IN THE FLIGHT DECK

HEAD-UP GUIDANCE SYSTEM (HGS®)
Every aircraft in Horizon's fleet is equipped with HGS, which allows us to fly and land in very low-visibility conditions. In the 1990s, Horizon pioneered this technology as the first HGS-equipped Part 121 turboprop operator, and its first operational CAT III approach occurred June 1995.

HGS gives pilots the ability to see critical navigation information and look for the runway as they hand-fly approaches, avoiding the classic "inside-outside" view transition. Pilots are intuitively able to establish and maintain a very high level of situational and inertial awareness that autoland does not provide.

HGS optically combines the displayed flight path symbology listed below with the pilot's view through the aircraft windscreen.

- Artificial Horizon
- Conformal Flight Path
- Inertial Acceleration (Caret >)
- Turn and Bank with Slip\Skid
- Airspeed
- Ground Speed
- Wind Speed and Direction
- Navigation Raw Data around flight path and guidance
- Selectable Angle Glideslope
- Radio Altimeter
- Barometric Altimeter
- Flight Idle Power Cue

With HGS, Horizon maintains high on-time performance and reliability even in difficult weather conditions. Standard CAT III landing minimums for the Q400 and CRJ are 600 RVR at touch down and 400 RVR at the runway mid-point and rollout. The Q400 is also certified for single-engine CAT III operations with the HGS. Horizon pilots use the HGS to take off in visibilities as low as 300 RVR.

FMS - FLIGHT MANAGEMENT SYSTEM
Horizon's Q400 fleet is equipped with dual Universal FMSs. Each FMS combines data from GPS, DME, VOR, inertial reference system (IRS), air data computers, attitude and heading reference units, and fuel flow to provide extremely accurate navigation and flight planning. These inputs are compared to the computers' navigation database, which includes thousands of instrument fixes and procedures. The FMSs make calculations autonomously, but constantly cross-check each other for accuracy.

This increase in accuracy allows Horizon to fly GPS approaches, including RNP procedures, and operate where ground-based radio navigation is out of service. Horizon has used this onboard high-tech tool to custom-build approaches, arrivals and departures that are more efficient, quieter and greener. The navaid-sub features have also been used to operate in airports that would otherwise be unavailable due to outages.

EFB - ELECTRONIC FLIGHT BAG
Horizon Air has committed to installing EFBs in each aircraft for captains, first officers and flight attendants.

Although the EFB concept is simple, the cutting-edge system by Flight Deck Resources that Horizon is installing on its aircraft is complex. It includes an ethernet router that connects all three EFBs and allows them to communicate via an external wireless local area network, and a Quick Access Recorder that allows maintenance to quickly diagnose problems. Two XM Satellite Weather receivers send up to 32 different weather products to each flight deck EFB. Finally, an Iridium Sat Com transceiver allows the EFBs to communicate wirelessly for text messaging and other ACARS-like data as well as Sat Phone voice communications between the flight deck, dispatch and maintenance control. Flight attendants also have access to the Sat Phone for emergency medical communications.

With the incorporation of navigation charts and manuals, the EFB provides a completely paperless cockpit.

TAMDAR - TROPOSPHERIC AIRBORNE METEOROLOGICAL DATA REPORTING
In cooperation with AirDat, LLC, Horizon Air is installing a Tamdar multi-function atmospheric sensor on all of its aircraft to receive accurate, timely, high-resolution weather forecasts. AirDat is installing this sensor on up to 1,500 aircraft in the United States.

The technologically advanced sensor provides AirDat with a continuous stream of real-time weather observations that fill the large temporal and geographic gaps between weather balloon soundings. The data is sent to the AirDat processing center via an Iridium Sat Com transceiver. Observations are taken approximately every 10 seconds on climb and descent and every five to seven minutes in cruise flight, providing an enormous amount of real-time weather data sampling.

JAWS - OUR WEIGHT AND BALANCE SYSTEM
Horizon Air developed and implemented a sophisticated weight and balance system based on hand-held devices (PDAs) used by each of our captains. The user interface, developed in-house, has been tailored to Horizon's workflow and processes. In addition to weight and balance calculations, it provides functions related to other areas, such as aircraft performance and V-Speeds.

IN THE CABIN

COMFORT
Our Q400 fleet is equipped with all-leather seating at a 32- or 33-inch pitch and a fuselage larger than a CRJ's. The Q400 has stand-up head room for a six-foot person and plenty of elbow room.

NVS - NOISE AND VIBRATION SUPPRESSION SYSTEM
The NVS system on the Q400 reduces sound and vibration at its source. During flight, microphones concealed throughout the cabin transmit noise information to a special onboard computer. These microphones also receive the propeller speed.

The computer continually analyzes this information and signals devices called Active Tuned Vibration Absorbers (ATVAs) that are mounted on the fuselage frame. The ATVAs produce out-of-phase counter-vibrations to significantly reduce the original vibrations and keep much of the noise from entering the cabin. The benefit is most dramatic in the seats closest to the arc of the propellers. NVS is unique to the Q Series, which Bombardier says represents the world's first application of this technology in an airline cabin.