

Express Press

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This issue introduces many new areas that are being developed by EDI which should give builders and interested parties increased confidence in the strength and future of EDI.

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From The Top

This issue of *Express Press* introduces many new areas that are being developed by EDI which should give builders and interested parties increased confidence in the strength and future of EDI. To capsule just a few: 1) an excellent Oshkosh showing, 2) the development of an organized sales program under David Bruener, 3) international support with organizations/partnerships forming in Europe and Australia to service and support builders and to sell airplanes, 4) the final development of the retractable model, the MORIAH, slated to start flying in December, 5) tremendous support by the majority of the Press and our peers (SkyStar, Glasair, Vans', etc.), 6) the instigation of a full, all encompassing flight testing program which will include spin testing, 7) undying support from our builders who have volunteered and given of their time at Oshkosh, at the factory, and elsewhere.

This is the first issue that will begin a column by our sales manager, David Bruener. Its called 'Sales Stuff', and while brief this issue we expect it to expand. I had one thing to mention in relation to Sales and that had to do with financing. In talking with Phil Reed at SkyStar the other day, he mentioned a new financing option that he will be offering to his customers. It sounded very good and while the credit established is still based on the individuals' credit rating, it did allow for a separate credit line to be established. Another benefit is that it allowed for no interest for the first 90 days. EDI(DB) will be looking into this and we hope to have something to offer along these lines within the next thirty days.

Our 'Notes from Tech Director' this issue are short & sweet. I continue to be pleased with our flight testing results, and more

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Sport vs Spam Can Drivers

As many of you know, EDI is dedicated to "full" flight testing of the *Express*. In this issue Mike talks a little about the current testing (longitudinal stability and stick force gradient in aft CG conditions) and I feel this area needs a little preliminary discussion before some of the preliminary flight testing results become judged on false assumptions.

The "world of sport aviation" means more to some people than it does to others. You can find numerous descriptions covering the range from 'Ultralight to BD-10' but to me the ultimate description comes down to the individual and what his personal goals and aspirations are of the aircraft he will build and spend the majority of his discretionary resources on for an extended period of time. A lot of people want a toy or something that will satisfy either short term goals or immediate time recreational wants such as aerobatics, short trips to close-in destinations, etc.. They don't care if it only fits one or two people, or that it has a short range, or if it is particularly "touchy" to fly.

There are some who would like to differentiate between what is commonly known as "Spam Can Drivers" - those who have previously owned or flown certified, aluminum aircraft, and Sport Aviation Drivers - those who are die hard experimental enthusiast. For those who have both that may be a valid distinction as previously eluded too, the experimental is a toy and the Bonanza, Saratoga, Baron, etc., is the real tool or cross-country aircraft if you will. Also, for those that don't either have the resources to spend on a Spam Can cross-country aircraft and/or to not have the need or want to cover a lot of ground, the distinction might hold true. Finally, the

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Notes From Our Tech Director

AFT Center of Gravity Testing

On August 16th, 1993 the *Express* designated engineering representative (DER) a flight test to determine the AFT C.G. limits of the *Express* aircraft. The flights covered progressive loading of the aircraft in the aft CG conditions while testing longitude stability, and stick force gradient.

Initial testing indicated that the handling characteristics of the *Express* could be enhanced through use of stability aids. The first item tested was the use of a stick installed down spring. While this did enhance the static longitudinal stability, as the spring pressure was increased we found the dynamic longitudinal stability decreased. We reached a point where dynamic stability had decreased to the point that when the aircraft was upset from level flight, it tended to gradually climb and descend in a long period sign-wave fashion for extended periods of time.

It is important to point out that even in certified part 23 aircraft there is no formal requirement for dynamic longitude stability, however good engineering practices dictate that dynamic longitude stability be positive.

After establishing a preliminary AFT C.G. limit of approximately 84.5 inches, we decided to remove the down spring and install a bob-weight which would give us identical stick force as previously accomplished by the down spring. We found the aircraft handling with the bob-weight to be very acceptable and pleasant. At the aft limit, the stick force was approximately 2 pounds per G, which while still light, seems quite acceptable for this type of aircraft. Of course, the stick force per G increases as the CG moves forward.

It is gratifying to reconfirm that four adults, baggage and fuel can be carried in the roomy cabin of the *Express* and still give the handling desired for a cross country aircraft

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Universal Exhaust for Express

The last newsletter illustrated the concept behind the new universal exhaust system for the *Express*. We have finalized the design and production tooling has been built to allow production to commence. The engine stack flanges are now CNC laser cut which gives a very clean cut outline with no measurable distortion such as encountered with stamped flanges. While we have received a few orders for the exhaust systems, we need a minimum of 25 system orders to receive favorable pricing from our vendors, which can be passed on to our *Express* builders. If you have selected your engine type, please consider placing your exhaust system order now so we can pass on this favorable pricing.

Motor Mount Development

We displayed the new universal motor mount at Oshkosh and received good response. Our computer modeling is in final stages of optimizing the design, and the production tooling is underway at this time. The firewall computer stress analysis is being finalized concurrent with the final motor mount design.

EXBB On Line

The Bulletin Board is being strengthened by some additional articles, some of which we have originated and some from builders. Two new articles slated to be put on the board soon are:



"An open newsletter to all SVX Enthusiasts from Phillip Johnson"

"A recent news clipping on the crash of a Canadair RJ during rearward CG flight testing."

This last article on the flight testing crash makes you appreciate the dedication that flight testing takes and the always present danger that factory personnel endure for the qualification of the product and the eventual safety of its owner(s) and occupants.

Service Bulletin-Mandatory Change

Date: August 26, 1993

Procedure: Landing Gear Install

Subject: Replacement of Part #111-14-002 with Part #111-14-002D and related hardware.

Supersedes: N/A

Application: All *Express* FT Models

Overview Operation experience has indicated that W.T.I. Rib "J" landing gear attach fitting will fatigue in a relatively short period of time in service with many operational factors contributing to the time of failure. Some builders have indicated that careful operation and reduced use of wheel brakes may extend the life of Part #111-14-002, however this is not the case. Landing gear loads are many and tend to interact in quite complex reactions regarding the loads dispersal in the airframes. EDI has designed a replacement fitting for part #111-14-002. The new part #111-14-002D is depicted in the installation file drawing, "JFITNG". All required hardware for replacement is listed in the above drawing.

Instruction: See EDI Drawing File "JFITNG".

Documentation Update

We are coming closer and closer to completely finishing the builders manual. All major sections have been completed, (and revised, modified, etc.), with the only sections left being the finishing procedures. Here are the sections yet to be complete;

8.140B, 8.600A, 8.800, 8.140C
8.600B, 9.100, 8.450, 8.600C
9.200, 8.500A, 8.650, 9.300
8.500B, 8.700, 8.500C,
8.750

Jim is working on these as best he can but a lot of the input must come from Mike in the case of IO-540 installation and other things which Jim did not accomplish, and/or which have changed from Jim's installation. Check with Jim or Mike if you are at some of these areas and they will try and talk you through. The good news is, if you have gotten to this stage, you will be flying very, very soon.

EDI Personnel On The Move

Rachael Shockey has taken over the parts and inventory department and is doing an outstanding job. She recently moved up from Santa Paula, California where she was finishing up her degree in accounting at Cal State Northridge. Rachael did some time in the US Navy as a hydraulic mechanic and holds a FAA Airframe & Powerplant certificate. She also worked for Lancair while they were in Santa Paula so she has a very good background for the position she has here at EDI.

Dan Begley is a very new employee, having just started with EDI this last week, but already we are starting to see some excellent progress. Under Mikes' supervision, Dan is directing the construction of the Moriah prototype and enjoying every minute.

Check Out the EXBB

Operation experience has indicated that the WTI "J" Landing Gear Attach Fitting will fatigue in a relatively short period of time in service with many operational factors contributing to the time to failure.

"Sales Stuff" Oshkosh Kudos

Public Relations

In case you haven't noticed yet, we've been receiving some good PR in a lot of the trade magazines. For those interested, here is a breakdown on some of the more recent coverage received to date:

- a) Air Progress - Sept 93 Cover Article "Express Delivery",
- b) Air Progress - Aug 93 Article "Express in the Fast Lane",
- c) Sport Pilot - July 93 Article "EDI's 6 Passenger Express"
- d) Kitplane - June 93 Cover Article "Express Yourself".

There has been numerous other press releases in other magazines, but the above articles cover the major stuff. We are continuing with maximum effort to keep the *Express* in the headlines. In late August, I flew two additional flight demonstrations with Bill Cox of Plane and Pilot, and Dave Martin of Kitplanes magazines. We should see additional PR in these magazines in the coming months. The response received from this media coverage has been exceptional.

Remaining Airshows/Fly-Ins:

We continue to exhibit the *Express* at as many events as practical. History has shown us the benefits of taking the *Express* on the road. (i.e., order taking!) We will be attending the following events with the demonstrator at the following locations: (Commitments to other events later in the season have not yet been finalized - call later for details)

- a) **Northern Cal Builders Group meeting** - September 19, Sunday at 10:30 to 11:00 a.m., Brothers hangar #340 south side of Livermore Airport. For additional info, contact Bill or John Copeland @ (510) 455-1036 or (510) 449-1105.
- b) **Southern Cal Builders Group meeting** - Sept 25, Saturday at Hangar #79 on southeast corner of Fullerton Airport, or meet at base of tower at 3:00 p.m. For info, contact Dave Holly @ (714) 447-4771.
- c) **Copperstate Fly-In** - October 1-3, Glendale Airport, Phoenix AZ.

Thanks to all of the volunteers that helped make Oshkosh so successful.

Many of you may have met Jim Anderson when you were at Oshkosh. If you didn't, you missed meeting an exceptional individual. Jim's a naturalist extraordinaire and has spent most of his life studying, teaching and safeguarding wildlife here in Central Oregon and elsewhere. Jim was our 'rig' driver, motivating our 2 ton Isuzu diesel stake truck and 21 ft self-contained trailer through the wind and rainstorms to make it to "Osh-Slosh" in time.

Once there, we weathered a thunderstorm Tuesday night that would have floated Noah's Ark. The next day, with the help of Mike Thurner, a crew was formed to make a wooden platform that "saved the day". Thanks to Mike and his willing crew, we survived and were able to go through the whole show high and dry. There were many other volunteers to whom we owe many thanks. I'm going to mention a few below and I apologize if I have left anyone out. We couldn't have done it without each and everyone of you. **Thanks!!!**

Tom Magill
Carol Magill
Mark Thurner
Ralph Kenner
Jerry Sjostrand
Jim Anderson
Ed Watson
Dick Waters
Jane Waters
Jim Warner
Ed Bernard
Dick Lind

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Sport vs. Spam Can Drivers

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distinction again might hold true if the person just liked to "build".

One of the reasons I started EDI was that I believe there are a lot of people out there, like myself, that "want it all", not because we can have it all, because most of us can't, but rather for the simple reason that we like efficiency, not only in performance but more to the point, in our personal finances. Therefore for us, the distinction between Spam Can Driver and Sport Aviation Driver is almost non-existent, we want the all-around capability that an *Express* can offer, something that can be fun to fly and maneuver in airwork, short-fields, etc., but can also cover a lot of ground quickly, efficiently, and with a good size payload.

This same line of reasoning can be applied to the "Sport Aviation" marketplace from a kitplane manufacturers standpoint. If you are producing an aircraft which satisfies, or is targeted to satisfy, those people that want the recreational "feel", have short term-goals for the aircraft and don't want the cross country capability, then fine, don't worry about designing the aircraft with all-around capabilities in mind. This works great for that person that never tries to make the plane into something its not. But when someone tries to fly cross country in that plane with the "light, recreational" touch its a real pain to be "hands-on" all the time. Likewise, filling the envelope and approaching that rearward CG with any kind of baggage again tends to bring an even lighter touch which adds to the cross country work load.

The *Express* handles the "inherent stability" problem quite well within a wide CG range without sacrificing the touch or feel to any significant degree. Getting the *Express* to the point where in a fully loaded, aft CG condition it handles as it would in any other configuration will require, as preliminary flight testing is showing, some enhancements. These enhancements typically take the form of something that develops a heavier stick force. On a Cessna 210 and a Comanche, it's called a bob weight. In fact on the Comanche they also have an anti-servo tab.

All aircraft, if taken to the extent of their design, have similar problems when their envelope is expanded to its limits. It is only a matter of where those limits exist. Some aircraft have minimal CG limits and some have

very liberal limits such as the *Express*. The way that the enhancements work and/or are designed also varies from plane to plane. Heres' how Lancair defines the problem and how they are looking to solve it:

"We're about to begin flight testing of an "anti"-servo tab on the elevator of our company Lancair 360 MK-II. As you may know, a "servo" tab helps move a control surface and consequently an "anti"-servo tab tries to resist the motion. With sport aircraft, the dynamics are typically similar and a servo tab is a possible candidate for an aileron, as one is usually working hard to come up with ways to lighten those surfaces. Conversely, the elevator is a prime candidate for the anti-servo tab as we're usually trying to heavy up those surfaces."

Most of us flying sport planes have come to enjoy the light touch of the controls yet, with more and more former spam can drivers entering the world of sport aviation, the need for "adjustment" is becoming obvious as we're seeing over control being the first lesson during flight training. Thus the anti-servo trim tab program here at Lancair. With such a device, as the control surface moves up, for example, the anti-servo trim tab will move even further up thus imparting an opposite force on the control surface trying to move it back down - a resistance force. Obviously, the more "differential" built in, the more force required to effect a control surface movement. Such a tab can either be a fixed tab, meaning one can not trim the aircraft with it, or it can also serve as the trimming surface as well. Our direction is to use it for double duty".

N362L is currently outfitted with a mixer box that mounts in the T.E. cove of the horizontal stab and converts a 3 inch bowden cable input into a 1/2 inch output to the tab. As of this writing, we have installed but not yet test flown it. However, my (Lance) early estimate is that while it will surely work, it won't have quite enough "anti" effect and therefore not be the best approach. The mixer was developed by our oleo strut manufacturer/customer in Australia. What makes an anti servo tab work is the relationship of tab driver arm origin vs. elevator pivot point. With the center line

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From The Top

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to the point, the fact that we are establishing the empirical and theoretical with the actual results. Something that I'm sure that gives us all a shot of confidence. For those of you who don't know our DER test pilot, or perhaps have not read his book, the following is a brief biography:

Our test pilot and chief critic, W.D. Thompson, is well known in General Aviation circles, having served as an engineering test pilot at Cessna since his graduation from Purdue University in 1947 until his retirement from Cessna in 1975. In addition to participating in or managing flight tests, aerodynamics and preliminary design efforts, he has written many aviation articles and technical papers in this period. From 1961 to 1975 he served on NASA Aerodynamics and Aeronautics Committees representing general aviation. He is also a long time member of the SAE Cockpit Standardization Committee which develops design guidelines for instrument panels and controls arrangements.

Bill's pilot qualifications include a commercial pilot license with single and multi-engine land, single engine sea, instrument, and glider ratings. He has taught or given quest lectures on flight test engineering at several Universities. As a member of The Society of Experimental Test Pilots, he organized the Central United States section in 1964 and served as its first chairman.

As a Designated Engineering Representative (DER) for the FAA as a flight test pilot and flight analyst, he has continued to test and certificate modifications to many aircraft ranging from Piper Cubs to Cessna Citations.

There are many that EDI and myself personally have to thank for our progress, and we still have a long way to go, so I don't want to leave anyone with the impression that "you can stop now"! Thank you!! and thanks to Him who has given me this opportunity to be involved with great people and a great airplane.

Enjoy the Issue

Sport vs Spam Can Drivers

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hinge system used on the MK-11 tail, we were unable to get as much differential as desired. Our dealer in ustralia is flight testing one with more differential travel than our current installation and is reporting much higher stick forces (9 lbs. @ 3.8 g's)".

Another system is in the works and should be test flown as well, hopefully by February. We'll report on the outcome and if we like it, we'll produce an option for it since with all such programs, they are fully intended to be retrofitable and this retrofit is looking to be pretty easy. Never a dull moment around here!"

So, when you read about our flight testing, don't jump to the conclusion that these enhancements, or stability aids as Mike calls them, are anything but just that. You only have to talk to Jim Warner or Ed Bernard to confirm that loading the plane sensibly within the middle of the envelope allows for a optimum "hands-off", four place cross country aircraft that both a Spam Can and Sport Aviation Driver can be thrilled with.

Update on Moriah

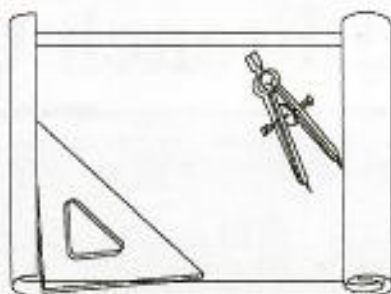
We are 'full steam ahead' on Moriah. With the addition of Dan Bagley, (see new personnel), at the 'prototype works' we have been seeing excellent progress. Mike has just about finalized all the retract design and expects to have that installed in October. Meanwhile, the engine and controls are installed and wiring has started. Flying by December, even though in "green" (primer and no interior finish) colors and finish, is a very reachable goal.

**ATTENTION
ALL BUILDERS
SEE PAGE 3 FOR
MANDATORY
CHANGE**

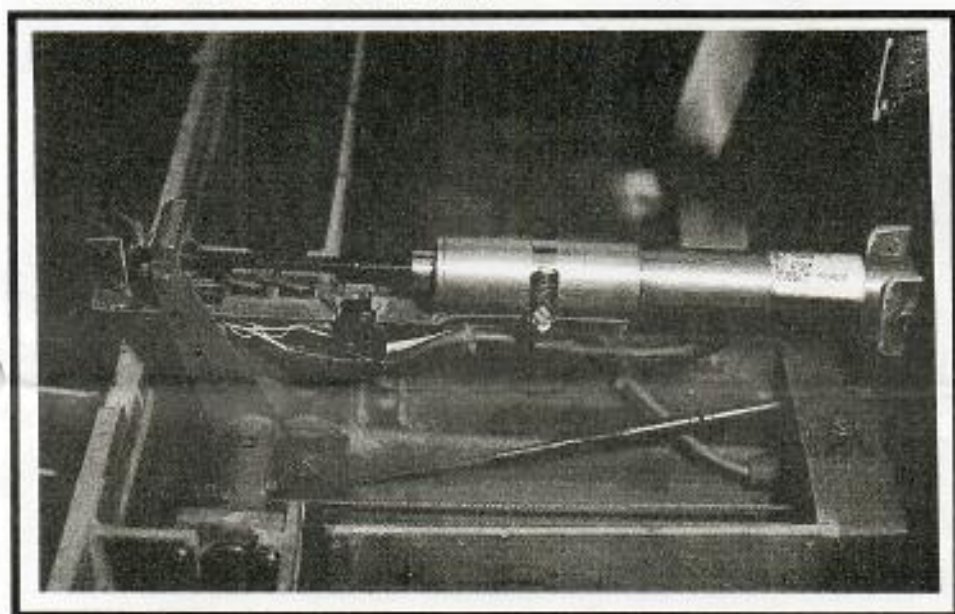
Loading the plane sensibly within the middle of the envelope allows for a optimum "hands-off", four place cross country aircraft that both a Spam Can and Sport Aviation Driver can be thrilled with.

Builders Corner

I did not receive any correspondence from builders this issue in regards to builders' tips or whatever so I'm going to pass on some things I saw while visiting Hardy Huber this month. As again many of you "old timers" might remember, Hardy Huber was one of four builders that Ken Wheeler had targeted back in 1989 to give extra assistance to and to get flying the quickest, (the others were Mike Betts and two builders in Iceland). Well Hardy is finally there. I gave him some time in 540ED the other day and he handled it just fine. Now if only the FAA would come through with his numbers he'll be flying.



Anyway, the following photos give you a look at how first he handled the flap indication, (notice the micro switches under the actuator screw), and secondly how he handled the nose gear fairing attachment.



Hardy Huber was one of four builders that Ken Wheeler had targeted back in 1989 to give extra assistance to and to get flying the quickest.

* * The French Connection * *

Many of you "old time" builders remember Mr. Edmond Maudiere from France. He and his partners have been building their *Express* now for a few years. Recently they instigated a partnership to specifically sell the *Express* in Europe. At the recent R.S.A. show in Moulins they displayed their *Express* and solicited orders (see photo). We at EDI are as excited about their progress as they are themselves as they had over sixty interested parties discuss the potential purchase of the *Express*. Mr. Edmond Saintenoy, one of the partners, tells me that the C.D.N. (certificate de navigabite) effecting the *Express* is currently being evaluated by the D.G.A.C. (French FAA) and is expected to be approved shortly.



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