

A high-angle, close-up photograph of a white Glasair II-S kit airplane in flight. The aircraft is shown from the side, highlighting its high-wing configuration and the open cockpit. The fuselage features blue and white stripes. The background is a dark, textured sky.

STRETCHING EXERCISES

Call the II-S the ultimate "little" Glasair.

BY MARC E. COOK

Longevity is not a quality always associated with kit-airplane manufacturers, which should come as no surprise given that the industry remains in its infancy and that it occupies a small corner of an already small field. Working with limited finances, many companies labor vigorously just to stay

afloat. This situation leaves little room for product evolution and model expansion and can mean that builder support, a seldom-mentioned but vitally important part of constructing your own airplane, might be less than ideal.

And yet against tough odds, a handful of companies has flourished. One of those, and arguably the elder statesman of the kit-built manufacturers, is Arlington, Washington-based Stoddard-Hamilton Aircraft, Incorporated. Founded in 1980 by Tom Hamilton, the company hit the trail running with a simple 115-horsepower, two-seat, composite-construction taildragger called the Glasair. That airplane has evolved through the years to include fixed-gear tricycle models, retractable models, and the fire-breathing, 256-knot Glasair III. Through this journey, the basic fuselage and wing planform have remained substantially unchanged. Viewing the first Glasair next to the race-horse Glasair III at the Stoddard-Hamilton factory proves the point; you don't have to look hard to find the family resemblance.

In 1986, Stoddard-Hamilton introduced two follow-on models to the original Glasair. The most direct descendant was the II, which incorporated a slew of changes to the kit, the vast majority of which were intended to cut build time and to provide finished pieces—like the canopy frame—that in the original had to be built by the owner.

But the big news in 1986 was the Glasair III, which sported a 300-hp engine and set more speed records than a felon in a Ferrari. In moving from the II to the III, Stoddard-Hamilton found itself having to answer some knotty engineering questions, like how do you offset the weight of a six-cylinder, fuel-injected engine swinging an 80-inch constant-speed propeller where a much lighter propulsion package once resided? Also, the airplane would be far faster with 100 additional horsepower, and maintaining (or better yet, increasing) stability would be essential. The company's solution was to stretch the basic II fuselage, between the baggage compartment and the tail, by 18 inches. Other changes were made, of course, including a stronger wing spar, longer landing gear legs, and a revised and much strengthened horizontal stabilizer.

Another benefit of the III's stretch was purely aesthetic. In the III, the longer fuselage took away some of the stubbiness of the original-series Glasair. The same thinking applied to the II resulted





in the II-S, Stoddard-Hamilton's newest model. It differs from the II by having a 12-inch-longer fuselage (between the rear window and the origin of the ventral fin) and another 2 inches added ahead of the fire wall.

As with earlier Glasairs, the II-S can be built with a bewildering array of factory airframe options. You can have the II-S with plain or slotted flaps (incorporating manual or electric actuation); the slotted flaps reduce stall speed by 7 knots, to 48 knots. The gear can be fixed tricycle, fixed conventional, or retractable tricycle gear. Engine choices include 160 hp to 200 hp carbureted and fuel-injected Lycomings. Also, you can opt for wing-tip extensions that add 11 gallons to the 48-gallon fuel supply, increase maximum gross weight by 100 pounds, reduce stall by 5 knots (a total of 11 knots, to 43 knots, with the slotted flaps), and marginally improve climb and high-altitude cruise. What's more, the tips are bolt-on affairs that can be removed should aerobatics be desired, as they slow the roll rate somewhat. All these options—and there are many more, including special instrument panels—can be retrofitted to airplanes during or after construction. Currently, Stoddard-Hamilton is doing a land-office business selling the slotted flap kits to Glasairs already flying.

Such interchangeability is one reason Stoddard-Hamilton has been loathe to mess with the basic Glasair design. Another was to ensure product support for the existing kits. "We have a tremendous inventory of spares," says Company President Ted Setzer. "Every time we make a change to a part, we think about how that will affect the airplanes in the field. Often we provide incentives to get the builders to retrofit to a newer part." When asked if the company intends to compete in the four-place market, Setzer is adamant: "No. We are busy enough with this airplane and providing customer support. We will stick with what we know."

So for the foreseeable future, only two-seat kits will roll out of the Stoddard-Hamilton plant, and that's no bad thing. For personal transportation, the II-S proves a willing and capable partner. The cabin, though certainly no Bonanza's, carries a claimed width of 42 inches (the Beech's measurement, by the way) and provides a cozy, yet comfortable, place to work. Broad-shouldered types might find the high sidewalls a bit crowding, and a few pilots have men-

ter completely at low speed—especially when dirtied up with gear and flaps—the II-S remains, pardon the expression, unflappable. Forget not that this is a slick airplane, and it doesn't like to come down without a substantial power reduction. When slowed, though, it seeks trimmed airspeed the way an alley cat looks for a fight. We flew the pattern at Arlington at about 85 knots, which required us to hold very little power. Never did the II-S feel unhappy at that velocity, and it exhibited no tendency to sink with the power pulled off. Blipping the flaps down through the pattern slowed the airplane predictably and with little pitch change. In the demonstrator, the flaps are controlled by a small switch on the throttle handle; this jury is still out on the setup, largely because I tend to hold quadrant-mounted throttles below the handle, my palm resting on some solid object. Otherwise, the II-S's ergonomics are good, with a console-mounted power quadrant and electric trim located on the control grip.

In the landing phase, as in most other flight regimes, visibility is good. The windshield bow, a seriously beefed-up structural member intended to make rollover accidents more survivable, re-



*An almost complete
lack of adverse
yaw makes most
maneuvers feet-on-
the-floor exercises.*

stricts vision occasionally, but that's the only gripe. Once turned onto final, the airplane provides a good view of the runway over the nose—an advantage of the slotted flaps, which provide a more nose-down approach than the plain flaps, said Sprague—and the II-S required no special tricks to get consistently smooth, accurate touchdowns. Despite a rather high wing loading of

24.6 pounds per square foot, the II-S performed power-off approaches and landings with aplomb. It might be fast in cruise, but the II-S is no hot rock around the pattern. Anyone experienced in fast, complex production aircraft would have no trouble transitioning into the II-S.

But before you can enjoy any of this performance, you must build the airplane. Here's the Achilles heel of kit-built airplanes—time. Stoddard-Hamilton figures that it would take the average builder about 1,300 hours (for the fixed-gear models) to 1,800 (for the retractable) to complete a II-S. The company notes that build times can vary tremendously, depending on the amount of avionics. "But you must view the building process as an education. You are going to spend two or three years of spare time building the airplane. You have to want to do that," says Sprague.

All Glasairs are delivered in one shot; the kits include all airframe parts, hardware, manuals, and materials; the packaging and documentation are complete and first-rate. The builder must upholster the interior and provide an engine, prop, and avionics. Construction is straightforward room-temperature-curing fiberglass, with the skin components

made up of glass-vinylester with foam cores. The fuselage is provided in two pieces, split vertically, that run from the fire wall back to the vertical stabilizer. The wing spar comes bonded to the lower wing skin. Prices for the II-S models run from \$16,900 for the taildragger to \$24,500 for the tricycle retractable.

In addition to longevity, Stoddard-Hamilton has an enviable completion record for the Glasair. Of the more than 1,100 kits sold, more than 270 aircraft are currently flying. That's a good record, especially when you consider that the vast majority of the kits are retractable-gear IIs and IIIs, both complex airplanes with hydraulic systems and fuel injection to deal with. Another facet of building and owning this airplane, and one Stoddard-Hamilton points proudly to, is the company's service bulletin reporting system. Just like the Wichita crowd, when the company sees something wrong with a part or perhaps discovers a design flaw that manifests itself only after time, a service bulletin goes out, warning other owners. (A good example: There were several reported failures of welded joints in fixed-gear Glasair nosewheel assemblies; the factory made this known and provided a

prompt fix.) This takes a great deal of staff time, but Stoddard-Hamilton seems happy to expend the effort.

This—alongside a highly desirable product—only helps improve the company's shot at longevity. □

Stoddard-Hamilton Glasair II-S

Base kit price: \$24,500

Specifications

Powerplant	Textron Lycoming IO-360-B1E, 180 hp at 2,700 rpm
Recommended TBO	2,000 hr
Propeller	Hartzell constant-speed, 76-inch diameter
Length	20.2 ft
Height	6.8 ft
Wingspan	23.3 ft
Wing area	81.3 sq ft
Wing loading	24.6 lb/sq ft
Power loading	11.1 lb/hp
Seats	2
Cabin width	3.5 ft
Empty weight, typical	1,325 lb
Maximum gross weight	2,000 lb
Useful load	675 lb
Payload w/full standard fuel	387 lb
Payload w/full optional fuel	421 lb
Fuel capacity, std	48 gal (48 gal usable) 288 lb (288 lb usable)
Fuel capacity, w/opt tanks	59 gal (59 gal usable) 354 lb (354 lb usable)
Oil capacity	8 qt
Baggage capacity	80 lb, 10 cu ft

Performance

Rate of climb, sea level	1,700 fpm
Max level speed, sea level	217 kt
Cruise speed/endurance w/45-min rsv, std fuel (fuel consumption)	
@ 75% power, best power	204 kt/3.8 hr
8,000 ft	(63 pph/10.5 gph)
@ 65% power, best power	190 kt/4.6 hr
8,000 ft	(54 pph/9 gph)
@ 55% power, best economy	173 kt/5 hr
8,000 ft	(50 pph/8.3 gph)
Service ceiling	19,000 ft

Limiting and Recommended Airspeeds

V _x (best angle of climb)	69 KIAS
V _y (best rate of climb)	91 KIAS
V _a (design maneuvering)	126 KIAS
V _{fe} (max flap extended)	122 KIAS
V _{le} (max gear extended)	139 KIAS
V _{lo} (max gear operating)	122 KIAS
V _{no} (max structural cruising)	174 KIAS
V _{ne} (never exceed)	226 KIAS
V _r (rotation)	70 KIAS
V _{s1} (stall, clean)	58 KIAS
V _{so} (stall, in landing configuration)	48 KIAS

For more information, contact Stoddard-Hamilton Aircraft, Incorporated, 18701 58th Avenue, N.E., Arlington, Washington 98223; telephone 206/435-8533.

All specifications are based on manufacturer's calculations. All performance figures are based on standard day, standard atmosphere, sea level, gross weight conditions unless otherwise noted. Extended wing tips are available for the Glasair II-S, which allow an increase in maximum gross weight of 100 pounds, provide an 11-gallon increase in fuel capacity, reduce stalling speed by 5 knots, reduce wing loading by 1.6 pounds per square foot, increase wing area by 10.2 square feet, and increase wingspan by 4 feet. □