GLASAIR

When better lightplanes are built, will we have to build them ourselves?

BY J. JEFFERSON MILLER

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Inside the Stoddard-Hamilton factory, I have the strange feeling I am witnessing something important. The feeling is strange because no one else is around (the workers have gone home for the day) and nothing seems to be happening on the shop floor—a space about the size of two indoor tennis courts.

But something is happening. An airplane is being built, or more precisely, cured. I can smell the boatyard aroma of resin kicking off. A Glasair fuselage is solidifying in two female molds, and a wing spar is being mated to a bottom wing skin. It all happens so quietly I almost can hear the fiberglass stiffening.

Funny, this does not look like an aircraft factory: There are no sheets of aluminum, rivet guns or welding equipment—just rolls of fiberglass, barrels of resin, autoclaves and molds. This, I think to myself, is what the light aircraft factory of the future will look like. But instead of kits being produced as they are here, completed airplanes will be the end product.

Spending time at Stoddard-Hamilton can lead you to speculate about the future of the lightplane industry. Maybe that is because at Stoddard-Hamilton they believe the industry has a future. The airplane produced there, the Glasair, makes you question the assumption put forth by some industry observers that the market for two- and four- place light aircraft is virtually dead.

In the past three years, Stoddard-Hamilton has built a solid business based on the proposition that pilots are looking for better performance and economy than are available today from the airplanes offered by Beech, Cessna, Mooney and Piper.

Since the Glasair's introduction at Oshkosh in the summer of 1980, 475 kits have been sold, and 30 now are flying. More than 100 kits were sold in the first 11 months of 1983, slightly fewer than the 129 Bonanzas sold by Beech or the 136 aircraft sold by Mooney.

It is not hard to see why an individualistic few would choose the hard road of building their own airplane. The Glasair offers an almost irresistible combination of qualities. It is sleek, fast and nimble, yet very sparing with a gallon of gas (achieving 29 nautical miles per gallon at 11,000 feet and 174 knots, according to factory figures). The retractable version of the Glasair offers all of these qualities for about $40,000, IFR equipped, if you do all of the building yourself.

Stoddard-Hamilton estimates that it takes 1,200 hours to build a Glasair. The Glasair comes with much of the work that requires special machinery or skills already accomplished. All of the controls are pre-welded and the metal parts pre-stamped.

The fuselage goes together in two halves like a Revell model. The wings arrive with the fiberglass main spar already fastened to the lower wing skin. The builder installs the wing tanks, control push rods, autopilot servos (if desired), plumbing lines, wiring and wing ribs before sealing up the wing.

All of the components are bonded together with fiberglass and a vinylester resin, a petroleum-based substance that gives shape and rigidity to the fiberglass cloth.

The moment of truth for a Glasair builder comes when he has to make the first incision into the fuselage for the windows or the wing insert area. A bad cut could ruin the fuselage.

Putting the pieces of the kit together actually accounts for only a few hundred hours of the process. Most of the construction time is devoted to detail work, such as filling in the gaps between trailing edges and ailerons, making the gear doors seal tightly, connecting the engine controls and running wiring and plumbing.

The recommended engine for the Glasair is the Lycoming O-320 150- to 160-hp model. Some builders have installed 180-hp engines, and at least one builder is using a 200-hp engine.

Building a Glasair requires a large commitment of effort and time (virtually every spare moment if you want to finish the airplane within a couple of years). Not surprisingly, many Glasair owners have hired others to do part or all of the construction work.

During its short time on the market, the Glasair has evolved from a fixed-gear taildragger to a tricycle-gear retractable. Both versions now are available. The origins of the airplane go back to 1975, the year Thomas Stoddard Hamilton, age 22, decided to design and build an airplane.

After taking a couple of aeronautics courses at the University of Washington, Hamilton set up shop at the Cedar Grove Airport, a small grass strip south of Seattle affectionately referred to by Stoddard-Hamilton employees as the Pig Farm, because, it once was one.

Two-and-a-half years later, in the summer of 1977, Hamilton had completed his first aircraft, a fiberglass, low wing, two-place, tandem design, dubbed the Pocket Rocket. It suffered from several shortcomings directly relating to the tandem seating arrangement, according to Hamilton. Flying from the front seat placed the center of gravity very far forward. Visibility was limited when flying from the rear seat. Baggage space almost was non-existent. And the airplane's handling qualities were disappointing. "It wasn't everybody's airplane," Hamilton explained, then added with a wry smile, "It stunk!"

The Pocket Rocket took to the air only a few times and then was burned, intentionally, by its creator. But out of the ashes rose a new and better design.

By summer 1979, after two more years of toil, the prototype Glasair was completed. It differed from the currently marketed production taildragger in only two main regards. The prototype's canopy was three inches lower, giving the airplane a low-slung, racer-like profile, and the engine was a 115-hp Lycoming O-235.

Side-by-side seating was chosen to alleviate some of the weight and balance problems that manifested themselves in the Pocket Rocket. Hamilton also found that this arrangement provided plenty of space for an IFR panel and saved some weight by eliminating the need to duplicate some of the instruments and controls.

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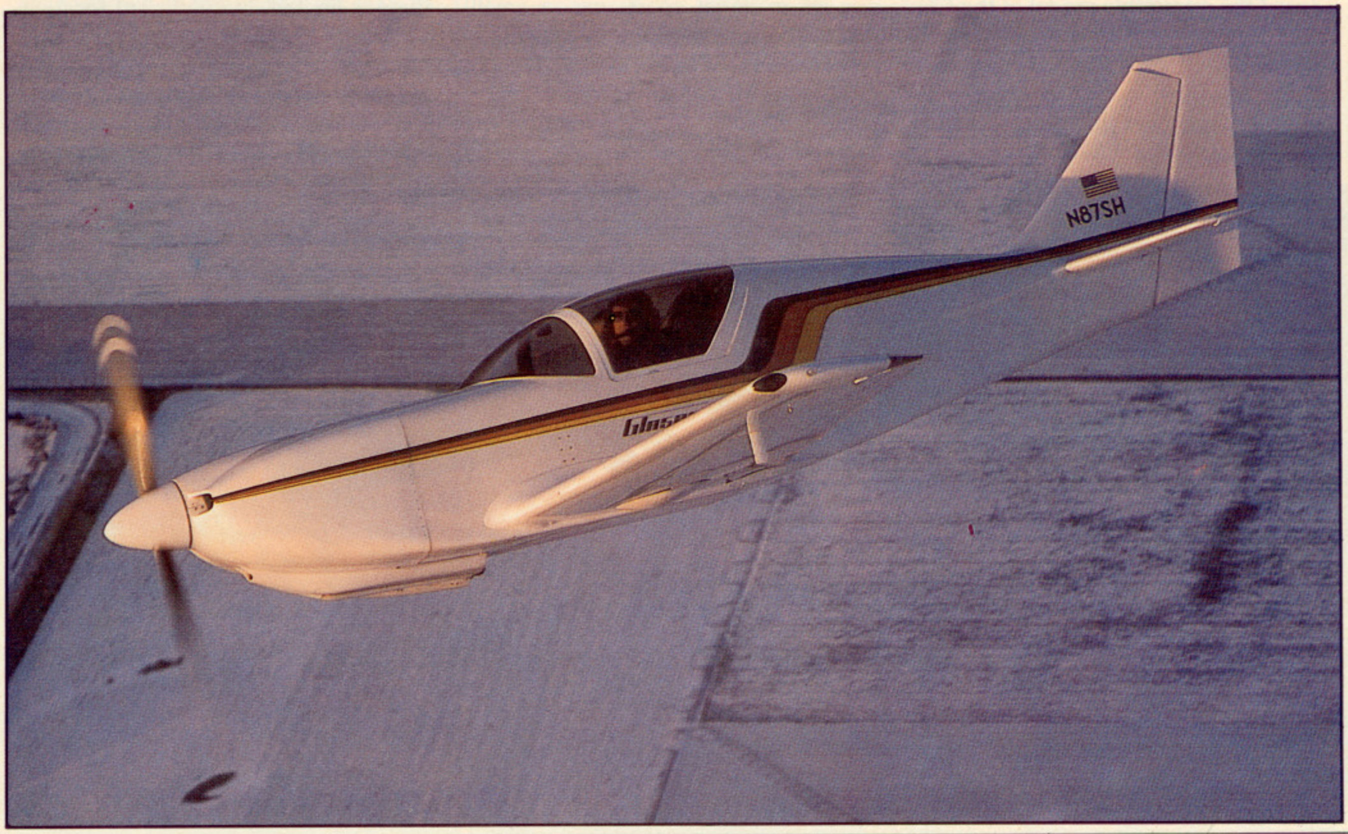

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A NASA-designed GA(W)-2 airfoil (the same airfoil employed on the Piper Tomahawk) was selected because, according to Hamilton, it provides a coefficient of lift more than 10 percent higher than other airfoils used on light aircraft, while creating a relatively low amount of drag. The airfoil's high coefficient of lift enabled Hamilton to keep the wing area relatively small without sacrificing tolerable stall speeds.

Hamilton's brother, Steven D. Hamilton, a Boeing engineer, lofted the design with the aid of a computer. By using the computer to determine numerous points on the airframe, the brothers were able to plot perfect conic curves for the fuselage. The result was an airplane that delivered a 75-percent cruise speed of 174 knots from a 115-hp engine.

The payoff for five years' effort came at Oshkosh '80. As a result of contacts made at the air show and information packets distributed there, Hamilton netted 100 orders for the Glasair.

In order to meet increasing production demands, larger facilities in an industrial park in Kent, Washington, were leased shortly after Oshkosh. Then, in September 1982, Stoddard-Hamilton moved again, this time to a complex on the Arlington, Washington, airport.

Also in mid-1982, the company introduced the retractable model of the Glasair. Hamilton selected an electrically actuated hydraulic retraction system. There are three doors for each main gear—one to cover the strut, the other two to enclose the wheel. Only one

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gear door is used for the nosewheel to minimize gaps. After initial installation of the gear doors, they were examined in flight and then recontoured until a tight seal was achieved.

The retractable costs $6,000 more than the fixed-gear version, but it is outselling the taildragger 4:1. The preference for the retractable version is due, in large part, to it offering the ground handling advantages of tricycle gear. But it probably is perceived by all but the die-hard tailwheel advocates as the sportier model.

It is difficult not to think of the Glasair as an aerial sports car—a small, fast, responsive machine that sacrifices spaciousness for performance. The impression of the Glasair as a sports car is formed as soon as you unbutton the canopy and climb in. Actually, you do not so much climb into the Glasair as slip into it—by stepping onto the forward part of the wing where it runs through the cockpit, bracing yourself on the window frame and seat back and easing your legs under the instrument panel. Once situated, the position is quite comfortable. According to Stoddard-Hamilton, the cockpit can accommodate pilots up to six feet four inches in height. Very broad pilots, though, may find the fit a little tight. The cockpit is three inches wider than a Cessna 152, but four-and-a-half-inches narrower than a Mooney 201. Baggage space is limited, but sufficient for each occupant to take a soft travel bag.

A relatively small cabin is the necessary trade-off for a fast airplane. Nevertheless, Hamilton has taken pains to leave enough room for comfort, but

nothing more.

The Glasair does not have a steerable nosewheel (nor does the Glasair TD have a steerable tailwheel). Taxi turns are accomplished by working the mainwheel brakes. The rudder can be used to steer during a fast taxi.

Initial rate of climb in the Glasair is impressive. With the gear up, full power still in and about 100 knots indicated, the Glasair was climbing at 1,800 fpm with two on board. A cruise climb at 120 knots provided better visibility over the nose and about 1,000 fpm on the way up to 10,000 feet. (Granted, on the two occasions I flew the Glasair, the temperature was approximately 20°F and we were under gross, but I still had the impression that, on high-density-altitude days, the airplane will not have too much trouble getting off the runway.)

The company's promotional literature claims that the Glasair is the world's fastest kit-built aircraft. That may or may not be true, but there is no question that it is fast. A 200 knot cruising speed is not unreasonable, but some Glasair owners will no doubt consider it sinful to burn the 10 gallons per hour required to achieve that speed. Many will opt to power back to 55 percent and amble along at 174 knots while burning only 6.1 gph.

In a descent it is hard to keep the airspeed out of the yellow arc (174 to 217 knots) without making a fairly substantial power reduction. Pulling the manifold pressure back to 17 or 18 inches will allow about an 800 fpm rate of descent at 174 knots. The airplane slows up for pattern entry surprisingly well once the power is pulled back below 15 inches and the prop is moved to flat pitch. The gear can be dropped at 117 knots, and then the airplane can be slowed to about 85 knots for downwind—slower if you need to give yourself space for traffic, but you still will need to keep an eye out to avoid running down any Aeroncas. Final approach can be made at 65 to 70 knots.

You might imagine that the little Glasair bobs through the air in even the lightest turbulence. But, in fact, it handles the bumps rather well, due in large measure to the airplane's high wing loading. At gross weight the RG model has a higher wing loading than a Beechcraft B-36TC Bonanza—22.2 pounds per square foot versus 20.72 pounds per square foot.

The Glasair is very responsive, just

Glasair RG	**Model**	**Glasair TD**
$19,475	Base price	$13,400
$40,000*	Price as tested	$25,000*
IFR Panel*		VFR Panel*
Variable	Current market value	Variable
	Specifications	
Lycoming O-320 160 hp	Powerplant	Lycoming O-320 160 hp
2,000 hr	Recommended TBO	2,000 hr
Hartzell, constant speed	Propellers	Fixed pitch wood
18 ft 7 in	Length	18 ft 7 in
6 ft 6 in	Height	7 ft
23 ft 3 in	Wingspan	23 ft 3 in
81.2 sq ft	Wing area	81.2 sq ft
22.2 lb/sq ft	Wing loading	18.5 lb/sq ft
11.25 lb/hp	Power loading	9.4 lb/hp
2 side-by-side	Seats	2 side-by-side
Seat to pedals, 45 in	Cabin length	Seat to pedals, 45 in
39 in	Cabin width	39 in
Seat to canopy, 37 in	Cabin height	Seat to canopy, 37 in
1,090 lb	Empty weight (approx.)	925 lb
1,091	Empty weight, as tested w/o oil	945 lb
1,800 lb	Max ramp weight	1,500 lb
1,800 lb	Gross weight	1,500 lb
700 lb	Useful load	575 lb
700 lb	Useful load, as tested	540 lb
448 lb	Payload w/full fuel	423 lb
448 lb	Payload w/full fuel, as tested	388 lb
1,800 lb	Max takeoff weight	1,600 lb
1,800 lb	Max landing weight	1,500 lb
1,106 lb	Zero fuel weight w/oil	960 lb
252 lb (252 lb usable)	Fuel capacity, std	252 lb (252 lb usable)
42 gal (42 gal usable)		42 gal (42 gal usable)
8 qt	Oil capacity, ea engine	8 qt
80 lb, 10 cu ft	Baggage capacity	80 lb, 10 cu ft
	Performance	
630/380 ft	Takeoff distance, ground roll, gross/solo	790/390 ft
1,200/755 ft	Takeoff distance, over 50-ft obst, gross/solo	1,425/755 ft
22 kt	Max demonstrated crosswind component	17.4 kt
1,400/2,300 fpm	Rate of climb, sea level gross/solo	1,300/1,900 fpm
210 kt	Max level speed, sea level	200 kt
204 kt, 10gph	Cruise speed, fuel flow, endurance std/opt fuel @75% power 8,000 ft	195 kt, 10.5 gph
183 kt, 7.2 gph	Cruise speed, fuel flow endurance std/opt fuel @65% power, 8,000 ft	174 kt, 7.5 gph
174 kt, 6.1 gph	Cruise speed, fuel flow endurance std/opt fuel @55% power, 8,000 ft	154 kt, 6.3 gph
20,000 ft	Service ceiling (gross)	20,000 ft
1,100/795 ft	Landing distance over 50-ft	1,200/875 ft
530/435 ft	Landing distance ground roll (gross/solo)	550/475 ft
	Limiting and Recommended Airspeeds	
65 KIAS	Vx (Best angle of climb)	65 KIAS
87 KIAS	Vy (Best rate of climb)	113 KIAS
126 KIAS	Va (Design maneuvering)	126 KIAS
96 KIAS	Vfe (Max flap extended)	96 KIAS
117 KIAS	Vle (Max gear extended)	—
	Vlo (Max gear operating)	
117 KIAS	Extend	—
117 KIAS	Retract	—
217 KIAS	Vne (Never exceed)	208 KIAS
57 KIAS	Vr (Rotation)	57 KIAS
56 KIAS	Vs1 (Stall clean)	56 KIAS
56 KIAS	Vso (Stall in landing configuration)	—

*All specifications are based on manufacturer's calculations. All performance figures are based on standard day, standard atmosphere, at sea level and gross weight, unless otherwise noted. *Operations/Equipment Categories are defined in June 1983 Pilot, p. 96. The prices reflect the costs for equipment recommended to operate in the listed categories. Stoddard-Hamilton Aircraft, Incorporated, 18701 58th Avenue, N.E. Arlington, Washington 98223; 206/435-8533* as an aerial sports car should be. The controls are light and sensitive in both roll and pitch. Fingertip flying is essential; a death grip on the stick will lead to overcontrolling. Unlike some high performance singles that require a hammerlock on the yoke in a steep bank turn, the Glasair will hang in a 60-degree bank with hardly any effort from the pilot. (And while steeply banked, you will be able to see where you are going by looking through the top of the canopy.)

According to company President Theodore E. Setzer (Tom Hamilton is the company's chairman), light stick forces were achieved by giving the control stick a high moment arm for good

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leverage and by using push rods and bearings for control linkages, rather than pulleys and cables that would create more friction.

Power-on and power-off stalls gave fair warning of a break. Stall strips along the inboard leading edge of the wing cause the inboard sections to stall first. Without the strips installed, however, (and at least one builder I know has chosen not to install them) the stall characteristics are unpredictable.

Intentional spins are prohibited by Stoddard-Hamilton. According to the owner's manual: "The *slightest* deviation or change from our prototype N89SH could cause adverse spin characteristics, and because of our lack of control over the way builders construct their aircraft, we must prohibit intentional spins."

Setzer elaborated on the rationale behind the prohibition, saying that many owners have made modifications (such as extending fuel tanks farther outboard) that could alter the aircraft's spin characteristics in ways it would be impossible for the company to determine. In spin tests conducted by Stoddard-Hamilton, the Glasair recovered from three-turn spins to the left and right within three quarters of a turn.

Several aerobatic maneuvers, including barrel rolls, aileron rolls, loops and hammerhead turns, are permitted. The airplane is rated by Stoddard-Hamilton at six Gs positive and four Gs negative. According to the company, roll rate is 140 degrees per second, a figure that seemed to be about right according to my observations in flight. Maneuvers that place high torsional loads on the fuselage, however, such as snap rolls, tail slides and lomcovaks are advised against.

The kit price for the Glasair retractable gear is $19,500 and for the taildrager, $13,400. Neither kit includes engine or propeller. Stoddard-Hamilton plans to make both aircraft available in a series of four kits, each of which can be purchased separately.

A factory-built Glasair will not be a reality any time soon, if ever. The cost of obtaining type and production certificates is simply too high for a small company such as Stoddard-Hamilton.

Then again, if the Federal Aviation Administration adopts a new set of standards that would make it less expensive to put a "basic" airplane in

PEOPLE IN GLAS HOUSES

To find out how Glasair owners were faring with their kit-built airplanes, we conducted a telephone survey between January 16 and January 29. We attempted to contact the owners of the 30 Glasairs (out of 475 kits sold) that have reached flying status, and succeeded in contacting 20 of them. Nineteen of the owners who were contacted had purchased the taildragger version of the Glasair. The retractable version of the Glasair was introduced more recently, and only one of the RGs has flown.

We did not ask about company support for builders in the field, but most of the owners with whom we talked brought up the subject of their own accord, saying that Stoddard-Hamilton had been exceptionally helpful when they called for advice on the construction of their airplanes.

Questions were asked about various aspects of the Glasair's construction and performance, and the results follow.

• *Construction.* The majority of builders indicated that the instructions were adequate and that they did not encounter any major problems. Several pilots said they never had built an airplane before. Most of the pilots said that they had to make several calls to the factory, where their questions were answered promptly and adequately. One paraplegic pilot stated, "If I can build this airplane, with the problems encountered getting in and out of a wheelchair, anybody can build it; it's a great experience."

• *Handling.* One owner cited roll instability as a problem, but the remaining 19 pilots are very pleased with the way the airplane handles. The most frequent response was, "The Glasair is quick and responsive." One pilot stated, "[The Glasair] is fun to fly because it's so responsive," but cautioned, "you can't take someone who's used to flying a 150 or a Cherokee and put them in [a Glasair] without any training."

• *Cockpit comfort.* The owners range in size from five feet eight inches and 155 pounds to six feet four inches and 220 pounds. Comments about the cockpit comfort ranged from "snug" to "excellent." Most said that the cockpit is comfortable for a small airplane cockpit. Five individuals compared the cockpit to the front seat of a sports car. All five agreed that it is difficult to get in and out of the Glasair, but once you are settled inside it is comfortable.

• *Use.* Eighteen pilots use their Glasairs for cross-country flying; two use them for local flying. Nobody mentioned aerobatic use.

• *Ground handling.* Seventeen pilots reported no difficulties, saying that the Glasair handles like a typical taildragger. The owner of the RG version also reported no problems. One pilot stated, "I wasn't completely satisfied with the fixed tailwheel in landing because you have to use a lot of brake." He modified his airplane with a steerable tailwheel and is pleased with the performance. Another pilot modified his TD version with fixed tricycle gear.

• *Cruise performance.* Speeds ranged from 165 knots at 75-percent power with a 150-hp engine, to 200 knots at 65-percent power with a 200-hp engine. The average cruising speed is 178 knots at 75-percent power.

• *Additional remarks.* One pilot has broken four propellers and believes this happened because the gear is too springy. The same pilot also expressed a problem with the fuel tanks. "You can't fill the fuel tanks; [the fuel] runs out the pants on both sides of the wings. Anytime you get in an asymmetric flight with the airplane, there's fuel overboard." He has reported the problem to the company.

Four pilots reported poor forward visibility, and two pilots mentioned that the airplane is noisy.

When asked if they generally were pleased with their Glasairs, the majority of the owners said that they wouldn't trade their airplanes for anything on the market. One pilot even is beginning work on his second Glasair.

—*Erin L. Harman*

production, as AOPA has petitioned the agency to do, Stoddard-Hamilton and other kit makers could consider making complete airplanes. In November 1983, FAA representatives met to discuss such a set of rules with representatives of AOPA, the Experimental Aircraft Association, the General Aviation Manufacturers Association, Air Transport Canada and kit aircraft and engine manufacturers. (See: "Pilot News: FAA Solicits Rules for New Primary Aircraft" by Mark Twombly, January 1984 *Pilot*, p.17.)

Another possibility is that the FAA may change the rules to allow homebuilders to do less than 51 percent of the work on a kit-built aircraft, as now is required. "I would like to see the percentage changed," said Hamilton. "A lot of people would like an airplane such as ours, but don't have the time to build it. I would like to see them be able to complete the Glasair in 200 hours. Building an airplane need not be the draining, demanding experience it is now."

For the present, Hamilton is not very concerned about competing with Beech, Cessna, Mooney and Piper. He is more interested in improving his kits and staying competitive in the homebuilt market. Asked what his dream airplane would be, Hamilton answers quickly, a 200-hp airplane made of fiberglass cloth pre-impregnated with resin and cured in an oven. The resulting airplane could be produced more quickly and would be 150 pounds lighter than one produced by Stoddard-Hamilton's present room temperature curing technique. "But would you pay $4,000 more to take 150 pounds off the airplane?" Hamilton asks. "Or how about $10,000 more for an all carbon airplane? I don't know that we can afford the tooling for that kind of airplane, or whether there is a market for it."

Whether or not Hamilton builds his carbon airplane, he is at least thinking about new light aircraft designs. And that in itself is refreshing. Cessna may never develop a successor to the Skyhawk, nor Beech an heir to the Bonanza. If new, faster, more efficient small airplanes are produced, they will have to come from somewhere else. Some may be coming out of Tom Hamilton's oven. □

ONE MAN'S GLAS

In many ways, Charles D. (Chuck) Mason, AOPA 132799, typifies the pilot who has owned a succession of aircraft over the years as the size of his family and paycheck has grown.

Mason learned to fly in a J-3 Cub in 1945. In 1956, a year after he married, he bought a ten-year-old Ercoupe for $1,750. He and his wife, Elsie, traveled around the country in the little two-seater. After their first child was born, they would nestle the baby girl in a hammock in the baggage space behind the seats, where she would sleep through much of a flight.

But it was clear to Mason that more room soon would be needed, and in 1958 he bought a Piper Tri-Pacer for $4,650. A year later the Masons' second child was born. In 1971 Mason bought, with a partner, a 1957 Cessna 182 Skylane, an airplane big enough to carry the whole family (three children now).

Then, in 1974, he sold his share in the 182 and bought his own Skylane, a 1964 model, for $10,000. With the help of a friend, he overhauled the engine. On his own he installed new wing tanks, strobes and $15,000 worth of avionics, including an autopilot and new navigation radios. (Mason is an electrical engineer and project manager at NASA's Goddard Space Flight Center in Greenbelt, Maryland. One of his recent responsibilities has been to supervise the installation of remote sensing equipment in a Lockheed ER-2, a new, larger version of the U-2, for severe storms research.)

Mason owned his 182 for eight years, averaging about 200 hours of flight time per year. Over that span of time he kept a very accurate record of his expenses. Using a Visicalc program, he fed his expense figures into his Apple II Plus computer and produced a spread sheet that helps explain why flying has become so expensive and why people such as Chuck Mason are looking for more affordable ways to fly.

Perhaps "pondering the best way to do something," Mason sits in his unfinished Glasair. He has incorporated many of his own modifications into the building of his Glasair.

Expense record for Cessna Skylane N28CM excerpted from Chuck Mason's Visicalc spread sheet.

year	cost per gallon	flight hours	total cost	cost per hour
1975	$0.70	215	$4,275	$20
1976	$0.73	337	$4,380	$13
1977	$0.76	268	$5,375	$20
1978	$0.81	206	$5,273	$26
1979	$0.90	197	$6,085	$31
1980	$1.32	129	$4,648	$36
1981	$1.72	119.2	$5,52	$46
1982	$1.84	124.5	$6,138	$49

The cost of gasoline, of course, turns out to be the major culprit in the rising cost of flying. According to Mason's data, the average price he paid for avgas rose from 70 cents per gallon in 1975 to $1.84 in 1982. But other costs rose too. His insurance premium climbed from $386 in 1975 to $660 in 1982. And his tiedown cost rose from $230 to $480.

The inflationary spiral did not mean that Mason no longer could afford to own his airplane, but that he could not afford to fly it as much as he would like. In 1975 he flew 215 hours at a total cost of $4,275, or $20 per hour. In 1982 he flew 124.5 hours at a total cost of $6,138, or $49 per hour. While the Apple II Plus had no trouble swallowing those numbers, they were hard for Mason to accept. If the trend continued, he realized he would fly fewer and fewer hours

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and pay more and more money. He became determined to find a more economical way to fly.

He briefly considered buying another used airplane. A Mooney, he thought, would offer some savings in fuel but not as much as he would like, and with the children grown up the rear seats would be superfluous. It ought to be a two-seater, he decided, and a machine that could travel long legs through IFR weather.

In late 1981 he saw a picture of the Quickie 2 on the cover of *Popular Mechanics* and thought that the Quickie kit might be a solution to his problem. He had considered restoring an aircraft years earlier and had actually designed his house around such a project, first laying out the basement/workshop/garage area, then designing the rest of the house.

The Q2 appealed to Mason because, he said, "It looked like a piece of exotic sculpture." But after visiting a Quickie distributor in Pennsylvania, he decided that the Q2 was not quite large enough or powerful enough for his needs. Still, he felt a kit-built aircraft might best fill his needs.

Through a friend, Mason met Mike Hendricks of Columbia, Maryland, who was building a Glasair. Mason visited Hendricks in his shop to see the Glasair kit and decided it was the airplane for him. "The Glasair was more expensive," said Mason, "but more capable. I put a $500 deposit on the Glasair in March 1982 and decided to see it that year at Oshkosh. If I had not liked it, I would have forfeited the deposit. But when I saw the airplane fly, I fell in love with it."

Mason's kit arrived in September 1982, and he has been spending several hours in his basement workshop most evenings since then. His is an early kit, a taildragger version, requiring Mason to do all the welding and to fabricate many of the metal parts. He expects to spend about 2,500 hours building his Glasair. "Not all of the time I spend on the project is fruitful building time, though," Mason said. "I can spend several hours pondering the best way to do something. And I plan to add a lot of extras."

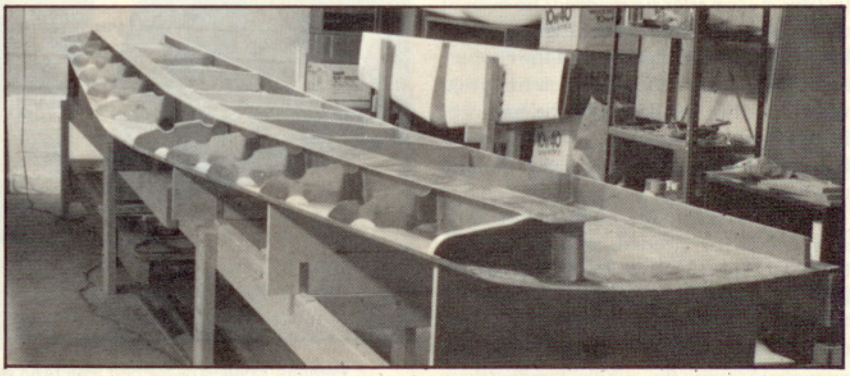
In the fashion of many homebuilders, Mason has come up with his own modifications. He has extended the fuel tanks and has added a fuselage header tank. (Mason plans to cut operational costs by filling the wing tanks with autogas and the header tank with avgas. He intends to take off with avgas and to switch to autogas when reaching cruise altitude.)

Mason also has developed dual sliding canopies for pilot and passenger. (Stoddard-Hamilton offers a sliding canopy only on the pilot's side; the passenger side has a gull-wing canopy.) He has worked out an installation for the Century I autopilot he took from his Skylane. Mason will install dual nav/coms, a transponder, an ADF, a DME, a Loran C unit, a fuel totalizer, a digital thermometer and carburetor air temperature gauge, and a CHT/EGT.

He plans to have his airplane finished and ready to fly by the end of 1984. The key to completing such a demanding project, he says, is not technical knowledge, but resourcefulness in solving problems and the will to stick with it. Once he has his airplane flying, Mason estimates that his hourly operating costs will be less than $20.

Mason's example demonstrates that you can own an airplane, tailor-made to your needs, if you are willing to expend an extraordinary effort to get it. Not everyone will be inclined to make that effort. Chuck Mason is one of those relatively rare individuals who will build something himself if he cannot find it or cannot afford it.

His next project—building an energy efficient house. —*JJM*



The keys to the do-it-yourself airplane are resourceful problem solving and the will to stick with it, according to Mason, who documented each step of the 2,500-hour project.