PLEASE READ THIS FIRST

Many thanks for buying the Wabbit!

To ensure a great maiden flight, there are several things we really want to emphasize before you begin assembling the model, and before your first launch.

(a) ***NAIL THE CENTER OF GRAVITY!!!*** *Wings of this type are very CG sensitive. Please follow the recommended CG placement and "Fine Tuning" procedure carefully… you will be glad you did!*

(b) ***DO NOT EXCEED THE RECOMMENDED ELEVATOR THROWS.*** *One other aspect of planks, or pseudo plank-style plan forms, is that they need very little up / down elevator. Use the Dual Rates and/or End-Point Adjustments on your transmitter to dial-down your elevator to the recommended throws. If you exceed them, hyper-stalling, a feeling of sluggishness (meaning only the plane, but who knows?), and short flights are almost guaranteed.*

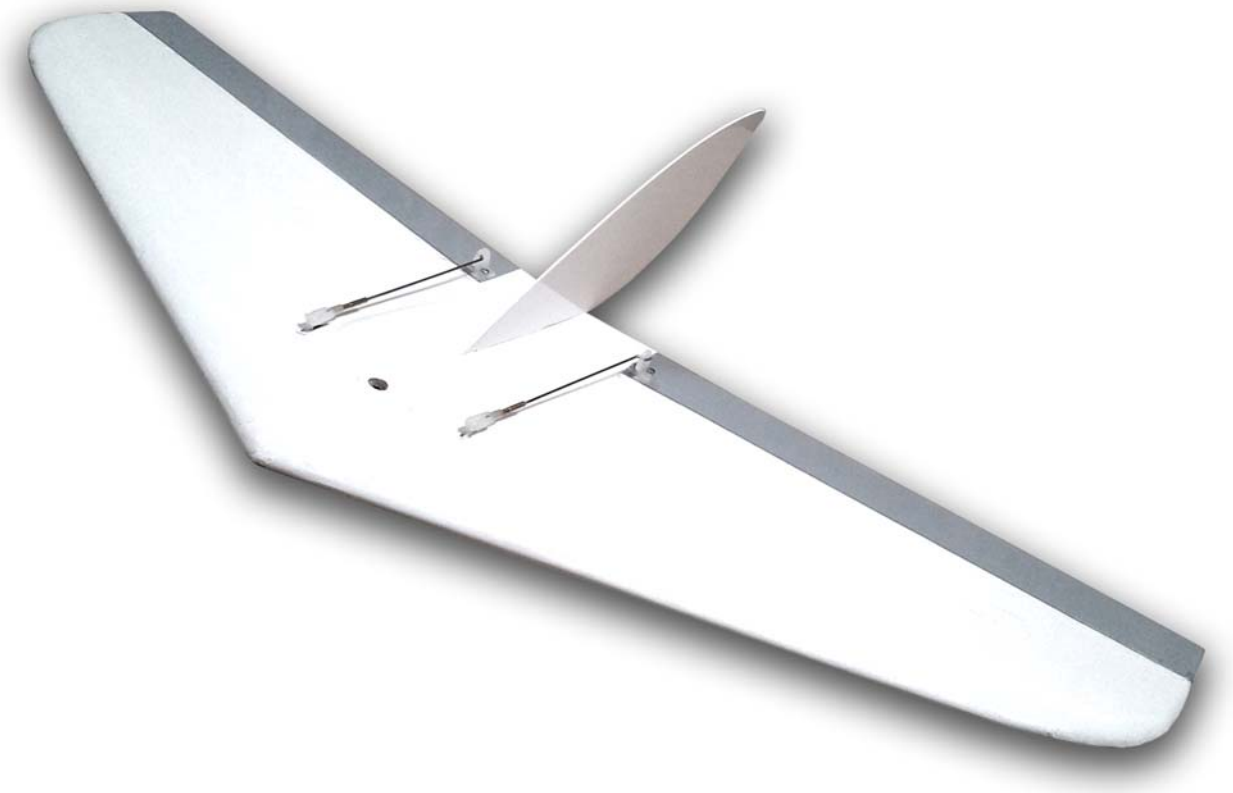
As with most NCFM gliders, the ***Wabbit*** *is intended for medium to heavy air. It should maintain in lighter lift, depending on how clean the airframe is, but it is happiest in beefier conditions.*

We are always learning, modifying, adjusting and improving our aircraft. Consequently, we continually update our website with the latest findings. The "Latest News" and FAQ sections can be checked for reference.

THANKS!!

☺

The Wabbit



High Performance Sloper

For when you want to annoy the competition!

Wing Span: 24" • 160 Area: Sq.In. • Typical Minimum Weight: 6.2 Oz.

Note: For the very latest info on any CG or building updates, please check the "Latest News" section on our website.

www.northcountyflyingmachines.com

(858) 485-1137

~ N C F M ~

ASSEMBLY INSTRUCTIONS:

7.18. 2010

Package Includes:

One fully built and covered Wabbit (with all electronics installed).

One fully covered fin.

One male charge jack.

One User Manual DVD

Also Needed:

A transmitter with elevon mixing, end-point and/or dual rate adjustments.

A micro receiver no thicker than ½" , no longer than 2" and no wider than 1-1/2"

A small roll of Scotch Tape

A piece of string that's about 12" long.

A small piece of lead. (How small? You'll find out!)

Before you start: *You should read this User Manual from beginning to end. That's why it was taped to the outside of the packaging. It is meant to give you an idea of what the Wabbit is all about. If after reading the instructions you decide that it's not for you, put the whole thing in the box and return it to us or the distributor you bought it from. We cannot reimburse you for the shipping costs, but we can refund the cost of the plane. The last thing we want is you stuck with an item you don't want.*

After you've read these instructions, if you decide you like to give the Wabbit a go, take it out or its wrapping and take a close look at to make sure it is in good shape. If it's not, return it to us before you prepare it for its fist flight.
We will do our best to replace it with one that is in good shape.

Now what is "Good Shape"?

The Wabbit is made of a of EPP foam and some balsa wood (if you ignore the electronics that are buried in its belly). The EPP foam is covered with heat shrink covering that was tight as a drum when it left our shop. The covering might have developed wrinkles while in transit, but the wing should not we warped, dinged or scratched. The wrinkles are pretty much unavoidable in a foamie and don't affect flight that much if you don't let them grow. Use an iron to remove the wrinkles but be careful no to warp the wing!

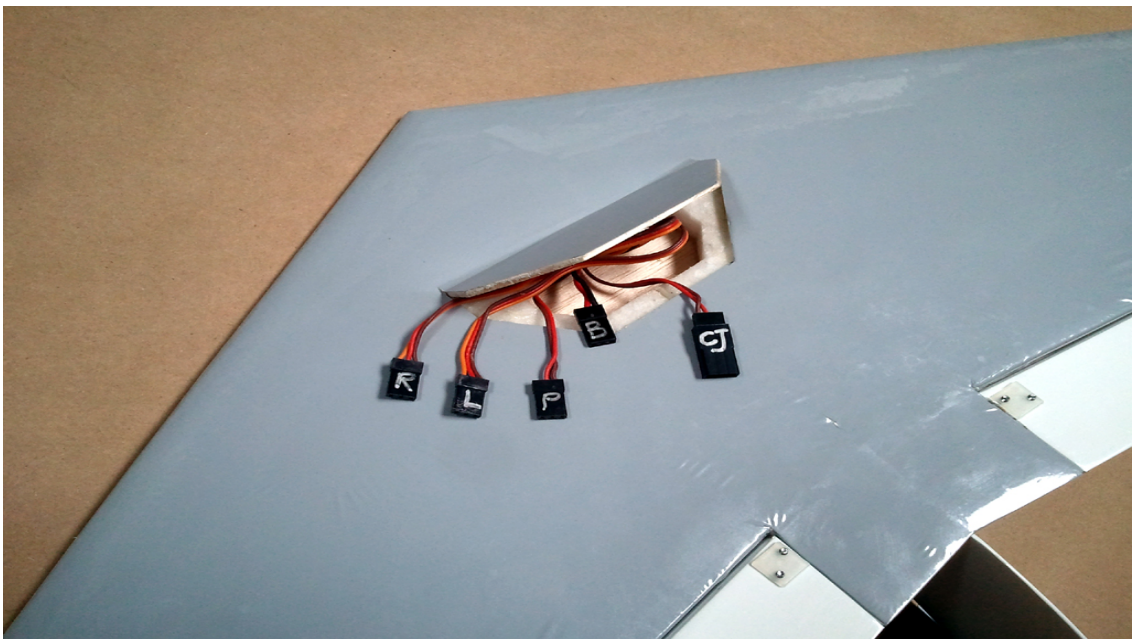
So if the Wabbit is in good shape, your next step would be to install your receiver.

Installing the Receiver:

Turn the Wabbit over and look at its belly. You will see a hatch that's covering the receiver compartment and is held down with a small piece of yellow tape. The hatch has been cut open for you on three sides but is attached to the belly and hinged in the front with the covering.

Slowly pull the tape off of the belly and use it to lift the hatch open.
If the hatch resists opening, do not pull hard on the yellow tape because all you'll accomplish will be to peel the covering off the hatch without opening it!
Use the tip of a knife or a small screw driver to coax the hatch open.

Inside the receiver compartment you will see 5 wires.
Four of the wires have male connector and one has a female connector.
Each wire has a letter designator on the connector.



This is what the letters mean:

B = Battery (this lead brings the charge from the battery pack in the nose)
CJ = Charge Jack (this is the lead that sends the battery charge to the charge jack)
P = Power (this is the lead that brings the charge from the charge jack to the receiver)
R = Right Servo
L = Left Servo

We assume you know your R/C system well enough to know which channels you should connect the servos to (wires R and L) and where the power connector goes (wire P). The Power terminal on most receivers is called "Battery" or you can use any channel terminal.

So here is what you need to do step by step:

1. *Remove the red male jack from its plastic bag and insert it into the switch terminal on the top of the Wabbit.*
   This will turn the power off at the charge jack and prevent the servos from going wild!

2. *Insert connector "B" into connector "CJ".*
   This will connect the battery to the charge jack.

3. *Insert connector "P" into the Battery terminal of your receiver.*

4. *Insert connectors "R" and "L" into the respective Right and Left servo terminal on the receiver.*

The receiver installation is now complete. Before fitting it into the Rx compartment, make sure it operates optimally. But do not turn it on yet!

Turn on the transmitter, center the trims and set the rates to "low".
You can now pull the male jack out to turn the receiver on.
The servos should come to life, and if the transmitter is programmed correctly, they should operate as required.

Once you are satisfied with the receiver operation, fit it into the compartment.
As you can see, space is at a premium here. So instead of stuffing everything in, try to organize the wiring so there's enough room for the receiver.
If the receiver is too big for the compartment, you might be able to take it out of its hard shell and encase it in shrink wrapping instead. Consult your R/C manufacturers manual and instructions to ensure that removing the receiver from its case does not affect its performance adversely.

Once you have everything fitting, it's time to close the hatch.
Here, you have three options:

1. *Keep the hatch closed with a piece of removable tape.*
2. *Cover the hatch with heat shrink covering.*
3. *Gluing the hatch to seal the compartment.*

It's not a bad idea to keep the compartment accessible for the first few flights in case something needs adjusting.
After that you want to fashion a more permanent closure for the hatch.
Gluing the hatch in place will stiffen the plane and is probably the best option.

Adjusting the Control Surfaces:

The servos have been "centered" at the shop and before they were installed.
In the centered position, the servo arms will stand vertical.
The control rod lengths have also been adjusted so that with the servos "centered", the elevons will be in the neutral position, so that they are in line with the fixed center section of the trailing edge.
This means that if your transmitter trims are centered, the elevons should remain neutral when you turn the transmitter on. But this is not always the case due to differences between R/C systems.

So, if the elevons do not line up neutral, they need to be adjusted manually (via the control rod clevis) or electronically (via the transmitter's programming).

Once the control surfaces are centered and neutral, you should move to adjusting the control surface travel and dual rates.

Control Surface Travel:

The recommended control surface travel distances are as follows:

	Low Rates	*High Rates*
Elevator travel:	*3/16" UP , 3/16" DOWN*	*3/8" UP , 3/8" DOWN*
Aileron travel:	*1/4" UP , 1/4" DOWN*	*1/2" UP , 1/2" DOWN*

You will adjust these rates as you become familiar with the Wabbit.
But to start, you shouldn't deviate from these figures.

To produce these rates you have to use your transmitter programming and/or move the clevis to a different hole on the control horn.
It is, however, recommended that you leave exponential at zero for the first few flights.

As you will read in the next sections, as you move the CG back, you will need to reduce the elevator travel.

Charge the Battery:

The battery pack installed in the nose section of the Wabbit has enough charge to allow you double check your Rx installation and then some.
But it's a good idea to fully charge it before taking it to the slope.

*Remember that the battery pack is a **4 cell 4.8 volt 1/3AAA 200mAh NiMh** variety and it is best trickle charged over a longer period of time.*

Installing the Fin:

The Fin is made of 1/16" balsa and covered with heat-shrink covering. It is stiff, but over time it will get damaged. So before going forward, trace the outline of the Fin on a piece of paper and save it. It will come in handy when you eventually break the Fin and need to make another one yourself!

Insert the fin into the fin slot and push in down until fully seated. The fit can be tight here, so be gentle so as not to break the Fin.

Even if the Fin fits tightly, it is a good idea to secure it to the wing so that it cannot be knocked away in flight.

The best way to secure the Fin is to use two small pieces of tape, one on each side.

The best place to secure the Fin is near the trailing edge. At this spot the pieces of tape will hold the back end of the Fin securely and prevent it from flapping around. It is much easier to fly the Wabbit with precision when the Fin is not flapping around!

Although you can glue the Fin in place permanently, you will lose the ability to transport your Wabbit effectively if you do so.

Balancing:

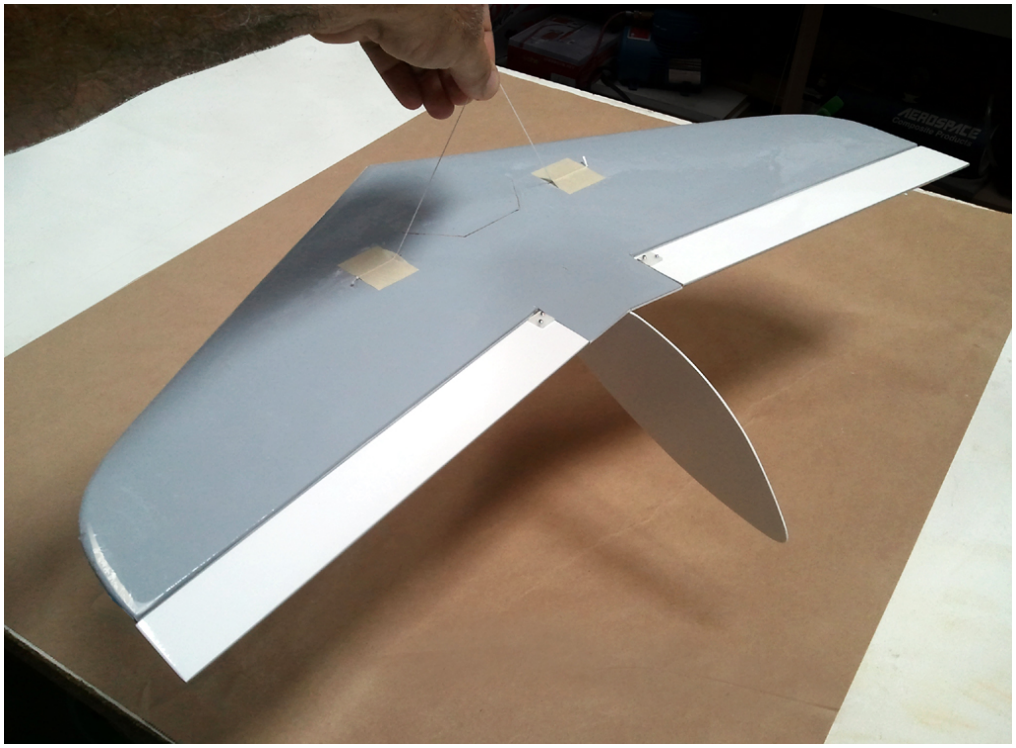
The starting balance point of the Wabbit is 4-1/8" (105 mm) behind the nose.
Measured differently, the balance point is roughly 7/16" (11 mm) in front of the back edge of the Rx hatch.

This balance point is marked for you on both sides of the hatch with two black lines.

You can use two sharp points to balance the plane on these marks with the plane in an upright position.

Alternatively you can use a piece of string to balance the plane in the inverted position. To do so, follow these steps:

1. *Attach the ends of the string at the balance points with two pieces of tape.*
2. *Holding the string from the middle, lift the plane and see which way it tips.*
3. *Add small weights where needed until the plane stays horizontal.*



Now that your Wabbit is balanced at the so-called hash marks, we will call this balance point the Center of Gravity (CG).

Most Wabbits will fly straight and level with the neutral control surfaces and the starting ***CG set at 4-1/8" (105 mm)****. This, however, is not guaranteed!*
Be prepared to make adjustments to the CG and/or the control surfaces if the plane does not behave as expected.

"Making Adjustments" involves moving the CG forward or aft and/ or changing the neutral point of the control surfaces and/or changing the control surface travel distances and the amount of elevator reflex, and/or a combination of all of these.

This is not really a difficult task as long as you have "patience", are able to "observe" the planes behavior and know how to "respond" accordingly as you will read about later.

Depending on the weight of your receiver and the closure option you choose for the hatch you might need to add balance weight to the nose or tail area.
In most cases the weight will be needed in the tail. The reason for this is that we have erred in making the Wabbit a little nose heavy so that you don't have to bother with adding weight to the nose area. The nose of the Wabbit has no room for balance weights and if needed they have to be attached to the exterior. This makes the Wabbit less efficient and the weights will be a pain to maintain. Adding weight to the back is much easier especially if you pound the pieces of lead that's needed until it is thinner than a coin.

Fly!:

The Wabbit should now be charged, shop CG'd, travel adjusted and the elevons should be neutral. Make sure that you have set up dual rates for the elevator throw, just in case.

For the maiden flight, set the elevator control to low rates and trim the elevator up just a bit (no more than 1/16" of up-elevator) also just in case.

The best way to launch the Wabbit is to use a flat-palm throw otherwise known as a "pizza toss". Wait for good lift and give it a straight, firm, and level launch, with a good follow through…not too wimpy, not too hard… more like a javelin toss than a baseball pitch. Fly conservatively and make shallow turn , until you become used to the controls, then trim the Wabbit as best you can for straight and level flight. To improve the flight performance, follow the "Fine Tuning" steps below.

Fine Tuning:

The goal of fine-tuning is to find the optimal CG location and the corresponding elevator reflex/trim/travel that would allow the Wabbit to fly faster and "bang" turns better.

A plane that is not fine-tuned will exhibit one or many of the following behaviors:

1. *Rapid up and down bobbing of the nose known as "hyperstalling"*
   This is caused by the plane being extremely "nose heavy" with excessive elevator travel.

2. *Extreme altitude gain with increased airspeed.*
   This is caused by the plane being moderately "nose heavy".

3. *Extreme altitude loss with increased airspeed.*
   This is caused by the plane being moderately "tail heavy".

4. *Sluggish flight.*
   This is usually caused by the plane being moderately "nose heavy" or when the" airframe is aerodynamically un-clean and so called "draggy"!

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5. *Slow turns.*
   This is usually caused by the plane being moderately "nose heavy"

6. *Extreme altitude loss while inverted*
   This is usually caused by the plane being moderately "nose heavy"

7. *Lack of positive control*
   This is usually caused by the plane being extremely "tail heavy"

To correct these behaviors, it is best to make one adjustment at a time and observe the effects of that adjustment in flight before making another adjustment. This can be time consuming but it isn't really difficult.

In most cases the plane is nose-heavy and the CG needs to be moved back. Remember that when you move the CG back you also need to reduce the reflex (the amount of elevator up-trim) and the amount of elevator travel (reduced elevator rate). If you don't, the aircraft will become increasingly sensitive to elevator control and ultimately uncontrollable.

To start moving the CG back:
Place a small supplemental sticky weight on the CG and begin moving it back with successive flights until the plane feels smooth yet very peppy on the turns and energetic in the vertical pumps. Make very small movements with the weight, about 1/2" at a time. Properly CG'd, the Wabbit will be fast, stable, maintain energy extremely well in both medium and heavy lift, fly effortlessly inverted, snap turns, and have great spiral and yaw stability. If it doesn't have ALL of these properties, it is likely due to one or two things:

(a) Your CG is not yet perfect.
(b) You have too much elevator throw. In our experience, it is usually both.

Keep the Wabbit in good shape:

The best way to clean the Wabbit is to wipe it down with glass cleaner.
To remove tougher stains you can use acetone as long as you don't let it seep into the electronics.

Do not leave your Wabbit in a hot car! The wing is stiff but it will develop a warp if exposed to extreme heat.

To check for a warp, sight the Wabbit from behind. If the trailing edge is not centered on the silhouette of the top and bottom of the wing, it is warped.
To remove a warp, gently twist the wing in the opposite direction and use heat to remove the wrinkles that develop in the covering.

When using an iron to remove wrinkles, do not press the iron down. Hover it over the area until the wrinkles disappear. Don not touch the area until it has cooled down.

HAPPY FLIGHTS & THANKS FOR CHOOSING THE WABBIT