GPS Simulation Challenges and Solutions for Avionics

One of the biggest issues in using any GPS Simulator, like the VIAVI OSPREY or GPSG-1000 GPS Simulators, is getting an aircraft's GPS Receiver to obtain a 3D Lock. GPS Receivers, in general, leverage the last location it was locked to and compare any new signals against that previous location. So, jumping a great distance geographically or even a prolonged length of time can be problematic. Some actions that can be taken on the GPS Receiver include what is referred to as 'warm start' and 'cold start'.

A 'warm start' is just a power cycle of the GPS Receiver. This can be helpful in some situations, but there are other situations where a 'cold start' might be required. A 'cold start' involves a reset of the GPS Receiver's memory so that it 'forgets' any previous information and will re-acquire GPS satellites as a new event. A 'cold start' typically takes longer for the GPS Receiver to lock.

A fresh load of GPS almanac data in the GPS Simulator is also important. The older the almanac, the greater the error in the extrapolation of the location of each of the simulated satellites.

Isolation from real GPS satellites is necessary as well. The use of RF blankets can help add additional isolation, if necessary. Powering up the aircraft with the simulated signals already running is a key component.

In summary, here are some of the steps that can be taken to ensure GPS lock – in no particular order:

- Warm Start (power cycles) vs. Cold Start (clearing the GPS memory)
- Stay close — geographically and in time as well
- Isolate the aircraft GPS antenna from real satellite signals and repeaters
- Apply power to GPS receiver *after* the simulation is running
- Ensure Almanac information is up to date on both the simulator and the GPS receiver
- Check output power levels

Contact Us: +1 800 835 2352 | avcomm.sales@viavisolutions.com.

gps-challenges-solutions-an-avi-nse-ae
30194558 900 0825