# Glasair News

Newsletter **No. 26** Third Quarter, 1987

## Glasair III Shatters 3 World Records

September 4, 1987, Paine Field, VVA. Ted Potter, of KOMO radio and television and Seattle's traffic air patrol king, set not one or two, but THREE world records flying Stoddard-Hamilton's Glasair III prototype.

You are probably wondering why we didn't set the records ourselves. Well, the answer is simple: we had our noses to the grindstone trying to get caught up on instruction manuals, service bulletins, back-ordered parts, ad infinitum. Ted paid for all the sanctioning fees, fuel, donuts, bribed the timekeepers, and was excited and primed to go fast. Can you picture this poor guy droning along at 100 mph day after day over endless traffic jams ? Now picture him at the controls of a 300 mph (well....almost} airplane! He was like a kid in a candy store and a lot of fun for us to work with. The details (unofficial until approved in Paris):

**1st Record**
3 km, Group **1 C1B, 500-1000 kg**

| Old Record | New Record |
|---|---|
| Amsoil racer, 234.64 mph | Glasair III, 274.02 |

**2nd Record**
**15/25 km, Group 1 C1B, 500-1000 kg**

| Old Record | New Record |
|---|---|
| Russians, 235.93 mph | Glasair III, 293.67 |
| unofficial: White Lightning, 267.17 mph | |

**3rd Record**
**15/25 km, C1C, 1000-1750 kg**

| Old Record | New Record |
|---|---|
| Russians, 236.68 mph | Glasair III, 290,21 |
| unofficial: White Lightning, 272.19 mph | |

We attempted a fourth record over the 3 km course in the C1C class and missed by a few mph. (Current record is 284 mph}.We will probably try again this next spring. Existing world records must be exceeded by a minimum of 1% to be broken.

## Glasair Taildragger Donated to E.A.A.

Pictured above is Frank Miller (STODDARD HAMILTON BUILDER SUPPORT) Presenting the log books to Carl Swickiey, director of the E.A.A. air museum at Oshkosh '87.

We dusted off our old number one prototype (Glasair N88TH) and restored the paint scheme back to the original colors of red and yellow. One of our past employees had changed the colors to green and gold, but we thought it would be appropriate to display it in its original colors. Our only regrets were in regard to the interior which was also changed to green. We simply didn't have the time to change the interior back to its original colors and it is quite a clash with the exterior colors. Oh well, at least we specified the airplane be displayed with the canopies closed.

## Glasair III On Tour in Texas

Here is a schedule of the airshows we will be at through the rest of the year:

October 3,4 El Paso, Texas (Amigo Airshow)
October 10,11 Harlingen, Texas (C.A.F.)
October 17,18 Casa Grande, Arizona (E.AA) If you would like to see the Glasair III in person or have friends who are interested, contact Ron Bowden at (713) 376-7230. Ron is a Glasair builder we have recruited to fly the III to Texas and make appearances at these shows. The airplane will not be performing aerobatics; however, Ron will be available for demonstration rides for prospective customers.

## Pilot Reports Needed

In order for the Glasair to be accepted for construction in several foreign countries, they require that at least six aircraft are flying with a minimum of 100 hours each. We need verification from at least 6 RG builders with wing tip extensions with 100 hours or more of flying time on your Glasairs. Please contact us with name, N-number and hours. Thank you!

## Reminders for System 4 Purchasers!!

Reminder: The current estimated delivery for new orders is March 1988. We would like to encourage system 4 purchasers to plan ahead and place their order for their next kit in advance so they won't be held up. Feel free to contact Sandra Hamilton to stay abreast of the delivery schedule.

Reminder: The new prices are in effect for all system 4 kits ordered after October 31, 1987. The old prices were held for 5 months for system 4 purchasers who had placed their original kit order prior to June 1, 1987. The new prices* are as follows:

| Glasair III | | Glasair II FT | |
|---|---|---|---|
| Kit#1 | $8,350. | Kit#1 | $1,950. |
| Kit #2 | 9,400. | Kit #2 | 5,750. |
| Kit #3 | 10,850. | Kit #3 | 5,150. |
| Kit #4 | 5,350. | Kit #4 | 3,100. |

| Glasair IIRG | | Glasair IITD | |
|---|---|---|---|
| Kit#1 | $5,600. | Kit#1 | $1.950. |
| Kit #2 | 6.150. | Kit #2 | 5,000. |
| Kit #3 | 7,950. | Kit #3 | 5,900. |
| Kit #4 | 3,500. | Kit #4 | 3,100. |

' All prices are subject to change without notice.

## First Flights

| | | |
|---|---|---|
| 6/19/87 | DaveSwanbeck | FT |
| 6/23/87 | Jeff Ackland | TD |
| 7/14/87 | JoeHaines | TD |
| 7/18/87 | Chuck Hooper | RG |
| 8/19/87 | MarkElworthy | TD |
| 8/27/87 | Richard Monte rosso | TD |
| 9/1/87 | Bill Denny | RG |
| 9/20/87 | Jim Mederer | RG |

CONGRATULATIONS"!

You Want To Talk To WHO? In order to have your questions answered quickly as possible as please direct them to the following:

| Question | Person |
|---|---|
| Payments & Kit delivery schedule | Sandra Hamilton |
| System 4 reorders Shipping information | Sandra Hamilton |
| Builder Support & Technical questions | Roy Matson or Paul Dice |
| | Chris Klix, Frank Miller or Louis Kitz |
| Newsletter information | Joyce Kellenberger Roy Matson or Paul Dice |
| Options sales Kit sales | Ted Setzer, Roy Matson |

Dr. Swiezy of Jensen Beach, Fiorida provided us with the following report of his roundabout flight from Florida to Fairbanks, Alaska and back this past summer.

The total trip covered 10,092 statute miles.
Total cost for fuel, oil, tie downs and landing fees was$642 (including Canadian fuel at$3.15/gal) Total flight time: 61 hours Route of Flight: Florida - Ohio - Grand Rapids, MI -
Oshkosh - St. Cloud, MN - Bismarck, ND -
Edmonton, Alberta- Fairbanks, AK. Return Trip: Fairbanks - Northway, AK - Whitehorse,
Yukon Territory - Fort Nelson, BC -
Vancouver, BC - Bellingham, WA - Arlington,
WA (Factory Visit) - Portland, OR - Billings, MT-
Denver, CO - Tennessee - Florida.

Dr. Swiezy has an RG with a 160 hp fuel injected engine and constant speed propeller. His Glasair is equipped with wing tip extensions and a Brittian wing leveling system. Most of his trip was on IFR flight plans.

One slight problem he encountered is worth passing on to other RG builders. He experienced a gear extension problem on his return trip and found that the wires to the microswitch mounted on the nose gear drag brace had worn through and shorted out. He made the necessary repair by spacing the wires off of the drag brace to prevent a recurrence.

His recommendations for those contemplating a similar trip:

1. Begin making the application to get permission to fly a homebuilt into Canada at least 2 months prior to your planned trip.
2. Obtain a facility directory which lists all frequencies in Canada. He reports that even though he was on an IFR plan most of the time, there are times when you can be completely out of touch with controllers due to the mountainous terrain.
3. He recommends visiting the Edmonton Mall. Apparently it is the largest shopping mall in the world and has an indoor zoo, a beach with artificial waves, a huge roller coaster and everything a shopper could dream of.

He of course commented on the spectacular scenery in Alaska: the endless mountains and glaciers. He spotted bear, moose, sheep and lots of other wildlife enroute.

## Hartzell Propeller Orders

A friendly reminder: Hartzell Propeller has increased prices on January 1st for the last two years by approximately 3-5%. If you wish to lock in the current price, your order must be placed by October 15th to assure delivery before January 1st. The price increase from Hartzell is based on delivery date not order date.

| | |
|---|---|
| 1) HCF 2YL-1F/F7663 D4 160/Non-Aerobatic | $3,479. |
| 2) HCC 2YL-4BF/FC7663D4 160 / Aerobatic | $3,987. |
| 3) HCC 2YK-1BF/F766A2 180/Non-Aerobatic | $3.085. |
| 4)HCC2YK-4CF/FC7666A4 180/Aerobatic | $3.600. |
| 5) HCC 2YK-1BF/F8475J4 | $4,018. |

## Glasair News

Oshkosh '87

Those of you who didn't make it this year missed a good one. It comes as no surprise since every year seems to just get better and better.

We Hew every available Glasair in the hangar to Oshkosh this year. Frank Miller and Roy Matson flew N84AG (180 RG) to lead the pack and set up our booth. Ted and Kari Setzer flew N88TH on its last nostalgic flight since it had been donated to the E.A.A. air museum. Lance and Cathy Turk {local Glasair builders - see New Products, this newsletter) flew our factory Glasair FT, N89SH. Lance had installed his prototype engine instruments in this plane and was testing his design as well as ferrying our airplane to Oshkosh ior us.

The Glasair 111 was flown to Oshkosh by Peter Lert of Air Progress along with Chris Klix from the factory. Peter was flying the 111 to evaluate its cross-country capabilities and write a future story for the magazine. Upon his arrival at Oshkosh he frowned and said there was one thing he didn't like about the airplane: "it's not mine!"

All of us stopped in Helena, Montana to visit Ted and Vicky Beck and were treated to the most spectacular barbequed steak dinner we had ever laid our eyes or stomachs on. We could have walked out their front door into a typical Rocky Mountain blizzard and survived for two months off of that meal. If we hadn't all been flying Glasairs we would have never made it off of the ground.

Ted Beck is building an absolutely beautiful RG with a 200 hp engine. He is setting his Glasair up to do aerobatics and wants to try skywriting with his smoke system. (Ted is a dentist and he probably wants to be able to advise all of his patients at the same time when he plans to go on vacation - via sky messages.)

His instrument panel is one of the most complete we've seen to date. We better not say any more about his plane so that he will have *a* few surprises left.

More hospitality, food, beds and ground transportation were also provided by Gary Speketer of Minneapolis, Minnesota. Gary is building a Glasair III and would likely be flying by now if we would have had all the parts in the box for him. Gary is one of our lead Glasair III builders and is smoothing out many of the wrinkles for the rest of the pack.

We counted approximately 35 Glasairs in attendance, with many very fine examples of craftsmanship, beautiful interiors, avionics bundles and innovative gadgetry. The common denominator of comments from Glasair builders who flew in to Oshkosh was in regard to the cross-country capability of their Glasairs. A typical comment went something like, "We flew all the way from L.A. and it only took us an hour and a half, but we would have made it faster if we hadn't stopped for a hamburger!"

Dick Dobson won an outstanding workmanship award for a beautiful Glasair he built called "Magic Carpet." This RG had one of everything in it.

It is very satisfying for us here at the factory to talk to those of you who are flying regularly and enjoying your Glasairs. Some of the regulars at Oshkosh now have 500-700 hours on their Glasairs. {They are probably bound and determined to match the flying hours to building hours.) Additionally, it's always a pleasure for us to renew old acquaintances with many of you. The builders from Florida always jump into mind - they seem to be so charged up and extra friendly. We wonder if it is the sunshine, orange juice or salty sea air that makes them that way!

We have so many quality Glasair builders spread all over this country as well as the rest of the world and it's a shame we can't see more of all of you. At the Glasair Builders Banquet, Bud Davisson (who writes for Air Progress) hit the nail on the head when he clearly pointed out how homebuilders are distinctly different people than the average citizen. He explained, with entertaining examples, that most homebuilders are also deeply involved in other hobbies and interests as well as building airplanes. Most homebuilders are do it. action oriented people and not couch potatoes or cocktail party sitters.

There were some very nice new designs introduced at Oshkosh '87, two of which were designed by former Glasair builders. A big 4 or 5 place design called the Cirrus was introduced by Dale and Al Clapmeier of Wisconsin. The Cirrus looks similar to a past French design called the Orion which was introduced at Oshkosh 3 or 4 years ago. It is a mid-engine pusher using a Lycoming IO-540. 200 hp engine and a Hoffman 3 blade propeller. First impression of this airplane was the beautiful workmanship for a prototype. It hasn't flown yet, but looked like it was pretty close to that point.

Also introduced was a 4 place design called the Wheeler Express. You have no doubt seen the ads for the Express so we can save the description. Ken Wheeler decided to get into the kit business after completing a Glasair FT. Both his FT and the Express prototype were built with excellent craftsmanship. Our best wishes to both the Clapmeiers and Ken Wheeler.

Bob Henderson and Bud Granley put on fabulous acrobatic demonstrations in our Glasair III at Oshkosh. After each performance, people would flock over to the airplane or our booth and want to know what extras we did to our prototype to allow it to fly like that. They seemed surprised to learn that it's a stock Glasair III airframe with the exception of an inverted oil system and smoke system.

In regard to aerobatics in the Glasair III, the 300 hp Lycoming engine wasn't designed with negative aerobatic maneuvers in mind. We had to pull the oil sump off, modify it, and when that didn't guarantee steady oil pressure when inverted, we installed an oil accumulator behind the seat. The oil accumulator keeps the oil pressure from falling beyond a minimum of 20-30 psi.

If you're building a IN and have serious aerobatics in mind, you might want to consider the 260 hp engine - at least consult with someone who knows the ins and outs of aerobatic suitability for these engines. In any event, call our builder support people for further details.

At Oshkosh we spend so much time answering questions in the booth, coordinating airshows, fiddling with the airplanes, giving forums, etc that we miss much of the fun stuff that goes on. To learn more about the thousands of events, you'll just have to plan on attending next year's convention.

## Bill of Sale

We have on file a standard blank Aircraft Bill of Sale written specifically for amateur built planes by NASAD (National Association of Sport Aircraft Designers).

It you are planning on selling your Glasair (Heaven Forbid!) you may call our office and request a copy.

## Glasair Builder Association

Many other homebuilt airplane builder groups have formed associations. From time to time we receive letters or calls from Glasair builders who wish a Glasair Builder association existed.

If Glasair builders are interested, the first step is for a builder or group of builders to step forward and volunteer to do the work of organizing the association. We would be happy to announce the forming of such a group in a newsletter or genera! mailing and would be willing to cooperate with such a group when needed.

The closest thing we have seen to date is a group of builders in the mid-state area who are subscribing to a newsletter published by Gary & P.J. Hornbeck, 633 Woodbriar Lane, St. Charles, Missouri 63303.

They have been publishing for one year now and report a threefold increase in membership since they first began with eight charter members. They've done a good job with their local newsletter and we would like to encourage more of that type of activity : pooling ideas, helping each other, listing fly-ins, organizing activities, builder hints, etc. Subscription rate to their newsletter is a real bargain at $2.00 per year.

(Keep up the good work Gary & P.J.)

## Glasair II! Builder Assistance

Dave Morgan is a local businessman who has owned and operated a successful roofing materials supply company for years. He is nearing completion of his Glasair III and has built a building here on the Arlington Airfield for the purpose of contracting build assistance to Glasair HI builders.

His company, Morgan Aircraft, Inc., is not associated with Stoddard-Hamilton Aircraft in any way, however, we have worked very closely with Dave to enhance the construction processes and change the manuals where necessary to make the Glasair III as easy to build as possible. Along with several other lead Glasair III builders, Dave has helped us very much to iron out the wrinkles in order for the assembly to be as trouble free as possible and understandable for first time builders.

Morgan Aircraft's builder assistance program is an accelerated program yet is designed to be within the spirit and intent of the amateur built category.

For further information contact Dave Morgan:

Morgan Aircraft, Inc. 18712 59th Dr. NE
Arlington, WA 98223

(This is a letter to the students of Centennial High School, Greenfield Park, Quebec, Canada, from their principal:)

## Welcome Aboard the Project SCHOOLFLIGHT

Recognizing the changing needs of hi-tech society, Centennial has taken a bold step in pioneering a unique project. If successful, the project SCHOOLFLIGHT should open a new vista of educational opportunities and experience for high school students, particularly for Centennial students. In this context, the project is unique and one of its kind in Canada.

The SCHOOLFLIGHT project involves the assembly of a kit plane - GLASAIR RG. The assembly process is intricate and complex. It requires tremendous patience, team-work and certain skill. There is no room for error.

The aviation history is a chronicle of extraordinary challenges met by extraordinary people. Your participation in this unique and ambitious project should assure you of a place among those "extra- ordinary people."

With true spirit of cooperation, team-work and determination, we will ensure successful completion and airworthiness of our aircraft- GLASAIR RG.

Together we can do it.

Good Suck!

S. Ephraim
Principal

{Ed. comment: What a neat opportunity for high school students!)

## New Developments

After considerable consulting, deliberation and head scratching, we have decided to make some fairly major changes in regard to the Glasair fuel systems. That's not to say that our existing fuel system is unsafe and cause for immediate concern. The existing fuel system is patterned after most small general aviation aircraft, however it could be improved with additional safety features, and we have decided to do it.

The most significant change is in regard to the placement of the electric boost pump. According to knowledgeable sources and test results, most vane type pumps of this design lose their ability to self prime after only a few hours of use. They will function just fine as long as fuel is in them. Current placement of the electric fuel pump is above the level of the fuel tank and we are moving its location to at or below the level of the tank in the area of the seat pans. In this location, the pump will always be primed with fuel even under low fuel conditions and a high angle of attack.

The second change we are making is to eliminate the gascolator and use a full time Quality fuel filter with a replaceable element. The low point on our fuel system is the sump in the wing which is drainable. A good fuel filter makes a whole lot more sense, especially since some builders have reported fuel contamination with fiberglass dust, etc during their first 20 hours of operation or after a modification or repair to the fuel cells.

We are designing *a* new fuel pick up tube with fingerscreen to be mounted through the main span in the center section (left seat).

Although we do not have everything finalized or parts available yet, Glasair II and III kits will be supplied with these changes and Glasair I kits will be able to evaluate and purchase this fuel system in the near future.

## Builder Support Personnel

At Oshkosh, many builders had a chance to meet our builder support people. For those of you who haven't met them and wonder who it is on the other end of the line and what makes them qualified to help, we thought that a brief introduction was in order.

Chris Klix. Product Support Manager

Chris has been employed at Stoddard-Hamilton for over four years. He holds an A&P mechanics license and has had prior work experience with Boeing and Robertson STOL (a local airframe modifier).

In 1984, Chris managed and supervised the construction of N84AG, our 180 hp airshow Glasair RG. He was responsible for the conversion of our TD prototype NS9SH to the FT configuration. Last summer Chris managed the construction of our Glasair III prototype, N540RG (which was designed and built in 5 months!).

Chris oversees alt Glasair R & D, instruction manual proofing and quality assurance of ail metal parts and tooting. He is an excellent glider pilot, tow pilot, Glasair demonstration ride and test pilot. Chris also serves as a member of Stoddard-Hamilton's management team.

Frank Miller

Frank has worked at Stoddard-Hamilton since 1984. He also holds an A & P mechanics license and was rated as the top student by his instructor. Frank has been involved in the supervision and construction of two Glasair RG's, the Glasair FT and the Glasair III. His responsibilities include annual inspection, 100 hour inspection, repairs and modifications to our demonstration Glasairs. He helps supervise all shop R & D, and serves as a demonstration ride pilot and test pilot.

Louis Kitz

Louis, also an A & P mechanic, has been employed at Stoddard-Hamilton since 1982. He has been involved in the construction of all the above mentioned aircraft as well as the maintenance and servicing of them. Louis holds a student pilot certificate. We recently added Louis as the third member of our Glasair builder support staff.

We are very confident of the ability of all three of these employees to answer any of your construction questions. If they can't answer your question immediately, they will research an answer and get back to you with a solution as soon as possible.

About a year ago, we began to hear that our builder support was in need of improvement and a few Glasair builders had the courage to tell us so point blank. We certainly have made some large strides since then and hope that many of you have seen the changes. We stand committed to you through the safe completion of your Glasair project.

Word for the wise:

Mondays are typically a tremendous workload for our builder support department. It seems that all the questions from a weekend's worth of construction are phoned in on Monday. Try Tuesday or Wednesday or Thursday and you'll get through to a technician much easier.

## For Sale

Glasair FT Retrofit landing gear package. Call Jack Luders (203) 869-0348.

Dear Joyce:
The following is a description of my plane. I would appreciate it if you could place this in the next newsletter.

GLASAIR TD '85 Oshkosh Award Winner, 260 hrs TT SMOH, 160 hp 0-320, KX155 navcom, KT-76 transponder, Apollo 612B Loran, IFR panel, professional interior. 612-934-6491.

Reason for selling: I'm building a Glasair III.
Thanks for your help.
Sincerely,
Chuck Hautamaki
8452 Monterey Court
Eden Prairie, MN 55344

Dear Ted,

1 ran across a very good engine for a Glasair but I have my engine installed in my aircraft and about a month from firing it up. I thought someone else who is building a Glasair might be interested and if you have space in the next issue of the newsletter you might want to mention it.

It's a Lycoming 160 hp AEIO-320 E1B with only 800 total hours. It's fuel injected with an inverted system. Great engine for someone interested in doing aerobatics! It came out of a Bellanca 8 K.C.A.B. "Decathlon." Anyone who might be interested should contact:

Mack Huff
Moraine Aircraft Corp.
Moraine Airport
3900 Clearview Rd.
Dayton, OH 45439
513-866-6585

Sincerely, Willaim E.
Speyer

## Accident Brief

A year ago last spring a Glasair crashed into a lake in Kansas, piloted by an individual who had purchased the plane from the original builder. The Glasair had approximately 35 hours prior to the fatal accident. People who knew the pilot said he may have been circling the lake apparently to look at a sailboat he was considering purchasing. Three witnesses reported the airplane stalling at an altitude of 500' and entering a right-hand spin 2-3 turns into the lake. A fourth witness from a farther distance reported the spin to the left. Weather conditions at the time were VFR with gusty winds.

Initial NTSB reports do not list probable cause, but judging from past accident reports, the cause in this case will probably be listed as the pilot's failure to maintain control and failure to initiate recovery.

No evidence of pre-accident mechanical failure was found during two separate NTSB examinations.

What's to learn from this one? Consider what the immediate response would be if you were circling at a low altitude, preoccupied with something else, and suddenly you are headed for the ground. Eight pilots out of ten will probably pull back on the stick because it's instinctive to do when you are that low to the ground. Your mind says, "Pull out!"

continued next page

Accident Brief (cont)

We are speculating on the cause as is likely the NTSB will be doing. In fairness to the pilot, we can't rule out the possibility of physical impairment due to a medical problem, although this cause is much rarer than pilot error.

The Glasair has a forgiving stall; an early indication is felt when the stall strips induce the stall at the wing root 3-4 miles above the actual full stall. You can be sure, however, that the airplane will stall and all pilots must be prepared mentally for what to do in that event.

The other thing to learn from this unfortunate accident is to give yourself plenty of room, or a margin of error. 500' does not allow for a margin of error.

As long as we're on the subject of stalls, here's another example worth mentioning: (From Ted)

Last month I was giving a young man a demonstration ride in our 180 hp RG. I demonstrated the stall behavior to him and then he requested to try one himself to get a feel for it. I obliged. After feeling the characteristic bump of the stall strips, he held the stick back momentarily to see if anything worse would happen. The nose finally started to drop abruptly in what was the actual full stall and then he pushed the stick forward very fast and added power to recover. Not knowing the power and sensitivity of the Glasair elevator, he realized that he had exaggerated the recovery and then pulled back hard on the stick. At approximately 70 mph indicated we stalled again, completely taking him by surprise. He recovered again (this time less abruptly) and at the same time looked at me dumbfounded and asked why we stalled again. He either forgot or had no concept of accelerated stalls. I then did some further demonstrating and explaining on that subject to him.

Now, to be fair, I must pass on a story of my own experience: I thought I knew about accelerated or secondary stalls until 1 went up with Jacque Herenden one time to do aerobatics. (For those of you who don't know it - she's more than being the wife of Bob Herenden, she has also been very involved in competitive aerobatics and is an accomplished Pitts and Eagle driver!)

We were in the Glasair and she was doing a very fast, tight loop not unlike I'm sure they do in the Pitts. Twice during the loop the Glasair shook and shuddered and as we pulled, out I made the following unintelligent remark: "I don't understand why the engine is running rough like that, Jacque." She looked over at me and said as kindly as she could, "That's not the engine, we were high speed stalling and you felt the buffeting."

I bet my face was pretty red. Sure, somewhere in my pilot training I learned that an airplane could stall at any airspeed and at any attitude, but I didn't know how to recognize it until I had experienced it. Don't let an accelerated stall catch you by surprise. Fly to a safe altitude and practice them or better yet get a refresher flight with an instructor so that you will know what to expect and how to recognize when one will occur.

## New Products

A Glasair builder, Lance Turk, local to us here in Marysville, Washington, was at the stage where he needed to buy instruments for his panel. Not satisfied with having to mix different instrument brands, while at the same time wishing for something new, he decided to design and build his own! After three years in the making, Lance introduced his engine instrumentation line (called Vision Microsystems) at Oshkosh '87.

Lance combines a LCD digital display with a LCD graphic outer scale to give an analog/digital combination on each instrument. The analog function allows for quick scanning and trend information while the digital function gives a pilot the capacity to troubleshoot or read the exact temperature, RPM, etc.

Lance's 2 1/4" instruments are only 3/4-1" deep, very light, internally lit and simply plug into the master computer which is also light and compact. ,(-;;r more information write or call Lance Turk at:

Vision Microsystems. Inc.
19018 59th Dr. NE
Arlington, WA 98223
(206) 435-8931

We recently received notice of the availability of an electrically controlled variable pitch propeller to be used on Lycoming 160-180 engines. The brochure states that the propeller was designed by Aero Trading Ltd of Auckland, New Zealand, Static and vibration testing was done at the University of Auckland and blade retention tests at the Forest Research Institute. Information on these propellers can be obtained from:

Lake Aero Props
1405 Reclamation Road
Upper Lake, CA 95485
(707) 275-2587

We have not investigated or tested one of these propellers, but if anyone out there has an interest and pursues this, please let us know what you find out.

## Glasair Builder Hint Policy

Note: Stoddard-Hamilton Aircraft freely shares ideas submitted by other builders, however, inclusion in the newsletter does not mean that the ideas are reviewed or approved by Stoddard-Hamilton. Builders are urged to use their own discretion and judgment when considering the use of suggestions submitted by others.

## Builder Hints

Factory hint on Electrical Potting Compounds:

Notice in regard to using silicone as an electrical contact sealant or for a firewall pass through sealant:

Ordinary silicone rubber uses acetic acid which is corrosive to metallic parts such as electrical connectors, pins, P.O. Boards, etc. It will also affect thermocouple wires that breathe (have a fabric coating).

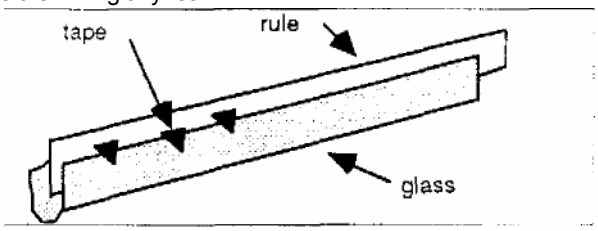
It is more of a problem if the potting is thick like a firewall pass through or potting in a cannon plug, where the acetic acid cannot readily escape.

The proper silicone to use would be a silicone with either an amine base or an alcohol base. Dow Corning manufactures two types of construction sealant which do not contain acetic acid:

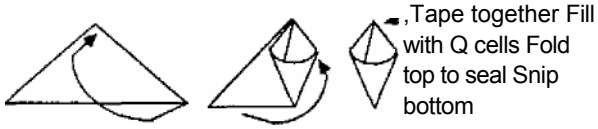
Type 790: Amine base, more elastic, commonly used for elastic joints with movement. Type 795: Alcohol base, better adhesion.

From Dean Sjoquist and Darreil Pearson, Richfield, Minnesota:

1. Glassing the leading edge of the vertical fin, figure D-7. To apply the glass strips to the fin, we used masking tape to hold a strip to a 4' rule. The edge of the rule was centered along the canter of a glass strip and de-tacked masking tape was used 1o hold the glass to both sides of the rule. The glass is easily lowered into position. The key to getting the tape off of the glass is to de-tack the tape until it doesn't seem that it will hold the glass. Also use only a corner of the tape to grab about 1/16th" of glass. About 12 pieces of tape were sufficient. Experiment before mixing any resin.




2. Applying Q cells for a radius. A fast, accurate way to gel a thick Q cell mixture into corners is So squeeze the goop through a frosting cone. Follow up with an appropriate dowel to form the radius. We've made cones out of triangles of heavy paper and snipped off the end to an appropriate size. The paper will get wet with resin so a piece of plastic around the cone is needed. Cones made from 4 mil plastic don't work very well.




Factory hint:

Replacement of windshield or canopy plexiglass on Glasair I aircraft.

This question has come up a few times so we thought we'd address it here for your future reference. On all Glasair III and II models we built recessed flanges into the windshield and canopies for bonding the plexiglass flush from the outside. There are no external laminates used to contain the plexiglass since our destructive peel testing demonstrated a more than adequate bond between the plexiglass and adhesive. The best adhesive found among many types tested was good old vinylester resin and cabosii. The vinylester resin melts slightly into the plexiglass and when we try to separate them the plexiglass will not peel clean from the flange but rather breaks off and leaves large chunks stuck to the flange.

Therefore, based on these new developments, the easiest procedure for replacing an existing windshield or canopy could be from either the inside or the outside, depending on your preference.

The windshield would be easiest to replace from the outside it seems because of the inaccessibility due to the permanent installation of the dash. The canopy plexiglass could be replaced from either inside or out. Cosmetic reasons may be the deciding factor when determining which way to go.

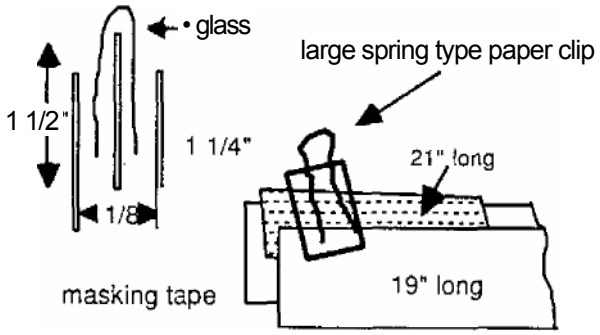
The bonding flange size on the Glasair III and II's is 5/8" wide as opposed to 1/4" used on the Glasair I windows. If you plan to replace a window from the outside, fry to grind back farther to get more flange bonding area.

From Jim Frankard, Minnesota:

1. Use a paper funnel for applying a bead of Q cell or cabosil (doesn't work with mill fiber). The funnels can be obtained at a bakery and are made of parchment paper. Squeezing out a bead of Q cell is fast and precise.

2. When assembling the horizontal stabilizer, jig it on a table which can be lifted and rotated 90°, so that when it is necessary to have the stabilizer in a vertical position it wilt not be necessary to take it out of the jig and then rejig it. I set the stabilizer and the table it was jigged on up on my fiber glass cutting table when I wanted to have it in a vertical position.

3. On page D-114 it tells how to bond 16 strips of fiber glass 3" x 18" (I had to use 3" x 20") into the aft fuselage between the inside tail cone and the horizontal stabilizer. I found an easy way of placing these strips by using a couple pieces of picture framing board material (It is almost 1/8" thick). Clamp the fiber glass between the strips of hard paper board as shown below.




Using this method the man at the back hands it forward to the man inside, each man takes off the large spring type paper clip and then presses the fiber glass against the apex of the joint and then removes the outer and inner pieces of paper board and the fiber glass is in place and sticking to the resin and can easily be patted down or up, ready to be coated with more resin.

Factory hint: Carburetor Problems?

This is a reminder to point out that if you buy an engine or currently have an engine with a carburetor which has a part number ending with -32 it will not work well with our Glasair induction system. We fought this problem until we were blue in the face years ago, and reported the problem and our findings back in Newsletters # 17, 18 & 19.

Recently a few builders have gone through this very same problem (one of them flight testing here at Arlington) and *a* lot of expense until we remembered the solution and could point them toward another carburetor.

Please call our builder support people for more details.

We did receive a report from one builder who installed a completely different induction system with a NACA duct and directional vanes mounted to the -32 carburetor and had good luck.

From Bill Russell, La Jolla, California:

S/N 472 TD, 240 hours on aircraft as of 2/5/85

Bill supplied us with a list of changes he has made on his taildragger and the reason for each change. A few of these we featured in greater detail in earlier newsletters. Here is the complete list:

1. Maximum flap deflection increased 60°.
   Reason: Improve drag during approach and landing for better speed control.
2. Added flap setting of 7° down.
   Reason: Improve slow speed climb & maneuvering performance.
3. Filled in flap and aileron lower surface concavities.
   Reason: Improve cruise performance.
4. Added Bill Stamm (Mooney 231) wing tip extensions.
   Reason: a. Improve cruise performance, particularly at higher altitudes. b. Improve lateral stability.
5. Added I.E. trimmer on right wing tip extension.
   Reason: Remove lateral out-of-town condition, particularly between solo and dual crew flight.
6. Inserted horizontal steel tube between top L/G strut countersunk fuselage attach screws to create a box structure.
   Reason: a. Strengthen gear struts and reduce splaying.
   b. Eliminate pulling fuselage sides inward just aft of firewall,
7. Added provisions for threading 3/8" diameter eyebolts in bottom of L/G struts.
   Reason: Permit pulling struts together while on ground and thereby allay splaying.
8. Added NASA fan shaped ventilation air inlets on fuselage sides.
   Reason: Provide adequate air supply while avoiding possible air contamination should engine compartment air duct be penetrated.
9. Added hinges as necessary to provide three hinges on all control surfaces.
   Reason: Redundancy in event of single hinge failure.
10. Drilled all hinges for riveting at base of fingers rather than in between fingers.
   Reason: Improve strength of hinge pivot.
11. Added engine inlet air filter. (This required modification of the lower cowl scoop and carburetor air box.)
   Reason: Reduce engine wear resulting from abrasives inducted into engine from unfiltered air intake.
12. Added an inlet air duct on the left side (looking forward) of the upper cowl similar to the right side ventilation duct. Modified both ducts with a 45° elbow at the effluent end to bathe the accessory section with cool outside air.
   Reason: a. Increase the cooling, particularly in flight, of the engine accessories.
   b. Increase the structural rigidity of the upper cowl.
13. Cut a 16" square hole in cowl scoop centered just forward of firewall and inserted metal louver.
   Reason: Increase engine cooling air outlet area and thereby reduce engine operating temperatures. (This results in a 10-20° reduction in engine oil operating temperature with no detectable degradation in aircraft performance.)
14. Located all instruments on left side of instrument panel by using multiple and mini-indicators.
   Reason: Free up right side "glove compartment" for flight publications storage.
15. Installed shut-off valve in bottom leg of fuel header tank sight-glass tubing.
   Reason: Permit shutting off fuel leakage into the cockpit in event of in-flight sight-glass tubing failure.
16. Installed tie-down fitting in bottom of fuselage just forward of tail wheel strut similar to wing tie-down fitting.
   Reason: Provide three-point tie-down security.
17. Installed tail wheel strut/ventral fin which raises tail s. inches.
   Reason: a. Improve safety for taxi and ground handling.
   b. Improve ease and safety of three-point landings.
   c. Increase directional stability.

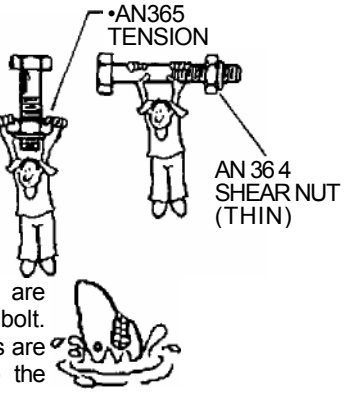
From: Dick Fisher, Pembroke, Massachusetts:

A year or so ago I installed wedge shims for restoring camber between the axles and the gear-legs. In late months I had been vaguely aware that controlling direction on roll-out after touch down was getting increasingly exciting. When I removed the wheel-pant on the damaged side one nut was missing and the other one stripped on the top forward axle attach bolt. The corner of the wedge shim was bent from the axle springing aft! The combination of a hole in the runway, application of braking and axle yielding was enough to bust things to a fare thee well!

Why did the nuts fail? After I installed the 1/4" wedge the bolts were not long enough. What I am sure of is that the nuts on the pant-plate wouldn't engage their lock sections. The bolt-end not only failed to protrude, it was a thread or more within the nut. I put star-washers under the nuts and figured that would hold the pants. I assumed the other nuts would hold the axle.

Until rereading the instructions I have been assuming that I had also substituted a thinner "shear nut" beneath the pant plate for holding the axle, and I have just now replaced them with AN365 42SA types on longer bolts. Apparently the book calls for thin nuts, AN364 428A's. I presume the idea is that two such nuts - properly applied! - are adequate. I plan to talk to Bob about this. When it is sorted out I feel a "lecture" about the importance of distinguishing a shear-nut (only a substitute for a cotter pin!) from a real nut might be well placed in the advice at the beginning of the instruction books. I am not the smartest nor probably the dumbest builder and confusion on this has caused me two accidents which could well have been much worse.

(Editor's note: In reference to Dick's recommendation, our Glasair II and III manuals have a discussion explaining the difference between the AN364 thin nuts used in shear-load applications and the AN365 thick nuts used for tension-load applications. A nut is in shear when the forces are perpendicular to the shaft of the bolt. A nut is in tension when the forces are in the direction of or parallel to the shaft.



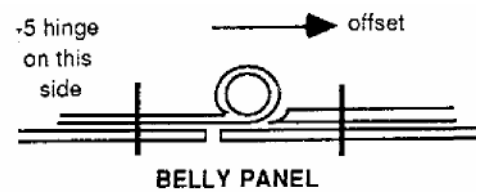
From Inge Ray, Phoenix, Arizona:

(Inge is upgrading a Glasair I to a Glasair II.)

1. Well, first off, congrats on a fine improvement in the Glasair II construction manuals. New Glasair II builders will never know how good they've got it, and now we can understand how the "old kit" Glasair I builders felt about the "new kit" Glasair I.

It was gratifying to see lots of builder ideas incorporated in the new manuals. Maybe you guys'd already thought of all the good ideas, but we like to think we contributed some.

2. We've noticed daylight coming through the belly panel hinges on flying Glasairs, a source of noise, CO and smoke as the last newsletter pointed out. We offset the belly panel hinges slightly so that the solid part o! the hinge covers the gap. This requires a very small gap at the split lines (1/32"), but it is possible. If we had to do it again, we'd use MS2000 1-P5 hinge hall on the long offset hinge. This idea might also help on the cowl hinge to make a more perfect seal.



BELLY PANEL

3. The new Glasair II way of cusping the main spar using mat doth sure beats the "mill fiber fill" method we used. To get that "perfect" fit, we made a tongue depressor template of the curvature of the top wing panel. Mark the upper spar cap location on the top panel, lay the top panel in position on the wing <u>without</u> weights and sand a tongue depressor to match the contour. Simply use the template to check the progress when shaping the upper spar cap. (Editor's note: Other builders have contoured the top of the spar to accurately match the skin contour with good results as well.)

We suggest doing all this <u>before</u> fitting the ribs, as we found that the rib fitting all changed after we had done the filling (weighting the panels without the spar cap filled causes enough deflection - even with spacers - to change things). The poly cell trick in an earlier newsletter works great: We used a 40 watt bulb in a trouble light to light up internal spaces and sight the fit of the ribs. Easy to see the low spots!

4. Measuring the angles of the flaps and ailerons can be tricky, especially with the cusp in them. We used the shearwebs as a reference, making a cardboard 22° template. We place its point at the hinge line and its side lined up with the shearweb when the aileron is even with a wing tip. 22$^{s}$ of deflection with the shearweb should be 22° of aileron deflection. Might also work on elevators using tape to make a reference shearweb between top and bottom panels.

5. Keep up the good work!

P.S. We like Augsberger Dark Beer P.P.S. The 28 volt alternator may be a little more efficient than a 14 volt unit, but it doesn't work half as hard: they both work just as hard, contrary to statements in the last newsletter.

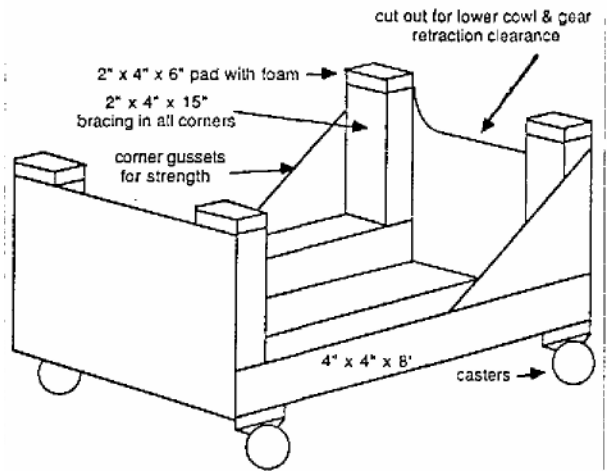
From Charlie Largay, Miami, Florida:

Cradle for Glasair I, II, or III

<u>Materials:</u>

2 4" x 4" x 8' wood posts 1 sheet 3/4" CDX plywood
1 2" x 4" x 8' stud
4 360° steel or H.D. plastic casters nails or drywall screws packing foam for top of cradle

The cradle will accommodate an aircraft with wing attached <u>and</u> gear down. It may be necessary to put extra weight on tail of aircraft due to CG of the engine installation. However, a simple strap tied over fuselage from rear gussets will ensure no rocking of aircraft. The cradled aircraft can be rolled around by one person and multiple jobs made easier.




Also, I used a secretary chair to sit on and roll around. It's padded and rolls and tilts back: makes job 100% easier.

Factory hint:

The instruction manuals specify aileron travel as 24° up and 22° down. To keep the gaps to a minimum, we have settled on 20-21° up travel and 22° down on our factory birds. The lesser amount of up travel is acceptable and will only slow the roll rate slightly.

Glasair III Engine Notice

The Lycoming IO-540 engines have machined "ears" or aluminum mounts bolted to the rear side of the case which serve as the mounting points for bolting the engine to the engine mount via the shock mounts.

Preston Welch, building a III, has reported to us that III builders should be aware that many of the early A, B, and C series 540 engines prior to the K series have small ears. Our engine mount is designed to use big ears, therefore, if one of these earlier engines is to be used, the bigger ears will have to be purchased and mounted to the engine lorthe Glasair installation.

Loran Antenna

Jim Ewing of Fresno, California reports that he had success with his Apollo loran only after installing a 31" vertical 1/4" copper tube for the antenna. He used a 6" lead to the pre-amp.

He also mentioned that he covered the total belly panel with an .012 aluminum sheet used as a ground plane. The ADF antenna is mounted to this ground plane and needs as much ground plane as possible according to Jim.

Factory note:

After testing our own Glasair with an ARNAV Loran and based on information from other Glasair builders (flying) the best results so far have been from mounting the pre-amp at the base of the baggage bulkhead, running a long wire to the top of the baggage bulkhead, down the top of the empennage and up the vertical stabilizer.

Ground the pre-amp and the groundwire for the antenna to the main ground buss and tie in all control linkages to ground. Using thin aluminum sheets, aluminum foil or copper foil on the inside skin of the belly panel would help achieve a better ground plane.

1. All ground wires used to tie in the loran pre-amp, antenna groundwire and control linkages to the ground plane should be copper braidwire commonly called bonding or grounding straps. The tin-coated strapping is available from most A/C supply houses but is expensive at nearly $1.00 per foot. An alternative is to purchase coax cable and strip the rubber or plastic insulation off. The copper grounding strap inside the coax cable may then be pulled out and used. It lacks (he protective tin coating and therefore may be more prone to corrosion, but may be OK as long as it is in an inspectable area of the plane.

2. The higher (vertically) the long distance antenna wire is, the better your antenna performance will be.

Header Tank Fuel Filter Cap

One builder at Oshkosh reported installing his fuel filler cap for the header tank slightly off-center to avoid cutting into the fuselage seam.

He also said that he used a standard Radio Shack grounding lug in place of the washer/eyelet under the nut for the fuel cap retainer mentioned in Newsletter 24.

Cosmetic Work

Gary Lichte of Tuscon, Arizona visited with us for a couple of days at Oshkosh. He reported a severe case of sandpaper blues attributed to the fact that he saved all of his cosmetic work for the very end of the project. If he had to do it all over again, his advice is to do a little cosmetic work between construction of the various components as you progress.

Side note from Ted regarding Gary Lichte: We had the chance of meeting the friendly Oshkosh police not once, but twice during our week in Oshkosh and both times Gary Lichte was with us. Now, Gary and I go way back together, and it's a long story, so I'll spare you all the details. However, Gary thinks that whenever he's with me there's always action. I think that it's the other way around. Whenever I'm with Gary, things are bound to get exciting. Here's what happened at Oshkosh:

Gary needed a place to spend for a few nights. We (Stoddard-Hamilton) rent a house in Oshkosh off campus in a nice, quiet neighborhood and we invited Gary to stay with us. It was hot and humid, so three of us slept in sleeping bags on the dining room floor under the ceiling fan. Suddenly we are all staring into a 5,000 watt policeman's flashlight at 3 am. He wants to know who we are, what we are doing, etc. Somebody had called the police and reported hearing breaking glass.....or crying out loud.

The next night we had a late dinner with our Brazilian distributors (we'll report more on Brazil in the next newsletter) and didn't get back to the house until 11 pm. Gary and I sat in the car parked in the driveway talking until midnight. A guy in his late thirties with white tennis, shorts and a green shirt, walks across the street, into the driveway and starts jimmying on our trunk trying to get into it. Gary and I are dumbfounded trying to figure out who this is and what he is doing. Finally, I lean out and say, "Can I help you with something?" The guy leaps about four feet into the air and starts walking rapidly down the sidewalk muttering "no...no..." and trying to pretend he wasn't doing anything. The police station is on the end of our block (rock throwing distance) and it took them seven minutes to respond. The guy got away and we kicked ourselves for not jumping on him when we had the chance. When the policeman arrived he eyeballed us suspiciously and said, "Hey, didn't I meet you two guys last night?"

I'll be traveling to the Copper State fly-in in Arizona on October 17, 18 with the Glasair 111 and visiting with the Lichtes.. I wonder what kind of excitement Gary has in store for me when I get there.

From Roger White, Joplin, Missouri:

Dear Chris,

Here is another set of drawings for the nose wheel swivel release assembly. Sheet one (1) has a couple of changes, the return spring depiction and some notations.

The spring drawing is changed to a double "mouse trap" type. The builder shouldn't take the spring depiction too literally. Homemade springs usually take some experimenting to get them working properly.

Feel free to make whatever use you wish of the drawings.

I apologize for the delay but the hobby project had to take a low priority in our drafting room.

Sincerely,
Roger G. White

(Editor's note: We mentioned Roger's FT nose wheel swivel release in Newsletter 24. We have Roger's update drawings on file for those interested.)

Factory hint:

To remove primer in preparation for bonding in the new Glasair III and IIIs, the use of a 3M power sanding metal stripper (kind of like a scotch brite wheel) will come in handy. Cat. #7771, 4" diameter, comes one piece with mandrel. Use judiciously to avoid damage to underlying laminates. Cost $5.00-$6.00.

## Letters

Hello Editor of the Newsletter,

This is in response to your comment to my letter published in Newsletter #25. To review, in my letter I pointed out that I thought that the "Adverse Aileron Input" reported in previous newsletters was really just a manifestation of adverse yaw. In your response, you debunk my theory.

Well, there's no easy way to say this, and no, I haven't read the August 77 Sport Aviation, but 1 still think I'm right.

I won't try to convince you that I'm right, but I've enclosed two copies from two fairly respected books which might help clarify my position. See what you think. Also, Lyle Powell in his article VMC in Newsletter #23 talks about the same effect I'm talking about, (first paragraph, sentence starting, "If, in addition, " to the end of the paragraph) although he says it more eloquently than I.

Thanks, Mike
Palmer

August 17,1987

Dear Editor:

With all due respect, I am becoming disenchanted with Glasair's technical expertise if the Editor's note responding to Mike Palmer's letter on adverse yaw is any indication. Your editor is clearly confusing "adverse yaw" with "overbanking tendency." What your editor described is precisely what causes overbanking tendency, (depositing too much money in one bank?) i.e., in a steep bank, the outboard wing has a higher velocity at any particular section than the inboard wing, therefore, generates more lift which causes overbanking. This phenomenon occurs in a steady state turn where there is little aileron deflection involved, or there may actually be reverse aileron applied to maintain a constant bank angle.

By definition, adverse yaw is a result of yawing moments produced during roliino maneuvers which require rudder deflection to maintain zero sidesiip, i.e., coordinate the turn. It is adverse yaw because the direction of the yawing moment is opposite to the direction of the roll. There are two usual contributions to adverse yaw in low speed aircraft. The primary contributor is the yaw resulting from differential drag introduced by large aileron deflections. Any flight instructor worth his salt has demonstrated to his students the effect of adverse yaw during the rolling maneuver to enter or exit a steep turn. Large rudder inputs are frequently required to coordinate the roll in and roll out of such maneuvers. It can also be easily demonstrated in straight and level flight, introducing large, rapid deflection of the ailerons and observing the position of the nose change on the horizon. The yaw occurs long before the aircraft actually develops any substantial bank angle, and therefore, long before any differential lift or drag as hypothesized by your editor could occur.

Contrary to your editor's opinion, if he checks with aircraft manufacturers, he will most certainly find that the purpose of differential aileron deflection is precisely to reduce differential drag during large aileron deflections and, therefore, reduce adverse yaw. It has no effect on overbanking tendency which is caused by a different phenomenon and with streamlined ailerons.

The second contributor to adverse yaw in low speed aircraft is the change in angle of attack induced by the rolling motion. The down-going wing experiences an increase in angle of attack while the up-going wing experiences a decrease in angle of attack. The induced angle of attack alters the lift vectors of each wing in such a way that when resolved into vertical and longitudinal components, it is found that a yawing moment is produced which is opposite the direction of roll. For the typical general aviation aircraft, the contribution from induced angle of attack is small because of the low roll rates typically involved.

Finally, your editor has observed that sail planes and other aircraft with long wingspans are more affected by adverse yaw than aircraft with short wingspans. This is absolutely true, but the cause, contrary to your editor's opinion, is that the long wingspans obviously have a longer moment arm for the ailerons to operate on, therefore, the effect of differential drag between up-going and down-going aileron is more pronounced.

Thanks for your informative newsletter,

Yours very truly,
B.J. McClure

Editor's note: Thanks B.J. for your very informative response. Since the newsletter editor is not an expert in this area, I went back to my initial source for a final comment, as follows:

Ted, You were right!

I got egg on my face. Although I was well aware of the overbanking tendency, I still believe the increased drag on the faster moving wing causes adverse yaw to some extent. After reading Mr. McClure's letter it has become clearer to me that the primary contributor is the yaw resulting from differential drag introduced by large aileron deflections.

At no time did I say or mean to imply that differential aileron deflection was designed to reduce overbanking tendency, as he implies I did. Nor was I confusing it with overbanking! - Chris Klix

July 21,1987

Dear Editor:

I have just received Newsletter #24 and wish to take issue with some of the statements regarding the 28 volt electrical system.

It is suggested that the current requirements for all of the electrical and avionics components is one-half that required for the 14 volt system. That simply is not correct. Particularly in the avionics area, the majority of manufacturers build 14 volt avionics and use a simple dropping resistor to make it compatible with a 28 volt system. The current requirements for those avionics components remain the same regardless of whether it is a 28 or 14 volt system. It is true that many of the electrical components, particularly lighting and motor driven systems, will require one-half the current of a 14 volt system if properly selected. The power nevertheless, remains the same. The current has been reduced to one-half, but the voltage has been doubled, therefore, the power consumption remains constant.

Secondly, it is suggested that wire sizes can be smaller saving space and weight. Wire size is dictated by the current flow through the wire and the length of the wire, or to state it in another way, the thermal properties and the conductive properties of the wire. For most avionics systems, the current will remain unchanged, and therefore, there should be no wire size reduction.

It is also suggested that the voltage drop allowable in a 28 volt system between buss and equipment is always double that in a 14 volt system. Taint necessarily so. The

builder should always be cognizant of the manufacturer's limitations on input voltage and recognize that the equipment is nominally rated at either 27.5 volts or 13.75 volts. If the builder permits voltage drop in the wiring between buss and equipment, he should be willing to accept the degradation in performance that may result.

Finally, the statement about the alternator working half as hard in a 28 volt system clearly is not accurate. Even if the builder selects avionics that have switching regulators or which are built specifically for 28 volt systems, i.e., do not have a dropping resistor, then he is working with a system where the current requirements are reduced approximately one-half that of a 14 volt system, but the voltage is doubled and, therefore, the power consumption remains the same. The alternator, therefore, is required to produce the same amount of power, even though the current requirements may be less than the 14 volt system. The horsepower required to drive the alternator is directly proportional to the power output, therefore, the load on the engine remains constant. In the more usual situation where standard avionics is used and a dropping resistor accounts for the increase in supply voltage, the actual power output of the alternator will be increased with 1he corresponding increase in the horsepower required from the engine to drive the alternator.

The primary benefit of a 28 volt system is in the cranking system. Particularly, as in some Piper aircraft, where there is a long run required between battery and cranking motor, wire size and weight can be significant. In addition, the reduction in voltage drop that can be achieved in a 28 volt system improves cranking performance substantially. Of course, the internal resistance of the battery, and therefore the battery output voltage at the terminals during cranking, is also beneficial from the standpoint of cranking performance.

In summary, it is doubtful there will be any achievable weight reduction as a result of switching to the 28 volt system, however, for those builders who will be flying in the winter time in the northern climates, the increase in the cranking performance might be worth the investment.

Thanks for an informative newsletter. Keep up the good work.

Very truly yours, B.J.
McClure

Editor's note: Thanks once again to B.J. for the corrections. (We hope you realize, B.J., that the next time we need some technical help, we're coming straight to you!)

Dear Ted, July 20,1987

Just a note to tell you and your staff what a wonderful time you showed my mechanic, Paul Gordon, and myself. We are anxiously awaiting your stay with us next week if it works out for you, I really appreciate my checkout and find it is an essential part of building a Glasair,

I might not have mentioned it but I used the tail number N681GA since my kit number was 681 and obviously the GA is for Glasair. If others used the kit number and GA you would hear a lot of Glasair call signs around the U.S. Just a thought that you might put in the newsletter.

Once again, thank you for your wonderful support and hope to see you next week on your way to Oshkosh.

Regards,
Ted Beck