Quick 60

Assembly & Parts Listing

Exclusively distributed by: Hobbies & Helis International 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 60 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 60 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, Hobbies & Helis is proud to release the first in a new standard in Helicopters - the Quick 60.

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.

Quick 60 Features

1. Heavy Duty Frame Construction: Quick 60 frames are made of the highest Quality 2000 series Aluminum. 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 60 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 60 Kit are high quality 2.3mm stainless steel rods and the rod ends are made of a high quality liquid Delrin.

9. Independent Blade Axle Design: The dual blade axle construction is pinned above and below the centerline of the main blade grips. This rotor head design far exceeds the quality of any rotor head on the market today.

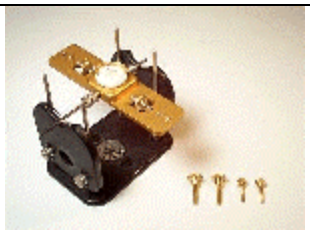
10. Advanced Airfoil Fly-bar Paddles: These paddles will provide the best both kind of flight characteristics for both 3D & Sport flying. Not only do they provide smooth forward flight, they also provide quick response upon demand.

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 60”

Phillips Screw Driver

Ball End Drivers
HHI7050



Bubble Blade Balancer
HHI7010
High Point Balancer
DUB499

Piston Head Lock
HHI7020

Composite Paddle Gauges
HHI7000

Nut Drivers
5.0mm WIH26550
5.5mm WIH26555
7.0mm. WIH26570
Allen Drivers
1.5mm WIH26315
2.0mm WIH26320
2.5mm WIH26325
3.0mm WIH26330

Pitch Gauge
HHI7001

Universal Fly-bar Lock
HHI7040

Ruler

Hobby Knife

Needle Nose Pliers

Scissors

Hardware & Accessories

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

OS61WC

YS61ST2

Glues & Thread Lockers

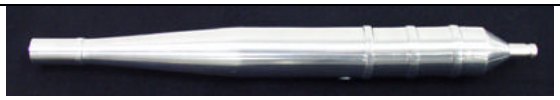
Ca Glue. …GBG1

JB Weld…JBW8265S

Locktite. …….PT40

Exhaust Systems

HHI 60 Size Tuned Muffler



HHI 60 Size Long Tuned Pipe

HHI 60 Size Tuned Heli-Pipe

Tuned Pipe Accessories
Rear Facing Exhaust Header
Exhaust Coupler
Exhaust Coupler Clamps

Glow Plugs

OS #8 Glow Plug. …OSMG2691

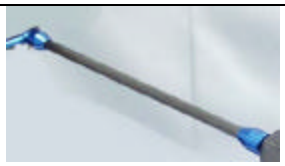
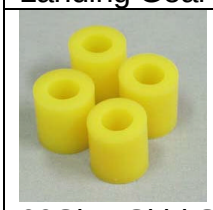
Fuel System Accessories

 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	 4mm Fly-Bar Stiffeners…HHI402*
 60Size Skid Stops HHI200* Available in many Colors See website or Call for Detail	 Quick 60 Pro 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 OS61 & YS61ST2	

Radio Requirements

Radios:

Hobbies & Helis & its distributors carry various lines of helicopter radios. We recommend the use of at least a 7 or 8 channel radio. Other radios support the EMS Mixing but provide less of the essential functions that make flying more enjoyable. In conclusion, any radio that supports EMS mixing will work fine.

Servos:

This is the single most important function of the helicopter. Any premium 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 match servo timing without servo interaction.

Introduction:

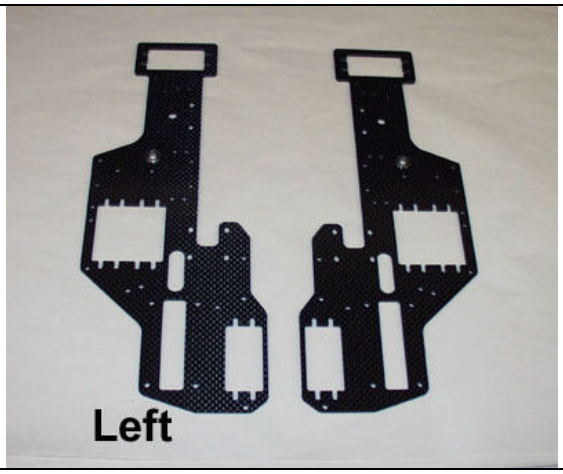
Please read through the entire manual before starting your construction of the Quick 60 if there are any question or concerns regarding the assembly of the Quick 60 you can E-mail HHI@Fast.net or Call Hobbies & Helis International (610)-282-4811.

Section 1 – Upper Frame Assembly

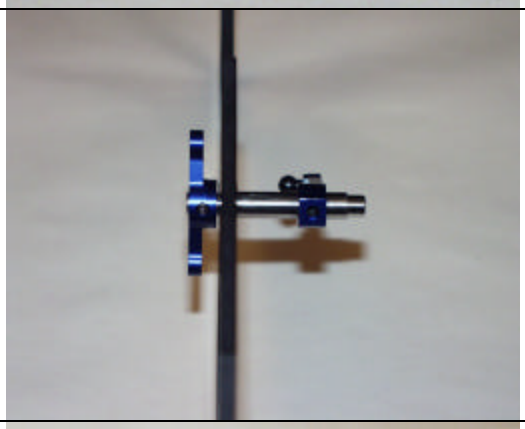
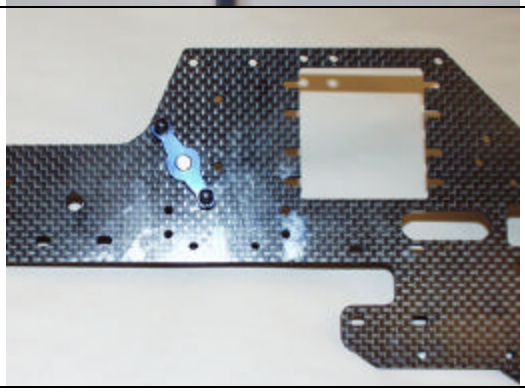
Parts List

Bag 1	**Frame Set Bag**
5 X 10 X 4 Flanged Bearings X 2 Upper Main Shaft Bearing Block X 1 Lower Main Shaft Bearing Block X 1 Clutch Bell Bearing Block X 1 26mm Cross Members X 4 Outer Elevator Control Arm X 1 Inner Elevator Control X 1 Elevator Shaft X 1 Counter Gear X 1 Counter Gear Shaft X 1 Tail Pulley Gear X 1 Front Tail Transmission Bearing Blocks X 2 Swash Plate T-Lever X 2 Swash Plate T-Lever Mount X 2 M3-30 Cap Head Bolts X 2 M3 Lock Nuts X 2 M3-3 Set Screws X 3 M4-3 Set Screws X 1 M3-8 Cap Head Bolts X 28 M3-4 Pivot Ball Studs X 9	Upper Frames X 2
Bag 1A – Servo Fixing Set 20 – M2.6-14 Cap Head Bolts 20 – M2.6 Lock Nuts 10 – Servo Fixing Plates	

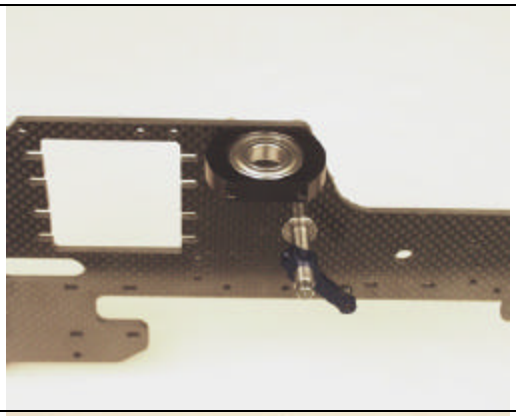
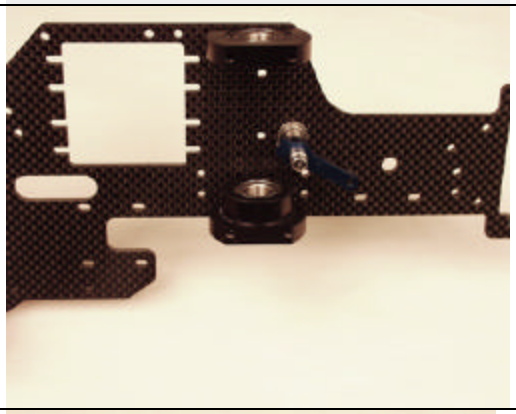
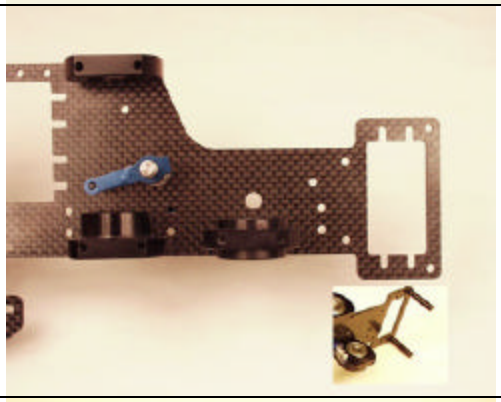
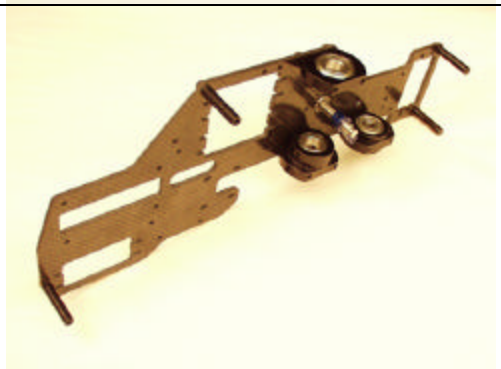
Step 1- Bearing Installation

Layout the frames as displayed in picture	
Install the (2)5 X 10 X 4 Flanged bearings in the Upper Frame. The Flange of the Bearing goes up. (You may need to file out the holes if they are too tight.)	

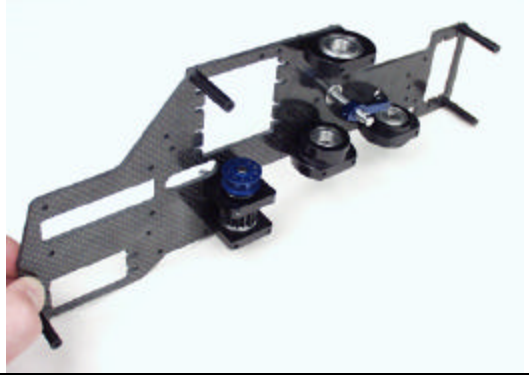
Step 2 – Elevator Control Assembly

Install the inner Elevator Control Arm with (1) M3-3 set Screw to the Elevator Control Shaft.	
Install (1) M3-4 Pivot Bolt on the Inner Elevator Control Arm.	
Install the Elevator Control Shaft through the 5 X 10 X 4 Flanged Bearing in the Left Frame Half	
Install the Outer Elevator Control Arm to Elevator Control Shaft using (1) M3 set screw. Install (2) M3-4 Pivot Bolts to the Outer Elevator Control Arm.	

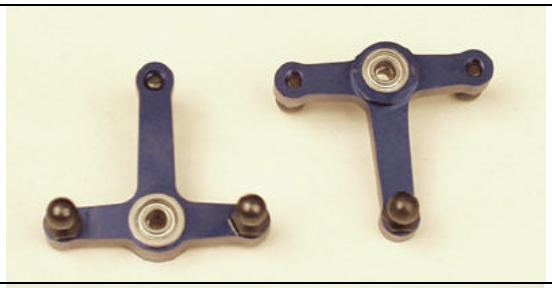
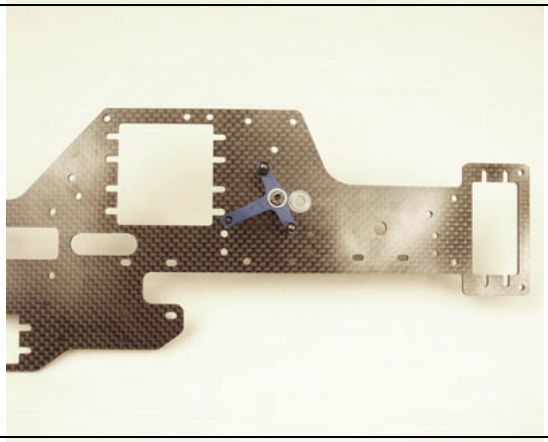
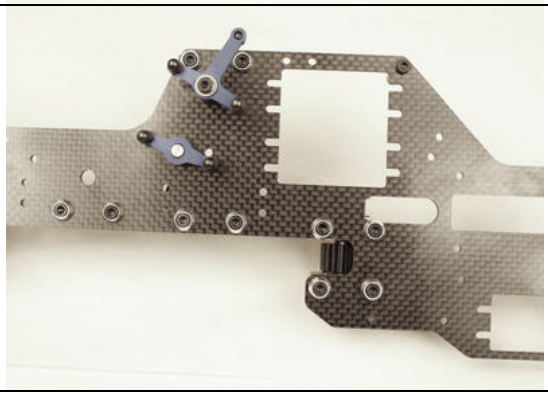
Step 3 – Cross Members & Bearing Block Installation

Install Upper Main Shaft Bearing Block to Left Upper Frame Using (2) M3-8 Cap Head Bolts.	
Install Lower Main Shaft Bearing Block to Left Upper Frame Using (2) M3-8 Cap Head Bolts.	
Install Clutch Bell Bearing Block to Left Upper Frame Using (2) M3-8 Cap Head Bolts. The Bearing with the 5mm ID is to be installed towards the top of the frames	
Install (4) 26mm Cross Members to the Left Upper Frame using (4) M3-8 Cap Head Bolts.	

Step 4 – Building & Installation of Front Tail Transmission

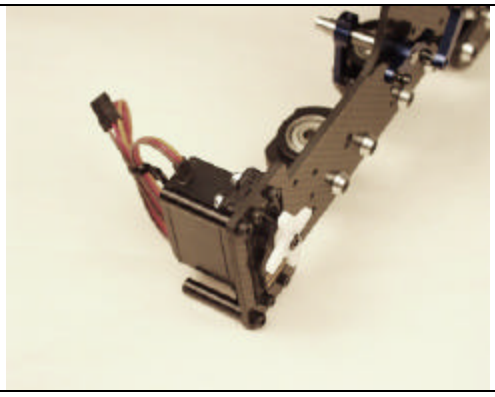
Install Counter Gear to Counter Gear Shaft using (1) M4-3 Set Screw	
Install both (2) Front Tail Transmission Bearing Blocks so protruding side of the Bearings face the counter Gear.	
Install Tail Pulley Gear to the reduced portion of the Counter Gear Shaft using (1) M3-3 Set Screw.	
Attach the above Transmission Assembly to the Left Upper Frame using (4) M3-8 Cap Head Bolts	

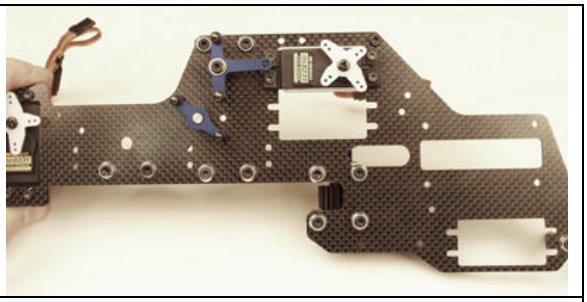
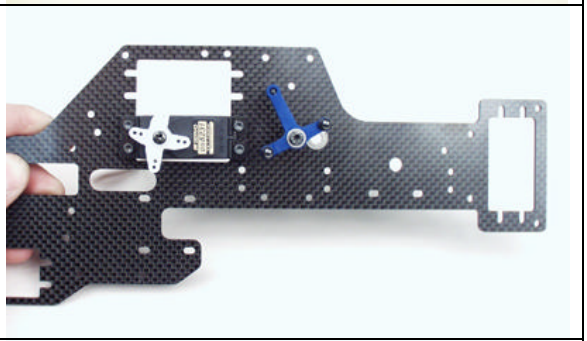
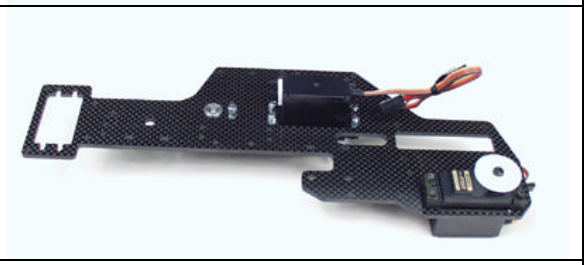
Step 5 – Swash Plate T-Lever Installation

Install (6) M3-4 Pivot Ball Studs on the Swash T-Levers	
Install the Right Lower Swash T- Lever to the Right Upper Frame. Using (1) M3-30 Cap Head Bolt, (1) Swash T-Lever Mount, (1) M3 Locknut	
Install the Left Upper Swash T- Lever to the Left Upper Frame. Using (1) M3-30 Cap Head Bolt, (1) Swash T-Lever Mount, (1) M3 Locknut.	

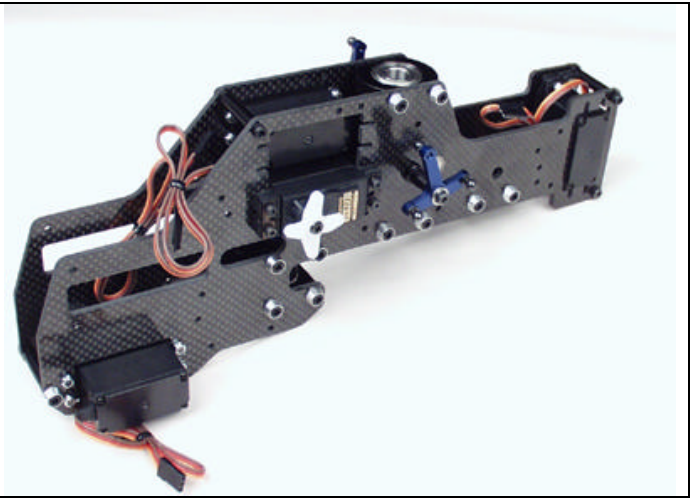
Step 6 – Servo Installation

Note: *Please refer to the beginning of the manual for Servo Recommendations for this Helicopter*

Install the Elevator Servo to the Left Upper Frame Using (4) M2.6-14 Cap Head Bolts, (4) M2.6 Lock Nuts & (2) Servo Fixing Plates	

Install the Left Lower Aileron Servo to the Left Upper Frame Using (4) M2.6-14 Cap Head Bolts, (4) M2.6 Lock Nuts & (2) Servo Fixing Plates.	
Install the Right Upper Aileron Servo to the Right Upper Frame Using (4) M2.6-14 Cap Head Bolts, (4) M2.6 Lock Nuts & (2) Servo Fixing Plates.	
Install the Rudder Servo to the Inside Right Upper Frame Using (4) M2.6-14 Cap Head Bolts, (4) M2.6 Lock Nuts & (2) Servo Fixing Plates.	
The remaining servo hardware will be used at a later time to install the Throttle servo.	

Step 7 – Assembling the Upper Frames

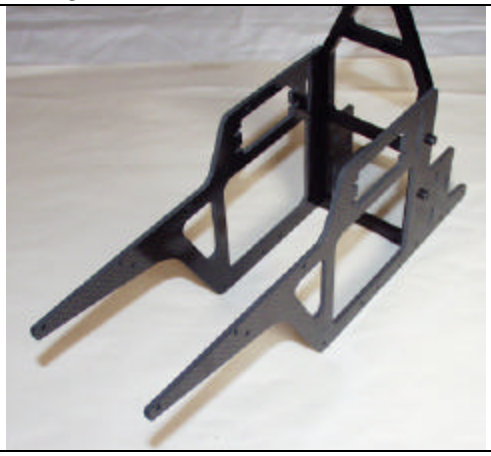
Take the Left and Right Upper Frame Halves and fit them together and Attach the right to the left using (14) M3-8 Cap Head Bolts.	

Section 2 –Lower Frame Assembly

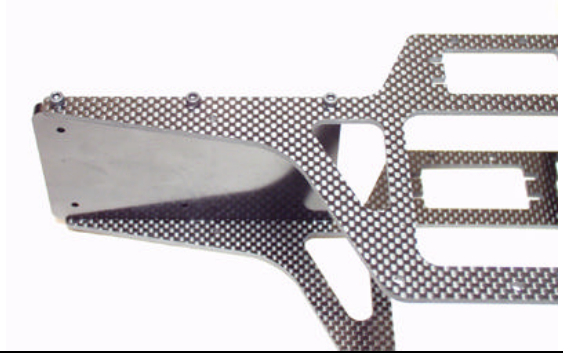
Parts List

Bag 2	Frame Set Bag
66mm Cross member X 1 One Piece Frame Spacer X 2 26mm Cross Member X 3 M3-30 Cap head Bolts X 6 M3-8 Cap Head Bolts X 12 M3-10 Cap Head Bolts X 8	Front Lower Frames X 2 Rear Lower Frames X 2 Bulk Head X 1 Front Radio Bed X 1 Gyro Plate X 1

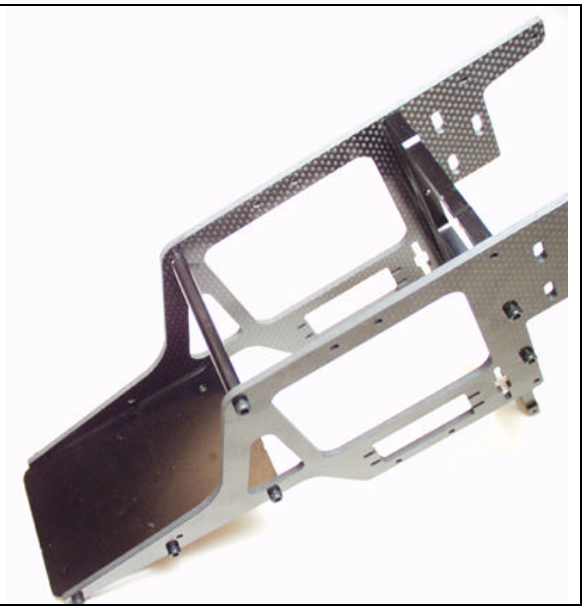
Step 1 – Bulk Head & Front Frame Assembly

Install the Front Lower Frames to the Bulk Head using (4) M3-10 Cap Head Bolts	

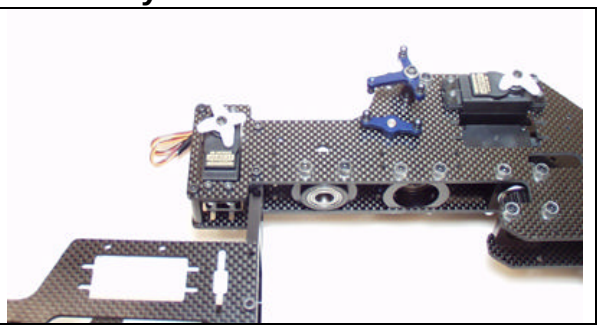
Step 2 – Front Radio Bed

Install Front Radio Bed Between Front lower Frames using (6) M3X8 Cap Head Bolts.	

Step 3 – 65mm Cross-Member

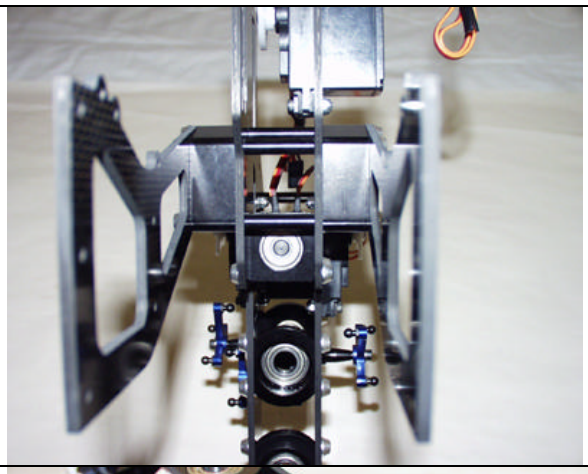
Install 65mm Cross Member between front frames using (2) M3 X 8 Cap Head Bolts.	

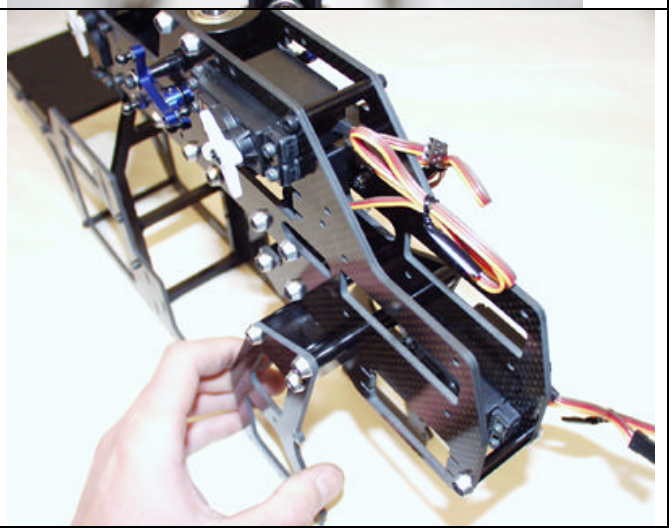
Step 4 – Front Frames & Upper Frame Assembly

Install the upper portion of the Bulk head to the upper frames to the us (4) M3-10 Cap Head Bolts	

Step 5 – Rear Lower Frame Installation

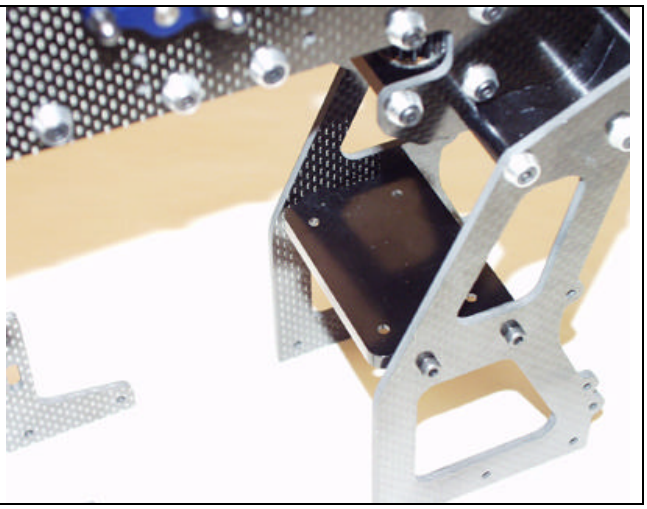
Using (6) M3-30 Cap Head Bolts, (2) One Piece Frame Spacers, (2) Rear Lower Frames, & (3) 26mm Cross Members. The 26mm cross members go between the main frames and the One piece Cross Members will go between the outside of the upper frames and the inside of the rear lower Cross Members the assembly is bolted together with the (6) M3 X 30 Cap Head Bolts.





Step 6 – Gyro Plate Installation

Install the rear Gyro Plate between the rear lower frames with (4) M3-8 Cap Head Bolts



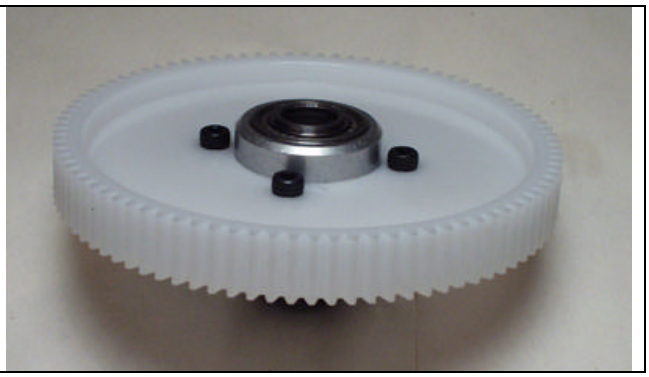
Section 3 – Drive Train Installation

Parts List

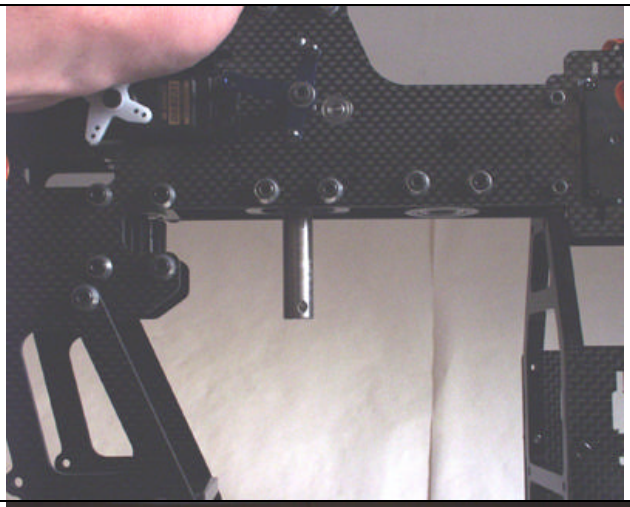
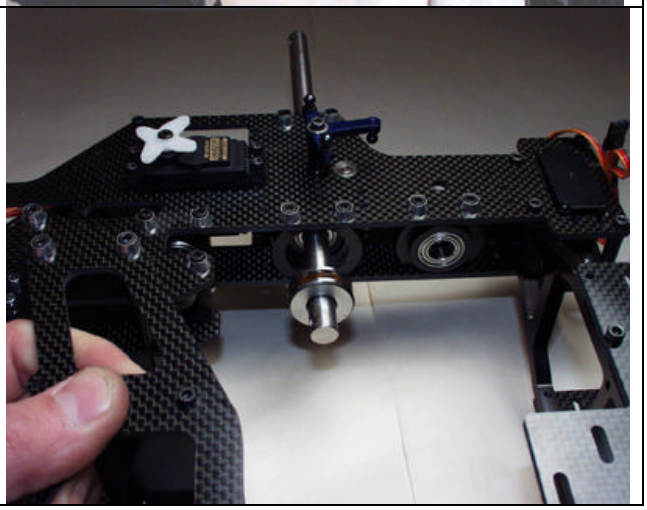
Bag 3
Main-Shaft x 1
Auto-Rotation Clutch x 1
Auto-Rotation Clutch Shaft x 1
Auto-Rotation Clutch Spacer x 1
Main Gear x1
Main-Shaft Thrust Bearing x 1
Main-Shaft Collar x1
Clutch Bell x 1
Clutch x 1
Clutch Lining x 1
Fan x 1 (Plastic)
Fan Hub x 1
Engine Collet x 1
Motor Mount x1
Start Shaft x 1
Start Coupler x 1
M3-8 Cap Head Bolts X 4
M3-20 Cap Head Bolts x1
M3 Locknut x 1
M3 Set Screws x 4
M4-4 Set Screws x 1
M4-10 Cap Head Bolts x 8
M4-12 Cap Head Bolts x 4
M8 Nord-lock Washers
M3-6 Phillip Screws x 4

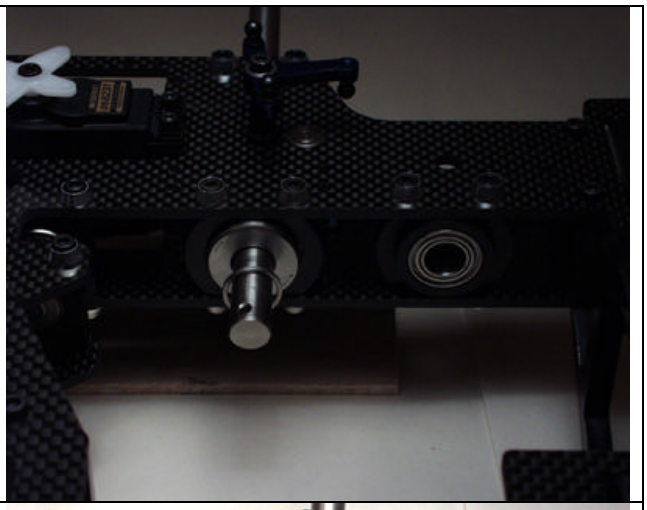
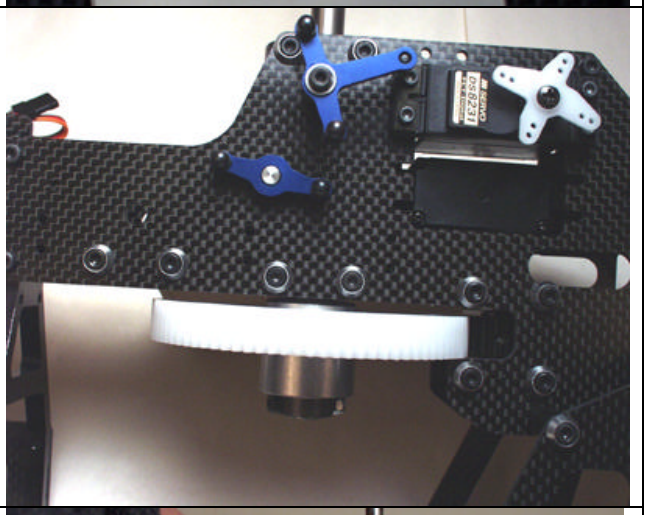
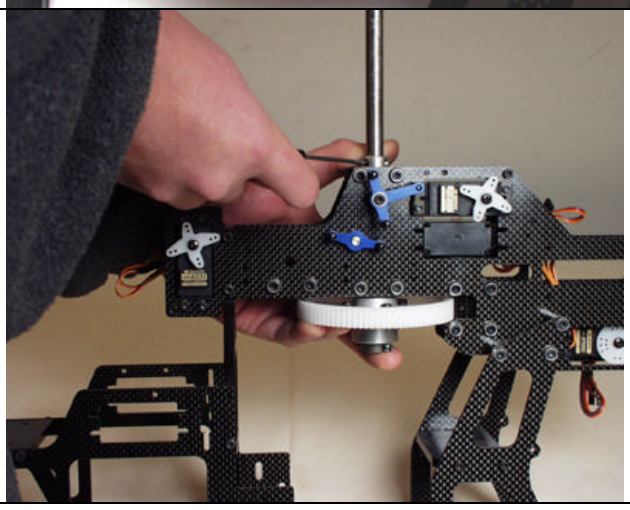
Step 1 – Main Gear & Autorotation Clutch Assembly

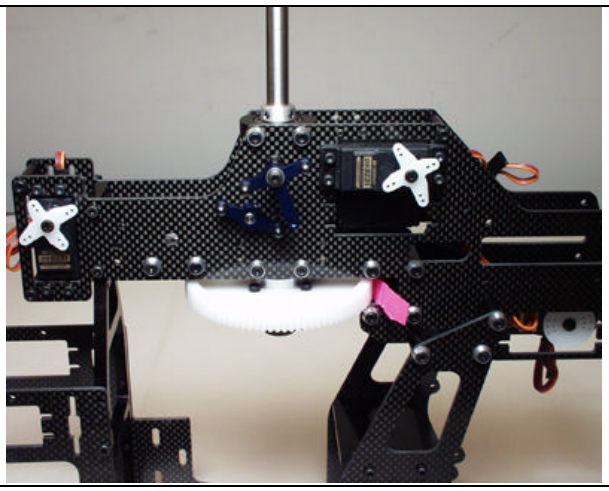
Install the Auto-rotation Clutch shaft into the Auto-Rotation Clutch. It only fits one direction.

Install the Main Gear to the Auto-rotation Clutch using (4) M3-8 Cap Head Bolts. **Note:** *Some Gears are White & Some Gears are Black they are both molded Gears*	

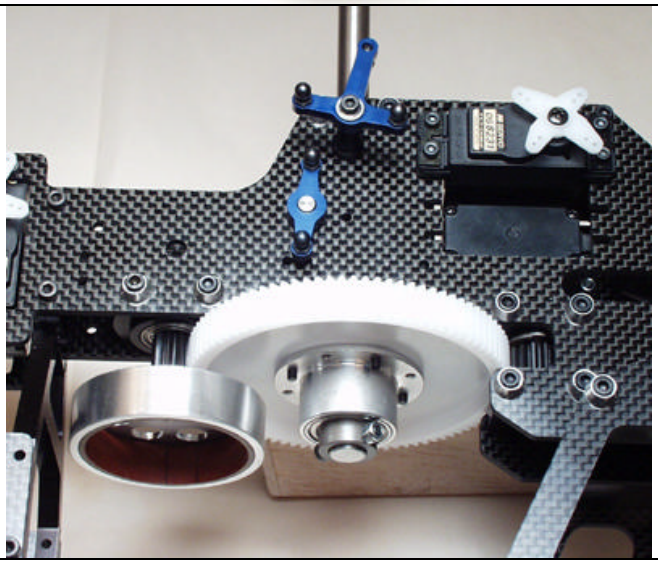
Step 2 – Main Shaft & Main Gear

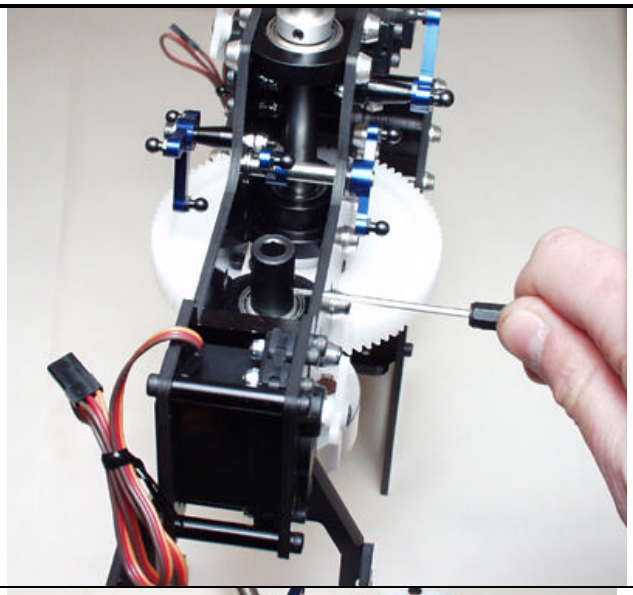
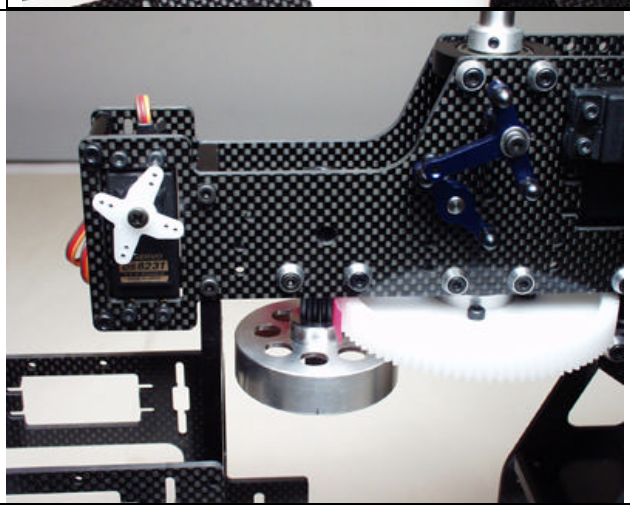
Insert the Main-shaft through the Bearing Blocks with the end that has the cross-hole closet to end, down.	
Put the Main Shaft thrust bearing on the lower portion of the main-shaft with the larger hole of the thrust bearing towards the top of the machine.	

Put the Auto-rotation clutch spacer on the bottom of the main-shaft below the thrust bearing.	
Next put the Auto-rotation clutch on the main-shaft and attach it to the shaft using (1) M3-20 Cap Head Bolt and (1) M3 Locknut.	
Slide the Main-Shaft collar over the upper portion of the main-shaft Note: there is a ridge on the collar that goes down towards the bearing. Pulls up on the main shaft making sure there is no up or down play then tighten the collar to the shaft using (4) M3-3 set screws.	

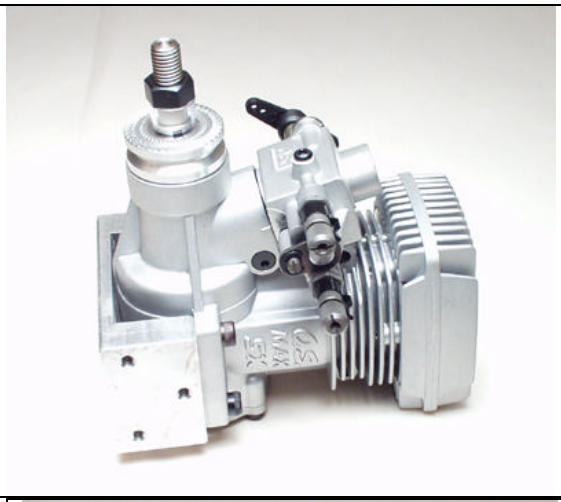
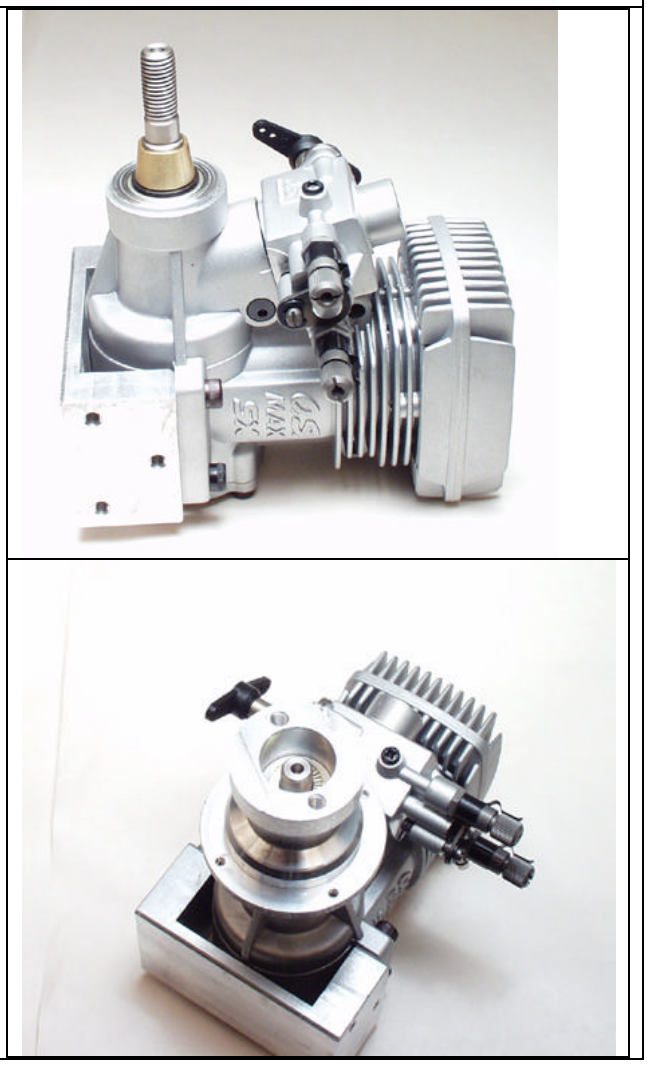
Set the gear mesh between the rear tail transmissions using a double thick piece of notebook paper. Place the paper between the counter gear and the main gear. Loosen the eight bolts that fasten the transmission to the frames and rotate the paper between the gears press the gears together firmly and retighten the bolts and remove paper check for smooth operation of the gears readjust if necessary.	

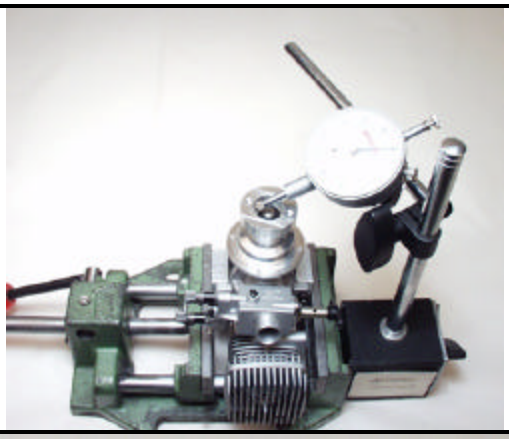
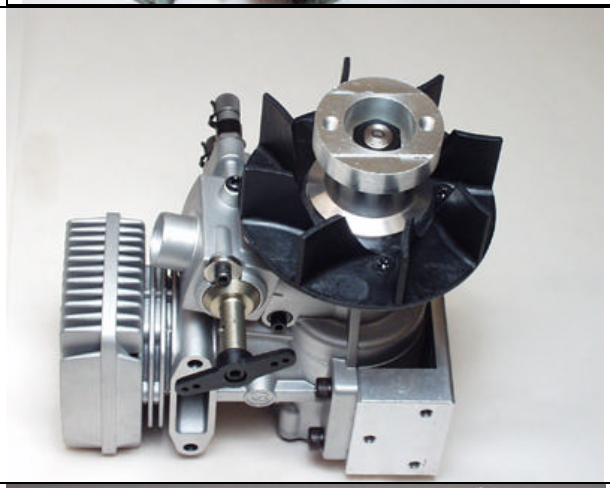
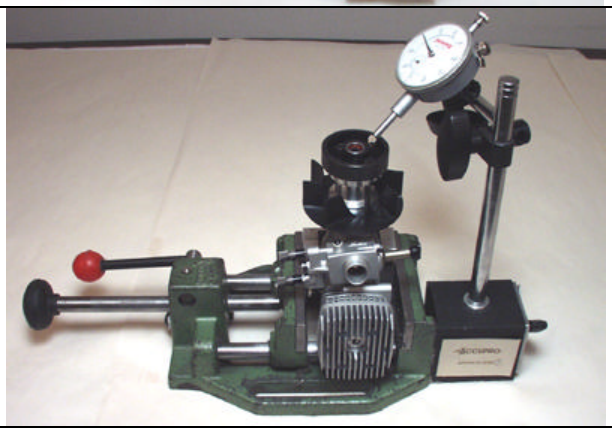
Step 3 – Clutch Bell Installation

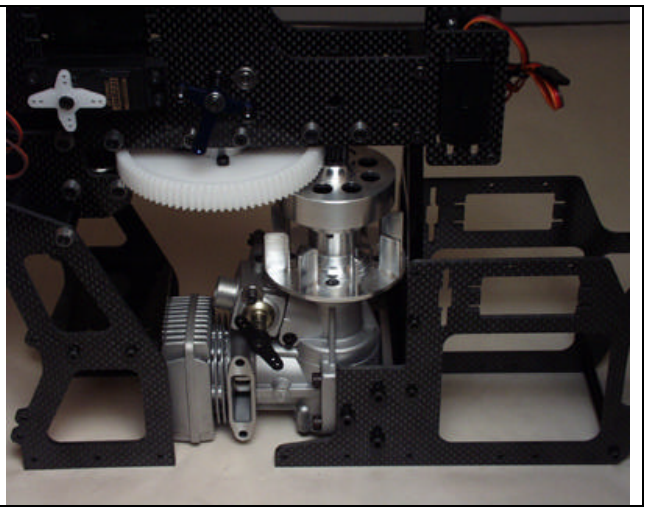
Install the clutch lining in the Clutch bell using JB weld. The Clutch lining may have to cut to a length of 145mm. Note: Be sure not to over apply the JB Weld be sure that you clutch lining is smooth when the installation is complete.	
Install the clutch bell into the start shaft-bearing block.	

Install the start shaft thru the clutch bell and the bearing block locking it in place using the start coupler and (1) M4-4 Set screw. **Note:** There should be no up or down play once the shaft is fastened in place.	 
Set Gear mesh between the Clutch Bell and the main-gear as previously described is step 2 of this section.	

Step 4 – Engine Installation

Locate the engine mount and mount the engine to it using (4) M4-12 Cap Head Bolts. Depending on your engine choice you will use different holes.	
Mount the fan hub to the engine using the Engine collet and the M8 Nord Lock washers. Remove the engines drive washer and replace it with the Brass Collet. Finish attaching the fan hub with (2) M8 Nord Lock Washers under the prop-nut. **Note:** The fan hub must be checked for run out no more than .002”	

	
Mount the fan on the fan hub using (4) M3-6 Phillips Head Screws.	
Install Clutch to the fan hub using (2) M4-10 Cap Head Bolts. **Note:** The Clutch must be checked for run out no more than .002” Dial indicate the clutch between the one-way bearing and the clutch shoe.	

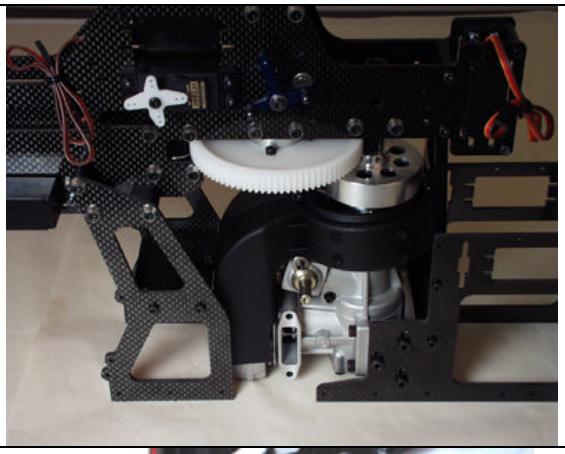
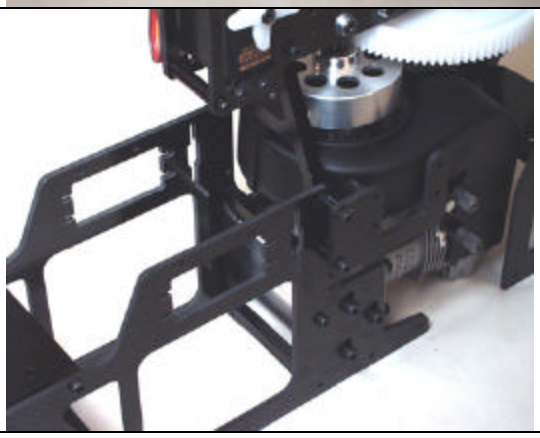
Install Complete engine assembly into the frames using (6) M4-10 Cap Head Bolts. The engine installation must be done carefully making sure that engine and the clutch are assembled straight and that the gear mesh between the clutch bell and the main-gear is smooth. **Note:** Use a double thick piece of notebook paper to set the gear mesh as described in Step 2 with the counter gear.	

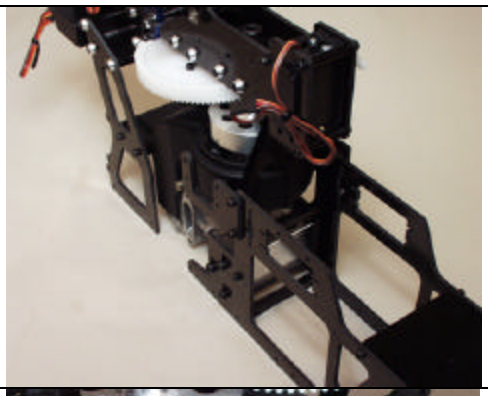
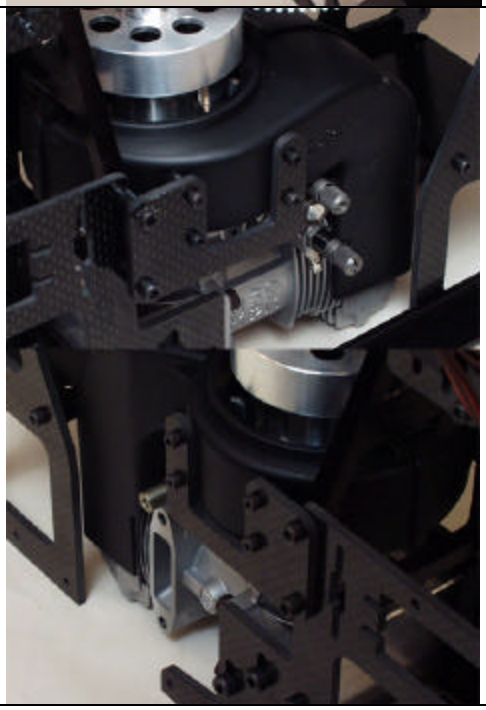
Section 4 – Completion of Lower Frame Assembly

Parts List

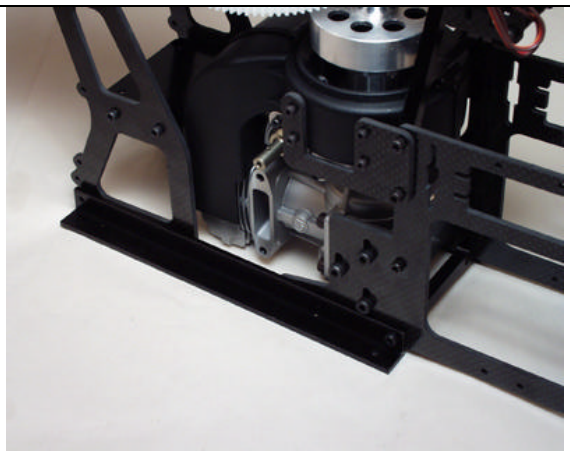
Bag 4	**Bag 4A**
Fan Shroud x 1 66mm Cross-member x 1 9mm Cross-Spacer x 2 Landing Gear Skid Pipe Caps x 4 Fuel Tank Plate x 1 M3 Locknuts x 16 M2.6-6 Cap Head Bolts x 8 M3-10 Cap Head Bolts x 13 M3-12 Cap Head Bolts x 8 M3-18 Cap Head Bolts x 4 M3-20 Cap Head Bolts x 2 M3-3 Set Screws x 4	Fuel Tank x 1 Rubber Fuel Stopper x 1 Aluminum fuel tubing x 3 Outside Stopper Plate x 1 Inside Stopper Plate x 1 M3 Aluminum Bolt x 1
Frame Bag	**Loose in Kit Box**
Frame Rails x 2 Fan Shroud Mount x 2	Landing Gear Struts x 2 Landing Gear Skid Pipes x 2

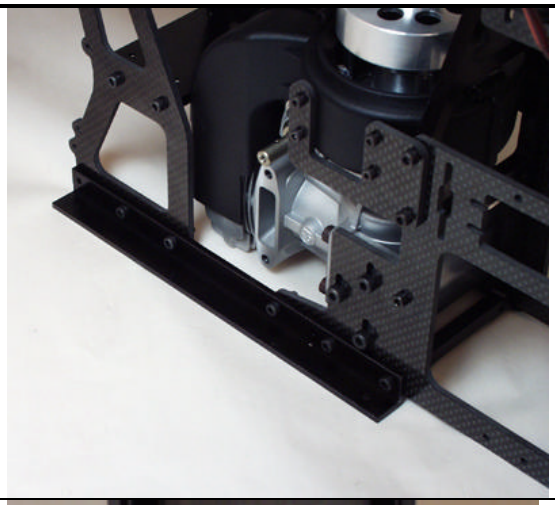
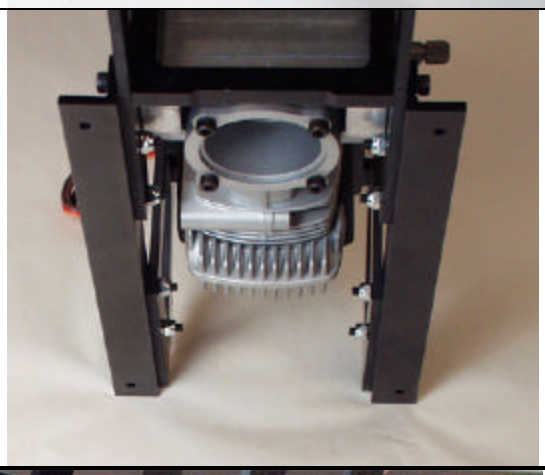
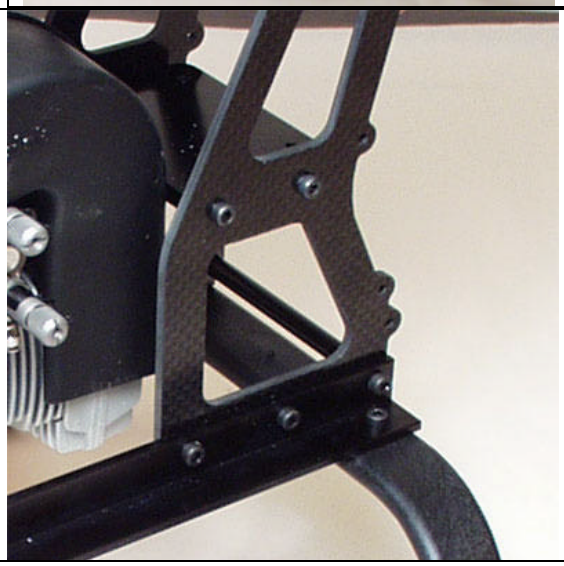
Step 1 – Fan Shroud Installation

Install Fan Shroud around the motor, Bolt the two halves together using (3) M3-10 Cap Head Bolts.	
On the right side (Looking from the front of the helicopter) Install Shroud mount using 9mm Cross-spacer and (2) M3-20 Cap Head Bolts.	

On the Left side (Looking from the front of the helicopter) Install Shroud mount using (2) M3-10 Cap Head Bolts.	
Attach the Shroud to the mounts to the fan Shroud using (8) M2.6-6 Cap Head Bolts.	

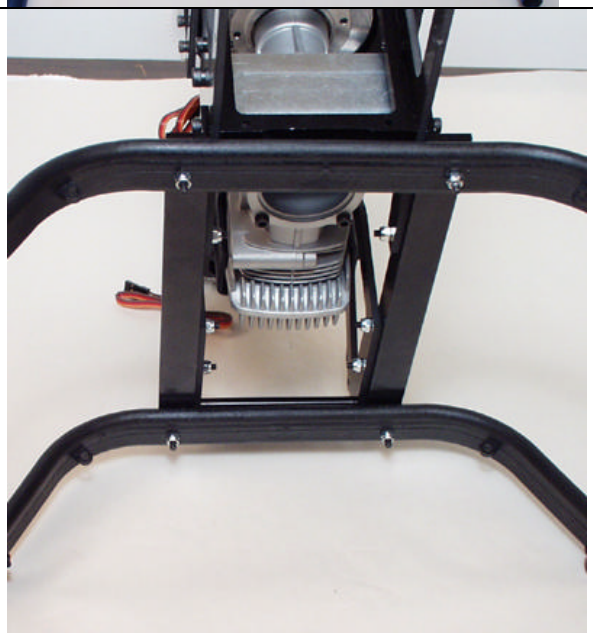
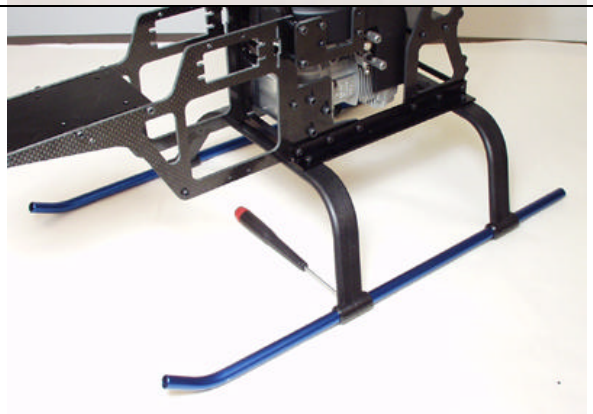
Step 2 – Frame Rail Installation

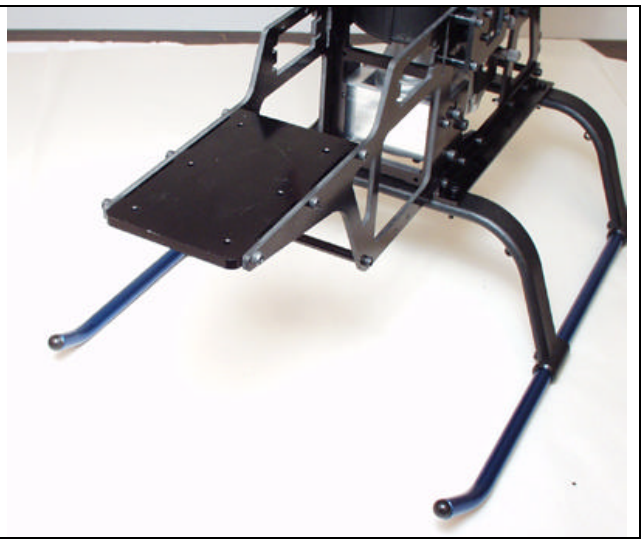
The frame rails are not affected by left and right orientation.	
Attach the front of the rails on both sides with (2) M3-10 Cap Head Bolts.	

Install (8) M3-12 Cap Head Bolts with (8) M3 Locknuts these nuts and bolts will be installed in the next 4 holes on the frame rails.	 
Install a 65mm Cross-member in the last hole of the frame rail using (2) M3-10 Cap Head Bolts.	

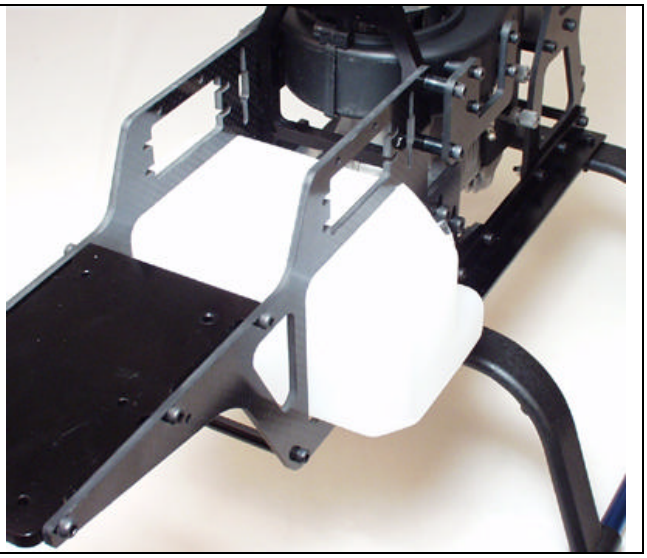
Step 3 – Landing Gear Installation

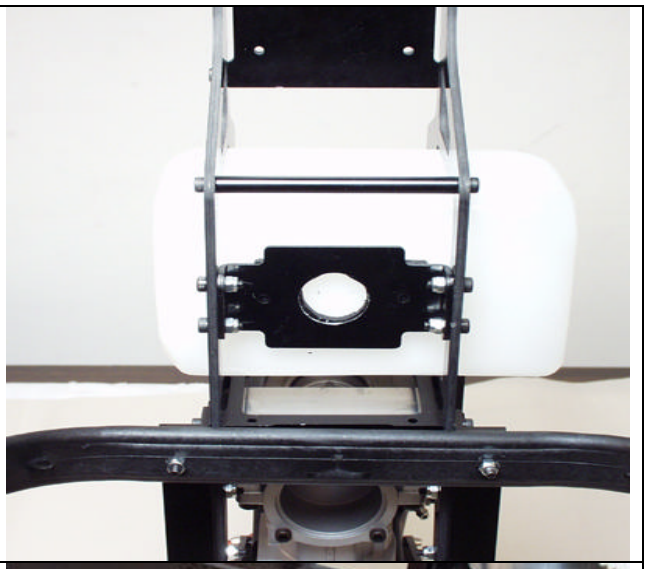
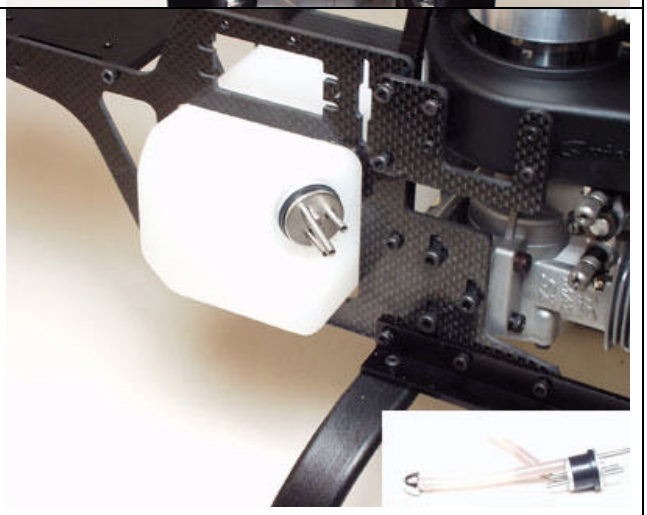
Building Note: *It is recommended but not required to use landing gear dampeners. If so you will have to acquire them and the necessary hardware from your Quick-worldwide dealer.*

Locate and drill two holes 3mm in diameter spaced and 92mm center to center. Note: make Sure the holes are centered on the struts.	
Mount the Struts to the frame rails using (4) M3-18 Cap Head Bolts.	
Slide the Skid pipes thru the Struts till you center them to allow adequate support for the helicopter. Fasten the Struts to the skid pipes using (4) M3-3 Set Screws.	

Locate and epoxy the skid pipe tube end caps into the skid pipes.	

Step 4 – Fuel Tank Installation

Insert fuel tank into the frames and check that it is centered.	

Install mounting plate below tank using (4) M3-10 Cap Head Bolts and (4) M3 Lock Nuts **Note:** For additional support you may want to put a piece of double sided tape onto the mounting plate.	
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!	

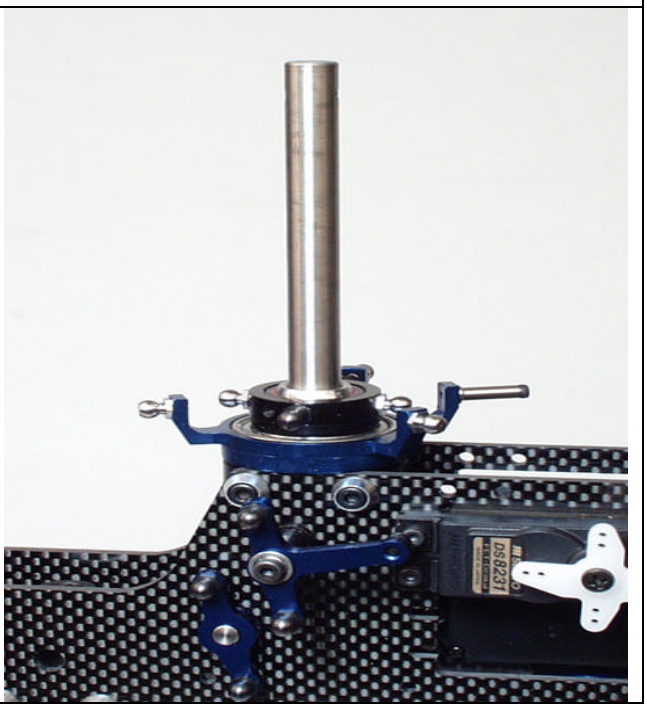
Section 5 –Rotor Head & Control System Assembly

Parts List

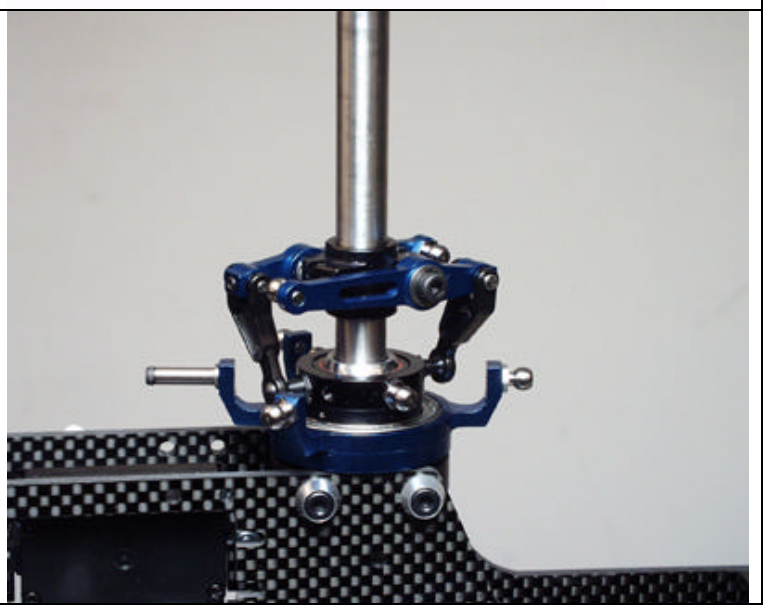
Bag 5	**Bag 5A**
Swash-plate x 1 M2-14 Cap Head Bolt x 1 Swash-plate Anti-rotation pin x 1 M3-4 Pivot ball Studs x 7 M3-6 Pivot Ball Studs x 2 Swash-plate Anti-rotation Guide A x 1 Swash-plate Anti-rotation Guide B x 1 Washout Unit x 1 Washout Link Pins x 2 Washout Links x 2 Washout Guide Pin x 1 M3-3 Set screws x 2 M3-8 Cap Head Bolts x 4 M3-10 Cap Head Bolts x 3	Complete Rotor Head x 1 M3-18 Cap Head Bolt x 1 M3 Locknut x 1 Fly-bar Control Arm A x 2 Fly-bar Control Arm B x 2 Fly-bar Control Arm Spacers x 2 M3-8 Cap Head bolts x 2 M3-4 Pivot Ball Studs x 2 M3-3 Set Screws x 2 M4 Fly-bar Paddles x 2
Parts Loose in Box M4 Fly-bar	

Step 1 - Build & Install Swash-plate

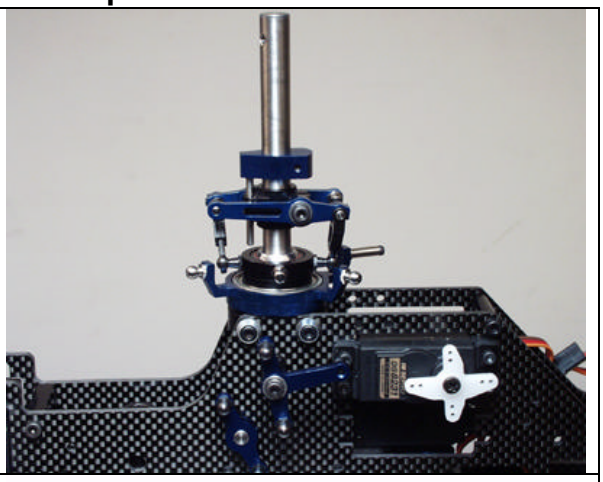
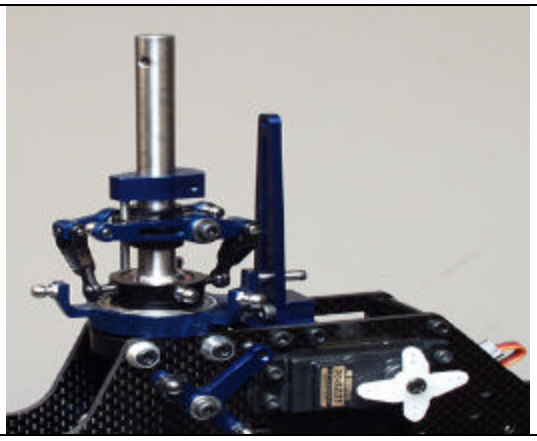
Install (5) M3-4 Pivot Ball Studs on the Swash-plate	

Install (2) M3-6 Pivot Ball Studs on the Swash-plate	
Install (1) Anti-Rotation Guide Pin using (1) M2-14 Cap Head Bolt.	
Slide Completed Swash-plate over the main-shaft.	

Step 2 –Build & Install Washout Unit

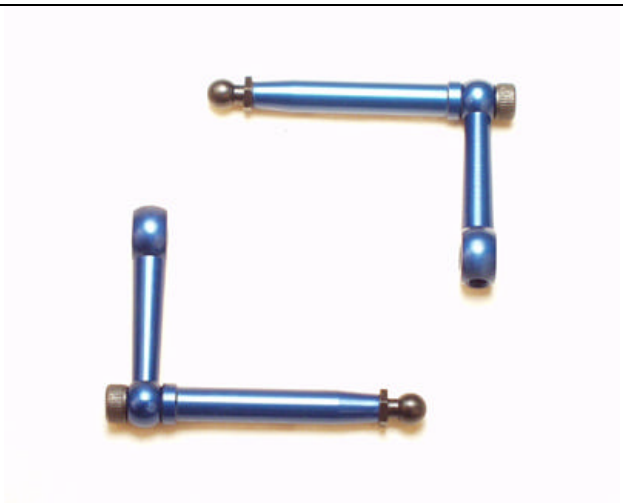
Install (2) M3-4 Pivot Ball Studs	
Install (2) Washout Links using (2) Washout Link Pins & Lock the Pins in place using (2) M3-3 Set Screws	
Slide completed washout over the main-shaft and attach the washout links to the M3-6 Pivot Ball Studs on the inner ring of the swash-plate.	

Step 3 – Build & Install Washout and Swash-plate Anti-Rotation Guides

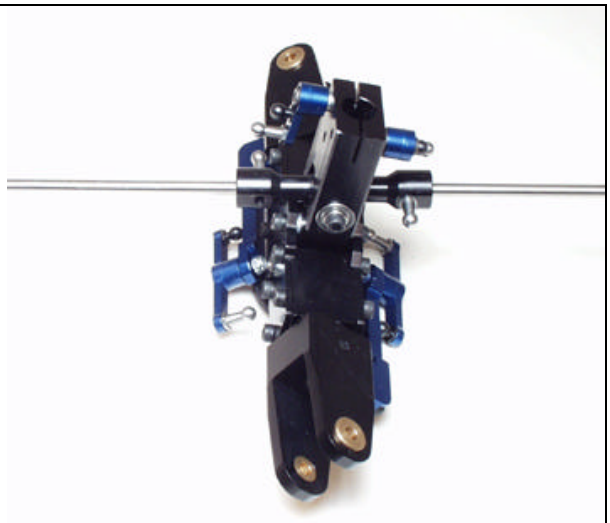
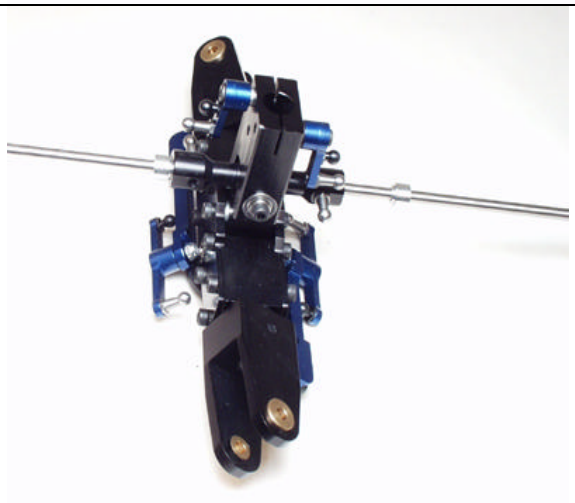
Slide Washout Guide over the main-shaft and put the pin into the slot on the washout unit. Snug the guide to the main-shaft using (1) M3-10 Cap Head Bolt. Note: The final adjustment will be made on this Guide later in setup.	
Attach the Anti-rotation Guides Part A & B together using (2) M3-10 Cap Head Bolts.	
Attach the assembled guide to the frames with (4) M3-8 Cap Head Bolts making sure that you capture the swash pin in the slot of the guide.	

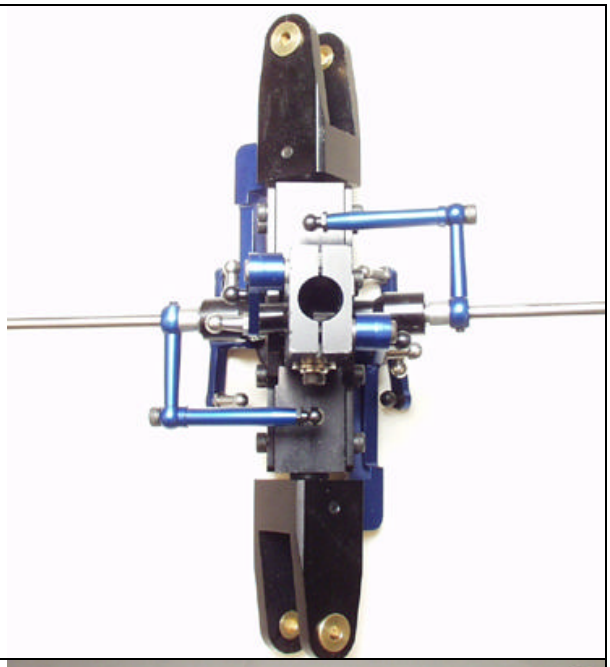
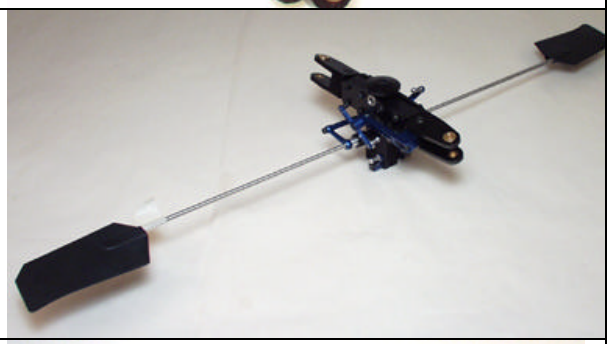
Section 5A

Step 1 – Fly-bar Control arm Assembly

Locate Fly-bar Control Arm Part A & B and attach them together using (2) M3-8 Cap Head Bolts one for each arm set.	
Install (2) M3-4 pivot Ball Studs in each assembly.	

Step 2 – Installing Fly-bar and Control Arms

Locate the (1) M4 Fly-bar slide it thru the Sea-saw unit on the rotor head approximately centering it.	
Locate (2) Fly-bar Control arm spacers and slide one on each side of the fly-bar with the ridge of the spacer towards the bearing in the sea-saw.	

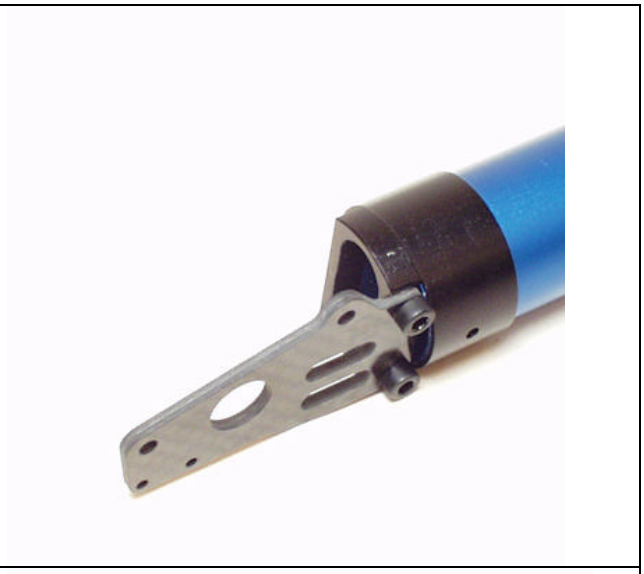
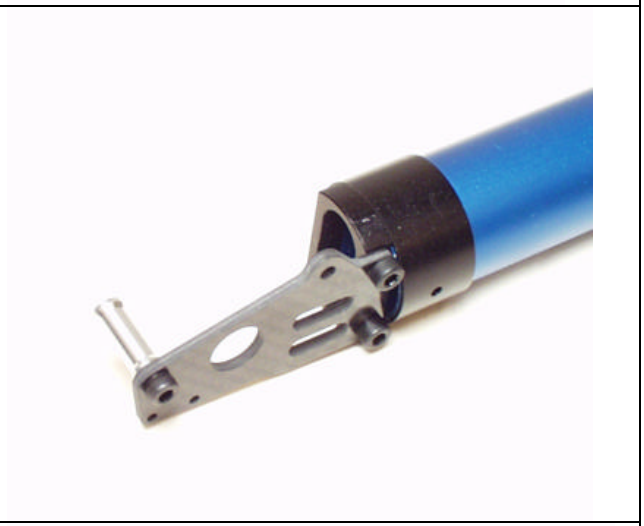
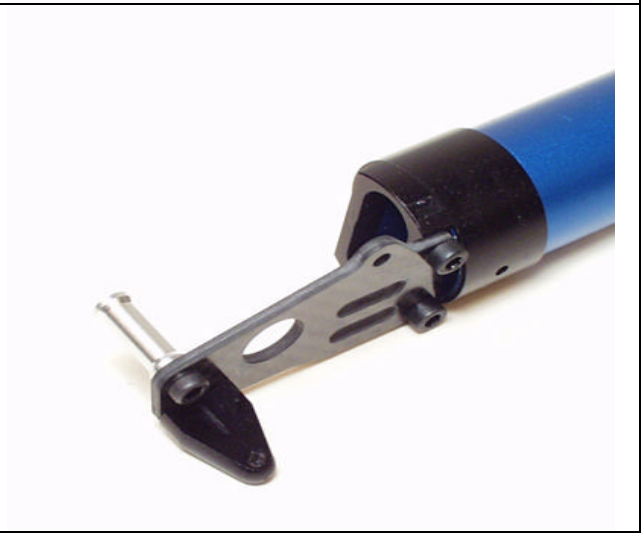
With the rotor head sitting on the head button on the table slide the fly-bar control arms on each side of the sea-saw with arms in left hand orientation. Measure to insure the fly-bar is centered as closely as possible and secure the arms to the fly-bar using (2) M3-3 Set Screws. Also make sure that the arms are parallel to one another.	
Install M4 Paddles on each end of the fly-bar threading them on 15mm on each side.	
Attach the Completed rotor Head to the Main-shaft using (1) M3-18 Cap Head Bolt & (1) M3 Locknut	

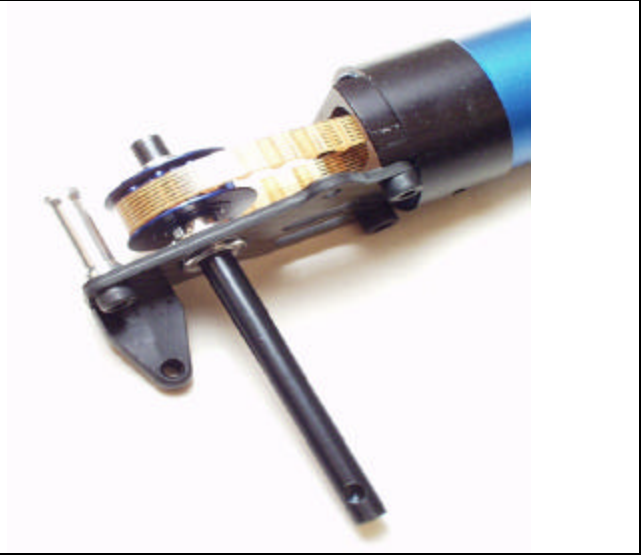
Section 6 – Tail Boom & Rotor Assembly

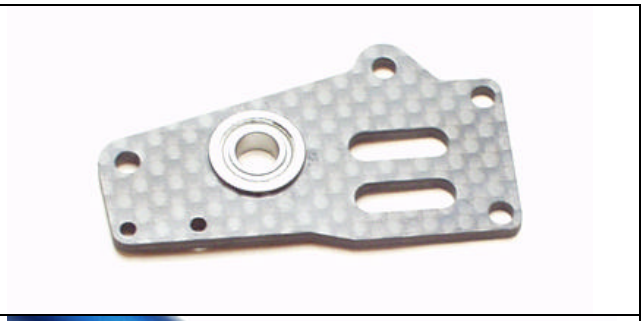
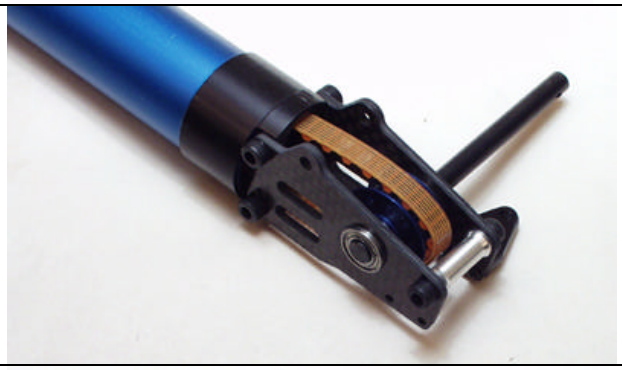
Parts List

Bag 6	Parts found in box
Boom Halves x 2 Horizontal/Vertical Fin Mount x 2 Tail Case Side Plates x 2 Horizontal Fin x1 Vertical fin x 1 Pulley Gear x 1 Pulley Gear Spacer x 2 Tail-output Shaft x 1 5 x 10 x 4 Flanged Bearings x 2 Tail Pitch Slider x 1 Tail Pitch change Lever x 1 Tail Pitch change Lever Mount x1 M3-4 Pivot Ball Studs x 1 Idler Pulley x 1 Idler Pulley Spacer x 2 Triple Bearing Tail Rotor Assm. x 1 Boom Support Ends x 4 Tail Case Cross-member x 1 M3-3 Set screws x 2 M2-8 Phillips Screws x 2 M3 Lock Nuts x 15 M3-6 Cap Head Bolts x 6 M3-10 Cap Head Bolts x 6 M3-12 Cap Head Bolts x 2 M3-18 Cap Head Bolts x 3 M3-22 Cap Head Bolt x 1 M3-35 Cap Head Bolts x 4 M2-12 Cap Head Bolts x 4 M3 Spacer x 1 Tail Rotor Blade Spacers x 4 5mm Plastic Tail Rotor Blades x 2	Boom x 1 Tail Drive Belt x 1 Carbon Boom support Rods x 1

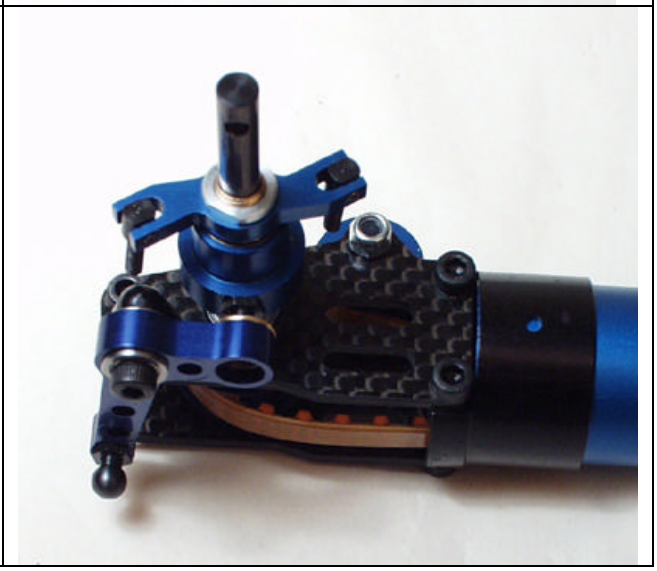
Step 1 – Tail Case Assembly

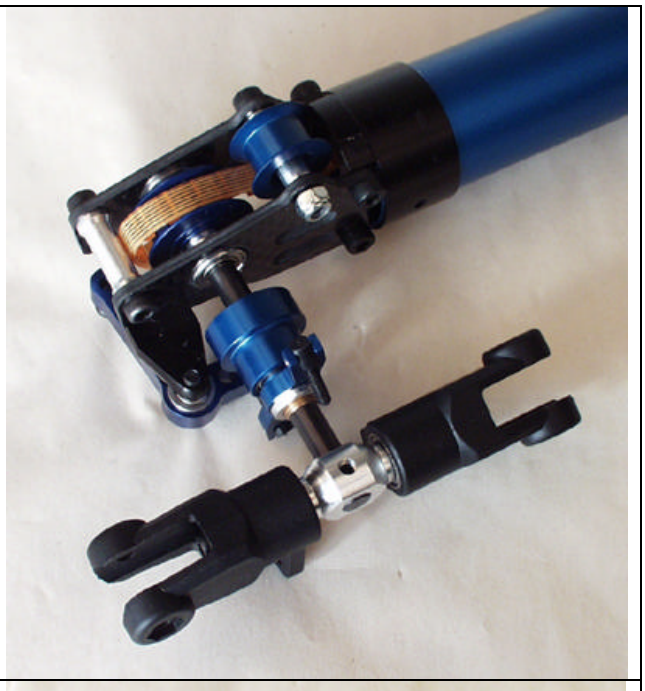
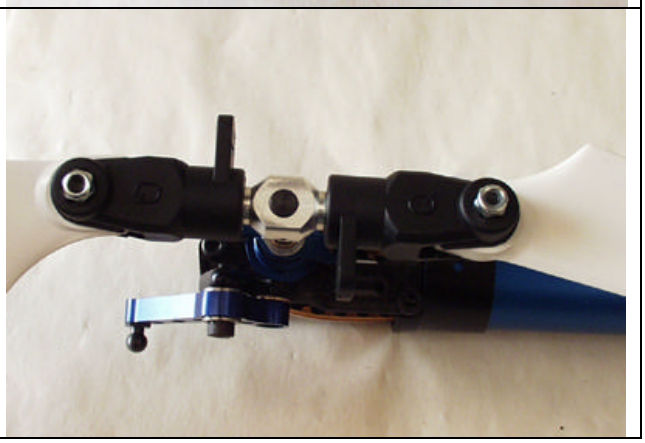
Install (1) Right Tail Case side plate) to the boom using (2) M3-6 Cap Head Bolts.	
Install (1) Rear Tail Case Cross-Member to the right Tail case side plate using (1) M3-6 Cap Head Bolt.	
Install (1) Tail Pitch change lever mount to the right tail case side plate using (2) M2-8 Phillips Screws	

Install (1) 5 x 10 x 4 Flanged Bearing into the Right Tail case Side Plate	
Install (1) Tail pulley gear to the (1) Tail Output Shaft using (1) M3-3 Set Screw	
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.	

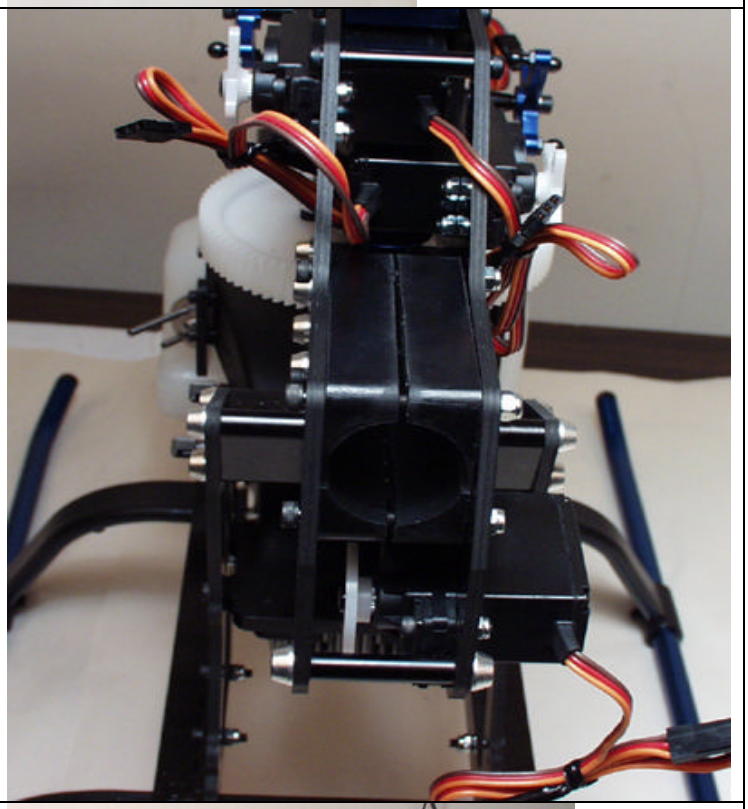
Install (1) 5 x 10 x 4 Bearing into the left tail case side plate.	
Install the left tail case side plate to the boom & tail case cross member using (3) M3-6 Cap Head Bolt	
Install (1) Idler Pulley using (2) Idler Pulley spacers and (1) M3-22 Cap Head Bolt & (1) M3 Lock Nut.	

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	
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 (1) M3 Spacer & (1) M3-12 Cap Head Bolt	

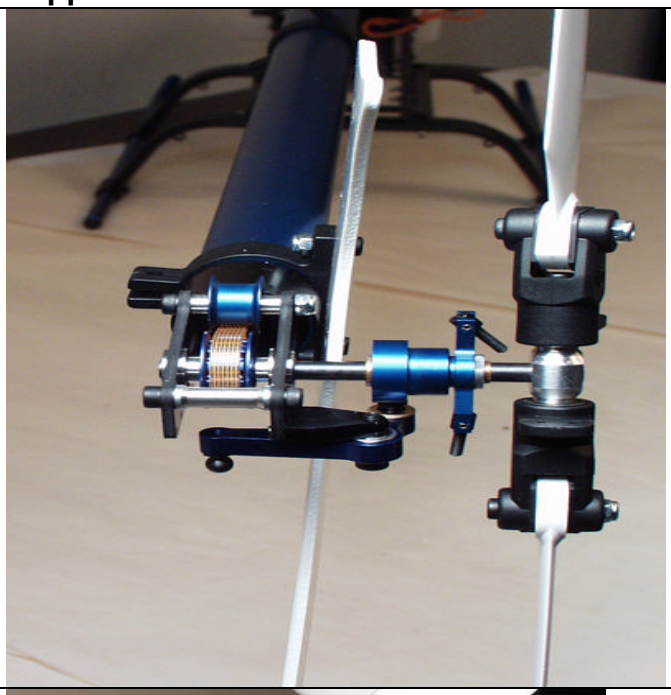
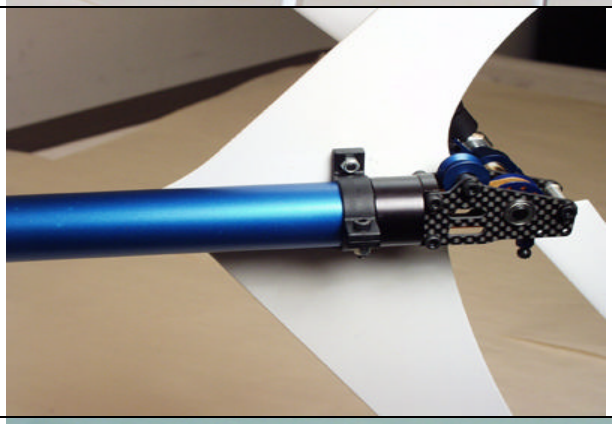
Attach (1) Triple Bearing Tail Rotor Assembly to the Tail Output Shaft using (1) M3-3 Set Screw.	
Install (2) 5mm Tail Rotor Blades Using (4) Tail Rotor Blade spacers, (2) M3-18 Cap Head Bolts, (2) M3 Lock Nuts.	

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	

Step 4 – Fin Mount & Boom Support Installation

Install (1) Vertical Fin to the Rear most fin mount that you earlier placed on the boom using (2) M3-10 Cap Head Bolts & (2) M3 Locknuts.	
Adjust the Fin parallel to frame set and lock it down using (1) M3-12 Cap Head Bolt & (1) M3 Locknut	
Install (1) Horizontal Fin to other Fin Mount Using (2) M3-10 Cap Head Bolts & (2) M3 Locknuts	

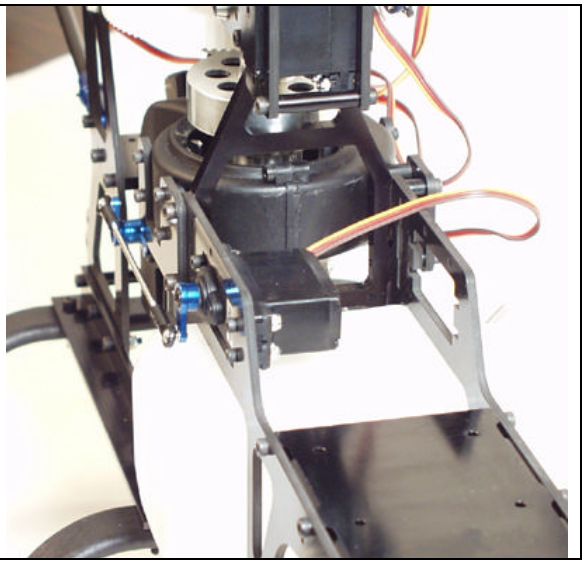
Build the Boom supports using (4) Boom Support ends, (2) Boom Support Rods, & (4) M2-12 Cap Head Bolts. The ends should be parallel to each other and drill a 2mm hole for the retaining bolts to go through and apply a little CA to each end while bolting them together.	
Attach each of the boom supports to the rear lower frames in any of the 3 holes provided using (2) M3-10 Cap Head Bolts & (2) M3 Locknuts	
Attach both boom supports to the vertical fin mount using a (1) M3-18 Cap Head Bolt & (1) M3 Locknut The fin should be perpendicular to the frames.	

Section 7 – Linkage & Final Setup

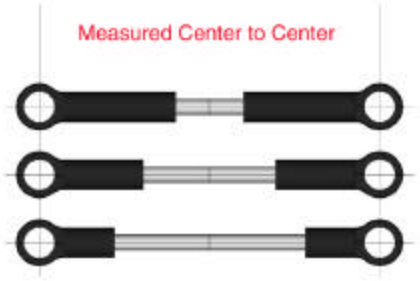
Parts List

Bag 7	**Loose in Box**
2.3-15 Stainless Steel Rod x 2 2.3-25 Stainless Steel Rod x 3 2.3-35 Stainless Steel Rod x 6 2.3-50 Stainless Steel Rod x 3 2.3-70 Stainless Steel Rod x 2 2.3-80 Stainless Steel Rod x 2 2.3-90 Stainless Steel Rod x 1 Long Ball Links x 36 Medium Ball Links x 4 Short Ball Links x 2 M2-10 Phillip Screws x 2 M2-7 Phillip Screws x 9 M2-Nuts x 2 Aluminum Shim Balls x 11 Machined Carbon Push Rod Ends x 2 Tail Control Rod Guides x 3 Tail Control Rod Guides inserts x 3 Tail Control Rod Guides inserts B x 3 40mm Canopy Standoffs x 4 Canopy Grommets x 4 M3-10 Cap Head Bolts x 4 M3-15 Cap Head Bolts x 4	Carbon Tail Control Rod x 1 Fiberglass Canopy **Bag 1A** 4 – M2.6-14 Cap Head Bolts 4 – M2.6 Lock Nuts 2 – Servo Fixing Plates

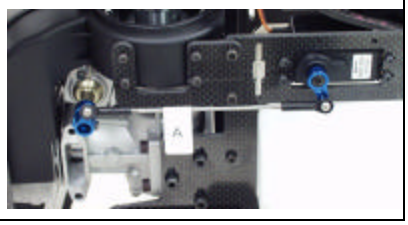
Step 1 – Throttle Servo installation

Install the Throttle Servo using the remaining hardware from Bag 1A. (4) M2.6-14 Cap Head Bolts, (4) M2.6 Lock Nuts, & (2) Servo Fixing Plates	

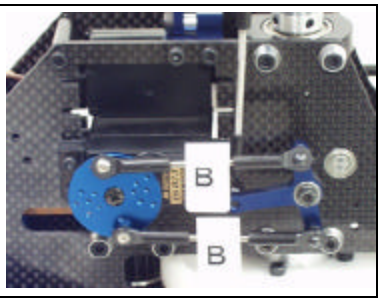
Step 2 – Linkage Rod Setup

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 you	

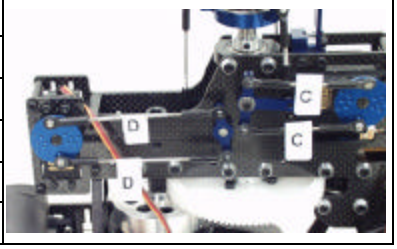
Rod Use	*Throttle Servo to Carburetor*
Linkage ID Letter	A
# of Rods	1
Rod Size	2.3-90
Ball Link 1	Long
Ball Link 2	Long
Center to Center	110mm



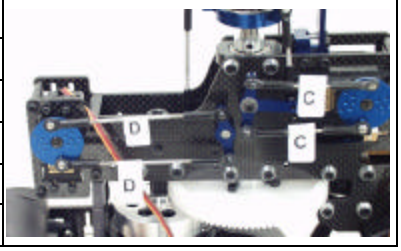
Rod Use	*Rear Lower Swash Servo to T-Lever*
Linkage ID Letter	B
# of Rods	2
Rod Size	2.3-35
Ball Link 1	Long
Ball Link 2	Long
Center to Center	57.6mm



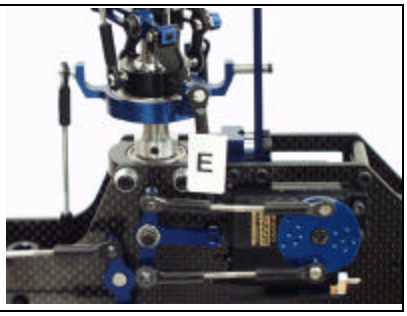
Rod Use	*Rear Upper Swash Servo to T-Lever*
Linkage ID Letter	C
# of Rods	2
Rod Size	2.3-35
Ball Link 1	Long
Ball Link 2	Long
Center to Center	57.6mm



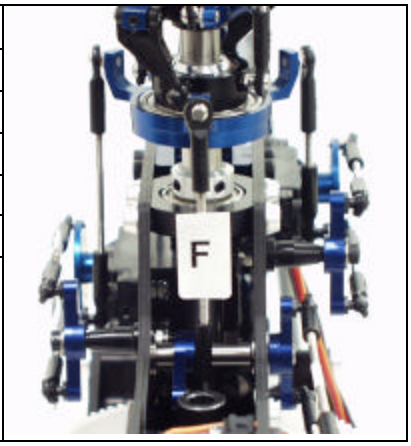
Rod Use	*Elevator Servo to Elevator Control Lever*
Linkage ID Letter	D
# of Rods	2
Rod Size	2.3-70
Ball Link 1	Long
Ball Link 2	Long
Center to Center	88.8mm



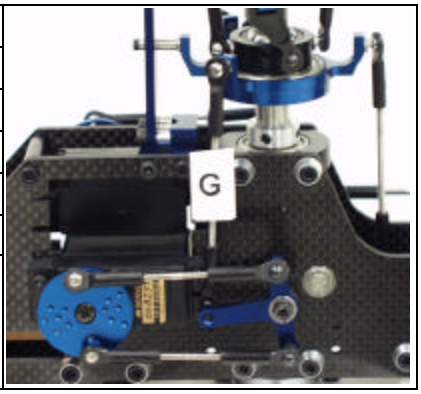
Rod Use	*Upper Swash T-Lever to Swash-plate*
Linkage ID Letter	E
# of Rods	1
Rod Size	2.3-25
Ball Link 1	Long
Ball Link 2	Long
Center to Center	49.1mm



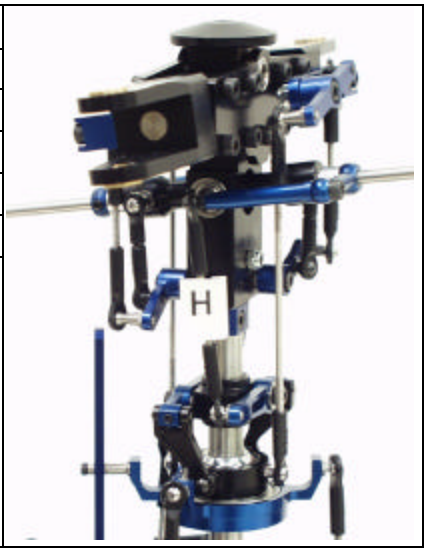
Rod Use	*Elevator Control Lever to Swash-plate*
Linkage ID Letter	F
# of Rods	2
Rod Size	2.3-50
Ball Link 1	Long
Ball Link 2	Long
Center to Center	74.3mm



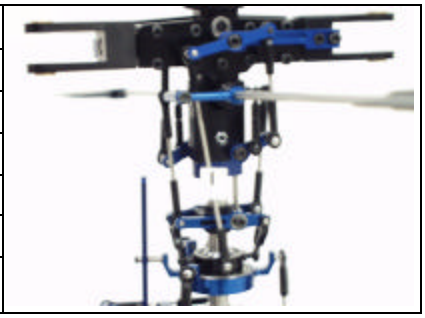
Rod Use	*Lower Swash T-Lever to Swash-plate*
Linkage ID Letter	G
# of Rods	1
Rod Size	2.3-50
Ball Link 1	Long
Ball Link 2	Long
Center to Center	74.3mm



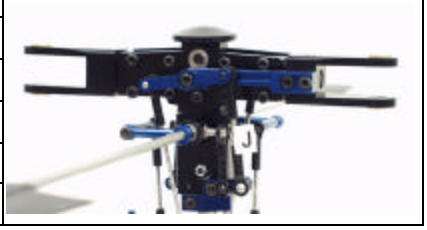
Rod Use	*Washout Arm to Fly-bar Control Arm*
Linkage ID Letter	H
# of Rods	2
Rod Size	2.3-35
Ball Link 1	Long
Ball Link 2	Long
Center to Center	59mm



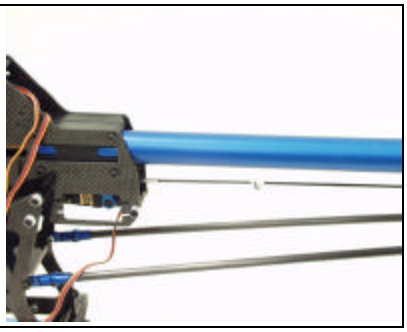
Rod Use	*Swash-plate to Hiller Arm*
Linkage ID Letter	I
# of Rods	2
Rod Size	2.3-80
Ball Link 1	Long
Ball Link 2	Long
Center to Center	104.5mm

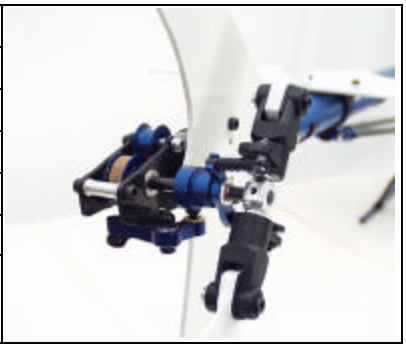


Rod Use	*Hiller Arm to Multiplier Arm*
Linkage ID Letter	J
# of Rods	2
Rod Size	2.3-25
Ball Link 1	Long
Ball Link 2	Long
Center to Center	52.5mm



Rod Use	*Multiplier Arm to Sea-saw*
Linkage ID Letter	K
# of Rods	2
Rod Size	2.3-15
Ball Link 1	Short
Ball Link 2	Med
Center to Center	25.25mm

Rod Use	*Rudder Servo to Tail Pitch Change Lever*	
Linkage ID Letter	L	
# of Rods	1	
Rod Size	Carbon Rod	
Ball Link 1	Long	
Ball Link 2	Long	
Center to Center	768.35mm	

Rod Use	*Tail Pitch Slider to Tail Rotor Assm.*	
Linkage ID Letter	Pitch-slider	
# of Rods	NA	
Rod Size	NA	
Ball Link 1	Med	
Ball Link 2	Med	
Center to Center	NA	

Step 2A – Additional Setup Information

Tail Blade Holder Setup

Using (2) M2-10 Phillips Screws, (2) Shim Balls, (2) M2 Nuts attach the shim balls to the tail blade grips.

Servo Arm Hardware

The remaining (9) Shim Balls & (9) M2-7 Phillips Screws are used on the servo arms.

Tail Rudder Push Rod Hardware

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) Long 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.

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 (4) 40mm Canopy stand-offs using (4) M3-10 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.