

## **SUPPLEMENTAL GENIE LT/S FILE** BY Harley Michaelis(3/19/09)

The LT/S is rugged, zooms like crazy, has great legs, is thermal sensitive & really agile. With overall CF cloth in the skin & a Kevlar thread wrapped spar system that includes top/bottom CF spars, the center section is like a board. The wing will handle full pedal, deep dip & hard zoom launches. It's perfect for sport & thermal competition.

The 10' span wing area is 978 sq. in. (6.79 sq. ft.) Though light, this is not a flimsy airframe & is "full house" with 6 servos. The glassed-over wood fuse version is built like the Smooth Genie Pro. There's no skimping for the sake of making it light. Materials were just well selected & construction carefully engineered. You can use a "gorilla" grip on the fuse without fear of crushing it.

Although the first one weighed less than 62 ounces, my personal preference is in the 70-72 ounce range. To me, they move, groove, launch & handle better & give up nothing in the ability to thermal in light lift. The liberal flaps slow them down well for landings.



Plans show the pattern for one-piece slab sides cut from a 48" ply sheet. This produces a ship with proportions shown here.



The composite fuse, shown here, is longer behind the wing. Handling is smoother in the pitch axis.

A highly recommended option is to lengthen the glassed-over fuse behind the wing for nicer handling in the pitch axis. Compared to the composite fuse, it is much cheaper, tougher, more readily repairable & needing no tray, greatly simplifies servo installation. The regular, taller balsa fin with the bellcrank assembly & the easily installed stab pushrod tube made from straws & HS tubing can be used. Leave the formers as shown on the SS pattern on the plans.

Two simple changes in the SS's are involved. (1) Extend the SS lines 2-1/2" at the tail end. This makes the length over 48". (2) Top & bottom from the SS front end, make marks 11-3/16" & 11-15/16", respectively. Connect for the splice line. Follow File 1 about splicing. Move the rear ply/CF doublers to the same location relative to the fin.



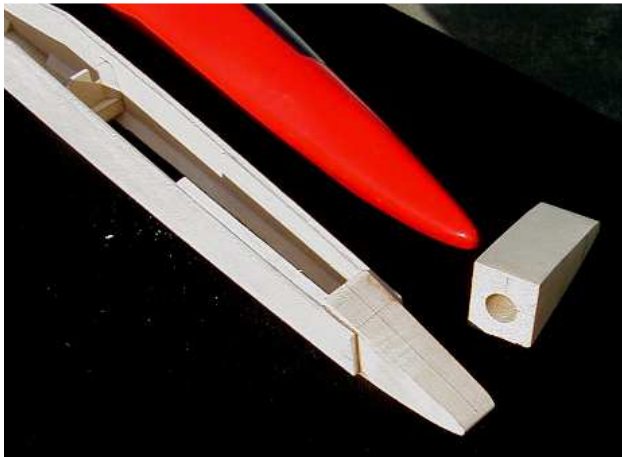
Small cross section by the tail in the glassed-over fuse shown here includes CF laminate between ply doublers. Light tail helps keep stress low on fuselage in hard landings.

Rudder is a lightweight built-up structure. The LE is rounded to fit into a concaved solid balsa fin. Snug pull-pull cable system cleanly operates the rudder.

Built-up stab pair weighs about 1 oz. Unique, internal rubber gripper system keep stabs snug to the fin.

**CF SPARS:** These are discussed in the Costs, Materials and Tools document. Center the spar back 2-3/8" from the LE of the Section 1 core pieces at their outer ends. Fuselage requires servos sized like the JR micros, Hitec 225 BB's, Airt. 761Z etc. so the pushrod & rudder cables will conveniently pass under the main bolt holddown assembly.

**STAB:** If using the 48" SS's, shorten the large plan stab one bay at the root. If going for the 2-1/2" longer one or the composite fuse, use smaller stab on the plans. Rather small deflections are needed for pitch control. Plans outline a smaller vertical tail for the LT/S.



This pic shows a 4" long drilled out basswood nose block sandwiched between 1" of the 1/16" ply slab sides to which 1/8" balsa doublers have been added.

After the thicker woods are added top & bottom, this is shaped, glassed & painted.

The closed compartment behind the nose block is made 4-1/2" long.

See Const. File 4 about dealing with the nose block & slotting it for the single tooth nose skid. With band saw & sanding tools, taper the sides of the 4" block so it is 1-1/8" wide at its rear end & 7/8" wide at its front end. As shown, this fits nicely between the tapering sides & accommodates a standard square pack of AA cells or squat sub-C cells upright side by side. The block is rectangular in cross section at this stage. When called for, glue the nose block vertically centered between the front 1" of the SS's. Run the closed portion on top 4-1/2" behind it & ending 1/2" high. When the fuse is ready to shape, taper the block toward the nose so the end is about 3/8" wide. Taper the 1/8" balsa doublers on the sides & that first 1" of the ply sides down to near the nose block.

In general, when shaping, keep the bottom balsa & the turtle deck no thicker than needed to impart nice curves, say 5/16" at the thickest areas.



The tow hook blocking glues to an internal 1/16" ply plate. 1/2" triangular stock is placed where sides meet the bottom. The wing saddle has been widened with 3/8" triangular stock & capped over with 1/64" ply.

**FLAP & AILERON CHORDS:** I had tapered flaps on the first 3 built. On the 4<sup>th</sup> one, I went constant chord to easily cut a straight line on the bandsaw using a fence. The trimmed flap chord was a constant 1-13/16" as is the aileron at its root. I extended the aileron hinge line out so that at the 5.7" point where the Section 4 begins tapering forward, the chord was 1-1/4". The aileron end, 1" in from the extreme tip, is about 1/2" less in chord.



Rear end of the canopy is contoured to the actual mounted wing & ends up shaped as in the foreground. This rear end fitting is done in increments so it nicely fits around the LE. A "stop block" is glued to the inside of the fuselage to prevent the canopy from gouging the wing.

<<<< >>>>