SECURITY SUMMARY & SPECIAL HANDLING REQUIREMENTS

The title of this application is : RT-1944/U Radio Set

The overall classification of this application is : **UNCLASSIFIED**

Refer to your Security Manual for further guidance.

The Application Level Special Handling is : A

Approved for public release; distribution is unlimited (DoD Directive 5230.24)

DOWNGRADING INSTRUCTIONS

Special Handling Instruction : A

J/F 12/09763

CLASSIFICATION

UNCLASSIFIED

APPLICATION FOR EQUIPMENT FREQUENCY ALLOCATION	CLASSIFICATION UNCLASSIFIED	DATE 7/26/2010	J/F 12/09763 PAGE 1

DOD GENERAL INFORMATION

TO (U) Navy Marine Corps Spectrum Center (NMSC)
2461 Eisenhower Ave.
Hoffman 1, Suite 1202
Alexandria, VA 22331-1400

FROM (U) Commander, Program Executive Officer, Command, Control, Communications, Computers, Intelligence, PMW-170 Pacific Highway
San Diego, CA 92110-3127

1. APPLICATION TITLE (U) RT-1944/U Radio Set

2. SYSTEM NOMENCLATURE (U) RT-1944/U Radio Set

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) 2200.000 MHz - 2300.000 MHz (U) 2310.000 MHz - 2417.000 MHz (U) 4800.000 MHz - 4990.000 MHz
b. EMISSION DESIGNATORS (U) 19M4W7D

5. TARGET STARTING DATE FOR SUBSEQUENT STAGES

a. STAGE 2	b. STAGE 3	c. STAGE 4 (U) 8/1/2010

6. EXTENT OF USE (U) The RT-1944/U radio set will be used intermittently 24-hours a day, 7 days a (See Data Overflow Page)

7. GEOGRAPHICAL AREA FOR
a. STAGE 2
b. STAGE 3 (U) Melbourne, (U) Florida - Single Point - Lat/Lon
c. STAGE 4 (U) US&P - Polygon

8. NUMBER OF UNITS

a. STAGE 2	b. STAGE 3	c. STAGE 4 (U) 1000

9. NUMBER OF UNITS OPERATING SIMULTANEOUSLY IN THE SAME ENVIRONMENT (U) 32

10. OTHER J/F 12 APPLICATION ID(S) TO BE
☐ **a. SUPERSEDED**
☐ **b. RELATED**

11. IS THERE ANY OPERATIONAL REQUIREMENT AS DESCRIBED IN THE INSTRUCTIONS FOR PARAGRAPH 11?
☐ **a. YES** ☐ **b. NO** ☐ **c. NAVAIL**

12. NAMES AND TELEPHONE NUMBERS
(U) Duncan Peterson Program Manager (619) 524-3216
(U) Jeremy Mucha Assistant Program Manager- Engineering (Tactical Communications) (858) 537-8657

13. REMARKS

DOWNGRADING INSTRUCTIONS
Special Handling Instruction :A

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DOD DATA OVERFLOW PAGE

6. EXTENT OF USE

Cont. (U) s a week. This would include both peacetime and wartime operations and in a schoolhouse training environment

DOWNGRADING INSTRUCTIONS

Special Handling Instruction :A

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CLASSIFICATION

UNCLASSIFIED

TRANSMITTER EQUIPMENT CHARACTERISTICS

1. NOMENCLATURE, MANUFACTURER'S MODEL NO.
(U) RT-1944/U Transmitter, (U) RT-1944/U

2. MANUFACTURER'S NAME
(U) RELIABLE SYSTEM SERVICES CORP.

3. TRANSMITTER INSTALLATION

4. TRANSMITTER TYPE
(U) Networked Data Communications

5. TUNING RANGE
(U) 2200.000 - 2500.000 MHz (U) 4800.000 - 5900.000 MHz

6. METHOD OF TUNING
(U) Synthesizer

7. RF CHANNELING CAPABILITY
(U) 5000.0 kHz Increments (U) 5000.0 kHz Increments

8. EMISSION DESIGNATORS
(U) 19M4W7D

9. FREQUENCY TOLERANCE
(U) 20 ppm

10. FILTER EMPLOYED
(U) Bandpass Filter

11. SPREAD SPECTRUM
☐ **a. YES** ☒ **b. NO**

12. EMISSION BANDWIDTH

☐ **CALCULATED** ☒ **MEASURED**

a. -3 dB	(U) 16600 kHz	(U) 16600 kHz
b. -20 dB	(U) 18900 kHz	(U) 18900 kHz
c. -40 dB	(U) 46700 kHz	(U) 46700 kHz
d. -60 dB	(U) 123000 kHz	(U) 123000 kHz
e. OC-BW	(U) 19400 kHz	(U) 19400 kHz

13. MAXIMUM BIT RATE
(U) 72000000 bps

14. MODULATION TECHNIQUES AND CODING
(U) Digital

15. MAXIMUM MODULATION FREQUENCY

16. PRE-EMPHASIS
☐ **a. YES** ☐ **b. NO**

17. DEVIATION RATIO

18. PULSE CHARACTERISTICS

19. POWER

a. MEAN (U) 1.00 W - (U) 10.0 W

a. RATE

b. PEP

b. WIDTH

c. CARRIER

c. RISE TIME

d. FALL TIME

20. OUTPUT DEVICE
(U) Transistor

e. COMP RATIO

21. HARMONIC LEVEL

22. SPURIOUS LEVEL
(U) -89.6 dB

a.	(U) -91.0 dB
b.	(U) -92.3 dB
c.	(U) -94.4 dB

23. FCC TYPE ACCEPTANCE NO.

24. REMARKS (U)

(U) Frequencies: Low Band 2200 - 2500 MHz (prefer 2200 - 2400 MHz) and High Band 4800 - 5900 MHz (prefer 4800 - 5000 MHz). Low band will be used to support ship to off-board Platforms, ship to airborne, and airborne to off-board platforms. High band will be used to support ship-to-ship and off-board platform launch-recovery communications.

(U) Tuning Increments: 2200 - 2400 MHz, 2212 to 2387 (center frequencies) 5 MHz steps, 36 overlapping and 9 non-overlapping channels. 2400 - 2500 MHz , 2412 - 2487 (center frequencies), 5 MHz steps, 16 overlapping, 4 non-overlapping channels. 4800 - 5000 MHz, 4810 - 4990 MHz (center frequencies), 5 MHz steps, 37 overlapped and 10 non-overlapped channels. 5000 - 5900 MHz, 5010 - 5890 MHz (center frequencies), 5 MHz steps, 177 overlapping and 45 non-overlapping channels.

TRANSMITTER DATA OVERFLOW PAGE

24. REMARKS

(U) Filter Type: Bandpass Filter - Internal (-3dB 2160-2440MHz and 4760-5040MHz, -20dB 2120 to 2520MHz and 4720-5120MHz, and -60dB 2000-2750MHz and 4400-5350MHz.)

(U) Modulation Type: OFDM, each tone(information rate, excludes coding)
6 Mbps, BPSK, R1/2
9 Mbps, BPSK, R3/4
12 Mbps, QPSK, R1/2
18 Mbps, QPSK, R3/4
24 Mbps, 16-QAM, R1/2
36 Mbps, 16-QAM, R3/4
48 Mbps, 64-QAM, R2/3
54 Mbps, 64-QAM, R3/4

RECEIVER EQUIPMENT CHARACTERISTICS

1. NOMENCLATURE, MANUFACTURER'S MODEL NO.
(U) RT-1944/U Receiver, (U) RT-1944/U

2. MANUFACTURER'S NAME
(U) RELIABLE SYSTEM SERVICES CORP.

3. RECEIVER INSTALLATION

4. RECEIVER TYPE

5. TUNING RANGE
(U) 2200.000 - 2500.000 MHz (U) 4800.000 - 5900.000 MHz

6. METHOD OF TUNING
(U) Synthesizer

7. RF CHANNELING CAPABILITY
(U) 5000.0 kHz Increments (U) 5000.0 kHz Increments

8. EMISSION DESIGNATORS
(U) 19M4W7D

9. FREQUENCY TOLERANCE
(U) 20 ppm

10. IF SELECTIVITY	1st (U)	2nd (U)	3rd
a. -3 dB	(U) 18000 kHz	(U) 18000 kHz	
b. -20 dB	(U) 20000 kHz	(U) 20000 kHz	
c. -60 dB	(U) 40000 kHz	(U) 40000 kHz	

11. RF SELECTIVITY (See Data Overflow Page)
☐ CALCULATED ☒ MEASURED

a. -3 dB	(U) 280000 kHz
b. -20 dB	(U) 400000 kHz
c. -60 dB	(U) 750000 kHz

d. Preselection Type
(U) Bandpass Filter

12. IF FREQUENCY
a. 1st (U) 1678.000 MHz
b. 2nd (U) 1783.000 MHz
c. 3rd

13. MAXIMUM POST DETECTION FREQUENCY
(U) 20.00000 MHz

14. MINIMUM POST DETECTION FREQUENCY

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

16. MAXIMUM BIT RATE
(U) 72000000 bps

17. SENSITIVITY (See Data Overflow Page)

a. SENSITIVITY	(U) -72.0 dBm
b. CRITERIA	(U) 10 (U) Other
c. NOISE FIG	(U) 4.00 dB
d. NOISE TEMP	(U) 438 K

18. DE-EMPHASIS
☐ a. YES ☐ b. NO

19. IMAGE REJECTION
(U) 70.0 dB

20. SPURIOUS REJECTION
(U) 39.0 dB (U) 39.0 dB

21. REMARKS (U)

(U) Tuning Frequencies: Low band: 2200-2500MHz (prefer 2200- 2400MHz) and High band 4800-5900MHz (prefer 4800-5000MHz). Low band will be used to support ship to off-board platforms, ship to airborne, and airborne to off-board platforms. High band will be used to support ship-to-ship, and off-board platform launch/recovery communications

(U) Tuning increments: 2200 - 2400 MHz, 2212 to 2387 (center frequencies) 5 MHz steps, 36 overlapping and 9 non-overlapping channels. 2400 - 2500 MHz , 2412 - 2487 (center frequencies), 5 MHz steps, 16 overlapping, 4 non-overlapping channels. 4800 - 5000 MHz, 4810 - 4990 MHz (center frequencies), 5 MHz steps, 37 overlapped and 10 non-overlapped channels. 5000 - 5900 MHz, 5010 - 5890 MHz (center frequencies), 5 MHz steps, 177 overlapping and 45 non-overlapping channels

RECEIVER DATA OVERFLOW PAGE

11. RF SELECTIVITY

3.00 dB(U) 280000 kHz
20.0 dB(U) 400000 kHz
60.0 dB(U) 950000 kHz
Measured

17. SENSITIVITY

a. SENSITIVITY	(U) -72.0 dBm
b. CRITERIA	(U) 10 (U) Other
c. NOISE FIGURE	(U) 4.00 dB
d. NOISE TEMPERATURE	(U) 438 K

21. REMARKS

(U) IF Selectivity: Channel selectivity established at baseband (second IF stage)
-3dB baseband 2nd IF nominal 18MHz
-20dB baseband 2nd IF nominal 20MHz
-40dB baseband 2nd IF nominal 40MHz

(U) RF Selectivity: determined by selected band and front end filter at LNA.
-3dB 2160-2440MHz, and 4760-5040MHz
-20dB 2120-2520MHz, and 4720-5120MHz
-60dB 2000-2750, and 4400-5350MHz

(U) IF Frequency: 1st: Low band block conversion, L0=672MHz, IF Frequency=RF Frequency -672MHz
High band, tunable 2/3 RF Frequency, IF Frequency= RF Frequency-2/3 RF Frequency

2nd: Low band, tunable RF Frequency- 672MHz, conversion to baseband IQ.
High Band, tunable, 1/3 RF Frequency, conversion to baseband IQ

(U) Sensitivity: Measured (xx Mbps/sensitivity dBm), for 10% Packet Error Rate
6Mbps/-90dBm, 9Mbps/-89dBm, 12Mbps/-88dBm, 18Mbps/-87dBm, 24Mbps/-83dBm,
36Mbps/-80dBm, 48Mbps/-74dBm, 54Mbps/-72dBm.

ANTENNA EQUIPMENT CHARACTERISTICS

1. ☒ **a. TRANSMITTING** ☐ **b. RECEIVING** ☐ **c. TRANSMITTING AND RECEIVING**

2. NOMENCLATURE, MANUFACTURER'S MODEL NO.
(U) ANTENNA SYSTEMS Model F02200-8, (U) F02200-8

3. MANUFACTURER'S NAME
(U) ANTENNA SYSTEMS INC.

4. FREQUENCY RANGE
(U) 2200.000 - 5900.000 MHz

5. TYPE (U) Dipole

6. POLARIZATION
(U) Vertical

7. SCAN CHARACTERISTICS

a. TYPE

b. VERTICAL SCAN

(1) Max Elev

(2) Min Elev

(3) Scan Rate

c. HORIZONTAL SCAN

(1) Sector Scanned

(2) Scan Rate

8. GAIN

a. MAIN BEAM
(U) 6.00 dBi

b. 1st MAJOR SIDE LOBE
Horz. (U) 6 dB Actual Vert. (U) -14 dB Actual

9. BEAMWIDTH

a. HORIZONTAL
(U) 360 degrees

b. VERTICAL
(U) 15.0 degrees

d. SECTOR BLANKING ☐ (1) YES ☐ (2) NO

10. REMARKS (U)
(U) Antenna omni-directional used for off-board platforms

ANTENNA EQUIPMENT CHARACTERISTICS

1. ☐ **a. TRANSMITTING** ☐ **b. RECEIVING** ☒ **c. TRANSMITTING AND RECEIVING**

2. NOMENCLATURE, MANUFACTURER'S MODEL NO.
(U) HAIGH-FARR Model 6125, (U) 6125

3. MANUFACTURER'S NAME
(U) HAIGH-FARR INCORPORATED

4. FREQUENCY RANGE
(U) 2200.000 - 2500.000 MHz

5. TYPE (U) Blade

6. POLARIZATION
(U) Vertical

7. SCAN CHARACTERISTICS

a. TYPE

b. VERTICAL SCAN

(1) Max Elev

(2) Min Elev

(3) Scan Rate

c. HORIZONTAL SCAN

(1) Sector Scanned

(2) Scan Rate

8. GAIN

a. MAIN BEAM
(U) 3.00 dBi

b. 1st MAJOR SIDE LOBE
Horz. (U) 3 dB Actual Vert. (U) -17 dB Actual

9. BEAMWIDTH

a. HORIZONTAL
(U) 360 degrees

b. VERTICAL
(U) 30.0 degrees

d. SECTOR BLANKING ☐ (1) YES ☐ (2) NO

10. REMARKS (U)
(U) Antenna is omni-directional used for airborne platforms

ANTENNA EQUIPMENT CHARACTERISTICS

1. ☐ **a. TRANSMITTING** ☐ **b. RECEIVING** ☒ **c. TRANSMITTING AND RECEIVING**

2. NOMENCLATURE, MANUFACTURER'S MODEL NO.
(U) NEARSON Model 800, (U) 800

3. MANUFACTURER'S NAME
(U) NEARSON

4. FREQUENCY RANGE
(U) 2200.000 - 5900.000 MHz

5. TYPE (U) Patch

6. POLARIZATION
(U) Vertical

7. SCAN CHARACTERISTICS

8. GAIN

a. TYPE

a. MAIN BEAM
(U) 21.0 dBi

b. VERTICAL SCAN

(1) Max Elev

(2) Min Elev

b. 1st MAJOR SIDE LOBE
Horz. (U) 1 dB Actual Vert. (U) 1 dB Actual

(3) Scan Rate

c. HORIZONTAL SCAN

9. BEAMWIDTH

(1) Sector Scanned

a. HORIZONTAL
(U) 40.0 degrees

(2) Scan Rate

d. SECTOR BLANKING ☐ (1) YES ☐ (2) NO

b. VERTICAL
(U) 16.0 degrees

10. REMARKS (U)
(U) Main Beam Gain: 18dBi for lower band, 21dBi for upper band

(U) Ship patch antenna used for shipboard applications

NTIA GENERAL INFORMATION

1. APPLICATION TITLE (U) RT-1944/U Radio Set

2. SYSTEM NOMENCLATURE (U) RT-1944/U Radio Set

3. STAGE OF ALLOCATION (U) ☐ **a. STAGE 1 CONCEPTUAL** ☐ **b. STAGE 2 EXPERIMENTAL** ☐ **c. STAGE 3 DEVELOPMENTAL** ☒ **d. STAGE 4 OPERATIONAL**

4. FREQUENCY REQUIREMENTS (See Remarks for any Selected Modes)

a. FREQUENCY(IES) (U) 2200.000 MHz - 2300.000 MHz (U) 2310.000 MHz - 2417.000 MHz (U) 4800.000 MHz - 4990.000 MHz

b. EMISSION DESIGNATORS (U) 19M4W7D

5. PURPOSE OF SYSTEM, OPERATIONAL AND SYSTEM CONCEPTS **(WARTIME USE)** (U) ☒ **a. YES** ☐ **b. NO**

(U) The RT-1944/U radio set is a multi-mode/multi-purpose networked system that provides transport of data from various off-board systems that

(See Data Overflow Page)

6. INFORMATION TRANSFER REQUIREMENTS

(U) Transfer data, launch and recovery information at rates up to 72Mbps

7. ESTIMATED INITIAL COST OF THE SYSTEM (U) $ 60000

8. TARGET DATE FOR

a. APPLICATION APPROVAL	b. SYSTEM ACTIVATION	c. SYSTEM TERMINATION
(U) 8/1/2010	(U) 8/1/2010	(U) 8/1/2030

9. SYSTEM RELATIONSHIP AND ESSENTIALITY

(See Data Overflow Page)

(U) The RT-1944/U is a datalink that transports data between naval surface vessels and external off-board platforms. The system does not transmit telemetry data Only high-band links (4800 - 5900

10. REPLACEMENT INFORMATION

(U) N/A

11. RELATED ANALYSIS AND/OR TEST DATA

12. NUMBER OF UNITS (U) 1000

13. GEOGRAPHICAL AREA FOR

a. STAGE 2

b. STAGE 3 (U) Melbourne, (U) Florida - Single Point - Lat/Lon

c. STAGE 4 (U) US&P - Polygon

14. LINE DIAGRAM See Attached

15. SPACE SYSTEMS

16. TYPES OF SERVICE(S) FOR STAGE 4

Aeronautical Mobile

Fixed

(See Data Overflow Page)

17. STATION CLASS(ES) FOR STAGE 4

FA FC FX FXE

(See Data Overflow Page)

18. REMARKS

TX (U) RT-1944/U Transmitter, RX (U) RT-1944/U Receiver, (U) 10.0 W Mean, (U) 4800.000 MHz - 4990.000 MHz (U) 19M4W7D
TX (U) RT-1944/U Transmitter, RX (U) RT-1944/U Receiver, (U) 10.0 W Mean, (U) 2200.000 MHz - 2300.000 MHz (U) 19M4W7D
TX (U) RT-1944/U Transmitter, RX - Generic (U) 10.0 W Mean, (U) 4800.000 MHz - 4990.000 MHz (U) 19M4W7D
TX (U) RT-1944/U Transmitter, RX (U) RT-1944/U Receiver, (U) 10.0 W Mean, (U) 2200.000 MHz - 2290.000 MHz (U) 19M4W7D
TX (U) RT-1944/U Transmitter, RX (U) RT-1944/U Receiver, (U) 10.0 W Mean, (U) 2345.000 MHz - 2417.000 MHz (U) 19M4W7D Out-of-band
TX (U) RT-1944/U Transmitter, RX (U) RT-1944/U Receiver, (U) 10.0 W Mean, (U) 2200.000 MHz - 2290.000 MHz (U) 19M4W7D
TX (U) RT-1944/U Transmitter, RX (U) RT-1944/U Receiver, (U) 10.0 W Mean, (U) 2345.000 MHz - 2390.000 MHz (U) 19M4W7D
TX (U) RT-1944/U Transmitter, RX (U) RT-1944/U Receiver, (U) 10.0 W Mean, (U) 2200.000 MHz - 2290.000 MHz (U) 19M4W7D
TX (U) RT-1944/U Transmitter, RX - Generic (U) 10.0 W Mean, (U) 2200.000 MHz - 2290.000 MHz (U) 19M4W7D

DOWNGRADING INSTRUCTIONS

Special Handling Instruction :A

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CLASSIFICATION

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NTIA GENERAL INFORMATION

TX (U) RT-1944/U Transmitter, RX - Generic (U) 10.0 W Mean, (U) 4800.000 MHz - 4990.000 MHz (U) 19M4W7D
TX (U) RT-1944/U Transmitter, RX (U) RT-1944/U Receiver, (U) 10.0 W Mean, (U) 2200.000 MHz - 2300.000 MHz (U) 19M4W7D
TX (U) RT-1944/U Transmitter, RX (U) RT-1944/U Receiver, (U) 10.0 W Mean, (U) 4800.000 MHz - 4990.000 MHz (U) 19M4W7D
TX (U) RT-1944/U Transmitter, RX (U) RT-1944/U Receiver, (U) 10.0 W Mean, (U) 2345.000 MHz - 2390.000 MHz (U) 19M4W7D
TX (U) RT-1944/U Transmitter, RX (U) RT-1944/U Receiver, (U) 10.0 W Mean, (U) 4800.000 MHz - 4990.000 MHz (U) 19M4W7D
TX (U) RT-1944/U Transmitter, RX (U) RT-1944/U Receiver, (U) 10.0 W Mean, (U) 2200.000 MHz - 2300.000 MHz (U) 19M4W7D
TX (U) RT-1944/U Transmitter, RX (U) RT-1944/U Receiver, (U) 10.0 W Mean, (U) 2200.000 MHz - 2290.000 MHz (U) 19M4W7D
TX (U) RT-1944/U Transmitter, RX - Generic (U) 10.0 W Mean, (U) 4800.000 MHz - 4990.000 MHz (U) 19M4W7D
TX (U) RT-1944/U Transmitter, RX - Generic (U) 10.0 W Mean, (U) 2310.000 MHz - 2390.000 MHz (U) 19M4W7D
TX (U) RT-1944/U Transmitter, RX - Generic (U) 10.0 W Mean, (U) 2200.000 MHz - 2300.000 MHz (U) 19M4W7D
TX (U) RT-1944/U Transmitter, RX - Generic (U) 10.0 W Mean, (U) 4990.000 MHz - 5900.000 MHz (U) 19M4W7D Out-of-band
TX (U) RT-1944/U Transmitter, RX - Generic (U) 10.0 W Mean, (U) 2390.000 MHz - 2500.000 MHz (U) 19M4W7D Out-of-band
TX (U) RT-1944/U Transmitter, RX - Generic (U) 10.0 W Mean, (U) 2300.000 MHz - 2310.000 MHz (U) 19M4W7D Out-of-band

NTIA DATA OVERFLOW PAGE

5. PURPOSE OF SYSTEM, OPERATIONAL AND SYSTEM CONCEPTS

Cont. (U) function independent of the transport vessel

9. SYSTEM RELATIONSHIP AND ESSENTIALITY

Cont. (U) MHz) to perform a launch-and-recovery function (telecommand) for the platform.

16. TYPE OF SERVICE(S) FOR STAGE 4

Maritime Mobile Mobile

17. STATION CLASS(ES) FOR STAGE 4

MA MAD MO MS MSD

DOWNGRADING INSTRUCTIONS

Special Handling Instruction :A

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Line Diagram: RT-1944/U Radio Set