

**Exhibit 1 - FCC Form 442**  
**HawkEye 360 Pathfinder Cluster**  
**Item 7 and 8: Purpose of Experiment and Duration**

**A. The Proposed Program of Research and Experimentation**

HawkEye 360, Inc. (“HE360”), a Delaware corporation headquartered in Herndon, VA, was formed in September, 2015 as a wholly owned subsidiary of Allied Minds, Inc. a Boston MA company that funds, manages and builds products and businesses based on innovative technologies developed at leading U.S. universities and federal research institutions. HE360 is requesting FCC experimental authorization to test and validate its proprietary cutting-edge satellite technology which will allow for unprecedented detection, analysis and mapping of wireless signals, resulting in more accurate information and advanced Earth Exploration Satellite Service (“EESS”) capabilities for commercial customers when compared to information not currently available through terrestrial detection and image analysis.

Specifically, HE360 requests FCC experimental authority to construct, launch and operate three low-Earth orbit, non-geostationary (NGSO) microsattellites on an unprotected, non-interference basis using the space-to-Earth downlink frequency band of 8025-8400 MHz and the Earth-to-space uplink frequency band of 2025-2110 MHz. The 8025-8400 MHz band is allocated in the U.S. Table of Frequency Allocations on a primary basis to non-government EESS in the U.S. subject to a case-by-case electromagnetic analysis of compatibility with U.S. government and other authorized operations in the band. US Footnote 347 to the U.S. Table of Frequency Allocations allows EESS operations in the 2025-2110 MHz band on a non-interference basis with all other allocated services on a case-by-case basis. The three satellites will fly in proximate formation and work together to form a single observation platform (the “Pathfinder” cluster).

Subject to achieving successful results from its experimental program, HE360 plans to submit an FCC 312 application to the International Bureau for a commercial space station license for a constellation of up to eighteen (18) microsattellites as well as an application for authority to operate two (2) or more fixed earth stations in the United States in order to introduce to the public its EESS data services. The Pathfinder satellites are designed to store data collected by the RF survey and geolocation payload until a satellite ground station is within view, at which time the satellite will transmit the collected data to the associated ground station. The collected data and generated reports on geolocated wireless signals promises to be an unparalleled asset for natural resource protection, emergency response and maritime domain awareness, among other fields of activity. The satellites that HE360 proposes to use in this experimental program are carefully designed and optimized for data relay with very low power consumption and radiation. Excluding antennas, each satellite is a 200 mm x 267 mm x 440 mm prism weighing less than 13 kg.

The Pathfinder RF survey and geolocation satellites are not subject to regulation by NOAA under Title 51 of the U.S. Code. NOAA has assessed the HawkEye 360 Pathfinder Cluster and has determined that a NOAA operator’s license is not required (see Exhibit 4 attachment, NOAA letter of disposition dated February 23, 2016).

## **B. The Specific Objectives Sought To Be Accomplished**

1. Test the basic capabilities of the low-cost bus built from Commercial Off-the-Shelf (COTS) components.
2. Investigate the effectiveness and efficiency of various power management techniques for the HE360 low-Earth orbit satellite communications system...
3. Measure the accuracy of RF Survey and geolocation performance.
4. Evaluate the performance for RF sensing of different frequency bands, signals and satellite formations.
5. Evaluate new techniques for RF signal detection and capture using COTS payload processing components.
6. Conduct limited field trials with prospective customers to determine the accuracy and viability of performing RF survey and geolocation missions for specific signals of interest (i.e. AIS, EPIRB, and SATCOM)
7. Demonstrate the use of a scheduling and remote API to external data users.
8. Evaluate autonomous operations command and control for formation flying.

## **C. How the program of experimentation has a reasonable promise of contribution to the development, extension, expansion, or utilization of the radio art, or is along line not already investigated.**

1. Through its experimental program, HE360 will be able to conduct the necessary tests and market studies that will enable it to apply for a commercial license in order to introduce to the public a whole new method for visualizing information in a way no one has before.
2. There is growing public recognition and demand for the type of service that is under development at HE360. The goal of the HE360 experimental program is to develop, test and demonstrate its satellite-based data delivery and analytics system that will facilitate critical information exchange and provide businesses and government agencies with global visibility of transportation networks, environmental impact conditions, illegal fishing activity, and emergency response situations, among other applications, resulting in new levels of executive control, personnel efficiency and response time.
3. HE360 hopes to augment other EESS systems through its experimental program. Other EESS's rely on collecting large data sets for post processing and digestion. The HE360 system allows for a focused approach and will work in cooperation with other EESS systems to improve efficiency and response time for critical events.

4. A partial list of HE360 applications include the following:
- Spectrum Mapping – Map and monitor world-wide usage of spectrum, both authorized and unauthorized users.
  - Counting and Analytics – Quantify economic activity such as shipping activity.
  - Ionospheric Monitoring – Measure and monitor the Total Electron Content (TEC) in the ionosphere, which impacts communications and the GNSS systems.
  - Interference Mitigation – Geolocate sources of RF interference for telecommunication systems, including Geostationary satellite systems.
  - Natural Resource Protection – Identify exploited protected areas. e.g. Logging in a protected jungle.
  - Emergency Response – Provide independent tracking and geolocation of emergency beacons. Filling pending gaps in coverage and capability.
  - Asset Management – Identify and track high value supply chain assets including cargo ships and railcars.
  - Fishing – Identify illegal fishing behavior in commercial ship behavior.

#### **D. Estimated Experiment Duration**

Pursuant to Part 5 of the Commission's Rules (§ 5.71 License period), HE360 respectfully requests approval for a 5 year license for its experimental program. Due to the long lead times required for spacecraft construction, consideration of HE360's requested frequencies is of paramount importance in the near term. However, the earliest date that HE360 can begin its experimental program is in 2018 as the Pathfinder cluster is scheduled to be launched in the fourth quarter of 2017, subject to launch delays. Validation of the HE360 technology for the commercial market through tests, demonstrations and market studies, will provide a solid basis for pursuing an FCC 312 application and entering the commercial market. Additional benefits to the U.S. government and commercial sectors will accrue from the ongoing research and development activities by HE360 in the field of RF spectrum survey and geolocation measurements. These activities will provide a stimulus to U.S. development, expansion and utilization of these services and contribute to the body of U.S. technological innovation.

In summary, HE360 respectfully requests the Commission to grant its application for launch and experimental operation authority as detailed herein. To the extent possible, HE360 hopes that expedited consideration of this Application will be given in order to ensure favorable authorization in advance of the scheduled 4Q2017 launch of the Pathfinder cluster.