BUILDERS & FLYERS
GP4
NEWSLETTER

THE OFFICAL VOICE OF GP-4 BUILDERS ALL OVER THE WORLD

VOLUME 6 JANUARY - FEBRUARY 1996

JAKE JACKSON'S GP-4 OF RIO LINDA, CALIFORNIA

● GEORGE'S CORNER

Fellow GP-4 builders,

I was delighted to see how far along Bill Berrick was on his GP-4 in our last newsletter, volume #5. The photo's he has sent me in the past show excellent workmanship. Bill's plan component index is very helpful as well! I use it all the time when talking to the builders.

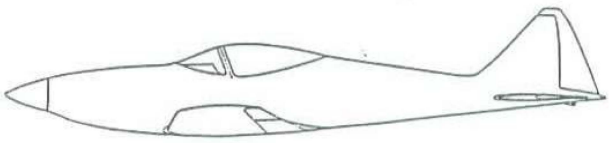
Spud has sent me a few questions.

1. Hydraulic gear plans? I have finally frozen the design for the mains and the nose gear. All mock ups (full scale) are finished and working. I have only used air pressure to actuate the cylinders since I don't have the exact electric hydraulic pump as yet. With 70 lbs of air pressure the gear comes up and the uplocks

engage. We will eventually use about 1,000 to 1,200 lbs of hydraulic pressure to actuate the system. My design shuts the pump off because the up locks hold all three wheels up. We don't depend on pressure to hold them up. I have designed a "CAM" arrangement that releases the uplocks when the pump starts so there are no separate levers or switches to work to get the gear to actuate. Just one switch up and down. F.A.A requires a redundant system to get the gear down, as they should. The mains will free fall when the uplocks and pressure are released. The nose gear must be pushed out into the relative wind. The dynamic pressure to do this is about 70 lbs. at 110 mph. A cable and pulley arrangement will now pull the nose gear into a down and locked position with the pull of about 60 lbs. A slower airspeed would reduce the pull required! I believe I mentioned before that this hydraulic system must be installed prior to installing the main gear and closing up the nose tunnel.

2. More on gluing: Some one mentioned using a two part glue. One part on one board and the other part on the opposite mating surface. I believe this is Aerolite. Aerolite was developed in World War 2 for the Mosquito bombers. Some Falco builders use it. I made some test with Aerolite glue and was able to induce some failures. I prefer the epoxy T-88 adhesive. If you sand the end of a board on a high speed sander you can glaze the end which restricts the glue from penetrating the end of the grain. Its better to just use the saw cut , however an end grain joint hasn't much strength at best so perhaps its academic! The gusset or side skin is what really does the job.

3. Weight and balance: Some of you are getting pretty close to flying so perhaps you would like to see a copy of a weight and



PEREIRA GP-4

WEIGHT & BALANCE COMPUTATION
APRIL 25, 1989

INCLUDES: Head sets, engine oil, Micro Vision instruments, air uplock system no fuel.

Datum: Cowl seam at firewall

FULL GROSS COMPUTATIONS

WEIGHT FORWARD OF DATUM:					
Nose wheel	335.13 lbs.	X	15.375"	=	5152.6" lbs.
WEIGHT AFT OF DATUM:					
Main wheels	960.8	X	34.25"	=	32907.40" lbs.
Fuselage fuel (17 gal.)	102.0	X	12.5"	=	1275.0" lbs.
Wing fuel (37 gal.)	222.0	X	19.375"	=	4301.25" lbs.
Baggage	75.0	X	66.625"	=	4996.88" lbs.
Pilot	170.0	X	51.0"	=	8670.0" lbs.
Passenger	170.0	X	51.0"	=	8670.0" lbs.
	1699.8				60820.53" lbs.

60820.53	1699.80		
-5152.6	335.13		
55667.93 divided by	2034.93	=	27.4" aft of datum

(Wing L.E. is 9" aft of datum, chord = 60") 30.07 % of M.A.C.
(Total empty weight is 1295.93 lbs.)
(Total gross weight is 2035 lbs.

WEIGHT AND BALANCE PERFORMED BY GEORGE PEREIRA DESIGNER - BUILDER.....

MOST AFT CONDITION COMPUTATION

2 PILOTS, 75 LBS. BAGGAGE, EMPTY WING TANKS, 5 GALS. OF FUEL IN FUSELAGE TANK (30 LBS.)

WEIGHT AFT OF DATUM:					
Main wheels	960.8	X	34.25"	=	32907.40" lbs.
Fuselage fuel	30.0	X	12.50"	=	375.0" lbs.
No wing fuel	0		0	=	0
Baggage	75.0	X	66.625"	=	4996.88"lbs.
Pilot	170.0	X	51.0"	=	8670.0" lbs.
Passenger	170.0	X	51.0	=	8670.0" lbs.
	1405.80 lbs.				55619.28 lbs.

55619.28	1405.80		
-5152.6	335.13		
50466.68 divided by	1740.93	=	28.99 aft of datum
33.33% of M.A.C.			

MOST FORWARD CONDITION COMPUTATION

1 pilot, no baggage, full fuel (54 gal. 324 lbs.)

WEIGHT FORWARD OF DATUM:					
Nose wheel	335.13 lbs.	X	34.25"	=	5152.6 lbs.

WEIGHT AFT OF DATUM:					
Main wheels	960.80	X	34.25"	=	32907.40 lbs.
Fuselage fuel (17 gal.)	102.0	X	12.50"	=	1275.00 lbs.
Wing fuel (37 gal.)	222.0	X	19.375"	=	4301.25" lbs.
Pilot	170.0	X	51.0"	=	8670.00" lbs.
	1454.80 lbs.				47153.65" lbs.

47153.65	1454.80		
-1454.80	335.13		
45698.85 divided by	1789.93	=	25.53 aft of datum
			27.55 % of M.A.C.

balance sheet. This copy is afte had repainted my GP-4 henc the empty weight 1,295 lbs. Yo finish paint will ad about 40 lbs. you clear coat. I will also ad tha my GP-4 is a little nose heavy a the battery is just behind th baggage compartment. As yo can see in the most aft condition show a balance 33.3% of M.A.C I have flown the prototype up t 35% aft of M.A.C. It did not ge overly sensitive in pitch or squir rely at all. The only difference could notice was as the flaps came down I still had some af trim left. As some of you know the GP-4 is very responsive to control inputs. This does not mean it is unstable and must be flown all the time. It does just what you tell it to do, quickly!

Spud had sent the last three years or so of the Falco newsletter, I found them very interesting! I was very surprised at the Falco's empty weight. More than the GP-4's but at almost half the G factor! I had the opportunity to fly Carl Hansen's 160 hp Falco. Nice flying aircraft. Handles much the same as the GP-4 except for the fact that is 45 to 50 mph slower!

The GP-4 is really a ball to fly so get busy you guys and maybe we can get together and start having our very own annual GP-4 fly-in!

Very Best Regards

George

RICHARD NADIG UPDATE

ear Spud,

appreciate your efforts in starting up the GP4 news letter. nyone who has not had the "privilege" of editing a news etter has no idea of the time and effort required. For that eason I thought it would be fun to write to you and give you an update on the "wooden tornado" that I have under construction.

The Thursday before Oshkosh I headed to northern Indiana to pick up the wood kit that was advertised in Trade-A-Plane. Turns out that David had begun building the fuselage some 6 years ago and had lost interest somewhere along the way. He had the sides joined and the vertical stabilizer mounted but not covered. The rest of the wood was still in the crates.

I thought that the best place to start building would be the since it seemed most complicated. Also, while the glue dries on the wing parts I can work on the fuselage. As it is always enjoyable to see pictures of what others are doing, and it helps for FAA purposes, each step of the main spar construction was photographed. Just before the back shear web went on the film ran out, so off to the photo shop with it. Nothing! My camera shutter was not opening!!! *&^%$#

Well anyway perhaps I can still be of some help to others that are building the plane. One of the things that was hard for me to adjust to was the lack of detail in the construction manual. I was used to the old Heath Kit manuals. "Find part A, dress part A , install part A next to parts C and F near the front of the chassis." So when the manual says scarf the boards first my first thought was what boards and what is a scarf! Well a few minutes with the plans and it was clear that 2 eight foot boards had to be joined to a twelve foot board. It is not possible to cut a 7 inch board on a 10 inch radial saw so I made two wedges on a 12:1 taper and screwed them to the work table. Next I attached a 1/2 x 4 x 16 inch board to the base of my router and proceeded to route the scarf. Ten minutes each but they were real nice scarf's. Make sure you move the router with [illegible] surface.

The next thing was to build all of those clamps and supports for the jig. Note that the drawing for the support frame(Drawing 17) is incorrect in that the foot of the support should extend under the spar material. See the pictures of George's wing construction and you will see what I mean. I didn't catch this until after the supports were made and this caused some problem in that the wing wanted to twist the supports. One and half inch masking tape was laid out on the table in an outline of the top and bottom spar caps and the top and bottom spar lines carefully drawn on with ball point pen. The top cap support frames were lined up and the top cap built then all but the four center ones were relocated to the bottom cap line. when it came time to join the two caps a number of the support frames were again relocated to the top cap line. In effect there was only one jig for the entire spar and it remained the same since it was not redrawn at each step in construction.

It sure helped to put all of the boards into the jig before gluing as George suggests. That is where I found out about the clamps twisting and it also gave me an idea of how long it would take get it all clamped. It was here that the fact that the boards are too wide for the clamps came to light. So the boards were ripped to 6 inches. This would have been easier before they were scarfed. The most useful tool in my shop is the cordless, variable speed drill. I used that to tighten the clamps. Since it has a release clutch on it there was no problem with over tightening.

Then there was that glue! How much was it likely to take tc glue the spar? How quickly could I apply it? How much is enough? I found some 5 oz cups that had rings on the side and calibrated it for 40 teaspoons of glue. I would fill the cu to the mark and add 4 teaspoons of hardener and mix. On mistake I made on the first cup was to use a fresh woode tongue depressor as a stir. The hardener soaked into th stick and there was no way to know what it did to the rati Out it went and from then on my stir stick always had a co of glue on it.

I laid all of the seven boards on the table in the order tha expected to use them. The long board was placed on c

half of two clamps placed at about 15 inches from the center. After all of the boards were glued then I lightly clamped the 7 boards and placed all of that into the jig. I used a 2 inch brush to paint on the glue fairly heavy so it had a wet look. Two broads were painted and then prior to stacking them I would apply extra glue where it had a dull dry look. Then paint the top of the stack and the next board and stack it until all were glued and stacked. It took five 5 oz cups to do this. I would not try to mix all of the glue at once as I have found it will heat up and harden in the cup. With everything pre-positioned it took me one hour and 20 minutes to paint and jig working alone. The first batch of glue I had mixed was still sticky and had by then soaked into the wood quite well.

The rear spars were not so difficult after I figured out that the four 2 1/2" x 1/2" x 8' boards had to be scarified into 2 sixteen foot boards and ripped into 7/8" strips. Cut off to length before ripping so you have material for the spar webs. It was hold your breath time when cutting the 7 degree angle the length of these spars, however, with a little trial on blank pieces of wood both rear spars measured out correctly.

Since the landing gear must go in before the wing tanks are mounted it seemed that the next step ought to be the building of the center half of the wing. With the center ribs finished it was time to do a layout on the main spar. By the way, I left a 1/2" strip across the bottom of rib 3 to give it some stability until I had it glued in place.

Chord lines were carefully drawn on the front and back faces of the main spar as was a center line down the top. Next the wing was leveled on its' front face and some bondo was used to secure it and the leveling blocks to the table. Small wooden blocks were glued to the top of the spar as a convenient way to level.

The next step was to lay out the rib locations. This is a little confusing in that there is no measurement for center rib 1 to center line and the measurements for the nose rib and tail rib are 1/2 inch different. I finally decided that it was because the cap strips were on different sides of the rib and used the same measurement for all three places. As you lay out these lines for the ribs note that they are perpendicular to the chord line. After the lines were drawn, a square corner block was glued in place on the inboard side of each location the full height of the spar.

Rib one and eleven were located and wooden leveling blocks glued next to the cord lines about two feet apart(the length of my level). On rib one they were on the inboard side and on eleven on the outboard. Rib one was glued into place perpendicular to the center line of the spar(left and right of the rib) and to the chord line(vertical on the leveling blocks which is the rib chord line). Now I deviated from the plans. They say to put in the wing wash later by twisting the main spar. That this is stiff! So, using techniques learned building other aircraft it was decided to build it into the wing. This is done by putting the 1.5 degree nose down on r eleven. That comes out to 5/8 of an inch in two feet so a 5 inch block was added on top of the leveling block at the tw foot point. Rib eleven was glued in place using these block to adjust the chord line. Earlier small holes had been punche with a knife in rib eleven so now a thread could be stretche from rib one to eleven at the back of the ribs at the chord lin The other ribs were lined up to the chord line on the spar an the thread then glued and stapled to the square block previously glued to the front spar. When the rear spar wa laid on the ribs it fit perfectly.

Well, Spud, you can use any, all or none of this in the new letter. It seems to have gotten a little long. Feel free to ca me any time @ 423-396-2220.

I'll send along a copy of this on disk so you won't have t retype if you decide to use any of it. Are you on any of th nets?

Regards, Richard Nadig

MULTICOM

● **Sorry, No Sun N' Fun.....**

I am sorry, I will not be able to attend Sun N' Fun this year The trial for the attempted murder of my son (Ryan) starts that Mon. April 15th 1996. If it wasn't for the death threats made to our family over the phone just after the shooting would come down for Friday, Saturday & Sunday. I feel these calls were meant only to intimidate Ryan not to testify. The police and DA's office say that these types of calls could reoccur just prior and during the trial. You just never know and I just can't take a chance. How all this started over a high school game still has us shaking our heads. Also time has gotten away from me in order to prepare any type of dinner or forums. If I can arrange thing with one of our fellow builders to get something together in regards to a general meeting place or maybe a informal dinner somewhere. I will have them post this information at the WOOD WORKSHOP TENT and/or the Wicks Aircraft booth. Please check these areas soon after your arrival so you won't miss anything. The first Saturday (I now they officially don't open till Sunday) Sunday and Monday are the most popular and we'll try to work around that weekend. I am truly sorry that I can not attend or get things properly setup, but we can shoot for next year. I am already working on things for Oshkosh - Spud

● **Oshkosh 1996!**

I am already working on Oshkosh. We will be having meeting Saturday or Sunday at the Homebuilders Corner Building and

Multicom continued on page 7

THE HIGH PRICE OF METAL COMPONENTS

- **The high price of Metal Parts**

- **Or maybe we have it pretty good!**

If a metal fabricator would offer many more of the parts at a reasonable price I would also be interested so I can go on with the wood building of my GP-4. If anyone knows of any persons please let me know. I already know of one person but the price is much too high. Some $7000.00 of labor and machining seems high.

Larry Boggan
P.O. Box 49416
Colorado Springs, CO. 80949

Now I'll be the first one to say when I saw Darry Capps price sheet in the last issue my "Heart skipped a double beat" and I like to pinch my pennies just like the other guy. BUT... the farther I looked and thought about it the better these prices looked. We must first remember that Darry or anyone else is not mass producing these components. Basically when you place an order with Darry he then sets out to make you "one of each metal component that is required for the GP-4." Each piece is made and welded by hand. If anyone has TIG welded, sometimes referred to as "Heliarc" should know that it creates a weld of beauty and strength. but this welding process alone is incredibly SLOW.

You estimated that there was $7000.00 in machining, welding and labor built into Darry's metal kit (not counting the raw materials). If you divide this $7000.00 buy even at a modest shop fee of $35.00 this only equated out to 200 hours to build all these parts. I know that I "can not" personally produce (best estimate) these parts in 300 hours. We must also remember that Darry Capps isn't building these components because he doesn't have anything else to do or because "He just loves us, Man!". He is doing this for a profit, but from here, looks like a very modest profit. Also, what I hear of Darry's machine shop equipment list (spell that as expensive!), $35.00 would be a minimal shop rate.

Let's look at it from a different angle or perspective. I have a friend that is building a Falco. I showed him Darry's price sheet and he said "Boy, that's a buy" I said "Right smarty" He then disappeared into the house. He reappeared with a catalog and price sheet from Sequoia's Aircraft who puts the kits together for the Falco. The catalog and price sheet were dated January 15, 1995. We went through and studied very closely what kits were wood kits and metal kits. Below is a list of the Falco kits and prices for the manufactured metal components:

801-1 Tail Group Equipment $1240.00
802 Fuselage Equipment $1125.00
803-1 Wing Equipment $2350.00
804 Flap Control Equipment $1290.00
805-1 Control System Equipment $2750.00
808-2 Dynafocal Engine mount $1965.00
810-1 Main Landing Gear & Eqpt $4475.00
811 Nose Gear Equipment $2780.00
812 Landing Gear Retraction Eqpt $5150.00

This adds up to $23,125.00 Dollars!!! Darry Capp's complete metal package is 60% cheaper than the Falco's. That's $13,195.00 less. The savings over the Falco metal kits alone will pay for all the materials from Wicks Aircraft, all the fiberglass components from Jake Jackson, the canopy and still have money left over.

I left some others things out that are metal, all the Falco fuel tanks are metal (another $4340.00), trim tab system and etc.

This is not meant to undermined the Falco in any way, it too is a remarkable aircraft. But is meant to give a value comparison to the GP-4. We must give George credit for building in these "economics" into his design. One of his design goals was to be able to allow the builder to get "More Bang for the Buck!". In others' words, we may "all" have had to settle for a little bit lessor aircraft if it wasn't for the way George designed the GP-4 to be constructed.

A couple of other ways to "Soften the Costs" of the metal component pieces.

1. You can build all of these components yourself. Buy a gas welder and/or a TIG Welder. Take a night course in welding. This could be a very enjoyable process. I personally love to weld.

2. No where does it say in Darry's price sheet that you must buy all of the components. This gives some option:
A. Divide up the purchase into 3 to 5 different purchase times.
B. Build the easy items yourself and then purchase the difficult to build items from Darry Capps.

Spud Spornitz

also I am working on a builders dinner banquet. I sure would like to get a ball park idea on how many people are interested in attending these events. We're going to do it up right! - Spud

● **Up coming builders list!**
We are going to release all of the names of the current builders that are on the GP4BFN roster. This has been one of our largest requests, so we are going to do it. If for some reason you do not want your name released to your fellow builders. Please phone or write ASAP - Spud

● **You missed it too and nobodies perfect!**
It was just a couple of days after the mailing of our inaugural issue GP4BFN #1 last March and I thought I would stop for a moment to review my handy work..... I looked at the front cover and my eyes almost came right out of my head! I had spelled George's last name wrong, on the damn front cover yet! I thought for a moment..... then the hot rush came over me and I shrank down to about 3 inches. I've already mailed them and I can't get them back. After much procrastination I decided to call George and confess in advance. George, the super guy that he is just laughed it off. About a week later I received a note from George and it read like this. "Dear Spud, The war was just over in Europe and we were all getting ready to ship home. There was a long line to get a stencil made for our foot lockers. I decided to paint mine on rather than wait out the line. I lettered my last name PERIERA, instead of Pereira. It can happen to anyone! Thought the newsletter is off to a great start! Regards, George" - *It takes a special person to laugh at himself . Thanks again for very special design and all your support - Spud and the gang.*

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 peices for $925.00. Jake Jackson - Rio Linda, CA (916) 992-0608

For Sale: Elevator torque tube as per DWG 12 and rudder pedals and clivis arms per DWG 7 $150.00 Don Milker, Port Ludlow, Washington (360)437-9331

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

GP 4

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913-764-5118

E-MAIL BSPORNITZ@AOL.COM

It is said that the Falco is considered to be the Ferrari of the air!

If so.....

That would obviously make the GP-4 the Lamborghini!

'Spudley

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