



SPAD

Simple Plastic Airplane Design

Plan Index



SPAD Dynamo



The Dynamo is our first budget entry into RCCA legal open "B" class combat competition. The prototype was equipped with a ThunderTiger® Pro .25,,¢, a 4 oz. fuel tank, and a standard sized Futaba® flight pack. All Coroplast® parts are made from 4mm Coroplast®. It weighed in at 3.45 lbs. Slightly heavy compared to some of the current planes used in competition, but an excellent way to get involved for a minimum amount of money. Flight performance is outstanding, and will provide any pilot a good entry level plane with which to get in the mix.



Type: Combat

Wingspan: 36"

Length: 24"

Engine: .25 - .30

Channels: 3 - Elevator, Ailerons & Throttle

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SPAD Devestator Building Instructions



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Fuselage:

The fuselage is cut from a 24€ section of 2 ½€ O.D. PVC gutterpipe as shown on the fuselage drawing. A butane or propane torch is used to heat and bend in the wing saddle rails, and bend out the tail cradles. We fabricated a 1€ wood block to fit the inside dimensions of the gutterpipe with which to bend the wing saddle rails inward against. There is no down or right thrust in the Dynamo fuselage. Two ¼€ x 4 ½€ long dowels are used for the wing rubber band hold downs. Coat them with CA to fuel proof them, and hold them in place. The firewall is fabricated from ½€ plywood to the I.D. of the gutterpipe, and is installed flush with the forward edge of the fuselage. The fuel tank is mounted on a 4€ yardstick tray glued to the back of the firewall. A slot cut into the firewall to receive the fuel tank tray will help strengthen this assembly. Make sure the fuel tank tray will clear the forward wing hold down dowel! Mount the firewall to the fuselage with 4 #6 x ¾€ self tapping screws. Mount the engine as high on the firewall as possible for the best €thrust line€. This will aid in nice clean axial rolls! Drill a small hole in the aft fuselage for combat streamer attachment!

Wing:

You have two choices to use for your Dynamo wing. The wing shown in the wing drawing was used on the prototype. It is constructed from one piece of Coroplast® with the flutes running in the spanwise direction. A 36€ standard yardstick is used for the spar, with four 1€ pieces of yardstick used for spar supports, as shown on the drawing. The ailerons are hinged simply by cutting away one side of the Coroplast® flute! For a more rigid wing, with the flutes running in the chordwise direction, simply build a Dominator wing, as all chordwise dimensions are the same. Just cut it down to a 36€ span! Use the Dynamo spar configuration, and please note that the wing center reinforcement is used only on the top to save weight. We leave the wing tips open, also to save weight. €Flame€ the plastic and use medium CA for all glue areas. **USE SMALL 1/8" DROPS EVERY INCH OR SO. A BEAD OF GLUE MAY NOT WORK! USING TOO MUCH GLUE IS THE BIGGEST MISTAKE HERE!** Cut a hole just aft of the spar for a snug aileron servo fit, with the ears of the servo resting on the plastic. Secure the servo in place using a zip-tie, and zip-tie doubler as shown in the drawing. Fabricate aileron control horns from scrap PVC, and glue in place. Flame the horns and ailerons before gluing! This is VERY important, as we don€™t use screws or backplates to save

weight! Cut a small hole in the bottom of the wing aft of the servo for the aileron servo lead to pass through.

Tail:

The Dynamo tail is cut from a 20€ x 7€ piece of Coroplast® as shown in the tail drawing. Score and fold the center section as shown on the drawing, and hinge the elevators by cutting away one side of the Coroplast® flutes. Fabricate two elevator control horns from scrap PVC. Glue the horns in place, and glue the tail to the fuselage using medium CA. Flame the tail, horns, and fuselage before gluing! This is VERY important, as we are not using backplates, doublers, or screws to save weight!

Radio Installation:

The elevator and throttle servo are stuck in place using double sided foam mounting tape, drill a hole on each side of the servo, then secure using zip-ties as shown in the radio installation drawing. The battery and receiver are simply stuck in place using double sided foam mounting tape. Use the battery positioning to achieve the proper CG. Your Dynamo should balance level at the forward top spar line! Slightly nose heavy is **ok**, tail heavy is **UNACCEPTABLE and DANGEROUS!** Your antenna can be routed up through the tail by poking a small hole in a Coroplast® flute near the base of the tail. Mount your switch where convenient along the side of the fuselage. Fabricate a €æwishbone€ pushrod for your elevators, and rig your ailerons and elevators to your satisfaction. The Dynamo ailerons are very responsive, so be ready for it! The nature of a V-tail makes the elevators less responsive than a conventional elevator, so they can be rigged with a considerable amount of throw!

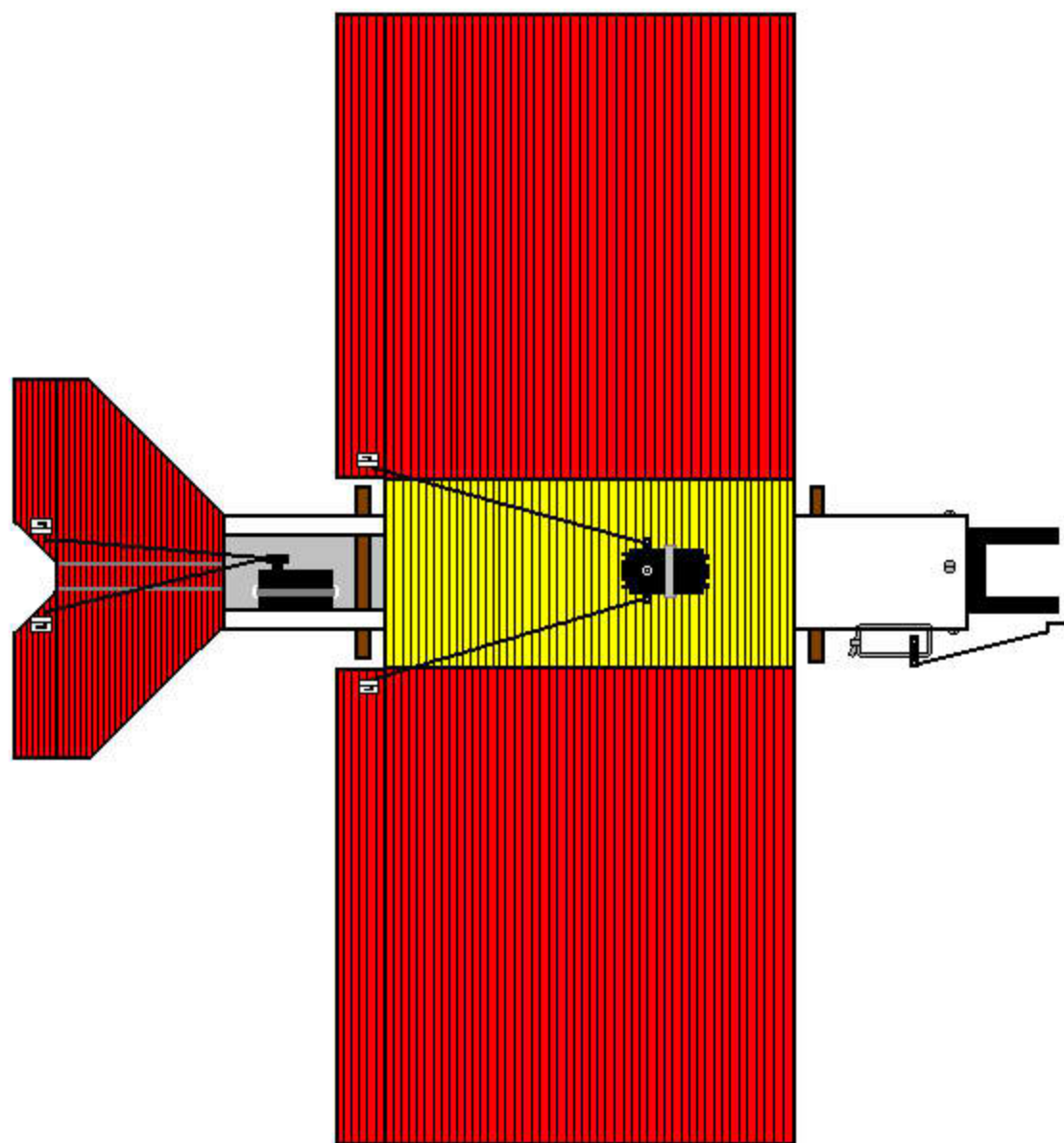
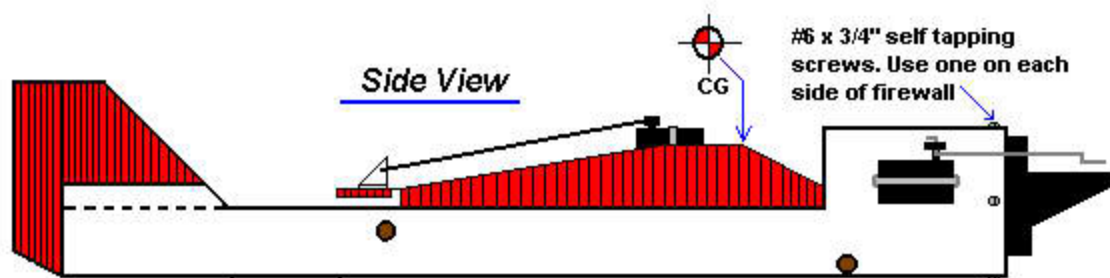
NOTE: When rigging your ailerons, ensure that the bottom of the ailerons are parallel to the top of the fuselage! Do not allow them to droop (like flaps)! If your ailerons droop, they will drastically affect pitch trim!

Flying the Dynamo:

Make sure your throttle is rigged to shut your engine OFF for landing, and your prop is €ælocked€ to stop in the horizontal position. **ALWAYS FOLLOW ALL AMA SAFETY RULES AND REGULATIONS!** If you plan to enter an RCCA sanctioned combat event (open class B), weigh your Dynamo to assure that it falls under the 3.5 lb. weight limit. Mount your wing with at least 12 (6 per side) #64 rubber bands! The ThunderTiger® Pro .25,¢ was plenty of power for our Dynamo prototype, and at full throttle, it climbed out perfectly with a slight hand launch. The Dynamo will perform any maneuver a combat pilot could desire, and float in for a gentle dead stick landing after engine shutdown. If your enemies are balsa or foam, they better hope they don€™t get in your way! **IF YOU ARE NEW TO COMBAT, AND HAVE NOT FLOWN THIS TYPE OF AIRCRAFT BEFORE, PLEASE ENLIST THE HELP OF A QUALIFIED INSTRUCTOR!** It is also highly recommended that you add some bold graphics to the top of your wing for in flight orientation!

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Dynamo Overview



Wingspan--36"

Chord--12 1/2"

Fuselage length--24"

Engine Used on Prototype--ThunderTiger Pro .25

Radio Used--Standard size Futaba Flight Pack

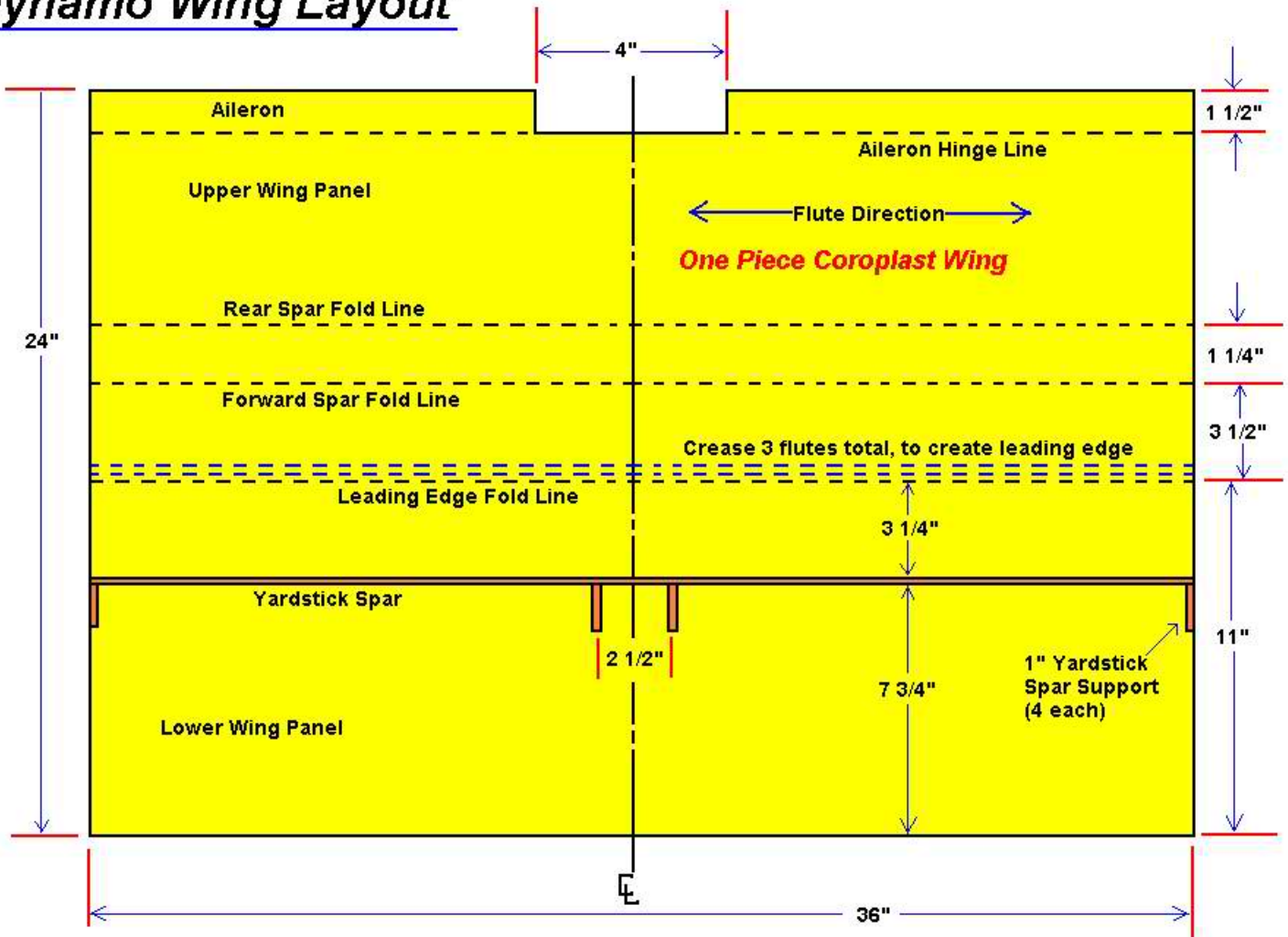
Dry Weight, Ready to Fly--3.45 lbs.

Fuel Tank Used--TT 4 oz.

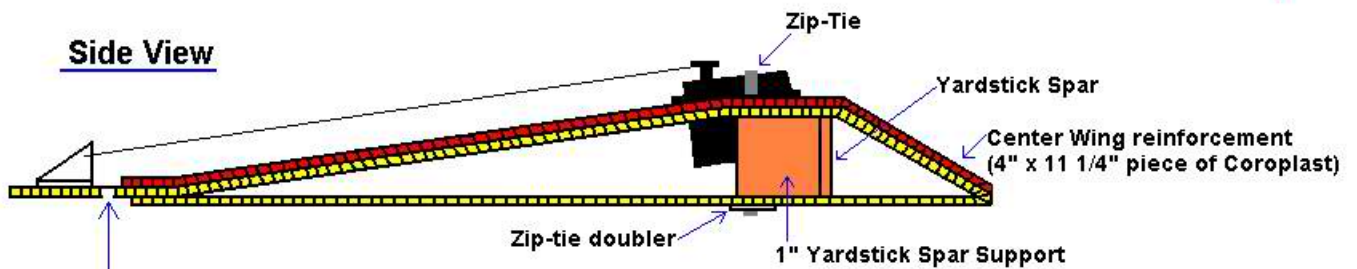
Engine mount--Dave Brown

Firewall--1/2" Plywood

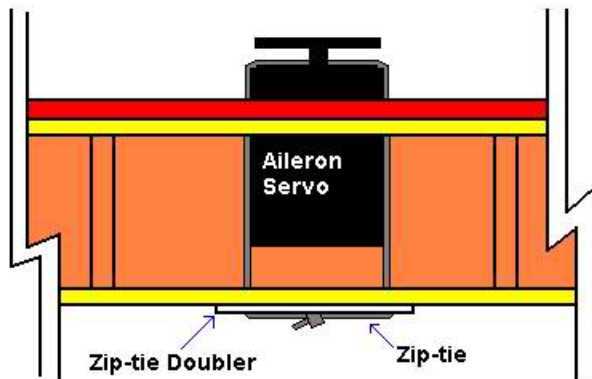
Dynamo Wing Layout



Side View

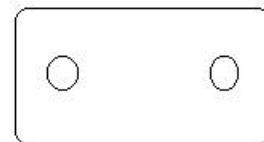


Aileron hinges created by cutting away one side of a Coroplast flute



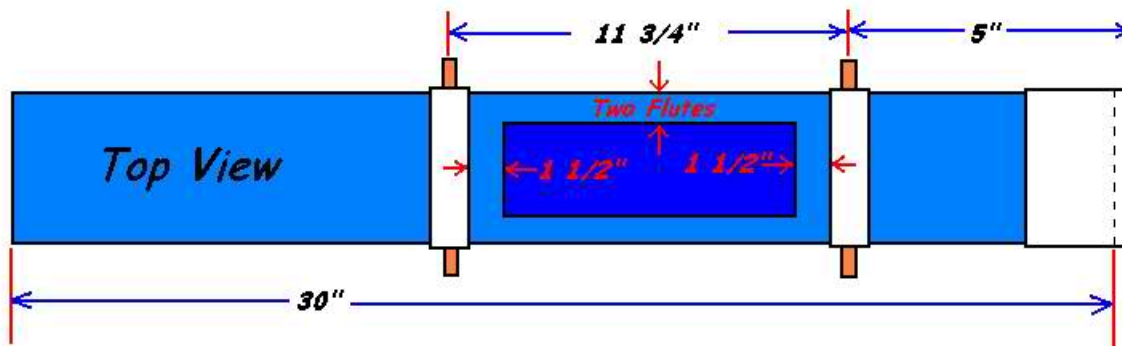
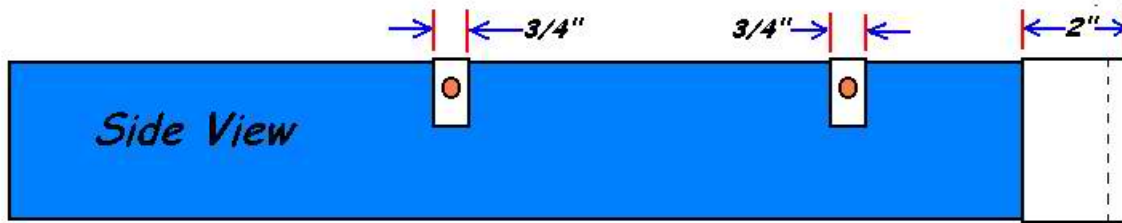
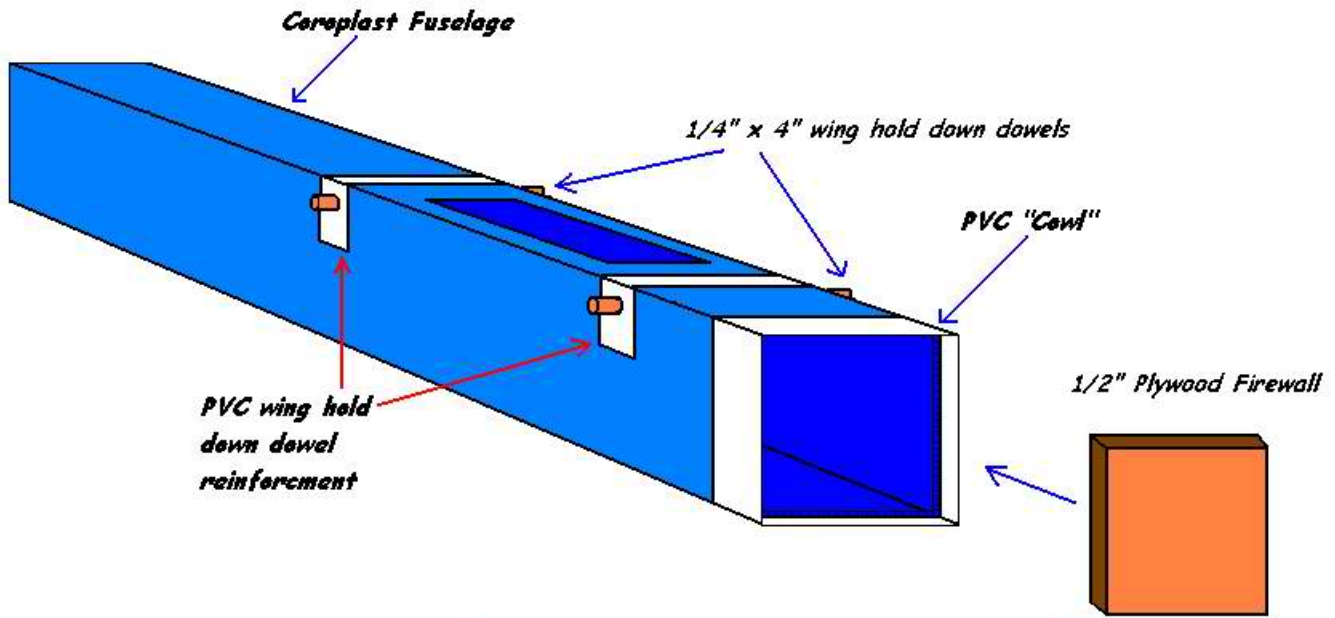
Aileron Servo Installation

Rear View

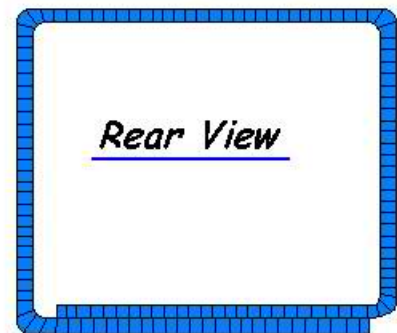
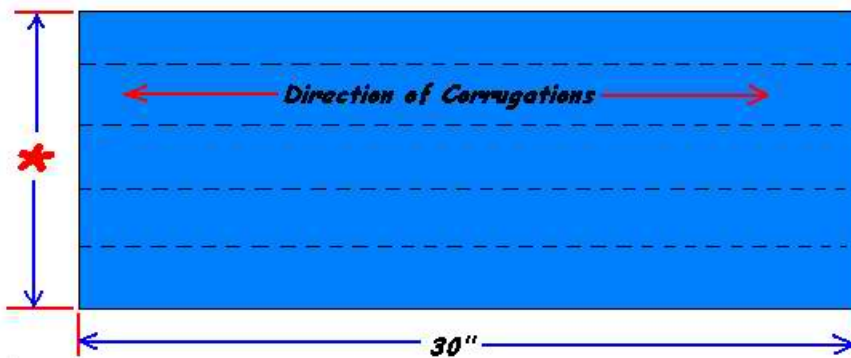


Fabricate zip-tie doubler from scrap PVC, dimensions will be determined by the size of servo you are using

Devastator Fuselage



Fuselage Layout



* Use a piece of scrap Coroplast to determine this dimension (see instructions)