Go big or go home

The late and rotund actor and poet Victor Buono, whom you recall as King Tut from the long-ago *Batman* television series, once opined, "Being thin is where it’s been, but being fat is where it’s at." When it comes to new business jets this is indeed the marketing mantra that OEMs pray will ring the register. The svelte fuselages spawned from the minds of Bill Lear and Ed Swearingen are now the stuff of disdain, flying archeological curiosities left over from the bygone era of the average 170-pound American male of the 1960s.

What today’s bizjet customers want are wider seats adjoining ever wider aisles in a utopia of super-size fuselages. Gulfstream and Dassault Falcon have already set the new standard of galloping girth with the 102-inch cabin cross-section on the new G650ER and 5X twinjets, respectively, for purpose-built bizjets. Of course if you want wider than that there are always the bizliner variants from Airbus, Boeing, Embraer, Sukhoi and likely soon from Bombardier and Mitsubishi.

Inner space is key even farther downstream, with OEMs battling keenly to show that even the smallest of aircraft are “space craft.” From the Hondajet to the new Cessna Citation Latitude, OEMs are emphasizing cabin comforts like never before, regardless of aircraft size category. Over the summer I visited One Aviation’s Eclipse maintenance facility at Chicago Executive Airport where the virtues of that aircraft’s comparatively Liliputian cabin space were touted—once you removed two of its six seats. Fractional provider Flexjet stresses the comfort of its new Learjet 75s, which also subtract two cabin seats from the standard configuration.

With as much as four fifths of private jet dollars forecast to be spent on large and super-large jets over the next decade the race to the top is on; the old theory that you develop customers over time by moving them "up the food chain" into progressively larger and larger aircraft seems less valid in today’s global economy. Increasingly a customer’s first jet is a big one. And there is no shortage of choices. But will this race to the top create an eventual glut of too many consumer options that the market simply cannot sustain? Or to channel Buono, the belt of today’s crop of new jets is definitely not svelte. But with this new offering of widebodies there is more to like than just the size.

The trend toward attention to total life-cycle costs continues to evolve, with a new generation of engines with either no overhaul requirement or suggested intervals that are so long as to be essentially irrelevant, just like their on-condition airline cousins. These engines, such as the GE Passport and the Pratt & Whitney Canada PW800, feature lower specific fuel consumption and emissions as well. The amount of maintenance data aircraft are transmitting and will be able to transmit in real time is on the rise, too, thanks to new Ka-band satellite technology. The flexibility of hourly maintenance plans available from aircraft OEMs also seems to be getting better every day, covering more items and for longer durations as components become more reliable. Digital fly-by-wire flight control technology and cockpit side-sticks are migrating down to midsize aircraft such as the Embraer Legacy 450 and 500 and partially in the Cessna Citation Longitude. Touchscreens have eliminated most of the switchology in new cockpit designs.

Cabin technology is also making strides. You can now order a steam shower in the Falcon 8X and Lufthansa Technik offers an aftermarket galley dishwasher. The aforementioned Ka-band satellites open up a whole new frontier of speed and connectivity for in-flight information and entertainment with wider coverage areas. Cabin carpeting can be embedded with a light show. Seats on the upcoming Bombardier Global Expresses will not only recline; they will literally rock you all night long. Granted there is something incongruous about sitting in a rocking chair attached to a floor that moves at 600 mph—and maybe faster. Supersonic bizjets seem to be nudging ever closer to reality.

So here is the current crop of new business jets as the sun sets on 2015.

Bizliners

**Airbus ACJneo**

Airbus will make its re-engined “neo” (new engine option) A319, A320 and A321 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 Pure Power PW1100G.

**Airbus ACJ350**

Airbus began delivering the A350 XWB to the airlines late last year. In VIP configuration the aircraft will be known as the ACJ350 and without an interior will sell for $254 million. In typical executive configuration with 25 passengers, it will have an unfueled range of 10,050 nm—about 20 hours in the air—allowing direct connection between most major city pairs on the globe. Top speed is Mach 0.89. The cabin measures nearly 170 feet long, more than 18 feet wide and eight feet tall, yielding almost 3,000 sq ft of floor space. Mtow 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. 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 feature the same engine technology. Given the thrust these engines generate, they’re remarkably quiet.
With so much space to work with, the interior options on the ACJ350 are limited only by what you care to spend. Airbus has floated a few ideas, including a grand entryway; above-deck crew rest areas; forward and mid-cabin gourmet galleys; a forward master stateroom suite with bedroom, bathroom with shower and private office; a mid-cabin lounge; an oversized circular dining table with seating for 10; three junior staterooms with shared bathroom and shower; and an aft cabin media room/theater with a dozen reclining seats and a large flat-screen monitor mounted to the aft bulkhead.

**Boeing 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. Deliveries 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 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 larger Boeing 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 network 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.)

**Ultra-long-range**

**Bombardier Global 7000/8000**

Bombardier announced its new Globals as a counterweight to the Gulfstream G650 back in 2010 but the program has been beset by delays as Bombardier strains under the weight of the CSeries regional jet program and developing fly-by-wire and a new wing for its next-generation Globals. It now looks as if the Global 7000 will not be delivered until 2018. The order book for both is thin, but growing, and Bombardier is believed to have commitments for about 100 between the two. Major players such as fractional ownership leader NetJets have placed orders for the aircraft.

The first Global 7000 is being assembled now and the engines are on, and while it conceivably could fly before year-end, Bombardier would be hard-pressed to do so. Further program delays will allow Gulfstream to stretch its market lead in the new-generation, large-cabin, long-range space even further. However, when they do come to market, the newGlobals hold the promise of new dimensions of cabin comfort and efficiency.

The $75 million Global 7000 will have a maximum range of 7,300 nm, while the slightly shorter $71 million Global 8000’s range will be 7,900 nm (for both aircraft, those range numbers assume 10 passengers, four crew and a cruise speed of Mach 0.85/487 knots). Top speed for both is Mach 0.90. Both aircraft use the
current 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 some 80 percent larger than the 6000’s and extending higher up the sidewall. With 2,637 cu ft of cabin volume, the Global 7000 offers substantially more room than the Gulfstream (at 2,138 cu ft). The Global 8000’s cabin is marginally larger too, coming in at 2,236 cu ft. However, the Gulfstream’s cabin is taller and wider, at six feet five inches and eight feet six inches, respectively, compared with the Globals’ six feet three and eight feet two inches for those same dimensions.

The new aircraft will feature full fly-by-wire flight controls, a new thin high-speed wing, more fuel-efficient GE Passport engines (16,500 pounds of thrust each) and the Bombardier Global Vision flight deck. The latter is built on Rockwell Collins Pro Line Fusion avionics, with sidestick pilot controls and the latest touchscreens and safety features. The Pro Line system is the first avionics system with synthetic vision on a head-up display (HUD), a visor that folds down and presents the pilot with all the necessary aircraft performance, mapping and terrain information.

GE reported in May that the new engines concluded flight-testing with more than 100 hours and 20 sorties. The engines should deliver new metrics of quiet, low emissions and vibration, reliability and economy. They are based on the guts of the new high-efficiency CFM Leap engines being developed for new-generation Airbus Neo and Boeing Max series. Among the new technologies incorporated into the engines are a 52-inch titanium “blisk,” a single forging of the fan blades and turbine disk that saves weight and reduces vibration; a lightweight aerodynamic nacelle; and a “super-finish” on the blisks and compressor blades that further improves efficiency by smoothing airflow.

Aside from their new engines, wings, flight controls and their range and speed, the new Globals promise heightened passenger comfort; a quiet cabin divided into three or to four zones, a galley that is 20 percent larger than that on the Global 6000 with double convection/microwave and convection/steam capabilities, a mid-cabin/self-serve galley, redesigned and larger crew rest areas, large 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 adjustable-color LEDs in the ceiling, a conference/dining table that seats six, private stateroom, optional stand-up steam shower, more robust environmental control system and a capacious 195 cu ft baggage hold.

The new Globals also sport an all-new passenger seat design that incorporates a rocking motion. There is a new integrated cabin management and in-flight entertainment (IFE) system that will allow passengers to control all cabin functions such as LED lighting and window shades as well as communication, entertainment and information access and streaming with their personal smart devices with the same content providers they use at home via new high-speed, Ka-band satellite technology.

**Dassault Falcon 8X**

Dassault Aviation unveiled the Falcon 8X trijet in May 2014. It’s 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 has longer legs—a maximum of 6,450 nm. From Los Angeles, Beijing is within reach. From New York, the 8X can travel nonstop to Dubai. The aircraft first flew in February, and three test aircraft are currently flying. Dassault says certification is on target for next year, with deliveries set to begin in the second half. The model 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.

**Gulfstream G500/G600**

Gulfstream Aerospace formally launched two new large-cabin jets in October last year to replace the G450 and G550. The $43.5 million G500 has a range of 5,000 nm at Mach 0.85 or 3,800 nm at Mach 0.90. The larger $54.5 million G600 can fly 6,200 nm at Mach 0.85 or 4,800 nm at Mach 0.90. The top speed for both aircraft is Mach 0.925, the same as the G650ER flagship. With the introduction of the G500/600, all Gulfstream large-cabin models will pay homage to the need for speed.

The G500 rolled out under its own power during its debut at Gulfstream’s Savannah headquarters last year and first flew on May 18. Gulfstream is adding two flight-test G500s to the fleet this fall and two more are under construction. The company anticipates it will obtain G500 type certification from the FAA and EASA in 2017 and begin deliveries in 2018. Certification for the G600 is projected for 2019.
The G500 is the first business aircraft manufactured with a data concentration network (DCN) to significantly reduce cables, parts and weight. Power for the pair will come from Pratt & Whitney Canada’s new PW800 series. The 16,000-pound-thrust-class PW814GA and PW815GA have the same core technology used in the company’s line of geared turbofan commercial engines. They have a 10,000-hour TBO and no midlife inspection requirement.

The finished passenger cabin cross-section of each aircraft measures 91 inches wide and 74 inches tall—about seven inches wider and two inches taller than all the seat controls on the inboard armrests and has pockets sculpted into the interior arms for more hip room. Some architecture from the Elite interiors developed for the G650 and later used in the G550 and G450 is adopted in the G500 and G600, such as the high-tech display of galley and IFE equipment. For new, a 32-inch flatscreen appears to be the largest monitor that can be mounted above a mid-cabin credenza while maintaining adequate access to emergency egress. However, Gulfstream executives emphasize that this is a largely all-new cabin interior design and likely not the final cut. IFE offerings in particular are expected to evolve between now and 2017, and a final determination has yet to be made. The cabins feature more built-in storage nooks in the sidewalls and the seats, as well as USB charging ports. Both aircraft provide a cabin altitude of 4,850 feet at 51,000 feet and 100 percent fresh air. The aircraft use the same large oval windows that are on the G650 with dimming provided by a system of dual roller shades. The cabin noise level for the G500 and G600 is expected to be extremely quiet, less than 50 dBA. The new latching mechanisms for the cabinetry are also quieter.

The aircraft’s common cockpits provide fly-by-wire active control sidesticks and the new touchscreen Symmetry flight deck 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 flight-envelope protection, stability augmentation, increased redundancy and reduced maintenance.

The streamlined and highly styled cockpit is the most striking feature of the aircraft’s interior, finished in black leather with metallic accents. Most of the visible switchology found in earlier designs has been eliminated. Inputs are made through a group of five Honeywell touchscreen with large and easily viewed 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 CCD gives each pilot control of three of the four main display screens and allows data to be shifted between them in the event of a failure. Out the windshield and over the nose visibility is expansive. The gapers are large and located to provide optimum ventilation. The new-design Ipeco crew seats have multiple adjustments. The elbow rests behind the sidesticks are adjustable, as are the rudder pedals. There is ample storage in the sidewalls for personal items. Two 110-volt power outlets are located aft of the pilot seats.

Large-cabin

Bombardier Challenger 650

Deliveries of the latest iteration of Bombardier’s 10-passenger Challenger 600-series large-cabin business jet began earlier this year. The $33.35 million 650 features a redesigned cockpit and cabin interior and optimized GE CF34-3B MTO turbofan engines that will provide additional takeoff thrust on a limited basis to facilitate shorter takeoff distances, greater payloads and more range from “challenging” airports during high/ hot operations. Maximum range of the new model is 4,000 nm (with six passengers and standard NBAA IFR reserves). The GE engines have 5 percent more takeoff thrust than the engines on the Challenger 605. The additional thrust is pilot selectable via a new performance thrust setting. The higher thrust setting does not affect engine maintenance, provided it is used for no more than 10 percent of takeoffs. New standard equipment includes a galley pocket sliding door and a bulkhead monitor with a baseline audio/video-on-demand (AVOD) system.
The Challenger 650 features the Bombardier Vision flight deck based on the Rockwell Collins Pro Line Fusion avionics system, originally designed for the Global 6000. Vision has 15-inch displays and includes head-up guidance, synthetic vision, enhanced vision, MultiScan weather radar and the Integrated Flight Information System.

The 650's passenger cabin borrows design elements from the cabins of the canceled Learjet 85 and recently refreshed Challenger 350. Improvements include wider seats, a galley with a high-temperature oven, more personal storage in and around the seats and Lufthansa Technik’s Nice HD cabin management/in-flight entertainment system, which accommodates technologies such as HD and audio/video on demand. Styling cues adopted from other Bombardier models include larger interior window cutaways to let in more natural light, bullnose accents that run the length of the drink rail, in-wall speakers and stylized passenger service units.

Dassault Falcon 5X

The $45 million 5X twinjet was announced in 2013 and introduces an 8.86-foot fuselage diameter, slightly wider than that of the 8X; it yields 6.5 feet of headroom and cabin volume of 1,766 cubic feet. Available configurations include seating for 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 feature fly-by-wire controls with sidesticks and new Snecma Silvercrest engines (11,450 pounds of thrust each). The avionics will be based on the Honeywell EASy system, which includes dual head-up displays with synthetic and enhanced vision information. The large cockpit will incorporate a windshield that is 32 percent larger than the one on the 7X as well as pilot seats that recline 130 degrees, allowing one crew-member 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 11.5 hours in the air. It will be able to take off from 5,000-foot runways but still land fairly slowly with an approach speed of just 105 knots. It will do this without sacrificing high-speed cruise performance. The 5X will have a top speed of Mach 0.90. An 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 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 sky light can adjust tint in virtually any degree to modulate the amount of incoming light and solar heating. The 5X’s pressurization system creates 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 features the Falcon HD in-flight entertainment system, is available with various layouts, and the seats can be fully reclined to produce sleeping areas for up to six passengers. The pressurized 155-cub- foot 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.

Super-midsize

Cessna Citation Longitude

Cessna is expected to announce a significant redesign of its in-development super-medium jet that builds on the same fuselage cross-section of the recently certified Citation Latitude. The $25.9 million
Longitude was expected to enter into service in 2017. As originally envisioned, the Longitude shared the smaller Latitude’s avionics, cabin management system, seats, windows and fuselage cross section, but is nine feet longer and was to use Snecma’s Fadec-controlled Silvercrest engines (11,000 pounds of thrust each) with auto-throttles for power. The Longitude will have limited fly-by-wire (FBW) capabilities for controlling the rudder, spoilers and brakes (“brake-by-wire”). The 30-degree swept wing will incorporate leading-edge slats, winglets, centrifugal ailerons and five speed-brake/spoiler panels per side. Cessna has selected the Garmin G5000 for the Longitude, using the same three-screen “touch control” avionics architecture that the company is using on both the Latitude and the revised X+ and Sovereign+. The CMS will build on the new wireless Clarity system.

The Longitude will have seating for eight passengers, a full-fuel payload of 1,950 pounds, a maximum range of 4,000 nm at Mach 0.82 and an Mmo of Mach 0.86. Takeoff distance at an mtow of 55,000 pounds is estimated at 5,400 feet, but that drops to 4,000 feet on missions of 2,000 nm or less with lighter loads. Service ceiling is 45,000 feet. The cabin features a large forward galley and aft lavatory with vacuum flushing toilet. The forward cabin may include a crew lavatory as well as a third crew-flight attendant seat.

Like the Latitude’s, the Longitude’s interior cross-section is 72 inches tall and 77 inches wide. The forward club-four configuration is capacious and the single executive seats are fully berthing.

There is room for another club-four in the aft cabin or a three-place divan, certified for takeoff and landing, opposite an entertainment center with large flat-screen monitor.

Cessna Citation Longitude

control panels. It includes synthetic vision, electronic charts, Garmin’s Safe Taxi airport charts, dual FMS, Waas and Taws.

Cessna unveiled the $14.9 million Citation Longitude in 2011.

Embraer Legacy 450

The $16.6 million Legacy 450 made its first flight in late December 2013 and received FAA certification on August 31 this year. It has been optimized with a six-inch cabin stretch and a range increase to 2,500 nm over the original design specifications. The shorter sibling of the Legacy 500 mid-size, the 450 shares many of the same systems, including fly-by-wire (FBW) flight controls, engines, avionics and fuselage diameter. Power comes from a pair of Honeywell HTF7500Es (6,540 pounds of thrust each) that can propel the aircraft to 43,000 feet in 22 minutes. The pressurization system keeps cabin altitude at 6,000 feet at the 450’s maximum cruising altitude of 45,000 feet. Maximum cruising speed is Mach 0.83. The 678-cu-ft-cabin offers seating for seven to nine passengers. Cabin management and IFE is courtesy of Honeywell’s HD Ovation Select cabin-management system, which allows for control of entertainment, communications, lights, temperature, window shades and more via units mounted in the drink rail, wireless handheld remotes or a galley touchscreen. The system can interface with high-speed satellite communications and consumer electronics.

The cockpit offers Rockwell Collins Pro Line Fusion avionics. The four large active-matrix LCDs in the panel connect the pilots with synthetic enhanced vision with an optional head-up display; electronic charts, maps, graphical weather depiction from an intuitive MultiScan weather radar system that sees up to 300 miles out; and an airport surface-management system that minimizes the chances of ground mishaps. Fusion can grow to accommodate future technology add-ons such as voice recognition, surface guidance and automatic dependent surveillance-broadcast (ADS-B).
Light

Honda HA-420 HondaJet

Honda expects to receive full FAA certification of the $4.5 million light twin later this year. The HA-420 will have a range of 1,180 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-pas- senger jet will be 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 cabin configuration that features a single-place, side-facing divan opposite the entry door followed by club-four seating and an aft-cabin lavatory with privacy door.

Key suppliers include 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 its SkyPro HD IFE and cabin-management system, which features audio/video on demand, interactive 3-D moving map, exterior camera and wireless cabin control of lighting and monochromatic window shades at each seat via passengers’ personal electronic devices.

More than 800 employees are working at Honda’s massive 83-acre campus in Greensboro, N.C., which has 500,000 sq ft under roof and 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.

One Aviation Eclipse 550

The $2.995 million update of the original EA-500 features cockpit avionics upgrades with synthetic and enhanced vision; sharper, more powerful display screens; a separate avionics standby display unit; dual integrated flight-management systems; and autothrottles. The 550 also has new electronic antilock brakes. The 550’s upgraded cabin has higher-grade, piped leathers; finished carpets; more robust table and cup-holder attachments; better hand rails; a one-piece headliner that improves aesthetics; portable server; iPad and Bluetooth connectivity; and an intercom system for pilot-passenger communications. Eclipses are offered with Iridium satphones capable of transmitting aircraft engine data for monitoring. The 550 has a top speed of 375 knots and a range of 1,125 nm. Deliveries of the 550 began earlier this year.

Pilatus PC-24

The first PC-24 test aircraft rolled out of the hangar on Aug. 1, 2014, and made its first flight this past May. The first two years of production quickly sold out. Pilatus aims to have the up to 10-passenger, $8.9 million all-metal aircraft certified by 2017 and approved for single-pilot operations. The OEM has temporarily stopped accepting new orders. 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 turboprop single, the PC-24 has an aft cargo door and the capability to operate from unpaved and unimproved fields, needing as little as 2,690 feet at an mtow of 17,650 pounds. Power comes from a pair of Williams International FJ44-4As each rated at 3,435 pounds of thrust. The engines have unique features including 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 speed of 425 ktas at FL300. Range with four passengers is 1,950 nm and at mtow the maximum payload is 2,500 pounds. Up front, the customized avionics suite (dubbed PACE–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 means less headroom in the aisle. The aircraft will come with seven different interior layout options, among them executive, commuter, combi and quick-change configurations, as well as options for an externally serviced lavatory, either forward or aft, and galleys. Like the PC-12, the PC-24’s dominant feature is its rear cargo door, which measures 4.1 feet wide and 4.25 feet tall.

SyberJet SJ30i and SJ30x

MSC Aerospace is planning two new versions of the SJ30 light twin-jet: the SJ30i will have an upgraded Sybervision avionics suite featuring 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 and is expected to provide higher cruise speed at altitude, swifter climbs, more payload and better hot and high performance. It will also provide single-point refueling. Price for both aircraft is expected to be in the $8 million (2014 $) range.

The SJ30 program began in the late 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 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 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.

Singles

Cirrus Vision SF50

Cirrus now has three conformal test aircraft flying and is well on its way to earning certification late this year or early next for the $1.96 million SF50 jet single. Range is estimated at 1,000 nm at 300 knots; 1,200 at 210. The single FJ33-4 Williams turbofan is expected to power the aircraft to 25,000 feet. The five-plus-two layout is retained but options such as weather radar, a “relief station” and upgraded leathers have been added. The SF50 will feature an emergency whole-aircraft parachute that will deploy from the nose.

Cirrus is beginning to gear up for production by adding factory robotics and a fuselage lay-up mold for the all-composite aircraft. The company has received deposits for more than 550 of the jets. As the SF50 bucks up against the $2 million price mark, company chairman Dale Klapmeier indicated last year that Cirrus may tap its owner, China Aviation Industry General Aircraft (Caiga), to build certain component parts in that country to cut costs. Klapmeier said the company plans to spool up SF50 production gradually to 125 per year after certification.

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 to the middle of next year as the company grapples with the need for an engine more powerful than the originally envisioned 1,460-pound-thrust Pratt & Whitney Canada PW610F. This past summer the company indicated it had signed a deal with Williams International to secure the FJ33-5A (1,900 pounds of thrust) for the aircraft.

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 a whole-aircraft ballistic parachute mounted in the nose. The aircraft’s target performance includes maximum 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.
New Business Jets

The Supersonics

Aerion AS2

Last year, Aerion revamped its 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 at weights of less than 100,000 pounds. Flying at the lighter weight reduces range by approximately 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. Last year it announced an agreement to collaborate with Airbus to collaborate 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 technology development.

HyperMach SonicStar

This design proposes a top speed of Mach 4.5, 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 revolutionary “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.

Spike Aerospace S-512

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. The company continues to search for additional funding for the $1 billion program and estimates a market for 600 aircraft between 2020 and 2030.