

2004 CAP National Congress on Aviation and Space Education

The 2004 Civil Air Patrol conference, Teaching Today for Tomorrow, is scheduled for March 24-27 at the Atlanta Marriott Marquis. Focus of the three-day gathering is preparing students for future aerospace industry careers with an emphasis on hands-on, minds-on sessions applied to

Teaching Today for Tomorrow learning appropriate for all
March 24-27, 2004 grade levels.

Atlanta Marriott Marquis The National Congress on Aviation and Space Education is a national standards-focused educational event that encourages the use of aviation and space themes to help inspire students to excel in science, math, technology, language arts, social studies, and other subjects. Those planning to attend should come prepared to build on the excitement with peers, aviation heroes, and enthusiasts. For more information or to register, visit www.cap.gov/events/ncmain.html.

DeltaHawk Porting Diesel Power to GA

DELTAHAWK ENGINES LLC OF RACINE, WISCONSIN, IMPRESSED A group of Milwaukee SAE (Society of Automotive Engineers) members recently with an update on its promising diesel engine development program that expects to begin deliveries later this year. Meeting at the EAA Chapter 838 facility on Racine's John H. Batten Airport, more than 100 engineers listened to company founder, chief engineer, and vice president Doug Doers tell the story of a little engine company that seeks to become a big player in the general aviation powerplant market.

As part of the program, DeltaHawk ran its 160-hp DH160V4, a 327-pound, cast-aluminum turbo diesel that burns Jet-A fuel. The engine's test-bed aircraft is a sleek Velocity RG that Doers built, and in the hangar with it was a Glasair I RG, Skip Gdisis' 1989 Sun 'n Fun and 1990 Oshkosh Grand Champion, which is being prepared for an inverted DeltaHawk DH200A4 installation.

DeltaHawk was born in February 1996 when John (J.P.) Brooks (now the company's principal shareholder) asked Doers to create a clean-sheet engine design for a world record endurance flight attempt from Tokyo to Texas.

Eight years and about \$3.5 million later, DeltaHawk holds a patent (granted in September 2003); is conducting regular flight tests; and is preparing to make 160-, 180-, and 200-hp engines available to the homebuilt market toward the end of this year. About 300 delivery position agreements are already in place, and DeltaHawk expects to begin taking firm orders from homebuilders by the end of March with deliveries starting in August. Prices are \$21,500 for the 160; \$24,000 for the 180 (which includes a new turbocharger and fuel-injection system); and \$28,500 for the intercooled 200.

DeltaHawk is pursuing FAA Part 33 certification, which is on schedule to occur as soon as two years. It's working with officials at the Des Plaines (Illinois) and Milwaukee Flight Standards District Offices (FSDOs) on certification issues. When that time approaches, certified airframe manufacturers will likely come calling, and several have asked that the company call when the engine is "up and flying," Doers said.

The DeltaHawk-powered Velocity RG made its first flight on May 3, 2003, and achieved 140 knots at 5,500 feet AGL. Since that 38-minute flight the engine has



logged more than 30 test hours, driving the Velocity to 176 knots and 14,700 feet AGL. When conditions are favorable, 18,000 feet is the next target. So far, Doers said, the engine has performed "flawlessly."

A small company, DeltaHawk's five full-time and three part-time employees have achieved success with limited resources thanks to "CAD [computer-aided design] and computer technology," which allows them to rapidly prototype parts and engines. "We build most of the parts ourselves," Doers said. Other parts, such as injection pumps, are obtained locally.

Ingenuity has helped along the way. Instead of spending thousands to install a safety window in DeltaHawk's in-house dynamometer facility, employees visually connected the dyno to its control room with a video camera and monitor. "That's the kind of thinking we used as the company grew and proceeded," he said.

Test flights have produced some favorable fuel efficiency estimates: At 160 knots (2400 rpm) and 7,500 feet MSL, the DH160V4 burns about 6 gallons of Jet-A per hour, which is about 3 gallons better than a 100LL-burning Lycoming 160-hp O-320. At the economy setting (110 mph), DeltaHawk uses 2.6 gallons per hour compared to about 5 for the Lycoming. With 73 gallons of fuel on the DeltaHawk Velocity, that equates to a 2,100-mile range.

The company has shipped preproduction engines to several beta testers, including two to helicopter builders and several more to aircraft homebuilders. The 180-hp engine will be available in October this year and the 200 in December. To learn more, visit www.deltahawkengines.com or call 262/634-9660.—Ric Reynolds



Eclipse Inks Deals for Avio System

ECLIPSE AVIATION HAS SIGNED LONG-TERM DEALS WITH SEVERAL companies to team on its 500 jet's exclusive Avio system. Avio's integral, redundant computer systems and advanced power distribution system monitor can control all aspects of the aircraft, from engine controls and avionics to fuel system management and cabin reading lights. The system will deliver integration and safety previously available only in advanced military aircraft and commercial airliners.

"This total aircraft integration provides a major step forward in safety and reduced pilot workload," said Eclipse President and CEO Vern Raburn. "Our strategy is to seek out the best of the best, so that Eclipse customers can have one of the most advanced aircraft in the world at a cost of \$950,000."

The new suppliers and their systems are Autronics (aircraft computer system); Crossbow Technology (attitude and heading reference system); FreeFlight Systems (GPS with WAAS); Harco Laboratories (air data computer with reduced vertical separation minimum capability); Hispano-Suiza (full authority digital engine controls); and Meggitt Avionics (digital autopilot).

The new suppliers join existing Avio partners Avidyne (dual primary flight displays and multifunction display, keyboard, autopilot control panel, and navigation and communication radios) and General Dynamics (power distribution system and starter generator). For more about Eclipse, visit www.eclipseaviation.com.