Quick Learner

Assembly & Parts Listing

Exclusively distributed by: Quickworldwide 201 South 3rd. St. & 309 N. Coopersburg, PA 18036 **Phone:** (610)-282-4811 **Fax:** (610)-282-4816	Websites: http://www.hhiheli.com http://www.quickheli.com http://www.giantscaleplanes.com E-mail: hhi@fast.net Stefan@ewtech.com (Tech. Support)

Quick Learner 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.

Quick Learner Features

1. Frame Construction: Quick Learner frames are made of the highest Quality Black G-10 Frames. These frames are not only rigid but will provide excellent vibration absorption.

2. One-Way Hex Start Shaft System: The one-way bearing allows the engine to continue to run after the starter motor has been stopped.

3. Ball Bearing Idler Pulley: The ball bearing idler pulley provides smooth consistent power to the tail by not allowing the belt to jump teeth.

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: Based on the same design as our famous heavy-duty clutch upgrade that fits most popular machines, this clutch will give many years of problem free operation.

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.

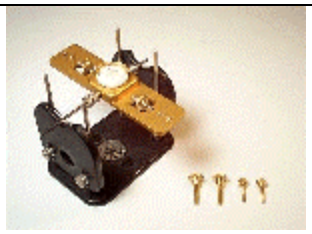
10. Advanced Airfoil Fly-bar Paddles: These paddles will provide the best both kind of flight characteristics for both 3D & Sport flying. Not only do they provide smooth forward flight, they also provide quick response upon demand.

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”

Phillips Screw Driver

Ball End Drivers
HHI7050



Bubble Blade Balancer
HHI7010
High Point Balancer
DUB499

Piston Head Lock
HHI7020

Composite Paddle Gauges
HHI7000

HHI7320 – 6pc Nut & Allen Driver Set

Pitch Gauge
HHI7001

Universal FlybarLock
HHI7040

Ruler

Hobby Knife

Needle Nose Pliers

Scissors

Hardware & Accessories

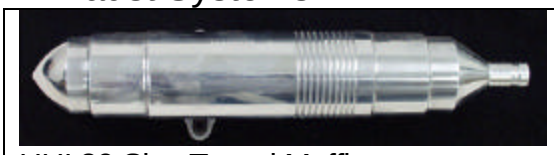
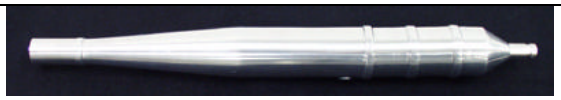
Engines (These are our Recommended Motor but others will work)

 OS32SXH	Coming Soon…. **Quick Big Shot 36** This ringed 36-size Japanese quality motor will provide plenty of great power at an affordable price.

Glues & Thread Lockers

 Ca Glue. …GBG1	 JB Weld…JBW8265S	 Locktite. …….PT40

Exhaust Systems

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

Glow Plugs

OS #8 Glow Plug. …OSMG2691

Fuel System Accessories

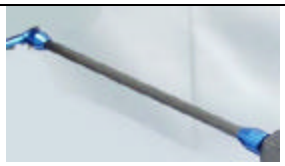
 Fuel Filter… QUI9002	 Tube Ends…. QUI9001
 Mini Cock Straight… TET4321	 Fuel Tubing…. PRA7092
 Triangle Joint. …. TET4301	

Radio Mounting Accessories

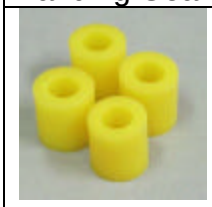
 Single Sided Foam Tape… HHI2008	 Receiver Hold Down Straps HHI55** $4.99 2 Per Bag & Colors: Red, White, Purple, Black
 Receiver Strong Box… HHI2200	 Spiral Wrap HHI2809 & HHI2810
 Wire Ties…HHIWT01	

Other Optional Accessories

Landing Gear Dampeners…HHI2004



3mm Fly-bar Stiffeners…HHI402*



60Size Skid Stops
HHI200*
Available in many Colors
See website or Call for Detail

Quick Learner 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

Throttle Extension
OS32

Radio Requirements

Radios:

Hobbies & Helis & its distributors carry various lines of helicopter radios. Any radio that supports EMS/CCPM Mixing will work fine.

Servos:

This is the single most important function of the helicopter. Any sport servo will offer acceptable performance. However due to the nature of EMS collective we suggest the use of digital servos to enhance and ensure matched servo timing without servo interaction.

Introduction:

Please read through the entire manual before starting your construction of the Quick Learner if there are any question or concerns regarding the assembly of the Quick Learner you can Call Hobbies & Helis International (610)-282-4811 or Email the any of the following techs.

Technical Support Personnel:

Stefan – Stefan@ewtech.com
Dale – Dale@ewtech.com
Jon – Jon@ewtech.com

Locktite Warning (Very Important):

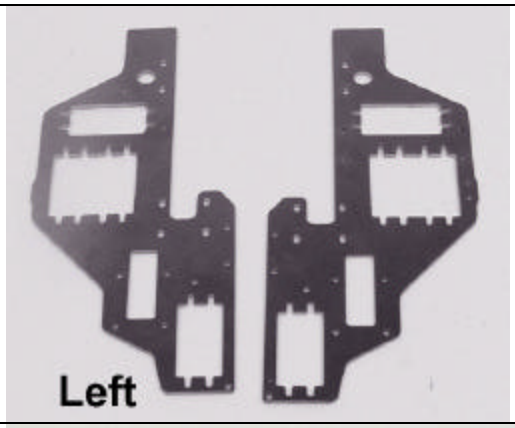
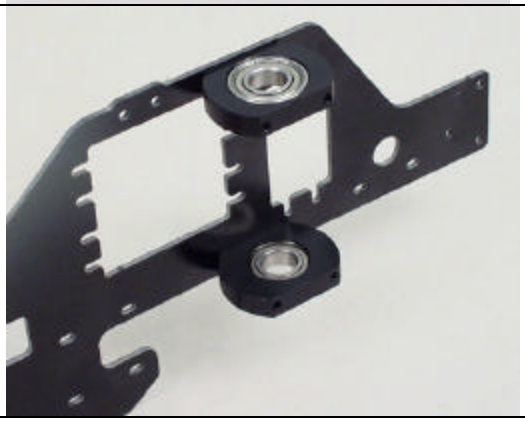
This is a general warning about the use of Locktite and it's importance. Locktite must be used anywhere that a metal fastener i.e. (M2, M3, M4 Cap Head Bolts, Set Screws etc.) are threaded into a metal part i.e. (Bearing Blocks, Cross-members, etc.). The Failure to use Locktite can result in parts falling a part and possible loss of control of the model, which can lead to a crash.

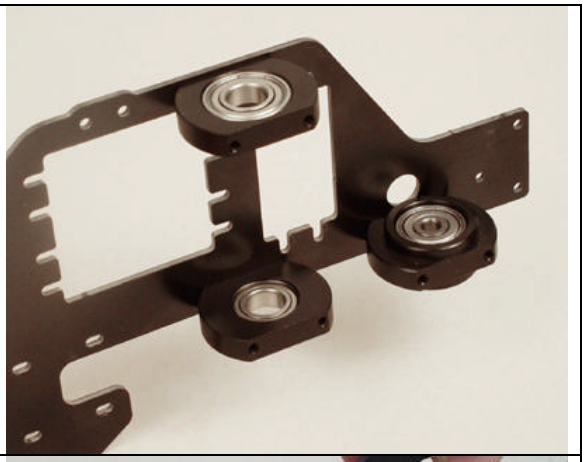
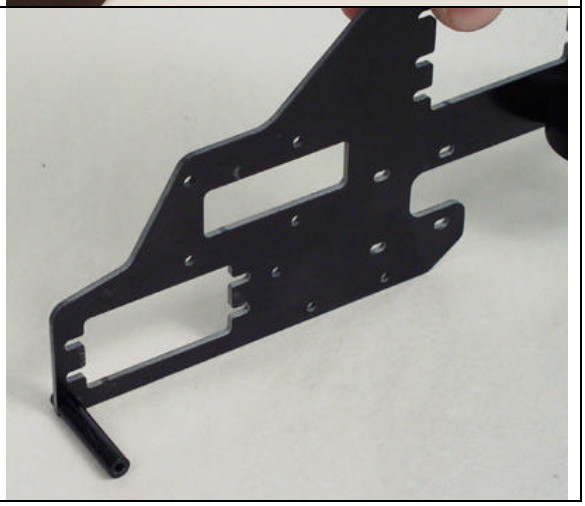
Section 1 – Upper Frame Assembly

Parts List

Bag 1	**Frame Set Bag**
Clutch Bell Bearing Block X 1 Main-shaft Bearing Block X 2 Front Tail Trans. Bearing Blocks X 2 Counter Gear Shaft X 1 Counter Gear X 1 Front Tail Pulley X 1 26mm Cross Member X 1 M3-12 Cap Head Bolts X 16 M3 Locknuts X 16 M3-8 Cap Head Bolts X 22 M4-3 Set Screw X 1 M3-3 Set Screw X 1	Upper Frames X 2

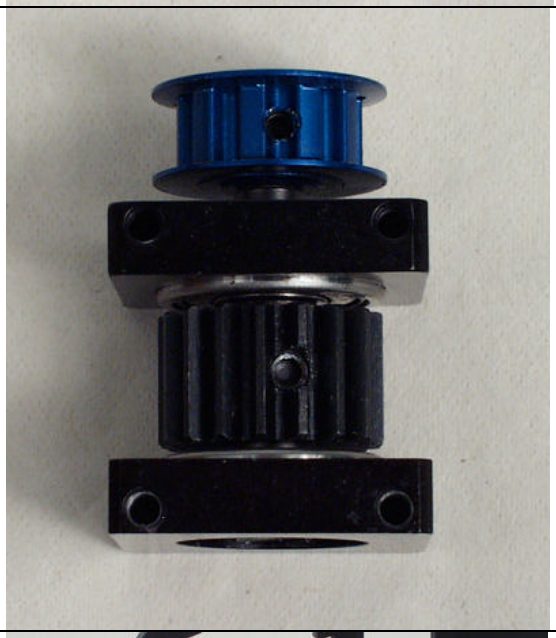
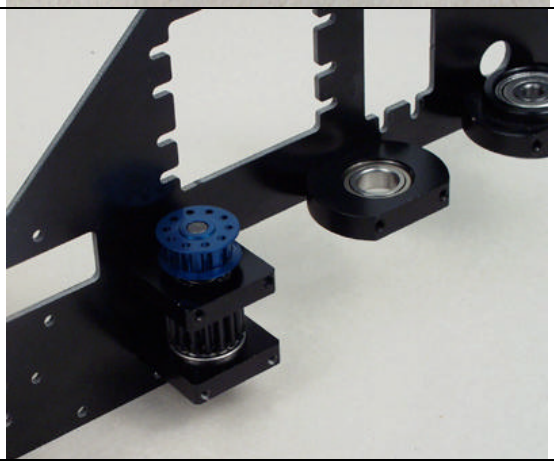
Step 1- Bearing Block Installation

Locate and layout frames as displayed in the picture the frames will be Identified by left and right in the steps to follow.	
Install (2) Main-shaft Bearing Blocks to the left frame half using (4) M3-8 Cap Head Bolts	

Install (1) Clutch Bell Bearing Block to the Left Frame half using (2) M3-8 Cap Head Bolts. **Note:** The open side of the bearing blocks must face opposing outward direction.	
Install (1) 26mm Cross-member using (1) M3-8 Cap Head Bolt	

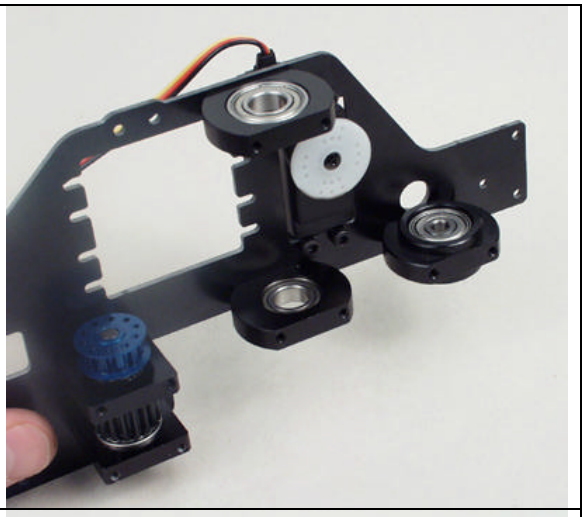
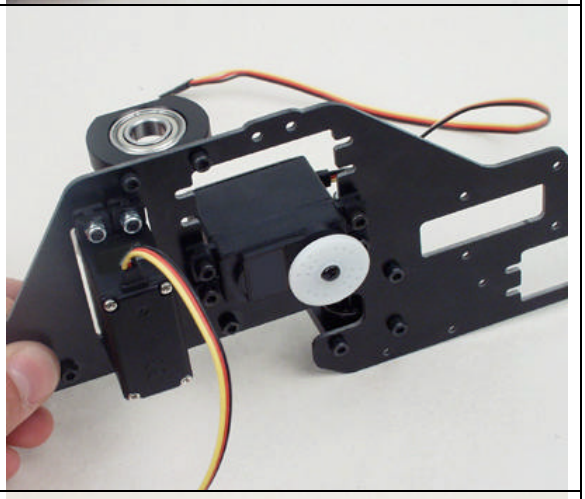
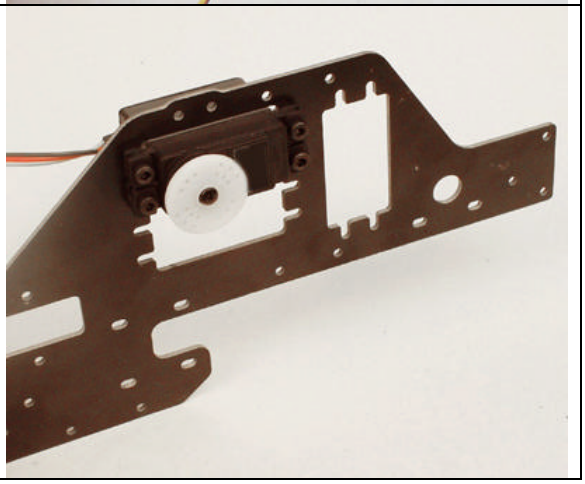
Step 2 – Front Tail Transmission Installation

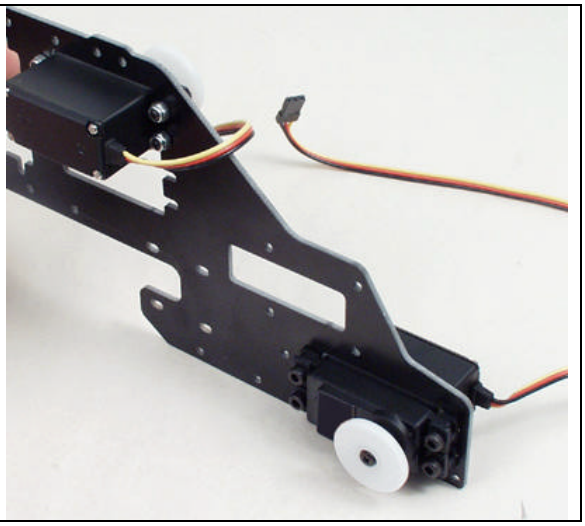
Install (1) Counter Gear to (1) Counter Gear Shaft using (1) M4-3 Set Screw. Making sure the set screw hits the flat on the Counter Gear Shaft	

Install both (2) Front Tail Transmission Bearing Block so the protruding side of the bearings face the counter gear assembly. (Assembled above).	
Install (1) Tail Pulley Gear to the reduced portion of the Counter Gear Shaft using (1) M3-3 Set Screw, Making sure the set screw hits the flat on the counter gear shaft. **Note:** The side of the pulley gear with the holes should face up as per picture in the next step.	
Install the above Transmission Assembly to the Left upper frame using (4) M3-8 Cap Head Bolts	

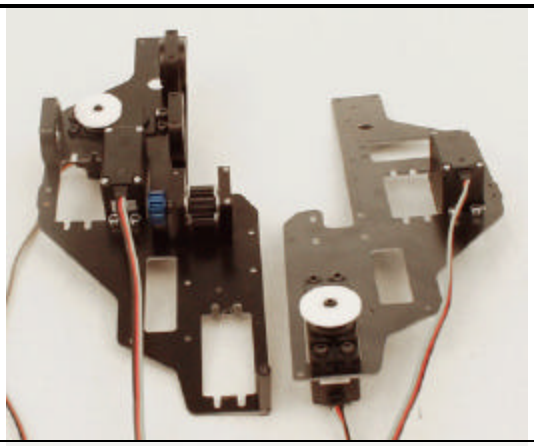
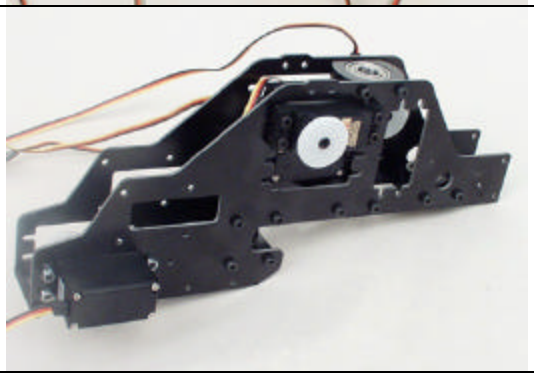
Step 3 – Upper Frame Servo Installation

Prior to servo installation make sure you install the rubber grommets provided by the servo manufacture to the servo. As for servo selection any sport servo will work fine.

Install the Elevator Servo in the left Frame half using (4) M3-12 Cap Head Bolt & (4) M3 Locknuts.	
Install the Lower Swashplate Aileron Servo into the Left upper frame using (4) M3-12 Cap Head Bolts & (4) M3 Locknuts.	
Install the Upper Swashplate Aileron Servo into the Right upper frame using (4) M3-12 Cap Head Bolts & (4) M3 Locknuts.	

Install Rudder Servo in right upper frame using (4) M3-12 Cap Head Bolts & (4) M3 Locknuts	

Step 4 – Assembling the Upper Frames

Take the left and right frames and fit them together and attach the right to the left using (11) M3-8 Cap Head Bolts	 

Section 2 – Lower Frame Assembly

Parts List

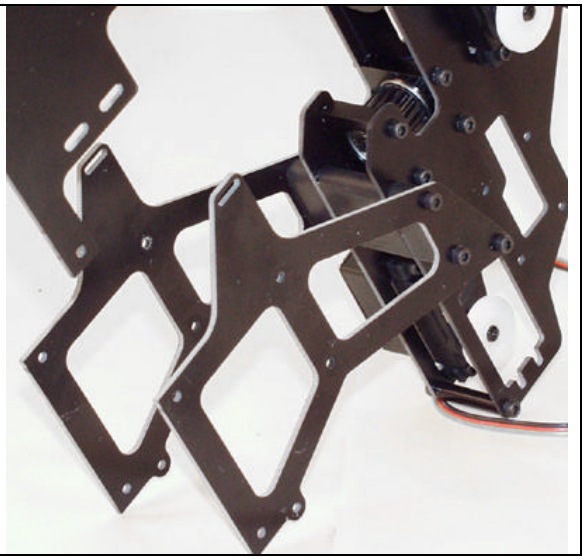
Bag 2	**Frame Set Bag**
Rear Inner One-Piece Cross-member X 1 Rear Outer One-Piece Cross-members X 2 54mm Cross-member X 1 M3-8 Cap Head Bolts X 20 M3-20 Cap Head Bolts X 6	Lower Front Frames X 2 Lower Rear Frames X 2 Frame Support Bulk-Head X 1 Plastic Radio Tray X 1 Plastic Gyro Plate X 1

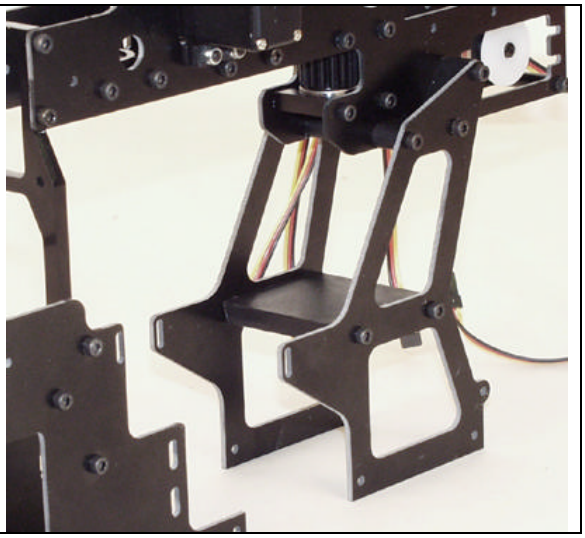
Step 1 – Bulk-Head & Front Frame Installation

Install (2) Lower Front Frames to (1) Frame Support Bulk-Head using (4) M3-8 Cap Head Bolts. **Note:** Notice the Left & Right Orientation of the Front Frames as well as bolt placement.	
Install (1) Front Plastic Radio Tray between the two front frames using (6) M3-8 Cap Head Bolts.	

Install (1) 54mm Cross-member using (2) M3-8 Cap Head Bolts	

Step 2 – Lower Rear Frame Installation

Install (2) Rear Lower Frames using (1) Rear Inner One-Piece Cross-member, (2) Rear Outer One-Piece Cross-members and (6) M3-20 Cap Head Bolts.	

Install (1) Rear Plastic Gyro Plate using (4) M3-8 Cap Head	

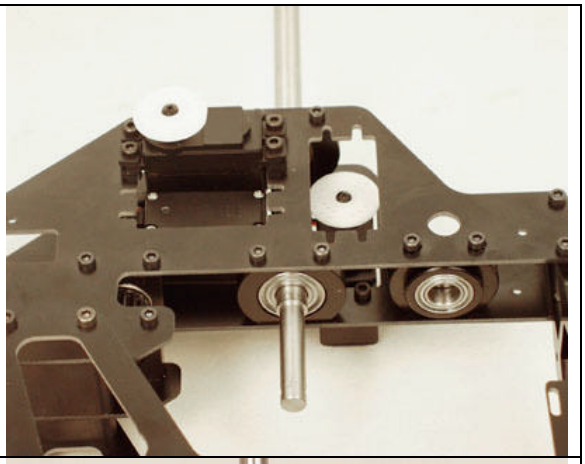
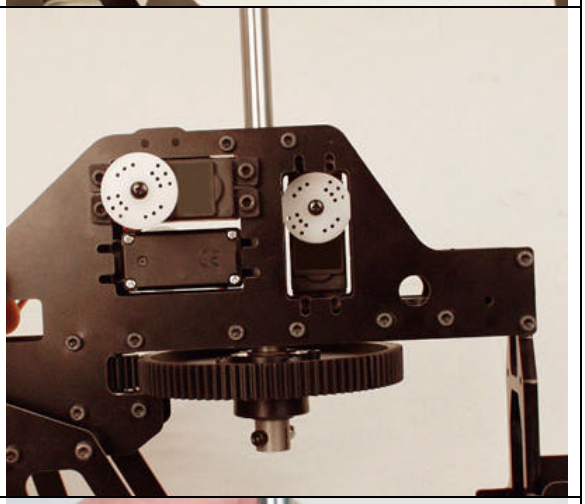
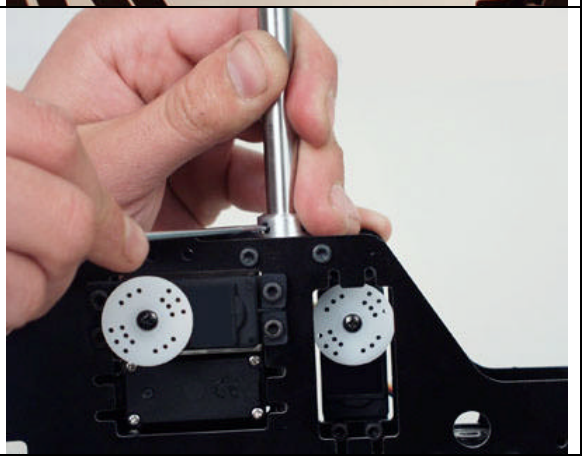
Section 3 –Drive-Train Assembly

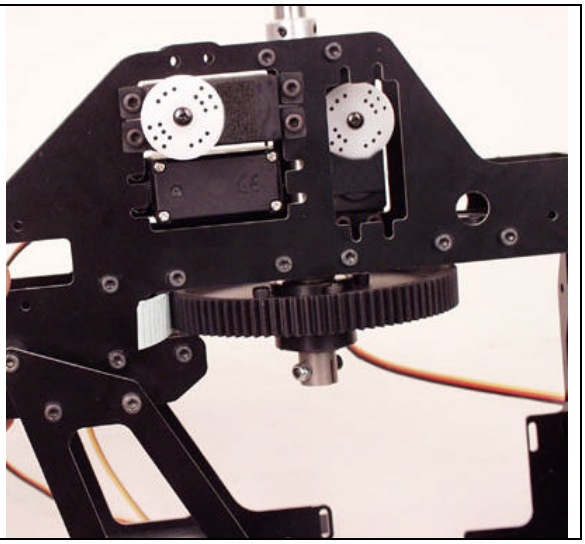
Parts List

Bag 3	**Frame Set Bag**
Main-shaft X 1 Main-Gear X 1 Auto-Rotation Clutch X 1 Main Shaft Collar X 1 Start Coupler X 1 Start Shaft X 1 Clutch Bell X 1 Clutch Lining X 1 Clutch X 1 Plastic Fan X 1 Fan Hub X 1 Lower Fan Hub Collet X 1 Upper Fan Hub Collet X 1 Engine Mount Blocks X 2 54mm Cross-members X 1 M3-3 Set Screws X 4 M4-4 Set Screws X 1 M2.6-6 Self Tap Screws X 4 M6 Nord-Lock Washers X 2 M3 Nuts X 4 M3 Locknuts X 5 M3-8 Cap Head Bolts X 14 M3-10 Cap Head Bolts X 8 M3 Washers X 4 M3-16 Cap Head Bolts X 1 M3-6 Flat Head Phillips X 4	Right-Angle Frame Rails X 2 **Loose in Box** Fan Shroud X1

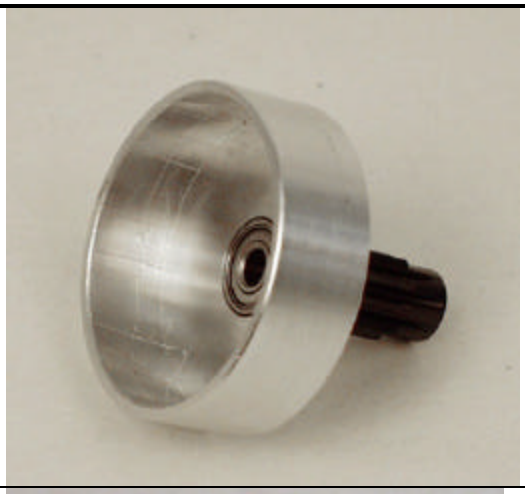
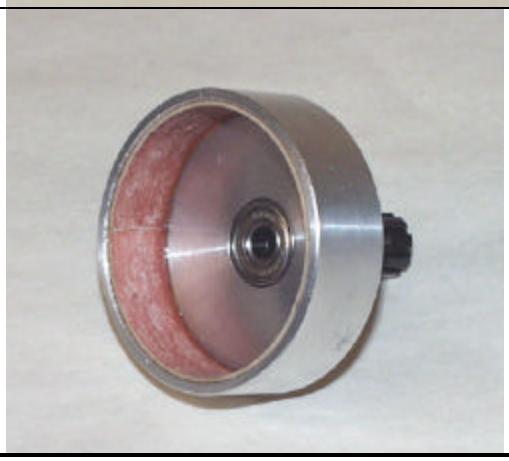
Step 1 – Main Gear & Main Shaft Installation

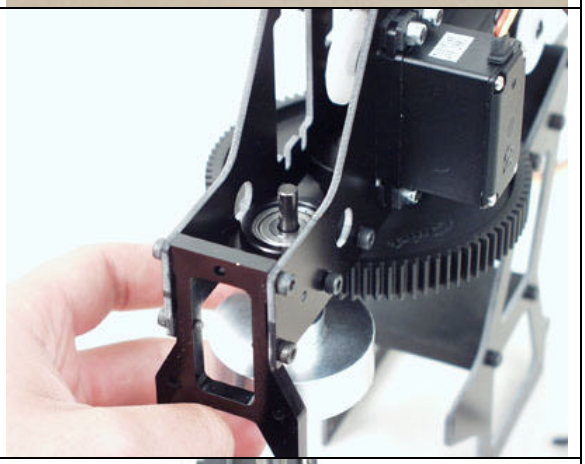
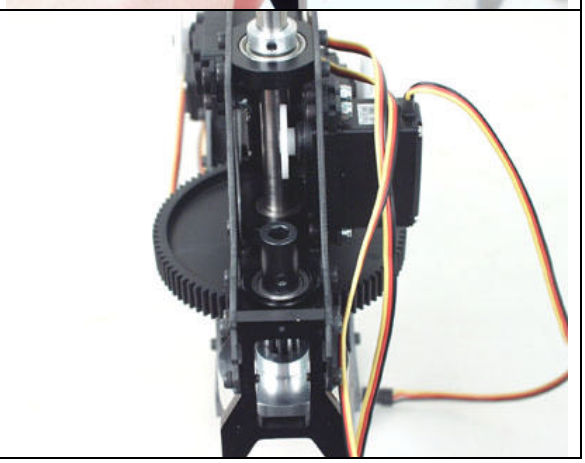
Install (1) Main Gear to (1) Autorotation Clutch using (4) M3-8 Cap Head Bolts & (4) M3 Nuts.	

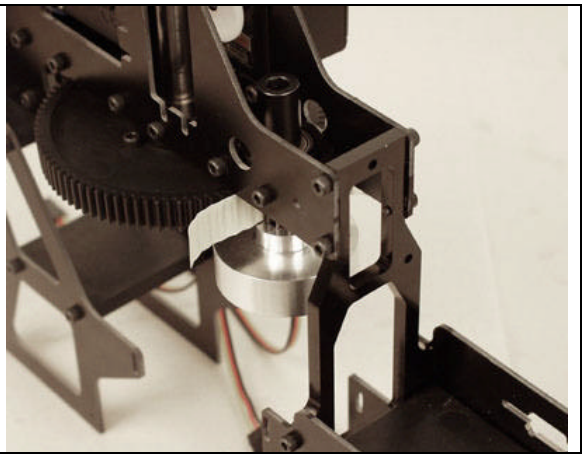
Install (1) Main Shaft into Main Shaft Bearing Blocks with reduced portion of the shaft down.	
Install (1) Auto-Rotation Clutch/Main Gear Assembly to the Main Shaft using (1) M3-16 Cap Head Bolt & (1) M3 Locknut.	
Install (1) Main Shaft collar over the top of the Main Shaft and secure using (4) M3-3 Set Screws. Note: Be sure the ridge on the collar goes down towards the upper bearing. Also after the collar is tightened to the shaft there should be No up or down movement in the Main Shaft.	

Adjust the Gear mesh between the Main gear and the Counter Gear on the Front Tail Transmission using a double thick piece of notebook paper in between the 2 gears and adjust the Tail Transmission by pushing tight against the main gear. Remember the gear mesh should be smooth readjust if necessary.	

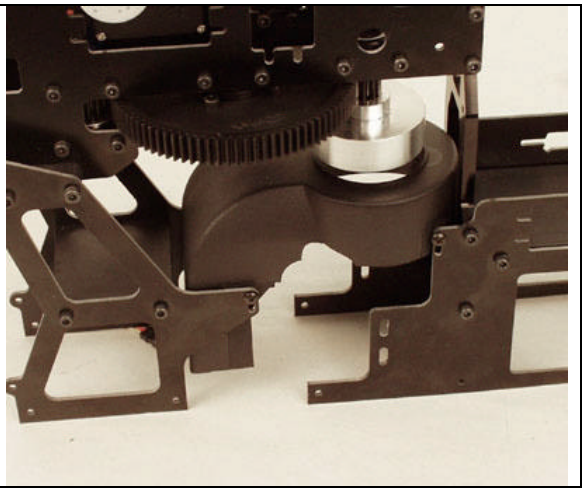
Step 2 – Clutch Bell Installation

Install (1) Clutch Lining into (1) Clutch Bell using JB Weld or 30 min epoxy. Note: The clutch lining length prior to installation should be 121.9mm cut if necessary. Also note that we score the inner portion of the clutch bell where lining is glued with 80 Grit Sandpaper.	 

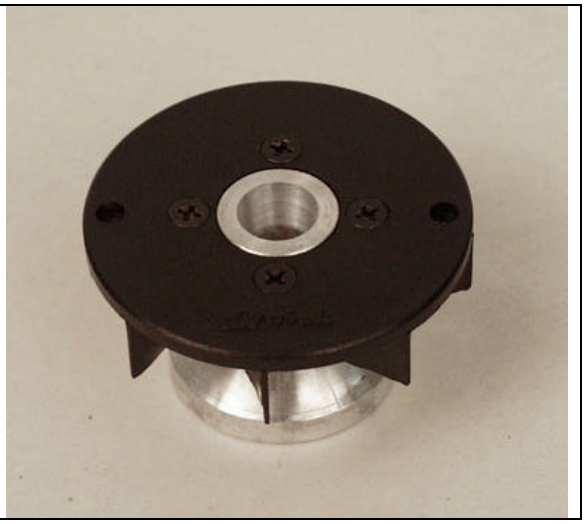
Install (1) Start Shaft into (1) Clutch Bell. **Note:** The larger Diameter side of the shaft inside the Clutch Bell.	
Install Start Shaft/Clutch Bell Assm. Into the previously installed Clutch Bell in the frames.	
Install (1) Start Coupler with (1) 4-4 Set Screw. Note: There should be no up or down play in the clutch bell once the start coupler is fastened to the Start Shaft.	

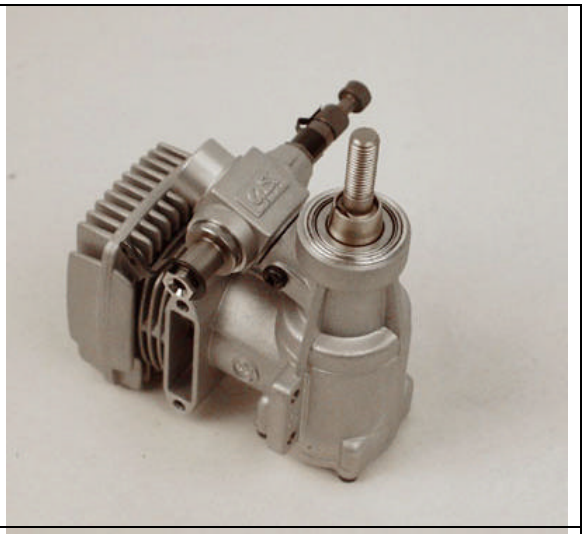
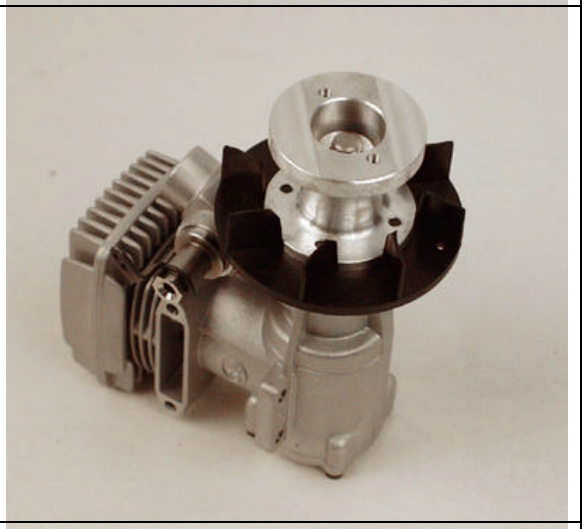
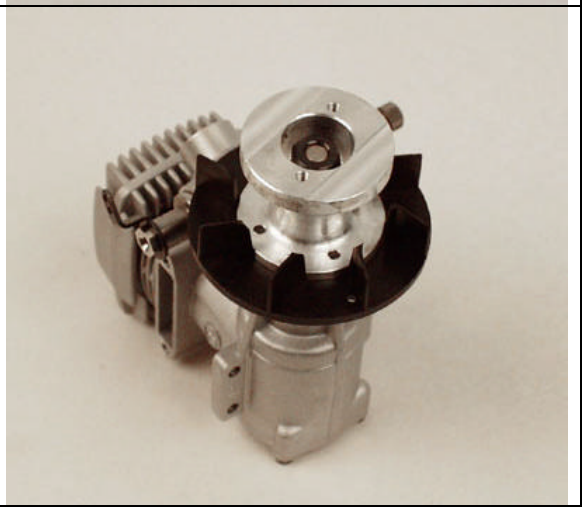
Adjust the Gear mesh between the Main gear and the Clutch Bell on the Clutch Bell Bearing Block using a double thick piece of notebook paper in between the 2 gears and adjust the Clutch Bell Bearing Block by pushing it tight against the main gear. Remember the gear mesh should be smooth readjust if necessary.	

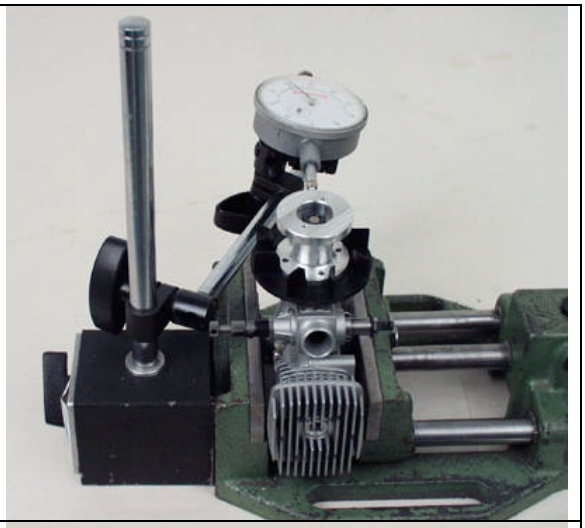
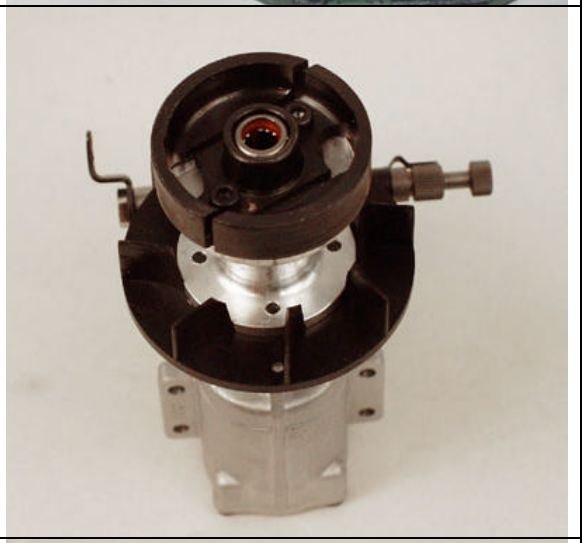
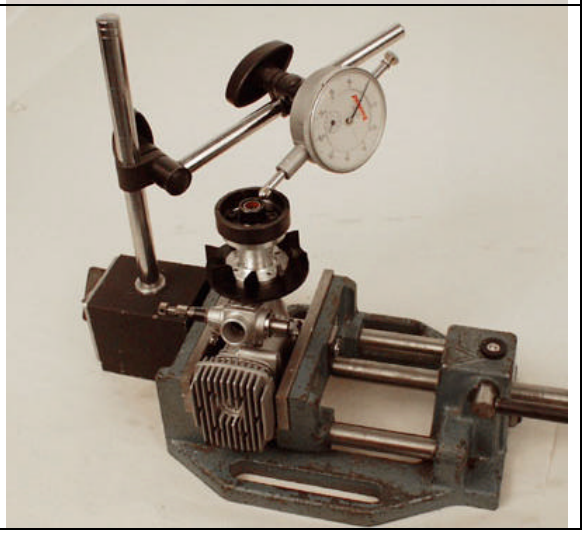
Step 3 – Fan Shroud Installation

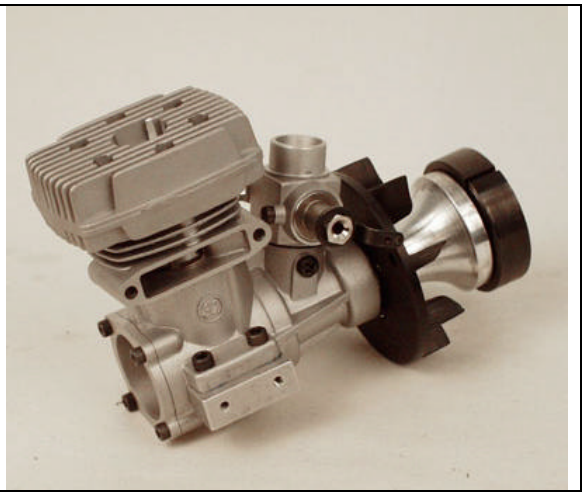
Install (1) Fan Shroud using (4) 2.6-6 Self Tap Screws. Install the fan Shroud at the top of the slots provided in the frame after the engine is installed lower the fan Shroud as close to the fan as possible without interference.	

Step 4 – Fan, Clutch, & Engine Mount Installation

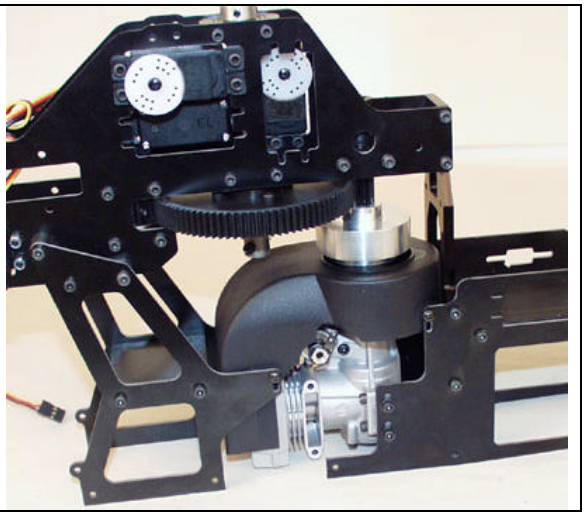
Install (1) Plastic Fan onto (1) Fan Hub using (4) M3-6 Flat Head Phillips	

Install (1) Lower Fan Hub Collets on the crankshaft of your 30-size engine. Note: You may have to use a flat head screwdriver to open the collets so it will slide over the crankshaft.	
Install (1) Fan Hub/Fan onto the crankshaft and over the Lower Fan Hub Collets. Option Part: HHI2550 Machined Blue Throttle Extension	
Install (1) Upper Fan Collet and (2) M6 Nord-Lock Washers on the crankshaft above the Fan Hub/Fan. Install nut. **Note:** The use of a Piston Head Lock will ensure that you get the prop nut tight. Use Red Locktite on the prop nut.	

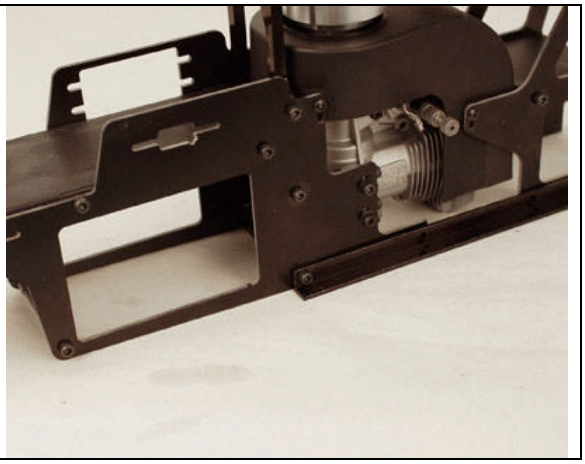
Dial-indicate the Fan hub to ensure that the hub is running true. The run-out on this should be no more than .002-.004”	
Install (1) Clutch using (2) M3-8 Cap Head Bolts to the Fan Hub Assembly.	
Dial-indicate the Clutch to ensure that it is running true. The run-out on this should be no more than .002-.004”	

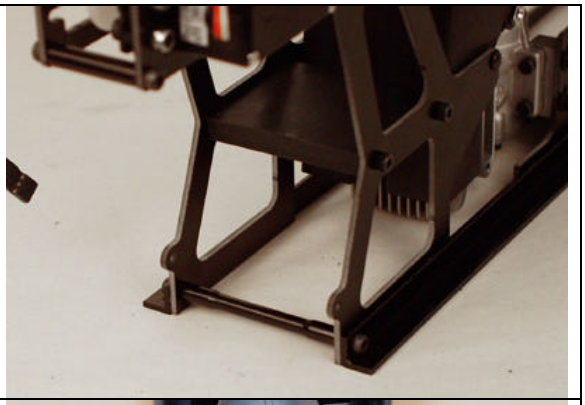
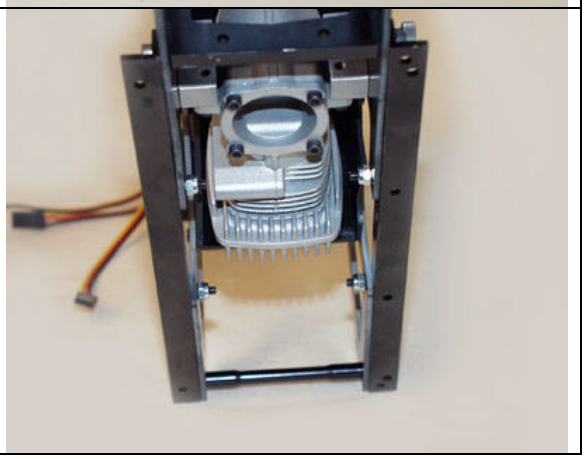
Install (2) Engine Mount Blocks to the motor using (4) M3-10 Cap Head Bolts. Note: Install so thin profile is in line with the crankshaft of the motor. The holes for the frame bolts should appear closer to the head of the engine.	

Step 5 – Engine Installation

Install engine assembly into the frame assembly using (4) M3-8 Cap Head Bolts & (4) M3 Washers. Note: The following points ?? Clutch must be fully inserted into the Clutch Bell. Also make sure there is no interference when the clutch is inserted ?? Clutch should be square in the Clutch Bell ?? Start shaft will turn smooth in one direction.	

Step 6 – Frame Rail Installation

Install (2) Right Angle Frame Rails to the bulk head using (2) M3-8 Cap Head Bolts Note: There are no Left & Right Rails but line up all the holes before you start to install them.	

Install (1) 54mm Cross-member using (2) M3-8 Cap Head Bolts.	
Install (4) M3-10 & (4) M3 Locknuts in the center 2 holes on each frame rail side.	

Section 4 –Landing Gear, Fuel Tank, Servo Installation

Parts List

Bag 4

Landing Gear Struts X 2
Landing Gear Skids X 2
Landing Gear Skid Ends X 4

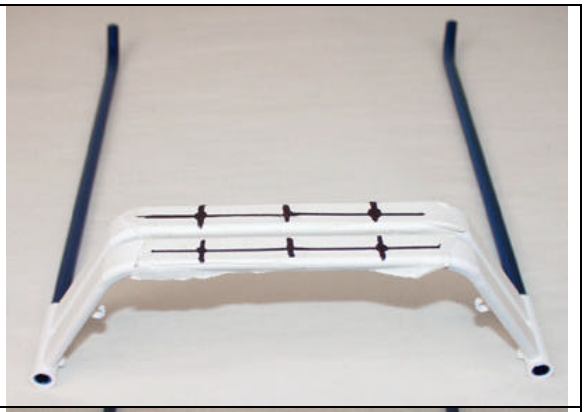
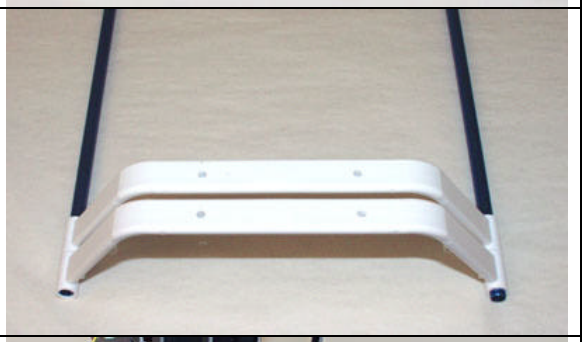
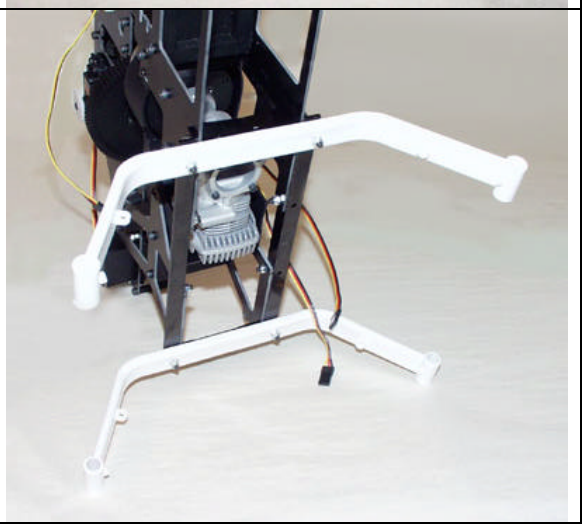
Bag 4A

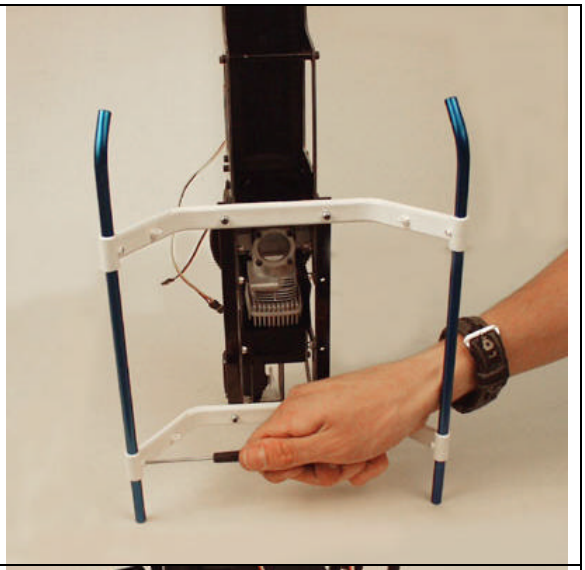
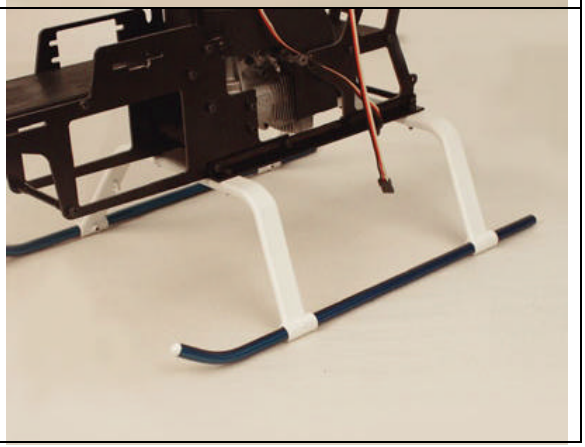
Fuel Tank X 1
Fuel Tank Stopper X 1
Fuel Tank Plates X 2
Stainless Fuel Tank Lines X 3
Fuel Tank Clunk X 1
M3-25 Stainless Cap Head Bolt X 1

Bag 4B

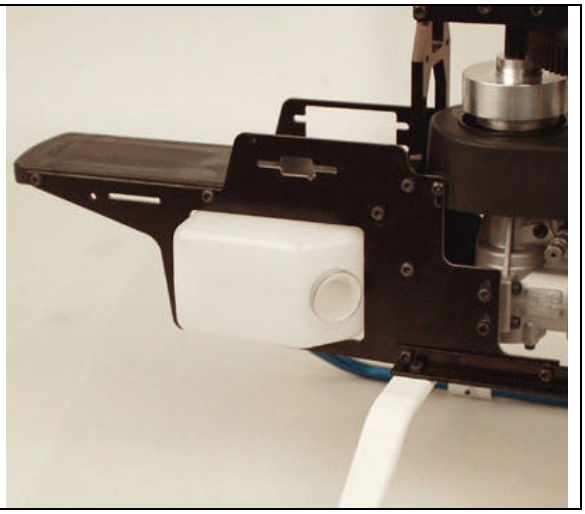
M3-12 Cap Head Bolts X 4
M3-16 Cap Head Bolts X 4
M3 Lock Nuts X 8
M3 Set Screws X 4

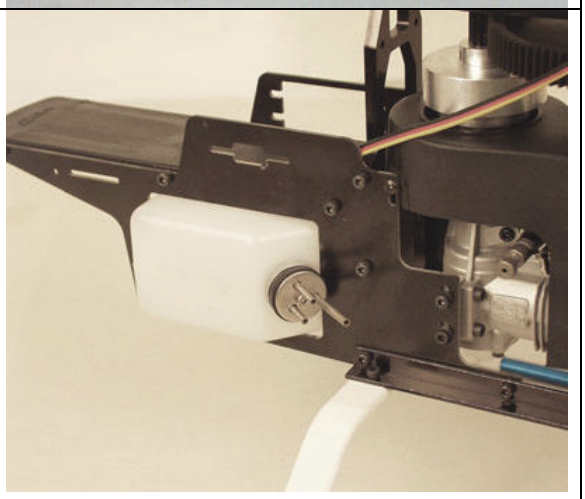
Step 1 – Landing Gear Installation

Locate (2) Landing Gear Struts place a piece of masking tape across top and Center helicopter on the struts and mark holes	
Drill (4) M3 holes at the previously determined locations. After holes have been Drilled remove tape.	
Install (2) Previously Drilled Struts to the Right angle frame rails using (4) M3-16 Cap Head Bolts & (4) M3 Locknuts	

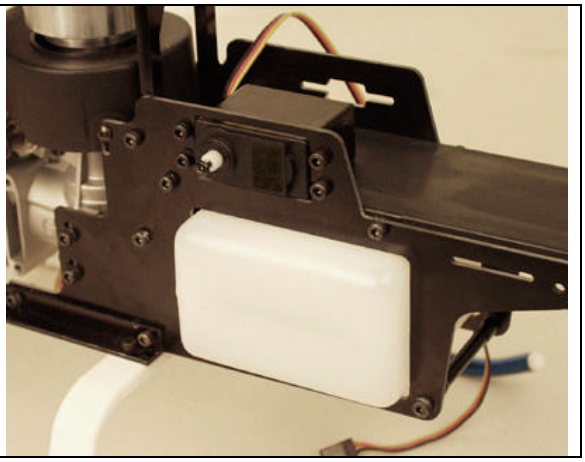
Install (2) Skid Pipes into the struts so the Helicopter is adequately balanced and secure using (4) M3 Set Screws.	
Install (4) Skid pipe end caps using medium CA glue.	

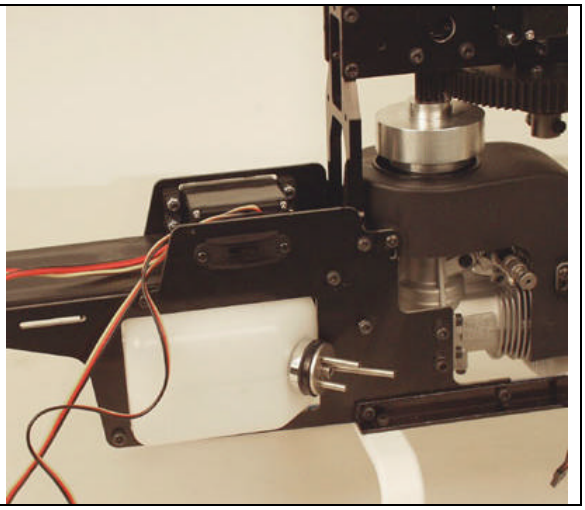
Step 2 – Fuel Tank Installation

Install (1) Fuel Tank into cutout in the front frames.	

Build fuel tank cap with the following (1) Fuel Tank Stopper, (2) Fuel Tank Plates, (3) Stainless Fuel Tank Lines, (1) Fuel Tank Clunk, (1) M3-25 Stainless Cap Head Bolt	
There are three (3) lines (Aluminum fuel tubing) that need to be constructed for the tank assembly. Depending on the engine you use, you may need only two (2) lines. One line is the fuel pick-up line and requires a length of silicon fuel tubing running from end of alum. Tube to clunk – which should be centered in tank. The other line is pressure-line, which should be bent to reach the top of the tank on the inside. The third line will generally be plugged. Tighten rubber stopper screw – <u>but do not over tighten</u> or you will ruin rubber stopper!	

Step 2 – Throttle Servo & Switch Installation

Install throttle Servo using (4) M3-12 Cap Head Bolts and (4) M3 Lock Nuts	

Install receiver switch with the provided hardware.	

Section 5 –Tail Installation

Parts List

Bag 5

Boom Clamp Halves X 2
Horizontal Fin Mount X 1
Vertical Fin Mount X 1
Double BB Tail Rotor Assembly X 1
Tail Case Side Plates (G-10) X 2
5 X 10 X 4 Flanged Bearings X 2
Tail Output Shaft X 1
Tail Pulley Gear X 1
Tail Pulley Gear Spacers X 2
Tail Idler Pulley X 1
Tail Idler Pulley Spacer X 2
Tail Case Cross-member X 1
Tail Pitch Slider X 1
Plastic Boom Support Ends X 4
Tail Rotor Blade Spacers X 4
Shim Ball X 2
2.3 Medium Ball Links X 2
M2-8 Phillips Screws X 4
M3-6 Cap Head Bolt X 6
M3-10 Cap Head Bolt X 2
M3-18 Cap Head Bolt X 2
M3-20 Cap Head Bolt X 1
M3-25 Cap Head Bolt X 1
M3-35 Cap Head Bolt X 4
M3 Set Screw X 2
M3 Locknuts X 10
M2.6 Self Tap Screws X 2
M3-4 Pivot Ball Stud X 1
5mm (30 size) Tail Blades X 2

Bag 5B

Horizontal Fin X 1
Vertical Fin X 1

Loose in Box

Tail Boom X 1
Boom Support Rods X 2
Tail Drive Belt X 1

Bag 5A (M2 or M3)

Tail Pitch Change Lever X 1
Tail Pitch Change Lever Mount X 1

(M2) Version

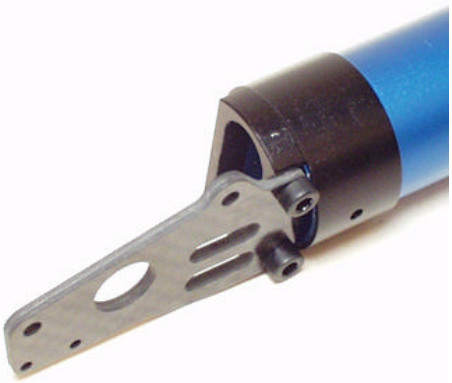
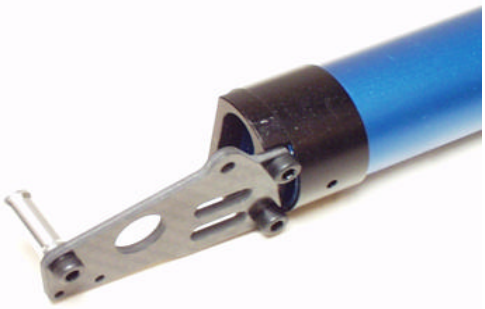
M2-12 Cap Head Bolts X 1
M2 Nut X 1
M2 Shim X 1

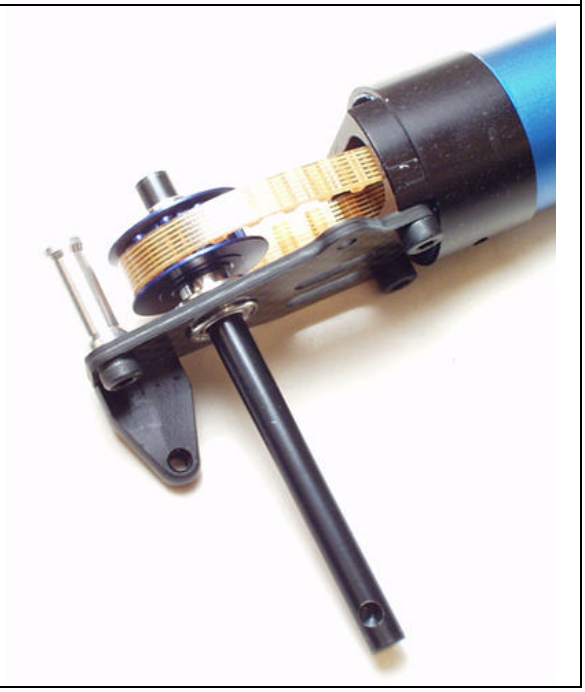
OR:

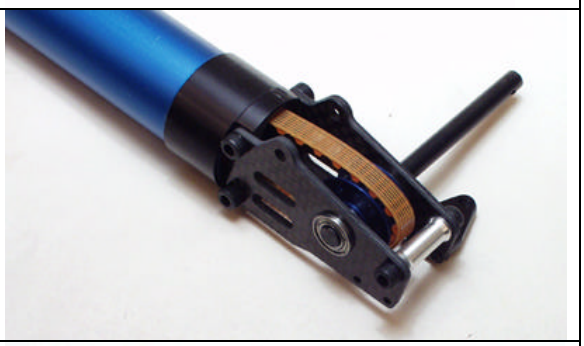
(M3) Version

M3-18 Cap Head Bolts X 1
M3 Locknut X 1
M3 Shim X 1

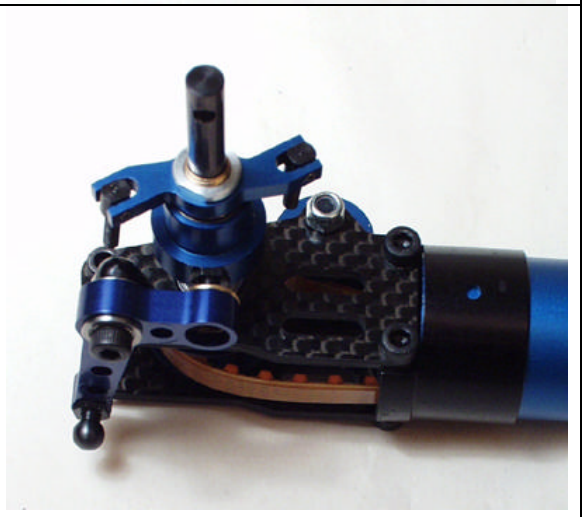
Step 1 – Tail Case Assembly

Install (1) Right Tail Case side plate G-10) to the boom using (2) M3-6 Cap Head Bolts. **Note:** Tail Case Side Plates may be made out of any of the following materials. 1. G-10 (Fiberglass) 2. Aluminum	
Install (1) Rear Tail Case Cross-Member to the right Tail case side plate using (1) M3-6 Cap Head Bolt.	
Install (1) Tail Pitch change lever mount to the right tail case side plate using (2) M2-8 Phillips Screws	

Install (1) 5 x 10 x 4 Flanged Bearing into the Right Tail case Side Plate. **Note:** Flange of Bearing goes towards the center of the Tail Case.	
Install (1) Tail pulley gear to the (1) Tail Output Shaft using (1) M3-3 Set Screw **Note:** Make sure set screw is securely in the hole on the shaft.	
Install a (2) Tail Pulley Gear Spacers on each side of the Tail Pulley Gear	
Install the Tail Pulley Gear Assembly into the 5x 10 x 4 Bearing in the right Tail Case Side Plate. Install (1) Tail belt through the boom and around the Tail Pulley Gear.	

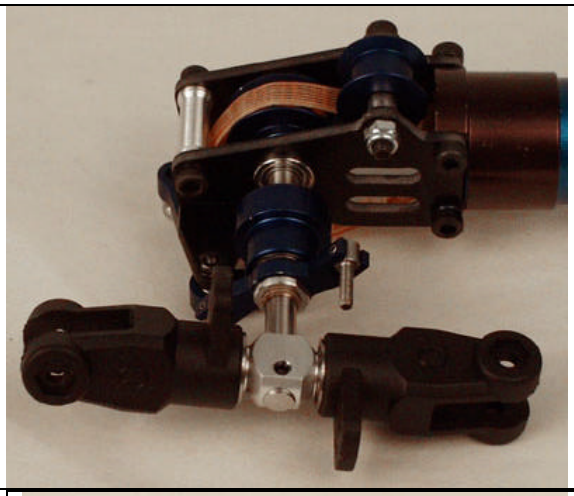
Install (1) 5 x 10 x 4 Bearing into the left tail case side plate G-10.	
Install the left tail case side plate to the boom & tail case cross member using (3) M3-6 Cap Head Bolt	
Install (1) Idler Pulley using (2) Idler Pulley spacers and (1) M3-25 Cap Head Bolt & (1) M3 Lock Nut.	

Step 2 – Tail Rotor Assembly

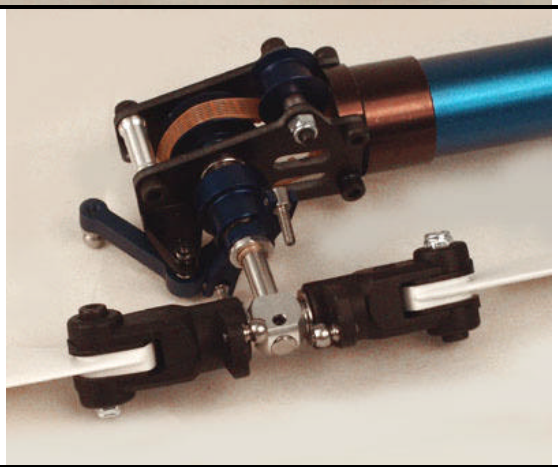
Slide the (1) Tail Pitch Slider over the Tail output Shaft	
Locate Tail pitch change Lever and attach (1) M3-4 Pivot Ball Stud *There are 2 Versions of the Tail Pitch lever & Mount M2 & M3.It is possible that you could receive both version and the required hardware to install it.*	
Install Tail Pitch Change Lever Capturing The stud Ball on the Tail Pitch Slider in the bushing on the Tail Pitch Change Lever & Bolt the Tail Pitch Change Lever to the Tail Pitch Change Lever Mount using **M3 Version** (1) M3 Spacer, (1) M3-18 Cap Head Bolt, & M3 Locknut **M2 Version** (1) M2 Shim, (1) M2-12 Cap Head Bolt, & M2 Nut	

Attach (1) Double Bearing Tail Rotor Assembly to the Tail Output Shaft using (1) M3-3 Set Screw.

Note: Make sure set screw is securely in the hole on the shaft.



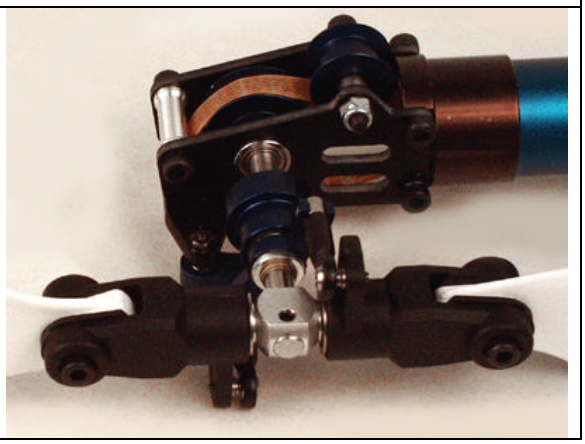
Install (2) 5mm Tail Rotor Blades Using (4) Tail Rotor Blade spacers, (2) M3-18 Cap Head Bolts, (2) M3 Lock Nuts.



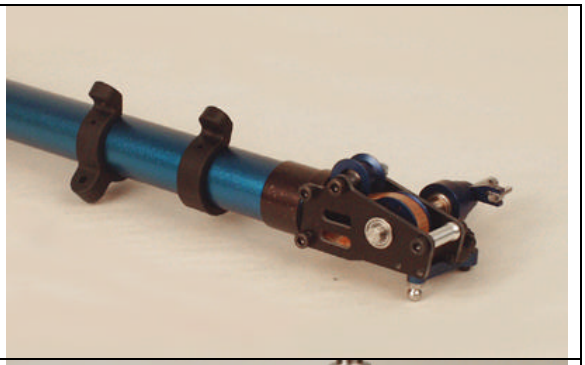
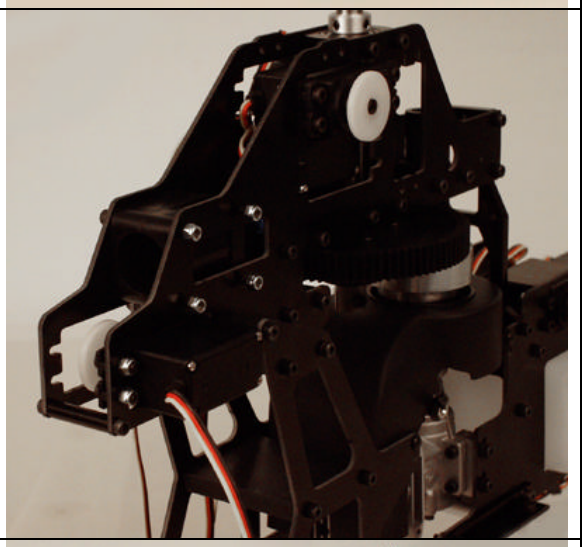
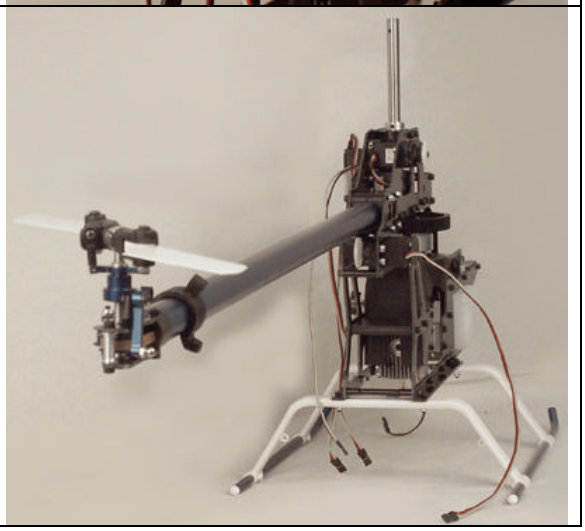
Install (2) Shim Balls using (2) M2-8 Phillips Screws to the outside hole of the Tail Blade Grips.

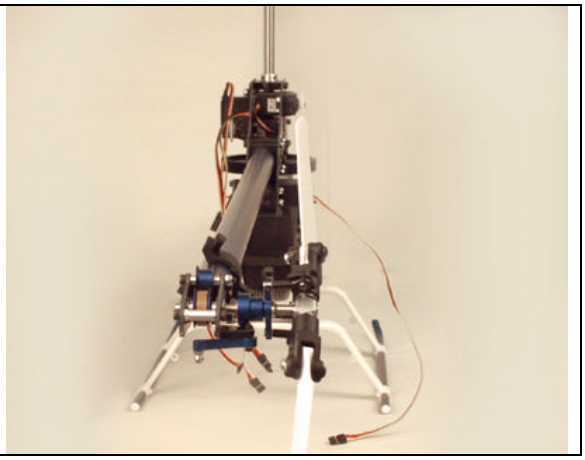
Install (2) Medium Ball Links to the Tail Pitch Slider and connect them with shim balls on the blade Grips.

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

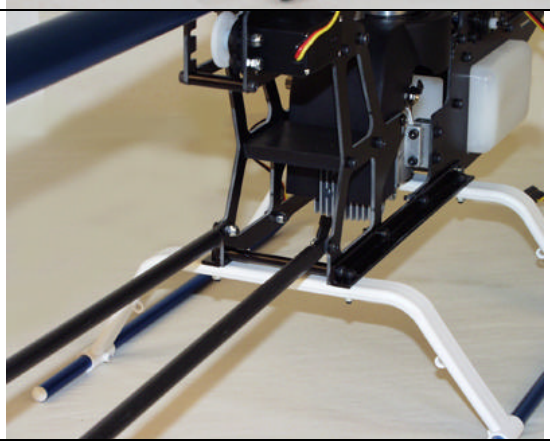


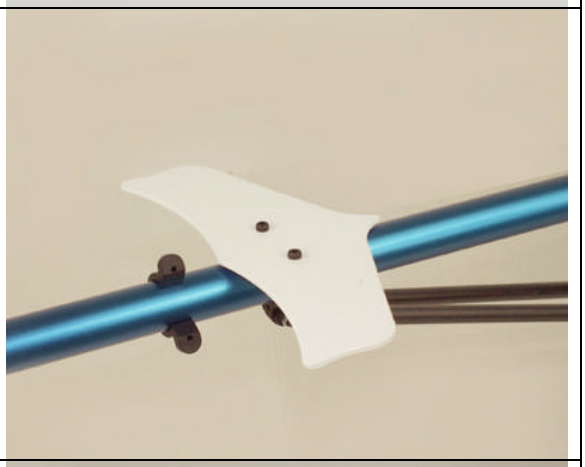
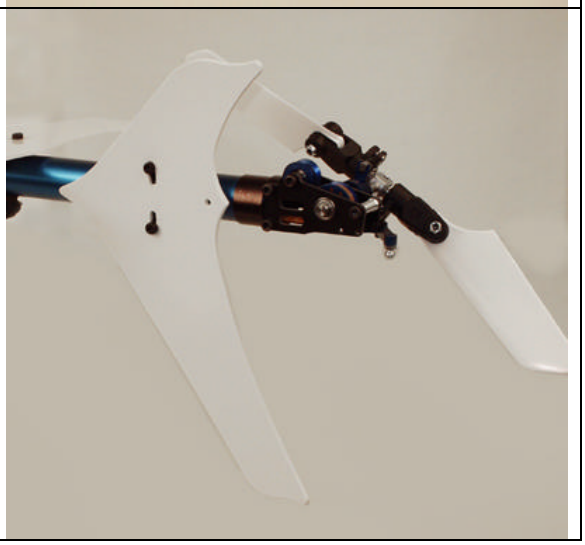
Step 3 – Installation of Boom

Slide (2) Horizontal/Vertical Fin Mounts onto the boom. This installation will be finalized later in the assembly process.	
Install the (2) Boom Halves into the frames using (4) M3-35 Cap head Bolts & (4) M3 Lock nut only loosely attach the nuts and bolts.	
With the belt straight and the Tail rotor Assembly pointed up insert the boom into the boom halves and put the belt over the Front Pulley Gear and pull boom tight to apply tension to the belt	

Rotate the Tail rotor down to a 90 degree position and make sure the belt is tight and tighten the four bolts that hold the boom Halves Note: The Belt should be approximately ¼-1/2 the distance of the boom when depressed from one side.	

Step 3 – Installation of Boom Support & Fin Sets

Epoxy (4) Tail Boom Support Ends into the (2) Boom Support Rods. **Note:** The Ends must be parallel for proper fit.	
Install (2) Boom Supports to the Lower Frames using (2) M3-10 Cap Head Bolts and (2) M3 Lock nuts	

Install the Boom Supports to Horizontal Fin Mount using (1) M3-20 Cap Head Bolt and (1) M3 Locknut	
Install (1) Horizontal Fin to the Horizontal Fin Mount using (2) M3-8 Cap Head Bolt and (1) M2.6 Self Tap Screw	
Install (1) Vertical Fin Mount to the Vertical Fin Mount using (2) M3-8 Cap Heads Bolt and (1) M2.6 Self Tap Screw	

Section 6 – Head, Swash-plate, & Washout Assembly

Parts List

Bag 6

Center Hub w/bearings X 1
Seesaw Collars X 2
M3 Seesaw X 1
Plastic Blade Grips X 2
Hiller Arms X 2
Flybar Control Arms Part A X 2
Flybar Control Arms Part B X 2
Head Spindle X 1
Head Spindle Spacer X 2
Head Spindle O-rings X 2
8 X 16 X 5 Regular Bearings X 4
M4-8 Flange Head Bolts X 2
M3-5-1 Spacers X 4
Washout Unit X 1
Washout Links X 2
Washout Link Pins X 2
Washout Anti-Rotation Pin X 1
M3-4 Pivot Ball Studs X 6
Swashplate Anti-Rotation Guide X 1
M3-6 Pivot Ball Studs X 2
M3 Flybar Paddles X 2
M3-3 Set Screws X 5
M3-8 Cap Head Bolts X 4
M3-12 Cap Head Bolts X 2
M3-20 Cap Head Bolts X 1
M3-35 Cap Head Bolts X 2
M4-30 Cap Head Bolts X 2
M4 Locknut X 2
M3 Locknut X 3

Loose in Box

M3 Flybar X 1

Bag 6A (M2 or M3)

Swashplate X 1

(M2) Version

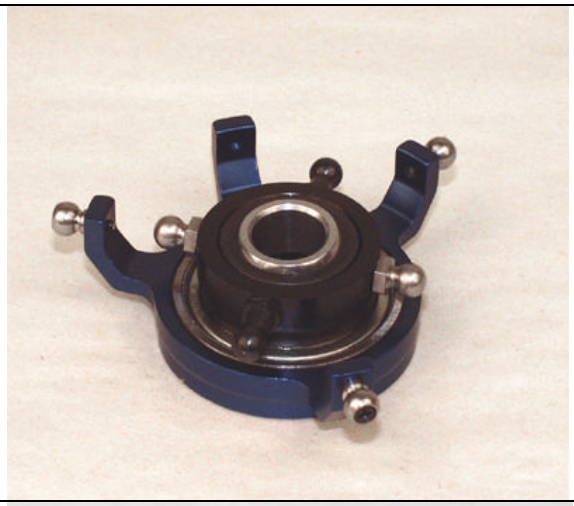
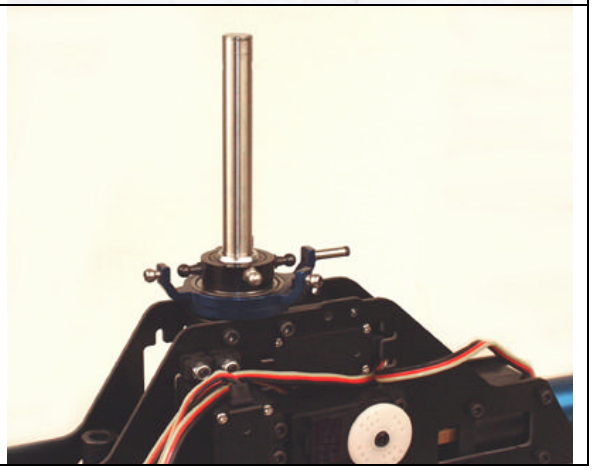
M2-15 Cap Head Bolts X 1
Swashplate Radius Pin X 1
M2 Shimball X 3
M2-7 Phillips Screw X 3

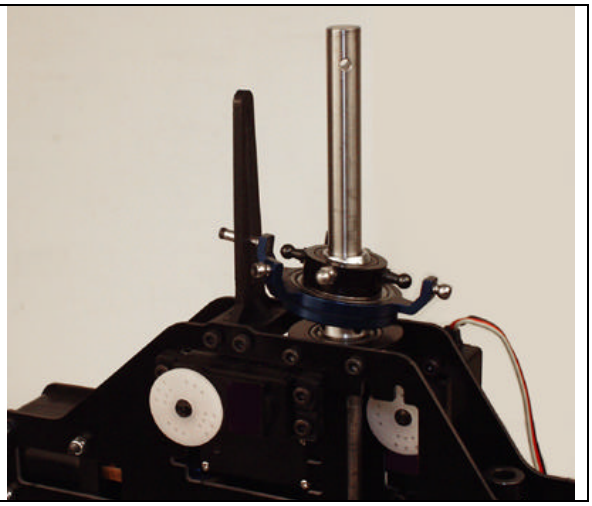
OR:

(M3) Version

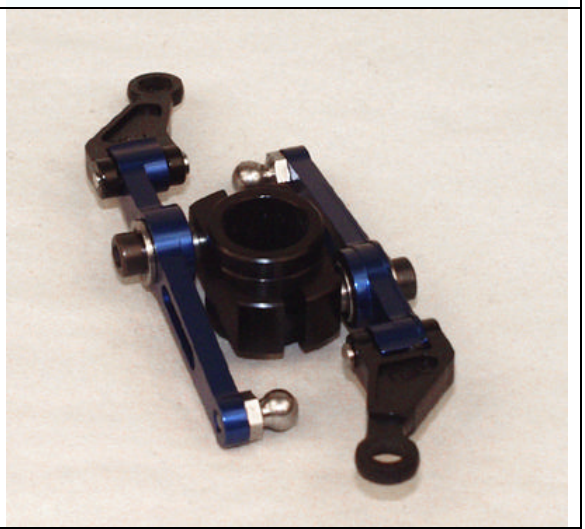
M2-15 Cap Head Bolts X 1
Swashplate Radius Pin X 1
M3-4 Pivot Ball Studs X 3

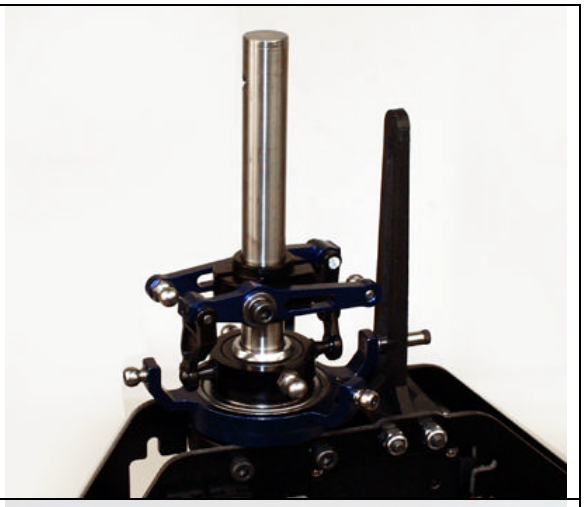
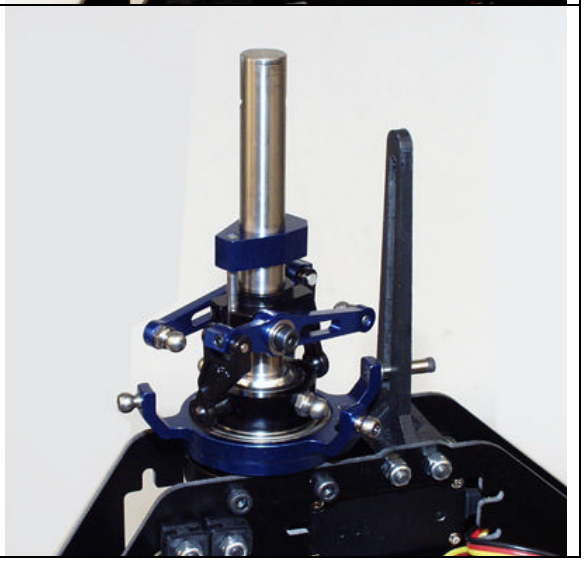
Step 1 – Swashplate Assembly & Installation

M2 Version Install (3) shim balls using (3) M2-7 Phillips Screws. **M3 Version** Install (3) M3-4 Pivot Ball Studs **Note:** Kit comes with M2 or M3 Version	
M2 Version or M3 Version Install (1) Swashplate Radius Pin using (1) M2-15 Cap Head Bolt	
Install Completed Swashplate over the Main Shaft.	

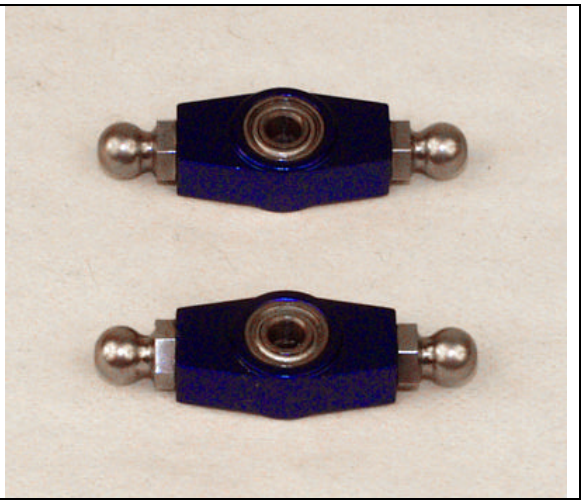
Install (1) Swashplate Anti-Rotation guide using (2) M3-35 Cap Head Bolts and (2) M3 Locknuts. **Note:** Be sure to capture the Swashplate Anti-Rotation Pin.	

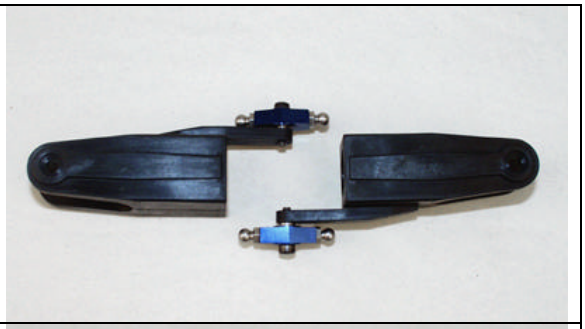
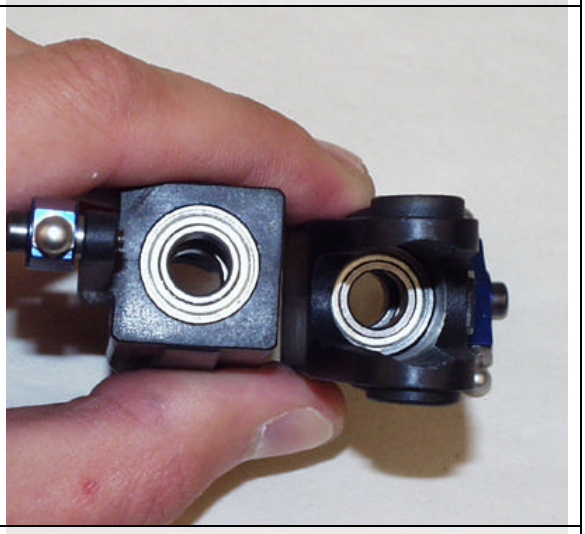
Step 2 – Washout Unit, Guide Assembly & Installation

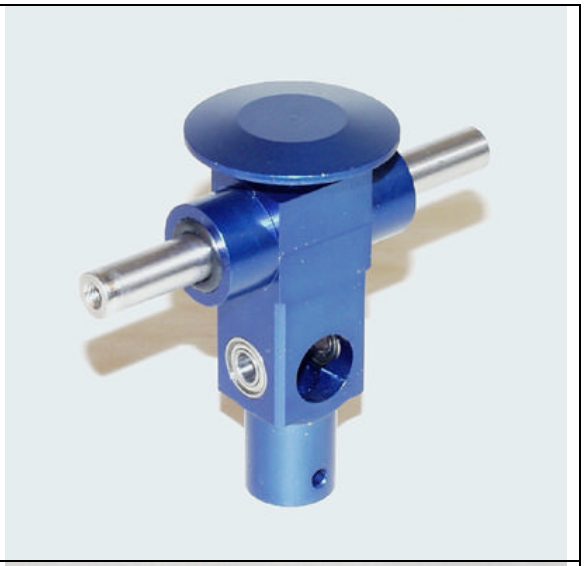
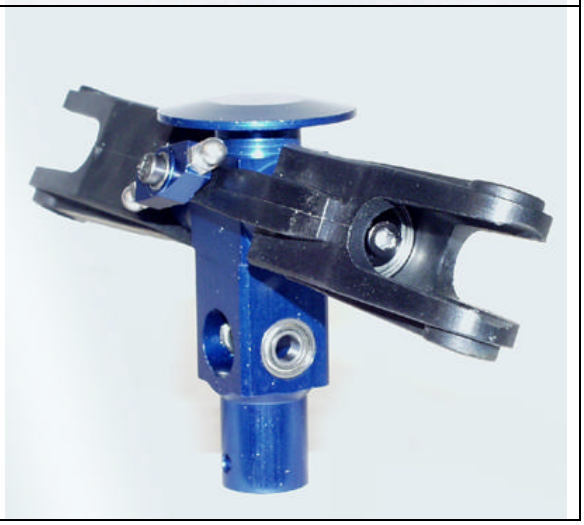
Install (2) Washout Links using (2) Washout Link Pins & (2) M3-3 Set Screw to the Washout Arms.	
Install (2) M3-4 Pivot Bolts to the Washout Arms.	

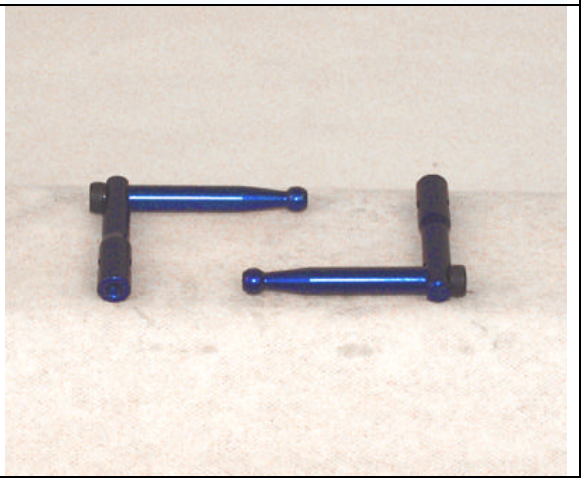
Install Completed Washout Unit. Slide Washout over Main Shaft and attach the Washout Links to the M3-6 Pivot Ball Studs on the Swashplate.	
Install (1) Washout Anti-Rotation Pin Guide using (1) M3-3 Set Screw. **Note:** Final Adjustment will be made Later.	

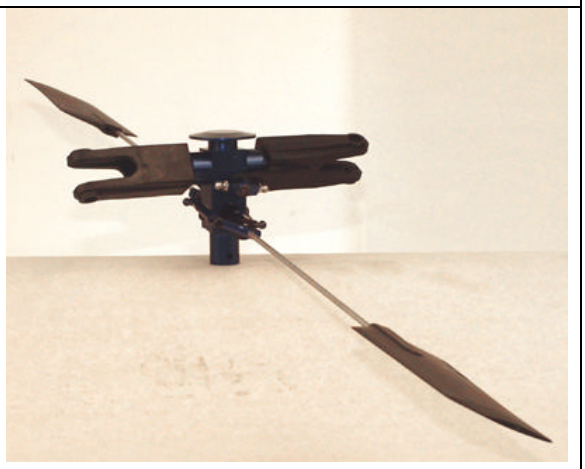
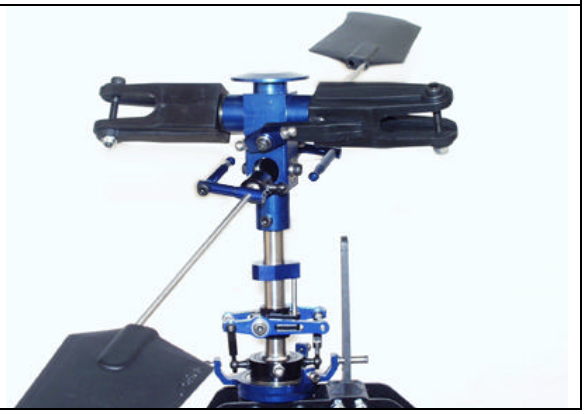
Step 3 – Rotor Head Assembly & Installation

Install (4) Pivot Ball Studs to (2) Hiller Arms.	

Install (2) Hiller Arms to (2) Blade Grips using (2) M3-5-1 Spacers and (2) M3-12 Cap Head Bolts. **Note:** The Spacer goes between the Hiller arm and the Arm on the Blade Grip.	
Install (4) 8 X 16 X 5 Regular Bearings into (2) Blade Grips. **Note:** One Bearing on each side of the each Blade Grips.	
Install (2) Spindle O-rings in (1) Center Hub **Note:** One on each side.	

Install (1) Spindle through O-rings and Center Hub. **Note:** Center Spindle in Center Hub.	
Install (2) Spindle Spacers over each side with the reduced portion facing out.	
Install each Blade Grip on the spindles with the pitch arms of the grip leading in the clockwise rotation looking from the top. Complete the installation using (2) M4-8 Flange Head Bolts to hold the grips in place.	

Install (1) Seasaw using (2) M3-8 Cap Head Bolts and (2) Seasaw Collars.	
Install (2) M3-6 Pivot Ball Studs to the seesaw.	
Assemble (2) Flybar Control Arms Part A and (2) Flybar Control Arms Part B using (2) M3-8 Cap Head Bolts.	

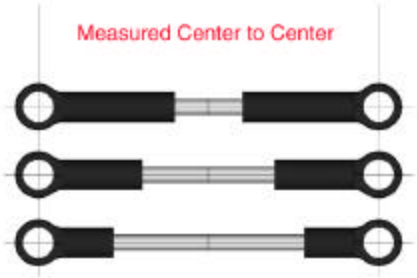
Install (1) M3 Flybar using (2) M3-5-1 Spacers, (2) Completed Flybar Control Arms, and (2) M3-3 Set Screws. **Note:** Slide Flybar into Seasaw add (2) Spacers on each side, next slide the Flybar Control Arms on each side with the arm facing the clockwise rotation. Tighten the arms in place with the M3 Set Screws when the Flybar is centered (same distance exposed on each side of the rotor head) and the arms are in parallel to each other.	
Install (2) Flybar Paddles by threading them on to the M3 Flybar 23-25mm. **Note:** ?? The Paddles must be threaded on the same distance and must be parallel to the Flybar Control Arms. ?? The short sides of the Paddles are the leading edge. ?? The Distance must be the same from the paddle to the control arms must be the same.	
Install Completed Rotor Head to the Main Shaft using (1) M3-20 Cap Head Bolt and (1) M3 Locknut. Attach (2) M4-30 Cap Head Bolt and (2) M4 Locknut in the Drag Bolt Hole.	

Section 7 – Linkage & Final Setup

Parts List

Bag 7	**Loose in Box**
2.3-15 Stainless Steel Rod X 2 2.3-30 Stainless Steel Rod X 1 2.3-35 Stainless Steel Rod X 3 2.3-50 Stainless Steel Rod X 1 2.3-80 Stainless Steel Rod X 1 2.3-85 Stainless Steel Rod X 2 Medium Ball Links x 20 Short Ball Links x 2 M2-8 Phillips Screws (Shim-ball) X 6 Shim-balls X 6 2.3 Tail Control Rod Ends X 2 Tail Control Rod Guide A X 3 Tail Control Rod Guide Insert A X 3 Tail Control Rod Guide Insert B X 3 M3-8 Cap Head Bolts X 4 M3-15 Cap Head Bolts X 4 Rubber Canopy Grommets X 4 40mm Canopy Standoff X 2 28mm Canopy Standoff X 2	Carbon Tail Control Rod X 1 Fiberglass Canopy X 1

Step 1 – Linkage Rod Setup

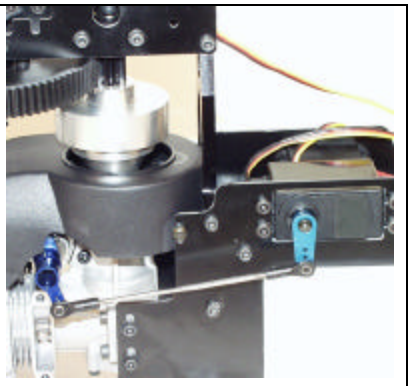
In the following table the linkages will be measured center to center as per the picture. The table explains the amount of rods you need to make and which ball links to use on each end. This will get the helicopter close to finished setup, as always you will need to make some final adjustments to maximize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

Step 1A – Shim Ball Installation

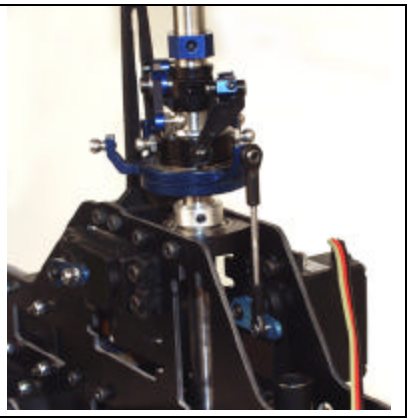
Install (6) Shim Balls using (6) M2-8 Phillips Screws. Install each Shim ball as close to the recommended distance for the center of the servo splice and the center of the shim balls.

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

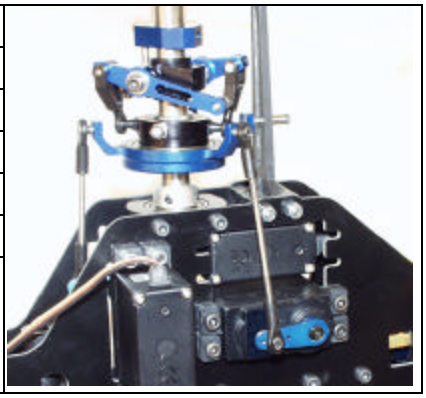
Rod Use	*Throttle Servo to Carburetor*
Linkage ID Letter	A
# of Rods	1
Rod Size	2.3-80
Ball Link 1	Medium
Ball Link 2	Medium
Center to Center	93.2mm



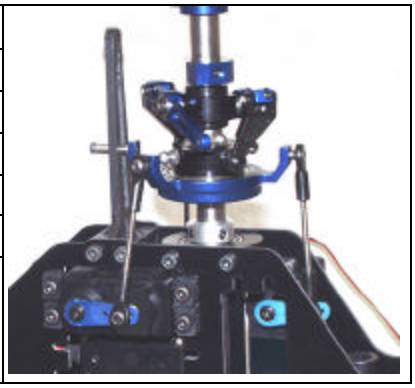
Rod Use	*Elevator Servo to Swashplate*
Linkage ID Letter	B
# of Rods	1
Rod Size	2.3-35
Ball Link 1	Medium
Ball Link 2	Medium
Center to Center	54mm



Rod Use	*Rear Lower Swash. Servo to Swashplate*
Linkage ID Letter	C
# of Rods	1
Rod Size	2.3-50
Ball Link 1	Medium
Ball Link 2	Medium
Center to Center	71.45mm



Rod Use	*Rear Upper Swash. Servo to Swashplate*
Linkage ID Letter	D
# of Rods	1
Rod Size	2.3-30
Ball Link 1	Medium
Ball Link 2	Medium
Center to Center	51.4mm



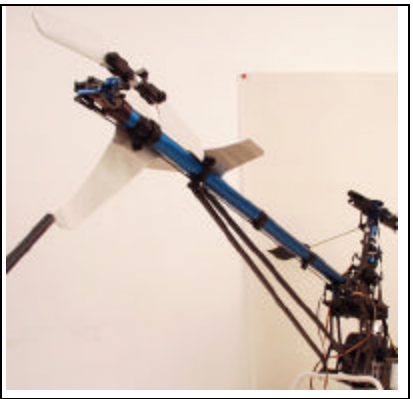
Rod Use	*Washout Arms to Flybar Control Arms*
Linkage ID Letter	E
# of Rods	2
Rod Size	2.3-35
Ball Link 1	Medium
Ball Link 2	Medium
Center to Center	51mm

Rod Use	*Swashplate to Hiller*
Linkage ID Letter	F
# of Rods	2
Rod Size	2.3-85
Ball Link 1	Medium
Ball Link 2	Medium
Center to Center	98.7mm

Rod Use	*Hiller to Seesaw*
Linkage ID Letter	G
# of Rods	2
Rod Size	2.3-15
Ball Link 1	Medium
Ball Link 2	Short
Center to Center	26.5mm

Step 2- Rudder Push Rod Assembly

Rod Use	*Rudder Servo to Tail Pitch Change Lever*
Linkage ID Letter	H
# of Rods	1
Rod Size	N/A
Ball Link 1	Medium
Ball Link 2	Medium
Center to Center	615.95mm



Construct the Rudder push rod with (2) Machined Carbon Push Rod Ends & (1) Carbon push rod cut the rod to length and epoxies the ends on finish with (2) Medium Ball Links. Use the (3) Tail Control Rod Guides, (3) Tail Control Rod Guides inserts, & (3) Tail Control Rod Guides inserts B. The three tail control rod guides are epoxies together to make complete assemblies. Space the assemblies evenly about the boom and use CA Glue to attach them.

Note:

- The Carbon Rod will have to be cut to length.
- The second end will have to attached after the rod is installed into the Guides

Step 3 – 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, 25 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.

Step 4 – 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.

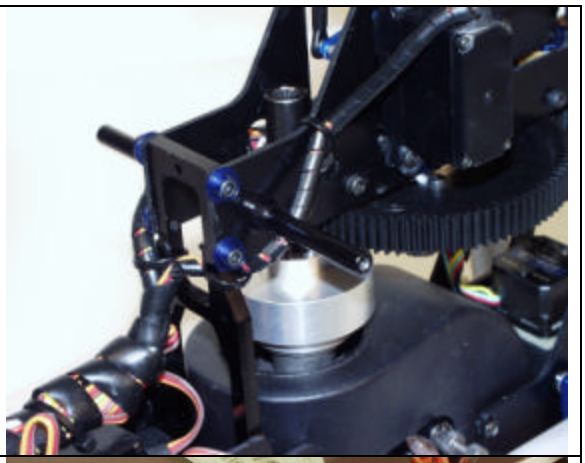
Leveling the swash: Using a ruler measure from the bottom of the swash plate to the top main shaft-bearing block. Adjust all the connecting rods so that the swash plate is level. Equal all the way around the swash plate. Also Hobbies & Helis makes a nice swash-leveling tool to make this task easy.

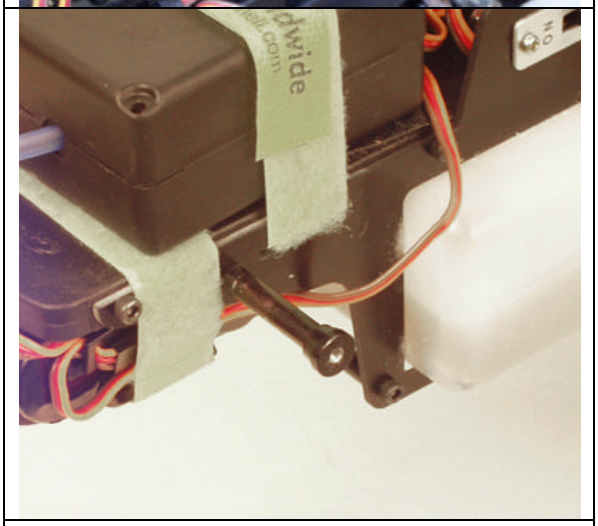
Level the washout and mixer arms: With the collective stick centered and the fly-bar perpendicular to the main-shaft, ensure that the washout and mixer arms are perpendicular to the main-shaft. Adjust rods as necessary.
Additional tail rotor information: When you set up your tail rotor you need to make 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.

Step 5 – Canopy Installation

Install (2) 40mm Canopy stand-offs and (2) 28mm Canopy stand-offs using (4) M3-8 Cap Head Bolts. After you have attached the canopy cross stand-offs you must place the canopy on the machine and mark the canopy for the locations of the standoffs. Drill a 1/4" inch hole in the previously marked position. After the 4 holes have been drilled insert (4) Canopy Grommets and attach the canopy to the helicopter using (4) M3-15 Cap Head Bolts.





Step 6 – Final Building Information

Final Building Notes:

- Run servo wires neatly and out of the way of moving parts
- A Receiver box will go a long way towards protecting your receiver.
- Run fuel tubing making sure to keep your tubing away from moving parts
- Always charge and check your batteries before you fly the model.
- It is a good idea to have an experienced modeler check and fly your model if this is your first model.