

Resilient Navigation

DATASHEET

The partnership between Honeywell and infiniDome introduces a cutting-edge UAV navigation system, merging Honeywell's HCINS and HRVS with infiniDome's Anti Jamming technology. This blend delivers steady, accurate navigation in GNSS-challenged conditions, making it the most robust UAV navigation solution globally.



Alternative Navigation System for Autonomous and GNSS-Denied Operations

3 Layers of Protection

Anti-Jamming Module

A small-sized, add-on device that provides protection against GNSS interference, making the GNSS input ~50x more resilient to attacks, boosting GNSS data availability and strengthening the UAV's navigation source even in highly challenged environments through integration with HCINS's advanced logic.

Compact Inertial Navigation System (HCINS)

Leveraging Honeywell's inertial navigation sensors and algorithms, the HCINS fuses data from multiple sources with proprietary Kalman Filters to determine location, velocity, and heading in a compact, lightweight unit. With a MEMS-based IMU, it ensures accurate navigation even without external inputs.

Radar Velocity System (HRVS)

A compact radar-based system, uses mmWave technology to provide range, velocity, and angle data, compensating for drift in the inertial system. Paired with HCINS, it achieves less than 3% error, even in full GNSS denial.





First Layer of Protection - Anti Jamming

GPSdome-SunStone

*Preliminary specifications

- Null Steering Technology
- Protected Frequency: One frequency band
- Optional Secondary Protected Frequency
- Latency: 100ns \pm 15ns (fixed)
- Waterproof Rating: IP65
- Operating Temperature Range: -40°C to +85°C
- Size: 80mmx79mmx28mm
- Weight: 100g
- Peak Power Consumption: <2.7W



Scan for full Preliminary datasheet of GPSdome-SunStone

OR

GPSdome2

- Null Steering Technology
 - Protection from 3 jamming directions simultaneously
 - Dual Band Protection
 - Latency: ~100ns
 - Waterproof Rating: IP65
 - Operating Temperature Range: -30°C to +71°C
 - Size: 99mmx95mmx56mm
 - Weight: 500g
 - Peak Power Consumption: <16W
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- Dual use (non-ITAR) (ECCN: 7A005.b)



Scan for full datasheet of GPSdome2

Second Layer of Protection

Honeywell Compact Inertial Navigation System

- Small INS with dual GNSS receivers
 - Horizontal drift after 30s GNSS outage with no aiding ~ 5m
 - Navigation health monitor
 - Latency: 100ns ±15ns (fixed)
 - Size: 104mmx60mmx28mm
 - Weight: 140g
 - Max power consumption: <3W
- Not export controlled (ECCN: 7A994)



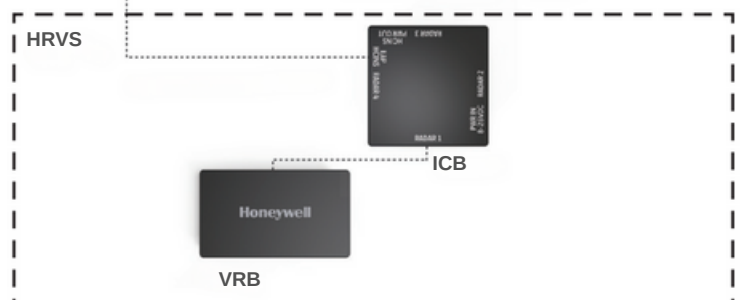
Third Layer of Protection

Honeywell Radar Velocity System

- 3D velocity aiding system
 - CEP error of 1-3% distance traveled when integrated with HCINS
 - Navigation health monitor
 - 60GHZ / 80GHZ
 - Size: 113mmx65mmx31mm
 - Weight: 63g
 - Max power consumption: <2W
- Not export controlled (ECCN: 6A998.a)



Interconnections diagram



For GPSdome2 the connection configuration differs.

Proven Performance in Combat

Setup:

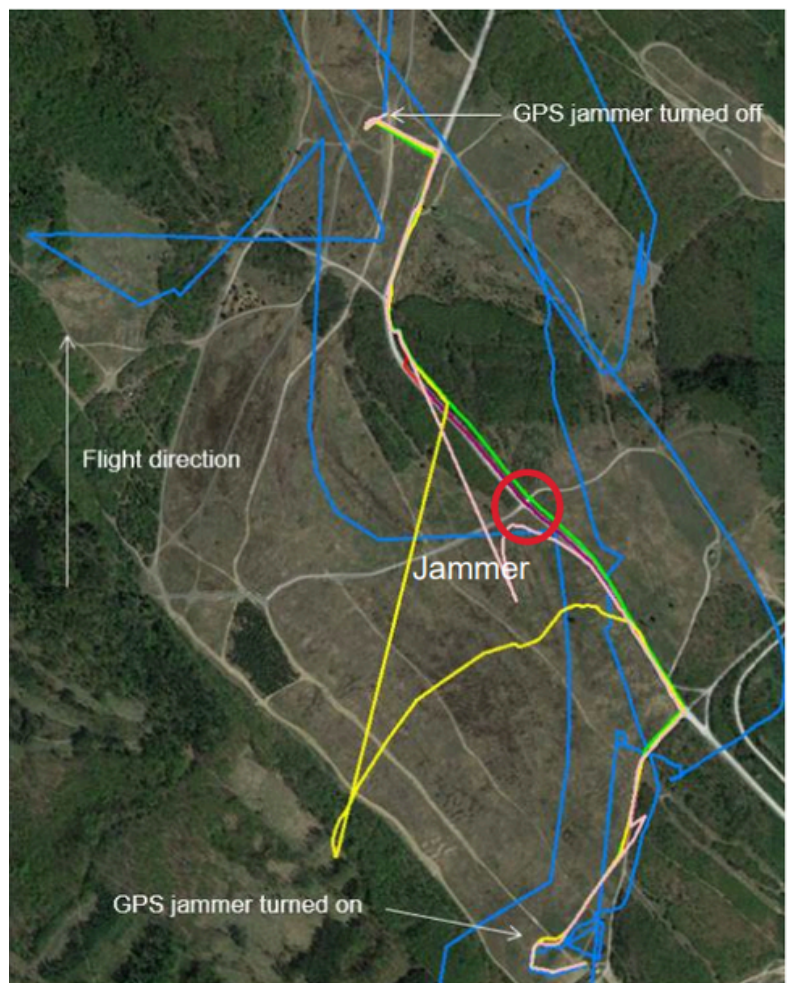
- 20W GPS jammer with omnidirectional antenna placed in the middle of the track (**Red Circle**).
- Jamming Level: Medium power GPS jamming.
- Flight speed 5 m/s.

Results:

- HCINS + GPSdome-SunStone were able to provide reasonable position for half of the flight time, except for a 250m radius around the GPS jammer (**Pink line**).
- HCINS correctly rejected poor GPS measurements (**Pink & Purple lines**) and started to use the GPS position once it was available.
- HRVS is an important part of the system, able to maintain high navigation accuracy in case of higher GPS jamming conditions (**Purple line**).

Legend:

- **Green** – True Position.
- **Blue** – Unprotected Pixhawk GPS.
- **Yellow** – Protected by GPSdome-SunStone (With GPS Aiding).
- **Pink** – GPSdome-SunStone + HCINS (With GPS Aiding).
- **Purple** – GPSdome-SunStone + HCINS + HRVS.
(No GPS aiding, Only HRVS aiding).



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