

**DETAILED BUILDING  
AND  
AND FLYING INSTRUCTIONS  
FOR YOUR NEW**

*Classic*

**Grasshopper**

**FUN MACHINE**

Can be built and flown by anyone who can read  
This is the world's simplest, engine powered model airplane.  
All flying adjustments are built in. Designed to FLY !

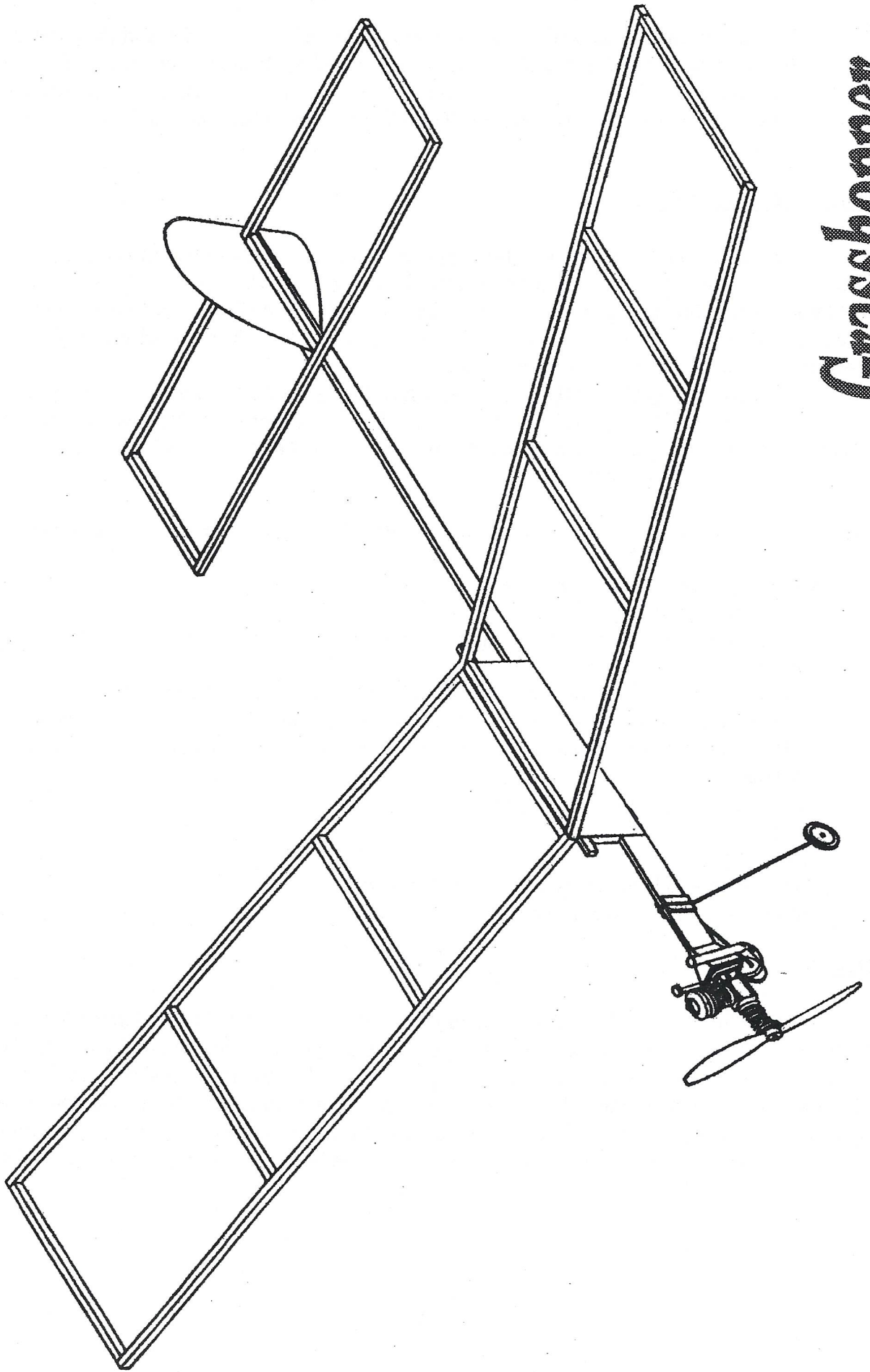
**From**

**Lansing Area Flying Aces**

P.O. Box 81093  
Lansing, MI 48908-1093

**Designed by: Model Research Labs**

*Our experience shows in each design*



**Grashopper**

## This is where it all starts

We have spent a great deal of time and effort developing this model, and the construction kit into the simplest to build, and easiest to fly of any model airplane kit ever produced. In return we are expecting you to pay attention to details, follow these instructions, take your time and do an excellent job of constructing this model. This kit is fool proof, so you don't need to test us.

## Materials and tools

This is the most complete kit ever supplied. Every piece of wood in the kit is already cut to the correct size. Every little item on the model is in the kit. Including the engine, prop, screws, fuel tank, wheels, fuel line, and even the covering material. So, don't cut any of the wood, don't lose any of the pieces. You will need to purchase your own glue. This model was designed to be constructed with one of the slow cure epoxies.

WE INSIST THAT YOU USE A 30 MINUTE EPOXY. Slower curing epoxy is satisfactory, but **DO NOT ATTEMPT** to use any of the 5 min epoxies. You would not be able to complete some of the construction steps within the 5 min cure, **AND** the 5 min epoxies all become brittle in a few months.

The tools you need are very common and most households already have everything you need.

A small #2 screwdriver to attach engine

Ruler, to measure wing dihedral.

Electric iron, to iron on and shrink tight covering material.

Sharp new single edge razor blade.

Wax paper or plastic food wrap to prevent glue from sticking to the plans.

A flat building board or table large enough to build at least 1/2 of a wing. A large smooth workshop table makes things go a lot faster. A scrap piece of plywood on the table works.

Sandpaper.

Spring type clothespins for clamping.

Straight pins.

Ball point pin.

A few weights to hold things in place while the glue dries.

And of course the 30 minute epoxy.

## Step 1

Let the fun begin. The very first thing you need to do is get a clear understanding of the project at hand. So..... Spread out the plans. Examine the plans. Read everything on the plans at least twice. Now lay all the parts right on the plans where they fit, and notice they do fit. Spend at least 20 min becoming totally familiar with every part and its function. Now read completely through these step by step building instructions. Read the instructions again while comparing the plans and the parts. By now all your question should have been answered and this fine model

airplane kit should be looking downright simple. There are no surprises and no magic, and, we planed it that way.

## Step 2

We are going to start with the most difficult task first, this will make the rest of our model easy. The first thing is to glue the two halves of the rudder together. Here's how. Find a nice smooth flat surface and cover it with a piece of the wax paper or plastic food wrap. Mix up a very small amount of epoxy per the manufactures' instructions, a bottle cap is a good place to mix epoxy. With a toothpick or other small stick, apply a tiny amount of epoxy to one edge of part A. Place the two pieces, A and B, of the rudder on the wax paper or plastic food covering about 1/8 of an inch apart. Now slide the rudder piece that does not have any glue on it, up tight against the other piece.

Note that there is a bit of glue that got squeezed out of the joint. You must wipe off this excess glue. We would like to recommend that you make a habit of wiping excess glue off with a paper towel or a bit of cloth. Put a couple of little weights on the rudder to hold it down flat while the glue dries.

In the model building world, it is the generally accepted practice that you always wipe the glue off with your finger and then wipe your finger on your best pants.. As you can see there is wasted motion in this process and it's faster to just skip the finger part. Dried glue on your pants does look kinda of ugly.

## Step 3

The hard part is done. Lets start on the fuselage. Pick out the plywood engine mount, part C, and the two triangle balsa parts, D and E that fit behind the engine mount. Note that the engine mount holes are low on the fuselage like shown in fig. 1. Mix up some more epoxy and glue the parts D and E on the fuselage. Also glue the engine mount piece onto the fuselage.

Now to make it easy to get these three pieces aligned properly we place a small piece of wax paper or what ever on a flat surface. Carefully place the fuselage on its top edge with the glue joint on the wax paper and sort of squeeze the parts together. Once again wipe off the excess glue but this time you must also take a toothpick or such and clean some of the glue out of the engine mounting holes. It's OK to have some glue in these holes but there has to be a hole in order to get the screws started in step 12. Don't touch this part anymore, allow the glue to dry.

## Step 4

Now the easy parts. Next is the stabilizer. Cover the stabilizer portion of the plans with the wax paper or plastic food wrap. Put one of the long pieces in its proper place and put some weights on it to hold it steady. Mix up some more epoxy. Now, one at a time. Touch the end of each of the four short pieces into the epoxy and place them in their proper places. A small weight on each will help hold them in place. Using that toothpick again, put a nice big drop of glue on the other end of each short piece and place the other long piece in place and weight it down also.

Wipe off the excess glue again. Fast and easy wasn't it. But we're not done here yet. If

you read the plans you know that those two center pieces must be spaced to provide a reasonable fit on the rudder.

By now the glue on the rudder should be almost dry and we can pick up the rudder and carefully peel off the wax paper or whatever you used. Use the rudder to size the gap between the two center pieces. Just sort of slide those pieces together until the rudder is a nice slip fit between them. You are almost half done now. Let the glue dry.

### **Step 5**

With the modeling experience you have gained up to this point you are now capable of building the two halves of the wing. Do them just like you did the stabilized. There is no top or bottom, no right or left, and no front or back yet. Just go ahead and build them.

Let the glue dry for at least 6 hours.

### **Step 6**

We are now going to assemble the two wing halves. Study fig. 2 very carefully and notice the special shaped piece of balsa, F, that fits between the wing halves. For this step we will need a smooth flat surface about 48 inches long. The concrete floor works fine if you can trust the dog to stay away.

The first thing you do is get a piece of wax paper or whatever you use and place it where the wing center will be. Lay that special shaped piece of balsa, F, on the center, and half of wing on each side. Get some big books or bricks or something and prop up each wing tip the required 5-1/2 inches. No cheating here, do it right. There is no second chance. When you are sure that the wings fit together properly and everything looks like fig. 4, go ahead and mix up decent size batch of epoxy.

The best way of getting these three parts glued and assembled is to put the epoxy on each wing half and with the special shaped piece of balsa, F, in its proper place, press the two wing halves together against the special piece, F. Now with the other hand, it's probably worth getting a finger dirty here, smooth out and wipe off the excess glue. And with the other hand, make sure that the parts all stayed in perfect position. Back up a bit and clean the glue off your fingers while double checking that there really is 5-1/2 inches under EACH wing tip.

This is an excellent time to go ahead and glue on those little plywood "V"s referred to on the plan as part, G. Now you must leave this assembly alone for at least 6 hours. We all know this is difficult, but it must have ample time to dry nice and straight.

### **Step 7**

By now the fuselage and rudder should be plenty dry for the next step which is gluing the rudder on the fuselage. Lay the rudder on the plans right on the lines. Mix up another batch of epoxy and put some epoxy on the rudder where the fuselage will fit. Make sure you get a good joint here as this does a lot to hold the stabilized in place later on. Place the fuselage on the plans right on the lines, and press it down on the rudder. Pick up this assembly and wipe off and excess glue. You did remember to cover that part of the plans with the wax paper or whatever so the fuselage and rudder won't get glue to the table, didn't you? Put it back down on the plans, make sure things are still lined up properly and put a couple of weights to keep it there.

## Step 8

This is where you start on the wing mounting. Look at parts H, I, J, and K in fig. 3, see how they go together to provide a snug fit on the fuselage. This allows the wing to be shifted back and forth to achieve perfect balance and a beautiful flying model every time. A couple of rubber bands hold the wing in place and allow the wing to be removed for transportation purposes. When you are looking at parts H, I, J, and K, notice how part H, must be on edge in the sandwich in order to fit properly.

Turn the wing over upside down, it's a good idea to place something under the center of the wing to support it and hold the wing steady. Mix up some epoxy, take the rubber band post, part H, and glue it on edge, to the special shaped piece, part F, that's already in the center of the wing. It is very important that you glue this piece on straight. Model airplanes should never be built like corkscrews, keep it straight.

## Step 9

Lets put the landing gear on now. Get out those four little pieces know as part L, and the wire landing gear. Put a little mark right where you want the gear on the fuselage. Mix up some more epoxy and glue those four little pieces and the landing gear on all at the same time, Make sure those little pieces are snug against the landing gear so it can't ever move again. Now I like to wrap about 10 or 15 turns of bright colored thread around the landing gear just below the fuselage so I know it's not ever going to come off and get lost no matter how hard we land.

## Step 10

This step is a little messy, we probably should have told you about this sooner but we all tend to put off the messy parts till later. Model airplane fuel contains three ingredients, they are Alcohol, Castor Oil, and Nitromethane. The mix for your engine should be 60% Alcohol, 15% Castor Oil, and 25% Nitromethane. These are all nice safe things for our use and they don't pose any serious danger to us.

There are a couple of minor problems with our fuel. Number one problem is that the Nitromethane is a very effective paint remover and glue dissolver. As you may have guessed by now it doesn't have any effect on epoxy glue. Problem two is that Castor Oil is gummy, sticky, grimy stuff when it starts to dry out on your model, and it soaks into the wood and destroys it.

The simple solution is to coat the model with epoxy and then keep the Castor Oil wiped off before it gets gummy, sticky, or grimy. So, step 10 is to mix up a fresh batch of epoxy and starting at the engine mount and using your fingers, rub on a thin coat of epoxy. Now this epoxy must cover the engine mount, fuel tank, and landing gear area of the fuselage. There is no need to cover the whole thing with epoxy, if you get the front half, that's plenty.

Get out that toothpick again and clean out the four engine mounting screw holes so as to be ready for step 12. You should have the first half of the fuselage covered by a very thin coat of epoxy glue and lot of glue on your fingers. Don't wipe it on your pants.

### **Step 11.**

We are going to attach the wing mount to the wing. Get out the parts I, J, and K. You are going to glue these three parts and part H, which is already on the wing, together and see some real progress. About all we can tell you is to pay attention and put the parts together like shown on the plans. You may find that a couple of spring type clothes' pins would come in handy to hold that slippery sandwich together while the glue dries.

By now you are a reasonably experienced model builder and we don't need to tell you everything. Don't get glue on your pants.

### **Step 12**

You may as well go ahead and screw your engine on the engine mount. It's a lot easier to play with when it's mounted. Chances are you put the propeller on the engine a long time ago. Before you screw the engine down its a good idea to attach the fuel line to the engine at the little brass tube at the rear of the engine

### **Step 13**

If all the glue is dry, take a few minutes to slip the wing on the fuselage and slide the stabilizer down over the rudder. This thing is starting to look like an airplane. And it is not ugly either. The true beauty of this model is in it's simplicity. Simple beauty that is more than skin deep.

At this point you are allowed to fly the parts around for a few minutes.

### **Step 14**

Back to work. Now you are going to put the fuel tank on. The Grasshopper uses an eyedropper fuel tank that allows us to limit the engine runs to whatever we need. If you were to use an ordinary fuel tank and have a 3-4 min engine run, your Grasshopper could easily get over a 1000 feet high and it's not likely you would ever see it again. So we use an eyedropper and its time to install it. In order to get your eyedropper to stay glued on you must sand a deep groove in part D, which you glued on ages ago in step 3. To cut this groove you will need to wrap a piece of sandpaper around something like a pencil and spend some time carefully sanding the groove like it's shown on the plans. Sand the groove all the way through part D, and stop when you reach the Fuselage. Mix up another batch of epoxy and glue it in place.

This is a good opportunity to examine the entire structure for weak glue joints and touch up any that appear substandard.

## Self confidence and the covering material

Covering with the plastic film included in the kit is quite easy and if you follow these steps it will also look good. Just about everyone is a bit intimidated the first time, but your success in covering this model will inspire confidence. Your limitations are all in your head. The plastic film covering is a heat shrinkable material with an adhesive on one side. This adhesive is also heat activated. All you need to do is place the frosty surface of the film against the wood and iron the film onto the wood. This super adhesive melts into the wood and you're done. To shrink the film tight, you just run the iron lightly over the surface of the film and it will turn clear and shrink up drum tight. If you do mess up a bit, just peel it off and try again.

A few simple rules. Don't waste the film. Plan your layout of parts on the film so as to conserve the film, Running out of film is bad news. Set the temperature of your iron at the lower end of the "COTTON" setting. Don't burn holes in the film by letting the iron touch the film and set in any one place more than about two seconds. Keep the iron moving at all times until you get the hang of this task. Trimming the excess film is best done with a brand new single edge razor blade.

Model airplanes simply can not stand to have any twist in the flying surfaces. This means the wings, stabilizer, and rudder must be perfectly flat and straight with no warps. None. Nada. To avoid such warps, lay the flying surface flat on the work bench and press it down while shrinking the film. Then immediately flip the surface over and shrink the other side. In the event you screw up and do in fact end up with a warp in a flying surface, it's not the end of your world.

Warps can be corrected if you have three hands. Use two hands to twist the flying surface just slightly past the correct, no warp position, and then run the iron over the surface on both sides. You must hold the surface in this position until it cools. When you release the surface it should return to the straight, flat, no warp position. Actually, it seldom comes out straight on the first try, but with this film you get to try again and again until it is flat and the model will fly.

### Step 15

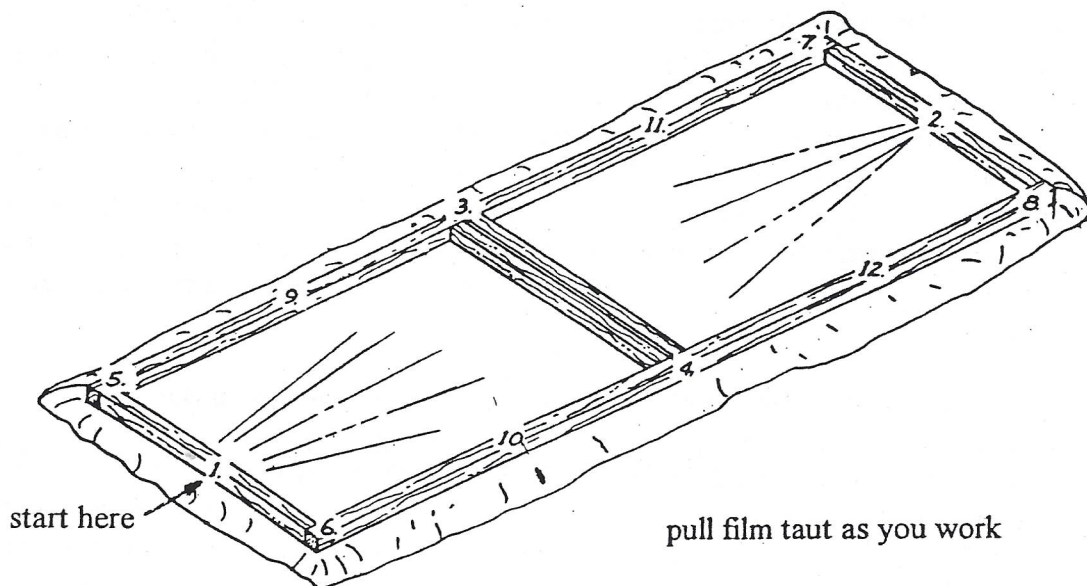
Time to DO IT. We are going to cover the stabilizer first because it's the easiest. We both know there is no top or bottom to the stabilizer but we are still going to cover the bottom first. We are going to cover the bottom and wrap the excess film up the edges of the stabilizer and iron it on the edges real good. Then we cover the top surface and iron the excess film down over the edges of the stabilizer and really have a good tight covering job.

1. Lay the stabilizer on the film at the very end of the roll, and with a sharp blade cut about 1 inch beyond the stabilizer so you have some working space.
2. Lay the stabilizer down on a flat surface and place the film, frosty side down on the stabilizer.
3. Allow at least 15 minutes for your iron to reach the LOW-COTTON setting. Tack the film down at spot 1. Now, put the iron down and let spot 1. on the film cool for a couple of minutes. Try to peel the film off the wood, if the film peels off easy, it means your iron is not hot enough. Raise the iron's setting up a notch and wait about 5 minutes for your iron to adjust itself. Iron down spot 1. again and repeat this whole process until your film really hangs on to the wood. If, on the other hand your iron was too hot and

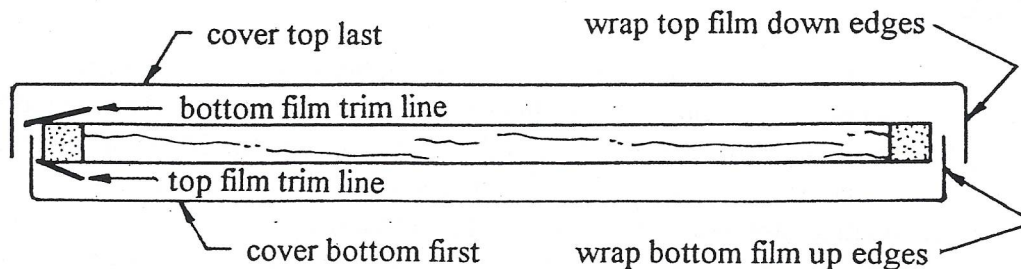


you just about burned a hole in the film you must lower the irons setting a notch and wait at least 15 minutes. Irons don't cool very fast. At this point you should know enough to be able to set your iron properly, so onward and upward! If you did scrap out any film, save it to use on the rudder.

4. Pull the film taut and tack the film down in the sequence shown below. Don't try to iron it down, use the tip of the iron and just press it down for about 2 seconds and then lift the iron. The iron will melt the film if you let it stay in one place very long. Don't try to slide the iron sideways or the film will move slightly and cause little wrinkles



5. Go ahead and iron the film down all the way around.
6. With that sharp blade, cut the film at each corner and iron the film on to edges of the stabilizer like shown below.



seal all the edges down one last time when you have completed covering.

7. With that sharp blade trim all the excess film off and toss it.
8. Repeat this process for the top side of the stabilizer.
9. When its all ironed down good on the edges, you heat shrink the film down real tight by slowly moving the iron over the surface of the film. It is important that you not do this until both sides are completely covered or you may get unwanted warps. It is very important that you keep the iron moving at all times or you will

burn a hole in the film. Your kit contains extra film just for this reason. Do not waste the extra film as you may need it for any repairs later on.

10. You also will need to iron the film down at those two center pieces, because you will soon be cutting a hole in the film where the rudder slides through.

### Step 16

Now we're having fun..... Let's cover the wing.

You cover the wing just like you did the stabilizer. The wing requires four separate pieces of film. Start by covering a bottom half and then cover the top of the same half. Repeat the process for the other half. When the wing is all covered and edges ironed down good, you can heat shrink both top and bottom of the entire wing. Covering is easy, but it is time consuming.

### Step 17

We cover the rudder because it keeps it clean and makes it much stronger. You can cover the rudder using scraps of left over film. Start by covering the side of the rudder that is glued onto the fuselage. The part of the rudder that hangs down below the fuselage is called the sub-rudder and you should cover that first since it is small and covering wood surfaces is different. To cover this sub-rudder, cut a piece of film about 1/4 inch larger than needed. Hold the film in place and tack it down with the tip of the iron in several places. Now iron it down good and pull the film around the edges of the sub-rudder and trim off the excess. Small imperfections can be ironed out, but if you have any major problems just carefully peel the film off and practice it again.

Next is to cover the top part of the rudder on the same side. Then the opposite side of the rudder and you are done covering. However there is one thing you should remember: Do not cover the area on the rudder where the stabilizer will be glued on. If you do it will be necessary to cut and peel the covering off as the epoxy will not stick very well to the plastic film.

### Step 18

Attaching the stabilizer to the fuselage is kind of tricky but it's easy this way. Put the wing on the fuselage and hook on a few rubber bands to hold it firmly in place. You know how, hook the rubber band on the rubber band post, loop it under the fuselage and then hook it on the rubber band post again. Now with the model setting there all ready to go but with no stabilizer, prop up the tail end so the fuselage is about level, and glue the stabilizer on.

We must now take a sharp blade and cut away the film in the rudder slot, AND, what is not so obvious, You must also trim away a bit of the film from the stabilizer where it touches the fuselage. The glue simply does not hold very well to the film so you remove a bit of film and provide some bare wood for the glue to hold on. You should remove about 1/2 of the film at each of the pieces on the stabilizer. You must leave enough film so that the covering is still well attached to each piece or it will be flapping in the breeze.

Mix up a batch of epoxy and put some on the fuselage and the portion of the rudder that's not covered. Now carefully slide the stabilizer down over the rudder and press it on the fuselage. Pin the stabilizer in place.

Now is the time to get the stabilizer all lined up with the wing. When you view the model from the tail end, the stabilizer must be level in relation to the wings. With some small books and weights this is easy to do but very important. If you were to glue the stabilizer on tilted, your model is always going to turn towards the high side of the stabilizer. Even the birds usually make turns in the glide by tilting their tails. At your age it's much better to keep you tail straight.

### **Step 19**

In order to fly good your model must be straight and balanced properly. The straight part you took care of while covering. If not you better go back about 5 steps and pay attention.

We are going to balance the model using a string and a pin. At the center of the wing, measure back exactly 3-1/2 inches and push in a pin. Now tie a string or thread on the pin.

Completely assembly the model including the propeller, fuel line, and rubber bands. Carefully lift the model up by the string. The model must balance perfectly level before the first flight is attempted. You can accomplish this perfect balance simply by sliding the wing mount front or back as required. When you find the correction location you should put a small ball point pen mark on the fuselage.

At this point you model is almost ready. But first you need to put your name and phone number permanently on the model. We like to use a ball point pen and write it on the plywood wing mount on both sides.

### **Let the fun begin lets go flying !!**

Before leaving the hanger it's a good idea to do a little preflight check. With the model setting in front of you go through the instructions just one more time. Make sure there are no warps. Make sure it balances 3-1/2 inches back of the front edge of the wing. And it's very important that your name and phone number is on the model.

To put fuel in the eyedropper fuel tank, you will need a small plastic bottle with a plastic spout. These bottles in the 4 ounce size can be purchased at the beauty supply stores or most people can find one in the home some where. Wash it out and dry it well. It is easy to see how this will work to fill the tank and then refill the tank just before take off.

Starting a new engine can be very frustrating at the flying field. It is much better to learn how to operate your engine at home away from the pressures of that first flight. Although your engine will run just fine in the dining room or even in the garage, it's a lot better to do all your engine running outside.

Now the main point is to run the engine at least 10 to 20 times before going out to the flying field. Success is good for you. Be prepared. Make sure you can start you engine. We all know the model is going to fly. Just give it a chance.

Follow the instructions with the engine, it is a good engine and it will run just fine. If you have trouble with the engine it is your own fault. Note that Cox does have an 800 number you can call for help. Over 95% of engine starting problems are due to the glow plug not being lighted the dull red color it should be. There are only three reasons for this. 1. Poor connection from the battery to the glow plug. Or 2. The battery is already dead. Or 3. You burned out the glow by using the wrong battery voltage. Not all batteries are the same, the glow plug requires a 1-1/2 volt battery.

Bare in mind that the glow plug draws about 2 Amps of current at 1-1/2 volts. This means that the battery can only light the glow plug for a very limited time. It is sort of like leaving the flashlight "on", the batteries go dead. Glow plugs drain batteries a lot faster than flashlights. Don't leave the battery connected to the glow plug any longer than necessary.

If you still have trouble with the engine, don't send it back to us. We do not accept any returns for any reason. Call Cox Hobbies with engine problems. Please. If you have problems with building or flying the model we are real interested and would welcome your letter.

### Test flying

Make sure you have large field to fly on. Pick a day with little or no wind, the model drifts with the wind. If the wind is 10 miles an hour you can't possibly keep up with your model. After you have a few flights on your model you can make your own flying rules. When your model is flying well and you are using long motor runs, a horse would really come in handy for retrieving the model. Never having had a horse we always run after the models or rode on bikes or motorcycles. With a 30 second motor run this model will fly about 1-1/2 minutes and it will therefore drift just as far as the wind travels in 1-1/2 min. Be prepared.

First flight, This is always fun. And yes it does cause you heart to beat faster. If you have a smooth surface about 10 feet long, that is known as a runway and your model will take off quite smartly with no push required. In the event you do not have a suitable surface for take off you will be hand launching like the competition flyers. Now a word about hand launching, Many models have been destroyed by fools just standing up and giving the model a very hard throw. This can be counted on to either collapse the wings or cause the model to hit the cold hard earth very sudden and hard.

The proper way to hand launch a model is hold the it with the thumb and fore-fingers right on the balance point. Hold the model perfectly level and point the model directly into the wind, now run about 3 or 4 steps, thats enough. Release the model with a GENTLE push, thats all it takes. The reason this works is because the model starts to fly at about 12 miles an hour airspeed and you run maybe 6 or 7 miles an hour and your push is about 5 miles an hour. Now if there is any wind that gets added in also and you must ease off on the run or push part to avoid overdoing it. By the time you have read this twice you can do it. Hand launching is easy and if you have a field of nice soft high grass it's an ideal way to make those first few test flights painless.

Ready to start the engine. We'll first figure out which way the wind is blowing so you can launch the model straight into the wind. Cross wind take offs are a big no-no.

Fire up the engine, get it running about 3/4 speed nice and smooth. Refill the fuel tank and point the model directly into the wind. Now watch the fuel level in the eyedropper fuel tank and when it gets down to about half full, LAUNCH THE MODEL. Pay attention and observe what it does. Which way does it circle while the engine is running? Which way does it circle in the glide ? Does the model stall and dip in the glide? Or does it seem to be gliding faster and faster ?

**There is no question about the model flying. It flies, we all know that.**

A normal well adjusted flight is for the model to climb in a spiral pattern while the engine is running, make one large dip when the engine quits, and settle into a glide.

If your model were built absolutely perfect with straight flying surfaces and properly balanced, it would climb upward in a tight right hand spiral turn and then glide in a straight line for about 200 yards. We have never seen this occur with a new model and yours can be counted on to turn and circle in the glide.

Now back to that first flight. What did your model do? Did it almost crash from turning too tight? Did it loop? Or did it climb out with a nice spiral turn? How was the glide? Did it have repeated little climbs and dips all the way into the ground? Or did it come down like a big hawk at meal time? Before you make the second test flight we are going to fix some of the problems.

The flight of this model must be divided into two very different segments. The power segment and then the glide segment. This is because the engine is so powerful that when it is running the model will fly 3 times as fast as does in the glide. It is important that you understand this concept.

### Power segment

PROBLEM	CURE
Does not climb, flies around in circles	Increase engine speed
Turns too tight, does not climb but flies quite fast.	Add optional power tab and bend in 1/8 inch of opposite turn power tab.
Does not turn, tries to loop	Add optional power tab and bend in 1/8 inch of right power tab.

### Glide segment

PROBLEM	CURE
Glides like a sick bird and gains speed on the way down.	Slide the wing mount forward 1/4 inch.
Little climbs and dips that continue all the way down.	Slide the wing mount back 1/4 inch.
Glides straight without turning	Glue weight on right wing tip, use a penny or similar weight of clay.

NOTE: The power tab is shown on the plans but seldom needed. If your model needs a power tab, you make it of the thin aluminum from a soda pop can. Cut the tab out of the can with scissors, get it nice and straight, then cut a slit in the edge of the rudder with a sharp blade and glue the tab in place.

The adjustments that work for the power segment have little effect on the glide and the glide adjustments will have only a slight effect on the power segment. All adjustments should be done carefully and in small increments. A little bit is good, more is better does not work for flight adjustments. Always make sure that it actually needs a bit more before you do more.

### **The glide turn is never done with the rudder or the power tab!**

The adjustments will need to be made over a series of flights. Once you are sure that the power segment is safe, you can start increasing the engine speed and engine run a little bit each flight. After each flight you should wipe the model off and keep it nice and clean. When you have found the ideal location for the wing mount, that provides the slowest glide without dipping, you should put a new mark on the fuselage so you will always know where to place the wing.

On a good full speed engine run and a full eye dropper of fuel the model will climb to about 300 feet and glide for about 1-1/2 minutes. In the event you are flying in or near a field of high grass and having trouble finding the model after it lands, you may need to increase the visibility. About the best way to do this is by spray painting a thin light transparent coat of bright red paint on the bottom of the stabilizer only. Notice that at no time did we say to paint the stabilizer or anything else. The model should not be painted or be forced to wear a bunch of decals. This is not a taxi cab. This is a good model airplane, we want it to fly like a feather, not a lead balloon. Also remember that fuel removes paint.

By now you have the beginnings of a decent model builder and a basic understanding of how to make a model fly. Welcome to our world of imagination. It is just a very small cross section of life, a section you can control. There are no limits on what you can accomplish. Decide what you want to do and get started on it. This is a do it yourself project, just like your life.

*The above instructions were prepared for grade level 7.0 per the Flesch standards, and are rated at 80.3 for ease of reading. The Flesch-Kincaid level is 5.2. We believe anyone reading at the 5th grade level will be able to successfully build and fly this model.*