

The "Sickle"



by Tim Tong (aka "Grim Reaper")

Type: Sport Flying Wing

Wingspan: 40"

Chord: 11.5" @ root, 8.5" @ tip (3" trailing edge taper)

Wing area: Approx. 400 sq. in.

Engine Size: .25 - .36 2-stroke

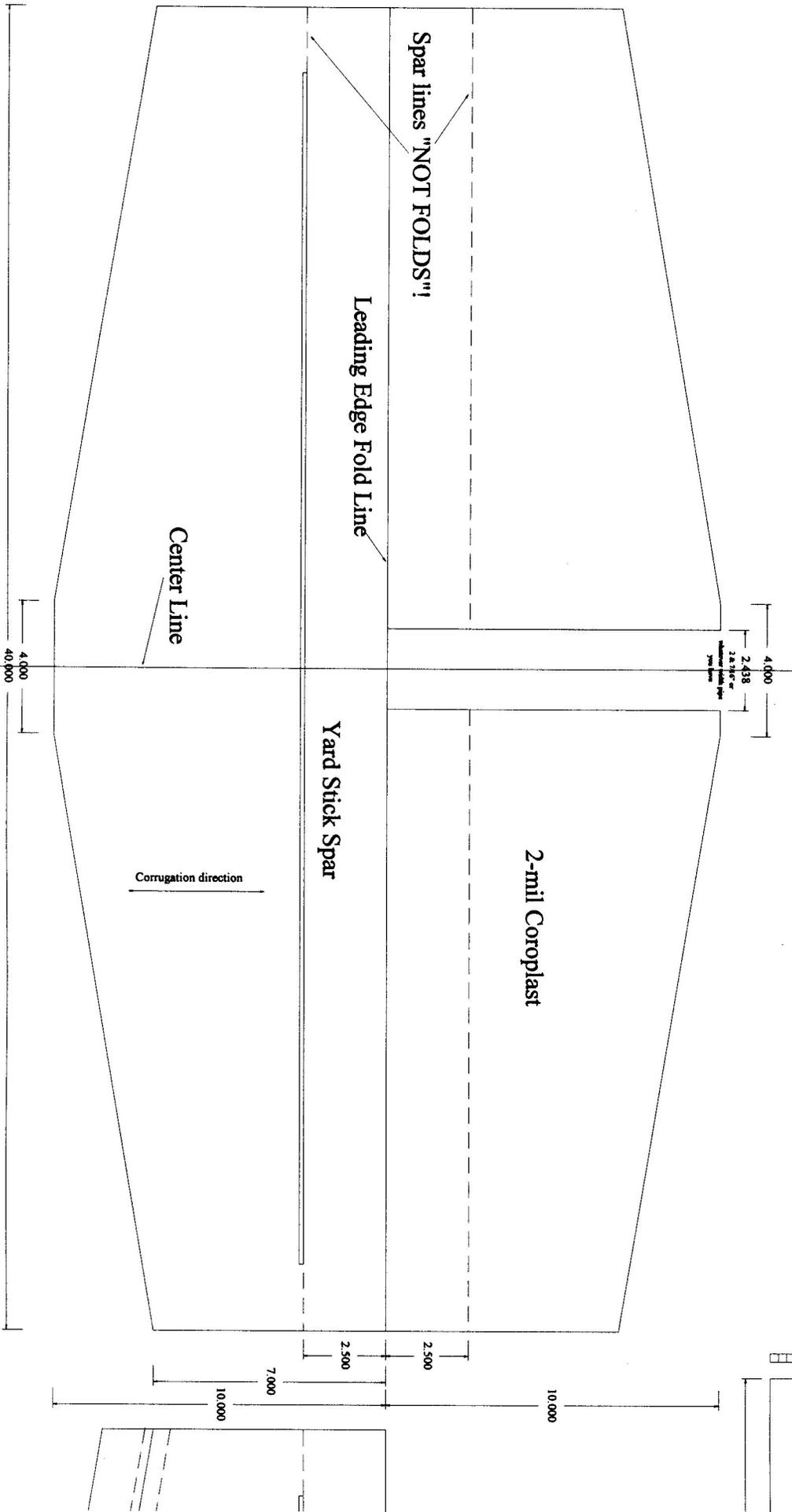
Servos required: 3

Mixing: Radio with elevon mixing, or onboard mixing required *

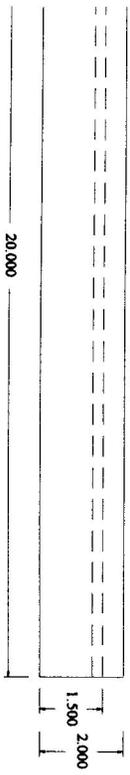
Weight: 2.5 - 2.75 lbs.

The "Sickle", designed by Tim "Grim Reaper" Tong, goes back a few years, but still manages to remain one of the most highly requested plans ever that was NOT available on www.spadtothebone.com, until now. It's popularity is understandable, since it is one of the most simple to construct Spad designs around, yet it's menacing appearance and super maneuverability and responsiveness guarantee an adrenaline rush for even the most seasoned and experienced modeler. This model is absolutely not for beginners. Please do not build and fly the Sickle unless you have a few hours under your belt flying tamer sport models. The plans were originally created in .DXF format, however, since many folks have had difficulty viewing and printing the .DXF file, the plans have been scanned into 3 separate .JPG image files, which you can save, print and paste together. I have also included the original instructions and a brief sketch on building an elevator version that does not require mixing capabilities, but you will need an extra servo. If you have not yet tried a Sickle, you're missing out! -STTB

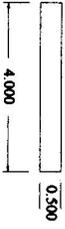
Wing Folding and Layout Guide



e of the flue to serve as a hinge

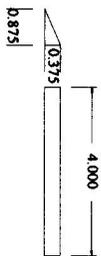
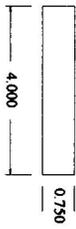


Aileron
(4-mil Coroplast)



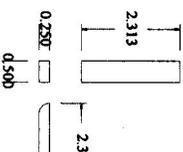
4" Filler
(4-mil Coroplast)

Wing Protection Straps
(PVC)



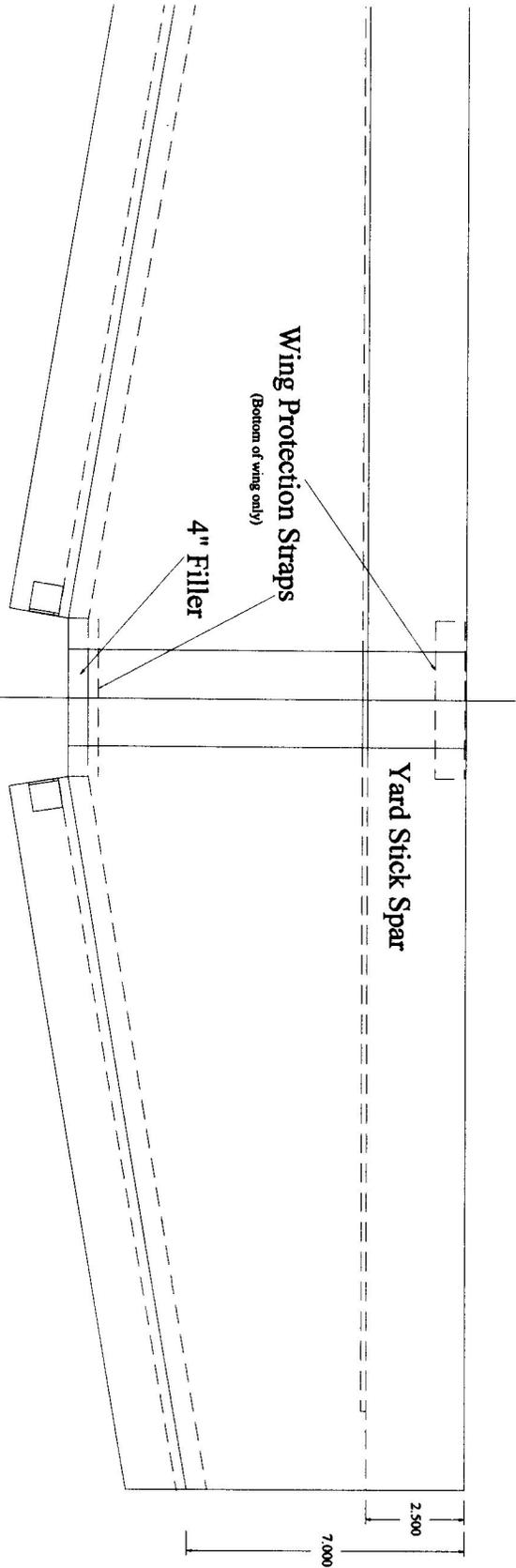
Filler block
(Bass wood or Pine)

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Tom Tong
P.O. Box 354
316 N. Michigan
Oxford, Kansas 67119-0354
E-Mail: tomt@att.net
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Wing Moor Plates
(1/4" Plywood)

CAUTION
Move Wing 1/2" if you are a heavy Ball Engine or you have to add

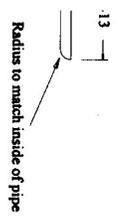


Spar

(Std. Give away hardware store Yard Stick)

RESERVED
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 Address.

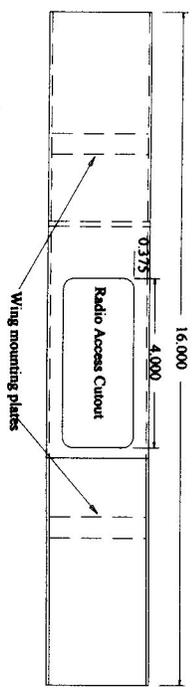
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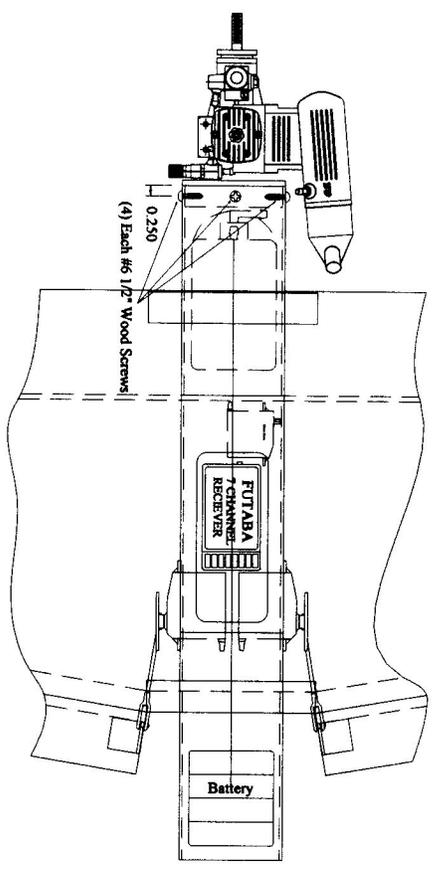
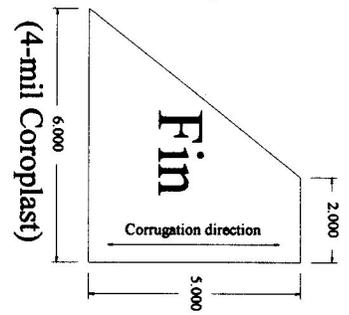
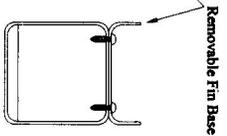
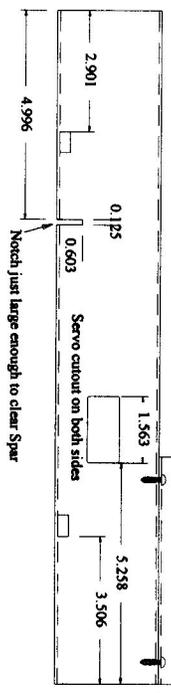
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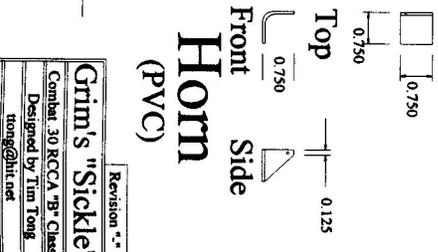
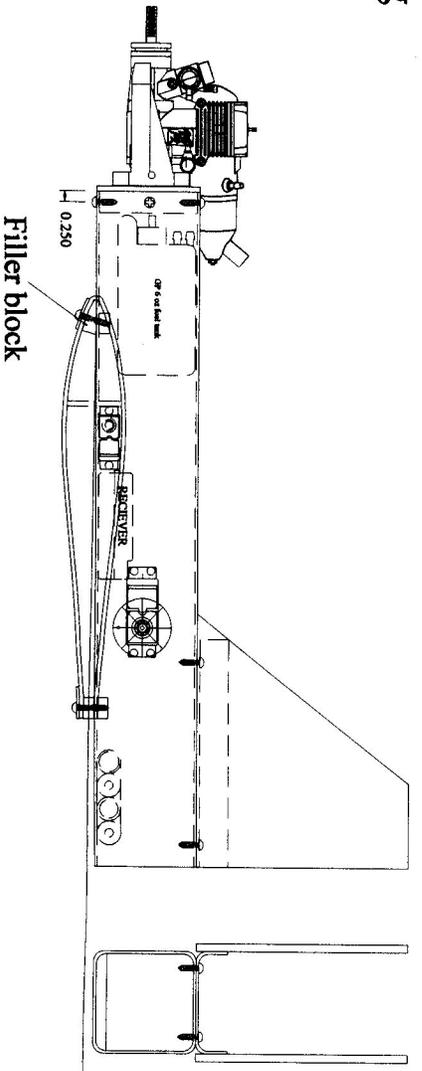
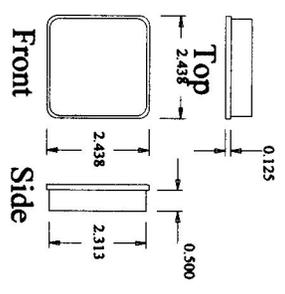
ON
 Forward
 e using
 | Bearing
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 weight



Fuse



Firewall
 (5/8" to 3/4" PLY)



Revision "A"
 Grim's "Sickle"
 Combat 30 RCCA "B" Class
 Designed by Tim Tong
 tong@htr.net

Sickle Building Instructions

"Sickle"

NOTE: Remember to flame the plastic and use medium CA for all glue joints. This is important, because CA will not stick to plastic due to manufacturing oils on the surface of the parts.

Wing:

The wing is fully symmetrical and constructed from 2-mil Coroplast with the flutes running in the chord wise direction. Use a standard yardstick (tapered as shown on the drawing) for the spar, but do not install it until later!

The easiest way to make the wing is to make the leading edge fold, then only cut the tapers on the bottom half. Fold the upper and lower surfaces together and then trim the upper half to match. Make sure you draw the 2 lines at 2 1/2" on both the upper and lower inside surfaces per the drawing. You will use these lines to install the spar. Cut a "slot" in the upper wing skin to exactly the width of your PVC pipe.

Cut two ailerons, from 4-mil Coroplast as shown on the drawing. They are hinged simply by cutting away one side of the Coroplast flute. The wing center filler can be made out of scrap 4-mil Coroplast.

Glue the ailerons and the 4" filler to the bottom wing, then fold over the top halves and glue them down to the ailerons and fillers. Next, after the glue is set up, slide the spar into the wing from one end, insuring that the tapered edges are on the bottom, and move it around until it is centered on the 2 1/2" lines you drew earlier. Run thin CA down both the top and bottom of the spar where it contacts the surface of the Coroplast. Let it dry.

Fabricate aileron control horns from scrap PVC, and glue in place. Rig your "Elevons" with your choice of pushrods and clevises.

Fabricate (2) Center Wing Protection Straps and CA them only to the bottom of the wing as shown on the drawing. These straps help prevent the screws from pulling through the wing.

Fabricate a tapered wood leading edge "filler block", then glue it inside the wing at the leading edge. Insure that the block is centered in the opening before the glue sets.

Fuselage:

The fuselage is constructed from a piece of PVC down spout pipe. Cut it as shown on the drawing. NOTE: If you are going to use a heavy ball bearing engine, you will want to move all the wing mounting hardware and cutouts forward 1/2 inch. This will help balance the plane without adding extra weight.

Fabricate two Wing Mounting Plates to fit your pipe, then epoxy them in place.

Cut a notch for the wing spar. Only cut the notch large enough to clear the spar, any more than necessary only weakens the fuselage.

Mount the wing on the fuselage with (4) #6 X 3/4" screws. Insure that the screws will pick up the center of the previously installed mounting plates. NOTE: This mounting method makes changing damaged wings easy and eliminates the use of rubber bands.

Fabricate your firewall.

The firewall is cut to the inside diameter of the gutter pipe, and is mounted flush with the front edge of the "cowling". The small "lip" shown on the plans helps keep oil out of the fuse, but is not really necessary.

Mount the firewall with four #6 x 1/2" screws, one on each side. Use care not to hit an engine mount screw, throttle pushrod, or fuel line.

Locate and drill the holes for the wing hold down dowels as shown on the drawing. Secure them in place with a small amount of CA.

Center the engine on the firewall.

Wrap the fuel tank in foam (if necessary) to achieve a snug fit inside the fuselage.

Drill a small hole in very aft bottom edge of the fuselage for streamer attachment.

Tail:

The Fins are made from two pieces of 4-mil Coroplast cut as shown on the drawing.

Fabricate the removable PVC tail mount on the drawing.

Glue the Fins onto the sides of the doubler, then attach the assembly to the fuselage with (4) #6 X 1/2" screws.

Radio Installation:

The Elevon servos are mounted directly in the sides of the fuselage using standard servo screws. Cut a servo holes just large enough for the servos and put the screws directly into the PVC.

The throttle servo is mounted in the bottom of the fuselage with double sided servo tape as shown on the drawing. You may use a different location if desired.

Wrap the battery and receiver with foam, then position in the fuselage for best balance. The CG should be approximately 1.5" to 1.75" aft of the leading edge. **DO NOT ATTEMPT TO MOVE THE CG AFT OF THIS POINT UNTIL YOU HAVE FLOWN THE PLANE AND KNOW HOW IT WILL REACT! THIS PLANE WILL BECOME VERY UNSTABLE IF THE CG IS MOVED BACK TOO FAR.**

Your antenna can be routed out through the aft end of the fuselage then up out of one of your Fins, or routed out of one of the wing tips.

Mount your switch wherever it is convenient. I hide mine just inside the aft end of the fuse to protect it from accidental shut off.

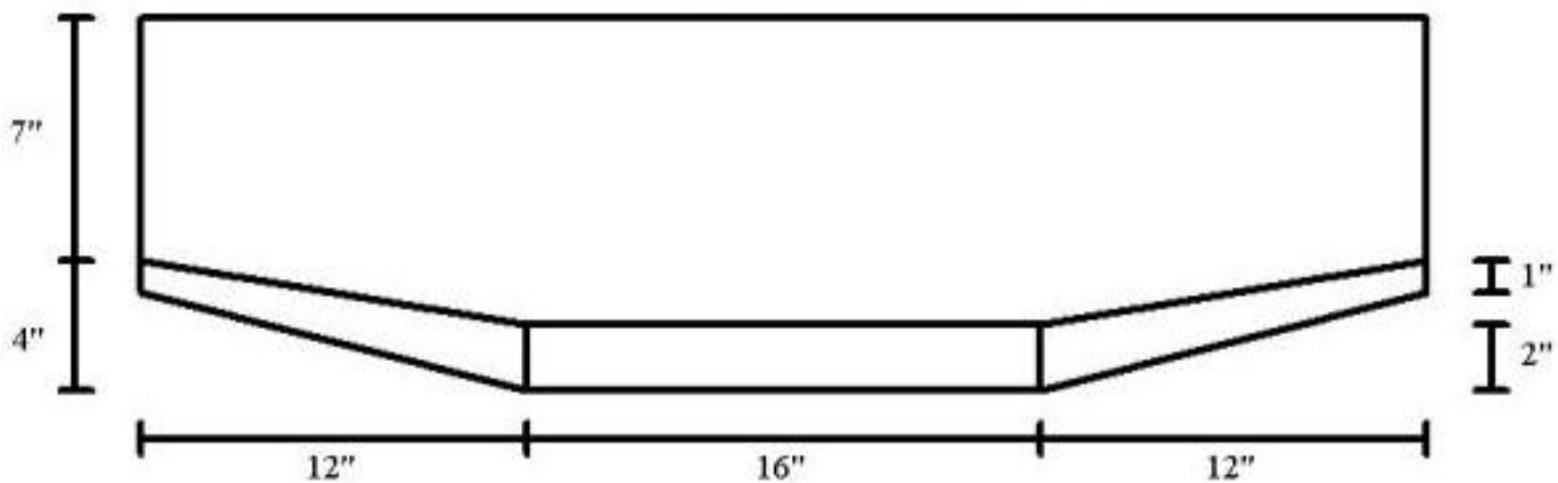
Rig your Elevons (combination ailerons/elevators) and throttle to your own tastes.

Mixing Shmixing!!

You do not have (or want) mixing ability?
Try the elevator version...



Sickle Wing (Elevator Style)



Study the Sickie diagrams and written instructions in detail to get a feel for how the Sickie is normally built. If however, you have no access to mixing capabilities or just like the idea of an elevator version, above are some rough dimensions for a Sickie built this way. Remember, you will now need 4 servos total instead of 3, and your elevator must be clear of the fuselage to function properly. As you can see in the example up top, you can cut a taper in the rear of the fuse to facilitate full unobstructed elevator movement. Aileron servos will need to be installed in the wing rather than the fuse. The rest of construction is unchanged. From some accounts, the Elevator Sickie actually improves upon the standard versions' flight capabilities.