FOR AGENDA SPS

DEPARTMENT OF THE AIR FORCE
AF FREQUENCY MANAGEMENT AGENCY
2461 EISENHOWER AVE, HOFFMAN 1, SUITE 1203
ALEXANDRIA, VIRGINIA 22331-1500

5 January, 2006

MEMORANDUM FOR SECRETARY, SPECTRUM PLANNING SUBCOMMITTEE, IRAC

FROM: AFFMA/DON

SUBJECT: Application for Spectrum Review

The Application for Spectrum Review listed in the table below is submitted for review by the SPS under the provisions of Chapter 10 of the NTIA Manual of Regulations and Procedures for Federal Radio Frequency Management.

TITLE	J/F 12 #	PRIOR SPS	NSEP
DARPA NEXT GENERATION (XG) RADIO	**9204**	**NO**	**NO**

Please refer any questions regarding the above application to Wilbert Wells, 703-428-1511, FAX 703-429-1575. Email address is: wilbert.wells@pentagon.af.mil.

JIMMY NGUYEN, GS-13, DAF
USAF SPS Member

Attachment:
AF DARPA XG Radio

APPLICATION FOR SPECTRUM REVIEW	CLASSIFICATION **UNCLASSIFIED**	PAGE 1

NTIA GENERAL INFORMATION

1. APPLICATION TITLE (U) DARPA Next Generation (XG) Radio

2. SYSTEM NOMENCLATURE (U) DARPA Next Generation (XG) Radio

3. STAGE OF ALLOCATION (U)

- [ ] **a. STAGE 1 CONCEPTUAL**
- [X] **b. STAGE 2 EXPERIMENTAL**
- [ ] **c. STAGE 3 DEVELOPMENTAL**
- [ ] **d. STAGE 4 OPERATIONAL**

4. FREQUENCY REQUIREMENTS

a. FREQUENCY(IES) (U)	225 MHz - 328.6 MHz	335.4 MHz - 399.9 MHz	420 MHz - 450 MHz
b. EMISSION DESIGNATORS (U)	(See Remarks)	(See Remarks)	(See Remarks)

5. PURPOSE OF SYSTEM, OPERATIONAL AND SYSTEM CONCEPTS **(WARTIME USE)** [ ] **a. YES** [X] **b. NO**

(U) Proof of concept demonstration of the technology of interference avoidance in a policy (rule) based radio to achieve high spectrum access. Program will develop sensors that can dynamically sense, characterize, react, and adapt to actual spectrum usage. XG technology will make increases in the

6. INFORMATION TRANSFER REQUIREMENTS (U) 6 Mbps data

7. ESTIMATED INITIAL COST OF THE SYSTEM (U) NAvail

8. TARGET DATE FOR

a. APPLICATION APPROVAL	b. SYSTEM ACTIVATION	c. SYSTEM TERMINATION
(U) ASAP	(U) 12/30/2005	(U) NAvail

9. SYSTEM RELATIONSHIP AND ESSENTIALITY (U) Next generation (XG) spectrum sharing concepts between XG enabled wireless networks of grounds vehicles, dismounted soldiers, and point-to-multipoint systems in an urban, rural or test range environment.

10. REPLACEMENT INFORMATION (U) NA

11. RELATED ANALYSIS AND/OR TEST DATA (U) Reports and analysis are in progress.

12. NUMBER OF MOBILE UNITS (U) 6

13. GEOGRAPHICAL AREA FOR

a. STAGE 2 (U) Dahlgren, Va; Ft Dix, NJ; Ft Irwin & Camp Pendleton, CA (Remarks)

b. STAGE 3 (U) NAvail

c. STAGE 4 (U) NAvail

14. LINE DIAGRAM (U) **See Page(s)** 5

15. SPACE SYSTEMS (U) **See Page(s)** NA

16. TYPE OF SERVICE(S) FOR STAGE 4
(U) No Specific Service

17. STATION CLASS(ES) FOR STAGE 4
(U) XT

18. REMARKS ()

Item 5 (continued): spectrum available for tactical world-wide operations while greatly reducing the time needed for spectrum planning, management, assignment and coordination.
Item 13a (continued): Ft Huachuca, AZ; Ft Polk, LA; Ft Story, VA; Fort A.P. Hill, VA; Eastern Neck Wild Life Reserve, MD; Riverbend Park, VA; Quantico, VA; Vienna, VA; Laurel, MD; Annapolis, MD; Rural Locations in Maryland & Virginia; Idaho National Laboratory (INL), Idaho Falls, ID.

DOWNGRADING INSTRUCTIONS

J/F 12/09204

CLASSIFICATION **UNCLASSIFIED**

TRANSMITTER EQUIPMENT CHARACTERISTICS

1. NOMENCLATURE, MANUFACTURER'S MODEL NO.
(U) DSA-2

2. MANUFACTURER'S NAME
(U) Shared Spectrum Company

3. TRANSMITTER INSTALLATION
(U) Ground Vehicle & Buildings

4. TRANSMITTER TYPE
(U) Digital Communications

5. TUNING RANGE
(U) 200 MHz - 600 MHz

6. METHOD OF TUNING
(U) Synthesizer

7. RF CHANNELING CAPABILITY
(U) 225 MHz in 100 kHz Increments

8. EMISSION DESIGNATORS
(U) 1M75G2D (U) 3M50G2D (U) 7M00G2D

9. FREQUENCY TOLERANCE
(U) 1 ppm

10. FILTER EMPLOYED
(U) [ ] a. YES [X] b. NO

11. SPREAD SPECTRUM
(U) [ ] a. YES [X] b. NO

12. EMISSION BANDWIDTH
[X] CALCULATED [ ] MEASURED

a. -3 dB	(U) 1613 KHz	(U) 3226 KHz	(U) 6452 KHz
b. -20 dB	(U) 1750 KHz	(U) 3500 KHz	(U) 7000 KHz
c. -40 dB	(U) NAvail	(U) NAvail	(U) NAvail
d. -60 dB	(U) 3043 KHz	(U) 6087 KHz	(U) 12175 KHz
e. OC-BW	(U) 1750 KHz	(U) 3500 KHz	(U) 7000 KHz

13. MAXIMUM BIT RATE
(U) 6 Mbps

14. MODULATION TECHNIQUES AND CODING
(U) Orthogonal Frequency Division Multiplexing with variable data rate and turbo coding

15. MAXIMUM MODULATION FREQUENCY
(U) 6452 KHz

16. PRE-EMPHASIS
(U) [ ] a. YES [X] b. NO

17. DEVIATION RATIO
(U) NAvail

18. PULSE CHARACTERISTICS

a. RATE	(U) NA	(U) NA	(U) NA
b. WIDTH	(U) NA	(U) NA	(U) NA
c. RISE TIME	(U) NA	(U) NA	(U) NA
d. FALL TIME	(U) NA	(U) NA	(U) NA
e. COMP RATIO	(U) NA	(U) NA	(U) NA

19. POWER

a. MEAN	(U) 100 mW - 10 W	(U) See Remarks	(U) See Remarks
b. PEP	(U) NA	(U)	(U)

20. OUTPUT DEVICE
(U) Solid State

21. HARMONIC LEVEL
a. 2nd (U) -50 dB
b. 3rd (U) -60 dB
c. OTHER (U) NAvail

22. SPURIOUS LEVEL
(U) -60 dB

23. FCC TYPE ACCEPTANCE NO.
(U) NA

24. REMARKS (U) Item 19 (continued): Power is incrementally adjustable from 100 milliwatts to 10 watts in 1 dB steps.

RECEIVER EQUIPMENT CHARACTERISTICS

1. NOMENCLATURE, MANUFACTURER'S MODEL NO.
(U) DSA-2

2. MANUFACTURER'S NAME
(U) Shared Spectrum Company

3. RECEIVER INSTALLATION
(U) Ground Vehicle and Building

4. RECEIVER TYPE
(U) Dual Conversion Superheterodyne

5. TUNING RANGE
(U) 200 MHz - 600 MHz

6. METHOD OF TUNING
(U) Synthesizer

7. RF CHANNELING CAPABILITY
(U) 225 MHz, in 100 kHz Increments

8. EMISSION DESIGNATORS
(U) (See Remarks)

9. FREQUENCY TOLERANCE
(U) 1 ppm

10. IF SELECTIVITY

	1st (U)	2nd (U)	3rd (U)
a. -3 dB	NAvail	NAvail	NA
b. -20 dB	NAvail	NAvail	NA
c. -60 dB	NAvail	NAvail	NA

11. RF SELECTIVITY
[X] CALCULATED [ ] MEASURED

a. -3 dB	(U)	NAvail
b. -20 dB	(U)	NAvail
c. -60 dB	(U)	NAvail
d. Preselection Type	(U)	Switchable Filter

12. IF FREQUENCY
a. 1st (U) NAvail
b. 2nd (U) 13.5 MHz
c. 3rd (U) NA

13. MAXIMUM POST DETECTION FREQUENCY
(U) 6 MHz

14. MINIMUM POST DETECTION FREQUENCY
(U) NA

16. MAXIMUM BIT RATE
(U) 7 Mbps

15. OSCILLATOR TUNED

	1st (U)	2nd (U)	3rd (U)
a. ABOVE TUNED FREQUENCY	X		
b. BELOW TUNED FREQUENCY			
c. EITHER ABOVE OR BELOW THE FREQUENCY		X	

17. SENSITIVITY

a. SENSITIVITY	(U)	- 86 dBm
b. CRITERIA	(U)	13 dB SINAD
c. NOISE FIG	(U)	7 dB
d. NOISE TEMP	(U)	NA

18. DE-EMPHASIS
(U) [ ] a. YES [X] b. NO

19. IMAGE REJECTION
(U) 60 dB

20. SPURIOUS REJECTION
(U) 60 dB

21. REMARKS (U) Item 8 (continued): 1M75G2D, 3M50G2D, 7M00G2D.

ANTENNA EQUIPMENT CHARACTERISTICS

1. (U) [ ] a. TRANSMITTING [ ] b. RECEIVING [X] c. TRANSMITTING AND RECEIVING

2. NOMENCLATURE, MANUFACTURER'S MODEL NO.
(U) Diamond D-130NJ

3. MANUFACTURER'S NAME
(U) RF Parts Company

4. FREQUENCY RANGE
(U) 50 MHz - 1300 MHz

5. TYPE (U) Discone

6. POLARIZATION
(U) Vertical

7. SCAN CHARACTERISTICS
a. TYPE (U) NA
b. VERTICAL SCAN (U)
(1) Max Elev (U) NA
(2) Min Elev (U) NA
(3) Scan Rate (U) NA
c. HORIZONTAL SCAN (U)
(1) Sector Scanned (U) NA
(2) Scan Rate (U) NA
d. SECTOR BLANKING (U) [ ] (1) YES [X] (2) NO

8. GAIN
a. MAIN BEAM
(U) 2 dBi
b. 1st MAJOR SIDE LOBE
(U) NA

9. BEAMWIDTH
a. HORIZONTAL
(U) 360 deg
b. VERTICAL
(U) 60 deg

10. REMARKS (U)

DARPA NEXT GENERATION (XG) RADIO

M225-328.6
M335.4-399.9
M420-450
1M75G2D, 3M50G2D, 7M00G2D