

## REQUEST FOR EXPERIMENTAL AUTHORITY

BlackSky Global, LLC (“BlackSky”) herein requests experimental authority to demonstrate and test the use of two microsatellites in the manner described below for a period of eighteen (18) months, beginning no sooner than August 1, 2015.

BlackSky notes that the OET has already issued it experimental authority, by way of Special Temporary Authority (“STA”), to demonstrate and test the subject satellites.<sup>1</sup> Because of significant political developments making unavailable the Russian-operated Soyuz launch vehicles and technical issues relating to the International Space Station, including recent launch anomalies, BlackSky’s proposed launch has been delayed and it has had to change launch vehicles, resulting in a different orbital inclination and elevation, as discussed below. While the current request does not propose significant technical changes from BlackSky’s initial STA application, BlackSky is submitting the instant request for new authority, rather than further amendment of its STA, at the request of the staff to account for these changes and to seek a new license term.

### *Purpose of Experimental Authority.*

BlackSky seeks to test, develop, and demonstrate the efficacy and design of a newly configured microsatellite, including associated software applications, relative to their ability to provide high-resolution remote sensing in the Earth Exploration Satellite Service (“EESS”). To this end, BlackSky seeks experimental authority to launch, test, and demonstrate<sup>2</sup> two prototype satellites – Pathfinder-1 and Pathfinder-2<sup>3</sup> – anticipated to be launched and ready for testing as soon as August 1, 2015.<sup>4</sup>

Consistent with Section 5.64 of the Commission’s rules,<sup>5</sup> BlackSky acknowledges that it has begun construction of the proposed experimental satellite facilities, at its own risk, and on the basis of the terms of its original authorization.

The launch and operation of the subject microsatellites on the basis of experimental authority will permit BlackSky the opportunity to assemble critical feedback both as to the

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<sup>1</sup> FCC Call Sign WH9XCA (File No. 1004-EX-ST-2013).

<sup>2</sup> BlackSky has followed herein the Commission’s policy articulated regarding the seeking of experimental authority for such purposes. *See Guidance on Obtaining Experimental Authorizations for Commercial Space Launch Activities*, Public Notice, DA 13-446 (rel. Mar. 15, 2013).

<sup>3</sup> In its original application, BlackSky’s satellites were referred to as Scout 1 and Scout 2. BlackSky refers to them now internally as Pathfinder-1 and Pathfinder-2, which is reflected in the instant request.

<sup>4</sup> Because BlackSky’s current launch window is between August 1, 2015, and September 30, 2015, it is requesting a start date of August 1, 2015, with the possibility that the microsatellites may be ready for testing later than, but not earlier than, that date.

<sup>5</sup> 47 C.F.R. § 5.64.

performance of the microsattellites themselves and the overall architecture of the proposed imaging and communications system.

BlackSky brings to the Commission's attention that it had previously received authority to operate its microsattellites from the National Oceanographic and Atmospheric Administration ("NOAA"). Because of the above-referenced change in launch vehicle, BlackSky has submitted an amendment to NOAA and has requested that its authority be reissued to reflect that change. When such authority is reissued, BlackSky will submit the public summary of it into the relevant OET application docket.

Additionally, BlackSky is submitting herewith the following supporting materials: (1) an analysis it performed to satisfy the Commission's Orbital Debris Assessment requirements; (2) the application data in an exhibit formatted to facilitate its analysis by the NTIA; and (3) the application data in SpaceCap format, for submission to the ITU.<sup>6</sup>

#### *Operational Description.*

BlackSky is developing plans to deploy two satellites intended to demonstrate the technology and to experiment with configurations and processes. The satellites are proposed for launch to Low Earth Orbit on a SpaceX-owned and operated Falcon 9 launch vehicle.

Pathfinder-1 and Pathfinder-2 will be deployed from the Falcon 9 upper stage into a planned elliptical orbit of 720 x 450 km at 97.4 degrees inclination. This is a sun synchronous orbit with a local time of descending node (LTDN) of 1030.

Once in orbit, the demonstration and testing will focus on each satellite's subsystems and their collective interaction, as well as the ability to communicate with and control the satellites, test the imaging capability of the satellites, and ascertain the actual throughput of imaging data from the satellite to ground stations<sup>7</sup> and the BlackSky network operations center.

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<sup>6</sup> BlackSky will also be submitting under separate cover to the International Bureau correspondence relating to the cost recovery of the ITU filing fees.

<sup>7</sup> BlackSky notes that it had submitted a corresponding application for authority to operate ground stations that would communicate with Pathfinder-1 and Pathfinder-2 for communications and control purposes under FCC File No. 1136-EX-ST-2013. BlackSky is withdrawing that STA request and submitting concurrently herewith a corresponding application for full experimental authority, with updated ground station locations necessitated by property lease and system design issues.

The technical details of the space segment are as follows:

Pathfinder-1 and -2 frequency characteristics:

<b>Primary Payload Downlink:</b>	<b>(X-band)</b>	<b>8080 MHz ± 55 MHz</b>
<b>Secondary TT&amp;C Downlink:</b>	<b>(UHF)</b>	<b>401-402 MHz</b>
Primary TT&C Uplink <sup>8</sup> :	(S-band)	2071.875MHz ± 44kHz
Secondary TT&C Uplink:	(UHF)	449.75–451.25 MHz

Pathfinder-1 and -2 radio characteristics:

<i>Frequencies</i>	<i>Manufacturer</i>	<i>Model Number</i>
<b>X-Band</b>	Syrlinks	EWC22
<b>S-Band</b>	Quasonix	QSX-RDMS-S-1100-AB-RS
<b>UHF</b>	L3 Communications	Cadet-UHF

Pathfinder-1 and -2 antenna characteristics:

**X-Band (Tx):**

15 dBi patch antenna, 18 degree half power beamwidth, nadir pointing, right-hand circular polarization (RHCP)

**S-Band (Rx):**

6 dBi patch antenna, 90 degree half power beamwidth, nadir pointing, right-hand circular polarization (RHCP)

**UHF (Tx/Rx):**

2.15 dBi non-directional dipole, 156 degree half power beamwidth  
Linear polarization

24-hour contact details:

BlackSky maintains a 24-hour, 7-day-per-week hotline at its Mission Control Center, which can be reached at the following telephone number for any interference issues: (206) 351-5165.

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<sup>8</sup> BlackSky is providing in this exhibit the proposed earth station uplink frequencies only as informational. These frequencies are the subject of a separate application for experimental earth station authority. See n.5.