

CUSTOMIZING A CLASSIC



Brodia Aircraft puts gourmet taste into plain vanilla.

BY MARK TWOMBLY

Lawrence S. Brodia was a college student, majoring in criminology, when he built his first custom interior. Brodia had bought a new utility van equipped inside with only a driver's seat. Inspired by the then-new California passion for outfitting vans with swiveling captain's chairs, picture windows and airbrushed murals, Brodia designed, built and installed a complete interior in his van. The compliments he received from friends convinced Brodia to abandon a career in law enforcement and start selling van conversions. Three years later, he had built his own 15,000-square-foot complex on 11 acres and signed a contract with General Motors Corporation to fabricate and install custom interiors in 30 vans per month. He also bought a new Cessna Turbo 210 Centurion.

Brodia has since sold most of the company to his brother. The 210 was

sold when gasoline prices rose and sales of fuel-inefficient customized vans dropped off. But Brodia has not forgotten the meteoric success he enjoyed as a customizer, nor his love of flying. He has combined both in a new venture: customizing aircraft.

His first effort is called the Eclipse 350. On the outside, the Eclipse 350 is a Cessna 172 Skyhawk with an unusual paint design and a slightly different engine cowl. On the inside, it is something else entirely. The Eclipse 350 has a 180-hp engine with constant-speed propeller, a wool and leather interior and a new suite of instruments and avionics in a polished walnut instrument panel.

Brodia has ambitious plans to refurbish a variety of aircraft models, including piston and turboprop twins. He is starting with the Skyhawk because of the vast potential market. The

Skyhawk's popularity is unmatched; more than 33,000 have been sold in the 30-year production run.

Raw material for Eclipse 350 conversions is limited to 1977 through 1980 Skyhawks for two reasons. A new instrument panel was introduced in 1977 that still is very similar to the panel on new Skyhawks. More important, Brodia is able to buy used 1977 through 1980 Skyhawks powered by 160-hp Lycoming O-320-H2AD engines at very low prices. The H2AD engine suffered from valve train and crankshaft wear problems, and it was the subject of three major airworthiness directives covering the valve tappets, crankshaft and oil pump. Brodia said he has no problem finding Skyhawks with high-time H2AD engines at very attractive prices.

Brodia acts as a contractor who arranges with vendors to supply specific services and individual components for Eclipse 350s. Avcon Conversions, Incorporated, in Udall, Kansas, supplies the engine conversion kit, which includes a factory-new Avco Lycoming O-360-A1A engine with new carburetor and accessories, a new Hartzell propeller, propeller governor and spinner, new baffling and exhaust system, upper and lower nose-bowl cowlings, auxiliary electric fuel pump, propeller control and manifold- and fuel-pressure gauges. A Los Angeles-area aircraft specialty shop reupholsters the seats. The walnut-veneer instrument panel is cut and finished by a company that builds custom dashboards for luxury cars. An aircraft paint shop refinishes the Eclipse to Brodia's specifications. All of the nuts-and-bolts work of removing the original interior and installing the new one is done by Santa Barbara Aviation, Brodia's base of operations. Brodia plans to assume most of the conversion tasks with his own staff gradually.

Brodia does not claim to rebuild Skyhawks; only to customize them. The only supplemental type certificate required for the transformation from Skyhawk to Eclipse is the STC for the Avcon engine conversion. The Skyhawk is given a thorough annual inspection during the conversion process, after the original interior and engine are removed and the paint stripped. Worn parts are replaced, even though that may not be required for the annual. The second Skyhawk undergoing Brodia's customizing received



CUSTOMIZING A CLASSIC

Eclipse performance surpasses a Skyhawk, but the accommodations are the attraction.





new tires, brakes, vacuum pump, wheelpants, side windows, pilot's seat tracks, and a rebuilt nose-gear strut.

Standard avionics in the Eclipse 350 include dual King KX155 nav/coms and course deviation indicators with glideslope receiver and indicator, King KMS24 audio panel, a II Morrow Apollo I or Arnav 20 Loran C receiver, automatic direction finder, transponder, electronic clock, three-way temperature gauge with outside air, exhaust gas and cylinder-head temperature displays, and an avionics master switch. Other avionics and instruments are included if they are on the original Skyhawk when Brodia buys it. Major options include an S-TEC single-axis autopilot and two 12-gallon wing-tip fuel tanks for a total usable fuel capacity of 64 gallons.

The interior of the Eclipse 350 is, without question, handsome and comfortable. Brodia retains the original Skyhawk seat frames but has the old fabric and foam stripped and replaced with thicker foam, wool covers and leather trim. The door and kick panels are similarly finished, and the standard plastic window and door-post trim is replaced with foam-backed cloth.

Brodia has designed a new fresh-air ventilation and overhead lighting system for the Eclipse. Fresh air is routed from the wing-root inlets to adjustable vents in an overhead console. The console also has adjustable lights and a speaker. There are nice touches throughout the interior: padded, leather-covered control yokes, thick nylon carpeting, foldable cup holders for front seat occupants, foam-backed leather trim on the bottom and top of the instrument panel and a polished mahogany fuel-selector panel.

The additional 20 horsepower improves climb and cruise performance of the Skyhawk, but Brodia has not altered any markings on the airspeed indicator nor changed any pilot's operating handbook performance specifications. To do so would require extensive and expensive Federal Aviation Administration tests and supplemental type certification.

The certificated maximum gross takeoff weight of the Eclipse is 2,500 pounds, which is 250 pounds more than the 1977 Skyhawk. Useful load is 1,147 pounds, compared to 897 pounds for the 1977 Skyhawk II. However, the changes Brodia makes to the Skyhawk add to the empty weight, so



there is a corresponding decrease in useful load. The first Eclipse 350 conversion added 55 pounds to the empty weight of the airplane. At press time, Brodia had completed five conversions and was finishing a sixth. Each conversion was slightly different because of avionics that were installed on the original Skyhawks.

Performance specifications for the Eclipse 350 were established by Brodia through informal flight testing. In several hours of flying around the spectacular Santa Barbara area in the first Eclipse 350, a 1977 Skyhawk, Brodia and I ended up four knots short of the 129-knot cruise speed (at 7,000 feet and 75-percent power) that is claimed in the Eclipse 350 brochure. A climb-out demonstration from Camarillo Airport (elevation 75 feet msl) in Camarillo, California, yielded 900 fpm at 73 knots; not quite up to the brochure figure of 1,100 fpm at sea level. However, the performance we saw during our brief evaluation was better than can be expected from a standard 180-hp 172Q Cutlass. Manufacturer's performance specifications for the Cutlass, which has a fixed-pitch propeller and fixed gear, include a 75-percent-power cruise

CUSTOMIZING A CLASSIC

Brodia plans other conversions. Next: the Eclipse 450, a customized Cessna Centurion.



speed of 122 knots at 8,000 feet, and a 680-fpm climb rate.

Noise level in the Eclipse 350 cabin is considerably lower than in a standard Skyhawk. There was no need for us to yell at each other to be heard, and controllers were easily understood without using headsets. Brodia glues lead-foil soundproofing material to the kick panels to block engine noise, and the thick carpeting, seats and trim panels soak up noise and vibration.

The Eclipse 350 may represent the ultimate Skyhawk. At \$64,825, it is out of the price league for used, eight-year-old Skyhawks, but Brodia is not comparing the Eclipse 350 to used Skyhawks. "I want to compete against new airplanes," he said. A new 1984 Skyhawk II (with less sophisticated avionics) parked near the Eclipse on the ramp at Santa Barbara carried a sticker price of \$66,779.86.

The Eclipse 350 offers a step up in performance for the Skyhawk, but its real attraction is the first-class accommodations for pilot and passengers. The overall effect is of overstuffed, but not overstated, luxury. The only item missing from the Eclipse 350 options list is the chauffeur. □