SPAD

***S**imple **P**lastic **A**irplane **D**esign*

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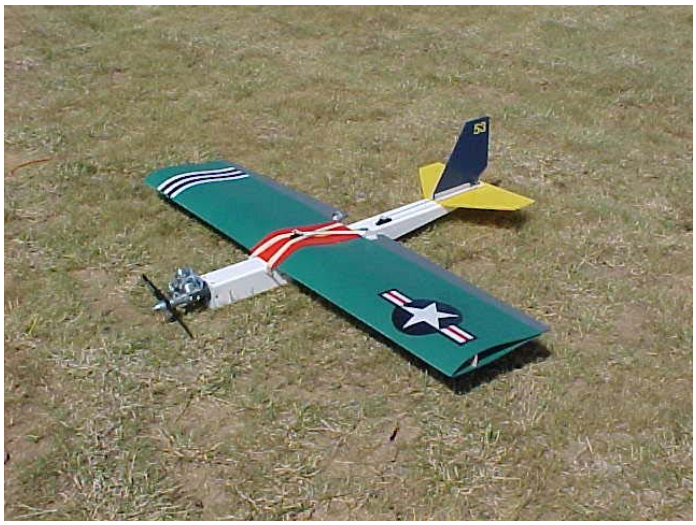
SPAD Debut



This little gem is named the Debut - and like its name implies - it is designed as an introductory, beginners RCCA open "B" class plane. With a whopping 48" streamer grabbing wingspan, and an all up flying weight of just slightly over 3 lbs (with full size radio gear and a Thunder Tiger Pro .25) this plane is a terrific entry level combat plane that can help you "learn the ropes" of combat!

Type: Combat Trainer

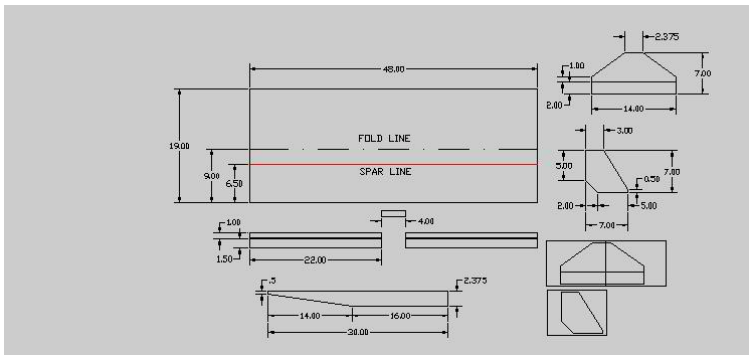
Wingspan: 48"

Length: 30"

Engine: .25 - .30

Channels: 3 - Elevator, Ailerons & Throttle

NEW! Debut DXF Files sent in from ChrisJ
Downolad by right clicking HERE and saving the file link.



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SPAD Debut Building Instructions

The Debut was designed with combat training as it's main purpose! The Debut does not contain any new secrets or design breakthroughs, in fact it's construction is extremely simple and true to all it's other SPAD family members! The difference here is material selection! We have discovered that our local Pay-Less Cashways carries a Canadian brand of PVC gutter pipe that has a thinner wall & also has a smaller O.D. measurement (2 3/8"), and it is much lighter than American made gutter pipe (about half the weight!). We have also discovered that our local Coroplast® supplier now stocks 2 MIL Coroplast®, which is half the thickness, and almost half the weight of the 4 MIL we use for our .40 sized planes. The Debut uses the 2 MIL Coroplast® for the wing, and 4 MIL Coroplast® for the tail, and ailerons. The 2 MIL Coroplast® is flexible enough to bend perfectly over the wing spar, without the need for any upper airfoil folds! The prototype is equipped with a Thundertiger® Pro .25, a 600 mah battery pack, three Hitec® HS-81 metal geared servos, and weighed in at just under 3 pounds! The Debut is geared towards experienced builders and flyers, but it's main puropose is to safely and successfully introduce a sport pilot into the exciting world of RCCA B-Class Combat, where your fighting skills need to be learned, and your nerves turned to steel! With over 480 square inches of wing, the Debut will be a little more forgiving than it's B-Class counterparts, but with a strong engine, and a little experience, you'll be plenty competitive, and have 48" of streamer grabbing wing for your opponents to fear! If you have any further questions, please don't hesitate to post them on our SPAD message board .

Fuselage:

1) Starting with a 30" piece of gutter pipe, measure, mark, and cut out the radio access hole, and rear cut out as shown on the fuselage drawing. A Dremel® with a cutting wheel works best for this. There is NO down or right thrust on the Debut. If you are using full size radio gear - see the note below, if you are using micro gear, procede to step 2.

NOTE: If you are planning on using full size radio gear, we highly recommend installing all of the radio gear, engine and fuel tank in the fuselage first (before drilling the wing hold down dowel holes). Then take the wing and tape it to the fuselage - sliding it fore and aft as necessary - until the correct CG position is achieved. Mark the fuselage where the leading and trailing edges are on the fuselage. Then mark and drill for the dowel holes - keeping them 1/2" in front of the leading edge mark and a 1/2" aft of the trailing edge mark you made earlier. If you build the

Debut per plans, and you use full size gear, you will have a tail heavy airplane that you may not be able to balance correctly!

2) Drill for, and install the 4 1/2" long x 3/16" dia. wing hold down dowels as shown. Fuel proof the hold down dowels with CA.

NOTE: Install the wing hold down dowels as close to the upper fuselage gutter pipe radius as possible to assure proper fuel tank clearance!

3) With the rear fuselage cut out scrap, fabricate 3 control horns, two tail mounting "L" brackets, and two small aileron servo mounting pieces (size will be determined by the servo you use).

4) The firewall is fabricated from 1/2" plywood cut to the inside diameter of the gutter pipe, and is mounted flush with the forward edge of the fuselage with four #6 x 1/2" self tapping screws.

5) Drill a small hole in the rear left side lip of the fuselage for combat streamer attachment!

Tail:

1) Cut the horizontal stab/elevator, and vertical stablizer from 4 MIL Coroplast® as shown on the tail drawing, with the corrugations running in the direction shown in the drawing.

2) Hinge the elevator by cutting away the bottom side of the hinge line corrugation.

3) Attach the tail "L" brackets to the verticle stab, using two #6 x 1/2" self tapping screws. Exact location of these screws is not critical. Drill 1/8" holes in one side for the screws to pass through, and 1/16" holes in the other side, for the screws to self tap into.

Helpful Hint: Several drops of CA will "tack" the "L" brackets to the vertical stab nicely, while drilling for the screws.

4) Drill the "L" brackets for the 4 fuselage attach screws. Exact location of these holes are not critical. Drill these holes 1/8".

5) Now things get CRITICAL! Using your Vertical stab/"L" bracket assembly as a template, mark the 4 tail attachment screw locations on the fuselage. This assembly MUST be centered and perfectly straight when
marking!!! The aft edge of the "L" brackets must be flush with the rear edge of the fuselage. Drill the 4 screw locations on the fuselage 1/16". Once done, center and tack glue the verticle stab assembly to the horizontal stab/elevator. Make sure the "L" brackets DO NOT interfere with the elevator hinge!

6) The tail is now attached to the fuselage using four #6 x 1/2" self tapping screws.

Wing:

1) The wing is fabricated from a 48" x 19" piece of 2 MIL Coroplast®, with the corrugations running chordwise

2) The ailerons are fabricated from 4 MIL Coroplast® with the corrugations running spanwise. Hinge as shown in the drawing. A 4" piece of 4 MIL scrap is used as a filler between the ailerons.

3) Mark the wing leading edge fold line, and spar glue line. Using a straight edge and small blunt tipped object, score the inner radius of the leading edge fold line, and bend over the edge of a table.

NOTE: Flame all plastic parts with a propane torch before gluing! Medium CA is used for all wing construction. USE SMALL DROPS EVERY 1/8" INCH OR SO. A BEAD OF GLUE MAY NOT WORK! USING TOO MUCH GLUE IS THE
BIGGEST MISTAKE HERE!

4) Fabricate a 48" spar by splicing a 12" piece of yardstick to a 36" yardstick, using a 1" piece of yardstick. Glue the spar to the bottom wing. Place the splice on the left side, to compensate for engine muffler weight.

5) Separate the top wing into two halves, by cutting TO THE LEADING EDGE FOLD LINE ONLY. This is to facilitate folding and gluing the wing, one side at a time...which we have found to be much easier! Test bend the
wing top panels over the spar. Here is where things can get tricky, and it's nice to have 5 hands or a helper! The bottom wing panel should remain flat, and the top panel trailing edges must be marked and trimmed flush with the bottom panel trailing edge. Once accomplished, unfold the wing, and glue the ailerons and filler piece to the bottom wing panel.

6) Fold and glue the top panels to the spar and trailing edge. A wood 2 x 4 works great for holding the trailing edge down! Kraut has found that holding the leading edge down with a piece of angle iron while glueing also works great!

NOTE: By nature, the leading edge of your finished wing may be slightly raised, and your lower wing may be slightly undercambered towards the rear, giving you a natural eppler type airfoil. This is perfectly acceptable, and is what gives this airplane such great performance!

7) Cut a 4" wide 2 MIL wing center wrap and glue to the top of the wing. Insert a 4" piece of coat hanger into the end flutes of the center wrap, for rubber-band crush protection.

Engine and Fuel Tank:

1) The fuel tank is wrapped in foam for a snug fit, and the engine and engine mount are mounted conventionally. Make sure the throttle pushrod housing doesn't chafe directly on the fuel tank (we've learned this one the hard way!). We have also learned that mounting the engine at 45° (muffler down) not only helps keep goop off your plane, but helps fuel draw during high G maneuvers! Note: A 4 ounce fuel tank is enough fuel to get you through a 5 minute combat round, but there is plenty of room inside the Debut fuselage for a 6 ounce tank. The prototype equipped with a TT pro .25 engine and a 6 ounce tank will get 15 minute flights at full throttle! That's a lot of good combat training time...and that's what the Debut is all about!

Radio Installation:

NOTE: Your engine and gas tank should already be mounted at this point. USE YOUR RADIO EQUIPMENT PLACEMENT TO ACHIEVE PROPER CG. Your Debut MUST balance level to slightly nose heavy at the wing spar. A tail heavy condition is not acceptable, and is VERY unsafe!

1) Glue the elevator and aileron control horns in place. Be sure to take into account the pushrod angles on the ailerons. FLAMING OF THE HORNS AND CONTROL SURFACES PRIOR TO GLUEING IS VERY IMPORTANT!!!

2) Cut a hole in the wing just aft of the spar for a snug aileron servo fit. Flame and glue the two PVC aileron servo mounts to the wing. Cut a small hole in the bottom of the wing for the servo lead. Drill for, and
mount the aileron servo using servo screws.

3) Mount the elevator servo by cutting a hole in the rear fuselage to accept the servo, and secure using servo screws. We have found that drilling a hole, and then using a small dremel stone works great for this. Exact fore/aft placement of the elevator servo can be used to achieve proper CG. Note: Before cutting the elevator servo hole, MAKE SURE YOUR SERVO LEAD WILL REACH YOUR RECEIVER!

4) Secure the throttle servo to the inside of the fuselage using two sided foam mounting tape. For extra security, you may wish to drill a hole on each side of the servo in the fuselage, and secure with a zip-tie.

5) The battery and receiver are wrapped in foam for a snug fit. We have also used two sided foam mounting tape or velcro for this. As this is a combat plane, we recommend filling all voids inside the fuselage with foam to protect your equipment. We also recommend drilling holes in the fuselage on each side of the battery and receiver, and further securing them in place with a zip-tie!

6) Switch mounting and antenna routing are a matter of personal preference. A section of plastic tubing glued to the inside of the fuselage makes a great antenna guide, and the switch on the prototype is mounted on the left side of the fuselage, as high as possible.

Note: Any time you mount the switch on the side of the fuselage on a combat plane, be sure the forward position is "on" and it is as high on the fuselage as possible. This helps prevent the switch from being turned off when
your plane is hand launched!!!

7) Install pushrods and set your control surface throws as follows: set ailerons & elevator - 1/2" to 3/4" up & down (1" to 1 1/2" total). Make sure your throttle is rigged to shut your engine OFF.

NOTE: When rigging your ailerons, ensure that the bottom of the ailerons are parallel to the top of the fuselage WITH THE WING INSTALLED! Do not allow then to droop (like flaps)! If your ailerons droop, they will drastically affect pitch trim!

Flying your Debut:

1) Follow ALL AMA safety codes!

2) Attach your wing with at least 12 #64 rubber bands (6 per side).

3) Make sure your prop is clocked to stop horizontal, and that your throttle is rigged to shut the engine off for landing.

4) Have some one else hand launch your plane until you have it trimmed out properly. IF YOU

ARE NOT AN EXPERIENCED PILOT, DO NOT ATTEMPT TO FLY YOUR DEBUT BY YOURSELF - PLEASE FIND SOMEONE EXPERIENCED TO HELP YOU!

5) Fuel up, have fun, learn the combat basics, and then go kick some serious butt!

As always, send pictures if you would like to show off your plane on the SPAD gallery! And if you have any further questions, please don't hesitate to post them on our SPAD message board !

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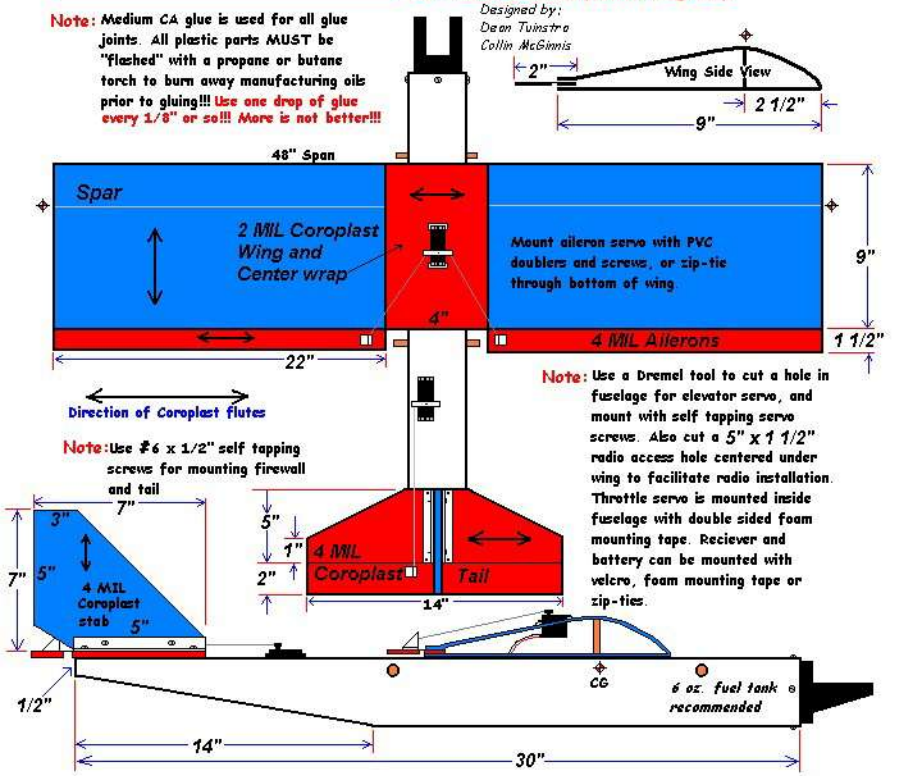
S.P.A.D. Debut

Low Cost Beginner's Combat Plane For RCCA B-Class (.25-.30 Engines)

Designed by:
Dean Tuinstra
Collin McGinnis

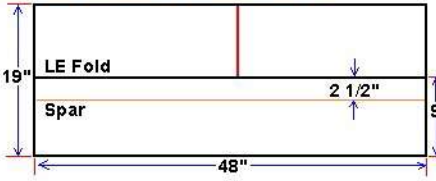
Note: Medium CA glue is used for all glue joints. All plastic parts MUST be "flashed" with a propane or butane torch to burn away manufacturing oils prior to gluing!!! Use one drop of glue every 1/8" or so!!! More is not better!!!



Note: Use a Dremel tool to cut a hole in fuselage for elevator servo, and mount with self tapping servo screws. Also cut a 5" x 1 1/2" radio access hole centered under wing to facilitate radio installation. Throttle servo is mounted inside fuselage with double sided foam mounting tape. Reciever and battery can be mounted with velcro, foam mounting tape or zip-ties.

Fabricate a 48" wing spar by joining 12" of yardstick to a 36" yardstick with a 1" yardstick splice. Place the splice in the left side of the wing to offset engine muffler weight.

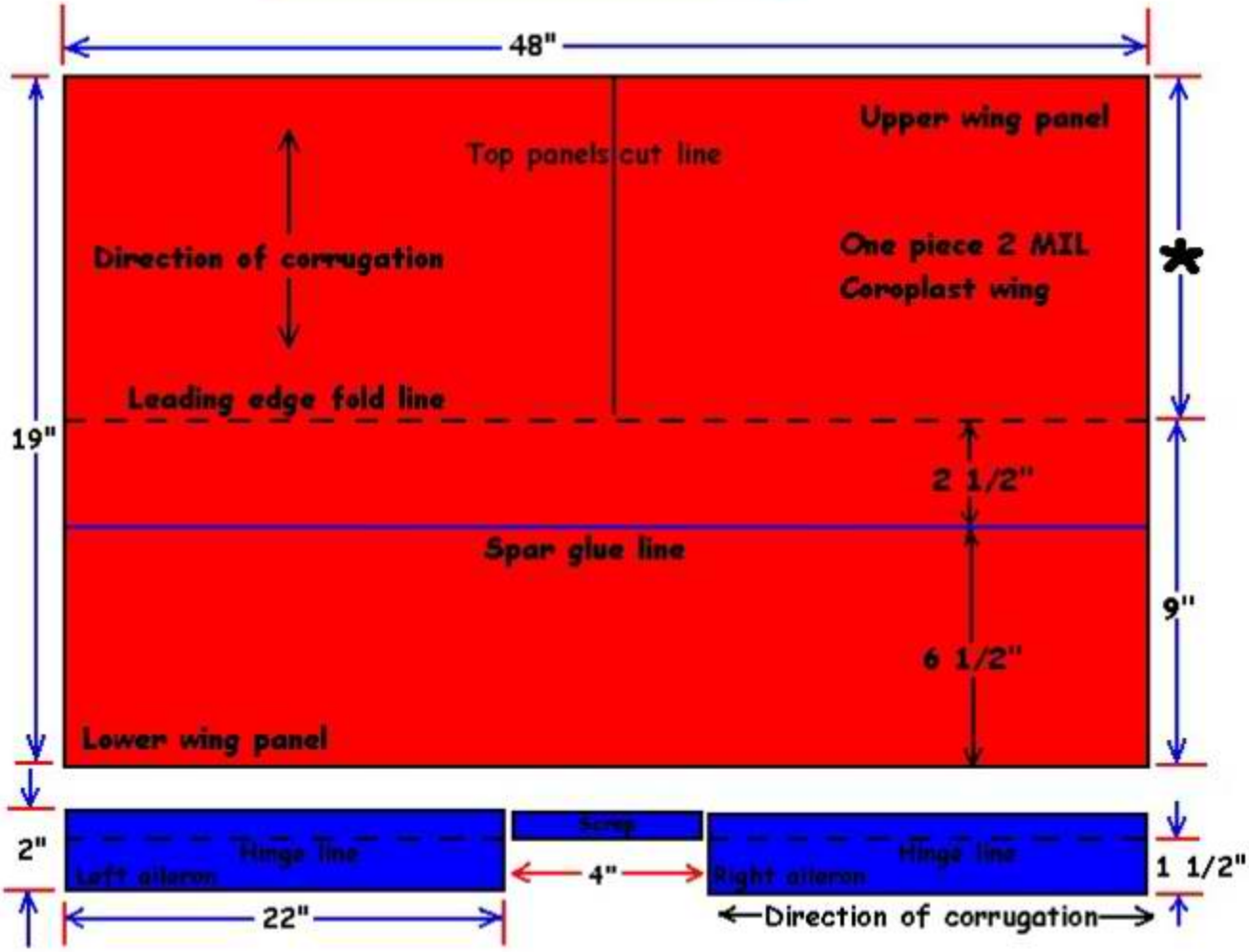
Wing building: 1) Mark, score, and fold LE.
2) Cut top panels apart at center (Red Line).
3) Mark for, and glue spar to bottom wing.
4) Test fold each top panel, and trim top trailing edges to match wing bottom TE.
5) Glue ailerons (and a 4" filler scrap between them) to the wing bottom.
6) Fold and glue top panels to spar and TE.
7) Glue center wrap to top wing.



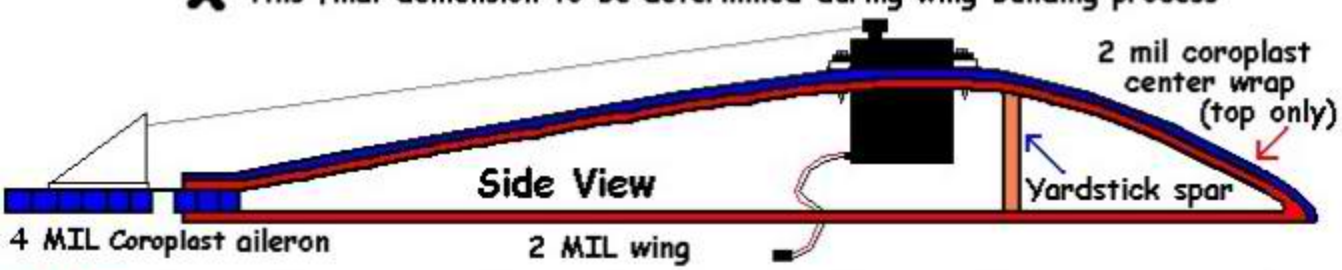
1. 2 & 4 Mil Coroplast is available at Central Sign Supplies Inc. 4520 W. Harry, Wichita, Ks. 67209 (1-800-999-0935).
2. Fuselage is 30" PVC Gutter Down Spout, 2 3/8" O.D. available at Pay-Less Cashways. (Other brands are too heavy)
3. Wing hold down dowels are 3/16" x 4" long, and mounted as near to top of fuselage radius as possible. Space dowels 10" apart. Install forward dowel 5 1/2" from front of fuselage.
4. Fabricate firewall from 1/2" plywood. Cut to fit inside diameter of gutter pipe, and flush with forward edge of fuselage. There is NO down or right thrust.
5. Hinge the Coroplast by cutting away one side of a flute for the elevator and ailerons.
6. Build wing from a 19" X 48" piece of Coroplast, Horizontal stab from a 7" x 14" piece, and vertical stab from a 7" x 7" piece.
7. Fabricate control horns and tail "L" brackets from PVC gutter pipe. Tail "L" brackets are 5" x 1/2" x 1/2".
8. Use a straight edge and #1 phillips head screw driver (or similer blunt tip object) to score inside radius of wing leading edge fold before accomplishing the fold.
9. Sheet metal shears work great for cutting out small PVC parts
10. Glue a 4" wide 2 MIL wing center wrap to top of wing only. Use a 4" piece of coat hanger inserted into the end flutes of center wrap for rubber-band crush protection

HAVE FUN!!! EXPERIMENT!!! IF YOU HAVE BETTER IDEAS....TRY THEM!!! ALL DIMENSIONS, SHAPES, AND IDEAS ARE ALWAYS OPEN TO PERSONAL PREFERENCES AND INDIVIDUALIZATION!!!

Debut Wing



* This final demension to be determined during wing building process



Note: Aileron hinge created by cutting away one side of a Coroplast corrugation

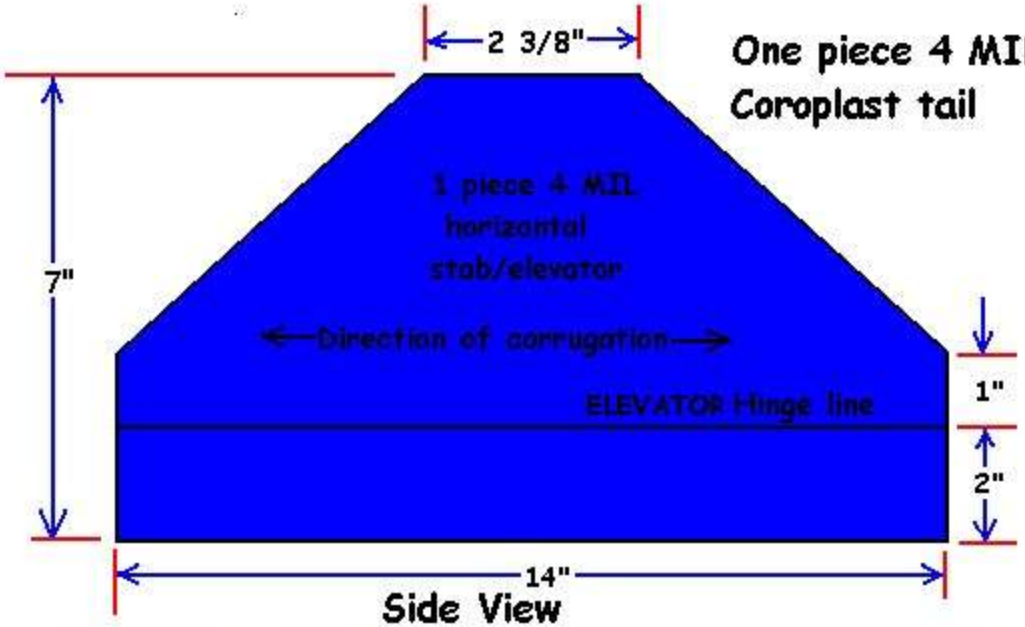
Note: Aileron servo mounted with servo screws onto small PVC scraps glued to wing

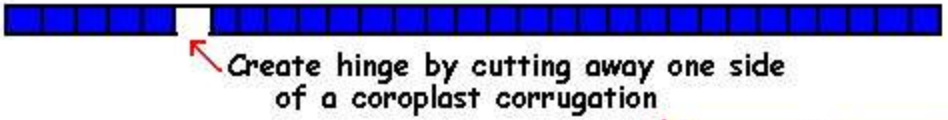
Note: Cut a small hole in the bottom of the wing for servo lead to pass through

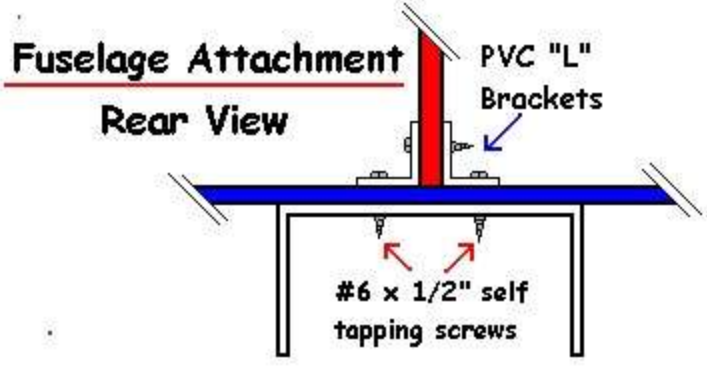
Note: Wing center wrap is 4" wide and glued to top of wing. Insert a 4" piece of coat hanger into the end flutes of the wing center wrap for rubber band crush protection

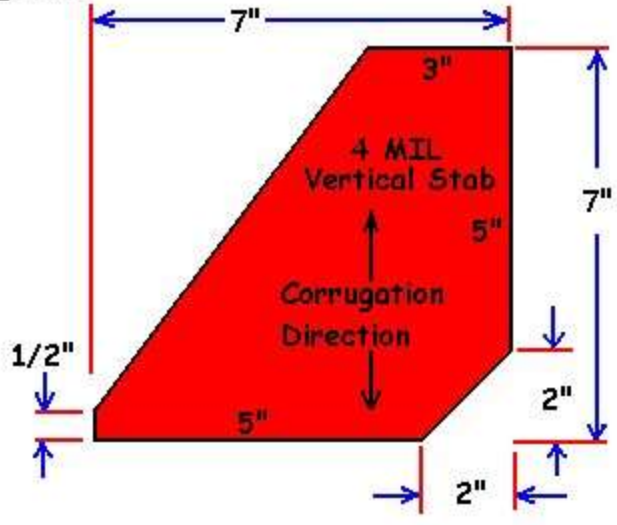
Note: Be sure to "flash" all plastic parts prior to gluing!

Debut Tail



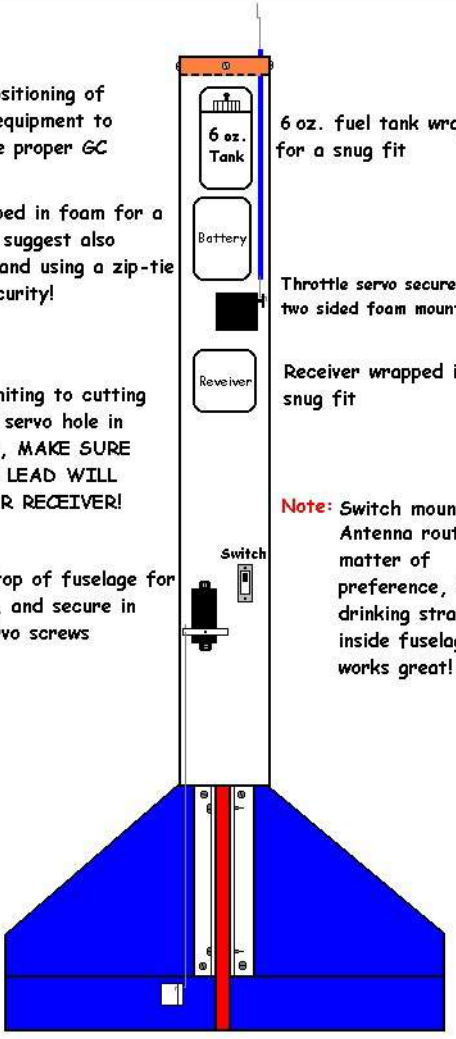






Tail attachment: Drill 1/8" holes for screws to pass through, and 1/16" holes for screws to self tap into (one side of "L" bracket, and fuselage).

Debut Radio Installation



Note: Use positioning of radio equipment to achieve proper GC

6 oz. fuel tank wrapped in foam for a snug fit

Battery wrapped in foam for a snug fit. We suggest also drilling holes and using a zip-tie for added security!

Throttle servo secured in place with two sided foam mounting tape

Receiver wrapped in foam for a snug fit

Before commiting to cutting the elevator servo hole in the fuselage, MAKE SURE THE SERVO LEAD WILL REACH YOUR RECEIVER!

Note: Switch mounting and Antenna routing is a matter of preference, a drinking straw glued inside fuselage works great!

Cut a hole in top of fuselage for elevator servo, and secure in place using servo screws