

Gulfstream G350, G450, G500 and G550

Honeywell



**FEATURING HONEYWELL'S PRIMUS EPIC®
INTEGRATED AVIONICS SYSTEM**

**Gulfstream PlaneView™
Advanced Cockpit**

Gulfstream and Honeywell: A long-lasting partnership

Since the introduction of the Gulfstream I in 1959, Honeywell and Gulfstream Aerospace have enjoyed a partnership of setting new standards in flight technology. Gulfstream and Honeywell's relationship is built upon a passion to constantly break new technological barriers which have a profound effect on improving airplane performance, improving crew awareness, and making flying safer.

When Honeywell's SPZ-8500 avionics system for the Gulfstream V was certified in 1997, the two companies established new standards for integrated avionics for business jets. Today, Honeywell's Primus Epic® integrated avionics suite for the Gulfstream G350, G450, G500 and G550 PlaneView™ advanced cockpit builds on this partnership with an enhanced avionics package to offer unprecedented levels of additional physical and functional integration coupled with the latest in display technology.

The next generation Primus Epic integrated avionics system is the heart of Gulfstream's new PlaneView™ advanced cockpit for the G350, G450, G500 and G550. Primus Epic, chosen as the integrated avionics solution for this new family of aircraft provides these top-level benefits:

- Enhanced safety through improved cockpit situational awareness and reduced workload
- A modular design that substantially reduces avionics line replaceable units (LRU) count and can more readily support upgrades for future technology
- Smaller, lighter system to provide more cabin living area and reduced aircraft weight
- Improved reliability and maintainability
- Supports same type rating among all four aircraft models with minimum differences training
- Commonality among aircraft models enhance product support efficiencies and increase savings

Experts in integration

Honeywell's unmatched expertise in systems integration has revolutionized commercial aviation. Primus Epic is based on a modular design offering high reliability and dispatchability to ensure cost-effective operation. The all-new Primus Epic integrated avionics system for the G350, G450, G500 and G550 features unprecedented levels of integration, and a highly flexible and cost-efficient framework. Operators will appreciate the functionality and the clarity of four 13x10-inch flat panel displays. A side-mounted cursor control device has been developed by Gulfstream for the PlaneView™ advanced cockpit to interface with the windowed-environment operating system and is designed so pilots can manage its many features. And our next generation Primus II Epic integrated radio system has been developed into a more highly integrated package than before.

Communications management function

The Primus Epic communications management function (CMF) is a next generation data link platform designed for both software flexibility and hardware expandability. The CMF communicates through a VHF transceiver or with a satellite data communications system. Three multifunction control display units (MCDUs) provide the interface between the flight crew and the CMF with supported data link functions to include terminal weather reports and forecasts, D-ATIS reports, free-text messages, oceanic clearances, and up-linked flight plans, winds, and temperatures aloft forecasts.

The human centered designed cockpit

Human centered design concepts were used in the development of the PlaneView™ advanced cockpit to enhance pilot performance and safety. Joint Gulfstream and Honeywell research in this area were critical to the design of the PlaneView system for the G350, G450, G500 and G550.

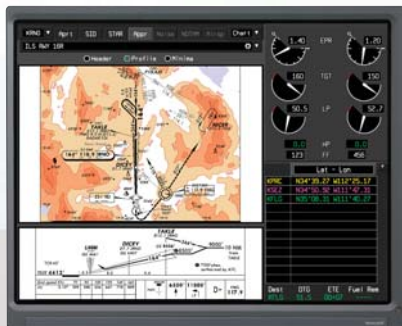
Liquid crystal flat panel displays

The Primus Epic architecture for the new G350, G450, G500 and G550 will be centered around four large 13x10-inch, liquid crystal displays that function in a point-and-click, windowed environment.

LCD units in the PlaneView advanced cockpit include dual primary flight displays (PFD), and dual multifunction displays (MFD). The PFDs incorporate all of the information necessary to safely operate the aircraft, including traditional PFD information. Included are combined attitude director indicator (ADI) and horizontal situation indicator (HSI) formats with air-speed, altitude, vertical speed, other essential information and pilot selectable aircraft systems information. Weather radar and enhanced ground proximity warning system (EGPWS) information are available on the PFD when the ARC mode is selected.

As a result of the outstanding integration, a single PFD provides the display for all the primary parameters that previously have required separate displays. The MFD displays navigational maps and weather data, engine data, aircraft system pages and windows for display of TCAS, uplinked weather services, video and other information.

Developed specifically for the G350, G450, G500 and G550 are a series of synoptic pages that provide information on flight controls, electrical systems, fuel, environmental control/door, hydraulic systems and pneumatic systems.



Integrated Navigation (INAV)

Primus Epic INAV® is a revolutionary breakthrough in display technology.

First certified on the G550, INAV is the industry's first interactive navigation system. Primus Epic INAV allows crews to select objects on the display through the cursor control device allowing intuitive interaction between the pilot and the display functions. In the PlaneView™ advanced cockpit, the displays render navigation and aircraft sensor data in real time resulting in unprecedented improvements in situational awareness.

The blending of Honeywell's EGPWS and INAV patented technology provides crews with increased levels of safety both on the ground and in the air. Imagine an approach where airport and terminal information is displayed coupled with EGPWS information. Only Primus Epic offers this type of integrated information.

DISPLAY INFORMATION:

Navigation data

- Terrain
- Airspace
- Airways
- Airports
- NAVAIDS (VHF and NDB)
- Intersection
- Active flight plan
- Vertical situation display with terrain (growth)

Sensor data

- EGPWS cautions and warnings
- Airborne weather radar
- TCAS
- Uplink weather (growth)

Graphical flight planning

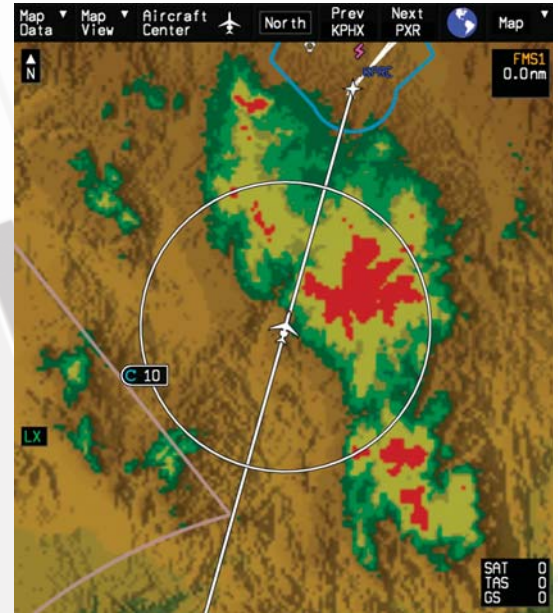
Crew interface with the displays is naturally applied to graphical flight planning. Pilots can interact directly with the flight plan entered into the flight management system using the INAV display. By selecting objects through the cursor control device, the pilot can perform flight planning tasks which automatically become part of the flight plan.

Flight planning tasks performed with INAV:

- Direct to
- Add/delete waypoints
- Add/delete arrival and departures
- Add/delete/modify enroute and terminal holding patterns
- Radial or airway intercepts

Terminal procedures

The PlaneView advanced cockpit offers the electronic display of Jeppesen terminal procedures (SIDs, STARs, approaches), NOTAMS, airport taxiways, noise abatement procedures, and other terminal information. Crews can zoom, pan and split the display to focus on areas of interest using the cursor control device.



Standard **Honeywell** avionics

Fail-operational automatic flight control system

Primus Epic's fully digital, integrated autopilot/flight guidance system gives the G350, G450, G500 and G550 fail-operational/fail passive control throughout the entire flight.

Primus Epic's dual flight guidance computers transition automatically should one fail. An integrated mode selector and flight guidance controller provides simple, confident control of all flight functions. Automatic altitude preselect, flight level change mode and VNAV capability combined with the required control servo authority matches every flight condition and aircraft configuration for the smoothest ride available.



Flight management/performance management

Honeywell, the leader in vertical navigation (VNAV) flight management systems, has provided the G350, G450, G500 and G550 with a revolutionary integrated flight management system (FMS) with full three-dimensional mission performance, including required navigation performance (RNP) navigation. The integrated FMS' precision long-range navigation blends inputs from all on-board long and short-range sensors and can navigate entirely by GPS while maintaining input from all available sensors.

Honeywell has integrated an autothrottle (A/T) system into the G350, G450, G500 and G550 that works in conjunction with the FMS and is fully integrated with the automatic flight control system (AFCS) to control the aircraft's thrust throughout the flight.

The integrated FMS TOLD software is designed to significantly reduce pilot workload by automating the computation of takeoff and landing performance data. Using inputs from the onboard aircraft systems, as well as a minimal set of pilot inputs, TOLD also computes such requirements as obstacle clearance and engine/aircraft limits.

The G350, G450, G500 and G550 also offers significant operational enhancements with full triplex operation. Flight planning and initialization data may be entered by the pilot on any of the three MCDUs and the data will be automatically synchronized with the other FMS' to provide:

- Automatic flight plan and custom database updating, performance initialization, and TOLD initialization.
- Synchronized lateral/vertical navigation with the ability to couple any FMS to the AFCS and A/T.
- Synchronization of radio tuning data.
- Automatic reversion to DUAL system operation in the event of an FMS failure.

The PlaneView™ advanced cockpit also provides important communication, navigation, surveillance/air traffic management (CNS/ATM) features. The system provides aircraft operational control (AOC) data link for transferring flight plans, position reports, addresses, and winds between the aircraft and the Honeywell Global Data Center. The system also provides the air traffic services (ATS) data link functions such as aircraft facilities notification (AFN) and automatic dependent surveillance (ADS).

Primus® II Epic integrated radio system

The dual Honeywell Primus II Epic integrated radio system includes digital nav/comm/ID radio system and is standard on the G350, G450, G500 and G550. The Primus II Epic system is a digital remote integrated system that encompasses the standard navigation and communications functions, including VOR, ADF, DME, ILS, VHF communication and Mode S diversity transponder modules. It uses a modular radio cabinet that reduces the system's line replaceable units, while reducing weight and power, and increasing reliability. The VHF data radio (VDR) and VOR/ILS/data link (VIDL) are the first of a new generation of radios that provide over 100 times more computing power than current radios. Honeywell's digital radios use Primus Epic's digital engine operating system to allow the flexibility to change modulations, protocols and data rates with a simple software change.

This integrated radio system for the G350, G450, G500 and G550 is fully ICAO compliant, offering FM immunity, and 8.33 kHz communication bandwidth required for European flight and Change 7.



SENSOR SYSTEMS

Micro inertial reference system (IRS)

The micro IRS is the most advanced inertial reference system available today, providing every essential attitude, heading and position parameter with unmatched precision. All this functionality resides in a unit that offers a smaller size, lower weight and higher reliability than ever before. With a volume of just 276 cubic inches and a weight of only 10.25 pounds, the passively cooled micro IRS provides the same functionality with less than half the size and 60 percent of the weight of its predecessor, the Laseref IV.



Micro Inertial Reference System

Air data

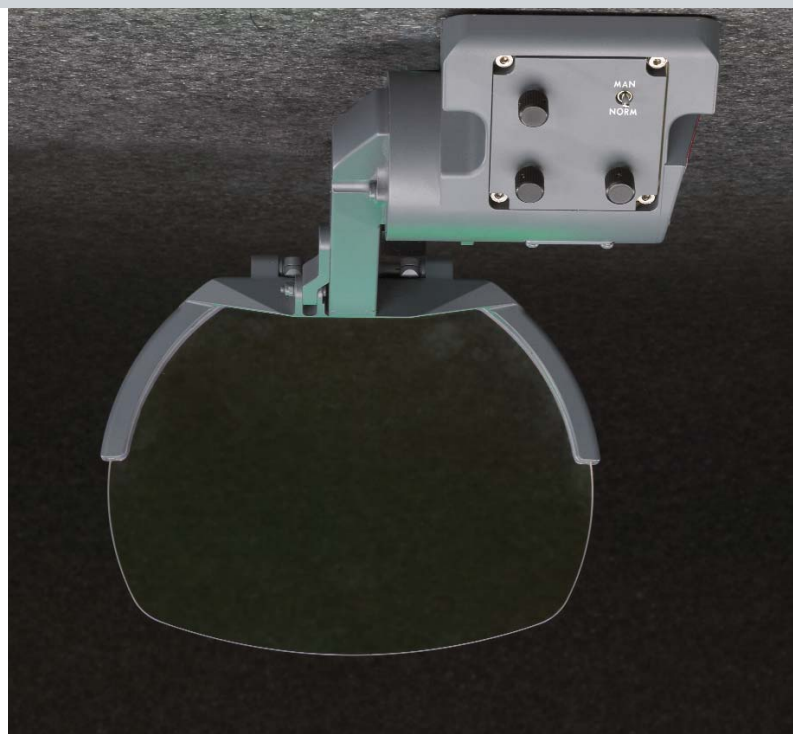
The Primus Epic air data system provides precise airspeed, altitude and vertical rate to the inertial reference systems, flight control and display systems. Separate air data modules within the modular avionics unit act as sensors to provide pressure information for the air data processing of airspeed, altitude and vertical rate information.



Air Data Module (ADM)

Visual guidance system (VGS)

Honeywell's VGS developed in partnership with BAE Systems helps pilots' visual focus remain on the outside world. Designed in partnership with Gulfstream, the compact VGS electro-optical overhead unit projects an image on the lightweight combiner that provides the pilot with real time flight and aircraft performance information. The pilot's focus remains outside as viewed through the combiner, while the VGS intuitive symbology provides conformal information on aircraft performance and energy state, critical aircraft position during low visibility final approach, airport and runway orientation, actual flight path and touchdown point, all within a large, full-time conformal 30-by-25-degree field of view. The VGS also enhances the pilot's vision and increases safety by superimposing data from Gulfstream's enhanced vision system on the combiner. *Optional equipment on G350 and G500.*





**You can't afford to be out of touch
MCS-7000 satellite communications system (SATCOM)**

The MCS-7000 SATCOM is designed to provide worldwide continuous multi-channel voice and data capability for the G350, G450, G500 and G550. The system may be used for cabin or cockpit voice communications and supports airborne flight information service (AFIS) data transmissions including personal computer data and facsimile machine operations. In addition to serving the cockpit and crew, the MCS-7000 provides telephone service to passengers including voice circuits, cabin management functions, or data from modems or facsimile machines.

Optional equipment on G350.

The Primus Epic system will include the following installed avionics functions as standard equipment except as noted:

- Large 13x10-inch (DU-1310) four-tube liquid crystal displays electronic display system
- Dual fail-operational automatic flight control system
- Triple flight management/performance management system
- Dual autothrottle
- Visual guidance system (VGS optional on G350, G500)
- Primus® 880 turbulence weather radar
- Dual enhanced EGPWS
- Dual radio altimeters
- Triple micro-inertial reference systems
- Triple air data sensors
- Dual 24-channel GPS sensors
- Seven-channel MCS-7000 satellite communications (optional on G350)
- Primus® II Epic integrated radio system including dual modular radio cabinets with digital radios
- Primus® II NAV/COM radio as the third radio
- AV-900 digital audio system including telephony and SELCAL
- Initial CNS/ATM functionality including AFN, AOC, ADS-A and dual communications management function (CMF)
- Traffic collision avoidance system (TCAS)
- Airborne flight information system (AFIS)

Optional equipment on all models

- LSZ-860 lightning sensor system
- HS-700 High Speed Data system
- AIS-1000 and 2000 regional OneView systems



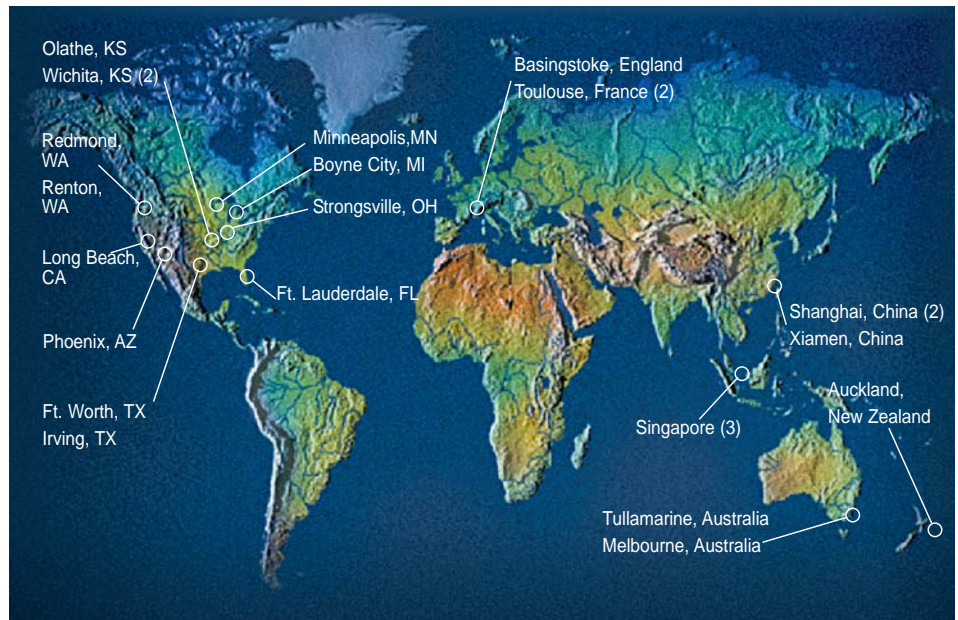
Worldwide customer support

In addition to providing avionics designed for rigorous business travel environments, Honeywell also provides extensive support that includes maintenance training, pilot courses, support documentation, and on-site support at your facility. This level of service ensures a smooth transition from aircraft delivery to line operation and continues for the service life of the aircraft.

Honeywell's avionics are based on proven technology and offer exceptionally high reliability and simplified maintenance. When service is needed our customer support engineers and service centers are strategically located around the world to provide efficient, responsive support. As always, our SPEX exchange service is available 24 hours a day.

Honeywell's Global Data Center

Honeywell's Global Data Center (GDC) offers dependable flight support services to corporate, fractional, charter, private, government, and military aircraft operators worldwide. In addition to VHF and satellite data link communications, the GDC also provides a wide variety of valuable flight planning and support services including Flight SentinelSM, personalized flight planning and following, text and graphical weather, international flight planning, message forwarding and more.



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