

The *Starduster* Magazine

Vol. 28, No. 2, April 1998

Published for the biplane builder, the biplane owner, and the aviation enthusiast



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Published by –
Stolp Starduster Corp.
129 Chuck Yeager Way
Oroville, CA 95965

The *Starduster* Magazine

Stolp Starduster Corp.

129 Chuck Yeager Way
Oroville, CA 95965-9200
530.534-7434
530.534-7451 (FAX)
stardstr@pacbell.net

President
Les Homan

Secretary
Mary Homan

Operations Manager
Dave Baxter

Office Manager
Sandra Bosch

Consultant
Bill Clouse
e-mail
BCPREZ1@AOL.COM

Front Cover
Mat Kerr's Too, over the
countryside near Bay City,
Michigan

Inside Back Cover
Flying in to Oroville?
This is what it looks like

The Starduster Magazine

Editors
Clay Gorton
801.292-0127
cgorton@burgoyne.com

Glen Olsen
801.292-2708
801.943-2981 (Home)

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This magazine uses material submitted by its readers. The articles printed do not necessarily represent the views or opinions of *The Stolp Starduster Corp.* or *The Starduster Magazine*. The Corporation and the Magazine assume no responsibility nor liability for the accuracy of the printed material.

President's Message

Les Homan, President, Stolp Starduster Corp.

The first of May we will be one year into this adventure. As with any adventure some things worked better than planned and others not as well. The three biggest downside items were getting the catalog updated by Oshkosh 97, getting Galen's Starduster Too finished and getting Starduster Too drawings on Autocad.

Reflections regarding the catalog leave me with the thoughts that building another Super Starduster would have been easier. The catalog will be a continuing project for sometime and we will be sending out updates to those with catalogs. Galen's Starduster Too was going to be a 3 or 4 month project last May. You will be able to view it in the air at the open house. The paint scheme is an eye catcher. The drawings on Autocad looked easier than they were, but they will be ready by the open house.

On the upside, I met lots of aviation people this past year. Some of the most outstanding memories are of Bartlesville and the reception I received after Charles Harris introduced me at the awards banquet and told the audience what we are doing with Starduster. The group of Starduster pilots at Wautoma who took part in the promotional video were outstanding, as were the efforts of Jon Hansen. I viewed the final cut of the video this morning and was very pleased. Jon has done an outstanding job.

All the people from Oroville and from Livermore and members of my family who helped Starduster move was one of the most impressive displays of people with common interests working

together I believe I have ever seen. I want to thank all these people for making this a great year.

Starduster has moved into our new quarters. It looks like our larger building will come to be in a couple of months, and orders are starting to pick up. We want to thank all those people who have ordered from us, and express our gratitude for their patience. We are in the process of growing and it is not always without pains. Our present goals are to expedite getting orders out the door and shortening the time from order receipt to shipment.

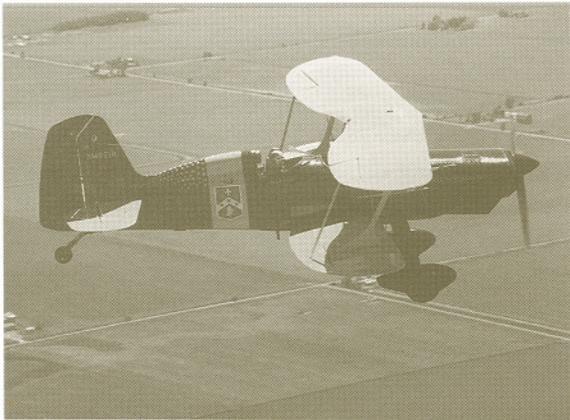
Another goal was getting all Starduster owners, builders and pilots identified and onto a data base. This is not complete but being worked on. Surveys from all EAA chapters in the USA are still trickling in. We appreciate the time and efforts put in by the chapters.

We will be at Sun-N-Fun, arriving back in Oroville just a few days prior to the open house. We are going to take a new idea with us to Florida, a fast build kit for the Starduster Too and will have info at the open house.

Goals for next year include a promotional video and a construction manual for the Starduster Too, getting a V-star in the Oroville area, acrobatic video for Starduster aircraft and the installation of a direct drive Chevy 350 on a Starduster Too. There are several other goals for next year. Come to Oroville and be part of the adventure. Remember, STARDUSTERS ARE FOREVER.

Les Homan





18th Annual! Starduster Open House

May 1, 2 & 3, 1998

**Oroville Municipal Airport (OVE)
Oroville, California**

Come join us for a weekend of fun and good fellowship. All airplanes welcome, especially biplanes & other homebuilts

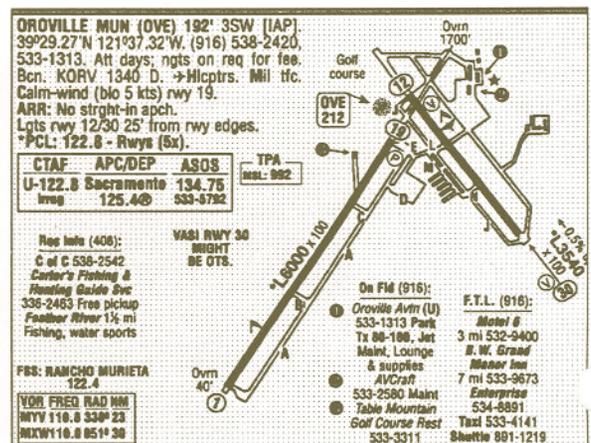
Free admission

**Houseboat cruise Fri. afternoon
Pancake Breakfasts Sat. & Sun.
BBQ's Fri. & Sat. Nights**

Hosted by EAA "City of Gold" Chapter 1112

Information or reservations call

**Chairman Ray Bell 530-345-3453 or
Stolp Starduster Corp. 530-534-7434**



CALIFORNIA

Rev. 95-11/98

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99

18TH ANNUAL STARDUSTER OPENHOUSE

Oroville Municipal Airport

Friday, May 1

10:00 a.m.	Registration opens
11:00 a.m. - 1:00 p.m.	Complimentary snack & soft drinks
2:00 p.m.	Leave airport for houseboat cruise
2:30 — 5:00 p.m.	Houseboat cruise (drinks & hors'd oeuvres)
5:30 p.m.	Social time, Bidwell Rec. Hall
7:00 — 9:00 p.m.	Cowboy BBQ Chicken Dinner, Oroville Airport

Saturday, May 2

5:45 a.m.	Briefing for dawn patrol
6:00 a.m.	Depart for Willows for breakfast
8:00 a.m.	Pancake breakfast - Oroville Airport
10:00 — ?	Local flying, rides and flights over Lake Oroville
11:00 — 1:00 p.m.	Sack lunches & beverages available
12:00 p.m.	Antique store tours and other sightseeing
5:00 p.m.	Social time, Oroville Airport
7:00 p.m.	Tri-Tip BBQ Dinner & Awards, Oroville Airport

Sunday, May 3

8:00 — 11:00 a.m.	Pancake breakfast, Oroville Airport
8:00 — ??	Local flying & departures



Call for Hotel Reservations in advance:

Travelodge—	800.578-7878, 530.533-7070, FAX 530.532-0402
Villa Motel (AAA)—	530.533-3930
Grand Manor Inn (Best Western)—	800.626-1900, 530.533-9673, FAX 530.533-5862
Days Inn—	800.329-7466, 530.533-3297, FAX 530.533-4809

Call for information

Stolp Starduster Corp.
Les Homan, President
530.534-7434
530.534-7451 FAX
stardstr@pacbell.net-

EAA "City of Gold" Chapter 1112

Ray Bell, Chairman
530.345-3453
530.345-3453 FAX

See Registration Form, Page 38

Starduster History, Part 1

By Dave Baxter

Bill Clouse, Past President, Stolp Starduster Corp.

Before Bill's retirement from the USAF he flew 166 missions over South East Asia as a B-52 crew member. After retiring during the early 1970's and wondering what he could do to supplement his military income, he was offered a job in shipping and receiving by the then owner of Starduster Corp., Jim Osborne. After a short stint in this capacity as well as several other business related jobs he was promoted to shop foreman and in this capacity was involved in many of Starduster Corporation's prototype airplanes—the SA-700 Acroduster One N181J and the SA-750 Acroduster Too N750X, 260 hp company prototype. He also worked on the Acroduster One N700XP. In addition, Bill interfaced with many interesting people including Manx Kelly, Bob Herendeen, Jim Appleby, Cindy Rucker and John and Janet Helton. He was also involved in several WWI reproductions that Jim Osborn owned and promoted. During the late 1970's he also worked with Mike Snow, Norm Eaves, Vernon Payne and of course Eric Schilling. Many of these people went on to be very successful and notable in the aviation world.

Between April and July of 1981 Jim Osborn decided to sell the company. The new owner was to be Bill Clouse. During his first editorial as president of Starduster Corp., July 1981, he wrote several things about the reality of the business that still hold true today and his view of the previous owner, Jim Osborne. He thought that Jim didn't have much to do—stop

over in the shop late in the morning, ask how things were going, make and answer a few phone calls, maybe spend a few minutes in the drawing room and then go flying, weather permitting. Boy, he found out that was not quite the case! After wearing the hat of boss, owner and president, he was also involved in customer satisfaction and ideas to make the company better.

He was involved with the Greens in the development of the Super Starduster One and hosted some of the biggest Starduster open houses at Fla-Bob. During the last ten years he ran the business virtually by himself, which is quite a feat—as I have been trying to do the same for the last nine months and certainly understand how hard it is. Also, when the phone rings, they ask for Bill. He would say, "Dave, it's for you." Now he's finding out where the cruise control is on his motor home.

I only say this because he has served his time and certainly is ready to retire again and enjoy traveling, because this is really what it is all about.

Another very wonderful thing I found out about Bill was during our move from Southern California to Northern California. While packing things I found a small binder written by Bill's niece, Missy Mortimer, and titled, "Stories About My Uncle Bill." The dedication says, "given to not only my uncle, but to my best friend, Uncle Bill, AKA BC Prez." There were at least half a dozen

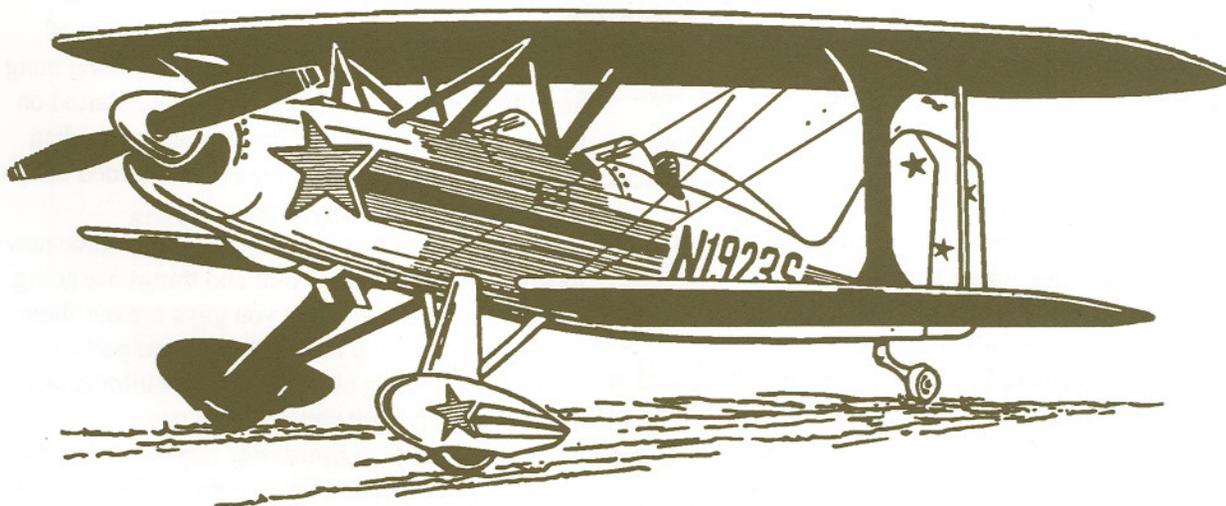


pages in the binder written about Bill by his niece, Missy. It is pretty obvious that he is a roll model and a very strong mentor that influenced her view about a lot of things.

Some other things I discovered about Bill was that he had been a sky-diver, and has over 1030 jumps to his credit. I also discovered a book titled "The Secret Explorers," by Fred Wack. It is about the saga of the 46th and 72nd reconnaissance squadrons, of which Bill was a member. These squadrons flew B-29s and RB-50s on very long range missions. They were conducted from 1946 up to the late 1950s, when the new super secret U-2 spy planes took over the task.

The early missions were flown from Alaska over the North Pole, skirting the northern borders of the USSR and down along the east coast of Russia. Most of these were flown by RB-29s, and most of the missions were about 20 hours long. When the B-36 Peacemakers reached squadron readiness in the early '50s they were flown from Travis AFB in California to Germany over a number of different routes. These missions for the most part were well over 30 hours long.

Some interesting facts about these flights were of the three or four airplanes lost. One of them was the Kee Bird, an RB-29 nicknamed after a mythical polar bird. This airplane was the one that Darrel Greenemeyer and his crew tried to rescue from the northwest Greenland icecap several years ago, only to have it burn up from a leaking AUX power unit. At any rate, Bill was not on this particular airplane, but later flew with the 46th/72nd recon squadrons. Grid navigation was pioneered by these squadrons, as well as the use of the super secret long range angle cameras later used on the U-2s and SR-71s. Most of us know about Bill's service in the RB-29 and RB-36. There is, however, a written notation in the front cover of this book which goes like this, "William C. Clouse, Jr., a secret explorer. Your participation in the activities of this squadron helped to write its history. Hope you enjoy reading about it 50 years later." Signed, Fred John Wack, Author. At any rate, the point is that Bill Clouse has been much more than just the president of Starduster Corp.



Correspondence

Time to Fly

Wayne Ensey

Fifteen months ago Ray Siefker started construction on his second airplane in three years. The first was a Cassutt Racer. The second was a Starduster Too. I was fortunate to be involved in both projects. Keep in mind that Ray owns and operates a large manufacturing plant on a full time basis. Ray has another absolute rule, he never works on Sunday. However, a normal work night went on until one, two or even three o'clock in the morning, only to be back at work at eight the following morning. That's how you complete a six year project in a little more than a year. By the way, Ray is still married.

Those of you who have completed an airplane will probably remember the day you realized there was nothing left to do on the plane and your flying skills were as good as they were going to be without another thousand hours of flight time. At this point you have two options. One, find someone to test fly your plane or do it yourself. Either way, the project's not done until the flying's done. A couple of weeks ago Ray was at that point. There was little doubt that he would do his own first flight. However, February in Oregon presents a real challenge trying to find good flying days.

The morning of the 27th looked promising. By 2:00 we had assembled the team. Ray, of course, was in the Starduster. Steve Kimura acting as the ground crew was backed up by Ray's wife, Teri. Craig and I flew chase in our Acroduster. Earlier that afternoon Ray and I went for a flight in the Acroduster to loosen up. He wanted to do some slow rolls so I had to oblige. It's a dirty job but somebody's got to do it. Back on the ground he was ready to go. After a trip down runway 17 to check a tail wheel modification it was time to fly. After all of the work, preparation and worry his first flight was pretty much like most others. The ground roll was straight, the lift off was steady and even and the climb was—what a climb! After a climb to 4000 feet it was time for some stalls to check the airspeed indicator and determine the

landing speed. As with most things Ray does, it was right on. With that behind him, we spent the next hour just flying around while Ray made friends with his new bird. Ray made his approach first while I watched from behind. Of course, a near perfect approach was followed by a near perfect (beginners luck) first landing. As I flew overhead at about 100 feet I was treated to a spectacular view of the second hottest red white and blue biplane I have ever seen, sitting in the middle of the runway. Ray said that he was just waiting on the taxiway for me to come back around so we could taxi in together, but I think he may have been waiting for the emotions to subside. Either way, everyone at CVO saw a pretty flight of biplanes taxi in. The next goal is flying off the 25 hours in time for the annual Starduster Acroduster open house in Orville, CA this coming may. **Congratulations Ray! It's going to be a great summer!**

Dear Dave,

8 January, 1998

Thanks for spending time with me on the phone yesterday. Going into my third winter of working on my wings. The ailerons are being hung and I have started varnishing. I just got started on them again on the first of January after spending the first part of the winter on a much needed clean-up and repainting of my shop.

I understand that you have moved to your new location. I hope all went well and things are going smooth. It's great to know you guys are out there supporting guys like me with these two part dreams—just being able to work on building one, and actually flying it some day.

I did get to fly a Starduster (my first) this past summer. I met a fellow from Bismark by the name of Logan Holm who owns and flies N357DS, a 180 hp, CS prop, orange and white model. If I remember right, I thought he told me it was built by a fellow from the Portland area and they bought it from a fellow in Port Townsend, WA. (Or could

it have been Port Orchard?) Anyhow, by the looks of it that Starduster is in very good hands and it was a joy to fly, much lighter on the controls than the Citabria I am used to flying. What a building inspiration pill that was to swallow! Maybe you are familiar with the plane, Dave.

Enclosed is a check for the 1998 magazine. I patiently wait for it four times a year, and enjoy it very much. Keep up the great work! Thanks again.

Bob Engkvist, Esmond, ND

Dave, 24 February, 1998

We miss having you up here but I hear that you are doing great things down there. I finally feel that I've got everything just about right on my plane. Cruise 155 mph, climb 1900 fpm. Love the canopy. Ray is ready to fly his Starduster. He's just waiting for the weather. Know what I mean? We're both going to Oroville. I'm in close contact with Joe May down in Eugene. He's doing well. I'm excited that there is going to be another Acroduster close by. I just ordered the magazine. I'm doing quite a bit of writing for our EAA Newsletter. If you're interested, some of the articles might fit in your magazine. Let me know.

I hear that there is a new method for attaching the spring gear on the Acroduster. Can I get some info and /or plans?

Wayne Ensey, Albany, OR

Dear Dave, 15 January, 1998

IT'S DONE, FINISHED and FLYING! My SA100 after 27 years! N22PF. I'm enclosing a picture as you mentioned you wanted pictures and any other info we might have.

I installed a geared Toyota starter to save weight up front, plus a Toyota alternator and reg. and it does the job.

On the first and only flight to date it flew well, but I had to hold about six or eight lbs. nose-up pressure on the stick; but I'm working on that. As you know, I have been flying Dick Waltermire's Starduster Too, but the SA100 keeps me a little more on my toes as it has more of a mind of it's

own on landing roll-out.

We are still at the Nut Tree Airport. Oh yes, another thing I really like, there is so little wind in the cockpit.

Pat Fitzpatrick, Citrus Heights, CA

(See Photos, page 19)

Dear Les and Dave, 16 February, 1998

Congratulations on your move, and on the coming rejuvenation of Starduster. I am looking forward to the first national ad. And thank you for the copies of Starduster Magazine. I am going to build airplanes for the next few years. If you will send me a catalog, I will be happy to order from you instead of Brand X.

Right now I am working on a Sky Raider Ultra Light and a Fokker D-VII. Will probably sell the Fokker and keep the Sky Raider. Then I hope to build an Acroduster I.

I am also selling my motor home, complete with tow car. If you are interested, give me a call. The motor home is an Apollo, 33' long, rear bedroom, island bed, 3300 lbs. Contains all the appliances and many extras. The tow car is a Gazelle sport car and we have a top-of-the-line tow dolly. All the above for only \$25,000.00.

I sure enjoyed your visits a couple of years ago. You would be more than welcome to drop by any time when you are on your aerial trips. Give me a phone call beforehand, and stay the night.

With best wishes for your new venture.
Cordially,

Jim Osborne, 208.495-2059

Melba, ID

Les, 15 January, 1998

You requested more info on our SA300 via e-mail. Well, here it is. N6191A, Serial 743, 220 hp Franklin sport-6 with a Hartzell c/s prop. We purchased a set of plans and completed frame and tail feathers that were started in 1969. The engine and prop both new in 1974. Never run until this year. Engine performs very well and burns about 12 gph, 2800 rpm red line. We usually run at 25/25 square. We purchased Stolp's new landing gear,

installed eight inches aft of the firewall because the original builder used the 1969 pre-welded gear. Too much weight on the tail wheel. Our tail weighs 75 lbs. level flight and 125 lbs. three-point. Aircraft empty weight is 1275 lbs. Ground handling straight forward and smooth.

Pilot info:

Ken Williams, age 45, 2300 TT, 800 tail, mostly in T-craft and Luscombe.

Gid Shaw, age 69, 2900 TT, 1500 tail, Pitts, PA-12, etc.

Wayne Rumble, age 64, 1500 TT, 25 tail.

Ron Boomhower, age 50, 750 TT, 0 tail.

Ken Williams,

Fairway.Cycle.Honda@worldnet.att.net

Les,

5 February, 1998

Currently building—rather completing—a Starduster SA300, N62DS. Hopefully will fly this summer. Would like to attend some Starduster fly-ins, but it would be in my spam can this spring.

Passed through Wautoma two years ago and saw the Stardusters—a bit disappointed that none were at Oshkosh.

What I like best—the smooth lines, supposedly easy flying, (read that—landing) and open cockpit, although in ND it could be a bit cool in the winter!! What I like least—can't think of anything, same goes for improvement. Haven't needed any factory advice for a while, but Bill Clouse was always easy to talk to and very helpful on the phone. Keep up the good work! See you at Wautoma this year, hopefully, or the next.

Any of you guys passing through here on the way to Oshkosh/Wautoma are welcome to drop in. (Our private field is 1/4 mile east of Bis VOR.) Put your planes in the hangar, stay overnight and talk Starduster. Fuel available here and pilots—especially Starduster pilots—are always welcome. As the kids gradually move out, we have lots of spare rooms. Feel free to drop in.

Bob

Bismark, ND

Dateline— *Yakima Herald-Republic*, 23 May 1994

Harrah man's homemade plane still grounded—but not for long

By Greg Tuttle

HARRAH—Lyle Taylor can't wait to strap on his leather flying helmet, wrap a white scarf around his neck and soar into the wild blue yonder.

But, at least for a few more weeks, he'll have to keep the scarf, leather and wild blues grounded while he puts the finishing touches on his 12-year-old project.

However, people who go to this weekend's Yakima International Air Fair will get a chance to see his vision. Somewhere on the tarmac, mingling with a Warthog, Bearcat and Fighting Eagle, will be Taylor's hand-built Starduster II.

You'll notice it because Taylor will probably be standing beside the red, white and blue biplane wearing the grin of a proud father.

"It's a rewarding thing," Taylor said recently while still working on the aircraft that has been over a decade in the making. "I'm not patting myself on the back, but there are very few homemade airplanes out there."

Taylor 68, is a retired cabinet maker who, while still a child, was smitten with a desire to fly. He's spent his life in that pursuit, and in 1946 was one of the founding members of the Harrah Flying Club. He has been a member of the Yakima Air Fair since its inception 12 years ago, and is a past president and longtime member of the local chapter of the Experimental Aircraft Association.

But his greatest joy, and perhaps his greatest challenge, has been making his own airplane. He started 12 years ago in his back yard with a set of blueprints he ordered from the Stolp Aircraft Co. in California and a stack of steel tubing.

It was a daunting task even for a man who had the will and skill to build an airplane from scratch.

"It's just like walking to China—you've got to take that first step," he said of the early days when the plane resembled anything but something that would actually fly. Working only from the blueprints without the benefit of prefabricated mater-

ials, Taylor has molded, melded or manufactured nearly every part of his airplane. He bought the two gas tanks and the engine—a four-cylinder Lycoming that puts out 180 horses. He also bought the engine mount—tolerance levels are important when it comes to staying airborne—and a few other parts. The rest he's made by hand.

"There are 88 pieces in the rudder and brake system that you've got to grind, file and weld and then make them do something," he said. "I'd guess you'd say it's been a labor of love. I just kind of learned as I went. It's been fun."

The wings are made of a wood frame wrapped in a synthetic material that, when heated, shrinks to fit. A two-seater, the plane is capable of cruising at about 120 mph and has a range "farther than my bladder," Taylor said.

Now, it's almost done. Taylor said he won't fly the craft at the Yakima air show because he has yet to have it inspected and approved by the

Federal Aviation Administration, a matter of "paperwork" that will be completed soon.

"It's pert near done," said Dick Gagner, also a member of the Yakima Air Fair and the current president of the local Experimental Aircraft Association, said he has watched Taylor toil away for years as his airplane took shape. The association would often hold its meetings in the makeshift hangar at Bouchey Farms near Harrah, where Taylor has worked on his project for the past year.

"All I've done to Lyle's airplane is look at it," Gagner said. "But it's a source of immense pride for all of us. It's just a thing of beauty."

Taylor said he looks forward to piloting the craft to several air shows this year. There is a club of Starduster II pilots he hopes to hook up with in Arizona, and he is planning a trip to Wisconsin for the Oshkosh Air Fair, one of the largest in the country.

He'll fly there, of course.

2 February, 1998

Dear Glen and Clay,

First off I'm going to say I'm sorry for not answering sooner, but after you retire, the days get shorter and time goes a lot faster.

And first, Glen, I want to say I was looking forward to seeing you in Yakima this summer, but

we set the Yakima Air Fair the same dates as Oshkosh. They were the only dates we could get the Snow Birds. Maybe we can get you up here next year because I was going to have you, Oscar and Les up here all in one line. But I know our hearts are back East.

And about my flying, I started flying right



Lyle Looking to the Future

after the Big War under the GI Bill in 1946. In 1954 I started the Harrah Flying Club. There were ten of us that bought an Aeronca Chief. I got my instructor's ticket and did a lot of instructing. Members came and went, and we had a high of 32 members with two airplanes

Over the years we had Aeronca Chiefs and Champs, Stinsons, Tripacers, Cessnas (140, 172, 175); and my son, Roy, has the last 172. It was one of the longest running clubs in the country—and I wound up with about 4000 hours of flying.

And besides the Harrah Flying Club that I mothered, I was the Scoutmaster here at Harrah for 37 years and was on the Harrah Volunteer Fire Department for 37 years, and led the Boy's Church Group for another 15. All this was concurrent, and besides I just gave my 114th pint of blood. And when this was all going on I started building an airplane besides working forty hours a week as a cabinet maker.

Keeping the wolf away from the door and

building an airplane sometimes is very trying on our wives, but Dorothy has taken it very well.

I sent for my Starduster plans in about 1978, was going to have it done by 1984 and fly to Oshkosh. I was only about ten years late. I finished it in 1994. My first flight was 27 June, 1994, and I had to hurry to get the 25 hours flown off before Oshkosh, but I did make it. Dave Baxter met me here at home and we flew down to Salt Lake City, met some neat guys there, had some bugs and these neat guys helped me smash them.

Since then I have flown to Oshkosh twice, to the sand dunes here in the State and in Oregon. A couple of times to the Arlington Fly-in and to the Prosser fly-ins and to the Yakima Air Fair three times.

Again I'll say I'm sorry. Wanted you fellows up here to our Air Fair here in Yakiima—but the invite will still be open another year.

Sincerely,

Lyle

(See Photo, Page 19)

Hello,

Good luck to the two of you on your new business venture, and thanks to you, Dave, for giving myself and Greig Coben a lift into Oshkosh ('96) from the airport to get something to eat the last day of the fly-in.

Enclosed is a check for the 1998 subscription

to the Starduster Magazine and a photo of my Starduster Too in flight over Central Ohio. It's a real pleasure to fly and has been trouble free. It took me 17 years to build, working on and off on it, but was well worth it. Thanks again.

Dan McAlonan

(See Photo, page 20)

Les and Dave,

March 6, 1998

Enclosed are pics from my Starduster Too "Show and Tell" to some members of our EAA Chapter 186 on Feb. 7—sixteen attendees. Basics of tube, wood and fabric and the beauty of Stardusters. Gave out several of the handouts you sent. Our

spring fly-in is May 23/24. I want to display a finished Starduster Too plus my project—before and after. Great to see Starduster ads back in the magazines. Please feel welcome to refer any East Coast inquiries to me for a visit to my project.

Hohn Huie, Clifton VA

(See photo, page 20)

Dear Glen and Clay,

11 February, 1998

Thanks for your letter requesting information on N84MM and for putting John Reed's passing in the Starduster Magazine. Mary Jane Reed was pleased.

Our Starduster was badly damaged April 1996 in a tornado that hit the Carmi, IL airport. It experienced +5.8/-4.0 G's on its G meter. Eight of the ten enclosed T-hangars were destroyed and seven aircraft were totaled, but N84MM was partially protected by an office built inside its hangar.

Bud Fritchley and I decided it would be a good rebuild project, and with 45 hours plus in John Reed's N767NP I knew it would be a fun aircraft, so we bought it. Bud had started a Space Walker II project, which he put on hold, and we started the rebuild in the middle of May. I made the first flight on 12 November, 1996. N84MM has been totally recovered and painted, fuselage, wings and tail damage repaired, new right upper wing, a different rudder and considerable repair to the horizontal stabilizer and elevator. Accomplishing this in six months was due to Bud's skills, the help of Starduster Corp., John Reed and using N76NP as a prototype model.

We are now the proud owners of a flying Starduster Too. It has flown to seven local airports—

Henderson and Owensboro, KY (winning a plaque at the OWB fly-in); Noblesville, IN; Rantoul, IL; Janesville, WI; and Wautoma, WI. Then the return trip to Peru, IL; Matton, IL; and home to Helper Airport (43IN). It has also shown us loops, rolls, split-S's, spins and wing-overs. It flew 77 hours in our first year and taught us several things only bi-planes and tail-draggers teach.

N84MM is hangared at Helper Airport, which is owned by Bud and his family. It has a 2600-foot East-West grass runway. There are thirteen aircraft (only one with training wheels) hangared at 43IN. Location is 9.5 NM northwest of Evansville Regional Airport (EVV). Bud's Phone number is 812.963-6047 (home) and -5819 (work), and Gene's is 812.867-3103. All Stardusters and tail-wheel aircraft are welcome!

By the way, Bud finished his Space Walker II and it was first flown on 26 June, 1997. The restricted twenty-five hours was flown off in three weeks by Bud, his son, Steve and Gene. It now has 80 hours. Between the Space Walker and Starduster 23 Young Eagle flights have been made.

Sincerely yours,

Gene Glackman and Bud Fritchley

(See Photo, page 20)



Starduster Catalogue

Les Homan, President

The first edition of the new *Starduster* catalogue is finally complete. It will be updated and added to as we move forward. The cost is \$5.00, which is refundable with the first \$50.00 order.

We regret the need to charge for catalogs, but expenses related to moving and getting the Starduster Corp. headed upward force us to do so. Please let us know if there is anything that you would like to see added to the catalogue.

Dear Dave,

27 January, 1998

We enjoyed meeting with you and Donna at Flabob (see photo). Thanks for the flight in your Starduster Too. I realized later that was probably the first and last time I will fly out of Flabob. I guess you had good weather for the flight back to Oroville.

We followed the sun for the next couple of weeks into Arizona and then back to California, calling in at Flabob again to see if you were still there. However, you were gone.



I don't know how you packed up and moved all the stuff. You must have had lots of help!

Saw Kenny Ware with his Starduster Too and spoke with him awhile. We couldn't stay long as we had to push on to L.A. Airport for the flight back to London.

All the best with Stolp Starduster Corp. in its new home. I hope to visit Oshkosh/Wautoma this year. I am saving my air miles.

Hope to arrange an informal fly-in for Stardusters in southern England in the spring. I have met quite a few owners now.

Best regards to you and Donna.

Harry Mackintosh, London, UK

Dear Starduster Magazine

22 March, 1998

I would first like to compliment you on the January issue of the Starduster magazine. . . .Very

professional! Enclosed is my check for another year. I am a first-time builder, and will probably start construction of my Starduster Too in the spring of '99 (a year from now). Right at the moment I am getting ready to build the two-car garage for the building of my Starduster. I am mind set on installing a Lycoming O-540 engine, and would appreciate any information you possibly could offer with construction changes (weight/balance, landing gear, etc.)

With Oroville so close to Reno, I hope to meet you at the 18th Starduster Open House. Also, I have set time aside to attend Bartlesville in June.

Thank you again for supplying me with the inspiration/magazine to build my Starduster.

Craig "Gus" Gustavson, Sparks, NV

Sandra and Dave,

Enclosed is a check for the magazine—still the best. Heard about your move. Hope everything is going well for you all.

Finally starting to see the end on my Too—starting to build the front cowling. Everything else is mostly done except the instrument panels and wiring. We don't have a warm place to work, but we do what we can. Thanks much and good luck.

Carl Buerger, Green Bay, WI

Dear Dave,

I trust the holidays went well for yourself and your family. I was really nice to visit you and hang out at Flabob. It seems like a long time ago. Julia, our new daughter, is now three months old and really growing! She is certainly a joy.

Simon the Starduster is doing fine, seems the landing gear are still holding up, with all the bends! I will keep an eye on them for any more deformation. If I do see any I think the fix would be to straighten the existing gear. I have adjusted to the heavy tail, and with my weight and balance perfect I do not think I want to move it any farther aft.

It does not look like I will be taking any long trips in the plane soon, being a Dad is keeping me busy at home. I did sign on so I will do my best. I

do still fly at least a little every week end. (I usually need it.) I hope all goes well with the move. Keep me posted as I will be up to visit you on one of my business trips up north.
Speak to you soon,

Peter Cavallo, Arcadia, CA

Hi Dave and Crew,

Hope all is well at the new location. Only wish I could have been involved in the move and grunt work. It's fun to be with friends and pitch in for such a worthwhile project as Stardusters.

I am pulling 26AH down after January 18th or so to recover the wings and will plan on completion in April in time for flight test and tweaking so I can get to the Open House. Can't miss that!

Everything else is fine but the weather up here. So I will talk to you soon. Thanks

Hap Schinase, Scappoose, OR

Dear Sirs:

Find a money order for the renewal of my Starduster magazine for 1998.

At present I am painting my Acro II project using the Airtec paints. Hope to start final assembly in about a month. I will send you pictures as soon as it is together.

Leonard Sebulsky, Sheho Saskatchewan, Canada

Dave,

Feb. 19, 1998

Many thanks for the Starlet info! After reading Art Scholl's report I went out and spun my bird. It does wrap up quicker to the left! Recovers nicely, though. Happy New Year.

John Russell, N73KG, San Antonio, TX

Hi Guys,

16 January, 1998

Enclosed is a photo (see page 21) of a "Christmas Ornament" I welded up for my house. I took the 3-view from the first page of the Starduster Too plans, scanned them and enlarged them to 3' wingspan. I welded up the frame from 1/4" mild steel rod, painted it white and put white lights on it. The propellor disk is a set of 40 motion lights that go through several different gyrations. There are 250 white lights. I have welded up a five-section banner that says "Merry Christmas". I wasn't able to get the banner lighted for Christmas. It will go up next year and I'll send you another photo of a Starduster Too towing a banner.

Bob Rogers, Mendon, IL

Dave:

5 January, 1998

A quickie update on the Starduster History Department: re N6385C. Last September on my return from Cottage Grove annual trek to the Hatz fly-in, stopped as usual to check on 85C rotting away in the Estacada Airport weeds, as I'm sure you recall. Imagine my surprise when I didn't see her about!

An inquiry of Bill White at Sonova Beech—I knew he was interested in 85C, and possibly had her in his hangar—disclosed that Mr. Richardson, who owned that part of the airport property where 85C sat for years, had died subsequent to my '96 visit. The kids (heirs) put the ship in Richardson's hangar, effectively seizing it for back rent/tie-down lien. White told me the ship was slightly damaged in a nose-up when being pulled from the mud with a pick-up because the brakes were frozen.

White said he had tried to negotiate with 85 Charlie's owner, but bowed out because he wanted \$6000 for her.

Anyway, at last known position, she was at last out of sight, where her horribly slow death, if not decent burial, is at least a more private matter.

Hope all is well with you and yours.

L.W. Amacker, Walla Walla, WA

Stolp Starduster Corp.

February 12, 1998

Dave, it was pleasant talking with you on the phone this morning about Bob Ledera's Starduster Too project. Bob died in late December, 1996; complications from heart and stroke. I am attempting to help his wife, Amy, find a buyer for his project. There is also available a 1974 Piper Warrior Pa-28-151 with 2653TT and 563 SMOH that Bob had. Below please find info on the Starduster Too project (See below) and some color prints. (See photo, page 22)

Many thanks,
Richard B. Strawn

Starduster Too Project, Model SA300

Fuselage on gear, tail surfaces mounted, cabane struts on. Dual controls, toe brakes and trim. Instruments in rear panel only. R.O.C., ball bank, airspeed, altimeter, tach, cyl. head 3 in 1 gauge. Factory fiberglass nose bowl, turtle deck and wheel pants. New Maule tailwheel, Model

SFS. Open cockpit with wind screen. Factory fuel tanks. Aluminum wing tank and fuselage tank with inverted system. Aluminum tubing for fuel lines. Aluminum sheets for building side and top cowl. Engine mount for a Lyc. 0-360. Floor boards are cut, fit and varnished. Cleveland brakes, model 30-63A. Throttle quadrants in front and rear cockpits. Two lower wings nearly finished, one aileron finished, second one nearly finished. Top wing spars all made up and metal fittings made and ready for assembly. All wood to complete top wing. Many boxes of required bolts, fittings, screws and special parts from manufacturer. New mag switch, position lights, rubber strip molding for cowling. Fighter-type push-to-talk switch for control stick. Full set of flying wires. Miscellaneous 4130 tubing and flat 4130; also some A/C birch plywood. Plans for the project included. Many small containers of parts and 4130 metal wing fittings. Everything goes. Owner deceased. \$8,500. Contact Richard B. Strawn at 1900 SW 1st Avenue, Fruitland, ID 83619. 208.452-3149.

Dear Dave,

January 16, 1998

I thought I'd write you about something that has been consistently absent in most articles on building Stardusters, the ELECTRICAL SYSTEM. There is a system shown in "Building the Golduster" but the layout wasn't that clear to me and there were other aspects I wasn't comfortable with. After researching "Firewall Forward" by Tony Bingelis, I had an idea of what I wanted. Since I occasionally fly a Piper Cherokee and a Cessna 172, I also looked at their system schematics. I wound up laying out a system much like the Piper's and incorporated the separate radio bus found in the C-172 system.

For background, I use a 35A Hitachi alternator with a built-in regulator with a Zefronics 16V over-voltage relay in the alternator field circuit. The electrical equipment includes a Facet boost pump, Whelen strobe/nav lights, Val 760 VHF, Flybuddy Classic CPS, KT-76A, and ACK encoder. As to the load, with EVERYTHING turned on and the radio in transmit, the load is 28.5A. The normal flight ops load is about 11A.

The schematic is pretty much self-explanatory but a few comments are in order. I used switch/circuit breakers on the main bus except

for the starter switch and Westach Quad. This was due to space constraints on my panel. Most schematics show the feed to the bus from the battery coming off the hot side of the starter solenoid. This is because, in many installations, the battery and starter solenoids are adjacent to each other on the firewall. My battery box and solenoid are in the front cockpit. I ran the bus feed off the switched side of the battery solenoid to avoid an unnecessary long run of wire.

I haven't ops-checked the alternator circuit, as my engine isn't ready to run. The rest of the system passed the "blue smoke" test last week. It is reasonably simple and I hope it will give Starduster Too builders a place from which to start laying out their electrical system.

On an unrelated note, I found coming up with a bracket to support the throttle and mixture controls at the carburetor a real nuisance. Then I found a very clever engine control bracket offered by Van's Aircraft, p/n VA-1 49 that cost under \$12 and works perfectly. Time for work. Hope things are going well in Oroville!
Sincerely,

Bob Dwyers
2941 N. Rio Verde Drive, Tucson, AZ 85715-3544. 520-722-3117 or dwyers@theriver.com

A Marriage Made in Heaven—Tom Jense Acquires Bob Barney's Starduster SA100

By Paul Richards, Provo, Utah

Tom Jense has become an unwilling contortionist over the years, trying to fold his lanky 6'3", 230-pound frame into small cockpits. He usually ends up looking like an NBA player riding a kid's tricycle. So he was understandably conflicted last summer when he fell in love with a beauty of a Starduster built by Robert Barney of Bountiful, Utah. He wanted that little red biplane so badly his teeth ached, but then there was the problem of fit. "Not to worry," Bob said. The semi-retired craftsman, who began the plans-built project in 1983, had incorporated modifications to the experimental plane to accommodate his own 6'4", 230-pound bod.

"Bob has that artistic ability to look at something and say, 'This is what is needed, based on pilot size,'" Tom says. Bob widened the cockpit section and lengthened the fuselage 11 inches. To keep things in proportion, he extended the wings, adding eight square feet of surface area.

It was a marriage made in heaven, Tom thought, not realizing he was getting more than he bargained for. He has logged more than 55 hours in the craft since his initial self-checkout last August, coming to appreciate his little bird as one of the most "inherently stable, straight-and-level, smooth handling airplanes" he has ever flown. And he has been flying 43 years. "You just think turn, and away you go," he says.

"This airplane has absolutely no bad characteristics at all. It doesn't wander when you're looking at the scenery, it skates right down the runway where it is supposed to, and once trimmed, you can let go of the stick and it stays put." Tom, who owns and operates Central Utah Aircraft Maintenance in Provo, Utah, says the plane often gets accused of being a Pitts because Bob rounded off the empennage tips, deviating from the quasi-P-51 profile called for in the original Lou Stolp-USA 100 design. Another Pitts look-alike is the accent striping that Tom and friend Dennis Argyle, a professional painter, put on the shiny red Imron finish. They spent days mulling over various color combinations, knowing that once applied, the paint and tape could not be removed from the fabric

skin. Then one day Dennis spotted a Dr. Pepper can and realized its colors—black, white and maroon—were just the ticket. He called Tom and the deed was done. The plane sits lower to the ground than called for in the specs because Bob spread the landing gear 1 foot for a 6-foot wheel stance. This makes the plane more stable for take-offs and landings but also decreases prop clearance. Tom is planning to have the 74-inch Sense-nich prop shortened to provide more ground clearance.

"Workmanship on every aspect of the plane is outstanding," Tom says. "The fabric job is flawless. You can't buy a new, commercially-built airplane with better workmanship."

Bob installed a factory-new Textron Lycoming O-320-D2A, 160-horsepower engine (up from the 125 horses called for in the plans) and brand new radios and instruments.

Standard empty weight for Tom's N97TJ (1997 Tom Jense) is 937 pounds; useful load is 363 for a total of 1,300 pounds. Tom carries 21 gallons of fuel in the fuselage and 5 in the top wing. "At a cruise burn rate of 7 gallons per hour, endurance is about three and a half hours," Tom says.

"The plane trues out at 155 miles per hour ground speed or about 140 indicated at 2550 rpm," Tom explains. "It takes off in 200 feet and can climb at 1,450 feet per minute at 95 indicated."

His Starduster is rated for certain aerobatics but is not equipped for inverted flight, he notes. When Tom first got the plane, indicated airspeed never exceeded 124 mph even though he knew it should be higher. He moved the static port from behind the pitot tube head to the fuselage, and that fixed the problem. In a plane like this, your first flight is a solo flight," Tom says with a grin. "In that first landing I pulled 1.5 G's, so I went around and came in faster and higher the second time for a no G, tail-wheel-first landing. I didn't go for a third because I wanted to think for a while about what I had done right." Ever since then when he flies his bird, he can't help but think good thoughts. "It's smooth and real soft but with a reactive feel," he explains. "I love it." (See photos, page 21)



**SA100 N22PF
Pat Fitzpatrick,
Vacaville, CA**

N22PF Cockpit



**SA300 N312LT
Lyle Taylor
Wapato, WA**

**SA300 N7165R
Dan McAlonan
Medina, OH**



**Bud Fritchley and
Granddaughter with
Bud's and Gene's
SA300, N84MM**

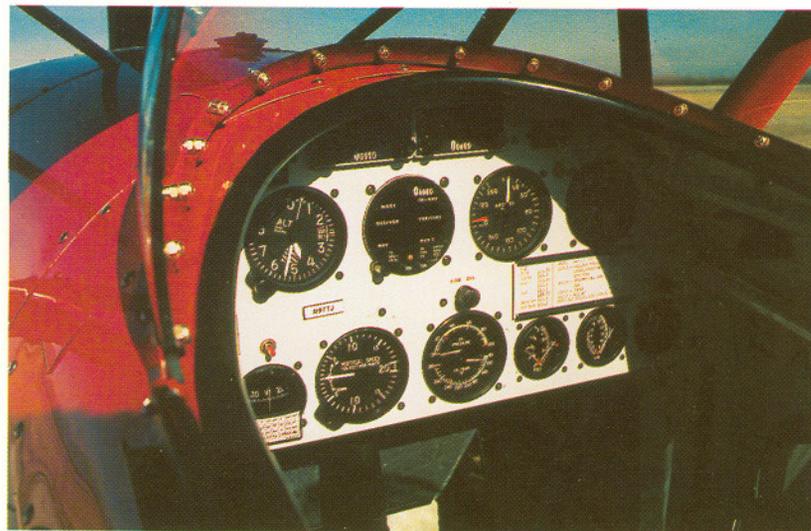
**John Huie's SA300
"Show and Tell"
EAA Chapter 186**





**A Belated
Merry Christmas
from Bob Rogers,
Mendon, IL**

**SA100 N97TJ
Tom Jense, Provo, UT**



**Cockpit View of
Tom Jense's SA100**

**Bob Ledera's
Starduster Too Project**



**SA750 N12DD
Dave Spencer
Martinsville, VA**

**SA300
Jim Snodgrass
Racine, OH**



From Our Readers

Hello Clay,

Just wanted to touch base with you and my good friend Glen and tell you what a fine magazine you published. What a change! It ranks right up there with Sport Aviation, Kit Planes and all the others. Keep up the good work.

Kenny Ware N311JK, Fountain Valley, CA

Starduster Magazine,

Please renew my subscription for 1998. I have always enjoyed the magazine, particularly the subject matter, but now the vivid color of the photos is a 100% improvement. Please keep up the good job!

James Pollard, Luscombe owner, Santa Cruz, CA

Hi, Dave,

WOW! What a great face-lift the "new look" *Starduster Magazine* has. (Vol. 28, No. 1, '98) It certainly is befitting the infusion of renewed energy in the Starduster Corp. A class act publication for class act airplanes.

Lee Amacker, Walla Walla, WA

Clay and Glen,

Great job on the magazine. Really like the color photos, can't wait for the next issue. Even my wife looked through the magazine before I got home from work.

Bill Gauger, Mesa, AZ

Hello Clay and congrats to a beautiful new magazine! I have shown it to all my EAA, IAC and flying buddies. NICE JOB & my hats off to you and Glen!!!

Fred R. Myers III, Conyers, GA

Clay,

The 28th Vol. No. 1, Jan '98 issue is better even than its looks (which are considerable). Impressive contents: readable, comfortable layout, easy to physically peruse or study, excellent photographs. (I like the capital letters on each word accompanying the photos.) This issue is technical and human, mechanical and social; the results—it's fun and satisfying.

Mike Guarino, Salt Lake City, UT

Great New Magazine! Will be in touch soon as I have to re-build my Starduster N14524—rollover accident, May '97.

A.G. Coleman, Miami Springs, FL

Clay,

17 Feb. 1998

The new magazine is outstanding, and you and Glen are to be congratulated. Apologies accepted Glen, but I know it was really Les' fault. See you in Oroville.

Oscar Bayer, Arroyo Grande, CA

WOW.... That pretty much sums up my response to the changes you made to your quarterly magazine. What a pleasant rebirth. Congratulations on a job well done.

Gary Thomas, Hurlburt Field, FL

Clay and Glen,

WOW! What a magazine you produced! WONDERFUL! The Starduster and other biplanes are fit subjects for those dazzling color photos!! Articles all of intense interest and subjects, too. We always did read the magazine front to back. We have to say that the slicks and color are gorgeous additions..

Mary Jane Reed, Evansville, IN

Tech Tips

TUBE CUTTING TIPS

By Casimer Porowski, Milford, OH

A double canted engine mount is a nightmare to fit up and cut since no two tubes are alike. Since tubing weld gaps should be held to .060 maximum, it's hard to get a good fit.

I have a method to save some tubing and some frustration.

Procure some wood dowels the same O. D. size as the tubing used on the structure you are building. Get some hard thin paper to make the end wrap around the tube cutout patterns. First mark a reference line on the wood dowel and tubing lengthwise. To start, paste a paper wrap around one end of a dowel as shown on the illustration and position the dowel in place. Cut the paper tube to match the joint. Mark the reference line on the paper. Wrap around the tube to match the dowel reference line.

Start on the other end with a paper tube wrap around. Line up the dowel end already fitted and slide the wrap around on the other end for the other joint and cut to fit. After fitting the paper tube mark the reference line on the wrap around tube; also mark the length reference line on the dowel.

Transfer this to the steel tube and mark the tube ends from the template tube wrap around. The reference line marks are important to get length and angular reference. Note that after the templates are cut and put in place they cannot be taken out due to the wrap around of the templates on the

tubes. It's important to remember that the tube has to have one member movable or assembled at one time into their position.

BOOK REVIEW

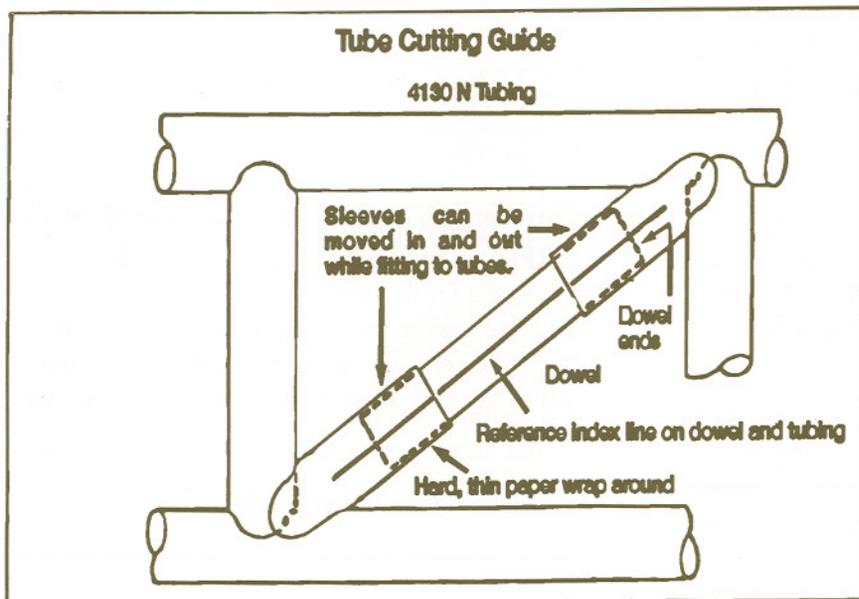
Aircraft Welding Manual, revised in 1992, stock #21-3786 for \$11.95. This manual covers fundamentals of welding, preparation, flame adjustment, torch tip sizes, rod sizes, welding techniques, welding ferrous and non-ferrous metal, geometry of steel tube fuselages, fitting tubing design defects and many other subjects. Again, one of EAA's most complete and up-to-date manuals.

STEEL TUBING PROTECTION

In several STC's the required process is that the steel tubing be epoxy coated with the specific coating recommended by the manufacturer before fabric is attached. In some cases we are seeing the wrong primer used on steel tube and the cements used to cement fabric to steel tubing lifting the primer and causing rusting. When you are using a specific manufacturer's fabric covering process we suggest you also use the primer that they recommend for their process alone.

WOOD-ALUMINUM/STEEL INTERFACE

When steel or aluminum are contacting wood we suggest that you epoxy these components before attaching them to the wood. This will assist in reducing the transfer of moisture from the wood to the metal and reduce corrosion and rust. Aluminum bushings used in spar bolts should always have the interior of the wood thoroughly painted. When you are running regular bolts through wood it is suggested that you use either pipe cleaners or cotton swabs to be sure that the wood is varnished or epoxied inside before inserting the bolt. Routing the wood to an exact dimension and then putting a bolt into uncoated wood may lead to corrosion. It is better to plan for the thickness of the coating inside the wood to retard the transfer of moisture.



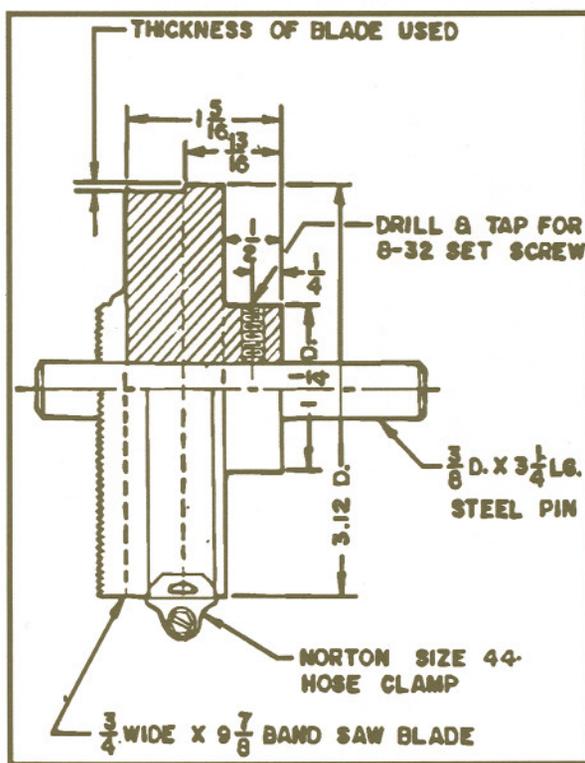
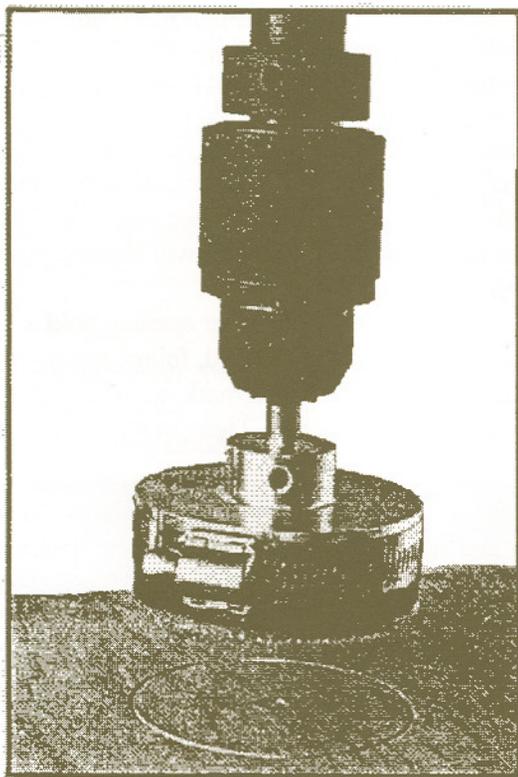
HOLE SAW FOR INSTRUMENT MOUNTING

Tom Henegry and Ken Clunis, EAA Chapter 723, Caramillo, CA

Locating a saw for drilling the 3.12" diameter holes necessary for mounting aircraft instruments can be time consuming, expensive and sometimes nearly impossible. EAA Chapter 723 member Ken Clunis devised this smooth turning hole saw to cut the instrument holes in his LongEZ. The photo and drawing by Tom Henegry tell the story of how to make this neat tool. The dimensions can, of course, be changed for other sized holes. The blade is a segment of band saw blade appropriate for the

material to be cut. The set of the saw teeth provides the correct clearance.

This hole saw can be used in a hand drill but it is much more accurate if a drill press is used. A pilot or centering hole for the steel guide pin should first be drilled in the material. The hole saw is then used to cut part way through the material and completed by cutting from the opposite side. This procedure assures a smooth, accurate hole for your instrument mount.

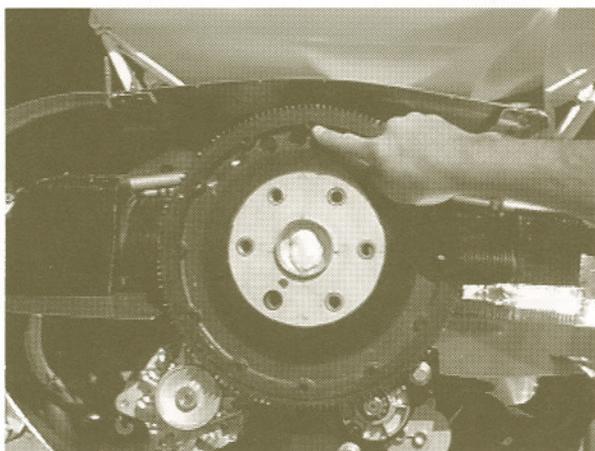


Nose Cowl Installation

Fred R. Myers III

To begin your cowl installation, I would recommend using the 37" wide nose cowl. If you use this wider nose cowl, you should not have an excessive opening at the aft end of your cowl doors. This opening, or bowing is normally needed to obtain clearance between cylinder heads and the cowl doors. I prefer using the three hole nose cowl as it is much stronger, more stream lined and offers a sportier look. This nose cowl is available from the Stolp Starduster Corp.

Start by placing the starter ring gear at 0 degree top dead center as aligned with the engine top case split centerline. Some starter rings may have a hole which you can view the case split line from the front. This will square up the prop attach bushings.



Starter Ring Alignment

Next cut two support channels long enough to hold the nose cowl. Note that the support channels must be wide enough to accept the 1/2" prop bolts.

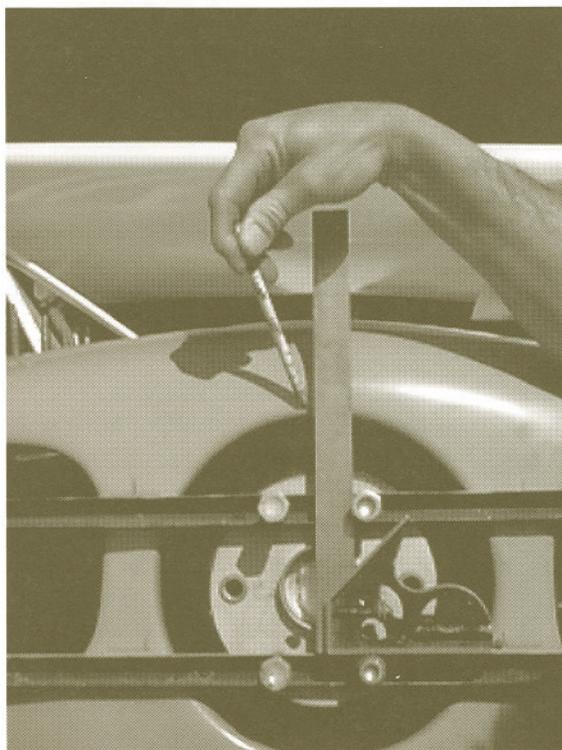


Nose Cowl Support Channels

On the starter ring gear, mark a line half the distance between the upper prop attach bushings. Do the same for the lower two prop attach bushings. Draw a line vertically to find the center line of the starter ring. This is the line which you'll use to square and center your nose cowl. Place the support channels on the upper two prop bushings and mark where you will drill for the prop bolts. Do the same for the lower support channel. Drill a pilot hole in the center of the support channels and step up the holes to 1/2". I like using a uni-bit as it cuts a clean, neat hole then de-burrs it.

The center line of the nose cowl must be established. To do this, lay the nose cowl flat on a large piece of paper. Trace around the nose cowl using a heavy felt pen. Fold the paper in half matching the lines you just drew. Lay the folded paper down and set the nose cowl back down on the folded paper, lining up one side of the cowl to the traced lines. The fold will become your nose cowl center line.

At the nose cowl center opening hold a square vertically at the fold, follow square up to the cowling and make a mark on the upper and lower center openings. These marks will be



matched to the starter ring center line.

It is important to determine the spacing between your spinner backing plate to the nose cowl— $3/8"$ - $1/2"$ will work and look fine. Slip the nose cowl over the starter ring. Using $1/2"$ bolts, bolt on the support channels using pipe or washers as spacers if your bolts are too long. Tighten the bolts to ensure the starter ring gear is flat against the crankshaft flange. If not your nose cowl will be offset. Square off the lower support channel and check the center line on the starter ring. Match these lines to the nose cowl center opening. Measure the distance

between the crankshaft and the nose cowl center hole at the 3, 6, 9 and 12 o'clock positions. With these dimensions equal, your nose cowl is centered. Clamp it into position.

Recheck the starter ring gear alignment to the engine case, especially at the beginning of a work period. If you accidentally bump a support channel or the nose cowl, stop and check the starter ring alignment. Now you are ready to fabricate and install your four cowling support channels, which will function as a cantilever frame for your engine cowling.

Beware of 100LL Impostor

Taken from *AOPA Pilot*, February 1998

At a recent American Society for Testing and Materials (ASTM) meeting in San Antonio, Texas, AOPA was alerted to the potential misfueling of aircraft with a blue 100-octane auto racing fuel.

According to Doug Macnair, AOPA's director of aviation standards, Unocal is producing a racing fuel labeled "10 octane." Like aviation's 100LL, this fuel has a low vapor pressure of 6.8 psi, is dyed blue, and would likely pass all of the common field tests performed by FBOs. However, the fuel's octane was tested using automotive-industry test methods which place it at an octane rating significantly

lower than 100. If subjected to the same test methods, 100LL would achieve at least 112 octane.

The potential danger exists if this fuel is confused with 100LL in shipment or storage and burned in an airplane with a high-horsepower engine. Damage may occur because of severe detonation. This fuel contains some percentage of MTBE (methyl tertiary-butyl ether) and may have an odor distinguishing it from 100LL. AOPA is working with ASTM to resolve the situation.

Crankshaft Replacements in Continental Engines

Taken from *AOPA Pilot*, February 1998

After more than five years, the FAA has finally published the final-rule airworthiness directive requiring replacement of crankshafts in Continental engines made via the airmelt process with those made using the vacuum arc remelt (VAR) process. The following engines are subject to the AD: IO-360, TSIO-360, LTSIO-360, IO-520, LIO-520, TSIO-520, LTSIO-520, and Rolls-Royce PLC IO-360 and TSIO-360. Replacement is required at the next overhaul or other removal of the crankshaft. In addition, an ultrasonic inspection of the crankshaft

will have to be conducted at each subsequent removal of the crankshaft. The FAA estimates the cost of crankshaft replacement at \$2,799 per engine, and each subsequent ultrasonic inspection is estimated to cost \$200. There are approximately 10,100 engines with airmelt crankshafts still installed. This is down dramatically from five years ago because of replacement by owners at overhaul per the mandatory service bulletin issued in the interim.

SAFETY

Shortcut to Disaster

Bruce Landsberg, Executive Director, AOPA Air Safety Foundation

Extracted from AOPA Pilot, February, 1998

The maintenance safety record of old airplanes is generally good. The technicians who keep old aircraft aloft generally do an outstanding job, and the statistics prove it. Over the past 15 years, the National Transportation Safety Board has identified maintenance as a probable cause in only about 19 percent of all accidents. However, there are occasional maintenance-related accidents, and they serve as a painful reminder as to why shortcuts cannot be tolerated in aircraft maintenance.

This is a delicate subject because pilots and owners understandably want to control costs and the use of substitute parts and practices is sometimes rationalized. After all, a hose clamp is a hose clamp, right? That, of course, depends on where the clamp is used. Fuel and exhaust systems must be handled with extreme care.

In-flight fires, fortunately, are relatively rare. In the last 15 years there have been 346 in-flight fires in all kinds of aircraft, which works out to an average of 23 per year. The result was 68 fatal accidents, so it's not something to be taken lightly.

Last year a Piper Cherokee was returning from a spring fly-in with a flight instructor, two student pilots, and another passenger on board. Witnesses near the accident site heard the engine tone change pitch. The aircraft was observed at very low altitude "banking from side to side, with white smoke trailing from it." The white smoke turned to black, and one witness saw "orange flame coming from the left side of the engine compartment." The aircraft rolled to the left and struck the ground in a near-vertical dive. There were no survivors.

The airplane was found inverted in an open field with the nose approximately 70 degrees below the horizon. The engine appeared to have been running at the time of impact and was buried in the ground up to the accessory case, which is located on the rear of the engine. A post-impact fire destroyed the airplane.

Investigators noted that the lower left portion of the engine cowling, where it attaches to the fire

wall, was located 10 feet from the engine and on the edge of the post-crash burn area. An 8- by 18-inch hole was burned through the cowling and adjacent to the hole was an area that showed no soot deposits. This is indicative of an extremely hot flame—greater than 700 degrees Fahrenheit. Bordering the hole in the cowling was another burn hole in the engine fire wall that measured 2 by 4 inches.

The lower left rubber engine mount was consumed by fire, while the other three mounts sustained minimal damage. Likewise, the left magneto had significantly more fire damage than the right. The handheld fire extinguisher in the cabin was severely burned and damaged. However, the plastic safety tie and seal were found broken and unburned—an indication that the extinguisher may have been used.

The fuel selector and mixture control positions could not be determined because of fire damage, so it is unknown whether the pilot attempted to shut off the fuel.

Of particular interest to the investigators were the exhaust clamps used to attach the muffler to the exhaust stacks. According to the Piper parts list, a special clamp with a pin on the inside (see next page) is used to hold the muffler in place. The pin penetrates a hole in the muffler and in the exhaust stack to prevent the pipes from separating. The accident aircraft had the appropriate alignment holes in the pipes and the muffler, but automotive-type clamps without pins had been installed.

A 1972 FAA advisory circular states, "The exhaust system often operates at red-hot temperatures of 1,000 degrees or more; therefore, parts such as ignition leads, hoses, fuel lines, and flexible air ducts should be protected from radiation and convection heating by heat shields or adequate clearance." Fuel lines, which run in areas around the muffler and exhaust system, should have protective fire sleeves. According to the manufacturer, "The purpose of the fire sleeve is not to increase

the temperature of a hose line but to protect the hose from direct fire long enough to allow appropriate action to be taken." The upper temperature limit of the fuel line increases from 300 degrees to 500 degrees with the use of the sleeve.

A fuel supply line that had a fire sleeve attached showed little discoloration or deformation, but a line leading to the cockpit pressure gauge had no sleeve. According to the NTSB it showed "considerable deformation and exhibited a melting pattern consistent with high-velocity air flow." The implication is that the line was subjected to very high heat that occurred in flight when air-flow, and presumably exhaust pressures, were high. Post-crash fire damage and melting would not normally show high-velocity airflow. This also implies that a properly attached fire sleeve might have delayed or prevented the fuel line failure.

The NTSB cited the probable cause as the improper installation of incorrect exhaust clamps by unknown persons, which led to an exhaust system disconnect and a subsequent in-flight engine compartment fire.

The Cherokee was built in 1975 and had flown approximately 7,050 hours. The aircraft tachometer showed only 10 hours of flight time since a routine annual inspection that had been conducted three days before the accident. The maintenance history was normal for a flight school airplane with the required 100-hour and annual inspections.

A year prior to the accident, during the previous annual inspection, the front muffler had been replaced along with other exhaust-system parts. It is possible that the wrong clamps were installed at that time. The exhaust system had to be disassembled and reassembled to complete that work. Several months later a top overhaul was performed that could have required the disassembly of the muffler system, so the clamps could also have been replaced then. After the 1995 annual, several 100-hour inspections were conducted by different mechanics, but no irregularities were noted in the log

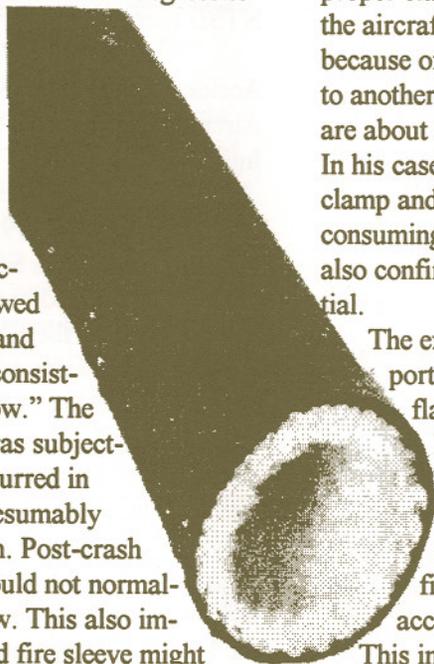
regarding the exhaust system.

It appears that one of the technicians, either out of ignorance or deliberately, substituted improper clamps, left off the fire sleeve, and returned the aircraft to service. This could have occurred because of parts unavailability or cost. According to another Cherokee owner, the approved clamps are about \$30 apiece and can be very hard to find. In his case, he had to have the pin welded onto a clamp and approved. It was expensive and time-consuming. His inspection-authorized mechanic also confirmed that the proper clamps were essential.

The exhaust system is one of the most critical portions of the aircraft. Mufflers, pipes, flanges, gaskets, clamps, fire sleeves and heat shields are designed to keep the system intact and the 1,000-degree Fahrenheit gases inside. The inspection-authorized mechanic who performed the final annual inspection just before the accident used a checklist to guide his work. This indexes 150 items to be approved, and each must be initialed as airworthy. He signed off

on two critical elements in the engine group: "inspect exhaust stacks, gaskets, etc.," and "inspect mufflers and shrouds." This implies that the offending clamps and the missing fire sleeve were overlooked. FAA records showed that the IA technician was highly experienced and had no prior in fractions.

According to one of the accident investigators, the approved clamps and the SAE "warm-type" clamps actually used do not look similar, and it seems likely that they should have been spotted. The automotive-type clamp is used in some warm-air aircraft applications, such as heater and fresh-air ducting, but never high-temperature applications like the exhaust system. It is also troubling that the clamps and missing fire sleeve were not identified during the several in-



pections prior to the last annual, assuming that the improper work was done the previous year. Missing flight-critical items once is bad enough, but to continually overlook such a potentially dangerous area implies an extensive breakdown in the maintenance management of this aircraft.

According to the FAA rules, the last mechanic to work on an aircraft is the one who takes the responsibility—even if he or she did not install the offending part. This explains why many technicians are particularly fussy about checking things—their certificates are literally on the line. A typical sanction is a 90-day suspension for the first offense.

There is a natural desire to save money. To some, a hose clamp is a hose clamp. As we've seen, it ain't necessarily so. To maintain an increasingly elderly fleet, everyone from pilot to technician should clearly understand that there are no safe maintenance shortcuts in critical systems. Compare the great risk to the relatively small savings.

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Tall Grass Too Much For Starduster SA100

NTSB Identification: FTW98LA087

Accident occurred JAN-04-98 at ROLAND, AR
Aircraft: Starduster SA-100, registration: N87SD
Injuries: 2 Uninjured.

On January 4, 1998, approximately 1530 central standard time, a Starduster SA-100 home built tail wheel equipped bi-plane, N87SD, registered to and operated by the pilot, flipped over during landing roll on a private grass airstrip (Pecan Grove) near Roland, Arkansas. The aircraft was substantially damaged and both occupants, the private pilot and one passenger, not injured. No flight plan was filed and visual meteorological conditions prevailed for the Title 14 CFR Part 91 personal flight, which originated from North Little Rock, Arkansas, at 1510. In a telephone interview with the NTSB investigator, the pilot reported that, after an uneventful 20 minute flight from North Little Rock, he decided to do a few touch and go landings at Pecan Grove Airstrip. The pilot stated that, after a normal landing, the aircraft slowed down prematurely. During the end of the landing roll, the two main landing gear tires became bogged down in soft grass, and the aircraft flipped inverted. The resultant structural damage was a buckled vertical stabilizer, and a cracked spar on the right upper wing. The pilot stated that he had landed on the runway numerous times before and that he thought that the "grass looked ok" during his approach. According to local witnesses, it had rained on the day prior to the accident, but not on the day of the accident. No mechanical anomalies were discovered with the landing gear and braking system of the aircraft. Additionally, the pilot reported that the aircraft had just had an annual inspection performed and that no preexisting anomalies were known to him.

Owner: Gary Chamberlin, North Little Rock, AZ.

Editor's Note:

An SA100 with two people on board?

Odds And Ends

Flying The 'Pressure Hills'

A practical explanation of how air density affects an aircraft in flight.

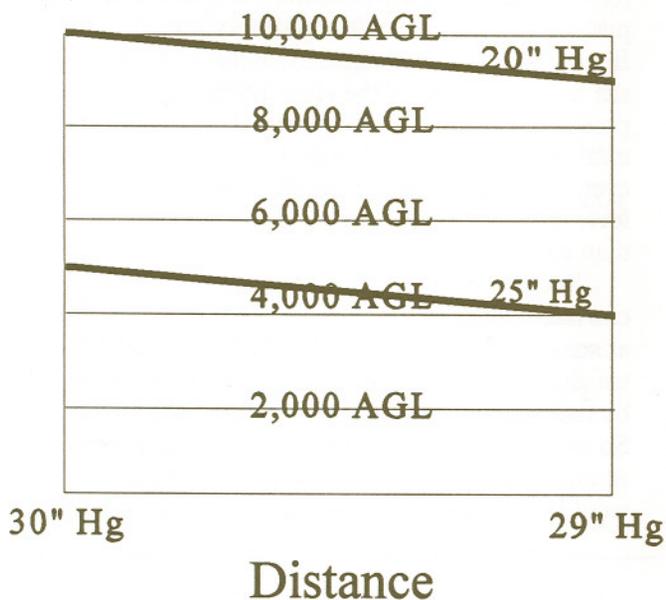
By H. Clay Gorton

Reprinted From *Aviation Safety*, August 15, 1994

Density altitude is something we all contend with. Before a flight, altimeter settings are adjusted to the airport elevation and station pressure and temperature are taken into account when calculating the length of the takeoff roll.

However, atmospheric pressure and temperature are dynamic meteorological conditions that are constantly changing, and they affect flight performance as well as takeoff and landing conditions. Aircraft operations would be safer and simpler if only airplanes were equipped with altimeters, which they are *not*. What we call an altimeter is, in reality, an aneroid barometer which measures atmospheric pressure. When we fly a constant indicated altitude, we are actually flying a constant barometric pressure.

If we could visualize the constant isobaric surface indicated by our onboard "altimeter," we would see a surface of hills and valleys in fluid motion. If we fly at constant indicated altitude into an area of lower pressure, we fly 'downhill' into the



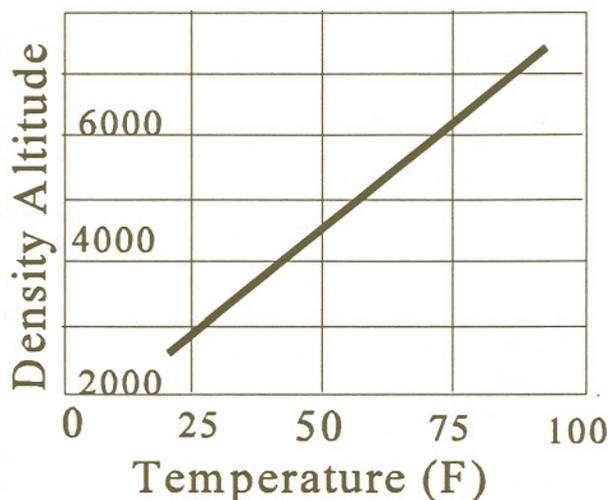
Sliding down a pressure hill: Flying with constant altimeter settings at 10,000 and 5,000 feet from an area of 30 inches atmospheric pressure to one of 29 inches, the two airplanes would be 1,000 feet lower than their indicated altitudes.

pressure valley. If we fly into an area of higher pressure, we climb the pressure hill.

Pressure variations affect us as we fly cross-country from one pressure level to another or in an extended local flight where the pressure wave may pass over the airport. In local flights of any extended duration, it is always well to get a current altimeter setting before beginning the landing sequence. In cross-country flights, we may not be able to get an en route altimeter setting. Therefore, it would be prudent in a preflight weather briefing to get the en route barometric pressure, especially when flying over mountainous terrain.

But what is the extent of actual normal pressure variations on true altitude? It is not uncommon for the pressure drop into a low pressure area to be as much as 0.5 inches Hg over a distance from as little as 200 miles in a severe front, to as much as 500 miles in an extended cyclonic system.

Since the atmospheric pressure above a point decreases by about 0.1 inch per 100 feet of altitude, the pressure effect can, indeed, be appreci-



Taking off from the Salt Lake airport (elevation 4,227 feet) on a 90-degree day would be akin to taking off from an airfield at an elevation of 7,200 feet under standard conditions.

able. The graph at left shows the altitude effect of flying at a constant altimeter setting from a high pressure area of 30.0 inches to a low pressure area of 29.0 inches. Air temperature also affects the density of the air and, consequently, the density altitude. At station altitude, although the air pressure may be constant, as the temperature rises, the air becomes less dense, resulting in a higher density altitude. The density altitude increases by about 60 feet per Fahrenheit degree increase in temperature. The density altitude vs. temperature at standard pressure for Salt Lake City International is shown on the second chart.

Flying from warm air into cold air has the

same effect as flying from a high to a low atmospheric pressure. As air cools, it condenses; thus the same atmospheric pressure level in the colder air would be closer to the ground.

Since the onboard altimeter follows constant pressure levels, as we fly from warm to cold air, we fly into a 'temperature valley' in the atmosphere. As mentioned, the magnitude of this effect is about 60 feet per degree Fahrenheit. Thus, a temperature drop of only 10 F translates into a decrease in true altitude of 600 feet.

When flying from a warmer high-pressure area into a cooler low-pressure area—double jeopardy! *High to low, look out below.* ♦

How Much Does Air Weigh?

H. Clay Gorton

There are things about the theory of flight that the old hands would consider grade school stuff. But to us novices the wonderment of what keeps an airplane in the air is still 'wondermentful.' We hear a lot about the Vernouli principle, lift and weight, thrust and drag, but those concepts don't really give a feeling for what's going on.

An airplane stays up because it's being pushed up by the air striking it from below and by the partial lack of air sucking on it from above. The faster a plane goes, the greater is the thinning effect of the air going over the upper cambered surface of the wing. Thus, less air is needed to push on it from below and the plane flies at a more shallow angle of attack. As the plane slows down the sucking aspect of the air above the wing decreases and more air is needed to push up from below, and so the angle of attack must be increased. As the plane slows even further the force of the air blowing against the wing isn't strong enough to overcome the plane's weight, and it falls from the air. Since the weight of air decreases with altitude, the higher the plane flies the faster it must go to keep enough air blowing against the wings to keep it from falling.

Even with these concepts in mind it was surprising to me to learn how much air actually weighs. Of course, since the volume of a gas increases as the pressure against it decreases, the higher one goes the less a given volume of air weighs. How much do you think a cubic yard of air at sea level weighs? It weighs about the same as a quart of water! If we could take that cubic yard of air and shape it into a one-inch-square column (and hold the pressure constant), it would make a pile 3,888 feet high, and would weigh two pounds. If we took a one-inch-square column of air from sea level to the top of the atmosphere and let the pressure decrease naturally with altitude, that column of air would weigh only 15.5 pounds. However, a one square foot column of air from sea level to the top of the atmosphere weighs more than a ton!

Because of the expansion of air with altitude, one half of the weight of any column of air starting at sea level would be below 18,000 feet, and the weight of the column would continue to decrease by half for every 18,000 foot increase in altitude. So at 54,000 feet a cubic yard of air would weigh as much as a cup of water, and at 90,000 feet it would weigh only as much as a tablespoonful.

THE SENSE OF A GOOSE

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In the fall when you see geese heading south for the winter flying along with a “V” formation, you might be interested in knowing what science has discovered about why they fly that way. It has been learned that as each bird flaps its wings, it creates an uplift for the bird immediately following. By flying in a “V” formation, the whole flock adds at least 71% greater flying range than if each bird flew on its own.

(People who share a common direction and sense of community can get where they are going quicker and easier, because they are traveling on the thrust of one another.)

Whenever a goose falls out of formation, it suddenly feels the drag and resistance of trying to go it alone, and quickly gets back into formation to take advantage of the lifting power of the bird immediately in front.

(If we have as much sense as a goose, we will stay in formation with those who are headed the same way we are going.)

When the lead goose gets tired, he rotates back in the wing and another goose flies point.

(It pays to take turns doing hard jobs—with people or with geese flying south.)

The geese honk from behind to encourage those up front to keep up their speed.

(What messages do we give when we honk from behind?)

Finally, when a goose gets sick, or is wounded by gun shot and falls out, two geese fall out of formation and follow him down to help and protect him. They stay with him until he is either able to fly or until he is dead, and then they launch out on their own or with another formation to catch up with their group.

(If we have the sense of a goose we will stand by each other like that.)

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1983 Starduster AS300, 220TTA, 220 SMOH on 180 hp Llyc. 0-360-A1A with fixedpitch prop. Looks like Pitts S2A. Recent KY197A Com, Magellan GPS. Hangared aircraft. Offers. Call Joel, 941.643-2500. 982

1981 Starduster Too. 420 TTAF. Fresh annual, 200 hp Lyc. injected engine, fresh OH, new constant speed Hartzell prop, inverted fuel/oil, full canopy, intercom w/stick switch, KY197, Nav-12, portable GPS, ELT, IFR, full panels front/rear, new lights & beacon, prize winning paint, aux. tank, 3 new tires, \$42,250. Call Gordon 440.238-3053. 982

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Acroduster Too fuselage tacked together. Make offer. Jonny Nimmons, 6426 Rayo Del Sol, Houston, TX 77083. 281.934-4707. 981

Starduster SA100, needs lower left wing, landing gear straightened. Engine available. Fun, economical flyer. Call Gary Melton, home 310.694-3098, work 714.759-2930. 981

Starduster Too. Airframe 2/3 completed. Materials to complete airframe. Fuselage on gear, Wing ribs on spars. Fuel tanks, fiberglass turtledeck, cockpit fairing, wheel covers, nose bowl, much more. A&P-A&I, FL 850.927-2432. 981

Starduster SA100, good electronics, 180 hp, new paint. Call John Thomas, 209.532-2006. 981

1978 Starduster SA100, 130 TTSN, 6:00x6 Cleveland wheels and brakes, Scott master heel brakes, standard day VFR plus G-meter, wheel pants, Maule full swivel tailwheel, cotton fabric, always hangared. Disassembled, with plans. \$4,500. New, zero time, 0-290-3 for \$3,000 more. Call Jim, 916.646-4504. 981

1988 Starduster Too, 180 hp Lycoming 0-360-A4M, 335.5 hrs TTSN, NARCO Escort II, NAV/COM, fuel cap. 45 gal, cruise at 135, hangared, white w/ brown trim. \$27,500. Call 619.562-7467. 981

Starduster SA100, airframe TT 525, Lycoming 0-320, 100 SMOH, starter, generator, King KY 97A digital radio, Cleveland wheels and brakes, Scott tailwheel, wing lockers, G-meter, turtledeck cargo mod., enlarged cockpit, Acroduster II gear, 18 gal. fuel, polished spinner, metal prop, white with yellow starburst/blue trim, polished gear legs, wheel pants, \$17,000. Call James at 915.859-7272. 981

1976 Starduster Too, built by an ex-FAA inspector, re-covered 1994. White with red stars, 0-540 Lycoming with inverted oil and fuel, constant speed prop, Narco comm, xponder with Mode C, intercom, airframe 550 TT, engine 550 SMOH, approx. 2000 TT since new. Needs loving care by a new owner, \$32,000. Call Tevis 903.796-0383. 981

1989 Starduster Too, 160 hp Lycoming, smoke system, all extras. This aircraft has won numerous awards, including the Doctor Bede Perpetual Award at Merced. Capable of all sportsman category aerobatics. Call Baron 619.562-7467. 981

Starduster Too, Lycoming 0-360, Bendix-King 97A, Mode C, Stits, heater, spring gear, \$35,000 or \$33,000 less radios. 503.399-0809. 981

1964 Starduster Too, N1300S. Recently completely refurbished, painted, new prop. I'm not a pilot, so don't know of the many features it possesses, but if you want the first of its kind in existence, it is now available! Unknown engine time, but always hangared. Much TLC, labor put into preserving this in its original. California based. Call Jack 714.744-6901. 981

1993 Starduster Too. 225 TT airframe, 450 SMOH Lyc. IO-360. \$38,000. Call 510.370-0855. 981

Starduster Too, 0-360, C/S prop, 498 TTA&E, KY-97, PTT, headsets/helmets, spades, dual controls, fun basic aerobatics. \$25,000. Call 425.252-4985. 981

0-435-1 190 hp Lyc. and parts. \$3500, or offer. Landing gear, SA300, modified to latest design, \$500 or offer. Call Dave, lv. msg. 810.648-1949. 981

1983 Starduster AS300, 220 TTA 220 hrs. on 180 hp Lyc. 0-360 w/ fixed pitch prop, looks like Pitts S2A, recent KY97A Com, Magellan GPS, hangared, 26-gal. fuel. Make offer. Call Joel, 941.643-2500. 981

1973-1994 Starduster SA300, SN2718, TTAF+3 256 hrs. Rebuilt 1994, new spars, brakes, strobes, cables, long range 42-gal., com 760, encoder, new paint & stits, reduced to \$26,000. Call Bob Simpson 407.884-5893, or Denny Moore 305.367-3690. 981

1980 Stolp V-Star SA900, 0290DI, 125 hp, 3" G-meter, EGT, CHT, Vernier throttle, full electric, Maule tail wheel, 450 TT & SMOH, very nice, \$12,000 or trades. Call 812.523-8029 or 812.522-7824. 981

1985 Starduster Too, 762 TT, 0-360, \$29,500, Call 501.372-3131 or 835-6703. 981

Starduster SA100, 1993 Rebuild. 60 TTAF, 0-290D Lycoming, full electric, seatpack chute, \$17,000. Call Gene 931.635-2325. 981

Starduster Too Project. Back on market, fuselage, tail feathers done and on gear, wings built, many extras. \$5,000. 248.347-1791. 981

1979 Starduster Too. 910 TT, 400 SMOH on IO-540, 275 hp, full gyro panel, spare canopy, King digital radios, M1 Loran, Call Don Patch, Northeast A/C Sales, 207.774-6318, or 207.883-4976 evenings. 981

Starduster SA100, 650 TT, 150 hp, inverted fuel/oil, Sensinich 74DM-6-060 prop, 9 inside/ out, fresh annual 9/79, \$14,000. Call 602.938-5922 or 581-7481. 981

Calendar of Coming Events

May 1-3— 18th Annual Starduster Open House, Oroville, CA. All types of biplanes invited. Food, fun and fellowship. Houseboat cruise on Lake Oroville, sightseeing, fly-in breakfast— and lots of Stardusters!

April 19-15— Sun 'n Fun EAA Fly-in, Lakeland, FL. Look for the Stolp Starduster Corp. display booth.

June 4-6— National Biplane Fly-in, Bartlesville, First annual Starduster gathering at Bartlesville. Starduster forums and displays are planned. Let's make Stardusters a major presence!

July 8-12— Northwest EAA Fly-in, Arlington, WA.

July 29-August 4— EAA International Fly-in Convention, Oshkosh, WI. Again, look for the Stolp Starduster Corp. display booth at the Oshkosh Convention.

September 25-27— Golden West Fly-in, Castle-Merced AFB.

