

# Express

LINK  
NEWSLETTER

July, 1996 - No. 11



## Sjostrand Scores at Arlington

### Three Long Time Express Supporters No Longer With Us

#### MISSING MEN

One of the greatest joys of building our *EXPRESS* has been the privilege of making many new friends among the builders group.

It is with considerable sadness that we report to the readers of this newsletter that three long time supporters of the *EXPRESS* are no longer with us. Since our last publication Jim Warner, Bob Hockett and Wally Breuner, David's (D.B) father have died.

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Jim Warner, best known as the first builder to have completed an *EXPRESS* and author of much of the latest documentation material published by EDI, succumbed to his long running battle with cancer in the first part of April. Much to his credit Jim saw to it that his son was checked out in their *EXPRESS*, and we hope that he and Irita will continue to enjoy flying the fine example of *EXPRESS* construction, of which Jim was so proud.

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### Judged Grand Champion Kit Plane

In the very home of much of the composite kit plane manufacturing and construction in the U.S. Jerry Sjostrand turned a last minute decision to travel to the annual Arlington Washington Air Show into an award winning appearance.

In the heart of Lancair, Glassair and RV country, the Northern California *EXPRESS* was determined to be the best example of kitplane construction at the show. We have said here before that Jerry's *EXPRESS* is a "work of art", and the very astute judges confirmed our opinion.

In a hurry to get started on his return flight to Mariposa, Jerry left just as the judges were announcing their decision and was totally unaware that he had won an award until Larry Olsen, who was also at the show, called him the next day with the news. The award brought with it a special feeling of satisfaction for Jerry as Ken Wheeler was also at the show (representing Seawind).

It should be understood that the award was somewhat of a surprise to Jerry as he considered the airplane to be somewhat short of "finished" (as though that will ever happen), lacking trim stripes and a decorative N number.

It is not clear whether his success at the Arlington show was the motivation, or whether Jerry decided it was time to

find out just how useful his new sign shop would be. For whatever reason, Jerry got busy with some minor improvements designed to make his *EXPRESS* prettier and more comfortable. We have already mentioned that he used his sign shop to produce trim stripes and shadowed N numbers, but the other improvement he made was for the comfort of the pilot and co-pilot seats.

Jerry had previously found that the fresh air system he had installed did not provide enough circulation and he had been contemplating installing a scoop near the forward edge of the door. Cutting an opening approximately 2 inches long and 4 inches wide near the front of the door (see Photo No. 1) a plenum approximately 6 inches by 12 inches was

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**MISSING MEN**

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Bob Hockett, who was building his **EXPRESS** at Pine Mountain Lake in California, was killed during a check flight of the Glassair in which he was a partner. Having completed an annual inspection of the Glassair, during the check flight departure from the Pine Mountain Lake airport the throttle cable apparently malfunctioned leaving him insufficient power to complete a circuit, and in an attempt to return to the runway, lost flying speed and crashed near the airport killing him instantly.

Wally Breuner was killed with a friend in the crash of his SEA BEE near Ketchikan, Alaska during the first week of June. Wally was living his dream of flying an amphibian to Alaska. He had successfully completed the trip to Ketchikan, where he had planned to spend several weeks fishing in remote lakes in the area with some friends and his son, David. David had arrived in Ketchikan the day before the accident which occurred on a flight piloted by Wally, with one of their party, to one of the lakes at which the group were to camp and fish. The cause of the crash is not known. David, better known as D.B. (or DIRT) had been well known as the Sales Rep/Demo pilot for EDI during the early part of the EDI experience. David, his wife Robin, and son, Ben, are now living in Kansas City, MO. Wally was a source of great support to D.B. and for the **EXPRESS** program.

Our sincere condolences and offer of support are extended to Irita Warner, Donna Hockett and D.B. and Ros Breuner and their families for their loss.

We sorely miss our **EXPRESS** friends.

**More Than 20 *Express* Examples Now Flying**

**See One At Your Local Airport !**

If you count S-90s and Aurigas, some do - some don't (we do), the number of **EXPRESS** examples now flying exceeds 20.

It will be a long time before the headline above will be true, but it seems that about once per week we are hearing of new completions and successful test flights of both CT and Series 90 models. To date there are more CT's flying, but series 90 examples are beginning to appear.

The even better news is that there have been no problems encountered with the airframe or aerodynamics, and most report performance very near or better than, as one builder put it, "to what Ken Wheeler sold us".

The following is a list of flying CT and Series 90 examples (to the best of our knowledge - in no particular order)

Factory Demonstrator CT - currently in possession of Ralph Kenner.

Factory Demonstrator - S-90 currently in possession of David Ullrich.

Factory Demonstrator - S-90 conventional gear- currently in possession of David Ullrich.

Jim and Irita Warner - CT based at Grass Valley, CA.

Ed Bernard - CT- based at Ashland Or.

Hardy Huber - CT based at Novato CA.

Bob Gisburne - S-90 based in Phoenix, AZ.

Bob Starck - Springhill, FL.

Dennis Kaas - Doraville, GA.

George Carhart - CT Fernandina, FL.

Glen Parks - CT Elysburg, PA.

Jerry Sjostrand - CT Oakhurst, CA.

Joe O'Neal - Clovis, NM.

Ken Boling - S-90 Chico, CA.

Mark Turner - Rochester, MN.

Richard Sutton - CT -Bellevue, WA.

Robert McCann - CT- Tijeras, NM.

Bruce Decker - Chadds Ford, PA

Dick Lind - CT -Rancho Santa Margarita, CA

Rick Feehery - Auriga, West Newbury, MA.

Martin Jennett - ?

Buddy Edwards - ?

Joseph Polsgrove - CT Lexington, KY.

Nat Mathieson - S-90 Daytona Beach, FL.

Ufe Gertzman CT -?

If you know of anyone who has been left off the list, please let us know - it is the kind of information which holds the **EXPRESS** builders group together.

We also know of several more that are very near completion.

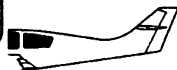
Most of the builders we have talked to agree that the most effective form of advertising for the **EXPRESS** is flying examples. It is apparent that, as more start showing up at flyins and airshows, a renewed interest in the type will surface and if production can be restarted, the next owner will find a profitable market niche.



**NOTICE:**

Many of the builders on the original **EXPRESS LINK** subscription list have not been asked to renew their subscription on a timely basis, and as a result have received more issues than the original subscription price was calculated to include. We also believe that there are builders or kit owners out there on the mailing list that are no longer interested in receiving the **EXPRESS LINK**, for one reason or another. If you find an (\*) on your mailing label and wish to continue your subscription, please forward \$36 at your earliest convenience. If you find the (\*) on your label and do not wish to continue to receive the **EXPRESS LINK**, your non response will be understood and your name will be removed from the mailing list. Payment of the additional \$36 will extend your subscription to include issue No. 16.

Thank you for your continued interest.  
Bill C





## Grand Champion

(Continued from page 1)

installed which contains 4 eyeball vents and a large cabin light. The entire interior assembly was finished with the same fabric as the rest of the interior. (see Photo No. 2). How does he keep water from getting into the cabin, you ask? Simple - the small scoop/door on the outside of the door is operated by a MAC servo complete with position indicator. Jerry's first trip with the new vent system was to Livermore on a rather warm day and Jerry reported that the system operated very well at about 1/2 open. This addition to Jerry's **EXPRESS** may seem like "gilding the lily", but Jerry says "it was a matter of survival on extended trips".

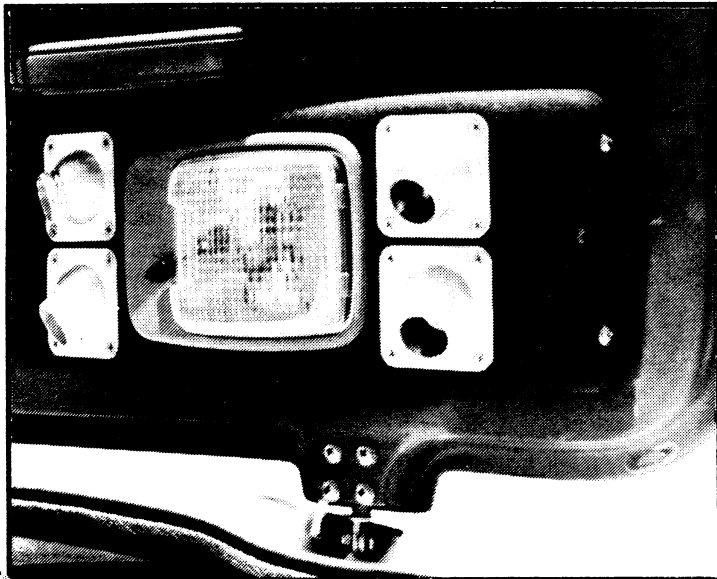


Photo No. 1 Plenum mounted on inside of door

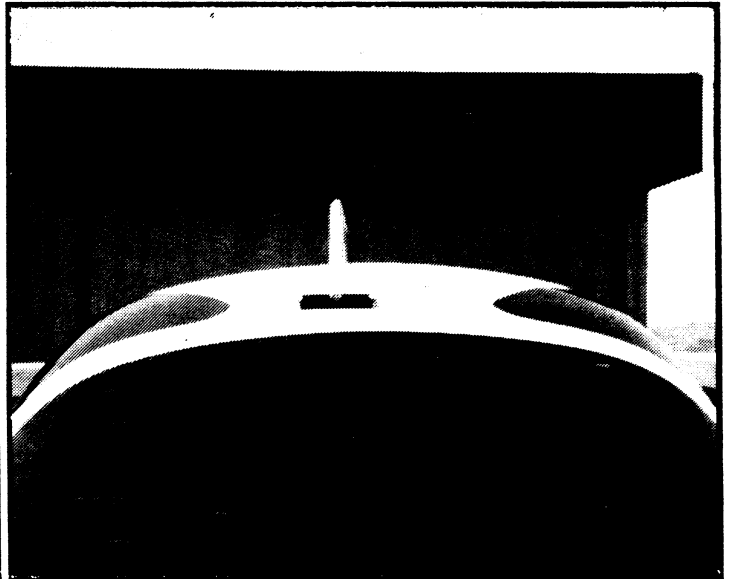


Photo No. 2 Servo operated scoop shown approximately 1/2 open

## Strings Too Short To Save:

....**GAP SEALS CBROS** has been considering the use of gap seals, especially on the elevator and rudder gaps, to improve the effectiveness of the control surfaces at low speeds and larger deflections. Being in the same hangar as Acro Sport Aviation, which does fiberglass repairs on sailplanes, among other things, has its advantages. We often ask Steve Brown, the owner, questions concerning the use of fiberglass and related products, materials and techniques (and you always thought that John and I were just naturally talented). When Bob Wallace, an **EXPRESS** builder in McAllen, TX called about gap seals I was almost ready with the info. I have since talked to Steve and have the following information to share with you.

Gap seal material is available in several forms and dimensions, generally tape with adhesive on one side, from:

Wings and Wheels; 81 Jackson Avenue, W.E.; Jamestown, NJ 14701. Their telephone number is (716)664-6894. I do

not know if they can furnish installation instructions, but here are some typical prices:

**Pre-curved Mylar**, 2.2mm wide - \$3.00, 2.5mm wide - \$3.50, 3.0mm wide - \$3.75 and 4.0mm wide - \$4.00 - all per meter.

**Teflon Tape**,...3.0mm wide by 33 Meter roll - \$89.00 per roll.

It is my understanding that the pre-curved mylar, the teflon tape and a safety tape called "tessa" will be needed to complete the installation correctly.

They also sell turbulator tape, but that's another story.

If you get stuck figuring out the best installation method(s), let us know and we will see if we can get Steve to help.

.... **KEN BOLING** and his partner have completed the sale and delivery of their first **EXPRESS**. I say first, because they have acquired the kit(s) started by Ray Holt and are well on their way to completing their second **EXPRESS** project.

....**DICK LIND** should have flown as

this is being written. We have not heard in the affirmative though, and assume that no news is good news. (Ed note: A telephone call from Dick on Tuesday, August 7th confirmed that we were right - he had indeed flown his **EXPRESS** on Friday the 2nd and has about five hours flown off between Friday and Tuesday. Dick reports that his version is flying with nominal trim inputs, but that it seems to be a little left wing "heavy". Dick initially attributes that situation to the weight of a single pilot (him - no cracks please). He also says that even though he is not well into the flight test program, the extra area he added to the horizontal stabilizer appears to have been effective in the area of rotating down to the nose wheel during landing. Dick said that while flying at 6500 ft at 23X23 he was seeing an indicated air-speed of about 160 knots. This is without wheel fairings. Dick also noted that rudder authority seems a little weak, particularly during the initial phase of the full power takeoff run, which required some use of the brakes in addition to full

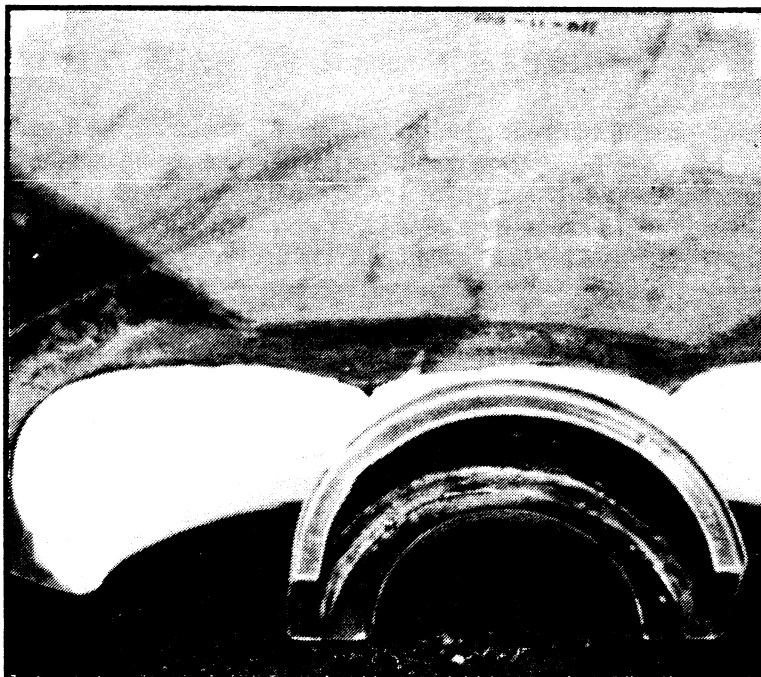
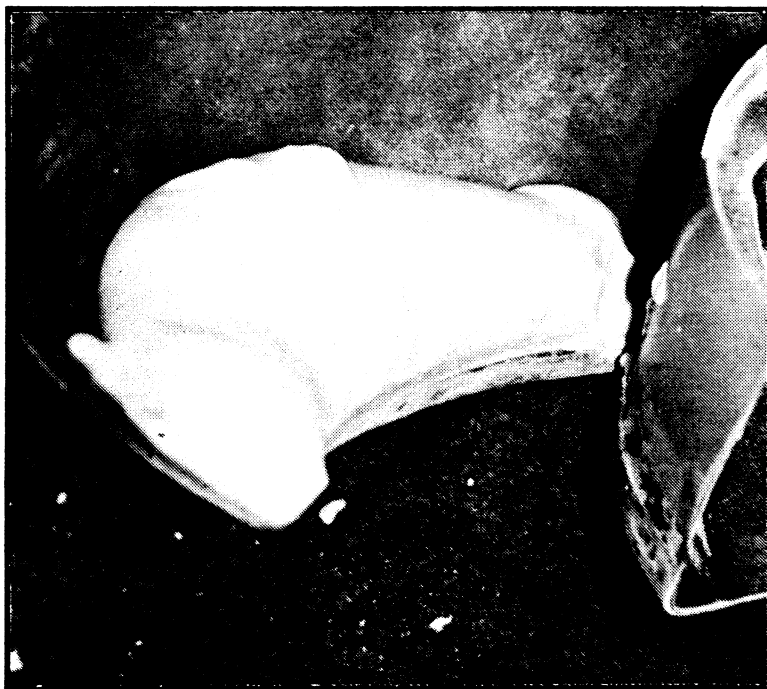
(Continued on page 5)

## Fun With Free Form Foam

From time to time the builder will find it necessary to construct a mold which defies the use of regular 4-5lb foam due to compound curves. Discussions with Brand X builders indicated that the most improvement in cooling a tightly cowled engine, assuming tight baffling, that is available is to smooth the inlet on the upper cowl just behind the inlet lip to reduce turbulent flow as the cooling air moves aft of the inlet. This seemed like a good investment as we were fitting the cowl, so our first attempt used the standard method of carving a piece of 4-5lb foam to fit in the proper location. It soon became apparent that producing such a "plug" was difficult, if not impossible. The solution: use "liquid" foam.

Purchasing a pint each of parts A and B of a product sold by our local plastic supplier called X-40 Expanding Foam, a two part, polyurethane product designed for use in boats as flotation cells, we proceeded to form a suitable "plug" by the simple expedient of pouring the mixture of expandable foam directly into the area where the "Plug" was required. The instructions for the expandable foam material indicated that the mixture would chemically expand up to 40 times the volume of the two part batch which is

*Below: Photo No. 1*



mixed. This depends to a great extent on the ambient temperature and, we found, impossible to predict. We experimented with small batches until we were satisfied that we could mix a proper amount with some accuracy

For the actual application the top cowl half was positioned to provide a more or less level condition to prevent the liquid from running into areas where it was not required. This was found not to be critical as the material is mixed until it is homogeneous, at which point it will almost immediately begin to ex-

pand. As we found the foam, when mixed, poured and left to cure, sticks to whatever it touches. We used clear tape around the edges where we did not want the foam to adhere.

Our first pour produced the result shown in Photo No. 1. Our second pour was not as "pretty" and required an

additional application to build up the required section. The second pour adhered completely to the first pour after the first pour had cured about 15 minutes. An additional pour was added to the back of the circular flange to provide support and a better transition in that area.

The result, after shaping which is easily done, is shown in Photo No. 2.

*Above: Photo No. 2*

All that was left was to apply two layers of BID and the job was complete. It turned out that this procedure was one that we did not have to do three times (our normal number of attempts to get it right), and the result was very satisfactory.

## Publishing Schedule Needs Attention!

I know, I know....

One of the things we struggle with in producing the **EXPRESS LINK** is making a decision as to just when to stop writing and start printing. It seems that we always feel that if we wait just one more day or one more week we will be able to add another good feature to the publication.

But we should know that some news is probably more important to builders, than no news. We promise to print what is on our plate on a more regular schedule in the future.

Don't forget - If you have anything which you would like to contribute, call and let's talk about it, or write it down, or sketch it out. We are getting to the time when we should all be able to share the one or two features which makes each **EXPRESS** unique and special for the builder. We look forward to making it possible for you to have the opportunity to share your passion with most of the active **EXPRESS** builders through out the world. Let us hear from you!



### ...Strings

(Continued from page 3)  
 rudder. Judicious application of power during the early part of the takeoff roll allows effective rudder control. At the time of the call Dick was in the process of changing the bearing portion of the outboard aileron bell crank, which he feels is necessary to eliminate slop in that portion of the control system. (see Builder Alert) He feels the bearing was the primary reason for some aileron "vibration" experienced during his first five hours of flight. Procedures yet to be completed include the wheel fairings and a servo operated, pivoting, front landing gear leg fairing which will serve as "yaw" trim if it seems to be needed).

While we are on the subject of Dick Lind, those of you who have not completed the landing gear leg to wing fairing might want to talk to Dick about acquiring a set from molds Dick has developed. They will save you a lot of work. Dick can be reached at (714)770-1912 during regular work hours PDT.

.... **BOB GISBORNE** had planned to go to Oshkosh this year, but recently reported that he has spent so much time flying his Series 90 example that he has not had time to finish and paint it. He reports that the airplane has completed trips to the East Coast and Midwest, performing as advertised and without incident. Bob has also reported that he may be able to make available the lower wing

fairings for use by other builders. Seems like a set of molds were made to complete Bob's *EXPRESS* and duplicate sets may be available for other builders. If so, it will save a lot of work for those interested.

....**RALPH KENNER** reports that negotiations are ongoing with Dave Ullrich - actually attorney to attorney - but that a resolution is expected by the end of August. It is not yet known what the results will look like. It is hoped that Mr. Kenner will end up with enough of the tooling and engineering records to allow a subsequent re-start of production, at least on a limited basis. There are several builders who will need some additional "factory" parts to allow them to complete their projects. We know of several individuals and groups who have expressed an interest in producing parts, at least on a limited basis - so keep your fingers crossed.

....**LARRY OLSEN**, who is at Oshkosh as this is written, had hoped to have the LPE engined *EXPRESS* at the big show this year, but time caught up with him and I believe he was forced to settle on taking the inverted V-8 on the test stand which he has developed. He has the engine running, but continues to experience development problems in several basic design areas. If Larry can solve all the problems before he runs out of time, money and ideas, the engine should be a strong addition to the "alternative" engine market. (see picture below)

### Look Before You Leap!

#### Too Tight Cowl Worse than Too Tight Shoes

Take care when fitting the upper and lower cowl halves to allow clearance for whatever "rub" strip you intend to install between the cowl and the firewall flange. Once again, CBROS attempted to "zero close" the sides without any "rub material" and have ended up with a very tight fit. (read too tight). Looks like all we will have room for is Teflon tape.

#### Excess play in Aileron Control System

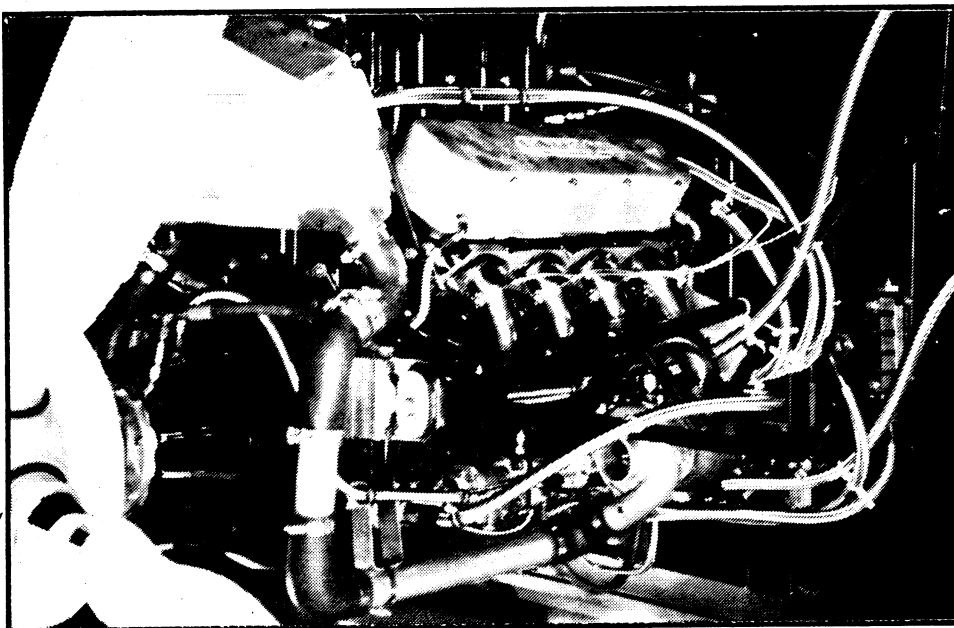
Dick Lind has described an experience with excessive play in his aileron control system during his first flights which he attributes to the outboard aileron bellcrank bearings.

According to Dick's report the excess play led to noticeable vibration at certain airspeeds, (not flutter, just "vibration")

Dick notes that some of the later bell cranks were furnished from the factory using cheap, press fit ball bearings. He is in the process of replacing the factory bearing units with a bearing that is riveted onto the bellcrank. Unfortunately this requires that one of the supports which attaches the

bellcrank to the rib be replaced to provide additional clearance for the modified bellcrank assembly. According to Dick an inspection and modification of this problem is best done at the earliest opportunity to avoid having to do it on your back beneath the already closed and installed wing.

Left: The Light Power Engineering turbo charged inverted V-8 engine on the test stand. Note the radiator just behind the prop and the turbo charger lower right.







## Ailerons Too Heavy? Try This For "Lighter" Aileron Loads

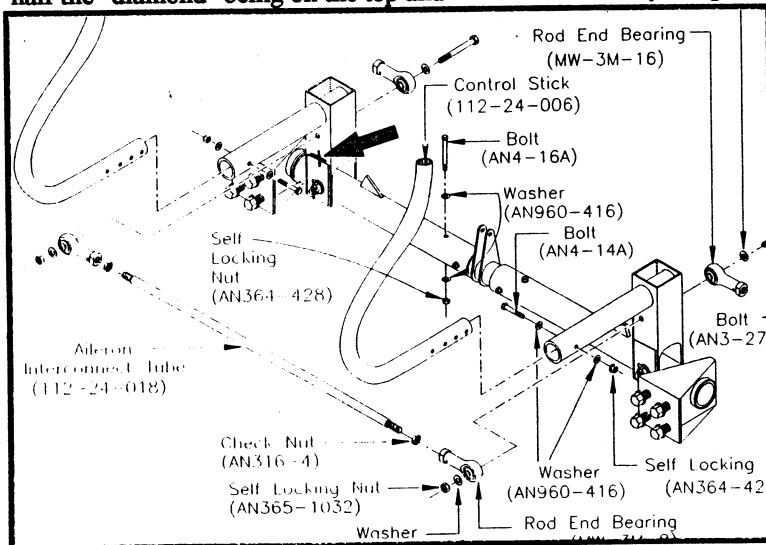
We have discussed with many builders the technique of adding various shapes to the trailing edges of the ailerons to improve the control harmony by reducing the aileron stick pressure. There is also a simple mechanical change that can be accomplished by drilling a 3/16" hole in each of the stick mount columns.

To discuss the simplest first, the drawing below shows the control stick installation per the manual. If the hole, which is drilled through the upright column, is used to secure only the aileron interconnect and an additional 3/16" hole is drilled below the first hole approximately 0.70 inches to provide a new location to attach the inboard aileron push pull tube, it will improve the mechanical advantage available at the stick grip, giving the feeling of "lighter" aileron control. We have actually moved the hole as far down as we could (see arrow), retaining clearance for the washer and nut.

For the aeronautical engineers out there, the other "fix" works aerodynamically. The story goes that this "fix" was originally explored by the designers of the Spitfire to reduce the air load on the ailerons at the speeds being used in combat. Their solution, and one that works on the EXPRESS ailerons, involves the construction of a long, thin "diamond" shape at the trailing edge. By long and thin we mean an overall fore/aft dimension of approximately 2.5 inches, with half the "diamond" being on the top and

half on the bottom of the aileron. The recommended dimension, according to information we got from factory sources, for the height of the "diamond", both above and below, should be approximately 0.09 inches. The highest point of the shape should occur at approximately 1.25 inches forward of the trailing edge. The actual shape has been accomplished in several ways, but the simplest seems to be to secure an appropriate diameter aluminum rod (as in welding), then fairing the forward and aft sides of the rod with Q cell as required. The one caveat that needs to be repeated here is that the shape of the "diamond" should be increased, using great care, as there is a possibility that it could induce aileron "snatch" - something to be avoided unless you enjoy having your airplane fly you.

An additional fix, which is gaining some attention, involves attaching a triangle shaped balsa (read preformed trailing edge for you modelers out there) strip above OR below the trailing edge of the aileron with the THICK EDGE AT THE AFT SIDE of the aileron. This narrows, or eliminates, the neutral "null" of the aileron and is said to provide "crisper" roll response. If you plan to use this "fix", it is suggested that it be used to the same extent and location on both ailerons, as a single side treatment on the bottom of the fixed portion of the wing trailing edge outboard of the aileron has been used as a wing levelling fix for a "heavy wing" condition.



Left: Move the attach point down until weldment interferes with bolt head/washer seating. Attach with AN3-27A bolt - four locations. Connects to Inboard Aileron Push pull tube - both sides

## Elevator Bellcrank Mod

As we assemble the various systems in our EXPRESS for what we like to call the "last" time, we have continually been confronted with interference problems often caused by trying to make everything fit as close as possible the "first" time. Our most recent revelation came as we assembled the elevator control system to install the up/down control stops (the subject of another article). Without knowing what the extent of the movement of the bellcrank would be at the time we first installed the system with the cables in place, we found that deflection of the elevators to the full up and down positions moved the cable forks through a greater arc than imagined which caused interference between the fork and the bellcrank.

To alleviate the situation we carefully began to file the bellcrank where the interference occurred. By continuing to file and fit we arrived at a configuration which eliminated the interference at both limits of the elevator system movement. The picture below shows a stock bellcrank with broken lines indicating the approximate amount of material to be removed, and a finished bellcrank. After arriving at the final outline the edges that had been filed were finished with emery paper to eliminate any scratches which might cause a stress riser.





## High Altitude Performer

One of the most challenging *EXPRESS* projects we have seen to date is the CT version being constructed by Doug McMillan in Morgan Hill, CA. Planning to use his *EXPRESS* for trips from his home in Morgan Hill to the high plateau country of Nebraska and Wyoming, Doug decided that the most advantageous power plant set up, one that would make him most comfortable, would be the installation of a turbo charged Lycoming, IO-540. Those readers who have been through the problems connected with installing the smaller 4 cylinder engines can readily appreciate what it might take to not only stuff a six cylinder engine in the small cowl area of the *EXPRESS*, but to add a turbo charger to it as well.

While working on the construction of the composite structure, Doug discussed his power plant ideas with Larry Olsen and became convinced that the concept was feasible. Larry was assigned the tasks of securing a suitable engine, overhauling it to zero time status, building the engine mount and installation of the turbo charger.

The engine project took over a year to complete, but when the engine was

run on the test stand, the result was fully satisfactory.

The engine was subsequently delivered to Morgan Hill where it rested on an engine stand until recently, when Doug had reached the point in the assembly process where he could bolt the engine to the firewall and have a look at how the engine package fit the front of the airplane. From measurements taken previously, Doug knew that a significant amount of the turbo piping and the throttle body would fall below the normal bottom line of the Olsen furnished lower cowl, and was prepared to modify the cowl to fit.

Once the engine was mounted, Doug was somewhat surprised at the extent of the mod required. To enclose the whole package Doug has grafted the lower part of the standard *EXPRESS* cowl as furnished by WTI to the Olsen cowl and will include a large air intake opening and filter at the front, just below the spinner. The required addition to the bottom falls 4 to 5 inches below the "normal" cowl line and Doug has opted to close in the aft portion of the extension before it reaches the aft edge of the cowl at the firewall. The required mods

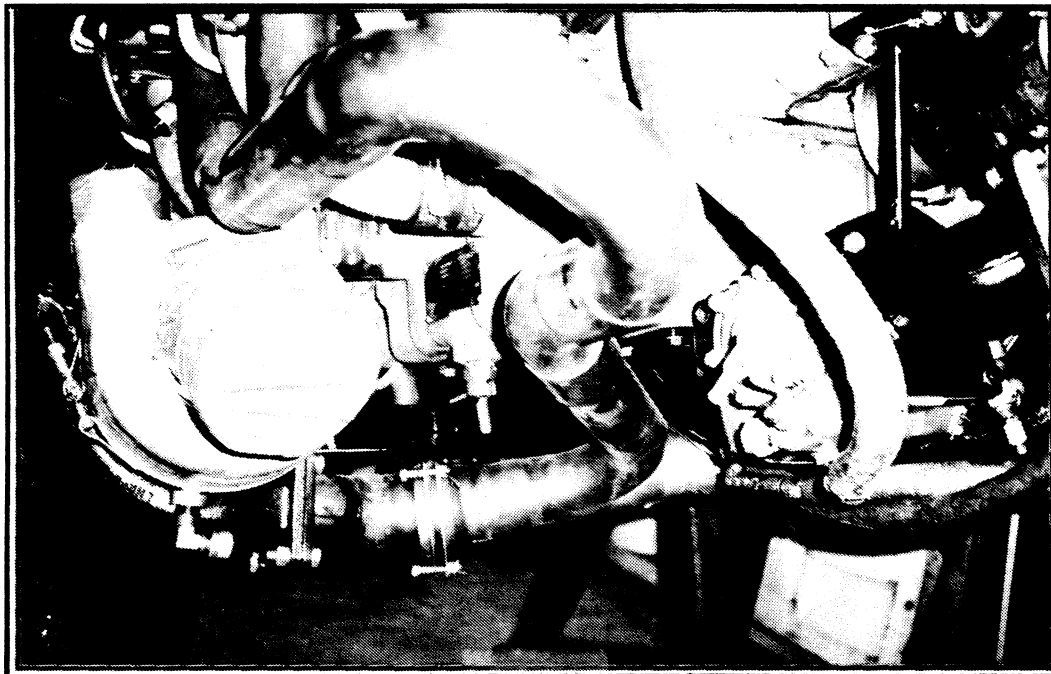
will present a rather different look to the nose of the airplane which will distinguish it from most other *EXPRESS*s. Seen in the picture below is the intake manifold piping and the turbo charger located on the lower right side of the engine. As Doug completes the modification of the cowl we will publish additional pictures and perhaps describe some of the problems Doug solved to make this turbo charged version work.

### FOR SALE:

#### CT STYLE ELEVATOR PUSH PULL TUBE ASSEMBLY

As engineered and manufactured by Dick Lind at Complete Composites. Originally purchased to convert completed cable system, but not installed due to time consumed in R and R. Perfect for a project without cable system installed.

Contact: Jerry Sjostrand at  
(209)683-5523 for details and price.





**Subscription Information:** Subscription to the *Express LINK* will be based on a 8 issue volume for the subscription price of \$36.00. Subscriptions entered during each volume will entitle the subscriber to all back issues of the current volume. There are 8 issues in Vol. 1, dating back to July '92. Back issues from the earlier volume may be obtained upon request for \$3.00 each which includes shipping and handling.

**Documentation:** CBROS, Inc has retained an extensive file of patterns and templates for all procedures through flap and aileron construction. We will be happy to share them with any builder for the cost of copying them. If you have a particular need, give us a call at (510) 455-1036.

**Materials/supplies available:** CBROS, Inc. can furnish vacuum bag material, 7781 fiberglass cloth, and self stick window covering, for use on your *EXPRESS*. If you are interested in any of the above, call John or Bill at CBROS, Inc. for prices.

**Component construction:** CBROS, Inc is prepared to assist other builders with their projects. It is not our intention to build complete airplanes, but to assist with component construction of parts such as wings, lower fuselage/firewall, empennage, and control surfaces. Our plan is to parallel the Factory "quick build" program, but on a more customer controlled basis. As each project is unique, if you are interested in speeding up your *EXPRESS* project, call CBROS, Inc. to discuss costs and scheduling.

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