THE

Stardust er

JANUARY 1977

MAGAZINE

DEDICATED TO THE ACTIVE HOMEBUILDER

When 1977 was only a few days old, we had a mid air collision at Flabob. A Cessna 120 had just completed a 90 degree turn to the downwind leg when a Cessna 140 completed a 45 degree turn into the downwind leg. Their paths converged. The cessna 140 chopped the complete tail off of the 120. The 120 immediately nosed straight down and went in. The pilot was killed. The 140 continued to fly straight and level for perhaps a mile, while slowly losing airspeed and altitude. The entire tail assembly was tucked between the wing and wing strut of the 140. At an altitude of between 40 and 50 feet, the 140 stalled, and started to spin. Because of the low altitude it did not complete more than 1/4 turn befroe it hit flat. Other than a cut on one arm, the pilot was unhurt.

I think it behooves us all to,every once in a while, evaluate our flying habits with a critical eye. As we get more experience, and get older, we tend to fly by well grooved habit patterns. Perhaps we also become less observant, and more set in our ways. The biannual flight review is good. But frequent self r4views are even better.

Think hard now. Has anyone made rude and uncomplimentary remaks about your flying lately. The rudeness may be deplored, but the observations may be uncomfortably accurate. Give the devil his due. Maybe your flying isn't the greatest, lately.

When driving your car have you had several incidents in the past year or so when you find someone in your blind spot honking vigerously at you as you started to change lanes on a super highway? What's the matter? Were you relying on your mirror instead of physically looking over your shoulder before changing lanes ?

In the air. Have there been any times when you were in the traffic pattern and suddenly became aware of another plane being uncomfortably close to you? Perhaps it was the other pilots fault. You had the right of way. But was the Plane THAT close before you were aware of it?

If you fly a biplane, like I do, you are probably suffering from a plane with poor forward vision to begin with. It may also have upward and downward blind spots caused by the wings also. Therefore, extra care and procedures are called for.

On takeoff, be sure your top wing tip is not blocking out a plane sizzling down the landing slope, as you taxi onto the active runway. On climbout, as well as on taxi gentle s turns are an excellent idea. I won't even go near an airport traffic area any more without making gentle s turns and looking all over the sky. I also restrict all turns in traffic areas to not more than a 90 degree change in heading. Turn 90, level out and look, and then turn 90 more.

All this is a lot of trouble. But it will be appreciated by other pilots in the sky, who are not cut out or endangered by you. These other pilots may not appreciate the visibility problems of a biplane. And there is no good reason why they should. You fly it. You watch out. And by taking extra care and caution, you can be reasonably sure that you will never have to wonder if the accident was your fault. Just call me old swivel head.

THE STARDUSTER MAGAZINE--DEDICATED TO THE PROPOSITION THAT THE ULTIMATE IN SPORT AIRCRAFT WAS REACHED WITH THE DESIGN AND DEVELOPMENT OF THE OPEN COCKPIT, TAIL DRAGGING BIPLANE--AND THAT EVERYTHING ELSE HAS BEEN DOWNHILL--EVER SINCE.

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ON OUR COVER THIS MONTH IS OUR BEAUTIFUL NEW NIEUPORT 28, CIRCA 1917. MUCH CREDIT MUST BE GIVEN JIM AND ZONA APPLEBY FOR THE MAGNIFICANT JOB THEY DID IN BUILDING THIS REPLICA AIRPLANE.

ON OUR BACK COVER IS THE STARDUSTER TOO OWNED BY JOHN CHANEY AND S. E. COCHROME OF BLUFFTON, OHIO. THIS IS AN AWARD WINNING AIRPLANE. WE WISH TO THANK JOHN FOR SENDING US THIS BEAUTIFUL PICTURE OF IT.

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THE BUILDING OF "MARMALADE"

BY RON POWERS

In 1966, I saw a Starduster One in San Diego, and I knew that was the airplane a person shouldn"t live without. It was 70P, owned by john Tucker of Stardust Aviation, and my Dad, Ned Powers, was fortunate enough to fly it. He felt that there were better acrobatic planes, as it would not do outside maneuvers.

Shortly after this, Lou Stolp came out with the Starduster Two. Now they were really on the right track, except it was supposed to be non-acrobatic, and needed symmetrical wings.

Two more years of looking, and nothing looked right. Then the August issue of Sport Aviation 1972 had the Acroduster Too, but the pictures showed it as a single place, and it took me until January or February 73 to find that it was a two place. I had a chance to look at Morgan Schrack's, and that sold me.

The plans came in March, and I began.

I recommend to all builders to get a couple of good parts catalogs to help identify parts and to help in planning. Also, the "HOW TO BUILD THE ACRO SPORT" manual has many good ideas. STARDUSTER magazine is a must, and belonging to the EAA goes without saying.

I ordered one of the first wing kits. I don't have saws and routers, and it seemed that it would be easier and faster with a kit.

While waiting for the Wings kit I studied plans and designed paint schemes; one of which is on the airplane.

The first big step was to buy tubing. Most I bought from a local supplier, but some had to be ordered from STOLP STARDUSTER CORPORATION.

I bought two 4'x8' 3/8 plywood sheets and 2x4's and made a 16'x4' table to build on.

The first step was to draw all the tube center lines for the side of the fuselauge on the table. Then I drew in all the tube widths from the dimensions. I then cut up 1x2's for blocks to hold the tubing. I used a square to alien the tubing to the drawn lines.

I bought a good grinder and began cutting and grinding the tubing. I found that grinding worked well for me. A friend, Burt Sisler, uses tin snips and does very well.

About this time I found a question that couldn't be answered by local friends so I began a long telephone bill to Jim Osborne, which is probably not over yet. I'll add that he has been super to work with and has really helped. The question concerned itself with the rear spar carry thru and the seat configuration. I beleive the revised plans with the drawing of the seat structure on the back will help.

I took pictures of one in the Starduster shop and I recommend to all builders to get all the pictures they can of other projects and to take lots of their own project.

After all the cutting and fitting I double tacked every joint and used a wire arrangement to keep everything straight(figure 1).

I was very fortunate to have Burt Sisler help with the welding of the fuselauge and make sure that everything was straight. After the fuselauge was welded up I started the tail group. Again I drew all center lines and tube sizes on the table. The curves on the tail were interesting, especially the leading edge of the horizontal stabalizer, where it curves and flatens. I took a scrap of tubing and bent it and then flatened it to get an idea of how it would work. I made one small change in the rudder. I bought a rudder horn to slip into the bottom of the rudder post. Looks better.

Now its winter, which seems to happen a lot in Minnesota, and its to cold to work in the garage, but fortunatly the wing kit is here.

After discussing glues with everyone who would listen I chose epoxy glue. The biggest reason was that I felt epoxy would help fill the gaps between the cap strips and the rib.

Contrary to popular opinion the ribs on the Acroduster are as easy to build as any, because all ribs except the tip ribs, are identical back to the rear spar and then you only have four each of four different ribs.

Next I cut and filed the wing fittings. I drilled them in matched pairs; always filling a drilled hole with a bolt to keep everything straight. All the drilling was done on a drill press with everything firmly clamped. I then tapered the spars on a friends radial arm saw. I drew all the measurements on the spars, double and triple measured and then stook back to look before drilling and even so I have an extra spar in garage. Its always the last of the group that mistakes are made.

I used the matched sets of fittings to drill the holes in the spars, again on the drill press. I layed the wing center lines on the table and used some scrap spar material to block up the front and rear spars to allow the ribs to slid under. The center lines of both spars were the same distance from the table. I screwed 90 degree book shelf clamps to the table and clamped the spars to these. (figure #2) Then I double checked that the distance between the spars matched the carry thru on the fuselauge.

Next I bolted the wing and U fittings to the spars. I drill all U fittings on the drill press to get a very straight hole, then leveled them on the spars. I drilled, one hole in the end of the compression tube and then turned the tube over and placed a bolt in the hole. Then I centered the tube again and drilled the same hole.

After all the tubes were bolted in place, I took the whole thing apart and slid the ribs on the spars. Zinc chromate the fittings and varnish the spar in the area of the fittings before glueing the ribs to the spars.

The only thing I changed in the wings was to point the center section as the Starduster Too. That required 5 longer ribs and a check with Jim Osborne to make sure I wasn't goofing the wing up. (figure #3)

The ailerons were next and a little easier because they are flat on the bottom and can lay on the table. I have the orginal three aileron hinge configuration which wasn't much fun to alien. The new two aileron hinge arrangement should be much easier to build. I also like the new wing fitting which have exposed wing wire attach points. You might note when building the wing tip bows that the top and bottom curves are the same except for about a foot on the front. So make four the same and adjust.

Spring again and back to the garage to build the cabane struts. I found a couple measurement errors which have since been corrected. The cabane went good with a check to see that it fits the center section. I took two threaded rods with jam nuts to hold the cabanes while welding.

I bought the gear from Starduster and mounted with 0 degree toe in. I might caution the builder to buy good quality tires. We had some cheap ones on a Citabria once and they really made a difference in landing. Also I recommend the big Scott tail wheel for the same reason and it also makes the tail sit a little higher for better visiblity.

Next I began one of the most time consuming projects, the controls. I purchased two curved sticks from Citabria. This required re-doing the stick attach points, again I checked with the designer.

Next I jigged the wings and built the I struts. I don't remember any problems. I drew it out on the table and built two the same. (figures 4&5)

Now you can start sitting in it and moving the controls, not that you haven't sat in it a hundred times already. It really looks like an airplane and just about ready to fly. WRONG--- 90%to go.

I then went to all the littl things on the fuselauge. Starting with the firewall I made all the stand offs and formers. Most of this is all eyeball work, trying to find a curve you like and matching it to the other side.

I moved the rudder pedals back so that the firewall would not have to be cut out. I also moved the instrument panel forward to get more clearance for my nose.

For mounting the stringer to the stand offs I used large cotter keys which seem to be working well. I also looked at building 200 tabs and bought them instead.

When installing the firewall and all the formers it would be best to have the engine installed. It makes it easier to get the clearance for the cowling. The engine moves a lot so have about an inch clearance on the cowling. Also remember that with the offset engine mount the left rear cylinder is a lot farthur out than the right side.

When building the cowling I wanted one that would allow me to look at the engine and not need a screw driver to do it. Therefore the whole side of the cowling opens with wing Dzus fastners. Building the cowl and wrap around just takes lots of measuring and eyeballing. I used builders cardboard to make patterns.

When cutting the holes for the cockpit make sure to leave enough room for the windshield and the cockpit coming. I pop riveted 3/8 aluminum tubing on the outside of the rear cockpit and on the inside of the front and covered both with 3/4 inch radiator hose. I also made a window in the floor in the rear cockpit and made the cover and windshield in front attached with Dzus fastners. The windshields were attached as per Starduster magazine and worked fine.

I recommend that all metal work be done before any painting. I had painted the gear before the gear fairings were made and I had to repaint because of chipped paint on the gear.

I used Stitts covering process with Aerothane finish. I believe it to be a good process. I couldn't find anyone in the local area who had used it and I did have a couple problems. It would help if Stitts would publish a comprehensive manual. I also found 2 gallons out of 9 of color which were a shade lighter. I recommend mixing all paint of one color before painting. I have found the Aerothane super easy to clean.

Some notes on painting; buy a very good spray gun, such as a Binks or Devilbiss; use only the very best masking tape, 3M #233 and professional masking paper. I used a double spray mask and changed the filters at least once a day when spraying. Polyaerothane paint will definitly make you sick if you breath very much of it.

When all the painting was done I rented a trailer and with the help of many friends we moved to the airport. (figure #6)

It took about one more month to assemble and double check everything.

The airplane was signed off on June 29, 1976.

This was to be my first flight test of a new airplane, so I read all I could on testing. It seems to come down to two schools of thought. One is to takeoff chop the power and land; the other is to takeoff and go test. Most everyone agrees that you should have taxi tests up to almost liftoff speed.

I'm well aquainted with the Citabria so I tried the "takeoff chop power and land" method in it. The whole process keeps you pretty busy even in a familiar aiplane so I didn't consider it to be a good test proceedure in an unfamiliar airplane. These airplanes are pretty standard aerodynamic construction, so you know they will fly; how well is something you find out by flying at altitude not during takeoff and landing.

I also took dual in a Pitts S-2 before I test flew my Acroduster.

So after all the taxi tests, with no steering or overheating problems its time to go. After the FAA approval it was a normal preflight, taxi out and takeoff.

The takeoff was normal but as I began to climb out I noticed the airspeed begin to drop. I lowered the nose and the airspeed held steady at about 90. As I began to climb again the airspeed began to drop again and I noticed the altmeter was not working properly. There have been some recent accidents because of static blockage and I supposed that to be the problem.

I climbed up to do some turns and stalls. The airplane turned very nice but dropped the left wing a little in the stall. The landing seemed fast especially with the airspeed indicating about 140.

I have a Champ type pitot static system with both tubes out in the right bottom wing attached to the front spar. When painting I didn't want to paint the holes shut so I neatly taped the holes shut. Well there was the tape still on the static holes. When you tape the holes tie a string to it to remember.

After the first flight I got down to some serious test flying.

I had two things in mind for the flight test program; one, learn the airplanes performance, and two, learn how to fly the airplane. For the first I used many of the suggestions of Eric Shilling from Starduster magazine. For the second I used the private pilot guide to manuevers. Each time I went up I did some testing, some practic manuevers and lots of takeoffs and landings. I found that the airplane does beautiful wheel landings.

During the climb tests I discovered that if you are climbing at the best angle of climb speed and lose power you will need about 300 ft. loss of altitude to regain good flying speed, so don't leave the ground at best angle of climb speed, better at best rate of climb.

I've had to re-rig the wing because of the left wing drop during stalls, and also add aileron trim tab for a heavy wing.

I don't have a constant speed prop or electrical system and the airplane is toward the aft CG limit. To make the airplane fly better with two people I lowered the rear of the horizontal stabilizer.

I've done most manuvers including spins with two 200 lbs. passenger and it recovers very fast. It seems to be very easy to load up the wings in loops and such so easy on the back pressure and you get a nice big loop.

In testing I've found that the ailerons are so effective that it is possible to stall the airplane with two people and hold the stick all the way back and fly, but your sink rate is about 2000 ft. per minute and it could ruin your whole day if you were to hold it to the ground. The elevator seems to be the most sensitive of the controls. All the others are very nice, and there are no ground handling problems at all.

I've been asked if I wasn't excited on the first flight. Well to tell the truth I was too busy to notice. And flying 6 to 7 hours a day in order to get 50 hours in time for Oshkosh, didn't leave much time to enjoy myself. But on July 31 the restrictions were lifted and on Saturday Aug. 1 I took my first passanger. The passanger was my wife Sharon and that was enjoyable.

Three and a half years of work was finally paying off. The same day I also took 12 other people for rides. Sunday Aug. 2 Pat O'Kelly and I flew to Oshkosh and I thoughly enjoyed the attention the airplane recieved. We also went to Fond Du Lac and had a super time with people like Paul Poberzney and Harold Newman also in the Sportsman Catagory.

Two place airplanes are built to take people flying, and to date 44 people have flown in the airplane; for some its been a very expensive ride because they have started projects of there own.

I must first thank my wife and family for putting up with this project. Next I thank Burt Sisler for everything from welding to weight and balance. Thanks go to Pat O'Kelly and Paul Howe and Chapter 25. I must thank Jim Osborne and all at Stolp Starduster Corp. I saved a special thanks for the EAA; without this organization I would not have this airplane nor would I have the many friends I've met through this project.

PERFORMANCE: 1400 lbs - 80F - 900 ft. (note; I have a super flat pitch climb prop and a constant speed prop should change the performance)

Top Speed Level Flight	127 MPH	
Cruise Speed 2500 RPM	110 MPH	
Stall Speed	50 MPH	
Best Rate of Climb Speed	80 MPH	= 1400 ft/min
Best Angle of Climb Speed	65 MPH	
Approach Speed	80 MPH	
Rate of Decent-Idle-80MPH		800 ft/min

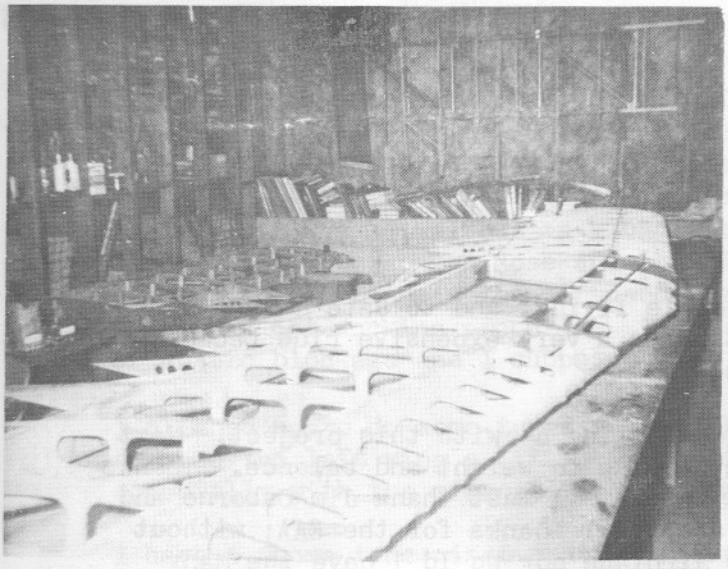
MANEUVERS:	ENTRANCE SPEED	
Barrel or Slow Roll	120 MPH	
Loop	140	with two passangers- 160
Immelmann	140	
Snap Roll	110	

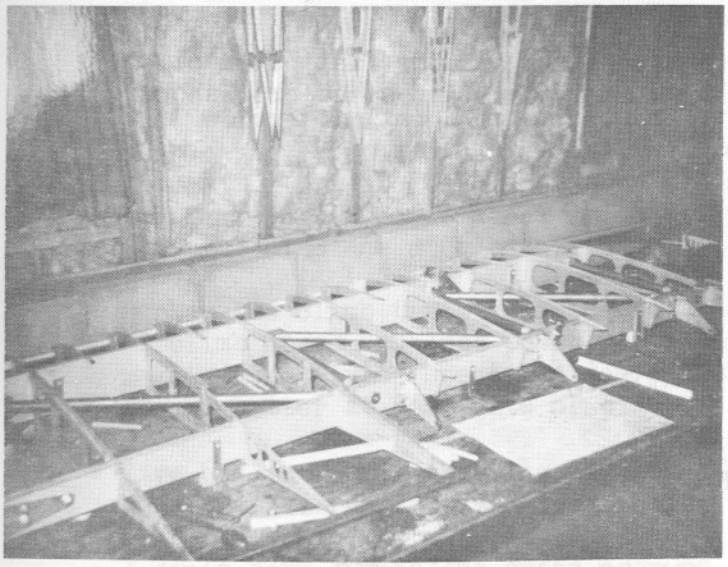
-- STARDUSTER TOO FOR SALE--

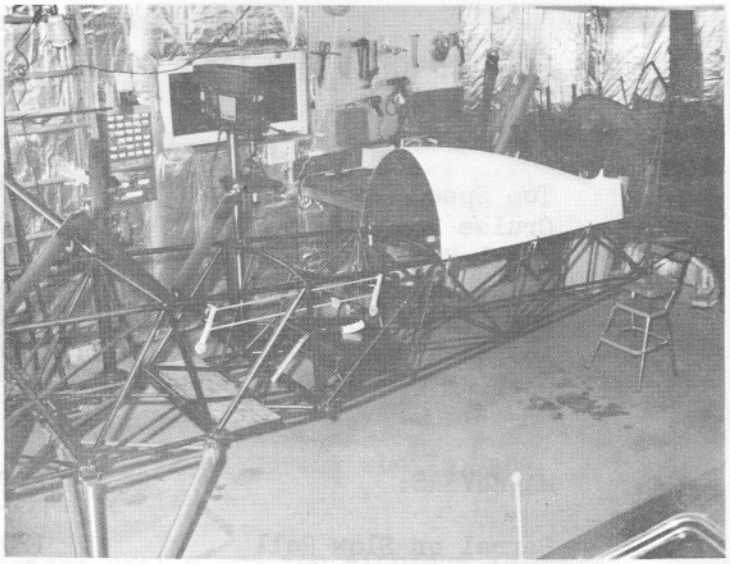
John Morrissey, National Sportsman Aerobatic Champion, has his beautiful STARDUSTER TOO up for sale. This is an extraordinarily good airplane. It is built with quality workmanship thruout, but more important it is built relatively light.

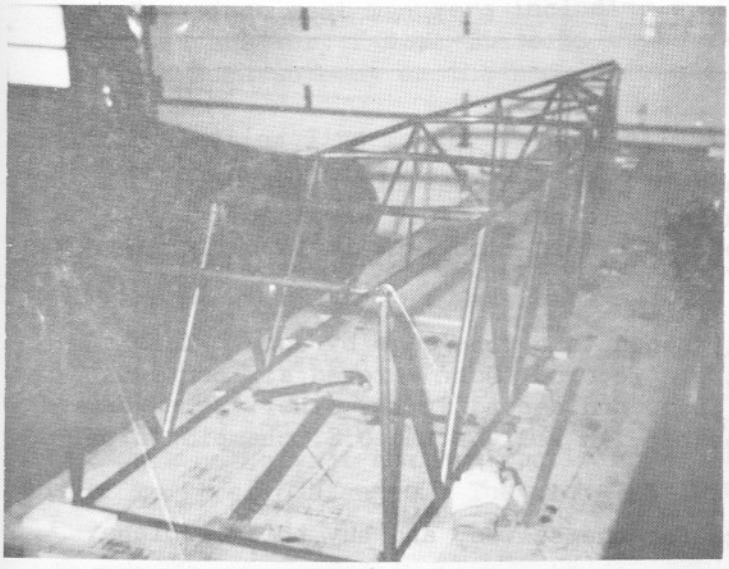
The flying qualities have been carefully honed to a fine edge by John. This is attested to by its Aerobatic Contest win record. John entered six contests last year. He placed First in five of them, and second in the other. John won the national Canadian Aerobatic championship, as well as the U.S. championship (sportsman category).

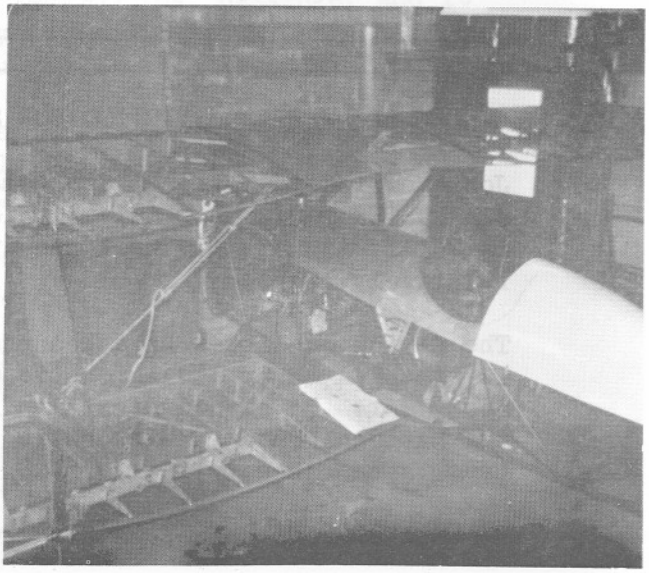
We hope someone does something real nice for themselves, and buy this airplane.











"STARDUSTER " OPEN HOUSE by Jim Osborne

Last year, on March 28, "STARDUSTER" had its first open house. It was a one day affair, and little notice could be given our friends and customers. Never-the-less, the people who attended seemd to have a good time, and we have had inquiries about holding another one.

This year, we will be holding open house on Sunday, March 20, 1977. You are invited. Please come. We will have on display our Nieuport 28, and, very probably, Gaff Mueller's Acroduster Too.

We would like to expand our little party this year. To that end, we propose having a dinner party on Saturday night before the Flyin. We will arrange for the dinner party at one of the better motels. We would also be happy to arrange room reservations for those of our friends who would like to spend the night.

We plan on featuring dancing and music from the "SWING ERA" at our dinner party. If you prefer a trumpet to a guitar, and Tommy Dorsey and Glenn Miller to the Beatles, then this party may be for you.

So that we may make adequate plans, please let us know if you plan on attending, and how much. Use the form at the bottom of this page, if you like.

DEAR JIM AND ERIC,

YES, I DO PLAN ON ATTENDING THE STARDUSTER OPEN HOUSE PARTY ON SUNDAY, MARCH 20.____

ALSO, I EXPECT TO ATTEND THE DINNER DANCE. RESERVE _____ SEATS FOR ME.

ENCLOSED IS DEPOSIT OF $5.00 PER SEAT.

I PLAN ON STAYING OVERNIGHT. PLEASE RESERVE A MOTEL ROOM FOR ME.

SINGLE_____ DOUBLE_____ OTHER _____

ENCLOSED IS ROOM DEPOSIT OF $20.00 PER ROOM

I WILL BE FLYING_____ NAME_____

ADDRESS_____

I WILL BE DRIVING_____

TELEPHONE_____

YOU AND YOUR FLIGHT PHYSICAL EXAMINATION

By Jim Osborne

Next to his wife, probably a flying mans most valued possession is his current and valid medical certificate, which permits him to exercise privileges denied common ordinary earthbound mortals. So it can come as a severe and psychic shock when the FAA Medical arbiter turns thumbs down on furthur aeriel activity.

According to one of our eminent Flabob pilots (we don't have any other kind) who has been the route, the first medical word on this subject is not necessarily the last. He says if your illness, chronic desease, medical deficiency, or whatever is not so disabling as to cause you to be unable to function in normal stressful activities such as driving a car, thereis a reasonably good chance that you can have your flying rights restored.

According to Hank Silvera,former fighter pilot, Airline pilot, and crop duster, the FAA. is primarily concerned with whether or not you can fly safely. This means that they are constantly reevaluating their minimum standards in the light of experience, and are not averse to considering applications for waivers, if the applicant can present a reasonable case for the restoration of his flying rights.

Hank says that one of the biggest changes in the FAA attitude towards medical disabilities has occurred towards pilots who have suffered heart attacks. Not too many years ago a heart attack was an automatic and permanent grounding. Not so, nowadays, according to Hank. Within the past 15 years, treatment of Heart Attack Victims has improved to the point that they are able to lead normal or near normal lives after recovery. Taking this into account, the FAA has issued many waivers to men who would formerly have been grounded for life.

Hank says that the first man to see in the event you lose your medical is your own family physician. If your grounding was due to something treatable such as high blood pressure (hypertension), then there is a good chance that your doctor can help you get back in flying shape. The FAA does not condone drug therapy to relieve high blood pressure. The standard treatment, under medical supervision, is to lose weight. A medical cardiovascular evaluation reoport must be submitted to the FAA after this condition has been corrected.

After your condition has benn corrected or improved, your doctor should write to the FAA and acquire their set of standards as pertaining to your medical condition. In case of doubt or trouble the AOPA can be of tremendous help, according to Hank. He says the AOPA maintains a list of 30 or 40 attorneys in each State, who have helped other grounded pilots. They are familiar with medical precedents. And each precedent makes it easier for the next man. These attorneys are usually fliers themselves, and take a more than ordinary interest in helping their client.

For unusually difficult cases Hank recommends that you contact Dr. JAMES E. CRANE, HANGAR C, SUITE 201, 7515 LEMMON AVENUE, DALLAS, TEXAS, 75209. The Doctor is is a very busy man, so Hank recommends that you write to him in cases of last resort, where your own FAA Doctor, or one recommended by the AOPA, is having problems, or when your attorney needs expert medical opinion.

Health problems for which there is hope include Heart Attacks, High blood pressure, diabetes, if it can be brought under diet control, and many other medical conditions which can be corrected by medicene, or controlled to the point that the patient can lead a relatively normal life.

So, remember, if one day the Doc says you are grounded, it may not be for good. Take treatment. Lose weight and exercise, if called for, and learn to control your condition as much as possible. Then, if you are still a total, functional human being, perhaps you will find that the FAA really does have a heart, and you too may fly again.

ACROBATICS IN THE ACRODUSTER TOO

By Eric Shilling

Several Acroduster Too builders have asked about entry speeds for various acrobatic maneuvers. I have flown Gaff Muellers Acroduster Too, which is one of the original prototypes. I might point out that, first of all, Gaff's airplane has wings with a slightly different airfoil than those built from the plans. It is more of a high speed laminar flow airfoil than the airfoils used on subsequent ones. This, and weight, will probably account for whatever differences you may find between my numbers and yours. Here they are.

I have found that 140 MPH was the lowest entry speed at which a decent loop could be accomplished. At 140 MPH, and using a 3 g pullup, a nice round loop could be accomplished. More or less g's results in a sloppy or incomplete loop. At higher entry speeds 4 g's appeared to give the best results. 6 g's caused a speed bleedoff more rapidly than when using the 4 g pull. I therefore think that the 4 g pull is optimum up to 180 MPH.

Induced drag is a function of angle of attack. For speeds higher than 180 MPH, a higher g loading may be used to attain a higher speed.in a vertical roll, or increased speed at the top of a loop. One must always keep in mind, however, the envelope in which the plane was designed to operate, and NOT EXCEED IT.

In regard to buffet, the wires on this airplane were slightly loose, and would vibrate when pulling high g's. Check for this, and tighten, if necessary. It would buffet when pulling too much g's, such as one may do at the top of a loop and when descending in the vertical position. You must relax back pressure apprcaching the top of a loop, and also not pull it in too much at the start of the down vertical.

If you do pull to tight you will get buffet, and it goes without saying that your loop would not be round.

MANEUVER	MIN SPEED	MAX G LOADING	BEST SPEED	BEST G LOADING
Loop	140 MPH	3	160-180	3 and 4
Snap Roll	120 MPH		130	
Slow Roll	120 MPH		160	
Aileron Roll	120 MPH		160	
Immelman	180 MPH	4	180	4
Cuban 8's	140 MPH	3	160	4

On the min entry speed, it means that it is just barely acceptable, but will give a good idea as to the envelope, or starting point for the maneuvers.

Some pilots have suggested that the buffet may have been due to the large canopy. I am more inclined to think that it is associated with the high speed stall warning on aircraft with this type of airfoil.

As more Acroduster Toos begin flying, I hope to be able to compare figures with other builders, and thus accumulate more accurate data for this model airplane.

TEST FLIGHT- NIEUPORT 28

JIM OSBORNE

On Saturday, January 8, 1977, Nieuport 28 C-1 lifted off the runway at Flabob airport for a short but completely satisfactory first test flight. Jim Appleby, who built the machine along with his wife Zona, was at the controls.

A shallow climbout followed by circling flight at 2000 feet or so proved the control response to be completely satisfactory. The landing was anti-climatic, being dead smooth and with no hint of any problems.

When it came my turn to fly, I was very impressed with the starting procedure. First comes an unusually complex and complete walkaround inspection. Start at the cockpit. Check to see that the magneto switches are off and that the misture control is full lean. Unlike modern airplanes this one is full lean with the control know full forward. See that the gas selector valve is off. Walking out around the left wings check flying and landing wires, and the left aileron. Get down on your knees and crawl under the fuselage just forward of the cockpit. Drain some gas from the drain valve. Check aileron control linkage thru some little holes in the fuselage, put there for that purpose. Get out from under and check the back of the engine thru cowling access holes. Walk around to the front and swing the big wooden prop thru for six blades. This checks for liquid lock and starts the oil to moving around in the engine. Climb on top of the big right wheel and check the oil level and the gas level. Continue around checking wires, struts, and control surfaces until you find yourself right back at the starting point, on the left side of the cockpit.

After making sure the wheels were chocked, I climbed into the cockpit. Gas valve on, mixture rich, and pump the primer 8-10 strokes until Appleby told me that fuel was running out of the engine. He then rocked the prop back and forth until he was satisfied that all cylinders were adequately primed. A helper then hooked up a "buzz box" to the engine. Jim Appleby yelled for both mags on and throttle cracked. He then hollered "now" and swung the prop backwards

against compression. At the instant "now" was hollered the helper hit the "buzz box" switch. The prop fired against compression and the engine began to run so slowly and smoothly, just typical of these old timey engines. It was a real delight just to hear it chuffing and puffing away.

In order to get in takeoff position I taxied the length of the field, s-turning and feeling the controls. As I taxied slowly along people popped out of every building and cameras were plentifully in evidence. Gorund steering was good, fast and responsive, although the high position of the pilot and the narrow gear gives somewhat the feeling of being on a rather high and unstable stoll. Vision forward was poor, making the S turns mandatory.

On the takeoff roll, the tails pops up almost instantaneously with the application of full forward stick. Directional control was excellent, thanks to the long tail moment arm and the big rudder. On the climbout a little forward stick was necessary, as it probably was with the originals. On attaining altitude (2500') both left and right circles were flown over the airport while a camera ship flew alongside and took pictures. It was evident that these old airplanes had good elevator control, although stick throw was at least twice what you would find on a modern airplane. Rudder control was also good. However, the rudder bar made my feet travel in a small circle whenever rudder was applied. This is a strange sensation, and takes a little getting used to.

The most ineffective control appears to be the ailerons. They were rather stiff and not very responsive. I would estimate that a complete roll would take 9-10 seconds. The control throw for the ailerons is also short, when compared with the elevators, making for quite a different feel to the ailerons as compared with the elevators. I would say that control forces are quite mismatched, with the aileron forces being much the higher.

The most noticeable thing, to me, while flying the airplane was the quietness. That old WARNER 145 was so quiet and smooth that the wind whistling thru the wires was the loudest noise I heard. Andit was relatively loud. I believe round wires make more noise than streamline wires.

After the picture taking, a stall seemed in order. It had a nice clean break, relatively sharp, but little altitude was lost, due to the light wing loading, and recovery was quick. Recovery was straight ahead, a tribute to Jim Applebys rigging capability.

Preparing to land, a glide speed of about 80 MPH seemed about right. I first established the glide speed by feel, and then checked the airspeed indicator. She flared nicely, but touched down when I thought I was at least still a foot in the air. As a result, it was a wheel first landing. However, there was no tendency to bounce, as would almost surely happen with a modern airplane. It just continued to roll along the ground with no increase in angle of attack until I slowly lowered the tail. There was no noticeable tendency to ground loop. Ground handling was excellent.

This was one of the biggest thrills of my life. I now have two hours in the new/old bird, and am eagerly looking forward to many many more.

One of the more surprising things to me was not the differences in flight handling, as compared to modern aircraft, but the similarities. For an airplane that was designed 60 years ago to fly so well, and so like our modern machines, is a tribute to the early designers. It appears that, aerodynamically at least, there hasn't been all that much progress in the last 60 years.

-TRIMMING YOUR BIPLANE- BY JIM OSBORNE

After years and months of waiting, your biplane is finally finished. The F.A.A. has signed it off for flight. Taxi tests are completed, and the first few flights are relatively uneventful. Your creation flies. How well does it fly?

Almost always, some trim changes are indicated. Some of these changes are more easily made than others. The most common conditions which may need correcting are as follows.

1. A tendency to turn right or left in level, cruising flight. Right or left rudder pressure is required in order to fly straight.

2. A tendency to nose up or down in level flight, with the trim tab in the near neutral position. Requires forward or aft pressure on the stick in order to maintain level flight.

3. A tendency to fall off on one wing during a stall. May, or may not, be correctable with aileron. Almost always will respond to proper rudder action.

4. A tendency to drop a wing in level flight. Requires right or left aileron pressure on the stick in order to maintain level flight.

Condition (1) is usually the simplest to correct. If your biplane has a steel tube and fabric vertical fin, with brace wires both front and rear, then the fixed vertical tail may be adjusted by these brace wires. Suppose your airplane wants to turn left. Loosen the right front brace wire, and tighten the left front wire. This forces the leading edge of the fin to move to the left. Ergo: The nose of the airplane wants to swing right. The proper amount of adjustment will cure your left turning tendency.

We find that the above adjustment almost always works, so that no rudder trim tab is needed. Always adjust for cruise. This may mean that you hold right rudder pressure for climb and left rudder pressure in a dive. If this doesn't appeal to you, then you may want to install a cockpit controllable rudder trim system. Dean Hall described such a system in the last issue of our magazine.

Condition (2) is also usually easy to correct, but requires a little more analysis. Let us imagine that your airplane seems to be tail heavy. With trim tab in neutral, and the horizontel tail level, as measured by the top longerons, forward stick pressure is required to maintain level flight. Is it tail heavy, or just out of trim?

First check your weight and balance. If your figures are correct, and the C.G. falls within the design envelope, then, almost surely, you have a trim problem.

Next, check the stability of your airplane. Apply nose down trim until hands off level flight is achieved. Then sharply displace the stick a small amount forward or aft, so that the plane oscillates up and down. In a stable machine the oscillations will diminish, and eventually damp out. In a tail heavy machine, the oscillations will get bigger and bigger until the pilot applys corrective stick forces.

If your biplane has a symmetrical airfoil, one additional check can be made. Trim for level flight. Roll over and fly inverted, at normal cruise speed. Check your stick pressure. In a tail heavy machine, aft stick pressure will be required. In an out of trim machine, forward stick pressure will be required. This test does not apply to non-symmetrical airfoils such as the M-6, because

of the center of pressure differential between the upright and the inverted positions.

One reason some builders think they have a problem with aft C. G. is because of the apparent positive incidence of the horizontel tail when compared with the top longeron. This is usually due to the way the basic fuselage box was built. The two side frames are generally made first. Then the top and bottom longerons are bent inward at designated points, and the top and bottom members welded in place. IF THE TOP AND BOTTOM LONGERONS ARE BENT INWARDS AT DIFFERENT FUSELAGE STATIONS, THE LONGERONS AFT OF THE BEND WILL NOT BE LEVEL. If the bottom longeron bend point is forward of the top fuselage bend point, (as is true in all of our airplanes), then the top longerons aft of the bend will kick up as compared to the longerons forward of the bend. Your longeron is then not a reliable indicator of the incidence of your horizontel tail. This condition can be prevented by tack welding side frames aft of the bend points. Complete the fuselage box in a top jig, and finish welding side frames while in the top jig.

A nose heavy airplane will be excessively stable, performance will suffer, and you may have trouble getting the tail down for a 3-point landing. Otherwise, this is not a dangerous condition.

Condition (3). If your biplane drops a wing during a normal, straight ahead reasonably gentle stall, then you have problems with the upper wing rigging. The reason the problem is with the upper wing is that the bottom wing normally never stalls. So a tendency to fall out of a stall on one side or the other is almost invariably due to the top wing being out of trim.

And also invariably, you will find that the wing panel on the dropping side has more incidence in it than the other side. So check your top wing rigging carefully to see which panel is out of rig. In our biplanes the wings should be rigged flat, that is without washin or washout. So eliminate all washin and washout on the top wing and your airplane will then break straight ahead in a gentle stall.

Condition (4) Now that we have eliminated all our other trim problems in a logical straight forward manner, we are ready to deal with any tendency to drop a wing in level flight. We now know that the top wing cannot be to blame because our bird breaks straight ahead in a stall. So we have only the bottom wing to deal with. Check carefully to see that you have the same amount of incidence in both lower wing panels. The is one on the most critical measurements on a biplane. You can put the wings on slightly askew so that one side has the tip further ahead than the other side and you will never know it when flying. But have even the smallest difference in incidence in the wing panels and you will know it real quick. A difference of 1/2 a degree is way too much, HAVE NO DETECTABLE DIFFERENCE, AT ALL. Washin or washout can change the incidence near the tips, and cause the wing to drop. On all our airplanes the lower wing panels have no washin or washout. Check the rigging of the ailerons. They should trail with the wing trailing edge. Finally, if all else fails, install a small aluminum trim tab on one of the lower ailerons and adjust it to eliminate all rolling tendency in level flight. Most biplanes have very little roll stability. This is particularly true of aerobatic biplanes. So, as a practical matter, the trim tab may be the best final solution. At your next flyin check to see how many biplanes have this trim tab on one of the ailerons.

-NEW PRODUCTS-

COMPLETE WELDED ASSEMBLIES-- These are available for the STARDUSTER TOO, STEEN SKYBOLT, AND THE ACRODUSTER TOO. These assemblies are in stock, on the gear, and the best buy in Sport Aviation today. The fuselages are completely finished, except for a bracket to hold the throttle, or quadrant. This is a matter of individual preference, so this is left off. Our assemblies include all assembly hardware, in addition to all brackets, standoffs, formers, gussets, etc. All this miscellaneous small stuff is not included in many so-called "Complete welded assemblies" that are advertised today. We also include vernier trim control, and shock cords for the gear.

The cost for all this is a modest $2950.00. Bargains like that you can't hardly find no more. When you consider that you save the cost of welding equipment and supplies, the cost of jigs and tooling, and that, in all probability your finished airplane will be worth more, it becomes a bargain you can't hardly afford to pass up. Order yours today, and fly a year sooner.

CAST ALUMINUM PEDAL AND BRAKE ASSEMBLIES- These have been mentioned before, but a good product is worth repeating. These little cast beauties come complete, assembled and ready to install in almost any airplane. They are even painted black. They save you hours and hours of jigging and precision welding. They also look better. Price is only $25.00 per set. Compare this with the $75.00 per set we have to charge for welded petals. The saving in time and money is very apparent.

SLIDING CANOPY RAILS- New item that will be part of our sliding canopy kits. (Our first bubbles are due momentarily, as this goes to press) These rails are of steel construction, with rugged ball bearings. Sliding action is smooth and free, yet without a bit of slop. As delivered, they open to 14". Thru a very simple modification they will open up to 27". These are the best rails for sliding canopies that we have been able to find, after combing the market. Our low price is only $10.00 per set.

IRON ON TRANSFERS- Attractive, full color picture of the Acroduster Too, or the Starduster Too, each picture with the Acroduster 1 in the background. The Acroduster Too picture is the same one that is one the cover of our magazine. These transfers work best on cotton, or near cotton cloth. Only $1.00 each.

LANDING GEAR SCISSORS- Developed for our P-51 Landing gears. Adaptable to almost any oleo type landing gear strut. Only $18.00 per set

SMALL TAILWHEEL-Steering, but non swivel. Use where weight saving is at a premium. Weight is only 2-1/2 pounds. $44.95 each.

STEERING SPRINGS- Compression type. Forms a solid link under max. compression. Very positive in action. Gives excellent sensitivity. Only $2.00 per pair.

SHRINK TUBING- Rout wires thru tubing. Apply heat. Tubing shrinks tight around wire. Gives excellent abrasion resistance. 1/2" I.D. Only $0.75/4 feet.

FLEXIBLE FIBERGLASS TUBING- 3 feet long. 3/4" I.D. Excellent for protecting large bundles of wire from abrasion. Used by most commercial airplane Manufacturers. Only $1.00 each.

PITTS TYPE NOSE BOWL- Smooth and minimum frontal area. Works best with no starter on engine. Used on our last Acroduster 1. Only $50.00 Packed.

NOSE COWLING- Made tp fit Cougar and Tailwind. Adaptable to similar type home builts. $145.00,pickup, or $150.00 packed for shipment.

SMALL LIGHT WEIGHT WHEEL PANTS- Originally designed for the Stephens Acro. Adaptable to any airplane with 5.00 x 5 wheels. $57.50 pickup, $62.50 packed.

NEW STRAIGHT WIND SHIELDS- With larger bend radius than the old ones. This type gives minimum cockpit turbulence. Clear or tinted. Only $21.50 each.

WINDSHIELD INSTALLATION KIT- For straight or bubble windshields. Soft aluminum and rivets required for windshield installation. Only $3.50

GERDES GASCOLATOR- 1/8 pipe connection for 3/8 fuel line. Built in filter push to drain metal bowl. Only $35.00

GERDES GASCOLATOR A-1540-1 Same as above but with remote drain by pull cable. Only $40.00.

THROTTLE CABLES- A-900 series from Gerdes. Push-Pull with 1032 threads on each end. Base lengths are 2'. Available in 12" increments. Add $1.50 for each foot over 2'

A-900-0240----------$14.00
A-900-0360----------$15.50
A-900-0480----------$17.00

GERDES VERNIER THROTTLE CABLE- With 1032 threads one end and vernier control on the other. $26.00 plus $1.50 for each foot over 2'.

GERDES FRICTION LOCK THROTTLE CABLE- With 1032 threads one end and friction locking knob on other. $31.00 plus $1.50 per foot over 2'.

NEW TOOLS- Hand Rivet squeezer. Can be used for dimpling. Only $45.00.

Metal shrinker $82.00. Stretcher jaws for same, only $48.10

Right angle drill attachment. Heavy duty. Only 29.95.

Standard Stop countersink. Surplus, but good condition. Only $6.95.

-THANKS TO HANK-

We wish to extend our thanks to Hank Silvera, local Flabob Nabob, who gave us the interview which resulted in the articel on page 11 about protecting your right to fly. Hank is an Eric Shilling type, a real nice guy who has done a lot of extroardinary flying.

In addition to Crop Dusting, Airline Piloting, and bush flying, Hank was a member of Gregory "Pappy" Boyington's famed Black Sheep. He was quite interested in Eric Shilling critique on the accuracy of the TV series, Baa Baa Black Sheep. He would like to add that not all the pilots in the squadron were assigned to it in the normal course of events, and were no different from pilots flying in any other squadron. He thinks "Pappy" was one hell of a pilot and leader, but thinks, like Eric, that perhaps he owed some of his ability to the training he received from General Chennault.

FLUSH THAT NEW GAS TANK

WHEN ASSEMBLING YOUR NEW AIRPLANE, DON'T INSTALL A NEW GAS TANK WITHOUT THOROUGHLY FLUSHING IT.

During the manufacturing process, bits and pieces of metal work themselves into cracks and crevices. These metal bits come from the rivet holes which must be drilled for assembly, droppings from the welding process, and shavings from the many holes which must be cut, for fuel gages, vents, et cetera. It is impossible to build a tank which is absolutely clean inside.

Our tanks are assembled with extra care in order to eliminate as much metal chaff as possible. After completion they are pressure checked to well above the FAA requirements. They are then flushed out with water.

When you receive your tank you should flush thoroughly with a high pressure water hose. Flush several times until you no longer get any specks of metal. After installation, and before you run your engine drain a pint or so of gas into a container, and recheck for metal, or other contamination. Run a little gas into your hand, and closely examine the palm of your hand to see if you can detect metal dust. If your fuel drain valve drips gas, and will not close completely, it is highly likely that metal dust is preventing the valve from seating.

After ground running your engine, check filter screens for any evidence of metal or other contamination. Clean filters, if necessary, and drain gas from fuel, drain until it comes thru clean.

During your flight test period, keep a close eye on this matter. Check for fuel contamination at every preflight. Run some gas into your hand, and not just onto the ground.

Metal dust could go thru your engine, if fine enough, and not do any amount of harm. Nevertheless, the path of safety is to keep all fuel contamination to an aboslute minimum. You will fly safer, and your engine will run longer.

-NEW DRAWINGS-

We have made a few minor drawing changes for the SA750, Acroduster Too.

Drawing numbers 4, 12, and 13 have been changed. Drawing number 4 has had the hinge pins changed from nuts and bolts to clevis pins and cotter pins. This is not a significant change. It does reflect what has been standard practice, though, for some months. If you have bought a tail kit of materials from us recently you have received these pins in place of the bolts and nuts. To update your drawing, mark out the 5 Bolts in the L/M and replace them with 5 AN394-67 Clevis pins. Replace the five nuts with 5 AN380-2-2 Cotter Pins.

The fittings on sheets 12 and 13 have been modified slightly in shape, to cut down on possibility of interference with corner blocks.

These drawings will not be mailed to plans holders. However they will be sent free, with any order, to any plans holder who requests them.

DON BATES BEAUTIFUL STARDUSTER TOO-OSH KOSH '76

SEEN AT OSH KOSH '76 OWNER UNKNOWN

SEEN AT OSH KOSH, 76. OWNER UNKNOWN.

SEEN AT OSK KOSH, 76. OWNER UNKNOWN

Dear Jim,

Sure was great to talk to you at Osh Kosh. It just didn't last long enough. We are working on our last two ailerons, and hope to be ready for wing and tail surface covering before long. Can you tell me the type flannel or fabric you use to cover the aluminum caps on the wings? I would appreciate any info you could give me on this.

I enjoyed that Christmas Card. It was great. I hope you and the "gang" have a happy, healthy, and prosperous New Year.

Best Regards,

BOB KNOX

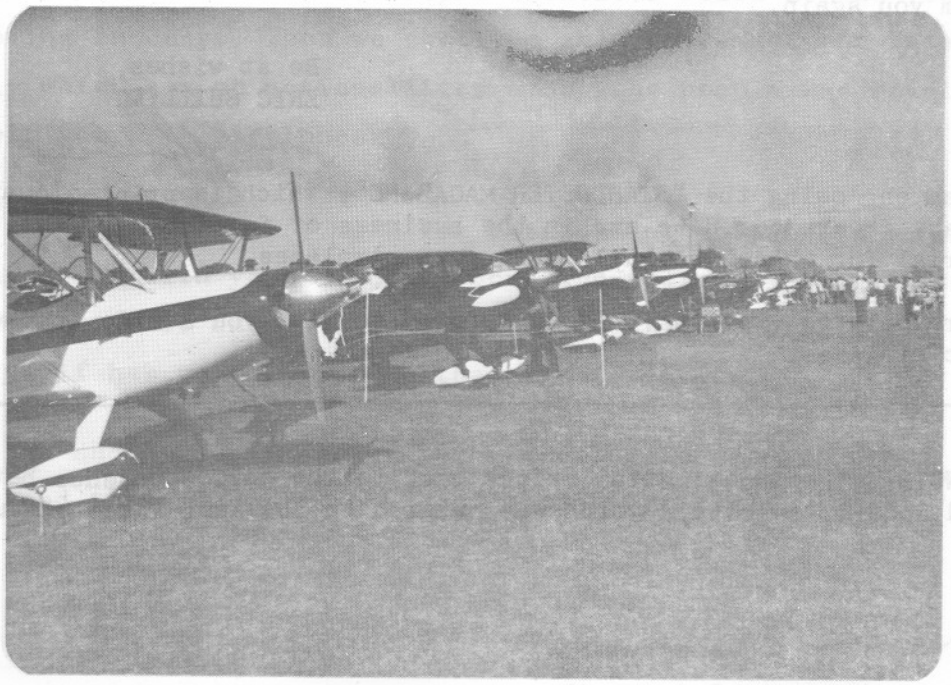
Dear Bob,

We use plain white cotton flannel to cover the Aluminum Leading edges on our wings. This gives a smoother covering job, and prevents the lap joints in the aluminum from working holes in the fabric, due to expansion and contraction.

Glue the flannel in place with super seam cement. When the covering is shrunk on and then doped, it will take a lot of dope to saturate the flannel. For this reason (because it adds weight) we do not cover the entire leading edge of an airplane that is weight critical. However, we always cover at least the lap joints with flannel.

Yours sincerely,

JIM OSBORNE



THE LINEUP OF STARDUSTERS AT OSH KOSH

STOLP STARDUSTER CORPORATION / 4301 Twining, Flabob Airport, Riverside, California 92509 / (714) 686-7943

December 16, 1976

25-14, 2-chome
Kitashinagawa, Shinagawa-ku
Tokyo, Japan

Dear Mr. Inoue,

It was indeed a pleasure to read your letter to Bob Prescott, a close friend of mine, and a fellow pilot while in China. I appreciated Bob's sharing your letter with the rest of us in the "FLYING TIGER", which was printed in our news letter, "THE TIGER RAG".

I have thought many times about friends who are no longer with us. I have also wondered about the faceless enemy of long ago, as I am sure my friends feel the same way. I have often felt that those of us who fought in the air were most fortunate, as our enemy was rather remote, instead of personal.

The saying is so true that time heals the wounds of unpleasantness of days long past. All that remains for me are the many happy moments shared with close friends. So, I would like to add my own expression of gratitude that you took the initiative to contact us.

Hopefully, we will meet many of your group during our reunion this coming July. There we would be able to recount many parallel events. I am certainly looking forward to seeing some of you of the Hayabusa Air Force, as well as hear from you again.

Be st wishes,
ERIC SHILLING
Eric Shilling

P.S. I am enclosing the "STARDUSTER MAGAZINE", which is printed quarterly by the Company I work for. We are in the business of furnishing plans, parts, and material for those who build their own airplanes.

If you are able to visit us, I'd be honored to give you a ride in one of our Aerobatic Biplanes.

EDITORS NOTE: The above letter refers back to the correspondence between Mr. Inoue and Robert Prescott, which was printed in the last issue of our Magazine.

Tokyo, January 11, 1977

Mr. Eric Shilling
Stlop Starduster Corp.
4301 Twining Flabob Airport
Riverside, California 92509
U. S. A.

Dear Mr. Eric Shilling,

Thank you very much for your letter dated December 16th and a copy of the Starduster. I am very much grateful to you to read my mind which I would like to put in the letter to Mr. Frescott with such a generosity.

Through kindness and understanding of you and your friends we can hope to have a joint meeting of fellow-soldiers in both America and Japan. If our dream comes true, it will be an unexampled meeting in the histories of Air Forces in both countries. Your brave pilots who lost their lives in the sky of China and our friends who passed away at the same place will be sure to be pleased with this plan. We shall be very happy if any one of you could come to our meeting in May and one or two of our representatives would attend your meeting in July. Then we shall be able to cement our friendship which has no nationalities among the people who devoted their youth to airplanes.

And thank you very much for introducing my letter in the Starduster with your kind introduction. I envy you, since you are still engaging in the work related to aviation. I-myself has no relation to the air at all now.

You shall hear from me again. Hoping to see you some day and that you will take good care of yourself,

Yours Sincerely,

Masaaki Inoue

Masaaki Inoue

Dear Jim,

Many thanks for your rapid, informative letter. I am so glad that you are putting out a Magazine. I have never seen one, so I don't know its format. I would like to suggest that you insert some articles concerning acrobatics with a Starduster Too, with such information as:

1. What maneuvers should never be done.

2. How to check for a structural strain or break? Wrinkled Skin? Or what?

3. What points should be continually checked just when doing acro?

I enclose my $5.00 for your magazine. How long have you been publishing it? And can I get back issues.

I guess you are aware that the Too sits real heavy on the tail. I had a lot of trouble with the Maule tail wheel. I have a huge Scott now, and it is great. Please send your latest catalog.

Yours very truly,

BRIAN POWER-WATERS
The Flying P-W Ranch
Church Hill, Maryland
21623

Dear Brian,

Your suggestion for articles dealing with Acrobatics in the Starduster Too sounds like a good one to me. I am sure it would be of interest to a great many people.

I hope John Morrissey will read this and volunteer to write us an artice(s) dealing with this subject. As U. S. and Canadian National Sportsman Champ he is undoubtedly the best qualified person to do this.

It is true that the tail end of a Starduster Too sits heavy on the ground. However, that is much more true of the older Too's with the old style landing gear. The new landing gear, with the wheels moved back 4", are much easier to ground handle, and much lighter on the Tail Wheel. If you haven't already done so I suggest switching to the new gear. Pilots who have tried it feel it is well worth the money.

On how to check for structural strain or break, use any and all ways. Sight carefully along the structure to note any wrinkled fabric. Check for lumps or bulges. Try to move any suspicious structure by hand. Look inside inspection plates. Move control surfaces to check for worn hinges. And always be careful, and suspicious. Luckily, however, your Design has a record for structural integrity.

Most sincerely,

Jim Osborne

November 29, 1976

Dear Eric,

We wish to thank you again for being so kind as to come all the way to Mojave to fly our plane. We thoroughly enjoyed the day, especially the flight you gave me.

We flew our airplane home to Ventura County Airport on Sunday and so now we are looking forward to many future trips.

We hope to see you again, soon.

Sincerely,

Myrna and Gary Solmi

Myrna and Gary Solmi

1726 Malcolm Ave.
Los Angeles, Ca. 90024
November 17, 1976

Dear Jim

Most of my friends have put up with me talking about the airplane I've been building in my garage for longer than I care to remember. Now that it is finished and flying I can't suppress the urge to report, to a few of the friends I seldom see, on the planes first flight.

With only a slight amount of apprehension I made the first flight early in the morning of August 22nd. As soon as the plane lifted off there was no question that it was fully controllable and had adequate power. My plan was to cut the power at this point if anything was wrong. After taking off I made one circuit of the pattern inorder to check all engine temperatures and pressures and at the same time be in position to land if anything appeared out of order. When no problems developed I climbed to 4500 feet and stayed within gliding range of the field at all times. After a 30 minute, rather uneventful flight, I mace a squirrlly but safe landing and was escorted back to the hanger by the fire department and the airport manager (flashing red lights and all) who had been standing by all the time I was in the air.

Since that first flight I have put another 12 hours on the plane with no problems developing. One turn on an adjustable eye bolt on the left N strut was all that was necessary to make it fly hands off. The flying quality is excellent: very stable yet the controls are extremely responsive, far superior to anything I've flown before. That open cockpit is unbelievable.

Although I havn't done enough flight testing to accuratley determine the performance, indicated cruise airspeed at 5000 feet seems to be about 115 MPH and rate of climb is in the 700-800 foot per minute range. The engine is a 100 HP Continental O-200A. For the time being the plane is hangered at Chino; FAA regulations limit me to a maximum distance of 25 miles from the home field until I have 50 hours on the ship.

It has been difficult for me to think of the plane as a complete working flying machine. Having fabricateed most of the pieces myself I still remember each vividly, each with its own very distinct personality. Very slowly I'm getting over the feeling that I'm flying a collectin of parts in a rather tight formation and taking on the feeling that I'm flying an airplane.

So long

Doug Butzbach

A BEAUTIFUL SMITH MINIPLANE, built by our good friend and customer DOUGLAS BUTZBACH, of Los Angeles, California. See letter at left.

A BEAUTIFUL STARDUSTER 1. OWNED BY ROBERT OLTARZEWSKI OF JAMESTOWN, N. Y.

December 30, 1976

Mr. Jim Osborne
STOLP STARDUSTER CORP.
4301 Twining
Riverside, CA 92509

Dear Jim, Hanako & Eric:

Thank you for the glasses you sent recently. They arrived in fine shape and be assured they will be put to good use.

As I have discussed with you over the phone several times, my Starduster Too Project is slowly approaching completion - at long last - it is hard to imagine that I am this close and yet have so much to do.

My bottom wings and center section have been finished and I delayed finishing the upper panels while I plumbed and wired my fuselage. I am now back on wing construction and hope to have them finished shortly.

Hopefully I can be covering by Spring and painting by warm weather.

I know I promised you some pictures and I will try to get some and send them to you shortly.

I am really pushing on the construction - so much to do that I hate to take time out for anything else - even pictures.

Might I take a moment to compliment you and your staff on the friendly, efficient and fast service you have given me over my construction period, I don't feel I would be as far along as I am without it.

We in the Midwest have some "problems" with material and although most items are available the knowledge needed along with the material is not usually there.

I should say thank you more often, but I know you understand.

Again much thanks for the glasses and heres hoping you all a very happy, healthy and prosperous New Year.

Best regards,

Joseph P. Ferraro

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FLEX ARMORED CABLE FOR THROTTLE INTERCONNECTS. Length accurate to 1". AN667 FORK on each end. Made to your measurement ready to install. $15.00 each.

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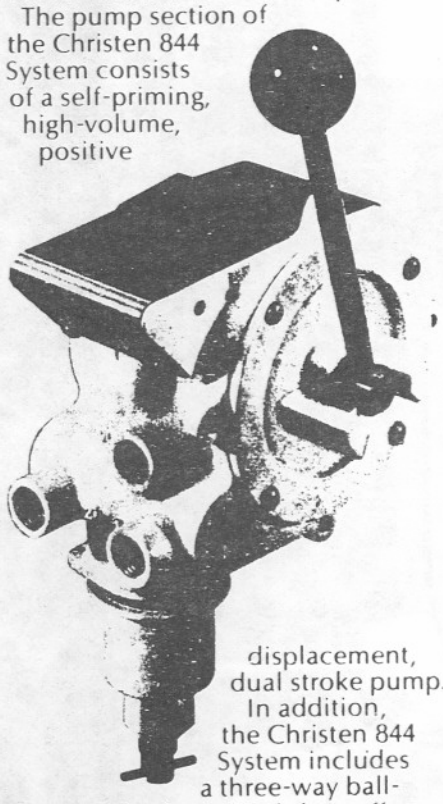
The pump section of the Christen 844 System consists of a self-priming, high-volume, positive displacement, dual stroke pump.



In addition, the Christen 844 System includes a three-way ball-type fuel selector and shut-off valve, a replaceable filter, and a moisture sump with a quick-drain valve. The Christen 844 System functions in all aircraft attitudes and is particularly suited for installation in sport aircraft. Simplicity of design assures reliable trouble-free performance.

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