Glasair News

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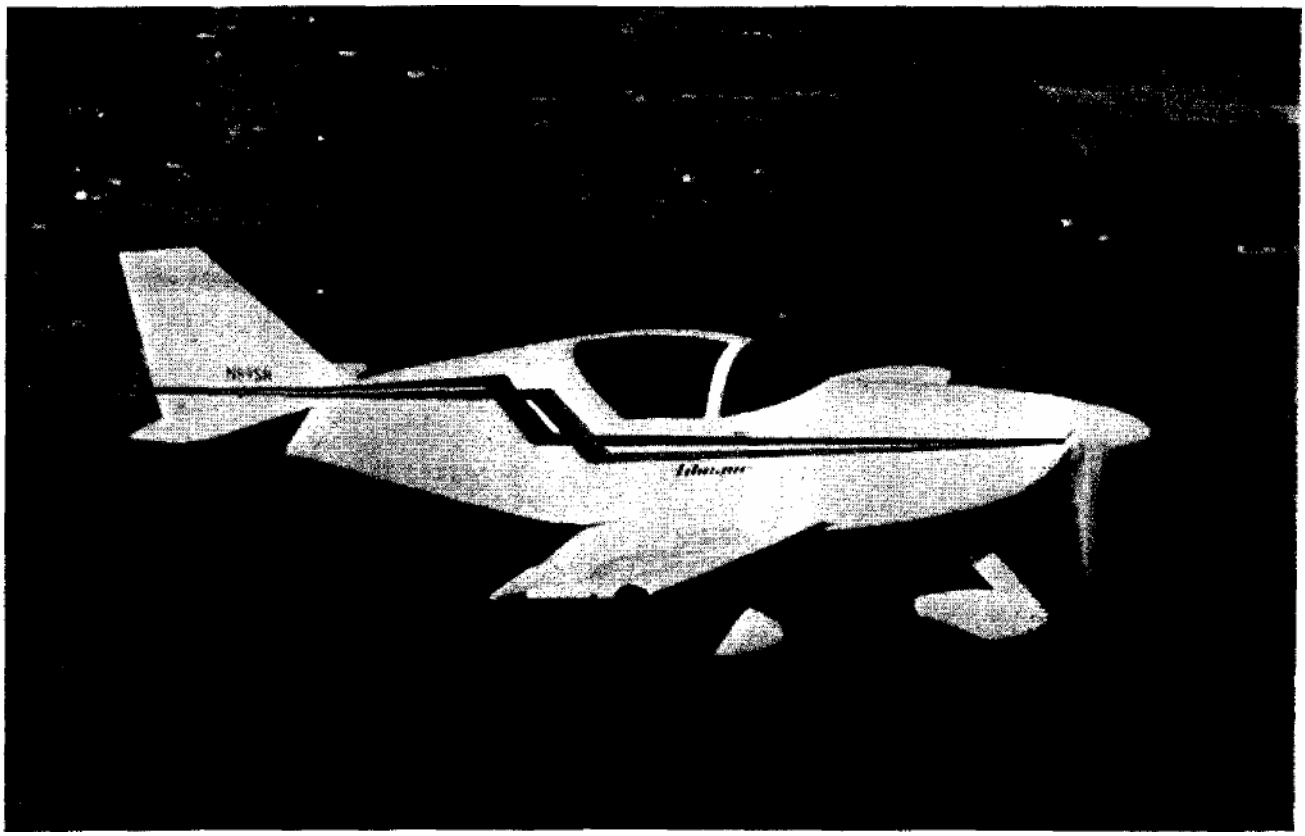

GLASAIR FT FLIES!

Our prototype fixed tricycle gear Glasair FT was successfully flown on Feb. 26, 1985. The airplane perform ed flawlessly, more than living up to our expectations. All who have flown the FT are amazed at how easily it lands and takes off, with characteristics similar to a tricycle gear trainer.

FLIGHT AND HANDLING CHARACTERISTICS

The taxi visibility of the Glasair FT is perfect, as expected, and steering the airplane, while taxiing, is very simple. The rudder provides control at speeds above 10 or 15 mph, and

the brakes are very effective atslower speeds and for assistance in cross winds. For maneuvering in tight quarters, the airplane will easily pivot around a locked wheel. Our engineer designed the fiberglass main gear struts with an optimum combination of strength and limberness, making the FT very smooth when taxiing over rough terrain.

Take-offs are uneventful in the FT. The airplane seems exceptionally well balanced on its gear — it tracks unerringly, rotates easily and smoothly, and lifts off positively, all with a minimum of pilot input.

Landings in the FT are also extremely easy. Our pilots took turns putting the airplane through its paces and were unable, even with determined effort, to make a bad landing. We tried dropping the plane from five feet off the runway and the gear simply absorbed the impact with scarcely a bounce and with very little energy transmitted to the occupants.

The airplane was also loaded to gross weight and put through a series of full-effort short field landings with no problems. We even tried touching down in a slip; the airplane just straightened out and tracked down the runway without complaint. Landings on a rough grass strip were also handled beautifully, with the new gear providing a very smooth ride on roll-out.

It is our feeling that any pilot who has flown only a Cessna 150 could fly the Glasair FT without difficulty, once he or she became used to the lighter, more responsive controls and the slightly higher take-off, landing, and stall speeds.

PERFORMANCE

As our Glasair TD was converted to the prototype Glasair FT, we have been able to make precise performance comparisons between the FT and the TD. We have been amazed at the results. The FT has consistently performed within one or two miles per hour of the TD in all performance classifications. The fact that the FT's main gear legs are more aerodynamic than the TD gear legs might offset the extra drag of the FT nose gear. Other theories such as a straightening of the propwash, and decreased intersection drag where the gear legs and fuselage meet, may ac-count for the performance of the FT. All we know is that there appears to be a negligible decrease in speed from the TD to the FT — a real delight to those who worked so hard on the project.

Use of a 180 hp engine, coupled with constant speed propeller should deliver incredible performance. With information gathered from some of the Glasair TD's flying with this combination of engine and propeller, our estimated top speed for the FT is close to 240 mph. Solo climb rates with a 180 hp engine should be around 2800 ft/min., if the plane is kept light.

DESIGN CONSIDERATIONS

Keeping the landing gear maintenance-free and as simple as possible were our primary considerations in designing the new gear. We also felt the need for greater strength in the main gear than on our taildragger in order to provide a higher gross weight. Finally, since we anticipated that the FT would be a popular retrofit to existing Glasair TD's, we designed the gear to be easily installed to finished airplanes.

After analyzing several different landing gear designs, we concluded that the simplest, least expensive, lowest maintenance main gear design is the molded fiberglass gear strut, similar to that used on the Glasair TD.

Although the oleo-pneumatic gear is a beautiful system with great energy absorption characteristics, oleo struts were much too complex to meet our stated design objectives, and also quite expensive to produce.

Telescoping steel tube struts with either internal coil springs or rubber donuts were also considered, but are limited in the energy absorption ability required to meet Federal Aviation Regulation (FAR) Part 23 standards. Having spoken with people who have flown other homebuilts with this type of gear, we determined that it would also require very careful design, and periodic maintenance, to prevent wear on the telescoping tubes.

The cross sectional area on the FT struts has been increased significantly, compared to the TD struts, to provide much greater strength and permit a higher gross weight. The molds for the FT struts are designed with the parting plane between the mold halves perpendicular, rather than parallel, to the shear stresses, which results in stronger finished parts. Finally, the struts are post cured at 200° F. for resistance to sagging from exposure to heat.

The nose gear is a simple, rubber shock mounted, heat-treated 4130 steel tube strut. A simple, free-castering nose wheel with a shimmy damper is also used, along with the same Cleveland 5:00 X 5 wheel and Lamb tire used on the RG.

The main and nose gear struts, and the main gear support structure were successfully drop tested to FAR Part 23 requirements. We placed an accelerometer on the test rigs during drop testing (from the height and under the weight required by FAR Part 23) which registered almost 7 G's for both the main and nose gear without failure. A high degree of gear flexing is tolerated at the top of the gear strut. Brake load testing was also performed on the main gear with satisfactory results. The overall impression derived from testing the FT gear is that it is extremely rugged and should survive many years of the roughest use without problems.

FT GEAR INSTALLATION

The main gear of the Glasair FT is attached to reinforced structure in the A and B ribs of the wing. All of the reinforcement laminates can be installed from the open seat pan area, so the installation in a finished wing is virtually as easy as an original installation in an open wing. Other than the A and B ribs and cutouts in the lower wing panel, no modification or relocation is required for any of the existing wing structure or control system.

The nose gear support structure consists of two vertical foam and fiberglass ribs located on the aft side of the firewall between the horizontal firewall rib and the fuselage belly. An attach bracket is bolted to each of the ribs to mount the upper end of the nose strut. The strut is also mounted, via rubber shock mounts, to tabs welded to the lower dynafocal engine mount rings. To retrofit the FT gear to an existing Glasair, these engine mount tabs must be jigged into position using the pre-welded nose gear support assembly, and welded in the field. Engine mounts for new purchase Glasair FT's will be welded at the factory.

KIT CONTENTS AND PRICE

The completeness of the Glasair FT kit is similar to our latest aircraft kits. The kit contains main gear struts; welded and heat treated nose gear strut, fork, and shimmy damper; rubber shock absorbers; nose wheel, tire, and tube; wheel fairings (nose gear only for retrofit kits); nose gear strut fairing; all necessary pre-welded, machined, and attach hardware; and complete installation instructions. All aluminum parts are anodized; other metal parts are finished with a superb electrically applied powder coat paint process.

The complete Glasair FT kit is priced at $13,950.* The Glasair FT landing gear retrofit package for Glasair TD owners who purchased their Glasair prior to introduction of the FT is $1,950.* The Glasair FT retrofit package is $2,450* for all other purchasers.

•Price subject to change without notice

GLASAIR RG WINS SUN 5O

Stoddard-Hamilton's Vice-president of Engineering, Bob Gavin sky, flew our Lycoming IO-360 powered Glasair RG Acrobat to victory in the first Sun 50 Airplane Race held on March 20 at the Sun & Fun fly-In in Lakeland, Florida. The race was an all put speed race covering 60 miles, and was timed from a standing start at Lakeland to a flying finish. Bob's average speed was 210.15 mph, more than 18 mph faster than the next competitor. Bob reported that he averaged about 245 mph once at speed. Unfortunately, his governor only allowed maximum of 2600

Glasairs took six of the top seven -places.

GLASAIRS SWEEP SUN & FUN

Glasair recently swept the top prizes at the Sun & Fun Fly-In in Lakeland, Florida. Jerry Gruber won Grand Champion with his Glasair RG, Ron Bowtfen won Best Composite Aircraft with his Glasair TD, and Richard Dobson won Best Low Wing Aircraft with his Glasair TD. Our congratulations to all of them for their magnificent performances. We hope these Glasair builders serve as an inspiration for those builders who have not yet completed their Glasairs.

BUILDER HINTS

We take this opportunity to say, "Thank you," to all of the builders who have contributed suggestions for use in this column. We would also like to request that if you have any hints, tricks, or suggestions, to send them to us to share with other builders. We relay these suggestions without trying them all ourselves, so builders should use their own discretion in applying them.

ROTARY CUTTER

The rotary "pizza" cutter that was recommended in our last Newsletter is a popular item among our builders, and now available through the Glasair Options Catalog. One of our builders made a special cutting table by bonding a 4' X 8' sheet of 1/8" polystyrene plastic to the top of a work table. He used large "T" squares (one at 90° and one at 45°) as a guide for the cutter and finds that the cutting is fast and smooth.

RUDDER HINGE

Mount the rudder hinges to the vertical fin using #8 screws and nutplates. This allows removal and reinstallation of the rudder panel without the bother of inserting and safetying the hinge pins. If this method is chosen, cut the hinge pins 1-1/2" to 2" longer than the hinges and bend the pins at a 90" angle above and below the hinge stock, or crimp the hinge knuckle, as in the elevator hinges, to retain the pin.

OSHKOSH

We would like to encourage as many of our builders as possible, especially those who have completed Glasairs flying, to attend the Experimental Aircraft Association's International Fly-In at Oshkosh during the last week of July. If you let us know in advance that you plan to attend, we can try to arrange group tiedowns for Glasairs on the grass flight line. Those builders who are still working on their projects will have an unequalled opportunity at Oshkosh to examine completed projects and to talk with other builders to get ideas for finishing their airplanes.

We are also arranging a Glasair Builder's banquet at Oshkosh again this year. Last year's banquet proved to be the high point of the convention for us because of the dialogue with our builders that occurred at the event. The banquet is scheduled for Monday, July 29, 1985 and will be served at the same establishment as last year's banquet: Dutch's Anchor Inn, Ltd., 225 W. 20th Street, Oshkosh. We will gather for a social hour at 7:00 pm; dinner will be served at 8:00 pm. We have arranged seating for approximately 100 people and there will be a choice of several possible entrees. We have tentatively been quoted a price of $12.60 per person. Builders should call Stoddard-Hamilton if they wish to attend so that we can arrange the proper number of meals.

FIRST FLIGHTS

As of this writing, over 70 Glasairs have flown. Since the last newsletter ; was published, the following builders have notified ass of their first flights: Chuck Mason of Burtonsville, MD. Bill Russel of LaJolla, CA, and Bill: McClmtock of Cocoa Beach, FL have flown their TD's; and Jerry Gruber, of Elkhart, IN, and Harry Busclier of Hawaii have flown then- RG's. We failed to mention in the last newsletter that Ron Sowden of Tomball,

SHIMMING RG SIDE BRACE BRACKETS

To install the retractable main landing gear requires that shims be placed between the side brace brackets and Cl rib to achieve the proper operation of the gear. One builder suggested an easy method to accomplish this task. He threaded four small sheet metal screws into holes drilled in the Cl rib, and used the screws as tiny jacks to adjust the spacing of the side brace brackets from the rib. Once the proper spacing was achieved, he waxed the surfaces of the brackets and clamped them into place against the sheet metal screws. He then formed a modeling clay dam around the brackets and filled the space with a mill fiber mixture. This method has the advantage of allowing easy shim thickness adjustment and also allowing for a tapered shim, if necessary.

SLIDING CANOPY RAIL MOUNTS

A similar method to that described above for the side brace brackets may be used to install the rail mounts for the sliding canopies. The Instruction Manuals describe the fabrication of foam wedges on which to install the rail mounts. Instead, use sheet metal screws, as described above, to jack the rail mounts to the proper angle and then fill the volume under the mounts with a mill fiber mixture. The Shur-Loks should be fastened to the back of the rail mount, using the mounting screws, before the mill fiber mixture is applied. This will require that the inside fuselage skin be relieved in the Shur-Lok area to allow the Shur-Lok to protrude part way into the skin. The foam core of the fuselage skins should be relieved in the area of the Shur-Loks to allow adequate potting of the Shur-Loks with the mill fiber mixture.

CATALYST DISPENSER

Instead of using a syringe or a graduate to dispense the MEKP catalyst for small batches of resin, use a small plastic squeeze bottle. The recommended bottle has a capacity of about 1/2 to 1 oz. and is sold at plastics shops for dispensing methylene chloride which is used for cementing acrylic plastic. Using this bottle, the MEKP can be dispensed in a fraction of the time it takes to use a syringe and reduces the chances of skin contamination. There is also less danger of splashing which, considering the danger of blindness that MEKP poses to your eyes, is a real advantage. However MEKP is dispensed, builders should always wear eye protection when doing so. The recommended squeeze bottle dispenses MEKP at a rate of about 40 drops per cubic centimeter which is about .025 cc per drop. To mix up a 10 gram batch of resin, for expample, at 0.75%, you would need .075 grams of catalyst. Since a gram is approximately equal to a cubic centimeter, .075 grams equals 3 drops at .025 cc (grams) per drop.

If you choose to use this method, first verify the rate at which your squeeze bottle dispenses catalyst. Then, next to your resin mixing station, post a chart that lists the number of drops necessary to catalyze different sized batches of resin at different percentages of catalyst.

A typical chart might look like this:

SIZE OF BATCH	**CATALYST PERCENTAGE**			
	0.75% 3	1.0%	1.5%	2.0%
10 GRAMS	DROPS 6	4 DROPS	6 DROPS	8 DROPS
20 GRAMS	DROPS	8 DROPS	12 DROPS	16 DROPS (etc.)

FITTING FLAP AND AILERON RIBS

Here is an easy way to fit the flap and aileron foam ribs: Shape the lower edges of the rib foam cores and bond them in place with either Q-cells or body putty. Leave excess material on the upper edges of the ribs. Procure some long strips of sandpaper (such as 17" X 2-3/4" sheets for a long sanding block, or cut apart a sanding belt). Place the sandpaper with the rough side down over the upper edge of the rib with about an inch protruding past the trailing edge of the lower panel. Place the upper panel over the rib (sandwiching the sandpaper between the panel and the rib) and press down lightly on the upper panel while pulling the sandpaper through from the trailing edge. Since the 4.5 Ib. foam sands so easily, the proper upper edge contour of the rib will be formed in just a few passes. Be careful, as the rib approaches its final shape, to avoid cutting into the shear web or the trailing edge of the lower panel.

TESTING RG HYDRAULIC SYSTEM

For testing the RG hydraulic system, some sort of manually operated pressure pump is required (such as a Porta-Power unit). One of our builders made his own from a cheap hydraulic jack, using the following procedures: drill and tap a hole into the base of the jack. This hole must penetrate into the chamber that is connected to the slave cylinder of the jack. Using some heavy angle iron and long sturdy bolts, clamp the jack together so that it cannot extend. Fill the jack with Dexron II and thread a suitable fitting for connecting to the hydraulic system into the drilled and tapped hole. Now the jack may be connected to the hydraulic system, as described in the Instruction Manuals, and the system pressurized to the proper value.

TRIMMING **PLEXIGLASS**

One of our builders has found that a router works well to trim the plexiglass windshield and canopies. He recommends using a dull bit for a slower cut. He decided to try the router after seeing some of his fellow builders break their plexiglass parts using a bandsaw for trimming.

TRIMMING REAR SPAR SHEARWEB LAMINATES

One of our builders suggests using a carpenter's plane to trim the laminates on the rear spar shearweb when adjusting the Z dimension at the trailing edge of the wing.

HANGAR FLYING

In the last newsletter (No. 15), we published the story, related to us by Jim Cline, of a Glasair's encounter with airframe ice. We would like to provide space in each issue of the Newsletter for similar stories. Everyone knows that, next to flying, pilots enjoy talking about flying more than anything else, and that, in any airport bull session, each succeeding story has to top the last one. So if any of you have interesting, exciting, frightening, or humorous anecdotes to relate about building or flying your own Glasair (or any other airplane), we would be happy to pass the stories on to our readers. We would like to publish the stories in your own words, as much as possible, to relieve ourselves of responsibility for any inaccuracy, exaggeration, or embellishment that tends to characterize the telling (and retelling) of these epics.

INSURANCE FOR YOUR PROJECT

In the aftermath of a hangar fire that totally destroyed two Glasair projects in addition to numerous other aircraft, we would like to warn our builders that most homeowner's insurance policies will not cover an airplane while it is stored in a garage or workshop. The situation is similar to that of an automobile while stored in a garage — the automobile comprehensive insurance is expected to cover any loss. Given this fact, we recommend that Glasair builders consider protecting their investments by purchasing hull insurance for their projects while under construction.

NEWSLETTER BACK ISSUES

Back issues of the "Glasair News", from #7 (4th Quarter, 1982) to the present, are available. The price for back issues #7 through #11 is $2,00 each; issues #12 through the present are $3.50 each.

OPTIONS AND PARTS ORDERS

Stoddard-Hamilton now accepts VISA and MASTERCARD payment for Glasair options and parts orders up to $2500. We hope that this service will make the processing of orders more efficient and convenient than C.O.D. and pre-payment, now that we have discontinued open accounts.

GLASAIR CONSTRUCTION WORKSHOP

The Iowa State University Department of Industrial Education and Technology is organizing a four week summer work shop during which a Glasair RG will be built. The primary purpose of the workshop is to provide educators with the hands-on experience and technical know-how to implement aircraft construction and related education activities in secondary and post-secondary schools. The workshop is open to other individuals who have an interest in aviation and the basic capabilities with materials and tools. Individuals who are interested in this workshop should immediately contact:

Dr. John N. Riley
10S Industrial Education I
Iowa State University
Ames, IA 50011

Due to an increasing number of order for nuts, bolts, and other small items for which we could not cover the cost of processing the order, we have implemented a $3.50 handling charge on orders of less than $25.00. As an aircraft company, we record every sale in our customer files, no matter how small.

SECOND ANNUAL GLASAIR PICNIC

We are currently making plans for the second annual Glasair Picnic. The dates for this year's event have been set for Saturday and Sunday, August 24 and 25, and the location will again be our facilities in Arlington, Washington. Early arrivals, beginning on Friday, August 23, are welcome. The attendance last year was approximately 100 builders and guests, and this year we anticipate this to double. In light of this, we would appreciate hearing from you if you're planning to attend.

Last year's picnic was a great success and we are again looking forward to many fun activities such as an early morning Glasair Dawn Patrol to local scenic sites, an open house of all our facilities, judging and awards in various categories for all Glasairs in attendance, and, hopefully, Glasair rides for all our builders who have never previously had the chance.

The tentative structure of the weekend will resemble last year's and the cost will again be $35.00 per person. This will include:

- A Saturday night Salmon Barbecue with the "works". (The "works", last year, included barbecued chicken and ribs, corn on the cob, and liquid refreshment).
- Sunday Brunch in the waterfront town of Anacortes, gateway to the beautiful San Juan Islands.
- An official "2nd Annual Glasair Picnic" T-shirt, and other items.
- An incredible chance to learn more about your Glasair and meet those who really DO understand what's going on in your garage.

We will be happy to make reservations for you at the local motel which is located only 2-1/2 miles from our factory. The reduced rates for our customers are:

One room with one bed: $30.00/night
One room with two beds: $35.00/night

The motel also has townhouses available, complete with cooking facilities for $40,00 per night.