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Wild Hare R/C Sbach 342 25% Assembly Manual

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If the buyer is not prepared to accept the liability associated with the use of this product, the buyer is advised to return this kit immediately in new and unused condition to the place of purchase.

While this kit has been flight tested to exceed normal use, if the plane will be used for extremely high stress flying such as racing or extreme aerobatics the modeler is responsible for taking steps to reinforce the high stress points.

Read through this manual before starting construction. It contains important warnings and instructions concerning the assembly and use of this model.

Warning. This is not a toy. If not properly controlled it can cause injury or death and property damage..

Specifications

Wingspan	73 inches
Length	69 inches
Wing Area	960 sq. inches
Weight	10-10.5 lbs .
Recommended engine	DLE-30 cc gas engine or 1.20-1.80 glow

Additional equipment required

Computer Radio with at least 5 channels, 7 channels preferred

2 elevator servos minimum 70 oz./in. of torque each.

2 aileron servos, total torque required not less than 70 oz./in. per aileron.

rudder servo at least 90 oz./in. (see text)

Servos must be either Karbonite or metal gear

throttle servo

battery pack at least 1500 mah

switch for receiver battery and battery pack

2x6" and 2x18" servo extensions.

3.5" spinner

We recommend the DLE-30 engine and a 19-8 "Bunny" prop.

All of these accessories can be purchased from Wild Hare directly.

Optional Accessories

Wild Hare R/C makes available several accessories that can enhance the Sbach-342. These are;

Spinner. The Sbach requires a 3.5" spinner. Wild Hare normally keeps Dave Brown Vortec spinners in stock.

DLE-30 engine is the best power plant that we have found for this plane. The engine mounting firewall is marked with the bolt pattern. You can simply drill the firewall as marked and bolt the DLE-30 engine on with no further adjustments.

Hitec or Airtronics servos, we have a selection of appropriate servos in all price ranges.

We recommend **A123 Lithium** batteries for long life, simplicity, and because they have all the power you will ever need. Of course Wild Hare sells these along with switches and chargers. Adequate power wiring is very important on larger planes.



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Step 1. Open and inspect everything

In the box you should have a fuselage with hatch, wings, carbon fiber wing and stab tubes, the elevator/stab assemblies, the rudder, cowl, wheel pants, canopy, landing gear, and a package with the tail wheel assembly and miscellaneous fasteners, axles, control horns, and other hardware. Check everything for shipping damage and/or manufacturing defects. **If there is a problem, report it to us NOW**, not after you start building the plane. Once you have begun cutting, drilling or gluing we cannot accept the return of the plane or any component parts.

Known issues and improvements

There are a few areas where, at this unassembled stage, you can improve the final results of your assembly project. There are many items that cannot be addressed on the assembly line due to cost and possibly because not every improvement would be welcomed by every builder. Here are the items that we have found so far.

Go over the covering with a heat gun or iron. The covering tends to get loose over time and with changes in temperature and humidity. It may have come out of the box with wrinkles, I can assure you it did not go into the box that way. Please be careful not to overshrink the covering. Be very careful not to use too much heat especially near an edge or seam, too much heat will cause the covering to pull away and wrinkle badly.

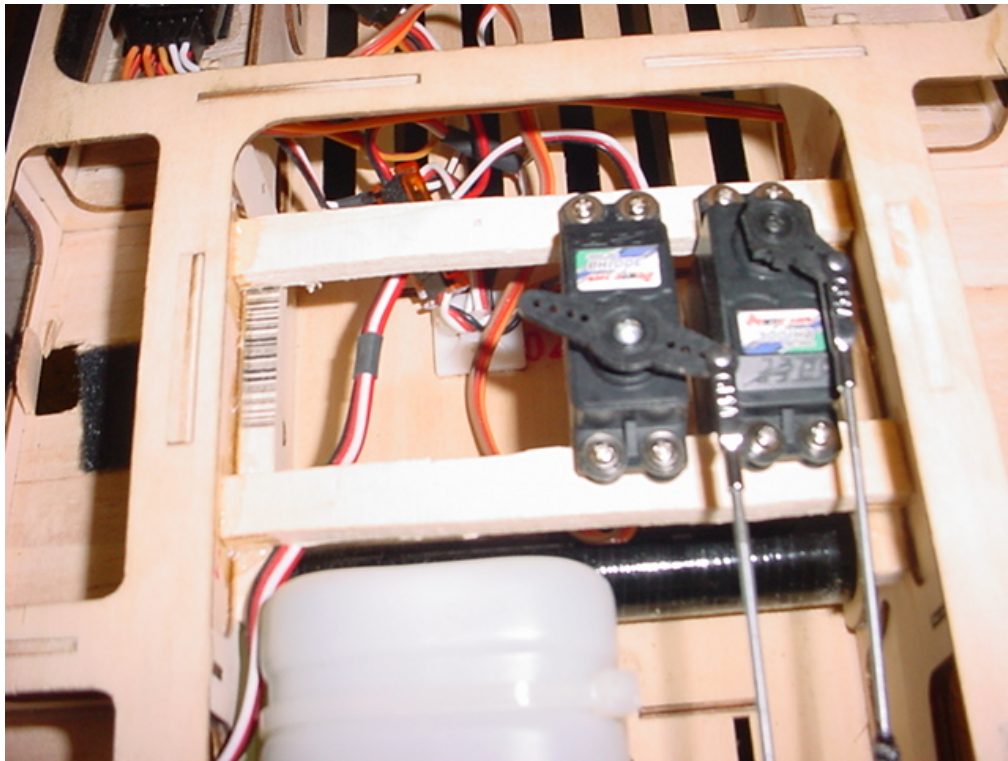
Plan your installation — In particular take note of the fact that the wing retaining bolts are about 1 inch behind the wing tube socket. If you mount your throttle servo behind the tank as shown in the photos access to the wing bolts will be difficult at best. Better to mount the throttle servo ahead of the fuel tank to leave the wing bolt area clear.

The elevator pushrods are packaged in the supplied gas tank. — In assembling a plane I failed to find the pushrods until I had already made replacements.

We have supplied a mounting tray for throttle and (optional) choke servos which mounts in the same position as shown in the photo below. Pieces of triangle stock are supplied to serve as supports, these need to be glued to the motorbox sides positioned as required. You will need to fabricate pushrods for throttle and choke linkage as required.

Mounting the fuel tank to one side helps to make space to mount two servos for throttle and choke. The tank should be as far back as possible against the wing tube.

Even though this works well it interferes with installing the wing bolts so we suggest mounting these servos forward of the fuel tank.

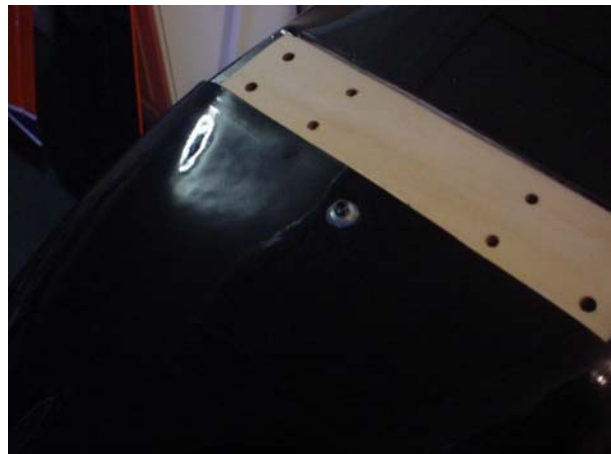


Cowl mounting modification — This plane's cowl mounting is similar at the top of the cowl to other Wild Hare planes, two bolts enter through the back of F1 and go into blind nuts in the cowl ring.

At the bottom a small tab (actually it's 2 pieces that you need to glue together with a little CA) is supplied which needs to be glued in from behind F1. The bottom of the cowl ring then slides over this tab. You will need to drill a hole through the cowl to match the hole in the tab and install the supplied blind nut in the tab to hold the cowl securely at the bottom.

You can get proper alignment by taping a piece of paper in place behind the tab and marking a guide hole where the hole in the tab is. Then slide the cowl on under that slip of paper and use the guide hole to drill the cowl.

A 3mm screw and blind nut are supplied along with a soft neoprene washer which will hold the cowl in place without shattering it.





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Step 2. Preparation work

Before you start actually assembling the plane there are quite a few things that can be done in preparation that will make assembly easier.

Trim away the covering from these areas using a very sharp exacto knife;

Fuselage Stab tube holes, anti-rotation dowel holes for, the holes for the stab retention bolts. Also open the elevator servo openings and the slots for the rudder pull-pull cables. Small holes can be opened up more easily with the tip of a hot soldering iron.

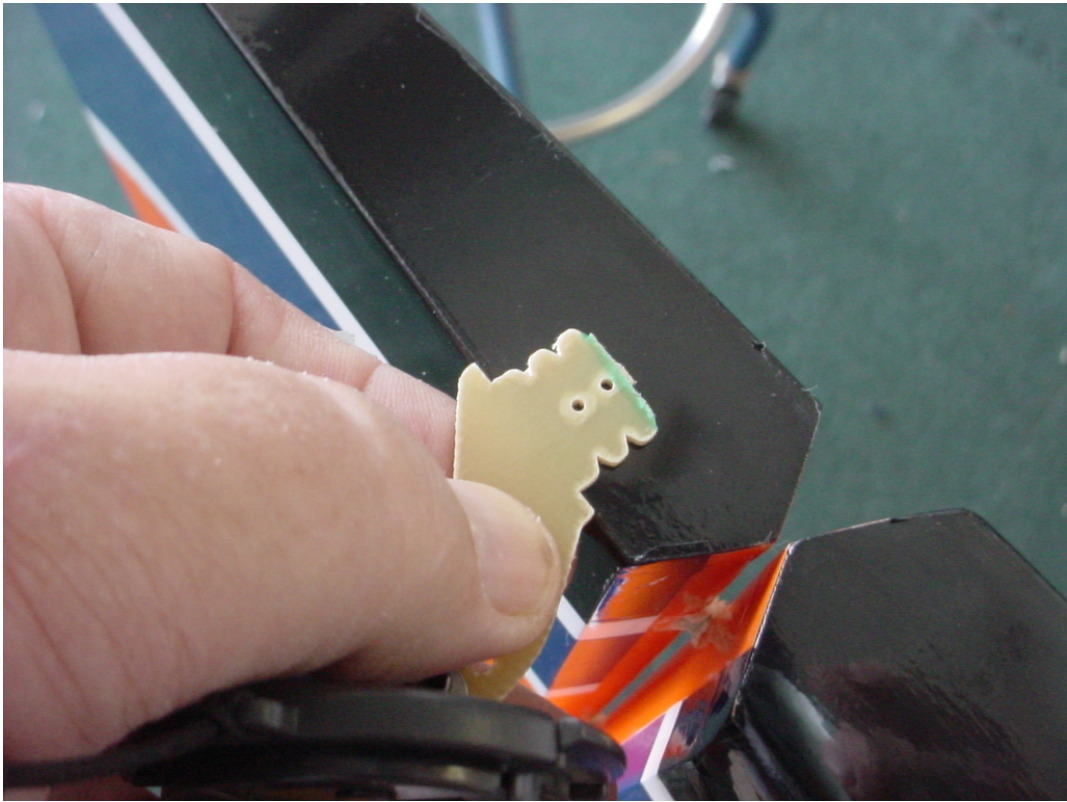
Wings Remove the covering over the servo bays and from the slots in the aileron hard point for the aileron control horns. Glue the horns in using medium CA or epoxy. Epoxy gives more working time. Before applying any glue be sure everything fits right.

Stabs Remove the covering over the slots for the control horns same as with the ailerons.

Rudder remove the covering over the cable slots on the fuse and over the slots in the rudder on both sides. **The base section of the rudder control horns will need to be shortened so that one horn can be installed from each side.**

Glue hinges into the rudder elevators and ailerons. This plane uses pin type hinges which work best with gorilla glue or Pro-bond poly-urethane glue. Just swab a little glue around inside the hole and insert the hinge being sure that the hinge pin is centered on the tip of the "V" and that the hinge rotates in a line so that the loose end moves perpendicular to the hinge line. See the section on hinging.

Glue the control horns into the slots. You should tighten the screw in the control horn so that the two sides are held securely in alignment. Then you can glue the pair of horns together into the slots as shown in the photo. Use either 15 minute epoxy or CA. Epoxy is safer because it gives you more working time to be sure everything is in the right place. CA will work but you must be very sure you know what you are doing since you only have a few seconds before the CA hardens.





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Engine mounting

Note that the firewall already has right thrust built in.

This plane is designed around a DLE-30 engine of 2-2.5 pounds. If you use a significantly lighter or heavier engine you may need to shift some components around to get a proper CG.

Locating the engine could not be easier. A bolt pattern for the DLE-30 is etched on the firewall. Use it as supplied. The DLE-30 standoffs (60mm standoffs on the rear carb DLE-30) are the proper length so it's a simple bolt on operation.

If you are not using a DLE-30 the engine centerline is marked with two lines on the firewall. You will have to make a template of your engine's mounting pattern that defines the centerline of the engine. Simply line up the template of your engine with the cross lines matching the lines on the firewall and drill the engine's mounting holes.

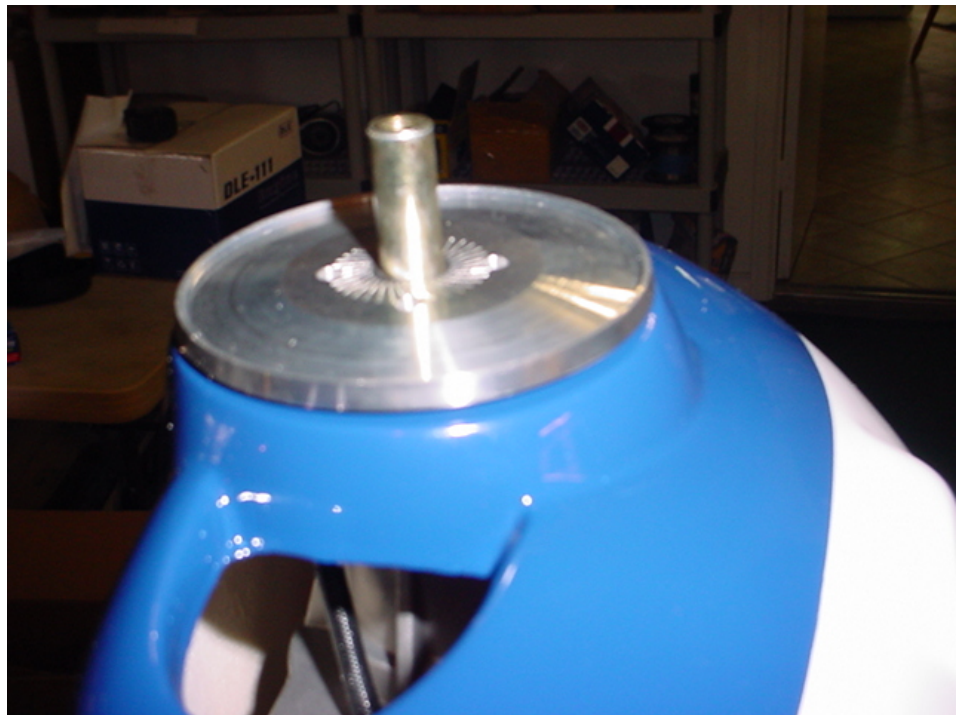
Other engines may pose other problems, we strongly suggest that you use the DLE-30 since this is how the plane was designed.

I mounted the supplied fuel tank (which is already meant for gasoline) immediately ahead of the wing tube and off to one side, leaving room to mount a throttle (and possibly a choke) servo alongside the tank. **Note that mounting these servos behind the tank as shown on an earlier photo obstructs access to the wing bolts.**

I mounted the ignition on a piece of foam on the port side of the engine box.

Holes for the ignition and radio power switches (never use the same switch for both) will need to be cut in the fuselage sides, you can use a razor knife for this.

The standard DLE-30 muffler will require a bit of trimming on the cowl, and a hole in the bottom of the cowl must be cut to allow the spark plug cap to protrude. There is an air inlet in the front of the cowl, this should supply sufficient cooling air. It's a good idea to open up a hole in the bottom of the fuselage to allow engine cooling air to exhaust.





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Hinging the control surfaces

Hinging is a very simple matter with these pin hinges.

Before you start gluing anything, test fit each control surface. Aileron to wing, elevator to stabilizer, rudder to fin/fuse, with the hinges in place. Make sure the hinges go in the pre-drilled holes smoothly and that there is ample room for the hinge so there is no large gap between surfaces.

Once you are certain that they all go together smoothly, first glue the hinges into one side and allow the glue to dry. To apply Gorilla glue just use a toothpick or small dowel and swab the inside of the hole with whatever glue will stick to the dowel. You don't need much, just enough to coat the inside of the hole. Gorilla glue foams and expands so using too much just makes a big mess.

Flex the hinge after about a half hour and scrape/wipe away excess glue foaming out of the hole as necessary. You can wipe it away with acetone on a rag.

Once the glue is dry on one side you can glue the hinges into the other side the same way. Be sure to flex the surface to as far as you will need, this may cause a small gap to form. Without that gap you may not get all the surface deflection that you want.

When everything is dry, flex the surface back and forth and put one tiny drop of 3-in-1 oil on the hinge knuckle.



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Step 5. Mounting the hatch and canopy

The hatch mounts to the fuselage by tabs on each side that are attached at the rear of the hatch. The tabs are already drilled and a 3mm blind nut is installed. You should be able to install the hatch with two 3mm screws through the fuse side.

The canopy is part of the hatch, it's all one piece.

Just as an improvement I usually replace the 3mm blind nuts with 6-32 blind nuts and I use 6-32 button head screws to retain the hatch. These screws are easier to find than metric size





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Step 6. Install horizontal stabilizer

This step is easy.

Trim the covering around the holes in the fuse for the stab spar tube and the retaining bolt hole on each side. You should also cut away the covering over the holes for the elevator servos, but don't cut out the rudder servo covering yet.

Slide the spar through the fuse, and slide the stabilizers onto the tube from each side.

Retain the stab to the fuse with one 4-40 bolt, washer and lock washer. I advise you to use washers and lock washers and/or a little red RTV silicone on the threads. Don't use a lot, and don't use red loctite, or you won't be able to get the screws out without tearing out the blind nut.

The assembled h-stab with controls is shown below.





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Installing the servos

1. Elevator servos.

Trim away the covering from the rear sides of the fuselage to expose the two servo trays. Servos should be secured with all screws.

2. Aileron servos.

There is a servo wire tunnel through the wing that touches the servo tray. You can use a piece of wire with a hook to fish through the hole and pull the servo pigtail through. Be sure the extension is long enough to reach the receiver. Also be sure the servo extension is securely attached to the servo lead.

3. Rudder servo.

Install a single digital servo such as a Hitec 5485 or better in the servo tray and use pull-pull cables to actuate the rudder. Cables, fittings, cable crimp sleeves and clevises are supplied with the kit. The factory parts have been supplemented with cable and crimp sleeves that we put in because of quality concerns.

The kit comes with carbon-fiber servo arms. These are a nice addition to get more throw, simply attach them to the servo wheel that comes with your servos using 2 supplied screws/nuts. Of course machine aluminum arms are better, but these are free and they work.

It also comes with turnbuckle style pushrods and ball links, this arrangement is very strong and free of slop. The pushrods have left hand threads at one end so to adjust the length just turn the pushrod one direction or the other.



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Install the landing gear

There should be drilled holes in the landing gear plate under the covering, these should match up with the holes in the landing gear.

To mount the wheel pants you simply drill through the back of the landing gear and through the wheel pant. Install a 4-40 blind nut in that wood backing piece.

The tail wheel bracket attaches to the hardwood plate at the bottom of the tail using two wood screws. Use the supplied arm to attach it to the rudder, or I have found that it is perfectly OK to just leave the tailwheel free floating and to steer with the rudder. I have tested this several times and it gives plenty of steering authority when taxiing.



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Mounting the wings

Push the cf tube spar through the tube in the fuselage until it protrudes an equal distance on both sides. Carefully push each wing onto the tube until the anti-rotation dowels engage the holes in the fuselage side. As the wing approaches the fuselage guide the aileron extension through the access hole.

The wings mount to the fuselage with one 6mm thumb screw on each wing through the fuselage side. The hole is located about an inch behind the wing tube.



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Balance the plane and adjust control throws

The first flight should be done with the plane balanced using the technique explained here, balance at the rear edge of the wing tube or 5" from the front of the wing pocket in the fuselage.

Balancing should be done on the fuselage, in ready to fly condition, but without the wings. Set the fuse on your workbench and place the wing tube under the fuselage centered on the rear of the wing tube socket, or as marked.



In this condition the plane (fuselage) should be teetering or should fall slightly at the nose. It should not rest on its tail. If your plane is tail heavy, consider moving batteries as far forward as possible, remove anything from the tail that might be adding weight, get a lighter tail-wheel. Remember that the farther weight is from the CG the less of it you will need. A small weight on a long arm makes a big difference. A heavy spinner has more effect than a bigger battery because it is farther from the CG.

This plane was equipped with DLE-30 and pull-pull rudder. The 6 ounce battery pack was mounted on the inside of the motor box just behind the engine, everything else was in its assigned location. This arrangement balanced nicely with no other weight.

We set the control throws as follows on planes in test. Please keep in mind the high rates specified here are for 3d, not for just faster response. The elevator in particular at these rates will cause instant stalling, tumbling, and all sorts of other things that can only be done at low speeds. **Do not use the 3d settings until you are thoroughly familiar with the plane on low rates and then do your initial tests at high altitude, be prepared to go to low rates if necessary.**

	High rate (3D)	Low rate
Ailerons	23 deg	15 deg
Elevators	40+ deg.	12 deg.
Rudder	45 deg.	25 deg.

Fly the plane on low rates at first. At high 3d rates it is very difficult to fly. The 3d rates are intended only for extreme aerobatics.

Ailerons in particular are very sensitive. Using 3d rates will cause the plane to roll so fast it's not possible to keep track of its orientation, use with care and have a backup plan (low rates).