

APPLICATION FOR EQUIPMENT FREQUENCY ALLOCATION		CLASSIFICATION UNCLASSIFIED		DATE 07/21/2004		J/F 12/07935/2 Page 1 of 6 Pages							
DOD GENERAL INFORMATION													
TO AF Frequency Management Agency AFFMA/SCOE 2461 Eisenhower Ave., Suite 1203 Alexandria, VA 22331-1500				FROM AF Materiel Command (ESC 011-04) Electronic Systems Center 66 MSG/SCB (Spectrum Management) 30 Hamilton St. Hanscom AFB, MA 01731-2802									
1. APPLICATION TITLE (U) Sensor Technologies & Systems, Inc. ST-101 Remote Detection and Tracking Sensor (RDTS)													
2. SYSTEM NOMENCLATURE (U) ST-101 Remote Detection and Tracking Sensor (RDTS)													
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) 16.2 GHz - 16.6 GHz b. EMISSION DESIGNATORS (U) 150MF3N 300MF3N													
5. TARGET STARTING DATE FOR SUBSEQUENT STAGES a. STAGE 2 (U) NA b. STAGE 3 (U) NA c. STAGE 4 (U) NA													
6. EXTENT OF USE (U) Continuous - up to 24 hrs/day, 7 days/week													
7. GEOGRAPHICAL AREA FOR a. STAGE 2 (U) NA b. STAGE 3 (U) NA c. STAGE 4 (U) US&P and Worldwide													
8. NUMBER OF UNITS a. STAGE 2 (U) NA b. STAGE 3 (U) NA c. STAGE 4 (U) 100													
9. NUMBER OF UNITS OPERATING SIMULTANEOUSLY IN THE SAME ENVIRONMENT(U) 2													
10. OTHER J/F 12 APPLICATION ID(S) TO BE (U) ☒ a. SUPERSEDED J/F 12/07935 ☐ b. RELATED				11.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) <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:45%;">a. PROGRAM MANAGER Phil Resca, ESC/FDPP</td> <td style="width:25%;">(1) COMMERCIAL 781-377-4126</td> <td style="width:30%;">(2) DSN 478-4126</td> </tr> <tr> <td>b. PROJECT ENGINEER Donald Rich, ESC/FDPT</td> <td>(1) COMMERCIAL 781-377-7222</td> <td>(2) DSN 478-7222</td> </tr> </table>								a. PROGRAM MANAGER Phil Resca, ESC/FDPP	(1) COMMERCIAL 781-377-4126	(2) DSN 478-4126	b. PROJECT ENGINEER Donald Rich, ESC/FDPT	(1) COMMERCIAL 781-377-7222	(2) DSN 478-7222
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13. REMARKS (U)													
DOWNGRADING INSTRUCTIONS						J/F 12/07935/2 CLASSIFICATION UNCLASSIFIED							

TRANSMITTER EQUIPMENT CHARACTERISTICS

1. NOMENCLATURE, MANUFACTURER'S MODEL NO. (U) ST-101 Transmitter		2. MANUFACTURER'S NAME (U) Sensor Technologies & Systems	
3. TRANSMITTER INSTALLATION (U) Fixed (Transportable)		4. TRANSMITTER TYPE (U) FM Communications	
5. TUNING RANGE (U) 16.2 GHz - 16.6 GHz		6. METHOD OF TUNING (U) Digital Synthesizer	
7. RF CHANNELING CAPABILITY (U) 16.2 GHz, 150 kHz increments, 2667 Chnls		8. EMISSION DESIGNATORS (U) 150MF3N (U) 300MF3N (U)	
9. FREQUENCY TOLERANCE (U) 300 ppm		12. EMISSION BANDWIDTH ☒ CALCULATED ☐ MEASURED	
10. FILTER EMPLOYED (U) ☐ a. YES ☒ b. NO		a. -3 dB (U) 150 MHz (U) 300 MHz (U)	
11. SPREAD SPECTRUM (U) ☐ a. YES ☒ b. NO		b. -20 dB (U) 151 MHz (U) 302 MHz (U)	
13. MAXIMUM BIT RATE (U) NA		c. -40 dB (U) 155 MHz (U) 310 MHz (U)	
14. MODULATION TECHNIQUES AND CODING (U) Frequency Modulated CW		d. -60 dB (U) 160 MHz (U) 320 MHz (U)	
16. PRE-EMPHASIS (U) ☐ a. YES ☒ b. NO		e. OC-BW (U) 150 MHz (U) 300 MHz (U)	
19. POWER		15. MAXIMUM MODULATION FREQUENCY (U) 610 Hz	
a. MEAN (U) 500 mW (U) 500 mW (U)		17. DEVIATION RATIO (U) (See Remarks)	
b. PEP (U) 1 W (U) 1 W (U)		18. PULSE CHARACTERISTICS	
20. OUTPUT DEVICE (U) GaAS FET MMIC Transistor Amplifier		a. RATE (U) NA (U) NA (U)	
22. SPURIOUS LEVEL (U) -40 dB		b. WIDTH (U) NA (U) NA (U)	
23. FCC TYPE ACCEPTANCE NO. (U) NA		c. RISE TIME (U) NA (U) NA (U)	
24. REMARKS (U)		d. FALL TIME (U) NA (U) NA (U)	
		e. COMP RATIO (U) NA (U) NA (U)	
		21. HARMONIC LEVEL	
		a. 2nd (U) -60 dB	
		b. 3rd (U) -60 dB	
		c. OTHER (U) -60 dB	

Item 8, 12 & 14. There are two modes of operation: normal mode (150MF3N), and high resolution mode (300MF3N). The normal (standard) mode is used to detect large targets; the high resolution mode is used to reduce the return clutter power and increase the probability of target detection on small targets.

12 & 14. Linear FM CW sweep width is 150MHz or 300MHz.

17. The transmitter sweeps 150 MHz or 300 MHz when modulated at 610 Hz rate. By the classical definition, the deviation ratio is 491803.

RECEIVER EQUIPMENT CHARACTERISTICS

1. NOMENCLATURE, MANUFACTURER'S MODEL NO.

(U) ST-101 Receiver

2. MANUFACTURER'S NAME

(U) Sensor Technologies & System

3. RECEIVER INSTALLATION

(U) Fixed (Transportable)

4. RECEIVER TYPE

(U) Homodyne

5. TUNING RANGE

(U) 16.2 GHz - 16.6 GHz

6. METHOD OF TUNING

(U) Microprocessor Controlled Synthesizer

7. RF CHANNELING CAPABILITY

(U) 16.2 GHz, 150 kHz increments, 2667 Chnls

8. EMISSION DESIGNATORS

(U) 150MF3N 300MF3N

9. FREQUENCY TOLERANCE

(U) 300 ppm

11. RF SELECTIVITY



CALCULATED



MEASURED

10. IF SELECTIVITY

1st (U)

2nd (U)

3rd (U)

a. -3 dB

NA

NA

NA

b. -20 dB

NA

NA

NA

c. -60 dB

NA

NA

NA

a. -3 dB

(U)

304 MHz

b. -20 dB

(U)

308 MHz

c. -60 dB

(U)

320 MHz

d. Preselection Type

(U)

Waveguide Cutoff

12. IF FREQUENCY

a. 1st

(U) NA

b. 2nd

(U) NA

c. 3rd

(U) NA

13. MAXIMUM POST DETECTION FREQUENCY

(U) 1.5 MHz

14. MINIMUM POST DETECTION FREQUENCY

(U) NA

16. MAXIMUM BIT RATE

(U) NA

15. OSCILLATOR TUNED

1st (U)

2nd (U)

3rd (U)

(See Remarks)

a. ABOVE TUNED FREQUENCY

b. BELOW TUNED FREQUENCY

c. EITHER ABOVE OR BELOW
THE FREQUENCY

17. SENSITIVITY

a. SENSITIVITY

(U)

- 90 dBm

b. CRITERIA

(U)

20dB S/N

c. NOISE FIG

(U)

4 dB

d. NOISE TEMP

(U)

NA

18. DE-EMPHASIS

(U)



a. YES



b. NO

19. IMAGE REJECTION

(U) NA

20. SPURIOUS REJECTION

(U) NA

21. REMARKS (U)

ANTENNA EQUIPMENT CHARACTERISTICS

1. (U) ☐ a. TRANSMITTING ☐ b. RECEIVING ☒ c. TRANSMITTING AND RECEIVING	
2. NOMENCLATURE, MANUFACTURER'S MODEL NO. (U) ST-101 Antenna	3. MANUFACTURER'S NAME (U) Sensor Technologies & Systems
4. FREQUENCY RANGE (U) 12.4 GHz - 18 GHz	5. TYPE (U) Parabolic Reflector
6. POLARIZATION (U) Linear	7. SCAN CHARACTERISTICS
8. GAIN	a. TYPE (U) ELECTROMECHANICAL
a. MAIN BEAM (U) 37.4 dBi	b. VERTICAL SCAN (U) See Remarks
b. 1st MAJOR SIDE LOBE (U) 32 dBi (See Remarks)	(1) Max Elev (U) +15 deg
9. BEAMWIDTH	(2) Min Elev (U) -15 deg
a. HORIZONTAL (U) 1.2 deg	(3) Scan Rate (U) See Remarks
b. VERTICAL (U) 3.7 deg	c. HORIZONTAL SCAN (U) ELECTROMECHANICAL
	(1) Sector Scanned (U) 360
	(2) Scan Rate (U) See Remarks
	d. SECTOR BLANKING (U) ☐ (1) YES ☒ (2) NO

10. REMARKS (U)

Item 5. 12 inch high by 60 inch wide oval parabolic dish with two center feeds, one used for transmitting and a separate one for receive.

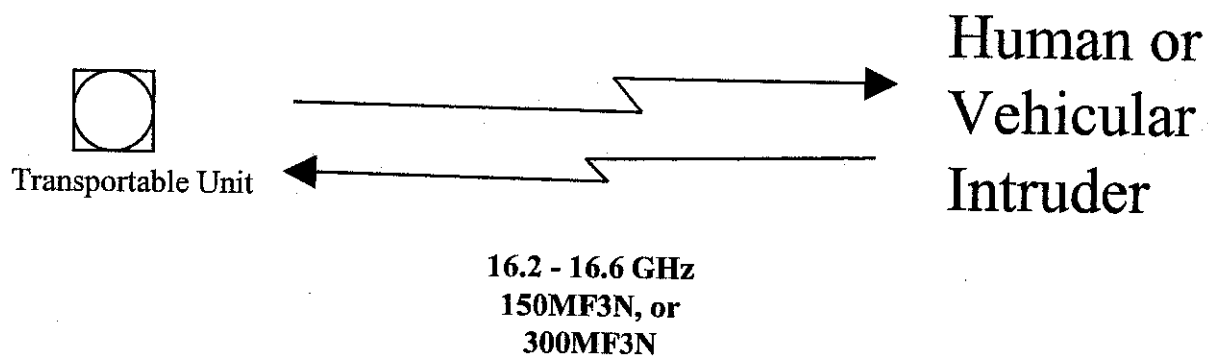
7b & 7b(3). A push rod assembly moves the antenna reflector with respect to the feeds in order to scan the antenna beams vertically. This allows the radar to follow non-level terrain and is based on data programmed into the system.

7c(2). The scan rate is programmed based on the operating location of the system. Nominal 7.5 RPM

8b. 1.5 deg in azimuth and 6.0 deg in elevation.

GENERAL CONTINUATION PAGE

Sensor Technologies & Systems, Inc. (STS)
ST-101, Remote Detection and Tracking Sensor (RDTS)



NTIA GENERAL INFORMATION

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	☐ c. STAGE 3 DEVELOPMENTAL	☒ d. STAGE 4 OPERATIONAL
4. FREQUENCY REQUIREMENTS		
a. FREQUENCY(IES) (U) 16.2 GHz - 16.6 GHz		
b. EMISSION DESIGNATORS (U) 150MF3N 300MF3N		
5. PURPOSE OF SYSTEM, OPERATIONAL AND SYSTEM CONCEPTS (WARTIME USE)		
(U) Remote detection and tracking system for use in resource protection of high value assets ☒ a. YES ☐ b. NO		
6. INFORMATION TRANSFER REQUIREMENTS(U) None		
7. ESTIMATED INITIAL COST OF THE SYSTEM (U) \$60,000 per production unit		
8. TARGET DATE FOR		
a. APPLICATION APPROVAL (U) ASAP	b. SYSTEM ACTIVATION (U) ASAP	c. SYSTEM TERMINATION (U) 12/2015
9. SYSTEM RELATIONSHIP AND ESSENTIALITY (U) Will be incorporated into site sensor communication and network for use by force protection personnel		
10. REPLACEMENT INFORMATION (U) NA		
11. RELATED ANALYSIS AND/OR TEST DATA (U) SPS-13131		
12. NUMBER OF MOBILE UNITS (U) None		
13. GEOGRAPHICAL AREA FOR		
a. STAGE 2 (U) NA		
b. STAGE 3 (U) NA		
c. STAGE 4 (U) US&P and Worldwide		
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) Radiolocation	17. STATION CLASS(ES) FOR STAGE 4 (U) LR	
18. REMARKS (U)		
DOWNGRADING INSTRUCTIONS		J/F 12/07935/2
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