

**TURBINE PILOT** 

# LATEST SUPER-MID

A high-tech cockpit, bigger interior, and 3,600-nm range mark the G280

BY THOMAS A. HORNE PHOTOGRAPHY BY MIKE FIZER

Gulfstream, widely known for its long-range, large-cabin business jets,

is recasting its position in the super-midsize market. That niche—loosely defined as an airplane with a 3,000-nm range with four passengers; a max cruise speed of 0.80 Mach or better; at least eight or nine seats, a galley, and lav; and a max takeoff weight in the 30,000- to 40,000-pound range—was formerly filled by Gulfstream's G200. That airplane, built between 2001 and 2011, was originally based on the Israel Aircraft (now Aerospace) Industries Galaxy—a design that was acquired by Gulfstream in 2001. The G200 cabin was a hit, and the main reason for its more than 250 sales. But its high wing loading and 6,040-lbst Pratt & Whitney PW306 engines meant takeoff field lengths of 6,000 feet or more, and its Pro Line 4 avionics were becoming dated.



## THE PLANEVIEW280

cockpit has three large screens that can be split for a total of six views, which can include system synoptics, traffic, electronic charts, weather, and even brake temperature. Data entry for many of the interactive fields is via sidewall-mounted cursor control devices. Black boxes for much of the PlaneView system live in the nose (opposite page).







Gulfstream retained the G200's cabin cross-section dimensions; swapped the PW306As for more powerful Honeywell HTF7250G engines of 7,624 lbst; installed a new, three-display, 15-inch-screen Rockwell Collins PlaneView280 avionics suite; gave the airplane a T-tail; and made several systems changes to come up with the new model G280. Oh, and the G280's huge new wing (495 square feet) outperforms the G200's (369 square feet), and is based on the Gulfstream G550 wing planform. It adds up to an airplane with more attitude than the G200, and takeoff field lengths more than 1,000 feet shorter. The G280 is part hot rod, part high-end luxury cruiser, and all high-tech.

Pilots will be interested to know that the G280 has the highest thrust-to-weight ratio of any Gulfstream, at one pound of thrust for every 2.66 pounds of airplane. And even though the G280 has more powerful engines than the G200, the HTF7250s gulp less fuel and put out fewer nitrogen oxide (NO<sub>x</sub>) emissions thanks to a more efficient combustor design. This fuel economy allowed Gulfstream to stretch the G280's max range to 3,600 nm with four passengers (the G200 maxes out at 3,400 nm)as well as remove the G200's aft fuselage fuel tank and stretch the cabin by eight inches, for a length of 25 feet, 10 inches. This, Gulfstream says, gives the G280 the largest seating area and biggest cabin volume (935 cubic feet) among its chief competitors-Bombardier's Challenger 300, Embraer's Legacy 500, and Dassault's Falcon 2000S.

**SYSTEMS INNOVATIONS.** During my 1.5-hour familiarization flight with Gulfstream's Erik Kauber and Glenn Gonzales, I had a chance to experience the G280's new cockpit features. The engines are controlled by full authority digital engine controls (FADEC) and autothrottles, which are common among newer business jets, but some other systems also are noteworthy. These include:

Rudder- and spoiler-by-wire. Instead of mechanical linkages to the rudder pedals, the G280 uses a digital control unit to send pedal inputs to the rudder; the hydraulic system serves as a redundant source of power. During a V, cut, the airplane's thrust control module sensed the bad engine and automatically applied the proper corrective rudder pressure. I still stomped on the rudder according to traditional dead foot, dead engine impulses, but that was OK. An artificial control-feel feature actually backs out some of the fly-by-wire authority to give pilots a dose of old-school pedal-pressure feedback. Ailerons are mechanically controlled, but differential spoiler-by-wire deflections help the pilot muscle the airplane through steeper turns. After touching down and applying reverse thrust, the weight on wheels system triggers all three spoiler panels to deploy, helping keep landing distances to a minimum.

Brake-by-wire and auto braking. Electronics also control braking, but by using a rotary auto-brake selector knob you can choose between normal, medium, and maximum braking force. Once there is weight on wheels and reverse thrust is applied, auto braking begins. The









amount of reverse thrust is automatically modulated as the ship slows and braking continues to a stop. By the way, you leave your HYDRAULIC SYSTEM accumulators can be checked externally (left, top). The external refueling panel (left, center) lets you gas up to predetermined levels. Cabin controls are run by apps on iPads or iPhones (bottom left).

was 104 knots,  $V_R$  was 111 knots, and  $V_2$  was 123 knots for the normal, flaps 20 takeoff from the Savannah/Hilton Head

feet off the pedals while the system does the work—if your instincts force you to inadvertently apply brakes, auto braking disengages. Maximum braking is dramatic, as is braking with RTO (rejected takeoff) selected. The G280 is the first Gulfstream to have auto braking.

Automatic emergency descent. Should cabin pressure be lost, the airplane will automatically begin a bank, and descend at idle thrust and with speed brakes deployed.

**Low-speed protection.** To prevent inadvertent stalls, the G280 has a stick pusher and shaker. However, the autothrottles will automatically advance power as angles of attack reach 70 percent of stick pusher trigger speed.

**FLYING.** We weighed in at 31,000 pounds the day I flew, so we were well below the G280's 39,600-pound maximum gross takeoff weight. Our balanced field length worked out to 3,210 feet (a far cry from the G200's); V, 8 degrees Celsius.

International Airport. Kauber used his cursor control device (CCD) to enter the data into the flight management systems while I taxied using the tiller. The CCDs, which are at both pilot stations, look like small control columns. It's while taxiing that you get an idea of the power at hand—unless you pop open a thrust reverser, you'll be braking a lot.

No tiller is needed for the takeoff run. Standard procedure is to activate the autothrottles, move the thrust levers halfway, and then watch as the levers continue to move to full power. And hang on! Acceleration is impressive, and soon we were airborne and climbing away at a fighter-like 8,000 fpm. After a mere 17 minutes we were level at FL450—and that was with an ATC-mandated one-minute level-off at FL400. When we resumed the climb from FL400 to FL450 we could still get 1,300 fpm. Static air temperatures up there, by the way, were minus 65 degrees Celsius, or ISA minus 8 degrees Celsius.

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Exploring the high-altitude buffet boundary was next. I put the G280 into a 40-degree bank doing 0.75 Mach and began gently pulling to maintain altitude. The stall buffet was barely perceptible—a good testimony to the effectiveness of that huge wing, even in the very thin air at the G280's maximum operating altitude.

Down at 15,000 feet, it was time for some airwork. During steep turns the ailerons seemed a tad on the heavy side, even with the spoiler panels helping out. But a slow-airspeed demonstration let the autothrottles show off their stall protection features, and stalls in the landing configuration were basically no-brainers. Just add a gob of power at the shaker, and the airplane flies out of the stall quite rapidly.

My landings at the Jacksonville International Airport were, um, acceptable—but maybe I'm being



# SPEC SHEET Gulfstream G280

### BASE PRICE: \$25 MILLION

### SPECIFICATIONS

Powerplants | (2) Honeywell HTF7250G, 7,624 lbst Recommended TBO | On condition Length | 66 ft 10 in Height | 21 ft 4 in Wingspan | 63 ft Wing area | 495 sq ft Wing loading | 80 lb/sq ft Power loading | 2.66 lb/hp Max seats | 2 + 10/18 Cabin length | 25 ft 10 in Cabin width | 7 ft 2 in Cabin height | 6 ft 3 in Basic operating weight | 24,150 lb Max ramp weight | 39,750 lb Max takeoff weight | 39,600 lb Max zero fuel weight | 28,200 lb Max payload | 4,050 lb Max payload w/full fuel | 1,000 lb Max landing weight | 32,700 lb Fuel capacity | 2,180 gal/14,600 lb

### PERFORMANCE

Takeoff distance | 4,750 ftNormal cruise speed/range, ISA, 4 pax |482 kts/0.84 Mach/3,000 nmLong range cruise speed/range, ISA, 4 pax |459 kts/0.80 Mach/3,600 nmMax operating altitude | 45,000 ftSea-level cabin to | 25,000 ftLanding distance | 3,050 ft

### FOR MORE INFORMATION

Contact Gulfstream Aerospace Corporation, Post Office Box 2206; Savannah, Georgia 31402-2206; 912-965-3000; www.gulfstream.com

All specifications are based on manufacturer's calculations. All performance figures are based on standard day, standard atmosphere conditions.

### EXTRA

More power means the G280 uses 2,000 fewer feet for takeoff than its G200 predecessor.

# Safer by Design.



Is - Dual Independent LCD Displays - Redundant Attitude Heading Reference Systems with Independent Gyro, Accelerometer and Magnetic Sensors - Dual In e or Redundant Air Data Computers with Independent Airspeed & Altitude Pressure Transducers - Redundant Emergency Batteries [30 Minutes Runtime or Redund ters 2 Hours with Optional External Battery] - Redundant Emergency GPS Receivers [Optional] - Dual Sixpack Displays - Dual HSIs - Dual GPSS Computers 2 Hours

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too hard on myself.  $V_{REF}$  was 130 knots and Kauber counted down with the automated-voice radar altitude callouts as the runway neared. "Fifty-forty-thirty-twentyten," said the voice at an even pace. At the 10-foot call I was to hold the pitch attitude and settle to the runway. There was some floating, but we landed with plenty of runway to spare.

And then the auto braking kicked in. Kauber had set it to Maximum, and brakeby-wire didn't disappoint. Ever had a cable-arrested landing? Well, the braking wasn't quite that dramatic, but it came close.

After an ILS at Jacksonville, plus an RNAV GPS and two visual approaches into SAV, my landings were getting better. The V, cut was impressive because huge, legshaking amounts of rudder pressure weren't necessary, as you might expect with the sudden loss of 7,600-plus pounds of thrust. Rudder-by-wire certainly helped here. The subsequent single-engine visual approach and landing were uneventful, but the same can't be said of the final demonstration: a rejected takeoff using auto braking. I accelerated to 80 knots, and then Kauber yanked the power back. The brakes dutifully kicked in, with a vengeance. I could hear the china and glasses rattling around in the galley.

CABIN CLASS. As impressive as the front office may be, the cabin is where the paying customers live, and it's a wonderful place. The nine-seat option is the most popular, but all cabin setups come with a huge range of standard equipment. This includes Iridium satellite communications; a 19-inch widescreen HD LCD cabin monitor; a dual BluRay/DVD/CD player; a Gulfstream Cabin Management System that uses individual iPhones to control lighting and select personalized entertainment options (yes, there's a Gulfstream Cabin Control app for that!); plus a galley with microwave oven, a sink with hot and cold water, and all sorts of storage compartments. The cabin's ultraquiet, too, thanks to Gulfstream's extensive efforts to silence even the smallest sources of noise.

At this writing, G280s have been on the market for just a few weeks and sales were around the two-dozen mark. Look for that number to go up in the months to come. What's for certain is that Gulfstream has shaken up the super-midsized market with the G280. **AOPA** 

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