The Splinter

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form drag, the larger the measurable effect of induced drag becomes. This effect shows itself dramatically when these ships are compared in careful flight tests.

Aerodynamic authorities recognize that higher aspect ratios cause an increase in the basic efficiency of the wing, that is, an increased slope of the lift vs angle of attack curve. So far we don't have positive proof that this is true for our size range, so we won't push it. The other REAL advantage of higher aspect ratio is better pitching stability without increase in length. This shows up in the tail volume coefficient calculation.

$$K = \frac{LS_T}{CS}$$

WHERE:

L is distance from CG to M.A.C. of Stab.
S_T is Stabilizer Area.
C is Mean Aerodynamic Chord of Wing (s/b)
S is Wing Area

Basically, increasing *K* moves the *neutral point* of the airplane farther back from the wing center of lift. The *neutral point* is that single position for locating the CG which would cause neutral stability. At this point the airplane wouldn't produce *any* aerodynamic forces to cause it to travel in any particular direction. CG forward of neutral point, then is positive stability, the farther forward, the better the stability. Since moving the CG forward increases stability, what's the problem?

More forward CG requires more tail force (size and movement) to maneuver. The value of K must be adjusted along with CG position to produce *both* stability and maneuverability. One other little detail, the stabilator creates drag in doing its job, so it shouldn't be too large either. If one starts to experimentally try all of the combinations available, the work is tremendous, rather like the 99-position bellcrank experiment a while back. We took the easy way out, nailing it in one series of calculations. By taking advantage of reduced wing chord, the *K* for the Splinter was increased without a long tail moment arm or large stabilator. The combined location of the CG and *neutral point* create the *static margin*. The magnitude of this dimension represents the static pitching stability of the plane.

Conventional combat ships are very critical to balance since K is small and the CG position necessary for good stability sometimes causes a sluggish machine. So, people accept a touchy machine as fact. The Splinter features guaranteed static margins up to three times that of other rigs. The "feel" of all this is rock steady, positive-action maneuverability with no hang-up in square corners, and no delay when you "pull the string." Better yet, she won't turn *before* you are ready. This makes you an excellent streamer chasing machine, smooth, quick and deadly; to your opponent.

Among the other features are correct line-rake angle for those CG positions most likely to be built-in, very slight (1%) thrust line offset—sometimes called shortening outboard wing panel. This offset, if carried to extremes causes the loose line takeoffs, and other less-than-perfect characteristics. The ½ ounce tip weight is necessary. Also we have a graph which will allow you to trim the movement of the stabilator to correctly turn the *Splinter* at her best turn radius for any reasonable CG location. With bellcrank travel fixed, the pushrod is placed in the proper hole in the horn. Only if the CG falls outside of the dimensions labeled "best" should you add lead for trim. We are not talking about balancing on the tips of your fingers, but by inserting a pin in each tip and using them as pivot points. A much more accurate location is gained this way. Once the finished CG is accurately located the stabilator movement can be adjusted using the graph on the plans. Thus flight adjustments are limited to warp elimination and turn radius adjustment.

Structurewise, the 2" wide trailing-edge box maintains the straightness of the wing, the spars webbed at the tip are very stiff, and the large leading edge is adequate for both strength and leading edge radius. The ⅛ thick projections from the pod make smooth landings a breeze, soak up some shock in a crash, keep the mill part way out of the dirt. You'll note that the pod is strong enough for a 35. Don't let the 15's fool you; they vibrate like any other powerplant. The 3/32" dia. pushrod is also necessary to completely eliminate the possibility of bending on down control and be sure to solder the washer at the bellcrank securely.

In the powerplant department the Cox Tee Dee 15 MK I is the hottest mill, since its light 4½ oz. weight and 18,000 air rpm give the wildest performance. The MK II turns up almost as fast with half the fuel consumption, but the needle valve is extremely critical (one click critical). When operated on Cox Red Label fuel and 7-6 Tornado nylon prop, airspeed is 90 to 96 mph sans FAI streamer and 82 to 84 mph complete.

Next best combo is the Oliver Tiger Diesel, on draw, set to run rich in level and peaked in maneuvers. One ounce of fuel is adequate for three minutes and an 8-6 prop is ideal. The Super Tigre G20-15 Glo is being tested, but is going to be harder to tame, as is the diesel version. They have perhaps the best life potential and high rpm capability. The Splinter can also be flown with a strong Fox 15X, a good Fox 15XX, OS Max 15, or most of the TR Diesels. Glo mills demand a pressure fuel system and 7-6 props to let them turn on. Diesels generally do well with 8-6 wood props—Rev-Up, Power Prop. Airspeeds with diesels are generally slower, between 75 and 80 mph, but they drop fewer mph with streamer and pull steadily through the corners. Perfect Wedge tank of 1.5 ounce capacity, modified for Uniflow vent, also works well on diesel.

The alternate wing tips increase wing area to 244 sq.in. from the 225 standard area. On paper, this larger wing has a foot and a half advantage on turning, but we couldn't measure it in the air. So suit yourself. The 244's aspect ratio is an even 7. Note that the 244 wing requires a wider stabilator chord to maintain geometric similarity. One final note: the long wing has no tendency to flap laterally *if* it is straight and warp-free. So if you're still interested in sticking together this pace-setter in the FAI Combat field, carry on.

Assembly contains only a few surprises, which we'll tell you about right now. As usual, you want to get some balsa wood of the right sizes, before you cut out the balsa parts. We'd suggest medium grade for most parts, except soft rib stock and hard stabilator stock. If you are fortunate enough to