SECURITY SUMMARY & SPECIAL HANDLING REQUIREMENTS

The Application Title is : X-Net Radio, AN/PRC-164

The System Name is : X-Net Radio, AN/PRC-164

The overall classification of this application is : UNCLASSIFIED

Refer to your Security Manual for further guidance.

The Application Level Special Handling is : B

Releasable to soil country and the North Atlantic Treaty Organization (NATO); otherwise, not releasable outside the US Government in accordance with (IAW) Section 552 (b)(1) of Title 5 of the US Code.

DOWNGRADING INSTRUCTIONS

Special Handling Instruction : B

CLASSIFICATION

UNCLASSIFIED

DOD GENERAL INFORMATION

TO (U) AFSMO/DON
6916 Cooper Ave.
DISA Operations Bldg, Level 5
Fort Meade, Maryland 20755-7088

FROM (U) HQ US Special Operations Command
USSOCOM/J633-O
7701 Tampa Point Blvd.
MacDill AFB, FL 33621-5323

1. APPLICATION TITLE (U) X-Net Radio, AN/PRC-164

2. SYSTEM NOMENCLATURE (U) X-Net Radio, AN/PRC-164

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

4. FREQUENCY REQUIREMENTS

* denotes Out-of-band

a. FREQUENCY(IES) (U) 225.0 MHz - 328.6 MHz (U) 335.4 MHz - 399.9 MHz (U) 420.0 MHz - 450.0 MHz *

b. EMISSION DESIGNATORS (U) 1M20F1D (U) 1M20G2D (U) 4M25F1D

5. TARGET STARTING DATE FOR SUBSEQUENT STAGES

a. STAGE 2	b. STAGE 3	c. STAGE 4 (U) 3/1/2020

6. EXTENT OF USE (U) Intermittent, 24 hours per day, 7 days per week

7. GEOGRAPHICAL AREA FOR

a. STAGE 2

b. STAGE 3

c. STAGE 4 (U) , (U) ~~USP (US & POSS) - Polygon~~

8. NUMBER OF UNITS

a. STAGE 2	b. STAGE 3	c. STAGE 4 (U) 15000

9. NUMBER OF UNITS OPERATING SIMULTANEOUSLY IN THE SAME ENVIRONMENT (U) 8

10. OTHER J/F 12 APPLICATION ID(S) TO BE (See Data Overflow Page)

☐ **a. SUPERSEDED**

☒ **b. RELATED** J/F 12/4547

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) Capt. Samantha Thorn
850.882.8100

13. REMARKS (U)

(U) 1494 Item 2) System Nomenclature: AN/PRC-164 X-Net refers to the RT-2090 transceiver module capable of (70-6000 MHz) and attachable Radio Frequency Front End (RFFE) modules. This specific application is for the X-Net using a 5W RFFE module tuned for 225-512 MHz or 1250-2500 MHz. The modular design allows for future RFFE modules to be developed operating at different power levels and frequency bands, paired with the same RT-2090 X-Net transceiver.

DOWNGRADING INSTRUCTIONS

Special Handling Instruction : B

CLASSIFICATION
UNCLASSIFIED

DOD DATA OVERFLOW PAGE

10. OTHER J/F 12 APPLICATIONS ID(S) TO BE :

RELATED J/F 12/9718 RELATED J/F 12/7049

13. REMARKS

(U) 1494 Item 4) Frequency Requirements: X-Net is capable three operational modes:

- In Electronic Warfare (EW), the emission designator is 4M25F1D and capable of transmitting on one channel or frequency hopping on up to 8 channels. 420-450 MHz is required for compatibility with fielded EPLRS/SADL users.
- In Combat Communications (CC), the emission designator is 1M20F1D and capable of transmitting on one channel or frequency hopping on up to 8 channels.
- In Wideband (WB), the emission designator is 1M20G2D and capable of operating on one channel or up to 12 simultaneous channels within a 20 MHz continguous span.

DOWNGRADING INSTRUCTIONS

Special Handling Instruction : B

FOREIGN COORDINATION GENERAL INFORMATION

1. APPLICATION TITLE (U) X-Net Radio, AN/PRC-164

2. SYSTEM NOMENCLATURE (U) X-Net Radio, AN/PRC-164

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

4. FREQUENCY REQUIREMENTS

* denotes Out-of-band

a. FREQUENCY(IES) (U) 225.0 MHz - 328.6 MHz (U) 335.4 MHz - 399.9 MHz (U) 420.0 MHz - 450.0 MHz *

b. EMISSION DESIGNATORS (U) 1M20F1D (U) 1M20G2D (U) 4M25F1D

5. PROPOSED OPERATING LOCATIONS OUTSIDE US&P

(U)

, (U) USP (US & POSS)

6. PURPOSE OF SYSTEM, OPERATIONAL AND SYSTEM CONCEPTS (See Data Overflow Page)

(U) The X-Net AN/PRC-164 radio is primarily designed for single-use, expendable platforms: 1) precision guided munitions, and 2) for small Unmanned Aerial Vehicles (UAVs) which have a high likelihood of not returning. The radio will be used to provide wireless network for ground vehicles.

7. INFORMATION TRANSFER REQUIREMENTS

(U) Information transfer rate is between 1-11 Mbps depending on operating mode

8. NUMBER OF UNITS OPERATING SIMULTANEOUSLY IN THE SAME ENVIRONMENT (U) 8

9. REPLACEMENT INFORMATION

(U) Not Applicable

10. LINE DIAGRAM None

11. SPACE SYSTEMS

12. PROJECTED OPERATIONAL DEPLOYMENT DATE (U) 3/1/2020

13. REMARKS (U)

(U) 1494 Item 2) System Nomenclature: AN/PRC-164 X-Net refers to the RT-2090 transceiver module capable of (70-6000 MHz) and attachable Radio Frequency Front End (RFFE) modules. This specific application is for the X-Net using a 5W RFFE module tuned for 225-512 MHz or 1250-2500 MHz. The modular design allows for future RFFE modules to be developed operating at different power levels and frequency bands, paired with the same RT-2090 X-Net transceiver.

(U) 1494 Item 4) Frequency Requirements: X-Net is capable three operational modes:
- In Electronic Warfare (EW), the emission designator is 4M25F1D and capable of transmitting on one channel or frequency hopping on up to 8 channels. 420-450 MHz is required for

DOWNGRADING INSTRUCTIONS

Special Handling Instruction : B

FOREIGN COORDINATION DATA OVERFLOW PAGE

6. PURPOSE OF SYSTEM, OPERATIONAL AND SYSTEM CONCEPTS

Cont. (U)

X-Net is designed for GPS denied operations and instead uses only Radiolocation technology to provide position location and data distribution using a secure wireless network in a mobile environment. The radio is capable of operating three signal processing modes: Electronic Warfare (EW),
Combat Communications (CC), and Wideband (WB).

Each signal processing mode has a unique emmision designator. X-Net is compatible with fielded Enhanced Position Location Reporting System (EPLRS) and Situation Awareness Data Link (SADL) operating units when operating in the EW mode in the 420-450 MHz frequency band and the EW signal processing mode.

13. REMARKS

(U) compatibility with fielded EPLRS/SADL users.
- In Combat Communications (CC), the emission designator is 1M20F1D and capable of transmitting on one channel or frequency hopping on up to 8 channels.
- In Wideband (WB), the emission designator is 1M20G2D and capable of operating on one channel or up to 12 simultaneous channels within a 20 MHz continguous span.

DOWNGRADING INSTRUCTIONS

Special Handling Instruction : B

TRANSMITTER EQUIPMENT CHARACTERISTICS

1. NOMENCLATURE, MANUFACTURER'S MODEL NO.
(U) AN/PRC-164, (U) X-Net Radio System, 6157000

2. MANUFACTURER'S NAME
(U) RAYTHEON CO. OR RAYTHEON MANUFACTURING CO.

3. TRANSMITTER INSTALLATION (See Data Overflow Page)
(U) Ground

4. TRANSMITTER TYPE
(U) GMSK (1M20F1D, 4M25F1D); OFDM (1M20G2D)

5. TUNING RANGE (See Data Overflow Page)
(U) 225.0 - 328.6 MHz (U) 335.4 - 399.9 MHz

6. METHOD OF TUNING
(U) Crystal Controlled Synthesizer

7. RF CHANNELING CAPABILITY (See Data Overflow Page)
(U) 125.0 kHz Increments (U) 125.0 kHz Increments

8. EMISSION DESIGNATORS
(U) 1M20F1D (See Data Overflow Page)

9. FREQUENCY TOLERANCE
(U) 0.5 ppm

10. FILTER EMPLOYED

11. SPREAD SPECTRUM (See Data Overflow Page)
☒ **a. YES** ☐ **b. NO**

12. EMISSION BANDWIDTH
☐ **CALCULATED** ☒ **MEASURED**

a. -3 dB	(U) .6 MHz	(U) .6 MHz
b. -20 dB	(U) 1.2 MHz	(U) 1.3 MHz
c. -40 dB	(U) 2.4 MHz	(U) 2.4 MHz
d. -60 dB	(U) 4.8 MHz	(U) 4.8 MHz
e. OC-BW	(U) 1.200 MHz	(U) 1.200 MHz

13. MAXIMUM BIT RATE
(U) 5000000 /sec

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

a. RATE

b. PEP (U) 5.00 W

b. WIDTH

c. RISE TIME

c. CARRIER

d. FALL TIME

20. OUTPUT DEVICE
(U) Transistor

e. COMP RATIO

21. HARMONIC LEVEL

22. SPURIOUS LEVEL
(U) -70.0 dB

a. (U) -64.0 dB

b. (U) -70.0 dB

23. FCC TYPE ACCEPTANCE NO.

c.

24. REMARKS (U)

(U) 1494 Item 3) Installation: In Precision Guided Munitions (PGMs) installations, the radio could be communicating with air and/or ground platforms.

(U) 1494 Item 4) Transmitter Type: EPLRS EW and CC modes are a Direct Sequence Spread Spectrum (DSSS) waveform utilizing Gaussian Minimum Shift Keying (GMSK) modulation. EPLRS WB mode is an Orthogonal Frequency Division Multiplexing (OFDM) waveform utilizing Binary Phase Shift Keying (BPSK) and Quadrature Phase Shift Keying (QPSK) modulation.

TRANSMITTER DATA OVERFLOW PAGE

3. TRANSMITTER INSTALLATION(S)

(U) Airborne | (U) Precision Guided Munitions

5. TUNING RANGE

(U) 420.0 MHz - (U) 450.0 MHz | (U) 450.1 MHz - (U) 512.0 MHz | (U) 1250 MHz - (U) 1557 MHz
(U) 1613 MHz - (U) 2500 MHz

7. RF CHANNELING CAPABILITY

(U) 125.0 kHz Increments | (U) 125.0 kHz Increments | (U) 125.0 kHz Increments
(U) 125.0 kHz Increments

8. EMISSION DESIGNATORS

(U) 1M20G2D | (U) 4M25F1D

11. SPREAD SPECTRUM

Modulation (U) 1M20F1D is Spread Spectrum
Modulation (U) 4M25F1D is Spread Spectrum

12. EMISSION BANDWIDTH

-3.00 dB (U) .6 MHz	-3.00 dB (U) .6 MHz	-3.00 dB (U) .6 MHz
-20.0 dB (U) 1.3 MHz	-20.0 dB (U) 1.3 MHz	-20.0 dB (U) 1.3 MHz
-40.0 dB (U) 2.4 MHz	-40.0 dB (U) 2.4 MHz	-40.0 dB (U) 2.4 MHz
-60.0 dB (U) 4.8 MHz	-60.0 dB (U) 4.8 MHz	-60.0 dB (U) 4.8 MHz
Measured	Measured	Measured
OC-BW (U) 1.200 MHz	OC-BW (U) 1.200 MHz	OC-BW (U) 1.200 MHz
-3.00 dB (U) .6 MHz	-3.00 dB (U) 1.1 MHz	-3.00 dB (U) 1.1 MHz
-20.0 dB (U) 1.3 MHz	-20.0 dB (U) 2.7 MHz	-20.0 dB (U) 2.7 MHz
-40.0 dB (U) 2.4 MHz	-40.0 dB (U) 21.4 MHz	-40.0 dB (U) 21.4 MHz
-60.0 dB (U) 4.8 MHz	-60.0 dB (U) 45.5 MHz	-60.0 dB (U) 45.5 MHz
Measured	Measured	Measured
OC-BW (U) 1.200 MHz	OC-BW (U) 1.200 MHz	OC-BW (U) 1.200 MHz
-3.00 dB (U) 1.1 MHz	-3.00 dB (U) 1.1 MHz	-3.00 dB (U) 1.1 MHz
-20.0 dB (U) 2.7 MHz	-20.0 dB (U) 2.7 MHz	-20.0 dB (U) 2.7 MHz
-40.0 dB (U) 21.4 MHz	-40.0 dB (U) 21.4 MHz	-40.0 dB (U) 21.4 MHz
-60.0 dB (U) 45.5 MHz	-60.0 dB (U) 45.5 MHz	-60.0 dB (U) 45.5 MHz
Measured	Measured	Measured
OC-BW (U) 1.200 MHz	OC-BW (U) 1.200 MHz	OC-BW (U) 1.200 MHz
-3.00 dB (U) 1.1 MHz	-3.00 dB (U) 2.1 MHz	-3.00 dB (U) 2.1 MHz
-20.0 dB (U) 2.7 MHz	-20.0 dB (U) 4.8 MHz	-20.0 dB (U) 4.8 MHz
-40.0 dB (U) 21.4 MHz	-40.0 dB (U) 5.4 MHz	-40.0 dB (U) 5.4 MHz
-60.0 dB (U) 45.5 MHz	-60.0 dB (U) 6.9 MHz	-60.0 dB (U) 6.9 MHz
Measured	Measured	Measured
OC-BW (U) 1.200 MHz	OC-BW (U) 4.250 MHz	OC-BW (U) 4.250 MHz
-3.00 dB (U) 2.1 MHz	-3.00 dB (U) 2.1 MHz	-3.00 dB (U) 2.1 MHz
-20.0 dB (U) 4.8 MHz	-20.0 dB (U) 4.8 MHz	-20.0 dB (U) 4.8 MHz
-40.0 dB (U) 5.4 MHz	-40.0 dB (U) 5.4 MHz	-40.0 dB (U) 5.4 MHz
-60.0 dB (U) 6.9 MHz	-60.0 dB (U) 6.9 MHz	-60.0 dB (U) 6.9 MHz
Measured	Measured	Measured
OC-BW (U) 4.250 MHz	OC-BW (U) 4.250 MHz	OC-BW (U) 4.250 MHz

TRANSMITTER DATA OVERFLOW PAGE

12. EMISSION BANDWIDTH (continued)

-3.00 dB (U) 2.1 MHz
-20.0 dB (U) 4.8 MHz
-40.0 dB (U) 5.4 MHz
-60.0 dB (U) 6.9 MHz
Measured
OC-BW (U) 4.250 MHz

24. REMARKS

(U) 1494 Item 5) Tuning Range: X-Net is capable of operating from 225-512 MHz and 1250-2500 MHz with exclusions 328.6-335.4 MHz and 1559-1610 MHz. Additional exclusions via operational procedures as required.

(U) 1494 Item 7) RF Channeling Capability: In the EW or CC modes, X-Net is capable of operating using a one (1) channel or using up to eight (8) channels with frequency hopping either enabled or disabled. Each channel frequency is user configurable. In the WB mode, X-Net is capable of operating using one (1) channel or using up to twelve (12) simultaneous channels within a 20 MHz contiguous band. Each channel frequency is user configurable.

(U) 1494 Item 8) Emission Designators: The transceiver is configurable at start-up to operate one of three modes: EW, CC, or WB mode, which is is a persistent configurable parameter.

(U) 1494 Item 11) Spread Spectrum Type: EW and CC modes use Direct Sequence Spread Spectrum.

(U) 1494 Item 13) Information Rate: The maximum information rate is based on the modulation scheme and Time Division Multiple Access (TDMA) architecture for each mode.

The maximum information rate is 2.67 Mbps for the EW mode, 1.00 Mbps for the CC mode, and 1.30 Mbps for the WB mode.

(U) 1494 Item 19) Power: Power is selectable between Low (0.5 W) or High (5.0 W).

RECEIVER EQUIPMENT CHARACTERISTICS

1. NOMENCLATURE, MANUFACTURER'S MODEL NO.
(U) AN/PRC-164, (U) X-Net Radio System, 6157000

2. MANUFACTURER'S NAME
(U) RAYTHEON CO. OR RAYTHEON MANUFACTURING CO.

3. RECEIVER INSTALLATION
(U) Ground

4. RECEIVER TYPE
(U) Direct Conversion

5. TUNING RANGE (See Data Overflow Page)
(U) 335.4 - 399.9 MHz (U) 420.0 - 450.0 MHz

6. METHOD OF TUNING
(U) Crystal Controlled Synthesizer

7. RF CHANNELING CAPABILITY (See Data Overflow Page)
(U) 125.0 kHz Increments (U) 125.0 kHz Increments

8. EMISSION DESIGNATORS (See Data Overflow Page)
(U) 1M20F1D

9. FREQUENCY TOLERANCE
(U) 0.5 ppm

10. IF SELECTIVITY

	1st	2nd	3rd
a. -3 dB			
b. -20 dB			
c. -60 dB			

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

a. -3 dB	(U) 15 MHz
b. -20 dB	(U) 40 MHz
c. -60 dB	(U) 163 MHz
d. Preselection Type	

12. IF FREQUENCY
a. 1st
b. 2nd
c. 3rd

13. MAXIMUM POST DETECTION FREQUENCY

14. MINIMUM POST DETECTION FREQUENCY

15. OSCILLATOR TUNED

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

16. MAXIMUM BIT RATE

17. SENSITIVITY (See Data Overflow Page)

a. SENSITIVITY	(U) -90.0 dBm
b. CRITERIA	(U) 90 (U) Other
c. NOISE FIG	(U) 6.00 dB
d. NOISE TEMP	(U) 865 K

18. DE-EMPHASIS
☐ a. YES ☐ b. NO

19. IMAGE REJECTION
(U) 50.0 dB

20. SPURIOUS REJECTION
(U) 50.0 dB

INTERMOD REJECTION : (U) 0.000 dB

21. REMARKS (U)

(U) 1494 Item 3) Installation: In Precision Guided Munitions (PGMs) installations, the radio could be communicating with air and/or ground platforms.
The radio could also be used for ground-to-ground communications, and air-to-air communications.

(U) 1494 Item 5) Tuning Range: The transceiver is capable of operating from 70-6000 MHz, but the radio's RF Front End limits the usable frequency to 225-512 MHz and 1250-2500 MHz with firmware exclusions for 328.6-335.4 MHz and 1559-1610 MHz. Additional exclusions via operational procedures as required.

RECEIVER DATA OVERFLOW PAGE

3. RECEIVER INSTALLATION(S)

(U) Airborne	(U) Precision Guided Munitions

5. TUNING RANGE

(U) 225.0 MHz - (U) 328.6 MHz	(U) 450.1 MHz - (U) 512.0 MHz	(U) 1613 MHz - (U) 2500 MHz
(U) 1250 MHz - (U) 1557 MHz		

7. RF CHANNELING CAPABILITY

(U) 125.0 kHz Increments	(U) 125.0 kHz Increments	(U) 125.0 kHz Increments
(U) 125.0 kHz Increments		

8. EMISSION DESIGNATORS

(U) 1M20G2D	(U) 4M25F1D

11. RF SELECTIVITY

3.00 dB(U) 15 MHz	3.00 dB(U) 15 MHz	3.00 dB(U) 15 MHz
20.0 dB(U) 40 MHz	20.0 dB(U) 40 MHz	20.0 dB(U) 40 MHz
60.0 dB(U) 163 MHz	60.0 dB(U) 163 MHz	60.0 dB(U) 163 MHz
Measured	Measured	Measured
3.00 dB(U) 15 MHz	3.00 dB(U) 15 MHz	
20.0 dB(U) 40 MHz	20.0 dB(U) 40 MHz	
60.0 dB(U) 163 MHz	60.0 dB(U) 163 MHz	
Measured	Measured	

17. SENSITIVITY

a. SENSITIVITY	(U) -90.0 dBm
b. CRITERIA	(U) 90 (U) Other
c. NOISE FIGURE	(U) 6.00 dB
d. NOISE TEMPERATURE	(U) 865 K
a. SENSITIVITY	(U) -90.0 dBm
b. CRITERIA	(U) 90 (U) Other
c. NOISE FIGURE	(U) 6.00 dB
d. NOISE TEMPERATURE	(U) 865 K
a. SENSITIVITY	(U) -90.0 dBm
b. CRITERIA	(U) 90 (U) Other
c. NOISE FIGURE	(U) 6.00 dB
d. NOISE TEMPERATURE	(U) 865 K
a. SENSITIVITY	(U) -90.0 dBm
b. CRITERIA	(U) 90 (U) Other
c. NOISE FIGURE	(U) 6.00 dB
d. NOISE TEMPERATURE	(U) 865 K
a. SENSITIVITY	(U) -90.0 dBm
b. CRITERIA	(U) 90 (U) Other
c. NOISE FIGURE	(U) 6.00 dB
d. NOISE TEMPERATURE	(U) 865 K
a. SENSITIVITY	(U) -90.0 dBm
b. CRITERIA	(U) 90 (U) Other
c. NOISE FIGURE	(U) 6.00 dB
d. NOISE TEMPERATURE	(U) 865 K

RECEIVER DATA OVERFLOW PAGE

17. SENSITIVITY (continued)

a. SENSITIVITY (U) -90.0 dBm
b. CRITERIA (U) 90 (U) Other
c. NOISE FIGURE (U) 6.00 dB
d. NOISE TEMPERATURE (U) 865 K

a. SENSITIVITY (U) -90.0 dBm
b. CRITERIA (U) 90 (U) Other
c. NOISE FIGURE (U) 6.00 dB
d. NOISE TEMPERATURE (U) 865 K

a. SENSITIVITY (U) -90.0 dBm
b. CRITERIA (U) 90 (U) Other
c. NOISE FIGURE (U) 6.00 dB
d. NOISE TEMPERATURE (U) 865 K

a. SENSITIVITY (U) -90.0 dBm
b. CRITERIA (U) 90 (U) Other
c. NOISE FIGURE (U) 6.00 dB
d. NOISE TEMPERATURE (U) 865 K

a. SENSITIVITY (U) -90.0 dBm
b. CRITERIA (U) 90 (U) Other
c. NOISE FIGURE (U) 6.00 dB
d. NOISE TEMPERATURE (U) 865 K

a. SENSITIVITY (U) -90.0 dBm
b. CRITERIA (U) 90 (U) Other
c. NOISE FIGURE (U) 6.00 dB
d. NOISE TEMPERATURE (U) 865 K

a. SENSITIVITY (U) -90.0 dBm
b. CRITERIA (U) 90 (U) Other
c. NOISE FIGURE (U) 6.00 dB
d. NOISE TEMPERATURE (U) 865 K

a. SENSITIVITY (U) -90.0 dBm
b. CRITERIA (U) 90 (U) Other
c. NOISE FIGURE (U) 6.00 dB
d. NOISE TEMPERATURE (U) 865 K

a. SENSITIVITY (U) -90.0 dBm
b. CRITERIA (U) 90 (U) Other
c. NOISE FIGURE (U) 6.00 dB
d. NOISE TEMPERATURE (U) 865 K

a. SENSITIVITY (U) -90.0 dBm
b. CRITERIA (U) 90 (U) Other
c. NOISE FIGURE (U) 6.00 dB
d. NOISE TEMPERATURE (U) 865 K

RECEIVER DATA OVERFLOW PAGE

17. SENSITIVITY (continued)

a. SENSITIVITY	(U) -90.0 dBm
b. CRITERIA	(U) 90 (U) Other
c. NOISE FIGURE	(U) 6.00 dB
d. NOISE TEMPERATURE	(U) 865 K

21. REMARKS

(U) 1494 Item 7) RF Channeling Capability: In the EW (4M25F1d) or CC (1M20F1D) modes, X-Net is capable of operating using a one (1) channel or using up to eight (8) channels with frequency hopping either enabled or disabled. Each channel frequency is user configurable. In the WB (1M20G2D) mode, X-Net is capable of operating using one (1) channel or using up to twelve (12) simultaneous channels within a 20 MHz contiguous band. Each channel frequency is user configurable.

(U) 1494 Item 10, 12) IF Selectivity & Frequency: There is no intermediate stage as the transceiver is a direct conversion RFIC from baseband to RF.

(U) 1494 Item 17) Sensitivity: Peformance Criteria: The performance criteria used is Packet Completion Rate. The performance value to determine that the message completion rate is adequate is a 90% packet completion rate.

ANTENNA EQUIPMENT CHARACTERISTICS

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

2. NOMENCLATURE, MANUFACTURER'S MODEL NO.
(U) Airborne Blade Antenna, (U) S65-8282-512

3. MANUFACTURER'S NAME
(U) SENSOR SYSTEMS

4. FREQUENCY RANGE
(U) 225.0 - 512.0 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) -2.00 dBi

b. 1st MAJOR SIDE LOBE
Horz. (U) 0.000 dB Actual Vert. (U) 0.000 dB Actual

9. BEAMWIDTH

a. HORIZONTAL
(U) 360 degrees

b. VERTICAL
(U) 40.0 degrees

d. SECTOR BLANKING ☐ (1) YES ☐ (2) NO

10. REMARKS

ANTENNA EQUIPMENT CHARACTERISTICS

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

2. NOMENCLATURE, MANUFACTURER'S MODEL NO.
(U) Omni Vehicle & Fixed Shelter, (U) NTDR

3. MANUFACTURER'S NAME
(U) R. A. MILLER INDUSTRIES

4. FREQUENCY RANGE
(U) 225.0 - 512.0 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) 3.00 dBi

b. 1st MAJOR SIDE LOBE
Horz. (U) 0.000 dB Actual Vert. (U) 0.000 dB Actual

9. BEAMWIDTH

a. HORIZONTAL
(U) 360 degrees

b. VERTICAL
(U) 40.0 degrees

d. SECTOR BLANKING ☐ (1) YES ☐ (2) NO

10. REMARKS (U)

(U) Vertical Bemwidth: The vertical beamwidth is frequency specific as follows; (Frequency : Vertical Beamwidth) => (225 MHz : 40 degrees); (335 MHz : 26 degrees); (400 MHz : 20 degrees)

ANTENNA EQUIPMENT CHARACTERISTICS

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

2. NOMENCLATURE, MANUFACTURER'S MODEL NO.
(U) UHF Monopole Antenna, (U) 1006817

3. MANUFACTURER'S NAME
(U) DYNETICS

4. FREQUENCY RANGE
(U) 402.0 - 498.0 MHz

5. TYPE (U) Monopole

6. POLARIZATION
(U) Vertical

7. SCAN CHARACTERISTICS

a. TYPE

b. VERTICAL SCAN

(1) Max Elev

(2) Min Elev

(3) Scan Rate

8. GAIN

a. MAIN BEAM
(U) 4.25 dBi

b. 1st MAJOR SIDE LOBE
Horz. (U) 0.000 dB Actual Vert. (U) 0.500 dB Actual

c. HORIZONTAL SCAN

(1) Sector Scanned

(2) Scan Rate

9. BEAMWIDTH

a. HORIZONTAL
(U) 110 degrees

b. VERTICAL
(U) 50.0 degrees

d. SECTOR BLANKING ☐ (1) YES ☐ (2) NO

10. REMARKS

ANTENNA EQUIPMENT CHARACTERISTICS

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

2. NOMENCLATURE, MANUFACTURER'S MODEL NO.
(U) Wrap-around Antenna, (U) 15375

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

4. FREQUENCY RANGE
(U) 420.0 - 450.0 MHz

5. TYPE (U) Linear

6. POLARIZATION
(U) Vertical

7. SCAN CHARACTERISTICS

a. TYPE

b. VERTICAL SCAN

(1) Max Elev

(2) Min Elev

(3) Scan Rate

8. GAIN

a. MAIN BEAM
(U) -10.0 dBi

b. 1st MAJOR SIDE LOBE
Horz. (U) 0.000 dB Actual Vert. (U) 0.000 dB Actual

c. HORIZONTAL SCAN

(1) Sector Scanned

(2) Scan Rate

9. BEAMWIDTH

a. HORIZONTAL
(U) 360 degrees

b. VERTICAL
(U) 180 degrees

d. SECTOR BLANKING ☐ (1) YES ☐ (2) NO

10. REMARKS

NTIA GENERAL INFORMATION

1. APPLICATION TITLE (U) X-Net Radio, AN/PRC-164

2. SYSTEM NOMENCLATURE (U) X-Net Radio, AN/PRC-164

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) * denotes Out-of-band

a. FREQUENCY(IES) (U) 225.0 MHz - 328.6 MHz (U) 335.4 MHz - 399.9 MHz (U) 420.0 MHz - 450.0 MHz *

b. EMISSION DESIGNATORS (U) 1M20F1D (U) 1M20G2D (U) 4M25F1D

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

(U) The X-Net AN/PRC-164 radio is primarily designed for single-use, expendable platforms: 1) precision guided munitions, and 2) for small Unmanned

(See Data Overflow Page)

6. INFORMATION TRANSFER REQUIREMENTS

(U) Information transfer rate is between 1-11 Mbps depending on operating mode

7. ESTIMATED INITIAL COST OF THE SYSTEM (U) $ 10000

8. TARGET DATE FOR

a. APPLICATION APPROVAL	b. SYSTEM ACTIVATION	c. SYSTEM TERMINATION
(U) 10/1/2019	(U) 3/1/2020	

9. SYSTEM RELATIONSHIP AND ESSENTIALITY

(See Data Overflow Page)

(U) Provides the wireless network for net-enabled precision guided munitions, ground units and airborne platforms. In addition, the radio uses position location features to provide location to

10. REPLACEMENT INFORMATION

(U) Not Applicable

11. RELATED ANALYSIS AND/OR TEST DATA

12. NUMBER OF UNITS (U) 15000

13. GEOGRAPHICAL AREA FOR

a. STAGE 2

b. STAGE 3

c. STAGE 4 (U)
, (U) USP (US & POSS) - Polygon

14. LINE DIAGRAM None

15. SPACE SYSTEMS

16. TYPES OF SERVICE(S) FOR STAGE 4

Aeronautical Mobile
Land Mobile

17. STATION CLASS(ES) FOR STAGE 4

MA ML

18. REMARKS

TX (U) AN/PRC-164, RX (U) AN/PRC-164, (U) 5.00 W Peak, (U) 420.0 MHz - 450.0 MHz (U) 4M25F1D Out-of-band
TX (U) AN/PRC-164, RX (U) AN/PRC-164, (U) 5.00 W Peak, (U) 420.0 MHz - 450.0 MHz (U) 4M25F1D Out-of-band
TX (U) AN/PRC-164, RX (U) AN/PRC-164, (U) 5.00 W Peak, (U) 335.4 MHz - 399.9 MHz (U) 4M25F1D
TX (U) AN/PRC-164, RX (U) AN/PRC-164, (U) 5.00 W Peak, (U) 335.4 MHz - 399.9 MHz (U) 1M20G2D
TX (U) AN/PRC-164, RX (U) AN/PRC-164, (U) 5.00 W Peak, (U) 335.4 MHz - 399.9 MHz (U) 1M20F1D
TX (U) AN/PRC-164, RX (U) AN/PRC-164, (U) 5.00 W Peak, (U) 225.0 MHz - 328.6 MHz (U) 4M25F1D
TX (U) AN/PRC-164, RX (U) AN/PRC-164, (U) 5.00 W Peak, (U) 225.0 MHz - 328.6 MHz (U) 1M20G2D

DOWNGRADING INSTRUCTIONS

Special Handling Instruction : B

NTIA GENERAL INFORMATION

TX (U) AN/PRC-164, RX (U) AN/PRC-164, (U) 5.00 W Peak, (U) 225.0 MHz - 328.6 MHz (U) 1M20F1D
TX (U) AN/PRC-164, RX (U) AN/PRC-164, (U) 5.00 W Peak, (U) 420.0 MHz - 450.0 MHz (U) 1M20F1D Out-of-band
TX (U) AN/PRC-164, RX (U) AN/PRC-164, (U) 5.00 W Peak, (U) 420.0 MHz - 450.0 MHz (U) 1M20G2D Out-of-band
TX (U) AN/PRC-164, RX (U) AN/PRC-164, (U) 5.00 W Peak, (U) 420.0 MHz - 450.0 MHz (U) 4M25F1D Out-of-band
TX (U) AN/PRC-164, RX (U) AN/PRC-164, (U) 5.00 W Peak, (U) 420.0 MHz - 450.0 MHz (U) 4M25F1D Out-of-band
TX (U) AN/PRC-164, RX (U) AN/PRC-164, (U) 5.00 W Peak, (U) 420.0 MHz - 450.0 MHz (U) 4M25F1D Out-of-band
TX (U) AN/PRC-164, RX (U) AN/PRC-164, (U) 5.00 W Peak, (U) 420.0 MHz - 450.0 MHz (U) 4M25F1D Out-of-band
TX (U) AN/PRC-164, RX (U) AN/PRC-164, (U) 5.00 W Peak, (U) 420.0 MHz - 450.0 MHz (U) 4M25F1D Out-of-band
TX (U) AN/PRC-164, RX (U) AN/PRC-164, (U) 5.00 W Peak, (U) 420.0 MHz - 450.0 MHz (U) 1M20F1D Out-of-band
TX (U) AN/PRC-164, RX (U) AN/PRC-164, (U) 5.00 W Peak, (U) 420.0 MHz - 450.0 MHz (U) 1M20G2D Out-of-band
TX (U) AN/PRC-164, RX (U) AN/PRC-164, (U) 5.00 W Peak, (U) 335.4 MHz - 399.9 MHz (U) 4M25F1D
TX (U) AN/PRC-164, RX (U) AN/PRC-164, (U) 5.00 W Peak, (U) 335.4 MHz - 399.9 MHz (U) 1M20G2D
TX (U) AN/PRC-164, RX (U) AN/PRC-164, (U) 5.00 W Peak, (U) 335.4 MHz - 399.9 MHz (U) 1M20F1D
TX (U) AN/PRC-164, RX (U) AN/PRC-164, (U) 5.00 W Peak, (U) 225.0 MHz - 328.6 MHz (U) 4M25F1D
TX (U) AN/PRC-164, RX (U) AN/PRC-164, (U) 5.00 W Peak, (U) 225.0 MHz - 328.6 MHz (U) 1M20G2D
TX (U) AN/PRC-164, RX (U) AN/PRC-164, (U) 5.00 W Peak, (U) 225.0 MHz - 328.6 MHz (U) 1M20F1D
TX (U) AN/PRC-164, RX (U) AN/PRC-164, (U) 5.00 W Peak, (U) 420.0 MHz - 450.0 MHz (U) 4M25F1D Out-of-band
TX (U) AN/PRC-164, RX (U) AN/PRC-164, (U) 5.00 W Peak, (U) 420.0 MHz - 450.0 MHz (U) 4M25F1D Out-of-band
TX (U) AN/PRC-164, RX (U) AN/PRC-164, (U) 5.00 W Peak, (U) 225.0 MHz - 328.6 MHz (U) 1M20F1D
TX (U) AN/PRC-164, RX (U) AN/PRC-164, (U) 5.00 W Peak, (U) 225.0 MHz - 328.6 MHz (U) 1M20G2D
TX (U) AN/PRC-164, RX (U) AN/PRC-164, (U) 5.00 W Peak, (U) 225.0 MHz - 328.6 MHz (U) 4M25F1D
TX (U) AN/PRC-164, RX (U) AN/PRC-164, (U) 5.00 W Peak, (U) 335.4 MHz - 399.9 MHz (U) 1M20F1D
TX (U) AN/PRC-164, RX (U) AN/PRC-164, (U) 5.00 W Peak, (U) 335.4 MHz - 399.9 MHz (U) 1M20G2D
TX (U) AN/PRC-164, RX (U) AN/PRC-164, (U) 5.00 W Peak, (U) 335.4 MHz - 399.9 MHz (U) 4M25F1D
TX (U) AN/PRC-164, RX (U) AN/PRC-164, (U) 5.00 W Peak, (U) 420.0 MHz - 450.0 MHz (U) 4M25F1D Out-of-band
TX (U) AN/PRC-164, RX (U) AN/PRC-164, (U) 5.00 W Peak, (U) 420.0 MHz - 450.0 MHz (U) 1M20G2D Out-of-band
TX (U) AN/PRC-164, RX (U) AN/PRC-164, (U) 5.00 W Peak, (U) 420.0 MHz - 450.0 MHz (U) 1M20F1D Out-of-band
TX (U) AN/PRC-164, RX (U) AN/PRC-164, (U) 5.00 W Peak, (U) 420.0 MHz - 450.0 MHz (U) 4M25F1D Out-of-band
TX (U) AN/PRC-164, RX (U) AN/PRC-164, (U) 5.00 W Peak, (U) 420.0 MHz - 450.0 MHz (U) 4M25F1D Out-of-band
TX (U) AN/PRC-164, RX (U) AN/PRC-164, (U) 5.00 W Peak, (U) 420.0 MHz - 450.0 MHz (U) 4M25F1D Out-of-band
TX (U) AN/PRC-164, RX (U) AN/PRC-164, (U) 5.00 W Peak, (U) 420.0 MHz - 450.0 MHz (U) 1M20F1D Out-of-band
TX (U) AN/PRC-164, RX (U) AN/PRC-164, (U) 5.00 W Peak, (U) 420.0 MHz - 450.0 MHz (U) 1M20G2D Out-of-band
TX (U) AN/PRC-164, RX (U) AN/PRC-164, (U) 5.00 W Peak, (U) 420.0 MHz - 450.0 MHz (U) 4M25F1D Out-of-band
TX (U) AN/PRC-164, RX (U) AN/PRC-164, (U) 5.00 W Peak, (U) 335.4 MHz - 399.9 MHz (U) 4M25F1D
TX (U) AN/PRC-164, RX (U) AN/PRC-164, (U) 5.00 W Peak, (U) 335.4 MHz - 399.9 MHz (U) 1M20G2D
TX (U) AN/PRC-164, RX (U) AN/PRC-164, (U) 5.00 W Peak, (U) 335.4 MHz - 399.9 MHz (U) 1M20F1D
TX (U) AN/PRC-164, RX (U) AN/PRC-164, (U) 5.00 W Peak, (U) 225.0 MHz - 328.6 MHz (U) 4M25F1D
TX (U) AN/PRC-164, RX (U) AN/PRC-164, (U) 5.00 W Peak, (U) 225.0 MHz - 328.6 MHz (U) 1M20G2D
TX (U) AN/PRC-164, RX (U) AN/PRC-164, (U) 5.00 W Peak, (U) 225.0 MHz - 328.6 MHz (U) 1M20F1D

DOWNGRADING INSTRUCTIONS

Special Handling Instruction : B

NTIA DATA OVERFLOW PAGE

5. PURPOSE OF SYSTEM, OPERATIONAL AND SYSTEM CONCEPTS

Cont. (U) Aerial Vehicles (UAVs) which have a high likelihood of not returning. The radio will be used to provide wireless network for ground vehicles.

X-Net is designed for GPS denied operations and instead uses only Radiolocation technology to provide position location and data distribution using a secure wireless network in a mobile environment. The radio is capable of operating three signal processing modes: Electronic Warfare (EW),
Combat Communications (CC), and Wideband (WB).

Each signal processing mode has a unique emmision designator. X-Net is compatible with fielded Enhanced Position Location Reporting System (EPLRS) and Situation Awareness Data Link (SADL) operating units when operating in the EW mode in the 420-450 MHz frequency band and the EW signal processing mode.

9. SYSTEM RELATIONSHIP AND ESSENTIALITY

Cont. (U) mobile units and information exchange for battlefield command and control (C2), and situation awareness (SA).

DOWNGRADING INSTRUCTIONS

Special Handling Instruction : B

FULL RECORD PRINT FOR X-NET RADIO, AN/PRC-164

SELECTED FREQUENCIES

(U) 225.0 MHz - 328.6 MHz
(U) 335.4 MHz - 399.9 MHz
(U) 420.0 MHz - 450.0 MHz

Application Title
(U) X-Net Radio, AN/PRC-164

System Name (Nomenclature) (U) X-Net Radio, AN/PRC-164	**Stage** (U) 4 - Operational
Coord. ID/Coord. Num. J/F 12/	**NTIA Certified** (U) No
Agency (U) AF - Department of the Air Force	**Date Of Import** 2/5/2019 6:04:51 PM (GMT)
Overall Security Unclassified	**Date/Time Last Mod.** 11/23/2019 12:10:45 AM (GMT)

GEOGRAPHIC AREAS FOR STAGE 4

(U)
, (U) USP (US & POSS)
Location Type : (U) Polygon

Control Numbers:	**Predefined Trunking?** (U) No

REFERENCES

Type : Related J12
Ref. To Cert. : False
Ref. Is Class. : False
Ref. J12 # : 4547

Type : Related J12
Ref. To Cert. : False
Ref. Date : 7/31/2012
Ref. Is Class. : False
Ref. J12 # : 9718

Type : Related J12
Ref. To Cert. : False
Ref. Is Class. : False
Ref. J12 # : 7049

SYSTEM INFORMATION

FULL RECORD PRINT FOR X-NET RADIO, AN/PRC-164

System Description:

(U) The X-Net AN/PRC-164 radio is primarily designed for single-use, expendable platforms: 1) precision guided munitions, and 2) for small Unmanned Aerial Vehicles (UAVs) which have a high likelihood of not returning. The radio will be used to provide wireless network for ground vehicles.

X-Net is designed for GPS denied operations and instead uses only Radiolocation technology to provide position location and data distribution using a secure wireless network in a mobile environment. The radio is capable of operating three signal processing modes: Electronic Warfare (EW), Combat Communications (CC), and Wideband (WB).

Each signal processing mode has a unique emmision designator. X-Net is compatible with fielded Enhanced Position Location Reporting System (EPLRS) and Situation Awareness Data Link (SADL) operating units when operating in the EW mode in the 420-450 MHz frequency band and the EW signal processing mode.

System Relationship and Essentiality:

(U) Provides the wireless network for net-enabled precision guided munitions, ground units and airborne platforms. In addition, the radio uses position location features to provide location to mobile units and information exchange for battlefield command and control (C2), and situation awareness (SA).

TARGET DATES

System Termination: **System Activation:** (U) 3/1/2020 **System Approval:** (U) 10/1/2019

NSEP Use: (U) No	**ITU Waiver:** (U) No
Number Of Units: (U) 15000	**National Coord. Required?** Yes
Num. Units in Same Environment: (U) 8	**Number Of Units Per Stage:** **Stage 4** (U) 15000
Estimated Cost of the System: (U) $ 10000	

Replacement Information:

(U) Not Applicable

Remark(s) (U)

(U) 1494 Item 2) System Nomenclature: AN/PRC-164 X-Net refers to the RT-2090 transceiver module capable of (70-6000 MHz) and attachable Radio Frequency Front End (RFFE) modules. This specific application is for the X-Net using a 5W RFFE module tuned for 225-512 MHz or 1250-2500 MHz. The modular design allows for future RFFE modules to be developed operating at different power levels and frequency bands, paired with the same RT-2090 X-Net transceiver.

(U) 1494 Item 4) Frequency Requirements: X-Net is capable three operational modes:
- In Electronic Warfare (EW), the emission designator is 4M25F1D and capable of transmitting on one channel or frequency hopping on up to 8 channels. 420-450 MHz is required for compatibility with fielded EPLRS/SADL users.
- In Combat Communications (CC), the emission designator is 1M20F1D and capable of transmitting on one channel or frequency hopping on up to 8 channels.
- In Wideband (WB), the emission designator is 1M20G2D and capable of operating on one channel or up to 12 simultaneous channels within a 20 MHz continguous span.

FULL RECORD PRINT FOR X-NET RADIO, AN/PRC-164

STATIONS

Station Name : (U) Airborne #1
Transmitters
Nomenclature : (U) AN/PRC-164
Receivers
Nomenclature : (U) AN/PRC-164
Antennas
Nomenclature : (U) Airborne Blade Antenna

Station Name : (U) Airborne #2
Transmitters
Nomenclature : (U) AN/PRC-164
Receivers
Nomenclature : (U) AN/PRC-164
Antennas
Nomenclature : (U) UHF Monopole Antenna

Station Name : (U) Land Mobile #1
Transmitters
Nomenclature : (U) AN/PRC-164
Receivers
Nomenclature : (U) AN/PRC-164
Antennas
Nomenclature : (U) Omni Vehicle & Fixed Shelter

Station Name : (U) Airborne #3
Transmitters
Nomenclature : (U) AN/PRC-164
Receivers
Nomenclature : (U) AN/PRC-164
Antennas
Nomenclature : (U) Wrap-around Antenna

Station Name : (U) Land Mobile #2
Transmitters
Nomenclature : (U) AN/PRC-164
Receivers
Nomenclature : (U) AN/PRC-164
Antennas
Nomenclature : (U) Omni Vehicle & Fixed Shelter

FULL RECORD PRINT FOR X-NET RADIO, AN/PRC-164

STATION INFORMATION

Transmitting Station:	Receiving Station:
(U) Airborne #1	(U) Airborne #2
Station Class: MA	Radio Service: Aeronautical Mobile

LINK INFORMATION

Transmitter:	Transmitter Antenna:
(U) AN/PRC-164	(U) Airborne Blade Antenna
Receiver:	Receiver Antenna:
(U) AN/PRC-164	(U) UHF Monopole Antenna

SELECTED MODES

Frequency	Emission Designator	Power	Notes
(U) 420.0 MHz - 450.0 MHz	(U) 4M25F1D	(U) 5.00 W Peak	[1]
[1] (U)	Interoperability with existing Airborne EPLRS platforms		

STATION INFORMATION

Transmitting Station:	Receiving Station:
(U) Airborne #1	(U) Airborne #3
Station Class: MA	Radio Service: Aeronautical Mobile

LINK INFORMATION

Transmitter:	Transmitter Antenna:
(U) AN/PRC-164	(U) Airborne Blade Antenna
Receiver:	Receiver Antenna:
(U) AN/PRC-164	(U) Wrap-around Antenna

SELECTED MODES

Frequency	Emission Designator	Power	Notes
(U) 420.0 MHz - 450.0 MHz	(U) 4M25F1D	(U) 5.00 W Peak	[1]
[1] (U)	Interoperability with existing Airborne EPLRS platforms		

FULL RECORD PRINT FOR X-NET RADIO, AN/PRC-164

STATION INFORMATION

Transmitting Station:	Receiving Station:
(U) Airborne #1	(U) Land Mobile #1
Station Class: MA	Radio Service: Aeronautical Mobile

LINK INFORMATION

Transmitter:	Transmitter Antenna:
(U) AN/PRC-164	(U) Airborne Blade Antenna
Receiver:	Receiver Antenna:
(U) AN/PRC-164	(U) Omni Vehicle & Fixed Shelter

SELECTED MODES

Frequency	Emission Designator	Power	Notes
(U) 225.0 MHz - 328.6 MHz	(U) 4M25F1D	(U) 5.00 W Peak	PRI
(U) 225.0 MHz - 328.6 MHz	(U) 1M20G2D	(U) 5.00 W Peak	PRI
(U) 225.0 MHz - 328.6 MHz	(U) 1M20F1D	(U) 5.00 W Peak	PRI
(U) 335.4 MHz - 399.9 MHz	(U) 4M25F1D	(U) 5.00 W Peak	PRI
(U) 335.4 MHz - 399.9 MHz	(U) 1M20G2D	(U) 5.00 W Peak	PRI
(U) 335.4 MHz - 399.9 MHz	(U) 1M20F1D	(U) 5.00 W Peak	PRI
(U) 420.0 MHz - 450.0 MHz	(U) 4M25F1D	(U) 5.00 W Peak	[1]
(U) 420.0 MHz - 450.0 MHz	(U) 1M20F1D	(U) 5.00 W Peak	[2]
(U) 420.0 MHz - 450.0 MHz	(U) 1M20G2D	(U) 5.00 W Peak	[3]

[1] (U) To be interoperable with fielded USAF SADL units.
[2] (U) Interoperability with existing EPLRS air and ground platforms that support this mode
[3] (U) Interoperability with existing EPLRS air and ground platforms that support this mode

STATION INFORMATION

Transmitting Station:	Receiving Station:
(U) Airborne #2	(U) Airborne #1
Station Class: MA	Radio Service: Aeronautical Mobile

LINK INFORMATION

Transmitter:	Transmitter Antenna:
(U) AN/PRC-164	(U) UHF Monopole Antenna
Receiver:	Receiver Antenna:
(U) AN/PRC-164	(U) Airborne Blade Antenna

FULL RECORD PRINT FOR X-NET RADIO, AN/PRC-164

SELECTED MODES

Frequency	Emission Designator	Power	Notes
(U) 420.0 MHz - 450.0 MHz	(U) 4M25F1D	(U) 5.00 W Peak	[1]
[1] (U)	To be interoperable with fielded USAF SADL units.		

STATION INFORMATION

Transmitting Station:	Receiving Station:
(U) Airborne #2	(U) Airborne #3
Station Class: MA	Radio Service: Aeronautical Mobile

LINK INFORMATION

Transmitter:	Transmitter Antenna:
(U) AN/PRC-164	(U) UHF Monopole Antenna
Receiver:	Receiver Antenna:
(U) AN/PRC-164	(U) Wrap-around Antenna

SELECTED MODES

Frequency	Emission Designator	Power	Notes
(U) 420.0 MHz - 450.0 MHz	(U) 4M25F1D	(U) 5.00 W Peak	[1]
[1] (U)	Interoperability with existing Airborne EPLRS platforms is required.		

STATION INFORMATION

Transmitting Station:	Receiving Station:
(U) Airborne #2	(U) Land Mobile #1
Station Class: MA	Radio Service: Aeronautical Mobile

LINK INFORMATION

Transmitter:	Transmitter Antenna:
(U) AN/PRC-164	(U) UHF Monopole Antenna
Receiver:	Receiver Antenna:
(U) AN/PRC-164	(U) Omni Vehicle & Fixed Shelter

FULL RECORD PRINT FOR X-NET RADIO, AN/PRC-164

SELECTED MODES

Frequency	Emission Designator	Power	Notes
(U) 420.0 MHz - 450.0 MHz	(U) 4M25F1D	(U) 5.00 W Peak	[1]
[1] (U)	Interoperability with existing Airborne EPLRS platforms is required.		

STATION INFORMATION

Transmitting Station:	Receiving Station:
(U) Airborne #3	(U) Airborne #1
Station Class: MA	Radio Service: Aeronautical Mobile

LINK INFORMATION

Transmitter:	Transmitter Antenna:
(U) AN/PRC-164	(U) Wrap-around Antenna
Receiver:	Receiver Antenna:
(U) AN/PRC-164	(U) Airborne Blade Antenna

SELECTED MODES

Frequency	Emission Designator	Power	Notes
(U) 420.0 MHz - 450.0 MHz	(U) 4M25F1D	(U) 5.00 W Peak	[1]
[1] (U)	Interoperability with existing Airborne EPLRS platforms is required.		

STATION INFORMATION

Transmitting Station:	Receiving Station:
(U) Airborne #3	(U) Airborne #2
Station Class: MA	Radio Service: Aeronautical Mobile

LINK INFORMATION

Transmitter:	Transmitter Antenna:
(U) AN/PRC-164	(U) Wrap-around Antenna
Receiver:	Receiver Antenna:
(U) AN/PRC-164	(U) UHF Monopole Antenna

FULL RECORD PRINT FOR X-NET RADIO, AN/PRC-164

SELECTED MODES

Frequency	Emission Designator	Power	Notes
(U) 420.0 MHz - 450.0 MHz	(U) 4M25F1D	(U) 5.00 W Peak	[1]
[1] (U)	Interoperability with existing Airborne EPLRS platforms is required.		

STATION INFORMATION

Transmitting Station:	Receiving Station:
(U) Airborne #3	(U) Land Mobile #1
Station Class: MA	Radio Service: Aeronautical Mobile

LINK INFORMATION

Transmitter:	Transmitter Antenna:
(U) AN/PRC-164	(U) Wrap-around Antenna
Receiver:	Receiver Antenna:
(U) AN/PRC-164	(U) Omni Vehicle & Fixed Shelter

SELECTED MODES

Frequency	Emission Designator	Power	Notes
(U) 420.0 MHz - 450.0 MHz	(U) 4M25F1D	(U) 5.00 W Peak	[1]
[1] (U)	Interoperability with existing Airborne EPLRS platforms is required.		

STATION INFORMATION

Transmitting Station:	Receiving Station:
(U) Land Mobile #1	(U) Airborne #1
Station Class: ML	Radio Service: Aeronautical Mobile

LINK INFORMATION

Transmitter:	Transmitter Antenna:
(U) AN/PRC-164	(U) Omni Vehicle & Fixed Shelter
Receiver:	Receiver Antenna:
(U) AN/PRC-164	(U) Airborne Blade Antenna

FULL RECORD PRINT FOR X-NET RADIO, AN/PRC-164

SELECTED MODES

Frequency	Emission Designator	Power	Notes
(U) 225.0 MHz - 328.6 MHz	(U) 1M20G2D	(U) 5.00 W Peak	PRI
(U) 225.0 MHz - 328.6 MHz	(U) 4M25F1D	(U) 5.00 W Peak	PRI
(U) 225.0 MHz - 328.6 MHz	(U) 1M20F1D	(U) 5.00 W Peak	PRI
(U) 335.4 MHz - 399.9 MHz	(U) 1M20F1D	(U) 5.00 W Peak	PRI
(U) 335.4 MHz - 399.9 MHz	(U) 1M20G2D	(U) 5.00 W Peak	PRI
(U) 335.4 MHz - 399.9 MHz	(U) 4M25F1D	(U) 5.00 W Peak	PRI
(U) 420.0 MHz - 450.0 MHz	(U) 1M20G2D	(U) 5.00 W Peak	[1]
(U) 420.0 MHz - 450.0 MHz	(U) 1M20F1D	(U) 5.00 W Peak	[2]
(U) 420.0 MHz - 450.0 MHz	(U) 4M25F1D	(U) 5.00 W Peak	[3]

[1] (U) Interoperability with existing EPLRS air and ground platforms that support this mode
[2] (U) Interoperability with existing EPLRS air and ground platforms that support this mode
[3] (U) To be interoperable with fielded USAF SADL units.

STATION INFORMATION

Transmitting Station:	Receiving Station:
(U) Land Mobile #1	(U) Airborne #2
Station Class: ML	Radio Service: Aeronautical Mobile

LINK INFORMATION

Transmitter:	Transmitter Antenna:
(U) AN/PRC-164	(U) Omni Vehicle & Fixed Shelter
Receiver:	Receiver Antenna:
(U) AN/PRC-164	(U) UHF Monopole Antenna

SELECTED MODES

Frequency	Emission Designator	Power	Notes
(U) 420.0 MHz - 450.0 MHz	(U) 4M25F1D	(U) 5.00 W Peak	[1]

[1] (U) Interoperability with existing Airborne EPLRS platforms is required.

STATION INFORMATION

Transmitting Station:	Receiving Station:
(U) Land Mobile #1	(U) Airborne #3

FULL RECORD PRINT FOR X-NET RADIO, AN/PRC-164

Station Class: ML | Radio Service: Aeronautical Mobile

LINK INFORMATION

Transmitter:	Transmitter Antenna:
(U) AN/PRC-164	(U) Omni Vehicle & Fixed Shelter
Receiver:	Receiver Antenna:
(U) AN/PRC-164	(U) Wrap-around Antenna

SELECTED MODES

Frequency	Emission Designator	Power	Notes
(U) 420.0 MHz - 450.0 MHz	(U) 4M25F1D	(U) 5.00 W Peak	[1]

[1] (U) Interoperability with existing Airborne EPLRS platforms is required.

STATION INFORMATION

Transmitting Station:	Receiving Station:
(U) Land Mobile #1	(U) Land Mobile #2
Station Class: ML	Radio Service: Land Mobile

LINK INFORMATION

Transmitter:	Transmitter Antenna:
(U) AN/PRC-164	(U) Omni Vehicle & Fixed Shelter
Receiver:	Receiver Antenna:
(U) AN/PRC-164	(U) Omni Vehicle & Fixed Shelter

SELECTED MODES

Frequency	Emission Designator	Power	Notes
(U) 225.0 MHz - 328.6 MHz	(U) 1M20G2D	(U) 5.00 W Peak	PRI
(U) 225.0 MHz - 328.6 MHz	(U) 4M25F1D	(U) 5.00 W Peak	PRI
(U) 225.0 MHz - 328.6 MHz	(U) 1M20F1D	(U) 5.00 W Peak	PRI
(U) 335.4 MHz - 399.9 MHz	(U) 1M20G2D	(U) 5.00 W Peak	PRI
(U) 335.4 MHz - 399.9 MHz	(U) 4M25F1D	(U) 5.00 W Peak	PRI
(U) 335.4 MHz - 399.9 MHz	(U) 1M20F1D	(U) 5.00 W Peak	PRI
(U) 420.0 MHz - 450.0 MHz	(U) 1M20G2D	(U) 5.00 W Peak	[1]
(U) 420.0 MHz - 450.0 MHz	(U) 1M20F1D	(U) 5.00 W Peak	[2]
(U) 420.0 MHz - 450.0 MHz	(U) 4M25F1D	(U) 5.00 W Peak	[3]

[1] (U) Interoperability with existing EPLRS air and ground platforms that support this mode

[2] (U) Interoperability with existing EPLRS air and ground platforms that support this mode

FULL RECORD PRINT FOR X-NET RADIO, AN/PRC-164

[3] (U) Interoperability with existing EPLRS air and ground platforms

STATION INFORMATION

Transmitting Station:	Receiving Station:
(U) Land Mobile #2	(U) Land Mobile #1
Station Class: ML	Radio Service: Land Mobile

LINK INFORMATION

Transmitter:	Transmitter Antenna:
(U) AN/PRC-164	(U) Omni Vehicle & Fixed Shelter
Receiver:	Receiver Antenna:
(U) AN/PRC-164	(U) Omni Vehicle & Fixed Shelter

SELECTED MODES

Frequency	Emission Designator	Power	Notes
(U) 225.0 MHz - 328.6 MHz	(U) 1M20F1D	(U) 5.00 W Peak	PRI
(U) 225.0 MHz - 328.6 MHz	(U) 4M25F1D	(U) 5.00 W Peak	PRI
(U) 225.0 MHz - 328.6 MHz	(U) 1M20G2D	(U) 5.00 W Peak	PRI
(U) 335.4 MHz - 399.9 MHz	(U) 4M25F1D	(U) 5.00 W Peak	PRI
(U) 335.4 MHz - 399.9 MHz	(U) 1M20G2D	(U) 5.00 W Peak	PRI
(U) 335.4 MHz - 399.9 MHz	(U) 1M20F1D	(U) 5.00 W Peak	PRI
(U) 420.0 MHz - 450.0 MHz	(U) 1M20F1D	(U) 5.00 W Peak	[1]
(U) 420.0 MHz - 450.0 MHz	(U) 1M20G2D	(U) 5.00 W Peak	[2]
(U) 420.0 MHz - 450.0 MHz	(U) 4M25F1D	(U) 5.00 W Peak	[3]

[1] (U) Interoperability with existing EPLRS air and ground platforms that support this mode

[2] (U) Interoperability with existing EPLRS air and ground platforms that support this mode

[3] (U) Interoperability with existing EPLRS air and ground platforms

TRANSMITTER EQUIPMENT CHARACTERISTICS

Nomenclature: (U) AN/PRC-164	**Manufacturer:** (U) RAYTHEON CO. OR RAYTHEON MANUFACTURING CO.
Other Nomenclature: (U) RT-2090	
NTIA Approval Status: (U) Unapproved	**Coordination ID:** J/F 12
Date of Import: 2/5/2019 6:04:51 PM (GMT)	**Date/Time Last Mod.:** 11/22/2019 6:38:11 PM (GMT)
Fcc Acc. Number:	**Radar/Comm:** (U) Communications
Model Name: (U) X-Net Radio System, 6157000	**Output Device:** (U) Transistor
Tuning Method: (U) Crystal Controlled Synthesizer	**Supp. of Harmonics:** (U) Yes
Freq. Stability: (U) 0.5ppm	
Tx Type: (U) GMSK (1M20F1D, 4M25F1D); OFDM (1M20G2D)	**Tx Installation(s)** (U) Ground (U) Airborne (U) Precision Guided Munitions

POWER

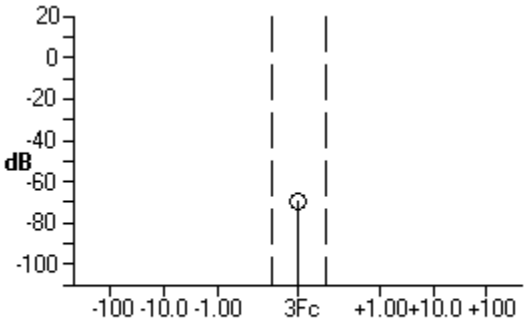
Power Type: Peak Envelope	
Upper Limit: (U) 5.00 W	

3RD HARMONIC CURVE

(UNCLASSIFIED)

Atten. -70.0 dB

Offset (Fo) 0.0000 MHz



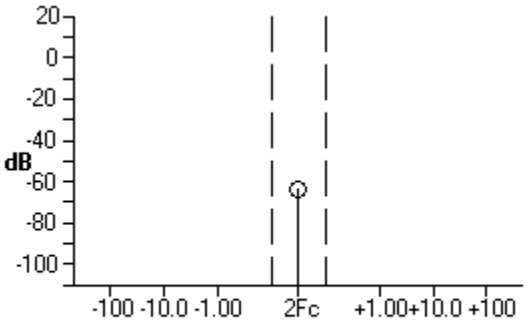
TRANSMITTER EQUIPMENT CHARACTERISTICS

2ND HARMONIC CURVE

(UNCLASSIFIED)

Atten. -64.0 dB

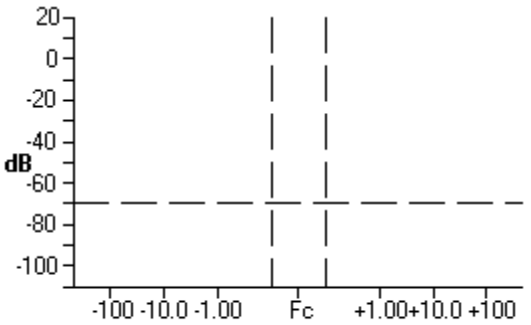
Offset (Fo) 0.0000 MHz



SPURIOUS EMISSION CURVE

(UNCLASSIFIED)

Maximum Spurious Emission
Atten.
-70.0 dB



FREQUENCIES

Tuning Range: (U) 225.0 MHz - 328.6 MHz	**Tuning Method:** (U) Crystal Controlled Synthesizer
Tuning Increment: (U) 125.0 kHz	**Freq Stability:** (U) 0.5ppm
Number of Frequencies Required: (U) 1	**Min. Separation:** (U) 1.200 MHz
Supp. of Harmonics: (U) Yes	
Freq. Blocking Indicator: (U) No	

EMISSION DESIGNATORS

Em. Designator: (U) 1M20F1D	**Necessary BW:** (U) 1.200 MHz
	Radar/Communications: (U) Communications

TRANSMITTER EQUIPMENT CHARACTERISTICS

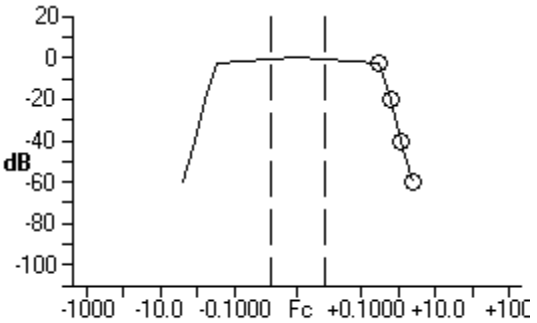
Measured/Calculated: (U) Measured	**Occupied Bandwidth:** (U) 1.200 MHz
Pulse Rep. Rate Lower Limit: (U) 256 pps	**Pulse Rep. Rate Upper Limit:** (U) 512 pps
Pulse Duration Lower Limit: (U) 1.38 ms	**Pulse Duration Upper Limit:** (U) 3.29 ms
Modulation Type: (U) Digital Modulation	**Spread Spectrum:** Yes
Spread Spectrum Type: (U) Direct Sequence	
Spread Spectrum Chip Rate: (U) 1250000 /sec	**Information Data Rate:** (U) 1000000 bps
SS Code Repetition Rate: (U) 1250000 /sec	**SS Processing Gain:** (U) 14.0 dB
Dig. Modulation Type: (U) GMSK - Gaussian Minimum Shift Keying	**Digital Bit Rate:** (U) 1000000 bps

FUNDAMENTAL CURVE

(UNCLASSIFIED)

Meas/Calc: Measured

Level	**Offset (Fo)**
-3.00 dB	0.3000 MHz
-20.0 dB	0.6000 MHz
-40.0 dB	1.200 MHz
-60.0 dB	2.400 MHz



EMISSION DESIGNATORS

Em. Designator: (U) 1M20G2D	**Necessary BW:** (U) 1.200 MHz
	Radar/Communications: (U) Communications
Measured/Calculated: (U) Measured	**Occupied Bandwidth:** (U) 1.200 MHz
Pulse Rep. Rate Lower Limit: (U) 192 pps	**Pulse Rep. Rate Upper Limit:** (U) 192 pps

TRANSMITTER EQUIPMENT CHARACTERISTICS

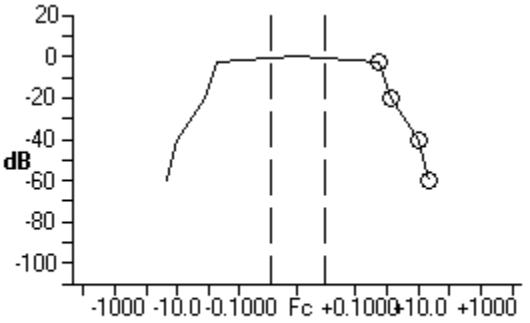
Pulse Duration Lower Limit: (U) 2.91 ms	**Pulse Duration Upper Limit:** (U) 5.82 ms
Modulation Type: (U) Digital Modulation	**Spread Spectrum:** No
Dig. Modulation Type: (U) OTH - Other	**Digital Bit Rate:** (U) 1300000 bps

FUNDAMENTAL CURVE

(UNCLASSIFIED)

Meas/Calc: Measured

Level	**Offset (Fo)**
-3.00 dB	0.5500 MHz
-20.0 dB	1.350 MHz
-40.0 dB	10.70 MHz
-60.0 dB	22.75 MHz



EMISSION DESIGNATORS

Em. Designator: (U) 4M25F1D	**Necessary BW:** (U) 4.250 MHz
	Radar/Communications: (U) Communications
Measured/Calculated: (U) Measured	**Occupied Bandwidth:** (U) 4.250 MHz
Pulse Rep. Rate Lower Limit: (U) 256 pps	**Pulse Rep. Rate Upper Limit:** (U) 512 pps
Pulse Duration Lower Limit: (U) 1.38 ms	**Pulse Duration Upper Limit:** (U) 3.29 ms
Modulation Type: (U) Digital Modulation	**Spread Spectrum:** Yes
Spread Spectrum Type: (U) Direct Sequence	

TRANSMITTER EQUIPMENT CHARACTERISTICS

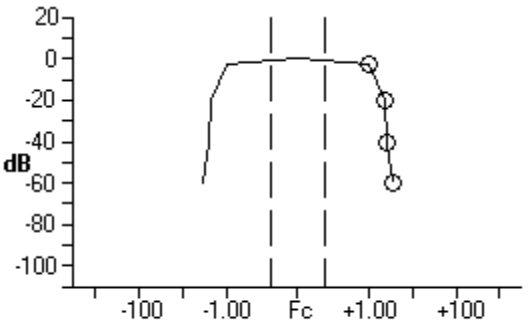
Spread Spectrum Chip Rate: (U) 5000000 /sec	**Information Data Rate:** (U) 2670000 bps
SS Code Repetition Rate: (U) 5000000 /sec	**SS Processing Gain:** (U) 14.0 dB
Dig. Modulation Type: (U) GMSK - Gaussian Minimum Shift Keying	**Digital Bit Rate:** (U) 2670000 bps

FUNDAMENTAL CURVE

(UNCLASSIFIED)

Meas/Calc: Measured

Level	Offset (Fo)
-3.00 dB	1.050 MHz
-20.0 dB	2.400 MHz
-40.0 dB	2.700 MHz
-60.0 dB	3.450 MHz



FREQUENCIES

Tuning Range: (U) 335.4 MHz - 399.9 MHz	**Tuning Method:** (U) Crystal Controlled Synthesizer
Tuning Increment: (U) 125.0 kHz	**Freq Stability:** (U) 0.5ppm
Number of Frequencies Required: (U) 1	**Min. Separation:** (U) 1.200 MHz
Supp. of Harmonics: (U) Yes	

GPS EMISSION LEVELS

Wideband 1164-1240 MHz: (U) -115 dBw/MHz	**Wideband 1559-1610 MHz:** (U) -120 dBw/MHz
Narrowband 1164-1240 MHz: (U) -115 dBw	**Narrowband 1559-1610 MHz:** (U) -120 dBw
Freq. Blocking Indicator: (U) No	

EMISSION DESIGNATORS

Em. Designator: (U) 1M20F1D	**Necessary BW:** (U) 1.200 MHz
	Radar/Communications: (U) Communications

TRANSMITTER EQUIPMENT CHARACTERISTICS

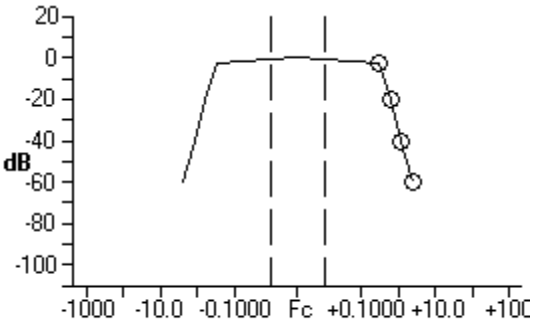
Measured/Calculated: (U) Measured	**Occupied Bandwidth:** (U) 1.200 MHz
Pulse Rep. Rate Lower Limit: (U) 256 pps	**Pulse Rep. Rate Upper Limit:** (U) 512 pps
Pulse Duration Lower Limit: (U) 1.38 ms	**Pulse Duration Upper Limit:** (U) 3.29 ms
Modulation Type: (U) Digital Modulation	**Spread Spectrum:** Yes
Spread Spectrum Type: (U) Direct Sequence	
Spread Spectrum Chip Rate: (U) 1250000 /sec	**Information Data Rate:** (U) 1000000 bps
SS Code Repetition Rate: (U) 1250000 /sec	**SS Processing Gain:** (U) 14.0 dB
Dig. Modulation Type: (U) GMSK - Gaussian Minimum Shift Keying	**Digital Bit Rate:** (U) 1000000 bps

FUNDAMENTAL CURVE

(UNCLASSIFIED)

Meas/Calc: Measured

Level	**Offset (Fo)**
-3.00 dB	0.3000 MHz
-20.0 dB	0.6500 MHz
-40.0 dB	1.200 MHz
-60.0 dB	2.400 MHz



EMISSION DESIGNATORS

Em. Designator: (U) 1M20G2D	**Necessary BW:** (U) 1.200 MHz
	Radar/Communications: (U) Communications
Measured/Calculated: (U) Measured	**Occupied Bandwidth:** (U) 1.200 MHz
Pulse Rep. Rate Lower Limit: (U) 192 pps	**Pulse Rep. Rate Upper Limit:** (U) 192 pps

TRANSMITTER EQUIPMENT CHARACTERISTICS

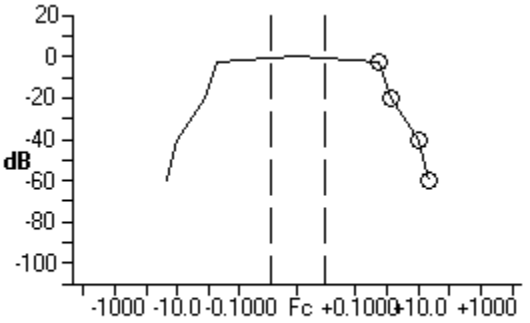
Pulse Duration Lower Limit: (U) 2.91 ms	**Pulse Duration Upper Limit:** (U) 5.82 ms
Modulation Type: (U) Digital Modulation	**Spread Spectrum:** No
Dig. Modulation Type: (U) OTH - Other	**Digital Bit Rate:** (U) 1300000 bps

FUNDAMENTAL CURVE

(UNCLASSIFIED)

Meas/Calc: Measured

Level	**Offset (Fo)**
-3.00 dB	0.5500 MHz
-20.0 dB	1.350 MHz
-40.0 dB	10.70 MHz
-60.0 dB	22.75 MHz



EMISSION DESIGNATORS

Em. Designator: (U) 4M25F1D	**Necessary BW:** (U) 4.250 MHz
	Radar/Communications: (U) Communications
Measured/Calculated: (U) Measured	**Occupied Bandwidth:** (U) 4.250 MHz
Pulse Rep. Rate Lower Limit: (U) 256 pps	**Pulse Rep. Rate Upper Limit:** (U) 512 pps
Pulse Duration Lower Limit: (U) 1.38 ms	**Pulse Duration Upper Limit:** (U) 3.29 ms
Modulation Type: (U) Digital Modulation	**Spread Spectrum:** Yes
Spread Spectrum Type: (U) Direct Sequence	

TRANSMITTER EQUIPMENT CHARACTERISTICS

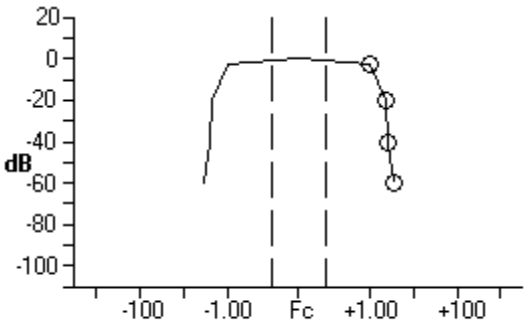
Spread Spectrum Chip Rate: (U) 5000000 /sec	**Information Data Rate:** (U) 2670000 bps
SS Code Repetition Rate: (U) 5000000 /sec	**SS Processing Gain:** (U) 14.0 dB
Dig. Modulation Type: (U) GMSK - Gaussian Minimum Shift Keying	**Digital Bit Rate:** (U) 2670000 bps

FUNDAMENTAL CURVE

(UNCLASSIFIED)

Meas/Calc: Measured

Level	**Offset (Fo)**
-3.00 dB	1.050 MHz
-20.0 dB	2.400 MHz
-40.0 dB	2.700 MHz
-60.0 dB	3.450 MHz



FREQUENCIES

Tuning Range: (U) 420.0 MHz - 450.0 MHz	**Tuning Method:** (U) Crystal Controlled Synthesizer
Tuning Increment: (U) 125.0 kHz	**Freq Stability:** (U) 0.5ppm
Number of Frequencies Required: (U) 1	**Min. Separation:** (U) 1.200 MHz
Supp. of Harmonics: (U) Yes	
Freq. Blocking Indicator: (U) No	

EMISSION DESIGNATORS

Em. Designator: (U) 4M25F1D	**Necessary BW:** (U) 4.250 MHz
	Radar/Communications: (U) Communications
Measured/Calculated: (U) Measured	**Occupied Bandwidth:** (U) 4.250 MHz
Pulse Rep. Rate Lower Limit: (U) 256 pps	**Pulse Rep. Rate Upper Limit:** (U) 512 pps
Pulse Duration Lower Limit: (U) 1.38 ms	**Pulse Duration Upper Limit:** (U) 3.29 ms

TRANSMITTER EQUIPMENT CHARACTERISTICS

Modulation Type: (U) Digital Modulation

Spread Spectrum: Yes

Spread Spectrum Type:
(U) Direct Sequence

Spread Spectrum Chip Rate: (U) 5000000 /sec

Information Data Rate: (U) 2670000 bps

SS Code Repetition Rate: (U) 5000000 /sec

SS Processing Gain: (U) 14.0 dB

Dig. Modulation Type:
(U) GMSK - Gaussian Minimum Shift Keying

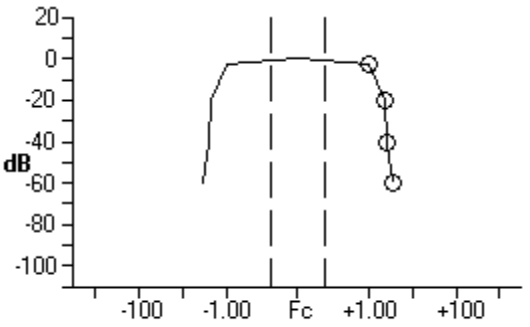
Digital Bit Rate: (U) 2670000 bps

FUNDAMENTAL CURVE

(UNCLASSIFIED)

Meas/Calc: Measured

Level	**Offset (Fo)**
-3.00 dB	1.050 MHz
-20.0 dB	2.400 MHz
-40.0 dB	2.700 MHz
-60.0 dB	3.450 MHz



EMISSION DESIGNATORS

Em. Designator: (U) 1M20G2D

Necessary BW: (U) 1.200 MHz

Radar/Communications: (U) Communications

Measured/Calculated: (U) Measured

Occupied Bandwidth: (U) 1.200 MHz

Pulse Rep. Rate Lower Limit: (U) 192 pps

Pulse Rep. Rate Upper Limit: (U) 192 pps

Pulse Duration Lower Limit: (U) 2.91 ms

Pulse Duration Upper Limit: (U) 5.82 ms

Modulation Type: (U) Digital Modulation

Spread Spectrum: No

TRANSMITTER EQUIPMENT CHARACTERISTICS

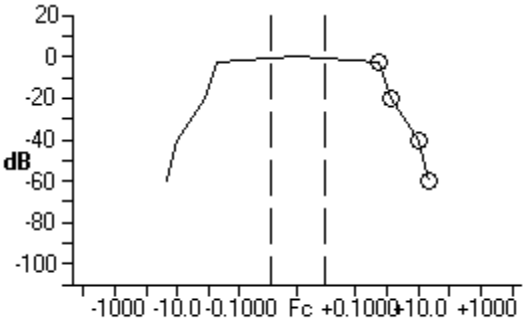
Dig. Modulation Type: (U) OTH - Other	**Digital Bit Rate:** (U) 1300000 bps

FUNDAMENTAL CURVE

(UNCLASSIFIED)

Meas/Calc: Measured

Level	**Offset (Fo)**
-3.00 dB	0.5500 MHz
-20.0 dB	1.350 MHz
-40.0 dB	10.70 MHz
-60.0 dB	22.75 MHz



EMISSION DESIGNATORS

Em. Designator: (U) 1M20F1D	**Necessary BW:** (U) 1.200 MHz
	Radar/Communications: (U) Communications
Measured/Calculated: (U) Measured	**Occupied Bandwidth:** (U) 1.200 MHz
Pulse Rep. Rate Lower Limit: (U) 256 pps	**Pulse Rep. Rate Upper Limit:** (U) 512 pps
Pulse Duration Lower Limit: (U) 1.38 ms	**Pulse Duration Upper Limit:** (U) 3.29 ms
Modulation Type: (U) Digital Modulation	**Spread Spectrum:** Yes
Spread Spectrum Type: (U) Direct Sequence	
Spread Spectrum Chip Rate: (U) 1250000 /sec	**Information Data Rate:** (U) 1000000 bps
SS Code Repetition Rate: (U) 1250000 /sec	**SS Processing Gain:** (U) 14.0 dB

Dig. Modulation Type:

TRANSMITTER EQUIPMENT CHARACTERISTICS

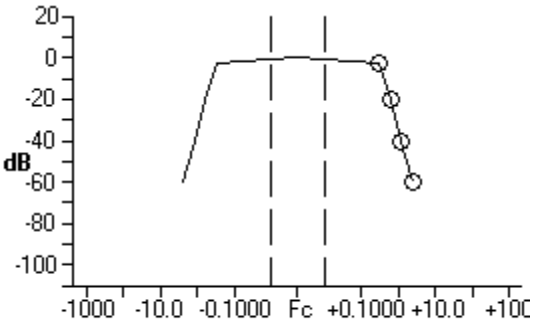
(U) GMSK - Gaussian Minimum Shift Keying

FUNDAMENTAL CURVE

(UNCLASSIFIED)

Meas/Calc: Measured

Level	**Offset (Fo)**
-3.00 dB	0.3000 MHz
-20.0 dB	0.6500 MHz
-40.0 dB	1.200 MHz
-60.0 dB	2.400 MHz



FREQUENCIES

Tuning Range: (U) 450.1 MHz - 512.0 MHz

Tuning Method: (U) Crystal Controlled Synthesizer

Tuning Increment: (U) 125.0 kHz

Freq Stability: (U) 0.5ppm

Number of Frequencies Required: (U) 1

Min. Separation: (U) 1.200 MHz

Supp. of Harmonics: (U) Yes

Freq. Blocking Indicator: (U) No

EMISSION DESIGNATORS

Em. Designator: (U) 1M20F1D

Necessary BW: (U) 1.200 MHz

Radar/Communications: (U) Communications

Measured/Calculated: (U) Measured

Occupied Bandwidth: (U) 1.200 MHz

Pulse Rep. Rate Lower Limit: (U) 256 pps

Pulse Rep. Rate Upper Limit: (U) 512 pps

Pulse Duration Lower Limit: (U) 1.38 ms

Pulse Duration Upper Limit: (U) 3.29 ms

Modulation Type: (U) Digital Modulation

Spread Spectrum: Yes

Digital Bit Rate: (U) 1000000 bps

TRANSMITTER EQUIPMENT CHARACTERISTICS

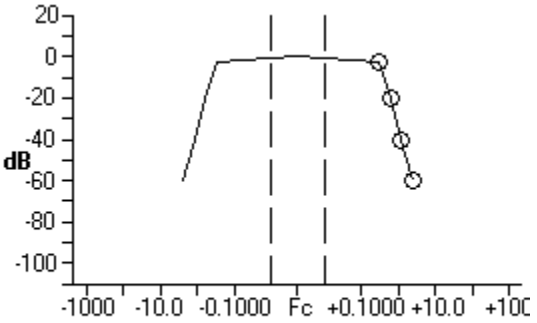
Spread Spectrum Type: (U) Direct Sequence	
Spread Spectrum Chip Rate: (U) 1250000 /sec	**Information Data Rate:** (U) 1000000 bps
SS Code Repetition Rate: (U) 1250000 /sec	**SS Processing Gain:** (U) 14.0 dB
Dig. Modulation Type: (U) GMSK - Gaussian Minimum Shift Keying	**Digital Bit Rate:** (U) 1000000 bps

FUNDAMENTAL CURVE

(UNCLASSIFIED)

Meas/Calc: Measured

Level	**Offset (Fo)**
-3.00 dB	0.3000 MHz
-20.0 dB	0.6500 MHz
-40.0 dB	1.200 MHz
-60.0 dB	2.400 MHz



EMISSION DESIGNATORS

Em. Designator: (U) 1M20G2D	**Necessary BW:** (U) 1.200 MHz
	Radar/Communications: (U) Communications
Measured/Calculated: (U) Measured	**Occupied Bandwidth:** (U) 1.200 MHz
Pulse Rep. Rate Lower Limit: (U) 192 pps	**Pulse Rep. Rate Upper Limit:** (U) 192 pps
Pulse Duration Lower Limit: (U) 2.91 ms	**Pulse Duration Upper Limit:** (U) 5.82 ms
Modulation Type: (U) Digital Modulation	**Spread Spectrum:** No

Dig. Modulation Type:

TRANSMITTER EQUIPMENT CHARACTERISTICS

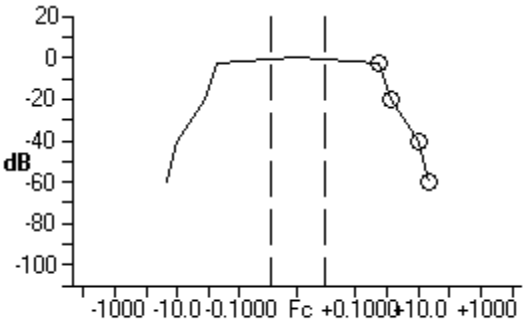
(U) OTH - Other

FUNDAMENTAL CURVE

(UNCLASSIFIED)

Meas/Calc: Measured

Level	**Offset (Fo)**
-3.00 dB	0.5500 MHz
-20.0 dB	1.350 MHz
-40.0 dB	10.70 MHz
-60.0 dB	22.75 MHz



EMISSION DESIGNATORS

Em. Designator: (U) 4M25F1D

Necessary BW: (U) 4.250 MHz

Radar/Communications: (U) Communications

Measured/Calculated: (U) Measured

Occupied Bandwidth: (U) 4.250 MHz

Pulse Rep. Rate Lower Limit: (U) 256 pps

Pulse Rep. Rate Upper Limit: (U) 512 pps

Pulse Duration Lower Limit: (U) 1.38 ms

Pulse Duration Upper Limit: (U) 3.29 ms

Modulation Type: (U) Digital Modulation

Spread Spectrum: Yes

Spread Spectrum Type:
(U) Direct Sequence

Spread Spectrum Chip Rate: (U) 5000000 /sec

Information Data Rate: (U) 2670000 bps

SS Code Repetition Rate: (U) 5000000 /sec

SS Processing Gain: (U) 14.0 dB

Dig. Modulation Type:
(U) GMSK - Gaussian Minimum Shift Keying

Digital Bit Rate: (U) 2670000 bps

Digital Bit Rate: (U) 1300000 bps

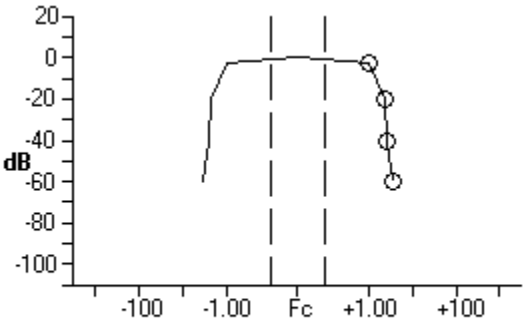
TRANSMITTER EQUIPMENT CHARACTERISTICS

FUNDAMENTAL CURVE

(UNCLASSIFIED)

Meas/Calc: Measured

Level	**Offset (Fo)**
-3.00 dB	1.050 MHz
-20.0 dB	2.400 MHz
-40.0 dB	2.700 MHz
-60.0 dB	3.450 MHz



FREQUENCIES

Tuning Range: (U) 1250 MHz - 1557 MHz	**Tuning Method:** (U) Crystal Controlled Synthesizer
Tuning Increment: (U) 125.0 kHz	**Freq Stability:** (U) 0.5ppm
Number of Frequencies Required: (U) 1	**Min. Separation:** (U) 1.200 MHz
Supp. of Harmonics: (U) Yes	
Freq. Blocking Indicator: (U) No	

EMISSION DESIGNATORS

Em. Designator: (U) 1M20G2D	**Necessary BW:** (U) 1.200 MHz
	Radar/Communications: (U) Communications
Measured/Calculated: (U) Measured	**Occupied Bandwidth:** (U) 1.200 MHz
Pulse Rep. Rate Lower Limit: (U) 192 pps	**Pulse Rep. Rate Upper Limit:** (U) 192 pps
Pulse Duration Lower Limit: (U) 2.91 ms	**Pulse Duration Upper Limit:** (U) 5.82 ms
Modulation Type: (U) Digital Modulation	**Spread Spectrum:** No
Dig. Modulation Type: (U) OTH - Other	**Digital Bit Rate:** (U) 1300000 bps

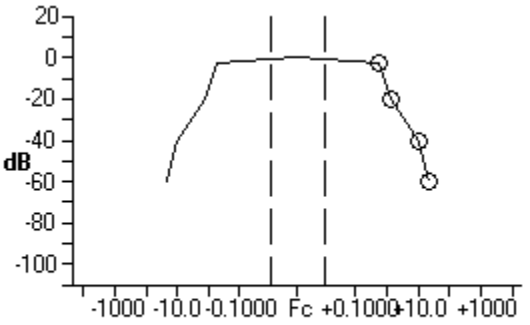
TRANSMITTER EQUIPMENT CHARACTERISTICS

FUNDAMENTAL CURVE

(UNCLASSIFIED)

Meas/Calc: Measured

Level	**Offset (Fo)**
-3.00 dB	0.5500 MHz
-20.0 dB	1.350 MHz
-40.0 dB	10.70 MHz
-60.0 dB	22.75 MHz



EMISSION DESIGNATORS

Em. Designator: (U) 4M25F1D

Necessary BW: (U) 4.250 MHz

Radar/Communications: (U) Communications

Measured/Calculated: (U) Measured

Occupied Bandwidth: (U) 4.250 MHz

Pulse Rep. Rate Lower Limit: (U) 256 pps

Pulse Rep. Rate Upper Limit: (U) 512 pps

Pulse Duration Lower Limit: (U) 1.38 ms

Pulse Duration Upper Limit: (U) 3.29 ms

Modulation Type: (U) Digital Modulation

Spread Spectrum: Yes

Spread Spectrum Type:
(U) Direct Sequence

Spread Spectrum Chip Rate: (U) 5000000 /sec

Information Data Rate: (U) 2670000 bps

SS Code Repetition Rate: (U) 5000000 /sec

SS Processing Gain: (U) 14.0 dB

Dig. Modulation Type:
(U) GMSK - Gaussian Minimum Shift Keying

Digital Bit Rate: (U) 2670000 bps

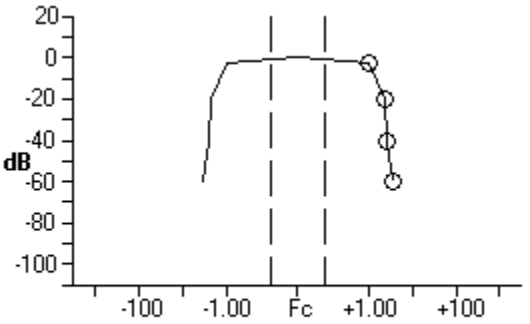
TRANSMITTER EQUIPMENT CHARACTERISTICS

FUNDAMENTAL CURVE

(UNCLASSIFIED)

Meas/Calc: Measured

Level	**Offset (Fo)**
-3.00 dB	1.050 MHz
-20.0 dB	2.400 MHz
-40.0 dB	2.700 MHz
-60.0 dB	3.450 MHz



EMISSION DESIGNATORS

Em. Designator: (U) 1M20F1D	**Necessary BW:** (U) 1.200 MHz
	Radar/Communications: (U) Communications
Measured/Calculated: (U) Measured	**Occupied Bandwidth:** (U) 1.200 MHz
Pulse Rep. Rate Lower Limit: (U) 256 pps	**Pulse Rep. Rate Upper Limit:** (U) 512 pps
Pulse Duration Lower Limit: (U) 1.38 ms	**Pulse Duration Upper Limit:** (U) 3.29 ms
Modulation Type: (U) Digital Modulation	**Spread Spectrum:** Yes
Spread Spectrum Type: (U) Direct Sequence	
Spread Spectrum Chip Rate: (U) 1250000 /sec	**Information Data Rate:** (U) 1000000 bps
SS Code Repetition Rate: (U) 1250000 /sec	**SS Processing Gain:** (U) 14.0 dB
Dig. Modulation Type: (U) GMSK - Gaussian Minimum Shift Keying	**Digital Bit Rate:** (U) 1000000 bps

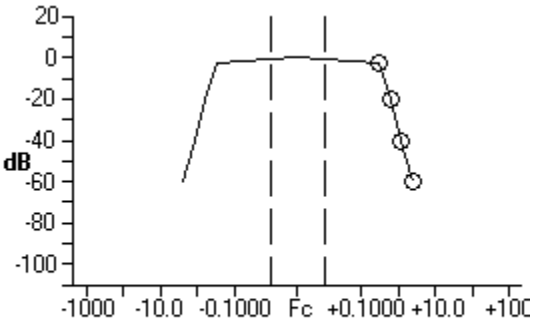
TRANSMITTER EQUIPMENT CHARACTERISTICS

FUNDAMENTAL CURVE

(UNCLASSIFIED)

Meas/Calc: Measured

Level	**Offset (Fo)**
-3.00 dB	0.3000 MHz
-20.0 dB	0.6500 MHz
-40.0 dB	1.200 MHz
-60.0 dB	2.400 MHz



FREQUENCIES

Tuning Range: (U) 1613 MHz - 2500 MHz	**Tuning Method:** (U) Crystal Controlled Synthesizer
Tuning Increment: (U) 125.0 kHz	**Freq Stability:** (U) 0.5ppm
Number of Frequencies Required: (U) 1	**Min. Separation:** (U) 1.200 MHz
Supp. of Harmonics: (U) Yes	
Freq. Blocking Indicator: (U) No	

EMISSION DESIGNATORS

Em. Designator: (U) 1M20G2D	**Necessary BW:** (U) 1.200 MHz
	Radar/Communications: (U) Communications
Measured/Calculated: (U) Measured	**Occupied Bandwidth:** (U) 1.200 MHz
Pulse Rep. Rate Lower Limit: (U) 192 pps	**Pulse Rep. Rate Upper Limit:** (U) 192 pps
Pulse Duration Lower Limit: (U) 2.91 ms	**Pulse Duration Upper Limit:** (U) 5.82 ms
Modulation Type: (U) Digital Modulation	**Spread Spectrum:** No
Dig. Modulation Type: (U) OTH - Other	**Digital Bit Rate:** (U) 1300000 bps

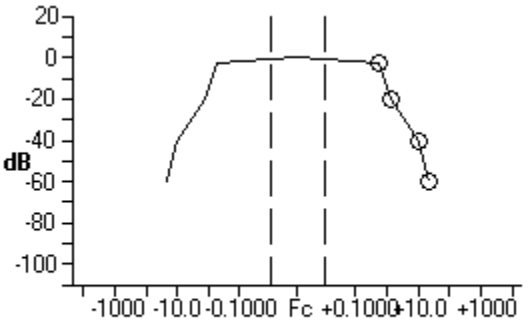
TRANSMITTER EQUIPMENT CHARACTERISTICS

FUNDAMENTAL CURVE

(UNCLASSIFIED)

Meas/Calc: Measured

Level	**Offset (Fo)**
-3.00 dB	0.5500 MHz
-20.0 dB	1.350 MHz
-40.0 dB	10.70 MHz
-60.0 dB	22.75 MHz



EMISSION DESIGNATORS

Em. Designator: (U) 4M25F1D

Necessary BW: (U) 4.250 MHz

Radar/Communications: (U) Communications

Measured/Calculated: (U) Measured

Occupied Bandwidth: (U) 4.250 MHz

Pulse Rep. Rate Lower Limit: (U) 256 pps

Pulse Rep. Rate Upper Limit: (U) 512 pps

Pulse Duration Lower Limit: (U) 1.38 ms

Pulse Duration Upper Limit: (U) 3.29 ms

Modulation Type: (U) Digital Modulation

Spread Spectrum: Yes

Spread Spectrum Type:
(U) Direct Sequence

Spread Spectrum Chip Rate: (U) 5000000 /sec

Information Data Rate: (U) 2670000 bps

SS Code Repetition Rate: (U) 5000000 /sec

SS Processing Gain: (U) 14.0 dB

Dig. Modulation Type:
(U) GMSK - Gaussian Minimum Shift Keying

Digital Bit Rate: (U) 2670000 bps

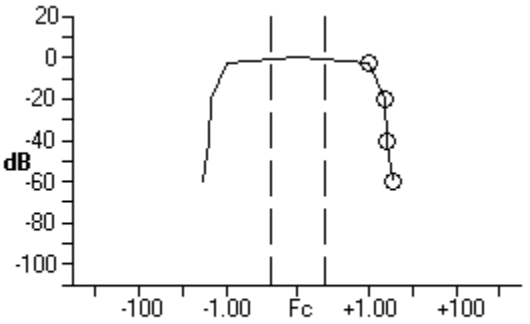
TRANSMITTER EQUIPMENT CHARACTERISTICS

FUNDAMENTAL CURVE

(UNCLASSIFIED)

Meas/Calc: Measured

Level	**Offset (Fo)**
-3.00 dB	1.050 MHz
-20.0 dB	2.400 MHz
-40.0 dB	2.700 MHz
-60.0 dB	3.450 MHz



EMISSION DESIGNATORS

Em. Designator: (U) 1M20F1D	**Necessary BW:** (U) 1.200 MHz
	Radar/Communications: (U) Communications
Measured/Calculated: (U) Measured	**Occupied Bandwidth:** (U) 1.200 MHz
Pulse Rep. Rate Lower Limit: (U) 256 pps	**Pulse Rep. Rate Upper Limit:** (U) 512 pps
Pulse Duration Lower Limit: (U) 1.38 ms	**Pulse Duration Upper Limit:** (U) 3.29 ms
Modulation Type: (U) Digital Modulation	**Spread Spectrum:** Yes
Spread Spectrum Type: (U) Direct Sequence	
Spread Spectrum Chip Rate: (U) 1250000 /sec	**Information Data Rate:** (U) 1000000 bps
SS Code Repetition Rate: (U) 1250000 /sec	**SS Processing Gain:** (U) 14.0 dB
Dig. Modulation Type: (U) GMSK - Gaussian Minimum Shift Keying	**Digital Bit Rate:** (U) 1000000 bps

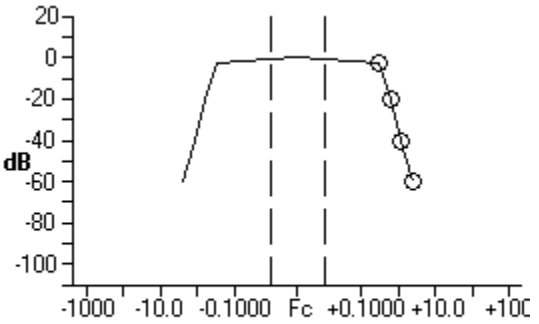
TRANSMITTER EQUIPMENT CHARACTERISTICS

FUNDAMENTAL CURVE

(UNCLASSIFIED)

Meas/Calc: Measured

Level	Offset (Fo)
-3.00 dB	0.3000 MHz
-20.0 dB	0.6500 MHz
-40.0 dB	1.200 MHz
-60.0 dB	2.400 MHz



Remark(s) (U)

(U) 1494 Item 19) Power: Power is selectable between Low (0.5 W) or High (5.0 W).

(U) 1494 Item 3) Installation: In Precision Guided Munitions (PGMs) installations, the radio could be communicating with air and/or ground platforms.

(U) 1494 Item 5) Tuning Range: X-Net is capable of operating from 225-512 MHz and 1250-2500 MHz with exclusions 328.6-335.4 MHz and 1559-1610 MHz. Additional exclusions via operational procedures as required.

(U) 1494 Item 7) RF Channeling Capability: In the EW or CC modes, X-Net is capable of operating using a one (1) channel or using up to eight (8) channels with frequency hopping either enabled or disabled. Each channel frequency is user configurable. In the WB mode, X-Net is capable of operating using one (1) channel or using up to twelve (12) simultaneous channels within a 20 MHz contiguous band. Each channel frequency is user configurable.

(U) 1494 Item 11) Spread Spectrum Type: EW and CC modes use Direct Sequence Spread Spectrum.

(U) 1494 Item 13) Information Rate: The maximum information rate is based on the modulation scheme and Time Division Multiple Access (TDMA) architecture for each mode.

The maximum information rate is 2.67 Mbps for the EW mode, 1.00 Mbps for the CC mode, and 1.30 Mbps for the WB mode.

(U) 1494 Item 8) Emission Designators: The transceiver is configurable at start-up to operate one of three modes: EW, CC, or WB mode, which is is a persistent configurable parameter.

(U) 1494 Item 4) Transmitter Type: EPLRS EW and CC modes are a Direct Sequence Spread Spectrum (DSSS) waveform utilizing Gaussian Minimum Shift Keying (GMSK) modulation. EPLRS WB mode is an Orthogonal Frequency Division Multiplexing (OFDM) waveform utilizing Binary Phase Shift Keying (BPSK) and Quadrature Phase Shift Keying (QPSK) modulation.

RECEIVER EQUIPMENT CHARACTERISTICS

Nomenclature: (U) AN/PRC-164	**Manufacturer:** (U) RAYTHEON CO. OR RAYTHEON MANUFACTURING CO.
Other Nomenclature: (U) RT-2090	
NTIA Approval Status: (U) Unapproved	**Coordination ID:** J/F 12
Date of Import: 2/5/2019 6:04:51 PM (GMT)	**Date/Time Last Mod.:** 11/22/2019 11:46:34 PM (GMT)
Model Name: (U) X-Net Radio System, 6157000	**Fcc Acc. Number:**
Image Reject: (U) 50.0 dB	**Oscillator Tuned:** (U) Either
Cond. Undesired Em.:	**Proxy:** No
Homodyne: Yes	
RxType (U) Direct Conversion	**Rx Installation(s)** (U) Ground (U) Airborne (U) Precision Guided Munitions

FREQUENCIES

Tuning Range: (U) 335.4 MHz - 399.9 MHz	**Tuning Method:** (U) Crystal Controlled Synthesizer
Tuning Increment: (U) 125.0 kHz	**Freq. Stability:** (U) 0.5ppm

EMISSION DESIGNATORS

Em. Designator: (U) 1M20F1D	**Sensitivities** **Sensitivity:** (U) -90.0 dBm **Necessary BW:** **Perf. Value:** (U) 90 **Noise Figure:** (U) 6.00 dB **Noise Temp.** (U) 865 K **Spur. Reject** (U) 50.0 dB **Intermod. Reject:** (U) 0.000 dB **Adj. Channel Sel.:** **Perf. Crit.:** (U) Other

RECEIVER EQUIPMENT CHARACTERISTICS

EMISSION DESIGNATORS

Em. Designator: (U) 1M20G2D

Sensitivities

Sensitivity: (U) -90.0 dBm
Necessary BW:
Perf. Value: (U) 90
Noise Figure: (U) 6.00 dB
Noise Temp. (U) 865 K
Spur. Reject (U) 50.0 dB
Intermod. Reject: (U) 0.000 dB
Adj. Channel Sel.:
Perf. Crit.: (U) Other

EMISSION DESIGNATORS

Em. Designator: (U) 4M25F1D

Sensitivities

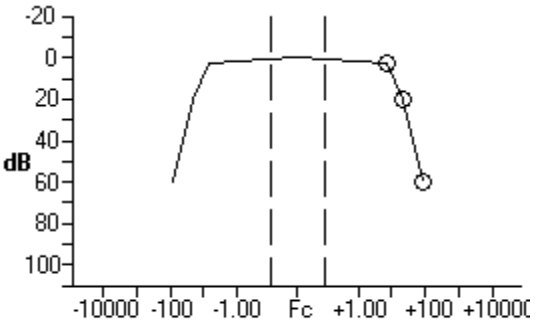
Sensitivity: (U) -90.0 dBm
Necessary BW:
Perf. Value: (U) 90
Noise Figure: (U) 6.00 dB
Noise Temp. (U) 865 K
Spur. Reject (U) 50.0 dB
Intermod. Reject: (U) 0.000 dB
Adj. Channel Sel.:
Perf. Crit.: (U) Other

RF SELECTIVITY CURVE

(UNCLASSIFIED)

Measured/Calculated: Measured

Atten.	Offset (Fo)
3.00 dB	7.500 MHz
20.0 dB	20.00 MHz
60.0 dB	81.50 MHz



FREQUENCIES

Tuning Range: (U) 420.0 MHz - 450.0 MHz

Tuning Method: (U) Crystal Controlled Synthesizer

Tuning Increment: (U) 125.0 kHz

Freq. Stability: (U) 0.5ppm

RECEIVER EQUIPMENT CHARACTERISTICS

EMISSION DESIGNATORS

Em. Designator: (U) 4M25F1D

Sensitivities

Sensitivity: (U) -90.0 dBm
Necessary BW:
Perf. Value: (U) 90
Noise Figure: (U) 6.00 dB
Noise Temp. (U) 865 K
Spur. Reject (U) 50.0 dB
Intermod. Reject: (U) 0.000 dB
Adj. Channel Sel.:
Perf. Crit.: (U) Other

EMISSION DESIGNATORS

Em. Designator: (U) 1M20F1D

Sensitivities

Sensitivity: (U) -90.0 dBm
Necessary BW:
Perf. Value: (U) 90
Noise Figure: (U) 6.00 dB
Noise Temp. (U) 865 K
Spur. Reject (U) 50.0 dB
Intermod. Reject: (U) 0.000 dB
Adj. Channel Sel.:
Perf. Crit.: (U) Other

EMISSION DESIGNATORS

Em. Designator: (U) 1M20G2D

Sensitivities

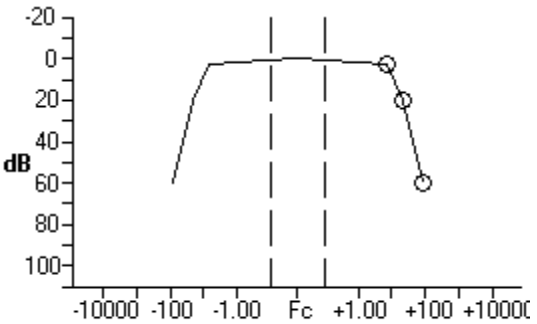
Sensitivity: (U) -90.0 dBm
Necessary BW:
Perf. Value: (U) 90
Noise Figure: (U) 6.00 dB
Noise Temp. (U) 865 K
Spur. Reject (U) 50.0 dB
Intermod. Reject: (U) 0.000 dB
Adj. Channel Sel.:
Perf. Crit.: (U) Other

RF SELECTIVITY CURVE

(UNCLASSIFIED)

Measured/Calculated: Measured

Atten.	Offset (Fo)
3.00 dB	7.500 MHz
20.0 dB	20.00 MHz
60.0 dB	81.50 MHz



RECEIVER EQUIPMENT CHARACTERISTICS

FREQUENCIES

Tuning Range: (U) 225.0 MHz - 328.6 MHz

Tuning Method: (U) Crystal Controlled Synthesizer

Tuning Increment: (U) 125.0 kHz

Freq. Stability: (U) 0.5ppm

EMISSION DESIGNATORS

Em. Designator: (U) 1M20F1D

Sensitivities

Sensitivity: (U) -90.0 dBm
Necessary BW:
Perf. Value: (U) 90
Noise Figure: (U) 6.00 dB
Noise Temp. (U) 865 K
Spur. Reject (U) 50.0 dB
Intermod. Reject: (U) 0.000 dB
Adj. Channel Sel.:
Perf. Crit.: (U) Other

EMISSION DESIGNATORS

Em. Designator: (U) 1M20G2D

Sensitivities

Sensitivity: (U) -90.0 dBm
Necessary BW:
Perf. Value: (U) 90
Noise Figure: (U) 6.00 dB
Noise Temp. (U) 865 K
Spur. Reject (U) 50.0 dB
Intermod. Reject: (U) 0.000 dB
Adj. Channel Sel.:
Perf. Crit.: (U) Other

EMISSION DESIGNATORS

Em. Designator: (U) 4M25F1D

Sensitivities

Sensitivity: (U) -90.0 dBm
Necessary BW:
Perf. Value: (U) 90
Noise Figure: (U) 6.00 dB
Noise Temp. (U) 865 K
Spur. Reject (U) 50.0 dB
Intermod. Reject: (U) 0.000 dB
Adj. Channel Sel.:
Perf. Crit.: (U) Other

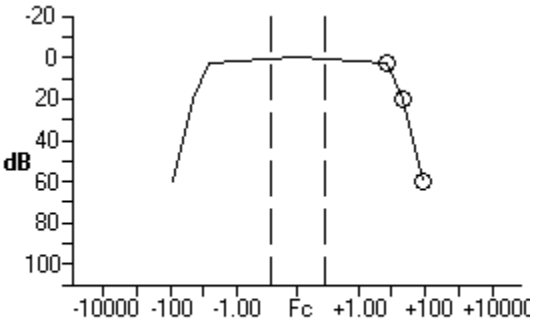
RECEIVER EQUIPMENT CHARACTERISTICS

RF SELECTIVITY CURVE

(UNCLASSIFIED)

Measured/Calculated: Measured

Atten.	Offset (Fo)
3.00 dB	7.500 MHz
20.0 dB	20.00 MHz
60.0 dB	81.50 MHz



FREQUENCIES

Tuning Range: (U) 450.1 MHz - 512.0 MHz

Tuning Method: (U) Crystal Controlled Synthesizer

Tuning Increment: (U) 125.0 kHz

Freq. Stability: (U) 0.5ppm

EMISSION DESIGNATORS

Em. Designator: (U) 1M20F1D

Sensitivities

Sensitivity: (U) -90.0 dBm
Necessary BW:
Perf. Value: (U) 90
Noise Figure: (U) 6.00 dB
Noise Temp. (U) 865 K
Spur. Reject (U) 50.0 dB
Intermod. Reject: (U) 0.000 dB
Adj. Channel Sel.:
Perf. Crit.: (U) Other

EMISSION DESIGNATORS

Em. Designator: (U) 1M20G2D

Sensitivities

Sensitivity: (U) -90.0 dBm
Necessary BW:
Perf. Value: (U) 90
Noise Figure: (U) 6.00 dB
Noise Temp. (U) 865 K
Spur. Reject (U) 50.0 dB
Intermod. Reject: (U) 0.000 dB
Adj. Channel Sel.:
Perf. Crit.: (U) Other

RECEIVER EQUIPMENT CHARACTERISTICS

EMISSION DESIGNATORS

Em. Designator: (U) 4M25F1D

Sensitivities

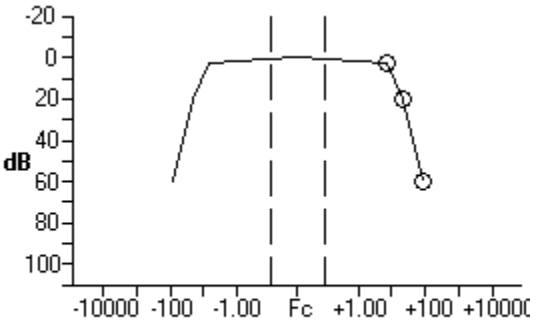
Sensitivity: (U) -90.0 dBm
Necessary BW:
Perf. Value: (U) 90
Noise Figure: (U) 6.00 dB
Noise Temp. (U) 865 K
Spur. Reject (U) 50.0 dB
Intermod. Reject: (U) 0.000 dB
Adj. Channel Sel.:
Perf. Crit.: (U) Other

RF SELECTIVITY CURVE

(UNCLASSIFIED)

Measured/Calculated: Measured

Atten.	Offset (Fo)
3.00 dB	7.500 MHz
20.0 dB	20.00 MHz
60.0 dB	81.50 MHz



FREQUENCIES

Tuning Range: (U) 1613 MHz - 2500 MHz

Tuning Method: (U) Crystal Controlled Synthesizer

Tuning Increment: (U) 125.0 kHz

Freq. Stability: (U) 0.5ppm

EMISSION DESIGNATORS

Em. Designator: (U) 1M20F1D

Sensitivities

Sensitivity: (U) -90.0 dBm
Necessary BW:
Perf. Value: (U) 90
Noise Figure: (U) 6.00 dB
Noise Temp. (U) 865 K
Spur. Reject (U) 50.0 dB
Intermod. Reject: (U) 0.000 dB
Adj. Channel Sel.:
Perf. Crit.: (U) Other

RECEIVER EQUIPMENT CHARACTERISTICS

EMISSION DESIGNATORS

Em. Designator: (U) 1M20G2D

Sensitivities

Sensitivity: (U) -90.0 dBm
Necessary BW:
Perf. Value: (U) 90
Noise Figure: (U) 6.00 dB
Noise Temp. (U) 865 K
Spur. Reject (U) 50.0 dB
Intermod. Reject: (U) 0.000 dB
Adj. Channel Sel.:
Perf. Crit.: (U) Other

EMISSION DESIGNATORS

Em. Designator: (U) 4M25F1D

Sensitivities

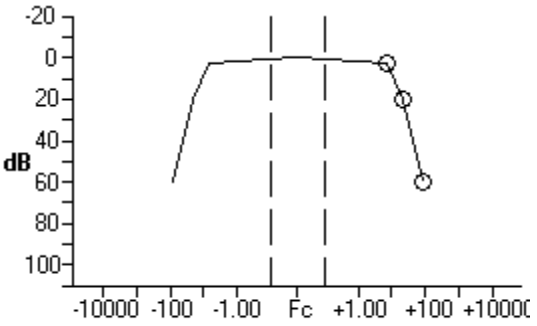
Sensitivity: (U) -90.0 dBm
Necessary BW:
Perf. Value: (U) 90
Noise Figure: (U) 6.00 dB
Noise Temp. (U) 865 K
Spur. Reject (U) 50.0 dB
Intermod. Reject: (U) 0.000 dB
Adj. Channel Sel.:
Perf. Crit.: (U) Other

RF SELECTIVITY CURVE

(UNCLASSIFIED)

Measured/Calculated: Measured

Atten.	Offset (Fo)
3.00 dB	7.500 MHz
20.0 dB	20.00 MHz
60.0 dB	81.50 MHz



FREQUENCIES

Tuning Range: (U) 1250 MHz - 1557 MHz

Tuning Method: (U) Crystal Controlled Synthesizer

Tuning Increment: (U) 125.0 kHz

Freq. Stability: (U) 0.5ppm

RECEIVER EQUIPMENT CHARACTERISTICS

EMISSION DESIGNATORS

Em. Designator: (U) 1M20F1D

Sensitivities

Sensitivity: (U) -90.0 dBm
Necessary BW:
Perf. Value: (U) 90
Noise Figure: (U) 6.00 dB
Noise Temp. (U) 865 K
Spur. Reject (U) 50.0 dB
Intermod. Reject: (U) 0.000 dB
Adj. Channel Sel.:
Perf. Crit.: (U) Other

EMISSION DESIGNATORS

Em. Designator: (U) 1M20G2D

Sensitivities

Sensitivity: (U) -90.0 dBm
Necessary BW:
Perf. Value: (U) 90
Noise Figure: (U) 6.00 dB
Noise Temp. (U) 865 K
Spur. Reject (U) 50.0 dB
Intermod. Reject: (U) 0.000 dB
Adj. Channel Sel.:
Perf. Crit.: (U) Other

EMISSION DESIGNATORS

Em. Designator: (U) 4M25F1D

Sensitivities

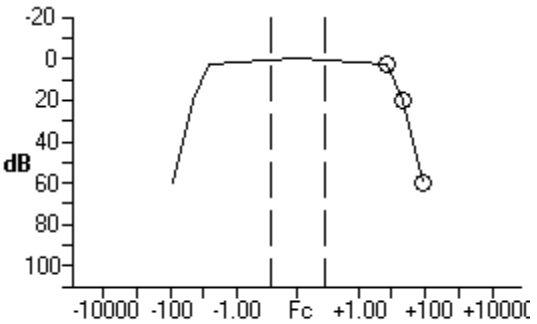
Sensitivity: (U) -90.0 dBm
Necessary BW:
Perf. Value: (U) 90
Noise Figure: (U) 6.00 dB
Noise Temp. (U) 865 K
Spur. Reject (U) 50.0 dB
Intermod. Reject: (U) 0.000 dB
Adj. Channel Sel.:
Perf. Crit.: (U) Other

RF SELECTIVITY CURVE

(UNCLASSIFIED)

Measured/Calculated: Measured

Atten.	Offset (Fo)
3.00 dB	7.500 MHz
20.0 dB	20.00 MHz
60.0 dB	81.50 MHz



RECEIVER EQUIPMENT CHARACTERISTICS

Remark(s) (U)

(U) 1494 Item 3) Installation: In Precision Guided Munitions (PGMs) installations, the radio could be communicating with air and/or ground platforms.
The radio could also be used for ground-to-ground communications, and air-to-air communications.

(U) 1494 Item 17) Sensitivity: Peformance Criteria: The performance criteria used is Packet Completion Rate. The performance value to determine that the message completion rate is adequate is a 90% packet completion rate.

(U) 1494 Item 7) RF Channeling Capability: In the EW (4M25F1d) or CC (1M20F1D) modes, X-Net is capable of operating using a one (1) channel or using up to eight (8) channels with frequency hopping either enabled or disabled. Each channel frequency is user configurable. In the WB (1M20G2D) mode, X-Net is capable of operating using one (1) channel or using up to twelve (12) simultaneous channels within a 20 MHz contiguous band. Each channel frequency is user configurable.

(U) 1494 Item 5) Tuning Range: The transceiver is capable of operating from 70-6000 MHz, but the radio's RF Front End limits the usable frequency to 225-512 MHz and 1250-2500 MHz with firmware exclusions for 328.6-335.4 MHz and 1559-1610 MHz. Additional exclusions via operational procedures as required.

(U) 1494 Item 10, 12) IF Selectivity & Frequency: There is no intermediate stage as the transceiver is a direct conversion RFIC from baseband to RF.

ANTENNA EQUIPMENT CHARACTERISTICS

Nomenclature: (U) Wrap-around Antenna

Manufacturer: (U) HAIGH-FARR INCORPORATED

NTIA Approval Status: (U) Unapproved

Coordination ID: J/F 12

Date of Import:

Date/Time Last Mod.: 6/12/2019 4:02:54 PM (GMT)

Model Name: (U) 15375

Antenna Type: (U) Linear

Antenna Category: Linear

FREQUENCIES

Lower Frequency Limit: (U) 420.0 MHz
Upper Frequency Limit: (U) 450.0 MHz

ANTENNA CHARACTERISTICS

Polarization: (U) Vertical

Atten. Rel/Act: (U) Actual dBi

BEAMWIDTH

Horizontal: (U) 360 degrees

Vertical: (U) 180 degrees

SCAN CHARACTERISTICS

GAIN

Main Beam: (U) -10.0 dBi

1st Horz. Side Lobe Lvl.: (U) 0.000 dB

1st Ver. Side Lobe Lvl.: (U) 0.000 dB

ANTENNA EQUIPMENT CHARACTERISTICS

Nomenclature: (U) UHF Monopole Antenna

Manufacturer: (U) DYNETICS

NTIA Approval Status: (U) Unapproved

Coordination ID: J/F 12

Date of Import: 2/5/2019 6:04:51 PM (GMT)

Date/Time Last Mod.: 6/7/2019 5:09:39 PM (GMT)

Model Name: (U) 1006817

Antenna Type: (U) Monopole

Antenna Category: Linear

FREQUENCIES

Lower Frequency Limit: (U) 402.0 MHz
Upper Frequency Limit: (U) 498.0 MHz

ANTENNA CHARACTERISTICS

Polarization: (U) Vertical

Atten. Rel/Act: (U) Actual dBi

BEAMWIDTH

Horizontal: (U) 110 degrees

Vertical: (U) 50.0 degrees

SCAN CHARACTERISTICS

GAIN

Main Beam: (U) 4.25 dBi

1st Horz. Side Lobe Lvl.: (U) 0.000 dB

1st Ver. Side Lobe Lvl.: (U) 0.500 dB

ANTENNA EQUIPMENT CHARACTERISTICS

Nomenclature: (U) Omni Vehicle & Fixed Shelter

Manufacturer: (U) R. A. MILLER INDUSTRIES

NTIA Approval Status: (U) Unapproved

Coordination ID: J/F 12

Date of Import: 2/5/2019 6:04:51 PM (GMT)

Date/Time Last Mod.: 11/22/2019 5:24:31 PM (GMT)

Model Name: (U) NTDR

Antenna Type: (U) Dipole

Antenna Category: Linear

FREQUENCIES

Lower Frequency Limit: (U) 225.0 MHz
Upper Frequency Limit: (U) 512.0 MHz

ANTENNA CHARACTERISTICS

Polarization: (U) Vertical

Atten. Rel/Act: (U) Actual dBi

BEAMWIDTH

Horizontal: (U) 360 degrees

Vertical: (U) 40.0 degrees

SCAN CHARACTERISTICS

GAIN

Main Beam: (U) 3.00 dBi

1st Horz. Side Lobe Lvl.: (U) 0.000 dB

1st Ver. Side Lobe Lvl.: (U) 0.000 dB

Remark(s) (U)

(U) Vertical Bemwidth: The vertical beamwidth is frequency specific as follows; (Frequency : Vertical Beamwidth) => (225 MHz : 40 degrees); (335 MHz : 26 degrees); (400 MHz : 20 degrees)

ANTENNA EQUIPMENT CHARACTERISTICS

Nomenclature: (U) Airborne Blade Antenna

Manufacturer: (U) SENSOR SYSTEMS

NTIA Approval Status: (U) Unapproved

Coordination ID: J/F 12

Date of Import: 2/5/2019 6:04:51 PM (GMT)

Date/Time Last Mod.: 11/22/2019 10:55:47 PM (GMT)

Model Name: (U) S65-8282-512

Antenna Type: (U) Blade

Antenna Category: Linear

FREQUENCIES

Lower Frequency Limit: (U) 225.0 MHz
Upper Frequency Limit: (U) 512.0 MHz

ANTENNA CHARACTERISTICS

Polarization: (U) Vertical

Atten. Rel/Act: (U) Actual dBi

BEAMWIDTH

Horizontal: (U) 360 degrees

Vertical: (U) 40.0 degrees

SCAN CHARACTERISTICS

GAIN

Main Beam: (U) -2.00 dBi

1st Horz. Side Lobe Lvl.: (U) 0.000 dB

1st Ver. Side Lobe Lvl.: (U) 0.000 dB

COMPLIANCE CHECK REPORT

Antenna: (U) Wrap-around Antenna

NTIA General NTIA-Gen-0031, Page: 60
Severity: WARNING
Description:

The Manufacturer is not listed in the pre-defined manufacturer table. Make sure this is a valid new manufacturer and not a variation of an existing manufacturer or a mis-spelling before sending this Certification to NTIA.

Antenna: (U) UHF Monopole Antenna

NTIA General NTIA-Gen-0031, Page: 61
Severity: WARNING
Description:

The Manufacturer is not listed in the pre-defined manufacturer table. Make sure this is a valid new manufacturer and not a variation of an existing manufacturer or a mis-spelling before sending this Certification to NTIA.

Table of Contents For

(U) X-Net Radio, AN/PRC-164