

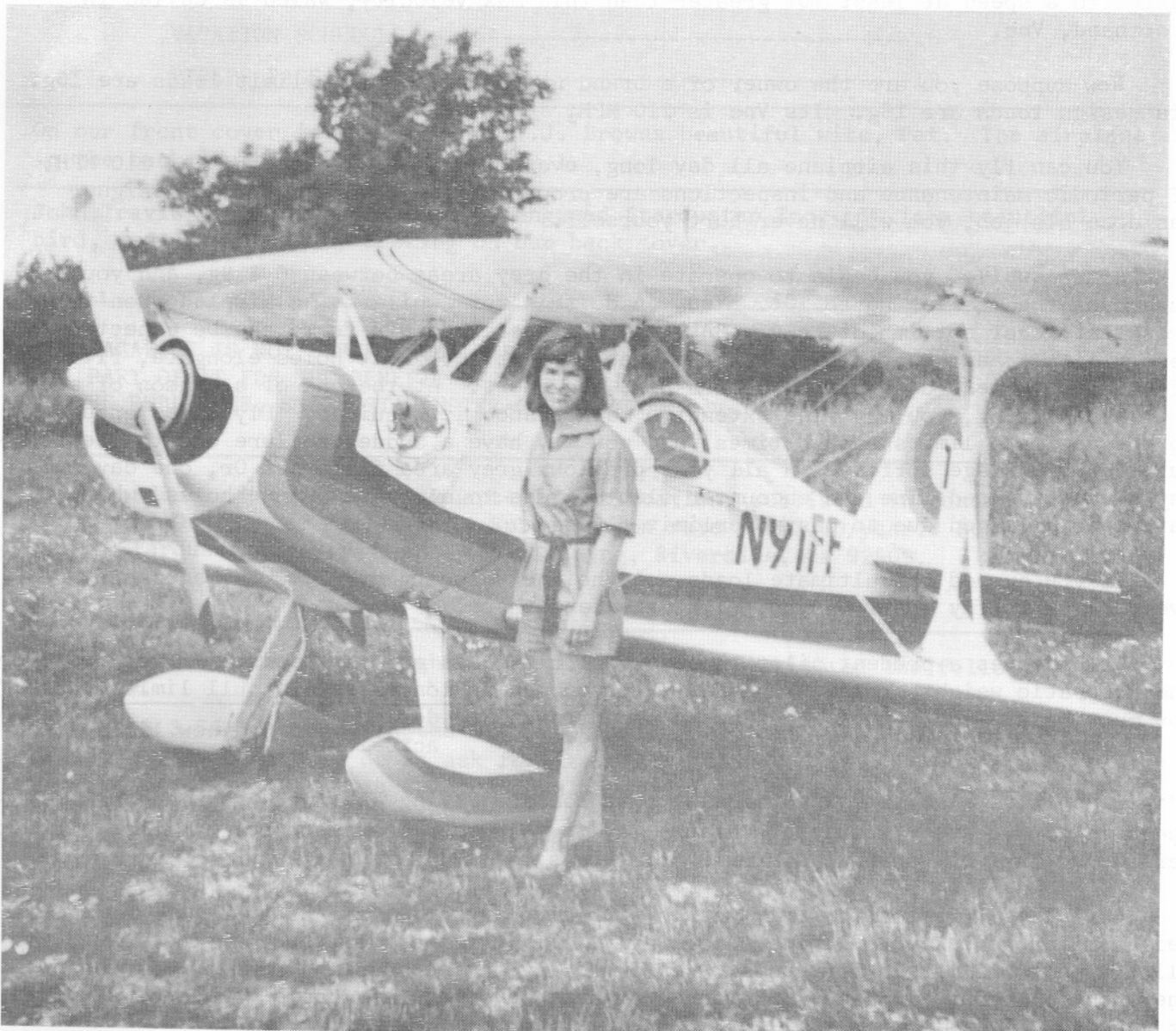
THE

# Starduster

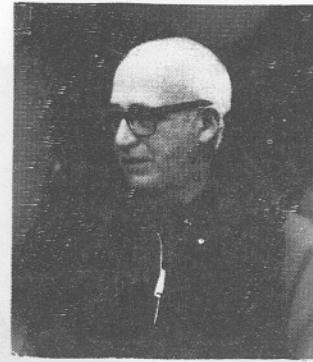
JULY 1976

MAGAZINE

DEDICATED TO THE ACTIVE HOMEBUILDER



PAGE ONE



How to be a widow maker - When an airplane is designed, it is designed to certain strength levels. The largest loads that the aircraft is expected to encounter during its service life are called limit loads. For an aerobatic airplane these are required to be at least plus six times the weight of the airplane at design aerobatic weight, and at least minus four times the aerobatic weight of the airplane. The shorthand notation for this is: limit loads = +6g, -4g. These limit loads are then multiplied by a factor of safety of 1.5. This gives design, or ultimate loads, normally expressed as design loads = +9g, -6g.

In addition to load limits, the aircraft is designed to travel at a max velocity without structural failure, or flutter. During the test program, the airplane is tested to a speed at least 10% greater than this max velocity, which is called in shorthand, Vne.

Now suppose you are the owner of a brand new airplane. Its limit loads are  $\pm 6g$ . Its design loads are  $\pm 9g$ . Its Vne is 210 MPH.

You can fly this airplane all day long, every day at limits of  $\pm 6g$  and 210 MPH. If periodic maintenance and inspections are properly carried out, and the designer has done his job, you will never hurt yourself.

After awhile, you begin to operate in the grey areas between 6 & 9g, and you push over the redline up to 10%. You can do this for awhile. The airplane won't break, at least not immediately. But, in this area, the air frame can be expected to bend a little, and stay bent after the load is removed. Bolt holes elongate, fittings stretch, permanent deformation occurs here and there. At the end of a season of such grey area flying, you may find extensive maintenance is required. Fly close enough to the ultimate limits enough times, and you may have a sudden failure due to the accumulation of damage suffered in all your previous grey area flights. Or, one day, you may exceed the red line and encounter flutter, due to elongated hinge holes, which have been enlarged due to past overlimit flying.

If you exceed the ultimate loads, or the Vne velocity by +10%, the airplane has every right to fly apart on you, right then and there.

It behooves a prudent pilot to observe limit loads and airspeeds. If you are over the acrobatic weight of the airplane, then you can no longer safely pull limit loads. You must reduce your limit loads by an amount equal to  $\frac{\text{design wt}}{\text{actual wt}} \times 6 = \text{new limit load.}$

Old pilots also take into account gust loads. Flying at limit loads and max. air-speed in windy, gusty weather is a sure way to make your insurance co. unhappy. A 30 ft per second gust can push an airframe from +6g's to +12g's in the twinkling of an eye.

Live long. Be smart. Stay within your airplanes limits. Be aware of your gross weights, and adjust your limits accordingly. In gusty weather, stay on the ground, or allow a suitable margin for gusts. Perform daily inspections and regular maintenance. When you sell your airplane, make sure the next buyer has as good a chance of survival as you had.

THE STARDUSTER MAGAZINE - Dedicated to the proposition that the ultimate in sport aircraft was reached with the design & development of the biplane, open cockpit tail dragger-and that everything has been downhill ever since-

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On our front cover is a picture of T.J. Browns beautiful wife, Pat. The airplane in the background is their Acroduster 1.

John Travis has finished his round engined Starduster Too. It is a beautiful bird, as you can see by looking on our back cover.

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The Starduster Magazine is a quarterly publication, published in January, April, July, and October of each year - Subscription rate -- \$5.00/year. Published by Stolp Starduster Corporation. 4301 Twining, Riverside, Ca 92509. Telephone (714) 686-7943

In order to do our bit to fight inflation, we have instituted the following policies.

- 1-We give 3-5# of short lengths of 4130 tubing free, with each substantial tubing order. All you have to do is ask for it. This tubing is primarily suitable for welding practice, although an occasional short piece may be useful in construction. No size selections will be made.
- 2-A 10% discount will be given to customers who walk in & select their tubing themselves from our short lengths rack, provided no cutting is done. If cutting is provided, the regular price will prevail.

## ENGINE MOUNT OFFSET

Recently, we received the following letter.

**VICTOR W. TATELMAN**  
9880 S.W. 88th STREET  
MIAMI, FLORIDA 33176, U.S.A.

June 29, 1976

Mr. Jim Osborne  
Stolp Starduster Corp.,  
4301 Twining - Flabob Airport  
Riverside, Calif. 92509

Dear Jim;

I've taken a photo, enclosed, of the fuselage with the centerline of the firewall lined up with the vertical fin post. You'll note the offset of the engine mount left of center; looks like about 1".

I'm concerned as to whether or not you intend this offset to be as great as it is. Please advise.

You supplied the engine mount for my 200 HP Lycoming, IO-360-11B.

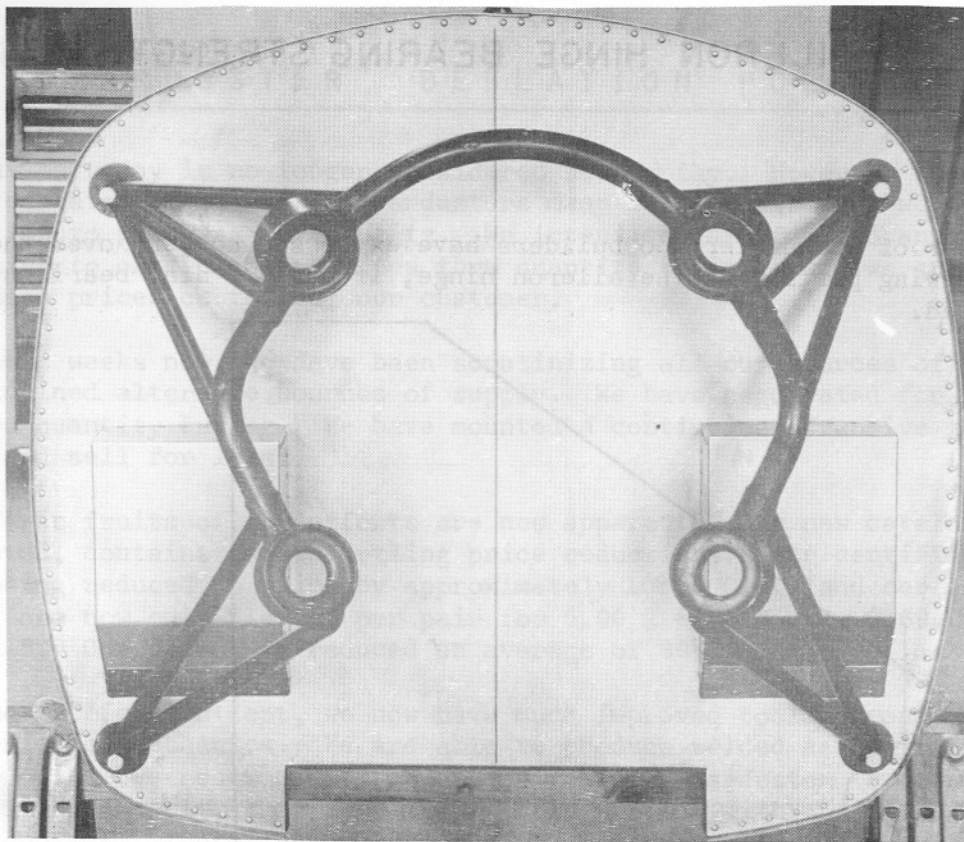
Best regards,

  
Victor W. Tatelman

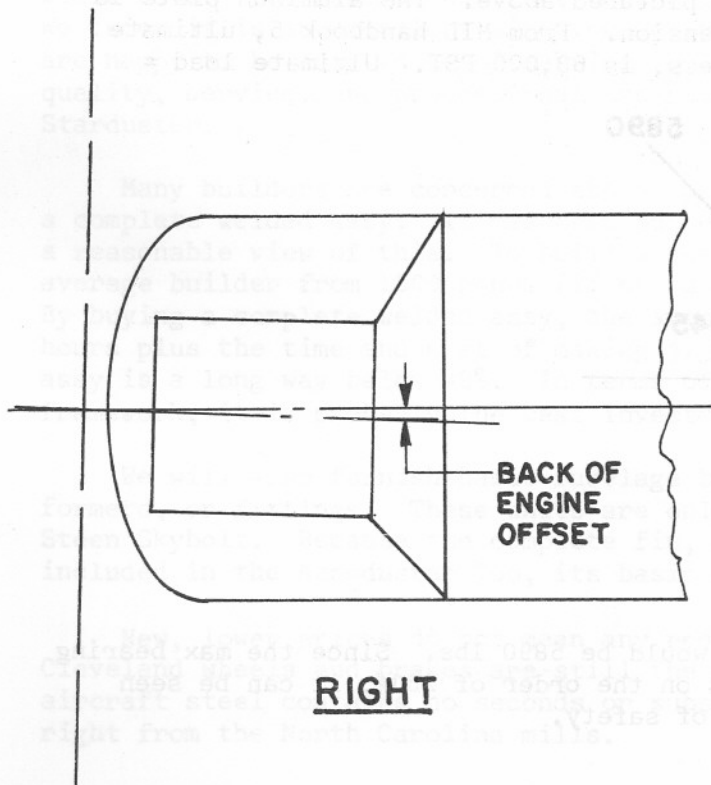
Other builders, from time to time, have expressed concern over this matter. Therefore, we would like to comment, as follows:

In airplanes with sidethrust, the propeller hub is maintained on the airplane center line. The engine is then swung to the left, behind the prop. This moves the back of the engine quite a bit to the left of airplane C.L. See fig. 1.

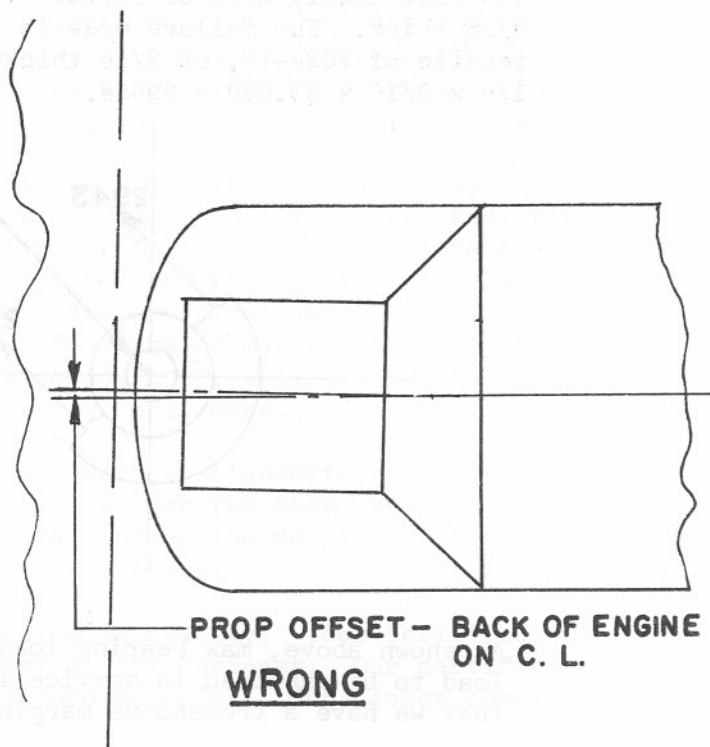
If the back of the engine was held on C.L. and side thrust put in, the prop hub would come out on the R.H. side of the nose bowl. See fig. 2. This not only looks ugly, but imparts a left turning moment which would tend to cancel out the side thrust. We are sure you would prefer your prop shaft on the C.L., and we make our mounts accordingly.



**IF YOUR OFFSET ENGINE MOUNT DOESN'T LOOK LIKE THIS, IT SHOULD!**



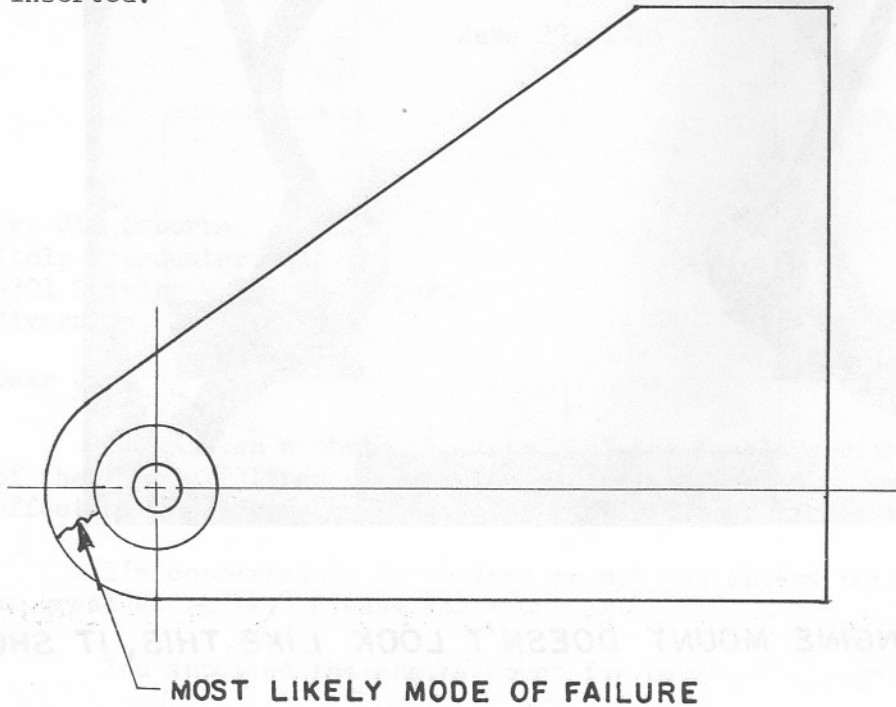
**SKETCH NO. 1**



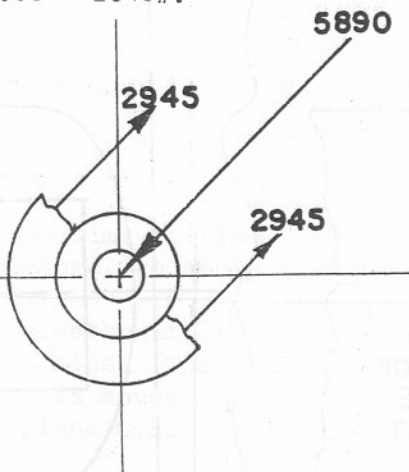
**SKETCH NO. 2**

## AILERON HINGE BEARING STRENGTH

A number of Starduster Too builders have expressed concern over the strength of the wing portion of the aileron hinge, if our 5/8 dia. bearings are inserted.



The most likely mode of failure is pictured above. The aluminum plate is 3/16 thick. The failure mode is tension. From MIL handbook 5, ultimate tensile of 2024-T3, of 3/16 thickness, is 63,000 PSI. Ultimate load =  $1/4 \times 3/16 \times 63,000 = 2945\#$ .



As shown above, max bearing load would be 5890 lbs. Since the max bearing load to be expected in service is on the order of 230#, it can be seen that we have a tremendous margin of safety.

" STARDUSTER " DEFLATION POLICY

Inflation today is no longer considered newsworthy. However, a reduction in prices certainly is. Due to Stardusters many loyal customers, we are now in a position to purchase in quantity. We intend to take full advantage of opportunities to obtain lower prices thru quantity buying. And we are going to pass these prices on to you, our customer.

For some weeks now, we have been scrutinizing all our sources of supply. We have examined alternate sources of supply. We have negotiated for lower prices thru quantity buying. We have mounted a continuing offensive to buy for less, and sell for less.

The first fruits of our efforts are now apparent. Our new catalog, now being printed, contains some startling price reductions. Our certified aircraft steel is being reduced in price by approximately 10%. Cleveland certified wheels and brakes are now only \$149.50 per pair for 6.00 x 6, and only \$169.50 per pair for 5.00 x 5. Our dacron is reduced an average of 30%.

In the fabrication dept, we now have much improved tooling, and more skilled (thru experience) mechanics. We are able to produce welded assemblies, in bunches, at a lower cost. We recommend to anyone building a Starduster Too, an Acroduster Too, or a Steen Skybolt, that they start their project with one of our complete welded assemblies. These assemblies consist of the fuselage, with all standoffs, formers, brackets and fittings, controls, complete tail with streamline braces, landing gear, and cabane struts. The price for one of these professional assemblies is a low low \$2950.00. For that price, you can hardly afford to do your own.

We have permission from LaMar Steen to fabricate and sell Steen Skybolt components. Our General Manager, Eric Shilling, is a Steen Skybolt builder. We think it is an excellent airplane, comparable to our own machines, and we are happy to be able to be of service to Skybolt builders. For the best in quality, service, and professional expertise, together with lowest prices, buy Starduster.

Many builders are concerned about the 51% work requirement, when buying a complete welded assy. It has been our experience that our friendly Feds take a reasonable view of this. To build a quality, two place biplane will take an average builder from 1500 hours (if he is good) to 2500 hours, (more likely). By buying a complete welded assy, the average builders saves about 250 welding hours plus the time and cost of making jigs. In terms of man hours, a complete assy is a long way below 49%. In terms of a sound, true, well aligned basic framework, it is probably the best investment you could make.

We will also furnish basic fuselage boxes, without standoffs, brackets, formers, or fittings. These units are only \$795.00 for the Starduster Too and Steen Skybolt. Because the complete fin, seats, and engine mount fittings are included in the Acroduster Too, its basic box is \$850.00.

New, lower prices do not mean any reduction in quality. Your certified Cleveland wheels and brakes are still the best in the business. Our certified aircraft steel contains no seconds or substandard material. Our dacron comes right from the North Carolina mills.

In addition to top quality materials and rock bottom prices, we offer free advice and information to our builders. With men like Eric Shilling and Glenn beets heading up our organization, we feel that we are fully capable of helping you solve most any of your problems. This can be a valuable dividend to our customers. Such expertise is not available from many supply houses.

Help us maintain and improve our position in the industry. For low prices, fast service, quality merchandise, and expert advice, BUY STARDUSTER.

OSH KOSH, BY GOSH BY JIM OSBORNE

As we have for many years, a Starduster delegation is preparing for the Oshkosh convention. Bill Clouse & I will make the trip in Bill's luxurious motor home.

At Oshkosh, we will have an outdoor display area in the commercial area. This area is on the north side of the convention area, and is just south of the adjoining campground.

We will set up and display the Acroduster 1 project of Eldon Boose, of Apple Valley, Minn. We understand that this will consist of a completed fuselage, tail group, landing gear, and one or more uncovered wing panels. We will also have available catalogs, with new lower prices, and other literature which may be of interest to you. The display will be manned continuously during convention hours. We do hope you will drop by and visit with us.

On Sunday, 1 August, in tent 2, from 1:00 to 2:15, I will conduct a forum on how to design biplanes. This will be a general information type forum, applicable to all biplanes. On Saturday, 7 August, tent #2, from 2:30 to 3:45 P.M. I will conduct another forum pertaining strictly to "STARDUSTER" Corp. aircraft. There will be a discussion period at the end of each forum. I will attempt to answer all questions, or find someone in the audience who can. I will also give a brief review of the Acroduster 1 crash, and state what I think happened. New catalogs will be available at these forums. I hope you can arrange to be there.

CONTEST WINNER

Major John Morissey, of Fort Leavenworth, Kansas, has won four first place awards in a row, flying his Starduster Too in aerobatic contests. He has been flying in the sportsman category. However, with a record like that, he will probably be moving up to intermediate soon. Congratulations, John.



## COVERING

BY ERIC SHILLING

Not too long ago it was necessary to make an envelope or blanket to cover aircraft surfaces. Modern cements and fabrics no longer require such treatment, which make for a easier and neater job.

These fabrics are known as mono-filament or continuous fiber. Having no nap the fabric requires complete penetration to ensure proper adhesion.

The cement method of covering is recommended on aircraft where fabric width is sufficient to cover an entire side of a surface. The fabric may run span wise cemented to the leading edge, trailing edge, tip and butt with Super Seam cement or other approved cement.

The opposite side of the wing is covered in a like manner using a 2" overlap (min) at the leading edge. 2" at the trailing and 1" at the tip. These overlaps are then covered with a 4" tape down the leading edge and 3" tape over the remainder of the joining seams.

When covering the fuselage, apply on each side first. Butt the fabric down the center of the turtle deck and wrap around the bottom longeron. Cover the bottom last as it will get the most abuse and can be replaced more easily than if the bottom is covered first.

See sketches illustrating covering methods.

Like everything else there are many ways and variations to accomplish an end result. There are undoubtedly better ways, however this way works for me. Preparing the surface is most important. I recommend the following to enhance fabric adhesion to the aluminum such as along leading edge, trailing edge and aileron area. Use medium grade scotch brite scouring pads with a metal cleaning solvent. This will eliminate grease at the same time as a lubricant. Do this along a four inch wide strip down the length of the alum leading edge as well as the entire trailing edge and about a 2 inch strip inside the aileron area.

Next cover all sharp corners with either masking tape or cotton tape similar to adhesive tape. Place the tape along the top and bottom leading edge where the nails were used. Also aileron area and other places where there is a possibility of sharp metal in contact with the fabric. Feel the ribs and all wood where fabric will touch, looking for sharp splinters. Sand where ever necessary.

Obtain graph paper and lay out your airplane surfaces in scale. Ascertain the amount of fabric required and how to cut the fabric for best utilization. You may be able to use quite a bit of 50" fabric instead of all 66" which would of course save money.

After all desired surfaces have been prepared, pre glue with thinned Super Seam cement (Acetone or MEK). After this has been done, start covering. The wing in the following manner. Place the wing upside down and cement the fabric to the back of the front spar. (see dwg) Notched 1" to accomodate ribs.

Bring fabric forward around leading edge. Then back wrap and glue into place on trailing edge. Use thinned cement to activate the preglued surfaces (leading edge, trailing edge, tip and butt).

After allowing enough time for the glue to dry shrink only enough to take out any wrinkle and slack. This should be done with the iron on its lowest setting, increase temp only if necessary. (see Step 1)

After the top covering has been preshrunk recoat all surfaces that will have fabric attached (coat until shiny). This assures good penetration and adhesion of subsequent fabric being attached whether bottom cover or tape.

Cement bottom in same manner as the top, by use of thinned cement. Again when dry preshrink. Then apply additional coats where the tape is to be applied. After applying tape the wing is ready for final shrinking to desired tautness.

Step 1. Shrinking dacron and Ceconite, I recommend you practice first on a piece of scrap. Set the iron on its very lowest setting possible. increase as necessary, until the fabric starts to shrink. Shrink in stages, over shrinking either distort the surface or melt if the iron is too hot. After you have the hang of it proceed. Shrink creases, wrinkles and puckered corners first before doing the rest of the surface. All such imperfections should be eliminated before doping.

When doping, humidity should be (desirable) within 45 to 50 percent and temperature 70 degrees to 80 degrees. Temperatures and humidities outside of this range will require adding either a reducer or retarder to eliminate blushing or too rapid a drying.

Step 2. Apply the first coat of nitrate thinned 30% to 50% for penetration, being careful not to spray or brush too heavy. Any runs which go through the material cannot be removed later by sanding. It causes a so called wart or pucker, lifting the fabric. One way I have been able to remove runs or drips that have gone through was to use a vacuum cleaner hose and draw the excess back through before it dried. Better yet is to coat one side of the surface at a time and immediately turn it over to dry. In this way the run would be on the outside and can be sanded later.

Allow sufficient drying time between coats, sit should not be hurried. Make certain the first coat wets the weave, which is necessary for good bonding of the tape covering the rib stitich, drain grommets and inspection rings. Actually due to the tendency of the latter two to peel off it is a good idea to cover the inspection rings and grommets with small patches of fabric after they have been glued on. Coat with nitrate until shiny and weave is filled.

Step 3. Mark off rib stitch spacing. This can be obtained from old Cam 18, taking into consideration your intended aircraft top speed. DON'T FORGET the reinforcint tape before rib stitching. After rib stitching I like to apply thinned Super Seam cement over these areas, especially if your red lined speed will be in the neighborhood of 200 mph. There have been some airplane that have shed tape. This may or may not have been due to improper penatration of the initial coat of nitrate.

Step 4. I prefer to use reinforced patches in place of regular drain grommets. Then use a very low power. Pencil type soldering iron. Extreme caution should be used as the fabric can catch fire if the iron should be too hot. Your whole wing could go up in flames in seconds.

After all cement has dried sufficiently and including leading edge, trailing edge, tip and butt tape and proper tautness. Inspect areas closely where cloth is double. If the weave is not closed completely pin holes will appear during the aluminum application, and almost impossible to eliminate. This will make for a bad final color coat.

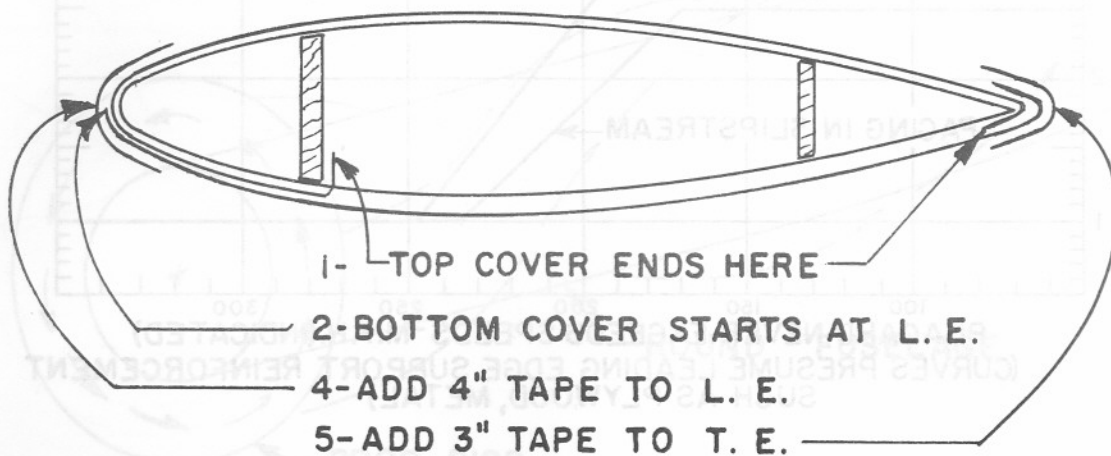
Step 5. Most people go to Butyrate for the final stage, which I also recommend. It does increase its resistance to fire over that of straight Nitrate. Spray 1 light coat 1st, then 2 more coats of Butyrate clear before silver. (again better adhesion) Mix 4 to 6 oz aluminum paste to each gallon of Butyrate Dope. One way to see if silver content is to great is to rub with you r finger when dry, If too much aluminum, your finger will pick up some aluminum.

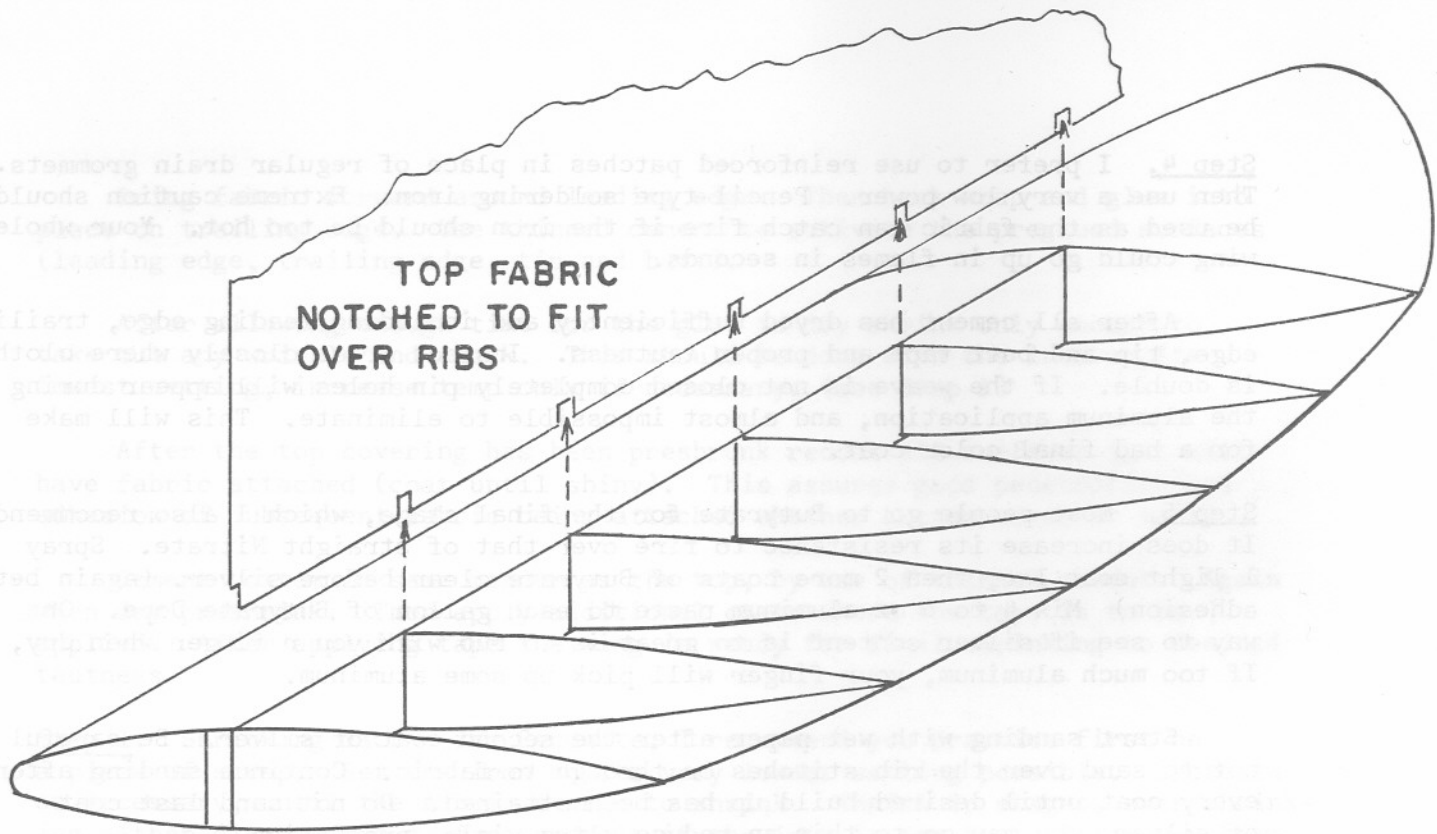
Start sanding with wet paper after the second coat of silver. Be careful not to sand over the rib stitches or through to fabric. Continue sanding after every coat until desired build up has been attained. Do not sand last coat of silver, you may go to thin an reduce ultra violet protection.

After the final coat of silver I recommend 2 coats of Butyrate White. This cuts down heat build up in the sun and also truer color rendition for final color coat, especially when light in color.

A smoother leading edge can be obtained by using flannel over the aluminum leading edge. This method is time consuming and requires extra care in its application. After glueing the flannel in place proceed as outlined previously. Extra care must be taken when applying Nitrate, as the flannel absorbs the Nitrate. It must therefore must be saturated before the weave can be closed. If this is not done pin holes will develop when shooting the silver. As mentioned previously they are almost impossible to eliminate at this stage.

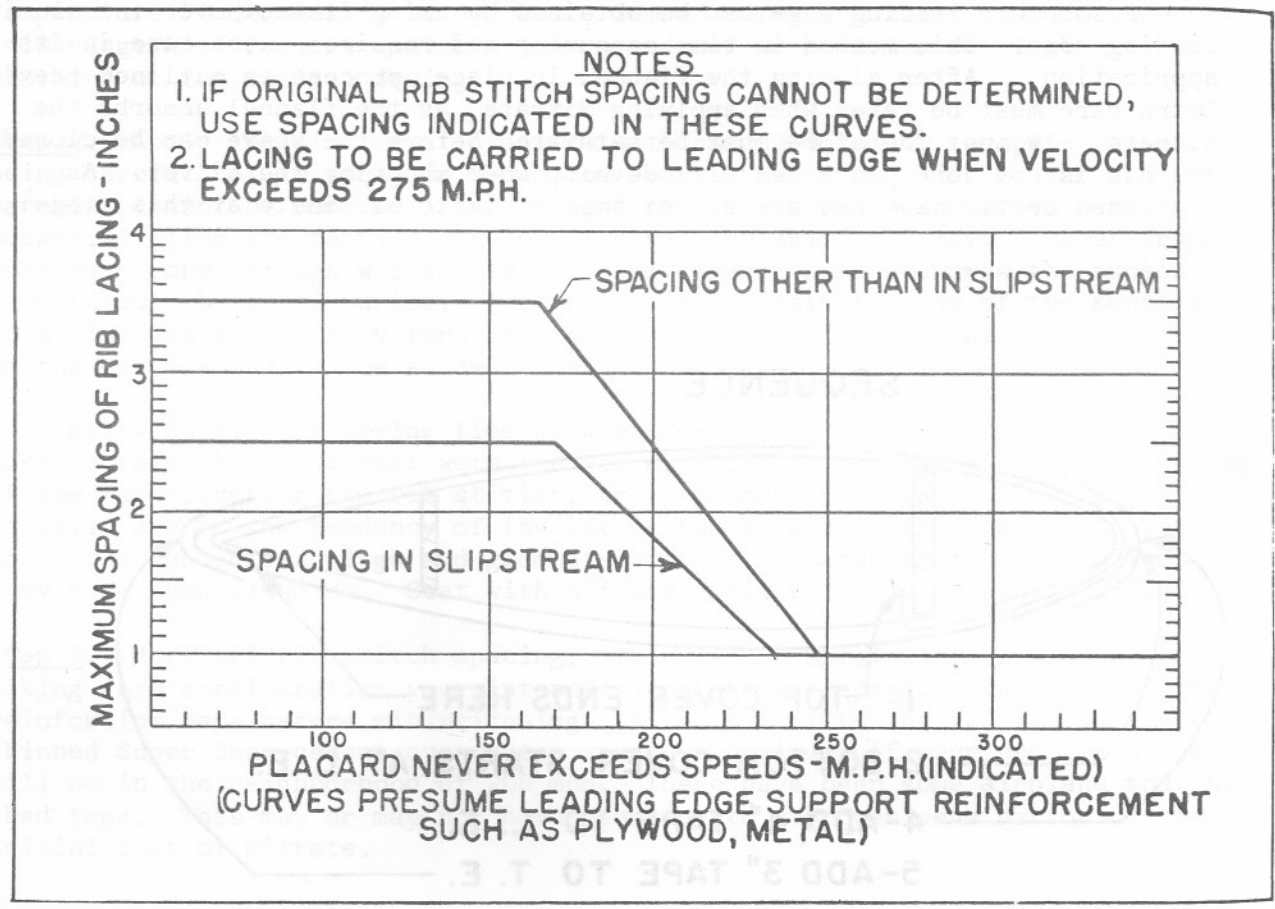
### SEQUENCE





**TOP FABRIC  
NOTCHED TO FIT  
OVER RIBS**

**WING SHOWN UPSIDE DOWN**



## TORQUE AND THE LEFT TURNING TENDENCY

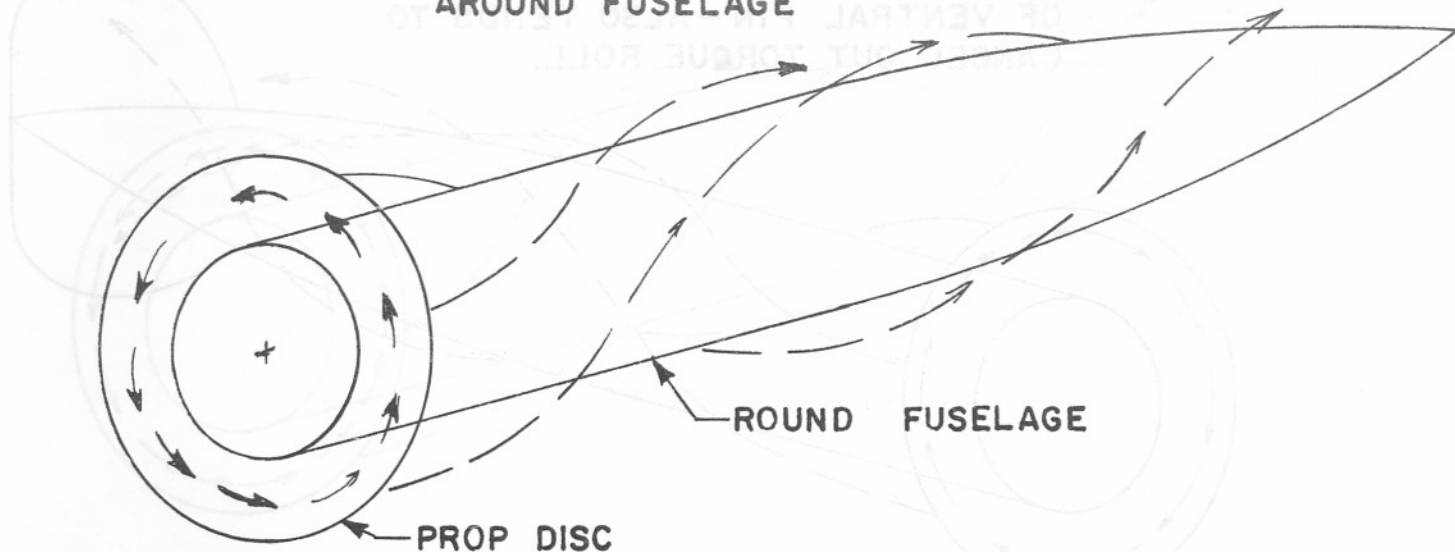
By Jim Osborne

In almost all airplanes, a student pilot soon encounters a left turning tendency. When I was a youngster, our old experienced instructors talked knowingly of "TORQUE". Nowadays, I understand that something called "P" factor is to blame. At the risk of committing heresy, I would like to venture the opinion that perhaps neither of these theories are correct. I believe the cause of the left turning tendency lies almost entirely with the cork screw propwash coming off the prop.

Let us consider the phenomenon. In most airplanes, the left turning tendency (hereafter abbreviated as LTT) is most pronounced at full power and very low airspeeds. Open the throttle of many high powered aircraft with the brakes on, suddenly release the brakes, and it may be beyond your power to prevent a swift and sudden left ground loop. In high powered military prop jobs like the P-51, the tail wheel locks tracking straight ahead, when the stick is aft of neutral. Standard takeoff technique is to gently open the throttle and let the airplane accelerate in the three point position. As the plane gathers speed, the LTT becomes less pronounced. Soon the tail can be lifted, and directional control is possible with the rudder alone. During the climbout, under full throttle, the slower the airspeed, the more pronounced is the LTT. In flying out of a stall, hard right rudder is usually called for.

It seems to me that our old villain, TORQUE, cannot be blamed for such shenanigans. All torque does is cause the airplane to tend to rotate around the thrust line. I strongly suspect, also, that "P" factor is more imaginary than real. The prop disc accelerates the air from dead ahead, no matter what angle you are holding it to the relative wind.

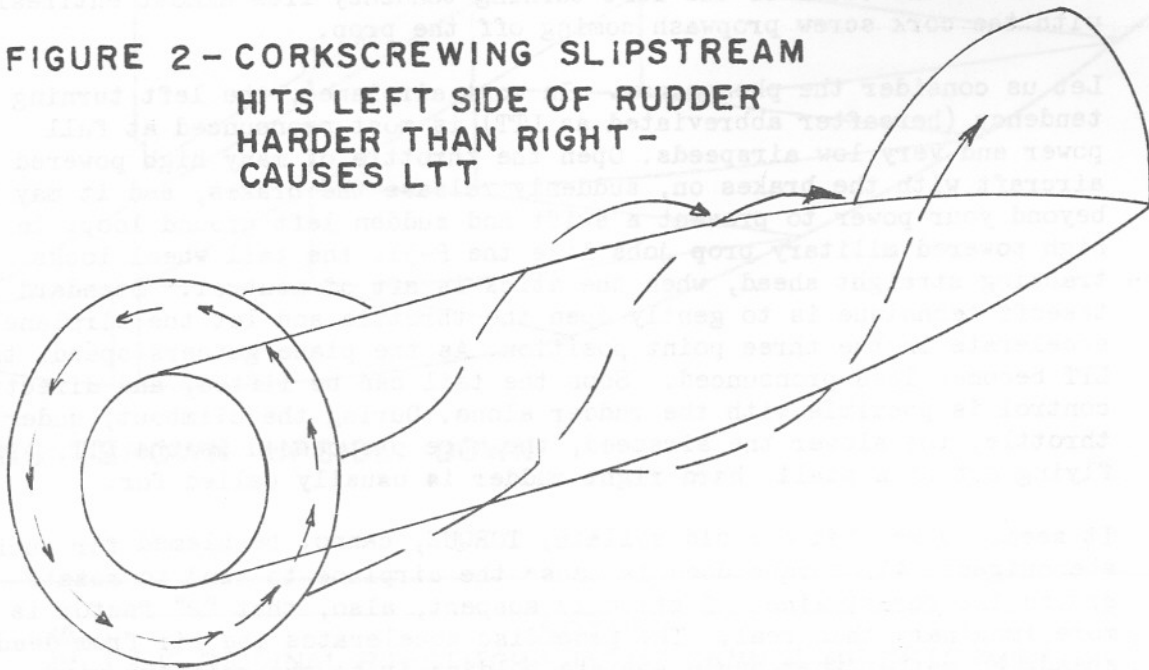
**FIGURE 1 - SHOWING CORKSCREW PATH OF SLIPSTREAM AROUND FUSELAGE**



Let us consider figure 1. It shows a smooth round fuselage with a prop on one end. The air corkscrews around it on its way aft. Torque makes the fuselage tend to roll. There is absolutely nothing to make it tend to turn left.

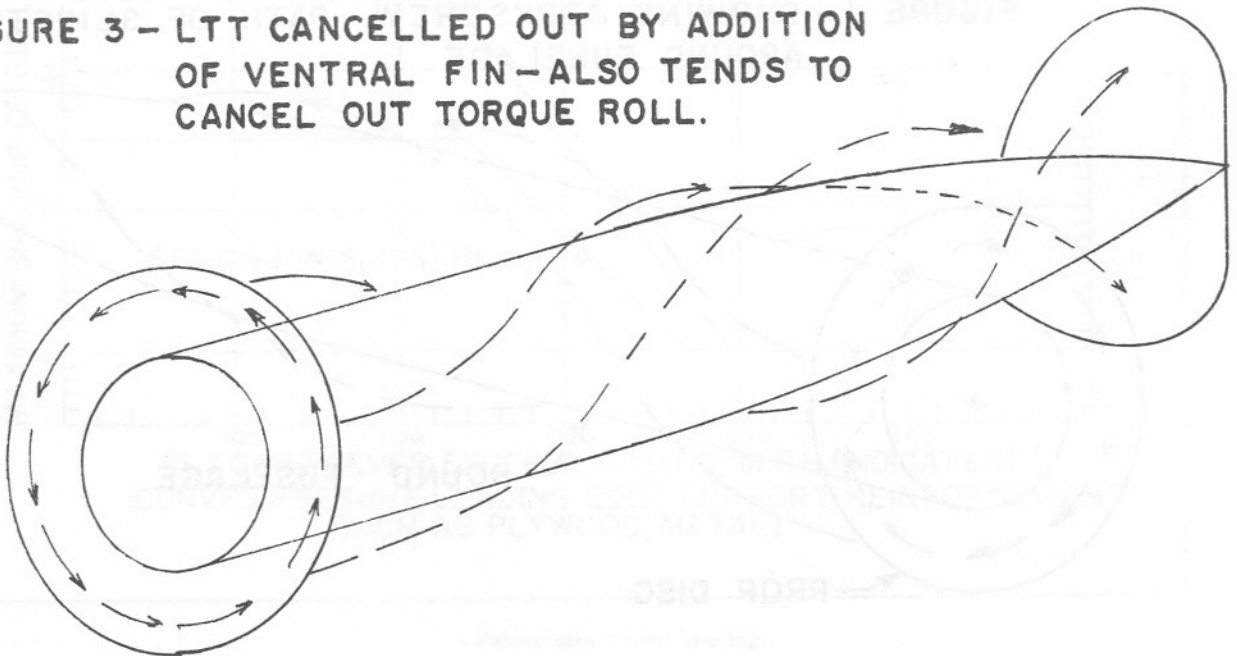
Now, stick a vertical tail on top of the fuselage, as in figure 2. All of a sudden we have a LTT. The cork screwing air hits the vertical tail harder on the left side than it does on the right. Voila. The fuselage wants to turn left.

**FIGURE 2 - CORKSCREWING SLIPSTREAM  
HITS LEFT SIDE OF RUDDER  
HARDER THAN RIGHT -  
CAUSES LTT**



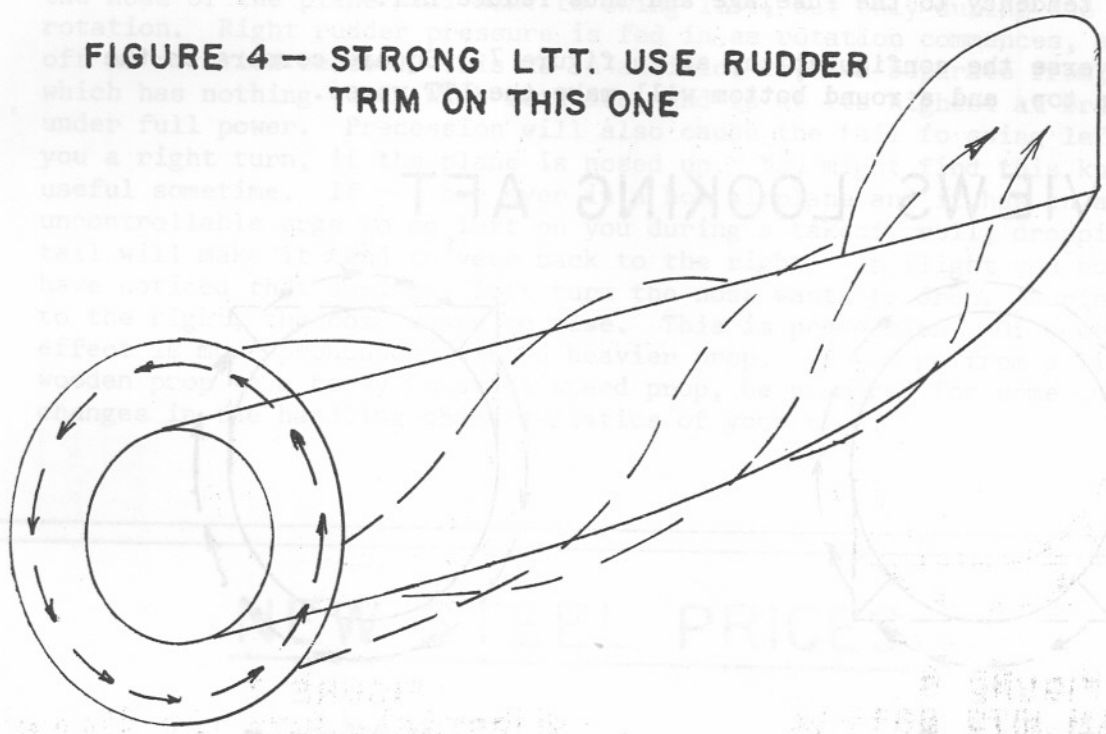
Suppose we add just as much vertical tail below the fuselage, as in figure 3. The left turning tendency is now cancelled out.

**FIGURE 3 - LTT CANCELLED OUT BY ADDITION  
OF VENTRAL FIN - ALSO TENDS TO  
CANCEL OUT TORQUE ROLL.**



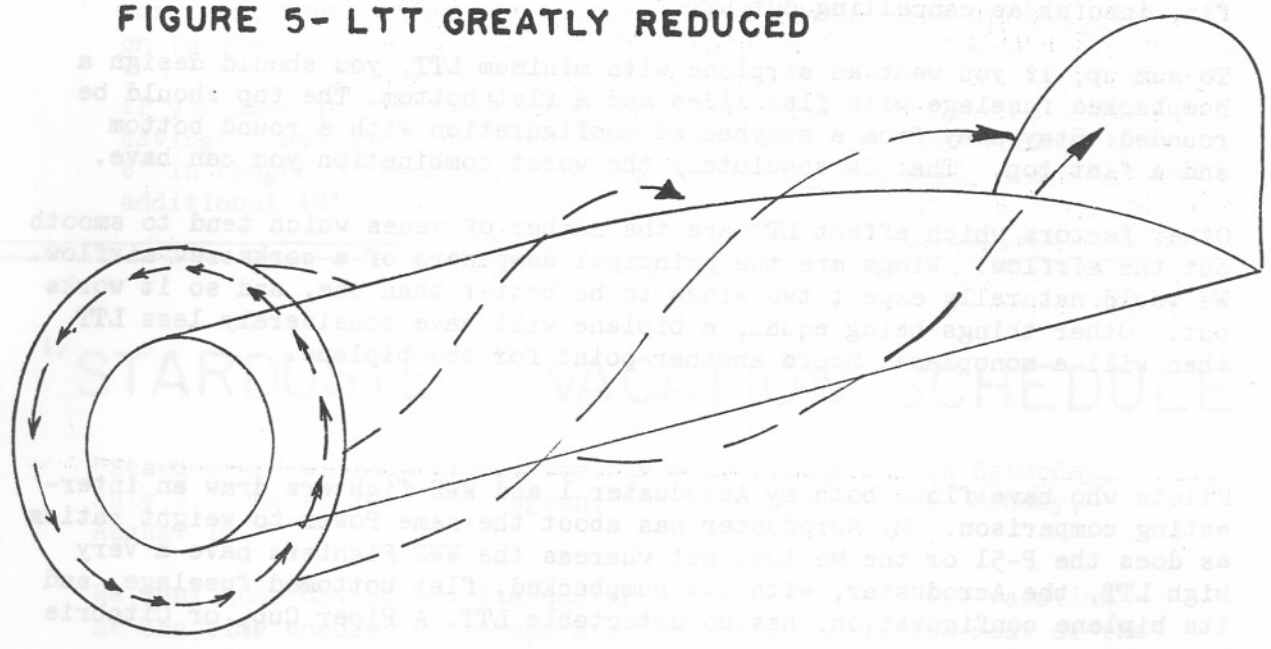
Carrying our "supposing" a little further, suppose we design an airplane with an upward tilting, or swaybacked, fuselage, with the vertical tail high in the air. See figure 4. This swayback design will give you one hell of a left turning tendency.

**FIGURE 4 - STRONG LTT. USE RUDDER TRIM ON THIS ONE**



Now, lets doodle us up an airplane with a drooping tail, or a humpbacked appearance. In this design, the left turning tendency is reduced.

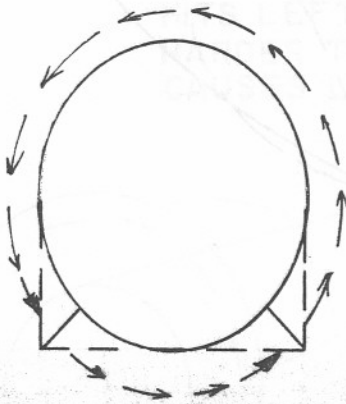
**FIGURE 5- LTT GREATLY REDUCED**



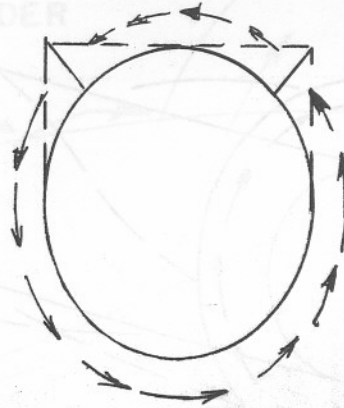
Another way to affect LTT is with strakes, or square corners. See figure 6. Put a round top on your fuselage, and a flat bottom. The square corners act like strakes along the bottom of the fuselage. They impart a right turning tendency to the fuselage and thus reduce LTT.

Now, reverse the configuration, as in figure 7. Square corners on the fuselage top, and a round bottom will make the LTT worse.

## VIEWS LOOKING AFT



**FIGURE 6**  
SLIPSTREAM HITS BOTTOM  
STRAKES OR SQ. CORNERS-  
TENDS TO CANCEL LTT.



**FIGURE 7**  
SLIPSTREAM HITS TOP STRAKES  
OR SQ. CORNERS-TENDS TO  
REINFORCE LTT.

Additionally, the sides of the fuselage can be used to act as lateral area below the thrust line. This is just as good as having a ventral fin, insofar as cancelling out LTT.

To sum up, if you want an airplane with minimum LTT, you should design a humpbacked fuselage with flat sides and a flat bottom. The top should be rounded. Stay away from a swaybacked configuration with a round bottom and a flat top. That is absolutely the worst combination you can have.

Other factors which affect LTT are the number of vanes which tend to smooth out the airflow. Wings are the principal dampeners of a corkscrew airflow. We would naturally expect two wings to be better than one, and so it works out. Other things being equal, a biplane will have considerably less LTT than will a monoplane. Score another point for the biplane.

Pilots who have flown both my Acroduster 1 and WW2 fighters draw an interesting comparison. My Acroduster has about the same Power to weight ration as does the P-51 or the Me 109. But whereas the WW2 Fighters have a very high LTT, the Acroduster, with its humpbacked, flat bottomed fuselage, and its biplane configuration, has no detectable LTT. A Piper Cub, or Citabria has much more.



There is one more phenomenon, actually not a true part of LTT, which occurs during rotation of the fuselage, and which is sometimes confused with LTT. I speak of gyroscopic precession. When the tail rises, as in a takeoff roll, the nose of the plane will want to swing left, but only during the time of rotation. Right rudder pressure is fed in as rotation commences, and bled off as rotation ceases. This is in addition to, and separate from, the LTT, which has nothing to do with rotation, and is at its highest at brake release under full power. Precession will also cause the tail to swing left, giving you a right turn, if the plane is nosed up. You might find this knowledge useful sometime. If you are ever in a hot airplane and it has an almost uncontrollable urge to go left on you during a takeoff roll, dropping the tail will make it tend to veer back to the right. In flight you no doubt have noticed that during a left turn the nose wants to drop. During turns to the right, the nose wants to rise. This is precession. Of course the effect is more pronounced with a heavier prop. If you go from a light wooden prop to a heavy Constant speed prop, be prepared for some quite noticeable changes in the handling characteristics of your bird.

## NEW STEEL PRICES

On pages 17 and 18, you will find our new steel prices. Actually, they are old prices. We are going back to our Feb. 1975 prices. This is a cut of 10%.

We are able to do this because we are in a better position to buy. We can get a little better deal when we buy. And we operate a little more efficiently than we used to. These savings are being passed on to you.

If you live in the Los Angeles area, you may obtain even greater savings. We have bins loaded with all sizes of steel tubing, up to 6' in length. Visit us, pick out the tubing you need, and save an additional 10%.

## "STARDUSTER" VACATION SCHEDULE

"Starduster" will be closed for our annual vacation on Saturday, July 31. We will be open again, for your business, on Monday, August 16.

We feel that having all Starduster personnel take their vacation at one time enables us to operate more efficiently the rest of the year, and give you better, overall service.

AIRFRAME TUBING - CERTIFIED 4130 CHROME MOLY, NORMALIZED CONDITION MIL-T6736

OD. IN.	.028	.035	.049	.058	.065	.072	.083	.095	.109	.120	.134	.156	.188	.219	.250
3/16	.78	.78	.89	.96	1.00										
1/4	.78	.78	.89	.96	1.00	1.02	1.11	1.16							
5/16	.78	.78	.89	.96	1.00	1.02	1.11	1.17							
3/8	.78	.78	.89	.96	1.02	1.03	1.12	1.17	1.17	1.22					
7/16	.78	.78	.90	.96	1.02	1.03	1.12	1.17	1.17	1.23	1.27	2.01			
1/2	.78	.78	.90	.97	1.02	1.03	1.14	1.17	1.17	1.23	1.27	2.02	2.21		
9/16	.93	.93	.98	1.14	1.27	1.29	1.35	1.43	1.47	1.53	1.60	2.05	2.27	2.89	
5/8	.96	.96	1.00	1.16	1.27	1.29	1.35	1.43	1.47	1.53	1.63	2.05	2.22	2.90	
11/16	.91	.96	1.20	1.33	1.46	1.49	1.51	1.63	1.69	1.78	1.78	2.06	2.27	2.92	
3/4	.96	.96	1.20	1.34	1.46	1.49	1.53	1.63	1.70	1.79	1.87	2.09	2.28	2.93	3.59
7/8	.98	1.00	1.30	1.46	1.57	1.63	1.73	1.87	1.96	2.13	2.19	2.45	2.84	2.95	3.62
1	1.11	1.11	1.37	1.58	1.79	1.81	2.02	2.13	2.22	2.31	2.39	2.80	3.05	3.34	3.67
1 1/8		1.36	1.46	1.67	1.84	1.93	2.11	2.36	2.45	2.57	2.73	3.05	3.79	3.93	4.10
1 1/4		1.50	1.63	1.80	1.95	2.05	2.26	2.54	2.65	2.73	2.95	3.30	3.83	4.15	4.53
1 3/8		1.72	1.78	1.92	2.10	2.20	2.40	2.67	2.79	2.90	3.16	3.55	4.10	4.46	4.93
1 1/2		1.80	1.84	2.07	2.30	2.35	2.60	2.82	2.95	3.12	3.36	3.84	4.42	4.81	5.25
1 5/8		1.93	2.02	2.23	2.48	2.55	2.76	3.01	3.16	3.32	3.62	4.11	4.77	5.32	5.54
1 3/4		2.76	2.78	2.80	2.84	2.88	2.93	3.21	3.33	3.59	3.88	4.39	5.10	5.74	5.91
1 7/8		2.90	2.92	2.93	2.95	3.01	3.12	2.45	3.55	3.79	4.11	4.69	5.54	6.17	6.86
2		3.02	3.03	3.05	3.08	3.16	3.30	3.56	3.72	4.00	4.40	5.02	5.90	6.75	7.49

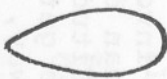
PRICES EFFECTIVE: Feb. 1, 1975

Stolp Starduster Corp.  
4301 Twining, Riverside, California 92509

Price change due to increase in mill cost of tubing. New price reflect our normal mark up formula.

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

**STREAMLINE TUBING**



size	Equiv. Round	.035	.049
1.012 x .428	3/4	\$2.14	*
1.180 x .5000	7/8	\$2.23	*
1.349 x .571	1	\$2.50	\$2.81
1.685 x .714	1 3/4	\$2.91	\$3.21
2.023 x .857	1 1/2	\$3.56	\$3.62
2.360 x 1.00	1 3/4	*	\$5.21
2.697 x 1.143	2	*	\$5.54
3.372 x 1.429	2 1/2	*	\$6.15
3.708 x 1.571 x .058		\$6.69/Ft	

**SPECIAL-LIMITED SUPPLY**

4.045 x 1.714 x .095	\$4.00 per ft.
----------------------	----------------

please order tubes in 6" increment.

**WELDING ROD**  
 Oxweld #7 \$1.30/lb  
 Mild Steel  
 Copper Coated  
 Type recommended in Manual 18 for non-heat treated assemblies.

**SQUARE TUBING**



	.035	.049	.058	.065	.095	.120
3/8 x 3/8	1.47	1.64	*	*	*	*
1/2 x 1/2	1.50	1.65	*	*	*	*
5/8 x 5/8	1.60	1.83	2.09	2.31	*	*
3/4 x 3/4	1.71	2.20	2.43	2.63	*	*
7/8 x 7/8	1.81	2.37	2.60	2.88	*	*
1 x 1	1.99	2.52	2.92	3.26	3.81	4.14

**RECTANGULAR**

1/4 x 3/8	*	1.74	*	*	*	*
3/4 x 1 1/2	*	2.74	*	*	*	*
7/8 x 1 1/4	*	*	*	*	4.51	*

**4130 ROD**



	per ft.		per ft.
1/8	\$ .19	9/16	\$1.16
3/16	.22	5/8	1/43
1/4	.28	3/4	2.00
5/16	.41	7/8	2.73
3/8	.54	1	2.16
7/16	.73	1 1/4	5.46
1/2	.91	1 3/8	6.63

**FIREWALL MATERIAL**

Stainless	Thickness	Width	Per Linial Ft.
	.016	30"	\$5.74
	.016	36"	\$6.83
Galv. Iron	.26 ga.	36"	\$2.32

Sold in required length, full sheet width only

**4130 CHROME MOLY STEEL SHEET: CONDITION N MIL-S-18729**



SIZE	.025	.032	.036	.040	.050	.063	.071	.080	.090	.100	.125	.160	.190	.250
1 x 36	.76	.89	.91	.93	1.14	1.32	1.44	1.51	1.72	1.87	2.24	3.34	4.34	4.81
2 x 36	1.14	1.25	1.51	1.54	1.87	2.30	2.45	2.70	3.04	3.32	4.07	5.87	7.04	9.23
3 x 36	1.51	1.81	2.01	2.11	2.61	3.14	3.52	3.82	4.36	4.80	5.87	6.35	9.34	13.10
9 x 9	1.09	1.25	1.58	1.77	2.07	2.50	3.11	3.41	3.93	4.37	5.46	6.35	9.34	13.10
9 x 18	1.99	2.48	2.93	3.18	3.99	4.55	5.64	6.16	7.13	7.93	11.15	11.23	14.12	19.48
18 x 18	3.61	4.60	5.32	5.76	7.23	9.07	11.17	11.93	12.99	14.42	18.04	22.21	25.50	36.50
18 x 36	6.56	7.76	9.56	10.47	13.13	16.47	18.58	20.21	23.51	26.17	32.79	42.16	50.16	68.82
36 x 36	13.12	15.53	19.13	20.95	26.26	32.95	37.18	40.40	47.03	52.34	65.61	84.33	100.33	140.37

## PIREPS PAGE



# EXPERIMENTAL AIRCRAFT ASSOCIATION

An International Non-Profit Organization Dedicated to the Advancement of Aviation Education, Homebuilt Aircraft and Sport Aviation

OFFICES & AIR EDUCATION MUSEUM: 11311 W. FOREST HOME AVE., FRANKLIN, WISCONSIN

Paul Poberezny, President

Ray Scholler, Vice-President

S. H. Schmid, Secretary

Arthur Kilps, Treasurer

PHONE 414 / 425-4860

POST OFFICE BOX 229, HALES CORNERS, WISCONSIN 53130

May 10, 1976

Mr. Jim Osborne  
4301 Twining  
Flabob Airport  
Riverside, CA 92509

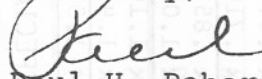
Dear Jim:

I have received your letter of May 3rd regarding the unfortunate mishap. We certainly all share the grief of this very unfortunate accident. I will publish your letter to bring it to the attention of others building your design, as well as those building other designs, to point up limitations on all aircraft. These aircraft should be operated within accordance of the designers' limitations and specifications.

It was unfortunate that we lost a Birdman shortly afterwards, and just a few days ago we lost one of our Chapter presidents in a Midget Mustang accident, on takeoff at Macon, Georgia. Also, we had a local accident here, involving a Stearman. The fellow was flying a stock Stearman down to a little strip, to perform for FAA for his low altitude waiver. It appears that he was not even qualified to get to the starting point. As he was practising on the way, he came out of a hammerhead, recovered too low and hit the ground at about 150 or 160 miles an hour, with a ten degree nose low attitude.

Do you have another Acro about ready to go? We will look forward to seeing you and your fine wife at Oshkosh.

Sincerely,

  
Paul H. Poberezny  
President

THOMAS G. BELL, M.D.  
PHILIP S. GRANT, M.D.  
MIXON M. DARRACOTT, M.D.  
RICHARD L. M. COLEMAN, M.D.

OBSTETRICS AND GYNECOLOGY

STAUNTON MEDICAL CENTER  
STAUNTON, VIRGINIA 24401

July 2, 1976

Stolp Starduster Corp.  
4301 Twining  
Riverside, California 92509

Attention: Mr. Jim Osborne

Dear Mr. Osborne:

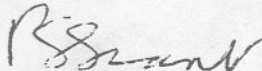
For some time I have been intending to write to you to give you a compliment. Everyone deserves a compliment now and then.

In 1975 I bought a set of plans for Acroduster Too. When they arrived, they seemed far too complicated for an amateur. Shortly afterwards I had a ride in a Skybolt and investigated that airplane. I now have the entire fuselage welded.

What I wanted to tell you was that your blueprints are not overly complicated. They are simply very complete. I use the Acroduster plans constantly to figure out what to do next on the Skybolt. There is good detail for such things as how to put the engine mount bushings on the front of the fuselage, and making the seats, along with the material for the seat bottoms.

So, this has been a great help to me in building another airplane. Congratulations on your fine blueprints.

Sincerely,



Philip S. Grant, M.D.

PSG/da

A most beautiful Acroduster Too, built and flown by Ron Powers of  
Burlington, Minn. We understand Ron will have this beauty at  
A BEAUTIFUL SATSO WING BY RON CRAUSE OF SOUTH AFRICA



ANOTHER VIEW OF BILL WICKS BEAUTIFUL STARDUSTER TOO



Paul H. Poberezny  
President

A BEAUTIFUL SA750 WING BY RON CRAUSE, OF SOUTH AFRICA

May 5, 1976

April 6, 1976

Dear Jim,

With the coming of spring the Stardusters should start coming out. I flew the restrictions off in Feb. and now have 60 hrs. No problems to date everything is fine. I am still thinking of a hatch over both cockpits. I am thinking about building a fuselage to be used, or rather can be better used to build the canopy on. Do you have the material for a canopy, & how much is material cost for fuselage & landing gear?

The Starduster magazine is fine.

Say before I forget, send me 2 Starduster Too decals. Hope to see you in Oshkosh.

Sincerely

Ray Branson  
Box 3432  
Kimberling City, MO  
65686



A most beautiful Acroduster Too, built and flown by Ron Powers of Burnsville, Minn. We understand Ron will have this beauty at Oshkosh.



FIRST NATIONAL BANK  
IN ELBERTON

ELBERTON, GEORGIA  
30635

JOHN H. BAILEY, SR.  
CHAIRMAN

June 17, 1976

Mr. Jim Osborne  
Stolp Starduster Corporation  
4301 Twining  
Flabob Airport  
Riverside, California 92509

Dear Jim:

The April 1976 "Starduster" Magazine is great---as all of them are. Your article on weight and balance is of particular interest to me because, for the first time, I know the capacity of the main tank I bought from you without filling it. I do have a question. For some unknown reason, I have installed a center section tank I bought from you. It seemed like a good idea at the time, a gasoline shortage came on the scene but now my wife reminds me that the range of the "Too" now far exceeds the range of my kidneys. Now the question---will you please give me the numbers for a weight and balance for the "Too" with a center section tank. I'll be happy to pay for it if you will let me know the cost. I do not know the capacity of the tank but it is one of yours.

Enclosed is my check in the amount of \$25.00 (plus \$2.00 shipping charges) for a set of aileron bearing inserts. I have completed and installed the torque tube so I guess I'll go with the original design on it.

Sincerely,

John H. Bailey, Sr.  
827 Sherwood Drive  
Elberton, Georgia 30635

JHB/nh

Enclosure



May 5, 1976

Dear Jim,

I just received your letter about Manx. I am sure it was a painful letter to write. We all hate to lose a fellow pilot & friend - especially so unnecessarily.

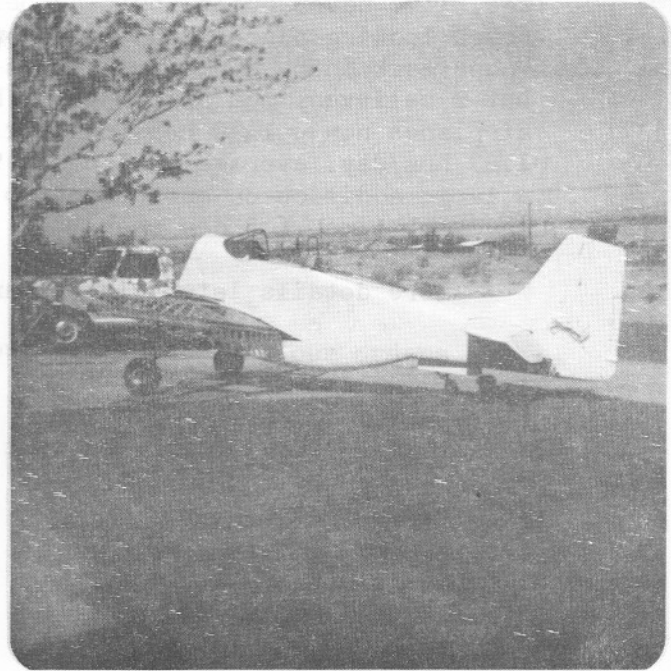
We always stress safety at our meetings, in our magazines and communications, but, there are always those who feel that it can't happen to them - it can & it does.

I know you have designed a good airplane, and if treated properly, will do anything any comparable plane will do. There hasn't been a light plane built, that some one hasn't torn the wings off of. This should be warning enough to those who continue to over stress their airplanes but I am sure it will continue to happen. People are killed daily with cars, boats, motorcycles, guns, knives and all sorts of mechanical devices - its not the fault of the designer - its the person using the machine or tool that does something foolish - just once.

If I can do of any help to you in this sad time - please don't hesitate to let me know.

Sincerely

Bill Haynie  
Route 3, Box 401  
Butler, MO 64730



P-51- BEING BUILT BY OUR GOOD FRIEND, ERNIE HARRIS, OF BARSTOW, CA.

May 21, 1976

Dear Eric & Jim:

My original plan to be in Oshkosh the end of July is - well, it looks like I've run out of time! I know you would like to have had the Acroduster Too there. So would I!

Have about finished remaking spacers, trunions, etc., to square up wings, flying wires, etc., for the trial fit. Have Alum. cover over engine and belly completed, but the side panels are giving me a fit. The compound curve of bow former plus narrowing of the fuselage is quite difficult. Much "oil-canning" & bulging. Am on my third try on the right side.

Basically all I lack is Alum covering of sides, cockpit cowl, fabric covering all surfaces, doping, etc. Am currently estimating approx 175 hrs additional work will be necessary to complete.

I sort of got carried away with instrumentation, and have ended up with a full rear panel. In fact, if my rally chronometer (digital) qualified as the clock, and my pitot system stands static check, it would be an IFR plane!

You might be interested in knowing about the time spent (to this point). Have kept a very detailed log on actual work time. Naturally, it does not include study the plans time, research, etc. As of yesterday I have a total of 1170 hours. Of this, 430 hrs have been spent working on the wings. Of course, as I told you 2 1/2 yrs ago, I've never built anything before, so I'm sure I'll have some rough looking places, but I'm proud of every hole I burned and every "pop" mark in my aluminum! It is really more than I bargained for, but I believe I'm a better pilot because I understand more about airplanes now. 1170 hrs in 2 1/2 yr @ 50 wks/yr, 5 days a week = 1.87 hrs/day. average. - I had a 9 months interruption to build a large addition on our house, so I've actually averaged 2.7 hrs/day work time. ( 5 day week).

More details later, if you are interested.

Sincerely

Kay Havenor  
P. O. Box 1936  
Roswell, New Mexico 88201

Jim,

This is the only/best picture of the plane I have right now. All others are being used for airshow publicity. I call this one "Beauty & The Beast". Hope you can use it!

Don Bates and Larry Denning have contacted you recently for a kit. They are part of our gang here and will build it fast and well. Please give them the same good service we have. Also, I'm working on two more guys - time will tell!

Thanks,

T.J. Brown  
9212 Wedd  
Overland Park, KS 66212

Editor's note: T.J.'s picture is on the cover of this magazine.

Dear Mr. Osborne,

Leslie got his Starduster Too flying. It has about 5 hours flying time. It is just beautiful. He did a fantastic job.

He says it flys real good and is real pleased. Hope to see you all at Oshkosh Wisconsin.

Mrs. Leslie Boyer  
Route 4, Box 259  
Festus, MO 63028

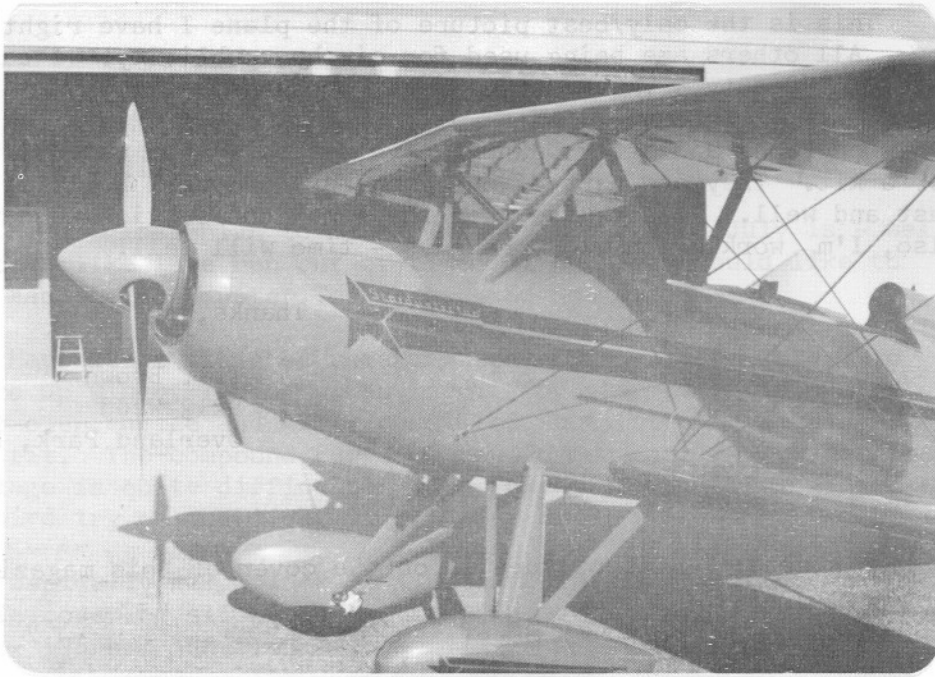
Dear Eric,

Thanks so much for your & your staff handling our orders so expeditiously.

We certainly appreciate the fine service.

Sincerely,

Mike Baribeau  
P. O. Box 506  
Parker, Az 85344



Dear Jim,

Enclosed are pictures of the newest of the Starduster Too fleet. She spread her wings for the first time on the 16th of May with yours truly at the controls. I'm sure you can appreciate the thrill of such an occasion.

We are based at the Oceanside Airport, hanger #28. If you drop by on a Sunday you will probably find us there. There are three Toos on the field.

Appreciated the article in the magazine. I must say that I enjoy your writings.

Sorry about the Acroduster I accident.

Respectfully,

Murray "Bill" Wick  
4460 Alhambra St  
San Diego Ca 92107

Mike Barbano  
P. O. Box 208  
Parker, Az 85344

# Classified Ads

Jim;

I really enjoyed following you by "aircharts" on you trip to Lakeland.

Sorry I was not in Palatka when you came.

Dick Roberts  
Route 2, Box 1636  
Palatka, Florida 32077

March 18, 1976

Mr. Osborne,

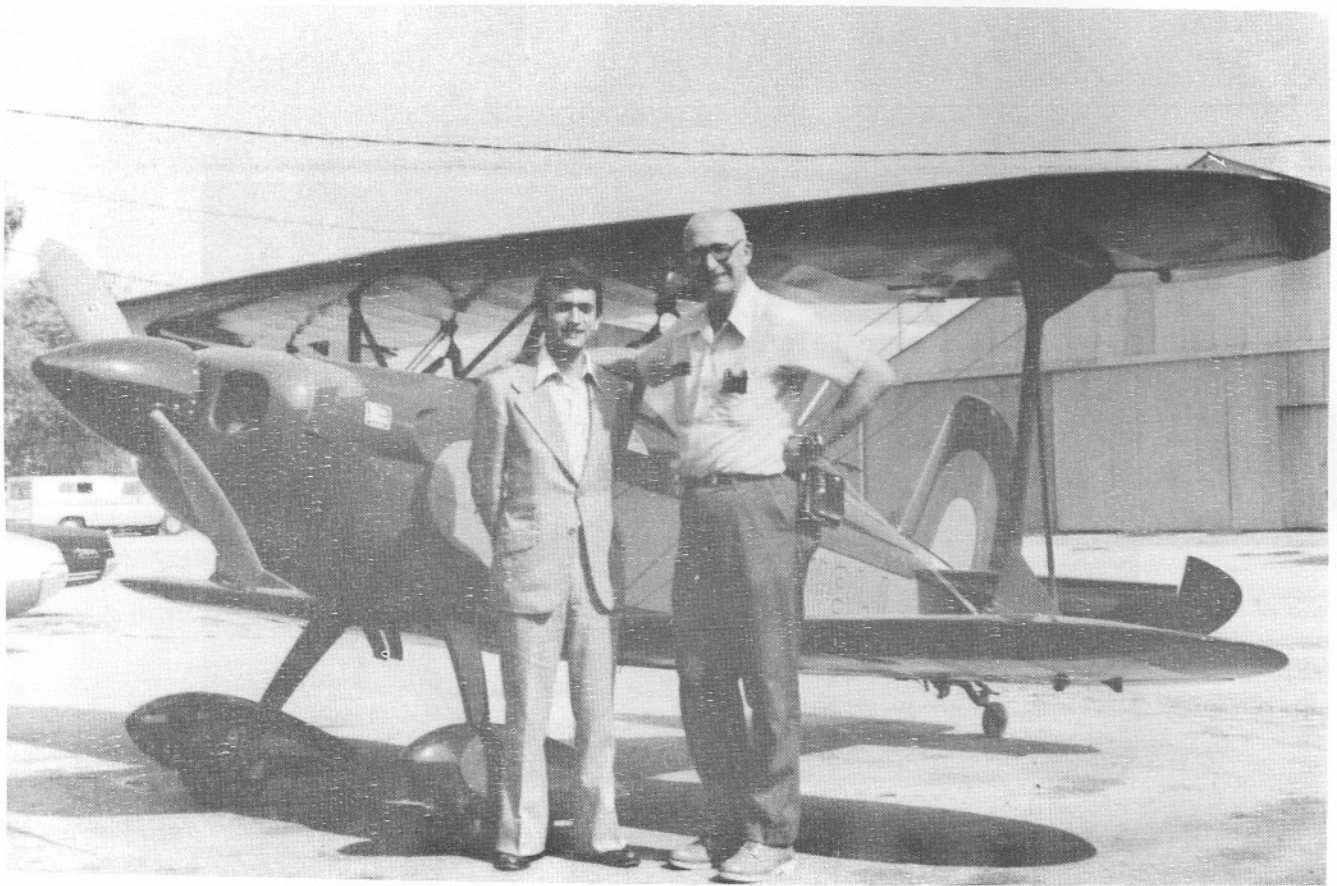
I sent the Fokker DVII plans you ordered and paid for to Ben Owen at the EAA Museum as you directed. I also enclosed a note notifying him that the plans were donated by you and, if he had any further questions or requests to contact with you or myself.

Thank you for your order, let me know if I can be of further service.

I have drawn up the model plans for the Walden monoplane circa 1909 made and designed and flown by Walden in the New York area. He made 7 models of this plane each some what different and then made the Walden IX. When it crashed he retired from aircraft and went back to Dentistry. Also too am investigating the Nieuport aeroplanes circa 1909 thru 1912 when his firm started the biplanes. The monoplanes would make a nice looking homebuilt project with the 40 HP Lycoming 4 cyl opposed. The original had a Darracq 2 cyl opposed 28 HP.

Best Regards

Herb Kelley  
56424 Handley Rd  
Yucca Valley, CA 92284



June 19, 1976

Dear Jim,

I received Thursday the April Magazine, and I could not believe what I was reading about the death of Manx. I am very sorry.

Now, It is most important to find the cause of the accident, which I'm sure will be something you hadn't figured on.

Here in Spain I'm working hard trying to change the regulations about homebuilts. I hope in two or three months everything will be ready.

I send you some photos and five dollars for a years subscription to the magazine.

Jim, if you need anything from the old continent, please let me know. I would be very happy helping you.

With my best wishes for everyone.

Yours sincerely,

Jose Luis Serrano Zamora  
 AVDA CANTABRIO3F 3°C  
 MADRID 22  
 Spain

# Classified Ads

ADVERTISING CLOSING DATE: JANUARY 1, APRIL 1, JULY 1, OCTOBER 1.  
 CLASSIFIED ADVERTISING RATE: \$3.00 PER COLUMN INCH-MINIMUM CHARGE \$3.00  
 MAKE CHECKS PAYABLE TO STOLP STARDUSTER CORP. THANK YOU.

## FOR SALE

Build & Fly The Worlds  
 easiest to build & best  
 performing biplane -  
**THE ACRODUSTER ONE**

BROCHURE \$5.00  
 COMPLETE KIT \$5500.00

FOR LIGHT WEIGHT, LIFE-  
 TIME, STAINLESS STEEL  
 EXHAUST SETS - CONTACT  
 STOLP STARDUSTER CORP.

0-180 MPH  
 AIR SPEED INDICATORS  
 NEW PRODUCTION  
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 STOLP STARDUSTER CORP.

Tell your friends -  
**New Fiberglass Turtle-**  
**back for Volksplane .**  
 From "Starduster"  
 Only \$39.95

"STARDUSTER" Decals  
 for

Starduster Too  
 Acroduster Too  
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"Starduster"  
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Get a New

Stewart Warner  
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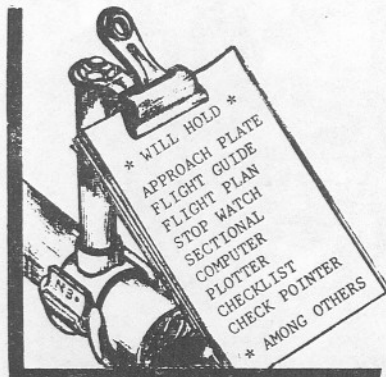
Straight & Bubble  
 Windshields - Fit  
 STARDUSTERS, PITTS,  
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 \$19.50 & \$25.00  
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SA300 I Struts Fairing.  
 Stamped Aluminum.  
 \$195.00 Set of 4,  
 Finished & Trimmed.  
 \$135.00 Set of 4, you  
 Finish & Trim.  
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Aileron Bearing Inserts.  
 Better Control Feel -  
 Longer life - Enables  
 you to feel air loads.  
 Not friction.  
 Dia: O.D. 5/8"  
 I.D. 1/4"  
 Width 3/16"  
 Set of 8 \$25.00

Fiber Glass Sleeving -  
 Varnish Coated - Anti-  
 Chafe.  
 Electric Bundle Sleeve.  
 \$1.00/each

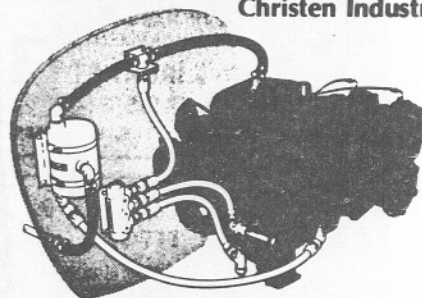
CLIP-IT



"Starduster" \$3.25

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 Christen Industries



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 Inverted Oil Systems for all direct-  
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Christen Blue Max  
 aircraft engine  
 oil for engine  
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 under conditions  
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 pressure



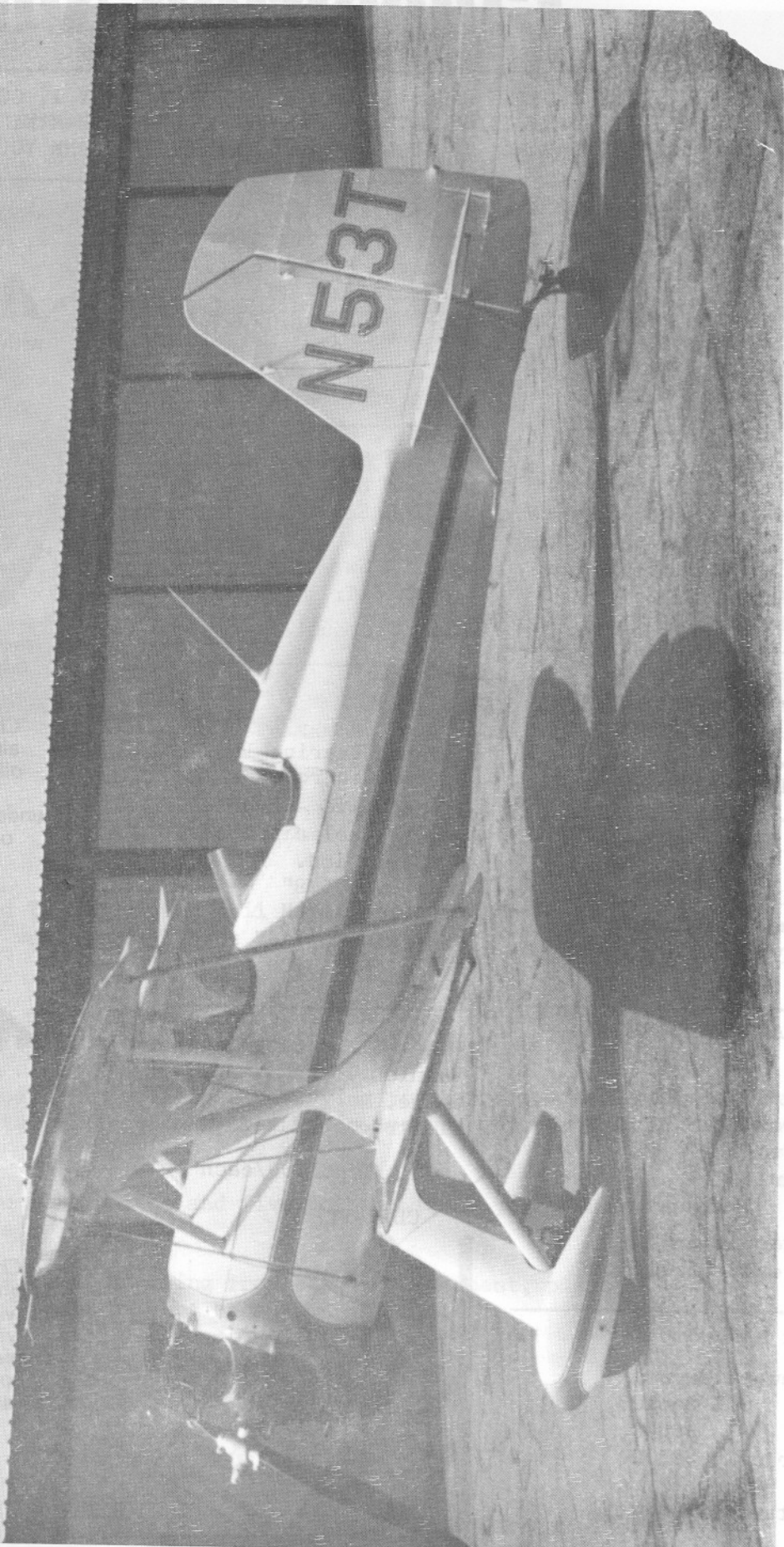
Christen 820 Seat  
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