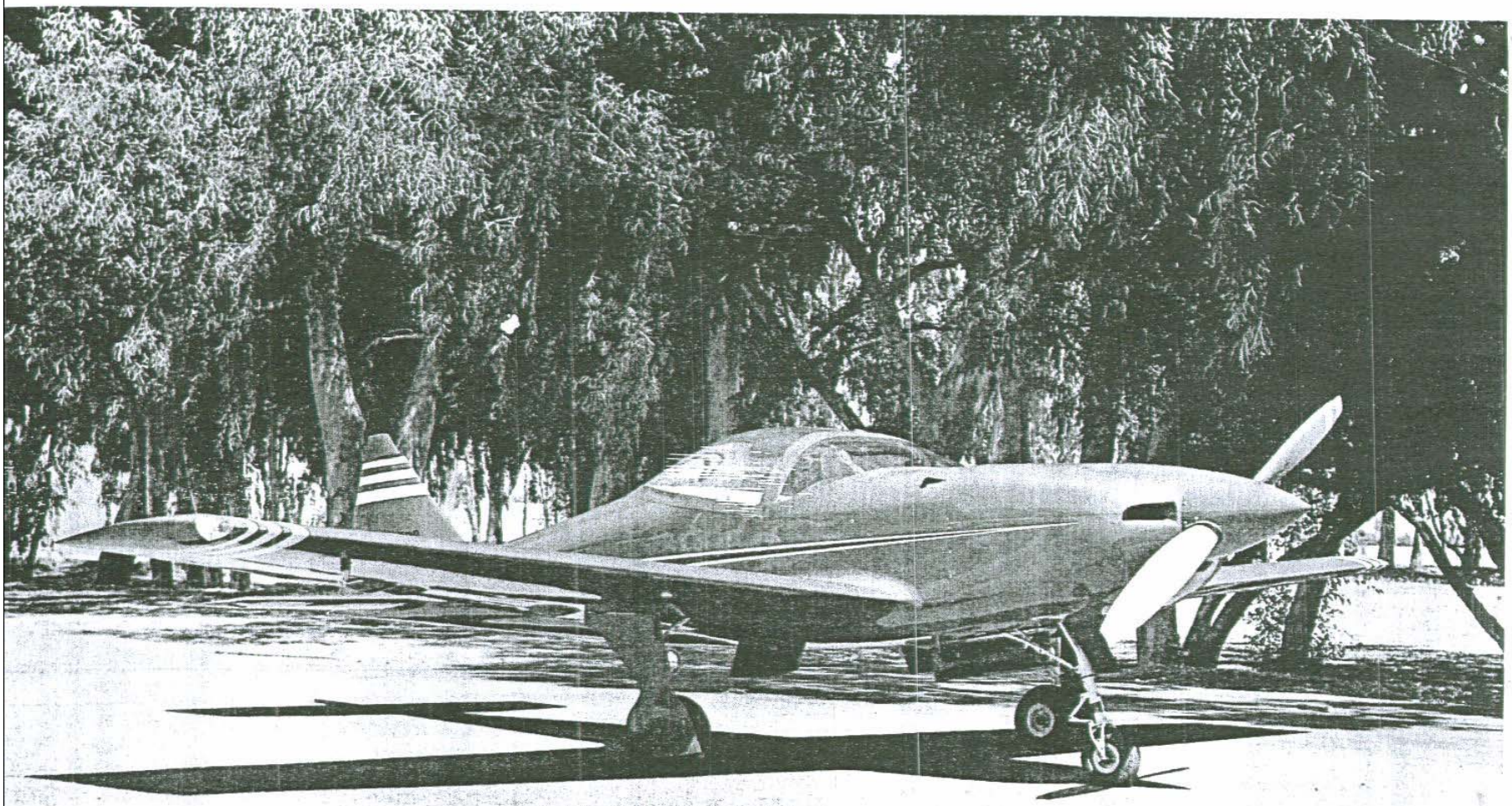
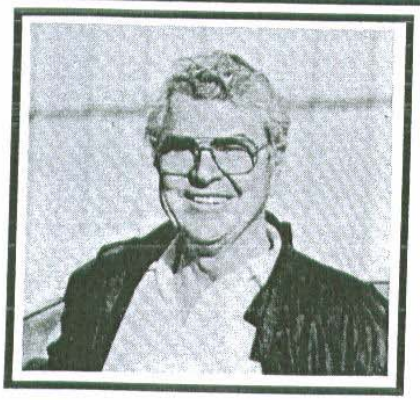


BUILDERS & FLYERS GP4 NEWSLETTER

November/December 1996 Volume 11

George's Corner



Fellow GP-4 Builders:

I want to apologize for the not writing an article in our last newsletter. Not intentional, just a lapse in memory, My 73 years are catching up!

Hey, how about that Jackie Yoder. I can attest there is no greater thrill than the first flight in something you put together yourself. Congratulation Jackie! His highly modified GP-4 is bound to turn some heads. It looks like Bill Berrick will be the next to fly if it hasn't flown already flown. Both Jackie and Bill have sent photo's of their projects. Its always a thrill to see such fine craftsmanship hatched out of a pile of blue line drawings. Since 12-20-96 there are 342 sets of these blue line plans out so look for many more first flights in 1997 and beyond!

● The Front Cover:

On the front cover of this issue is the GP-4 out front of the famous Nut Tree restraunt at Vacaville, California. You fly in there and a little minature train takes into the restraunt. Perhaps some of you may of heard of it. It is excellent. When in the area make sure to make it one of your stops.

● Batteries:

A couple of years ago I had battery in my GP-4 over flow. It was a manifold type with a plastic tube attached to the manifold and out through the bottom skin. The tube had slipped off and the electrolyte ate a hole through the plywood skin when it overflowed. I have since replaced the manifold type battery with a sealed gell cell battery. The sulfuric acid and water is in a gelled state, sealed in the battery case. A vent system is no longer required. Just a good hold down assembly as shown in drawing #40. I became concerned with a sealed case in the event of a voltage regulator failure where the alternator would (Max out) continue to overcharge the battery.

I installed an over voltage relay as a safety valve. Its a solid state little gadget about 2" X 1" X 3/4" thick. It has four wires that attach to the positive bus, a ground point and two wires spliced into the regulator field circuit. If your alternator, that normally regulates about 14 volts, starts to overcharge it opens the field circuit at 16 volts and stays open until your voltage regulator gets back to something below 16 volts. This safety valve should keep over voltage spikes from damaging your avionics as well. The one I used is called "INTER-AV", p/n 635-62448. I bought it through AVIALL but the address on the unit is INTER-AV, 100 East Nakoma, San Antonio, Texas 78216. It was just under $60.00. It should go on the cool side of the firewall. I suppose you could get a red warning light to go on should an over-voltage situation be encountered. I have a voltmeter as well as an amp meter I didn't feel it necessary.

● Gyro Instruments:

I have had to replace the two vacuum gyros in my GP-4 at about 500 hours. I attribute most of the failure to high G aerobatics. I have since stopped doing most of those wild gyrations after replacing these expensive gyros **and Peggy** reminding me of my 73 years! I replaced with SIGMA-TEC. These new gyros have held up very well and their dry vacuum pumps carries a two year, 1000 hour warranty. Their Sport Aviation ad list their address at 1001 Industrial Road, Augusta, Kansas 67010 - Phone (316)775-6373.

Speaking of instruments. Jake Jackson recently replaced his engine instruments with Vision Micro VM1000. This required an all new panel, but gave him room to put all of the circuit breaker in the panel. They used to be in the angle aluminum on the bottom of the old panel. It makes the panel an inch shallower now. Jake says its much easier to get in and out of his GP-4 now. His new panel is a real beauty as is the rest of the plane, even if it is painted ***YELLOW!***

● Wing Battens:

If you turn to page 37A of your plans you will see the batten lay up in the top side of the wing skin. Its obvious that you should skin the top of the wing first so you can glue in the battens on the underside of the top skin. Since the drawing is back on plate 37A it is possible you might miss the batten lay-up. In high humidity the plywood tends to expand and you will get some oil canning in the flatter areas of the wing. They will flatten out again in warmer, dryer air. The battens eliminates most all of the high humidity undulations. I am guessing that any skin undulations will not effect the flight performance much since they are pretty far aft in the wing chord. These laminar wing sections (63 series) are critical to smoothness and shape in the first thirty to forty percent of the chord. So the battens are more for cosmetics than anything else.

I hope you all have had a great 1996 and I look forward to working with all of you in 1997 and beyond. Call me if I

can help with any of your GP-4 problems.

Regards To All

George Pereira

TECH TIP!

This info on switches was taken from the FAA bulletin board a while back. It's excellent and should be used by all of us for reference.

A SWITCH IS A SWITCH....OR IS IT?????

by Art Bianconi

Some years ago I was fortunate to be able to work alongside engineers from Underwriters Labs (UL) during destructive testing of electrical devices. This was part of my apprenticeship as a designer for a major electrical manufacturer and it was during this period that I acquired an appreciation for the real-world differences between AC and DC current and the impact those differences have on switch design and applications.

I share this with you because I am growing increasingly concerned at the widespread lack of appropriateness most home builders demonstrate when selecting switches for the cockpit environment. Each time a builder asks me to perform a pre-FAA inspection of an aircraft, I carefully examine the switches and, to date, over THREE-FOURTHS of the projects inspected have turned up AC rated or non-rated switches in DC circuits.

Current is current; What difference does it make DC or AC ?

The difference between AC and DC load carrying capability are dramatically non-linear and are best appreciated by carefully inspecting a high-quality switch carrying both AC and DC ratings. Typical of this is the roller and bar micro switches made by MICRO Corp. Rated at 10 amps at 125 or 250 volts AC, the same switch can only carry 0.15 amps at 250 volts DC! In real terms, we have lost more than 98% of the original load carrying ability and all we did was to go from AC to DC! The voltage stayed the same!

But I'm using 120 volt AC switches with only 14 volts DC....?

Those of you who can still remember the old Kettering coil ignition systems will recall that when the condenser in the distributor went bad, the points generally turned blue and melted down in just a few minutes. Cockpit switches don't have the benefit of the condensers to absorb the electrical Inertia present in a DC circuit and as a result, the gap temperatures get hot enough to weld contacts. That includes AC rated switches, even those made with exotic high temperature alloys.

AC current changes directions 120 times a second in a 60 cycle circuit. As a result, there are 120 times each second when there is no current flow at all. The current actually helps turn itself off the moment it see a gap and the switch designers use this phenomenon to help reduce the cost of the manufacturing AC switches. In DC circuits, however, the `push' is constant even when the points begin to open and the resulting flash is DC current's way of demonstrating its resistance to termination.

But won't my circuit breakers protect me.....?

No they won't. Fuses and CB's provide overload protection, and a welded set of contacts will not, by themselves, cause an increase in circuit load. What often happened during UL testing was that the points welded shut, making it impossible to open the circuit. Cycling the

continued on page 7

LETTERS!

Hello Spud,

I've been feeling kind of guilty lately because I haven't written or had any input for the newsletter. I hope to resolve that now (at least in the writing department).

I didn't feel I had any input because I haven't started on my GP-4 yet and haven't built any other homebuilts either. Several things you said in the Nov.-Dec. newsletter really hit home. What you were talking about as far as the character and make-up of the GP-4 builder were right on the money. For me, the end product is very important because I plan to keep it and use it, but the journey to get to that finished product is what I crave. Everyone I talk to asks why I picked the GP-4, Why not build an RV or a Lancair or a Glasair or a whatever, I just wander how these people (most of whom have completed a homebuilt) ever completed anything in their life. I just tell them that "I'm building what I'm building because that's what I want to build." To me, a homebuilt aircraft is about the building at home, the act of cutting raw wood (metal, fiberglass cloth, or whatever) and piece by piece building that thing that I've been dreaming about for over 15 years. To go through a two, three, or five year project just because you want an airplane cheap is almost sacrilege to me (not to mention nearly impossible to complete).

Next subject, after seeing John Reinhart's letter in GP4BFN3, I was tempted to take a little road trip up to Fort Worth to see his project and talk with him. I haven't made it yet but hope to soon. I would really be interested to talk to anyone in my area about the GP-4.

Bill Berrick's project is looking great and I'm really jealous. On the other hand he's almost done and I still have the whole journey ahead of

me... and I'm sure looking forward to it. I had worked a little on an index like Bill made up but I ran out of steam. I might add to his and modify it to fit my needs but it sure is a great starting place.

Now about my project... Having just graduated from college 2.5 years ago, my financial situation has not allowed me to start until now. I am now ready to start but am still trying to resolve some problems we all have to deal with. My main problem is where do I build my GP-4? I live in an apartment and if I move into a house I won't have the money for my project. Where do I find a shop type building at a reasonable rental rate that still has at least partial climate control as required by a wood project? I will be going to the local EAA chapter meetings to see if someone might rent me some space in their shop or maybe they will have some other ideas. When I solve this little puzzle I will be building very soon. Now about the newsletter... I would like to see it a little larger and with more technical information. I'm sure that is what you were alluding to in GP4BFN5 about more input from the subscribers. You were right - There is only so much one person (you) can write and the rest of the newsletter will have to come from somewhere else... that's where the subscribers come in. I know the people building want to use their time to build and not write letters, but they would be doing all of us such a great service if they took just a few minutes to write a few notes down and sent them in.

I'm sure there were more things I wanted to ramble on about but I forgot what and I've run out of time. Until next time,

Karl D. Hamelmann
219 Englewood
League City, TX. 77573

HI SPUD:

THANK YOU FOR SENDING THE BACK ISSUES OF THE NEWSLETTER. I ENJOYED READING EVERY ONE OF THEM.. LOOKING FORWARD TO THE NEXT ONE. I HAVE PLANS #138 AND THE BEST I CAN FIGURE I AM ABOUT 60% COMPLETE. THE GP IS MY RETIREMENT PROJECT AND THERE IS NO HURRY, NO SCHEDULE AND NO SET COMPLETION DATE. ALTHOUGH I DO GET A LITTLE ANXIOUS NOW AND THEN. I HAVE ABOUT 2000 HOURS OF CONSTRUCTION TIME ON THE A/C. THE FUSELAGE IS COMPLETE LESS THE INSTALLATION OF THE FUEL TANK AND THE NOSE GEAR MOUNT BRACKETS. I PREFER TO INSTALL THE ENGINE MOUNT RING AND THE NOSE GEAR TRUSS FIRST WHICH WILL HELP IN LOCATING THE NOSE GEAR. I AM NOT GOING TO INSTALL ANY SKIN ON THE FUSELAGE NOW. ALSO IN MY CABINETS I HAVE ALL THE STEEL AND ALUMINUM PARTS. I WENT THROUGH THE B/P PAGE BY PAGE AND MADE EVERY PART AND STORED THEM ALL BY PAGE NUMBER. THE WING FWD, MID AND TAIL RIBS ARE COMPLETE AND IN THE CABINET ALSO. ON MY WALL I HAVE HANGING THE AILERONS, FLAPS AND THE REAR SPAR. ALL THIS I FEEL IS AT LEAST 60%. I'AM ABOUT TO MOVE THE FUSELAGE OFF OF THE TABLE AND STORE IT BY HANGING IT OVERHEAD. THE 16' TABLE WILL THEN BE EXTENDED TO 24' AND I WILL START THE MAIN SPAR.

THANKS TO YOUR NEWSLETTER I HAVE LOCATED AND TALKED TO TWO GP-4 BUILDERS. ONE IS IN CARSON CITY-25 MINUTES AWAY AND THE OTHER IS AT OLYMPIC VILLAGE FIVE MILES FROM ME. WE HAVE ALREADY MADE PLANS TO MEET.

DARRY CAPPS HAS BEEN WELDING MY STEEL PARTS FOR ME. AS FAR AS I AM CONCERNED THERE IS NO ONE ELSE. DARRY KNOWS THE GP-4, HAS JIGS TO FABRICATE PARTS ON AND DOES GREAT WORK. DARRY AND I HAD A DISCUSSION ABOUT THE LYCOMING VS A CONVERTED ENGINE. HE MADE ME AWARE OF SOME OF THE ADVANTAGES OF THE LYCOMING ENGINE. THEN I READ GEORGE'S COMMENTS IN THE NEWSLETTER. THERE IS NO QUESTION IN MY MIND. I AM GOING WITH THE IO-360-AIA. I HAVE LOCATED A SOURCE THAT CAN SUPPLY ME WITH A MID RANGE ENGINE FOR ABOUT 3-6K. HE WILL CALL ME WHEN HE GETS ONE. WHEN I GET A CURRENT PICTURE OF MY GP-4 I WILL SEND IT IN. YOU CAN PUT ME DOWN FOR A MEDIUM GP-4 TEE SHIRT IF THERE BECOMES ENOUGH INTEREST. IF I HAD TO PICK ONE AREA OF EXPERTISE IT WOULD HAVE TO BE WIRING THE GP-4. I HAVE WIRED COMPLETE COCKPITS OF F-80, T-33 AND FI04 A/C. I WILL BE RECEIVING A WIRING DIAGRAM FOR THE COCKPIT SOON.

I HAVE 44 YEARS IN THE A/C AND SATELLITE FIELD. I RETIRED FROM LOCKHEED SUNNYVALE WITH 34 YEARS. IN THE QUALITY ASSURANCE FIELD I HAVE LEARNED WHAT IS RIGHT AND WRONG WHAT IS AN ACCEPTABLE FIX TO THE MILITARY FOR ANY ERRORS I MAY FIND. I HAVE A SECTION IN MY LOG BOOK WHERE I RECORD ANY DISCREPANCIES AND MAKE NOTATIONS OF AREAS THAT NEED ATTENTION LATTER DOWN THE ROAD OF FABRICATION.

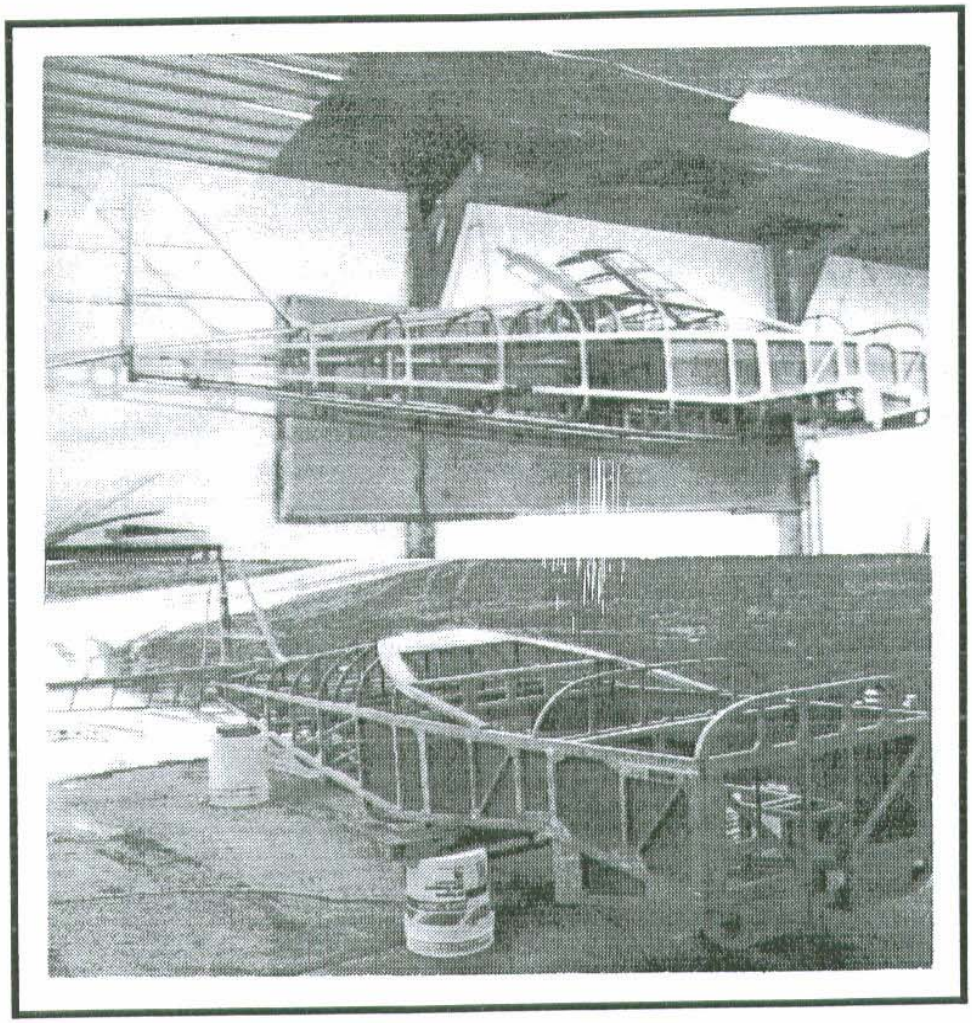
BEST OF LUCK TO ALL YOU GP

RALPH CRISTOFARO
Tahoe City, California

AN UPDATE AND A BUILDERS TIP!

Hi Spud:

Just thought I would send in this builders tip to share with everyone.
I also wanted to share the progress that I am making on plans number 132. As you can see from the pictures the fuselage took to the air early this year. Speed is not the greatest but the endurance seems to be good.



I moved two years ago and it has taken me a while to get my shop put back together so I could start working again. I still have some structural work to do on the rudder and fuselage but the majority of the work is done. The horizontal stabilizer and elevator structures are complete with the exception of the trim tab. I have a lot of the small metal parts made also. Hinges, rudder pedals, motor mount brackets, nose gear pivot plate etc.

I hope to complete the main wing this year. The main spar is almost done and I only have to glue the web and gussets to the rear spar. I have all of the wing ribs cut and capped so things should go fairly fast once I get started assembling the main wing.

In the "For what its worth department", I put together a couple of charts that show the distance from the center line of the main spar to the leading and trailing edge. Two times the measurement equals the spar width. I used the rear spar chart distances as a guide when I cut the blocking that goes between the caps. For the longer blocking, I drew a center line down the block, then measured out from the center line to get the total width. Since the spar is one inch longer then necessary, at each end for beveling, and my chart starts at zero I made my 1 & 16/64 inch measurement one inch outboard of the butt end, then moved 21 inches out for the second measurement of 1 & 7/64. At the wing tip I made the 20/64 inch measurement one inch inboard then moved in 3 more inches to make the 21/64 inch measurement. It seemed to work OK, or else I was lucky because both of my rear spars ended up being 1/32 wider then necessary at each end.

If anyone has any questions send by FAX (any time) 605-256-4335(H)or call same number anytime.

Well I better quit for now.

The Best to All My Fellow Builders

George Colombe

You'll find George's charts on the next page.

Rear Spar

Distance from the inside of the top and bottom spar cap to the center line of the spar in inches	Distance from C/L of spar to spar tip in inches	
0 20/64	141.6875	wing tip
0 21/64	138.6875	
0 25/64	129	rib 10
0 28/64	123	
0 30/64	117	rib 9
0 33/64	111	
0 36/64	105	rib 8
0 39/64	96	
0 41/64	93	rib 7
0 42/64	90	
0 46/64	81	rib 6
0 48/64	75	
0 51/64	69	rib 5
0 55/64	59.75	
0 56/64	57	rib 4
0 58/64	50.75	
0 61/64	45	rib 3
0 63/64	40.75	
1 01/64	35.25	rib 2
1 03/64	31.75	
1 07/64	21	rib 1
1 12/64	10	
1 14/64	5	
1 16/64	0	C/L

Double this distance to get the total distance between the spar caps

Main Spar

Inches from CL of Spar to the leading edge and the trailing edge.	Distance in Inches from Spar CL	Feet from Spar CL
1 20/32	141	wing tip
1 23/32	132	11.00
1 25/32	126	10.50
1 26/32	120	10.00
1 28/32	114	9.50
1 30/32	108	9.00
1 31/32	102	8.50
2 01/32	96	8.00
2 03/32	90	7.50
2 04/32	84	7.00
2 06/32	78	6.50
2 08/32	72	6.00
2 09/32	66	5.50
2 11/32	60	5.00
2 13/32	54	4.50
2 14/32	48	4.00
2 16/32	42	3.50
2 18/32	36	3.00
2 19/32	30	2.50
2 21/32	24	2.00
2 23/32	18	1.50
2 25/32	12	1.00
2 26/32	6	0.50
2 28/32	0	C/L

Double this distance to get the total width of the spar caps

"Tech Tip" Con'td from page 3

switch to the open position was often misleading; yes the lever moved, but inside the switch the cam had separated from the welded points. While it appeared to have broken the circuit, the circuit was, in fact, still hot. If the load involved was your fuel boost pump and you thought it turned off, when in fact it was still running, what would be the consequences be? If it were a flap or elevator trim device or a landing gear motor, how would a tripped circuit breaker save you if the activating switch was welded closed and in a mode other than what is required for a safe landing?

A DC rated switch will cost you about 3 times more than a AC rated switch of identical current capacity. If your panel sports 10 switches (which is not likely) the difference will be less than $35. You've gotten this far. Is it worth jeopardizing your investment or your safety by cutting corners with even one cheap or improperly rated switch? - *I hope you found this article as enlightning as I did.... Spud*

Increase for 1997!

Sorry Gang! The printer gave us a pretty healthy bump in printing costs. We have increased the US subscription rate from $18.00 to $20.00. - $20.00 to $22.00 in Canada and Alaska and International rates from $29.00 to $30.00.

Thank you in advance for your understanding.

Spud Spornitz

THE CLASSIFIEDS

For Sale: **Pre-fabricated composite components for GP-4.** Cowling - $700.00, exhaust blisters - $100.00, inlet ramps - $100.00, tailcone - $100.00. All four pieces for $925.00. Jake Jackson - Rio Linda, CA (916) 992-0608

For Sale: **Quality custom fabricated metal components for your GP-4.** See GP4BFN issue #4 for complete component listings and pricing. Please allow generous time allowances for your orders. Darry Capps, 813 Hoyer Road, Newman, California (209) 862-2707

For Sale: LETTERING BY ROBERT! - *"N" NUMBERS AND MORE!* High quality self-adhesive aircraft numbers. Numbers and lettering in any shape, size and color. You'll love our work - 100% satisfaction guaranteed. Pricing - 1"-.35, 2"-.55, 3"-.75, 4"-.95, 5"-$1.15, 6"-$1.35, 7"-$1.65, 8"-$1.95, 9"-$2.35, 10"-$2.75, 11"-$3.15, 12"-$3.45. postage and handling $3.50. Ask for Robert after 6:00 p.m. (913) 648-4022 or E-mail "apwrobert@aol.com or mail to: 6501 W. 80th Terrace, Overland Park, KS. 66204-3823

Subscribers Information Center

GP-4 Builders & Flyers Newsletter (GP4BFN) is currently published Bimonthly at a rate of $3.00 per issue/$18.00 a year in U.S. $3.33 per issue/$20.00 a yr. in Canada, Alaska & Mexico. $4.83 per issue/$29.00 a yr. (U.S. funds) per 6 issues to foreign subscribers. Send remittance to: GP4BFN, 1112 Layton Drive, Olathe, Kansas 66061. **PLEASE MAKE CHECKS PAYABLE TO: BILL SPORNITZ**

913-764-5118

E-MAIL BSPORNITZ@AOL.COM

Santa and the FAA!

It is a little-known fact that Santa has to keep his pilot's license current in order to make his deliveries every year, and so the old man wasn't too surprised when he got a letter from the FAA informing him that an examiner would be appearing shortly to run him through the usual recertification drill. A detail of elves was sent out to wash and polish the sleigh, another group was assigned to inspect, service, and repair all the tack, and a third squad started curry-combing all the Reindeer. Santa himself got out his logbook and the rest of the paperwork and made sure that it was all in order.

On the appointed day the examiner arrived, and after the ritual cup of coffee, he went over Santa's log and the paperwork, then followed Santa outside. After a meticulous review of Santa's weight and balance calculations, the examiner watched Santa do the preflight, then followed behind him, looking closely at everything from the bells on the back of the sleigh to Rudolph's nose.

When he finished, he turned to Santa and said: "It looks pretty good so far. Let me get one thing out of my bag and then we'll take her up."

When the examiner got back, Santa was in the sleigh and ready to taxi. As the examiner climbed into the sleigh, Santa noticed that he was carrying a shotgun.

"What's THAT for?" Santa asked.

The examiner looked at him, and with a sparkly smiling wink! "I really shouldn't tell you this, but you're going to lose an engine on takeoff."

Best Wishes To All In 1997!

Spud Spornitz

1112 LAYTON DRIVE

OLATHE, KANSAS 66061

FIRST CLASS MAIL

NEWS FOR CRAFTSMEN OF FAST WOODEN AIRCRAFT!