Project title Plug and Play Visual Landing Aid Accessory for UAVs

NDA required (Yes/No) No

Drug test required(Yes/No) No

US citizenship required (Yes/No) No

IP ownership (Student/Sponsor/Negotiable) Negotiable

Sponsor organization name SightLine Applications, Inc.

Individual sponsor name Jeremy Sarao

Sponsor’s email address jeremy.sarao@sightlineapplications.com

Sponsor’s phone number 503-459-8226

### BACKGROUND:

SightLine Applications has developed a precision visual landing algorithm that provides an excellent set of benefits:

* Works in degraded and denied GPS environments – Safety and reliability.
* Reduces operator training and landing phase complexity.
* Provides detection functions for landing zone safety - detect people, animals, or objects from entering the landing zone
* Provides a rich set of telemetry for flight controllers. 30 Hz data with range, XY offsets, relative azimuth, etc.
* Supports landing on moving platforms - ground vehicles, marine.
* Is not impacted by bright sun or low light conditions.
* Can be used with Thermal (IR) cameras as well as visible (EO) cameras
* Effective range of operation (distance to target) only limited by the size of the landing pattern used

SightLine is optimistic that a plug and play precision landing accessory will be highly valuable to a wide range of multi-copter integrators.

### PROBLEM:

Integration of the SightLine Landing Aid for end users is problematic. Often drone operators want to just “plug in” a component and fly their mission. Installing software components is acceptable, but any requirement for programming is a barrier to entry or a complete show stopper. Various cables, power, and other electrical connectivity issues are also difficult for vehicle integrators. Rugged or at least robust mechanical enclosures, easy mounting, and environmental reliability are equally important. Lastly, choice of optical system (camera) for the greatest range has cause adoption delays in that it has been a decision left to the integrator.

### Project Requirements:

* Develop **a set** of electrical sub-assemblies that will allow integration of the SightLine Precision Landing Aid (1500-OEM + Camera + accessories) for [Ardupilot](http://ardupilot.org/)  or [PX4](http://px4.io/) running on [Pixhawk](https://docs.px4.io/en/flight_controller/pixhawk4.html) autopilot or other autopilots in the multi-copter market.
  + Define required connections to the vehicle including power and communication interfaces to the flight controller
* Design and produce a prototype enclosure for electronics and camera
  + Should be smaller than 3” x 2” x 2” (or smaller)
  + Optional interfaces could be video output and ethernet for command and control and video streaming
* Develop documentation and software installers to meet plug and play expectations.
* SightLine will support with existing source code and technical support throughout the process as well as hardware and other materiel support.

### Project Deliverables:

* A working prototype including circuit boards and enclosure
* Demonstration of landing aid with off-the-shelf quadcopter (provided by SightLine)
* Schematics, 3D models, and other related documentation

### Skills:

* Electrical, mechanical, computer software development