



Save Money, Save Time, Minimize Labor

In Aviation, there is increasing emphasis on operational efficiency and cost control. Operational efficiency mandates that airlines have cost-effective airplane hangars that support productive maintenance activities. It is all about saving time. If you can save an hour here or there by NOT having to move aircraft out of the hangar, it adds up.

With the GPS Signal Available Inside, You Can Maintain GPS Avionics Without Ever Opening the Hangar Door...

- **Save On Utilities** - heating and cooling costs are minimized as hangar door can remain shut. When large hangar doors are opened, heat is quickly displaced with cold outside air. When the doors are closed, the heating cycle must start all over again.

One case study noted the cost to heat a 400' x 800' hangar at \$150,000 per year. Utility costs are usually the largest single expense for facilities. Facility Managers can have significant impacts on their operating costs by understanding what opportunities exist to reduce or control utility costs.

- **Use Less Manpower** - personnel not required to move aircraft in and out of hangar for GPS avionics testing. This means you will not need a tow supervisor, brake person, tow vehicle operator, a nose walker, wing walkers or a tail walker just to test the GPS avionics system.

"Conservatively, use \$500/week for maintenance hangar... cost of 1-2 aircraft per week is typically \$250/each aircraft to tow outside... just labor, we do not power up the aircraft" ... Small Aircraft Manufacturer

- **Use Less Fuel** - no need to start up aircraft, it remains in hangar during GPS avionics testing. *No one can deny the cost of jet fuel is enormous! -*

"It easily exceeds \$1000/wk just in fuel costs for moving 3-4 aircraft out from under the sunshades" ... Lieutenant Colonel, Air National Guard.

"There is an internal cost for the personnel and the tow. I would assume roughly around \$150-\$200 for each aircraft." ...International Supplier of Military Aviation Electronics

- **Use Less Time** - GPS avionics equipment can be maintained at any time, no need to wait for an outside opportunity

"Sometimes the airplanes are jacked up, so it is not possible at all to bring them outside" ... Aircraft Maintenance Consultant

REPEATER NOTICE: Due to current regulatory considerations, GPS repeater kits are only available for sale to: International Customers (outside the U.S.), agencies of the US Federal Government, parties operating under the direction of the US Federal Government, or parties that have received an STA or Experimental License under part 5 of the FCC rules, or parties that will be operating GPS Repeaters in a shielded room.

GLI-Hangar Kit

Your Kit Will Include Everything You Need

How Does It Work?

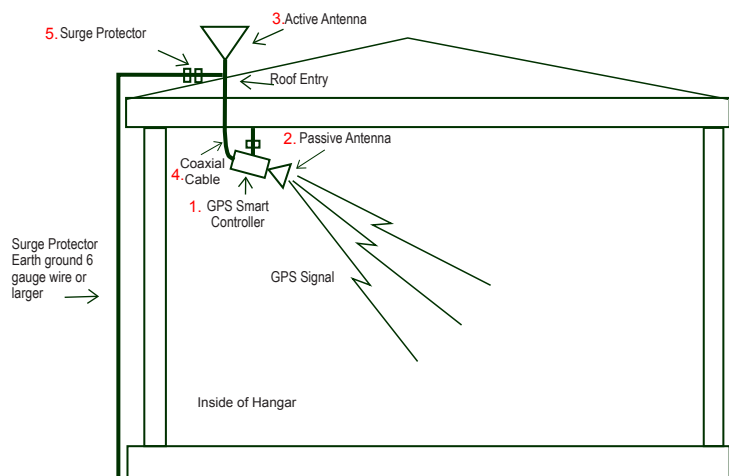
GLI-Hangar works by receiving GPS satellite signals through an antenna located on the roof of the hangar and moving the signal inside the hangar. It enables the GPS signal to be available inside the hangar (and only the hangar), allowing for ongoing testing and troubleshooting of GPS/avionics systems indoors. Delays of maintenance due to inclement weather or the placement of other aircraft is mitigated. The ability to work on the GPS navigation equipment is not dependent on the aircraft being outside or the hangar door being open.

Let Us Help!

Bringing the GPS signal inside an aircraft hangar can be challenging, GPS Source can help. Based on the dimensions and physical layout of your hangar, we can help you design an optimal system at no charge. GPS Source will help you determine the optimal place to install the GPS Smart Controller (GLI-METRO), determine the correct gain to set the controller, the correct length of cable to buy and the best location for the outdoor antenna. GPS Source has helped customers design systems for a variety of hangars all over the world. We have solutions for hangars that are 10,000 to 200,000 square feet. There is **no charge** for calling us to discuss your unique challenges.

GPS Smart Controller, GPS Antennas, Cabling, other options and accessories:

(1.) GPS (L1) Smart Controller; (2.) Passive Antenna; (3.) Active Outdoor Antenna; (4.) Cable Assembly; (5.) Coax Lightning Protection



**Sample GPS Network Design
for Aircraft Hangar**



If the task seems insurmountable, or if you are just not comfortable walking the roof of your hangar, we also offer an on-site survey and installation service. More information about on-site surveys can be found at www.gpssource.com/services.

Safety Information for Aircraft Hangar Operation

Operational Safety Features of the GLI-METRO

1. Operator Controlled EIRP:

Operator controlled Effective Isotropic Radiated Power (EIRP) feature. This enables the retransmitted GPS signal level to be set by the operator during installation. When configured for optimal performance, the retransmitted signal visible outside of the hangar will be significantly lower than inside the hangar. Other aircraft or GPS equipment in the area will receive the retransmitted signal at many dB below the level at which they receive the native signals.

2. Automatic Gain (EIRP) Control:

Once the system EIRP level has been set and locked by the installer (note that the GLI-METRO has the ability to lock the Operator Level Control to prevent unauthorized adjustment of the installer defined level), the GLI-METRO has an internal automatic gain control that will offset any variations in the system due to antenna variations, cable losses, extreme weather or system variations that result from temperature fluctuations. This is critical to ensure that the intended and verified retransmitted signal level is maintained regardless of variations in the operational environment.

3. Oscillation Detection & Mitigation:

GLI-METRO provides signal coverage in the hangar by receiving the native GPS signals, amplifying them, and then re-transmitting them on the same frequency. If the system malfunctions, or if the system is improperly installed, it is possible for the system to oscillate. The GLI-METRO includes a very important safety feature that prevents this scenario from occurring. It closely monitors the retransmitted signal. If the conditions necessary for oscillation becomes evident, the GLI-METRO will display a fault condition. It will then immediately reduce the system gain until the condition is eliminated (*even below the operator set level*). If the GLI-METRO reduces the signal level to the lowest setting and the condition persists, it will shut down the transmission altogether and set an additional fault code. The GLI-METRO will detect and mitigate an oscillation condition before any oscillation can form that would interfere with the operation of other GPS/Avionics systems.