tacked in place, for alignment vertically. The shape of the center headrest spine and fin shape can be laid out flat on the table, and attached to the headrest hoop, and fin post, with small tacks, until the fin ribs are installed.

In fuselage welding, I try to begin with the underside and hard to reach areas of the clusters, finishing up with overlaps with the easy long running cluster beads last. If you are not adept with welding steel tube fuselages, please don't get in over your abilities. Make good fits with your tubing fishmouths, make super small tackwelds to hold things together, and then enlist in the aide of a fellow homebuilder who welds, or hire a shop to do this important step for you. It is easy to make scrap tubing by over tacking and blowing away clusters with excess heat, so be careful here.

To keep the fuselage square, or plumb, you may use wire and hardware store turnbuckles to pull areas into alignment, when using the torch for persuasion.

All fittings. Tabs, bushings can be fabricated and welded into place next. Notice that the rear top wing cabane tubes are easy to align, by using the front Station A-A cabane, and the tailpost, as your straight line guide. The front lower wing carrythru can also be easily located from the rear one, which is part of the Sta. B-B bulkhead. Take care in drilling holes thru round tubes for bushings, as the drill bit wants to walk away from the desired centerline of the hole. It is best to start with smaller drill bits, and slowly increase in diameter till you are at the correct diameter for bushings to slip thru and weld.

After the fuselage welding is complete, I drill a #40 hole in each longeron, near the tailpost, and squirt r ust preventative oil in the holes, then rozette weld the holes up quickly, as to prevent the oil from smoldering- Also, 3/32" pop rivets can be used in place of the weld, if they are coated with epoxy, or Zinc Chromate before hand. Our oil of choice is LPS-3

Chapter 3- Tailgroup- Control System

The methods for building the tail surfaces, and the steel control system components are all about the same, with few variances in methods. The stabilizers are best built with the elevators flat on the jig table. Bending the leading edge/tip bow radius is accomplished with a plywood form block, or a car or implement tire and wheel to use as a cushioned bending tool that is non-abrasive. Try to make the hinges up with care and quality, as the alignment onto the various spars is critical to prevent binding. A-N and M-S hardware, in length, is not called out on the drawings, as homebuilders sometimes cut or file bushings and attach tabs to slightly different dimensions than the plans prescribe. This is why we only call out the Diameter number on hardware. Build the fuselage mounting pieces for the Stabilizers right on the fuselage, using the Stabs. As the functional fixture.The control system components can now be fabricated. Build everything 'to fit' your fuselage and tail, to avoid inaccuracies. Use Rod End bearings that have a minimum bore of 3/16", for A-N 3 bolts. Our testing is all with A-N-3 hardware in these areas, and A-N-4 hardware is totally acceptable, but remember, this is an ultralight, and every Gram of weight gained stays there forever- Something called the 'twinky effect'.

In final assembly remember that fiberlock stopnuts can be used on any non-rotational device, such as a rod-end bearing, but where bolts pass thru bushings, or brackets, that are designed to rotate, castle nuts, drilled bolts, and cotter pins will be required. . The Control system Torque tube Pillow blocks can be fabricated out of Nylon, Delrin, or Oak, providing that Grease is applied to the bearing surface of the oak pieces upon assembly.

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