SPAD

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

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SPAD SaturdayNightSpecial

A quick and easy build to an introductory fighter, the prototype of this airplane took a Saturday Night at the club meeting. Wonder where they got the name

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Type = Combat

Wingspan = 48 inches

Engine = .46 cu in

Channels : 3, Throttle, Aileron and Elevator

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SATURDAY NIGHT SPECIAL

low cost combat plane for .40 to .46 sized engines

Designed by:
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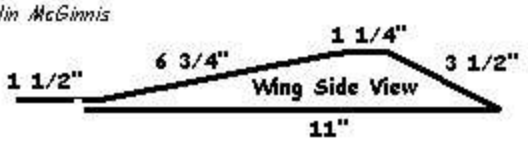
Collin McGinnis

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!!!



1. 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. If you are using 2 1/2" O.D. gutterpipe, cut away rear fuselage as shown by the red line on the drawing! This is necessary for weight reduction!
3. Wing hold down dowels are 1/4" x 4 1/4" long, and mounted as near to top of fuselage radius as possible. Space dowels 12" apart. If using a bushing engine, install forward dowel 5 1/2" from front of fuselage. If using a bearing engine, install forward dowel 5" from front of fuselage.
4. Fabricate firewall from 3/4" 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. Remove 4" of Coroplast from between the ailerons at wing center.
6. Build wing from a 24" 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, wing rubber band protectors, and tail "L" brackets from PVC gutter pipe. Tail "L" brackets are 5" x 1/2" x 1/2".
8. Wing spar is two yardsticks glued 1" apart between upper wing airfoil folds. To facilitate wing folds, crease inside of Coroplast flute with a #1 phillips screwdriver (or similer object) before folding.
9. Sheet metal shears work great for cutting out small PVC parts
10. HAVE FUN!!! EXPERIMENT!!! IF YOU HAVE BETTER IDEAS...TRY THEM!!! ALL DIMENSIONS, SHAPES, AND IDEAS ARE ALWAYS OPEN TO PERSONAL PREFERENCES AND INDIVIDUALIZATION!!!

Saturday Night
Special Building Instructions

The first SNS was designed and built in about two hours on a Saturday night, in preparation for a Sunday afternoon combat meet. It's flight performance, dimensions, and building techniques typify the type a aircraft which have welcomed many sport flyers safely and successfully into the exciting sport of R/C combat!

Fuselage:

1. The fuselage is simply a 30" piece of PVC gutter pipe. There is no down or right thrust on the SNS, so make sure the gutter pipe is cut square!

2. There are two basic types of gutter pipe available: 2 3/8" O.D. x 3/64" wall thickness, or 2 1/2" O.D. x 1/16" wall thickness. The 2 3/8" pipe is Canadian made, and harder to find. The 2 1/2" pipe is American made and is available at most home building supply or large hardware stores. If you use the Canadian pipe, it does NOT need the rear fuselage cut-out due to it's much lighter weight. If you use the American pipe, make a rear fuselage cut out, as represented by the red line on the drawing. Save the scrap piece and use it to make other PVC parts!

3. Beginning 8" back from the front of the fuselage, cut out a 7" x 1 1/2" radio access hole centered on the fuselage. A Dremel® with a cutting wheel works great for this.

4. Install and fuel proof two 1/4" x 4 1/2" wing hold down dowels. Make sure the dowels are at least 12" apart as this will minumize wing rubber-band pressure, and coroplast crush! As a general rule, if you are going to use a bushing engine, install the foreward dowel 5 1/2" from the front of the fuselage. If you plan to use a heavier bearing engine, install the forward dowel 5" from the front of the fuselage. Install the dowels as close to the top fuselage radius as comfortably possible.

NOTE: Another option for wing hold down dowel placement is to complete your entire SNS to FLIGHT READY CONDITION, and save this step for the last thing you do before flying! This way you can install your radio gear as convienient as possible, and use wing placement to achieve perfect CG.

Helpful hint: If you have never drilled a hole in gutter pipe...watch out! It likes to GRAB the drill bit...BE READY FOR THIS.

5. Fabricate a firewall from 3/4" plywood to fit flush with the foreward edge of the fuselage. It is mounted to the fuselage with at least one #6 x 1/2" self tapping screw per side.

NOTE: If you wish to get fancy here..."step" the firewall leaving a 1/8" lip so your firewall is in effect a gutter pipe "cap"...this will greatly increase the impact strength of both firewall and fuselage!

Tail:

1. Cut the vertical stab and horizontal stab/elevator from 4 mil. Coroplast® as shown on the drawing.

2. Create the elevator hinge by cutting away the bottom side of the Coroplast® flute. A utility knife works great for this!

3. Fabricate two tail mounting "L" brackets from gutter pipe. "L" brackets are 1/2" x 1/2" x 5" long. Sheet metal shears work great for cutting small PVC parts!

4. Assemble the tail and attach to the fuselage using #6 x 1/2" self tapping screws. Drill "L" bracket and fuselage holes as follows: Drill 1/8" holes for the head side of the screw, and 1/16" holes for the screws to self tap into.

Note: Exact location of the screws is not critical, however, assuring the tail is square with the fuselage, and the vertical stab is aligned straight is VERY CRITICAL.

Helpful hint: Several drops of medium CA will nicely tack the tail parts together while drilling the screw holes.

Wing:

1. The wing is built from a 24" x 48" piece of 4 mil Coroplast®, with the flutes running span wise. With the piece laying on the table, the upper surface will be the inside of your wing, and the edge closest to you will be the lower wing trailing edge. Mark the vertical center line on the Coroplast® for reference.

2. From the lower trailing edge measure up 11" and using a #1 phillips screwdriver (or similer blunt tipped object) crease the inside this flute, AND THE FLUTE ON EACH SIDE OF IT (3 flutes total) to give you a leading edge fold.

3. From the center flute of your leading edge fold, measure 3 1/2" into the top wing panel for the forward spar fold, and then 1 1/4" from there for the rear spar fold. Crease these flutes also.

NOTE: You must "Flash" the coroplast to make medium CA glue stick effectively. Simply run the flame from a butane or propane torch along the area to be glued. Do this slow enough to burn the manufacturing oils out of the plastic, yet fast enough so the plastic doesn't burn! Practice on scrap Coroplast®...AND BE CAREFUL!!! Keep in mind that there are flamable items all over your hobby room!!!

4. Glue two standard 36" wood yardsticks to the top inner wing, spaced 1" apart, between the two upper spar folds using medium CA.

NOTE: There is 6" of wing extending past the spars at each tip, and the wing tips are left open.

5. Test fold your wing (no gluing) to see how the top panel will meet the bottom trailing edge. with the wing folded and trailing edges touching, mark the first top panel flute that is unobstructed by the lower trailing edge...this will become your aileron hinge! Unfold the wing, create the aileron hinge by cutting away the inside of that flute, and cut away 4" of Coroplast® at the center section between the ailerons.

Note: Sometimes Coroplast® can vary slightly in wall thickness between batches, and the aileron hinge can be very stiff. If you feel your ailerons are too stiff, it is acceptable to cut the hinge from two adjacent flutes to help losen them up. Also, depending on how your Coroplast® was cut to size, your ailerons may be slightly larger or smaller than 1 1/2" wide. Slightly smaller is OK, but if they are wider than 1 1/2", trim them down to size to eliminate the possibility of in-flight flutter.

6. Once accomplished, fold and glue the wing together! The positive G strength of your wing depends on a good spar to lower wing bond, and a 2 x 4 piece of wood works great for holding the trailing edge down while gluing!

Note: When gluing Coroplast® to Coroplast® (trailing edge) with medium CA, USE 1 DROP OF GLUE EVERY 1/8" OR SO!!! MORE IS NOT BETTER! ALSO ASSURE THERE IS NO MOVING OR SHIFTING OF THE PARTS AFTER INITIAL CONTACT!

7. Fabricate two 4" long x 1/2" wide rubber-band protectors from gutter pipe and glue them in place. Although not represented in the drawing, they are much more effective if you use angled pieces, and they extend over the edge of the wing and make contact with the fuselage.

Engine installation:

1. Install engine to firewall using a conventional engine mount to fit your engine.

2. Fuel tank is wrapped in foam for a snug fit, and installed conventionally.

3. Make sure your throttle pushrod or housing does NOT make contact with the fuel tank...it will eventually chafe through!

Helpfull hint: If you are unsure of how to install your engine, tank, or radio equipment, please enlist the help of local club members or your local hobby shop, they will be more than glad to help!

Radio installation:

1. Fabricate 3 control horns from gutter pipe. 1" high x 1" long x 3/4" wide base works great. Glue them in place on the ailerons and elevator. Keep in mind the slight pushrod angle of the ailerons. Position the horns as close to, BUT NOT ON, the hinge as possible.

NOTE: It is EXTREMELY IMPORTANT to flash the control horns and control surfaces prior to gluing. If you do not feel safe with just gluing them in place, fabricate back plates from gutter pipe, glue in place, and install small screws.

2. Cut a hole in the rear fuselage centered between the wing and tail for the elevator servo. Drilling a hole, and using a small Dremel® stone works great for this. Secure servo in place with self tapping servo screws.

3. There are two ways you can mount your aileron servo. Cut your servo hole for a snug fit just aft of the rear spar. Either glue small gutter pipe scraps to the wing and mount with servo screws, or use a zip-tie around the servo through the bottom of the wing. If using the zip-tie method, make a small scrap gutter pipe doubler, glue to wing bottom directly below the servo, and drill two holes in it for the zip-tie. Cut a small hole in the bottom of the wing for the servo lead to pass through.

4. Mount your throttle servo to the inside of the fuselage using double sided foam mounting tape. It is highly reccommended that you drill a hole in the fuselage on each side of the servo, and further secure in place with a zip-tie.

5. Wrap your receiver and battery in foam and install. We also highly recommend drilling fuselage holes and securing them in place using zip-ties once you are assured of their proper location, and the CG is correct.

6. Mount your switch as high on the left side of the fuselage as possible, and assure that the foreward position is "on". This will decrease the possibility of the switch being turned off during hand launch, or a mid-air impact.

7. Glue a small piece of drinking straw or small plastic tubing just inside the rear fuselage for antenna routing. You can also poke a small hole in the bottom of the horizontal stab and continue routing the antenna into the stab and out the side.

8. Install elevator, throttle, and aileron pushrods. Make sure the throttle is rigged to shut the engine OFF for dead stick landings! Rig elevator and ailerons for 1 1/2" total travel (3/4" each direction)

VERY IMPORTANT NOTE: Rig aileron neutral position with the wing installed. At neutral, the ailerons must be parallel to the fuselage, or you WILL experience trim problems at different power settings!

9. CHECK YOUR CG!!! With the wing installed and no fuel in the tank, your ready to fly SNS MUST BALANCE LEVEL TO SLIGHTLY NOSE HEAVY AT THE FOREWARD SPAR. A tail heavy plane is NOT ACCEPTABLE AND VERY

DANGEROUS. Correct a tail heavy condition before any attemps to fly your plane!

10. Don't forget to drill a small hole in the left side of the rear fuselage for combat streamer attachment!

Flying your SNS:

1. Follow ALL AMA safety guidelines!

2. Install your wing with at least 12 (6 per side) #64 rubber-bands, MAKE SURE YOUR AILERON SERVO IS PLUGGED IN!

3. Make sure your prop is "clocked" to stop horizontal (at compression stroke) when the engine is shut off for landing.

4. DO NOT TRY TO HAND LAUNCH YOUR OWN PLANE UNTIL IT IS TRIMMED OUT!!!

5. If you are an experienced pilot, you will not need any more instructions...fly your SNS, and have a blast!!!

NOTE: If you need more instruction at this point, you should not be flying the SNS without experienced help. PLEASE ENLIST THE HELP OF AN INSTRUCTOR PILOT. Although many consider R/C aircraft as toys, they carry with them the potential to inflict great bodily harm and even death if caution, and all safety guidelines are not strictly adhered to!

Questions? Please post them on the SPAD Message Board, and as always, if you would like to show off your SNS to the world, send pictures to Collin at collin@spad.org and we will post them on the SPAD Gallery!

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