UNCLASSIFIED	
SECURITY SUMMARY & SPECIAL HANDLING REQUIREMENTS	
The title of this application is : AN/PPS-26A, Sense Through The Wall (STTW) Radar	
The overall classification of this application is: UNCLASSIFIED	
Refer to your Security Manual for further guidance.	
The Application Level Special Handling is : E	
Exempt from the Freedom of Information Act Not Releasable outside the US Government IAW Section 552 (b)(1) of Title 5 of	the US Code
Not releasable outside the GC Government in the GC (S)(1) of This G of	ino do odde.
DOWNGRADING INSTRUCTIONS	
Special Handling Instruction :E	OL A COLFIGATION
	CLASSIFICATION UNCLASSIFIED

CLASSIFICATION UNCLASSIFIED PAGE 1

FULL RECORD PRINT FOR AN/PPS-26A, Sense Through The Wall

Selected Frequencies

(U) 3150.000 MHz

Application Title

(U) AN/PPS-26A, Sense Through The Wall (STTW) Radar

System Name : (U) AN/PPS-26A, Sense Through The Wall

(Nomenclature)

Stage : (U) 4 - Operational

Agency: (U) AR - Department of the Army

NTIA Certified : (U) No

Date Of Import : 1/18/2011 10:04:07 PM (GMT) **Date/Time Last Mod.** : 1/18/2011 8:18:48 PM (GMT)

Overall Security : Unclassified

System Description

(U) A low power, hand held radiolocation device for through wall detection and location of moving personnel for military and law enforcement use to gain increased situational awareness in urban combat situations.

Geographic Areas for Stage 4

(U) Afghanistan (U) Polygon

(U) Buena Park, (U) California (U) Single Point

Lat/Lon : (U) 33 51'28"N 118 0'15"W

(U) El Segundo, (U) California (U) Single Point

Lat/Lon : (U) 33 54'38"N 118 25'33"W

(U) Iraq (U) Polygon

(U) Forest, (U) Mississippi (U) Single Point

Lat/Lon : (U) 32 21'29"N 89 24'12"W

(U) USP (US & POSS) (U) Polygon

Predefined Trunking? : (U) No

Certification of Spectrum Support Information

Attachments

File Name : (U) Measured data.pdf

File Name : (U) STTW EL-CID Remarks and Failures.pdf

Date of the Attachment: 1/18/2011

Recommending Offical : Stephen J. Butcher

<u>Title</u>: Chairman Spectrum Planning Subcommittee

<u>Certifying Official</u>: Edward M. Davison

<u>Title</u>: Deputy Associate Administrator

To Address : (U) Army Spectrum Management Office (ASMO)

2461 Eisenhower Ave., Suite 1204

CLASSIFICATION UNCLASSIFIED

UNCLASSIFIED PAGE 2

FULL RECORD PRINT FOR AN/PPS-26A, Sense Through The Wall

Cont. (U)

Alexandria, VA 22331-2200

From Address : (U) Intelligence and Information Warfare Directorate

ATTN: AMSRD-CER-IW-IM Building 600, McAfee Center Fort Monmouth, NJ 07703

Point(s) of Contact

(U) Raytheon Project Engineer

Scott Adcook 714-690-5055

adcook@raytheon.com
(U) USA Program Manager

Jim Herndon 703-704-2068

jim.herndon@us.army.mil (U) USA Project Engineer

Vincent Curto comm: 732-532-0915 DSN: 992-0915

vincent.curto@us.army.mil (U) Raytheon Program Manager

Carl Cook 714-690-8347

cdcook@raytheon.com

(U) Raytheon Spectrum Engineer

Igor Mikhaylov 310-616-9243

igor_mikhaylov@raytheon.com

Stage Start(s)

Stage (U) 4 - Operational Start Date : (U) 8/1/2011

Target Date(s)

System Approval : (U) 8/1/2011 **System Activation** : (U) 8/1/2011

National Coord. Required? Yes NSEP Use : (U) Yes

Extent of Use

(U) Testing: Continuous 10 hrs/day, 5 days/wk; Peacetime Training: Intermittent 2

mın

transmissions; Wartime: Intermittent 2 min transmissions 5/day.

ITU Waiver : (U) No

Number Of Units : (U) 7200

Num. Units in Same Environment: (U) 3

Number Of Units Per Stage Stage 4 : (U) 7200

Estimated Initial Cost of the System : (U) \$ 1000000

System Cost Comments

(U) \$1M for 30 developmental units.

Information Transfer Requirement

(U) N/A

System Essentiality

(U) The device provides situational awareness to tactical combat personnel engaged

CLASSIFICATION UNCLASSIFIED

UNCLASSIFIED PAGE 3

FULL RECORD PRINT FOR AN/PPS-26A, Sense Through The Wall

Cont. (U)

in urban combat. The device is a standalone system and does not require any external functional support or interfaces.

Replacement Information

(U) NA

Remark(s) (U)

- (U) AN/PPS-26A, Sense-Through-the-Wall (STTW) Radar, is Raytheon Model RS2-05. This is a low power, hand-held radiolocation system for detecting and locating moving personnel behind obstructions such as buildings and walls. The system provides situational awareness on personnel location in urban combat or law enforcement operations.
- (U) The STTW radar has center frequency of 3150 MHz. The frequency requirement ranges from 2900 MHz - 3400 MHz. The requested tuning range is 2900 MHz - 3400 MHz.
- (U) Army anticipates 1 sensor per squad, 3 per platoon. Training: Expect approximately 3 5 systems within a 150m radius in a training environment. Wartime: Expect approximately 3 10 systems within a 150m radius in an urban environment. Depending upon specific mission requirements, more sensors may be used in closer proximity in highly populated areas with a large number of buildings/structures. Due to handheld nature of system, sensors may come within 10m 20m of each other if used within the same building or area.

Stations

Station Name : (U) AN/PPS-26A

Transmitters

(U) AN/PPS-26A

Receivers

(U) AN/PPS-26A

Antennas

(U) AN/PPS-26A

Station Name : (U) Target - Generic

Selected Modes

Link

Transmitting StationReceiving Station(U) AN/PPS-26A(U) Target - Generic

Radio Service : Radiodetermination

Station Classes : MRP

Equipment Combination

 Transmitter
 : (U) AN/PPS-26A

 Tx Antenna
 : (U) AN/PPS-26A

 Receiver
 : (U) AN/PPS-26A

 Rx Antenna
 : (U) AN/PPS-26A

Selected Modes

 Frequency
 Em. Des
 Power
 Notes

 (U) 3150.000 MHz
 (U) 401MQ3N
 (U) 0.251 W Peak
 PRI

 (U) 3150.000 MHz
 (U) 322MQ3N
 (U) 0.251 W Peak
 PRI

CLASSIFICATION

CLASSIFICATION UNCLAS	SSIFIED		PAGE 4	
FULL	RECORD PRINT FOR AN/PPS-26A	, Sense Through T	he Wall	
(1	J) 3150.000 MHz	(U) 269MQ3N	(U) 0.251 W Peak	PRI
CLASSIFICATION	LINIOL ACCUSED			
	UNCLASSIFIED			

TRANSMITTER AN/PPS-26A

Nomenclature : (U) AN/PPS-26A

Manufacturer : (U) RAYTHEON CO. OR RAYTHEON MANUFACTURING CO.

Model Name : (U) STTW, RS2-05

Tx Type : (U) FM Pulsed Radar

NTIA Approval Status : (U) Unapproved

Coordination ID : J/F 12

Date of Import : 1/18/2011 10:04:07 PM (GMT) **Date/Time Last Mod.** : 1/18/2011 6:45:16 PM (GMT)

Fcc Acc. Number : (U) NA

Filter Type : (U) Low Pass with 1dB cut-off at 3800MHz and 30dB stop band at 5700MHz.

Freq. Stability : (U) 50ppm

Output Device : (U) Integrated Circuit

Tuning Method: (U) Programmable Frequency Synthesizer

Radar/Comm : (U) Radar Supp. of Harmonics : (U) No

Powers

Power Type: Peak Envelope Upper Limit: (U) 0.251 W

Figure 1 - 2nd Harmonic Curve (U)

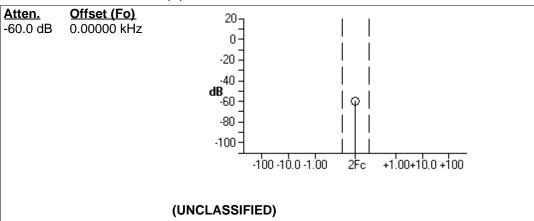
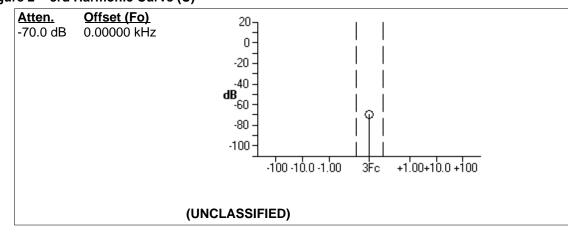
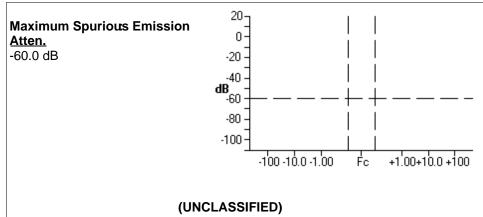


Figure 2 - 3rd Harmonic Curve (U)



CLASSIFICATION

Figure 3 - Spurious Emission Curve (U)



Frequencies

Fixed Frequency : (U) 3150.000 MHz

Freq. Blocking Indicator : (U) No

Em. Designator : (U) 401MQ3N Necessary BW : (U) 401000 kHz

Modulation - 401MQ3N

Occupied Bandwidth : (U) 400000 kHz

Measured/Calculated : (U) Measured

Radar/Communications : (U) Radar

Radar Type : (U) FM Pulse Radar

Pulse Repetition Rate: (U) 100 ppsPulse Rise Time: (U) 0.0000100 ms

 Pulse Fall Time
 : (U) 0.0000100 ms

 Pulse Width
 : (U) 2.17 ms

 Pulse Duty Cycle
 : (U) 21.74 %

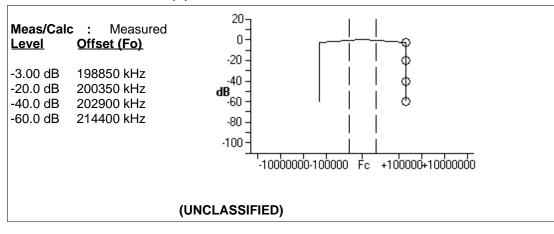
 Pulse Comp. Ratio
 : (U) 866048

 Pulse Freq. Deviation
 : (U) 398500 kHz

 Radar Processing Gain
 : (U) 15.0 dB

Radar Subpulses : (U) 2 Spread Spectrum : No

Figure 4 - Fundamental Curve (U)



Em. Designator : (U) 322MQ3N Necessary BW : (U) 322000 kHz

Modulation - 322MQ3N

Occupied Bandwidth : (U) 359000 kHz
Measured/Calculated : (U) Measured
Radar/Communications : (U) Radar

Radar Type : (U) FM Pulse Radar

Pulse Repetition Rate : (U) 100 pps Pulse Rise Time : (U) 0.0000100 ms

 Pulse Fall Time
 : (U) 0.0000100 ms

 Pulse Width
 : (U) 2.17 ms

 Pulse Duty Cycle
 : (U) 21.74 %

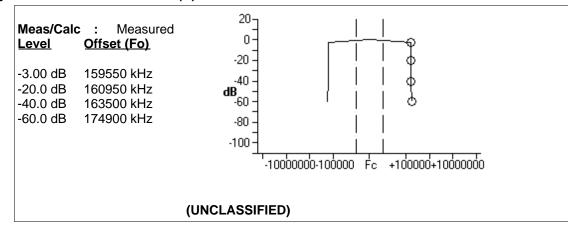
 Pulse Comp. Ratio
 : (U) 693082

 Pulse Freq. Deviation
 : (U) 318900 kHz

 Radar Processing Gain
 : (U) 15.0 dB

Radar Subpulses : (U) 2 Spread Spectrum : No

Figure 5 - Fundamental Curve (U)



CLASSIFICATION

Em. Designator : (U) 269MQ3N Necessary BW : (U) 269000 kHz

Modulation - 269MQ3N

Occupied Bandwidth : (U) 300000 kHz

Measured/Calculated : (U) Measured

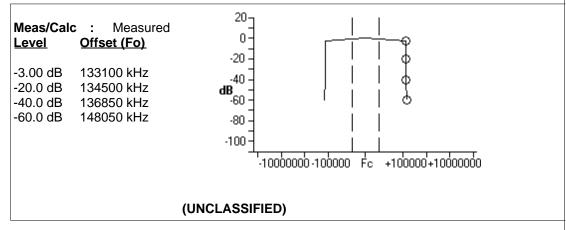
Radar/Communications : (U) Radar

Radar Type : (U) FM Pulse Radar

Pulse Repetition Rate : (U) 100 pps Pulse Rise Time : (U) 0.0000100 ms

Pulse Fall Time (U) 0.0000100 ms **Pulse Width** (U) 2.17 ms **Pulse Duty Cycle** (U) 21.74 % Pulse Comp. Ratio (U) 577366 : (U) 256600 kHz Pulse Freq. Deviation Radar Processing Gain : (U) 15.0 dB Radar Subpulses : (U) 2 **Spread Spectrum** : No

Figure 6 - Fundamental Curve (U)



Remark(s) (U)

(U) Corresponding Emission Designators: 269MQ3N, 322MQ3N, 401MQ3N

Mode Descriptions:

STTW Radar consists of three modes. Each mode is based on the range the device is used. The difference between the modes is the chirp width.

Range	Chirp	Width	Emission
20m	398.5	MHz	401MQ3N
30m	318.9	MHz	322MQ3N
40m	256.6	MHz	269MO3N

CLASSIFICATION

OLA COLFICATION	
CLASSIFICATION UNCLASSIFIED	PAGE 9
UNCLASSIFIED	0

Cont.

- (U) Remarks and Failures notes are presented in Attachments section under file Remarks and Failures.pdf.
 - Measured data is presented in the Attachments section under file Measured Data.pdf.
- (U) This is a Raytheon Sense Through the Wall (STTW) Model RS2-05
- (U) List of Failures:

Failures in Receiver Section:

401MO3N

1. At least one IF Selectivity Curve is required for each receiver frequency's Emission - Sensitivity in a Stage 4 Certification. Right-click on this Emission - Sensitivity and choose Add IF Selectivity. Make sure the curve has at least the 3, 20, and 60 dB points. Also ensure Measured/Calculated is specified.

322MO3N

2. At least one IF Selectivity Curve is required for each receiver frequency's Emission - Sensitivity in a Stage 4 Certification. Right-click on this Emission - Sensitivity and choose Add IF Selectivity. Make sure the curve has at least the 3, 20, and 60 dB points. Also ensure Measured/Calculated is specified.

269MQ3N

3. At least one IF Selectivity Curve is required for each receiver frequency's Emission - Sensitivity in a Stage 4 Certification. Right-click on this Emission - Sensitivity and choose Add IF Selectivity. Make sure the curve has at least the 3, 20, and 60 dB points. Also ensure Measured/Calculated is specified.

Failure 1-3 occur because the receiver is heterodyne and does not have IF Selectivity.

(U) These failures and their disposition have been reviewed and discussed with the NTIA/OSM and the EL-CID Help Desk who have advised to submit the .cid file "as is" along with these notes. For questions regarding these failures please contact: Ben Tadesse, NTIA/OSM, btadesse@ntia.doc.gov, +1-202-482-1693

CLASSIFICATION

CLASSIFICATION UNCLASSIFIED PAGE 10

FULL RECORD PRINT FOR AN/PPS-26A, Sense Through The Wall

RECEIVER AN/PPS-26A

Nomenclature : (U) AN/PPS-26A

Manufacturer : (U) RAYTHEON CO. OR RAYTHEON MANUFACTURING CO.

Model Name : (U) STTW, RS2-05 RxType : (U) Homodyne NTIA Approval Status : (U) Unapproved

Coordination ID : J/F 12

Date of Import : 1/18/2011 10:04:07 PM (GMT) **Date/Time Last Mod.** : 1/17/2011 7:26:21 PM (GMT)

Fcc Acc. Number : (U) NA
Freq. Stability : (U) 50ppm
Image Reject : (U) 0.000 dB
Oscillator Tuned : (U) Below

Tuning Method : (U) Programmable Frequency Synthesizer

Max. Post Detection Freq. (U) 0.1250000 MHz

Preselection Type : (U) Filter

Frequencies

Tuned Frequency: (U) 2900.000 MHz - 3400.000 MHz

Sensitivities

Em. Designator : (U) 401MQ3N

Compliance Check Result

Category: NTIA Chapter 10 NTIA-CH10-8.8.12-2-F

Severity: FAILURE

At least one IF Selectivity Curve is required for each receiver

frequency's Emission - Sensitivity in a Stage 4 Certification. Right-click on this Emission - Sensitivity and choose Add IF Selectivity. Make sure the curve has at least the 3, 20, and 60 dB points. Also ensure Measured/Calculated is specified.

Necessary BW : (U) 401000 kHz

Perf. Crit. : (U) SINAD - Signal-to-Noise and Distortion Ratio (dB)

 Perf. Value
 : (U) 0

 Sensitivity
 : (U) -120 dBm

 Noise Fig.
 : (U) 10.0 dB

 Noise Temp.
 : (U) 2610 K

 Spur. Reject
 : (U) 0.000 dB

<u>Sensitivities</u>

Em. Designator : (U) 322MQ3N

Compliance Check Result

Category: NTIA Chapter 10 NTIA-CH10-8.8.12-2-F

Severity: FAILURE

At least one IF Selectivity Curve is required for each receiver

frequency's Emission - Sensitivity in a Stage 4 Certification. Right-click on this Emission - Sensitivity and choose Add IF Selectivity. Make sure the curve has at least the 3, 20, and 60 dB points. Also ensure Measured/Calculated is specified.

01/18/2011

Necessary BW : (U) 322000 kHz

Perf. Crit. : (U) SINAD - Signal-to-Noise and Distortion Ratio (dB)

Perf. Value : (U) 0

 Sensitivity
 : (U) -120 dBm

 Noise Fig.
 : (U) 10.0 dB

 Noise Temp.
 : (U) 2610 K

 Spur. Reject
 : (U) 0.000 dB

Sensitivities

Em. Designator : (U) 269MQ3N

CLASSIFICATION

Compliance Check Result

Category: NTIA Chapter 10 NTIA-CH10-8.8.12-2-F

Severity: FAILURE

At least one IF Selectivity Curve is required for each receiver

frequency's Emission - Sensitivity in a Stage 4 Certification. Right-click on this Emission - Sensitivity and choose Add IF Selectivity. Make sure the curve has at least the 3, 20, and 60 dB points. Also ensure Measured/Calculated is specified.

Necessary BW : (U) 269000 kHz

Perf. Crit. : (U) SINAD - Signal-to-Noise and Distortion Ratio (dB)

Perf. Value : (U) 0

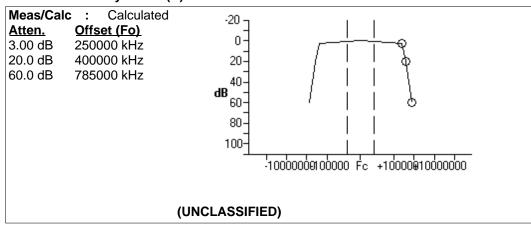
 Sensitivity
 : (U) -120 dBm

 Noise Fig.
 : (U) 10.0 dB

 Noise Temp.
 : (U) 2610 K

 Spur. Reject
 : (U) 0.000 dB

Figure 7 - RF Selectivity Curve (U)



Remark(s) (U)

(U) Homodyne receiver - oscillator is tuned at the RF input frequency (neither above nor below).

CLASSIFICATION

ANTENNA AN/PPS-26A

Nomenclature : (U) AN/PPS-26A

Manufacturer : (U) RAYTHEON CO. OR RAYTHEON MANUFACTURING CO.

Model Name : (U) STTW, RS2-05
Antenna Type : (U) Dipole Array
Antenna Category : Phased Array
NTIA Approval Status : (U) Unapproved

Coordination ID : J/F 12

 Date of Import
 : 1/18/2011 10:04:07 PM (GMT)

 Date/Time Last Mod.
 : 12/6/2010 7:51:09 PM (GMT)

Lower Freq. Limit (U) 2900.000 MHz (U) 3400.000 MHz Upper Freq. Limit Polarization (U) Vertical Main Beam Gain (U) 8.00 dBi Horz. Beamwidth (U) 50.0 degrees Vert. Beamwidth (U) 80.0 degrees Degrees of Scan (U) 360 degrees Vert. Scan Type (U) Manual

Remark(s) (U)

- (U) Scan Characteristics: The hand held device is scanned manually with variable rates. In typical applications, the user holds the device steady in one direction pointing towards a building or room at 0 degrees elevation (level over the ground) for a period of 6 to 30 seconds. As a hand held device it can be pointed by the user in any given direction.
- (U) 1st Major side lobe: -17dB
- (U) Vertical Scan:
 - Max Elev: +90 (typically 0)
 Min Elev: -90(typically 0)
- (U) Sector Blanking: NO

CLASSIFICATION

CLASSIFICATION UNCLASSIFIED PAGE 13

SUMMARY PRINT FOR AN/PPS-26A, Sense Through The Wall

Selected Frequencies

(U) 3150.000 MHz

Application Title

(U) AN/PPS-26A, Sense Through The Wall (STTW) Radar

System Name : (U) AN/PPS-26A, Sense Through The Wall

(Nomenclature)

Stage : (U) 4 - Operational

Agency : (U) AR - Department of the Army

NTIA Certified : (U) No

Date Of Import : 1/18/2011 10:04:07 PM (GMT) **Date/Time Last Mod.** : 1/18/2011 8:18:48 PM (GMT)

Overall Security : Unclassified

System Description

(U) A low power, hand held radiolocation device for through wall detection and location of moving personnel for military and law enforcement use to gain increased situational awareness in urban combat situations.

Geographic Areas for Stage 4

(U) Afghanistan (U) Polygon

(U) Buena Park, (U) California (U) Single Point

Lat/Lon : (U) 33 51'28"N 118 0'15"W

(U) El Segundo, (U) California (U) Single Point

Lat/Lon : (U) 33 54'38"N 118 25'33"W

(U) Iraq (U) Polygon

(U) Forest, (U) Mississippi (U) Single Point

Lat/Lon : (U) 32 21'29"N 89 24'12"W

(U) USP (US & POSS) (U) Polygon

Predefined Trunking? : (U) No

Certification of Spectrum Support Information

<u>Attachments</u>

File Name : (U) Measured data.pdf

File Name : (U) STTW EL-CID Remarks and Failures.pdf

Date of the Attachment: 1/18/2011

Recommending Offical : Stephen J. Butcher

<u>Title</u>: Chairman Spectrum Planning Subcommittee

<u>Certifying Official</u>: Edward M. Davison

<u>Title</u>: Deputy Associate Administrator

Stations

Station Name : (U) AN/PPS-26A

CLASSIFICATION UNCLASSIFIED

UNCLASSIFIED PAGE 14

SUMMARY PRINT FOR AN/PPS-26A, Sense Through The Wall

Transmitters

Nomenclature : (U) AN/PPS-26A

Receivers

Nomenclature : (U) AN/PPS-26A

Antennas

Nomenclature : (U) AN/PPS-26A

Station Name : (U) Target - Generic

Selected Modes

<u>Link</u>

Transmitting Station
(U) AN/PPS-26A

Receiving Station
(U) Target - Generic

Radio Service : Radiodetermination

Station Classes : MRP

Equipment Combination

 Transmitter
 : (U) AN/PPS-26A

 Tx Antenna
 : (U) AN/PPS-26A

 Receiver
 : (U) AN/PPS-26A

 Rx Antenna
 : (U) AN/PPS-26A

Selected Modes

<u>Frequency</u>	<u>Em. Des</u>	<u>Power</u>	<u>Notes</u>
(U) 3150.000 MHz	(U) 401MQ3N	(U) 0.251 W Peak	PRI
(U) 3150.000 MHz	(U) 322MQ3N	(U) 0.251 W Peak	PRI
(U) 3150.000 MHz	(U) 269MQ3N	(U) 0.251 W Peak	PRI

CLASSIFICATION

FORM NTIA-44 (3/91)

U.S. DEPARTMENT OF COMMERCE NATIONAL TELECOMMUNICATIONS

Classification

Control Numbers

AND IN	FORMATION ADMINIS	IKATION					
CERTIFICATION O	F SPECTRUM SUPP	PORT					
Recipient Agency	System				Stage of Review		
(U) Army (U) AN/PPS-26A, Sense Through The Wall			(U) 4 - Operational				
	Section 1: OPERATING CHARACTERISTICS FOR WHICH SUPPORT IS CERTIFIED						
Transmitter Nomenclature/ Transmitter Station	Frequenc	y (MHz)	Emission Designator	Power	Station Classes (Stage 4)		
	None						
	Section 2: CERTIFICA	TION LOCA	ATIONS				
	None						
	Section 3: SOURCE DO	OCUMENT	s				
	None						
	Section 4: SPS RECOM	MENDATI	IONS				
	None						
Name/Title of Recommending	Official	Signature		D	ate		
Stephen J. Butcher Chairman Spectrum Plan	ning Subcommittee						
	Section 5: NTIA CERTI	FICATION					
(U) The Office of Spe office concurs wi	ectrum Management cert th the SPS recommendat	ifies Stage tions in Se	4 spectrum support for ction 4.	this system. T	This		
Name/Title of Certifying Official	al	Signature		D	ate		
Edward M. Davison Deputy Associate Adminis	strator						
Downgrading Instructions							
	_						
Special Handling Instruction	:E						

Downgrading Instructions	
Special Handling Instruction :E	
	Page 1
Classification UNCLASSIFIED	Distribution IRAC SPS FAS

UNCLASSIFIED

Frequency List

Tx Station	Rx Station	Frequency (MHz)	Em. Des.	Radio Service	Stn. Classes
(U) AN/PPS-26A (U) Target		(U) 269MQ3N			
	(U) Target	(U) 3150.000	(U) 322MQ3N	Radiodetermination	MRP
			(U) 401MQ3N		

UNCLASSIFIED

Line Diagram: AN/PPS-26A, Sense Through The Wall

