

Intelligence

Duncan Gets Nod from Bombardier

Duncan Aviation-Battle Creek has been named an authorized service facility for Bombardier Aerospace, the 12th facility to receive such approval from the manufacturer. The network provides warranty work, engine and airframe inspections and repair, Service Bulletin installations and related service and support for current production Bombardier Challenger 604 business jets as well as the Challenger 600 and 601 models.



Grob Aerospace officially launched its twin-turbofan SPⁿ Utility Jet at June's Paris Air Show. The SPⁿ, short for exponential possibilities to the nth degree, is no VLJ. It will offer a super-light-jet-size cabin with double club seating. Known internally as project G180, the aircraft will feature Grob's signature all-composite construction; twin 2,800-pound-thrust, FADEC-equipped Williams International FJ44-3A turbofans; and four-display Honeywell avionics that look a lot like APEX. Zurich-based ExecuJet Aviation Group exclusively will furnish global distribution and spares support. Rucker AG is designing the interior, including a full-width forward lavatory.

The SPⁿ will turn heads in Wichita and Sao Jose dos Campos. It will have a 41,000-foot ceiling, a 272 KIAS V_{MO} and a 0.70 M_{MO}, enabling it to cruise as fast as 407 KTAS at FL 330. It will be able to fly a single pilot and six passengers 1,800 nm at 380 KTAS and land with 100-nm NBAA IFR reserves.

Eight-passenger range will be 1,670 nm. Maximum takeoff weight will be 13,889 pounds, maximum fuel capacity will be 4,422 pounds and maximum payload will be 2,491 pounds. Pressurization is pegged at 8.4 psi, yielding a maximum cabin altitude of 8,000 feet.

The 48.8-foot span wing, generously sized trailing edge fowler flaps and 1:2.48 thrust-to-weight ratio will endow it with a 3,000-foot takeoff field length, assuming standard day conditions. Initial all-engine climb rate should be close to 4,360 fpm. One-engine inoperative takeoff performance will meet Transport Category airplane standards. The V_{REF} landing approach speed will be 100 KIAS and unfactored landing distance is estimated to be 2,950 feet. The relatively high wing, wing flaps with replaceable armor plates on bottom surfaces, high-mounted engines, large rolling stock and chined nose tire will enable the SPⁿ to operate from unimproved runways. The winglets, though, essentially are cosmetic, neither enhancing nor reducing wing performance. More functional winglets, such as those fitted to the G160 single-engine turboprop, may be fitted to the SPⁿ in the future.

The 48.6-foot-long fuselage has a 405-cubic-foot volume cabin, with 5.4 feet of maximum headroom partly due to a nearly full-length, three-inch dropped aisle. Maximum width in the forward cabin is five feet and passenger section length is 16.8 feet. The cabin is slightly narrower at the rear. LEDs are used for the overhead reading and wash lights. The PSUs will feature individual chemical emergency oxygen generators, but the crew will have a gaseous oxygen system with quick-donning masks.

There's a 38-cubic-foot external baggage compartment, including a ski-tube extension, in the aft fuselage. Ipeco is furnishing the crew seats and Grob is fabricating the passenger seats, as it has for other models. The cabin interior features modular construction and a main entry door that measures 53.9 inches high by 33.1 inches wide, thus accommodating patient litters or freight in utility configurations. There's a right-side, plug-design emergency exit over the wing.

The wing is an integrated structure that bolts onto the fuselage with four large titanium knuckles. It has forward, main and aft carbon fiber spars. The leading edge is a special composite that will accommodate bleed-air anti-ice heating. Long travel, trailing-link main landing gear hinge at the main spar. No inner gear doors are fitted to the flight test aircraft, but they may be incorporated if needed to make the cruise speed numbers. LED position lights are at the wingtips. The whole assembly is designed for future growth.

An aerodynamically fine-tuned wing-to-fuselage fairing is integral with the fuselage. Three amply sized access plates on each side, emblematic of the SPⁿ's easy maintenance access design, allow quick removal and replacement of the entire wing assembly, if needed. Four large doors in the nose provide fast access to oxygen, hydraulic and avionics system components.

The 28 VDC electrical system features left and right engine-mounted starter-generators, plus forward (avionics) and aft (engine start) batteries. Engine-driven hydraulic pumps, backed up by an electrically powered standby pump in the nose, power landing gear, speed brakes, wing flaps, variable position spoilers, ABS anti-skid brakes and nosewheel steering systems. Pedal-actuated hydraulic master cylinders will actuate the brakes. Nosewheel steering also will be controlled by the rudder pedals.

No cables are used for control linkages. All primary flight controls will be actuated by carbon-fiber push-pull rods. Small, anhedral stabilizing fins are fitted to the test aircraft, but they may vanish



from the final production design. The cruciform tail eliminates the need for a stall warning stick shaker or stall recovery stick pusher. Bleed air will be used for engine and wing anti-ice protection, with electrical heaters for the windshields, three Rosemount pitot/static probes, total air temperature sensor and angle-of-attack vane. Bleed air also will be used for cabin pressurization and air-conditioning by means of an air-cycle machine in the aft equipment bay, above the baggage compartment. Grob plans to fit the aircraft with glass-faced, stretched acrylic windshields. The forward lav, behind the cockpit, is fully enclosed by forward and aft foldout doors. The left-side entry door and right-side forward fuselage cabin windows provide bright daylight illumination in the lav. The toilet is internally serviced and the washbasin has warm running water.

The cockpit features a quiet, dark design, with backlighted annunciator switches (arrayed on the instrument subpanel), controlling various systems. The main instrument panel has left- and right-side, 15-inch PFDs, along with dual, stacked 10-inch MFDs. Full EICAS is part of the package and the radios are internally mounted LRUs inside the displays. Wing and fuselage static tests have been completed and first flight is slated for the third quarter of this year. EASA type certification is scheduled for first quarter 2007, with FAR Part 23 Commuter Category single-pilot certification and initial customer deliveries to follow in the second quarter. **Fred George**