

THE

Starduster

APRIL 1977

MAGAZINE

DEDICATED TO THE ACTIVE HOMEBUILDER



CONTINUED ON NEXT PAGE

PAGE ONE



Before the Wright Brothers made their first powered flight, in 1903, they had spent several years experimenting with gliders. One of their most persistent problems was maintaining control of their gliders in turns. Quite frequently, according to their notes, their machines would quit flying with the nose high up in the air. It would then make a descending turn and smack the ground hard enough to shake them up a little. Other early glider experimenters encountered the same problem. This was the earliest known examples of the stall-spin accident.

These early accidents were not usually serious because of the low altitude and the low speed at which they occurred. The plane would make, at most, one half a revolution, and hit pretty flat. Usually, the pilot wasn't hurt. Even as late as 1910, most flying was at low altitude. One of the Wright brothers wrote, at this date, that he did all his student instructing between 6 and 12 feet high. If the student went below 6', or over 12', the instructor took the controls away from the student and restored the plane to its proper altitude.

As speeds and altitudes increased, Stall-Spins became more hazardous. For the past sixty odd years they have been the chief cause of fatalities.

Within the past few years, I have watched a low time pilot do a departure stall out of Flaboh airport in his first flight in his newly purchased homebuilt. He spun in, killing himself. A few months ago a Doctor flying a beachcraft stalled and spun in turning base to final, killing himself and his whole family. Last summer a midwest pilot stalled and spun in when he had engine failure on takeoff. And this past January, Gary Solmi, flying his new STARDUSTER TOO suffered an engine failure, and stalled and started to spin about thirty feet off the ground. Fortunately, both Gary and his lovely wife survived, and will live to fly another day. They share their experience with us in this issue.

The primary cause of such fatalities is trying to maneuver the airplane at low altitude, with insufficient airspeed. It doesn't matter whether the engine is running or not. The primary concern of a pilot should be to keep the airspeed up. This is done by forward pressure on the stick, to whatever extent necessary.

It is far harder for an inexperienced pilot to keep his airspeed up when he has just suffered an engine failure. The difference in drag between a gliding airplane with the engine throttled and a gliding airplane with the propeller windmilling is something that has to be experienced to be believed. I would estimate that a gliding biplane with a windmilling prop glides at least twice as steep as one with an idling engine. I believe the proper glide angle with a dead engine in a high powered little biplane approaches 45 degrees. If you can find a competent safety pilot and a suitable area to practice over, it might be worth your while to practice some dead stick glides, and perhaps even some dead stick landings.

CONTINUED ON NEXT PAGE

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 is a picture of the beautiful STARDUSTER TOO built and flown by Armand Holley, of San Diego, California. Armand is an exceptionally smooth Aerobatic pilot

OUR BACK COVER FEATURES A SHOT OF

Our back cover features a shot of AMERICAN ADVENTURE, the STARDUSTER TOO built and flown by Gary and Myrna Solmi. The picture shows their bird as it was before the forced landing described on page 9.

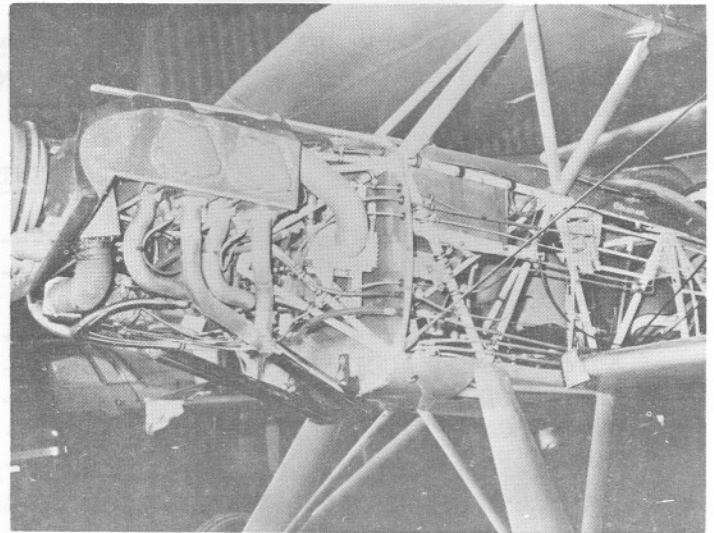
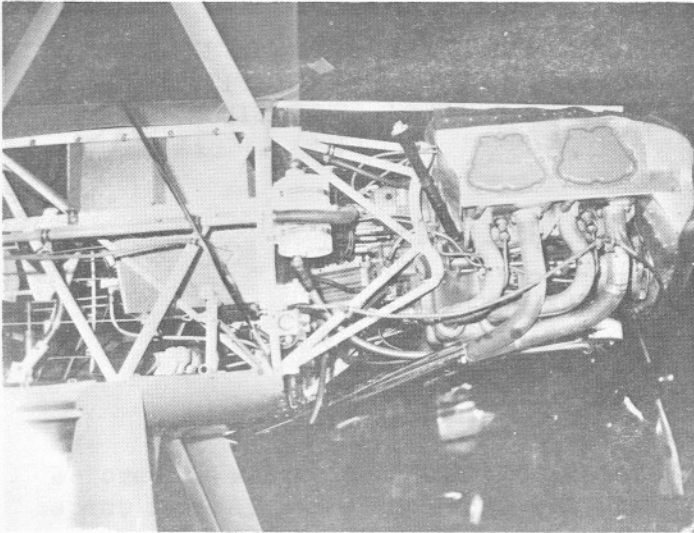
OUR TWO INFLATION FIGHTING POLICIES

1. WE GIVE 3-5 LBS OF SHORT LENGTHS OF 4130 TUBING FREE, WITH EACH SUBSTANTIAL TUBING ORDER. JUST ASK FOR IT. SUITABLE FOR WELDING PRACTICE. NO SIZE SELECTIONS WILL BE MADE.
2. A 10 PER CENT DISCOUNT WILL BE GIVEN TO CUSTOMERS WHO WALK IN AND SELECT THEIR TUBING FROM OUR SHORT LENGTHS RACK, PROVIDED NO CUTTING IS DONE. IF CUTTING IS PROVIDED REGULAR PRICES WILL PREVAIL.

But remember, whatever the FAA says, with a dead engine, you maintain your airspeed by pushing forward on the stick. And in an emergency, it better to land fast enough to be under full control, with capabilities for a flare, than it is to stall out close to the ground. Running into something is much better than falling out of the sky.

HAPPY LANDINGS,

Jim Calorne



ENGINE INSTALLATION PROCEDURE

BY RON POWERS

When I built my Acroduster Too, there was one area in which very little information was available to the builder. That is the engine installation. With that in mind, I will attempt to describe my methods.

The engine installed on my Acroduster Too is a Lycoming AEIO 360 A1D. This is a special 200 H.P. aerobatic engine with a forward facing fuel injector on the front of a special oil sump with all the necessary fittings to install the Christen inverted oil system. Essentially a normal 200 H.P. with a hollow crank for a constant speed prop.

The first step is to install the firewall. Be sure to get the firewall centered, and to get a straight line along the top from the aft instrument panel to the nose.

The engine mount was purchased from Stolp Starduster. The engine is offset for torque, and it looks as though building the mount might have been a little complex and time consuming. I also bought the Lord mount rubbers and bolts from them.

Next, the engine was bolted to the mount. If the fuel injector is installed on the engine, the fuel line to the fuel pump will have to be disconnected in order to get the engine on the mount.

Now the nose cowl can be centered on the prop flange. Use wooden blocks, and tape, or wire, to hold it. Always remember as the cowl is built that the left rear cylinder sticks out a lot further than the right rear because of engine offset. Also remember to leave about an inch clearance between the cowl and the engine all around, because the engine will move a lot when running.

It is a good idea to have the intake and exhaust stacks installed during engine hookup and cowl installation; also the starter and alternator, if they are to be used, and the fuel injector.

The Aluminum Channels can now be installed to hold the nose bowl. Keep the two top rails high enough to be able to get at the top plugs, and the bottom two low enough to get at the bottom plugs. To get a nice smooth curve you'll have to run the side cowl down to the bottom of the firewall, which is about at the bottom engine mount attach point.

Builders cardboard can be used to make the patterns for the cowling. The total product should look very much like the plans sheet no. 41. The screw spacing can be 4" on the top and bottom cowls, with 6" spacing for the DZUS fasteners. No screws are required in the front of the side cowl. The Dzus fasteners should be strong enough if installed thru the bottom channel aluminum. A piece of 3/8 aluminum tube should be riveted to the inside of the bottom cowl for strength. Install the tube about halfway between the nose bowl and the firewall, and from one bottom channel to the other. This will prevent the bottom cowling from buckling during some snap maneuvers.

A flange at the aft side of the bottom cowl is recommended to help prevent any overheating problems.

To help strengthen the nose cowl at the attach point of the bottom cowl, and to make installation easier; pop rivet nut plate to a 1/2" strip of aluminum, and pop rivet the aluminum to the inside of the nose bowl.

When the cowling is complete, remove it, and begin the engine hookup.

First, install the engine baffling. Starduster makes up an excellent set which only needs trimming to clear the cowl. Here again, make about an inch clearance.

Then pop rivet a two inch strip of baffling material to the baffling. This is to seal the baffling to the cowl.

The baffling was designed to accommodate the oil cooler at the left front, but this is also an excellent place to install an air cleaner, such as is installed on a Cessna 180. Use flex duct down to the fuel injector. The oil cooler can later be installed on the engine mount to the left rear.

In some areas of the country the FAA may want an alternate air source. One solution is to build a box. I installed a door on the outside, to prevent any accidental air blockages. A spring can be installed in the cockpit to help hold the door shut.

Next, the engine controls should be installed, because the fuel lines and inverted oil lines are more flexible, and can be routed around the engine controls. I used a CHAMP type throttle and carb heat set. With this type of installation no reversers are required between the throttle, mixture, and carb heat, and the engine.

Starduster sells a very nice throttle linkage cable. Remember to clamp the throttle cable to each tube it passes, and no sharp bends. Two brackets will have to be made to hold the engine controls to the sump.

Now the inverted oil lines can be installed. Be sure to use the Christen instructions while assembling the inverted system. The oil separator can be installed on the firewall for a cleaner installation than if attached to the engine mount. Remember again when installing all lines that the engine moves a lot when running. Leave room for the lines to flex. Also clamp all hoses to prevent chaffing where they may touch some metal.

The fuel lines can next be installed. If you have a Lycoming Operators Manual, forget the picture in the back of the book showing the RSA-5AD1 fuel injector. The fuel inlet and outlet holes are mislabeled. The fuel pressure connector should be on the top, and the idle cutoff is backwards.

The main fuel line should run from the flop tube in the fuel tank to the tank selector #1 side of the Christen pump. Then from the pump outlet to the engine driven fuel pump, and from the engine pump to the fuel injector. The fuel pressure line is taken from the top of the fuel injector for a manual instrument, and not from the fuel distribution manifold on the top of the engine. A line must also be run from the engine fuel pump to the fuel tank return, as illustrated in the April 75 Starduster Magazine.

Be sure to use bulkhead fittings going thru the firewall with all fuel and oil lines. Stainless steel is very sharp if a hole is just drilled in it. So drill about a 3/8 and then take a rotary file in a drill and file the hole to the correct size. The hole will be neat, and much smoother. Again, use plenty of Adel Clamps with rubber cushions to make sure the lines don't chaff.

When planning the location on the firewall for the gas and oil lines, keep in mind that these lines may have to be replaced sometime in the future, and they should be installed in a location where they can be reached without removing a lot of other equipment.

The instrument hookup can be next. I used a combination oil pressure and temp and fuel pressure gage to save space. The fuel pressure line can be run parallel to the fuel line to keep all fuel in one location. The oil pressure attach point on the engine is hidden near the right upper engine lord mount. A hose can be used to the firewall, with aluminum tubing back to the instrument, in all pressure lines. The oil temp bulb is too long to fit in the back on the engine. So either take three oil temperature bulb adapters and ream the hole large enough for the bulb, or build an adapter, as Pitts does. The oil temp line will still be too long, so coil it behind the front instrument panel out of sight, instead of behind the engine on the firewall. The tachometer cable will have to be made to order, and should be run as straight as possible, which is difficult with the gas tank directly behind the firewall.

The MAGS can be wired next. The newer Mags have an automatic ground when the terminal is removed from the back. If sheilded wire is used and installed on the terminal to the Mag, the clearance is so close that it will probably still ground the mag. So use the shielded wire from the Mag switch to just in back of the Mag to prevent chaffing in the fuselage; but use only the wire into the Mag terminal. One wire is required from each Mag to the switch, with a short ground wire at the switch.

The oil cooler Installation was saved for last because it blocks a large area of the left side of the engine mount, and it would have been difficult to install some of the lines with it in place. Some leftover aluminum angle can be used to make a bracket to attach the oil cooler to the engine mount. A 2-1/4" hole can be cut in the left rear engine baffling. A flange to hold the flex duct to be used to rout air to the oil cooler can be made by cutting about a 10"x 2" piece of .025 Aluminum. About 1/2" from one side drill 1/2" spaced 1/8" holes the full length. Then wrap the strip around a can and pop rivet together. Then flange to the drilled holes. Make a box over the oil cooler. This will insure that all possible air will be directed over the oil cooler. Now the two rubber hoses can be connected from the cooler to the engine. The Lycoming operators

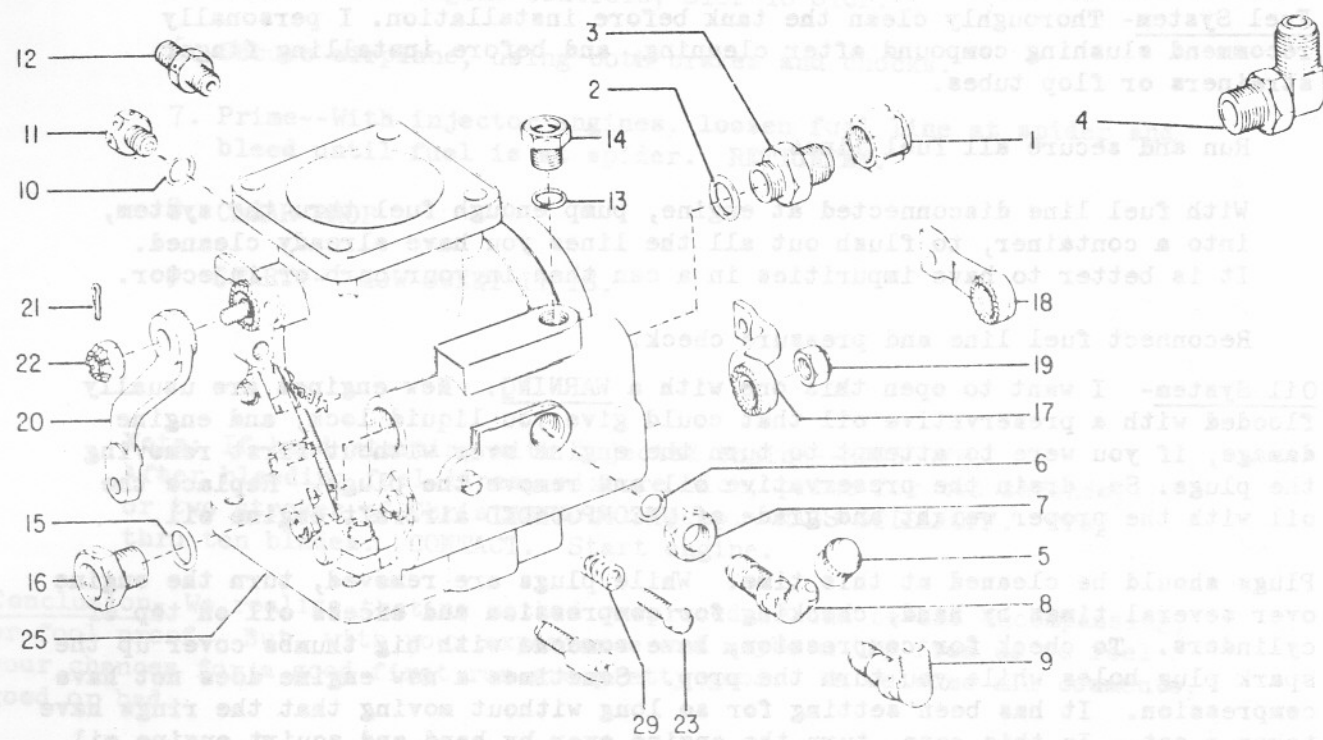
Manual is correct on the illustration of the oil cooler hookup. The line to the cooler connects directly below the oil temp hole, and the other above and to the left. I've noticed that many Lycoming engine installations have the cooler on the left rear engine baffle. It would make for a cleaner installation. However, I don't know how well they cool the oil.

If no electrical system is installed, it is still possible to have the convenience of a starter for those days you want to fly alone. An external plug can be installed at the rear cockpit. Then, when the engine is started, there will be no need to get out to disconnect the plug.

A Ford type solenoid can be mounted on the firewall near the right bottom cowling channel. One battery cable is run from the external plug to the solenoid, and from the other post of the solenoid to the starter. Be sure to use grommets when passing the wire thru the firewall. One post of the external plug is a ground, and can be grounded to the fuselage near the plug. Next, a wire, about the same as the mag wire, is connected from the external plug to the B post on the Mag "START" switch. Then from the S post a wire is run to the Starter solenoid. Now you have a starter without the weight of the battery, alternator, and extra wire.

Sometimes electrical problems are encountered if the engine isn't grounded. So remember to run a ground strap from the engine to the engine mount or firewall.

This engine installation has been run about 100 hours, troublefree. There has been no overheating problems despite flying 4-6 hours a day in 100 degree weather.



1. The fuel line from the fuel pump connects to fitting #3.
2. The fuel pressure line to the instrument is connected to fitting #8.
3. The fuel strainer can be reached thru plug #16.
4. The injector is mounted with small flange to sump, throttle on right, mixture to the left.
5. With the throttle and mixture control arms down; the throttle is idle, and the mixture is lean when the arms are back toward the firewall.

STARDUSTER PROCEDURES FOR A SUCCESSFUL FIRST ENGINE RUN
NEW OR FRESHLY OVERHAULED

Well, we have an engine and prop bolted to the firewall and fuel tank. Lets see if it will run? Chances are that you will have frustrating and unsuccessful run if the opening statement (and impatience) has led you to the cockpit and clearing the prop before completing the many steps required for a clean and gratifying first run.

We all know, enjoy, and share the good feelings after we have just installed our engine, and are already dreaming of flying. But we are many hours from that first run.

I am going to give a list of proven procedures, assuming that your system is complete--- Baffling, Cowling, Fuel and oil, Electrical, and engine Controls. The following list is not a numerical list of priority. All steps are equally important for success.

Baffling is required for a first run for proper cooling.

Cowling- Can be left off if your run is short, and held to low to intermediate RPM's. It is a lot easier to spot oil or fuel leaks with the cowling off.

Engine Controls- It can't be overemphasized that all engine controls be smooth, free, and easily accessible to the pilot. Controls should be complete; jam nuts locked, cotter keys where necessary, everything secured and double checked.

Fuel System- Thoroughly clean the tank before installation. I personally recommend slushing compound after cleaning, and before installing finger strainers or flop tubes.

Run and secure all fuel lines

With fuel line disconnected at engine, pump enough fuel thru the system, into a container, to flush out all the lines you have already cleaned. It is better to have impurities in a can than in your carb or injector.

Reconnect fuel line and pressure check.

Oil System- I want to open this one with a WARNING. New engines are usually flooded with a preservative oil that could give you liquid lock, and engine damage, if you were to attempt to turn the engine over without first removing the plugs. So, drain the preservative oil and remove the plugs. Replace the oil with the proper weight and grade of UNCOMPOUNDED aircraft engine oil.

Plugs should be cleaned at this time. While plugs are removed, turn the engine over several times by hand, checking for compression and excess oil on top of cylinders. To check for compression, have someone with big thumbs cover up the spark plug holes while you turn the prop. Sometimes a new engine does not have compression. It has been setting for so long without moving that the rings have taken a set. In this case, turn the engine over by hand and squirt engine oil in the cylinders until compression builds up. You will not get a start without compression.

Oil Cooler- If you are using a Stewart Warner type cooler, we recommend #8 lines, which will allow sufficient oil flow for a single unit installation, in most cases. Hose length should be kept as short as possible without tight bends or points of abrasion on engine case, controls, or electrical leads.

Again, thoroughly clean all lines before installation. We also strongly advise the use of a fuel and oil proof thread lubricant on all fuel and oil lines.

Electrical- Proper wiring of the Mags and Mag Switch heads my list of check and double check itmes, using two knowledgeable people to doublecheck each other. Good timing and synchronization are needed for a good start and run. The use of an electrical magneto synchronizing box is highly desirable. It makes the job a lot easier; almost foolproof.

Any electrical system on an airplane should be kept as simple and basic as possible, with adequate surge and overload protection. We are in the process of updating our basic wiring diagrams. This work, being done by STARDUSTER mechanic Bob Barker, expands on our previous drawing, and is easier to interpret.

PRERUN CHECKS-----

1. Recheck mag switch wiring.
2. Check fuel and oil supple.
3. CLEAN AND REINSTALL PLUGS-----IMPORTANT
4. Recheck all fuel and oil fittings.
5. Recheck all engine controls, STOP TO STOP.
6. Secure airplane, using both brakes and chocks.
7. Prime--With injector engines, loosen fuel line at spider and bleed until fuel is at spider. RETIGHTEN.
8. CLEAR PROP
9. START----NOW SWEET IT IS.

Note: If hand starting with injected engine--MAGS OFF. After bleeding fuel lines, mixture rich, prime for two seconds, or two strokes of Christen Wobble pump. MAGS STILL OFF. Prop thru ten blades. CONTACT. Start engine.

Conclusion- We realize that no method or procedure can be all encompassing, or fool proof. But, with your experience and maybe a tip from us we feel your chances for a good first run are pretty good. We welcome all comments, good or bad.

GOOD LUCK AND MANY HAPPY HOURS
to you and your machine.

Bill Clouse
BILL CLOUSE
General Foreman
Stolp Starduster Corporation



FORCED LANDING-----By Myrna and Gary Solmi

The morning was clear, cold and beautiful. Snow had fallen the day before on the mountains surrounding the SIMI and SAN FERNANDO Valleys. The view from our open cockpit biplane at 5500 feet was breathtaking.

It was January 8, 1977, and we were flying to CABLE Airport, near Montclair, to an airshow. It was only the second flyin we had flown to since we had finished building and testing our STARDUSTER TOO. After nine years of construction, with airplane parts occupying practically all areas of the house, we had finally realized our dream in August of 1976. Then began the tedious months of flying the time off at MOHAVE Airport.

When we began our trip that morning at 9:50 A.M., we had only 54 hours on the plane. Since our biplane was open cockpit we bundled up with heavy SKI clothes for our trip. Parkas, thick gloves, woolen underwear, etc. Gary had never flown with so many layers of clothing before. Unknown to him, this would become the main contributing factor to the conclusion of our flight.

We were to rendezvous with friends over SAN FERNANDO Airport, and then fly together to CABLE Airport. We arrived late, and after circling a few times over SAN FERNANDO Airport, we continued on alone. As Navigator, I was able to spot familiar land marks that appeared on the flight map. Gary contacted CABLE Airport on the temporary tower frequency that was set up for the Air Show. The tower responded, and we were told to fly South and report when entering downwind. We were also advised of other Antique Aircraft in the traffic pattern. We continued to descend South of the Airport until we were approximately three miles South, and 1800 feet above ground level. It was then that Gary asked me to check our map for the pattern altitude, which he had written on the side of the map. I looked at the map and couldn't find it, so he asked me to pass it back to him. After finding the information, he returned

the map to me. Then it happened. The engine quit, and I could count the revolutions of the prop. We started down at a very alarming rate, over a cluttered residential area. I called Gary over the intercom and asked what was wrong. He said, "We're going to land in that lot." All the fears that I had been able to conquer about flying, in the past, were suddenly before me. And yet I still had confidence that Gary would bring us down safely. Then, ahead of us loomed telephone poles and wires, and a very small lot. We were in a direct line with the wires, not able to go over them, and not enough room (with trees and fences) to go under them. But Gary then turned the plane to the left. In a vast darkness, I felt the almost unbelievable impact. I was alive. I quickly unfastened my seat belt and harness, thinking only of probable fire. I climbed out of the front cockpit and turned to see Gary unconscious, and his head bleeding. Quickly I turned off the main switch and unfastened his seatbelt. By this time, people were coming to help, so my energy failed me, and I collapsed to my knees beside the airplane.

The next words I recall were from Gary, asking if I was O.K. He then asked people to stand back and not continue to walk on the wings. We were then taken to Doctor's Hospital in Montclair for emergency treatment. From the Hospital we contacted our friends at CABLE Airport, A.C., and Lucille Boyles. They stayed with us, and returned our airplane to Ventura County Airport via trailer that same evening.

Gary and I were transported to Thousand Oaks, our home town, and Hospitalized. Gary had a concussion and lacerations and a back injury. I sustained a more serious back injury, and was confined to a cast for three months.

While lying in a hospital, four days after the accident, we were still trying to figure out what caused the engine to quit. It was hard for Gary to believe that after nine years of tedious building, a new engine, and all new parts, that this forced landing had to occur. Suddenly, he said, "I've got it". The Carb Temperature gage had read abnormally high, which would indicate fuel starvation. At this point we reached the conclusion that while reaching for the map in the front cockpit Gary had accidentally hooked his glove on the mixture control and put it in "IDLE CUTOFF", thereby shutting off the gas to the engine.

To this day Gary does not remember the final approach. He does, however, remember the falling sensation and impact. I was able to fill in the approach part, so we will now relate the last 15 seconds in the air. The engine raced, and then quit, as Gary pushed the throttle forward. He immediately dropped the nose, and as I stated previously, said, "We're going to land in the Lot below". He did a hurried Cockpit check, but was unable to detect the problem. We skimmed over the rooftops, and as the trees and poles ahead grew larger, our landing area grew smaller. He then made a steep bank to the left at an altitude of approximately 30 feet. The bank was abrupt, and created a stall, which developed into a spin. We made contact with the ground 180 degrees from our intended turn.

In conclusion to this 50 minute very eventful flight, my husband would like people taking time to read this article to benefit from his mistakes. The first mistake that a builder can make is not staying proficient while building his airplane. There is a false sense of capability created while building. The second mistake is to fail to realize your airplanes full capabilities, both good and bad. For instance, how many of you pilots who fly biplanes have shut your engine down and checked your rate of descent? I would not advise this procedure without the aid of an instructor, and over a proper area. Biplanes can begin to add up minuses on the scorecard quickly. Take two wings, add flying wires, and an oversized engine, hang the gear out, and shut off your engine. Things begin to happen quite rapidly. Unfortunately, most pilots, like Gary, do not realize this until it is too late. Take the above ingredients and put yourself over a residential area at 1200 feet, and you are in trouble.

Gary is rebuilding, and has just finished the fuselage, and is ready for paint.

We think the STARDUSTER CORPORATION can be proud of the sound engineering of the STARDUSTER TOO, which held together in spite of a 16 g impact. It is a beautifully designed airplane, and our STARDUSTER TOO, "AMERICAN ADVENTURE", will soon fly again.

ACRODUSTER 1 ACCIDENT INVESTIGATION

When Manx Kelly went in with my Acroduster 1 on May 1, 1976, this accident was reported in the April 76 issue of STARDUSTER MAGAZINE. At that time I promised to make the results of the accident investigation known, when these results became available.

Because of the prominence of the pilot, and the general interest in the airplane, this investigation was unusually thorough, and took an unusually long time.

The investigation was conducted by Mr. Ken Goodsell, of the Ontario, Calif. GADO. Statements were taken from witnesses, diagrams were made of the crash, drawings of the tail structure were secured from me, and the failed portions of the tail were sent to Washington for Laboratory analysis.

According to most witnesses, the initial failure occurred when the horizontal tail let go. This was followed almost immediately by the vertical tail, and then the wings. In the words of the report, "Examination of the elevator torque tube indicated that the torque tube fractured and separated on both sides of the elevator control horn".

A structural analysis of the elevator torque tube and the elevator trim tab control wire was conducted by the bureau of aviation Safety 11, NTSB, Washington, D.C. The preliminary tests revealed the cause of failure of both parts as structural overload. No evidence of corrosion or fatigue was present.

The NTSB, in its review of the accident, concludes with the following:

PROBABLE CAUSE(S)

PILOT IN COMMAND-EXCEEDED DESIGNED STRESS LIMITS OF AIRCRAFT

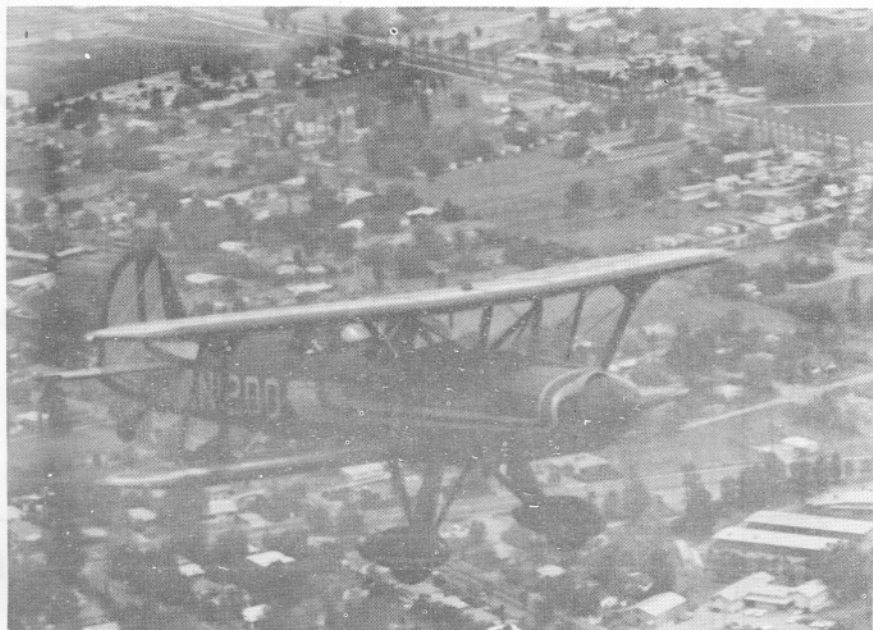
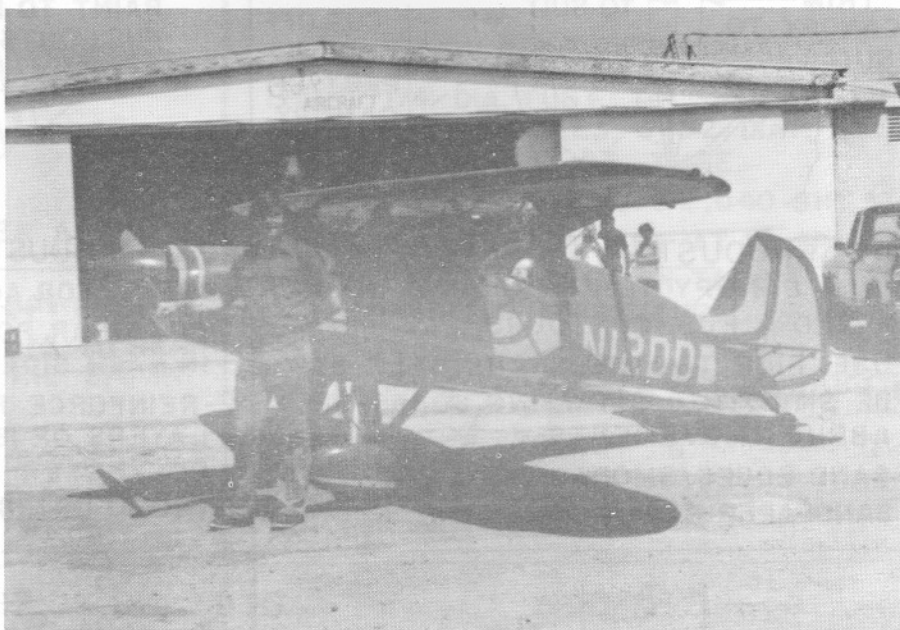
From my own examination of the wreckage, I am sure beyond a reasonable doubt that both elevators developed torsional flutter from being flown approximately 100 MPH over the red line speed. Once flutter developed, structural disintegration occurred almost instantly.

The airplane had been test flown and flutter tested to 240 MPH. It had survived two seasons of the hardest kind of aerobatics by numerous pilots. No structural weakness of any kind occurred prior to the fatal crash.

I am convinced in my own mind that Manx had developed such confidence in the machine, thru hard daily practice, that he did not believe he could tear it up. Hence the high speed terminal velocity dive, which led to his demise.

Jim Osborne

NEW ACRODUSTER AND
SOON TO BE OWNER
DOUGLAS DANIELSON,
OF 3997 WARNER AVE
HUNTINGTON BEACH
CALIFORNIA



IN FLIGHT, WITH ERIC
SHILLING AND DOUG DANIELSON
ENJOYING THE SCENERY OVER
RIVERSIDE, CALIFORNIA

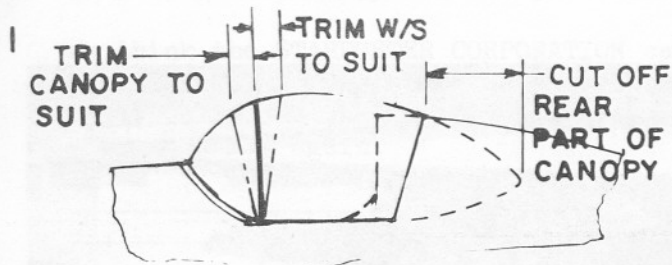
BUILT BY STOLP STARDUSTER CORPORATION GNERAL FOREMAN WILLIAM C. CLOUSE.

N12DD was built in Starduster Corporation Shops, and title will be transferred to Douglas Danielson in the near future. It is painted in accordance with the design and color scheme developed by Mr. Danielson. Power is by a 200 H.P Lycoming 10-360-ALB. The prop is an Aerobatic C/S Hartzell.

First flight was by our own Eric Shilling, on 20 April 1977. Building time was approximately six months. Flight Characteristics are delightful. All controls are light to the touch, and very, very responsive. Roll rate is in the vicinity of 180 degrees per second.

Doug has promised to have this beauty at Osh Kosh this summer. See you there.

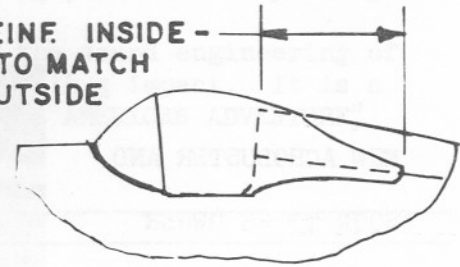
BUBBLE CANOPY INSTALLATION



FOR ACRODUSTER I OR TOO

- 1-TRIM CANOPY TO FIT BUBBLE WIND SHIELD & FUS. CONTOURS
- 2-USE FINE TOOTHED HAND HELD SAW
- 3-BE SMOOTH & SLOW- NO JERKS OR ABRUPT MOVEMENTS.
- 4-SAND EDGES SMOOTH WITH 240-300 SANDPAPER - BELT SANDER O. K.

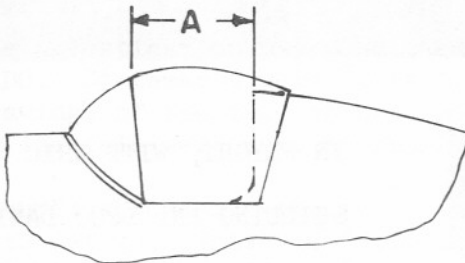
- 2 F.G. REINF. INSIDE - PAINT TO MATCH FUS. OUTSIDE



FOR STARDUSTER TOO, STARLET, V-STAR

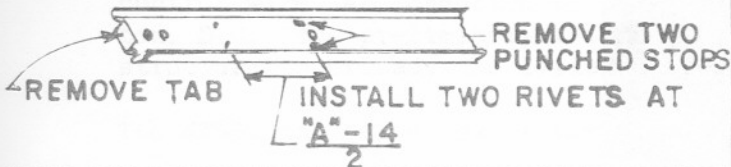
- SAME AS FOR ACRODUSTER, EXCEPT
- 1-CUT REAR PORTION OF CANOPY TO BLEND IN EACH SIDE OF HEADREST, AS SHOWN
 - 2-REINFORCE REAR OF CANOPY WITH TWO LAYERS OF 181 F.G. CLOTH OR EQUIV. & POLYESTER RESIN. (NOT FURNISHED IN KIT.)

3



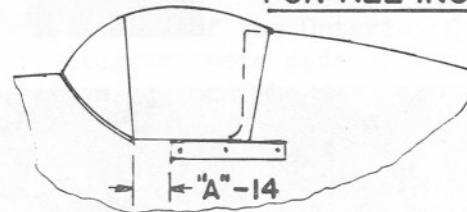
FOR ALL INSTALLATIONS

- 1-MEASURE OPENING "A" - SUBTRACT 14".
- 2-DIVIDE REMAINDER BY TWO - MODIFY OUTSIDE RAIL AS SHOWN.



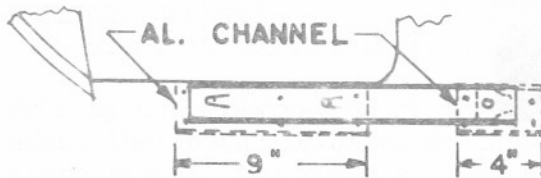
4

FOR ALL INSTL.



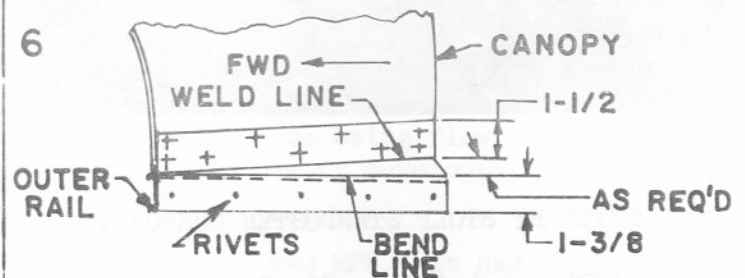
- 1-POSITION INNER RAIL BELOW CANOPY & BEHIND WINDSHIELD AS SHOWN. BEND TABS SO THAT RAILS ARE ABSOLUTELY PARALLEL WITH EACH OTHER.
- 2-WOODEN SPACER, APPROX. 1" x 3" MAY BE REQUIRED BETWEEN LARGE REAR TAB & TURTLEBACK. MAKE FROM ANY SOFT LIGHT WOOD. (NOT FURNISHED IN KIT.)
- 3- DRILL PILOT HOLES (1/8) FOR MOUNTING

5



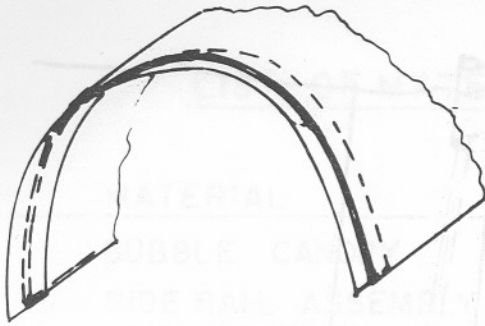
- 1-ADD AL. CHANNEL (DOUBLERS) TO INSIDE OF STRUCTURE AS SHOWN - USE 6 POP RIVETS FOR FWD DOUBLER, 4 FOR REAR.
- 2-INSTALL WOODEN SPACER, IF REQUIRED. MOUNT WITH TWO FLUSH HEAD SCREWS & AN365-1032 NUTS.
- 3-DRILL OUT MTG HOLES TO 3/16"
- 4-INSTALL NUTPLATES, USING FLUSH HEAD 3/32 POP RIVETS.
- 5-INSTALL RAIL-USE LONG 3/16 SCREWS CUT OFF EXCESS LENGTH OF SCREWS.

6



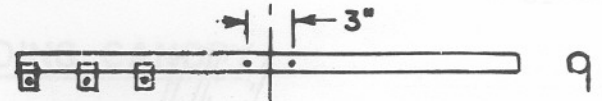
- 1-MAKE STEEL COVER FROM .040 SHEET. BEND & WELD AS SHOWN.
- 2-RIVET TO CENTER OF OUTER RAIL. USE SOLID MONEL RIVETS - BE SURE BUCKED HEAD OF RIVETS CLEARS BALL RETAINER ASSEMBLY.
- 3-ATTACH TO CANOPY USING 3/16 SCREWS, WASHERS, & NUTS - MAKE 7/32 HOLES IN CANOPY - DO NOT OVERTIGHTEN.

7



- 1-TAPE BROWN WRAPPING PAPER AROUND FRONT EDGE OF CANOPY.
- 2-MARK LINE ON PAPER AT CANOPY EDGE.
- 3- REMOVE PAPER-MARK LINE 3/4 TO REAR OF FIRST LINE & ANOTHER LINE 3/8 IN FRONT OF ORIGINAL LINE.
- 4-MAKE INSIDE DOUBLER FROM SOFT .040 ALUM., 1-1/8" WIDE.
- 5-OUTSIDE DBLR. SOFT AL., 3/4" WIDE.

8



MAKE CABLE GUIDE ASSEMBLY-

- 1-CUT 1/4 DIA. TUBE TO 36" LENGTH.
- 2-DRILL TWO HOLES, 3/32 DIA., 3" APART, AT C.L. OF TUBE.
- 3-MAKE 19 TAB, 5/8 x 5/8 x .040 SHT STL.
- 4-WELD TABS TO TUBE AT 2" SPACING.
- 5- DRILL 5/32 HOLES IN TABS.
- 6-BEND TO FIT INSIDE CURVE OF CANOPY.

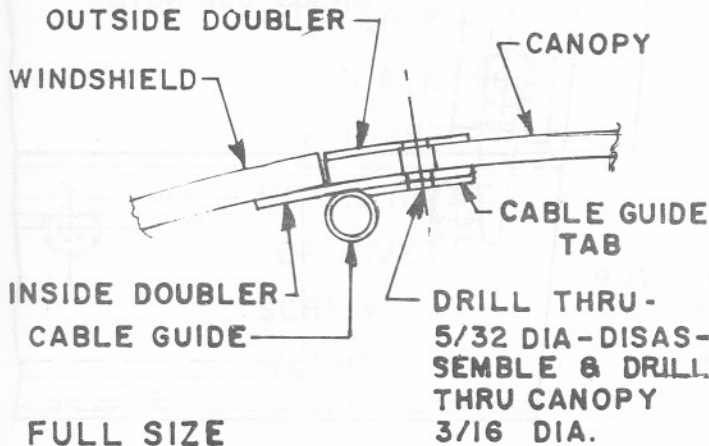
CABLE GUIDE TABS TO REAR & AGAINST CANOPY



CANOPY (REF.)

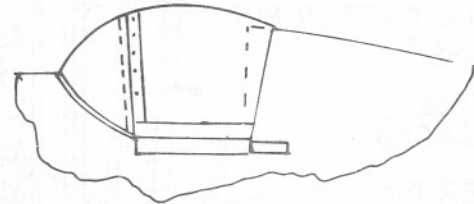
HOLES OPEN DOWN

9 TYP. X-SECTION AT JUNCTION OF CANOPY & WINDSHIELD



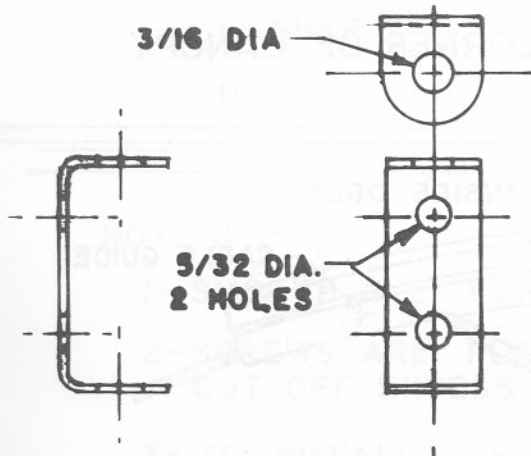
FULL SIZE

10



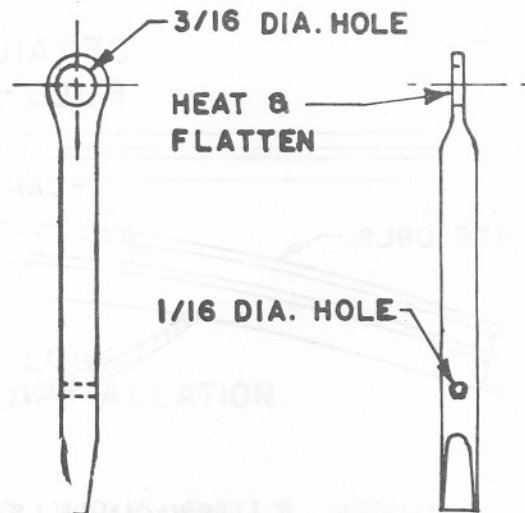
- 1-GET IN COCKPIT-SLIDE CANOPY IN PLACE
- 2-LOOSELY ASSEMBLE DOUBLERS AND CABLE GUIDE IN PLACE, USING NO. 6 SCREWS, WASHERS, & NUTS
- 3-MATE CANOPY TO WINDSHIELD AS PERFECTLY AS POSSIBLE.
- 4-WITH THE AID OF AN OUTSIDE FRIEND, TIGHTEN SCREWS & NUTS ENOUGH TO MAKE CANOPY HOLD SHAPE.

11



PIN HOLDER-FULL SIZE - MAKE TWO FROM .040 4130 SHEET. SCALE DWG FOR MISSING DIMENSIONS.

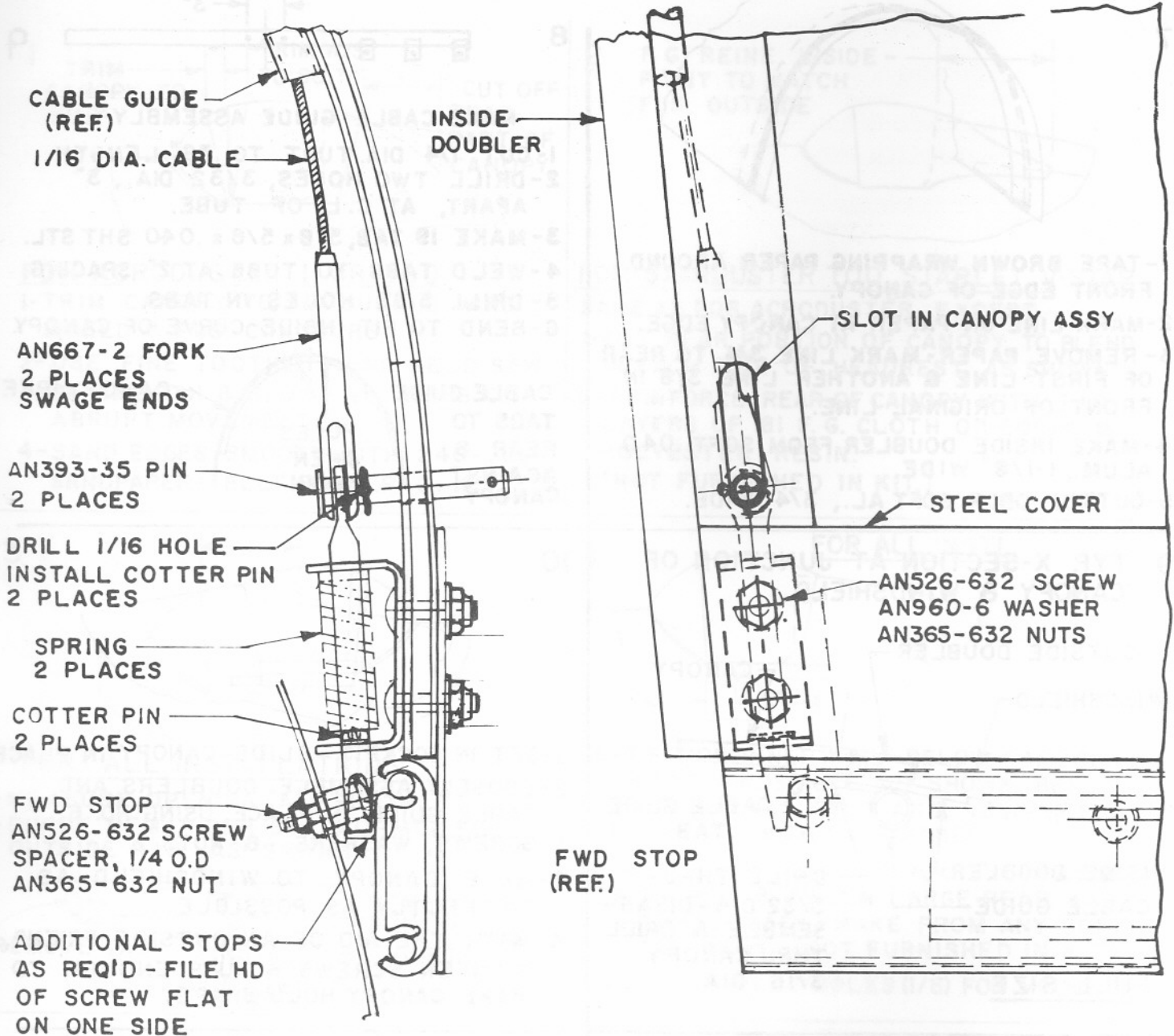
12



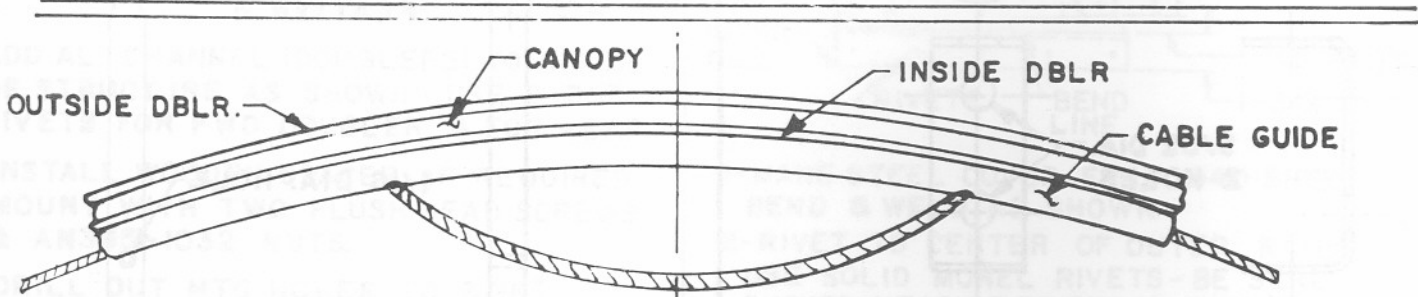
PIN-FULL SIZE. MAKE TWO FROM 3/16 DIA. ROD. SCALE FOR MISSING DIMS.

10

BUBBLE CANOPY INSTALLATION



DETAIL - FWD. L. H. CORNER OF CANOPY FULL SIZE.



CABLE - THRU 3/32 HOLES BEFORE SWAGING - LEAVE PULL LOOP AS SHOWN

DETAIL - TOP FRONT CANOPY

LIST OF MATERIALS-SLIDING CANOPY

MATERIAL	DESCRIPTION	QTY REQ'D
BUBBLE CANOPY		1
SIDE RAIL ASSEMBLY		2
ALUM. CHANNEL	2" x 1/4" x .032 x 24"	1
STEEL SHEET	4" x 36" x .040	2
STEEL SHEET	1" x 36" x .040	1
SOFT ALUMINUM	4" x 48" x .040	1
STEEL TUBE	1/4 x .035 x 42"	1
CABLE	1/16 G. I. x 48"	1
STEEL ROD	3/16 DIA. x 6"	1
FORK	AN667-2	2
PIN	AN393-35	2
SMALL SPRING		2
COTTER PIN	AN380-2-3	4
NUTPLATE	AN366F-1032	6
POP RIVET	CCC-32	12
MONEL RIVET	AN427-4-4	15
POP RIVET	CCP-42	20
SCREW	AN326-632-R16	34
WASHER	AN960-6	34
NUT	AN365-632	34
SCREW	AN526-1032-R30	24
WASHER	AN960-10	24
NUT	AN365-1032	24

NOTES:

1- SMOOTH ALL EDGES.

2- SCREWS ARE FURNISHED EXTRA LONG.
CUT OFF EXCESS LENGTH AFTER INSTALLATION.

3- TO INSTALL:

- (A) SLIDE CANOPY ASSY FWD, WITH RAILS MESHING.
(B) RAISE PROJECTING CLEVIS PINS, EACH SIDE,
IN ORDER TO CLEAR STOPS.

PIREPS PAGE

Tel. (913) 843-6555

GENE BURNETT
2022 KASOLD DRIVE
LAWRENCE, KANSAS
66044

Dear Jim,

It is always fun to meet other Starduster builders and with that in mind I would like to invite all builder/pilots based west of the Rockies, who are on their way to Osh Kosh in their Stardusters (any model) to stop overnight at my ranch either July 28 or 29.

My airstrip is 14nm at 94 degrees from the Topeka VOR or 5 nm at 327 degrees from the Lawrence, Kansas, municipal airport. Elevation is 1020' asl. Lawrence is 30 nm west of Kansas City, and is 410 nm from Osh Kosh. 80 and 100 octane are available at the Lawrence airport.

I have two 1800' grass strips, a NE-SW, and a NW-SE. Clear approaches landing SW and NW. You will have to drop down over a little hill landing SE and clear a low power line landing NE. A wind sock is located at the intersection of the two strips.

The first six guys who arrive can sleep in the Bunk House. The rest on the hay, or at the Ramada Inn, 8 miles away. T-Bone steaks are on the house both nights as well as a western breakfast the following morning. Reservations aren't necessary, but drop me a line if you plan to stop.

GLAD TO HAVE YOU ALL,

GENE BURNETT
STARDUSTER TOO N4GB

Now that is one of the nicest and most thoughtful invitations to come my way in a long time. Starduster builders have a reputation for being fine people, and it is nice to see Gene adding to that reputation.

I, for one, will most certainly avail myself of Gens's hospitality. I plan on visiting Gene on the 28th of July, and I hereby notify Gene to expect me.

Anyone else planning on stopping the same night is invited to get in touch with me, as well as Gene, with a view to flying to Osh Kosh together.

What could be nicer than a pleasant cross country trip flying your STARDUSTER in company with some other STARDUSTERS and ACRODUSTERS.

Dear Jim,

Enclosed is a check to cover my account plus a years subscription to the STARDUSTER MAGAZINE for '77. Also I have enclosed a couple of pictures of my 'TOO. It was given final inspection by the Feds in May of '76. It flew well the first time, and I have had no real problems.

It has a modified IO-360-B1B engine. This engine was from a drone, and I have modified the fuel system, replaced mags, replaced the blades on a C/S prop, and added an accumulator, for inverted flight. The engine was built to develop 225 H.P., but I have shaved the RPM from 3400 to 2800, so I think it develops about 190-200 H.P.

I have the old style landing gear (before they were moved back), and the tail is quite heavy. I have had no shimmy problems, but it is quite tricky on the ground. I have 70 hours on my bird, and it is really the showpiece on our airport. I have some trim to finish, but I have so much fun flying it, I don't seem to get around to it.

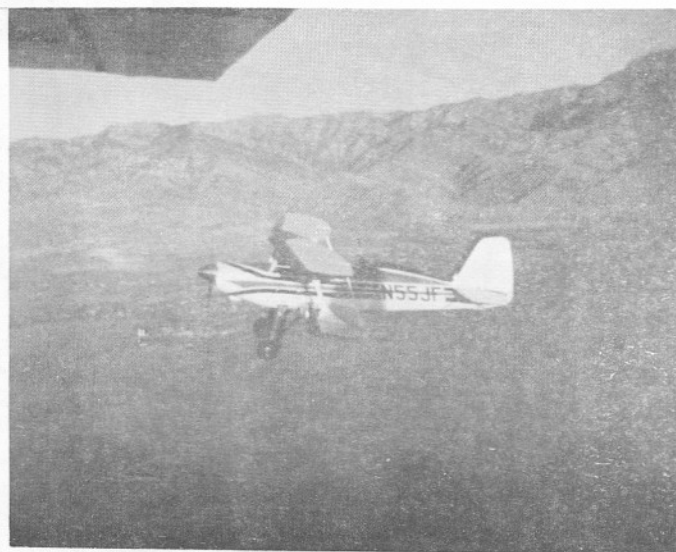
I am restoring two stearmans, and have a Fokker Triplane almost on the gear, so I keep plenty busy.

Keep up the good work, and thanks for all the help.

Sincerely,

Jerry Fackrell
763 Mountain View Drive
Leagn, Utah 84321

PH. (801) 752-6989



It is with sincere regret that we notify you that time ran out on Jerry Fackrell. He died in the recent crash of a popular twin engine airplane. Jerry was operating in IFR conditions in the Los Angeles basin, and flew into the side of a mountain. Our sincere sympathy goes to his wife and family. Mrs. Fackrell has indicated a desire to sell his Starduster. It appears to us to be a first rate machine, and we believe a buyer would be getting a bargain if he bought this airplane for \$18-20,000.

A NORTH DAKOTA
SUNRISE HIGHLIGHTS
THE STARDUSTER TOO
OF BUD AND PEARL
PAULSON, OF
ROCKLIN, CALIF.



THE FINE LOOKING
'TOO BELONGING TO
LEE AND SHARON
DORRANCE, OF
CORONA, CALIF.



A NEW STARDUSTER TOO,
BUILT AND FLOWN BY
FRED BROWNS, OF BUENA
PARK, CALIFORNIA. THIS
IS AN OUTSTANDING STAR-
DUSTER TOO. NOTICE THE
COAT OF ARMS ON THE FUSE-
LAGE SIDE. IT WAS HAND
LETTERED BY PAUL LITTLE, JR.,
AN ARTIST OF CONSIDERABLE
ABILITY.

Dear Jim,

Enclosed please find a couple of photographs of my STARDUSTER TOO, which you can use in the starduster magazine. It is coming along slow but sure. It has been six years since I started building. The four wing panels are all done. Every piece that I make and fit makes me prouder and prouder of my bird.

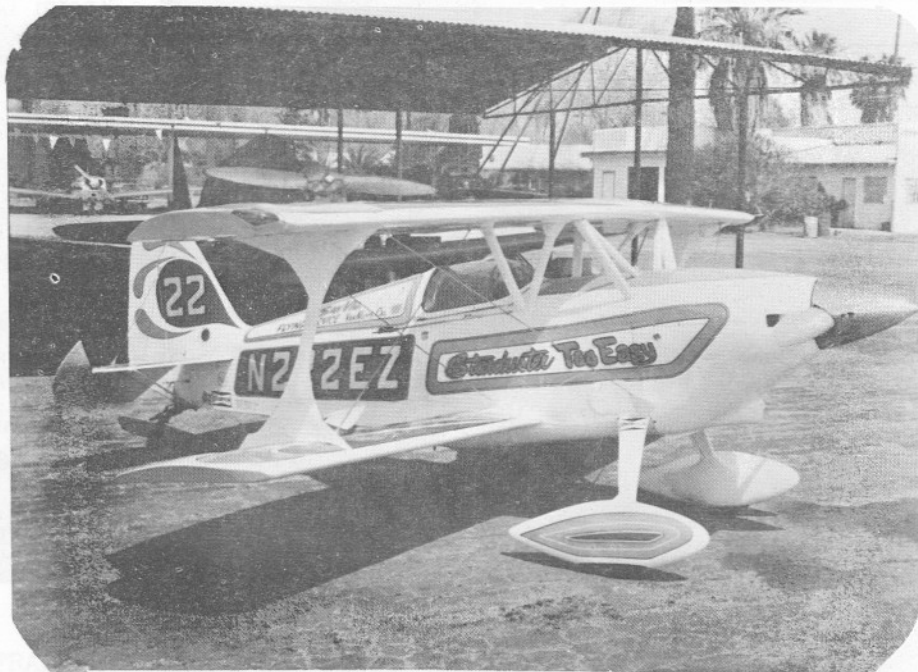
I was late in sending you my renewal for the STARDUSTER MAGAZINE, and requested the January issue, and I haven't heard from you as yet. I hate to miss an issue because it has so much information that I will refer to in the future.

Regards,

AMERICO J. MAZZIOTTI (MAZ)
84 Sherwood Street
Portland, Maine 04103



A STARDUSTER I IN RACING TRIM. OWNED AND RACED BY AL KRAMER, OF SAN VAL AVIATION, VAN NUYS CALIFORNIA. NOTICE THE ACRODUSTER I LANDING GEAR.



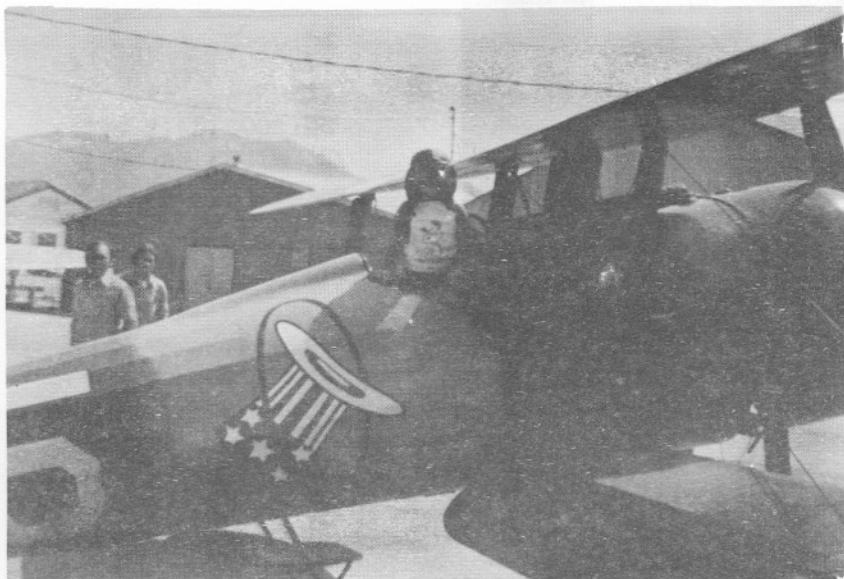
Dear Jim,

It took me six months to decide which of the many Sport Biplanes to build. Your organization, of the several that I contacted, impressed me the most. Replies to my letters requesting information were prompt, telephone conversations showed an eagerness (and, at times, patience) to help with a beginners questions, and STARDUSTER MAGAZINE gave encouragement by showing others projects.

Enclosed is my order for the first of the ACRODUSTER 1 materials kits. I am looking forward to a continued correspondence with your company and magazine throughout the building period.

Thank you,

CARL STRANGE



CAN YOU IDENTIFY THIS PILOT?
Wanted for low level Aerobatics
and firing machine guns in San
Bernardino County Limits.

Several missing aircraft
prompt this bulletin.

This pilot was identified as
raising hell around STOLP
STARDUSTER CORP., at FLABOB
Airport, Rubidoux, California

Pilot is suspected of being
Miss Julie Merritt, of Las
Vegas, daughter of a well
known Las Vegas Gambler.



ANOTHER PROUD AND HAPPY OWNER
AND ANOTHER TOP QUALITY AND
BEAUTIFUL STARDUSTER TOO.

OWNER; M.F. (MAC) CLIFF

FIRST FLIGHT ON AUGUST 25, '77.

constructed in three years
and eight months.

CONGRATULATIONS, MAC.

2016 South High
Denver, Colorado
80201

Mr. ERIC SHILLING,

Enclosed please find check to keep our subscription to your fine little magazine going.

The page on new pushrod ends sure came at the right time. We found a bunch of Heim rod ends at a surplus house. So, now we know what to do with them. Even tho we are building a WICHAWK, we find the technical information in your magazine invaluable.

We enjoyed your comments about Mr. Boyington and "BAA, BAA, BLACKSHEEP". I had the pleasure of meeting him when I was separated from the service in 1946, and was greatly impressed by his colorful storytelling. Also, at that time, he was very much against drinking, remarking that it almost killed him.

We are saving your test procedures for when we take to the air with the "WICHAWK", if we ever finish it. We chose Wichawk because of side by side seating. We may build a STARDUSTER next.

SINCERELY,

DON SAVAGE



STARDUSTER TOO BY FRANK HOSTERMAN, 1000 STAFFORD STREET, MINERVA, OHIO, 44657
Engine is O-435 Lycoming---190 H.P.



THE ORIGINAL ACRODUSTER TOO--BUILT BY MORGAN SCHRACK, AND OWNED NOW BY ALAN CAMPBELL, OF JACKSONVILLE, FLORIDA. PICTURES SHOW HIS MODIFIED REAR COCKPIT COVERING. THE ORIGINAL BUBBLE CANOPY WAS NOT NEEDED IN FLORIDA



Aero Sport, inc.

DEALERS FOR GREAT LAKES & PIPER AIRCRAFT

"Visit Beautiful St. Augustine"

P. O. DRAWER 1989
ST. AUGUSTINE AIRPORT
ST. AUGUSTINE, FLORIDA 32084
PHONE 904/824-1995

Allen Campbell
9645 Baymeadows Rd.
Apt. 601
Jacksonville, Fl. 32216

STOLP STARDUSTER CORP.
4301 Twining Flabob Airport
Riverside, Calif. 92509

Dear Jim,

Sorry you could not make the Sun 'n Fun flyin in Lakeland this year, but you will be glad to know several Stardusters were there along with my Acroduster II. I talked to quite a few people about my plane including many that had projects underway.

I included several pictures of the modification made to the rear cockpit after removal of the canopy. All work was completed in time for Lakeland and was well received. It seems to have smoothed out the airflow problems caused by removal of the canopy and improves the appearance considerably. Generally I liked the canopy and it's appearance with the aircraft, but in Florida they're just not needed.

For readers interested in the Acroduster II, this one now has 220 hours on it and has experienced no problems. Control pressures are light and well balanced between aileron and elevator. Stick throw is short and there is an abundance of control surface in all three directions. All maneuvers are done easily both inside and out and I have had no problems with stall/spin characteristics. Stalls are sharp but predictable, spins are conventional (inside and out) and easily recoverable. No fatigue has occurred with nearly all flights being aerobatic; fabric and sheet metal are holding up nicely.

The combination of 200 HP and the constant speed prop does seem to be the best for overall performance. A removable smoke tank in the front seat has worked out well but I am considering installing one as you did in the Acroduster I. The airplane has considerable appeal as an airshow performer but as yet I have not found time but for three shows.

Please send the last two issues of Starduster Magazine for 1975 and renew my subscription for this year. See you at Oshkosh if not sooner.

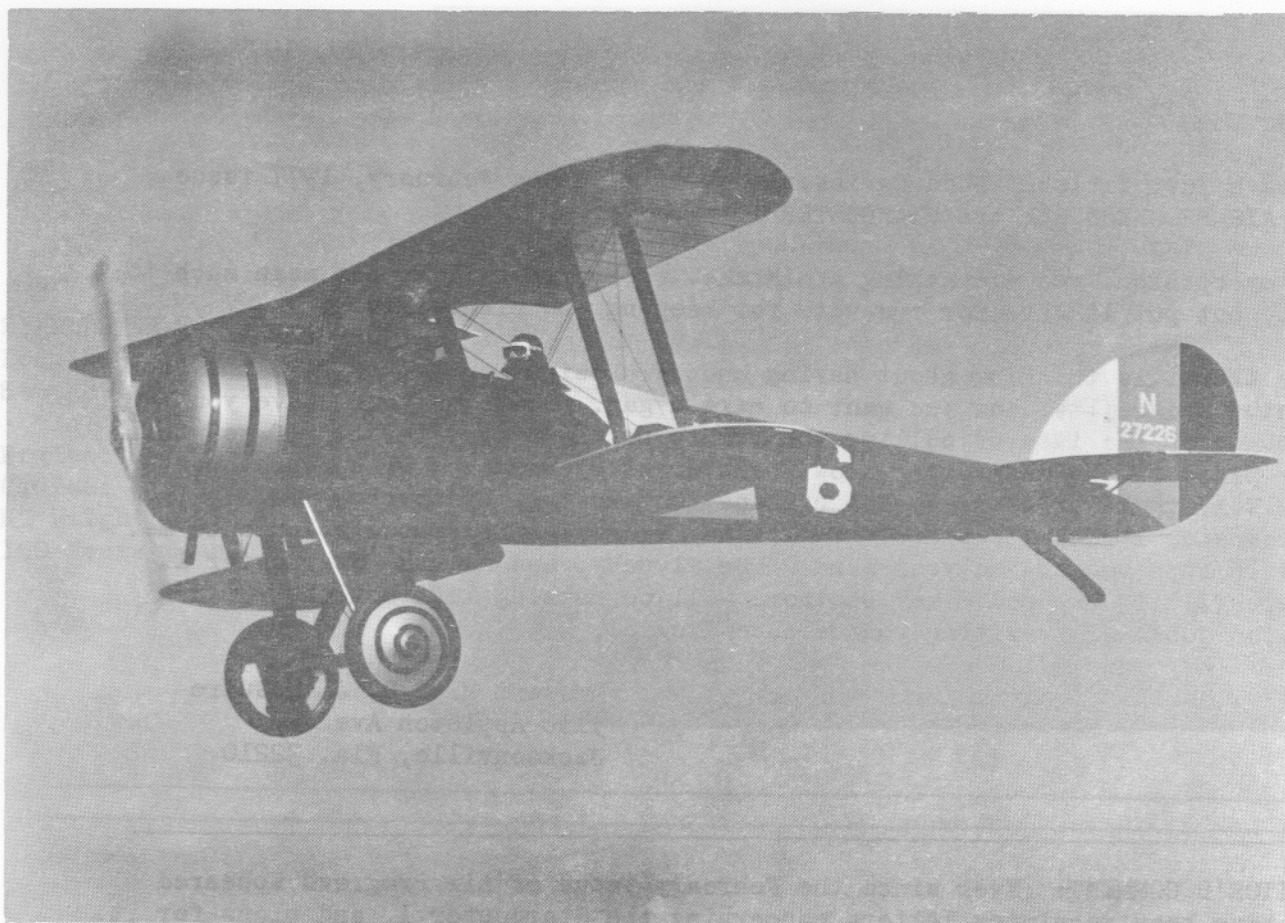
Sincerely,



A SUPERSANITARY STEEN SKYBOLT- BY MARSHAL FREEMAN, OF SAN FRANCISCO



A BEAUTIFUL STARDUSTER 1, BY K. E. BACKSMANN



A Nieuport 28, built by the well known Carl Swanson. Carl has probably built more WWI replicas than anyone else in the country. This Nieuport has a Lycoming opposed engine under that round cowl.

Dear Jim,

I just received the January issue of STARDUSTER MAGAZINE. It sure helps brighten a cold, snowbound wisconsin day.

I have my Starduster just about covered. I hope to roll it out this Spring.

Missed you at Osh Kosh this year, but have found your magazine invaluable. I constantly refer to back issues to find the best way to do something.

I am enclosing a picture of a Nieuport 28 my neighbor just finished, and sold to someone back east. It is about the eighth world war one aeroplane he has built. This is the second Nieuport he has built. The first one was very authentic, with authentic engine, machine guns, etc.

He has a SPAD in the Canadian War Museum. He has under construction two more WWI airplanes. The next one will be another SPAD.

Enclosed is a list of parts I need.

Thanks

EDWIN H. DANIELS
RFD 1, Box 60
Darien, Wisconsin 53114

January 20, 1977

Dear Jim,

I have just finished Budd Davisson's article in the February, 1977 issue of AIR PROGRESS, on the STARDUSTER 1.

In my opinion, you are making a mistake. Well, that might not mean much to you, but put it down for one vote for keeping the plans alive.

The E.A.A. is thinking about having another Design Contest to fill the gaps in the Homebuilts, and you want to make a gap. Shame on you. Have you thought of the idea of selling the rights to the Starduster 1? If you think the plans are not up to par, how about drawing a new set with improvements? The E.A.A. did it with the EAA biplane to make the AcroSport. You say the Acroduster 1 took its place. Well, they are two different airplanes to me. I sure hope you change your mind. The Flybaby, and now the Starduster 1. Where will it all end. May be there will be nothing left but the 200 MPH no-fun jobs. I'm writing you because I care.

Mr. and Mrs. D. J. McGuire
5116 Appleton Ave
Jacksonville, Fla. 32210

EDITOR'S COMMENT: Ever since the February issue of Air Progress appeared we have been receiving letters concerning the Starduster 1, and plans for it.

We appreciate the letters and sentiments of those concerned enough to write.

Nevertheless, we feel that this concern is largely misplaced. Most of the concerned folk are not interested in buying a set of plans. They are just interested in seeing that the plans continue to be available.

We discontinued selling plans for the Starduster 1 in 1973, when the Acroduster 1 came out. We did somewhat as the writer above suggests. We redesigned the Starduster 1 so extensively and made so many improvements, that the Acroduster 1 resulted. This is similar to the evolution of the AcroSport.

Since the demand for single seat biplanes is rather limited, it is uneconomic for us to stock and sell (and service) two such similar biplanes. We choose to go with the one which has the higher performance, the faster and easier building time, and the much more complete and improved set of plans.

The above comments are not meant to detract in any way from the Starduster 1. It is a beautiful airplane. It is easy and fun to fly. We simply feel that in promoting the Acroduster 1 we have picked a better horse.

For pilots who would be satisfied with lower performance, we offer the V-Star. Plans are much better than for the Starduster 1. It performs better on low horsepower. And it is cheaper to build and fly.

Owners of Starduster 1's are now in a rather enviable position. With no more being built, their airplane should increase in value over the years ahead. Perhaps it will eventually attain the status of a valuable antique.

STARDUSTER TOO--- By
Douglas Pfundheller, of
Stoughton, Wisconsin

Engine: Lyc 0-320-150 HP
Cruise: 125 MPH
MT Weight: 1014 #
150 Hours total time



March 19, 1977

Dear Jim,

Having recently completed one of your "babies", the Acroduster 1, I must comment on the good results I have had.

The time saving feature of the Materials kit is excellent.

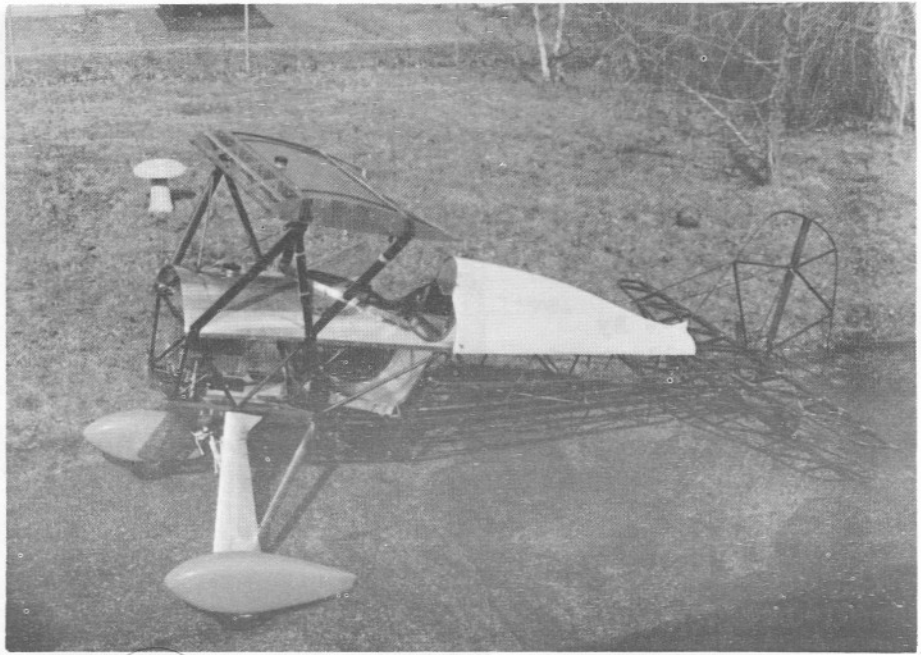
Instead of spending at least half of my time chasing parts, I spent all of my time on actual construction of the airplane.

The craft was started about the first of February, 1976. By the end of October, 1976, it was flying. Being an Ag pilot, my time was spoken for during the three summer months. About 4 and 1/2 months actual building time put it in the air. I was fortunate to be able to spend 8 hours a day, 5 days a week building, during the time I was not AG flying. It went together very fast. The results are great.

The airplane flies and handles beautifully. I am spending my time now flying instead of building.

Yours sincerely,

Ed Bowes.
Lincoln Nebraska



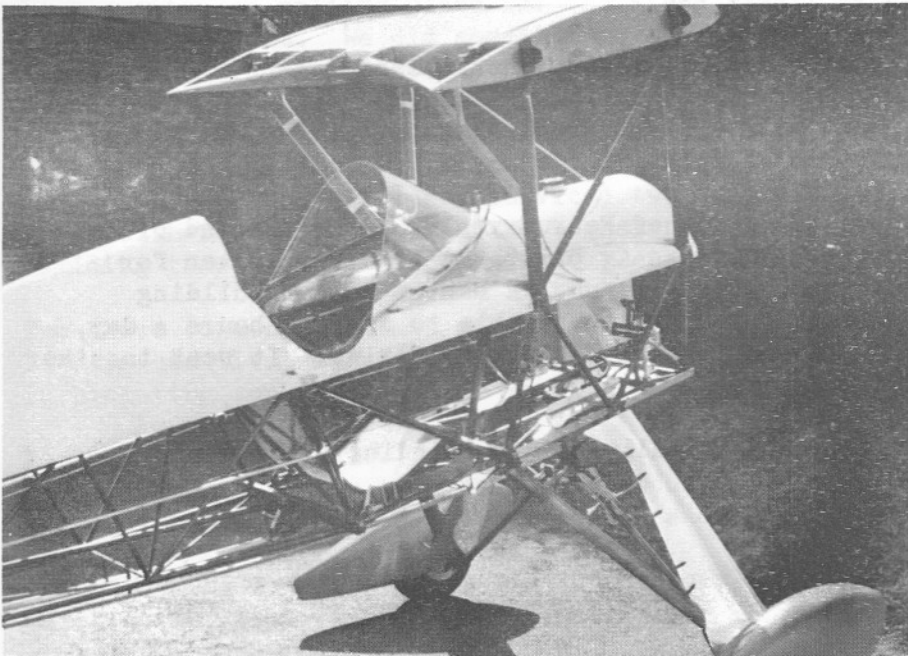
Stolp Starduster Corp.
 4301 Twining, Flabob Airport
 Riverside, California 92509

Dear Jim:

Kentucky is famous for V-Stars, fast horses, pretty women and bourbon whiskey. Enclosed are some pictures of a V-Star. You should come to the Bluegrass state and see about the others

Sincerely,

Art Morgan
 Art Morgan



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

IN STOCK- IMMEDIATE DELIVERY- (2) COMPLETE WELDED ASSEMBLIES-ACRODUSTER TOO-INCLUDES FORMERS, BRACKETS, STANDOFFS, ASSEMBLY HARDWARE, VERNIER TRIM CONTROL, SHOCK CORDS ONLY \$2950.00 EACH.

IN STOCK-IMMEDIATE DELIVERY- (1) WELDED FUSELAGE, ACRODUSTER TOO- PER PLANS SHEET 2- A GOOD FOUNDATION ON WHICH TO BUILD- ONLY \$ 850.00

IN STOCK-IMMEDIATE DELIVERY -(1) COMPLETE WELDED ASSEMBLY-STEEN SKYBOLT- INCLUDES FORMERS, BRACKETS AND STANDOFFS. ALSO TRIM CONTROL, AND SHOCK CORDS. ONLY \$2950.00 COMPLETE.

IN STOCK-IMMEDIATE DELIVERY-(1) STARDUSTER TOO WELDED FUSELAGE BASIC ASSEMBLY- ONLY \$795.00

FOR SALE-ONE ALMOST NEW STARDUSTER TOO- 10-360-B1B ENGINE-EXCELLENT CONSTRUCTION BY AN EXPERIENCED & CAPABLE MECHANIC- SEE AT LOGAN UTAH- PH (801) 752-6989

GET THE WORLD'S EASIEST TO BUILD AND BEST PERFORMING BIPLANE- THE ACRODUSTER 1. BROCHURE \$5.00 COMPLETE KIT, \$5500.00.

FACTORY NEW STEWART WARNER OIL COOLERS- CERTIFIED FOR AIRCRAFT USE- GUARANTEED- LIST PRICE \$146.00 OUR PRICE, ONLY \$95.00

LIGHT WEIGHT, STAINLESS STEEL EXHAUST SETS FOR LYCOMING ENGINES- IMMEDIATE DELIVERY- ONLY \$195.00

"STARDUSTER" DECALS FOR STARDUSTER TOO ACRODUSTER TOO V-STAR STARLET ONLY \$1.00 EACH

ONE CONTINENTAL A-75 ENGINE-75 H.P.- 68 HOURS SINCE MAJOR OVERHAUL BY JOE PFIEFFER OF COLUMBIA, CALIFORNIA. REMOVED FROM CWB FOR BIGGER ENGINE- ONLY 1300.00 PERFECT FOR VARIEZE OR OTHER SMALL AIRPLANE-OFFERED BY "STARDUSTER"

AILERON BEARING INSERTS BETTER CONTROL FEEL- LONGER LIFE- ENABLES YOU TO FEEL AIR LOADS BETTER ROLLER BEARINGS, NOT FRICTION-

DIA: O.D. 5/8"
I.D. 1/4"

WIDTH: 3/16"

SET OF 8: ONLY \$25.00

GET QUALITY, PRICE, AND SERVICE- BUY "STARDUSTER"

FIBER GLASS SLEEVING VARNISH COATED-ANTI CHAFE PROTECT YOUR WIRING- MAKE YOUR FAA INSPECTOR HAPPY ONLY \$1.00 PER 3' LENGTH

SHRINK TUBING- CLEAR PLASTIC TUBING 1/2" I.D. SHRINKS TO 1/4" DIA WITH THE APPLICATION OF HEAT. GREAT FOR SMALL WIRE BUNDLES- USED BY MOST AIRPLANE MANUFACTURERS ONLY .75 PER 3' LENGTH.

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