MILITARY COMMUNICATIONS ELECTRONICS BOARD
WASHINGTON, D.C. 20301

UNCLASSIFIED
NH J/F 12/7026
(Agenda Item No. J-12)

MAY 19 1998

NOTE TO HOLDERS

OF

J/F 12/7026

Radio Frequency Interrogator and Transponder (MITLA)

Holders of subject Air Force and Army document dated 6 Jan 94 are requested by the Army to note the following changes:

Pages 3 and 4, Item 1: add; "ST-410 series and SR-410R series"

Page 1 and 7, Item 4a: add; "2440 MHz"

Add attached receiver and antenna pages

STEERING MEMBER
J-12 Working Group
MCEB Frequency Panel

cc: MCEB J-12
Distribution List

CLASSIFICATION
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RECEIVER EQUIPMENT CHARACTERISTICS

1. Nomenclature, Manufacturer's Model No.
Transponder Savitag 410, Model ST-410 Series

2. Manufacturer's Name:
Savi Technology

3. Receiver Installation
Multiple Sites & Vehicles

4. Receiver Type:
Diode Detection AM Communication

5. Tuning Range:
2.44 GHz

6. Method Of Tuning:
NA

7. RF Channeling Capability:
NA

8. Emission Designator(s):
70K0F2D

9. Frequency Tolerance:
NA

10. IF Selectivity: 1st 2nd 3rd
NA
a. -3db:
b. -20db:
c. -60db:

11. RF Selectivity:
|__| Calculated |__| Measured
NA
a. -3 db:
b. -20 db:
c. -60 db:
d. Preselection Type:

12. IF Frequency:
NA
a. 1st:
b. 2nd:
c. 3rd:

13. Maximum Post Detection Frequency:
3.8 kHz

14. Minimum Post Detection Frequency:
NA

15. Oscillator Tuned:
NA

	1st	2nd	3rd
a. Above Tuned Frequency	|__|	|__|	|__|
b. Below Tuned Frequency	|__|	|__|	|__|
c. Either Above or Below the Frequency	|__|	|__|	|__|

16. Maximum Bit Rate: NA

17. Sensitivity:
a. Sensitivity: 50 dBm
b. Criteria:
c. Noise Fig: 40 dB
d. Noise Temp: NA Kelvin

18. De-emphasis:
|__| Yes |x| No

19. Image Rejection:

20. Spurious Rejection:
NA

21. Remarks:
None

CLASSIFICATION:
UNCLASSIFIED

J/F 12/7026

DD Form 1494, MAY 91

ANTENNA EQUIPMENT CHARACTERISTICS

1. Transmitting |__| Receiving |__| Transmitting and Receiving |x|

2. Nomenclature, Manufacturer's Model No.:
Cross-Loop Antenna

3. Manufacturer's Name:
Savi Technology

4. Frequency Range:
433.92 MHz

5. Type:
Tunable Loop

6. Polarization: Linear

7. Scan Characteristics:

a. Type: Fixed

b. Vertical Scan: NA
(1) Max Elev:
(2) Min Elev:
(3) Scan Rate:

c. Horizontal Scan: NA
(1) Sector Scan:
(2) Scan Rate:

d. Sector Blanking |__| Yes |x| No

8. Gain:

a. Main Beam: -2 dBi

b. 1st Major Side Lobe: NA

9. Beamwidth:

a. Horizontal: 360°
b. Vertical: 78°

10. Remarks:

None

ANTENNA EQUIPMENT CHARACTERISTICS

1. Transmitting |__| Receiving |__| Transmitting and Receiving |x|

2. Nomenclature, Manufacturer's Model No.:
Sealtag III PCB

3. Manufacturer's Name:
Savi technology

4. Frequency Range:
433.92 MHz

5. Type:
Tunable Slot

6. Polarization: Circular

7. Scan Characteristics:

a. Type: Fixed

b. Vertical Scan: NA
(1) Max Elev:
(2) Min Elev:
(3) Scan Rate:

c. Horizontal Scan: NA
(1) Sector Scan:
(2) Scan Rate:

d. Sector Blanking |__| Yes |x| No

8. Gain:

a. Main Beam: 3 dBi

b. 1st Major Side Lobe: NA

9. Beamwidth:

a. Horizontal: 360°
b. Vertical: 60°

10. Remarks:

None

ANTENNA EQUIPMENT CHARACTERISTICS

1. Transmitting |__| Receiving |x| Transmitting and Receiving |__|

2. Nomenclature, Manufacturer's Model No.:
2.405 GHz Slot Antenna

3. Manufacturer's Name:
Savi Technology

4. Frequency Range:
2405 - 2500 MHz

5. Type:
Self Resonant Slot

6. Polarization: Linear

7. Scan Characteristics:

a. Type: Fixed

b. Vertical Scan: NA
(1) Max Elev:
(2) Min Elev:
(3) Scan Rate:

c. Horizontal Scan: NA
(1) Sector Scan:
(2) Scan Rate:

d. Sector Blanking |__| Yes |x| No

8. Gain:

a. Main Beam: 0 dBi

b. 1st Major Side Lobe: NA

9. Beamwidth:

a. Horizontal: 360°
b. Vertical: 78°

10. Remarks:

None

A

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MILITARY COMMUNICATIONS ELECTRONICS BOARD (MCEB)

EQUIPMENT FREQUENCY ALLOCATION GUIDANCE

Military Department	Equipment	Stage
AIR FORCE	Radio Frequency Interrogator and Transponder (MILTA)	4-Operational

Section 1: ENCLOSURES

Enclosure Number	Description	Dated
1	J/F 12/7026	6 Jan 94

Section 2: EQUIPMENT APPLICATION INFORMATION

Frequency	Emission	Power	Type of Service	Operating Location
315 MHz 433.92 MHz	70K0F2D	1 uW	Fixed Mobile	Worldwide

Section 3: MCEB GUIDANCE

1. The enclosed application is approved for operational use on a non-interference basis in the US&P subject to the guidance provided in the following paragraphs.
2. For the intended operation in the fixed and mobile service, the subject equipment is not in accordance with the ITU and US Tables of Frequency Allocation.
3. The system meets the requirements of an Annex K device as described in the NTIA manual. As an Annex K device all operations are on a noninterference basis (NIB) to authorized services. In addition, the subject systems is not protected from any instance of harmful interference.
4. Operations of the subject equipment must be coordinated with the cognizant area frequency coordinator in accordance with ACP 190 US Supplement C, Guide to Frequency Planning (C), prior to activation.
5. Host Nation coordination has been initiated. Use of the subject system is not authorized in locations other than the US&P without the appropriate CINC's statement of supportability.

Steering Member	Signature	Date	Page
J-12 Working Group MCEB Frequency Panel	W. McAllister	NOV 09 1994	1 of 1

Downgrading Instructions	Distribution	MCEB J-12 Number
Classified by: Declassify on: NA	J-12 Holders	7026/1

APPLICATION FOR EQUIPMENT FREQUENCY ALLOCATION	CLASSIFICATION UNCLASSIFIED	DATE 6 Jan 94	J/F 12/07028 Page 1 of 7 Pages

DOD GENERAL INFORMATION

TO	FROM
AF FMA/SCM 4040 North Fairfax Dr. Suite 203 Arlington, VA 22203-1613	615 SMSG/SCSF 4225 Logistics Ave. Suite 20 Wright Patterson AFB, OH 45433-5759

1. APPLICATION TITLE (U) Radio Frequency Interrogator and Transponders

2. SYSTEM NOMENCLATURE (U) Microcircuitry in Transportation Logistics Applications (MITLA)

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 (U)

a. FREQUENCY(IES) 315.0000 MHz 433.9200 MHz

b. EMISSION DESIGNATOR(S) 70K0F2D 70K0F2D

5. TARGET STARTING DATE FOR SUBSEQUENT STAGES

a. STAGE 2	b. STAGE 3	c. STAGE 4
(U) NA	(U) NA	(U) NA

6. EXTENT OF USE (U) Intermittent, 2 to 20 times per day; 1-5 sec per transmit.

7. GEOGRAPHICAL AREA FOR

a. STAGE 2 (U) NA

b. STAGE 3 (U) NA

c. STAGE 4 (U) USAF, and those countries listed on page 2.

8. NUMBER OF UNITS

a. STAGE 2	b. STAGE 3	c. STAGE 4
(U) NA	(U) NA	(U) (See Remarks)

9. NUMBER OF UNITS OPERATING SIMULTANEOUSLY IN THE SAME ENVIRONMENT (U) (See Remarks)

10. OTHER J/F 12 APPLICATION NUMBER(S) TO BE

(U) [ ] a. SUPERSEDED J/F 12/ NA

[ ] b. RELATED J/F 12/ NA

11. IS THERE ANY OPERATIONAL REQUIREMENT AS DESCRIBED IN THE INSTRUCTIONS FOR PARAGRAPH 11?

(U) [X] a. YES [ ] b. NO [ ] c. NAVAIL

12. NAMES AND TELEPHONE NUMBERS

(U) a. PROGRAM MANAGER Mark Rebouiet	(1) COMMERCIAL 513-257-4118	(2) DSN 787-4118
b. PROJECT ENGINEER Mark Rebouiet	(1) COMMERCIAL 513-257-4118	(2) DSN 787-4118

13. REMARKS (U)

Block 8c. One million.

Block 9. Thousands can operate together in the same environment.

DOWNGRADING INSTRUCTIONS	CLASSIFICATION	J/F 12/07028
Classified By: NA Declassify On:	UNCLASSIFIED	

DOD GENERAL INFO CONTINUATION PAGE

DOD Continuation Page, block 7c continued.

Australia	Bahrain	Belgium	Bolivia
Bosnia-Herce	Botswanna	Brazil	Bulgaria
Colombia	Costa Rica	Croatia	Cuba
Czechoslovakia	Denmark	Ecuador	Egypt
El Salvador	Ethiopia	Fiji	Finland
France	Georgia	Germany	Greece
Greenland	Guatemala	Haiti	Holland
Honduras	Hong Kong	Hungary	Iceland
India	Ireland	Israel	Italy
Jamaica	Japan	Jordan	Kenya
Korea (Seoul)	Kuwait	Lebanon	Liberia
Lithuania	Malaysia	Mexico	Morocco
Myanmar	Netherlands	New Caledonia	New Zealand
Nicaragua	Nigeria	NATO	Norway
Oman	Pakistan	Panama	Peru
Phillipines	Poland	Portugal	Romania
Russia	Saudi Arabia	Singapore	Somalia
South Africa	Spain	Suriname	Sweden
Switzerland	Syria	Taiwan	Thailand
Tunisia	Turkey	Ukraine	United Arab Emirates
United Kingdom	Venezuela	South Yemen	Yugoslavia

CLASSIFICATION

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TRANSMITTER EQUIPMENT CHARACTERISTICS

1. NOMENCLATURE, MANUFACTURER'S MODEL NO.
(U) MMR-2300

2. MANUFACTURER'S NAME
(U) Savi Technology, Inc.

3. TRANSMITTER INSTALLATION
(U) Multiple sites and vehicles

4. TRANSMITTER TYPE
(U) FM Fixed Frequency

5. TUNING RANGE
(U) 315.0000 MHz
433.9200 MHz

6. METHOD OF TUNING
(U) Surface Acoustic Wave Resonator

7. RF CHANNELING CAPABILITY
(U) None

8. EMISSION DESIGNATOR
(U) 70K0F2D 70K0F2D

9. FREQUENCY TOLERANCE
(U) 2.000 ppm

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

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

12. EMISSION BANDWIDTH
[ ] CALCULATED [X] MEASURED

a. -3 dB	(U)	2.0000 KHz	(U)	2.0000 KHz	(U)
b. -20 dB	(U)	60.0000 KHz	(U)	60.0000 KHz	(U)
c. -40 dB	(U)	500.0000 KHz	(U)	500.0000 KHz	(U)
d. -60 dB	(U)	8.0000 MHz	(U)	8.0000 MHz	(U)
e. OC-BW	(U)	70.0000 KHz	(U)	70.0000 KHz	(U)

13. MAXIMUM BIT RATE
(U) 10.0000 Kbps

14. MODULATION TECHNIQUES AND CODING
(U) FSK, Pulse width modulation

15. MAXIMUM MODULATION FREQUENCY
(U) 60.0000 KHz

17. DEVIATION RATIO
(U) 8.00

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

18. PULSE CHARACTERISTICS

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

19. POWER

a. MEAN	(U)	0.001 mW	(U) 0.001 mW	(U)
b. PEP	(U)	NA	(U) NA	(U)

20. OUTPUT DEVICE
(U) Transistor

21. HARMONIC LEVEL

a. 2nd	(U)	-35.00 dB
b. 3rd	(U)	-55.00 dB
c. OTHER	(U)	-45.00 dB

22. SPURIOUS LEVEL
(U) -35.00 dB

23. FCC TYPE ACCEPTANCE NO.
(U) KL7-TYTAG-315-V1

24. REMARKS (U)

NOTE: The interrogator and the transponder each employ this transmitter configuration.

Item 10: The transmitter employs a ceramic bandpass filter.

CLASSIFICATION

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CLASSIFICATION

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RECEIVER EQUIPMENT CHARACTERISTICS

1. NOMENCLATURE, MANUFACTURER'S MODEL NO.
(U) NMR-2300

2. MANUFACTURER'S NAME
(U) Savi Technology, Inc

3. RECEIVER INSTALLATION
(U) Multiple sites and vehicles

4. RECEIVER TYPE
(U) Superhetrodyne - 1 stage

5. TUNING RANGE
(U) 315.0000 MHz
433.9200 MHz

6. METHOD OF TUNING
(U) Surface Acoustic Wave Resonator

7. RF CHANNELING CAPABILITY
(U) None

8. EMISSION DESIGNATOR(S)
(U) 70K0F2D 70K0F2D

9. FREQUENCY TOLERANCE
(U) 2.000 ppm

10. IF SELECTIVITY

	1st (U)	2nd (U)	3rd (U)
a. -3 dB	400.0000 KHz	NA	NA
b. -20 dB	800.0000 KHz		
c. -60 dB	3.0000 MHz		

11. RF SELECTIVITY
[ ] CALCULATED [ ] MEASURED

a. -3 dB	(U) 800.0000 KHz
b. -20 dB	(U) 3.0000 MHz
c. -60 dB	(U) 400.0000 MHz
d. Preselection Type	(U) SAW filter

12. IF FREQUENCY
a. 1st (U) 10.7000 MHz
b. 2nd (U) NA
c. 3rd (U) NA

13. MAXIMUM POST DETECTION FREQUENCY
(U) 30.0000 KHz

14. MINIMUM POST DETECTION FREQUENCY
(U) NA

15. OSCILLATOR TUNED

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

16. MAXIMUM BIT RATE
(U) 30.0000 Kbps

17. SENSITIVITY

a. SENSITIVITY	(U) - 95.00 dBm
b. CRITERIA	(U) 15 dB SINAD
c. NOISE FIG	(U) 8.00 dB
d. NOISE TEMP	(U) NA

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

19. IMAGE REJECTION
(U) 40.00 dB

20. SPURIOUS REJECTION
(U) 50.00 dB

21. REMARKS (U)
NOTE: The interrogator and the transponder each employ this receiver configuration.

CLASSIFICATION

UNCLASSIFIED

CLASSIFICATION

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ANTENNA EQUIPMENT CHARACTERISTICS

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

2. NOMENCLATURE, MANUFACTURER'S MODEL NO.

(U) NNR-2300

3. MANUFACTURER'S NAME

(U) Savi Technologies, Inc.

4. FREQUENCY RANGE

(U) 310.0000 MHz - 320.0000 MHz
430.0000 MHz - 440.0000 MHz

5. TYPE

(U) New design based on loop antenna

6. POLARIZATION

(U) Linear

7. SCAN CHARACTERISTICS

a. TYPE (U) NA

b. VERTICAL SCAN (U) NA

(1) Max Elev (U) NA

(2) Min Elev (U) NA

(3) Scan Rate (U) NA

c. HORIZONTAL SCAN (U) NA

(1) Sector Scan (U) NA

(2) Scan Rate (U) NA

d. SECTOR BLANKING (U) [ ] (1) YES [X] (2) NO

8. GAIN

a. MAIN BEAM

(U) 0.00 dBi

b. 1st MAJOR SIDE LOBE

(U)

9. BEAMWIDTH

a. HORIZONTAL

(U) 360.00 deg

b. VERTICAL

(U) 360.00 deg

10. REMARKS (U)

NONE

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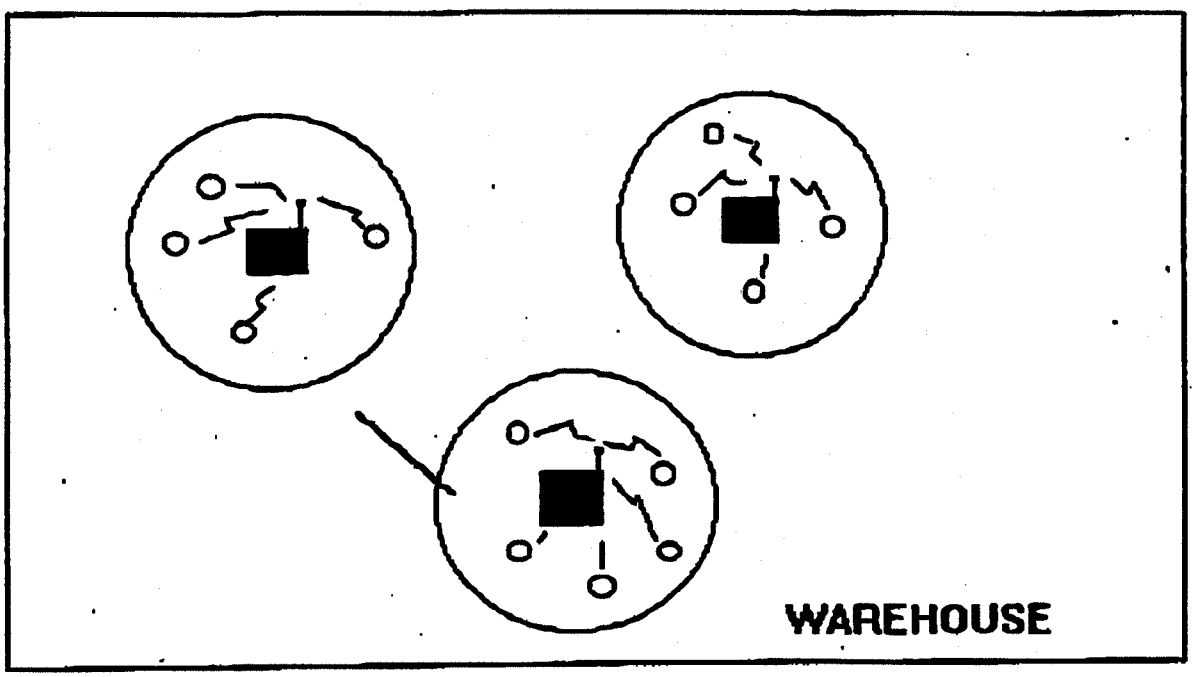
Line diagram.

MITLA RF TRANSPONDERS



← INTERROGATOR

○ ← RF TAG

315 MHz, 433.92 MHz
70K0F2D

APPLICATION FOR SPECTRUM REVIEW	CLASSIFICATION UNCLASSIFIED	PAGE 7

NTIA GENERAL INFORMATION

1. APPLICATION TITLE (U) Radio Frequency Interrogator and Transponders

2. SYSTEM NOMENCLATURE (U) Microcircuitry in Transportation Logistics Applications (MITLA)

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 (U)

a. FREQUENCY(IES) 315.0000 MHz 433.9200 MHz

b. EMISSION DESIGNATOR(S) 70K0F2D 70K0F2D

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

(U) Collect and report location, health, and status of principal logistics items.

6. INFORMATION TRANSFER REQUIREMENTS

(U) None

7. ESTIMATED INITIAL COST OF THE SYSTEM (U) $50.00 per transponder tag, 1 million to be

8. TARGET DATE FOR

a. APPLICATION APPROVAL (U) 31Aug94	b. SYSTEM ACTIVATION (U) 1Sep94	c. SYSTEM TERMINATION (U) NAVAIL

9. SYSTEM RELATIONSHIP AND ESSENTIALITY

(U) MITLA transponders are used to track principal assets in facility or in transit. Total asset visibility is a critical DoD priority.

10. REPLACEMENT INFORMATION (U) None

11. RELATED ANALYSIS AND/OR TEST DATA

(U) None

12. NUMBER OF MOBILE UNITS (U) 1 Million

13. GEOGRAPHICAL AREA FOR

a. STAGE 2 (U) NA

b. STAGE 3 (U) NA

c. STAGE 4 (U) USSP, and those countries listed on page 2.

14. LINE DIAGRAM (U) See Page(s) # 6	15. SPACE SYSTEMS (U) See Page(s) # NONE
16. TYPE OF SERVICE(S) FOR STAGE 4 (U) Fixed Mobile	17. STATION CLASS(ES) FOR STAGE 4 (U) FX MDP

18. REMARKS (U)

NONE

DOWNGRADING INSTRUCTIONS Classified By: NA Declassify On:	CLASSIFICATION UNCLASSIFIED	J/F 12/07028