) 38 MHz (U) (U)	
16. PRE-EMPHASIS (U) <input checked="" type="checkbox"/> a. YES <input type="checkbox"/> b. NO		e. OC-BW (U) 14.8 MHz (U) (U)	
19. POWER		15. MAXIMUM MODULATION FREQUENCY (U) 7.6 MHz	
a. MEAN (U) 1.5 W (U) (U)		17. DEVIATION RATIO (U) 1.027	
b. PEP (U) NA (U) (U)		18. PULSE CHARACTERISTICS	
20. OUTPUT DEVICE (U) Common Source FET Transistor		a. RATE (U) NA (U) (U)	
22. SPURIOUS LEVEL (U) -80 dB		b. WIDTH (U) NA (U) (U)	
23. FCC TYPE ACCEPTANCE NO. (U) NA		c. RISE TIME (U) NA (U) (U)	
24. REMARKS (U)		d. FALL TIME (U) NA (U) (U)	
Item 10: 7 pole low pass filter between output device and antenna. The insertion loss is 3 dB in the pass band and 75 dB at the 2nd Harmonic.		e. COMP RATIO (U) NA (U) (U)	
Item 15: Highest Modulation Frequency is subcarrier at 7.6 MHz. Highest Video is 4.2 MHz.		21. HARMONIC LEVEL	
Item 16: Video Pre-Emphasis per CCIR 405, 525 Line Curve.		a. 2nd (U) -86 dB	
Item 21c. None observed.		b. 3rd (U) -89 dB	
		c. OTHER (U) (See Remarks)	

Item 10: 7 pole low pass filter between output device and antenna. The insertion loss is 3 dB in the pass band and 75 dB at the 2nd Harmonic.

Item 15: Highest Modulation Frequency is subcarrier at 7.6 MHz. Highest Video is 4.2 MHz.

Item 16: Video Pre-Emphasis per CCIR 405, 525 Line Curve.

Item 21c. None observed.

RECEIVER EQUIPMENT CHARACTERISTICS

1. NOMENCLATURE, MANUFACTURER'S MODEL NO. (U) VR(10/20)LA/SC232 Receiver				2. MANUFACTURER'S NAME (U) L3 Communications																															
3. RECEIVER INSTALLATION (U) Ground Station				4. RECEIVER TYPE (U) Single Conversion Superheterodyne																															
5. TUNING RANGE (U) 1710 MHz - 1850 MHz				6. METHOD OF TUNING (U) Synthesizer																															
7. RF CHANNELING CAPABILITY (U) 1710 MHz, 57 channels in 2.5 MHz steps				8. EMISSION DESIGNATORS (U) 14M8F9W																															
9. FREQUENCY TOLERANCE (U) 30 ppm				11. RF SELECTIVITY <input type="checkbox"/> CALCULATED <input checked="" type="checkbox"/> MEASURED																															
10. IF SELECTIVITY <table border="1" style="width:100%; border-collapse: collapse; margin-top: 5px;"> <thead> <tr> <th style="width:15%;"></th> <th style="width:15%;">1st (U)</th> <th style="width:15%;">2nd (U)</th> <th style="width:15%;">3rd (U)</th> </tr> </thead> <tbody> <tr> <td>a. -3 dB</td> <td>24 MHz</td> <td>NA</td> <td>NA</td> </tr> <tr> <td>b. -20 dB</td> <td>27 MHz</td> <td>NA</td> <td>NA</td> </tr> <tr> <td>c. -60 dB</td> <td>40 MHz</td> <td>NA</td> <td>NA</td> </tr> </tbody> </table>					1st (U)	2nd (U)	3rd (U)	a. -3 dB	24 MHz	NA	NA	b. -20 dB	27 MHz	NA	NA	c. -60 dB	40 MHz	NA	NA	<table border="1" style="width:100%; border-collapse: collapse; margin-top: 5px;"> <tbody> <tr> <td style="width:60%;">a. -3 dB</td> <td style="width:10%;">(U)</td> <td style="width:30%;">200 MHz</td> </tr> <tr> <td>b. -20 dB</td> <td>(U)</td> <td>250 MHz</td> </tr> <tr> <td>c. -60 dB</td> <td>(U)</td> <td>350 MHz</td> </tr> <tr> <td>d. Preselection Type</td> <td>(U)</td> <td>8-POLE LC band-pass</td> </tr> </tbody> </table>				a. -3 dB	(U)	200 MHz	b. -20 dB	(U)	250 MHz	c. -60 dB	(U)	350 MHz	d. Preselection Type	(U)	8-POLE LC band-pass
	1st (U)	2nd (U)	3rd (U)																																
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12. IF FREQUENCY <table border="1" style="width:100%; border-collapse: collapse; margin-top: 5px;"> <tbody> <tr> <td style="width:15%;">a. 1st (U)</td> <td style="width:85%;">480 MHz</td> </tr> <tr> <td>b. 2nd (U)</td> <td>NA</td> </tr> <tr> <td>c. 3rd (U)</td> <td>NA</td> </tr> </tbody> </table>				a. 1st (U)	480 MHz	b. 2nd (U)	NA	c. 3rd (U)	NA	13. MAXIMUM POST DETECTION FREQUENCY (U) 7.6 MHz																									
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b. 2nd (U)	NA																																		
c. 3rd (U)	NA																																		
15. OSCILLATOR TUNED <table border="1" style="width:100%; border-collapse: collapse; margin-top: 5px;"> <thead> <tr> <th style="width:60%;"></th> <th style="width:10%;">1st (U)</th> <th style="width:10%;">2nd (U)</th> <th style="width:10%;">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></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				c. EITHER ABOVE OR BELOW THE FREQUENCY				14. MINIMUM POST DETECTION FREQUENCY (U) 6 Hz															
	1st (U)	2nd (U)	3rd (U)																																
a. ABOVE TUNED FREQUENCY	X																																		
b. BELOW TUNED FREQUENCY																																			
c. EITHER ABOVE OR BELOW THE FREQUENCY																																			
18. DE-EMPHASIS (U) <input checked="" type="checkbox"/> a. YES <input type="checkbox"/> b. NO				16. MAXIMUM BIT RATE (U) 9600 bps																															
19. IMAGE REJECTION (U) 60 dB				17. SENSITIVITY <table border="1" style="width:100%; border-collapse: collapse; margin-top: 5px;"> <tbody> <tr> <td style="width:60%;">a. SENSITIVITY (U)</td> <td style="width:40%;">- 85 dBm</td> </tr> <tr> <td>b. CRITERIA (U)</td> <td>12dB S/N</td> </tr> <tr> <td>c. NOISE FIG (U)</td> <td>6 dB</td> </tr> <tr> <td>d. NOISE TEMP (U)</td> <td>NA</td> </tr> </tbody> </table>				a. SENSITIVITY (U)	- 85 dBm	b. CRITERIA (U)	12dB S/N	c. NOISE FIG (U)	6 dB	d. NOISE TEMP (U)	NA																				
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c. NOISE FIG (U)	6 dB																																		
d. NOISE TEMP (U)	NA																																		
21. REMARKS (U) Item 18: 6 Hz to 5 MHz per CCIR 405, 525 lines.				20. SPURIOUS REJECTION (U) 60 dB																															

ANTENNA EQUIPMENT CHARACTERISTICS

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

2. NOMENCLATURE, MANUFACTURER'S MODEL NO.

(U) AeroVironment 55019

3. MANUFACTURER'S NAME

(U) AeroVironment, Inc.

5. TYPE (U) Stack Patch

4. FREQUENCY RANGE

(U) 1710 MHz - 1850 MHz

7. SCAN CHARACTERISTICS

a. TYPE (U) FIXED

6. POLARIZATION

(U) Vertical

b. VERTICAL SCAN (U) NA

(1) Max Elev (U) NA

8. GAIN

(2) Min Elev (U) NA

a. MAIN BEAM

(U) 7.5 dBi

(3) Scan Rate (U) NA

b. 1st MAJOR SIDE LOBE

(U) NA

c. HORIZONTAL SCAN (U) NA

(1) Sector Scanned (U) NA

9. BEAMWIDTH

a. HORIZONTAL

(U) 85 deg

(2) Scan Rate (U) NA

b. VERTICAL

(U) 60 deg

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

10. REMARKS (U)

GENERAL CONTINUATION PAGE

Line diagram

NTIA GENERAL INFORMATION

1. APPLICATION TITLE (U) AeroVironment Video Link

2. SYSTEM NOMENCLATURE (U) Small UAV

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) 1755 MHz - 1850 MHz
b. EMISSION DESIGNATORS (U) 14M8F9W

5. PURPOSE OF SYSTEM, OPERATIONAL AND SYSTEM CONCEPTS (U) Small Unmanned Aerial Vehical (UAV) designed to provide surveillance and reconnaissance information. (WARTIME USE) a. YES b. NO

6. INFORMATION TRANSFER REQUIREMENTS(U) FM Video and Data with 9600 bps

7. ESTIMATED INITIAL COST OF THE SYSTEM (U) \$139k each

8. TARGET DATE FOR

a. APPLICATION APPROVAL (U) 12-31-2004	b. SYSTEM ACTIVATION (U) ASAP	c. SYSTEM TERMINATION (U) 2030
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9. SYSTEM RELATIONSHIP AND ESSENTIALITY (U) Small UAV with Command and Video link

10. REPLACEMENT INFORMATION (U) None

11. RELATED ANALYSIS AND/OR TEST DATA (U) None

12. NUMBER OF MOBILE UNITS (U) 1000

13. GEOGRAPHICAL AREA FOR

a. STAGE 2 (U) NA

b. STAGE 3 (U) NA

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) MA

18. REMARKS (U) Item 4a: This equipment can be tuned from 1710 to 1850 MHz; however within the US&P usage will be limited to the 1755 to 1850 MHz band only.

DOWNGRADING INSTRUCTIONS	J/F 12/08252
	CLASSIFICATION UNCLASSIFIED

FOREIGN COORDINATION GENERAL INFORMATION

1. APPLICATION TITLE (U) AeroVironment Video Link

2. SYSTEM NOMENCLATURE (U) Small UAV

3. STAGE OF ALLOCATION

(U) [] a. STAGE 1 CONCEPTUAL [] b. STAGE 2 EXPERIMENTAL [] c. STAGE 3 DEVELOPMENTAL [X] d. STAGE 4 OPERATIONAL

4. FREQUENCY REQUIREMENTS

a. FREQUENCY(IES) (U)
b. EMISSION DESIGNATORS (U)

5. PROPOSED OPERATING LOCATIONS OUTSIDE US&P

(U)

6. PURPOSE OF SYSTEM, OPERATIONAL AND SYSTEM CONCEPTS

(U)

7. INFORMATION TRANSFER REQUIREMENTS

(U)

8. NUMBER OF UNITS OPERATING SIMULTANEOUSLY IN THE SAME ENVIRONMENT (U)

9. REPLACEMENT INFORMATION (U)

10. LINE DIAGRAM (U) See Page(s) #

11. SPACE SYSTEMS (U) See Page(s) #

12. PROJECTED OPERATIONAL DEPLOYMENT DATE (U)

13. REMARKS (U)

DOWNGRADING INSTRUCTIONS

J/F 12/08252

CLASSIFICATION UNCLASSIFIED

UNCLASSIFIED
MILITARY COMMUNICATIONS ELECTRONICS BOARD (MCEB)
EQUIPMENT FREQUENCY ALLOCATION GUIDANCE

Military Department: Air Force, Navy, Army
Equipment: AeroVironment Video Link
Stage: 4 - Operational

Section 1: ENCLOSURES

J/F 12/8252, 13 September 2004

Section 2: OPERATING CHARACTERISTICS FOR WHICH SUPPORT IS CERTIFIED

Frequency: 1755-1850 MHz
Emission: 14M8F9W
Power (Mean): 1.5 W
Type of Service: Aeronautical Mobile
Operating Location: US&P

Section 3: MCEB GUIDANCE

1. The enclosed application is approved for operational systems at the above locations subject to the guidance provided in the following paragraphs.
2. For the intended operation in the Aeronautical Mobile service, the subject equipment is in accordance with the ITU and US Tables of Frequency Allocation.
3. Based on the information provided,
 - a. The transmitter does not comply with NTIA Manual, Sections 5.2.1, requirements for frequency tolerance.
 - b. The transmitter complies with NTIA Manual, Sections 5.2.2, requirements for unwanted emission bandwidth, spurious emission and harmonic levels.
 - c. The transmitter does comply with MIL-STD-461E requirements for spurious emissions and harmonic levels.
4. In any instance of harmful interference caused by nonconformance with NTIA Manual, Section 5.2.1, the responsibility for eliminating the harmful interference shall rest with the agency operating in nonconformance.
5. Frequency assignment requests must be submitted using Standard Frequency Action Format (SFAF) and coordinated with the cognizant Area Frequency Coordinator (AFC) in accordance with ACP 190 US SUPP-1(C), Guide to Frequency Planning, prior to activation.
6. The 1755-1850 MHz band is heavily used by other DoD and Federal Government systems. It may be possible to accommodate the use of this system in the 1755-1850 MHz band on a case-by-case, location-by-location

NTIA ADMINISTRATIVE PAGE

(U) SPS #: 14822/2

(U) SIN #:

(U) AGENCY: AF

(U) STAGE: 4

(U) PREVIOUS CERTIFICATION:

(U) STATUS: DATE: ACTION:

(U) REMARKS:

IRAC DOC.#: 34197/1

(U) SPS RELATED DOCUMENTS: DATE: DOCKET #: DESCRIPTION:

(U) SPS RECOMMENDATIONS:

(U) NTIA CERTIFICATION:

basis; however, it will require extensive coordination and/or EMC analysis to prevent any potential mutual interference to or from the many DoD systems (e.g. Space Ground Link Subsystem (SGLS), Mobile subscriber Equipment (MSE), Tactical Control Link/Precision Guided Munitions, Air Combat Training Systems, Digital Wideband Transmission System, Point-to-Point Microwave Systems, etc.).

7. Coordination with NTIA/SPS was completed and the following US certification statements were received:

a. The Spectrum Planning Subcommittee (SPS) has reviewed this system under the provisions of Chapter 10 of the NTIA Manual, the SPS recommends that:

b. NTIA certify Stage 4 spectrum support for the AeroVironment Video Link as specified in Section 2.

c. Air Force be aware that mitigating interference caused by the nonconforming frequency tolerance of 30 ppm (vs. 20 ppm as specified in Table 5.2.1 of the NTIA Manual) shall normally rest with the agency operating in nonconformance, in accordance with Section 5.1.2 of the NTIA Manual.

d. Air Force be aware that it may be difficult or impossible to successfully coordinate assignments at some locations, due to the congested electromagnetic environment in the operating band of the subject system and the relatively wide bandwidth required for transmissions from an airborne station.

8. Authorization for use outside of the US&P is dependent on receiving a statement of supportability from the appropriate COCOM. Host nation frequency support coordination has been initiated.

Steering Member
ESG Working Group
MCEB Frequency Panel
APPROVAL Signature Date: 04 MAY 2005

IRAC/SPS Numbers:
IRAC Doc.#: 34197/1
SPS #: 14822/2

Downgrading Instructions: NA
Distribution: J-12 Holders
MCEB J-12 Number: 8252/1
UNCLASSIFIED

ADMINISTRATIVE INFORMATION PAGE

- 1. SYSTEM IDENTIFIER: (U) C
- 2. EQUIPMENT FUNCTION: (U) CH CT
- 3. EQUIPMENT NOMENCLATURE: (U) VNTXL-2A/SC232 LSC (U)
(U) VR(10/20)LA/SC232 LSC (U)
(U) VIDEO LINK AVN (U)
(U) (U)
- 4. ECI CODE: (U)
- 5. MCEB USE: (U) O (C:CONCEP; E:EXPER; D:DEVELOP; O:OPER; N:NOTED)
- 6. MCEB LOCATIONS: (U) COUNTRY STATE CITY
USP US&P

- 7. HOST COUNTRY: COUNTRY DATE MESSAGE DTG
(U)
(U)
(U)
(U)
(U)
(U)
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(U)

- 8. NOTE-TO-HOLDER:
(U)
(U)
(U)
(U)
(U)
(U)
(U)
(U)
(U)
(U)

9. JSC MEMO DATE: (U) 05-04-2005

10. USING AGENCIES: (U) 1:AF 2:N 3:AR

11. PROCURING AGENCY: (U) AF

12. APPLICATION STATUS: (U) 1 (1:APPROV; 2:CANCEL; 3:SUPERSE; 4:NOTED; 5:WITHDR; 6:PEND)