

EXPRESS LINK

NEWSLETTER



January, 1999 - No.18

DEDICATED TO PROVIDING TECHNICAL INFORMATION OF INTEREST TO EXPRESS BUILDERS AND ENTHUSIASTS

Ed note: The editors have agreed to act as an "unofficial" factory newsletter until such time as there is sufficient staff time available to allow factory staff production. Articles, such as the one that follows, submitted from factory sources, will be identified with an "EXPRESS factory" byline.

Builder Assist Program On Schedule

EXPRESS Factory, December 1998

Builder Assist Program Update

Doug and Molly Hoff have completed week 4 of the new Builder Assist Program, on-site, at the EXPRESS factory in Rochester, WA.

In just 4 short weeks, the Hoff's have completed the construction of their Series 90 wings, rudder, ailerons and horizontal stabilizer. In addition, they have mated the upper and lower fuselage halves together to allow for the interior and firewall forward work to begin! The Hoff's have saved themselves well over 1,000 hours of traditional building time (not to mention adding a year or two of flying time!) by utilizing precision construction tooling and assembly fixtures currently available only through our new Builder Assist Program at the factory.

Con-currently under construction by the AeroCenter in Puyallup, WA, the Hoff's custom, deluxe instrument panel will

Take a peek at:

Factory News	2
"Oshkosh West"	2
Flap Actuator Alert	3
Strings Too Short To Save	3
Cowl Mounted Taxi Lights	4
More On The Door	5
Solve Your Pitot/Static Plumbing.	6
Folding Seats	7
Readers Response	6
Retractable Flies	8
EXPRESS Stuff For Sale	10
EXPRESS Apparel	11

boast full IFR instrumentation including dual comms, nav, an Apollo IFR moving map GPS, VM-1000 Engine Monitoring System and an S-Tec System 50, 2-axis autopilot!

In addition, the Hoff's are currently finalizing the selection of a custom paint scheme and colors to add that special finishing touch to their completed aircraft.

EXPRESS Aircraft Co. has been contracted by the Hoff's to complete the interior and firewall forward work (engine, accessories, etc.). Both Doug and Molly should be back to do the final inspection sometime in January of 1999, and start the mandatory flight testing shortly thereafter.

In addition, Doug has completed 15 hours of dual instruction in the EXPRESS factory demonstrator (N90ED) and has mastered flying the EXPRESS to the point of being ready to solo! Considering that Doug has never flown before, this is a tribute to both his learning abilities and the EXPRESS' exceptional flying qualities! Doug and Molly have set the realistic goal of finishing their Series 90 EXPRESS by early 1999 in order to fly it to both the Sun-N-Fun and Oshkosh fly-ins. We're excited to have their beautiful plane on-hand for both of those shows!

If you're planning on attending the Sun-N-Fun and/or Oshkosh fly-ins in 1999, be sure to stop by the EXPRESS Aircraft Co. booth and see the Hoff's beautifully finished EXPRESS for yourself! In addition, be sure to check out the EXPRESS Aircraft Co. website at www.express-aircraft.com for pictures and and continuing updated progress report on their aircraft in the next week or so.

RG EXPRESS To Be Introduced In 1999!

In response to incredible builder interest and demand, EXPRESS Aircraft Company announces that a retractable gear (RG) version of both the EXPRESS CT and Series 90 will be available by mid 1999!!! While no specific details are available to publish as of yet, all early analysis indicate that the retractable gear system is easily adaptable to the existing EXPRESS wing, so no major retooling or wing design revisions

(Continued on page 2)



Factory News

(Continued from page 1)

will be necessary. In addition, the retractable gear will significantly increase the already impressive cruise performance of the **EXPRESS** aircraft, thus making the overall performance package even more attractive to future builders. Additional detailed information will be available as soon as the production engineering and system analysis are completed and finalized.

EXPRESS Apparel Now

Available On-Line!

High quality embroidered **EXPRESS** apparel is now available on-line at the **EXPRESS** website!

Whether you're looking for a new golf hat, comfortable jacket, T-shirt or an attractive polo shirt, why not treat yourself to some of the quality manufactured and attractive **EXPRESS** apparel now available from The Final Touch Embroidery Co. All items feature the **EXPRESS** logo, model(CT or Series 90) and your choice of custom embroidery (name, N-number, etc.) in a variety of different colors and sizes. Check out the ordering information on page 11, and order your next hat, jacket or shirt today!

New Info Pack And Video Ready!

They say that a picture is worth a thousand words.... so how many would a 15 minute video be worth????

For only \$25.00 (US funds), you can experience the beautiful **EXPRESS** in action by ordering one of our detailed informational packets - complete with a 15 minute VHS video highlighting the exceptional flying qualities of the **EXPRESS**! The new info pack provides detailed information on the complete **EXPRESS** line of composite aircraft, and includes both construction and performance specifications as well.

Telephone orders are accepted Monday-Friday 8am - 5pm PST, or 24 hours a day via our website. Visa, MasterCard and on-line checks are gladly accepted. To order call (360)273-8907



Contact The Factory:

All factory administrative, engineering and manufacturing activities are now consolidated in Rochester, WA.

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Larry Olsen - Operations Manager
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More Web EXPRESS Info!

If you have not already found the "**EXPRESS BUILDERS HELP PAGE**" on the internet, let me introduce you. Visit the URL:

<http://www.sierratel.com/jerico/>

Jerry Sjostrand has installed a web page specifically for **EXPRESS** builders. Not only will you find a great picture of Jerry's award winner, but some interesting articles from Jerry and other builders, "hot links" to other pages of interest, as well as a link to Jerry's E-mail address, which is:

jerico@sierratel.com.

Information of specific interest to builders can be exchanged between builders. There is some very interesting information and perhaps some questions you might be able to answer.

You can also ask questions in this venue and take advantage of some of the "expert" **EXPRESS** builders who may be able to solve your particular problem.

Jerry's page is in addition to the "official" **EXPRESS** Aircraft home page. Check it out!



Golden West Regional E.A.A. Fly-In

The former Castle AFB in Atwater, CA was the site of the first annual EAA Golden West Regional fly-in on September 25th, 26th and 27th. Generally good weather prevailed and while the overall attendance was not what the sponsors had expected, as bad weather from Merced north prevented many Northern California, Oregon and Washington based enthusiasts from flying in, a large crowd of spectators and "tire kickers" was on hand.

In fact the bad weather prevented Irita and Dennis Warner from flying, but they did make the extra effort to drive down from Nevada City.

The factory airplane with Larry Olsen, factory pilot John Klenke, and Chris Michaelak, who is the newest fact at the factory, aboard, arrived from Washington before the storm and were on hand all three days for attendees to "try on", which many did. Several parties expressed a sincere interest in the kit and particularly the Factory supported Builder Assist program. Shown in the Photo on page 3 is the factory Series 90 airplane on the left, Jerry Sjostrand's CT version on the right, with the Velocity tent in the background. (See article on page 7- Folding seats) Also next door, on the opposite side from Velocity, was a partially completed **EXPRESS** CT kit displayed for sale by Tom and Judy Carrillo, who live less than 5 miles from the site of the fly-in. Their kit provided an interesting contrast to the factory airplane and Jerry Sjostrand's example which was on hand on Friday. Jerry was on hand all three days to answer questions. On Saturday he also brought a banner he had made for the **EXPRESS** tent.

Other builders, in addition to your editor, who stopped by, included Shawn and Nadine Kelly from San Jose, and Jim Ward, also from San Jose. (I may have forgotten some)



Your EDI Flap Actuator Will Fail - The Only Question is When!

If you do not have access to Jerry Sjostrand's **EXPRESS Builders Help Page**, you may not be aware of the following critical information which was furnished by builder Joe Polsgrove.

I noticed in issue No. 17 of the **EXPRESS Link** on page 10, an article by Reinhard Metz about the flap actuator supplied by EDI part 111-22-006-01. I made a mental note, but did not evaluate my actuator as it had been working OK for over two years.

That is now history. My failure mode was not as might be anticipated. The motor threw a brush (which is a piece of carbon bonded to a copper strap), and the strap then rode on the commutator for a few revolutions until the strap and commutator were mutually destroyed by arcing. After removing the unit, I opened it up and found that the so-called motor was almost identical to ones sold by Radio-Shack for approximately three dollars.

"...I don't believe anyone should fly with this actuator. At the very least every E.D.I. furnished unit should be critically inspected before your next flight!"

BUT WAIT! This is not the real problem!

When I disassembled the actuator, it became apparent that the gearbox and motor had been lifted from a cordless screwdriver which was designed to run on much less than 12 volts.

BUT WAIT! It gets worse!

The push force (flaps down) can easily exceed 300 pounds, dependent on air-

speed, and the entire load, at least on my unit, was dependent on ribbon of hot melt glue which was the only method of capture holding the gearbox/motor in that force direction. I cannot say if my unit is only a prototype, but if all of these units which E.D.I. furnished are the same in the field, there is cause for real concern. If the glue should fail, and it will as soon as the aluminum and gearbox mystery metal corrosion lifts the bond, or the temperature rises melting the glue, the flaps may flutter, possibly leading to serious consequences. In the flaps up condition, the gearbox is constrained by the nosepiece and some rather small roll pins.

At a later date:

Only this morning I noticed a Black and Decker cordless screwdriver (model SD2000) in my Dad's shop. I found the gearbox to be identical to the flap drive unit, as is the motor made by Johnson Electronics.

The unit is designed to run on three nicad batteries at 3.6 volts!!!!

These units are certain to fail on 12 volts which is actually closer to 14 volts with the alternator running. The intermittent use of the actuator is the only savior of the motor by allowing it to cool between uses.

Any questions or comments, contact Joe at: @BGEXPRESS@MCI2000.COM or Telephone: (606)293-5071

Strings Too Short To Save!

...real and unconfirmed news and rumors of interest to **EXPRESS** voyeurs!

Donna Hockett has sold the CT kit partially finished by her husband Bob before his untimely accident to **Lazlo Zamolyi** who has transported it to his home in Bath, PA. Lazlo did extensive research at the factory, visited CBROS and inspected other partially finished projects before deciding to purchase the Hockett project. Lazlo has scheduled completion in two years or less.

Bob Gisburne experienced a progressive failure of his right inboard landing gear bracket, and then his left inboard landing gear bracket on his recently rebuilt main gear legs. If it weren't for bad luck, we fear that Bob would have no luck at all. More details as they become available.

Bob Pailca is currently flying his Series 90 retractable (N 987 ME) example. He says that he is well satisfied with the landing gear system and is happier with the overall performance since he has converted his CT tail to a Series 90 configuration. More details on page 8 in this issue.

We understand that **Glen Parks** of Elysberg, PA had an unfortunate accident in which his completed **EXPRESS** was lost in a hangar fire which did not originate in his hangar, but next door and spread to his hangar before it could be extinguished. We cannot imagine such a loss in our lives. Our deepest sympathy to Glen.

John Kee of Rock Hill, SC, reports that he has taxied his tailwheel equipped model successfully and is currently concentrating on finishing his cowling which is the only major item left on his check list. John reported that he experienced some vibration in the landing gear system and plans to check into this anomaly in the near future. That makes three tail wheel models being readied that we know of. The other two include **Dave Smith** of Los Altos Hills, CA, and **Bruce Newlan** from Napa, CA, who has moved his project to a hangar at the **Petaluma** airport.

Bob Kazmierczak of Bonita Springs, FL or Lodi, WS, depending on the time of the year, has also successfully

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Below: Left, the factory Series 90 airplane at the Golden West Regional Fly-in, with Jerry Sjostrand's CT example right.



Cowl Mounted Landing/Taxi Lights

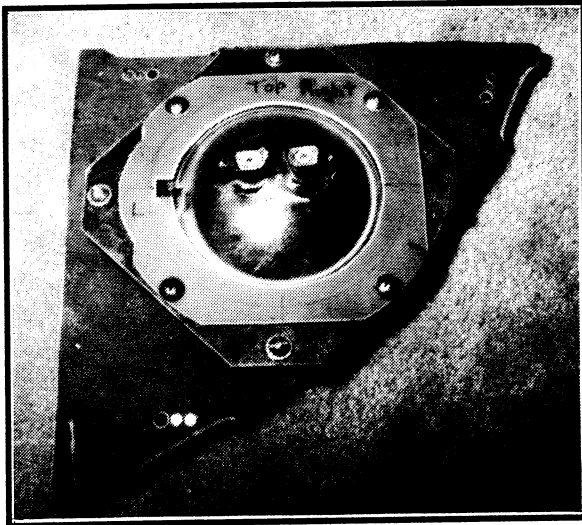
Submitted by Reinhart Metz

After seeing Ed Bernard's approach to lights in the cowl, I decided that was the cat's meow, so here's the technique for creating them. There are two parts: Light mounting and window inserts. Both are pictured below.

Light mounting:

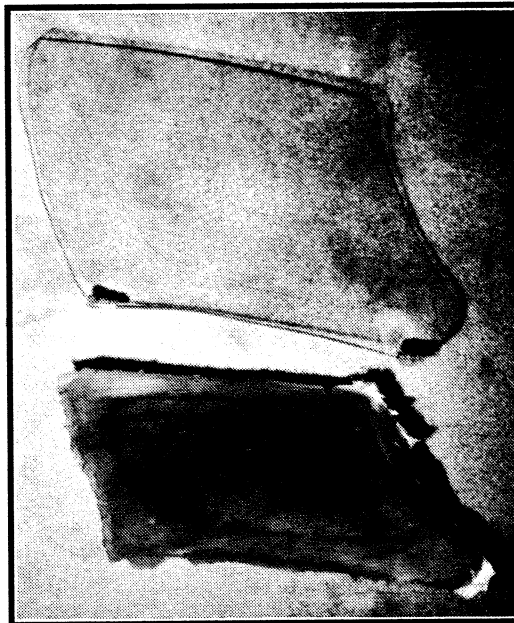
A triangular shape plate is made to match three tabs glassed into the lower cowl, attached with nuts on the plate. The plate has a hole for a 4519 light, which is mounted in another smaller plate, which in turn is attached to the carrier plate with three mounting screws, spaced with springs, as the mechanism for two-axis adjustment. The light is secured onto the smaller plate with a ring that was fashioned over a foam mold made to match the contour of the 4519 light.

Below: Triangular mounting plate, front view



Window and plexiglass molding process:

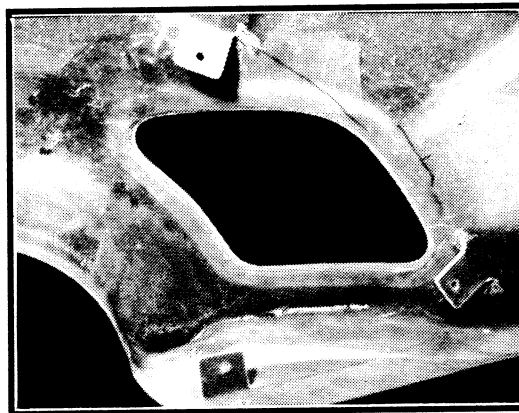
The job here is to make a piece of plexiglass shaped exactly like the cowl in the area of the window inserts. But first a few words about the choice of material, plexiglass vs. Lexan. I used Lexan because it is stronger and virtually unbreakable, but in retrospect I actually think plexiglass would have been a better choice. The Wheeler supplied windows are plexiglass, which is much less susceptible to attack by solvents than Lexan. Acetone, toluene, and most other common solvents will wreck havoc with Lexan.



Above: Top - formed plexiglass lens. Bottom - Completed mold

The first step is to mark on the cowl the outline of what will be the cutout for the window. Then, to make this area releasable, I use silicone grease smeared on in a thin layer. Then, cover the area, extending about two inches outside the marked boundary, with four or five layers of glass. You can use all kinds of scraps for this, as the structural integrity is of no concern. When the glass is set, do not remove it, but rather cover it with a "stiffener" of about one inch thick plaster of Paris. This completes the mold, which, when hardened, can be pried off the cowl.

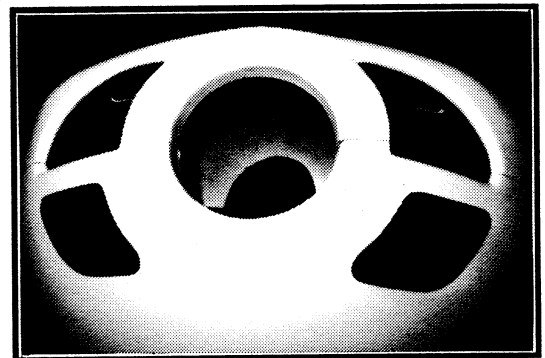
Below "Window" cut into lower cowl with mounting tabs in place



Next, cut out the window outline very carefully, and chamfer the hole from the back side over about a 1/2 inch back from the cutout.

Cut the plexiglass stock to roughly the size of the total mold. Cover the mold with felt. Now, hang the plexiglass piece, held by a pair of spring paper clips, in a 225 degree F. pre-heated oven. Remove after 15 minutes, and lay into the mold, remove the clips, pressing down lightly using an oven mitt. It doesn't take much - the plexiglass gets nice and soft and conforms easily. Let cool. Plan on doing a trial piece for starters to develop the technique.

Now, trim to remove any material that does not follow the mold, and hold the piece inside the cowl in the position that best conforms to the cowl in the area. From the outside, mark the outline of the hole. Cut the plexiglass one half inch larger than the hole, and chamfer to match the hole in the cowl. When good conformance is achieved, cabosil/resin in place, just like the windows, and glass over inside with three layers of glass. Fill and finish details on outside as needed.



Above: Finished, from the outside



More On "The Door"...

The baggage door article in X-Link No. 17 concerned itself with construction of the door itself. In this issue we will cover hinging and mechanics.

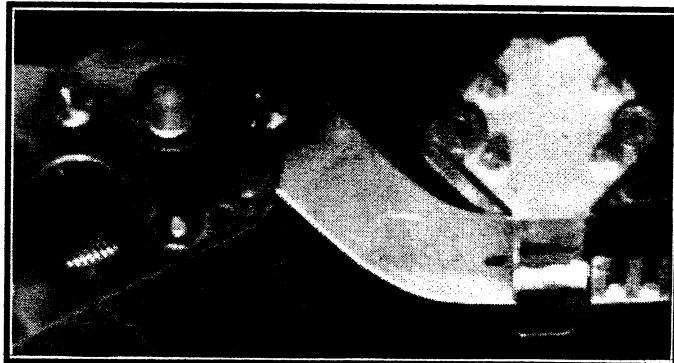
Recalling from issue No. 16 that the perimeter of the door and the "hole" in the fuselage had been "finished" with a bead of mill fiber/cabosil mixture about 1/2 inch deep.

At the locations you have marked for the hinges - try to locate the hinges in the straight part of the upper side of the door - proceed to remove enough mill fiber/cabosil and foam to form pockets for the hinges in the door and fuselage. Since you will find that the hinges are slightly thicker than the door and fuselage section, cutting through the inside skin vertically at the edges of the hinges will allow them to offset slightly to the inside, preserving the line of the outside skin and making the exterior finishing easier. The hinges used are called pocket hinges and are manufactured by SOSS. There are other manufacturers who make this type of hinge, but we recommend that you do not use a substitute. If builders cannot find the correct hinges locally, contact CBROS for additional information. The pockets should be somewhat larger than the hinges to allow the potting process to form a cavity on all sides of the hinge. When the pockets have been cleaned out, it is time to choose whether you will use the Sjostrand or CBROS method of installing fasteners. Jerry chose to use 1 1/4 in Flathead wood screws inserted during the potting process. CBROS used two threaded inserts on each of the No. 8 Flathead screws also inserted in the potting process. We offer

one additional option. With enough material in the area of the screws the mill fiber/cabosil filler could be tapped for either wood or standard Flathead screws. Either way, choose your screws and apply grease or Vaseline on half of the hinges and after filling the pockets in either the door or fuselage (we didn't have the nerve to try all four pockets at once) with mill fiber/cabosil mixture to ensure that the entire cavity will be filled after the hinge is inserted, check the operating direction and insert the hinges. Unless you did all four pockets at once, do the remaining two in the same manner.

With the hinges in place the next step is to install the pins and sleeves which will secure the door in the closed position. The sleeves should be located equidistant and parallel to the bottom line of the door, about four inches up from the bottom. Before securing any of the sleeves, align each pair as accurately as possible. Locating the sleeves in the door will require the removal of some of the inside skin and foam core. (See photo No. 1 on page 8, issue 17) Install the sleeves after thoroughly cleaning the outside and applying release material to the pins, which will be inserted to align the sleeves in their final position. Applying mill fiber/cabosil mixture, pressing the sleeves in place and inserting the pins to a position which will insure close alignment of the sleeves in the door and the sleeves in the fuselage, will finish this procedure.

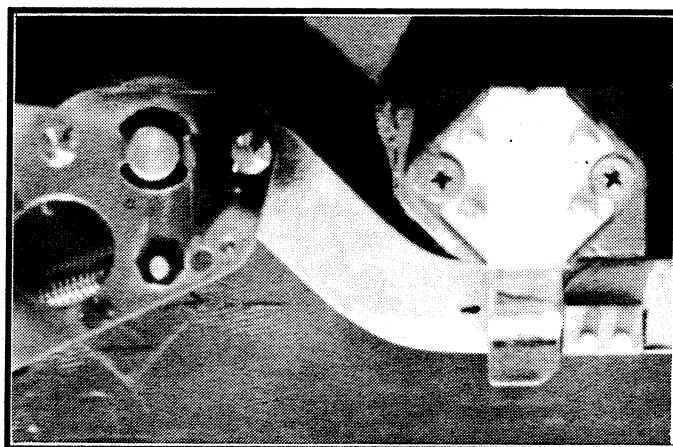
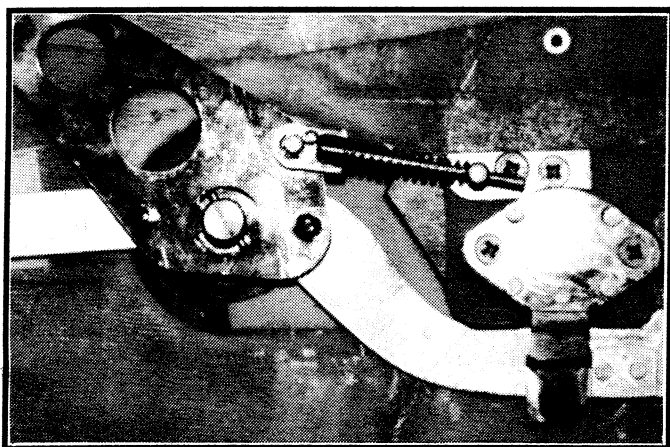
Next, using the door latch parts which you got from Stoddard Hamilton, - you did get your parts didn't you? - follow the S/H directions and install the main carrier and carefully finish the cutout for the handle. At this point you will need to make another decision (actually, we hope you have read the entire series of articles before you started and have decided to use a left hand or right hand inside handle. Either can be used, but using the left-hand model per Sjostrand will require the relocation of the over center pin and one of the drive pins in the handle. (See Photo below)



The CBROS inside handle is opposite hand and can be used without modification to the pins but will require that the shaft of the handle be drilled to relocate the outside handle drive pin. The difference in orientation is apparent in photos at the bottom of the page, by observing the position of the inside handle. In both photos the bottom of the doors is toward the bottom of the photo and both are locked.

The triangular shaped object in the photos is a standard drawer lockset which

(Continued on page 6)



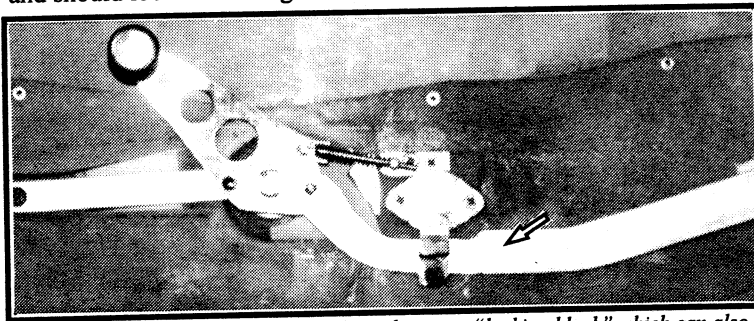
Above: Left, CBROS latch, right, Sjostrand latch, both in the locked position - bottom of door @ bottom of photos. Note difference in orientation of the door handle.

More On "The Door"...

(Continued from page 5)

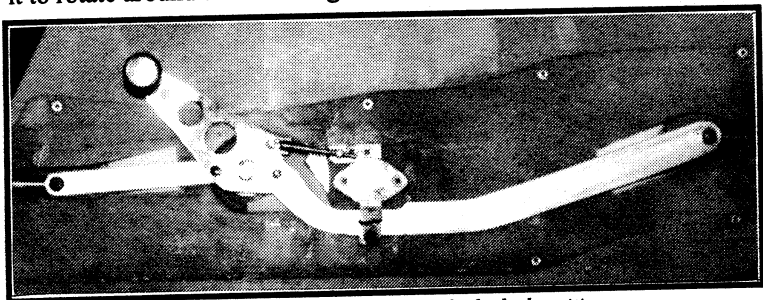
should be available at any good hardware store. Your next job is to mount the lockset so that it is flush with the outside of the pocket which will be left around the door handle and behind the outside door handle when in the closed position. We used a scrap of one of the spar blocks to fill most of the area and drilled an appropriate sized hole to locate the lockset. The exposed G-10 was counter bored and tapped to fasten the drilled post that captures the over center pin and spring. To prepare the lockset so that it can be used to actually lock the system, the tang of the lockset must be extended down and offset toward the door. The aft corner must be trimmed at a 45 deg. angle to allow the arm to clear the tang as it operates between the open and closed positions. Jerry provided us with a modified tang so that all we had to do was reassemble the lockset using drive rivets.

With the handle and lockset in place, proceed to fabricate the arms which drive the pins. The forward arm which will be furnished with your S/H door hardware, can be used without modification if the handle is located in the same place as our two examples are. The aft arm should be fabricated from 0.125 aluminum and should look something like the one in the photo, below.



Above: Aft actuating arm. Arrow points to aluminum "locking block" which can also be seen in the photos on page 5

Of particular interest is the small rectangular piece of 1/8th inch thick aluminum, riveted to the arm, in a position which will allow it to rotate around the lock tang.



Above: The completed mechanism shown here in the locked position

Now all that's left is to construct cover for the mechanism using the standard foam/glass techniques and installing the micro switch for the door open alarm.

CBROS can furnish templates and dimensions for the door cutout, hinge locations, pin and sleeve locations and aft arm configuration for the price of reproduction and postage.



...Strings

(Continued from page 3)

flown his Auriga example. Haven't heard directly from Bob, but understand test flights went without incident.

John Green of Watsonville, CA should have taxied and possibly flown his CT version by the time you read this.

Visitors to the CBROS site have included Lazlo Zamolyi, Tom Carrillo, from Atwater, CA, Nev Currey from Australia, Dennis and Irita Warner from Nevada City, CA, and, of course, Jerry, "Chainsaw" Sjostrand, who was welcomed, without his tool of choice.

The Solution To Your Static/Pitot and Brake Reservoir Plumbing Problems

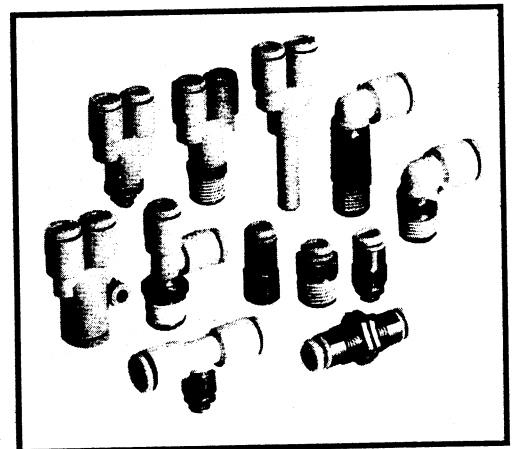
CBROS has stumbled onto a really slick system which can be used to install your static/pitot system and could also be used on the un-pressured side of the hydraulic brake system. The fittings, as illustrated below, are called "One Touch" and are installed by simply pushing the correct diameter flexible nylon tubing into the fitting. That's all there is to it, and your system is good for a pressure of up to 145 psi, or a vacuum up to 1.3KPa (whatever that is). The fittings are easily removed by pressing on the collar and pulling on the tube, and are reusable. Tubing sizes that can be used are 1/8, 5/32, and 1/4 inches. We prefer the "plyable" nylon tubing which can be ordered from the same source. We have soaked the tubing in brake fluid for several weeks with no apparent effect.

As shown in the photo below, there is a fitting for every use, including screwing into the back of the flight instruments.

They are pricey at an average of about \$3.00 each, and the source we ordered from in San Jose asked for a minimum order of 10 of each type, but we think they are well worth the cost.

There are dealers in many areas of the U.S. Their main office address is: SMC Pneumatics and is located in Indianapolis, IN, Phone: (317)899-4440, Fax: (317)899-3102. Get their catalog, you will be amazed! and delighted.

Right: Just some of the different types of "one touch" fittings available from SMC.



Folding Seats - The Answer!

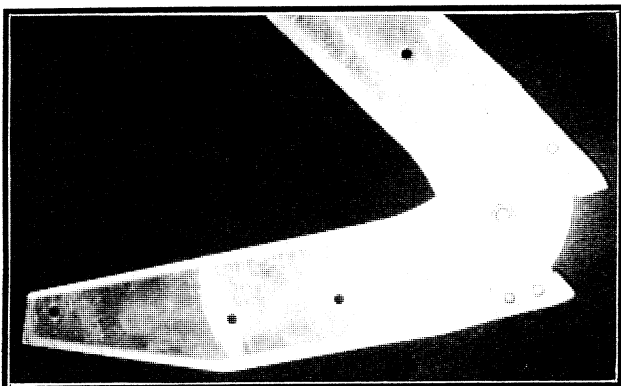
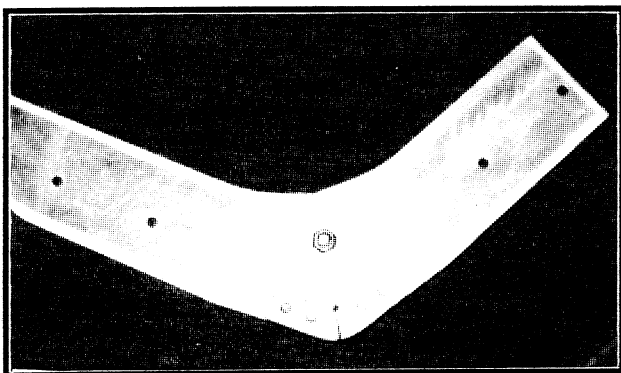
Many builders have thought about, and discussed, constructing a hinged seat back for the right front seat. The idea is to make loading and unloading passengers and baggage etc., easier and more convenient. Builder Joel Biggs had completed modifying his seat some time back and we have sent drawings of the mechanism as furnished by Joe to several builders.

Now we may have discovered the ultimate seat hinge. Shawn and Nadine Kelly from San Jose, CA made good use of their visit to the Golden West Regional Fly In held at Castle Airport in Merced, CA. While it may sound like heresy, they took the opportunity to visit the Velocity booth which happened to be next to the *EXPRESS* display. What they came away with was the information that the hinges developed for the Velocity will readily adapt to *EXPRESS* seats and can be purchased for a reasonable price from Velocity.

Shown in photo below is the Velocity hinge in the open position, left, and folded, right. Bolted into place, they look strong enough to take the beating that the right front seat invariably does. They could also be useful for one, or both rear seats.

The Kelly's went even further in their search for the "perfect" seat. They also purchased four pre-molded seat forms from Velocity shown in the photo at the bottom, from the front of the AC. The Velocity seat forms, while not the answer for everyone, certainly simplify the seat construction process.

Perhaps the factory should look at pre-molding seats for the *EXPRESS* which would take full advantage of the width of the fuselage, include accommodation for automobile style adjustable front seat rails, perhaps add some style by rounding the upper corners a little and adding a simple headrest design.



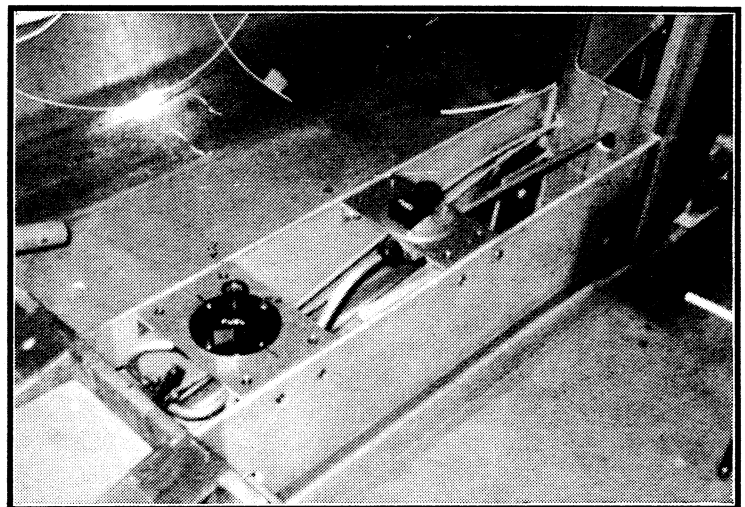
Readers Response

In issue No. 17 we asked readers to send us their solutions to fuel system plumbing and valves systems. Builder John Harlow responded with the picture, below, of his fuel control console and a reference to a 4-way control valve that doesn't cost an arm and a leg (in the neighborhood of \$165). John writes that he had spoken to Andy, of Andair, at Sun-N-Fun this year and learned that Andair could furnish a fuel control valve that could be used with a four tank system. The picture shows the Andair valve mounted in John's console. Any of four tanks can be selected, but there is no provision for a fuel shut off, so a separate on/off valve must be installed for that purpose.

John advises that the Andair valve can be furnished in a 1/2 inch size (part no. FS 25-6) or 3/8 inch size (part no. FS 20-6). John chose the FS 20-6 feeding into the FS 20-2 shut off.

Andair valves can be ordered from Chief Aircraft or Aircraft Spruce. The Andair company can be found on the Web at: <http://www.andair.co.uk>.

Looks like a neat installation. Thanks John!



Reinhart Metz also responded with the following:

Since I am now finally flying, I can say this approach is proven by some experience.

I have the 4-tank configuration - Two mains, and two auxes. For the most part, my wing plumbing is Wheeler stock. (Just don't forget if you installed the Continental vents for the future, and have a Lycoming, you need to plug them well.)

For me the biggest issue was not having to second mortgage my home to buy the fuel selector. The catalog market for selectors only goes up to three port models. The solution I chose to deal with this is to tie the two aux tanks together and treat them as one, and use a three port selector, which incidentally has a fourth "off" position. The mains are individually selected, and the third port is the T-ed Aux. This

(Continued on page 9)



First Retractable **EXPRESS** Flights Successful !

Bob Pailca Installs Retractable Gear-Changes Tail!

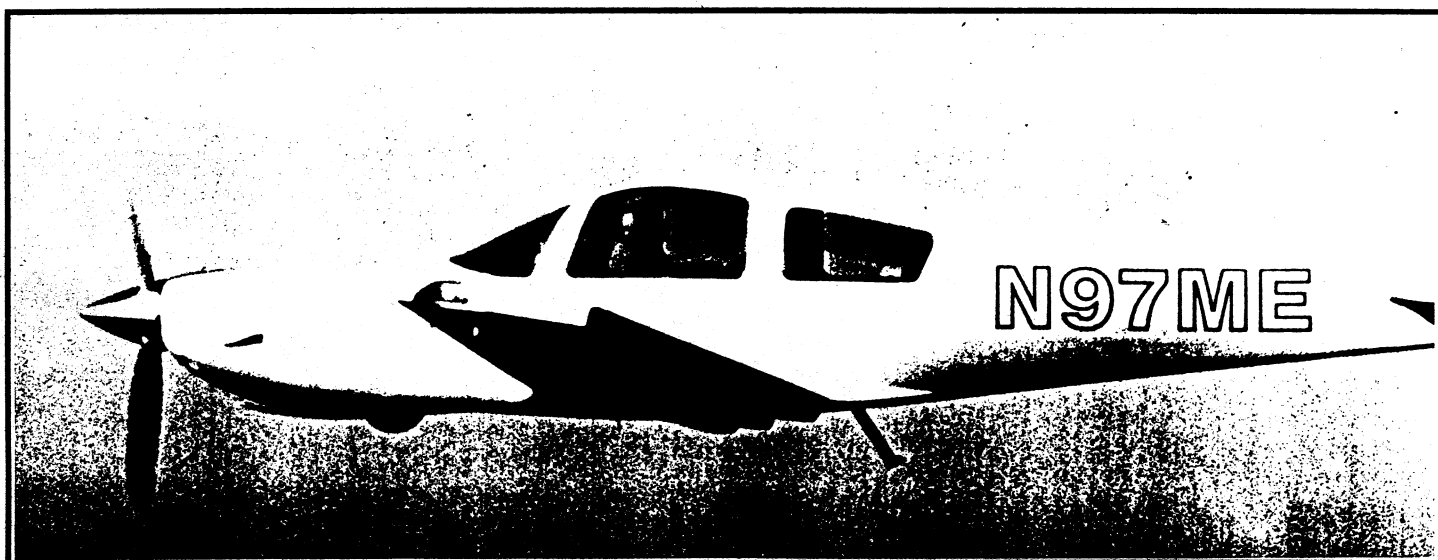
The first ever retractable gear **EX-PRESS** was successfully flown for the first time in November, 1998 as a CT model. Owner/builder Bob Pailca of Tacoma, WA reported that the first flight was "interesting". In level flight the GPS was indicating a ground speed of about 187 knots at 23 squared. The flight was cut short by a low fuel pressure indication (corrected by activating the boost pump), and high-indicated oil pressure reading. No opportunity presented itself during the short flight to explore the slow

was held at 100 MPH and the landing indicated that the "pilot could use some additional training to improve his landing technique ." For both flights the landing gear functioned well except for requiring some adjustment of the micro switches on the up side.

The adverse yaw, coupled with the extreme forward CG, caused enough concern that Bob made a difficult decision before further flight. After a lot of trial and error, including increasing the overall size of the entire tail, which only seemed to weaken the empennage and add unwelcome weight, Bob decided that the only viable solution was to cut the tail off and replace it with a series 90 empennage. Bob reports that it only took an

than with the CT tail, but "nice, just the same."

Load tests have been made up to a gross weight of 3315 lbs with an empty weight of 2200 lbs. The testing was done by increasing the weight incrementally with shot bags up to the max gross, 140 lbs (Bob) in the pilot seat, 200 lbs in the co-pilot seat, 175 lbs in the left rear, 175 lbs in the right rear, and 300 lbs of fuel. With the last weight added in the right rear seat, the CG moved aft to slightly more than 30%MAC. Bob plans to limit the rear seat loading to 300 lbs total for both. Performance at gross weight was "just fine." All hydraulics and the battery are located aft of Bulkhead 162. For those builders who are interested, Bob



flight characteristics due to low weather ceilings. Otherwise the flight was uneventful until, while in the landing pattern, the flaps were lowered while turning base, whereupon Bob experienced a "hard pitch down from which I recovered too late to do anything but execute a go around." The next approach was routine, as the flaps were lowered during straight and level flight on downwind. Bob notes that full up elevator trim was required along with considerable back pressure on the stick to keep the nose where it belonged, which was "not the way to run a railroad." With the weather continuing to limit the flight envelope, the second flight was taken with 150 lbs. of sandbags against the rear bulkhead, which allowed rotation at 85 MPH and a much easier handling aircraft. The approach speed

hour to cut the CT tail off and about three months to add the Series 90 version.

According to Bob the first flights with the Series 90 tail showed a dramatic improvement in flight characteristics. Adverse yaw tendencies were substantially diminished, and flap input could be initiated at any point, even in a banked condition. Take off rotation changed to what could be described as normal at 80 to 85 MPH with neutral elevator trim and 15 to 20 degrees of flap. Retracting the gear results in a slight pitch up that is of no consequence. As this is written the aircraft has been primed, but not been painted, and Bob reports cruise speeds in the 220 to 230 MPH range with power settings at 2350 to 2400 squared, indicating that the aircraft is somewhat slower

sent the weight and balance sheet for the empty aircraft. I can forward a copy to anyone who requests it.

Bob has made more than 75 landings and, with the exception of some adjustments to the hydraulic pressure to keep the main gear tucked in, in the up position, no other problems have been encountered with the landing gear system(s). Bob has also made some modifications to the main gear attach fittings, and says "the oleos work fine and are easily adjusted"

Being still plagued by low fuel pressure problems, Bob has tried several fixes, none of which have solved the problem and has become convinced that the problem is caused by fuel lines being too small. Apparently this problem is related to his use of an IO-540, K1G5 300

(Continued on page 9)



Reader Response

(Continued from page 7)

raises the question of what happens if one aux is emptied first, and the fuel system starts to suck air. So far, my experience has been that the tanks cross feed and the level stays the same in both and they run out together. Of course, if you fly around in tight left circles, this won't work. Other than that, a picture of the straight forward plumbing, housed in a center console, is shown here below.



Finally, my A&P friend gave me a piece of advice that I respect when he saw the auto racing fuel filter I had installed between the boost pump and engine driven pump, as an added "safety". He said, "geet that thing outta there!" In other words, only necessary stuff in the fuel flow - there's already a screen in the gascolator and fuel servo: That's enough. Anything else adds blockage or leakage risk. The others are tried and proven.

One more recently gained piece of info concerning the fuel boost pump. If you are using a Weldon pump, they are notorious for leaking with age, and last only about 120 hrs. (pump operating time). They have a new series that has infinitely better seals, last over 1000 Hrs., and you can rebuild them yourself. The 12 volt version is part number D8100E. You can get one from Stoddard-Hamilton.

Ed Note:

CBROS also has elected to use a fuel system that plumbs the outboard tanks together and the inboard tanks together. The lines come together in the center console and are controlled by two separate on/off valves.

In practice, both valves will be in the on position for take off and climb, allowing fuel flow from any/all of the four tanks. Once in cruise, the outboard tank(s) will be used until nearly empty (timed) and the mains turned on and the outboards turned off. Entering the pattern both valves will be turned on, allowing access to all useable fuel. It is expected that fuel in both the inboard and outboard tanks will find a common level (assuming level flight) and will burn off more or less evenly. We shall see!

Your Editor thanks both John Harlow and Reinhart Metz for their input on fuel system plumbing. Hope that we helped shed some light on the subject for those still facing making a decision.

Next issue subject: The console between the front seats and the nose gear support. Show and tell us how you did it!

If you have a subject you would like to have covered, let us know.

...Retract Flies

(Continued from page 8)

HP engine. He recommends that future builders might want to consider using 3/8 inch lines or, if it is too late for such a fix, shop for a vane type boost pump and avoid as many 90 degree bend in the lines as possible.

Bob says that he has solved the oil temp problems and will be happy to share his solutions with anyone who will be using the same engine. Bob notes that while the engine is a real performer, its potential with a supercharger would be the ultimate.

Overall, Bob reports that while he liked the CT configuration, the change to the Series 90 tail was well worth the trouble. He plans to disassemble the landing gear after 50 hours, or approximately 150 landings to insure that everything is working as required. He has had three sets of gear fabricated that have a straight trunnion which allows the main gear to rake forward at 10 degrees rather than 18 degrees and also has a set of wings in which he can install his retract system for resale for \$12,000 the pair, complete.

Bob can be reached at 14302 11th Ave, Tacoma, WA 98444, Tele:253-841-9557.

Ed Note: We are aware that Bob has sold a set of main gear components to Jeff Miller from Fremont, CA and that Jeff has been working on the installation for several months. Perhaps we can get him to report his progress in the next issue. Also we want to thank Bob Pailca for his time and effort in preparing this excellent report.

New Listing! FOR SALE:

All parts for CT kits 1 to 5. Wings 85% complete in the 92 gal configuration fitted with SkySport fuel monitoring system. Additional parts include Whelen Strobe kit, dual power supply, Nav/Com with Glide slope, marker beacon antenna kit. All manuals are up to date.

Asking \$25,000

Bob Rusteberg

153 Algonquin Road

Barrington Hills, IL 60010

Phone: 847-428-3630

Fax: 847-427-3677



EXPRESS STUFF FOR SALE:

A STRUCTURALLY COMPLETE SERIES 90 EXPRESS ORIGINALLY INTENDED AS THE EDI, SERIES 90, TURBINE DEMONSTRATOR.

Owner/builder **Ed Watson** is unhappily offering his "extremely" fast build **EXPRESS** kit for sale. Constructed by Ed, under the watchful eye and with the help of **Dick Lind** of Complete Composites, this aircraft provides a new owner with a quick way to a flying, Series 90, **EXPRESS**.

The only significant modification to the original kit design was to include extra reinforcing layers of fiberglass on the leading edges and aft shear webs of the wings. Ed was contemplating the installation of an Allison B-250, with the support of EDI and Allison, as a factory demonstrator. Then EDI quit and Allison was acquired by another company.

All structural components, including control surfaces are complete, with the exception that the rudder has not been closed. Doors and windows have not been installed, but are included in their original packaging. No instrument panel installation has been planned, and no engine or engine mount is included. Also missing is a flap actuator and door hinges, both of which are easy to come by.

Ed is asking \$40K, and actually has more than that invested in kit components, not including the investment of his time.

For more detailed information contact Ed directly at:

7461 Batista Street, San Diego, CA
Tele:(W)(619)291-7311, x1887
(H)(619)277-8818
FAX(619)277-9748

FOR SALE:

IO-540 Engine mount. Manufactured by EDI. Will not fit certain IO-540 models. Call to find out if yours will fit.
John Kee (803)328-3286

EXPRESS PARTS FOR SALE:

Wheeler **EXPRESS** lower fuselage kit, complete and still in the original crate. This kit component, at the bargain price of \$3,500 F.O.B. Bentonville, AR can easily be combined with other kits to complete acquisition of all five component kits.

Talk to: Charlie Scott
Days: (501)273-2471
Eves: (501)273-1232
E-mail: exp159cs@nwa.quik.com

COMPLETE WHEELER EXPRESS CT KIT FEATURING TIO-540 LYCOMING WITH 3HRS SMOH ON A TEST STAND - MAJOR PART OF FIBERGLASS WORK COMPLETED

Doug McMillan's, partially complete CT **EXPRESS** is being offered for sale by his estate.

CBROS is familiar with this particular example as we worked with Doug on the completion and installation of the empennage. We have made a short video tape of the aircraft in Doug's workshop and will loan either an 8mm or VHS copy to anyone seriously interested in purchasing this project.

One of the most unique features of this project is the adaptation of a turbo charged Lycoming 540 C1A, which was overhauled and test run by Larry Olsen at **EXPRESS** Aircraft Technology about two years ago. The engine is available separately, including engine mount, log books and all accessories for \$24,000.

The airframe, which is essentially complete except for the installation of the windows, features good, quality workmanship.

Construction of the wings features the two tank per side option, two wiring conduits per side, capacitance probe type fuel level sensors in the outboard tanks, standard float level senders in the inboard tanks, reinforced main landing gear attachment scheme with steel gear legs, and integral jack points. The engine has been mated with the fuselage, but the firewall is otherwise blank. The nose gear leg features a spindle reinforced by Express Aircraft Technology and has a "shock" system installed. The cowling modifications to allow for the turbo engine have been started.

Miscellaneous additional parts, besides the complete Wheeler hardware and composite part package include a 5 way fuel valve, audio panel and a Rocky Mountain Encoder.

Asking \$50,000 for the complete kit, as is, where is, or \$28,000 for the airframe with all accessories except engine and engine mount.

If the buyer happens to live in close proximity to Morgan Hill, CA, it may be possible to work out an arrangement to use Doug's shop to complete this project.

For additional details contact CBROS Inc, directly at (925)455-1036

FOR SALE:

Two each, Wheeler IO-360 (Lycoming) engine mounts. One is fabricated for use with the larger diameter pucks and one requires the use of the smaller pucks.

Wanted:

Engine mount to fit a Lycoming IO-540-C4B5
Call Ralph Kenner at (509)838-6807

FOR SALE

From Denise Waters

EXPRESS items:

- Set of steel main landing gear
- 4- way, 5 port, fuel valve
- CT empennage construction towers
- Wing tip strobes
- Rochester fuel senders and fuel drains (2ea.)
- Door hinges

Avionics:

- Bose, Series I headset
- PM2000 stereo intercom
- Electronics International EC-1 (EGT/CHT/OAT) with RS-1 remote switch for 4 cylinders.

Call Denise at: (315)699-7826

FOR SALE

Matched set of original Wheeler **EXPRESS** wings. The left is closed out, with complete documentation. The right is still in the crate.

I am unable to complete the project due to financial limitations. Asking \$7,500. Contact Jim Phelps (volunteer builder on Factory No. 3)
12015 246th Street N.E.,
Arlington, WA 98223.
Call (360)435-6845

WANTED:

Need an exhaust system for a Lycoming, IO-360. Stainless steel preferred. Call Jack Volkamer at: (501)443-9191

NEW ITEM

WANTED:

EXPRESS builder Don Adamson (501)676-7529 needs an engine mount and exhaust system for an IO-30 CONTINENTAL. He is also looking for a set of windows for his **EXPRESS** CT. If you have what he needs, call Don at the above number and let him know.

EXPRESS Apparel Price List

- #1 Jersey polo 50% cotton/50% polyester 5.6oz.
Colors: Navy, Ash gray, Red, Royal, Forest Green, Maroon, Black & White.
Sizes: Small - 3XL
\$21 Small - XL \$22.50 XXL \$23.50 3XL
- #2 Jersey polo 50% cotton/50% polyester 5.6oz. with pocket.
Colors: Navy, Ash gray, Red, Royal, Forest Green, Maroon, Black & White.
Sizes: Small - 3XL
\$22 Small XL \$23.50 XXL \$24.50 3XL
- #3 Pique polo 100% cotton 6.5oz
Colors: Navy, Ash gray, Red, Royal, Forest Green, Maroon, Black & White.
Sizes: Small - XXL
\$24 Small - XL \$26 XXL
- #4 Cotton Deluxe Heavy wt. polo 100% cotton 7oz.
Colors: Navy, Ash gray, Red, Forest Green, Maroon, Black & White.
Sizes: Med. - XXL
\$21 Small - XL \$22.50 XXL
- #5 Cotton Deluxe Heavy wt. polo 100% cotton 7oz. with pocket
Colors: Navy, Ash gray, Red, Forest Green, Black & White.
Sizes: Med. - XXL
\$21 Med. XL \$22.50 XXL
- #6 Loftteez T-Shirt Heavy wt. 100% cotton 6oz.
Colors: Navy, Ash gray, Athletic gray, Red, Forest Green, Black & White.
Sizes: Small - 3XL
\$12 Small-XL \$13 XXL \$14.50 3XL
- #7 9oz. Sweat Shirt 50% cotton/50% polyester
Colors: Navy, Ash gray, Red, Royal, Forest Green, Black & White.
Sizes: Small - 3XL
\$21 Small-XL \$22.50 XXL \$23.50 3XL
- #8 Charles River full zip jacket with or w/out hood.
Colors: Navy, Red & Black.
Sizes: Small - 3XL
\$44 Small-XL \$47 XXL \$49 3XL
- #9 Golf cap with leather strap. Colors: Navy & White. \$13.99
#10 Unstructured low profile cap. Colors: Navy, Tan & white. \$13.99

All of the above items include embroidery on left chest (or front of cap) with choice of 3 aircraft styles and N-numbers (if desired).

+++ Please indicate color of embroidery desired when ordering +++

Add \$7 for right chest embroidery (business name or personal name for example)

Shipping - \$4 for first item - \$1.50 for each additional item shipped UPS Ground unless otherwise stated.

Order by :
Telephone: (308)995-8840
Fax: (308)995-8840
e-mail:Sturgis@navix.net

Ask for Suzie at:
Final Touch Embroidery
403 West Avenue
Holdrege, NE 68949

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Documentation: CBROS, Inc. has retained an extensive file of patterns and templates for most procedures. We will be happy to share them with any builder for the cost of copying and postage. If you have a particular need, give us a call at (925) 455-1036 or Fax to (925) 606-7534. E-mail to bnbent@pacbell.net.

Materials/Supplies /Tools Available: CBROS, Inc. can furnish vacuum bag release film, 7781 fiberglass cloth, and self stick window covering, for use on your **EXPRESS** project. We also offer a limited selection of air tools such as angle grinders, together with support supplies which we use. If you are interested in any of the above, call John or Bill at CBROS, Inc. for prices.

Component Construction: CBROS, Inc. is prepared, on a limited basis, 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 rates and scheduling.

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