SPAD

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

Plan Index

S.P.A.D.
Spad Index
Page 1
Page 2

SPAD Saturday Night Midget

Well if it works good for the 40 size unit, it should work for a 15 shouldn't it? Tattoo's A class Saturday Night Midget is an agressive

---

Type = Combat

Wingspan = 38 inches

Engine = .15 cu in

Channels : 3, Throttle, Aileron and Elevator

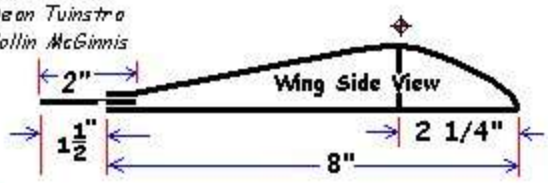
[S.P.A.D.] [Spad Index] [Page 1] [Page 2]

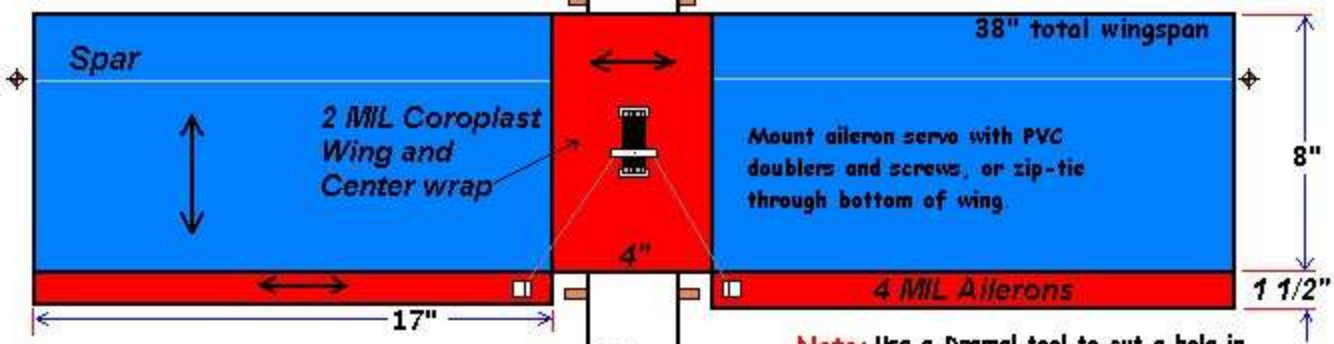
Saturday Night Midget

Low cost A-class (.15 sized engine) combat plane

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!!!

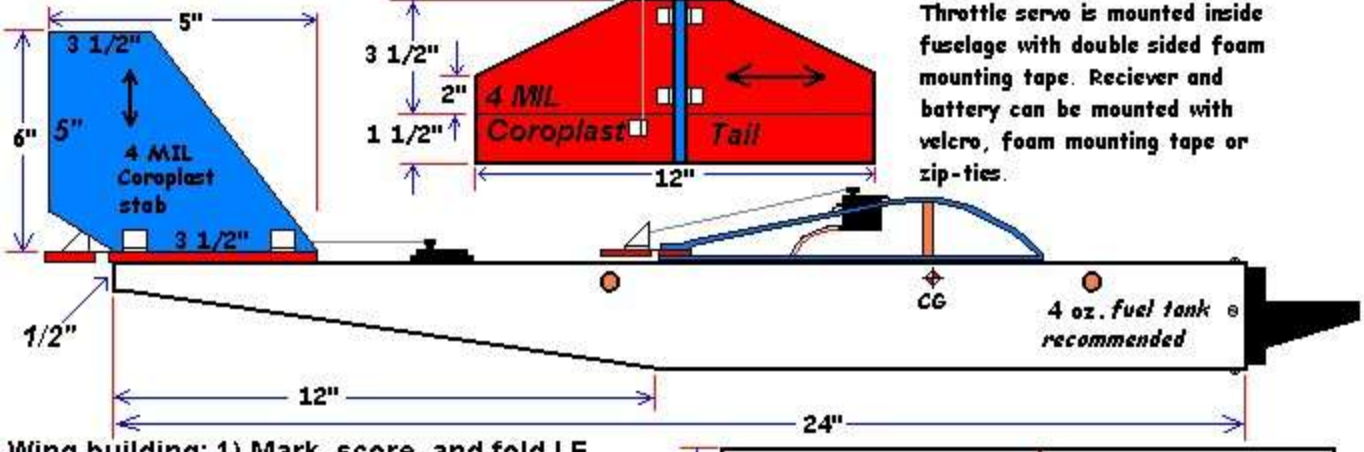




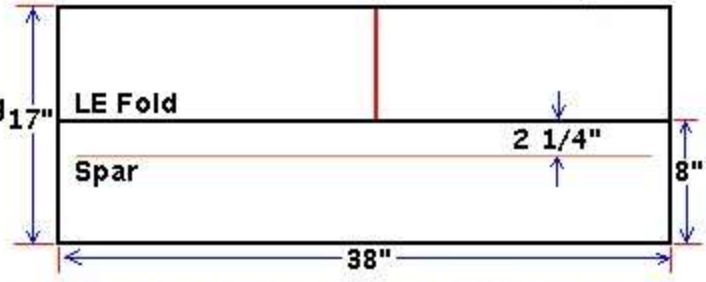
Direction of Coroplast flutes

Note: Use small self tapping screws for mounting firewall, servo screws work great!

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.



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.



NOTE: The wing spar is fabricated from a standard 36" wood yardstick, cut down to 7/8" in height!

Note: Use radio equipment placement to achieve proper CG!

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 24" 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 9" apart. install forward dowel 3 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 17" x 38" piece of Coroplast, Horizontal stab from a 5" x 12" piece, and vertical stab from a 5" x 6" piece.
7. Fabricate control horns and tail "L" brackets from PVC gutter pipe. Tail "L" brackets are 3/4" long 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

SPAD Saturday Night Midget

The Saturday Night Midget is a low cost, quick building entry into .15 sized A-class combat. Due to the weight of the plastics used in construction, this planes thrives on a good strong engine and micro radio gear. Using 2 mil Coroplast® for the wing, and Canadian 2 3/8" O.D. gutterpipe is a MUST. **THIS IS NOT A BEGINNER'S AIRPLANE. It's pitch sensitivity and roll rate are high, but any experienced combat pilot will enjoy the SNM's performance. The prototype is equipped with a Magnum® .15 XL, 3 Hitec® HS-81 metal geared servos, and a 600 ma. battery, and weighs in at 2 pounds 4 ounces. The prototype is plenty competitive, but we're sure that with lighter equipment, and a little "nipping" at our design by the experienced builders, a SNM weighing under 2 pounds is easily possible! We DO NOT recommend this plane be built by an inexperienced builder/pilot, the use of larger diameter gutterpipe, 4 mil coroplast wing, or the use of standard sized radio equipment. Although it may fly, it could be a disappointing experience.**

Please note that none of our dimensions, materials, or techniques are set in stone! We know that what is presented here works, but if you have different or better ideas, TRY THEM! EXPERIMENT! Have fun! That's what this is all about!

Fuselage:

1) Starting with a 24" piece of gutter pipe, measure, mark, and cut out the radio access hole, and rear fuselage cut out. Radio access hole starts 5 1/2" from front of fuselage, and is 1/2" x 5". A Dremel® with a cutting wheel works best for this. Save the scrap pieces! They are used to make other PVC parts! There is NO down or right thrust on the SNM. If you are using full size radio gear (not recommended) - see the note below, if you are using micro gear, proceed 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 SNM 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" long x 3/16" dia. wing hold down dowels. Install forward dowel 3 1/2" from front of fuselage, and space them 9" apart. 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 three 3/4" x 3/4" x 1/2" base control horns, four 1/2" x 1/2" x 3/4" long 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 small self tapping screws. Servo screws work great for this.

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 stabilizer from 4 MIL Coroplast® as shown on the 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.

NOTE: **Flame all plastic parts with a butane or propane torch before gluing! Medium CA is used for Tail attachment. USE SEVERAL SMALL DROPS - TOO**

MUCH GLUE MAY NOT WORK! USING TOO MUCH GLUE IS THE BIGGEST MISTAKE HERE! Also make sure there is no parts movement after initial contact! Please practice "flaming" the Coroplast® on a piece of scrap. The idea is to pass the flame across the area to be glued slow enough to burn the manufacturing oils out of the plastic, but quick enough so the plastic doesn't melt! It only takes seconds, and there is very little "visual" evidence of the oil burning. If the lighting is good in your shop, you may see the oil "shock wave" just in front of the flame, and the plastic may turn a slightly darker color for several seconds.

3) Attach the tail "L" brackets to the vertical stab, using medium CA. Exact location of these "L" brackets is not critical.

4) Glue the Horizontal Stab/Elevator to the fuselage as shown on the drawing, making sure it is mounted squarely.

5) Now things get CRITICAL! Glue your Vertical stab/"L" bracket assembly to the horizontal stab, making sure it does not interfere with the elevator hinge. This assembly MUST be centered and perfectly straight when glued in place!

Wing:

1) The wing is fabricated from a 38" x 17" 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" x 1/2" 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, flip over, and bend over the edge of a table.

NOTE: **Flame all plastic parts with a butane or 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) The spar is a standard 36" wooden yardstick CUT DOWN TO 7/8" IN HEIGHT. Glue the spar to the bottom wing. There will be 1" of wing overhang past the spar at each wing tip.

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 as flat as possible (the LE will naturally raise slightly), 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 4" scrap coroplast filler piece between them) 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 gluing 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. Small scrap pieces of yardstick will also work if you think the coat hanger is too heavy!

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!

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 SNM 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 GLUING 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 SNM:

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 SNM BY YOURSELF - PLEASE FIND SOMEONE EXPERIENCED TO HELP YOU!**

5) Fuel up, have fun, 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 !