

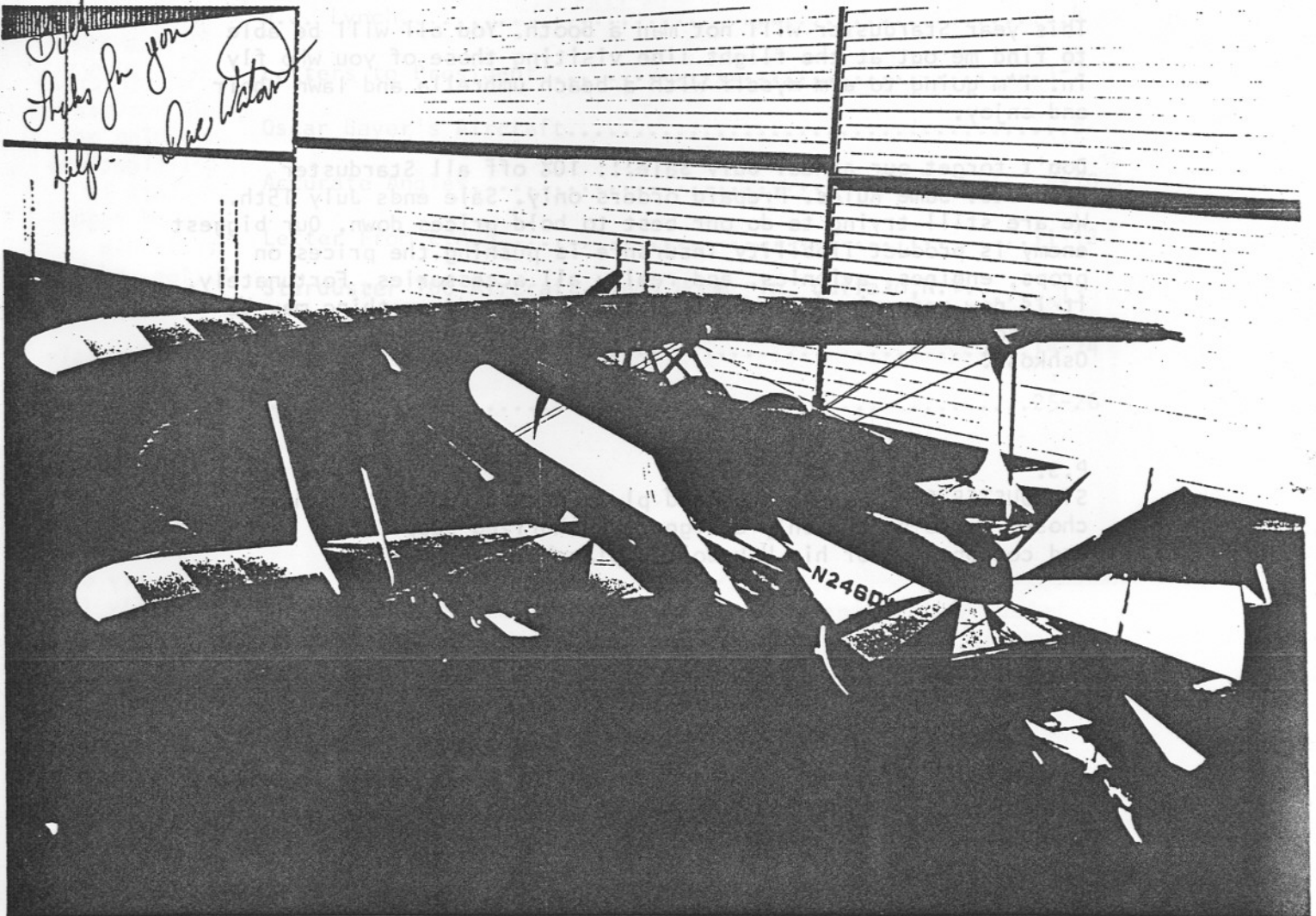
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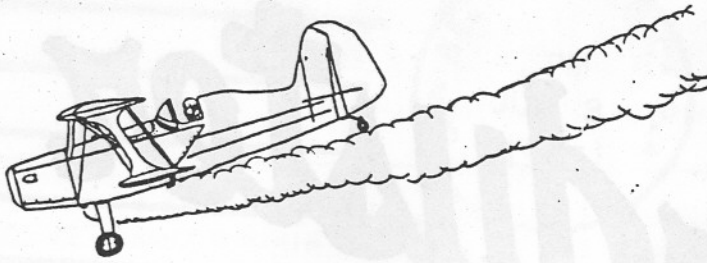
Starduster

APRIL 1986

MAGAZINE

DEDICATED TO THE ACTIVE HOMEBUILDER





Rambling From The President

Here it is mid-May and I'm writing for the April issue. Time really flies when your having fun, and fun we have had. Our May 3rd get together was great. 19 Stardusters flew in. Joe Hortung came all the way from Baton Rouge, La. and demonstrated his flying skills and the performance capabilities of his 260 HP Too. Weather was perfect. Food was delicious and plentiful, and the band played to few couples. The hot weather, good food, beer and wine, took its toll on many couples.

This year Starduster will not man a booth. You all will be able to find me out at the flight line visiting those of you who fly in. I'm going to arm myself with a beach umbrella and lawn chair and enjoy.

Don't forget our annual July Sale!!! 10% off all Starduster Products. Same Rules. Prepaid orders only. Sale ends July 15th. We are still trying to do our best to hold prices down. Our biggest enemy is product liability Insurance is pushing the prices on props, engines, avionics, and really all accessories. Fortunately, it is now recognized as a national problem and something may be done to give us some relief in the, not to far future. See you at Oshkosh!

B.C.

P.S.

STARDUSTER CORP. is honored and pleased that LaMar Steen has chosen us to be the only designer, Authorized supplier of parts and components for his "Skybolt Biplane".

STARDUSTER MAGAZINE

APRIL 1986

STARDUSTER MAGAZINE acts as an open source for homebuilders. The ideas expressed are often those of our readers, and Starduster assumes no liability or responsibility, either expressed or implied, as to suitability or accuracy thereof. Anyone using suggestions or ideas does so at his own risk. Materials contained herein may be reprinted without prior permission, but please credit the original source and Starduster-Magazine.

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April 9, 1986

Mr. Bill Clouse
Stolp Starduster Corp.
4301 Twining, Flabob Airport
Riverside, CA 92509

Dear Bill:

Starduster Magazine arrived and reminded me that my own Too is years behind schedule. At the moment, I'm hung up on wood leading edges and tips. I am probably as hard headed as Jim Fackler, but not half the craftsman. After seeing the prize-winning Too at Oshkosh last year, I think that I finally know what perfection is. I have seen many beautiful airplanes. That one is in a class by itself. Koodos to its builder.

I read every word in the magazine. It is, as usual, interesting and informative. The articles by Mr. Charles Webber are most interesting and provocative. In this, and the previous issue, he seeks my proxy for something or other based on a single-issue platform of continuous adversarial litigations with the FAA on issues involving our right to fly. Granted that there is no more important task than EAA's dealings with the FAA on matters of regulations and policy, that is only a small part of the EAA's activities in serving the needs of its members and all others involved in aviation, education and recreation activities.

Except for bad mouthing EAA and AOPA leadership, he has not voiced his position on any other of the myriad of activities in which the EAA is engaged. As the only industry representative to cast a vote (the EAA's vote) against the ARSA concept reporting requirement, co-originator of the proposal to abolish the Third Class Medical Certificate and supporter of EAA's concept of a Recreational Pilot Certificate, I share the disappointment of thousands of fellow EAA members.

The FAA had only a single vote in the ARSA matter. We were unanimously outvoted by the other elements of the aviation industry. We can still fly the same as before, but admittedly at more expense and inconvenience. The medical certificate issue is not dead, whatever the outcome of the AMA's possibly 'self-serving' study. It takes time to demolish a requirement instituted 60 years ago, when the mystique of flying demanded Superman for a pilot. Patience and persistence will prevail in time.

CALIFORNIA STATE UNIVERSITY - FRESNO

FRESNO, CALIFORNIA 93740



I don't know where the Recreational Pilot Proposal is and I don't care that much. Any grade of certificate is really only a license to learn. In spite of my 54 years in aviation, I still don't know many answers. Perhaps one reason is that answers won't stand still. I am confident, however, that the legal brawling and acrimonious confrontation will produce nothing more than a bruised ego and an empty purse. I suggest that Mr. Webber should borrow a book and read it.

I would be happy to give you my proxy for EAA Director.

Kindest regards,

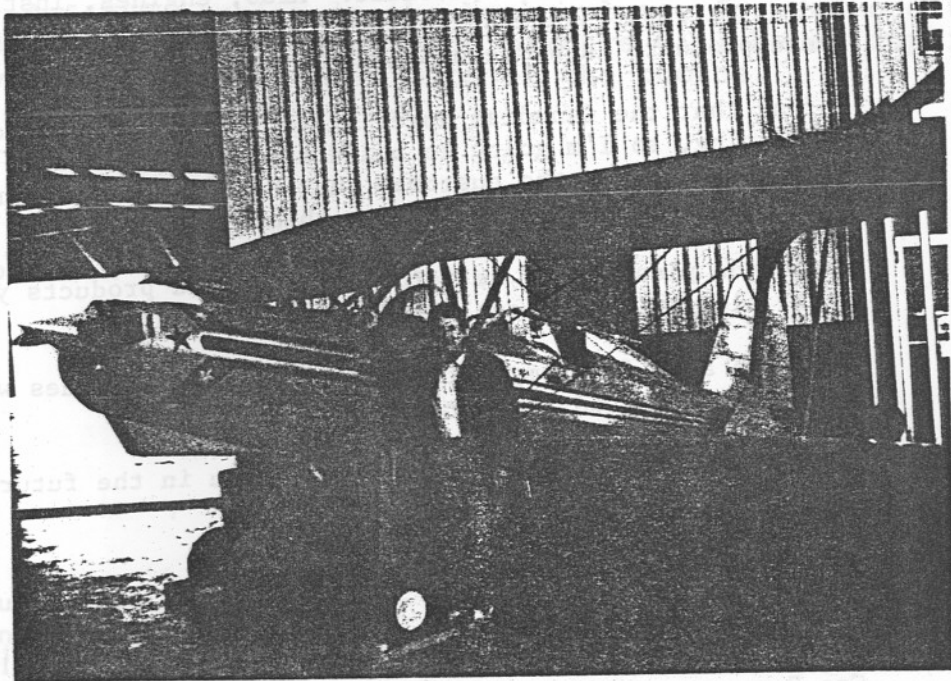
Dear Roger,

I enjoyed hearing from you, and concur with your feelings 100%.

Roger Boggs

Sincerely,
B.C.

W.J. LYNCH
10422 W.57
SHAWNEE, KANSAS
66203



LYNCH COMPLETED HIS AIRCRAFT IN 1986. HE SPENT APPROXIAMETLY 14 YEARS BUILDING THIS PLANE. HIS 1ST FLIGHT WAS FEBRUARY 18, 1986. FLEW HANDS OFF. IT'S A BEAUTY!

SaskCan Sport Flying Ltd.
Box 488,
White City, Sask.
SOG 5B0 CANADA

Mr. Bill Clouse
4301 Training, Flight
Knoxville, TN 37815

Dear Sir:

Dear Sir:

I am looking for Ultralight, light, Homebuilt and Sport aircraft in kit form & prebuilt. Also, engines, instruments and all aircraft accessories, for the purpose of marketing these products in Western Canada.

I find that the Canadian buyer likes to see the product he's purchasing, so I'm going to build some demos and also offer kits prebuilt for the customer that hasn't the time or probably the talent to build one themselves.

Would you please send me information on the products you offer along with wholesale and retail prices?

Being an avid flyer myself, I'm certain my colleagues would be most interested in your product.

I look forward to doing business with you in the future.

Sincerely,

Geo Garner
Manager, SaskCan Sport

Dear Geo,

We Are Expanding!

B.C.

CALIFORNIA STATE UNIVERSITY • FRESNO

FRESNO, CALIFORNIA 93740-0104

DEPARTMENT OF CRIMINOLOGY (209) 294-2305



Professor Cliff Roberson
Mail Stop 104
California State University
Fresno, Ca. 93740

May 12, 1986

~~Dear Sir:~~

I am completing a manuscript for a major publisher on an aviation related subject and need black and white, 8x10 glossy pictures to include in the book. This book will be published in the fall and should have a wide readership. If you would like for a picture of your aviation related product or aircraft in it to be considered for inclusion in the book, please forward one to me at the above address. Under each picture will be a caption and credit will be given to providers of the photos.

Sincerely,

Cliff Roberson

Dear Starduster Readers,

We can all try and support this article, and of course, Cliff Roberson. It would make good advertisement for each and every one of us.

Sincerely,
Bill Clouse

7
15 March 1986

Dear Bill:

Got the January issue of your magazine today and immediately realized that I have not kept my promise to provide test information as testing progressed. First of all, enjoyed having my aircraft on the cover, THANKS.

The initial flight went off on schedule, a perfect day at the San Luis Obispo airport with a goodly crowd on hand (hbws that for confidence). The aircraft jumped right off the ground and following sane practices I climbed directly over the field to 2500' did some turns, slow flight and an approach to a stall before descending into the pattern for a low pass and a 3 point landing. Rigging seemed to be about right, the Ball was about one/quarter out to the right and about one notch of nose down trim at 85 to 90 knots IAS. My biggest concern was the presence of lots of turbulence in the rear cockpit, enough to blow my goggles off and damn near undress me.

The next several flights were made to try to solve the above problem. I removed the front windshield and found lots of improvement so made a temporary replacement two inches shorter, it helped but not enough. Next I made a vortex generator and clamped it to the rear windshield, no improvement. I then moved the rear windshield back as far as possible, that with the lowered front windshield helped alot, but not enough. The last fix was to build an arch, fo pleglass which I hinged to the rear windshield, this seems to provide a much calmer rear seat and can be folded down out of the way on the ground.

I was now ready for serious testing and things proceeded well through upright aerobatics spin testing and low speed stability testing. Biggest disappointment was a sea-level top speed of only 105 KIAS at 29" and 2700 RPM.

I next progressed to Max-Gross weight performance which gave some interesting data, the most significant being the amount of nose down trim required at cruise power. After some talk with a couple of local aero-engineer types I raised the leading edge of the horizontal stab about one-quarter inch and at the same time tweaked the vertical stab a bit. The next flight showed the ball right in the middle at cruise power and an increase of 6 knots in the IAS. Sure did something right there.

I am now through some 17 hours and would have finished the 25 if the weather had cooperated a bit more. I am very pleased with the flight characteristics of the Starduster, it is a real joy in flight, truly jands off at cruise power but most important, as easy to land as a J-3 except for the forward visibility at touchdown. The only other T00 I have flown was Wil Neuberts' N7X, but it weighed a lot more and had that big round engine out front-it was a real squirrel to land.

The remainder of the test program will mostly consist of performance work, (I want to run some airspeed calibrations) a few more aerobatics (I'm pretty rusty) maximum dive speeds, and flutter testing. Will advise if anything new shows up.

Count on my wife and I (and H490B) for the Bar-B-Que, we will make it if I have to Taxi down the Interstate?

Regards,
Oscar

P.S. Glad to hear the great Eric Shilling is Back.



Oscar Bayer, 250 Stanton St. Arroyo Grande, ca. 93420
 colors- green, silver, yellow.

- Engine 10 360-BIE (Lycoming)
- Prop-Hartzell Constant Speed
- Empty Weight 1196#
- Gross Weight 1941#
- Fuel Capacity 50 Gallons
- Full Electrical System W/ Inner-Comm & Escort

Oscar was able to make it to our Early May Fly-In, And left with 3 rd Place.
 Beautiful job Oscar!

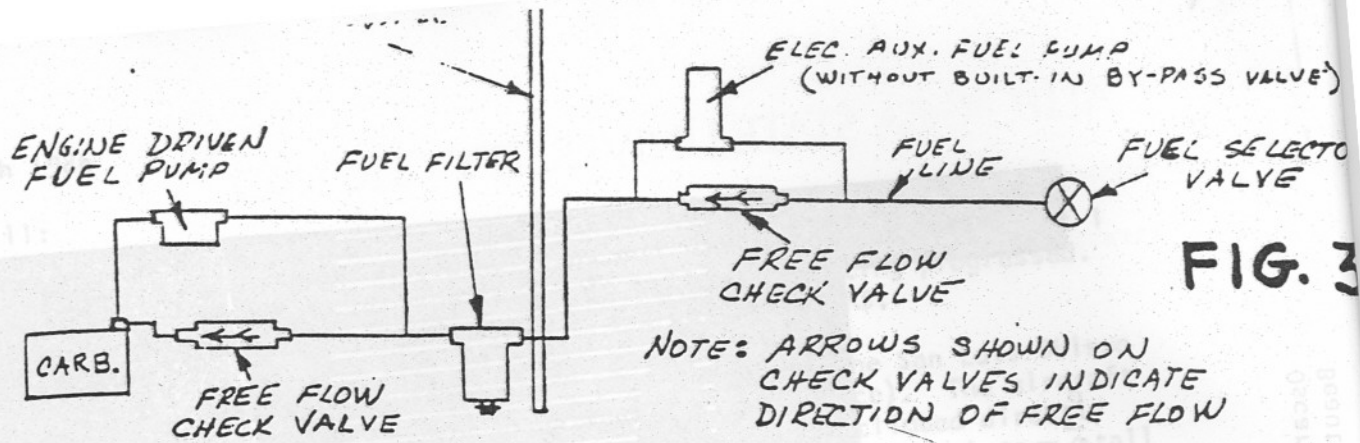


FIG. 3



ACCURATE ANGLES WITHOUT AN EXPENSIVE MACHINISTS PROTRACTOR

Many times during a construction project we feel the need of an accurate adj. protractor with which to set an angle such as the angle of incidence or dihedral. Using the chart that is displayed in FIG.#4 you can beat a machinists protractor all to heck. In fact, you can set the dihedral as an example, within 1/32 nd. of a degree or 1.875 minutes on the geometric clock. THERE IS NO WAY THAT YOU CAN MATCH THIS TYPE OF ACCURACY WITH AN EXPENSIVE ADJUSTABLE PROTRACTOR.

Lets persue the case of the missing dihedral. First of all we level the lower wing with a spirit level. From the butt end of the front spar we measure outboard 90 1/8" (90.125) which should be the inboard face of Rib Station 90 1/8. The inboard face of this rib is actually 89 1/2" from the center of the bolt that mounts the front spar to the fuselage. We keep this figure (89.5) as the multiplier for the problem we are about to solve, namely, how high will we have to raise the wing at Sta. 90 1/8" in order to achieve an angle of dihedral of 2 1/2 degrees. The answer is 3.911 inches. .911 inches is actually 29/32" plus .005" We forget the .005" and raise the wing from the level position 3 29/32". In order to be as accurate as mentioned above (1/32 nd of a degree) we must measure up on the back face of the spar 3/4" at sta. 90 1/8 which is the same height as the wing mounting bolt hole center and the point about which the wing pivots as we raise it to set the dihedral. Use a drafting pencil or one with a very sharp point to make the index mark from which we will measure. With the wing level, measure from our index mark to the floor and record the figure. To this figure we add 3 29/32". You would have to miss-read your ruler .049" (just over 3/64") in order to produce an error in dihedral of 1.875 minutes of 1 degree. Not bad for a homebuilt.

Now lets see how we read the chart in FIG.#4 that produced the figure of 3.911 or the amount of rise in 89.5". First

we look down the lefthand column and find the depth of 1". The term "depth" is a little misleading. Next to the 1" column is the first column of draft angles in degrees. The first angle we come to is 1/2 degree. To the right of 1" is a figure .0087". It means this. If we have an angle of 1/2 degree, it will rise or fall .0087" in a distance of 1 inch. To the figure of .0087, lets add .035 or the rise of 2 degrees in 1 inch. When we add these two figures together we now have a total of .0437" that a 2 1/2 degree angle will rise in 1 inch. Next we multiply .0437 by 89.5" and we get 3.91115. We drop the 1115 and elect to go with the nearest fraction which is 29/32" or .90625. You will find this chart most helpful in your shop.

D E P T H	DRAFT ANGLE PER SIDE (DEGREES)																D E P T H	
	1/2°	1°	2°	3°	4°	5°	6°	7°	8°	9°	10°	11°	12°	15°	20°	25°		30°
1/32	.0003	.0005	.001	.0016	.002	.0027	.003	.0038	.004	.005	.0055	.006	.0066	.008	.011	.014	.018	1/32
1/16	.0005	.0011	.002	.0033	.004	.0055	.007	.0077	.009	.010	.011	.012	.013	.017	.023	.029	.036	1/16
3/32	.0008	.0017	.003	.0049	.006	.008	.010	.0115	.013	.015	.0165	.018	.020	.025	.034	.044	.054	3/32
1/8	.0011	.0022	.004	.0066	.009	.0109	.013	.015	.018	.020	.022	.024	.027	.033	.045	.058	.072	1/8
5/32	.0014	.0028	.005	.008	.011	.014	.016	.019	.022	.025	.027	.030	.033	.042	.057	.073	.089	5/32
3/16	.0016	.0033	.006	.0098	.013	.016	.019	.023	.027	.030	.033	.036	.040	.050	.068	.087	.108	3/16
7/32	.0019	.0039	.008	.011	.015	.019	.023	.027	.031	.035	.039	.042	.047	.059	.080	.102	.126	7/32
1/4	.0022	.0043	.009	.013	.018	.022	.026	.031	.035	.040	.044	.049	.053	.067	.091	.117	.144	1/4
9/32	.0025	.005	.010	.014	.020	.024	.030	.034	.040	.045	.049	.055	.060	.075	.102	.131	.162	9/32
5/16	.0027	.0055	.011	.016	.022	.027	.033	.038	.044	.050	.055	.061	.066	.084	.114	.146	.180	5/16
11/32	.003	.006	.012	.018	.024	.030	.036	.042	.049	.055	.061	.067	.073	.092	.125	.160	.197	11/32
3/8	.0032	.0066	.013	.020	.026	.033	.039	.046	.053	.060	.066	.073	.080	.100	.136	.175	.217	3/8
13/32	.0035	.007	.014	.021	.028	.035	.043	.050	.057	.064	.071	.079	.086	.108	.148	.189	.234	13/32
7/16	.0038	.0077	.015	.023	.031	.038	.046	.054	.062	.069	.077	.085	.093	.117	.159	.204	.253	7/16
15/32	.0041	.008	.016	.024	.033	.041	.049	.058	.066	.074	.083	.091	.100	.126	.171	.219	.270	15/32
1/2	.0044	.0088	.018	.026	.035	.044	.053	.061	.071	.079	.088	.097	.106	.134	.182	.233	.289	1/2
17/32	.0046	.009	.019	.028	.037	.046	.056	.065	.075	.084	.093	.103	.113	.142	.193	.247	.306	17/32
9/16	.0049	.0099	.020	.030	.039	.049	.059	.069	.079	.088	.099	.109	.120	.151	.205	.262	.325	9/16
19/32	.0052	.010	.021	.031	.042	.052	.062	.073	.084	.094	.105	.115	.127	.159	.216	.277	.343	19/32
5/8	.0055	.011	.022	.033	.044	.055	.066	.077	.088	.100	.110	.120	.133	.167	.227	.291	.361	5/8
21/32	.0057	.011	.023	.035	.046	.057	.069	.082	.092	.104	.115	.127	.140	.176	.239	.306	.379	21/32
11/16	.006	.012	.024	.036	.048	.060	.072	.085	.096	.109	.121	.133	.147	.183	.250	.321	.397	11/16
23/32	.0063	.013	.025	.038	.050	.063	.075	.088	.101	.114	.126	.139	.153	.193	.261	.335	.415	23/32
3/4	.0065	.013	.027	.039	.053	.066	.079	.092	.106	.119	.132	.146	.159	.201	.273	.350	.433	3/4
25/32	.0068	.014	.028	.040	.055	.068	.081	.096	.110	.124	.137	.152	.166	.209	.284	.364	.451	25/32
13/16	.0071	.014	.029	.043	.057	.071	.085	.100	.115	.129	.143	.158	.173	.218	.296	.379	.469	13/16
27/32	.0074	.015	.030	.045	.059	.074	.089	.104	.119	.134	.149	.163	.180	.226	.307	.393	.487	27/32
7/8	.0076	.015	.031	.046	.061	.077	.092	.107	.123	.139	.154	.171	.186	.234	.318	.408	.505	7/8
29/32	.0079	.016	.032	.048	.063	.079	.095	.111	.128	.144	.159	.176	.193	.243	.329	.422	.523	29/32
15/16	.0082	.017	.033	.050	.066	.082	.098	.115	.132	.149	.165	.182	.200	.251	.341	.437	.541	15/16
31/32	.0085	.017	.034	.051	.068	.084	.101	.119	.137	.153	.170	.188	.206	.260	.353	.452	.559	31/32
1	.0087	.0175	.035	.052	.070	.087	.105	.123	.141	.158	.176	.194	.213	.268	.364	.466	.577	1
	1/2°	1°	2°	3°	4°	5°	6°	7°	8°	9°	10°	11°	12°	15°	20°	25°	30°	



Experimental Aircraft Association
CHAPTER ONE
FLABOB AIRPORT

P.O. BOX 3667

RIVERSIDE, CALIFORNIA 92519

March 9, 1986

EAA Headquarters
Wittman Airfield
Oshkosh, WI 54903-3086

Attention: Paul Poberezny

Dear Paul,

As you know by now, Bill Clouse, President of Stolp Starduster, and Travis Gammill, Treasurer of EAA Chapter One, have been nominated for EAA Board of Directors (Class III). We, the undersigned members of our Chapter, wish to cast our ballots for these nominees and find that there is no readily apparent and democratic way to do so without actually attending the annual membership meeting at Oshkosh. Many of us will be at the convention this summer, but consider it impossible to stay for the annual meeting. Therefore, we ask for the two following favors in order that we may effectively exercise our right to vote for candidates of our choice:

1. That you include a self-addressed, stamped absentee ballot in the SPORT AVIATION issue that announces the candidacy of the nominees, and that this announcement informs the membership of the nominee's objectives.
2. That you schedule the annual business meeting to coincide with peak attendance at the convention. The traditionally negligible attendance at these membership meetings proves conclusively that the members cannot make it. We believe that a well-attended business meeting would be the appropriate approach in a democratic association.

We look forward to your reply:

Travis Gammill
Gregory A. Matka
Bruce McWhitso
Walter E. Rupp

Janis Johnson *R. J. Hoffman*
Bob Albin *Philip R. Denham*
Shepherd D. Pearson *W. Heaton*
John Kerpelmeier *Edith*
Mike Fullall *Bob D. Stanton*
Merlin Sommers

Paul L. O'Neil
William K. Harrison
Walter E. Wilke
Charles Wicker
Fay K. Wilson
210203

Robert L. Sabine
John R. Lytle

ENGINE WILL NOT TURN STATIC RPM

<u>Cause</u>	<u>Solution</u>	<u>Procedure for Solution</u>
1. Restriction in induction air system, incorrect airbox, or airbox improperly installed.	1. Inspect and remove restriction.	1. Solution is self-explanatory.
2. Injector rich or lean.		

FAA Headquarters
 Wittman Airfield
 Oshkosh, WI 54903-3086

Attention: Paul Poberezny

Dear Paul,

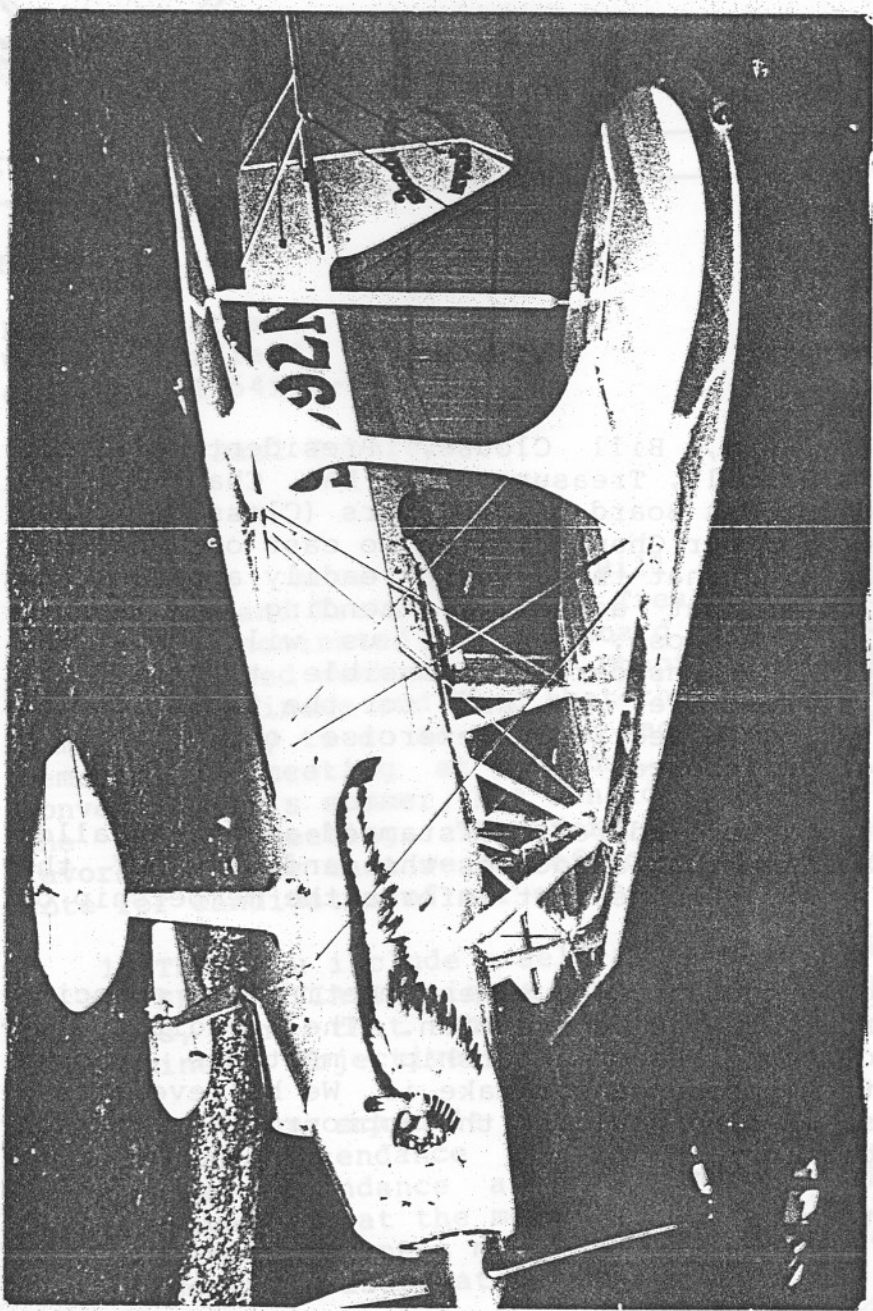
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We look forward to your reply:

CHAPTER ONE

PLANE AIRPORT



This beautiful aircraft belongs to Mr. Bennett stationed at Transit Airpark in Buffalo, New York.



PD-BOX 3667

Handwritten notes in the left margin:
 and E.O. 12812
 William 2/20/00
 William C. Ballou
 (below) W.W. Chubb with

Handwritten notes in the bottom right margin:
 We look forward to your...
 John...
 Mike...
 R.D. Hoff
 Phil...
 Photo...

ENGINE WILL NOT TURN STATIC RPM

<u>Cause</u>	<u>Solution</u>	<u>Procedure for Solution</u>
1. Restriction in induction air system, incorrect airbox, or airbox improperly installed.	1. Inspect and remove restriction.	1. Solution is self-explanatory.
2. Injector rich or lean.	2. Replace same or recalibrate or overhaul at approved facility.	2. Run engine at a known power setting, full rich. Observe fuel flow and compare to fuel requirements as found in Operator's Manual. Lean injector, if too rich engine will pick up RPM and run smooth. If injector is too lean, engine will become more aggravated.
3. Prop out of adjustment (low pitch).	3. Adjust same.	3. Solution is self-explanatory.
4. Governor linkage not adjusted properly.	4. Adjust for full travel.	4. Solution is self-explanatory.
5. Crankshaft to camshaft timing off.	5. Remove accessory housing and time correctly.	5. This condition may be checked by first disconnecting starter. Remove top spark plugs and rocker box cover on #2 cylinder. Turn engine to T.D.C. on compression stroke on #1 cylinder, observe that when piston in #1 cylinder goes over T.D.C. on compression, the intake valve

test purposes. If this solves the problem, adjust and replace parts as necessary.

9. Incorrect magneto to engine timing.

9. Check and adjust as necessary

9. Solution is self explanatory

10. Fouled spark plugs

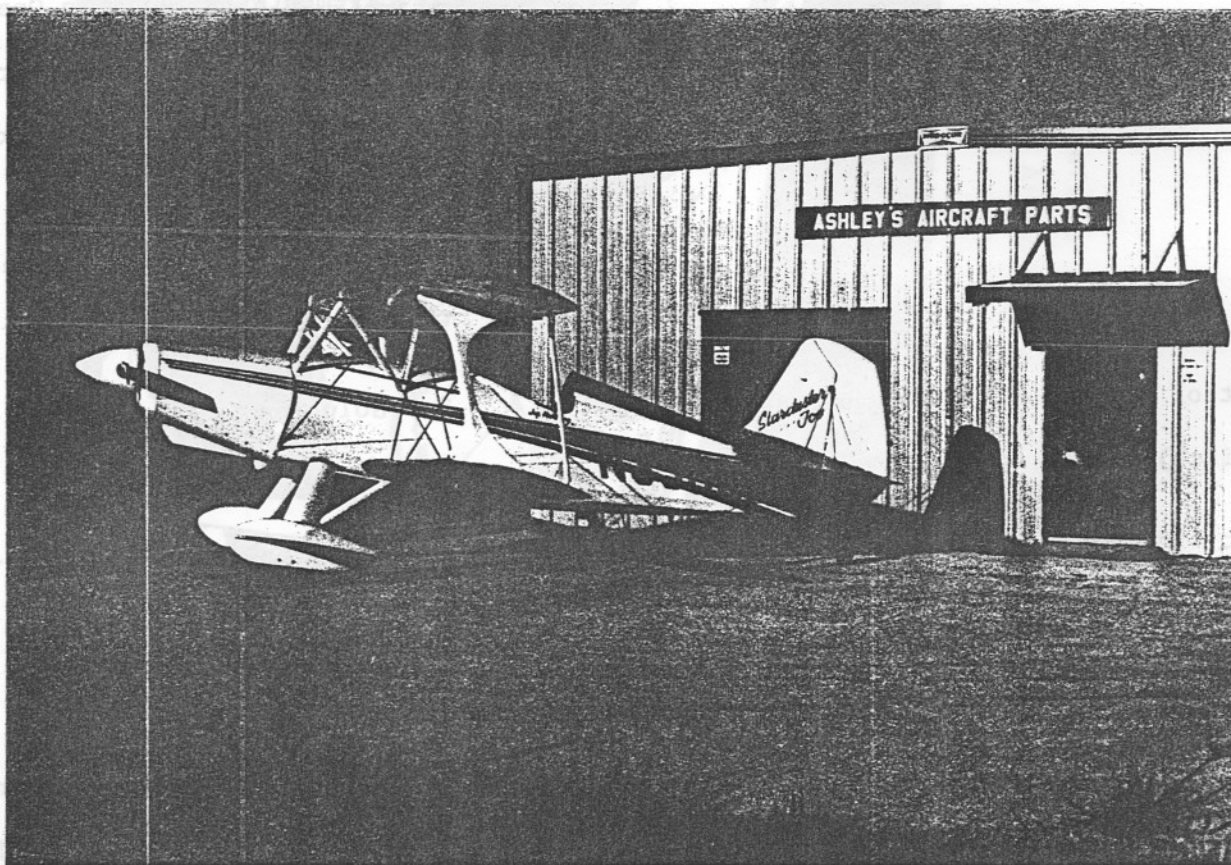
10. Remove and clean or replace as necessary.

10. Solution is self explanatory

11. Tachometer reading is incorrect.

11. Have tachometer repaired or replace same.

11. Solution is self explanatory



This amazing Starduster belongs to Joe Hortung in Baton Rouge, LA. Joe flew in for our May 3rd Fly-In. It was nice to see you Joe.

6. Exhaust muffler internal baffles broken and blocking exhaust outlet.

6. Remove muffler for thorough inspection and replace same, if necessary.

exhaust is just closing. If this condition does not exist, the crank to cam timing is off.

6. Note: If baffles are broken and are free to move around in muffler, engine may turn static and develop power sometimes and other times it may not due to the restricted flow of exhaust gases. Strike muffler with rubber mallet or soft object and listen for rattle in muffler.

7. Excessively dirty air filter.

7. Replace at regular intervals. Time between filter changes will depend on operating conditions of individual aircraft.

7. Note: Sometimes new filters may have an excessive air drop through them. If this condition is suspected, remove filter and run engine to F.T. without filter installed to observe whether the engine performs better. (This test should be performed in a dust-free area and on a hard surface).

8. Carburetor heat door not rigged properly.

8. Rig so that door goes from full open to full closed.

8. NOTE: Even though door is going from full open to full closed position when aircraft is shut down, when aircraft engine is operating vibrations and airflow may cause door to open slightly. If this condition is suspected,

ENGINE SURGES

<u>Cause</u>	<u>Solution</u>	<u>Procedure for Solution</u>
1. Injector nozzles dirty.	1. Remove and clean.	1. Clean by flushing in acetone or MEK and blow out with compressed air.
2. Faulty governor.	2. Replace governor.	2. Solution is self-explanatory.
3. Air in oil lines or wastegate actuator. (turbocharged)	3. Bleed system.	3. Engine will usually bleed air out of actuator and control system by running. If this does not work, loosen lines and bleed system.
4. Breather plugged.	4. Remove any obstructions from breather.	4. Solution is self-explanatory.
5. Injector nozzle pressure reference system leaking (turbocharged).	5. Repair leak	5. Check all hose connections, "O" rings, tubing, and hoses for breaks or loose connections.
6. Incorrect prop governor	6. Replace Gov.	6. <u>NOTE</u> : Check <u>Part No.</u> of Gov. to be sure someone did not put wrong Gov. on engine.

7. Defective oil pump.

7. Repair or replace oil pump.

7. Erratic oil pressure may be traced to the fact that pump may be sucking air. On T10 and TIGO-541 engines inspect "O" rings on inlet and outlet of pump, also high press oil relief at pump may be defective. NOTE: To remove oil pump from 541 engines, the sump must be removed.

8. Prop blades sticking in hub intermittently.

8. Remove and overhaul prop.

8. Check for prop blade movement and sticking. Check stops and angle on blades when against flat pitch stops.

9. Carburetor too rich.

9. Repair or replace carburetor

9. Solution is self explanatory.

10. Wastegate binding intermittently.

10. Free wastegate butterfly with a corrosion penetrant or replace same.

10. NOTE: Use a wrench to move butterfly from full open to full closed to determine if shaft binding is occurring.

FAILURE OF ENGINE TO DEVELOP RATED POWER

Cause

Solution

Procedure for Solution

1. Leaks in induction system and exhaust system. (Turbocharged engines)

1. Tighten all plugs and clamps and replace any defective parts.

1. Solution is self-explanator
Note: This condition is more noticeable at alt.

2. Improper fuel flow.

2. Check screen and gage, and replace injector, if necessary

2. Remove screens and flush out dirt. Disconnect gage and install master to determine accuracy of aircraft instrument.

3. Restriction in air inlet or manifold.

3. Check and clean or repair as necessary.

3. Note: Always make sure air filters are kept clean and there are no breaks in ducting to allow foreign material or heated air from nacelle to enter induction system.

4. Improper fuel.

4. Drain tanks and refill with recommended octane fuel.

4. Note: Never use a lower than recommended grade of fuel. Consult S.I. 1070.

5. Controllers out of adjustment. (Turbocharged)

5. Adjust same.

5. Variable absolute controller is adjusted by turning adjustment screw at cam end of controller counter-clockwise to increase boost, and clockwise to decrease boost. Controllers are set to obtain a specific MP and no compensation for density and temperature is necessary. Required MP settings will be found in Operator's Manual. Adjust for full throttle setting

Density controllers do compensate for temperature and pressure and require special equipment to adjust. S.I. 1187 sets forth procedures and required equipment for adjusting density controllers in the field.

Differential pressure controllers are set to maintain 6" differential between deck and MP, special equipment is required for adjusting. Note: This is not normally adjustable in the field.

6. Note: If turbo wheel is damaged or tips of blades are missing, turbo must be replaced because this condition will cause turbo to become unbalanced and severely wear the bearings causing complete turbo failure.

7. Solution is self-explanatory.

8. Solution is self-explanatory.

Note: Excessive dirt buildup on compressor wheel may create an out-of-balance condition and accelerate bearing wear.

6. Damaged turbo impeller, binding or tight turbo wheels. (Turbocharged)
6. Visually inspect for damage and check for free rotation of turbo. Disassemble and clean, if necessary.

7. Throttle lever not properly adjusted.
7. Check and adjust, as necessary.

8. Excessive dirt buildup in compressor housing or on compressor wheel.
8. Inspect and clean.

(Turbocharged)
Note: If excessive dirt buildup is observed on the compressor wheel, it may be necessary to remove the cylinder from the actuator to enable thorough cleaning of the wheel.

9. Kinked or restricted oil lines from engine to actuator, and actuator to controller.

10. Wastegate out of adjustment. (Turbocharged)

11. Inlet orifice in actuator plugged. (Turbocharged)

9. Remove and inspect or replace, as necessary.

10. Adjust same to correct open and closed limits.

11. Remove inlet line at actuator and clean orifice.

9. Solution is self-explanator

Procedure for Solution

1. Solution is self-explanator

Note: This condition is more

10. *The wastegate is adjusted to full closed position first, then full open. To adjust full closed, cap off outlet of actuator and apply 50 to 60 lbs. oil pressure to inlet. When oil pressure closes wastegate, measure clearance between butterfly and housing. If adjustment is improper, disconnect linkage and lengthen or shorten as required. After full closed adjustment is correct, set full open by disconnecting oil supply and allowing spring in actuator to open wastegate. Again, measure clearance between butterfly and housing. If adjustment is improper, loosen jam nut at end of cylinder and turn adj. rod in or out as required to obtain proper full open setting, then retighten jam nut.

11. Note: If orifice is plugged tight, it may be necessary to remove cylinder from actuator to enable thoroughly cleaning orifice

12. Wastegate stuck open.
(Turbocharged)

12. Remove actuator and loosen wastegate butterfly.

12. Wastegate butterfly may be freed by removing from engine, and using a wrench on the butterfly shaft. Rotate back and forth until all corrosion is removed and butterfly moves freely. This operation may be aided by using corrosion penetrant to help loosen butterfly. One penetrant used by some people in the field is mouse milk, manufactured by Worldwide Aircraft Filter Corp. 1685 Abram Ct., San Leandro, CA 94577. This penetrant could be used at each 25-hour inspection as a preventative measure. A little at each end of the shaft may help keep shaft from binding.

13. Piston seal in wastegate actuator leaking. Noted by excess oil coming out of drain.
(Turbocharged)

13. Disassemble, clean cylinder, and replace seal, or replace wastegate actuator assy.

13. Note: Any time wastegate actuator is disassembled or parts are replaced, the full open and full closed positions of the butterfly should be checked and reset, if necessary. (Reset according to item marked * of this section)

14. Oil pressure too low to close wastegate.
(Turbocharged)

14. Adjust oil pressure to at least minimum low limit in manual.

14. Check to make sure that the proper oil pressure relief spring is in engine and that it is not broken, or that relief valve is

15. Injector and controller linkage not adjusted properly.
(541 series engine)

15. Adjust as per S.I. 1211 to get full travel on both controller and injector.

does not have any dirt under it causing the low oil pressure.

15. Procedures set forth in S.I. 1211 include the use of two special tools, ST 318 and ST 319, to position the cross shaft and establish the clearance settings at full throttle and idle when making linkage adjustments. These step-by-step procedures should be followed to insure accurate linkage adjustment.

16. Broken Baffles in muffler.
(Normally aspirated engines)

16. Remove from engine and replace muffler system.

16. Note: If section of baffle is loose in muffler, engine may operate satisfactory at times and may be low on power at other times. This indicates baffle is moving around in muffler, blocking exhaust gases sometimes and out of the way at other times allowing an unrestricted flow of exhaust.

17. Poor combustion

17. Do a diff. comp. check and borescope inspection to locate excessively leaking valves, valve guides or rings and to locate any broken rings.

17. Do a top overhaul to correct this problem.

18. Butterfly in wastegate warped.

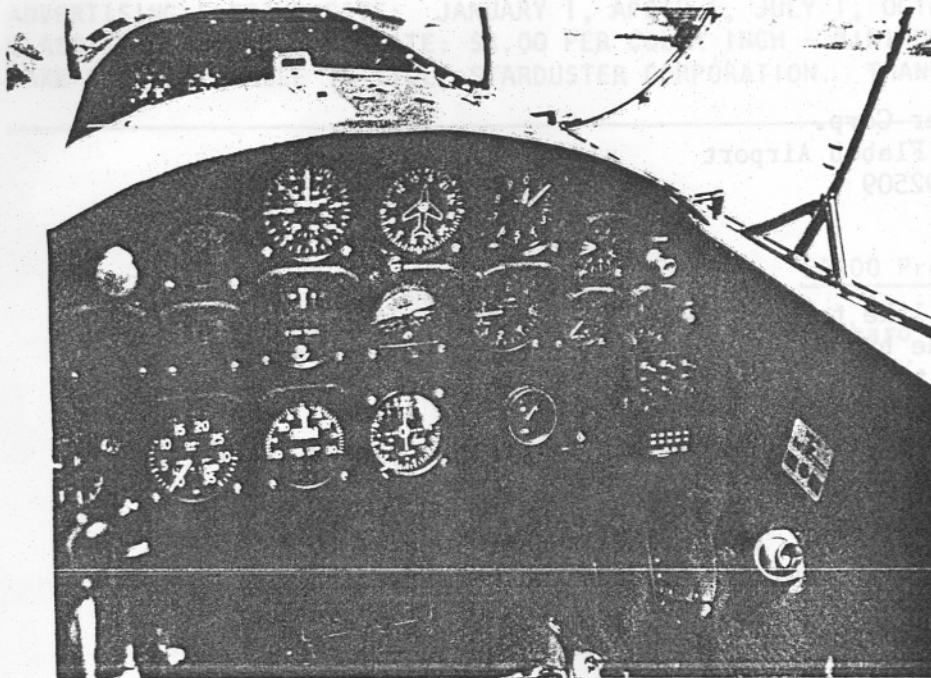
18. Replace wastegate.

18. Solution is self-explanatory.

19. Crankshaft to camshaft timing incorrect.

19. Remove accessory housing and correct timing.

19. This condition may be checked by first disconnecting starter, remove top spark plugs and rocker box cover on #2 cylinder. Turn engine to T.D.C. on compression stroke on #1 cylinder, observe that when piston in #1 cylinder goes over T.D.C. on compression the intake valve in #2 cylinder is just starting to open and the exhaust valve is just closing. If this condition does not exist, the crank to camshaft timing is off. Note: On engines with fixed pitch propellers the engine probably will not turn static R.P.M. On engines with constant speed propeller the engine will probably turn up static R.P.M. but manifold pressure will be a little low.



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