

QuickWorldwide.com

Quickie .15 Helicopters



Exclusively distributed by:

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Support)

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.

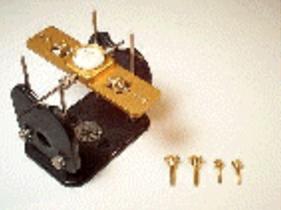
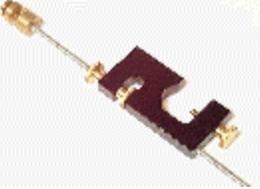
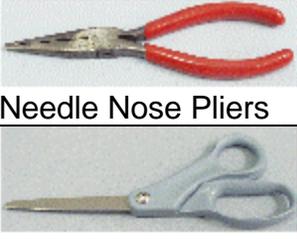
Pre-Assembly Information:

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 .15 Features

- 1. Frame Construction:** Quickie frames are made of the highest Quality Black G-10 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 Learner 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.
- 11. Rearward facing Engine Design:** This design provides quick access to the glow plug and is advantageous for easy engine removal.

Tools Needed to Assemble the “Quick Learner”

 <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 FlybarLock HHI7040</p>
 <p>Ruler</p>	 <p>Hobby Knife</p>	 <p>Needle Nose Pliers Scissors</p>

Hardware & Accessories

Engines (These are our Recommended Motor but others will work)

OS.15 CV-A	
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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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Exhaust Systems

 <p>HHI 30 Size Tuned Muffler</p>	 <p>HHI 30 Size Long Tuned Pipe</p>
 <p>HHI 30/46 Size Tuned Heli-Pipe</p>	 <p>Tuned Pipe Accessories Rear Facing Exhaust Header Exhaust Coupler Exhaust Coupler Clamps</p>

Glow Plugs

 <p>OS #8 Glow Plug. ...OSMG2691</p>

Fuel System Accessories

 <p>Fuel Filter... QUI9002</p>	 <p>Tube Ends.... QUI9001</p>
 <p>Mini Cock Straight... TET4321</p>	 <p>Fuel Tubing.... PRA7092</p>
 <p>Triangle Joint. TET4301</p>	

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

 <p>Landing Gear Dampeners...HHI2004</p>	 <p>3mm Fly-bar Stiffeners...HHI402*</p>
 <p>60Size Skid Stops HHI200* Available in many Colors See website or Call for Detail</p>	 <p>Quick Learner Servo Arm Set</p>
<p>3mm Finishing Caps HHI1110 Available in Blue, Silver, Gold, & Purple</p>	 <p>Base Load Antenna HHI53** Available in Blue, Gold, Purple & In 40, 50, 72mhz</p>

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@ewtech.com

ET – et@ewtech.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.

Section 1 – Upper Frame Assembly

Parts List

Bag 1	Frame Set Bag
Main-shaft Bearing Block X 2 M3x10 Self Tapping Screws x 16 M3x6 x 12 Radio Tray x 1 Lower Frame x 1 Rubber U-Channel x 2 Fuel Tank x 1 32mm Canopy Standoffs x 4 24mm Cross members x 2 Anti-rotation Guide x 1 Boom Halves x 2 M3x35 Cap Head Bolts x 4 M3 Locknut x 4	Main Frames X 2

Cut the rubber U-channel to 55mm in length.



Locate the two main frames.
Install the rubber u-channel onto both frame halves.



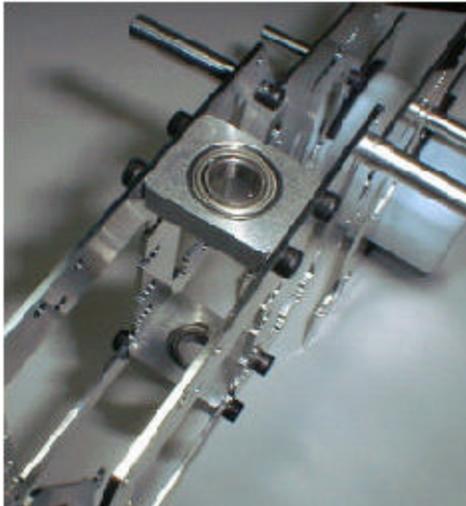
Install four canopy standoffs (32mm) onto the two frame halves.



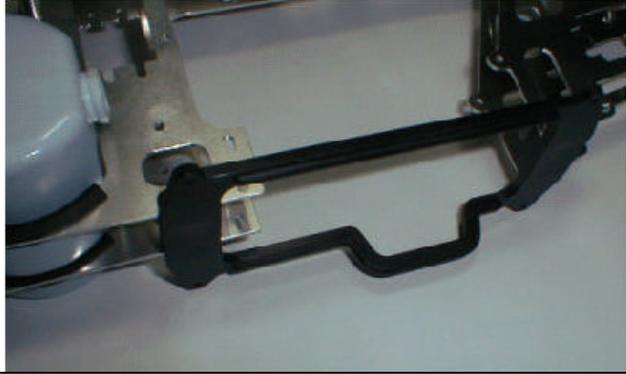
Slide two frame halves over fuel tank with canopy mounts facing outward. The fuel tank is on the front of the helicopter, so looking from behind the helicopter the open hole on the tank goes out to the left.



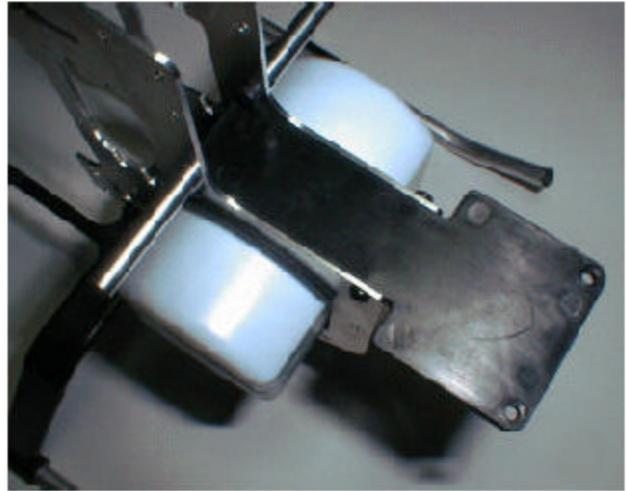
Install upper and lower main shaft bearing blocks using (8) M3x6 cap head screws. Note: Be sure that on the upper bearing block the open half faces up. The lower block the open face should be down.



Install the lower frame stiffener using (8) M3x10 Self tapping screws.



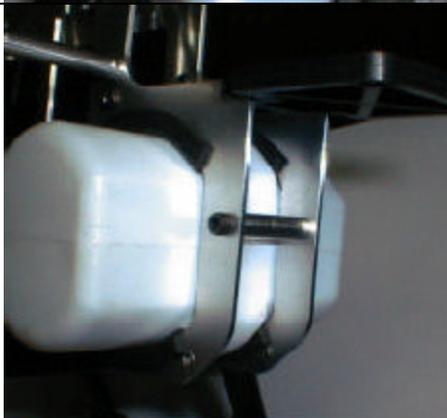
Install the front radio tray using (4) M3x10 self tapping screws.



Install (1) 24mm cross member using (2) M3x6 cap head screws.



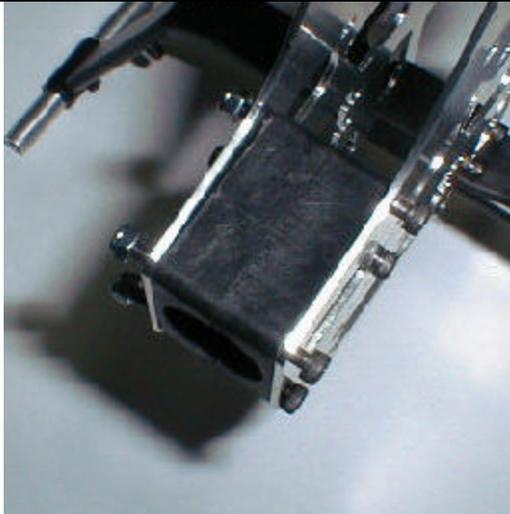
Install (1) 24mm cross member using (2) M3x6 cap head screws.



Install the anti-rotation guide using (4) M3x10 self tapping screws.



Install two boom halves using (4) M3x35 cap head screws, and (4) M3 locknuts.



Section 2 –Landing Gear Installation

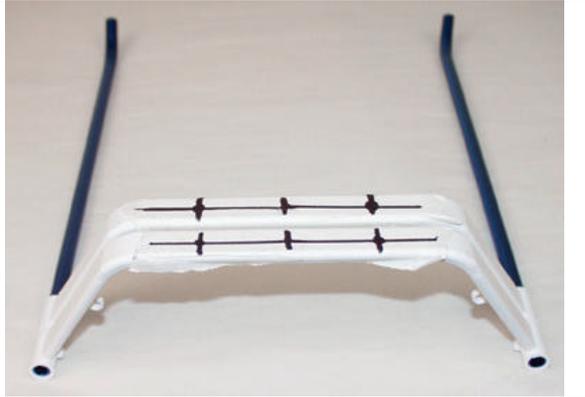
Parts List

Bag 2

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

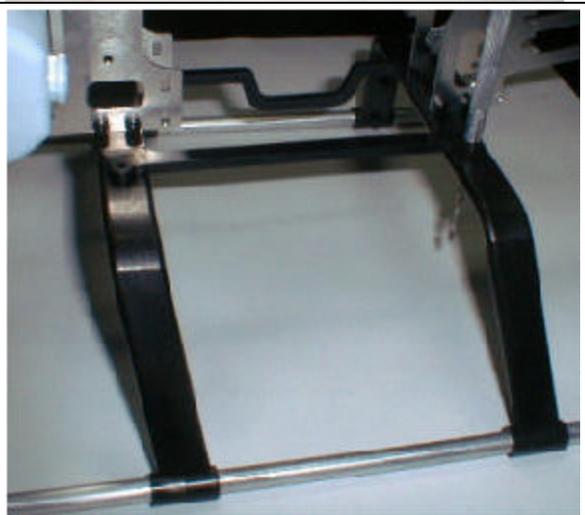
Replacement Part #:
Landing Gear Set – HHI4007



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.



Bag 3 – Clutch bell Assembly, Counter Gear Assembly, and Main Gear Assembly.

Clutch Bell	M3 Locknut x 1
Clutch Lining	Main Shaft Collar
Start Shaft	M3x3 Set Screws x 4
Cross Pin	Counter Gear
Start Shaft Bearing Block	Counter Gear Shaft
Hex Start Coupler	Lock Pin
M4x4 Set Screw x 1	E-Clip
M3x8 Cap Head Screw x 8	Counter Gear Bearing Block x 2
Main Gear	Pulley Gear
Main Gear Hub	Pulley Gear Plate
M3x6 Cap Head Screws x 4	Lock Pin
Main Shaft	E-Clip
M3x18 Cap Head Screw x 1	M3x8 Cap Head Screw x 8



Locate the Clutch Bell.



Score the clutch bell as shown. This provides better adhesion from the liner to the bell.



Locate the lining and cut it to 98mm. Glue this in place with JB Weld. The best way we to hold the clutch liner to the bell is to wrap the clutch with a few rounds of electrical tape and slide that into the bell.



After the clutch bell is dry move onto the next step. Slide the lock pin through the start shaft.

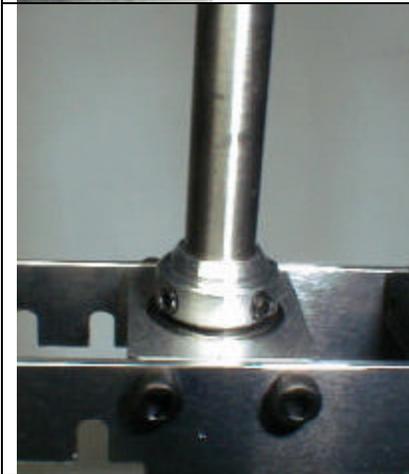


Slide the start shaft into the bell as shown to the left.

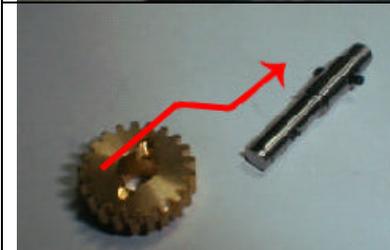
 A close-up photograph of a metal bearing block assembly. It consists of a cylindrical metal housing with a smaller cylindrical component mounted on top, secured with a nut and washers. The assembly is shown against a plain white background.		<p>Next, slide the start shaft bearing block onto the clutch bell and start shaft.</p>
 A close-up photograph of a start coupler assembly. It features a cylindrical metal shaft with a square-shaped metal block mounted on top. The block has a set screw visible on its side. The assembly is shown against a plain white background.		<p>Slide the start coupler over the top of the start shaft and secure it to the index mark. That means make sure the set screw hits the flat on the shaft.</p> <p>Note: There should be no up or down play in the clutch bell once the start coupler is fastened to the Start Shaft.</p>
 A photograph showing the clutch bell assembly being installed into a larger metal component, likely the helicopter's main gear hub. The assembly is being held in place by several screws. The background is a metallic surface.		<p>Install the clutch bell assembly into the helicopter and attach it using (8) M3x8 cap head screws. This unit will need to be adjusted later, so only put them in loosely.</p>
 A photograph of a large, black, circular gear with a serrated outer edge. The gear has several circular holes around its perimeter. A metal hub is mounted in the center of the gear, secured with screws.		<p>Attach the main gear to the main gear hub using (4) M3x6 cap head screws.</p>



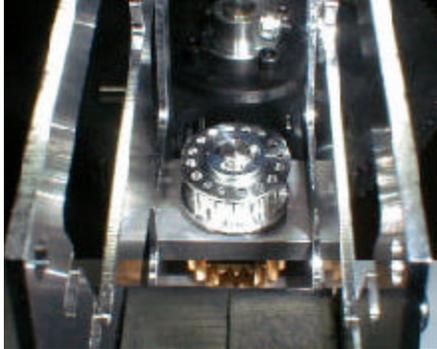
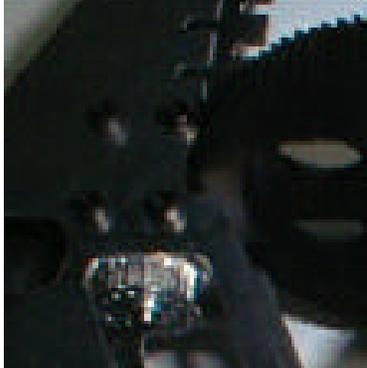
Slide the main shaft through the two main shaft bearing blocks. The end with the hole closer to the end should go down through the blocks from the top side first. The main shaft will slide through the main gear assembly. Lock the bolt in place using a M3x18 and a M3 Locknut



Next slide the main shaft collar over the main shaft and secure it with (4) M3x3 set screws. Be sure there is no up and down play in the mainshaft after the collar is secured.



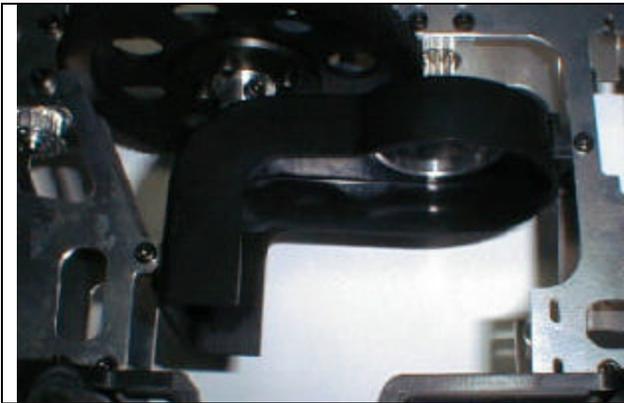
Install the steel stopper pin into the counter gear shaft. Then slide the counter gear onto the counter gear shaft.

		<p>Secure the gear in place using the provided E-clip.</p>
		<p>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 in toward the gear.</p>
		<p>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.</p>
		<p>Attach the counter gear assembly to the frame using (8) M3x8 cap head screws.</p>

Section 4 –Fan Shroud

Parts List

<p>Fan Shroud x 1 M3x10 Self tapping screws x 4</p>



Install the fan shroud using (4) M3x10 self tapping screws.

Section 5 – Clutch Assembly

Parts List

Fan Hub Fan M3x6 Flat head screws x 4 Clutch M3x8 x 2	Motor Mount M3x10 x 4 M2x8 x 1 Shim Ball x 1 M3x6 Cap head screw x 4
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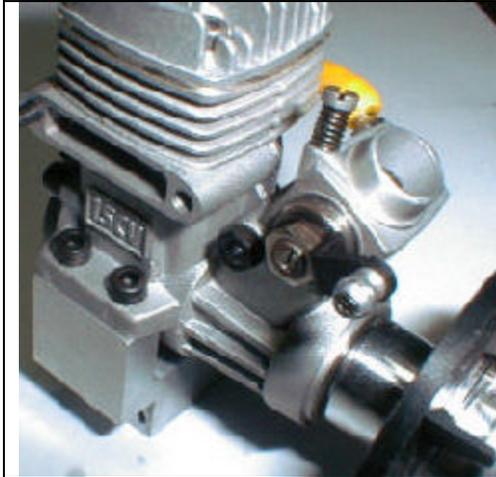
Attach the fan to the fan hub using (4) M3x6 flat head screws.



Install the fan hub onto the crank shaft and secure it in place using the nut provided with the engine. Be sure to use red threadlocker to ensure the nut does not come loose.



Attach the clutch to the fan hub using (2) M3x8 cap head screw.



Attach the motor mount to the motor using (4) M3x10.

Attach the shim ball to the throttle arm using a M2x8 screw.



Slide the engine up into place and secure it using (4) M3x6 cap head screws.

Section 6 – Control Items

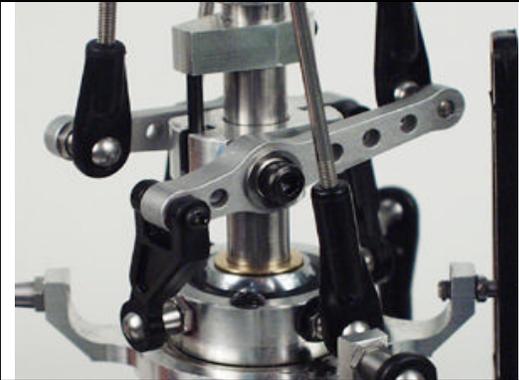
Parts List

Swashplate	M2x12 Pan head screw x 2
Washout Arms	M3x3 Set Screw x 1
Washout Base	M3x6 Pivot studs x 2

Antirotation guide pin Washout link x 2	M3x10 Cap head screws M3x5x1 Spacer x 2
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	Locate swashplate and slide it on the main shaft first.
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	Next locate the washout base, arms, links, M3x6 pivot studs, M3x10 cap head screws, M3x5x1 spacers, and M2x12 pan head screws. First slide an M3x8 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 M3x6 pivot stud to each of the washout arms. Finally attach a washout link to each arm with an M2x12 pan head screw. Next slide the washout onto the main shaft with the protruding side going down first.
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	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 7 – Head Assembly

Parts List

<p>Center Hub Seesaw Seesaw Collar x 2 M3x8 Cap head screw x 2 M3x6 Pivot studs x 2 M3x16 Cap head bolt M3 Locknut 7x13x3 O-ring x 2 O-ring spacer x 2 Spindle 5x10x4R Bearing x 4 M3x10 Cap head screw 3x8x1 Washer x 2</p>	<p>Hiller arm x 2 M3x10 Cap head screw x 2 3x5x1 Spacer Flybar Flybar control arm base x 2 Flybar control arm extension x 2 Flybar control arm spacer (3x5x5) x 2 M4x4 Set screw x 2 M3x8 Cap head screw x 2 Flybar paddle x 2 Blade Grip x 2 M3x22 Cap head bolt x 2 M3 Locknut x 2</p>
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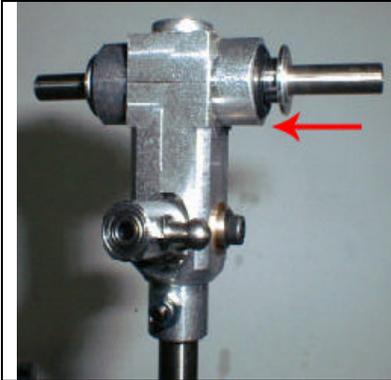


Locate the head block, seesaw, seesaw collars, and (2) M3x8 cap head screws. Slide the seesaw into the opening on the head block. Slide a seesaw collar into each of the bushings on the head block. Secure the seesaw using the (2) M3x8 cap head screws.

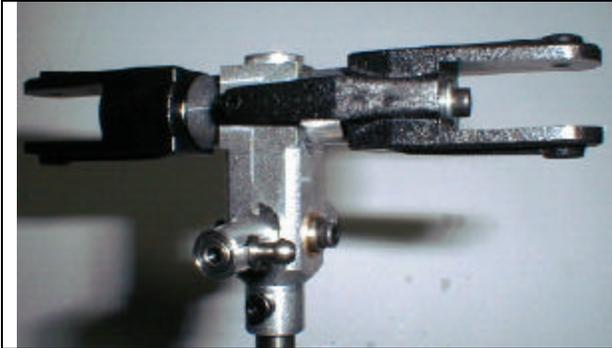


Locate (2) M3x6 pivot studs. Install the two pivot studs into the seesaw. They should be in holes opposite of each other. The other two holes tapped in the seesaw will be unused.

Attach the head block to the main shaft using the M3x16 cap head bolt and an M3 locknut.



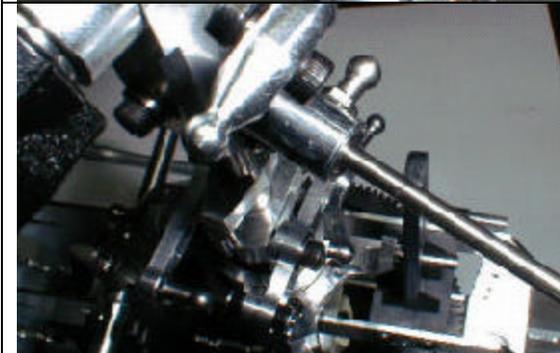
Install two 7x13x3 o-rings into the head block. Next slide the head spindle through the o-rings. Then slide the head dampener spacers onto the spindle



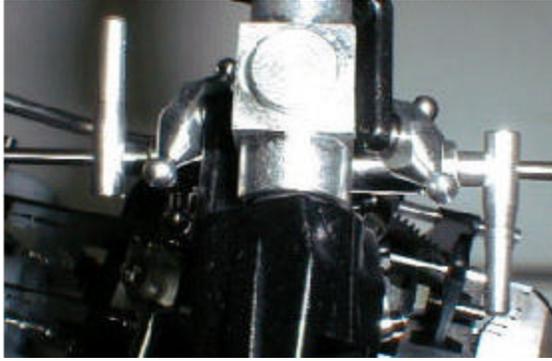
Each blade grip will have (2) 5x10x4R bearings. Install the bearings into the blade grips. Slide each one onto the spindle shaft. Secure the blade grips to the spindle using (2) M3x10 cap head screws. Place a 3x8x1 spacer under each bolt before installing them.



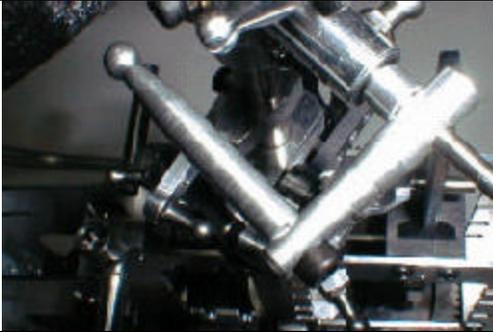
Attach each hiller arm to the blade grip using an M3x10 cap head screw. Put the bolt through the hiller arm and put a 3x5x1 spacer on the bolt next, and screw it into the blade grip.



Slide the flybar through the seesaw.



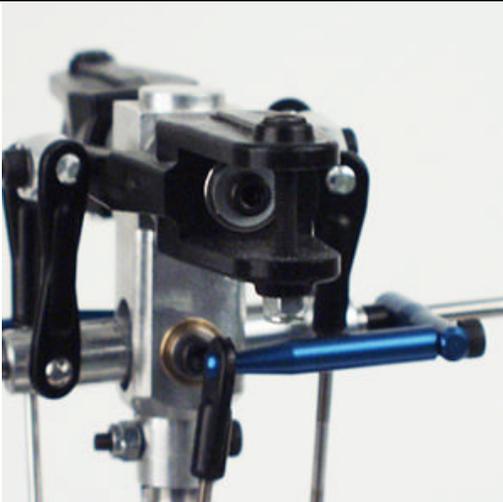
Locate two 3x5x5 spacers, two flybar control arm bases, two flybar control arm extensions, and two M4x4 set screws. Slide (2) 3x5x5 spacers onto the flybar with the protruding side going against the seesaw. Next slide the flybar control arm bases onto the flybar. They face in opposite directions and oppose the M3x6 pivot studs on the seesaw previously installed. Secure them with (2) M3x5 set screws. Be sure that they are parallel with each other and that the flybar is equally distant from both ends.



Attach the (2) flybar control arm extensions using (2) M3x8 cap head screws.



Screw each paddle onto the flybar 25mm. Be sure the paddles are parallel with each other. Also the paddles should be inline/parallel with the flybar control arms.

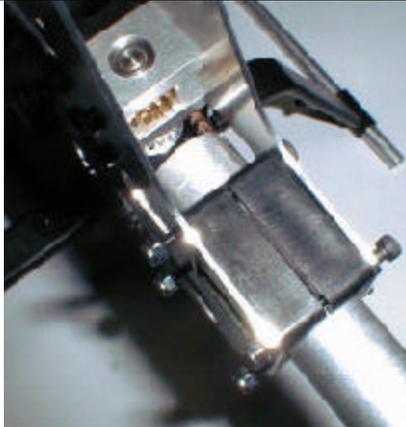


Use M3x22 cap head bolts with M3 locknuts to attach each blade to the grip.

Section 8 – Tail Assembly

Parts List

<p>Tail boom Belt Boom holder half x 2 M3x35 x 4 M3 Locknut x 4 Tail output shaft Pulley gear M3 set screw x 2 Tail case side plate x 2 5x10x4R Bearing x 2 Tail pitch lever base M2x6 Pan head screw x 2 M3x6 Cap head screw x 6 Tail Pitch Slider</p>	<p>M3x4 Pivot Stud 2.3 Medium ball ends Tail Pitch Lever M3x4 Pivot stud M3x10 Cap head screw M3x3 Set screw Tail rotor hub Tail blade grips x 2 3x7x3R Bearing x 2 M3x6 cap head screw x 2 M2x8 Pan head screw x 2 Shim ball x 2 Tail blades x 2 M3x20 Cap head screw x 2 M3 Locknut x 2 Tail blade spacers x 4</p>
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	<p>Locate the tail boom and the belt. Slide the belt through the boom. Be sure you do not twist the belt.</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>
		<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.</p>
		<p>Attach the tail rotor hub to the tail output shaft using an M3x3 set screw.</p>
		<p>Install a 3x7x3R bearing into each tail blade grip. Then attach each grip to the tail rotor hub using an M3x6 cap head screw.</p> <p>Install a shim ball onto each blade grip using an M2x8 pan head screw. They should go in the outmost holes.</p>



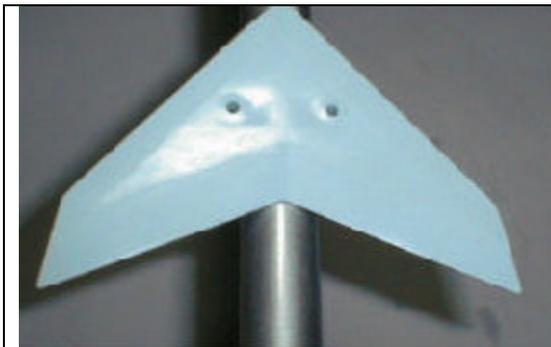
Attach a tail blade to each grip using (2) tail blade spacers, an M3x20 cap head bolt, and an M3 locknut.

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

Section 9 – Fin Set Installation & Fuel Tank Assembly

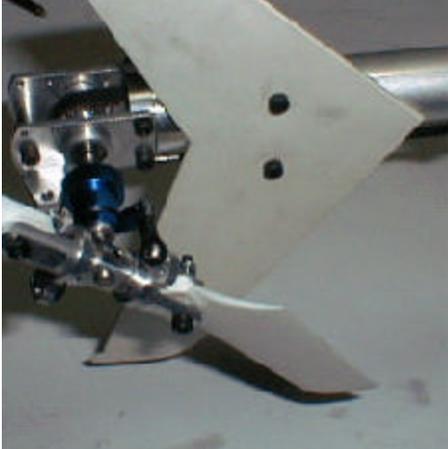
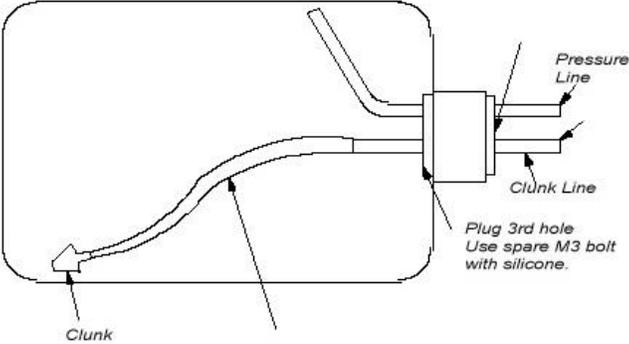
Parts List

Vertical Fin	Fuel tank outer plate
Horizontal Fin	Fuel tank inner plate
C-clamp x 2	2.6 Screw
M3x14 Cap head screw x 4	Fuel tank tubing x 2
	Clunk



Attach the horizontal fin using one c-clamp and (2) M3x14 cap head screws.

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

		<p>Attach the vertical fin using one c-clamp and (2) M3x14 cap head screws.</p>
		

Section 10 – Linkage Rod Installation

Parts List

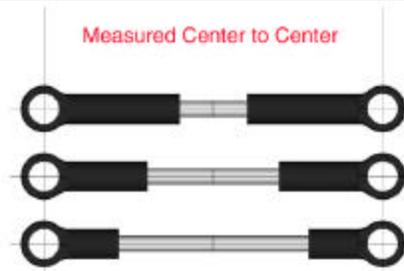
<p>M2x8 Pan head screws x 8 Shim ball x 8 M2.3x35mm Linkage Rod x 2 M2.3x50mm Linkage Rod x 4 M2.3x20mm Linkage Rod x 2 2.3mm Ball end, Medium x 8 Tail Rotor Pushrod guide set. (Clips, two inner sleeves (2))</p>	<p>2.3mm Ball end, Long x 10 Double Link x 2 Canopy Rubber grommets x 4 M3x14 Cap head screws x 4 Stainless rudder control rod end x 2 M3x14 Cap head screw x 40 M3 Locknut x 40</p>
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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

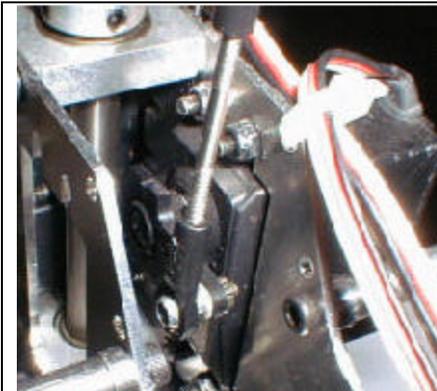
Replacement Part #:
Linkage Rod Set – QC150
All Linkages available individually just know the size



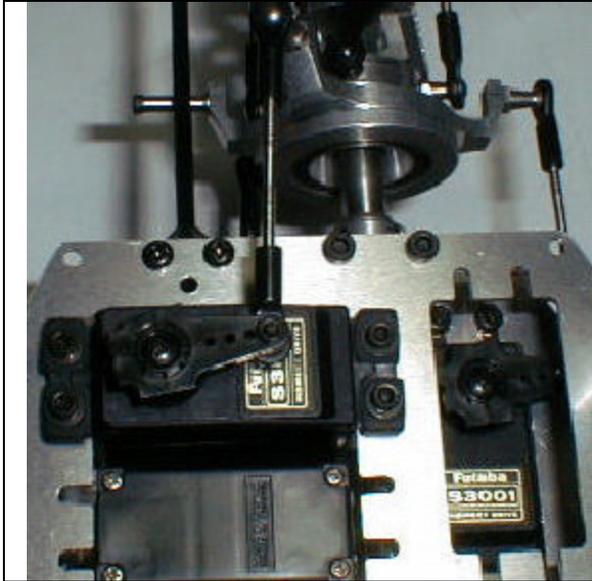
Step 1A – Shim Ball Installation

Install (8) Shim Balls using (8) 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.

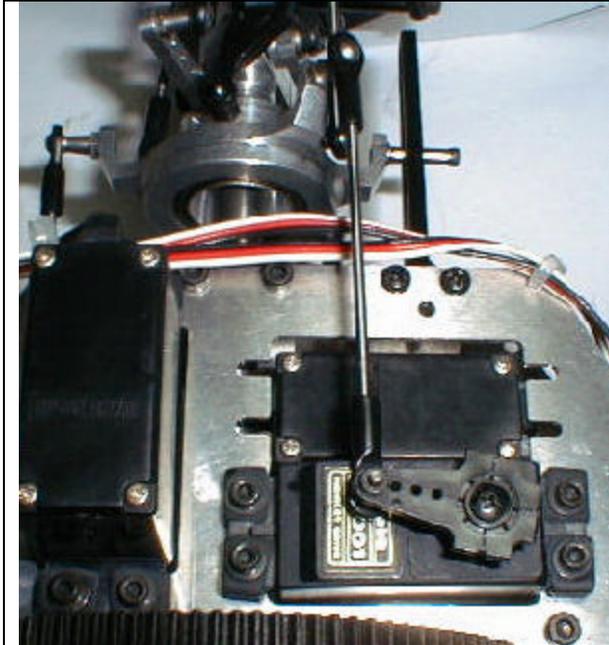
Carburetor	11.75-13mm
Throttle Servo	11.75-13mm
Swashplate Servos	18-20mm
Rudder Servo	11.75-13mm



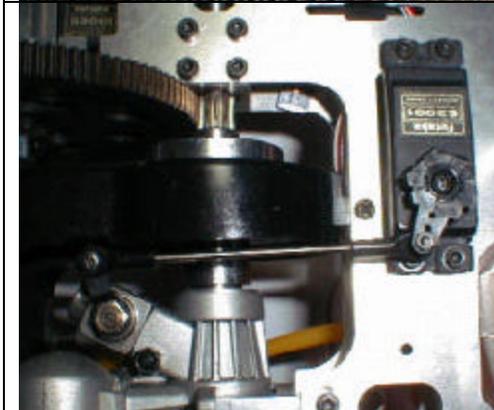
Rod Use	<i>Elevator Servo to Swashplate</i>
# of Rods	1
Rod Size	2.3-35
Ball Link 1	Medium
Ball Link 2	Medium
Center to Center	53mm



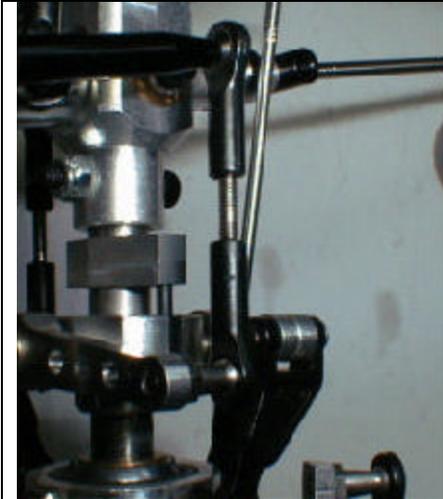
Rod Use	<i>Upper Swash Servo to Swashplate</i>
# of Rods	1
Rod Size	2.3-35
Ball Link 1	Medium
Ball Link 2	Medium
Center to Center	55mm



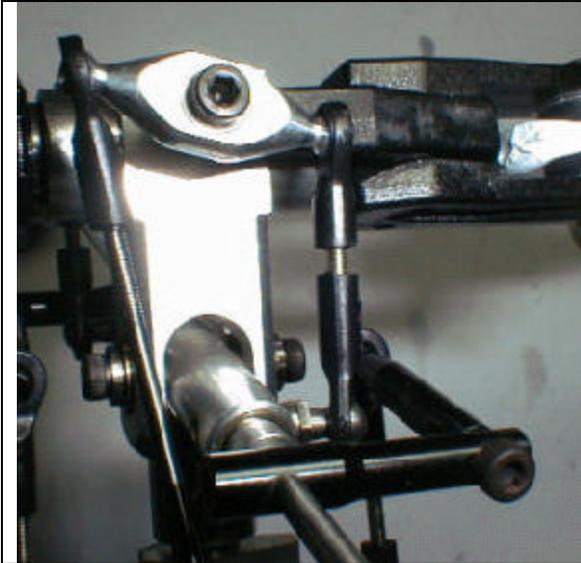
Rod Use	<i>Lower Swash Servo to Swashplate</i>
# of Rods	1
Rod Size	2.3-50
Ball Link 1	Long
Ball Link 2	Long
Center to Center	77mm



Rod Use	<i>Throttle to Carburetor</i>
# of Rods	1
Rod Size	2.3-50
Ball Link 1	Long
Ball Link 2	Long
Center to Center	78mm



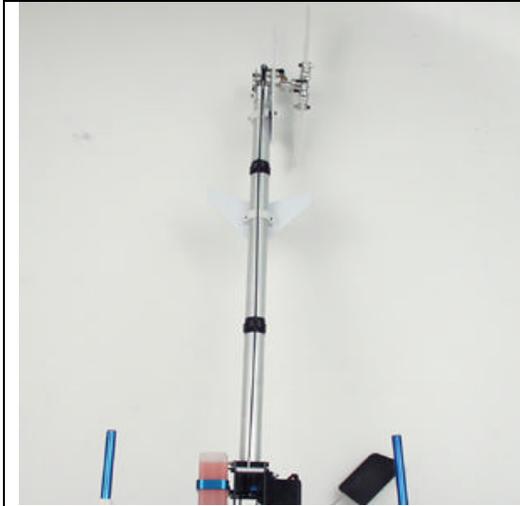
Rod Use	<i>Washout to Flybar Control Arm</i>
# of Rods	1
Rod Size	2.3-20
Ball Link 1	Medium
Ball Link 2	Medium
Center to Center	38mm



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



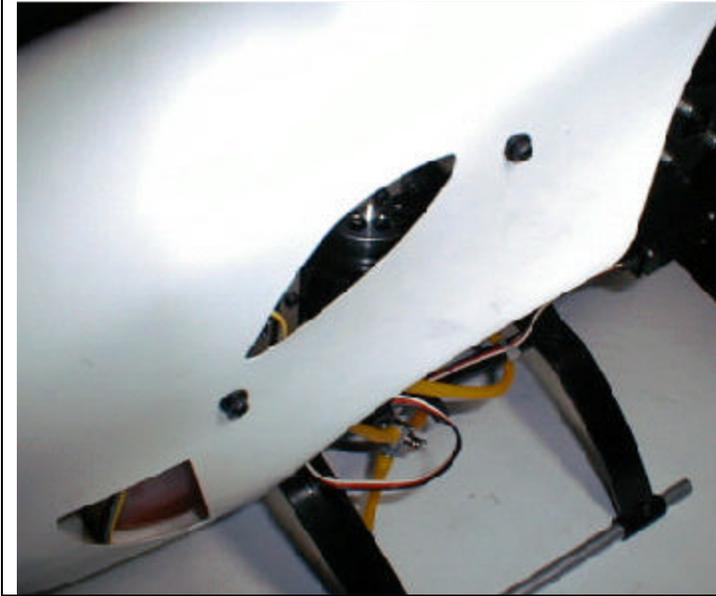
Assemble the push rod guides. There are three pieces the main clip and two inner sleeves. Simply slide the two sleeves into each other and then into the main clip and glue. Putting electrical tape onto the boom before gluing is good, so it is possible to reuse the clip later. (HHI2900 – Rod Guides)



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	83mm



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.

Radio Setup

General Information:

First, change your radio to 3 Point, 120 Degrees swash-plate mixing. My advice is to read your radio manual for proper adjustment of the swash mixing. After you have the radio gear installed, the basic guidelines for proper setup of an EMS system is everything must be 90 Degrees and Parallel with all control sticks in the center. After all linkages are installed and everything meets the above requirements, you should have 0 degrees of main rotor blade pitch at center stick. Make the necessary adjustment to complete the setup.

Pitch Curve Setup:

Complete the following steps in the Pitch Curve Menu of the Radio. In Normal Mode make the Pitch curve the following: at Bottom-Stick, 0 to -2 Degrees; Mid-Stick, 5 to 6 Degrees, and Top-Stick, 9 to 10 Degrees. For Stunt 1 & 2: Bottom-Stick, -9 Degrees; Mid-Stick, 0 Degrees; and Top-Stick, 9 Degrees. Note: Stunt one; two should only be used by pilots, ready for forward flight and aerobatics. Do not use these settings until your skill level is ready.

Throttle Curve Setup:

Normal Mode, Bottom-Stick 20 Percent throttle;

Mid-Stick, 50 Percent Throttle, Top Stick 100 Percent Throttle. Stunt 1 & 2 Bottom-Stick 100 Percent; Mid-Stick, 35 Percent; Top Stick, 100 Percent.

Tail Rotor: Setup the Tail rotor limits so the throws that the tail pitch slider does not exceed a 5mm gap between the tail case and the tail pitch slider.

Mechanical Setup

Servo Arm Length: Servo arm Length should be as close to the T-levers and elevator control arm as possible. This will allow for best servo setup.

Orient the servo arms: With the collective stick is centered; ensure that the head servo arms are perpendicular to their control rods. If they are not rotate your arms to they are close and use your sub trims to fine-tune them.

Leveling the swash: Using a ruler measure from the bottom of the swash plate to the top main shaft-bearing block. Adjust all the connecting rods so that the swash plate is level. Equal all the way around the swash plate. Also Hobbies & Helis makes a nice swash-leveling tool to make this task easy.

Level the washout and mixer arms: With the collective stick centered and the fly-bar perpendicular to the main-shaft, ensure that the washout and mixer arms are perpendicular to the main-shaft. Adjust rods as necessary.

Additional tail rotor information: When you set up your tail rotor you need to make sure that your tail pitch slider is not going to hit your tail pitch control lever mount. With some gyros you can adjust this and others you can't. If you have a gyro that you can't adjust this all you need to do is take a piece of fuel tubing and slide it onto your tail output shaft. Spin your tail rotor to make sure the fuel tubing is long enough but not too long.

Helicopter Center of Gravity (CG): When the fly-bar is perpendicular to the tail-boom, pick it up and the nose should be just slightly heavier. If you need to just move your battery forward to get proper CG.

Washout Anti-rotation Pin: Leave the pin relatively loose until you have your radio equipment installed and your servos are operating correctly. Next, take your washout link and line it up with the anti-rotation guide. Rotate the head so that the main blades are parallel with the tail boom while the link is lined up. This is where the pin should be rotation wise. Next, Cycle you swashplate all the way to the top and tip it all the way in one direction. Rotate the head and make sure the pin does not touch the swashplate at any point in the rotation. You should have the pin so that it is just not touching, but you want the pin as low as possible so you have plenty of pin left at full negative. Once you have the rotation and the

height, just lock the pin down.

Engine Break-in: Be sure to break in the engine with a prop or loosen the glow plug so not to break to start shaft. The 15 CV-A and car engines have very tight compression.