

**NARRATIVE STATEMENT**

Pursuant to Section 5.61 of the Commission's rules, 47 C.F.R. §5.61, FlightScan Corporation (FlightScan) hereby respectfully requests special temporary authority (STA) beginning May 15, 2018, to use discrete frequencies within the band 433.2125 MHz to 434.4625 MHz band for aeronautical mobile use and within in the 5030-5091 MHz band for command and control links to unmanned aircraft. FlightScan seeks this authority to enable flight operations that are intended to support its proof-of-concept to operate a Remotely Piloted Aircraft System (RPAS) that provides precise photogrammetry in direct support of bulk electrical power transmission networks.

FlightScan previously requested and received a similar STA (call sign WJ9XKW) for this same series of tests. That authority expired before the flight tests were concluded. This application is requested so that FlightScan can conduct and complete its intended experiments.

In conjunction with FCC experimental authority for the use of radio, FlightScan is fully aware of its need to secure FAA approval for all flights of unmanned aircraft for civil applications. No flights of unmanned aircraft will be conducted without proper FAA authority and approval. FlightScan is currently working with the FAA to receive a determination of airworthiness for the RPAS that it intends to use during this experiment (a Camcopter S-100). To that end, on November 16, 2017, the FCC published a [notice](#) seeking comment on proposed airworthiness criteria for the Unmanned Aircraft System, FlightScan Corporation, Camcopter S-100.

The following information is provided in support of this request:

**1) Applicant.**

FlightScan Corporation located at 200 Aviation Drive N., Suite 8, Naples, FL 34104 (FRN: 0024674616).

**2) Need for authorization**

FlightScan needs experimental authority to conduct an evaluation of the functionality and reliability of certain unmanned aircraft that will monitor and inspect utility powerlines and other similar critical infrastructure. FlightScan intends to demonstrate the feasibility and safety of an RPAS for beyond-line-of-sight flights. The STA is needed for the authorized operation of ground facilities that provide command and control data to the aircraft while in flight. Experimental authority for downlink channels is also needed to test the functionality and reliability of return transmissions.

**3) Purpose of Operation**

FlightScan seeks to conduct research into the performance and reliability of RPAS to provide continuous, routine inspection of critical strategic infrastructure using a highly sophisticated, technically advanced RPAS, equipped with the latest imaging sensor

technologies to accomplish the network monitoring. FlightScan will follow a precise mission plan that includes close interaction with a participating electrical utility to provide precise data concerning the health and reliability of their electrical transmission network. Employing sophisticated Safety Management Systems procedures, FlightScan's mission is grounded in safety; safety for the public on the ground, the stakeholder and those in the air. FlightScan intends to demonstrate that its concept of operations represents the safest, most cost effective and reliable method for monitoring and supporting the nation's electrical power grid.

The participants in the research are principals or employees of the company and will be advised that: (a) the operations are being conducted under an experimental authority issued to FlightScan, (b) the company is responsible for the experimental activities, (c) all operations are being conducted on a non-interference basis, and (d) after the test is completed, FlightScan will retrieve and recover all devices that do not comply with FCC regulations. FlightScan understands that the FCC may specify these as well as other conditions on its authorization.

#### **4) Spectrum Requested**

The primary link between ground station(s) and the RPAS will occupy the 5030-5091 MHz band. This band has been allocated for unmanned aircraft use but it not yet available for licensing under FCC rules. This spectrum would support both ground-to-air and air-to-ground links. FlightScan seeks flexibility to operate its 25 MHz signal across the band to maximize operational performance and minimize the potential for interference.

A secondary link in the UHF band would provide redundancy for the ground-to-air command and control link. The secondary link would operate within 433.2125 MHz to 434.4625 MHz. The secondary control link would occupy 25 kHz within that band. FlightScan seeks flexibility to select during the course of the experiment the most appropriate channel within this band to maximize operational performance and minimize the potential for interference.

In the event that it receives a complaint of harmful interference resulting from the proposed operation, FlightScan will take immediate action to address the interference, including if necessary discontinuing its operations. The company has designated David Morton, VP of Operations and Safety to act as the "stop buzzer" for this purpose. His contact information is also provided below to act as the "stop buzzer" for this purpose.

Notwithstanding the precautions it will take, FlightScan does not expect harmful interference to occur. The requested 5 GHz frequencies are mostly unoccupied at this time and have been allocated for the use described in this test. Further, operations will be limited in scope and duration – flights will typically last for 180 minutes a day which includes ground setup and programming) and be repeated at least three times per week.

FlightScan will also coordinate with the appropriate FAA Air Traffic control facility and publish a NOTAM and a flight Plan prior to every flight. FlightScan will also coordinate its flight missions with any other user the Commission deems necessary.

## **5) Technical Specifications**

- a. 5 GHz Temporary Fixed Ground Stations
  - i. Transmitter Power Output (TPO): 8 Watts
  - ii. Effective Radiated Power (ERP): 315 Watts
  - iii. Emission: 25M0F7W
  - iv. Frequencies: Within 5030-5091 MHz
  - v. Antenna: BMS Model Number BMA-9034, high gain panel antenna that provides 25dBi gain
  - vi. Overall Height of Antenna(s) Above Ground. 80 feet or less.
  
- b. 5 GHz Mobile Stations.
  - i. TPO: 8 Watts
  - ii. ERP: maximum of 25 Watts
  - iii. Emission: 500K0F7W
  - iv. Frequencies: Within 5030-5091 MHz
  - v. Antenna: The airborne transmitter in the RPAS operates with 8W transmitter power output which can be supplied to one of two antenna's onboard the aircraft, a 4.5dBi omni antenna and a 10.5dBi horn in the nose of the aircraft. After losses in the diplexer assembly and in cables, the total power at the antenna becomes approximately 3.6W. The 4.5dBi omni antenna yields an equivalent isotropic radiated power ("EIRP") of 10W, while the 10.5dBi horn antenna yields an EIRP of 39.8W or 6W and 25W ERP, respectively.
  
- c. 433 MHz Temporary Fixed Ground Stations.
  - i. TPO: 1 Watts
  - ii. ERP: 2 Watts
  - iii. Emission: 25K0F1D
  - iv. Frequencies: Within 433.2125 MHz to 434.4625 MHz
  - v. Antenna: The transmitter employs a 4dBi vertically polarized antenna

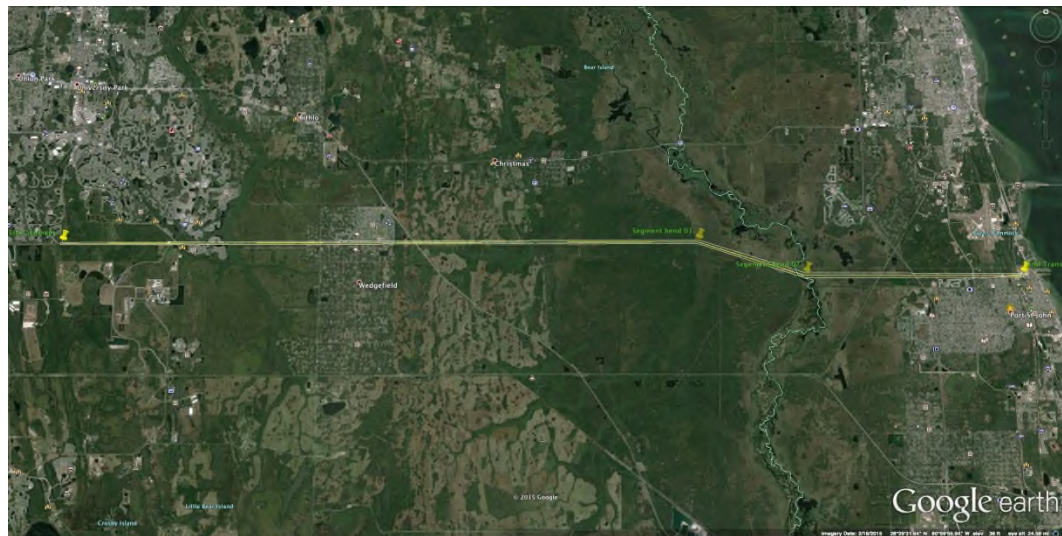
Notes: Other emission modes other than specified above under subsections (a) through (c) may be utilized, but in no event will the emissions extend beyond the frequency bands requested. All power levels will comply with the limits set forth in the FCC's rules, including those relating to human exposure to radiation.

- d. Proposed Operating Locations

**FlightScan Corporation  
Request for Experimental STA  
ELS File No. 0661-EX-ST-2017**

Subject to the FAA's approval, FlightScan's proof-of-concept mission profile will track along a narrow electrical power line right-of-way located within Orange County, Florida and Brevard County, Florida between Orlando and Titusville. The illustration below represents FlightScan's operational area under this proposed STA. The experiment will survey an approximately 42 kilometer transmission line segment for the Orlando Utility Commission, a Florida-based electric utility company. The yellow line represents the actual transmission line location and depicts the overall route of flight. Thus, the operations will occur within a narrow portion of an area defined in the accompanying application as "a 21 kilometer radius of the center coordinates (in NAD 83 Datum): 28°30'14"N; 80°58'46"W."

The operating area for the ground stations and aircraft will be within the right-of-way for the transmission line segment, which is located in a rural area in central Florida between Orlando and Titusville Florida. There is no population exposure within the right-of-way but the Flight Segment crosses over two highways (Florida Turnpike and Interstate 95). The operating area is nearly flat with little elevation variance. The average height of the terrain is approximately 22 meters above mean sea level.



In addition, prior to the initiation of the primary test, FlightScan will require FCC experimental authority to operate in the requested frequency bands when it takes delivery of the aircraft to be used in these tests. These equipment assessment and approval tests will be necessary to ensure that the supplied aircraft is operating within the manufacturer's stated specification. These tests will last only a few days and will be conducted on the grounds of the Dade-

Collier Training and Transition Airport located in the Florida Everglades at 54575 East Tamiami Trail, Ochoppee, Florida, 34141 (25-30-14N; 80-58-46W).

e. Radio Equipment To Be Used

FlightScan proposes to deploy only one ground station and one airborne transmitter located aboard a single unmanned aircraft. FlightScan expects that it will be able to complete its experimentation and demonstration with a maximum of 1 ground station and 1 aeronautical mobile device. In all experiments, FlightScan will limit the power, area of operation, and transmitting times of these units to the minimum necessary to evaluate the equipment. FlightScan does not propose to supply station identification as set forth in Section 5.115 of the Commission's Rules.

The equipment includes airborne and ground station transceiver assemblies integrated within the Schiebel Camcopter S-100 Remotely Piloted Aircraft System that have been in production by Schiebel Industries of Austria for several years for use in regions outside of the U.S. USA. As described above, the systems each include 8W TPO transmitter/receiver assemblies including diplexers, cables, and antenna assemblies. The airborne data terminal uses an RF switch to select either a 10dBi horn antenna, or a 4.5dBi omnidirectional antenna. The ground station system uses the same transmitter/receiver system connected to a multi-element 26dBi tracking antenna system. The ground station antenna is typically mounted on a tripod or on an elevated mast.

**6) Restrictions on Operation**

All transmitting equipment will remain in FlightScan's possession and control during experimentation and demonstrations. If any different treatment becomes necessary during the course of its experimentation and demonstrations, FlightScan will seek separate and additional authority from the agency.

Also as noted above, FlightScan recognizes that the operation of any unapproved or unlicensed devices under experimentation must not cause harmful interference to authorized facilities. Should interference occur, it will immediately take reasonable steps to resolve the interference, including if necessary discontinuing operation. To that end, the company will advise persons operating the equipment that permission to use the equipment has been granted under experimental authority issued to FlightScan, is strictly temporary and may be canceled at any time. The company will also advise operators that such operation is subject to the condition that the equipment may not cause harmful interference.

**7) Public Interest**

FlightScan submits that issuance of special temporary authority is in the public interest, convenience, and necessity. Grant of an STA will permit FlightScan to research beyond

line-of-sight flights designed to observe and protect the nation's critical infrastructure assets.

**8) Contact Information**

a. Company Contact and Stop Buzzer

David B. Morton  
VP of Operations and Safety  
FlightScan Corporation  
200 Aviation Drive N.  
Suite 8  
Naples, FL 34104  
[dbm@fltscan.com](mailto:dbm@fltscan.com)  
(239) 298-6355

Representative Contact

Michael A. Lewis  
DLA Piper LLP  
500 8<sup>th</sup> Street, N.W.  
Washington, DC 20004  
202.799.4042  
[michael.a.lewis@dlapiper.com](mailto:michael.a.lewis@dlapiper.com)