



new BIZJETS

by Mark Huber

The new business jet market used to be predictable. You could correlate rising sales to readily recognizable economic benchmarks such as country gross domestic products and the proliferation of ultra-wealthy people. But those predictors are no longer of particular use. For those schooled in traditional sales and marketing, the new reality must be especially discombobulating, akin to the awful feeling a pilot gets when he looks at his instruments and realizes that they are wrong. The number of billionaires in the world has doubled since 2008, the stock market continues to bump into record territory and Asian GDP is ripping along. Yet sales of new jets are on track to be less than half what they were in 2008 and the used jet market continues to suffer

from bloat, with one in four of the offerings less than 10 years old.

According to the General Aviation Manufacturers Association, the industry delivered just 292 new jets in the first half of 2016 (4.5 percent down on 2015). The current new jet sales market is challenging, and competition is intense. In this environment, OEMs are looking to create any market advantage, any new product niche, they possibly can. Many of the new product offerings reflect this in terms of new technology, longer maintenance intervals, better warranties and overall product support, or more mission flexibility all the way along the food chain, from the Airbus ACJ320neo to the Eclipse Canada. OEMs realize that in the current market the case for new aircraft acquisition must

be made across multiple parameters. The term “game changer” is going to be heavily overused in the next few years. New aircraft coming to market that truly fit that description should do well.

Still, compelling product alone might not be enough to restore the robustness the business jet market enjoyed in the past. Embraer Executive Jets CEO Marco Tulio Pellegrini is pushing an initiative intended to create non-traditional markets for his company’s aircraft. The “premium transportation” plan is designed to move professionals off the airlines and into light jets serving select city pairs and to get leasing companies more involved in business jets. Pellegrini believes it is not merely enough for companies to sell technology; they must also educate consumers about how to use it.

Supersonic

Aerion AS2

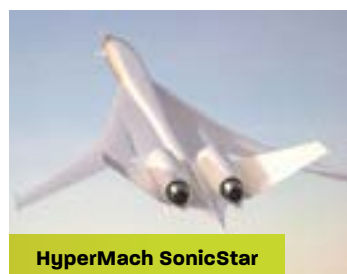
In 2014 Aerion revamped its proposed supersonic bizjet as a trijet with more range and a larger cabin. The new AS2—Aerion supersonic second design—retains the supersonic natural laminar-flow wing of its predecessor, but will have a range of at least 5,000 nm and a cabin cross-section nearly the size of a Gulfstream G550. 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. M_{to}w grows to 121,000 pounds and the fuselage is lengthened to 170 feet. Balanced field length is 7,500 feet at m_{to}w, but that is reduced to 6,000 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.

Aerion says a variety of existing engine cores in the 15,000-pound-thrust range could be applied to the new design, including the Pratt & Whitney Canada PW800, GE Passport and Rolls-Royce BR710.

In 2014 it 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. Aerion said the deal would lead to a first flight by 2019 and certification by 2021. Over the longer term, Aerion said it would provide proprietary technology and assistance to Airbus Group in its high-performance aircraft



Airbus A350 XWB



HyperMach SonicStar



Aerion AS2



Spike Aerospace S-512

technology development. Aerion says that the deal has already borne fruit. Earlier this year Aerion CEO Doug Nichols noted that Airbus had 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. Late last year the program got 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 its “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 in 2018.

Spike Aerospace S-512

Boston-based Spike's twinjet design features a windowless

cabin with seating for 12 to 18 passengers, fly-by-wire flight controls, a range of 4,000 nm and a top speed of Mach 1.6. Engine selection remains pending. Spike is looking for a low- to medium-bypass-ratio engine producing about 20,000 pounds of thrust at sea level.

The company continues to search for funding for the \$1 billion program and estimates a market for 600 aircraft between

Airbus ACJ Neo



2020 and 2030. Spike's goal is to bring an aircraft to market by 2022. Earlier this year it began working with Spain's Aernnova on development of the aircraft. Aernnova is providing structural expertise and collaborating on development and validation of structural systems such as the fuselage, wing and vertical tail. Spike now claims to have 40 aerospace engineers working on the project.

Airliners

Airbus ACJ Neo

Airbus will make its re-engined "neo" (new engine option) A319 and A320 available for the Airbus Corporate Jet (ACJ) program in 2018. For power, Neo customers have a choice of either the CFM Leap-X or the Pratt & Whitney PurePower PW1100G. Deliveries of the ACJ320neo are slated to begin in the fourth quarter of 2018, with ACJ319neo 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." This, plus the addition of more centerline fuel tanks, translates into more range, which rises to 6,750 nm on the 319 (eight passengers) from 6,000 nm and on the 320 to 6,000 nm (25 passengers) from 4,300 nm (eight passengers). Both aircraft also get lower cabin altitudes and redesigned luggage holds with more capacity.

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 earlier this year. In private configuration the aircraft will be known as the ACJ350 XWB and without an interior will sell for north of \$250 million. In typical configuration with 25 passengers, the private jet will have an unrefueled range of 10,800 nm—about 20 hours in the air—allowing direct connection between most major city pairs on the globe. The Airbus 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 feature the same engine technology.

Top speed is Mach 0.89. The cabin of the -900 version measures nearly 170 feet long, more than 18 feet wide and eight feet tall, yielding almost 2,910 sq ft of floor space. M_{to}w is close to 600,000 pounds. Obviously, 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.

While the 350's cabin is wider than the 787's, the windows on the latter 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. However, the smaller windows on the A350 mean the cabin is marginally quieter. Airbus is introducing a streamlined process called Easyfit for outfitting the cabin interior that uses the cabin wall attachment points.

BBJ Max

Boeing Business Jets (BBJ) announced in 2013 that it will build the BBJ Max, an executive version of the 737 Max outfitted with CFM Leap 1-B engines. The first 737 Max is scheduled to fly next year. Deliveries of the BBJ Max are expected to begin in 2018, to date in two variants, the Max 8 and Max 9.

They are based on the current BBJ2 and BBJ3, respectively, and have the same cabin sizes as their predecessors but significantly more range. The BBJ Max 8 will fly 6,325 nm, a 14-percent improvement over the BBJ2. The BBJ Max 9 will offer 6,255 nm, 16 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 aerodynamically cleaner 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 15.1-inch Rockwell Collins flight displays in the cockpit—the same ones that are on the larger 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 its enhanced onboard

network system and file server, doubling the amount of maintenance information available during flight and transmitting it live to ground stations so that issues can be quickly resolved 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 and 8000

Bombardier continues to develop 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 farther up the sidewall.

As of press time, Bombardier indicated it was getting close to the Global 7000's first flight and predicts entry into service in 2018, while the timetable for the Global 8000 remains noncommittal. The aircraft were originally scheduled to enter service in 2016 and 2017, respectively, but Bombardier's financial problems related to the development of the C Series airliners have pushed the development schedules of both programs to the right.

The aircraft will use a new, thin, high-speed wing; fuel-efficient GE Passport engines (16,500 pounds of thrust each); and Rockwell Collins Pro Line Fusion avionics. The engines were certified in April. Bombardier says that at Mach 0.85 the range for the 7000 bumps up to 7,900 nm and 7,300 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. The price for the 7000 is expected to be in the region of \$72 million.

Dassault Falcon 8X

Dassault Aviation unveiled the Falcon 8X trijet in May 2014 and the aircraft earned EASA and FAA certification in June this year. The first 8X entered service with Amjet Executive on October 8. The 8X is a significant step up from the 7X: a longer cabin offers more layout possibilities, including the option to install a large aft lavatory with a steam shower and a crew rest area in the front section and still have a comfortable three-lounge cabin in between. The 8X also offers greater range—a maximum of 6,450 nm. From Los Angeles, Beijing is within reach. From

New York, the 8X can fly non-stop to Dubai.

The aircraft will reportedly sell for about 10 percent more than the 7X, which would put the price in the neighborhood of \$58 million. Direct operating costs are estimated at \$4,075 per hour. The three 8Xs used in the flight-test program are now being redeployed following completion of the flight-test and certification campaign, which logged 830 hours over 400 flights. S/N 01 will be used to certify Dassault's FalconEye Combined Vision System (CVS) on the 8X and to gain approval for its use in dual head-up display configuration. FalconEye, which blends synthetic and enhanced vision, gained FAA and EASA certification on the 2000S and LXS last month, with approval for the 8X to follow shortly. The dual HUD approval is expected late next year, according to Dassault.

Gulfstream G600 and G500

In October 2014, Gulfstream formally launched two large-cabin jets designed to replace the G450 and G550: the G500 and the G600. 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. The company anticipates that it will obtain G500 type certification from the FAA and EASA next year and begin deliveries in 2018. It expects to receive certification for the G600 in 2019. 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



Bombardier Global 7000



Bombardier Global 8000



BBJ Max



Dassault Falcon 8X

the same core technology used in the company's geared turbofans for airliners. The cabin cross section of each aircraft measures 91 inches wide and 74 inches tall—about 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, plus 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 touch-screen Symmetry flight deck, driven by Honeywell Primus Epic avionics, provides Gulfstream's enhanced vision, Honeywell's synthetic vision with 3-D taxi and a head-up display. The full three-axis digital fly-by-wire flight controls offer flight-envelope protection, stability augmentation, greater

redundancy and reduced maintenance. The streamlined cockpit, which is finished in black leather with metallic accents, is the most striking feature of the interior. 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, 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 among them in the event of a failure.

Through September 25, five flight-test G500s had logged 1,605 hours during 384 flights, achieving a maximum speed of Mach 0.995 and flying to a maximum altitude of 53,000 feet. This testing included a successful crossing of the Atlantic and a flight of 8 hours 24 minutes. The G600 is expected to take to the sky by year-end.

Dassault Falcon 5X

The \$45 million 5X twinjet was announced in 2013 and has 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 cabin volume of 1,766 cu ft. A typical cabin configuration will accommodate 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



Gulfstream G600



Gulfstream G500

controls with sidesticks and Safran Silvercrest engines (11,450 pounds of thrust each). The avionics will be based on the Honeywell EASy system, with dual head-up displays showing synthetic and enhanced vision. Pilots in the spacious cockpit will look through a windshield one third larger than the 7X's while sitting in seats that recline 130 degrees, allowing one pilot 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 aloft. It will be able to take off from 5,000-foot runways but come back to earth at an approach speed of just 105 knots, without sacrificing high-speed cruise performance.

The 5X will have a top speed of Mach 0.9. An all-new wing incorporates a fresh winglet design, leading-edge slats for lower approach speeds to shorter runways and flaperons.

The 5X offers a brighter cabin with windows 30 percent larger than those on the 7X. The entryway can be filled with natural light, courtesy of an electronically dimmable "Zenith window" 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 yields a cabin altitude that is only 3,900 feet while the airplane cruises at 41,000 feet; and it's just 6,000 feet at the 5X's service ceiling of 51,000 feet. The cabin comes with the Falcon HD inflight-entertainment system, 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 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.

Dassault announced earlier this year that it expects to fly the 5X next year and earn EASA and FAA certification in 2019 for entry into service in 2020. This is later than the originally announced schedule, reflecting development difficulties and an 18-month certification delay with the airplane's Silvercrest engines. Safran announced earlier this year that it was taking a one-time



Dassault Falcon 5X

\$720 million charge associated with the delay. Both Safran and Dassault expressed satisfaction that the engine problems have been resolved.

Large cabin

Cessna Citation Hemisphere

The aircraft was announced late last year but little has been revealed beyond its size, range and price (\$35 million). Much of the aircraft is still being defined, although it appears that with the Hemisphere Cessna will be creating a niche between the traditional super-midsize and large-cabin, long-range models. To date the company has said that the jet will have a range of 4,500 nm, a top cruise speed of around Mach 0.9, a flat-floor, multi-zone cabin with a 102-inch diameter, "class-leading operating costs and performance," and will fly in 2019.

Super-midsize

Cessna Citation Longitude

This \$26 million aircraft logged its first flight on October 8, with certification and entry into service next year. Cessna revealed a major redesign of a shorter range (3,400 nm) Longitude last year built around a 12-passenger, 77-inch wide, six-foot tall, flat-floor cabin, a pair of Fadedec-equipped Honeywell HTF7700L turbofans (7,550 pounds of thrust each), and Garmin G5000 touchscreen avionics with autothrottles and radar and optional head-up display.

The Longitude will provide a low cabin altitude of 5,950 feet, standard double-club seating with eight single executive seats of a new and wider design, a walk-in baggage compartment accessible in flight, a full-fuel payload of 1,500 pounds



Cessna Citation Longitude

and a maximum cruise speed of 476 knots. It is designed to use 5,000-foot runways (at mtow). Other creature comforts are a vacuum-assisted externally serviced lavatory, a full galley with sink and potable water and 20 percent more legroom in the cabin than in competing airplanes, according to Cessna.

In late August, Cessna was conducting engine ground run tests with the aircraft in preparation for first flight. The tests were intended to verify engine start, fuel system and autothrottle functions, along with avionics, electrical and hydraulic system interfaces. Textron will turn next to functional and structural checks of the airframe before first flight in the “coming weeks.” The ground engine tests come about three months after Cessna mated the wings and fuselage on the first Longitude and two months after the company powered on the electrical distribution system in June.

The Longitude production line is also being set up in Plant IV at Textron Aviation’s East Campus on Beech Field,

the former Beechcraft facility that became part of Textron in May 2014. The first Longitude test articles are now under construction in Plant III, and as the assembly tooling and processes are finalized, the tooling will move over to Plant IV, where space has already been assigned for Longitude production.

Light mediums

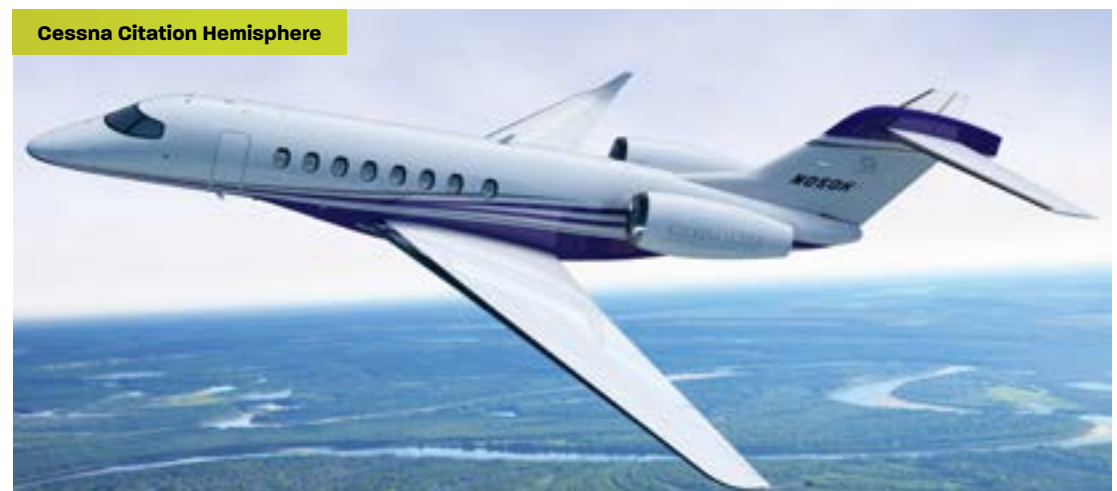
Pilatus PC-24

The second Pilatus PC-24 prototype made its first flight Nov.

16, 2015, from the company’s headquarters in Stans, Switzerland, and a third aircraft is scheduled to join the test program this fall. The new jet’s certification program is expected to last into next year. The third test aircraft will be used for function and reliability testing. Aircraft No. 2 is serving primarily to integrate the Honeywell avionics and autopilot and was used for hot- and cold-weather testing in the U.S. It is expected to be on display this month at the NBAA Convention.

The first PC-24 test aircraft rolled out of the hangar on Aug. 1, 2014, and made its first flight in May last year. The first two years of production quickly sold out, and Pilatus has temporarily stopped accepting new orders. With capacity for up to 10 passengers, the aircraft combines light jet operating economics with super-midsize jet capabilities and comfort and is aimed at more conventional offerings from Cessna and Embraer. Like the PC-12 turboprop single, the PC-24 retains an aft cargo door and the capability to operate from unpaved and unimproved fields—with the PC-24 needing as little as 2,690 feet at an mtow of 17,650 pounds. Pilatus aims to have the \$8.9 million all-metal aircraft approved for single-pilot operations.

Power comes from a pair of Williams International FJ44-4As each rated at 3,435 pounds of thrust. The engines have 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 anti-ice and noise-suppressing inlets. 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



Cessna Citation Hemisphere

Pilatus PC-24



than 30 minutes and achieve a high-speed cruise speed of 425 kts 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, for Pilatus Advanced Cockpit Environment—is based on the Honeywell Primus Apex system and features all the latest advances. The voluminous passenger cabin provides more overall space than either the Cessna XLS+ or the Embraer Phenom 300 and has a flat floor, which makes it more easily navigated but means less headroom in the aisle. The aircraft will come with seven options for interior layouts catering to executive, commuter, combi and quick-change roles as well as options for an externally serviced lavatory (forward or aft) and galleys.

In June Pilatus Business Aircraft broke ground on a 120,000-sq-ft facility for both PC-12 and PC-24 completions at its base in Broomfield, Colo. The new building will have the capacity to process two dozen PC-12s and PC-24s simultaneously. 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 2018, with the

facility up and running by the middle of that year.

Light twins

Honda HA-420 HondaJet

Honda Aircraft received its production certificate from the FAA in July this year after receiving type certification for the HA-420 last December and a variety of foreign certifications year to date, among them EASA approval. Customer deliveries have begun. The \$4.85 million HA-420 has a range of 1,223 nm, a maximum speed of 420 knots, an initial climb rate of 4,000 fpm and a maximum altitude of 43,000 feet.

Honda claims the aircraft has greater fuel efficiency and higher speed than competing models. The four- to six-passenger jet is certified for single-pilot operation. The HondaJet mates a carbon-fiber composite fuselage with metal wings. That, coupled with the positioning of the engines on over-the-wing pylons, reduces drag and creates a larger cabin volume with generous passenger legroom and less vibration. Honda expects most customers to opt for a single-place, side-facing divan opposite the entry door followed by club-four seating and an aft lavatory with privacy door.

Among the suppliers are GE Honda Aero Engines for the HF120 engines (2,050 pounds of thrust each); Garmin for the G3000 touchscreen avionics; and B/E Emteq for the SkyPro HD IFE and cabin-management system, which features Audio/Video on Demand, interactive 3-D moving map, exterior camera and wireless control of cabin lighting and monochromatic window shades at each seat via passengers' personal electronic devices.

Honda's 83-acre campus in Greensboro, N.C. should be able to turn out 70 to 100 aircraft per year when production is fully ramped up. The first two years of production are already sold.

SyberJet SJ30i and SJ30x

MSC Aerospace is planning two new versions of the SJ30 light twinjet. The SJ30i will incorporate an upgraded SyberVision avionics suite built on 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 updated Williams International FJ44-3AP-25 engines with dual Fadec controls and is expected to provide a higher cruise speed at altitude, quicker climbs, more payload and better high and hot performance. The aircraft 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 airplane, 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 0.83 Mach, 2,500 nm, seven-seat jet. The aircraft is designed with a 30-degree swept wing for high-speed and efficient cruising and with leading-edge slats and flaps 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.

SyberJet recently announced that it is ramping up its wire harness shop in Cedar City,



Honda HA-420 HondaJet



SyberJet SJ30i

Utah, to manufacture wire 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 wire harness design in the San Antonio location to support the SyberVision program. Harness installations have already begun on the flight-test aircraft (N50SJ), which is slated to fly later this year along the path to SyberVision certification next year.

Embraer Phenom 100EV

In July this year, Embraer Executive Jets announced an updated version of the Phenom 100E light jet with new avionics, slightly faster 405-knot top cruise speed, substantially quicker climb-to-altitude times, 43 pounds more full-fuel payload and better high/hot performance. The latter spells substantially shorter takeoff distances that shrink by nearly 1,000 feet as high/hot thrust rises by up to 15 percent. Mexican charter operator Across and the Emirates Academy will be the launch customers. Deliveries are scheduled to begin in next year's first half.

The \$4.495 million Phenom

100EV will have 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 per side more than the PW617Es on the 100E. Embraer Executive Jets president Marco Tulio Pellegrini said that Embraer is contemplating an interior block change on the Phenom 100 at a later date, much like the one recently unveiled for the Phenom 300. He said the Phenom 100E will be discontinued once the 100EV is introduced. The 100EV's performance gains stem from a combination of



Project Canada

more engine thrust and less airframe weight. Some 330 Phenom 100s are currently flying. The aircraft has been selected for the UK Ministry of Defence's flight training program. Seats for the 100EV, along with the Phenom 300 and the business aircraft seats in Embraer's transport-category aircraft, will be built at Embraer's new company-owned 50,000-sq-ft seating plant that opened in September in Titusville, Fla.

One Aviation/Eclipse "Canada"

In July One Aviation announced a new variant of the Eclipse 550 with four feet more wingspan and improved performance and range, as well as a higher max gross weight. Dubbed "Project Canada," the \$3.595 million twinjet will also have an

integrated Garmin G3000 suite and flat-rated Pratt & Whitney Canada PW615s. It will also shed the E550's tip tanks to reduce drag. Thanks to higher thrust—1,170 pounds each versus the E550's 980-pound-thrust PW610s—greater wingspan and aerodynamic improvements, the Eclipse Canada will require 24 percent less runway at sea level and ISA+25 to take off; nearly halve the time to climb to FL400 at ISA+10; have an NBAA IFR range of 1,400 nm; and be able to cruise at Mach 0.65 at a higher max ceiling of FL430.

"Project Canada has significant improvements in all performance on high-temp days," the company noted. The aircraft's extended wingspan—41.7 feet versus 37.9 feet—is accomplished by adding a new wing section at



Embraer Phenom 100EV

the root, which expands wing area by 13 percent, to 163 sq ft. This allows for more fuel (321 gallons versus 251 gallons) and a useful load of 2,787 pounds, 476 pounds more than the E550. The additional wing area also keeps the takeoff, approach and landing speeds similar to those of the current E550, One Aviation said.

The Canada's Garmin G3000 avionics suite will come with synthetic vision, GFC 700 autopilot, Garmin ESP protection system and Lnav and Vnav, as well as

said over the summer. "It has been a long time coming, but it's finally here," said Cirrus Aircraft chairman Dale Klapmeier. Cirrus said its components facility in Grand Forks, N.D. is spooled up, with SF50s already on the production line in Duluth, and that production has been "decoupled" from the certification process. Meanwhile, Cirrus's delivery center in Knoxville, Tenn. will come on line later this year, initially with deliver-

at 28,000 feet.

The Cirrus Perspective cockpit is built around the Garmin G3000 suite, with three touch-screen avionics controllers powering the two large main display screens. The system incorporates built-in flight-envelope protection to prevent loss of control. Enhanced vision and enhanced real-time weather radar are optional. Flight-control inputs are made via sidesticks. The SF50 will be certified for flight into known icing

whole-aircraft parachute that will deploy from the nose. Cirrus claims to hold deposits for more than 600 SF50s and plans eventually to ramp up to an annual production rate of 125 aircraft per year.

Flaris LAR 01

The Poland-based aviation newcomer unveiled its \$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, among them a powerplant change to the Williams International FJ33-5A (1,900 pounds of thrust) from the originally envisioned 1,460-pound-thrust Pratt & Whitney Canada PW610F. The LAR 01 is fitted with dual Garmin G600 avionics.

Other features include rear-hinged main cabin doors reminiscent of 1960s' Lincoln Continentals, detachable wings and stabilizers, a fuselage fuel tank, electric de-icing, and an in-the-nose whole-aircraft ballistic parachute. Target performance: max cruise speed 380 knots, stall speed 62 knots, 1,400 nm range, 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.

Flaris recently announced that it had completed ground run tests with the Williams engine and hoped to fly an aircraft this past summer. Ground tests were continuing on gearbox-driven accessories. Initial flight-testing 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.



ADS-B and RVSM compliance. One Aviation said first flight is scheduled for later next year, but it has not announced an estimate for certification. One Aviation chairman Alan Klapmeier said the aircraft "likely" would be available in two to three years, but emphasized that "there is no schedule." Klapmeier said the new airplane will be built on the same production line and use the same tooling as the EA550.

Singles

Cirrus Vision SF50

Cirrus is "close" to receiving FAA certification for the \$1.96 million SF50 Vision single-engine jet, the company

ies of SR-series piston aircraft and then SF50 jets next year. Cirrus is beginning its flight safety review board with the FAA to cover SF50 training, and it said both training and deliveries remain on track to begin later this year.

Power for the SF50 comes from a Williams International FJ33-5A turboprop (1,800 pounds of thrust). Maximum cruise speed is 300 knots and maximum range is 1,250 nm, albeit at a slower 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 listed

and fitted with pneumatic de-icing boots.

The full-fuel (296 gallons) payload is just 400 pounds—basically the pilot and one passenger or the pilot and a lot of gear—although the SF50 provides modular seating for up to five adults and two optional jump seats suitable for small children. Still, with the pilot and four passengers weighing in at 200 pounds each, the SF50 will take you better than 600 nm at 300 knots.

The overall useful load—passengers, gear and fuel—is 2,248 pounds. The heated external baggage hold has a volume of 31 cu ft. The SF50 will be equipped with an emergency