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GP-4 BUILDERS & FLYERS NEWSLETTER

February 2012
GP4BFN56

News for builders of fast wooden aircraft!

Les Conwell's GP-4

GEORGE'S CORNER

BY GEORGE PEREIRA

Fellow GP-4 builders:

Perhaps some of you have noticed on my website (www.ospreyaircraft.com) that my GP-4 is for sale. My 88 years are telling me it may be time to let someone else enjoy the fun and excitement I have had since 1984.

From the drawing board starting in 1979 to our new year, it's been an exciting and rewarding ride. My sale notice doesn't mean I am retiring from Osprey Aircraft. My phone, e-mail, and address are still open to help solve builder problems or share a chat about flying or building your own airplane.

The GP-4 serial number to date is 628. My estimate is that 40 to 50 have flown. It doesn't seem possible that it all started 28 years ago when I first test flew the 59GP and later in July headed for Oshkosh.

Oshkosh in 84 was a big year for me. The crowds around the airplane led me to enter it for judging in Outstanding New Design and Custom Built, a Lindy award. The new design award consisted of 10 judges, all aeronautical engineers, who gave you 10 minutes to explain your design after which they grilled you with questions. With several questions left unanswered, I left this inquisition with little hope of winning anything. I was also faced with very stiff competition, like Ed Swearingen's beautiful SX300 parked right in front of my GP-4. Cutting my reflections short, I lifted off Oshkosh runway 18 headed west for Sacramento with two coveted trophies in the baggage compartment. A grand champion and 10 guys who liked my GP-4.

These 28 years have flown fast and the rewards of builder completions never cease to thrill me. My message for 2012 is the same as past years. Build a safe, beautiful airplane and enjoy the excitement and fulfillment of your work. It puts you into a very special class.

Happy New Year,

George
3741 El Ricon Way
Sacramento, CA 95864
phone 916-483-3004
fax 916-978-9813

BUILDER'S RESOURCE

BY BOB FOSTER

Many GP-4 builders who have completed their fuselage have installed Jim Weir's antenna kit. Jim has many more "can't live without" electronic designs that will save you beaucoup bucks or as he says, "A champagne panel on a beer budget." He has published a full panels' worth of designs in Kitplanes for several years, from about 1996 to present. I have listed all the publications and subject that I have, perhaps someone else could fill in the blanks

Kitplanes Magazine

Jan 97, pg 87, Coaxial cable

Mar 97, pg 69, Extending landing light life

May 97, pg 72, ELT antenna

July 97, pg 79, Wire rack

Oct 97, pg 62, Radio Connectors

Feb 98, g 86, Radio "stuff"

Apr 98, pg 20, Altitude chamber

June 98, pg 86, Auto Am FM Radio

Oct 98, pg 60, Inexpensive intercom

(I missed most of 1999 & 2000)

Dec 99, pg 115, VHF nav antenna

Oct 00, pg 49, LED position lights

Nov 00, pg 65, GPS

Jan 01, pg 88, Dim Bulbs

Feb 01, pg 61, Antennas

Apr 01, pg 61, lamp dimmer

Aug 01, pg 68, Aviation software

Feb 02, pg 43, Engine monitor

Apr 02, pg 79, Battery sulfate buster

COMPLETED AND FLYING GP-4s

PLANS NUMBER	NAME
0	George Pereira
1	Darry Capps
2	Jake Jackson
8	Steve Baum
31	Pat Salomonde
49	Thomas Evans
134	Ernie Holmes
193	Mike Traud
202	Don Austin
233	John Reinhart
260	Phillip Foshee
283	Tony van den Heuvel
292	Paul Guglielmi
323	Jean Claude Luxey
360	Lynn Sheets
366	Jim Simmons
385	Les Conwell
396	John Evans
?	Tore Jostein Lie
?	Bernie Griffin
502	Mike Mahar

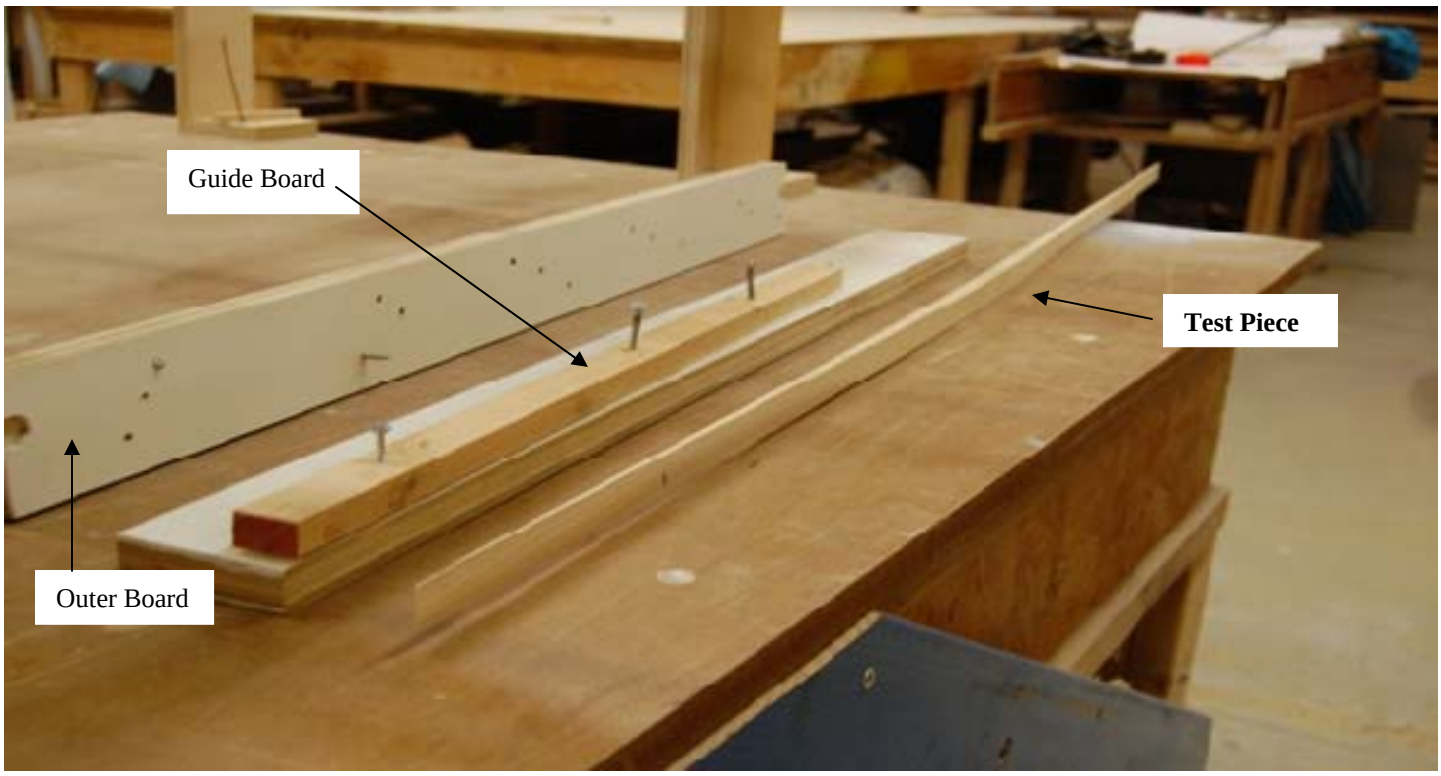
Send updates to gp-4@woh.rr.com

BUILDER RAY CALL'S UPDATE

By Ray Call

When Elton suggested a newsletter containing current projects and their status it seemed a good idea to include the self-awarded Best Jigs and Fixtures portion. The many aids to construction in my shop include the Double Sided Tapering Jig. That is the one I would like to show.

While pondering the instructions on dwg # 11 which show the stabilizer construction details, I was mightily confused for a time. Then it became clear that the stabilizer is symmetrical and things began to make more sense. The detail drawing of the stab spar includes two notes: "Top cap strip ¾ wide X 3/8 thick. 2nd cap strip ¾ wide & tapers, 25" from center line." Tapering the 2nd cap strip presented a challenge. Only 3/8" thick and tapering to a feather edge in 25 inches?



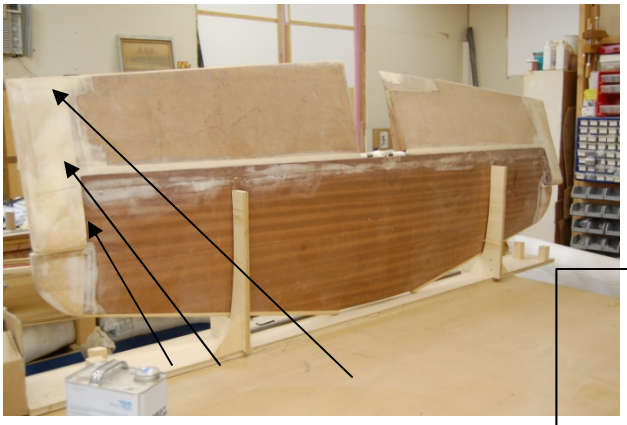
This is what I came up with. Two ¾ X 3" X 30" boards sandwiched around a shorter and narrower guide. The guide is the same thickness, ideally just a hair less, as the piece to be cut. The guide board is fixed to one of the outer boards such that the angle it makes with the edge of the outer board provides the desired taper. The second outer board is screwed in place so its edges are in the same plane as the first outer board. The desired part is held in position by the guide board and clamped edge to edge by the outer boards. The table saw fence is adjusted to cut flush with the width of the outer boards and the whole assembly is run by the blade. One outer board is removed, the part swapped end for end, the jig reassembled and run through the saw again. A perfectly tapered, 50" long part and you can make as many matching parts as you desire. The tapered piece shown is the test piece, of poplar, that I cut 4 years ago. I have used the jig for several additional projects including making the piece that joins the stab leading edge halves.

The fuselage is ready for the wing and stabilizer installation. I decided to put both wing and stab on the fuselage at the same time so I could adjust the rigging more easily. The fuselage is only covered on the top half to allow better access for putting those parts in. The antennas are installed, and rudder cables run from the rudder to the cockpit area. The rudder pedals are installed. I used an extra support for the rudder cables as described in the newsletter. Also, the rudder pedal torque tubes are made to separate to ease removal as described in the newsletter.

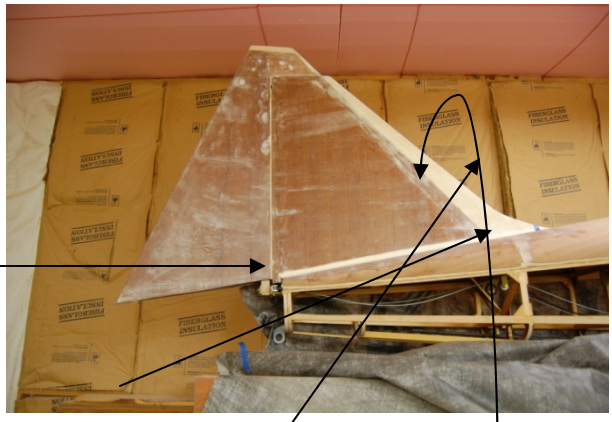
The brake actuating system includes the modified link described in the newsletter to enhance the mechanical advantage of the pedals. I used MATCO wheels partly because the Cleveland 199-102's weren't available for 6 - 9 months and I wanted to finish the gear legs and get them primed and painted. The MATCO units are less expensive, I used W51LT units with higher ratings than the 199-102.

This set of rudder cable guides are per the plans.

Sitting on the rack waiting for the wing and stab.



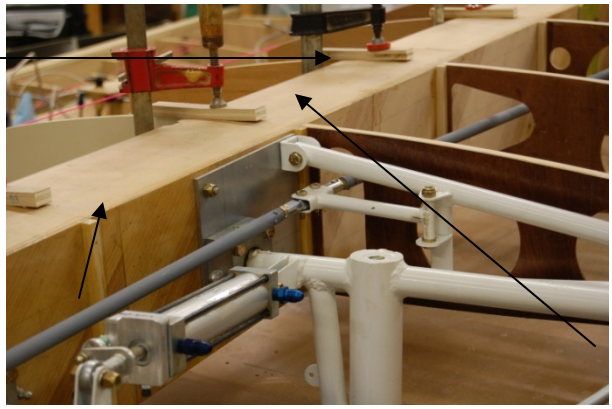
The tips are part balsa, part foam.
The counterweight is inside a balsa cap.



#1 comm ant is in the forward lightening holes.
The batten is just visible here.

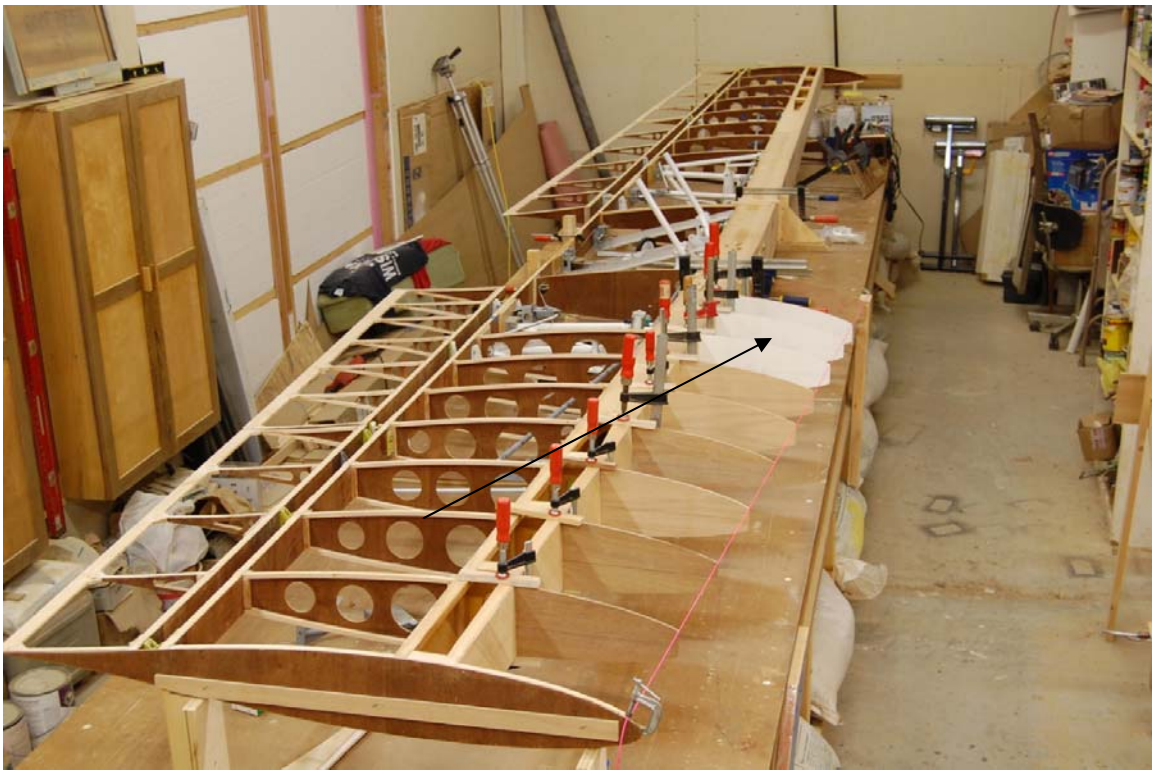
The #1 comm and transponder antennas are commercially made. The others are homemade, # 2 comm, VOR and Glide Slope. Here is the tail tie down ring. The leading edge is foam, the fillet micro balloons.

The main landing gear started out in a mock-up of the wing center section. Mounted there they tested well, retracting and extending with accompanying lights and horn. The mock-up has been very helpful but is now taken apart and the gear are installed in the wing. The hydraulics are not yet installed nor is the electrical wiring. Ribs number 2 and 3 are fitted but not yet glued in place. The seat rails and control sticks are in place. I made stick grips out of Osage Orange and installed 'coolie hat' trim switches and push-to-talk switches in both grips. The ailerons and flaps are mounted and the controls for them are in place. The aileron counterweight supports were modified so the spar only had to be drilled out enough to clear the ½ " support tube, not the entire lead pan. So far I have done all the welding and machine work for the various hinges, tubing, and parts.

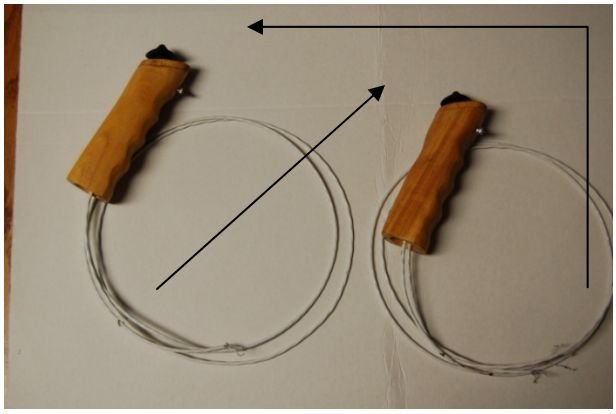


The up limit switch was moved to the actuator.
Aileron push rod just clears the landing gear mount.
The aileron idler arm is shorter than the plans call for in accordance with the modified plans that use the bearings in the mount blocks. Good thing it is shorter or the tube would interfere with the gear blocks.

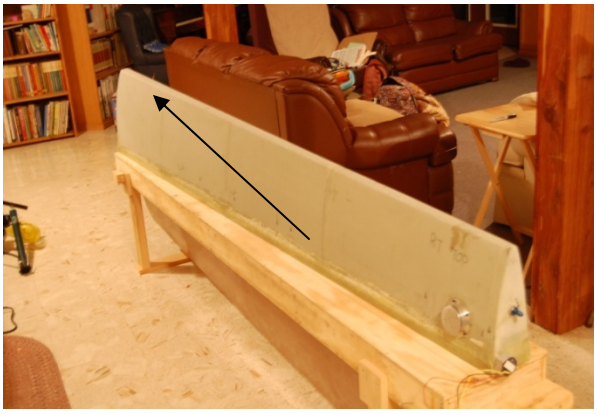
The landing light mounts are custom made.
Flap up stop is visible here.
The up limit switch uses this 'ring' to actuate.



The leading edge rib patterns are aligned. The leveling batten is still on rib 11. I built in the aerodynamic twist at this stage instead of later. The idea is in a newsletter.



Stick grips.
(This is a fuel tank mold upside down. A great smooth portable surface.)



Completed airtight fuel tank. Even the homemade fuel cap is airtight. The hex nut with wires is the business end of the capacitance fuel probe.

Inside the tank showing the fuel pick-up, filter screen, fuel probe, and tank sealer. The drain is also just visible.

The sump drain is visible here. It is a circle of Al. screwed and glued to the tank bottom. The drain is set in the center. The wooden blocks with eyelets are glued to the tank wall to hold it in position while applying the back to the tank. A couple more blocks still need to be added.

Thanks for letting me share some stuff. It is a great and sometimes frustrating adventure to build a GP4. Good luck on your various projects.

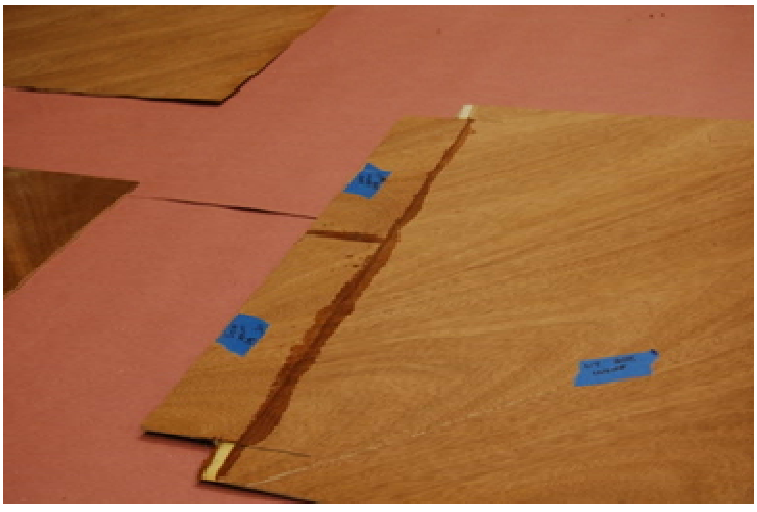
Suppliers:
Balsa wood in large pieces, great for the control surface gap seals. 'Specialized Balsa' Tel 970.461.9663, 405 8th St. SE Unit #2, Loveland, Colorado 80537-6491. Much less $ than the local hobby shop.
Bearings for the landing gear mounts: Motion Industries, 247 S. Gladstone, Columbus IN 47201. 4 each GEZ 100 ES and GEZ 014 ES spherical plain bearings.
2 foot wide adjustable radius pan brake, HECK, PO Box 425, 1480 Old 23, Hartland, MI 48353. Tel 810.632.5400
Antennas – Advanced Aircraft Electronics, INC. PO Box 28, Ellwood City, PA 16117 (I used a communications and their flat mount transponder antenna.)
JWF Technologies 3491Mustafa Drive, Cincinnati, OH 45241. Tel 513.769.9611. Hydraulic pump and cylinders, Whitey 3 way 'emergency extend' valve.
Kit Components INC, 2244 SE Airport way, Redmond, OR 97756 Tel 541.923.2244 This is a Lancair parts house. They have lots of goodies including the fuel tank sealer in gallons, H-9700 Epoxy Novolac Coating System, they recommend for coating the fiberglass fuel tanks in Lancairs. It is also recommended by other sources. This is the only place I could find that would sell it in one gallon kits, the others have 5 gallon minimum. They have various unique hardware items, fiberglass tools and materials, and other things. If you want an automatic gear extension system based on minimum speed, kind of like Piper's system, they have them.
Centroid Products, INC. 2104 Hibiscus Drive, Edgewater, FL 32141. Tel 386.423.3574. The only place I could find 8 foot, or longer, capacitance fuel probes. I got the 0-5 volt system like most aircraft fuel gauges use. They use a ½ npt fitting to secure the probe, and a 2 inch hex to house the electronics. You have to ask for that stuff, the normal probe uses the 5 hole SAE mounting system that would stick up above the surface of the wing.
www.cruzpro.com. Out of New Zealand, they make great fuel gauges that 'learn' the nonlinear shape of the fuel tank and provide accurate readings. The gauges also provide fuel flow and other options. I have the FU60S gauges. You have to work with the factory to get the 0-5 volt units.

www.digikey.com. A great source of all things electrical.
www.mcmaster.com A great source of tools and various materials. I got 3 inch aluminum bar stock here for the fuel tank caps and filler necks, lots of letter and number twist drills, copper foil designed for antenna elements – it is thicker and for me easier to get a permanent solder connection with the coax than with the .002 foil, and many other bits and pieces.
www.matcomfg.com for info about MATCO wheels and brakes. Tel 801.486.7574

The building table in the plans is fine, but I figured my project would take several years and is located in a barn that isn't all that environmentally stable. Concerned that 2 x 4s wouldn't stay as straight as desired in the changing weather conditions, I chose to use wooden 'I'beams, 'TJI' as I know them. I got some with laminated caps, 10 inches overall height. I used 20 legs with homemade levelers, ¾ inch bolts drilled into the leg ends and supported with washers with a nut between the head and washer for adjustment capability. With ¾ inch ply on the top I leveled the table and discovered the ply all had a cupped surface. I used a concrete floor- leveling compound, filled and screeded the cupped surface to level. To top the filled ply I screwed on a layer of ¾ inch MDF. The MDF provides a nice smooth consistent surface – very easy to write and draw on, supports screwed to it don't tilt in random directions. It is also easy to replace if required. Sand bags help hold the table in level position.

To continue... something that came to mind while preparing to skin the wings. With 5 sheets of 8 foot long plywood one sheet is cut into quarters which means those pieces are 2 feet long. The wing panels from inside rib one to the outside edge of the tip rib, is about 10 feet. Mine came to about 3/16 inch over 10 feet. Even if they come out exactly to 10 feet, each of the 4 wing skins will be about 1 inch short of 10 feet. Why you ask? Because 8 feet plus 2 feet is 10 feet, BUT, the scarf joint requires an overlap so your 10 foot skins are now 119 inches, plus or minus, long. Not wanting to buy another sheet of ply, I measured out the width of the wing onto the sheets. At the root most of the width of the sheet is required, but at the tips there is extra material. I cut 4 or 5 inch pieces of this material and scarfed together one 4 or 5 inch wide strip long enough to reach from leading to trailing edge at the tip, plus some room for error. Then I scarfed that strip onto the tip end of the 2 foot wide pieces, then that 2 foot plus wide piece was scarfed to the 8 foot piece. I did that 4 times and had 4 wing skins that allowed plenty of adjustment room to fit onto all four sides of the wing. Be careful when you cut the 4 inch strips that you get the grain direction you want. Use care in all the scarf joints to maintain the grain direction you want.

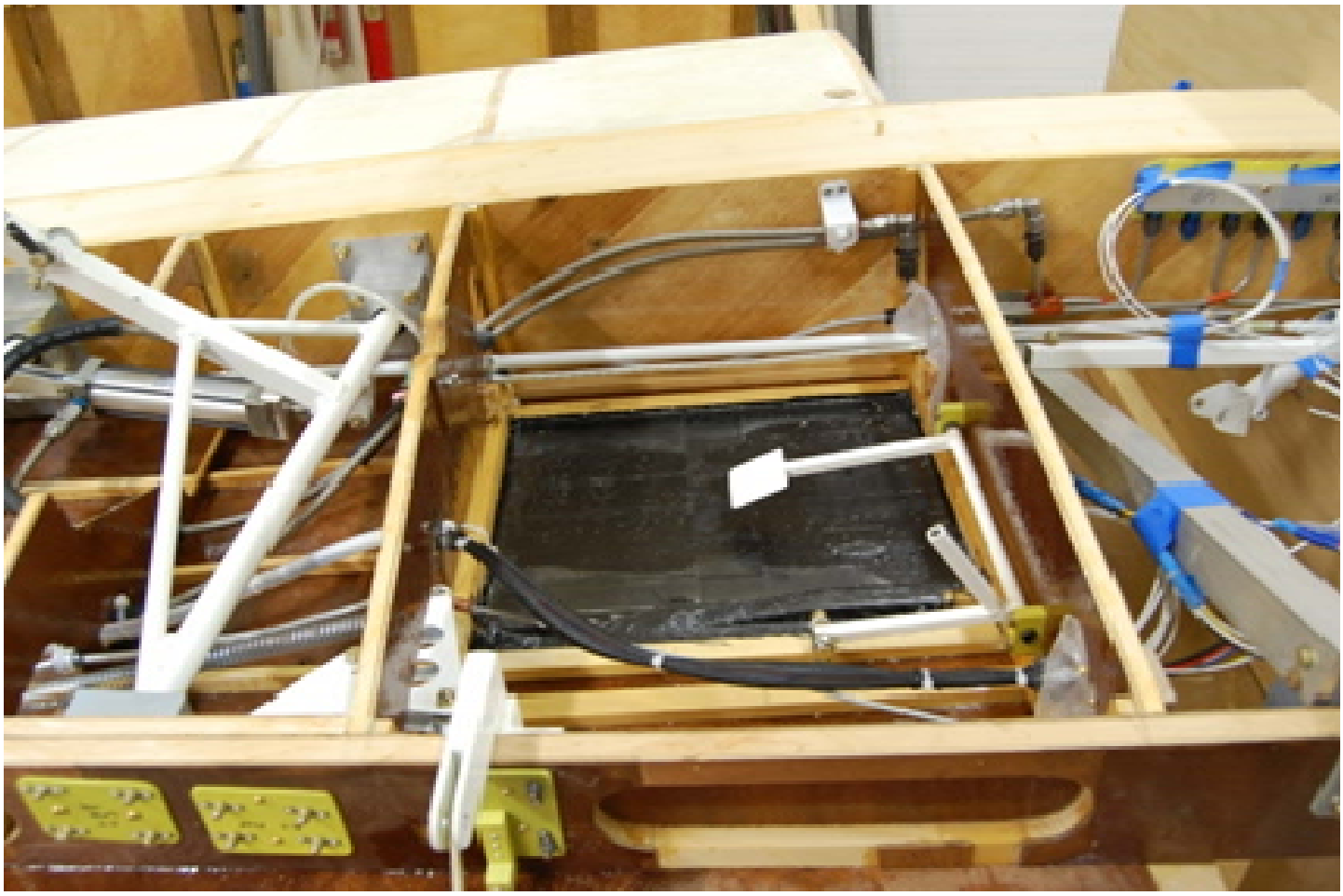
Here you can see the small strip scarfed onto the 2 foot piece. All pieces were marked as to final position to help maintain proper orientation.



The grain direction is shown in the plans one way and in the builder's manual pictures another. Geroge reminded Les Conwell who told me that the important point is that the top skins and the bottom skins be oriented in such a way that the grain of the top and bottom skins on the same wing are opposite each other, not parallel. For instance, the

tops skins could both be oriented so that the grain,-running from leading to trailing edge- slopes from tip to root, forming an upright "V" when viewed from the tail, and the bottom skins, -again from leading to trailing edge- slopes from root to tip. I think it is best to not have both top or bottom skins with grain running parallel from tip to tip. But it is essential that on each wing the top and bottom skins be oriented so the grain is opposite on top and bottom

A word about the wing walks. The plans give the option of using carbon fiber cloth in place of the wooden battens to allow more room for the wheel to retract into the well. I found the angle of the wheel in relation to the top skin is such that clearance is only an issue in a small portion of the chord of the wing. Being cheap, I used battens where clearance is not a problem and carbon fiber in the center area of the chord where the tire gets close to the top skin.

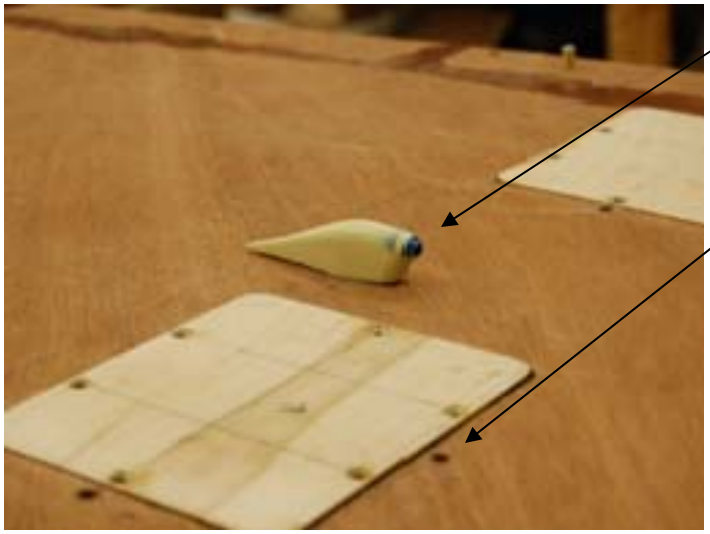


Here you can see the black carbon fiber cloth in the center of the chord area. I used a piece of masonite cut to fit the cloth and covered with a layer of duct tape to press the cloth while the resin cured. On top of the masonite were a few paint cans for weight. The cloth laps onto the ribs and battens.

The wing battens, listed on dwg 37A were installed prior to skinning the wing. I figured they would be much easier to fit at that point instead of having to remove all the landing gear items. The top skin was installed first, then the bottom. Cutting the landing gear access holes in the bottom skins was fun.

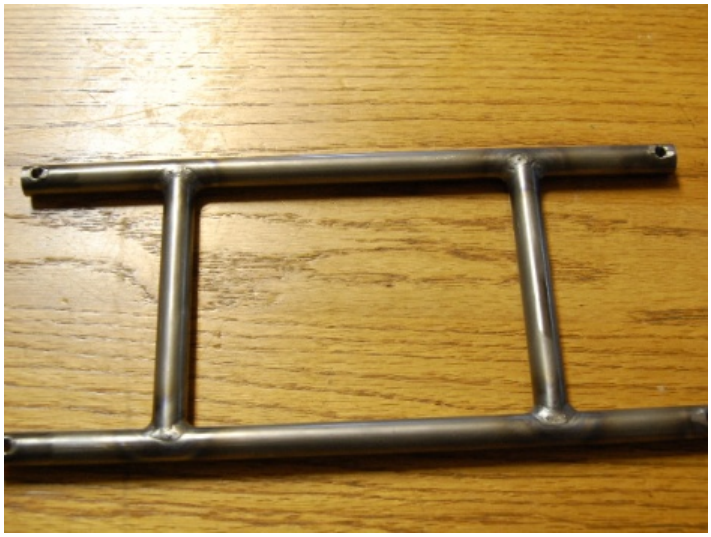
Here you can see the gap in the wing walk battens where the carbon fiber was later installed. The aluminum tubing visible between the two foreground battens above the flap bellcrank is the pitot tube line. The wire bundle is protected with spiral wrap and leads through a shop made grommet in rib #2.

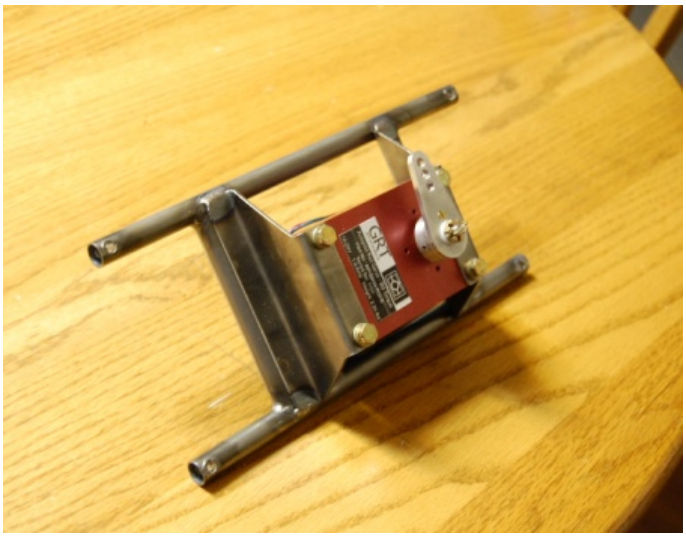
For all the inspection/access panels I used router inlay techniques and made all the covers from wood so they fit flush. They attach with flat head screws. They look better when the screws are installed.



The little fairing with the blue tip is the fuel tank vent. The fairing houses a 90 degree elbow so the vent line is still opening into the wind but is not protruding from the wing's leading edge. The two dark circles at the edges of the opening are ¼ inch dowels used to ensure proper positioning of the internal retaining flange – did not want to glue the access panel in the hole while gluing in the flange. The flange has #8 blind nuts riveted in place to catch the flat head mounting screws.

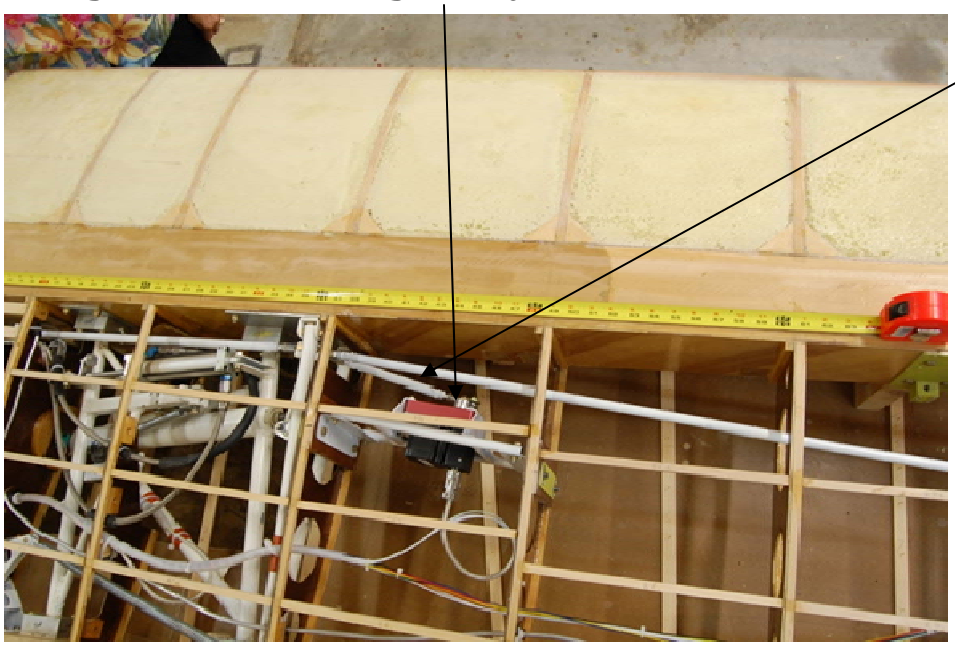
Some have asked about the autopilot servo mounts. With so much already going on under the seats I choose to mount the aileron servo in the wing. It has an access panel a bit larger than the plan's aileron bellcrank access panel. The tubing is 4130 of ½ inch diameter, .035 wall. The sheet is 4130 .070.

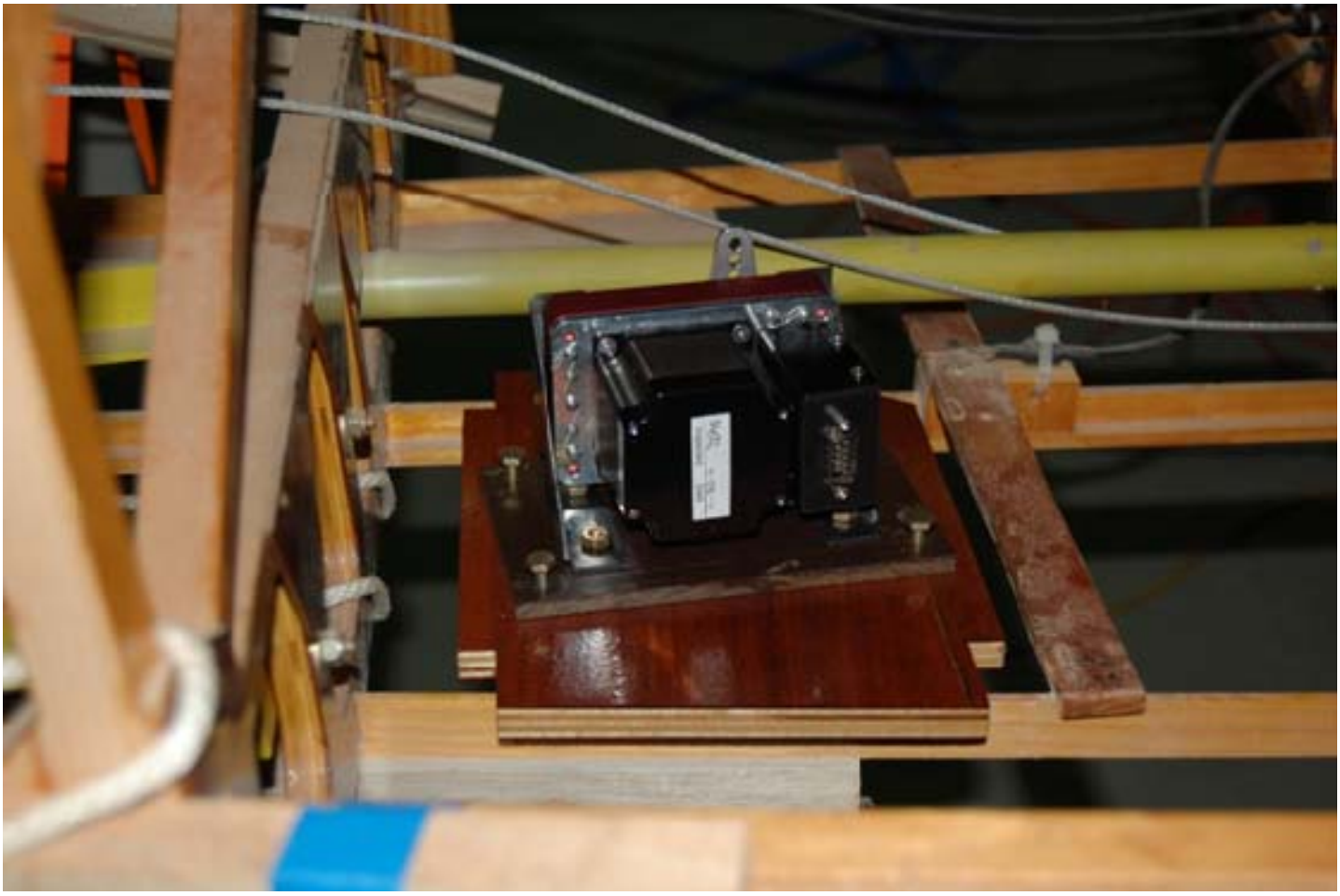




There are transverse tubes welded at the mounting holds so the bolts do not deform the main tubes. On the 'back' side of the short vertical tubes are some welds between the tubes and folded 4130. With the assembly mounted in the wing the drilled philster head screws used to mount the servo are now safety wired. This assembly mounts between two almost 90 degree steel flanges which are in turn mounted to the ribs with blind nuts and nut plates.

The pitch servo is mounted in the fuselage just aft of the baggage compartment. It uses a push pull tube that is mounted to the elevator push rod at the forward elevator idler arm. There is a piece of ½ inch mahogany ply grooved to match the lower "T' and "V' battens. On the wood are mounted two flanges that hold the servo in the same manner as the aileron servo. The aileron servo connects to the aileron push rod via a short rod from servo to idler arm bolt at the idler arm just outboard of the main gear. The red rectangle nearly in the center of the picture is the top of the aileron servo. You can see the white push rod from the servo to the idler arm and also the wire with the service loop coming from the back of the servo.





The pitch servo without its push rod and wiring hooked up. There is a ¼ inch thick phenolic plate bolted to the permanently installed ½ inch mahogany ply. The servo is mounted on the phenolic thus allowing easy removal of the servo.

Happy Building,

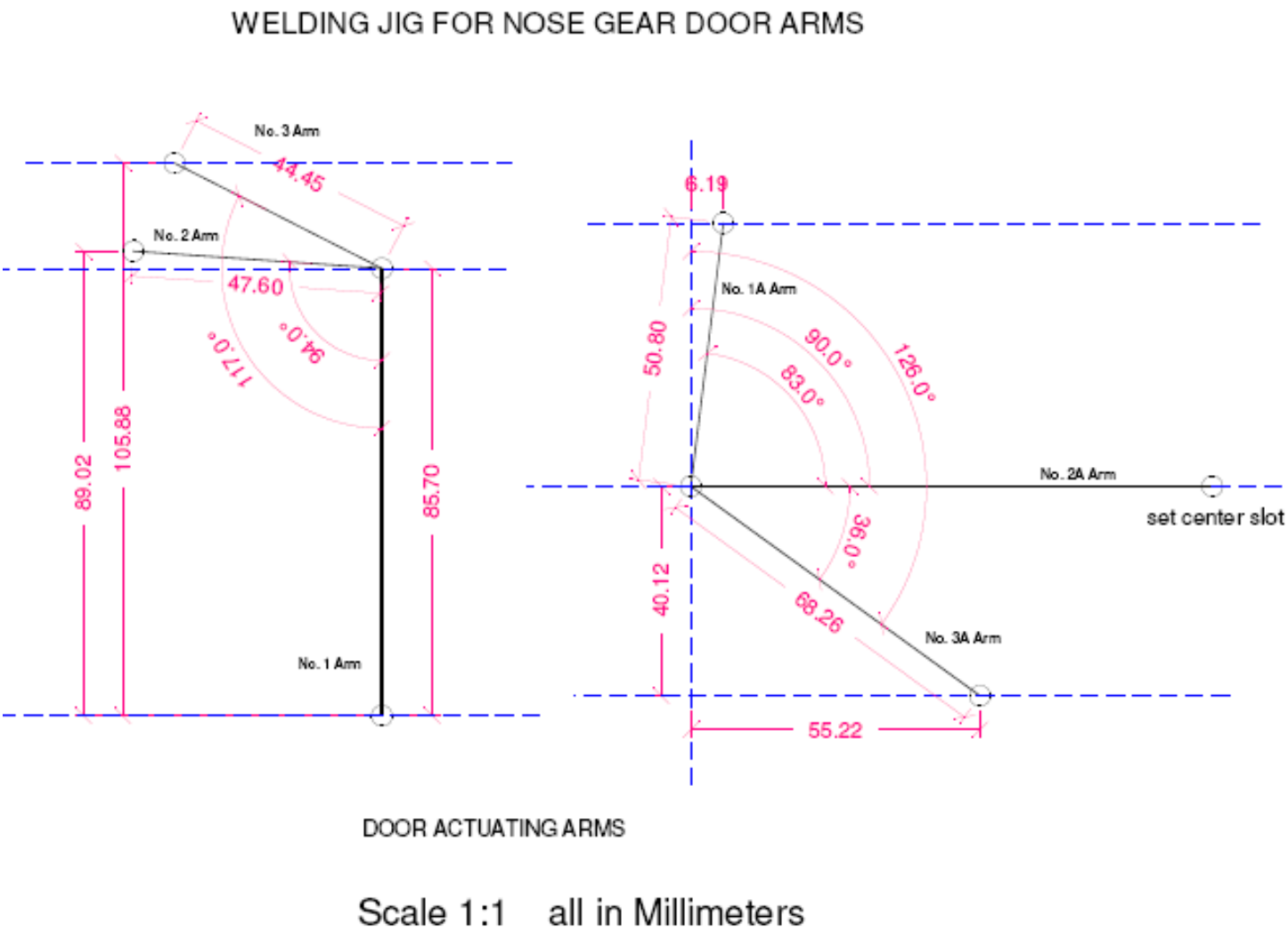
Ray Call

NOSE GEAR ACTUATOR ARM WELDING JIG

By Uwe Seimetz

Below is a little helper to build a welding jig for nose gear actuator arms (DWG No N-3). The system is self explanatory is you study the drawing. Draw the horizontal and vertical blue dashed lines and drill the holes in the correct diameter. If this is printed in the original measurements (to scale) the printout can be used for a model.

I have resized it here to fit the space available on the page, send me an e-mail and I will forward Uwe's original version e-mail to you. (elton) - ecultice@woh.rr.com



WING TURN-OVER DEVICE

By Bob Ringer

The finished wing of the GP4 is about 24.5 feet long and weights approximately 300 lbs with some protrusions such as pitot tubes that can easily be damaged. This makes the ability to rotate the wing safely 180 degrees, with a minimum of effort, a real plus to ease the task of sanding and applying paint. Working down on a surface makes sanding easier and reduces the chance of runs in the paint. The ability of one person to move the complete wing with little effort is another great feature. My good friend, Wayne Tomkins in Australia, who has his beautiful GP4 completed and ready for first flight, designed the device in this article and was kind enough to give me permission to publish it. I drew up the plans and completed a material list. The drawings may not be detailed but reference to the photos will make them useable.

The material cost less than $100.00 (less the wheels) and can be constructed in less than a day with a MIG or TIG welder. I purchased the four wheels, which are normally used at the bottom of standard construction staging, from a discount store for under $80.00.

Once completed, the wing is suspended on the frame using the same holes as the wing to fuselage brackets. The wheels are optional and I have drawn the plans allowing for a wheel height of 9 inches, so if the wheels are not used, just increase the length of the verticals by 9 inches.

The painter who will apply the finish to my GP4 is less than one mile from my shop and I intend to wheel the wing on the streets from my shop to his.

Material is 1/8 wall thickness steel	2″ X 2″ X 6 feet (4 pieces)	24 feet
	2″ X 2″ X 5 feet (3 pieces)	15 feet
	2″ X 2″ X 9 feet (1 piece)	9 feet
	1 ¾ X 1 ¾ X 6 feet (3 pieces)	18 feet
	1 ¾ X 1 ¾ X 8 feet (1 piece)	8 feet

Round tube stock to attach wheels in each corner

1 and 3/8 interior diameter 24 inches required

See Pictures Next Pages

WING TURN OVER DEVICE

PHOTO 1

NOSE GEAR ACTUATOR ARM WELDING JIG

PHOTO 2

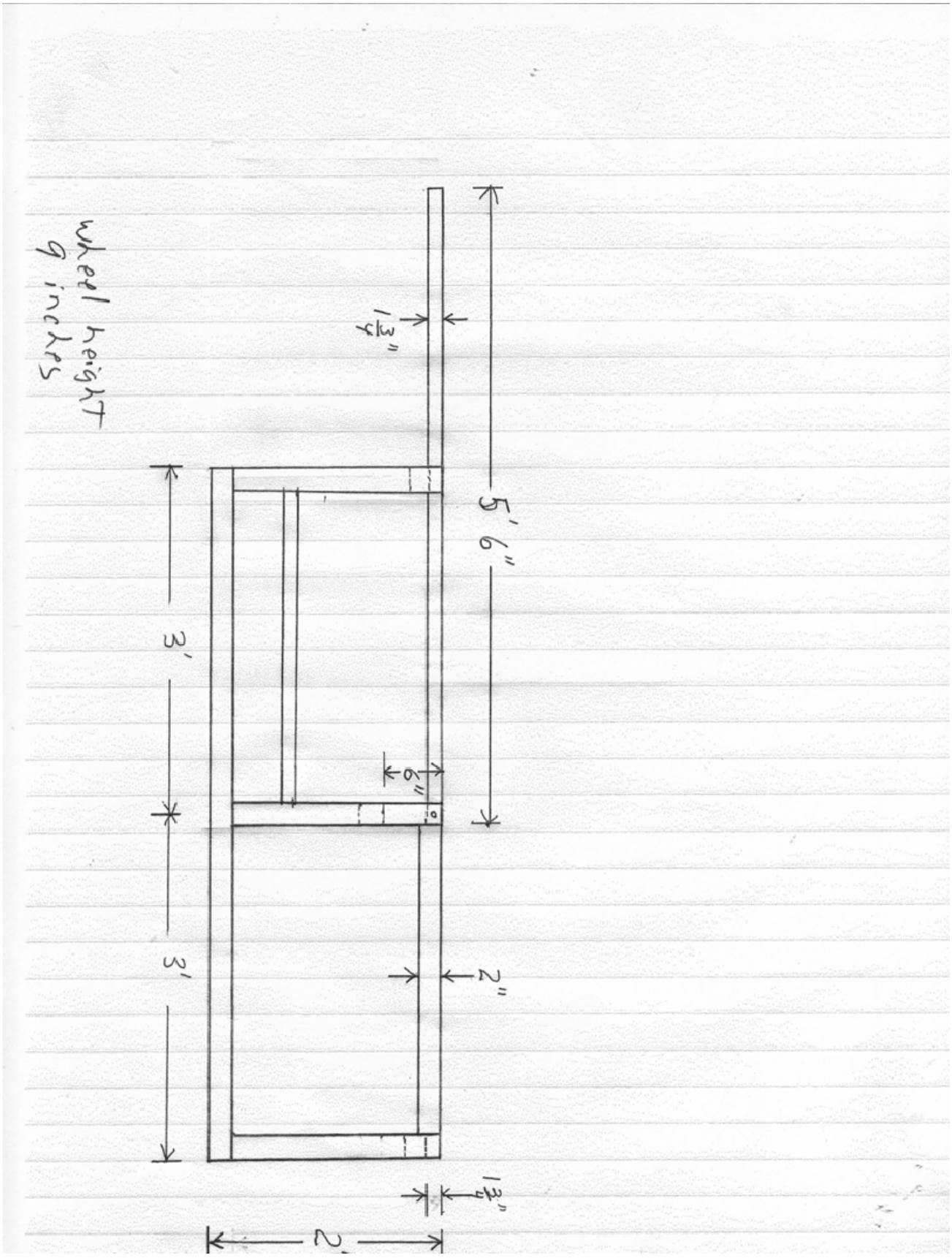
WING TURN OVER DEVICE

PHOTO 3

WING TURN OVER DEVICE

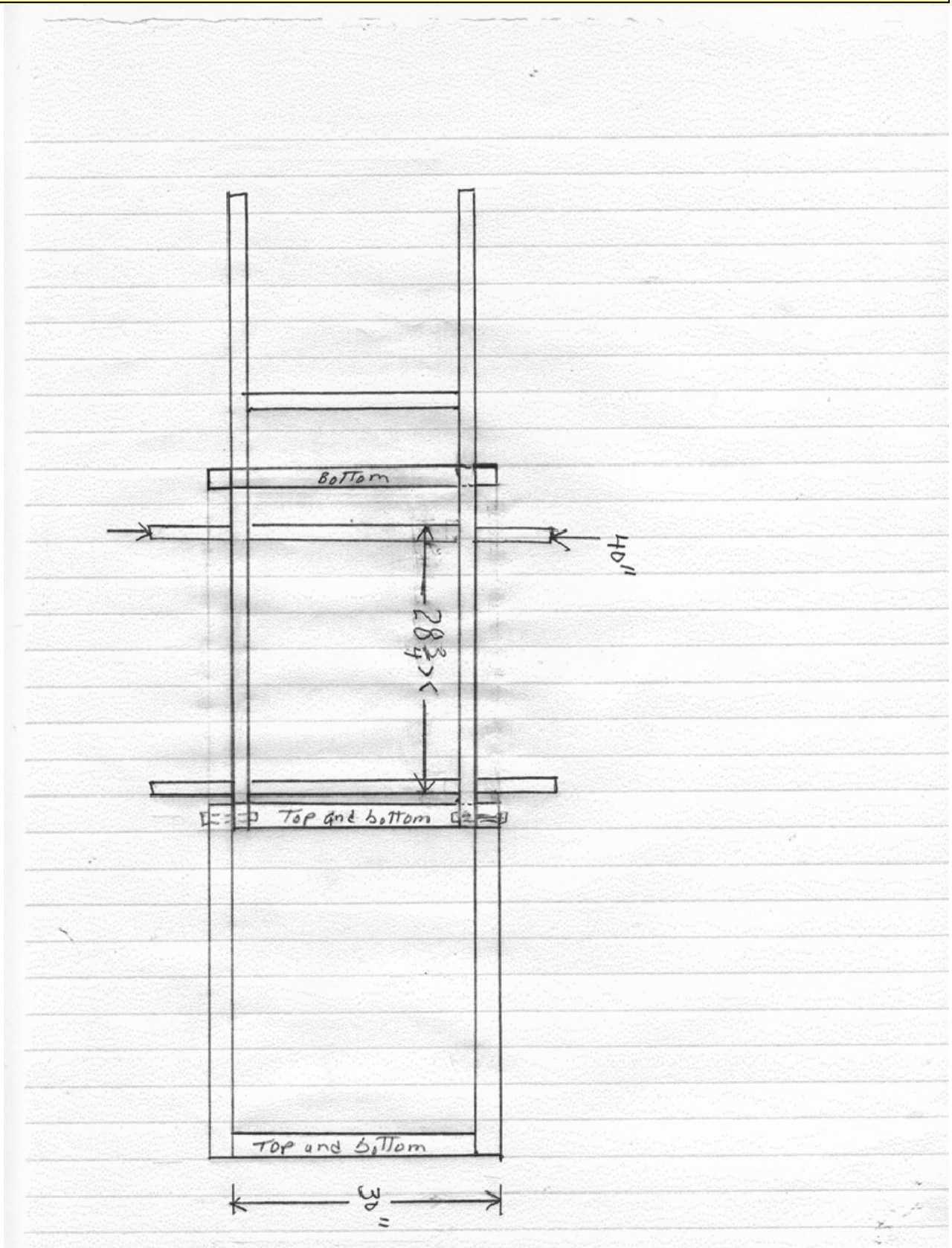
PHOTO 4

WING TURN OVER DEVICE



SIDE VIEW

WING TURN OVER DEVICE



TOP VIEW

Shipment of Engine Cowls by Bob Ringer

I purchased the molds to construct the GP4 engine cowls from Jake Jackson, Sacramento because Jake was no longer building them for GP4 builders. I had flown to Sacramento to visit George and also to try and convince Jake to build me a set but he refused stating it was a lot of work for a very little return. I offered to buy the molds and Jake accepted my offer. George, who I believe was part owner, agreed to the purchased on the stipulation I continue to supply the cowls to other builders. This I have endeavored to do.

The size of the cowls makes it necessary to ship them in a large cardboard pallet box measuring 40 inches wide by 48 inches long by 20 inches high. The weight is only about 40 pounds but the size makes it necessary to have a Shipping Company move the product.

Since the 9/11 attack the new Homeland Security has made shipping anything to the USA a long, complicated process in spite of 1.4 billion dollars a day trade between our two friendly Countries. I now have to hire a Brokerage Firm to process the necessary documents to cross the border before a shipping Company will even consider accepting the box for transport. The cost of the Brokerage Service is normally between $80.00 and $100.00.

Unless it is going to a Company in the USA that can provide a Company Number it is shipped to an individual who must provide their full name, address, telephone number and unfortunately their Social Security Number.

I have been able to find a Brokerage Firm in Halifax, Nova Scotia that will prepare all the documents and act as a go between with the Shipping Company and in fact will provide me with a firm quote for Brokerage. They can also obtain a quote for shipping costs if they are provided the recipients ZIP code and whether the goods are to be picked up at the nearest destination warehouse or delivered directly to the recipient's home. Shipment by air is no longer possible for security reasons. Since the Brokerage Firm has to expend person hours to provide me a quote I am reluctant to ask for quotes unless there is reasonable chance an order will be place for the cowls.

Builders in countries other than the USA, will also normally incur Brokerage fees, but they will be as a result of the receiving Country requiring a Brokerage Firm to obtain release of the crate when it arrives in the Country.

I am aware this creates additional cost to builders of the GP4 but it cannot be avoided. It takes me the best part of a week to complete the cowls and other fiberglass parts and the cost of material seems to climb monthly. I will hold the price down to the lowest possible amount without losing money myself however with the fluctuations of the various currencies I am requesting you e-mail me for a current price. Please include your address and a telephone number. You should e-mail me direct at bobringer@eastlink.ca and not through the somewhat public GP4 Builders site.

WWW.OSPREYAIRCRAFT.COM

WWW.SPRINGFIELDAVIATION.COM

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CLASSIFIEDS

For Sale:

Pre-Fabricated composite components for the GP-4. Cowling, Exhaust Blisters, Inlet Ramps, and Tailcones. Individual parts or complete packages available.

Cowls are constructed with West System ProSet 125 Resin and 225 Hardener. They are hand lay-ups of 4 layers of 6 oz cloth, and 2 layers of 10 oz cloth.

For current pricing, please call or send me an e-mail.

Bob Ringer

Halifax, Canada

Ph: 902-876-2871

Cell: 902-483-4611

E-mail: bobringer@eastlink.ca

For Sale:

Quality Custom fabricated metal components for the GP-4. State of the art equipment used by a certified welder to construct parts on the jigs obtained from Darry Capps.

Raymond Beazley

Dartmouth, Canada

Ph: 902-465-6141

Cell: 902-116-0835

E-mail: raymondbeazley@hotmail.com

- order by the piece, sub assy or pkg
- Parts tagged for identification
- All parts are cleaned and primed
- Small items within a week, complete packages up to six weeks

Note: Shipping to the U.S. is an involved process, make sure you read Bob Ringer's note previous page, and contact either Bob or Raymond before ordering.

For Sale:

Fuel Tanks made by builder Ray Call. Contact Ray for current pricing. Allow 4 weeks lead time. Shipping cost established on a case by case basis....For more info contact Ray direct.

Ph: 812-934-3260

E-mail: rtcall@gmail.com