

QuickWorldwide.com

Sweet 16 EP Helicopter



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Quick Pre-Assembly Information

Quick Worldwide & Hobbies & Helis International:

Quick of Japan and Hobbies & Helis International teamed up to make parts 6 years ago. In the beginning, our specialty was the manufacturing of various upgrade parts for many of the plastic helicopters on the market.

After four years of distributing numerous upgrades and crash parts for other helicopters, we decided to develop our own line of helicopters. That's when the notion of the Quick Learner was conceived. As the development of the kit began, initial designs were approved, proto-types were made and flown - all to ensure that the design was flawless. No minor details were over-looked. After countless hours of hard work and dedication, Quick-World-Wide is proud to release the first in a new standard in Helicopters - the Quick Learner.

Warning:

The radio-controlled model helicopter contained in this kit is not a toy. Rather, it is a sophisticated piece of equipment. This Product is not recommended for use by children, without adult supervision. Radio controlled models such as this, are capable of causing both property damage and/or bodily harm to both the operator/assembler and/or spectator if not properly assembled and operated. Hobbies & Helis assumes no liability for damage that could occur from the assembly and/or use/misuse of this product.

AMA:

We strongly encourage all prospective and current R/C aircraft pilots to join the Academy of Model Aeronautics. The AMA is a non-profit organization that provides services to model aircraft pilots. As an AMA member, you will receive a monthly magazine entitled Model Aviation, as well as a liability insurance plan to cover against possible accident or injury. All AMA charter aircraft clubs require individuals to hold a current AMA sporting license prior to the operation of their model.







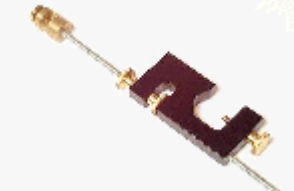


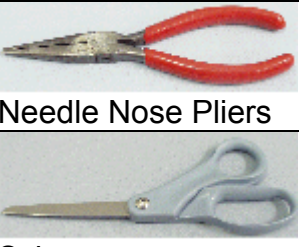
Pre-Assembly Information:

Quick Helicopters are put together with care and quality topping our priority list. A recommendation when you are ready to begin building this model is that you examine the kit and understand the contents of the packages and read thoroughly before starting the assembly process. Purchase a parts box for all the nuts, bolts, and other small parts. We take great care to ensure all parts are in the box.

Quickie Features

- 1. Frame Construction:** Quickie frames are made of the highest Quality Black G-10 or Carbon Frames. These frames are not only rigid but will provide excellent vibration absorption.
- 2. Hex Start Shaft System:** Allows the helicopter to be started with a regular start shaft. Kit can also be fitted with a pull-start.
- 4. Belt driven Tail:** Belt Driven tail is not only a reliable way to drive a tail, but is also very smooth and low maintenance.
- 5. High Quality Ball Bearings:** Quick Learner offers ball bearings on all moving parts.
- 6. EMS Collective System:** The EMS Collective design allows ease of setup with fewer moving parts. EMS constitutes overall design simplicity and represents the future of helicopter technology.
- 7. Heavy-Duty Clutch System:** Same material used in all of our quick upgrade clutches.
- 8. Control Linkages:** The control linkages that are provided with the Quick Kit are high quality 2.3mm stainless steel rods and the rod ends are made of a high quality Delrin.
- 9. Single Blade Axle Design:** The single blade axle design is simple very responsive system, with very consistent flight characteristics.

Tools Needed to Assemble the helicopter.

 <p>Phillips Screw Driver</p>	 <p>Ball End Drivers HHI7050</p>	 <p>Bubble Blade Balancer HHI7010 High Point Balancer DUB499</p>
 <p>Piston Head Lock HHI7020</p>	 <p>HHI7320 – 6pc Nut & Allen Driver Set</p>	 <p>Pitch Gauge HHI7001</p>
 <p>Composite Paddle Gauges HHI7000</p>		 <p>Universal Flybar Lock HHI7040</p>
 <p>Ruler</p>	 <p>Hobby Knife</p>	 <p>Needle Nose Pliers Scissors</p>

Hardware & Accessories

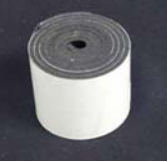




Engine (Recommended Motor but others will work)

Aveox 36/38/3	
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Glues & Thread Lockers

 <p>Ca Glue. ...GBG1</p>	 <p>JB Weld...JBW8265S</p>	 <p>Loctite.PT40</p>
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Radio Mounting Accessories

 <p>Single Sided Foam Tape... HHI2008</p>	 <p>Receiver Hold Down Straps HHI55** \$4.99 2 Per Bag & Colors: Red, White, Purple, Black</p>
 <p>Receiver Strong Box... HHI2200</p>	 <p>Spiral Wrap HHI2809 & HHI2810</p>
 <p>Wire Ties...HHIWT01</p>	

Other Optional Accessories



3mm Fly-bar Stiffeners...HHI402*



Quickie Servo Arm Set

3mm Finishing Caps
HHIM1110
Available in Blue, Silver, Gold, & Purple



Base Load Antenna
HHI53**
Available in Blue, Gold, Purple
& In 40, 50, 72mhz

Radio Requirements

Radios:

Hobbies & Helis & its distributors carry various lines of helicopter radios. Any radio that supports EMS/CCPM Mixing will work fine. We recommend using an eight-channel or better radio, although a six channel radio is all that is required.

Servos:

This is the single most important function of the helicopter. Any sport servo will offer acceptable performance. You should be sure to use all the same type of servo on the swash plate. Higher speed servo is recommended for tail, but not required.

Introduction:

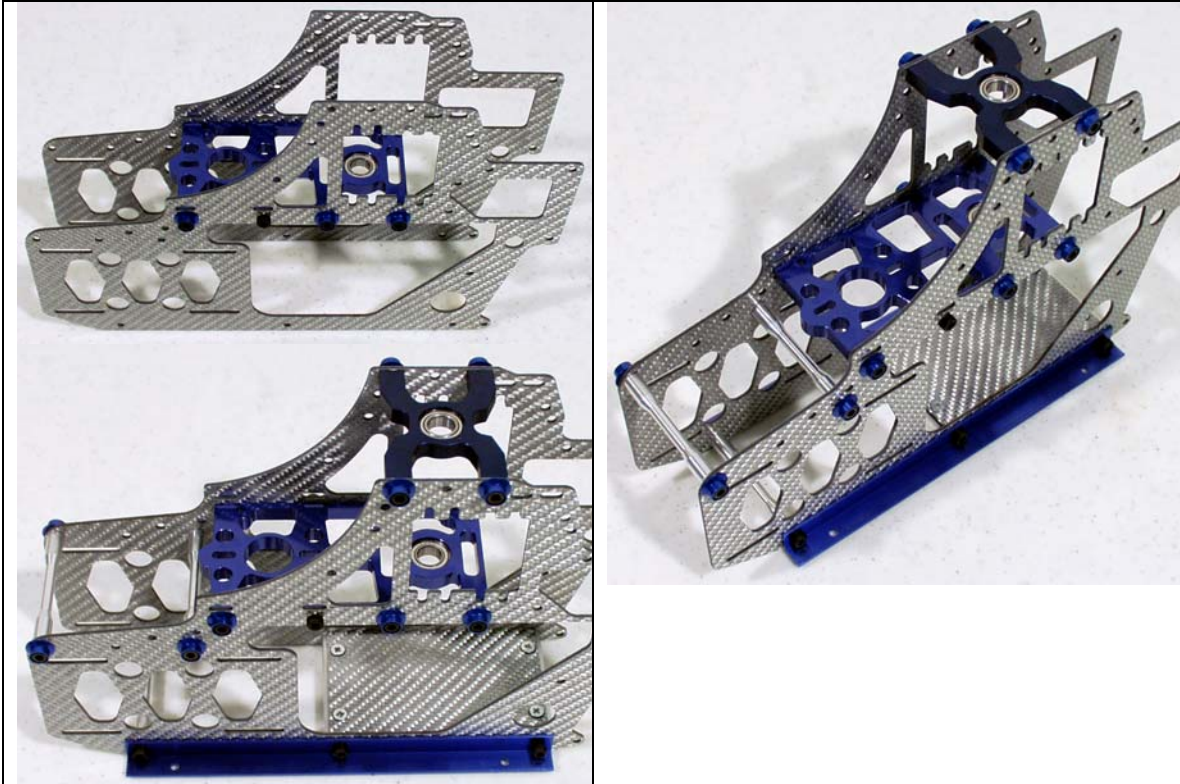
Please read through the entire manual before starting your construction of the Quickie. If there are any questions or concerns regarding the assembly of the helicopter you can call Hobbies & Helis International (610)-282-4811 or Email the any of the following techs.

Technical Support Personnel:

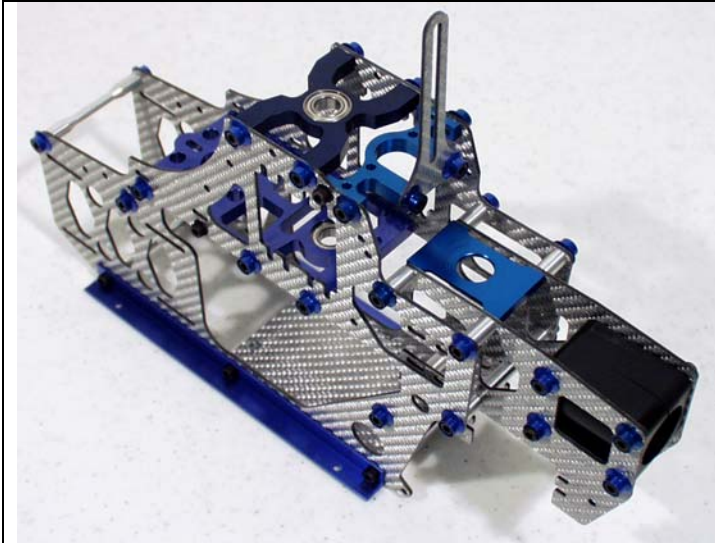
Jon – Jon@quickworldwide.com

Threadlocker Warning (Very Important):

This is a general warning about the use of threadlocker and its importance. Threadlocker must be used anywhere that a metal fastener i.e. (M2, M3, M4 Cap Head Bolts, Set Screws etc.) are threaded into a metal part i.e. (Bearing Blocks, Cross-members, etc.). The failure to use threadlocker can result in parts falling a part and possible loss of control of the model, which can lead to a crash. Also, be sure to check your bolts' tightness after each flight. Many bolts, even with the use of threadlocker can come loose from vibration in the helicopter.



Assemble the main frames as shown in the picture. The bearing blocks will be inserted as follows; the upper block will have the open part (Flush side) facing up, and the lower bearing block will have the open face down. Each of the bearing blocks are attached with (4) M3x6 cap head screws. Attach the canopy standoffs using (4) M3x6 cap head screws.



Attach the antirotation upright piece to the antirotation base using (2) M3x6 cap head screws.

Attach the antirotation guide using (4) M3x6 cap head screws and (4) M3 washer.

Assemble the rear sub-frame as shown. Attach the two frame halves with the boom holders. They will be attached using (4) M3x35 cap head bolts and nuts. Next you will attach the rear sub frame to the helicopter.

There are eight attachment points, four on each side. Take an M3x20 cap head screw and slide it through the hole on the frame. Next, slide a 10mm spacer onto each of the bolts. Slip the sub-frame into the middle and secure each bolt with a 24mm cross member in the middle.

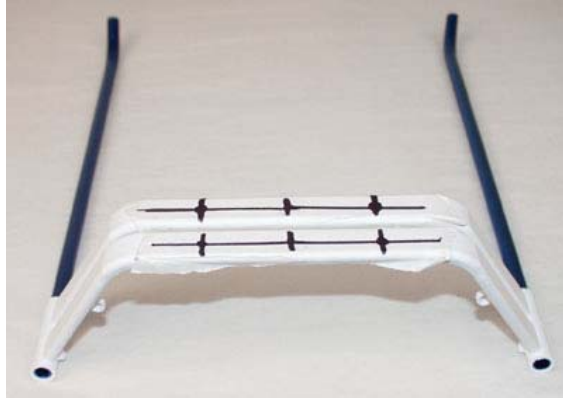
Landing Gear Installation

Parts List

Landing Gear Struts X 2
Landing Gear Skids X 2
Landing Gear Skid Ends X 4
M3x3 Set Screws x 4
M3x14 cap head screws x 4
M3 locknuts x 4

Locate (2) Landing Gear Struts place a piece of masking tape across top and Center helicopter on the struts and mark holes

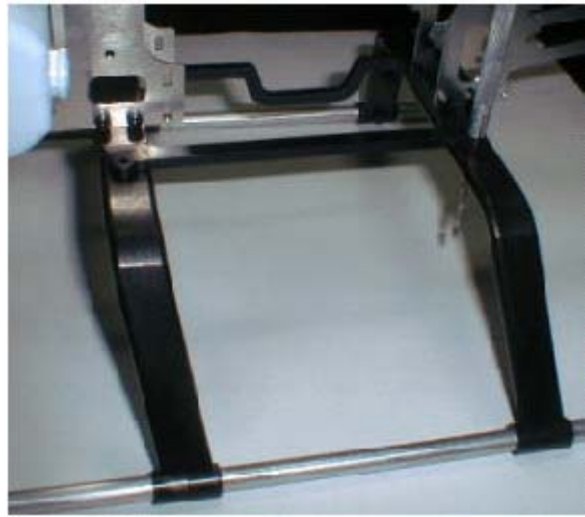
Replacement Part #:
Landing Gear Set – HH14007



Drill (4) M3 holes at the previously determined locations. After holes have been Drilled remove tape.



Attach the landing gear to the lower frame using (4) M3x14 cap head bolt. Secure the bolts using the (4) M3 locknuts.



Install (2) Skid Pipes into the struts so the Helicopter is adequately balanced and secure using (4) M3 Set Screws.

Install (4) Skid pipe end caps using medium CA glue.



Section 2 – Main Gear Installation

Parts List

Bag 2

Main Gear
Autorotation Hub-Deluxe/Main Gear
Hub-Standard
M3x6 Cap Head Screws x 4
Main Shaft x 1

Main Shaft Collar x 1
M3x18 Cap Head Screw x 1
M3 Locknut x 1
M3x3 Set Screw x 4



Next, attach the main gear to the antirotation/main gear hub. It will be attached with (4) M3x6 cap head screws.



Slide the main shaft down through the autorotation hub. Secure it in place with an M3x18 cap head bolt and M3 locknut. Then secure the main shaft on top with the main shaft collar and (4) M3x3 set screws.

This is how the helicopter should look at this point.

Section 3 – Counter Gear Assembly

Parts List

<p>Bag 3 Counter Gear Shaft x 1 Counter Gear x 1 Lock Pin x 1 E-Clip x 1 Counter Gear Bearing Block x 2</p>	<p>Pulley Gear Plate x 1 Lock Pin x 1 Pulley Gear x 1 E-Clip x 1 M3x6 Cap Head Screw x 8 M3 Washer x 8</p>
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Install the steel stopper pin into the counter gear shaft. Then slide the counter gear onto the counter gear shaft.



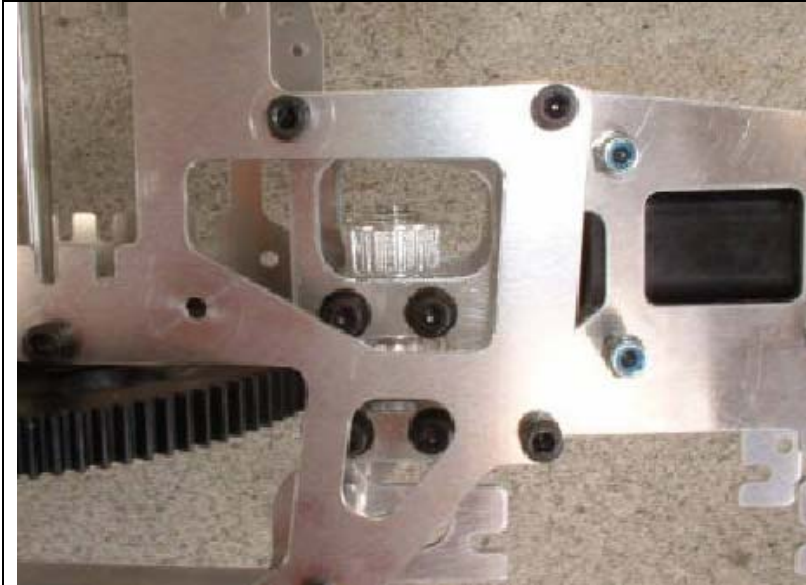
Secure the gear in place using an E-clip.



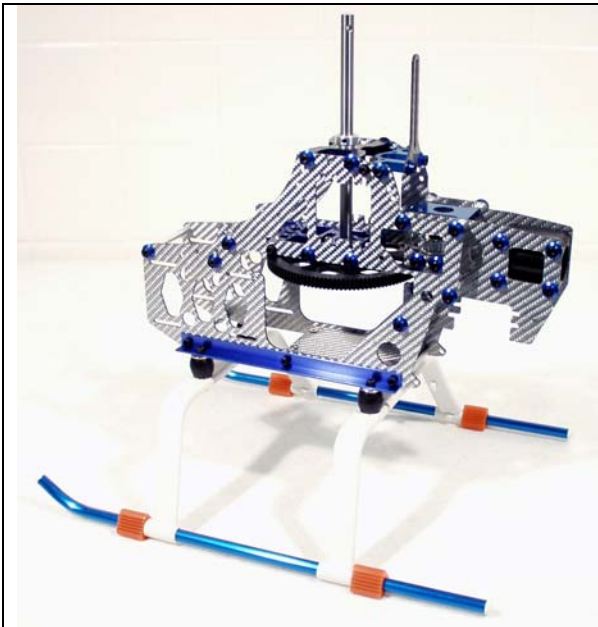
Locate the two counter gear bearing blocks. Next slide each bearing block onto the counter gear shaft. Each bearing block has an open face. The open faces should both face up as shown in the picture.



Then slide the pulley spacer on, and finally the cross locking pin. Next slide the gear on the shaft capturing the cross pin with the slot in the gear. Secure the gear down with the second e-clip.



Next, slide the counter gear assembly into the frame and secure it in place using (8) M3x6 cap head screws with a washer under each.



At this point, your helicopter should look like this.

Section 4 – Control Items

Parts List

Swashplate	M2x12 Pan head screw x 2
Washout Arms	M3x3 Set Screw x 1
Washout Base	M3x6 Pivot studs x 2
Antirotation guide pin	M3x10 Cap head screws
Washout link x 2	M3x5x1 Spacer x 2



Locate swashplate and slide it on the main shaft first. Install pivot balls as shown in the picture.



Next locate the washout base, arms, links, M3x4 pivot studs, M3x10 cap head screws, M3x5x1 spacers, M3 set screws, and washout link pins. First slide an M3x10 cap head screw through each arm. Note which direction the screw should go through the arm in the picture. Slide an M3x5x1 on each bolt and attach them to the base. Next attach an M3x4 pivot stud to each of the washout arms. Finally attach a washout link to each arm with a link pin and set in place with set screw. Next slide the washout onto the main shaft with the protruding side going down first.

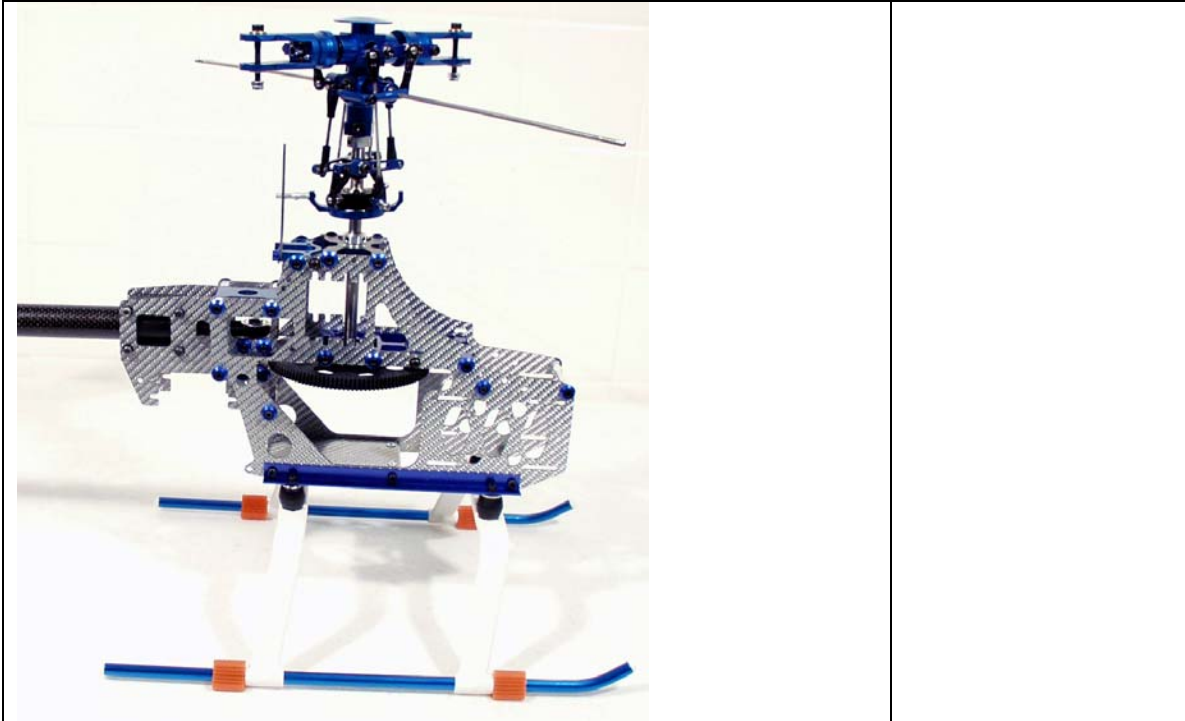


Attach the washout links to the pivot studs on the inner ring of the swashplate.

Slide the Antirotation guide pin on the main shaft next. Secure it using the M3x3 set screw. This will be adjusted later, so snug is all this screw needs to be for now.

Section 5 – Head Assembly






	<p>Gather all the components for the head assembly.</p> <p>Install (1) Seasaw using (2) M3-8 Cap Head Bolts and (2) Seasaw Collars.</p> <p>Replacement Part #: Seasaw w/Brgs – QH357 Seasaw Collars – QHL355</p>
	<p>Refer to the exploded view for further detail.</p>
	<p>Attach Flybar control arms and hiller arms.</p>



Section 6 – Tail Assembly

Parts List

Tail boom	M3x4 Pivot Stud
Belt	2.3 Medium ball ends
Boom holder half x 2	Tail Pitch Lever
M3x35 x 4	M3x4 Pivot stud
M3 Locknut x 4	M3x10 Cap head screw
Tail output shaft	M3x3 Set screw
Pulley gear	Tail rotor hub
M3 set screw x 2	Tail blade grips x 2
Tail case side plate x 2	3x7x3R Bearing x 2
5x10x4R Bearing x 2	M3x6 cap head screw x 2
Tail pitch lever base	M2x8 Pan head screw x 2
M2x6 Pan head screw x 2	Shim ball x 2
M3x6 Cap head screw x 6	Tail blades x 2
Tail Pitch Slider	M3x20 Cap head screw x 2
	M3 Locknut x 2
	Tail blade spacers x 4
	M2.5x6 Cap Head Bolt

		<p>Locate the tail boom and the belt. Slide the belt through the boom. Be sure you do not twist the belt. Drill 2.3mm hole at the side of the boom end (indicated by the arrow) and secure with M2.5x6 Cap Head Bolt.</p>
		<p>Install the two boom halves into the frames. Put the (4) M3x35 cap head screws through the four open holes in the boom halves. Loosely put the nuts on the ends of the bolts.</p>
		<p>Locate your tail output shaft and tail pulley gear. Secure the gear to the shaft using (2) M3x3 set screw.</p>
		<p>Locate your two tail case side plates. Install a 5x10x4R Bearing into each plate.</p>
		<p>Attach the tail pitch lever mount to the side plate using (2) M2x6 pan head screws.</p>

		<p>Attach the side plate to the boom using two M3x6 cap head screws. Next slide your tail output and shaft through the side plate.</p>
		<p>Attach the other tail case side plate to the tail boom using (2) M3x6 cap head screws. Also attach the tail case cross member using (2) M3x6 cap head screws.</p>
		<p>Locate your tail pitch slider, (2) medium ball ends, and an M3x4 pivot stud.</p>
		<p>Slide the tail pitch slider assembly onto the tail output shaft.</p>
		<p>Attach the M3x4 pivot stud to the tail pitch lever.</p>



Attach the tail pitch lever to the tail pitch lever base using an M3x10 cap head screw. Be sure that you capture the M3x4 pivot stud in the tail pitch slider with the brass coupler in the tail pitch lever.



Attach the tail rotor ass'y to the tail output shaft using an M3x3 set screw.

Install a shim ball onto each blade grip using an M2x8 pan head screw. They should go in the outmost holes.



Attach a tail blade to each grip using (2) tail blade spacers, an M3x20 cap head bolt, and an M3 locknut.

Note: The Tail Blades should rotate counter clockwise when looking at the right side of the Tail Case.

Section 6 – Fin Set Installation

Parts List

Vertical Fin Horizontal Fin C-clamp x 2 M3x14 Cap head screw x 4	
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Attach the horizontal fin using one black c-clamp and (2) M3x10 cap head screws.

Note: Be sure the fin doesn't interfere with the tail blades when they are rotating.

Attach the vertical fin using the clamp and (2) M3x30 cap head screws & nuts.

Section 7 – Linkage Rod Installation

Parts List

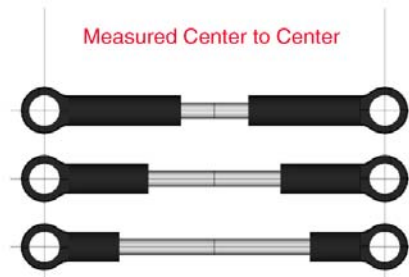
M2x8 Pan head screws x 6 Shim ball x 6 M2.3x35mm Linkage Rod x 3 M2.3x50mm Linkage Rod x 3 M2.3x20mm Linkage Rod x 2 2.3mm Ball end, Medium x 8 Tail Rotor Pushrod guide set. (Clips, two inner sleeves (2))	2.3mm Ball end, Long x 10 Double Link x 2 Canopy Rubber grommets x 4 M3x14 Cap head screws x 4 Stainless rudder control rod end x 2 M3x14 Cap head screw x 40 M3 Locknut x 40
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Attach each servo using (4) M3x14 Cap head screws and (4) M3 Locknuts. Look at the pictures that follow for the proper servo orientation.

Step 1 – Linkage Rod Setup

In the following table the linkages will be measured center to center as per the picture. The table explains the amount of rods you need to make and which ball links to use on each end. This will get the helicopter close to finished setup, as always you will need to make some final adjustments to maximize the performance of your Helicopter

Replacement Part #:
 Linkage Rod Set – QC150
 All Linkages available individually just know the size



Step 1A – Shim Ball Installation

Install (6) Shim Balls using (6) M2-8 Phillips Screws. Install each Shim ball as close to the recommended distance for the center of the servo splice and the center of the shim balls.

Swashplate Servos	18-20mm
Rudder Servo	11.75-13mm



All three swashplate rods will be the same length.

# of Rods	3
Rod Size	2.3-35
Ball Link 1	Medium
Ball Link 2	Medium
Center to Center	55mm



Rod Use	<i>Washout to Flybar Control Arm</i>
# of Rods	1
Rod Size	2.3-20
Ball Link 1	Medium
Ball Link 2	Medium
Center to Center	45mm



Seesaw to Hiller Arm
Use a double link on this spot.



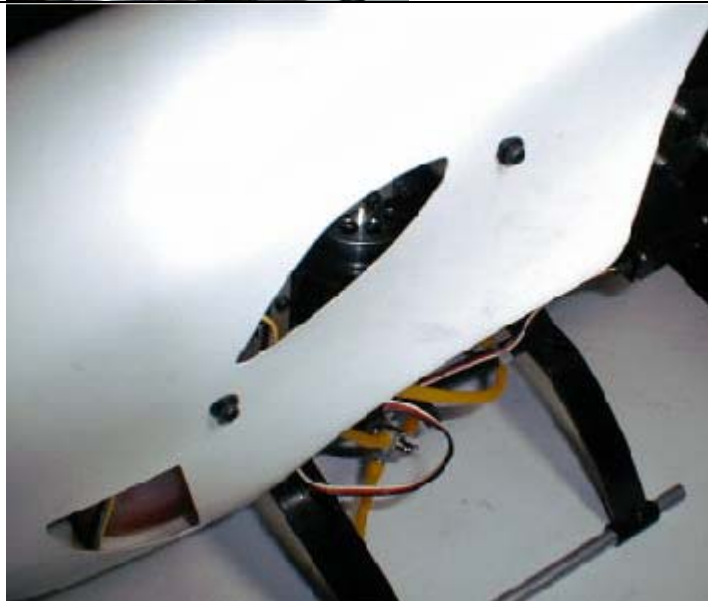
Assemble the push rod guides.
There are two pieces the main clip and two inner sleeves.
Simply slide the sleeve into the main clip and glue. Putting electrical tape onto the boom before gluing is good, so it is possible to reuse the clip later.
(HHI2900 – Rod Guides)



Install the carbon rudder control rod. The rod should end up 22" or 558mm long from ball to ball. Slide the carbon rod through the guides and glue the ends on. Screw the links onto the ends and attach to the balls.



Rod Use	<i>Swashplate to Hiller arm</i>
# of Rods	2
Rod Size	2.3-50
Ball Link 1	Long
Ball Link 2	Long
Center to Center	85mm



Place the canopy where you like, mark the holes for the canopy standoffs. Use a 1/4" drill bit. Place the grommets in the holes and secure the canopy to the helicopter using (4) M3x14 cap head screws.

Section 8 – Motor Installation

Parts List

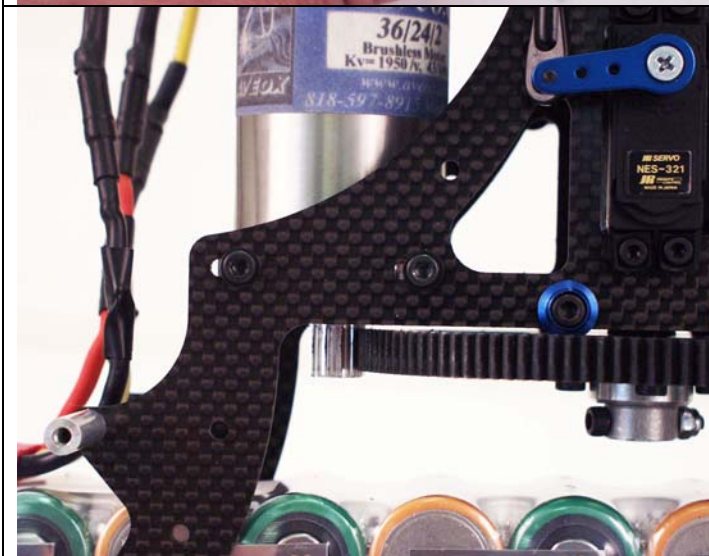
M3x6 Cap Head Screw x 2	
Pinion Gear x 1	
M3x5 Set Screw x 1	



Attach your pinion gear to the motor using an M3x5 set screw. It is recommended to grind a flat onto the output shaft of the motor if there is not already one there. This will help to prevent the gear from slipping.



Attach the motor to the motor mount using (2) M3x6 cap head screws.



Finally install the motor assembly into the helicopter. Be sure not to set the gear mesh too tight or too loose. A good way to set the mesh is to slide a piece of notebook paper between the gears and then tighten the bolts. This will give an idea mesh.

CCPM Helicopter Setup For all Quick Helicopters

General

Instead of giving you the exact length of each linkage rod we will explain to you what you are trying to achieve. This is the same for all Quick helicopters. Another thing worth mentioning is that all controls on our helicopters are leading edge controlled. We have three such controls on our helicopter and they are, Main blades, Tail blade and flybar control arms. For example the main blade pitch arms should be mounted so they are in front of the blades in the direction of travel, clockwise if you look at the helicopter from above, see picture 4.

As help during this setup your radio manual will be needed.

Swashplate

Instead of giving you the exact length of each linkage rod we will explain to you what you are trying to achieve. This is the same for all Quick helicopters.

Step 1

First set your radio up so that all servos are moving in the right direction and adjust all travel values to 100%. If you have a radio with Swash mixing values set those to 50% (Pitch, Aileron and Elevator).

Now center both radio sticks (including "throttle") and center all trim and sub-trim values. When this is done turn your receiver pack on. Now mount the servo arms at a 90deg angle towards the linkage rod. In our non push pull helis this will be horizontal. Use the mounting position on the servo arm that will be closest to 90deg, not all servos will line up 100% correct. If they are visible off from the 90deg position the use the sub-trim function in your radio for fine tuning, do not use regular trim for this, see picture 1.

Now you have a good start and the rest of the setup will become easier.

Step 2

Connecting the Swashplate at the right distance. This is done by moving your Pitch (throttle) stick all the way down, see picture 2. When the servos are in this position adjust the length of the linkage rods so the Swashplate is located towards the bottom, but still leaves enough room for left/right (aileron) and front/back (elevator) travel. During such travel, portions of the Swashplate will move below the Swashplate position archived during Pitch full down radio stick position. So make sure you leave enough room for this extra travel, see picture 2 for recommended height. Also make sure that all 3 linkage rods between the servo arms and the Swashplate are the same, so the Swashplate is level. It should not tilt in any direction; unless your right radio stick is moved. If it tilts, and all linkage rods are the same length, then go back to step one and make sure your three servo arms have the same neutral

position (horizontal on non push pull helis).

Step 3

Connecting the Washout assembly. Connect the fixed length plastic “A” arms to the Swashplate, connect to the two longer pivot studs, if all four are the same length then any two will do. The next step is to adjust the length of the linkage rod between the Washout Arm and the Flybar connection point. Turn your radio and receiver back on and center both sticks. Now adjust the length of the flybar linkage so the washout arms are level (horizontal), see picture 1. Also make sure your flybar arms and flybar-paddles are level (horizontal), when adjusting the linkage. After the length is adjusted make sure that you have free travel in all directions and stick positions. When the Pitch stick is all the way up it should look like picture 3. As you can see there is still plenty of room for aileron and elevator travel. Now adjust the Washout Anti-rotation pin height so the pin is still in the guide slot of the washout base during all travel positions. For the Left/Right Washout Anti-rotation position, line the attachment point of the plastic washout “A” arm on the Swashplate up with flybar linkage connection point. The imaginary line between these points should be vertical.

Now you are almost done, only one set of links left, and the length of those links will be depending on your desired setup whether it's Aerobatic or normal flying. Please refer to the Pitch travel setup table for this final link length.

Picture 1, Swash center

Picture 2, Swash Down



Picture 3, Swash Up



Picture 4, Head



Picture 5, Tail Center



Picture 6, Tail Positive Thrust



Picture 7, Tail Negative Thrust



Picture 8, Tail



Pitch Travel Setup

Collective Position	Normal Flying	Aerobic
Up (100%)	+10 deg	+10 deg
Center (50%)	+5 deg	+0 deg
Down (0%)	-3 deg	-10 deg

Throttle Curve Setup

Collective Position	Fuel		Electric (non governor mode)	
	Normal Flying	Aerobic	Normal Flying	Aerobic
Up (100%)	100%	100%	100%	100%
Center (50%)	70%	60%	75%	65%
Down (0%)	10%	100%	0%	100%

Tail

First adjust the servo arm position like you did with the swash, make sure your trim and sub-trim values are centered. Attach the servo arm so it's 90deg to the tail pushrod (vertical). Now adjust your two plastic ball ends, for the push rod, so they are screwed on about half way onto the threaded pushrod guide end piece. This was you have max amount of adjustment available in both direction. When this is done cut the carbon pushrod to a length that will achieve about 3 deg of positive pith on your tail blades, when the servo is in its neutral (vertical) position. When this is done glue the two end pieces on to the pushrod with CA glue, don't forget to insert the pushrod guides first.

When this is done you should have 3 deg of positive tail blade pitch. Use the outer holed on the tail blade grips for ball link attachment (on our larger machines with longer tail output shaft this is not critical). The tail should spin counter clockwise looking at the right side of the helicopter with the nose to your right and tail to your left. See pictures 5-8.

Throttle

The throttle curve will be affected by several conditions; some of them are, motor choice, blades choice, elevation, temperature, muffler, helicopter weight and type of helicopter. So in order to explain this I will explain what you are looking for. Your goal is to achieve a constant headspeed once the helicopter is airborne. If you ad pitch (climb) you need to ad power (throttle) to compensate for the added resistance a higher blade pitch creates. If during climb your headspeed drops, then you need to add throttle to that particular stick position, and reversed if you have an increase in rpm. You should always have 100% throttle when the collective (pitch) stick is moved all the way up. If during max climb out you experience an increase in headspeed then you need to give the blades a higher pitch, do not try to adjust the max climb rpm by reducing throttle. It need to be left at 100%, if you do not leave it there you will not be able to achieve max power. There are other ways of achieving this by using cyclic mixing, however we will stay away from this for now. Follow the pitch guidelines in the table above, and if you need more pitch at max power because the rpm is increasing, then ad pitch. 10deg is just a guideline and will work in most setups, but a powerful motor or a light helicopter might need more. For rpm adjustment during anything other than full stick deflection you should use the throttle.

A short recap, adjust throttle to adjust rpm during anything other than full collective. At full collective adjust the pitch. See the Throttle table for general setup.

Final words

These are guidelines and will get you going but might not be 100% accurate in regards to all helicopters. Especially the throttle curve table should be considered initial guidelines. As mentioned before it's greatly affected by your equipment. As you become more familiar and proficient with your helicopter you can change the pitch and throttle curves to your liking.