

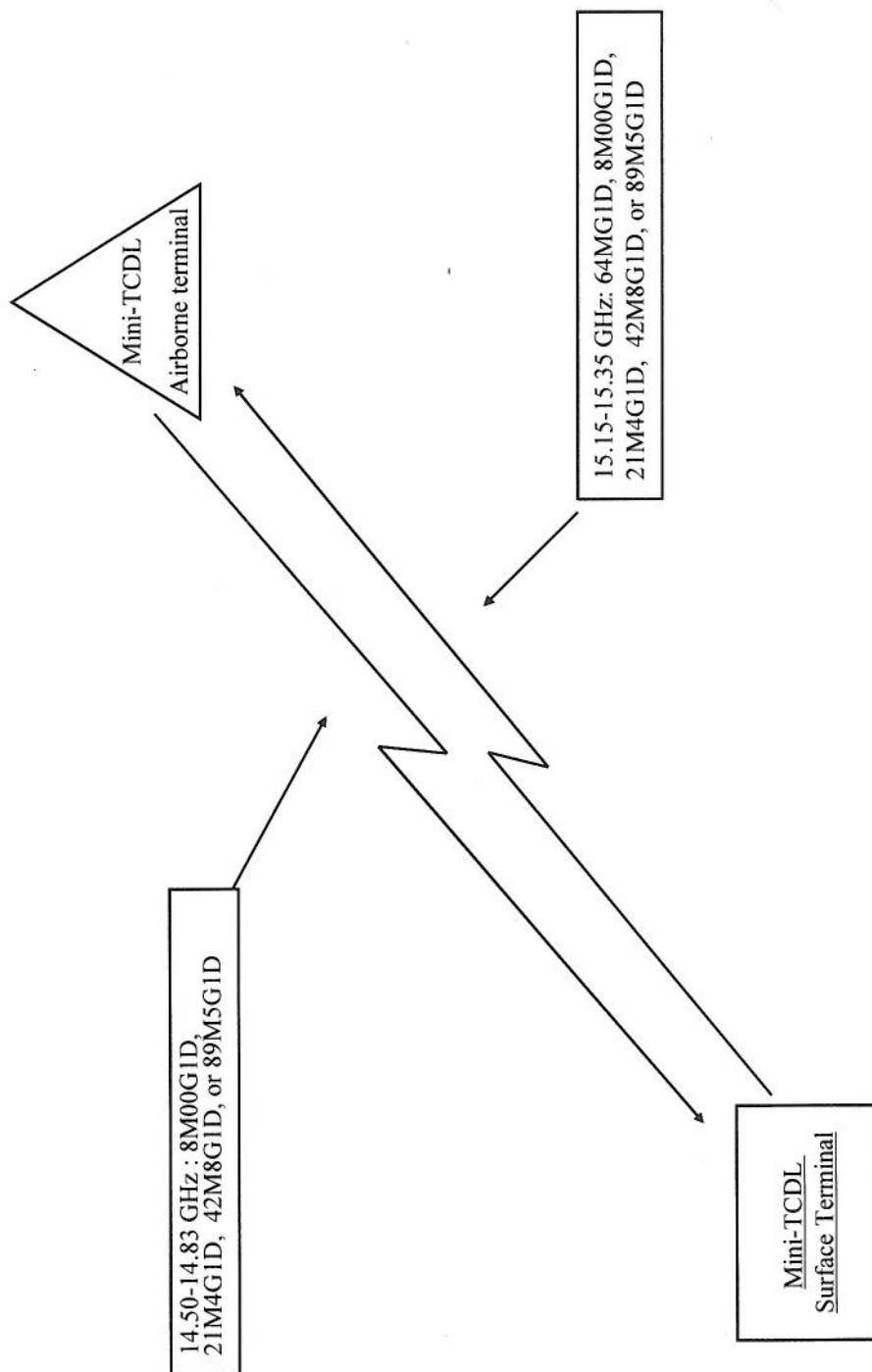
APPLICATION FOR EQUIPMENT FREQUENCY ALLOCATION		CLASSIFICATION UNCLASSIFIED		DATE 02/13/2008		/ Page 1 of 8 Pages	
DOD GENERAL INFORMATION							
TO AF Frequency Management Agency AFFMA/DON 2461 Eisenhower Ave., Suite 1203 Alexandria, VA 22331-1500				FROM Aeronautical System Center (AFMC) 88CG/SCXI (ASC 08005) 2690 K Street Bldg 47 Area B Wright Patterson AFB, OH 45433-7661			
1. APPLICATION TITLE (U) Mini-Tactical Common Data Link (Mini-TCDL) Airborne Terminal							
2. SYSTEM NOMENCLATURE (U) Mini-Tactical Common Data Link (Mini-TCDL) Network							
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) 14.50 GHz - 14.83 GHz 15.15 GHz - 15.35 GHz (See Remarks) b. EMISSION DESIGNATORS (U) 89M5G1D 64M0G1D (See Remarks)							
5. TARGET STARTING DATE FOR SUBSEQUENT STAGES a. STAGE 2 (U) NA b. STAGE 3 (U) NA c. STAGE 4 (U) 2010							
6. EXTENT OF USE (U) Intermittent use for demo flight tests.							
7. GEOGRAPHICAL AREA FOR a. STAGE 2 (U) NA b. STAGE 3 (U) Wright-Patterson AFB OH, Willow Run MI. (See Remarks) c. STAGE 4 (U) US&P, worldwide.							
8. NUMBER OF UNITS a. STAGE 2 (U) NA b. STAGE 3 (U) 2 c. STAGE 4 (U) 30							
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 OTHER J/F 12 APPLICATION ID(S) TO BE (U) ☐ a. SUPERSEDED ☐ b. RELATED				11.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 Thomas Lewis, AFRL/RYRR ext4347 (1) COMMERCIAL 937-255-6427 (2) DSN 785-6427 b. PROJECT ENGINEER Thomas Lewis, AFRL/RYRR ext4347 (1) COMMERCIAL 937-255-6427 (2) DSN 785-6427							
13. REMARKS (U) 4a/b. All transmissions will be within band listed for Emission listed: Tx 14.5010-14.8290 GHz for 8M00G1D & 14.5043-14.8257 GHz for 21M4G1D. Tx 14.5036-14.8264 GHz for 42M8G1D & 14.50025-14.82975 GHz for 89M5G1D. Rx 15.1530-15.3470 GHz for 64M0G1D & 15.1510-15.3490 GHz for 8M00G1D. Rx 15.1543-15.3457 GHz for 21M4G1D & 15.1536-15.3464 GHz for 42M8G1D. Rx 15.15025-15.34975 GHz for 89M5G1D. 7b. Primary test locations are 150 Mirad of Willow Run MI and 150 Mirad of Wright-Patterson AFB OH. Additional testing may be required at DOD Test & Training Ranges or military facilities. 11. Equipment being designed to be compatible with other DOD CDL assets.							
DOWNGRADING INSTRUCTIONS						/ CLASSIFICATION UNCLASSIFIED	

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TRANSMITTER EQUIPMENT CHARACTERISTICS			
1. NOMENCLATURE, MANUFACTURER'S MODEL NO. (U) Mini-TCDL Airborne Transmitter		2. MANUFACTURER'S NAME (U) L-3 Communications	
3. TRANSMITTER INSTALLATION (U) Aircraft		4. TRANSMITTER TYPE (U) Digital PSK Communications	
5. TUNING RANGE (U) 14.40 GHz - 14.83 GHz		6. METHOD OF TUNING (U) Crystal Controlled PLL Synthesizer	
		8. EMISSION DESIGNATORS See Data Overflow Page (U) 8M00G1D (U) 21M4G1D (U) 42M8G1D	
7. RF CHANNELING CAPABILITY (U) 14400 MHz, 87 channels in 5 MHz steps		12. EMISSION BANDWIDTH See Data Overflow Page ☐ CALCULATED ☒ MEASURED	
9. FREQUENCY TOLERANCE (U) 0.35 ppm		a. -3 dB (U) 3.8 MHz (U) 10.3 MHz (U) 23.3 MHz	
10. FILTER EMPLOYED (U) ☒ a. YES ☐ b. NO		b. -20 dB (U) 7.0 MHz (U) 20.1 MHz (U) 40.8 MHz	
		c. -40 dB (U) 15.6 MHz (U) 41.9 MHz (U) 83.6 MHz	
11. SPREAD SPECTRUM (U) ☐ a. YES ☒ b. NO		d. -60 dB (U) 54 MHz (U) 63 MHz (U) 130 MHz	
		e. OC-BW (U) 9.1 MHz (U) 21.4 MHz (U) 42.8 MHz	
13. MAXIMUM BIT RATE (U) 44.73 Mbps		15. MAXIMUM MODULATION FREQUENCY (U) NA	
14. MODULATION TECHNIQUES AND CODING (U) BPSK or O-QPSK (See Remarks)		17. DEVIATION RATIO (U) NA	
		18. PULSE CHARACTERISTICS See Data Overflow Page	
16. PRE-EMPHASIS (U) ☐ a. YES ☒ b. NO		a. RATE (U) NA (U) NA (U) NA	
		b. WIDTH (U) NA (U) NA (U) NA	
19. POWER See Data Overflow Page a. MEAN (U) 10 W (U) 10 W (U) 10 W		c. RISE TIME (U) NA (U) NA (U) NA	
		d. FALL TIME (U) NA (U) NA (U) NA	
b. PEP (U) NA (U) NA (U) NA		e. COMP RATIO (U) NA (U) NA (U) NA	
20. OUTPUT DEVICE (U) Solid State Power Amplifier		21. HARMONIC LEVEL	
		a. 2nd (U) -71.5 dB	
22. SPURIOUS LEVEL (U) -65 dB		b. 3rd (U) (See Remarks)	
23. FCC TYPE ACCEPTANCE NO. (U) NA		c. OTHER (U) (See Remarks)	
24. REMARKS (U) 7. Within US&P; 1st usable channel & available channels by emission are: 8M00G1D 14505 MHz, 65 channels in 5 MHz steps. 21M4G1D 14515 MHz, 61 channels in 5 MHz steps. 42M8G1D 14525 MHz, 57 channels in 5 MHz steps. 89M5G1D 14545 MHz, 49 channels in 5 MHz steps. 8. Necessary BW calculated per NTIA Manual Annex J, for PSK, with K=1. 10. 12-Section waveguide bandpass filter. 13/14. Emission Bit Rate Modulation Technique and Coding 8M00G1D 2.0 Mbps BPSK, 1/2 rate convolutional coding, k=7 21M4G1D 10.71Mbps O-QPSK, 1/2 rate convolutional coding, k=7 42M8G1D 21.42Mbps O-QPSK, 1/2 rate convolutional coding, k=7 89M5G1D 44.73Mbps O-QPSK, 1/2 rate convolutional coding, k=7 21b/c. Below noise floor.			
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TRANSMITTER DATA OVERFLOW PAGE			
1. NOMENCLATURE, MANUFACTURER'S MODEL NO.			
5. TUNING RANGE			
8. EMISSION DESIGNATORS (U) 89M5G1D			
12. EMISSION BANDWIDTH a. -3 dB (U) 40 MHz b. -20 dB 77.5 MHz c. -40 dB 161 MHz d. -60 dB 260 MHz e. OC-BW 89.5 MHz			
18. PULSE CHARACTERISTICS a. RATE (U) NA b. WIDTH (U) NA c. RISE TIME (U) NA d. FALL TIME (U) NA e. COMP RATIO (U) NA			
19. POWER a. MEAN (U) 10 W b. PEP (U) NA			
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RECEIVER EQUIPMENT CHARACTERISTICS					
1. NOMENCLATURE, MANUFACTURER'S MODEL NO. (U) Mini-TCDL Airborne Receiver			2. MANUFACTURER'S NAME (U) L-3 Communications		
3. RECEIVER INSTALLATION (U) Aircraft			4. RECEIVER TYPE (U) Dual Conversion Superheterodyne		
5. TUNING RANGE (U) 15.15 GHz - 15.35 GHz			6. METHOD OF TUNING (U) Crystal Controlled PLL Synthesizer		
7. RF CHANNELING CAPABILITY (U) 15150 MHz, 41 Channels in 5 MHz steps			8. EMISSION DESIGNATORS (U) 64M0G1D (See Remarks)		
9. FREQUENCY TOLERANCE (U) 0.35 ppm			11. RF SELECTIVITY ☒ CALCULATED ☐ MEASURED		
10. IF SELECTIVITY		1st (U)	2nd (U)	3rd (U)	a. -3 dB (U) 230 MHz
a. -3 dB		130 MHz	55 MHz	NA	b. -20 dB (U) 420 MHz
b. -20 dB		400 MHz	65 MHz	NA	c. -60 dB (U) 590 MHz
c. -60 dB		1200 MHz	100 MHz	NA	d. Preselection Type (U) Waveguide Bandpass F
12. IF FREQUENCY			13. MAXIMUM POST DETECTION FREQUENCY (U) NA		
a. 1st (U) 2300 MHz			14. MINIMUM POST DETECTION FREQUENCY (U) NA		
b. 2nd (U) (See Remarks)			16. MAXIMUM BIT RATE (U) 44.73 Mbps		
c. 3rd (U) NA			17. SENSITIVITY		
15. OSCILLATOR TUNED		1st (U)	2nd (U)	3rd (U)	a. SENSITIVITY (U) (See Remarks)
a. ABOVE TUNED FREQUENCY					b. CRITERIA (U) 10^-8 BER
b. BELOW TUNED FREQUENCY		X			c. NOISE FIG (U) 6.2 dB
c. EITHER ABOVE OR BELOW THE FREQUENCY					d. NOISE TEMP (U) NA
18. DE-EMPHASIS (U) ☐ a. YES ☒ b. NO			20. SPURIOUS REJECTION (U) 85 dB		
19. IMAGE REJECTION (U) 50 dB					
21. REMARKS (U) 7/8: 64M0G1D 15185 MHz, 27 channels in 5 MHz steps. 8M00G1D 15155 MHz, 39 channels in 5 MHz steps. 21M4G1D 15165 MHz, 35 channels in 5 MHz steps. 42M8G1D 15175 MHz, 31 channels in 5 MHz steps. 89M5G1D 15195 MHz, 23 channels in 5 MHz steps. 10/12b. The second stage of IF filtering occurs at baseband. 16. 64M0G1D is 200 kbps, 400 kbps, or 2 Mbps with spread spectrum. 8M00G1D is 2 Mbps. 21M4G1D is 10.71 Mbps. 42M8G1D is 21.42 Mbps. 89M5G1D is 44.73 Mbps. 17a: -106 dBm @ 200 kbps, -88 dBm @ 10.71 Mbps, -82 dBm @ 44.73 Mbps.					
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PICTORIAL LINE DIAGRAM

Mini-Tactical Common Data Link (Mini-TCDL)Airborne Terminal

APPLICATION FOR SPECTRUM REVIEW	CLASSIFICATION UNCLASSIFIED	PAGE 7
NTIA GENERAL INFORMATION		
1. APPLICATION TITLE (U) Mini-Tactical Common Data Link (Mini-TCDL) Airborne Terminal		
2. SYSTEM NOMENCLATURE (U) Mini-Tactical Common Data Link (Mini-TCDL) Network		
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) 14.50 GHz - 14.83 GHz 15.15 GHz - 15.35 GHz (See Remarks) b. EMISSION DESIGNATORS (U) 89M5G1D 64M0G1D (See Remarks)		
5. PURPOSE OF SYSTEM, OPERATIONAL AND SYSTEM CONCEPTS (U) (WARTIME USE) ☒ a. YES ☐ b. NO Line-of-sight transmission of intelligence, surveillance, & reconnaissance imagery data from an airborne platform to a ground control station.		
6. INFORMATION TRANSFER REQUIREMENTS (U) 200 kbps, 400 kbps, 2 Mbps, 10.71 Mbps, 21.42 Mbps, 44.73 Mbps.		
7. ESTIMATED INITIAL COST OF THE SYSTEM (U) \$40k		
8. TARGET DATE FOR		
a. APPLICATION APPROVAL (U) 10-01-2008	b. SYSTEM ACTIVATION (U) 05/01/2008	c. SYSTEM TERMINATION (U) 2025+
9. SYSTEM RELATIONSHIP AND ESSENTIALITY (U) Communicates with existing AF, Army, and USMC mobile ground stations. Provides links to disseminate Intelligence, Surveillance, & Reconnaissance (ISR) data.		
10. REPLACEMENT INFORMATION (U) None		
11. RELATED ANALYSIS AND/OR TEST DATA (U) None		
12. NUMBER OF MOBILE UNITS (U) 2		
13. GEOGRAPHICAL AREA FOR		
a. STAGE 2 (U) NA		
b. STAGE 3 (U) Wright-Patterson AFB OH, Willow Run MI (See Remarks)		
c. STAGE 4 (U) US&P, worldwide.		
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) 4a/b. All transmissions will be within band listed for Emission listed: Tx 14.5010-14.8290 GHz for 8M00G1D & 14.5043-14.8257 GHz for 21M4G1D. Tx 14.5036-14.8264 GHz for 42M8G1D & 14.50025-14.82975 GHz for 89M5G1D. Rx 15.1530-15.3470 GHz for 64M0G1D & 15.1510-15.3490 GHz for 8M00G1D. Rx 15.1543-15.3457 GHz for 21M4G1D & 15.1536-15.3464 GHz for 42M8G1D. Rx 15.15025-15.34975 GHz for 89M5G1D.		
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NTIA REMARK OVERFLOW PAGE

13b. Primary test locations are 150 Mirad of Willow Run MI and 150 Mirad of Wright-Patterson AFB OH. Additional testing may be required at DOD Test & Training Ranges or military facilities.