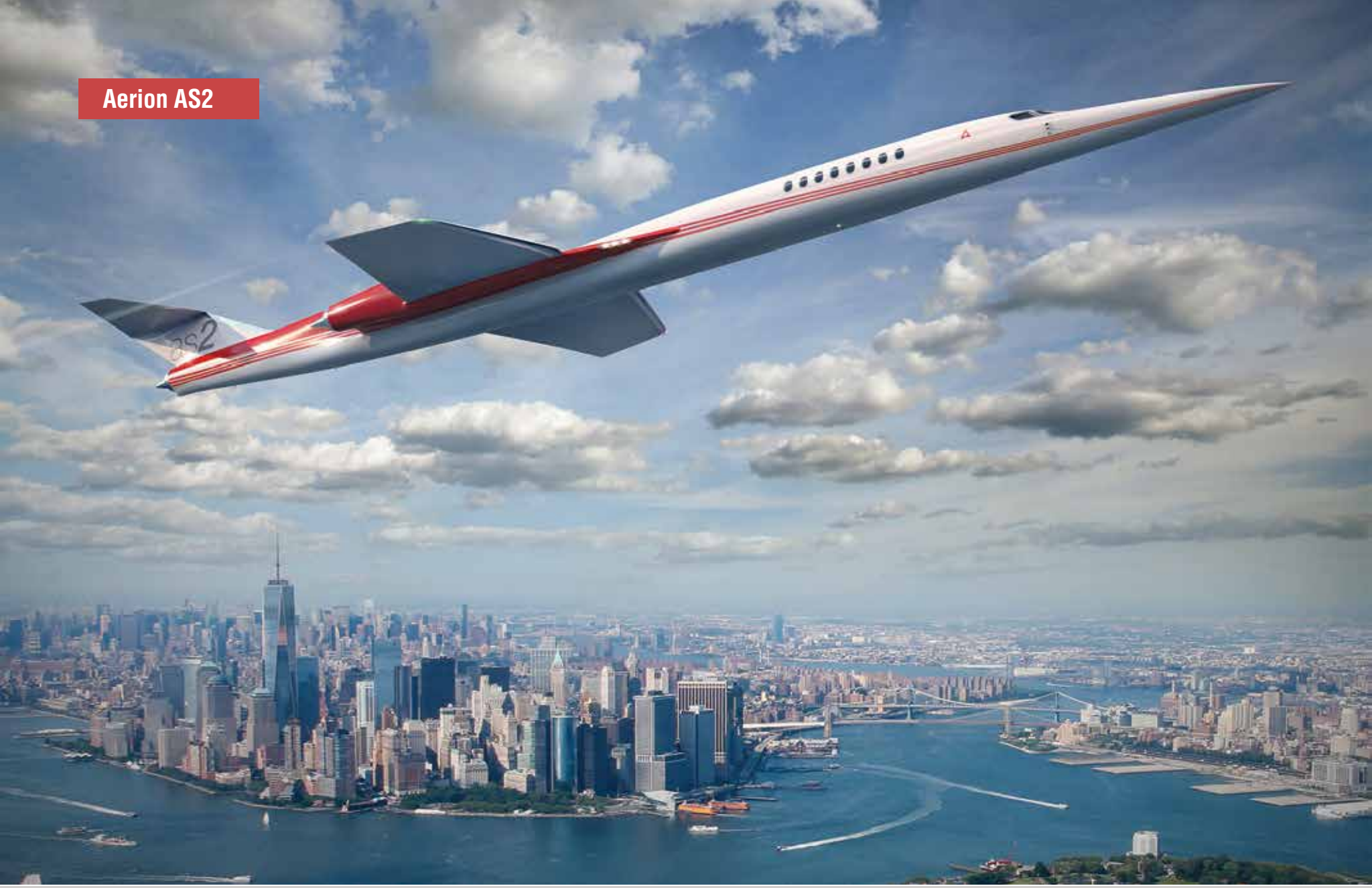


New Jets 2017

New models will be ready when market rebounds

by Mark Huber

The glut of recently used aluminum appears to be clearing out, and that's good news for sales of new jets, in the sense that things aren't going to get demonstrably worse. According to Rollie Vincent of JetNet iQ, "If you look at used airplanes that are five years old or newer there's virtually nothing left on the market. That cleanup has largely happened in the last 12 to 18 months, especially to the extent that it has taken away from new aircraft sales. The buyers are companies that normally would have bought new but could not pass up the value of a pre-owned." The available used business jet inventory for sale at the end of the summer was 7 percent lower year-over-year and represented 10.3 percent of the installed base, the lowest since before the financial crisis, according to data from UBS Global Research.

Nick Popovich of Sage-Popovich concurs. "This market is going to tighten pretty soon."

While optimistic, Alex Overstrom, head of PNC Aviation Finance, said that OEMs are still "in a tough spot, as used aircraft price declines have made new aircraft less competitive with pre-owned. That said, we are still financing a decent number of new aircraft, particularly with large corporate clients, who are often leasing. I expect that the used

aircraft market will remain robust while new aircraft will be challenged over the next 12 to 24 months. As used aircraft inventory declines and prices rise, and OEMs bring production to lower levels, the market should begin to get back closer to equilibrium."

As deliveries decline, OEMs typically tend to focus on maximizing revenue per aircraft, either by skewing their attention to large-cabin offerings or by adding value to existing models and raising the price. Both trends continue to dominate the new business jets coming to market and under development this year, and both are arguably healthy in the sense that they drive innovation.

However, given the current new business jet delivery numbers (661 last year, according to the General Aviation Manufacturers Association), one cannot expect the innovation to be uniform across product lines. As Vincent sanguinely points out, several OEMs have room for "pruning in the garden," by discontinuing slow-selling models or consolidating product lines. While almost any new aircraft can sell when sufficiently discounted, for production to be rational in this market for the OEMs' shareholders and customers, the aircraft must cross into new frontiers of operational efficiency over its entire life cycle. Several of the following aircraft are poised to do just that with new engines, new airframe alloys, more capable avionics and cabins that maximize interior space, comfort and convenience. New jet buyers are demanding more and OEMs that fail to deliver do so at their peril. While the new jet market's descent has slowed and it is poised to recover, it will do so by redefining value and catering to customers less tolerant of tardy or incremental product improvement.

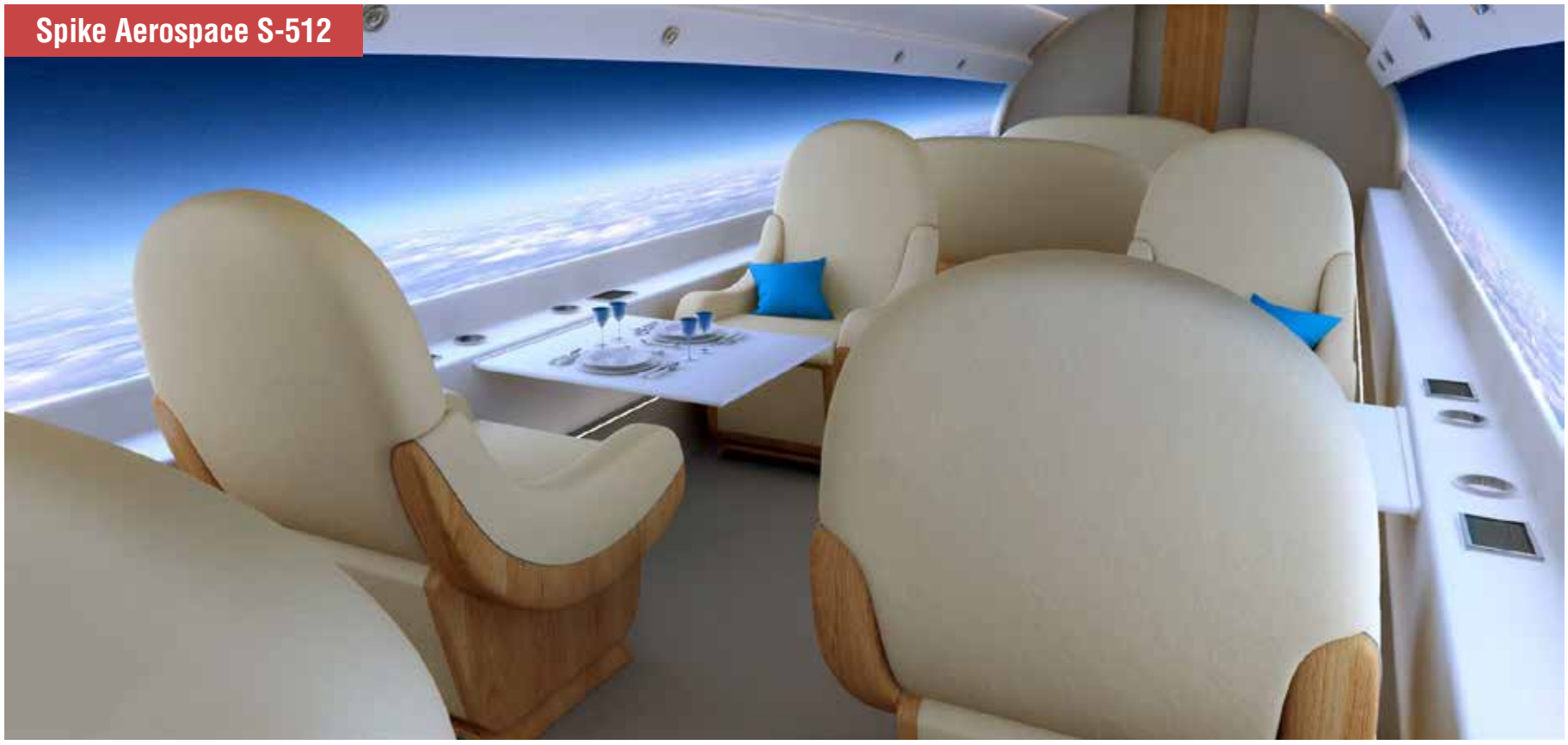
The Supersonics

Aerion AS2

Aerion is now hoping to formally launch development next year, with the goal of certification in 2025. In 2014 Aerion revamped the proposed supersonic bizjet as a trijet with more range and a larger cabin. The new AS2—Aerion supersonic second design—retains its predecessor design's supersonic natural laminar-flow wing, but will now have a range of at least 5,000 nm and a cabin cross-section nearly the size of a Gulfstream G550's. The 30-foot-long cabin, which is 17 feet shorter than the G550's, will feature a two-lounge layout, galley and both forward and aft lavatories, plus a baggage compartment accessible in flight.

Mtow grows to 121,000 pounds and the fuselage is lengthened to 170 feet. Balanced field length is 7,500 feet at mtow, but that is reduced to 6,000 feet at weights of less than 100,000 pounds. Flying at the lighter weight reduces range by 20 percent. Maximum speed is Mach 1.6; however, the aircraft is designed to cruise efficiently at Mach 0.95 to comply with existing supersonic overflight bans. Earlier this year Aerion announced that it had selected GE to provide the AS2's engines and that they would be derived from an existing commercial core that could deliver thrust in the 15,000- to 17,000-pound range.

In 2014 Aerion announced an agreement to collaborate with Airbus on technologies associated with the future of high-performance flight, and exchange knowledge and capabilities in design, manufacturing and certification. Over the longer term, Aerion said, the deal will provide proprietary technology and assistance to Airbus Group in the development of high-performance aircraft technology. Aerion said that Airbus has been instrumental in helping with the design of an articulating landing gear, the fuel system, the computerized fly-by-wire flight control architecture, and the carbon-fiber wing, fuselage and empennage structures. In 2015, the program got


Spike Aerospace S-512

another boost when fractional operator Flexjet signed a letter of intent for 20 AS2s with plans to offer them to Global Lease customers.

HyperMach SonicStar

This revised design proposes a top speed of Mach 4.4, a maximum range of 6,500 nm and seating for up to 32 passengers. The company says it has completed several rounds of financing and is continuing to develop "65,000-pound-thrust H-Magjet 4400 hybrid turbofan ramjet engines" with sister company SonicBlue. First flight for the $180 million aircraft is estimated in 2022 and certification in 2025. Testing of a half-scale model could start next year.

Spike Aerospace S-512

Spike Aerospace is planning a series of test flights of the first SX-1.2 demonstrator this fall. The SX-1.2 is a scaled, proof-of-concept aircraft that will help validate the aerodynamics of the S-512 supersonic jet. The company intends for the SX-1.2 to be followed by a series of successively larger and faster aircraft, leading ultimately to a supersonic demonstrator. Spike said in September that it is already building the third generation of demonstrators, with the first two complete and ready for first flights.

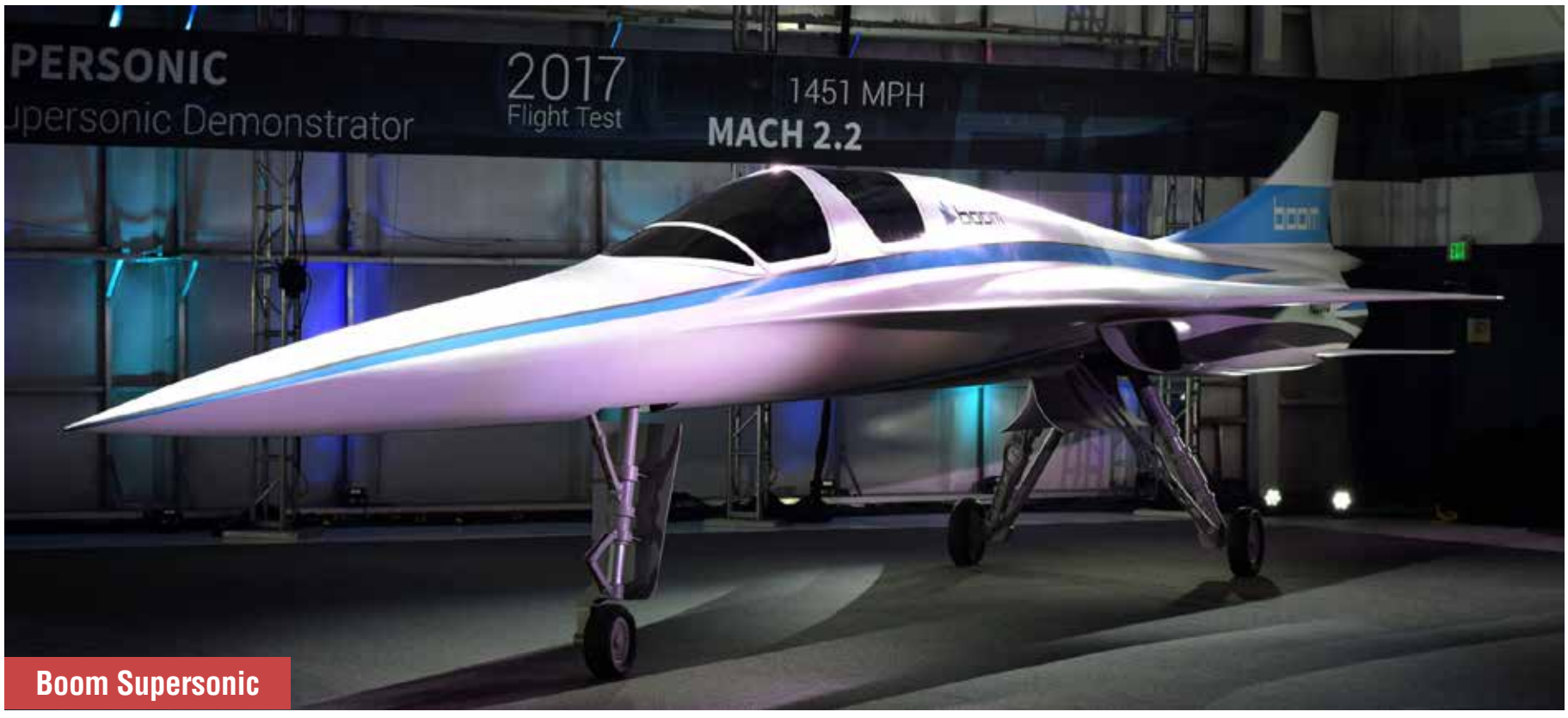
CEO Vik Kachoria said Spike is on schedule to begin high-speed testing by the middle of next year and build the crewed high-speed demonstrators in 2019. That will lead to final designs, production and testing of the S-512.

Spike has developed partnerships with Siemens, Quartus, Aernnova, Greenpoint and BRPH and intends to have the S-512 flying by early 2021, with customer deliveries beginning in 2023.

The S-512 will seat up to 22 passengers, with a range of 6,200 nm and a cruise speed of Mach 1.6. Spike is looking for a low- to medium-bypass-ratio engine producing 20,000 pounds of thrust at sea level. The company continues to search for more funding for the $1 billion program and estimates a market for 600 aircraft between 2020 and 2030. Spike's goal is to bring an aircraft to market by 2022.

Boom Supersonic

Boom Supersonic had raised $41 million through early this year to fund a one-third-scale XB-1 Baby Boom demonstrator that could fly as early as next year. The XB-1 features three non-afterburning General Electric J85-21s with variable-geometry intake and exhaust, Honeywell avionics, Tencate carbon-fiber prepreg and Stratasys 3D-printed



Boom Supersonic

components. The scaled aircraft will be used to evaluate the design for the larger aircraft's delta wing and carbon-fiber fuselage.

While Boom's ultimate goal is to manufacture a three-engine, $200 million, Mach 2.2 supersonic jetliner with about the same seating capacity as a first-generation regional jet that could be configured as a business jet, the company is currently focused primarily on securing airline orders. Boom has purchase commitments for 76 aircraft from five airlines for the full-scale version, which it aims to have in service by 2024.

Boom announced last year that Richard Branson's Spaceship Company will provide engineering, manufacturing and flight-test support to Boom and holds an option on Boom's first 10 aircraft. Two cabin configurations have been unveiled to date—for 45 and 55 passengers. The company maintains that the seat-mile costs will be comparable to those for airline business class.

Airliners

Airbus ACJ Neo

Airbus will make the re-engined Neo (new engine option) A319 and A320 available for the Airbus Corporate Jet (ACJ) program next year. For power, Neo customers have a choice of either the CFM LeapX or the Pratt & Whitney Pure Power PW1100G. Deliveries of the ACJ320neo are slated to begin in next year's fourth quarter, with ACJ-319neo deliveries beginning in early 2019.

The new aircraft are 16 percent more fuel-efficient than their predecessors thanks to the new engines and the addition of wingtip "sharklets." More centerline fuel tanks take the range from 6,000 nm to 6,750 on the 319 (eight passengers) and from 4,300 nm (eight passengers) to 6,000 nm (25 passengers) on the 320. Both aircraft also get lower cabin altitudes and redesigned luggage holds that provide more capacity.

Earlier this year, Airbus Corporate Jets unveiled the Infinito cabin design for the ACJ319neo developed with Italian hypercar maker Atelier Pagani Automobili. The design incorporates composite materials such as CarboTitanium and features a curved pathway through the cabin, shell-shaped valances and walls between zones that can switch from opaque to transparent. The interior has soft leather carpets and a wooden floor contrasting with carbon fiber in furniture and wall frames.

Airbus ACJ350 XWB

Airbus began delivering the A350 XWB to the airlines in 2014 and formally announced its intent to

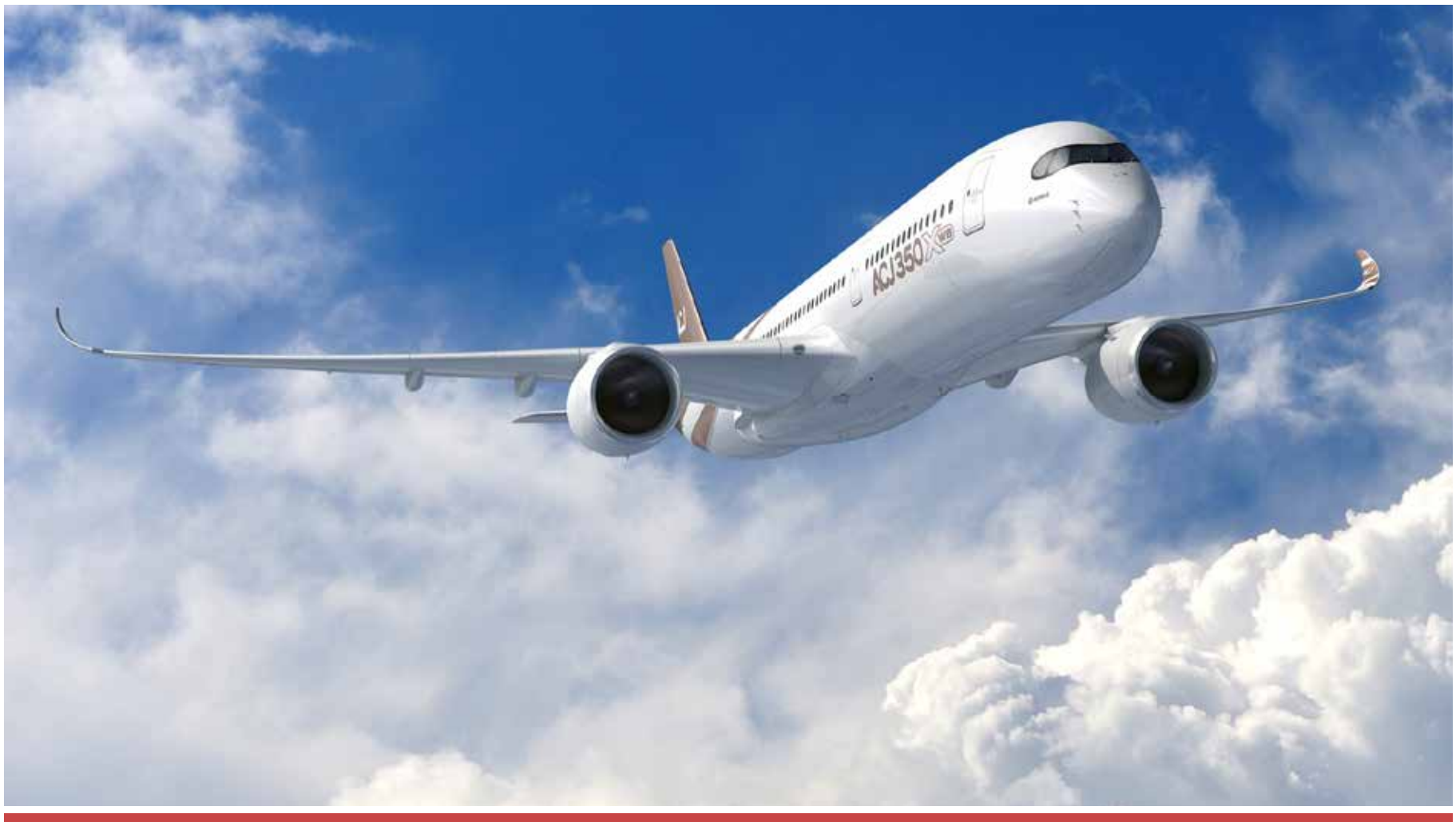
offer a private variant of the aircraft last year. The aircraft is known as the ACJ350 XWB and without an interior will sell for $250 million. In typical executive configuration with 25 passengers, it will have an unrefueled range of 10,800 nm—20 hours in the air—allowing direct connection between most major city pairs. Top speed is Mach 0.89.

The cabin of the Dash 900 measures 170 feet long, 18 feet wide and eight feet tall, yielding 2,910 sq ft of floor space. Airbus is introducing Easyfit, a streamlined process for outfitting the cabin interior that uses the cabin wall attachment points. While the 350's cabin is wider than that of the 787 (the other large composite airliner), the windows on the Boeing are noticeably larger and feature electro-chromic dimming, while the Airbus relies on old-technology electro-mechanical shades. The larger windows on the 787 create the illusion of more interior space. Conversely, the smaller windows on the A350 make the cabin marginally quieter.

Mtow is close to 600,000 pounds, and an aircraft this big can't land just anywhere: it needs 6,100 feet to stop. Takeoff distance at maximum weight is 8,770 feet. The claimed fuel-efficiency advantage over the 787 appears to come from Airbus's wider use of composites–53 percent versus 50 percent on the 787. The Airbus also employs a new winglet design called a "sharklet," which reduces drag and boosts top speed to Mach 0.89 from Mach 0.85. The two aircraft rely on the same engine technology.

Airbus ACJ330neo

The new private variant of the Airbus A330neo will be able to fly 25 passengers 9,400 nm, enabling non-stop flights from Europe to Australia. The A330neo will be powered by the new-generation Rolls-Royce Trent 7000 and incorporate a longer wing and wingtip sharklets similar to those on the A350 XWB. The improvements deliver a 12 percent fuel-burn reduction compared to a standard



Airbus ACJ350 XWB

A330, as well as payload and range improvements. Other ACJ330neo features: an onboard airport navigation system, runway overrun prevention system and LED exterior lights. The first A330neo will be delivered to the airlines next year and the first ACJ330neo slot will be available in 2019.

BBJ Max

The BBJ Max is the private version of Boeing's new 737 Max series. The 737 Max 8, the first of potentially five Max variants, gained FAA certification in March. Boeing plans to follow the Max 8 with the larger Max 9 next year and the higher-capacity Max 200 and smaller Max 7 in 2019.

Boeing Business Jets (BBJ) announced in 2013 that it would build executive versions of the 737 Max known as the BBJ Max, also fitted with CFM Leap 1-B engines. Deliveries of the BBJ Max are expected to begin in 2021, to date in three variants, the Max 7, Max 8 and Max 9. They are based on the current BBJ1, BBJ2 and BBJ3, respectively, and have the same cabin sizes as their predecessors but significantly more range and, in the case of the BBJ Max 7, more range and luggage space.

The BBJ Max 7 will be 6 feet, 4 inches longer than the BBJ1 with a range of 7,000 nm (four passengers), a significant improvement over the BBJ1. It will require only seven auxiliary belly tanks as opposed to nine on the BBJ1, opening more cargo space. The BBJ Max 8 will have a range of 6,325 nm, a 14.6-percent improvement over the BBJ2. The BBJ Max 9 will offer a 6,255-nm range, 16.2 percent more than the BBJ3. The new aircraft will be 14 percent more fuel efficient than current-production single-aisle BBJs, thanks to new-design winglets and the new engines, which are mounted farther forward and higher on the wing and connected by new and more aerodynamic pylons. The Max also gets a more aerodynamic vertical stabilizer. To provide adequate ground clearance for the larger engines, the landing gear will be lengthened so the airplane will stand a little taller on the tarmac.

The Max will employ limited fly-by-wire controls, mainly to the wing spoilers. Other planned technology includes the addition of four big 15.1-inch Rockwell Collins flight displays in the cockpit, the same ones that are on the 787 Dreamliner. Maintenance on the Max will be easier than on the BBJs, as fault data, once collected by instruments in the forward equipment bay, will now be available for technicians and pilots on the cockpit display screens. The Max will also hold more maintenance data on an enhanced onboard network system and network file server, doubling the amount of maintenance information available during flight and transmitting it live to ground stations so that issues can be resolved quickly in flight or shortly after the airplane lands. This will further enhance the aircraft's already high dispatch reliability—Boeing quotes a 99.7-percent dispatch rate for the current-generation 737.

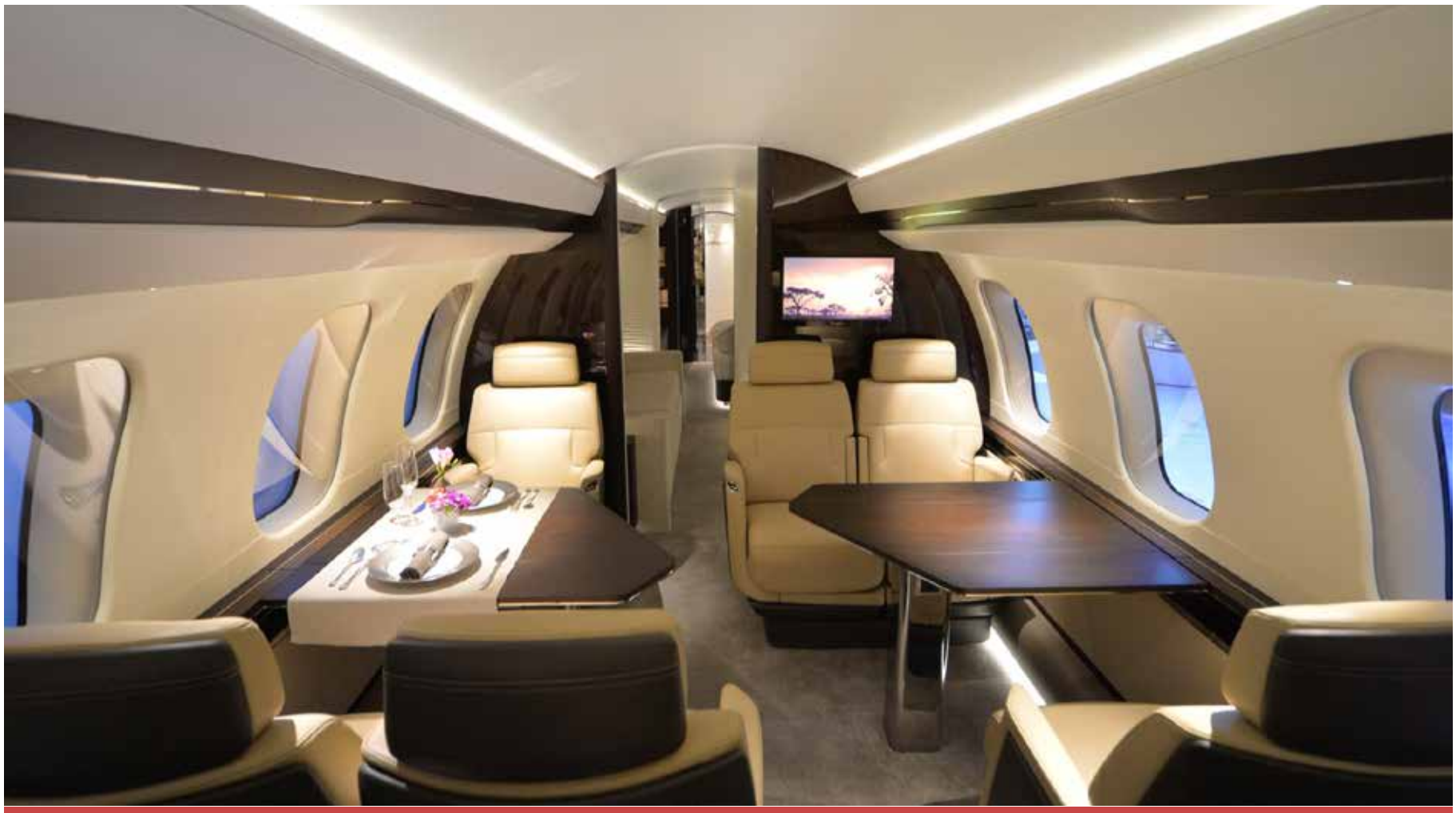
Large cabin, long-range

Bombardier Global 7000 & 8000

Bombardier continues development of a pair of new aircraft with more range and fuel efficiency than the current Global 6000 flagship. Both aircraft use the Global 6000 fuselage but stretch it—the 7000 by 11 feet, 3 inches and the 8000 by two feet, three inches—and add bigger cabin windows extending higher up the sidewall. Financial problems related to the development of the C Series airliners and problems related to the development of the Global 7000's thinner production wing have pushed the development schedule to the right. The aircraft were originally scheduled to enter service in 2016 and 2017, respectively.

Bombardier plans to decide later on the Global 8000 program schedule.

The fourth Global 7000 flight-test aircraft (FTV4) joined the test program in late September and a fifth will be added to the program before



Bombardier Global 7000

anticipated certification and entry into service next year. FTV4 is being used for interior validation testing in parallel with the Global 7000 interior test rig, which simulates real-world flexing and bending of the fuselage with interiors installed. The fuselage on the Global 7000 is being constructed with aluminum-lithium (Al-Li) alloy similar to the material used on the C Series airliner. The material can reduce weight by as much as 10 percent compared with composites and has the potential to improve fuel efficiency by up to 20 percent, according to the company.

The aircraft has a new thin high-speed wing, fuel-efficient GE Passport engines (16,500 pounds of thrust each), fly-by-wire flight controls and Rockwell Collins Pro Line Fusion avionics. The engines were certified last year. Bombardier said that at Mach 0.85 the range for the 7000 bumps up to 7,400 nm and 7,900 nm for the 8000. Range numbers assume 10 passengers and four crew on the 8000. Maximum ramp weights for both aircraft top 105,000 pounds.

Among the features of the new jets: a hyper-quiet cabin divided into three or four zones; a galley 20 percent larger than that on the Global 6000, with double convection/microwave and convection/steam; a mid-cabin/self-serve galley; redesigned and larger crew rest areas; panoramic passenger windows that give the cabin an airy feel; improved heating and cooling; redesigned seats; a center lounge/media room with 42- to 50-inch flat-screen monitors; adjustable color LEDs in the ceiling; a conference/dining table that seats six; a private state room; an optional stand-up steam shower; a more robust environmental-control system; and a capacious 195-cu-ft baggage hold. The price for the 7000 is expected to be in the region of $73 million.

Gulfstream G500 and G600

Gulfstream continues to report progress on two new large jet programs, the G500 and G600. Through August 20 the five G500s had flown 3,460 hours during 905 flights; the G500 recently completed certification testing for flyover noise,

cabin systems, brakes and lighting, while company testing of the fuel system is finished. The aircraft made a 10-hour, 6-minute flight in April and set a city-pair record from Savannah to Paris in May, covering the 3,788 nm in 7:40 at an average speed of Mach 0.90. The G500 has been flown to Mach 0.995 and 53,000 feet. Gulfstream expects to complete certification flying in this quarter.

Meanwhile, the four G600 test aircraft have logged 780 hours during 175 flights, the longest lasting 13 hours and 5 minutes in May. A fifth test aircraft, with a full production interior, will be added to the program later this quarter. Development testing has been completed in initial envelope expansion and flying qualities, brakes, low speed or stall, load calibration, parameter identification and climb performance. Certification testing for loads and flutter has been completed. The aircraft has reached Mach 0.995 and 54,000 feet. Gulfstream says the G600 is on schedule for certification and deliveries next year.

In October 2014, Gulfstream formally launched the two large-cabin jets designed to replace the G450 and G550. The top speed for both aircraft is Mach 0.925. The G500 has a range of 5,000 nm at Mach 0.85 and 3,800 nm at Mach 0.90. The G600 has a range of 6,200 nm at Mach 0.85 and 4,800 nm at Mach 0.90. Gulfstream has set initial prices at $44.65 million for the G500 and $55.65 million for the G600.

Power for the aircraft will come from Pratt & Whitney Canada's new PW800. The 16,000-pound-thrust-class PW814GA and PW815GA have the same core technology used in the company's geared turbofan airliner engines. The cabin cross-section of each aircraft measures 91 inches wide and 74 inches tall—seven inches wider and two inches taller than cabins in the G450 and G550—and they can be configured for up to 19 passengers. The G500 has three living areas and the G600 has up to four as well as an optional crew rest area. Both aircraft offer forward and aft lavatories, and a full-size galley that can be located either forward or aft.

The cockpits feature fly-by-wire controls and active-control sidesticks and the new touchscreen Symmetry flight deck, which is driven by Honeywell Primus Epic avionics. The avionics include Gulfstream's enhanced vision, Honeywell's synthetic vision with 3-D taxi and a head-up display system. The full three-axis digital fly-by-wire system offers benefits that include flight-envelope protection, stability augmentation, increased redundancy and reduced maintenance.

The streamlined and highly styled cockpit, which is finished in black leather with metallic accents, is the most striking feature of the interiors. Most of the switchology found in earlier designs has been eliminated. Inputs are made through five Honeywell touchscreens with large, easy-to-view icons. Gulfstream's familiar cursor-control devices (CCD) are integrated into the center console at the head of the hand grips. The console extends aft of the pilot seats, but it is lower slung, making step-over entry and exit easier. The CCDs give each pilot control of three of the four main display screens and allow data to be shifted between them in the event of a failure.

Dassault Falcon 5X

The Falcon 5X twinjet flew for the first time on July 5 from Dassault's Bordeaux-Mérignac final assembly facility, using a "preliminary version" of the long-delayed Safran Silvercrest engines. The flight-test campaign lasted a few weeks and was designed to streamline the development process. A full-fledged flight-test campaign with "certifiable engines meeting Dassault's specifications" was scheduled to begin next year, enabling the 5X to enter service in 2020. However, a new problem with the Silvercrest's high-pressure compressor, discovered during flights on Safran's GII testbed in San Antonio, Texas, will likely add further delay to the 5X program.

The $45 million 5X was announced in 2013 and offers an 8.86-foot fuselage diameter that is slightly wider than that of the 8X; it yields six-and-a-half feet of headroom and a cabin volume

of 1,766 cu ft. Cabin configurations provide seating for up to 12 passengers.

Dassault claims that the aircraft will be 50 percent more fuel efficient and cost 30 percent less to operate than competing models from other manufacturers. It will have fly-by-wire controls with sidesticks, and the new Silvercrest engines will each provide 11,450 pounds of thrust. The avionics will be based on the Honeywell EASy system, which provides dual head-up displays with synthetic and enhanced vision information. The large cockpit will incorporate a 32 percent larger windshield than the one on the 7X as well as pilot seats that recline 130 degrees, allowing one crewmember to rest while the other flies.

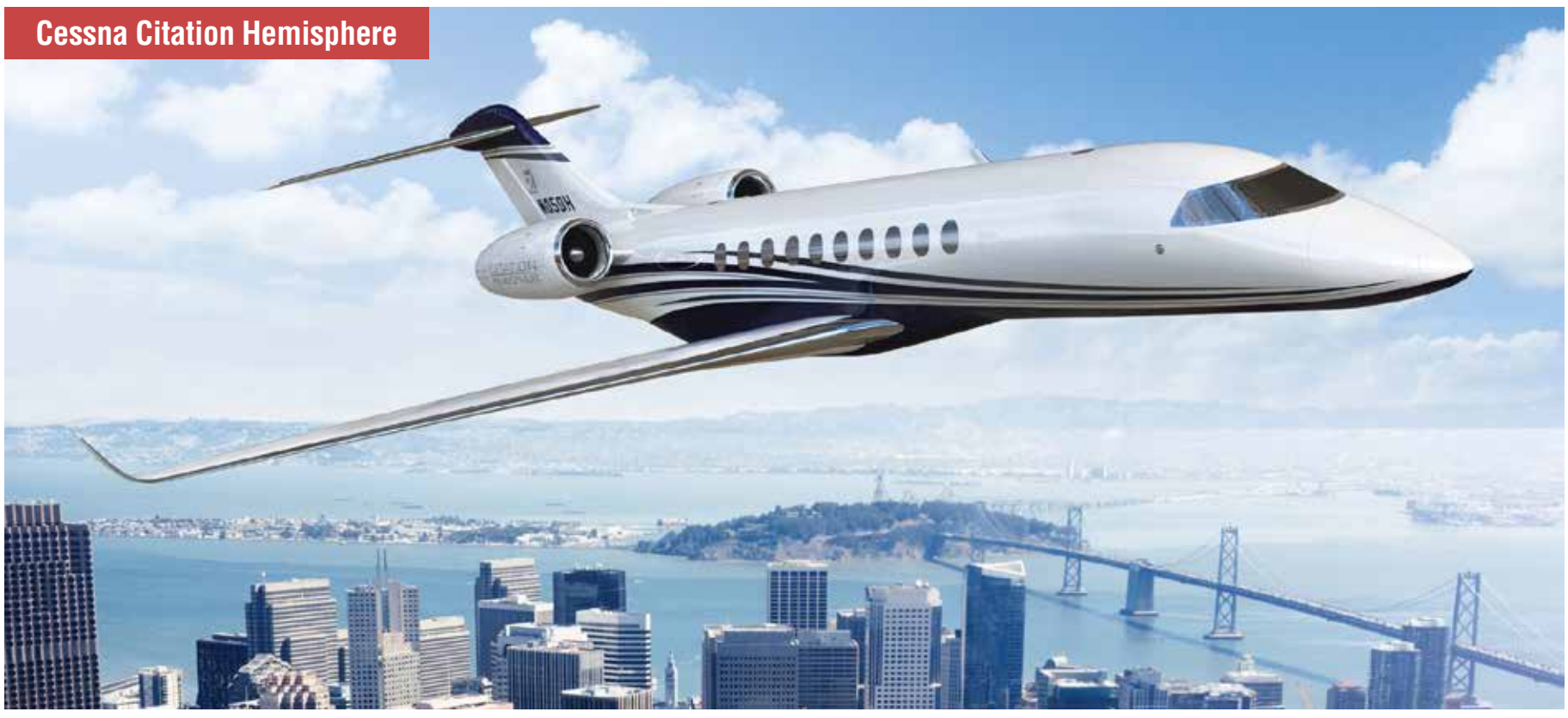
The 5X will have an mtow of 69,600 pounds and a range of 5,200 nm, which equates to 11 hours, 30 minutes in the air. It will be able to take off from 5,000-foot runways and return to earth at a modest 105-knot approach speed. It will do this without sacrificing high-speed cruise performance. The 5X will have a top speed of Mach 0.90. The all-new wing incorporates a fresh winglet design; leading-edge slats that enable lower approach speeds to shorter runways; and flaperons.

The 5X offers a brighter interior with windows 30 percent larger than those on the 7X. The entryway can be filled with natural light, courtesy of an electronically dimmable Zenith skylight from Vision Systems above the galley aisle. The smart glass in the skylight can adjust tint in virtually any degree to modulate the amount of incoming light and solar heating. The 5X's pressurization system yields a cabin altitude that is only 3,900 feet at 41,000 feet; and it's just 6,000 feet at the service ceiling of 51,000 feet. The cabin has the Falcon HD inflight-entertainment system and is available with various layouts, and the seats can be fully reclined to produce sleeping areas for up to six passengers. The pressurized 155-cu-ft main baggage area is accessible through the aft lavatory, providing dressing space in flight. The single executive seats have been redesigned with a slick-looking shell back and mechanical functions such as slide, swivel and recline controlled by an electric switch in place of the traditional, and maintenance-prone, cabling system. Full-electric-function single seats are an option.

Large Cabin

Cessna Citation Hemisphere

Relatively little is known about this aircraft, announced in 2015, other than its size, range and $35 million price. Much of the aircraft is still being defined, although it appears that Cessna will be



Cessna Citation Hemisphere

creating a niche between the traditional super-mid-size and large-cabin, long-range models. To date the company has said that the Hemisphere will have a range of 4,500 nm, a top cruise speed of around Mach 0.90, a flat-floor, multi-zone cabin with a 102-inch diameter, "class-leading operating costs and performance," and will fly in 2019. Textron Aviation's engineering head, Brad Thress, said earlier this year that progress on the program continues with the completion of advanced wind tunnel tests to decide the structural size of the aircraft. Cessna displayed a cabin mockup of the large-cabin jet last month at the NBAA convention and opened the order book for the airplane.

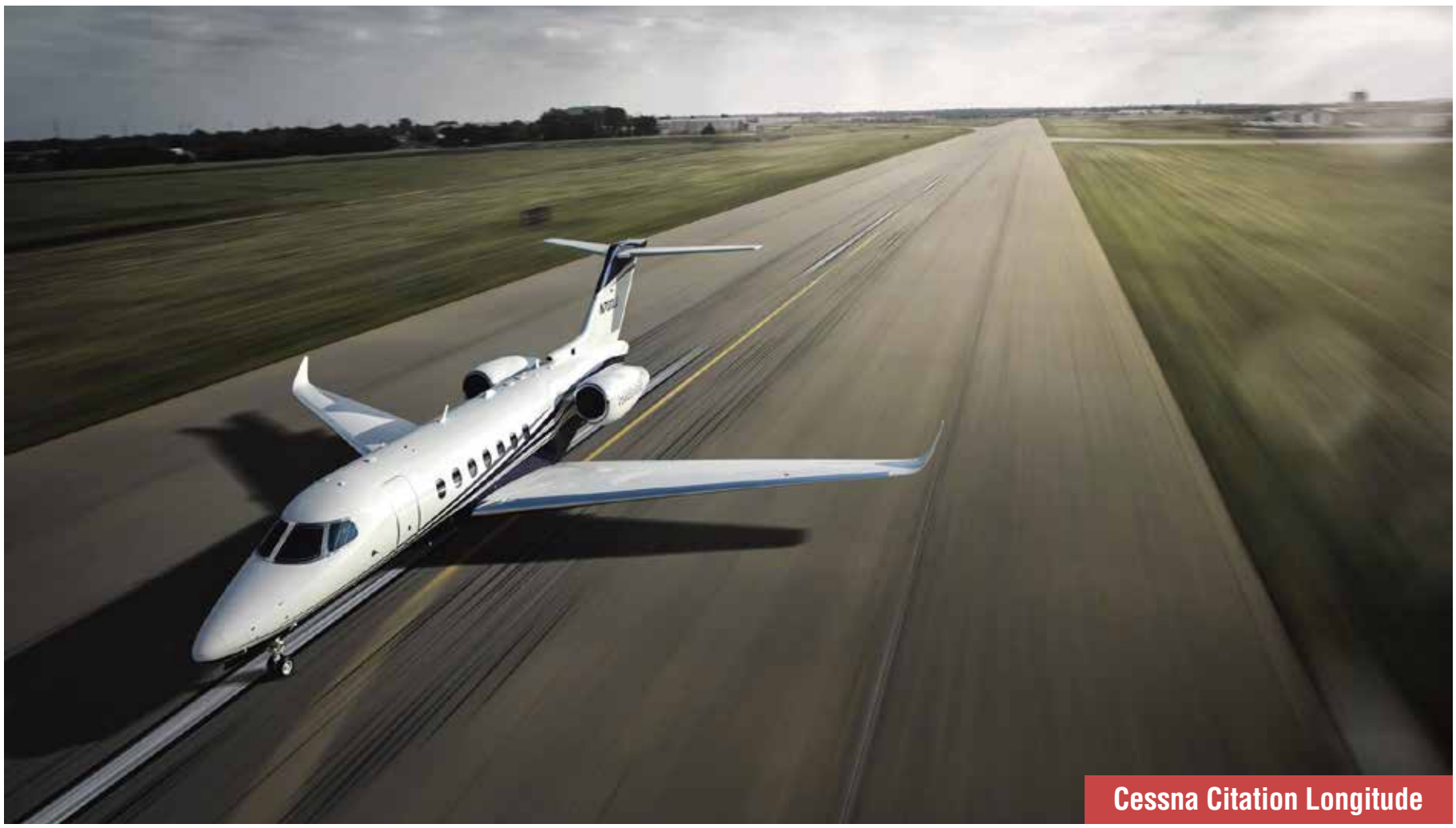
Super-midsize

Cessna Citation Longitude

Certification is expected late this year or early next for Cessna's $26 million entry into the super-midsize derby. Five aircraft are currently in flight-test and the first batch of production aircraft is being assembled. The 3,400-nm-range Longitude offers a 12-passenger, 77-inch-wide, six-foot-tall, flat-floor cabin; a pair of Fadec-equipped Honeywell HTF7700L turbofans (7,550 pounds of thrust each); and Garmin G5000 touchscreen avionics with autothrottles and radar, optional head-up display and extended maintenance intervals.

It has a cabin altitude of 5,950 feet, standard double-club seating with eight single executive seats of a new and wider design, a walk-in 112-cu-ft baggage compartment that is accessible in flight, a full-fuel payload of 1,600 pounds, a maximum cruise speed of 476 knots, and is designed to use 5,000-foot runways (at mtow). Other creature comforts: a vacuum-assisted externally serviced lavatory, a full galley with sink and potable water and 20 percent more legroom than in competing airplanes, according to Cessna.

Cessna is eschewing expensive systems such as full fly-by-wire flight controls. The Longitude will have limited fly-by-wire for the rudder, spoilers and brakes ("brake-by-wire"). The aircraft will be equipped with the LinxUs system to provide real-time maintenance monitoring in flight. It also has more user-friendly maintenance access ports than past models.



Cessna Citation Longitude

The OEM has focused on creating a comfortable cabin. Natural light throughout comes from 14 large windows. LED lighting is controlled via a wireless cabin-management system that Cessna has implemented on other models, among them the Citation X+. The system delivers a menu of information/entertainment choices, such as SiriusXM and moving maps. Iridium satcom is standard, and that allows Wi-Fi at speeds that are poised to increase significantly with the launch of next-generation satellites between now and the end of next year. Passengers can operate the system via onboard touchscreens, controllers or smart devices (with a downloaded app). Most of the slide/swivel/reclining seats will be full berthing. While the standard configuration features a double club-four arrangement of eight single seats plus a side-facing single kibitzer in the front of the aircraft that's suitable for a flight attendant, the aircraft can also be ordered with an aft three-place side-facing divan or a forward two-place side-facing kibitzer. Each single seat has two USB charging ports and sidewall stowage for personal items.

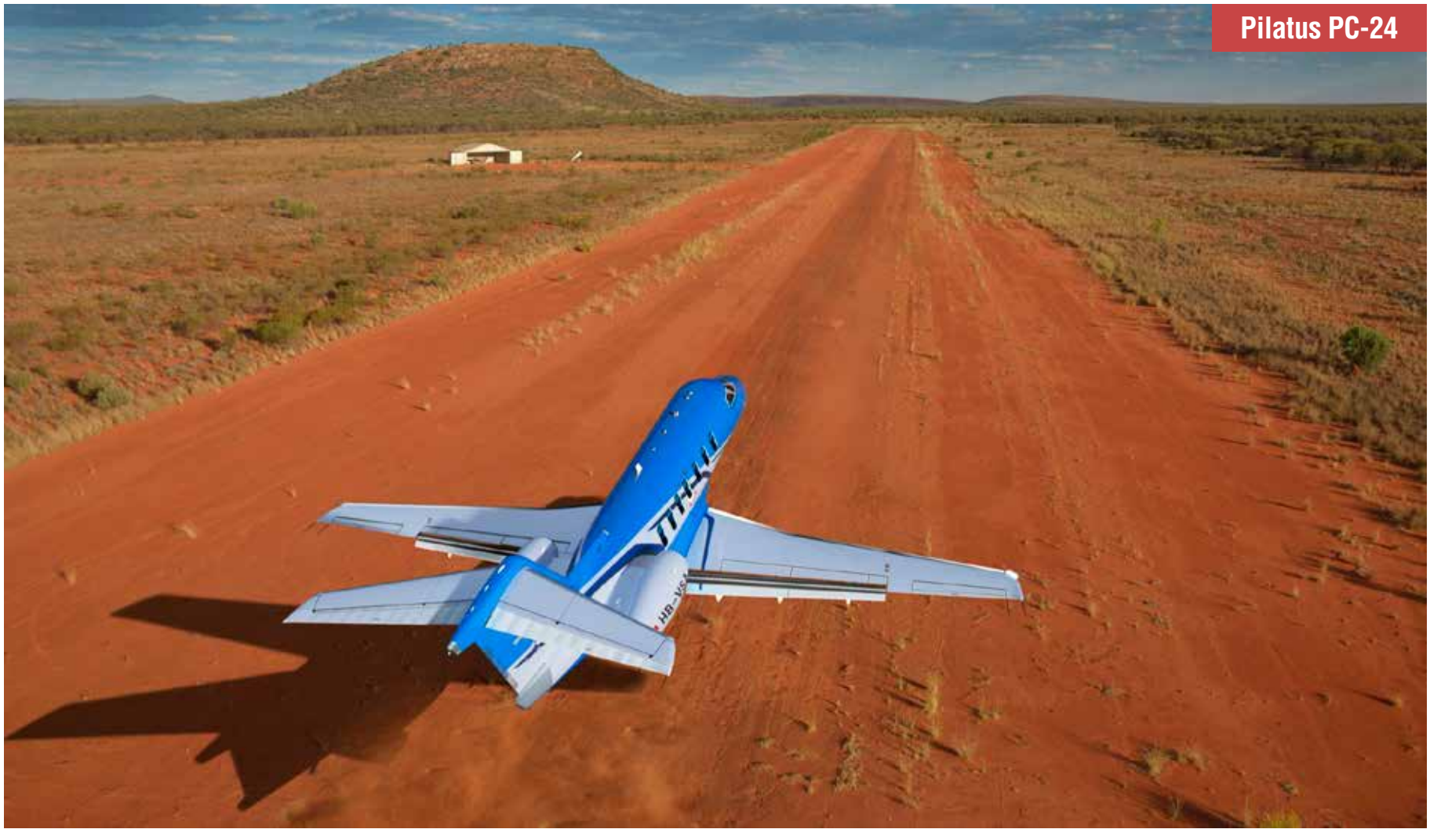
Light Mediums

Pilatus PC-24

Through the summer the three PC-24 "Super Versatile Jet" test aircraft had accumulated 1,800 flight-test hours and Pilatus is on track to certify the new twinjet in the fourth quarter of this year.

The first PC-24 test aircraft rolled out of the hangar on Aug. 1, 2014, and flew in May 2015. The first two years of production quickly sold out. Pilatus temporarily stopped accepting new orders at 84.

The aircraft combines light-jet operating economics with super-midsize capabilities and comfort and is aimed at more conventional offerings from Cessna and Embraer. Like the PC-12 single-engine turboprop, the PC-24 retains an aft cargo door. With a takeoff distance of 2,690 feet (2,526 feet for landing) at the 17,650-pound mtow, the PC-24 can operate from unpaved and unimproved fields. Pilatus aims to have the 10-passenger, $8.9 million all-metal aircraft approved for single-pilot operations.



Pilatus PC-24

Power comes from a pair of Williams International FJ44-4As each rated at 3,435 pounds of thrust. Engine features: automatic thrust reserve, passive thrust-vectoring nozzles, quiet power mode in place of an APU to provide ground power, integral pre-cooler to condition bleed air and reduce drag losses, and an anti-ice and noise-suppressing inlet. They have a 5,000-hour TBO and a hot-section time of 2,500 hours. The engines help propel the PC-24 to FL450 in less than 30 minutes and achieve a high-speed cruise of 425 ktas at FL300. Range with four passengers is 1,950 nm and at mtow the maximum payload is 2,500 pounds.

The customized avionics suite, dubbed Pace—Pilatus advanced cockpit environment—is built on the Honeywell Primus Apex system and features all the latest advances.

The voluminous passenger cabin provides more space than either the Cessna XLS+ or the Embraer Phenom 300 and has a flat floor, which means less headroom in the aisle. The aircraft will come with seven interior options for executive, commuter, combi and quick-change layouts as well as options for an externally serviced lavatory, either forward or aft, and galleys. The PC-24's dominant feature is the rear cargo door, which measures 4.1 feet wide and 4.25 feet tall.

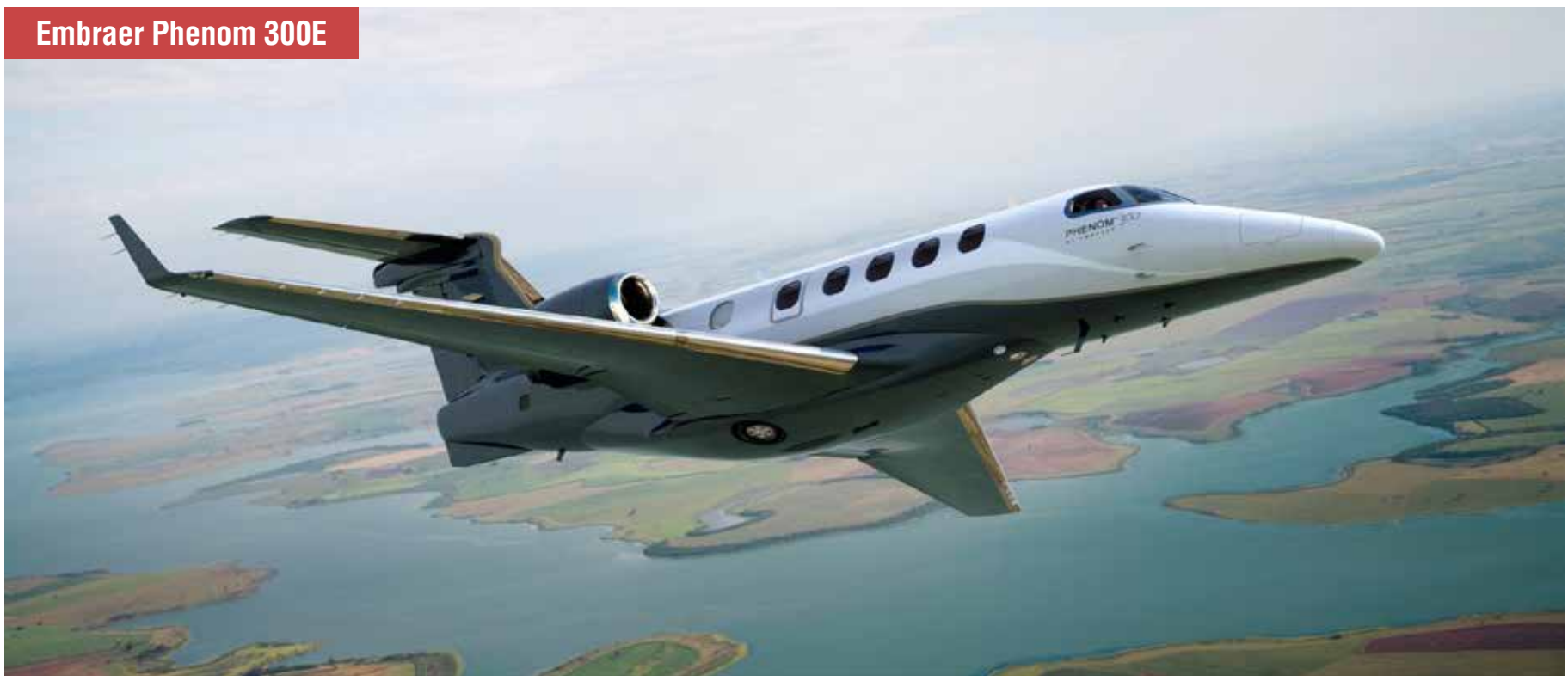
In June last year Pilatus Business Aircraft broke ground on a dedicated 120,000-sq-ft facility for PC-12 and PC-24 completions at its base in Broomfield, Colorado, that will be operational by the middle of next year. Plans call for the first eight PC-24s to be completed at the Pilatus plant in Switzerland; the ninth aircraft is scheduled to arrive in Broomfield for completion at the beginning of next year.

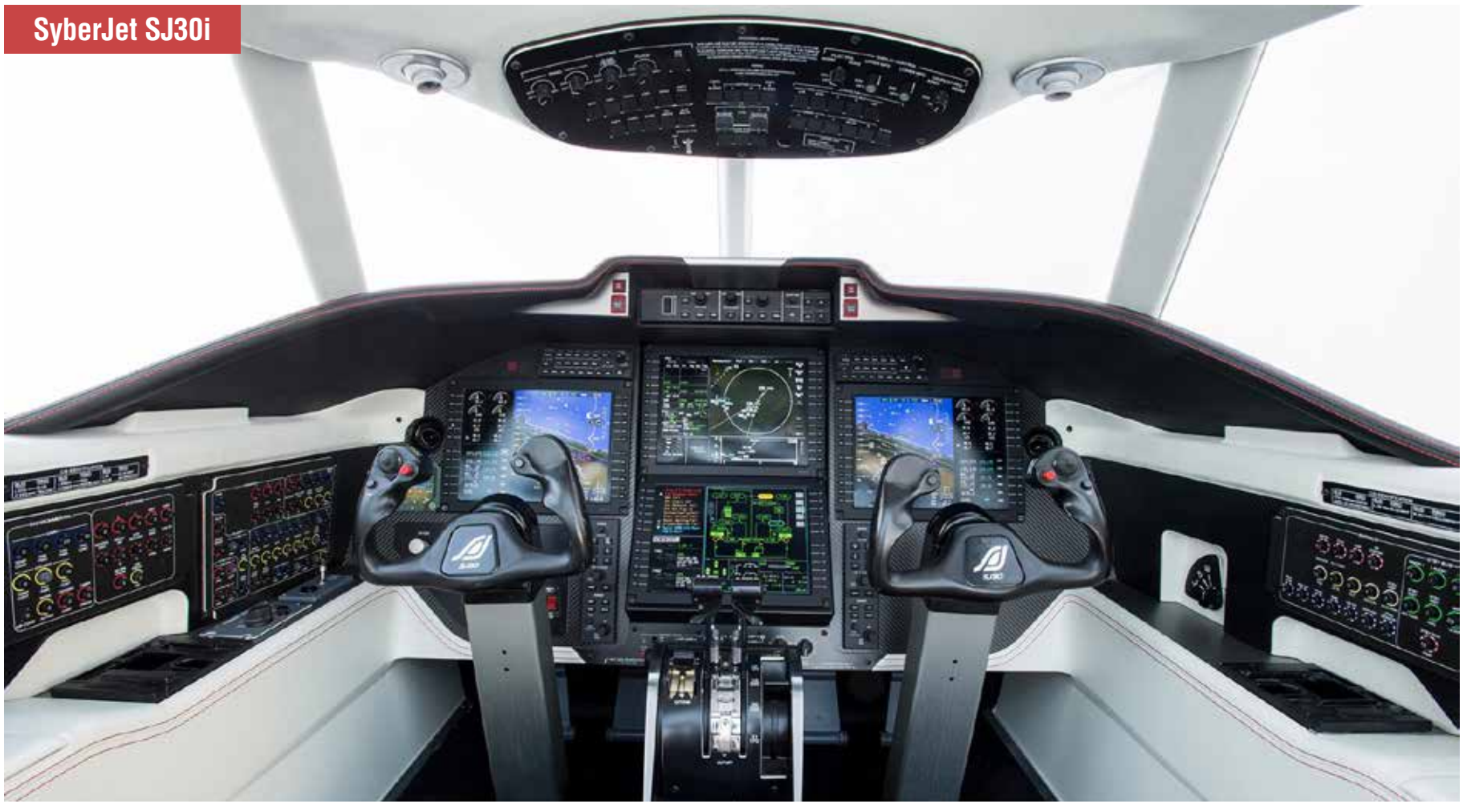
Light Twins

Embraer Phenom 300E

Embraer is unveiling an updated edition of the best-selling Phenom 300 that features a redesigned cabin with a shell that yields more interior space; wider and deeper seats with retractable outboard arms that expand aisle width by three inches; a slimmer valance for improved headroom; and a centerline tech panel. The side-ledge passenger service unit has also been redesigned, and receding the ceiling upwash edge emphasizes the sense of space. The 300E is available with various upholstery stitching patterns, and the snap-on seat coverings themselves can be replaced easily without removing the seats from the aircraft. Seats for the 300E will be built at Embraer's new company-owned 50,000-sq-ft seating plant, which opened last year in Titusville, Florida. Price for the refreshed model starts at $9.49 million.

Embraer Phenom 300E




SyberJet SJ30i

SyberJet SJ30i and SJ30x

MSC Aerospace is planning two new versions of the SJ30 light twinjet. The SJ30i will feature an upgraded Sybervision avionics suite with the Honeywell Primus Apex 2.0 system with 12-inch displays and a new interior. The avionics and interior are lighter than their progenitors and take an estimated 200 pounds out of the airplane. A follow-on aircraft, the SJ30x, will have uprated Williams International FJ44-3AP-25s with dual Fadec controls and is expected to provide performance benefits such as higher cruise speed at altitude, faster climbs, more payload, and better high and hot performance. It will also have single-point refueling. Price for both aircraft is expected to be in the $8 million (2014 $) range.

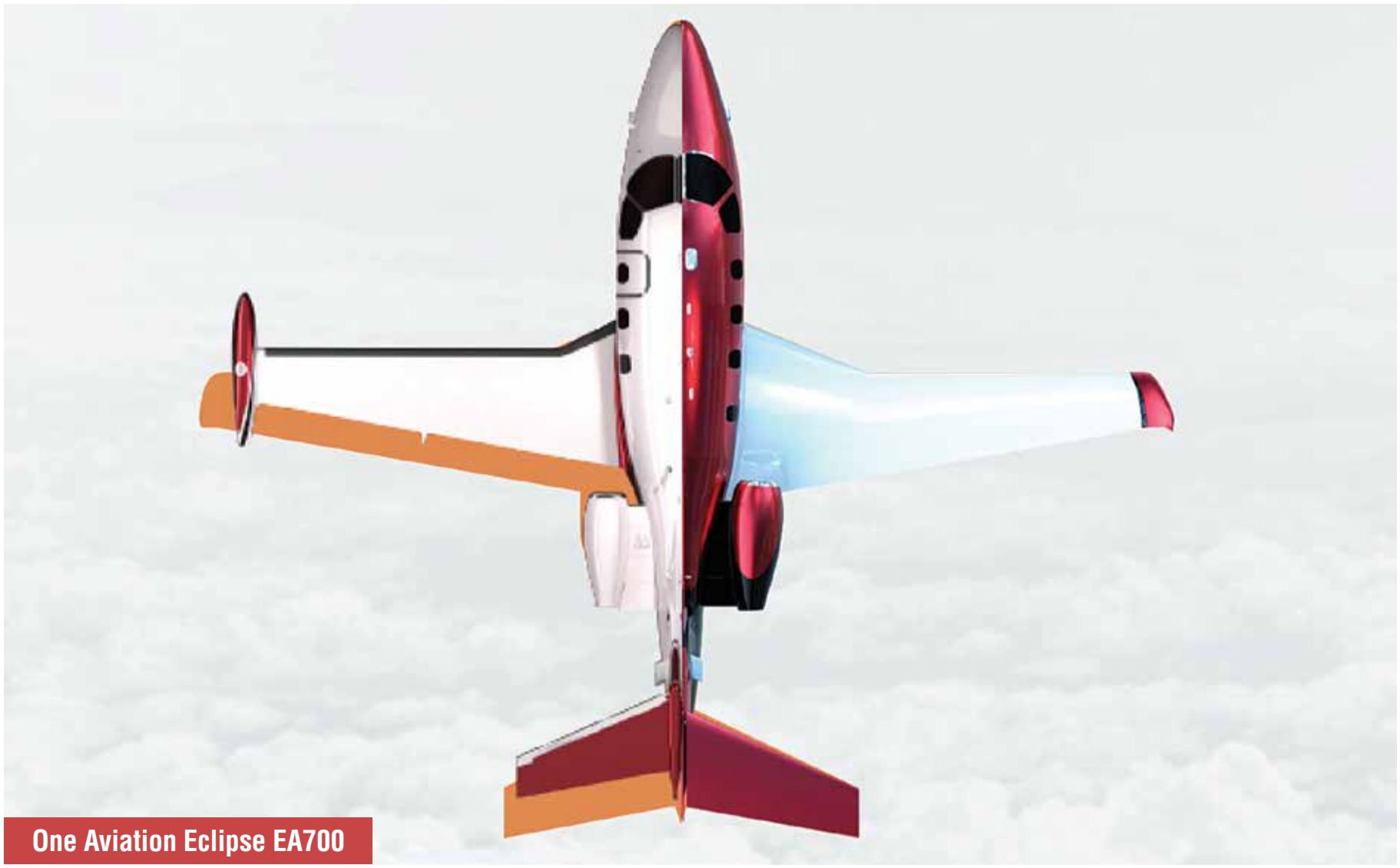
The SJ30 program began in the 1980s and the SJ30-2 finally received FAA certification in 2005. Since then, the company has had several different corporate owners and produced only eight examples of the Mach 0.83, 2,500 nm, seven-seat jet. The aircraft holds three world records for speed and distance. It is designed with a 30-degree swept wing for high-speed and efficient cruising and with leading-edge slats and trailing-edge flaps that are optimized for low-speed approaches. The SJ30 has a service ceiling of 49,000 feet, maintains a sea-level cabin to 41,000 feet and is approved for single-pilot operations.

Last year SyberJet announced that it was ramping up the wire harness shop in Cedar City, Utah, to manufacture wiring harnesses for the SyberVision flight-test aircraft, high-intensity radiated field (HIRF) laboratory testing, and subsequent production aircraft. SyberJet's engineering team has completed all of this wiring harness design in the San Antonio location to support the SyberVision program.

Entry-Level Twins

Embraer Phenom 100EV

Deliveries of Embraer's Phenom 100EV began this year. The updated $4.495 million Phenom 100 variant features new avionics, slightly swifter 405-knot top cruise speed, substantially faster climb times, 43 pounds more full-fuel payload and better high/hot performance. Takeoff distances



One Aviation Eclipse EA700

shrink by nearly 1,000 feet thanks to high/hot thrust gains of up to 15 percent.

The 100EV features Prodigy Touch avionics built on the Garmin G3000 system and Pratt & Whitney Canada PW617F1-Es that each deliver 1,730 pounds of thrust, 35 pounds more than the PW617Es on the 100E. The 100EV achieved its performance gains through a combination of more engine thrust and reduced airframe weight.

One Aviation/Eclipse EA700

In September, One Aviation flew the first Eclipse EA700 testbed, an experimental EA500 fitted with an aerodynamically conforming version of the 700's planned larger wing designed for greater fuel capacity and stronger performance. One Aviation plans to fly three prototypes, each testing different components for the EA700.

In July last year One announced a new variant of the Eclipse 550 with four feet more wingspan, a 14-inch fuselage stretch and improved performance and range, as well as a higher gross weight. The $3.6 million Eclipse 700 twinjet will also have an integrated Garmin G3000 suite and switch to Williams FJ33-5A-12 turbofans (derated to 1,200 pounds of thrust each). The engines will provide a range of 1,470 nm at max cruise speed. The more powerful engines will shorten takeoff runs, quicken climb times and boost the aircraft's service ceiling to FL430. The EA700's Garmin G3000 avionics suite will provide synthetic vision, GFC 700 autopilot, Garmin ESP protection system and Lnav and Vnav, and will comply with ADS-B and RVSM requirements.

One has selected Acme Aerospace for the lithium-ion battery system and PPG Alteos for electronically dimmable interactive cabin windows using Nuance V2 shading by Vision Systems. The changes make the Eclipse "a true six-passenger airplane," noted One chairman Alan Klapmeier. He said the company holds orders for 30 aircraft, mostly from current Eclipse owners. Klapmeier thinks the market for the Eclipse 700 is significantly larger than that for the EA500/550. He

estimated that work on the Eclipse 700 could be finished within 18 to 24 months, contingent on raising capital. One Aviation is looking for $100 million to restructure the company and "less than $50 million" to finish the 700 in particular.

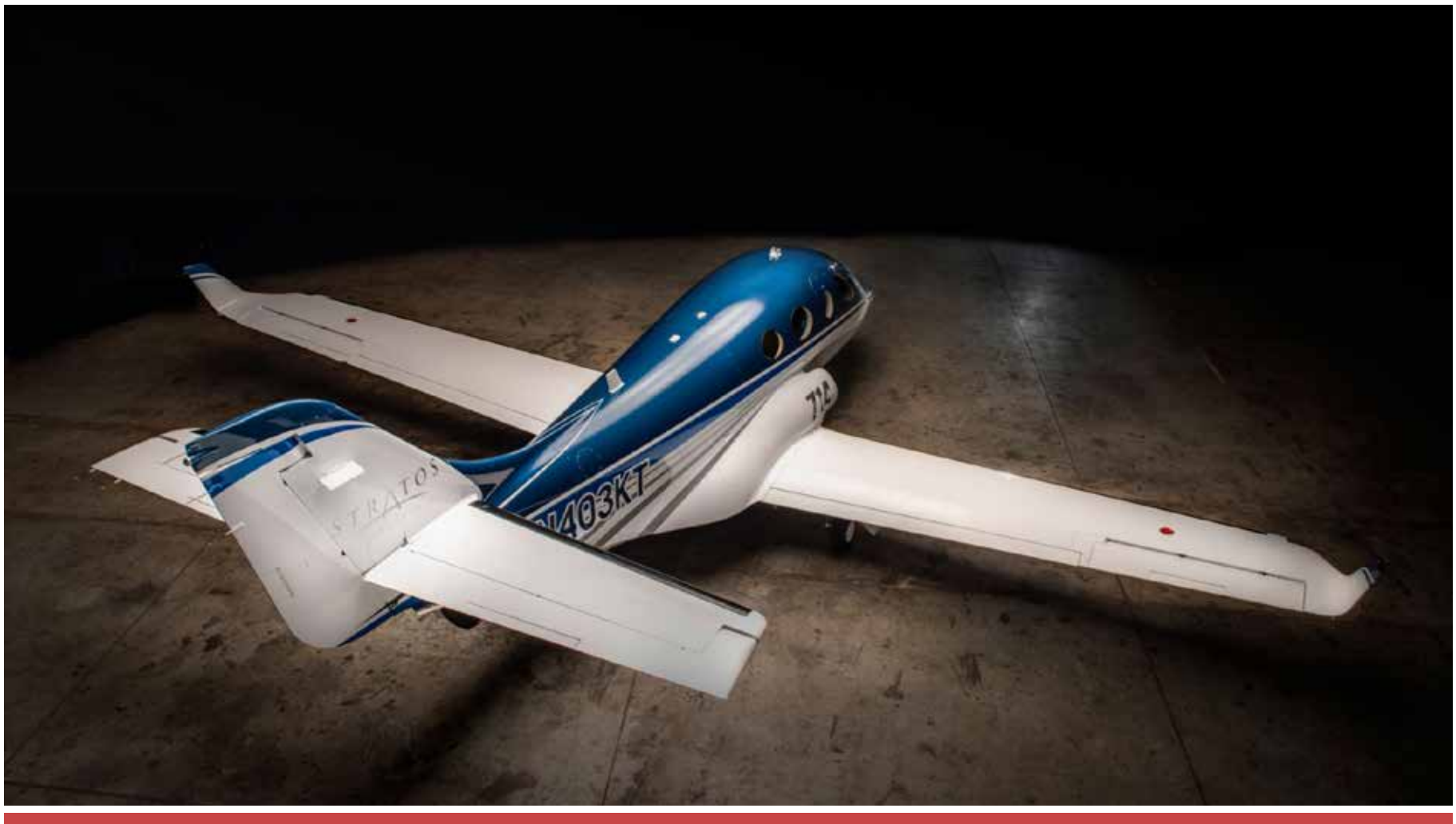
Singles

Cirrus Vision SF50

Cirrus received FAA certification for the $1.96 million single-engine SF50 Vision Jet in October last year and announced this summer that it is ramping up production to one aircraft per week. Pat Waddick, president of innovation and operations, said the slow delivery rate was deliberate and necessary to mature production processes. Waddick said Cirrus intends to bump production to two jets per week by early next year.

Cirrus has orders for 600 Vision Jets. In this year's first quarter it opened a 70,000-sq-ft paint and finishing center at the production facility in Duluth, Minnesota. The transfer of customer acceptance to the Vision Center in Knoxville, Tennessee, freed more space in Duluth. Waddick said that the company plans to bring a second shift to the jet line and more off-shift work to handle swifter jet production rates. By the end of the year customers for all Cirrus aircraft will take delivery at the Vision Center in Knoxville, and factory training for all Cirrus aircraft will be conducted there. Todd Simmons, president of customer experience, said the training building is under construction and will be finished by year-end. It will house a level-D full-motion simulator for the Vision Jet. In the next four to five months, all jet training will move there. Simmons said the Knoxville campus is also home to a factory service center, and Cirrus is supporting the SF50 with premium products and services such as Jet Stream, a prepaid maintenance program that covers the engine, airframe and avionics.

Power for the SF50 comes from a Williams International FJ33-5A turbofan producing 1,800 pounds of thrust. Maximum cruise speed is 300 knots and



Stratos 714

maximum range is 1,250 nm, albeit at 240 knots. At 300 knots it falls to 1,100 nm. The SF50 takes off in as little as 2,036 feet; lands in 1,721 feet; and stalls (full flaps) at 67 knots. It climbs at 2,000 fpm and the service ceiling is 28,000 feet.

The Cirrus Perspective cockpit is built on the Garmin G3000, with three touchscreen controllers powering the two large main display screens. The system incorporates built-in flight-envelope protection to prevent loss of control. Enhanced vision system and enhanced real-time weather radar are optional. The SF50 has modular seating for up to five adults and two optional jump seats suitable for small children. The useful load—passengers, gear and fuel—is 2,248 pounds.

Stratos 714

Stratos Aircraft reported in September that the lone flight-test Model 714 had logged 80 hours on 44 flights since first flying late last year. The company has started construction of a second prototype and has completed the erection of a 13,000-sq-ft composites facility in Redmond, Oregon. The company plans next for pressurized flights, receiving clearance to operate at FL280, and verifying the 714's projected 400-knot cruise. Through summer the aircraft had reached 18,000 feet and 250 knots indicated, or 330 ktas. The lone flight-test aircraft has been fitted with a complete interior that was designed and installed by Stratos, save for seat structures provided by Millennium Aircraft. Ninety percent of the aircraft was fabricated by Stratos, including the trailing link landing gear, which was fit-prototyped using additive manufacturing (aka 3D printing).

The 714 is currently flying with Garmin 3X avionics, but the company said the final decision on a suite is still years off. The cockpit has cabled sidestick controls. The current test aircraft is fitted with an older-generation Pratt & Whitney Canada JT15D-5, but plans now call for the PW535E to power production aircraft; this is the engine that powers the Phenom 300. The need for a 3,000-pound-thrust-class engine to meet the aircraft's mission parameters of Mach 0.7, 1,500 nm range and four 200-pound passengers drove the current configuration.

CEO Michael Lemaire said the company continues to focus on raising the bulk of the estimated $200 million required to finish certification and that, while interest in the aircraft has grown substantially since it flew, the company is three to four years away from taking deposits. Stratos has not ruled out offering the 714 as a kit before it offers a certified aircraft. The price is not set yet but should be in the same territory as the TBM 930, said John Hadlich, Stratos's prototype project manager, adding that the company has sufficient funding in hand to build a second aircraft and continue the development effort.

Flaris LAR 01

Poland-based aviation newcomer Flaris unveiled this $1.5 million five-seat, single-engine light jet at the 2013 Paris Air Show. Certification has slipped multiple times as the company grapples with engineering challenges exemplified by a powerplant change from the originally envisioned 1,460-pound-thrust Pratt & Whitney Canada PW610F to the Williams International FJ33-5A (1,900 pounds of thrust). The LAR 01 is fitted with dual Garmin G600 avionics. Other features: rear-hinged main cabin doors, detachable wings and stabilizers, a fuselage fuel tank, electric deicing and an in-the-nose whole-aircraft ballistic parachute. Target performance: max cruise speed of 380 knots, stall speed of 62 knots, 1,400 nm of range, a 45,000-foot ceiling and the ability to take off from short grass strips.

The company said a second airplane is nearly complete and construction is under way on two more fuselages. Last year Flaris announced it had completed ground runs with the Williams engine and hoped to fly an aircraft soon. Ground tests were continuing on gearbox-driven accessories. Initial test flights will be conducted with the fuselage unpressurized, although the company claims good progress with the ventilation and pressurization unit. Work is also continuing on the multistage whole-aircraft parachute system. ❑