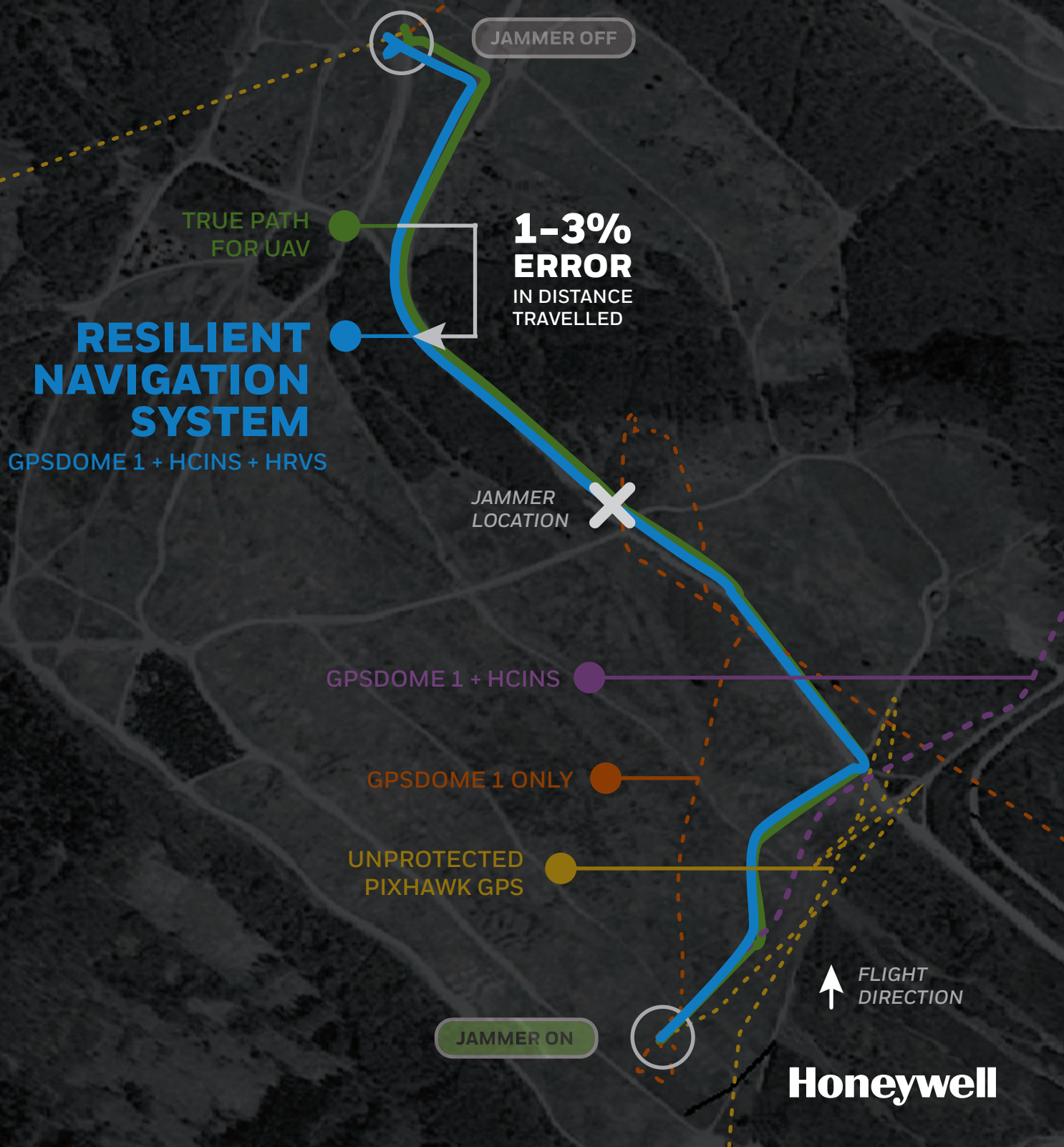


# RESILIENT NAVIGATION SYSTEM

Safe and secure navigation for UAV in GNSS denied environments



# RESILIENT NAVIGATION SYSTEM

Safe and secure navigation for UAV in GNSS denied environments

Resilient Navigation System is a low size, weight and power navigation system that combines GNSS, INS, anti-jammer and alternative navigation technologies to provide **three layers of resilience for safe navigation**.



Safe and reliable navigation in challenging environments is essential for BVLOS\* missions

Mission failure results in not just loss of the asset but the information on asset becomes a liability

## Multi-Layer Resiliency

GNSS + anti-jammer  
+ INS + Alternative  
Navigation

Enables  
**GNSS-Denied  
BVLOS\*  
Missions**

## Arducopter PX4

Integrated with  
commonly used UAV  
flight controls

Works in  
**Degraded  
Visual  
Environments**

**1-3 %**  
Distance Traveled CEP  
**< 800 g**  
Total system weight  
including accessories

**No  
Dependency**  
on maps or  
environment

\*Beyond Visual Line of Sight



# LAYER 1 GPSDOME 1

Industry's only non-ITAR GPS anti-jammer

**Low Size, Weight  
and Power**

**GPS L1**  
Protected frequency

**20 dB**  
Attenuation

**Low  
Latency**

**GPSdome 1** is a small-sized, add-on device that provides protection against GPS jamming, ensuring continuity of autonomous navigation and operation during jamming conditions. No other solution that offers the same protection is as small, light, affordable or as easily installed as GPSdome 1.

## FEATURES



- GPS anti-jammer
- Protected frequency: GPS L1 (C/A Code)
- Nominal 20dB attenuation of hostile signal
- Protection from 1 jamming signal



- IP67, -40°C to +85°C (enclosed)
- Minimal latency: 100ns ±15ns (constant)
- Compatible with most off-the-shelf active GNSS antennas



- Null steering technology in tiny form factor
- Dual use (non-ITAR) (ECCN: 7A005.b)



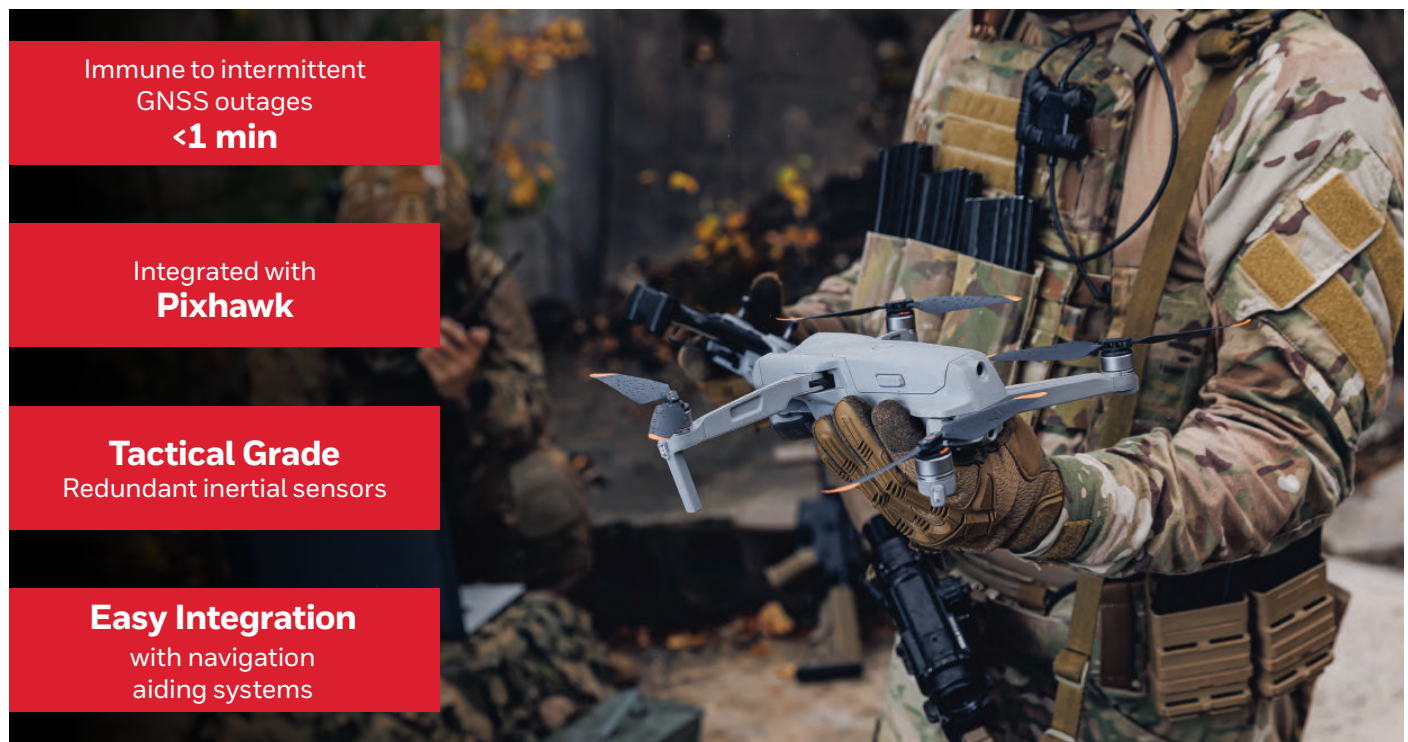
- Size: 74x47x25 mm (LxBxH)
- Weight: 150g
- Maximum power consumption: <1W



# LAYER 2

# HONEYWELL COMPACT INERTIAL NAVIGATION SYSTEM

Combined GNSS and inertial navigation system for UAVs



The Honeywell compact inertial navigation system (HCINS) for UAVs is a low size, weight and power (SWaP) inertial navigation system that is suitable for all types of UAVs. It enables safe navigation for UAVs during intermittent GNSS disruptions.

## FEATURES



- Small inertial navigation system with dual GNSS receivers
- Tactical grade redundant inertial sensors
- Integrated with Pixhawk (Arducopter, PX4, and Mission Planner)
- Horizontal drift after 30s GNSS outage with no aiding ~ 5m



- SD card for data storage
- Navigation health monitor
- Ethernet interface



- Easy integration with aiding systems (radar, vision)
- Not export controlled (ECCN: 7A994)



- Size: 104x60x28 mm (LxBxH)
- Weight: 140g
- Maximum power consumption: <3W



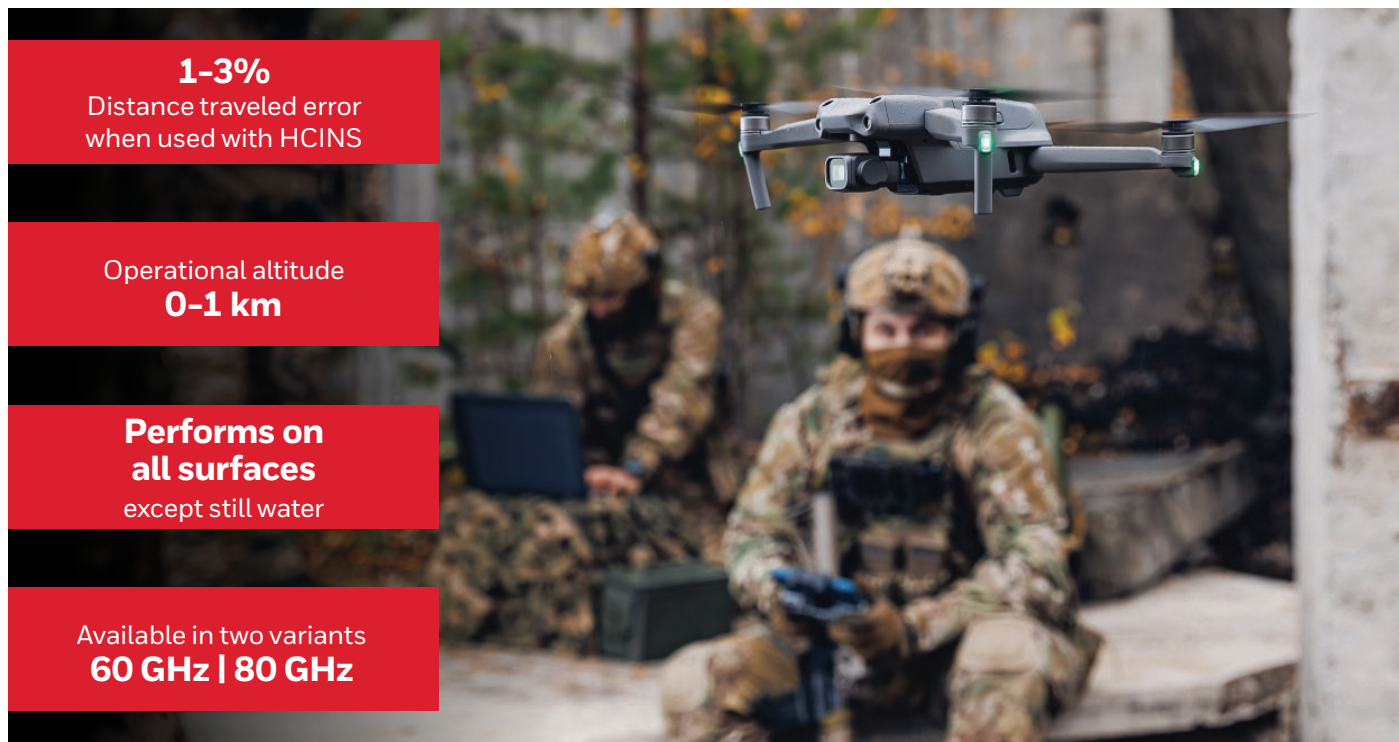


# LAYER 3

# HONEYWELL RADAR

# VELOCITY SYSTEM

Range and velocity without GNSS



**1-3%**

Distance traveled error  
when used with HCINS

Operational altitude  
**0-1 km**

**Performs on  
all surfaces**  
except still water

Available in two variants  
**60 GHz | 80 GHz**

The Honeywell Radar Velocity System (HRVS) is a low size, weight and power (SWaP) millimeter radar-based navigation aiding system.

## FEATURES



- 3D velocity aiding system
- 4 radars and 1 interconnection board for UAV applications
- CEP error of 1-3% distance traveled when integrated with HCINS
- Two variants - 60GHz and 80GHz
- Altitude < 400m (60GHz), <1000m (80GHz) at speed <20m/s



- Indefinite precise hover
- Works over all surfaces (except still water)
- Impervious to environmental conditions



- Not export controlled (ECCN: 6A998.a)
- Needs FCC waiver for US

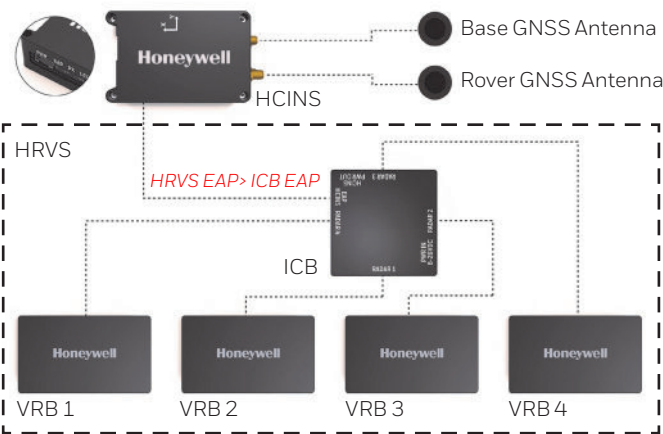


- Size: 113x65x31 mm (LxBxH)
- Weight: 63g (1 Radar), 290g (4Radars and 1 ICB)
- Maximum power consumption: <2W per Radar

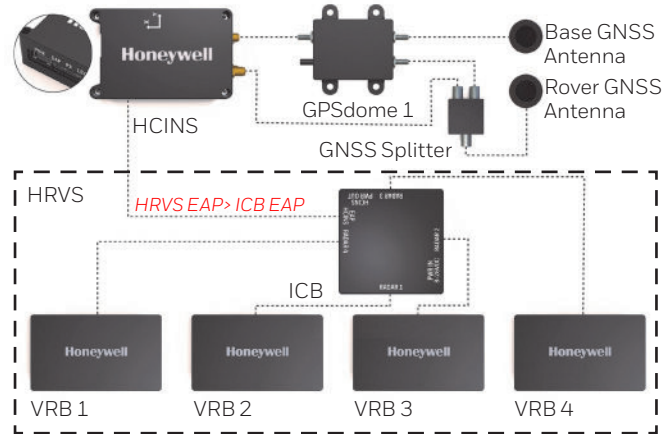


# INTERCONNECTIONS DIAGRAM

## WITHOUT GPSDOME 1



## WITH GPSDOME 1



# RESILIENT NAVIGATION SYSTEM

PART NUMBER	QUANTITY	DESCRIPTION
68013252-1	01	GPSdome1
88003175	01	HCINS Packaging Content (HCINS + Cables + Damping Platform + SD Card)
88003168	01	Honeywell Compact Inertial Navigation System (HCINS) 2.4
88003160	01	Power Cable for HCINS
88003161-001	01	Ethernet Cable for HCINS
88003162	01	External Aiding Port (EAP) Cable for HCINS
88003163	01	Pixhawk Cable for HCINS
53700092-2	01	SD card - inserted in HCINS
88004275 88004276 88004277-001/002/003/004	01	Damping Platform for HCINS
88003444	01	HRVS packaging content (4xVRB + ICB + 15cm flat cables)
88003442	04	Velocity Radar Board (VRB) 3.3
88003436	01	Interconnection Board (ICB)
88003432	04	VRB-ICB Cable flat 15 cm cable

## OPTIONAL

PART NUMBER	QUANTITY	DESCRIPTION
88003445	04	VRB-ICB Cable rounded 25 cm cable
88003445-001/002/003/004	04	VRB-ICB Cable rounded 35 cm / 40 cm / 50 cm / 100 cm cable
53700060 - 2	02	GNSS Antenna Maxtena M7h
53700144-1	01	GPS Splitter

### Honeywell Aerospace

1944 East Sky Harbor Circle  
Phoenix, AZ 85034  
aerospace.honeywell.com

N61-3165-000-000 | 05/23  
© 2023 Honeywell International Inc.

THE  
FUTURE  
IS  
WHAT  
WE  
MAKE IT

Honeywell