

FOR AGENDA

UNITED STATES DEPARTMENT OF COMMERCE
National Telecommunications and
Information Administration
 Washington D.C. 20230

DATE: November 1, 2016

MEMORANDUM

TO: Stephen J. Butcher
 Chairperson, Spectrum Planning Subcommittee

FROM: Ben Tadesse
 Chief, Systems Review Branch

Tadesse Binyam

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SUBJECT: NTIA Preliminary Assessment of the Air Force's Prowl Surveillance Kit,
 Stage 4

INTRODUCTION

This memorandum presents the results of the NTIA preliminary assessment of the Air Force's request for Stage 4 (operational stage) review of the Prowl Surveillance Kit. The Prowl Surveillance Kit is a low-power, battery-operated, portable radar that detects targets within foliage. It also detects human and vehicle targets. The radar will operate in the radiolocation service. The Air Force intends to use this system for Stage 4 operations at Fort Huachuca, AZ. The Air Force plans to procure 100 radars. The estimated initial cost of this system is \$35,000. Table 1 below summarizes this system's spectrum requirements.

Table 1: Prowl Surveillance Kit's Spectrum Requirements

Requested Bands (MHz)	Requested Emission Designator	Peak Power (W)	Stage 4 Station Class Symbol
5764	320MP0N	2.13	MR

Spectrum support issues/certification are discussed hereinafter. References to the NTIA Manual are for September 2015 Revision of the May 2013 Edition.

Table 2: Preliminary Assessment Findings

ISSUES	FINDINGS	REMARKS
<p>Data Adequacy</p>	<p align="center"> Y N <input checked="" type="checkbox"/> <input type="checkbox"/> Adequate per Chapter 10 of the NTIA Manual: </p>	<p>Submitted to SPS for review in August 2016.</p>
<p>Allocations Conformance</p>	<p align="center"> Allocation Compliance: Federal Allocations </p> <p>Operations in the Radiolocation Service in the Frequency Range 5604-5924 MHz (Center Frequency 5764 MHz):</p> <p align="center"> 5600-5650 MHz 5650-5925 MHz Y N <input checked="" type="checkbox"/> <input type="checkbox"/> </p>	<p>The frequency range 5604-5924 MHz (center frequency 5764 MHz) falls within two federal allocation bands 5600-5650 MHz and 5650-5925 MHz that are allocated on a primary basis to the federal radiolocation service.</p> <p>Pertinent Footnotes:</p> <p>G2: In the band 5650-5925 MHz, use of the Federal radiolocation service is restricted to the military services.</p> <p>G56: Federal radiolocation in the band 5350-5650 MHz is primarily for the military services</p> <p>G131: Federal stations in the radiolocation service operating in the band 5470-5650 MHz shall not cause harmful interference to, nor claim protection from, Federal stations in the maritime radionavigation service.</p> <p>5.150: The band 5725-5875 MHz (center frequency 5800 MHz) is designated for industrial, scientific and medical (ISM) applications. Radiocommunication services operating within this band must accept harmful interference which may be caused by these applications. ISM equipment operating in these bands is subject to the provisions of No. 15.13.</p>
<p>Spectrum Standards</p>	<p>Section 5.2.1 of the NTIA Manual applies:</p> <p align="center">FREQUENCY TOLERANCE COMPLIANCE:</p> <p align="center"> Transmitter: Receiver: Y N Y N <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> </p>	<p align="center">Frequency Tolerance</p> <p>System: Input Data: Transmitter: 20 ppm Receiver: 20 ppm</p> <p>NTIA Requirement: 1250 ppm</p>

Table 3: Findings (Continuation)

ISSUES	FINDINGS		REMARKS
<p>Spectrum Standards</p>	<p>Sections 5.5.3 and Section 5.5.7.1 (RSEC A) of the NTIA Manual apply.</p> <p>COMPLIES:</p> <p>a) -40 dB Emission Bandwidth</p> <p>b) Out-of-Band Emissions</p> <p>c) Harmonic Levels</p> <p>d) Spurious Level</p> <p>e) Antenna Pattern</p> <p>f) Radar Tunability</p> <p>g) Radar Receiver Selectivity</p>	<p>DOES NOT APPLY</p> <p>a) Radar Receiver Spurious Rejection (no provided data)</p>	<p>Endnote 1 describes the transmitter emissions roll-off and NTIA Manual Section 5.5.7.1 standards.</p> <p><u>Specified (Transmitter):</u> 2nd Harmonic Level: -60 dB 3rd Harmonic Level: -61 dB Other Harmonic Level: -65 dB Spurious Level: -62 dB</p> <p><u>NTIA Requirement:</u> 2nd Harmonic Level: -55 dB 3rd Harmonic Level: -55 dB Other Harmonic Level: -55 dB Spurious Level: -50 dB</p> <p><u>Specified (Radar Tunability):</u> Tuning method: Direct Digital Synthesizer The Air Force indicated that the radar transmitter is software programmable but is programmed to run at a single frequency 5764 MHz.”</p> <p><u>NTIA Requirement:</u> Section 5.5.7.1 states “Fixed tuning is permitted if there is some means or method to change the operating frequency to mitigate interference or justification is provided.”</p> <p><u>Specified (Antenna):</u> Peak Power: 2.13 W 1st Vertical Side Lobe: 12.23 dB 1st Horizontal Side Lobe: 22.79 dB</p> <p><u>NTIA Requirement:</u> Section 5.5.7.1 states “For systems operating in the band 5600-5650 MHz, the first antenna sidelobe shall be suppressed 10 dB when the peak power is greater than 1 watt.”</p> <p><u>Specified (Radar Receiver Selectivity):</u> The Air Force indicated that this system uses a homodyne receiver so an IF signal is not generated. The Air Force also indicated that the received signal is directly converted to a baseband signal.</p> <p><u>NTIA Requirement:</u> Section 5.5.7.1 states “The overall receiver selectivity characteristics are commensurate with the transmitter bandwidth.”</p> <p><u>Specified Receiver Spurious Rejection:</u> No provided data</p> <p><u>NTIA Requirement:</u> 50 dB (Spurious Rejection)</p>
<p>Radiation Hazard</p>	<p>For the operations at the frequency 5764 MHz, this system is not expected to generate power densities in excess of recommended criteria.</p>		<p>CRITERIA: 10 mW/cm² criterion of 29 CFR 1910.97 and the ANSI standard C95.1-1982 criterion of 5 mW/cm².</p> <p>Input data used: Average Power: 0.0001058 W (Peak Power 2.13 W) Frequency: 5764 MHz Antenna Gain: 13 dBi</p>

Table 3: Findings (Continuation)

ISSUES	FINDINGS	REMARKS
EMC	The Systems Review Branch expects EMC problems to be manageable, providing Air Force follows proper coordination and frequency assignment procedures.	

CONCLUSION:

Spectrum resources adequate to support the subject system are expected to be available in accordance with conditions delineated in the attached draft certification:

ENDNOTES:

1. Figure 1 below shows this system’s transmitter emissions roll-off and NTIA Manual Section 5.5.7.1 out-of-band emissions standard.

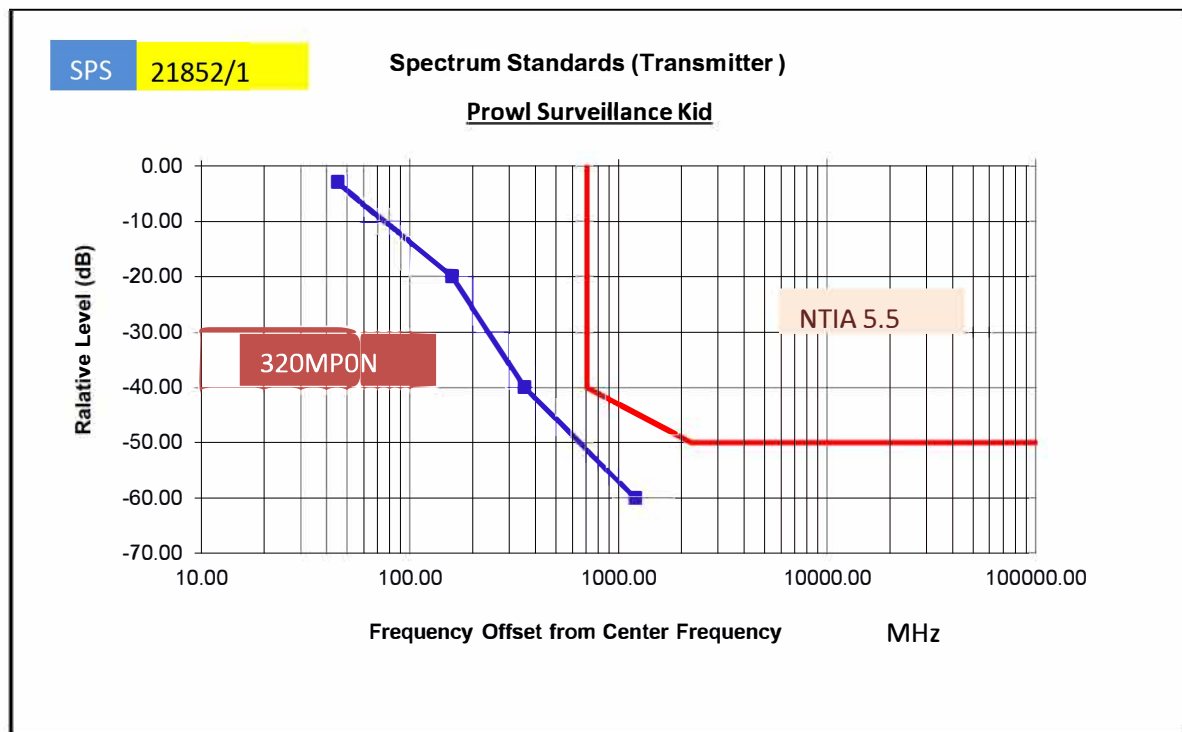


Figure 1: Conformance of the Prowl Surveillance Kit Transmitter to NTIA Out-of-Band Emission Standard (NTIA Manual Section 5.5.7.1)

FORM NTIA-44 (3/91)		U.S. DEPARTMENT OF COMMERCE NATIONAL TELECOMMUNICATIONS AND INFORMATION ADMINISTRATION		Classification UNCLASSIFIED		Control Number	
CERTIFICATION OF SPECTRUM SUPPORT							
Recipient Agency Air Force		System Prowl Surveillance Kit				Stage of Review 4 – Operational	
Section 1: OPERATING CHARACTERISTICS FOR WHICH SUPPORT IS CERTIFIED							
Frequency (MHz) 5764		Emissions 320MP0N		Peak Power (W) 2.13		Station Class MR	
						Operating Location Fort Huachuca, AZ	
Section 2: SOURCE DOCUMENTS							
Docket Number SPS-21852/1 SPS-22xxx/1		Description of Document Air Force Request for Stage 4 System Review NTIA Preliminary Assessment				Dated July 5, 2016 November 1, 2016	
Section 3: SPECTRUM PLANNING SUBCOMMITTEE (SPS) RECOMMENDATIONS							
<p>The SPS reviewed this system under the provisions of Chapter 10 of the NTIA Manual, and recommends that:</p> <ol style="list-style-type: none"> 1. NTIA certify Stage 4 spectrum support for the Prowl Surveillance Kit as specified in Section 1. 2. Air Force be aware that due to nonconformance of this radar with receiver spurious rejections standard specified in Section 5.5.7.1 of the NTIA Manual the responsibility for eliminating any harmful interference caused by the nonconformance shall rest with Air Force, in accordance with Section 5.1.2 of the NTIA Manual. 3. Air Force be aware that this system operating in the radiolocation service in the band 5470-5650 MHz shall not cause harmful interference to, nor claim protection from, Federal stations in the maritime radionavigation service, in accordance with Footnote G131 to the National Table of Frequency Allocations. 4. Air Force be aware that this system operating within the band 5725-5875 MHz must accept harmful interference which may be caused by industrial, scientific and medical (ISM) applications, in accordance with Footnote 5.150 to the National Table of Frequency Allocations. 							
Name/Title of Recommending Official Binyam Tadesse SPS Vice Chairperson		Signature				Date	
Section 4: NTIA CERTIFICATION							
<p>The Office of Spectrum Management concurs with the SPS recommendations Section 3. This office certifies Stage 4 spectrum support for this system.</p>							
Name/Title of Certifying Official Peter A. Tenhula Deputy Associate Administrator		Signature				Date	
Downgrading Instructions		Classification UNCLASSIFIED				Distribution IRAC, SPS, FAS, EPS	