Black Hawk

Sikorsky AH-60

Instruction Manual

SPECIFICATIONS

*** Full Body Length: 61.5”**

*** Body Width: 9.5” / 11.5”**

*** Body Height: 9”**

*** Weight: 11-14 lb**

*** Engine: 60 Heli or 23cc heli Gasoline engine.**

Century Helicopter Products

Designed and Developed in the USA

2nd Edition March. 2001

Building Instructions for the Black Hawk scale body kit

Introduction

Congratulations on your purchase of the Century Helicopter Product's Black Hawk scale helicopter body kit. This kit offers an easy entry into scale radio controlled helicopter flying whether you are just beginning into helicopters, getting into scale or an accomplished pilot. Though designed for the proven reliability of Century's scale body design your new helicopter is sure to be an attention grabber at your local flying site.

Warning

This Black Hawk body must be assembled and installed closely in accordance with these instructions. Failure to do so could cause failures in the body structure or the helicopter mechanics. Such failures could result in serious injuries. It is recommended that if you are in doubt of your abilities, you should seek the assistance from experienced radio control modelers and associations. As a manufacturer, we assume no liability for the use of this product.

Pre-assembly Information

Upon opening the Black Hawk body kit, you will find the major fiberglass and clear component parts and hardware bags. Hardware is identified by size of the fastener or part. This is done for ease of assembly. Be careful when opening the bags as not to lose any hardware, whenever possible keep all screws in a container until you use them up through the assembly process. Care has been taken in the filling and packing of each bag. However, mistakes do happen. If there is a shortage or missing hardware, please contact us at:

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Milpitas, CA 95035
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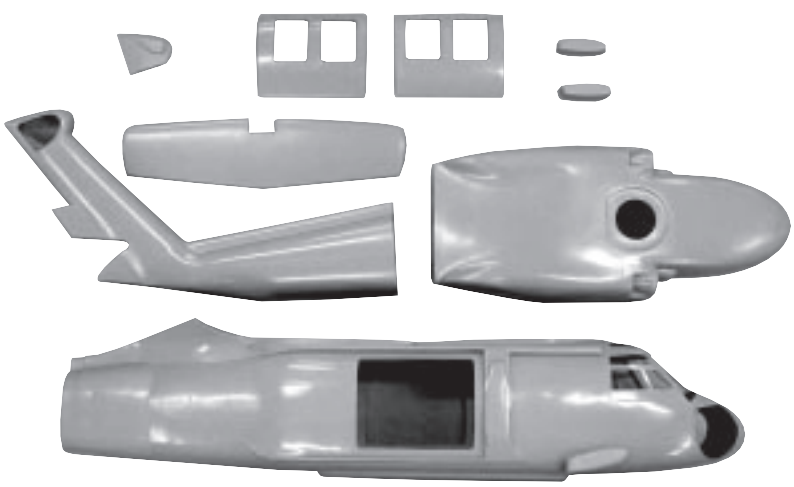
Black Hawk Construction Manual



This manual has been written to cover assembly of the Black Hawk. This instruction set is a supplement to your helicopter instruction manual, changes are listed below to the major areas that are affected by mounting.

Every attempt has been made to ease the assembly of your Black Hawk. At each step where there is a complex assembly, detailed written instructions are provided to walk you through the building process. Take a few minutes before each step to review the instructions, examine the hardware utilized in that step, and compare the drawings & pictures to your work in progress.

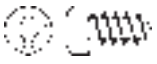
Symbols used to help assist you in building the kit:

	Apply "Goop"		Repeat Steps as specified		Partially tighten		Helpful Tip
	Special Attention		Apply threadlock		Purchased Separately		Cut away Shaded Portion

Hardware Description and Identification:

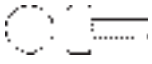
M3x6 = 3x6mm and can refer to screws or fasteners.

M3x6 Self Tapping Screw



M - metric
3 - diameter
6 - length

M3x10 Socket Cap Screw



M - metric
3 - diameter
6 - length

The tools and materials listed below are the minimum needed to build the Black Hawk.

Screwdrivers - Slotted and Phillips head.
Hex Key 2.5mm
Long-Nosed Pliers.
Paper Clip
Scissors & Ruler
Locktite (thread lock liquid)
Clear cellophane or masking tape.
Drill and drill bits (1/16", 1/8")

Recommended Tools & Accessories

In addition, the following will make assembly and setup easier, and prove useful later in your model toolbox:

Primer and paint to match box art.
5.0mm Open End Wrench.
5.5mm Open End Wrench.
7mm Open End Wrench.

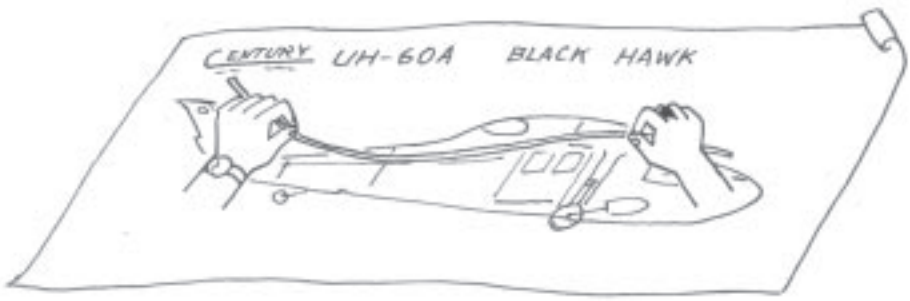
Warning
The Black Hawk fuselage is designed to use Century's flexible cable drive system, this requires that the mechanics chosen use a wire drive tail shaft or can be modified from a shaft or torque tube drive system. A belt drive system is not compatible. Consideration also must be taken when choosing a gyro as the demand from the cable drive system will require a lower gain setting and the heading hold gyro is generally not recommended from the high stress imposed on the tail. Century PG2000 gyro will work very well.

Congratulations on purchasing Century's magnificent scale fuselage of the UH-60 Black Hawk. The fuselage is manufactured from lightweight fiberglass using Epoxy resin with carbon fiber filament reinforcement at seams for extra strength. The fuselage has preprime coat surface and has the major open sections precut for convenience. All wooden parts are precut and labeled for easy identification. Semi-scale landing gear and wheels add that little extra that has made Century famous for their quality fiberglass scale fuselages.

This instruction manual is a supplement to the full size plan detailing the location of the formers and the construction of the landing gear. Wherever possible this is to aid the modeler in the construction of their fuselage, however, due to the large number of helicopter mechanics available on the market, **this instruction will only detail the general case. In many instances, additional modifications will be necessary to adapt to your helicopter.**

Section One Step 1.

Unfold the full size plan on a flat surface. Insert the flexible cable into the brass tube (to keep the bend smooth, without kinks) and tape off at one end. Slowly bend the long brass tube to match the curvature on the drawing, make the bends gradual in intervals using your hands. Do not cut the length of the brass housing at this time, this will be done near the very end of installing the flexible cable drive system.



Step 2.
Locate F9 and F10, these formers are for mounting the tail gearbox to the elevated tail section. The F10 former is to be glued to the F9 former with the offset notch to the front part of the F9 former. The basic design is to use Century existing vertical fin mounts on the tail gearbox to secure the tail gearbox to the wooden formers. Position and mark the holes for the vertical fin mount so the gearbox when bolted to the F10 former is either flush against the F9 former or is flush to the inside edge of F10 former. Depending on the tail gearbox, additional shims may be required. Drill through the plywood F10 former and deburr the holes.(see full size plan)

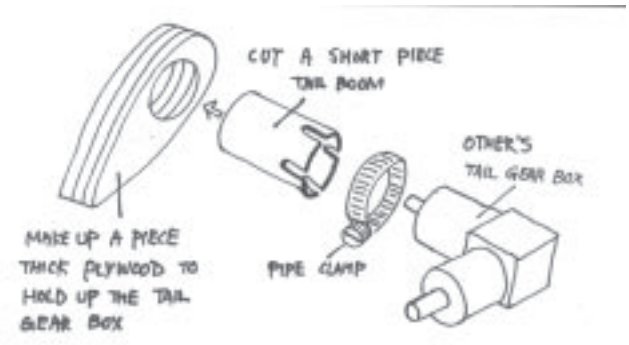
Step 3.
Disassemble and examine the tail gearbox, if possible install a grease fitting. This can be as simple as a small hole drilled into the gearbox housing and a matching screw that does not interfere with the internal workings of the gearbox to a brass tube epoxied flush to the inside surface with a cap commonly used to cap antennas.

Step 3a.
The following instructions detail installing **Century's tail garbox assembly**
Part# CN1109 into the elevated tail section of the fuselage. The finished solution will have the left half of the tail gearbox installed permanently with a removable top half of the right tail gearbox half. This will allow complete disassembly for maintenance of the tail gears and the flexible cable drive shaft and couplers.

Step 3b.
Initially assemble the F10 and F9 formers (do not use glue at this step) and install the tail gearbox assembly onto the F10 former. Position and mark the location of the F9 former on the outside of the fuselage using pencil. Mark both above and below the former and the angle as exactly as possible. This location is ideal when the three bolts that fasten the tail gearbox assembly are all accessible and the tail output shaft is generally centered in the opening in the top of the tail section.

Step 3c.
Measure and mark the tail gearbox input shaft and use 3mm drill bit to open a small hole into the input shaft, so the shaft can fully engages the series of set screws on the flexible drive shaft. Using a countersink or a larger drill bit, enlarge the exit hole slightly where the flexible cable will exit the input shaft.

Step 4.
If installing another tail gearbox other than Century's, follow the example detailed above and make the required modifications to mount into the tail section. It is very likely that the formers shown are better suited to mount smaller tail gearboxes. These need to be traced off the plans and cutout from 1/8" plywood (not included), note that the former is actually combined from three identical 1/8" formers bonded together. Position and mark the location of the formers on the outside of the fuselage using pencil.



Step 5.
A key element in installing a flexible cable drive system is to make sure the ends of the brass housing are properly secured. It is our recommendation to buy some additional º" plywood and cut two 1" diameter round circles. The F9 former has precut hole for the coupler to pass through, however in many installations the bare flexible cable will be exposed at this point (as when using the Century tail gearbox). Bond both wooden circles to each other and then bond below the F9 former using epoxy. Mark the centerline of the tail gearbox input shaft (simple when only one half of the gearbox is mounted to F10) and drill straight through with a drill bit that is 1/16" larger than the brass tubing.

Step 6.
Install the tail pitch lever to the tail gearbox with the necessary steel ball and mark the location for the flexible rudder pushrod (included with the fuselage) to pass through the F9 former. Again, drill the hole 1/16" larger than the size of the outside housing.

Step 7.
To prepare to permanently bond the F9 former into the elevated tail section, several things need to be completed. The brass tube, the rudder pushrod, and the left tail gearbox half need to be installed. First start with deciding the best method to bond in the former. The recommended choices are:

- Drill several small holes in the fiberglass body along the centerline of the former, once the former is moved into final position, use Stabilit or epoxy that is injected using a syringe inserted into each hole while forcing the fiberglass slightly away from the wood former. As the syringe is remove the fiberglass compresses against the wood former forcing any excess glue to the edges. Repeat process for all holes.
- Using a saw or moto-tool grind vertical slots in the edge of the former spaced at º" apart. Measure and mark the inside wall where the final position of the top surface of the former. Once ready, use a Q-tip or applicator and apply Stabilit or epoxy above the mark on the inside of the fiberglass and to the outside edge of the former. Wipe any excess from the edge leaving adhesive inside the slots. Move the assembly into final position, as the former passes through the glue previously applied to the inside of the tail section it will form a solid bond to the former.
- A variation on the first approach is to grind a slot through the centerline of the former 1/16-3/32" deep and drill only a few holes through the fiberglass. As the adhesive in injected, it will flow around the former and bond it in place.

Step 8.
The F9 former needs to be test fitted into the inside of the tail section. Inspect the internal opening and grind or sand any excess material that will interfere with test fitting the former. To make this task simpler, tie a cord through the pushrod and drive shaft hole to make removing the former simple. Sand the edges until the former can be moved into the final position with your fingers without excessive force. Once satisfied, stop here.

Step 9.
Before the F9 former is permanently bonded in place the same work needs to be performed on the remaining formers (F8, F6, F5 & F4) that will position the brass housing and the rudder pushrod housing. Inspect and grind or sand any material that will interfere with installing these formers. Also verify that the holes match the brass housing and the rudder pushrod, make any changes at this time. Each former needs to be prepared and test fitted according to your preferred gluing method, however; access to these formers is much

simpler and at minimum one side of each former can be properly reinforced by filleting.

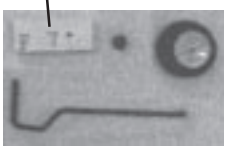
Step 10.
Wood block F7 needs to be prepared to mount the wire tail strut to the inside of the fuselage in-between former F8 and F6. Compare to the full size plan and mark the location for the F7 wood block in pencil on the tail section. Grind or sand the position on the inside of the tail section to get a good bond. Also align the strut and mark and cut a slot where the wire will exit the fuselage tail section. It is important to make this slot longer than necessary to allow the wire to flex or deflect when landing. The exact length can be finalized after the model is completed and tested. Do not glue any formers in place at this time. Stop here.

Step 11.
Compare, measure and mark the final position of the F8 former on the outside of the fuselage. Remember to do a final wipe down with acetone on the fiberglass parts before gluing, to clean and get the best bonding possible. Following the chosen gluing method, permanently bond the F8 former in place.

Step 12.
Permanently glue the F7 wood block in position capturing the wire tail strut.

Step 13.
Carefully feed the brass housing and the rudder pushrod through the F8 former, up and out through the opening in the top of the elevated tail section. Do not bond the brass housing or the pushrod to F8 at this time.

F7 Tail Strut Mount

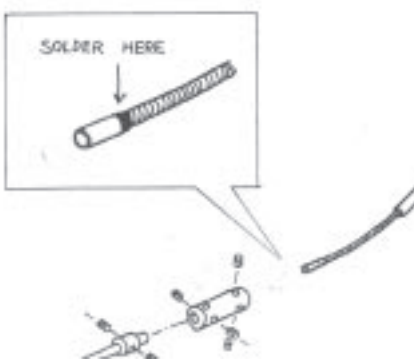


Step 14.
Before the end of the flexible cable can be used, the last 5/8-3/4" of the cable needs to be "tinned". Silver Solder is highly recommended but Rosin Core Solder can be substituted, heat the end of the cable with a soldering iron until the solder takes to the cable. Continue until an even silver coating has been applied. If the end will no long fit into the coupler, gently file along the length of the end until it can be fully inserted into the coupler.

Step 15.
With both the brass housing and the pushrod extended through the top opening in the elevated tail, test fit the tail components one last time. Assemble the tail gearbox with the coupler and attach the prepared end of the cable. Slide the end of the brass housing into the modified F9 former and insert the pushrod housing. Make the connection for the end of the rudder pushrod to the ball on the tail pitch lever. Inspect and verify that the end of the brass housing has a gap of 3/16-1/4" before contacting the coupler, measure and write down the exact position, noting the amount if any, that the brass housing is protruding past the F9 former. Measure and write down the same information for the rudder pushrod housing, remember that the final position must allow complete end to end travel of the pitch plate assembly.

Step 16.
Depending on the type of tail gearbox will modify the order of the following instructions to permanently bond the F9 and F10 former in place.

Step 16a.
For the Century tail gearbox, (Part# CN1109) bond the F10 former into the F9 former. Place the formers (still referred to as F9) into the cavity and reposition and bond the brass housing and the rudder pushrod housing in place using slow CA, or Epoxy using the information collected in Step 15. Attach the left gearbox half to the F10 former using socket head bolts and lock nuts (not included).



Choice: 1. Cut the top off the fiberglass tail to install the gearbox assembly then reattach the top of the elevated tail.

2. Use a heat gun to soften the top section, flex the opening to allow installation of the gearbox. Once the gearbox is inside, let the fiberglass cool to return to the original shape.

Step 16b.
Once the left half of the gearbox is inside the top of the elevated tail, move the gearbox with the F9 former into the final position. This position corresponds with having direct access to all the hex bolts that secure the right gearbox half in place. Using the preferred

method to bond formers, permanently glue the F9 former into the tail section.

Step 16c.
Slide the flexible cable out through the end of the brass housing and attach the cable to the tail coupler shaft (this can be done outside) assembled onto the tail gearbox input. Slide the shaft assembly into the tail and engage the ball bearings while mating the tail output shaft. Grease the gearbox at this stage.

Step 16d.
Re-attach the right gearbox side and tighten the three hex bolts.

Step 17.
If another tail gearbox assembly is being installed, read the previous step to become familiar with the process and position and permanently bond the formers in place.

Step 18.
Using a ruler, estimate the center of the tail output shaft and make pencil marks on the edge of the opening. Match the tail cap and transfer the marks. Using the ruler, mark the center of the shaft and drill or grind out a º" diameter hole. This will be further enlarged to include clearance for the tail pitch lever and the tail pitch plate. Complete this at this time.

Step 19.
Re-attach the rudder pushrod ball link to the tail pitch lever.

Step 20.
Before installing the F6 former, glue the brass housing and the rudder pushrod housing to the F8 former. Also reinforce the former by forming a fillet of epoxy around the edge of the former and the fiberglass wall.

Step 21.
Take the time to reinforce the tail wire mount F7, using fiberglass cloth (not included) cut and bond a section of cloth over the F7 wood mount and extend 3/8-1/2" away from the mount. A method to reduce the vibration of the brass housing is to inject expandable foam into the hollow cavities between the formers. This method has been proven to effectively dampen vibration, however; overfilling a section can bulge the shape of the tail and remember to only inject the foam into the inside space between permanently bonded formers.

Step 22.
Insert and slide the F6 former into final position and permanently bond in place using the chosen method. Remember to reinforce the edge with a fillet to the fiberglass. The F5 former is to support the rudder pushrod according to the original full size plans. **Note that the rudder servo no longer is required to be mounted directly behind the mechanics, the general rule is to make the rudder pushrod as short as possible to reduce slop in the control surface.** The exact servo position is the modeler's choice and is no longer detailed in these instructions. Please also note that in the redesign, the floor section of the main fiberglass body has been structurally reinforced and has the angle built into the floor eliminating the need for shaped hardwood rails as shown on the full size plans.

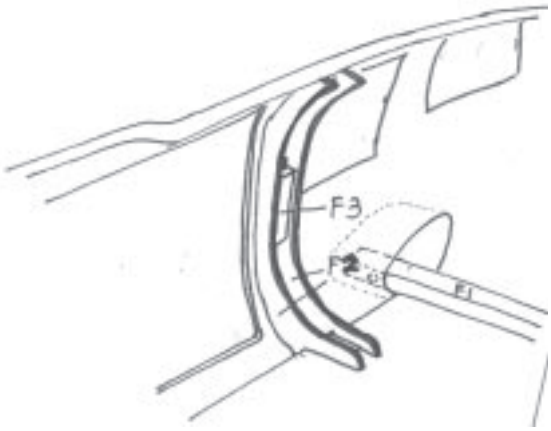
Step 23.
The elevator on this fuselage is best mounted in a fixed position following the general rule for model helicopters that the fewer moving non-flying parts the better. However; for the ambitious modeler, the elevator could be hinged in a manner that would allow some limited angle adjustment for forward flight.

Section Two

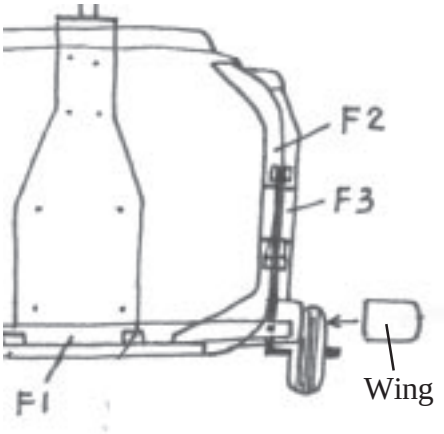
Step 24.
Start by thoroughly cleaning the main fiberglass fuselage section with mild detergent and water. Let dry and wipe all fiberglass surfaces. Position the main helicopter mechanics with the main rotor head and tail boom assembly removed so the main shaft is centered in the hole in the top hatch. Using pencil, mark the four landing gear locations with tick marks. Also mark the opening for the cooling fan shroud exhaust hole. Remove and complete the crosshairs, remember to use a ruler to verify the landing gear marks and the real measurements off the mechanics. Drill the four mounting locations and open the cutout for the cooling fan shroud exhaust. A simple method to open a large area in fiberglass is to drill the corner holes and use a moto-tool and a cutoff wheel to connect the holes. Final shaping can be done with a grinding stone attachment or a file.

Step 25.
The wooden parts in the main fuselage section are all susceptible to fuel contamination and should be fuel proofed with paint that will match the interior or with epoxy thinned with rubbing alcohol. Either way these wooden parts need fuel proofing.

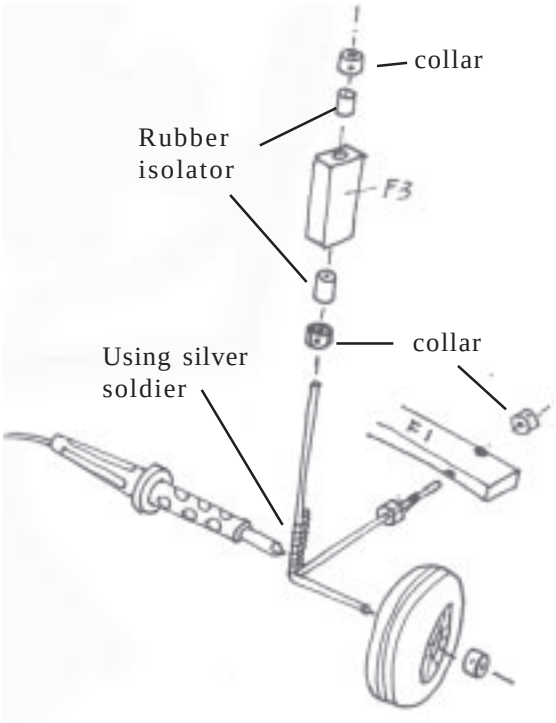
Step 26.
To prepare the main landing gear assembly, start by opening the ends of the landing gear fairing on both sides , be careful here to open only the end while leaving the flange in place that keys the fairing cap.
Locate and position the F1 wooden mount, note that the hole in forward face is higher than the rear face. Use a file to do any final shaping to position the F1 mount. Once satisfied with the fit, bond the F1 mount in place using epoxy, being careful to have both holes on the outside of the fuselage. Once dry, reinforce the F1 mount by adding fiberglass cloth (not included) and epoxy.



Step 27.
Following the drawings on the full size plan, mark the top and bottom edges of the F3 wood block with pencil and do any final fitting that may be needed to install on each side of the F3 wood block. Thoroughly roughen the fiberglass surface to be bonded with #320 grit sandpaper. Go ahead and permanently bond formers F2 & the F3 wood block in place on both sides of the fuselage. A simple tip here to mark the location of the hole below the F3 wood block and through the fuselage is to insert a hex key through the top and let it fall and stop on the glass. Now mark and drill the two vertical holes where the vertical landing gear legs will exit the fuselage. It is best to oversize these holes to allow for slight movement of the landing gear, without damaging the fuselage side.



Step 28.
Using the wheel collars and the rubber dampers according to the full size plans, assemble the landing gear with the wooden blocks to get a better understanding of how the landing gear will function. While supporting the fuselage from the center, position the one vertical landing gear strut (with 90 degree bend) and tape to the horizontal landing gear strut (with 60 degree bend) together. Position the tape where the wire is shown on the full size plan. The intention is to silver soldier these parts together which can create a difficulty in removing the landing struts at a later time. The key to installing and removing the assembled struts is to loosen and remove the end wheel collar from the horizontal and vertical struts and to flex the assembly down and rearward. Both struts will flex enough to clear the horizontal strut from the F1 wooden block. Once satisfied with the method to remove the landing gear, use steel wire (not included) wrap the length of the legs that overlap and tack with CA. Using silver soldier, permanently soldier the two legs together overlapping the wrapped wire. To improve the look, simple balsa strut covers can be made to look more scale. Once completed, remove the landing gear until the fuselage has been painted.



Final landing strut installation:
Guide the vertical and horizontal strut close to the wood mounts and slide one wheel collar followed by one rubber isolator. Insert both ends together into the wood mounts and flex slightly to slide into final position. Once the struts are passed the wood mount, slide another rubber isolator and wheel collar onto the end of each strut from the inside of the fuselage. Lastly, set the high of each strut by supporting the center of the fuselage and measuring from the table surface to each strut axle. Slide one wheel onto each side of the fuselage and attach using one wheel collar.

Step 29.
There are 24 pieces of 3/8" square plywood screw mounts and 24 3x8mm self tapping screws. These are to attach the top hatch and the tail cover to the main fuselage body. There is no set rule for using all of these parts to attach the hatches. Start by taping the hatch to the main fuselage using masking tape. Using a ruler, mark lines that overlap the top hatch and the main fuselage that are spaced 3-4 inches apart along the outside edge of the hatch. Measuring in from the edge of the hatch, mark and drill through the hatch and the main fuselage using a 3/32" drill bit. Once all the holes are made, remove the top hatch and roughen the surface on the inside at each hole location using sandpaper. One at a time, bond the 3/8" plywood squares centered over each hole from the inside using slow CA or epoxy. Let completely dry and drill though the wood using the 3/32" drill bit. Using one self tap screw, form the threads in all the plywood blocks. Finally, apply one drop of the fast CA glue to each hole to harden the wood. Repeat this process to mount the tail cap to the elevated tail section.

Step 30.
Carefully inspect the windshield and the cheek windows, there is a fine trim line on each clear window. Using a marker, follow the trim line to improve the visibility. For extra precaution, draw a second line beyond the first line and trim each part. This preliminary step allows test fitting of the slightly oversized window to see exactly how much additional trimming is necessary. In some instances, the clear part can be bonded in place as is without further trimming. Once each part is test fitted, use rubbing alcohol to remove any residual marker from the clear part. Stop here until after the fuselage has been painted to install the clear parts.

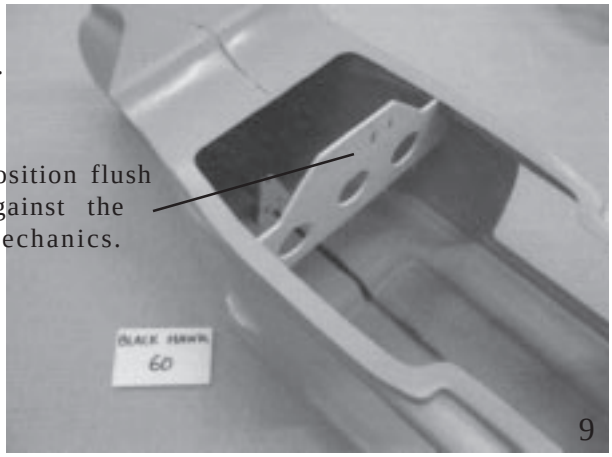
Final installation of clear parts:
Once the fuselage is painted, clean and wipe acetone (do not get any on the painted surface) on the inside surface of the window openings on the fuselage to be bonded. **Using "Goop" or "R/C 56 windshield adhesive"** commonly found in the local model hobby shop or hardware store apply an even coat to the edge of the windshield. Be careful not to get any on the surface of the clear part that you want to keep clear as this adhesive will create a blemish that cannot be removed.

Step 31.
Installation of the side doors can be done in the closed or open position. In either position, the doors are bonded to the main fuselage using epoxy. Remember to install after painting and prepare the contact edges by sanding through the paint before permanently bonding in place.

Step 32.
Place the helicopter mechanics into the center section of the fuselage with the muffler fitted to the engine. Measure, mark and drill/grind the hole for a flexible exhaust diverter (not included) to evacuate the exhaust from the fuselage. **Do not attempt to route the exhaust to the "scale" positions as the extra length of the exhaust diverter will cause unpredictable and inconsistent engine performance that is highly undesirable in a scale fuselage.**

Step 33.
The next major task is to attach the tail section to the main fuselage section. This can be done after the fuselage is painted but it is recommended to complete before to allow filling and blending of the tail to the main fuselage. Start by sanding through the surface of the mating surface on the main fuselage section and repeat for the inside surface of the tail section. Test fit the joint to make sure the two parts match correctly when brought together. Once satisfied, mix up plenty of Stabilit or epoxy and coat one surface with glue and slide the two parts together. A little preparation here can go a long way, sight the front to back alignment and look at the side view for proper alignment. Secure both the main fuselage and the tail assembly in place using long strips of masking tape. Make adjustments as necessary to get the perfect alignment.

Step 34.
Insert the tail coupler onto the tail transmission output shaft on the mechanics. Mark and grind the appropriate flat spots positioned at 90 degrees to one another on the tail shaft. Also remove any extra shaft length using the moto-tool with a cutoff wheel. Remember to deburr the end of the tail shaft when finished and to slightly countersink the entrance hole where the flexible cable will enter the coupler.



Step 35.
Test fit the F4 former into position on the main fuselage, some trimming or grinding of the fuselage may be necessary to get a good fit. Install and bolt the main helicopter mechanics into the main fuselage. Guide the F4

former and insert the brass housing through one of the large side holes. Position the F4 former behind the mechanics and initially position flush against the mechanics. While viewing from above, mark on the brass housing the position that will be approximately 1/2" past the end of the tail coupling. Trim the brass housing at the marked location and remove the mechanics and reposition the brass housing now inserted into the center hole in the F4 former.

Step 36.
Measure and mark past the beginning of the flexible cable as it would be positioned inside the tail coupling. Again, remove the mechanics. Trim the flexible cable using the cutoff wheel on the moto-tool. **Do not try to use side cutters to cut the cable as you will damage the cable.** Once trimmed, the last 5/8-3/4" of the cable needs to be "tinned". Silver Solder is highly recommended but Rosin Core Solder can be substituted, heat the end of the cable with a soldering iron until the solder takes to the cable. Continue until an even silver coating has been applied. If the end will no long fit into the coupler, gently file along the length of the end until it can be fully inserted into the coupler.

Final assembly.
Once painting is completed this will be the last step in assembling the fuselage. Insert the flexible cable and secure two 4x4mm set screws using threadlock.

Step 37.
Included in the kit are two "L" channel brackets. These are to brace the mechanics to the F4 former. As helicopter mechanics have evolved over the last decade, there may or may not be a vertical surface to attach the bracket to the mechanic, in this case some fabrication is necessary to make the connection. While holding the F4 former flush against the mechanics vertical, make two marks in pencil where the former will be mounted on the top and a mark inside the floor of the fuselage. When satisfied with the fit, permanently bond the F4 former in place using the preferred bonding method. Align the "L" brackets and mark and drill the mounting locations. Using socket head cap screws and lock nuts (not included) mount the "L" bracket to both the mechanics and the F4 former.

Final installation of the mechanics.
Once the flexible cable has been attached the "L" brackets can be attached.

Step 38.
This can be done after the fuselage is painted but it is recommended to complete before to allow filling and blending of the fairing cap to the main fuselage. Start by sanding through the surface of the mating surface on the main fuselage fairing stub and repeat for both sides. Test fit the joint to make sure the two parts match correctly when brought together. Once satisfied, mix up Stabilit or epoxy and coat one surface with glue and slide the two parts together

Section Three: The final section covers painting the scale fuselage.

A couple of topics can be discussed at this time, the fuselage is molded using epoxy resin and a combination of glass cloth and glass strips. Fiberglass fuselages have always been criticized as brittle, difficult to work with and difficult to repair. All of these statements are false, but it depends on who the person's is and their experiences.

First off, in strength compared to the space age canopies that are common on most pod and boom helicopters there is no contest. This plastic material is virtually indestructible at the penalty of being virtually un-paintable without specialized and expensive automotive primers and paints, there is also a very limited range of colors available. The reason you are reading this page is that you have come to your senses and wanted to fly a model that looks and holds all the prestige of a real helicopter.

Flexibility
A wonderful attribute of fiberglass is in its flexibility. Century and Funkey take care and pride in craftsmanship that goes into every fuselage. However, fiberglass parts will migrate while inside the shipping box. When two mating components are brought together and they do not align or mate, the culprit is a warped part. Many become upset and wish to lay blame but dealing with this is very simple when explained a simple procedure. Using a heat gun set at the high setting at a distance of 1-2 feet away, evenly heat the warped part until the outside surface is hot to the touch and the part has become pliable (flexible). Using adhesive tape, mate the two fiberglass parts together and let both parts sit until both parts have reached room temperature. Remove the tape and now both parts are stable and match one another. In some instances, depending on the location of the warp, the part may need to be held in an over-extended position to achieve the proper shape when the part is finished.

Dealing with Fiberglass.
Difficult to work with, I disagree. Fiberglass is easier to repair than you think. Using today's CA type of adhesives, a severe crack in a fuselage can be simply fixed and the repaired section is much stronger than in its original state. Add touchup paint and no one would ever know I had been damaged. There is a limit to this type of thinking where purchasing the replacement fiberglass part is simply cheaper and less work than performing major reconstructive surgery.

The Paint Job.
There is no magic to a good paint job, the true secret is time, patience and common sense. A modeler who thinks that they can throw paint onto a fuselage Friday night before flying on Sunday is dreaming, the helicopter would be flyable but even that is a stretch. The average modeler will spend the better part of a month to apply a good clean paint job.

Preparing the fuselage for painting.
After opening the kit version of the fuselage, examine all the fiberglass components to see where work needs to be done to allow a simple "bring up" of the fuselage. "Bring up" describes the necessary steps to complete all the jobs in order to start priming the fiberglass parts. Typical work that is done at this stage is rough sanding on seams and jointed components, filling of surface imperfections, adding panel lines and rivets, cutting required holes and preparation for priming.

Step 39.
Start by thoroughly washing all fiberglass parts in mild detergent and water, this will remove any residue remaining from the molding process. Next wipe down all the parts with Acetone (from the hardware store). The Acetone will remove all traces of oil or grease that will affect the adhesion of two fiberglass parts or between the paint and the fiberglass. Now using steel wool or an abrasive pad commonly used for scrubbing dishes, scuff all surfaces that will be joined or receiving paint. What is important to note here is that we are breaking through the topmost resin surface and creating the best surface for adhesive or primer to adhere to. The prepared finish will have very fine score marks usually seen when the part is held to the light at a slight angle.

Step 40.
This is the time to rough sand any accessories or small parts, using the 320 grip sandpaper, that will be assembled and attached at different positions on the fuselage. These can be marking lights, engine exhausts, scale fuel tanks, horizontal and vertical stabilizers, guns, antenna or any scale details being bonded to the fuselage. These accessories should be test assembled to make sure that all parts are prepared, and you will be able to see any problems that may arise in trying to paint these parts. Some thought should be put into how to hold the part as it is being painted. Go ahead and bond these parts at this time using the slow CA glue. A quick note on adhesives, as the fuselage resin is epoxy, go ahead and use any regular 5-30 minute epoxies to bond two fiberglass components together or unlike substances, like wood or metal to the fiberglass.

Step 41.
Once the detail parts have been built into the sub assemblies are ready to paint, use a filler in sections that have gaps or slight surface imperfections, occasionally there are voids (air bubbles in the resin) that occur near the surface that need to be filled. There are allot of good fiberglass fillers on the market, it is best to check with your local hobby shop to get a recommended product. Try to stay away from porous fillers designed for wood as they will shrink and are not a good choice for larger areas.

Step 42.
Most major windows and accessory holes have been precut by Century, leaving only those that have a user dependency like the type of exhaust system used on the helicopter or the exact exit position for the cooling fan shroud.

Step 42a.
When making cutouts or holes in the surface of the fiberglass the best procedure is to drill a pilot hole using the 1/16" drill bit at corners or along a curve. Start with using a permanent marker to draw the opening or window. The pilot holes serves to avoid leaving sharp corners which given the nature of a helicopter will be the focal point for stress cracking originating from the corner. Once the holes have been made, use the moto-tool for all other roughing cuts. The cut off wheel is the best for straight lines and either the sanding drum or the curved stone is used for smoothing edges. If the cut out is a window, do not use the moto-tool for the final work. Switch to a sanding blocks, square blocks of various sizes for straight edges and round dowels for rounded corners.

Step 42b.
In the case of the exhaust opening which will end up being 1/8" larger across the outside diameter of the exhaust pipe that extends below the bottom of the fuselage. After drawing the circle, use grinding stone and move in small circles until the hole is at the size wanted.

Step 43.

Priming the fuselage accomplishes two tasks: firstly, the primer paint is designed to aggressively adhere to the surface being painted and provide the best surface for the colored paint to adhere to; secondly, all surface imperfections will become visible. Depending on the particular imperfection, light sanding and the second priming will take care of 90% of the highly visible problems. The remaining 10% need to be filled, let dry, sanded and then sprayed with the second coat of primer. The primer process will be repeated until the surface is as perfect as your patience and time permit.

Step 44.
Select your paint color and follow the directions on the particular brand of paint being used as each manufacturer has different requirements.

Step 45.
Spray cans vs Airbrushed finishes. The preference is left the to the modeler, many good paint jobs have been accomplished using the spray cans however in the long run a good spray can finish requires more attention than using an airbrush. The answer is simple, you want a professional looking fuselage, not want a flying brick. We need not even think or mention any type of paintbrush larger than º" wide.

As for selecting the type of paint there are two different schools. For beginners, visit your local hobby shop and as their opinion on painting fiberglass. On a general note, polyurethane is always a very safe paint that is fuel proof. The key is the last point, a perfect paint job can be easily ruined by spilling raw 15-30% fuel accidentally. There is no paint manufacturer who will tell you that their product will resist 30% fuel for very long and for the most part the fuselage is only exposed to the oil residue from the burned exhaust. We all know very well that in tight, restricted fuelling areas like a scale helicopter are prone to having fuel spills from time to time. For this reason, it is recommended to paint the area around the engine and fuel tank, especially the edges of the fiberglass opening where paint runs will start. A good hobby shop will carry a bottle of clear polyurethane in liquid form just for this purpose. Thinned epoxy works well in a pinch.

The other very common paint used for models is automotive paints, these by nature are not fuel proof and will require the final top coat to be a polyurethane or equivalent. This usually insinuates that the paint is being airbrushed on to the surface of the fuselage.

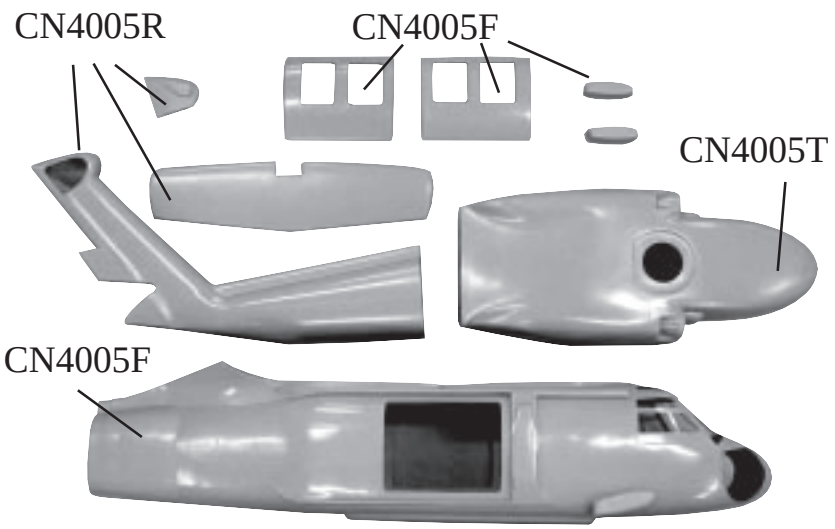
Good luck with your paint schemes and painting job undertakings.

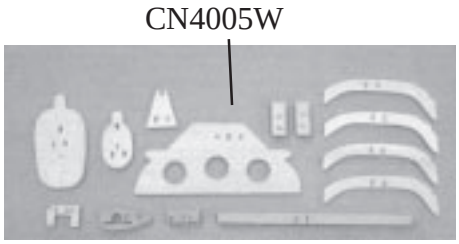
Optional Accessories to Complete your Black Hawk

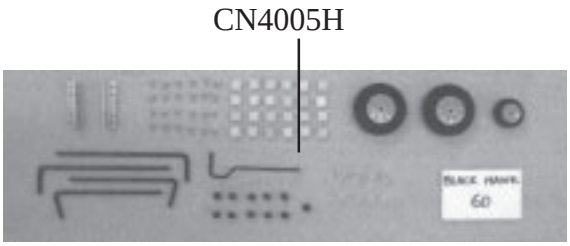
To truly make your Black Hawk scale, the high performance 4 blade scale rotor head is available. This rotor head consists of an all metal assembly, dual ball bearing aluminum main blade grips which feature the I.D.G. system (Individual grip damping) to dampen each blade individually to eliminate turbulence vibration which is crucial for super smooth flying with Century's multiple rotor blades. Century makes all the components required for this conversion: head assembly, 4 blade swashplate, custom follower and main rotor blades.

CN1104	Multi 4 blade rotor head (60/90 to Gasoline size)
CN1107-4	Swashplate - 4 blade (10mm shaft)
CN1108	Swashplate Follower (8 & 10mm shaft) - Keeps swashplate timed to main blades
CN1109	Scale tail gear box assembly
CN1202	4 blade multi tail unit (fits most helicopters)
CN2328B	4 Blade Multi Main Blade Set (600mm)

Black Hawk Replacement Part List







CN4005B	Black Hawk blue print & manual
CN4005D	Tail drive shaft & mount unit
CN4005C	Canopy and windshield
CN4005H	Hardwear and landing gear parts
CN4005F	Fiberglass main fuselage body & doors
CN4005R	Fiberglass tail boom
CN4005T	Fiberglass top cap
CN4005W	Wood parts

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