With Embraer’s Legacy 500 approaching certification and customer deliveries beginning later this year, other manufacturers are likely bracing. And they should.

The Brazilian planemaker is positioning this latest business jet as a midsize aircraft, because of its 3,000-nm range and $20 million base price. It would like all to believe its main competition is the Bombardier Learjet 85, Cessna Citation Sovereign and Gulfstream G150, among others in that category.

Yet, apart from measures of range and price, the Legacy 500 actually steps up to the super-midsize class, competing in many ways with the Bombardier Challenger 300/350 and Gulfstream G280. This aircraft is the result of 1,000+ engineers working on the clean-sheet design.

The comparison with other super mids starts with the Legacy 500’s passenger accommodations, which are wholly appropriate for a business aircraft with transcontinental U.S. range. The main cabin is equal in height and just 3 in. shy of the length and width of the Challenger 300, based upon our measurements of both.

The single-point pressure refueling port is ahead of the right wing leading edge. Credit: Embraer
The Legacy 500 has 12 of the largest windows in the super-midsize class, flooding the cabin with ambient light and making it appear larger than its actual dimensions. The windows are well placed for outside viewing by each of eight passengers. There also are windows next to each of the four foldout worktables.

As with the most popular super mids, the Legacy 500 has a flat floor with double-club seating for eight. The four pairs of facing chairs convert into fully flat berths for overnight missions. Either or both pairs of facing chairs in the aft club section may be replaced with one or two, three-place, foldout divans, certified for full-time occupancy. Such design flexibility is possible because the emergency exit is in the aft lavatory.

Similar to the G280, up front there’s a “wet” galley with hot and cold running water with a generously sized catering tray compartment, large ice storage and trash compartments. The galley floor is covered with an ultra-thin granite layer to make it easy to clean.

Plenty of upscale galley inserts are available, including optional microwave and convection ovens, a refrigerator, an espresso machine, fine china and stemware, plus all the other service amenities needed for missions that can approach 7 hr.

The aft lavatory has a high-capacity vacuum toilet, a feature previously found only aboard G280 and larger aircraft. The lav floor also is covered with a granite veneer. A window in the emergency exit door behind the toilet provides ambient illumination when the privacy shade is opened. The lav has a sink with hot and cold running water, large storage compartments and a power outlet.

*All exterior lights, including bottom-mounted landing and taxi lights, are 10,000-hr. life LEDs.*

Credit: Embraer

A Honeywell Ovation Select package offers cabin systems control, passenger air-to-ground communications and a wide array of inflight entertainment (IFE) offerings, including audio and video on demand and Apple TV. The Ovation CMS has evolved in recent years. Its functionality and feature set are now unsurpassed in the super-midsize class.

There’s an aft, 110-cu. ft., ground accessible, external baggage compartment, but it’s neither pressurized nor accessible in flight, a shortcoming relative to other super-midsize
aircraft. However, it does have an FAR Part 25.857 Class C fire protection rating and optional bleed-air heating system.

Passengers, though, have full-time access to another 35 cu. ft. of storage space in the aft cabin and 5 cu. ft. of closet space in the galley area. The aircraft’s 150-cu.-ft. overall baggage capacity is far more than offered by any midsize jet and more storage space than all super mids, except for the G280, which exceeds the Legacy’s by 4 cu. ft.

Thus, at face value, the Legacy 500 appears to straddle the gap between $16 million to $18 million midsize and $25 million to $27 million super-midsize jets, even though it shares more in common with the latter. However, if you take a close look at its technology package, it moves into a class of its own.

Seizing the High-Tech High Ground

The Legacy 500 is as much high technology demonstrator as it is a transportation tool. This starts with its digital fly-by-wire (FBW) flight control system, a technology previously only offered on a few large-cabin jets, such as the $52 million Falcon 7X and $65 million G650. Similar to Dassault and Gulfstream, Embraer’s FBW development team took a decidedly pilot-centric approach to the system.

This FBW system, however, is no copycat. It’s all Brazilian and intended to be used on a whole new family of Embraer business aircraft, as well as being adapted for Embraer’s KC-390 military transport and the second generation of regional E-Jets.

Embraer’s approach to FBW is elegant in its simplicity, providing carefree handling characteristics to minimize workload most of the time, but it also provides natural aerodynamic feel in the landing pattern.

There are no absolute pitch or roll limits, but the normal maneuvering envelope has +30/-15-deg. pitch and +/-33-deg. bank soft limits that can be exceeded by maintaining sidestick control deflection. Flight crews thus have virtually unlimited pitch and roll maneuverability with the FBW system only guarding them against over-speed and overstress, stall and spin.

The system has only two modes: normal law and direct law. There are no alternate laws or intermediate modes that could result from possible degradation scenarios. If the FBW’s
computers cannot support full envelope protection, the system automatically downshifts to
direct law mode. But even if the system doesn’t automatically go to direct law when it should,
pilots can manually select direct law mode at any time at the touch of a button. Envelope
protection is disabled in direct law mode, but there still are stall warning and yaw damper
functions.

The aircraft also has standard full-authority autothrottles and autobrakes, features currently
found only on the G280 and larger aircraft.

The Rockwell Collins Pro Line Fusion cockpit features four, 15.1-in. flat-panel displays.
Synthetic vision is standard.

In 2015, the Legacy 500 is slated to become the first aircraft equipped with optional
Rockwell Collins HGS-3500 head-up guidance and multi-spectrum EVS-3000 camera systems.
The IR/IR/IRIR/IR/IRvideocam will be able to detect LED runway and taxiway lights. The avionics maker
believes HGS/EVS will qualify as an enhanced flight vision system, enabling operators who use
it to fly down to lower weather minimums.

The aircraft is one of the first to be fitted with three-axis, self-aligning, Northrop Grumman
LITEF LCR-100 fiber-optic gyros, albeit labeled as Rockwell Collins AHS-4000 units. These
provide virtually all the same inertial position, attitude/heading reference and velocity outputs
of top-end laser IRS boxes, but at a much lower cost and weight. The 6-lb. units have better
than 12 nm per hour drift rate, they require no forced air cooling and they have a 15,000-hr.
MTBF.

Each pair of facing chairs converts into a full flat berth for overnight accommodations. Credit:
Embraer
The Legacy 500 is also fitted with four self-contained Gen IV UTC SmartProbe air data probes that sense pitot and static pressure, plus angle of attack (AOA) and sideslip using differential pressure. The probes digitize the air data and send it to the aircraft’s avionics. SmartProbes have no pneumatic plumbing, so there are no pressure lags associated with a conventional ports-and-pipes air data system and maintenance costs also are slashed by nearly 87%.

**Proven Construction, Simple Systems**

The basic aircraft, engines and airframe systems are designed for high reliability, long life — it has a 27,500-hr. economic design life, or a 50+ year service life in typical corporate flight operations — and easy maintenance. Inspection intervals are 750 hr. or 12 months, as part of an MSG-3-approved maintenance schedule. An onboard maintenance computer speeds troubleshooting.

High-strength aluminum alloys are used for most of the primary airframe, with composites mainly reserved for front and rear pressure bulkheads, empennage, fairings, doors and control surfaces. Composites are used in areas in which there are tangible benefits for operators, in the form of weight savings and reduced maintenance.

The high-life/low-drag wing optimizes the blend of runway performance, cruise speed, range, stability and control, and Mach buffet margins, along with internal fuel capacity, for the 3,000-nm mission. Aerodynamicist David Lednicer estimates wing area to be 432 sq. ft., giving the Legacy 500 the highest wing loading of any aircraft in this class.

With 27 deg. of wing sweep, long-range speed is about Mach 0.76 to 0.78. However, there is only about a 3% range penalty from cruising at Mach 0.80. Initial cruise altitude is FL 430 and time to climb is 22 min.

The wing has two main spars and a rear sub spar that provides an aft main landing gear attach point. It has a “hard” leading edge with no slats and a sharply swept inboard leading edge section that provides increased fuel capacity with little structural weight penalty. The four-panel trailing edge flaps are electrically actuated. The winglets are bolted on, thus they can be removed and replaced if damaged.

The Honeywell Ovation Select cabin management system is controlled through individual touch screens. Credit: Embraer
The 11 primary flight control surfaces, including two elevators and six-panel multifunction spoilers, are electrically controlled by the FBW system and hydraulically actuated. The horizontal stabilizer is electrically controlled by the FBW system in normal mode and repositioned by dual electrical actuators. The stab can be manually trimmed by means of an up/down rocker switch in the center console when operating in direct law mode.

All fuel is carried in left and right wet wing tanks. The APU feeds off the right tank. The single-point pressure refueling adapter, with a selectable refill quantity function, is ahead of the right wing. Alternatively, the aircraft can be refueled using over the wing refueling ports. B&CA estimates total fuel capacity to be slightly more than 12,000 lb.

The 28 VDC electrical system has three, 600-amp brushless generators powered by the two propulsion engines and the APU, plus a 15KVa ram air turbine that provides full rated power down to 140 KIAS. Two main batteries and two FBW backup batteries supply power when none of the generators are available. Power is distributed through two main buses, two load shed buses and three emergency buses.

There are three separate 3,000-psi hydraulic systems filled with phosphate ester fluid, such as Skydrol PE-5.

All three landing gear mounts have dual wheels. The main landing gear has trailing link geometry for smooth touchdowns. It’s fitted with 2,000-cycle design life carbon brake packs, controlled by means of a brake-by-wire system.

Bleed air is used for engine starting, heating/air-conditioning and pressurization, anti-ice protection and primary door seal inflation, plus optional aft baggage bay heating. Notably, the aircraft has both wing and horizontal stab leading edge anti-ice systems, providing a superior level of ice protection.
There is a single air-cycle machine pack and a backup bleed-air heat exchanger system. The cockpit and cabin have separate thermostats. Pressurization is fully automatic, with destination airport field elevation provided by the FMS. Cabin altitude is 6,000 ft. at the aircraft’s certified ceiling of FL 450. A 77-cu.-ft. oxygen bottle is standard and a 115-cu.-ft. bottle is optional.

All exterior and interior lights are LEDs. The interior LEDs have a 50,000-hr. design life. Exterior LEDs, used for landing and taxi lights, nav, beacon and strobe, and ice detection have a 10,000-hr. design life.

The engines and Honeywell 36-150 APU have fire detection and two fire extinguishing bottles. The aft exterior and interior baggage compartments both have smoke detectors. The exterior baggage bay has one bottle with fast discharge to knock down a fire and a second with slow discharge to keep the fire extinguished.

The APU provides bleed air for main engine starting on the ground and up to 23,000 ft., air-conditioning and pressurization up to 20,000 ft., and electrical power up to 31,000 ft.

No Compromises in the Cabin

The interiors of some of Embraer’s earlier business aircraft left much to be desired in form, fit, function and finish quality. Not so with the Legacy 500. The interior is top notch, judging from s.n. 550-004.
The air-conditioning was impressive on a warm, humid summer day in São José dos Campos. The air distribution system and recirculation fan were quiet, as was the APU.

The high-gloss, wood-veneer cabinetry and monuments, along with the granite veneer flooring, are supplied by List Components & Furniture of Vienna, Austria.

The BE Aerospace passenger seats are available with optional heating, massage and adjustable lumbar support, plus foldout leg rests. The foldout worktables extend and retract smoothly. Each pair of facing chairs has three windows, all with manually operated shades, but power shades are available.

Each of the eight chairs has a touchscreen passenger control unit (PCU) to handle reading and table lights and IFE choices. Individual 9-in. video displays are available for each seat. Each pair of facing chairs has a 115 VAC duplex power outlet.

The lavatory has a vacuum toil and sink with hot and colding running water. Credit: Embraer

The right forward-facing chair in the forward cabin is the designated VIP seat. Its PCU also has cabin temperature and lighting controls, including adjustments for color and intensity of interior wash lighting. Apps are available for the iPhone, iPod Touch and iPad to transform them into remote controls for the CMS.

The Ovation Select package comes standard with a 1080P HD video system, including forward 17-in. monitor, high fidelity cabin audio system and Blu-ray player. Available inputs include devices that use HDMI, USB, RCA, VGA and 3.5-mm mini-jacks, so the system is
compatible with most consumer electronics and office equipment boxes, including Apple TV, the Mac mini, iPads and iPhones.

Options include Wi-Fi, Inmarsat and Iridium satcom units, plus Aircell Gogo Biz air-to-ground communications systems. Also available is a second, 17-in. monitor mounted on the aft cabin bulkhead.

The galley has a 4-gal. water reservoir and electric water heater. The right-side forward cabinet has a top-mounted master touchscreen control station for CMS lighting, IFE, cabin temperature and galley functions. The standard counter surface is synthetic stone, but it’s optionally available with lightweight granite veneer. Above the counter is a tableware storage compartment, while below are a generous, three-drawer cabinet, large pull-out ice and trash bins, plus a galley stores compartment. Options include microwave and convection ovens, a refrigerator and coffee maker/espresso machine.

Behind the pilot, there’s a 5-cu.-ft. storage compartment. In place of it, customers may order a fold-down seat for a flight attendant or a foldout jump seat for a third flight crewmember.

The entry door is manually actuated, but counter sprung. It has an integrated air stair with tread lights and folding arm rail, a cabin pressure relief port and a small window to assure the area below the door is clear before it’s extended. An acoustical curtain for the door reduces wind noise in flight.

The galley area may be closed off from the main seating area with an optional pocket door in the bulkhead.

At the opposite end of the cabin, there’s the full-width aft lav with a solid, pocket, privacy door.

**Let’s Go Flying**

We belted into the left seat of EMB 550-001, Embraer’s first test aircraft, with Legacy 500 chief test pilot Eduardo Camelier in the right seat, instructor pilot Sydney Rodrigues on the jump seat, flight test engineer Gustavo Monteiro at the flight test console and communications manager Daniel Bachmann riding along as photographer and videographer.
Fold out work tables are housed in pockets in the sidewalls. Fit, form and function, as well as finish, are top notch. Credit: Embraer

With few exceptions, the flight deck is a model of ergonomic excellence and functional for flight.

The field of view through the large windshield and side windows is excellent, the seats are comfortable and all controls are intuitive. The displays are large, uncluttered and easy to interpret. Embraer’s use of color coding is clean and conventional.

Buried submenus are out; top-level controls and menus are in. The left- and right-side display control panels (DCPs) in the glareshield, for instance, have dedicated buttons for synthetic vision, TCAS, weather radar, VORLOC or FMS data, and HSI format. The layout of the center-mounted, flight guidance control panel (FCP) is comfortably intuitive.

Two nits to pick. The FCP lacks backlighted annunciator buttons and digital readouts to confirm the selected modes and data. Also, the Legacy 500’s sidestick controls are passive, lacking back-drive servos or linkages that would move both of them in tandem like conventional, mechanically linked yokes.

Serial number -001 was loaded with heavy test equipment and its BOW was 24,640 lb. We estimate production aircraft will weigh considerably less.

On the TOLD card: Three occupants and miscellaneous stores added 822 lb., resulting in a zero fuel weight of 25,462 lb. Fuel load was 10,580 lb., thus ramp weight was 36,042 lb. São José dos Campos’ field elevation is 2,120 ft., OAT was 26C and barometer was 29.95 in. Hg.
Based upon using full rated takeoff thrust and configuring with 7-deg. flaps (Flaps 1), Monteiro computed the V1 decision speed at 114 KIAS, rotation at 122 KIAS, the V2 takeoff safety speed of 129 KIAS and 148 KIAS for en route one-engine inoperative climb speed. Takeoff field length on Runway 15 was 4,920 ft. Available runway was 8,779 ft.

Sometime after certification, the Legacy 500’s FMS will feature optional airport performance computing software that will calculate takeoff, climb and landing data. Until then, operators will have to use Embraer’s OPERA software to compute TOLD numbers.

Checklists for the Legacy 500 are impressively short. After starting the APU, we turned the hydraulic and fuel pump control knobs to the 12 o’clock position. Then we successively turned each engine control knob to the 1:30 position to initiate start. Everything else pertaining to engine start is automatic.

Once the engines are running, their generator and bleed-air outputs automatically take over for the APU. Camelier selected Flaps 1. We checked FBW control freedom of movement, monitoring control surface position on the EICAS. Camelier selected full rated thrust for takeoff.

We released the parking brake, engaged nosewheel steering and taxied out with very little thrust. The aircraft turns much more sharply than the Phenoms, providing good maneuvering in tight quarters.

Large galley has room for crystal, china and flatware. A refrigerator, plus microwave and convection oven, along with an espresso machine are options. Credit: Embraer
Taxiing downhill from Embraer’s ramp, we occasionally used idle thrust reverse to control speed and avoid riding the brakes. We checked brake temperature on the EICAS, verified proper settings for flaps, parking brake and pitch trim with a “takeoff OK” synthetic voice annunciation and called for takeoff clearance.

Once cleared, we taxied to the thres–hold, armed the auto-brake system for rejected takeoff max braking, armed the autothrottles and pushed up the thrust levers to about 40% travel. The autothrottles engaged and servos advanced the throttles to the proper thrust setting.

Initial acceleration was moderate, proportionate to our relatively high takeoff weight and warm day conditions. At rotation, pitch response was crisp, but well damped. The FBW’s gamma dot, or G command, control law allowed us to make small inputs to the control stick, then release it to freeze the flight path vector. It was as though we were using control wheel steering with the autopilot engaged. The aircraft then holds the selected vertical nose flight path and bank angle within the soft limits while affording flight envelope protection.

The Legacy 500’s sidestick has a softer feel and control response is rather sporty compared to most civil FBW aircraft we’ve flown. We soon found, though, that the aircraft can be flown as smoothly with gentle fingertip pressure on the base of the sidestick.

Camelier asked for clearance into a block of flight test airspace and an unrestricted climb to FL 450. But that cruise altitude was higher than the aircraft’s service ceiling at our weight. So, we climbed at 280 KIAS and transitioned to 0.74 indicated Mach at FL 300. Most of the climb was in ISA+10C to ISA+12C conditions until the temperature dropped sharply above FL 400. During the climb, we noted that the FBW system makes it possible for pilots hand-flying the aircraft to rival the smoothness and precision of today’s digital autopilots. We reached FL 450 in 36 min., in spite of having to make several turns to stay in the small confines of the designated airspace.

Using the autopilot for cruise performance checks, we were unable to accelerate above Mach 0.750 or 422 KTAS at ISA-8C, while burning 1,500 lb./hr. at max cruise thrust, at a weight of 34,100 lb. So, we descended to FL 430 in ISA-7C conditions, a density altitude better suited for cruising efficiently at the aircraft’s weight. After several minutes, the aircraft stabilized at Mach 0.794, yielding 449 KTAS, while burning 1,665 lb./hr. at max cruise thrust and a weight of 33,600 lb.

This was 4 kt. faster than Embraer’s preliminary cruise performance predictions, all the more impressive because s.n. -001 still has draggy flight test antennas, external lipstick cameras, exposed rivets and other scars from wounds incurred during the flight test campaign.

We then began a descent to FL 200 for air work and noted that the flight level change (FLCH) function works both uphill and downhill, a capability not available on some other makers’ new models. On the way down, we extended and retracted the speed brakes several times and experienced very little change in the flight path vector. There was only mild airframe buffeting with the speed brakes fully extended.
Next, we sampled the FBW’s over-speed protection, overstress and stall prevention functions. We accelerated through the 320 KIAS Vmo, holding forward stick pressure. “High speed,” warned the synthetic voice. As soon as the stick was released, the nose gently pitched up to return the aircraft to normal flight envelope speed. If the aircraft is in a bank, over-speed protection levels the wings as it eases the nose up to correct the speed deviation.

This was followed by a wind-up turn at 280 KIAS to check the FBW’s 2.5-g overstress protection. Exceeding 33 deg. bank angle, though, isn’t easy because the FBW system introduces artificial spiral stability. Once established in the turn, the aircraft stabilized at 2.5 g’s with full aft stick.

And finally, we performed a series of low-speed protection checks, including turning and aggressively accelerated stalls in the clean configuration, at Approach Flaps 3 (21 deg.) and Landing Flaps 4 (37 deg.). Vref at Flaps 3 was 127 KIAS at 32,400 lb. and 113 KIAS with landing flaps.

During some of these maneuvers, we performed robust left and right turns with the stick all the way aft and the aircraft nibbling at Cl max, just 3% above the aero stall. The aircraft remained completely docile in response to roll control inputs and rock solid in yaw damping. Repeated “Low Speed” aural warnings reminded us that we were flying in the AOA protection range.

We also performed aggressive sideslip maneuvers with the rudders at 141 KIAS to sample the FBW’s P-Beta or roll rate/sideslip angle protection. This function mitigates proverse roll with asymmetric thrust or rudder inputs. The P-Beta function significantly improves aircraft controllability in the event of an engine failure on takeoff.

To see how the aircraft handled without all the FBW magic, we turned off the normal mode and flew in direct law mode. Camelier commented that direct law still provides yaw damping to augment stability. It also incorporates gain scheduling of control inputs. But all closed loop functions, including autopilot, shaping and smoothing of manual stick inputs and envelope protection, are disabled.

Up to 35 deg. angle of bank, control response was quite smooth. In wind-up turns, we noted that it was a little challenging to make gentle attitude changes because control surface movement varies progressively with stick displacement.

Next, we flew an approach to stall. Without envelope protection and because of the aircraft’s natural aerodynamic tendency to roll off on a wing at Cl max, V speeds are increased about 3 kt. in direct law mode to provide more stall margin. And stall warning margin also is increased to a lower, more conservative AOA.

At stall warning, we initiated recovery by adding thrust and lowering the nose when we heard “Stall, Stall” from the aural alert system. The aircraft recovered immediately.

Returning to São Jose for pattern work, we flew our first approach to Runway 15 at Flaps 3, using a bug speed of 133 KIAS, Vref + 5 kt. Descending to 5,000 ft., we experienced plenty of
early afternoon thermal turbulence. The FBW’s flight-path stability function smoothed out most of the perturbations, making it easy to hand fly with precision and providing a comfortable, well-damped ride. Quite a contrast to aircraft with conventional flight controls.

With gear down and Flaps 3, a designated landing configuration, the FBW switched from the flight-path stability mode to speed stability mode. Pressing the touch control steering (TCS) button atop the sidestick reset the trim speed or stable speed reference point, so the aircraft provided conventional control force cues as the speed changed. The TCS button doesn’t trim the stabilizer directly, but rather it changes the reference trim speed used by the flight control computers to provide the speed stability function. The speed stability mode feels very natural.

Over the threshold, we reduced thrust to idle, flared and touched down smoothly, in large part due to the trailing link gear. Camelier reset the flaps to the Flaps 2 position, leaving the flaps at 21 deg. but causing the flight control computers to recognize that we were in a takeoff configuration.

We pushed the thrust levers to the stops, accelerated and launched again. Tower instructed us to use right traffic, climbing to 3,500 ft. — an ideal opportunity to check right-side window visibility from the left seat. It was excellent, providing a significantly larger field of view than most other midsize and super-midsize aircraft we’ve flown.

Our second touch-and-go landing was at full flaps 37 deg. Monteiro computed Vref at 113 KIAS at a weight of 32,000 lb. After touchdown, Camelier again set Flaps 2, we pushed the thrust levers and followed through with the climb to traffic pattern altitude.

The third approach was a Flaps 3, balked landing maneuver with simulated one engine inoperative. Monteiro calculated Vref at 127 KIAS at 31,750 lb. At minimums, we executed the missed approach with full left engine thrust and right engine idle thrust. Because of the FBW’s P-Beta feature, very little rudder pressure was needed to counter asymmetric thrust. We also were able to level the wings with the sidestick and then just release it. P-Beta eliminated all of the challenge of flying the aircraft.

At the suggestion of Rodrigues, we even took our feet off the rudder pedals during the go-around. Only a mild sideslip ensued and the aircraft continued to head parallel to the runway centerline.

We continued our traffic pattern to a simulated OEI landing, using full flaps and 123 KIAS Vref speed, 6 kt. higher than the all-engine Vref speed for a 31,500-lb. landing weight. Gear up and Flaps 1 in the pattern, we found it easy to control the aircraft because of flight path stability and P-Beta thrust asymmetry compensation.

Our final approach and landing was in direct law mode, enabling us to sample the aircraft’s natural aerodynamic handling qualities. Camelier switched off the main flight control computers on the downwind leg. We used the manual stab pitch trim rocker switch in the center console to achieve a stable trim speed. Vref speed was set to 123 KIAS, 6 kt. higher than with normal law, to provide wider stall margins because of the lack of flight envelope protection.
In direct law, the aircraft was easy to fly in the landing pattern, all the way to touchdown. We also disconnected the autothrottles, noting that the thrust response of the HTF7500E turbofans is nicely linear with throttle movement.
The approach, touchdown and roll out were uneventful.

**Embraer Rewrites the Game Rules**

Marco Tulio Pelligrini, president and CEO of Embraer Executive Jets, calls the Legacy 500 a “game changer,” and based upon our observations that seems understated.

The FBW system transforms the Legacy 500 into the nicest flying midsize or super-midsize aircraft we’ve yet flown. In fact, we know of no other purpose-built business aircraft, at any price, that’s easier to fly and more confidence inspiring.

The Pro Line Fusion flight deck provides superb situational awareness. In keeping with Embraer’s “less is more” philosophy, the color palette on the flight displays, symbology and systems synoptics are as simple as possible, minimizing cockpit clutter and potential confusion. And when the new HGS-3500 head-up guidance systems and EVS-3000 IR sensor become available, the aircraft will become even easier to fly.

Most importantly, the cabin environment is on a par with the best offerings in super midsize. The Ovation Select CMS, galley capabilities and lavatory amenities provide passengers with a level of convenience and comfort that previously was available only in some Gulfstream products.

This also is a rugged aircraft, backed by a 10-year/10,000-hr. warranty. No other midsize or super midsize has longer scheduled maintenance intervals. Embraer’s product support now trails only Gulfstream in customer satisfaction.

The Legacy 500 will soon be joined by the $16 million, 2,500-nm range, slightly truncated Legacy 450, which is slated to enter service in 2015. It’s going to compete head on with the $15 million, 2,500-nm range Cessna Citation Latitude, a matchup in which the former boasts a wider, larger cabin, FBW controls and faster cruise speeds.

With the Legacy 500 and 450, the Brazilians have declared that they will set the standards of capability, affordability, comfort and reliability that others will be forced to meet or risk losing market share. Business aircraft buyers will benefit from the challenge.