SHOGUN 2

3D-Capable, 400-Size Electric-Powered Helicopter

Helicopters

- **Overall Length: 780mm**
- **Main Rotor Diameter: 645mm**
- **Tail Rotor Diameter: 140mm**
- **Overall Height: 200mm**
- **Weight RTF: 520 grams (Approximate)**

Shogun, the industry leader and creator of the 400-class 500 gram helicopter has once again raised the bar with the Shogun 400 V2. We've taken a great heli and made it better with all the parts and features loyal Shogun owners have asked for! Leading this long list of upgrades is the new belt drive system for driving the tail rotor. The belt drive provides a strength and durability level not achievable with a shaft drive design.

But we did not stop there! We packed the Shogun 400 V2 with tons of features you want! Lightweight flybar paddles make the cyclic controls fast without loosing the stability and smoothness that makes the Shogun so rewarding to fly. We've also widened the landing gear, updated the body style, included ball linkages for the controls, shifted the tail rotor servo position to the tail boom, and even extended the battery tray to make it easier to install your favorite LiPO battery.

All of this, combined with our complete line of after-market accessories, as well as our extensive dealer network and online support, means you can do whatever you want with your Shogun and we'll be there to back you up with the service and parts you want! Get a Shogun and find out what the world of performance electric helicopters is really all about! Performance, Reliability, and Excitement!

ASSEMBLY MANUAL AND SETUP GUIDE

The EF Helicopters Shogun 400 V2 helicopter is distributed exclusively by Global Hobby Distributors
18480 Bandilier Circle, Fountain Valley, CA 92708

GLOBAL

Version V1.0 June 2005

Kit Product Number: 163110

FEATURES AND SPECIFICATIONS:

- 90% Factory-Assembled w/Balanced Main Rotor Blades
- Belt Drive Tail Rotor
- Lightweight Paddles
- Boom-Mounted Tail Rotor Servo
- Wide Landing Gear Stance
- Fiberglass Composite Main Frame
- Strong, Lightweight Aluminum Tail Boom
- 3D-Aerobatic, Collective Pitch, 6-Channel Control
- Ball-End Control Linkages
- Extended Aluminum Battery Tray
- Durable Tail Boom Supports
- Complete Ball Bearing Set
- Online Parts Support
- Extensive Hop-Ups and After-Market Parts Available

The EF Helicopters Shogun 400 V2 helicopter is not intended for first-time helicopter pilots. Although it may be possible to learn to fly using this helicopter with an experienced instructor, the helicopter is designed for more experienced pilots.

CUSTOMER SERVICE INFORMATION

If you should find a part missing or damaged, or have any questions about assembly, please contact us at the address below:

Global Services
18480 Bandilier Circle
Fountain Valley, CA 92708

Phone: (714) 963-0329
Fax: (714) 964-6236
Email: service@globalhobby.net

CHECK IT OUT! We urge you to come check out our website at http://globalservices.globalhobby.com. There you will find public message boards frequented by other EF Helicopters product owners and the EF Helicopters support staff. This is a great place to learn about new products, get help and suggestions for your current EF Helicopters products or just simply hang out and chat with people that share your same interests.

To enable us to better serve your needs, please include your email address with any correspondence you send to us. Your email address will be added to our Customer Service Database so you will automatically receive free updates and tech notices for your particular product. You will also receive repair status updates (if applicable) and other important information about your product as it becomes available.

IMPORTANT INFORMATION ABOUT YOUR EMAIL ADDRESS

Global Hobby Distributors will not disclose the information it collects to outside parties. Global Hobby Distributors does not sell, trade, or rent your personal information to others . Your privacy is important to us.

WARNING - PLEASE READ BEFORE PROCEEDING

This R/C helicopter is not a toy! If misused or abused, it can cause serious bodily injury and/or damage to property. Fly only in open areas and preferably at a dedicated R/C flying site. We suggest having a qualified instructor carefully inspect your helicopter before its first flight. Please carefully read and follow all instructions included with this helicopter, your radio control system and any other components purchased separately.

- Just because the Shogun 400 V2 helicopter is powered by an electric motor doesn't mean that you shouldn't exercise caution when flying and operating it. You must use the same amount of caution during use as when flying and operating a glow-powered helicopter.
- We strongly suggest that when you first begin flying the Shogun 400 V2 helicopter that you perform only basic maneuvers, such as hovering, until you are more familiar with the setup and flight characteristics of the helicopter. This will give you time to feel comfortable with the way the helicopter reacts to control inputs and power.
- You must be cautious when plugging the flight battery into the helicopter. Unlike glow-powered helicopters that use a clutch assembly to allow the engine to idle without the rotor blades spinning, an electric helicopter features no such clutch. You must be sure that your transmitter is turned on and the power/collective control stick is in the full idle position before plugging in the flight battery. This will prevent any chance of the rotor blades spinning and harming you while plugging in the flight battery.

LITHIUM POLYMER BATTERY WARNINGS - PLEASE READ BEFORE CHARGING AND USE

- LiPO batteries may explode or catch fire. Serious injury can result from misuse.
- All instructions, warnings and cautions must be followed at all times. Failure to do so can lead to serious injury or fire.
- Do NOT overcharge. Maximum voltage for each pack must be followed.
- Do NOT over-discharge. NEVER discharge below minimum volts.
- Do NOT discharge at a rate greater than the maximum continuous discharge.
- Do NOT use or charge if the battery is hot.
- ONLY use a charger made for Lithium Polymer batteries.
- Do NOT charge at a rate higher than 1C. Example: if the battery's rating is 340mAH, then the charger's charge rate must be set at 340mAH or less.
- Do NOT leave in direct sunlight or in a hot car or storage area.
- Do NOT get wet or expose to moisture.
- Do NOT short-circuit the battery.
- ONLY discharge and charge the battery outdoors or in a fire-safe container.
- Do NOT charge with reverse polarity.
- Do NOT leave the battery connected when not in use.
- Do NOT operate or charge unattended.
- Do NOT solder to the battery directly and do not get the battery hot in any way.
- Always let the battery cool and "rest" between uses and charging.
- Do NOT charge inside your car or inside your house.
- Inspect the battery before each use for swelling or other malformation. If the cell has ballooned, it MUST be discarded.
- Set the charger to 1C (charge at 1/2C or less for the first 5 cycles).
- Check polarity and then connect battery to charger.
- In use, do not over-discharge or exceed maximum discharge.
- When handling the battery, remember not to poke, bend or damage the cell. The cell outer casing is soft and can be damaged.
- Remember, the cells must never exceed 160 degrees Fahrenheit for any reason.

ITEMS NEEDED FOR ASSEMBLY

This section describes our recommendations to help you decide which accessories to purchase for your Shogun 400 V2 helicopter.

Remember, this helicopter is small, lightweight and 3D-capable. When choosing accessories, we suggest choosing the lightest available. The lighter the overall weight of the helicopter, the better it will fly.

RECOMMENDED ITEMS FOR FLIGHT

6 Channel or More Heli-Capable Transmitter

Hitec Eclipse 7 Transmitter
or Equivalent
(Should Feature Throttle/Collective Mixing & Throttle Hold)

P/N 444053

Cirrus CS-10BBHD Micro Servos or Equivalent
(Should Be 8-10 Grams and Feature Ball Bearings)

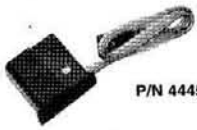
P/N 443536

Receiver uses Cirrus single conversion FM Crystal (not included).

Cirrus MRX-6 FM Micro Receiver
or Equivalent
(Use Micro Receiver Only)

P/N 165020

EF Helicopters ESC-20AH
Micro ESC or Equivalent**

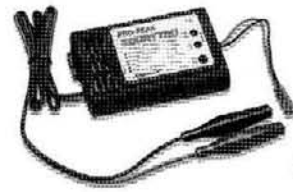


P/N 444509

Cirrus MPG-6 Micro Gyro or Equivalent
(Use Micro Gyro Only)

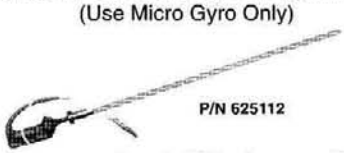
P/N 128763

WattAge 3 Cell 1250mAH - 2000mAH
LiPO Battery or Equivalent



P/N 158370

ProPeak Quattro LiPO Charger
or Equivalent*



P/N 625112

Dean's Whip Antenna (Optional)

*You must use a LiPO-compatible charger to charge LiPO batteries. Do not attempt to charge LiPO batteries with a charger not specifically designed to charge LiPO batteries.

**We recommend the EF Helicopters ESC-20AH ESC because it's designed for use with electric helicopters and specifically for LiPO batteries. This ESC features an on/off switch, smoother start and acceleration, no motor cutoff and an ultra-bright red LED to indicate when it's time to land. It's got a small footprint and is very light, too.

RECOMMENDED ITEMS FOR BRUSHLESS MOTOR SETUP

P/N 165370

EF Helicopters
Brushless Motor w/Pinion Gear

P/N 165022

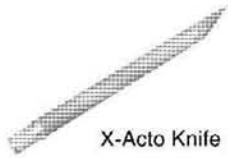
EF Helicopters
Brushless Micro ESC

While the Shogun V2 is 3D-capable out of the box, if you really want to ratchet up the power for ultra-extreme 3D aerobatics, we highly suggest upgrading to our brushless power system. This system drops right in, and it uses the same recommended LiPO battery. The only other addition is the use of a brushless* ESC.

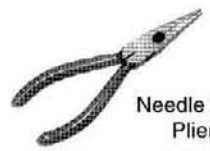
*You must use a brushless-compatible ESC with the brushless motor. Do not attempt to use a standard ESC with the brushless motor. It won't work.

TOOLS AND SUPPLIES REQUIRED

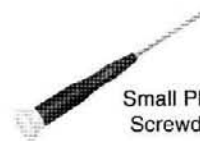
Double-Sided Foam Tape



X-Acto Knife

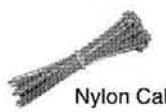


Needle Nose
Pliers



Small Phillips
Screwdriver

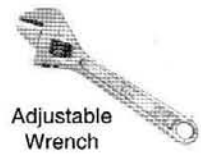
Velcro® Strip



Nylon Cable Ties

Assorted Hex Wrenches

Scissors



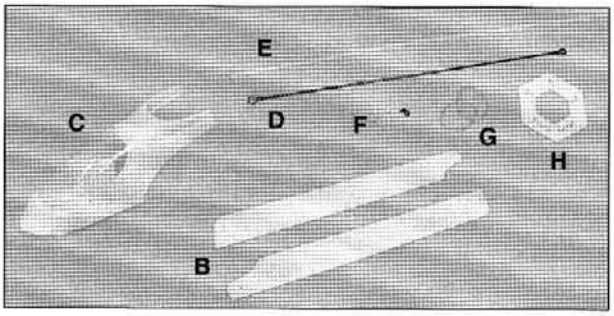
Adjustable
Wrench

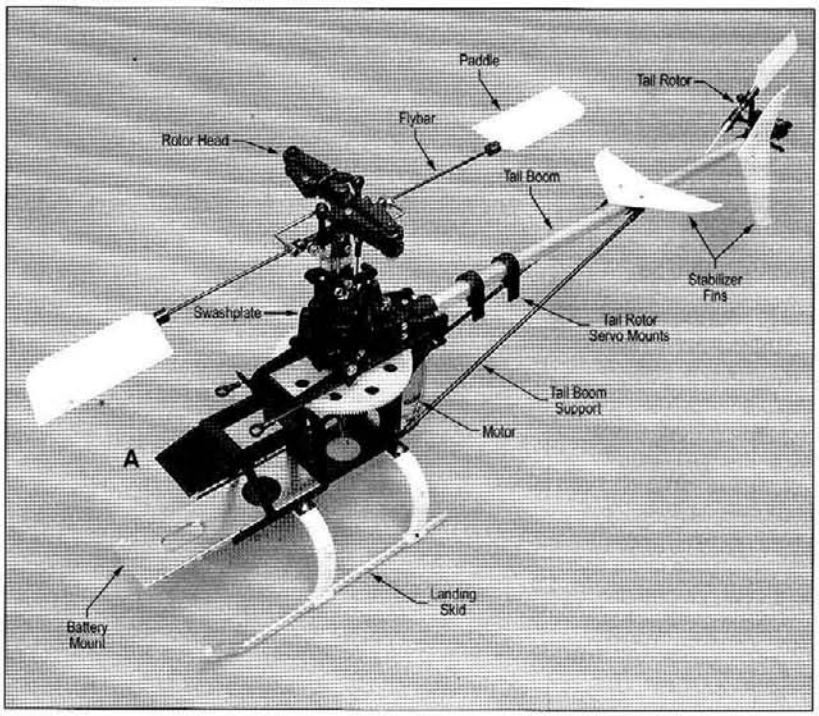
NOTE: A soldering iron and solder may be necessary if you need to change and/or add compatible plugs to your ESC and battery.

PARTS IDENTIFICATION AND FAMILIARIZATION

If you find any parts missing or damaged, please contact us as soon as possible, using the Customer Service Information on page # 2.

- ❑ (A) Shogun 400 V2 Helicopter - 1
- ❑ (B) Main Rotor Blades - 2
- ❑ (C) Body with Clear Canopy - 1
- ❑ (D) Tail Rotor Pushrod - 1
- ❑ (E) Antenna Support Tube - 1
- ❑ (F) Ball-End Mounts with Screws - 4
- ❑ (G) Rubber Bands - 2
- ❑ (H) Pitch Gauge - 1
- ❑ (I) Decal Set (Not Shown) - 1





FINAL ASSEMBLY SEQUENCE

Now that you're familiar with the main component-parts of your new Shogun 400 V2 helicopter, it's time to get started finishing it. There's really not much to it. Below we outline the main steps for your convenience:

- Install Your Servos
- Install Your Gyro, Electronic Speed Control and Receiver
- Install Your Battery
- Adjust the Tail Rotor Belt Tension
- Connect the Pushrod Linkages and Install the Tail Rotor Pushrod
- Install the Main Rotor Blades
- Apply the Decals
- Install the Body
- Balance the Helicopter
- Test Controls for First Flight and Set Up Your Transmitter

If you'd like to convert your Shogun 400 V2 helicopter from belt drive to solid carbon shaft drive, please see page # 17.

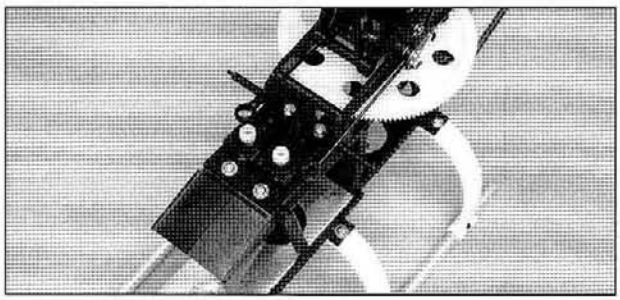
ASSEMBLY DRAWINGS AND REPLACEMENT PARTS INFORMATION

This assembly manual includes a complete set of 3D assembly drawings, a photo-illustrated replacement parts list and a photo-illustrated hop-ups and option parts list. These sections begin on page # 14. Please save this manual and refer to these sections if you ever need to order replacement parts or fix any problems with your helicopter.

INSTALLING YOUR SERVOS

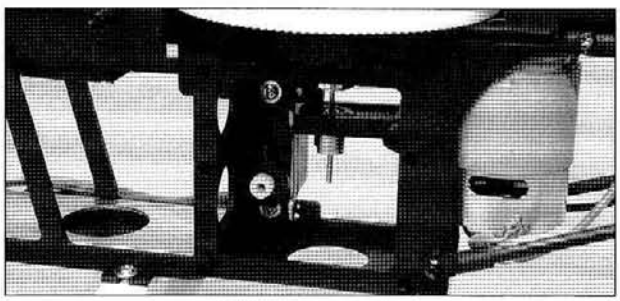
✦**IMPORTANT**✦ The helicopter frame is predrilled to fit servos with single-ended servo mounting lugs. If the servos you use have dual-ended mounting lugs, you will need to drill new 1/16" diameter holes through the frame to install the mounting screws.

For the best control response and reliability, it's important to make sure that you use high-quality, ball bearing micro servos. We don't recommend using bushing-supported servos, or control response and reliability will be compromised.



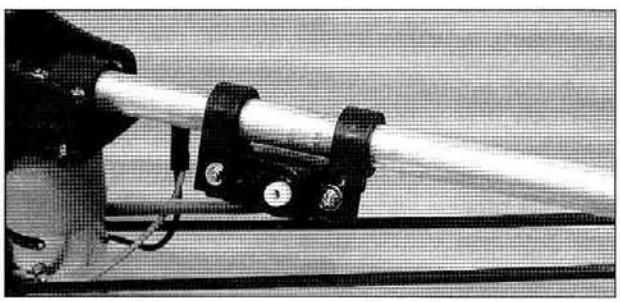
❑ Install your pitch (elevator) and roll (aileron) servos into the servo mounts at the front of the main frame.

✦**IMPORTANT**✦ Both servo output shafts MUST be toward the FRONT of the helicopter, so that the linkages will line up with the servo arms correctly.



❑ Install your collective servo into the servo mount in the side of the main frame. If you're installing a servo with single-ended servo mounting lugs, make sure to install the servo in the holes closest to the front of the frame.

✦**IMPORTANT**✦ The servo output shaft MUST be toward the BOTTOM of the helicopter, so that the linkage will line up with the servo arm correctly.

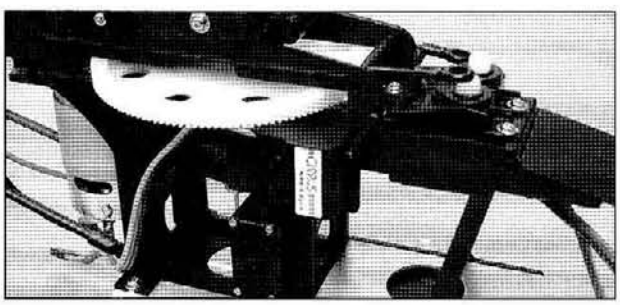


❑ Install your tail rotor (rudder) servo to the two servo mounting beams on the tail boom. Again, you may need to drill new holes through the mounting beams to fit your particular servo.

☞ You may need to loosen the screws in the servo mounting beam clamps, so that you can adjust the width of the beams to fit your servo.

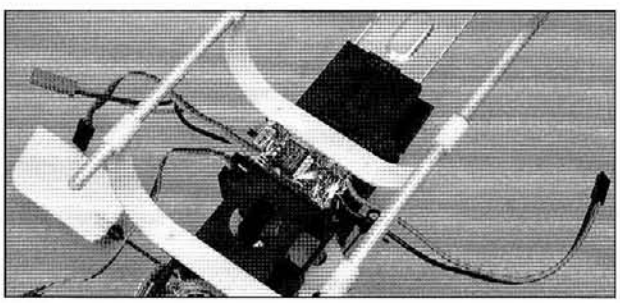
✦**IMPORTANT**✦ The servo output shaft MUST be toward the BACK of the helicopter.

INSTALLING YOUR GYRO, ELECTRONIC SPEED CONTROL AND RECEIVER



❑ Mount your gyro to the right side of the main frame, in the small mounting space below the main drive gear and directly above the top of the collective servo, using a piece of double-sided foam tape.

✦**IMPORTANT**✦ When installing your gyro, make sure to install it in the correct direction (see your gyro installation guide for more information). Making sure that the gyro is installed in the correct direction will ensure that the gyro moves the tail rotor in the correct direction.



❑ Mount your ESC to the bottom of the main frame, in the mounting space directly behind the forward landing gear strut, using a piece of double-sided foam tape.

✦**IMPORTANT**✦ If you're using the EF Helicopters ESC-20AH, make sure that the red LED points down so that you can see it during flight.

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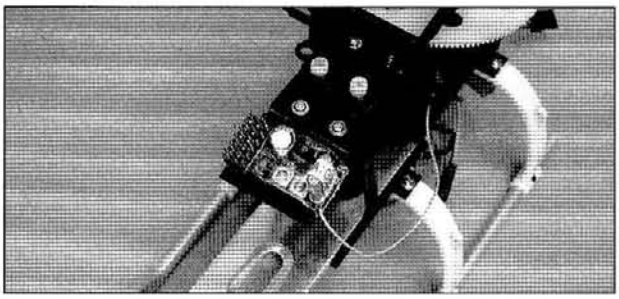
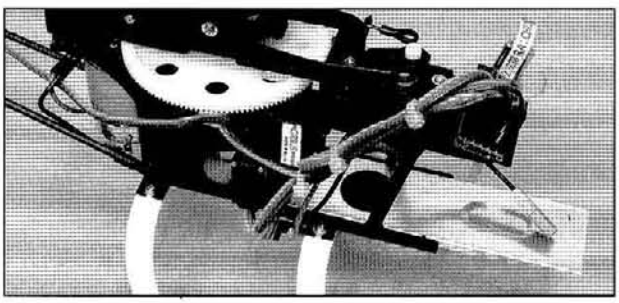


❑ Mount your receiver to the mounting space in front of the pitch and roll servos, using a piece of double-sided foam tape.

✦IMPORTANT✦ When installing your receiver, make sure that the servo lead mounting pins are toward the right side of the main frame. This will make it easier to connect the servo leads.

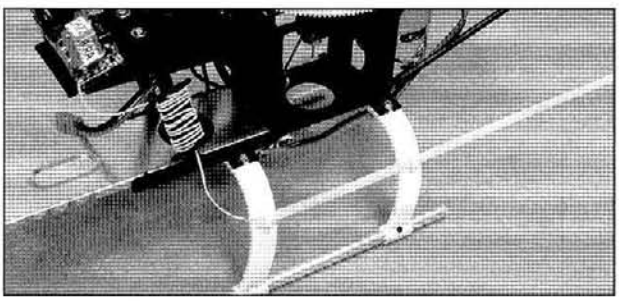


❑ Plug your servos, gyro, electronic speed control and ESC leads into their proper slots in your receiver (see chart below).

❑ Using nylon cable ties, carefully tie the servo wires together neatly to ensure that they don't hang loose and can't interfere with any mechanical parts, especially the main drive gear.

Double-check with your radio control system manual for the correct channel slots in your receiver to plug the servo leads into. Most receivers will be like the following, but yours could differ:

Roll Servo ---------- Channel 1	**Gyro ---------- Channel 4**
Pitch Servo ---------- Channel 2	**Collective Servo --- Channel 6**
ESC Throttle --------- Channel 3	**Tail Rotor Servo ---- Gyro**



❑ Snap the plastic antenna tube into the brackets on one side of the landing gear struts, then run the antenna through the tube and secure it to the vertical stabilizer, using a rubber band (not included).

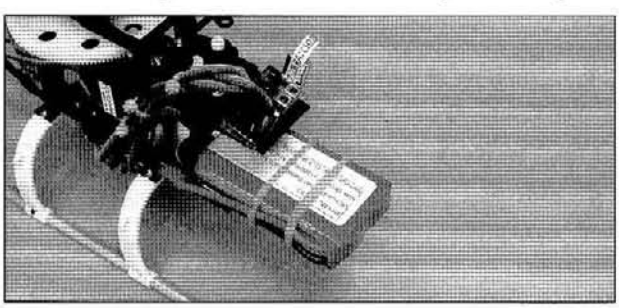
☞ As an alternative, you could also purchase and install a whip antenna, like the one shown on page # 3.

✦IMPORTANT✦ When securing your antenna to the helicopter, it's very important that the excess antenna cannot be drawn into the main rotor blades or the tail rotor. Because of the length of the antenna, we wrapped the first few inches around an antenna bobbin, so that there was no excess that would hang past the tail rotor and get cut off.

INSTALLING YOUR BATTERY

✦IMPORTANT✦ Before charging your battery, it's very important to read and fully understand the warnings listed on page # 2. Failure to understand those warnings could cause failure of your battery, resulting in damage to the battery, your battery charger or even to yourself. **Do not leave the battery unattended during the charging process.**

❑ If necessary, install a connector onto your battery that is compatible with the battery connector on your ESC.



❑ Fully charge your battery, then set it onto the battery mount and secure it into place, using the two rubber bands included.

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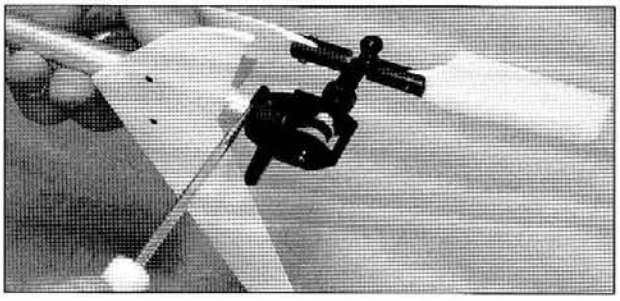
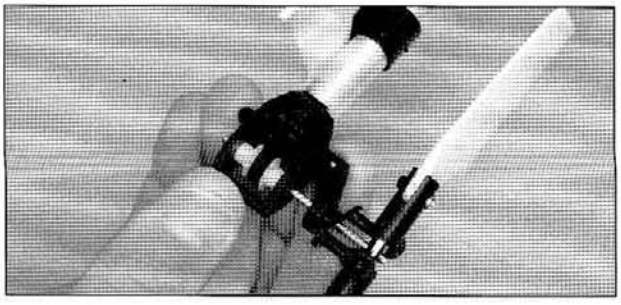
ADJUSTING THE TAIL ROTOR BELT TENSION

✦IMPORTANT✦ It's important to make sure that tail rotor belt tension is set properly. If the belt is too tight, the gears and/or the belt could fail, and the drive-train can bind, causing loss of power and control. If the belt tension is too loose, the belt could slip and cause loss of control.



❑ Loosen the retaining screw in the side of the tail gear case, then loosen the two upper screws that hold the tail gear case halves together.



❑ Adjust the rotor belt tension by adjusting the location of the tail gear case assembly on the boom either forward or backward. When adjusted properly, the rotor belt should be taught, but not so tight that the assembly binds when the main rotor is turned.

❑ When satisfied with the alignment, tighten all of the screws.

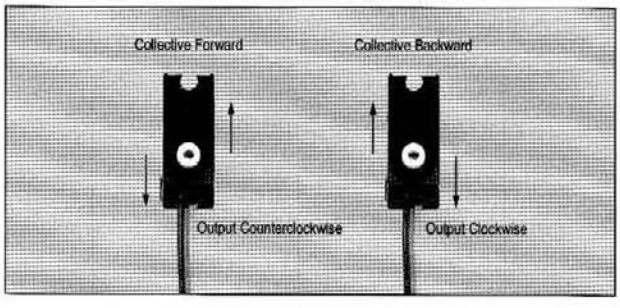
✦IMPORTANT✦ Before retightening the screws, make sure that the tail rotor is lined up 90° to the main rotor. See page # 11.

CONNECTING THE FLIGHT CONTROL LINKAGES

Even though it's pretty straightforward, take your time when connecting the flight control linkages. Here are a few things to remember:

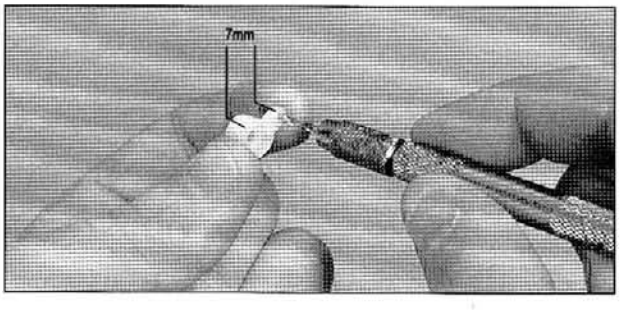
- Before installing the servo arms, the servos MUST be centered.
- Before attaching the control linkage wires to the ball-links, the particular control system that you're working on MUST be centered.
- The ball-links MUST be installed the specified distance from the center of the servo arms.
- The servo reversing settings in your transmitter MUST be set properly, so that the servo arms move in the correct direction.
- Make sure that your radio transmitter is set to heli mode and that collective mixing is turned ON.

INSTALLING THE COLLECTIVE CONTROL LINKAGE



❑ Turn on your radio control system and center the collective servo. It's important that the collective stick on your transmitter is centered, too.

❑ Double-check that the collective servo is moving in the correct direction. When the collective stick is moved forward, the servo output shaft should rotate counterclockwise.



❑ Cut away all but one arm from a servo horn.

❑ Enlarge the hole in the servo arm that is 7mm out from the center of the servo horn, just large enough to fit the diameter of the collective control linkage wire.

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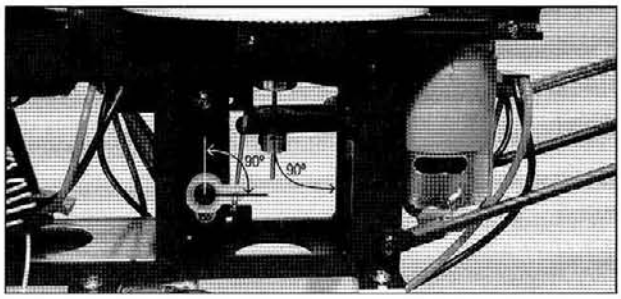
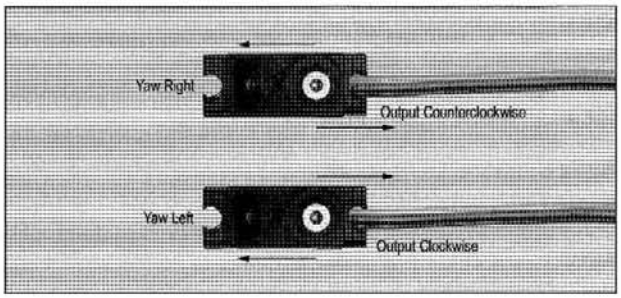


❑ Connect the Z-Bend in the collective control wire to your servo arm, then attach the servo arm to the servo.

✦IMPORTANT✦ When set up properly, the servo arm should be 90º to the servo and the collective pitch plate should be 90º to the vertical frame post.

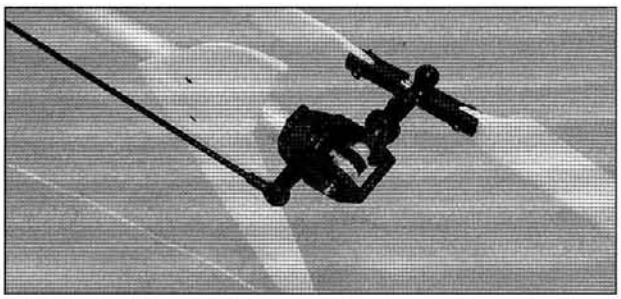
❑ Install the servo arm retaining screw, then move the collective up and down several times to ensure smooth operation.

INSTALLING THE TAIL ROTOR CONTROL LINKAGE

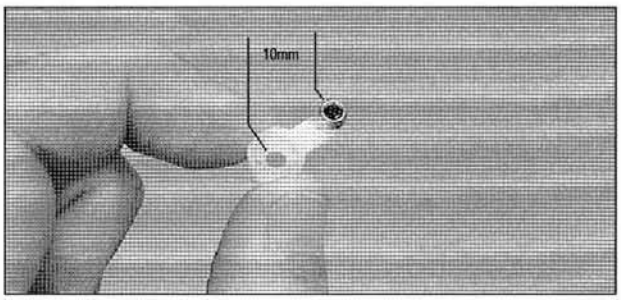


❑ Turn on your radio control system and center the tail rotor servo.

❑ Double-check that the tail rotor servo is moving in the correct direction. When the yaw stick is moved right, the servo output shaft should rotate counterclockwise.



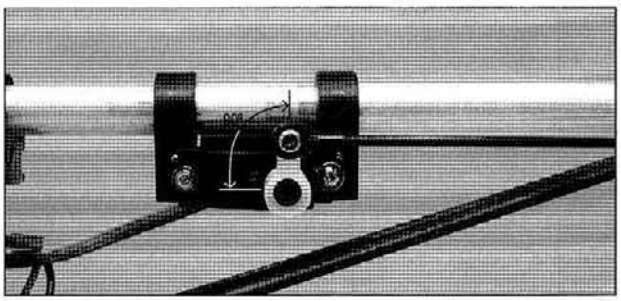
❑ Snap one end of the tail rotor pushrod onto the ball-link that's preinstalled on the tail rotor control arm.



❑ Cut away all but one arm from a servo horn.

❑ Install one ball-link into the hole that is 10mm out from the center of the servo horn, using the small screw provided.

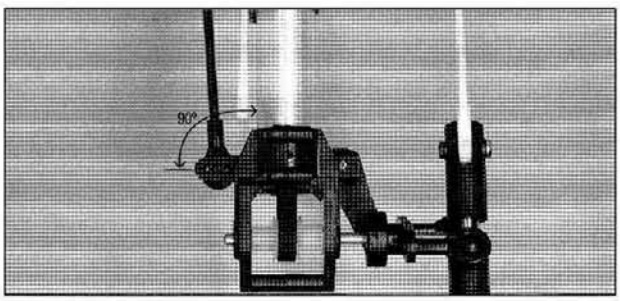
✦IMPORTANT✦ If the hole in your servo arm is too large for the screw to thread into, you will need to use a machine screw and nut to install the ball-link to the servo arm.



❑ Attach the servo arm to the servo, then snap the end of the tail rotor pushrod onto the ball-link.

✦IMPORTANT✦ When set up properly, the servo arm should be 90º to the servo.

☞ You may need to slide the servo mount assembly forward or backward, so that you can attach the tail rotor pushrod to the ball-link.



❑ With the servo arm centered, carefully slide the servo mount assembly forward or backward until the tail rotor control arm is 90º to the tail boom.

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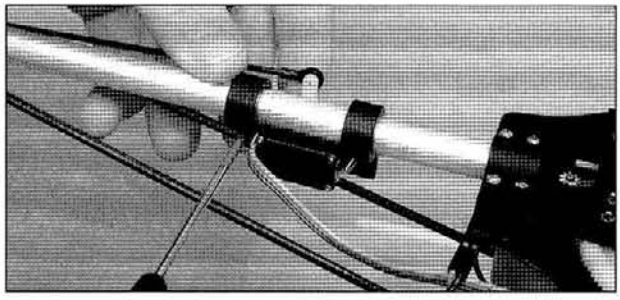
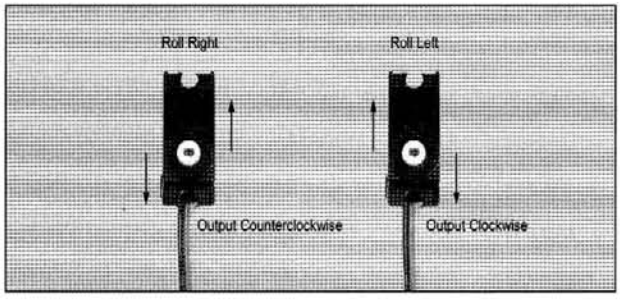


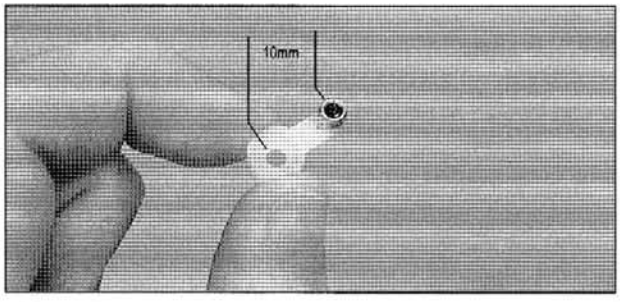
❑ When satisfied with the alignment, tighten the two clamp screws firmly to secure the servo mount assembly into place.

INSTALLING THE ROLL CONTROL LINKAGE



❑ Turn on your radio control system and center the roll servo.

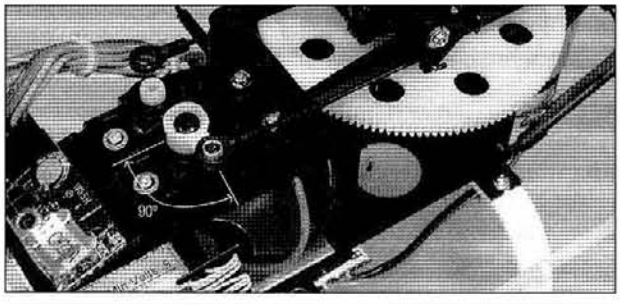
❑ Double-check that the roll servo is moving in the correct direction. When the roll stick is moved right, the servo output shaft should rotate counterclockwise.



❑ Cut away all but one arm from a servo horn.

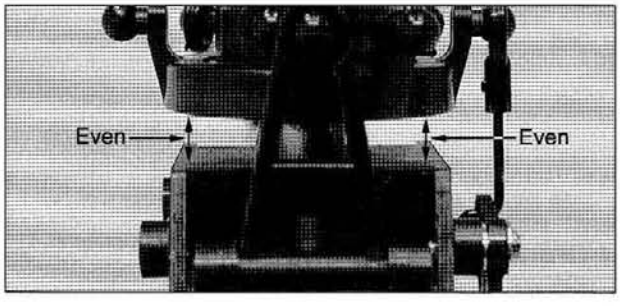
❑ Install one ball-link into the hole that is 10mm out from the center of the servo horn, using the small screw provided.

✦IMPORTANT✦ If the hole in your servo arm is too large for the screw to thread into, you will need to use a machine screw and nut to install the ball-link to the servo arm.



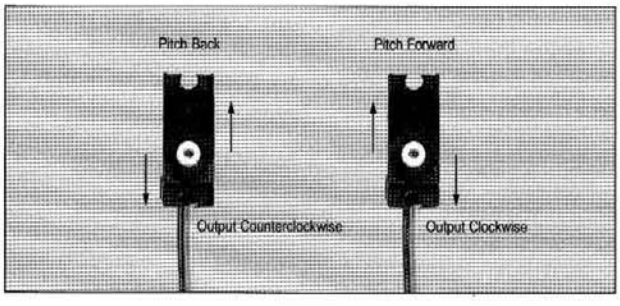
❑ Attach the servo arm to the servo, then snap the end of the roll control pushrod onto the ball-link.

✦IMPORTANT✦ When set up properly, the servo arm should be 90° to the servo.



❑ Check to ensure that the swashplate is level when viewed from the front. If it's not, you will need to unsnap the ball-end and thread it in or out to adjust the length of the control linkage.

INSTALLING THE PITCH CONTROL LINKAGE



❑ Turn on your radio control system and center the pitch servo.

❑ Double-check that the pitch servo is moving in the correct direction. When the pitch stick is pulled back, the servo output shaft should rotate counterclockwise.

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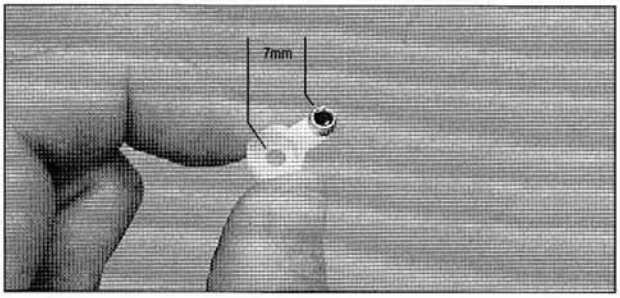
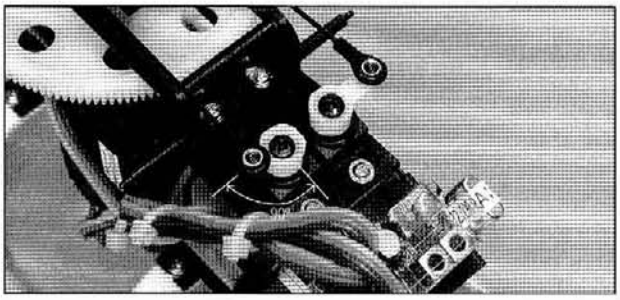


❑ Cut away all but one arm from a servo horn.

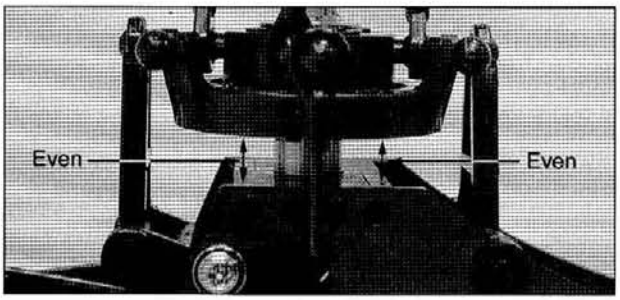
❑ Install one ball-link into the hole that is 7mm out from the center of the servo horn, using the small screw provided.

✦IMPORTANT✦ If the hole in your servo arm is too large for the screw to thread into, you will need to use a machine screw and nut to install the ball-link to the servo arm.



❑ Attach the servo arm to the servo, then snap the end of the roll control pushrod onto the ball-link.

✦IMPORTANT✦ When set up properly, the servo arm should be 90° to the servo.



❑ Check to ensure that the swashplate is level when viewed from the side. If it's not, you will need to unsnap the ball-end and thread it in or out to adjust the length of the control linkage.

INSTALLING THE MAIN ROTOR BLADES

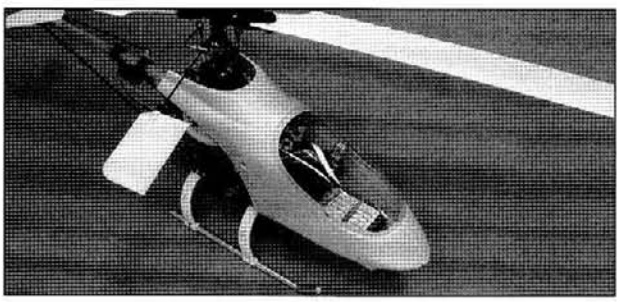
✦IMPORTANT✦ The rotor blades are balanced from the factory. No balancing is required. **The rotor head turns clockwise.**

❑ Install the main rotor blades, making sure that the rounded leading edge of both blades is facing the same direction as the rounded leading edge of the paddles.

✦IMPORTANT✦ Don't overtighten the socket-cap screws. Tighten them completely, then back them off about 1/4 - 1/2 of a turn. This will ensure that the rotor blades are tight, but not binding.

APPLYING THE DECALS AND INSTALLING THE BODY

❑ Carefully cut out and apply the decals to the body and stabilizers, using the box cover photos for reference. If any air bubbles form under the decals when you apply them you can "prick" the bubbles with a straight pin to release the air.

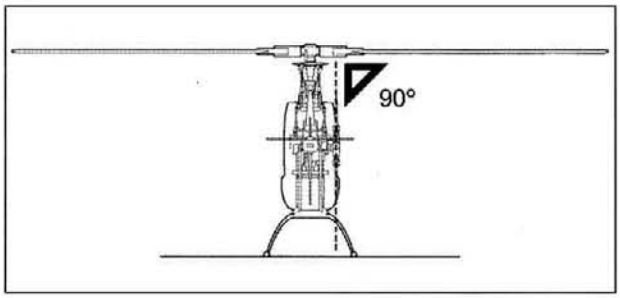


❑ Slide the body over the front of the main frame. To secure it into place, simply snap the predrilled hole in each side of the body over the matching pin on the body post on each side of the main frame.

✦IMPORTANT✦ Double-check that no part of the body interferes with the main drive gear or the swash plate assembly. If the fit is too close, trim the body slightly, using a pair of scissors.

PREFLIGHT SETUP

Before flying your helicopter for the first time, it's important to double-check everything once more and to make sure that you've set the helicopter up properly for its first few flights.



❑ Check the alignment of the tail rotor. With the main rotor blades level, look from the back of the helicopter at the tail rotor. It should be aligned perpendicular to the main rotor blades.

☞ You can adjust the angle of the tail rotor by loosening the retaining screw in each side of the tail gear case, then by loosening the two upper screws that hold the tail gear case halves together. Pivot the tail rotor, and when satisfied with the alignment, tighten the screws.

❑ Double-check the tail rotor belt tension as described on page # 7.

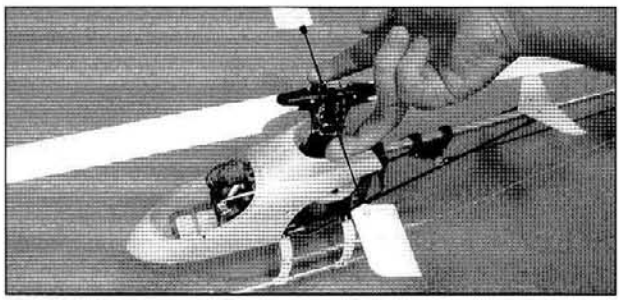
❑ Double-check that all of the screws that are used throughout assembly are tight. This includes the small self-tapping screws and the grub screws, too. All screws should be secured into place, using thread-lock (if threaded into metal) or with a small drop of thin C/A if threaded into nylon or composite material. This will prevent the screws from loosening during flight.

❑ Before each flight you should range-test your radio control system to ensure that it is functioning properly.

❑ Double-check that you've installed the servo horn retaining screws in all of the servos.

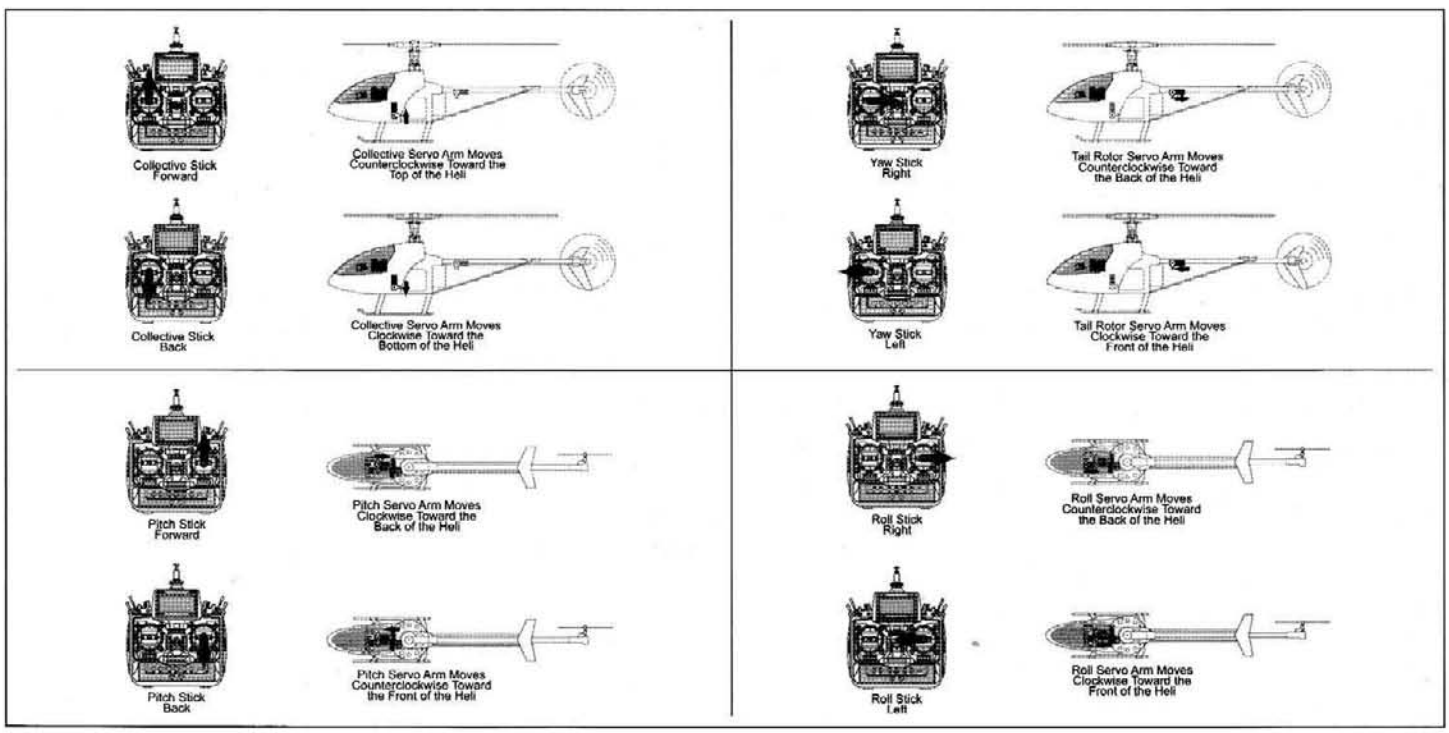
❑ Double-check that the main rotor blade screws and the tail rotor blade screws are snug, but not too tight.

❑ Double-check that the paddles are level when all of the controls are centered. Both paddles should be even with each other, too.



❑ Balance the helicopter by carefully lifting it up by the flybar with two fingers, as shown. When balanced properly, the helicopter should hang level when you lift it. If the nose of the helicopter hangs down, move the flight battery back a little. If the tail of the helicopter hangs down, move the flight battery forward a little.

❑ Double-check that all of the controls are working properly and that they are moving in the correct direction as described below:



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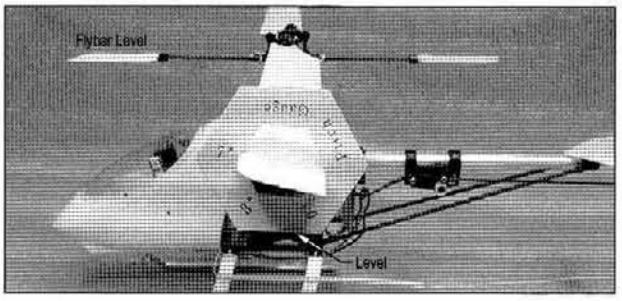
ADJUSTING THE COLLECTIVE PITCH - FOR NEW PILOTS OR NON-3D FLYING

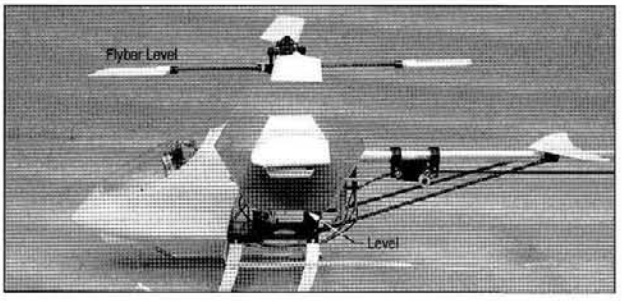
If you've never flown the Shogun before, or if you are new to helicopters (gas-powered or electric), or if you will not be using your Shogun V2 for 3D flight, then we recommend setting the collective pitch as described in this section. We suggest using positive 7º and negative 3º pitch. This will make the helicopter easier to hover and control throttle.

♦IMPORTANT♦ Before adjusting the collective, make sure to unplug the motor from the ESC. This will ensure that the motor doesn't turn on when you make collective adjustments.

♦IMPORTANT♦ When adjusting the collective as described below, it's not necessary to first zero out the rotor blade pitch angle with the collective stick centered.



❑ Set the recommended amount of collective pitch, using the pitch gauge included. To begin, slide the pitch gauge onto one main rotor blade, with the 7º mark lined up with the leading edge of the rotor blade. Now, apply full up collective. Using your transmitter's EPA adjustment, adjust the collective so that the base of the pitch gauge is parallel to the flybar.



❑ Remove the pitch gauge, **flip it around so that the printed numbers are toward the rotor head, and reinstall it so that the 3º mark is lined up with the trailing edge of the rotor blade.** Now, apply full down collective. Using your transmitter's EPA adjustment, adjust the collective so that the base of the pitch gauge is parallel to the flybar.

☞ You must flip the pitch gauge around so that you can properly set the negative pitch amount.

♦IMPORTANT♦ Using this setup method, the blades will not have 0º pitch when the collective stick is centered. 0º pitch will occur at approximately 1/3rd collective stick. This will result in the helicopter being easier to hover and control the throttle.

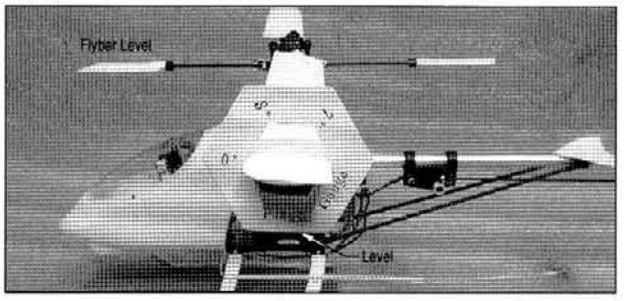
❑ We recommend between 75% and 100% throttle hold, so that you can switch the throttle to a fixed position by pressing the throttle hold switch on your transmitter. This allows the collective to work independently of the throttle.

❑ We use only standard collective/throttle mixing. If you would like to experiment with a linear throttle curve, linear pitch curve and/or revolution mixing, we recommended doing so only a little at a time, until you are satisfied with the results.

ADJUSTING THE COLLECTIVE PITCH - FOR 3D FLYING

If you're going to be using your Shogun V2 for 3D flying, then we recommend setting the collective pitch as described in this section. We suggest using positive 7º and negative 7º pitch.

♦IMPORTANT♦ Before adjusting the collective, make sure to unplug the motor from the ESC. This will ensure that the motor doesn't turn on when you make collective adjustments.



❑ Set the recommended amount of collective pitch, using the pitch gauge included. To begin, slide the pitch gauge onto one main rotor blade, with the 0º mark lined up with the leading edge of the blade. With the collective stick centered, the servo arm should be centered and the base of the pitch gauge should be parallel to the flybar, indicating 0º pitch. If necessary, use your transmitter to adjust the collective to 0º. You can also adjust the linkages mechanically.

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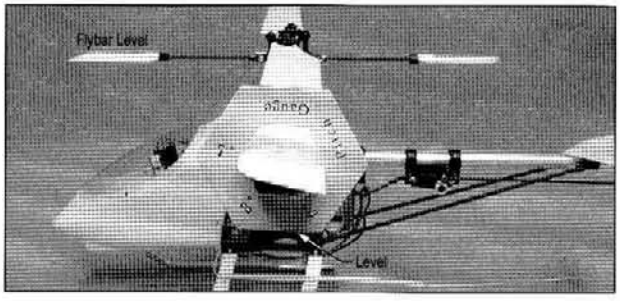
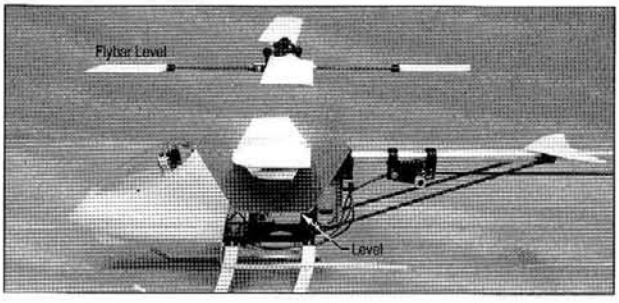


❑ Remove the pitch gauge and reinstall it so that the 7º mark is lined up with the leading edge of the rotor blade. Now, apply full up collective. Using your transmitter's EPA adjustment, adjust the collective so that the base of the pitch gauge is parallel to the flybar.

❑ Repeat the procedure above for full down collective. When set up properly, you should have 7º of collective pitch in each direction.



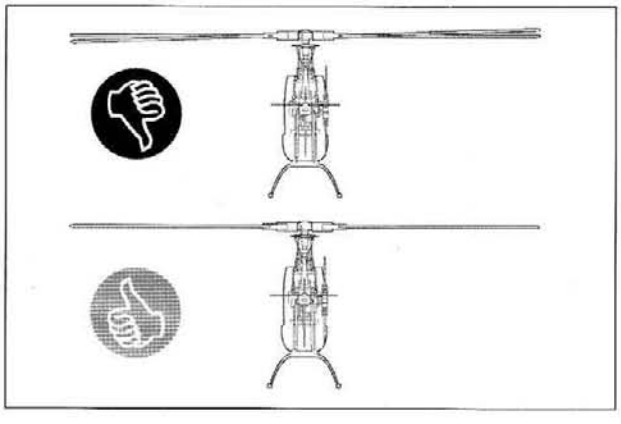
❑ Remove the pitch gauge, **flip it around so that the printed numbers are toward the rotor head, and reinstall it so that the 7º mark is lined up with the trailing edge of the rotor blade.** Now, apply full down collective. Using your transmitter's EPA adjustment, adjust the collective so that the base of the pitch gauge is parallel to the flybar.

☞ You must flip the pitch gauge around so that you can properly set the negative pitch amount.

❑ We recommend between 75% and 100% throttle hold, so that you can switch the throttle to a fixed position by pressing the throttle hold switch on your transmitter. This allows the collective to work independently of the throttle.

❑ We use only standard collective/throttle mixing. If you would like to experiment with a linear throttle curve, linear pitch curve and/or revolution mixing, we recommended doing so only a little at a time, until you are satisfied with the results.

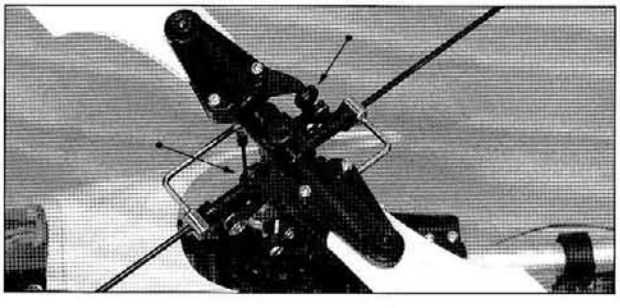
ADJUSTING THE MAIN ROTOR BLADE'S ROTATIONAL PLANE



❑ Put a 1/2" square piece of colored tape over the leading edge of one main rotor blade.

❑ Smoothly open the throttle until the heli begins to lift off and watch the rotational plane of the rotor blades. The rotational plane of both rotor blades should be the same. If they are not, adjustments need to be made.

✦IMPORTANT✦ When spinning, both blades should be even with each other. They should not appear to waver or oscillate up and down.



❑ To adjust the rotational plane, disconnect the ball-end from the blade with the higher rotational plane and tighten the ball-end 1 full turn.

❑ Reconnect the ball-end and test the rotational plane of the rotor blades again. Repeat the procedure until satisfied with the alignment.

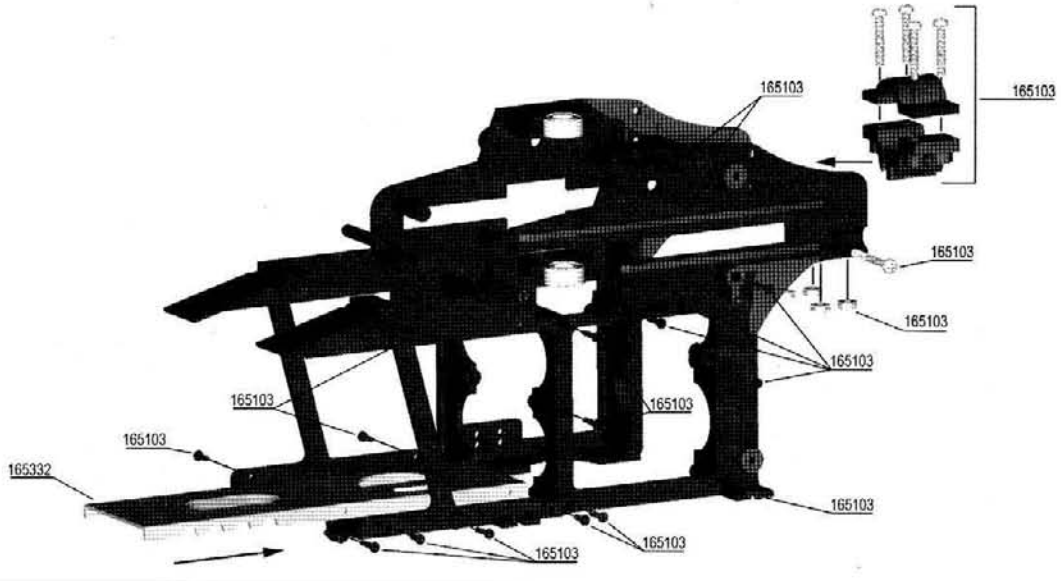
CHECKING GYRO OPERATING DIRECTION

❑ Check the correct operation of your gyro. While holding the helicopter, quickly pivot the tail counterclockwise and observe the movement of the tail rotor servo arm. If your gyro is lined up properly, the servo arm should move counterclockwise. If the servo arm moves clockwise, you'll need to mount your gyro in the opposite direction.

3D ASSEMBLY DRAWINGS, REPLACEMENT PARTS AND HOP-UP PARTS CAN BE FOUND BEGINNING ON THE NEXT PAGE

3D ASSEMBLY DRAWINGS

1



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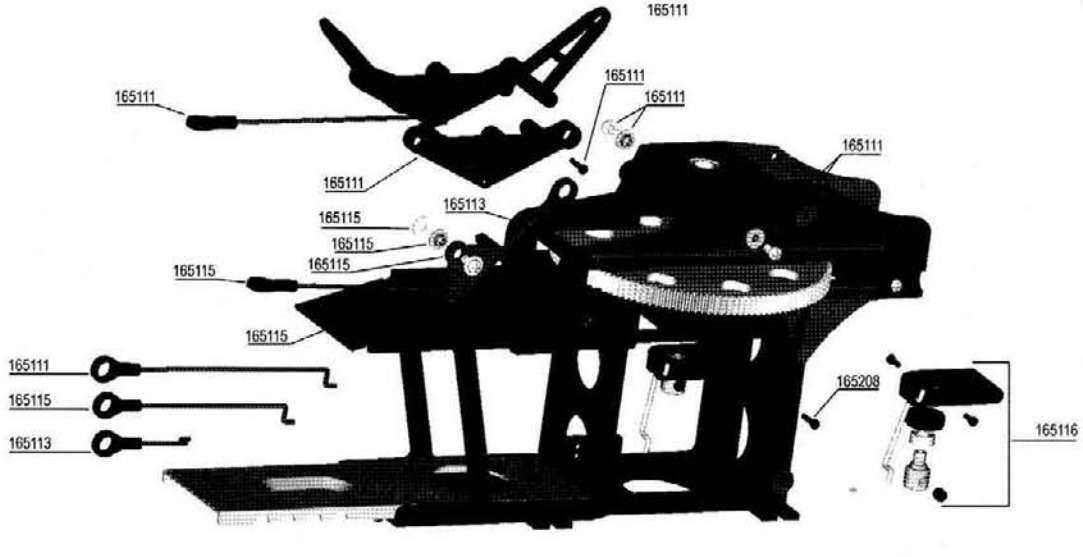

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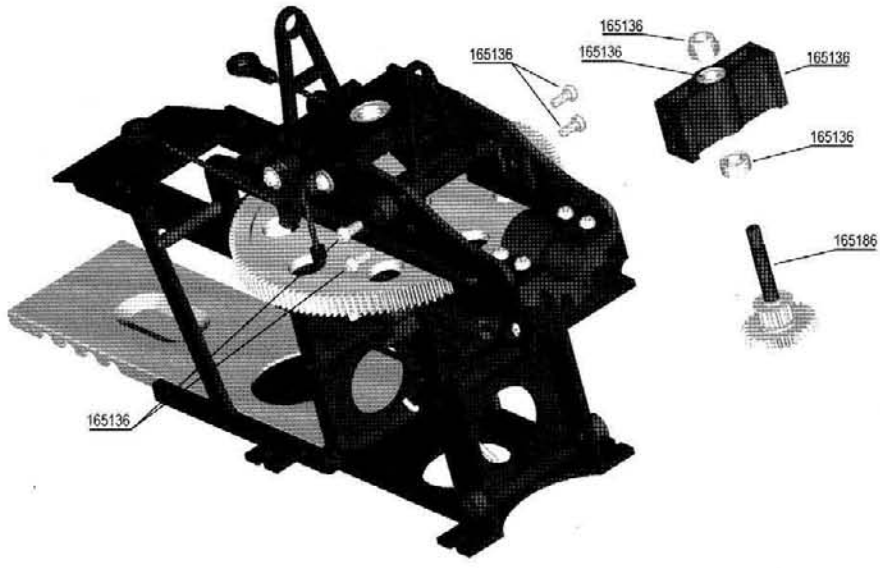

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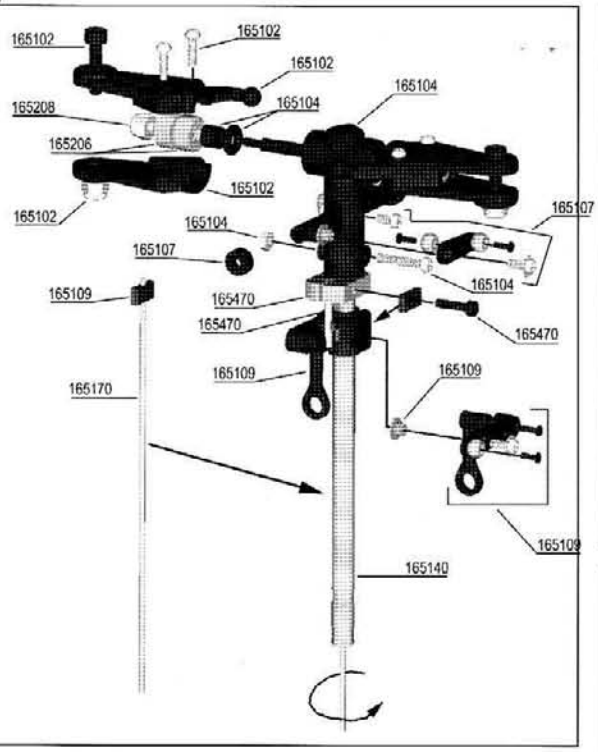

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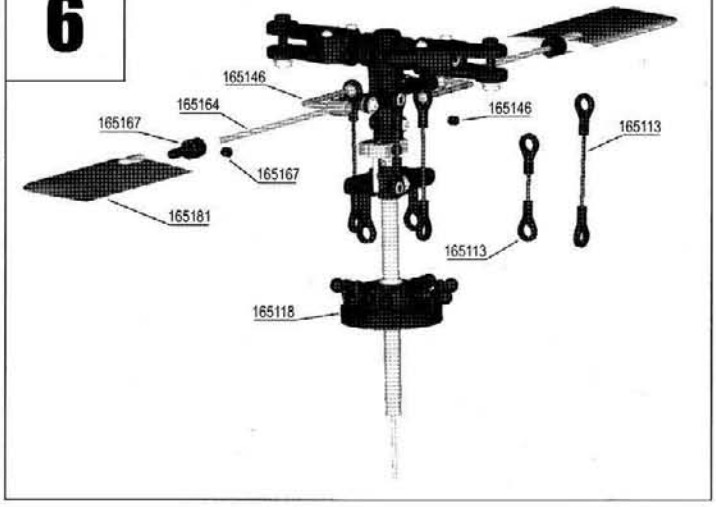

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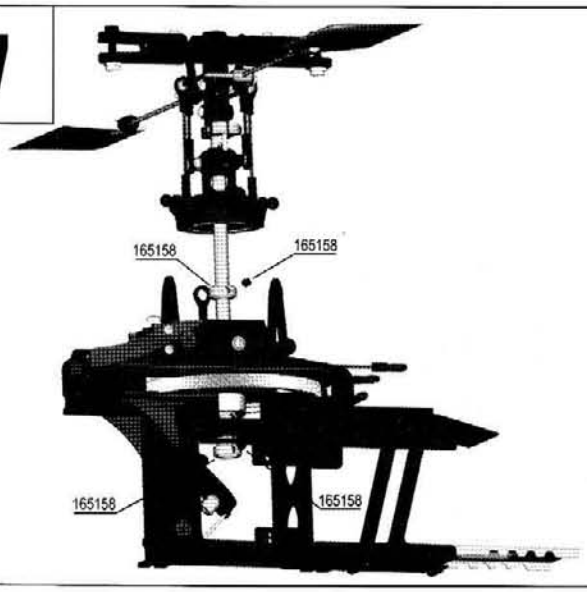

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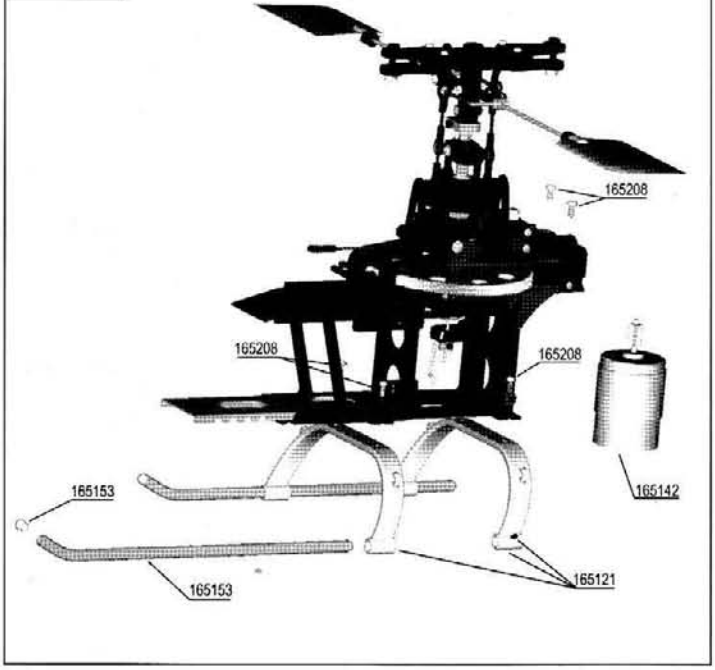

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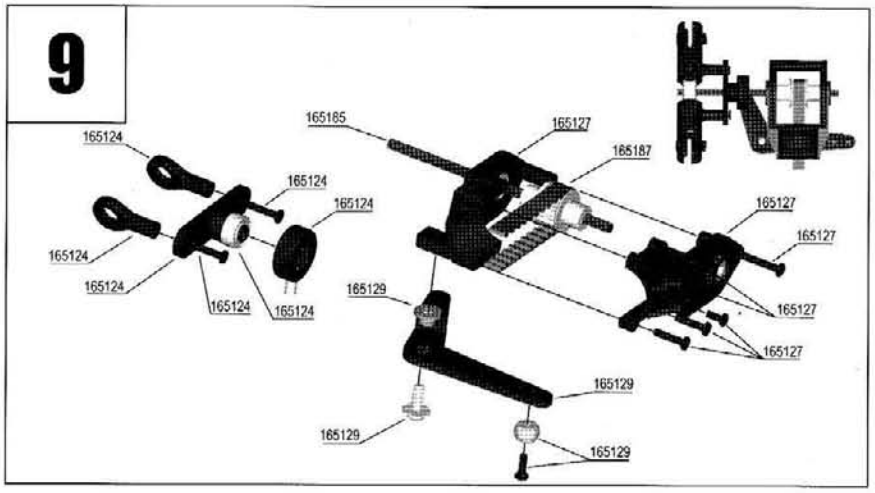

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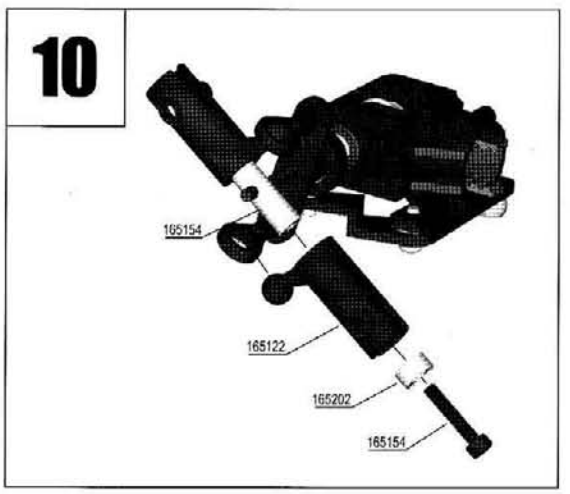

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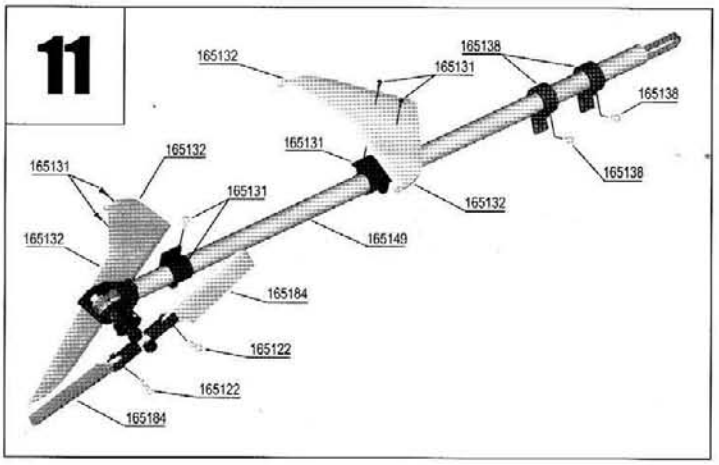

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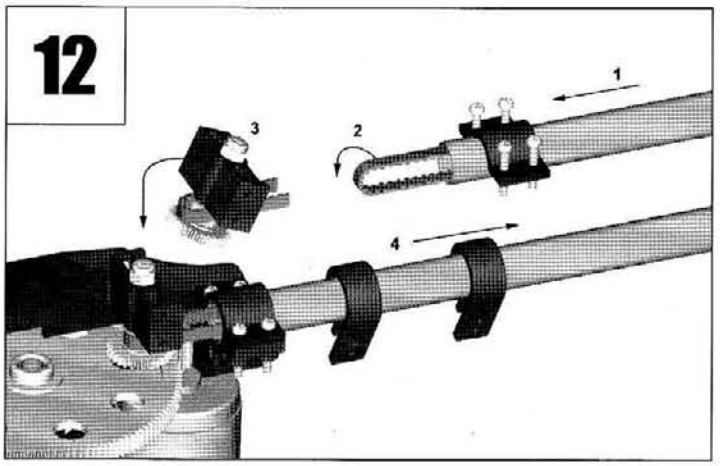

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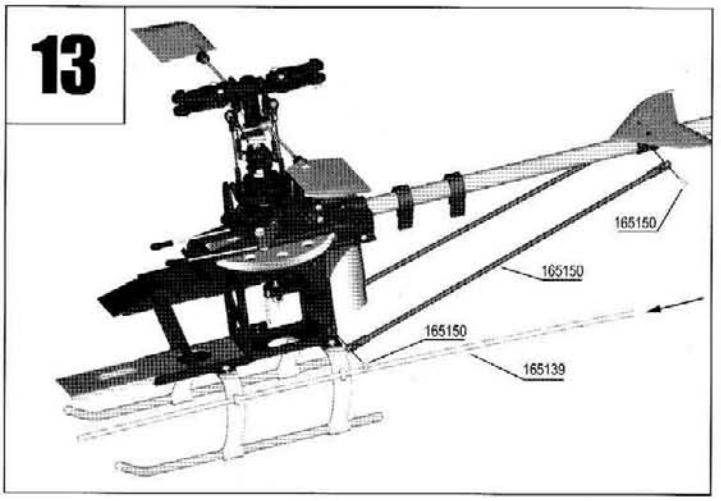

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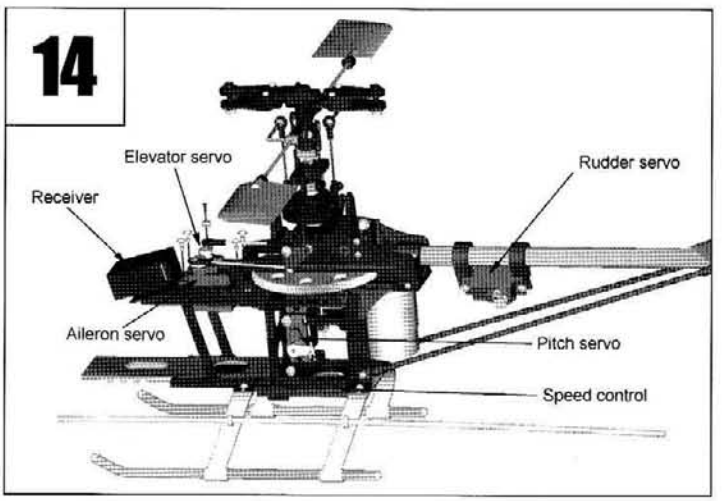

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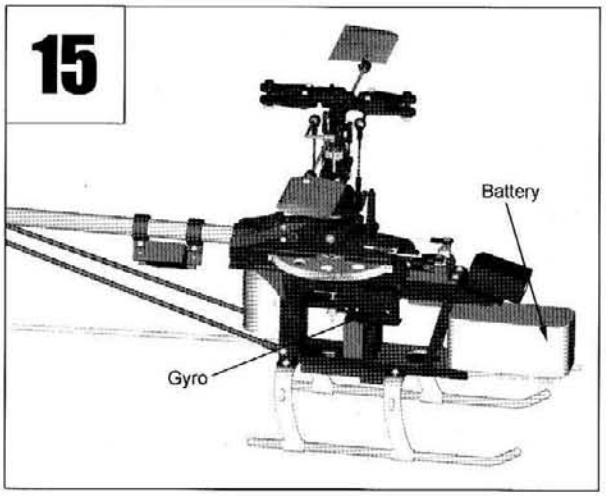

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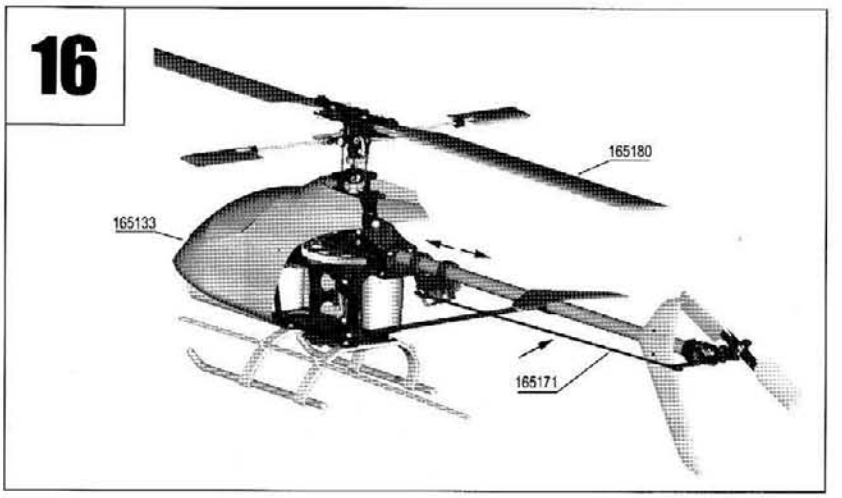
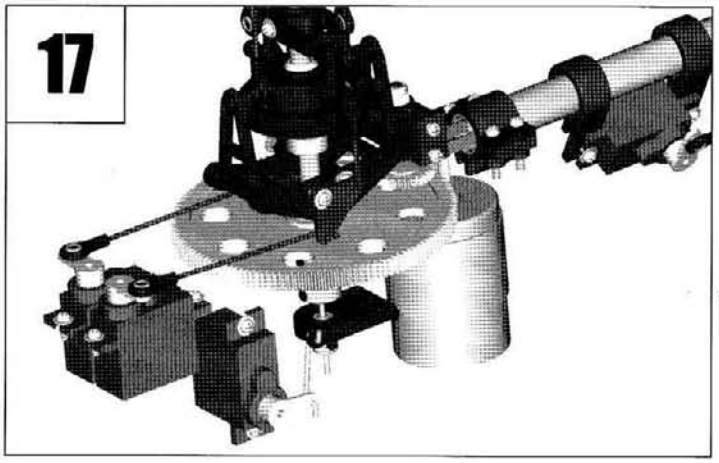
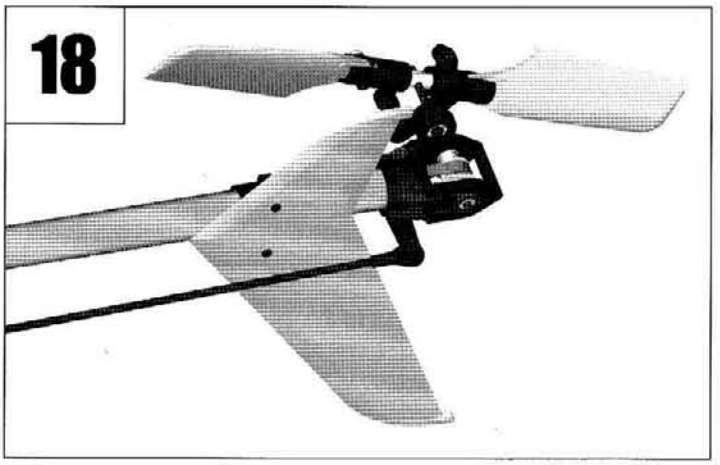


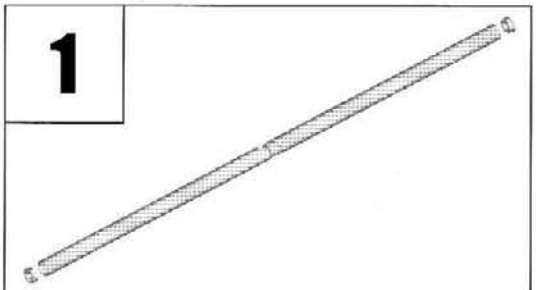




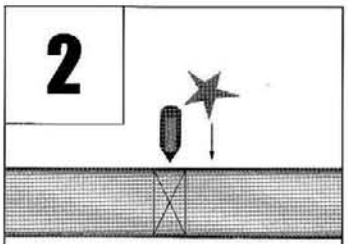
OPTIONAL BEVEL GEAR TAIL ROTOR DRIVE INSTALLATION

As an option, you can install the bevel gear tail rotor drive mechanism into your Shogun 400 V2 helicopter. To do this, you will need the following parts:

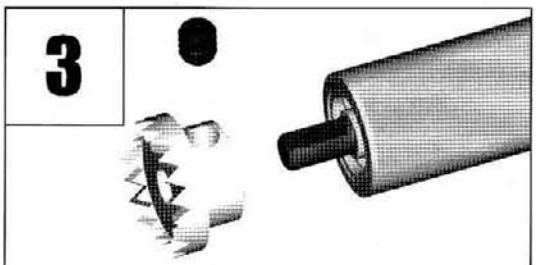
- 165161 Carbon Tail Rotor Drive Shaft with Bevel Gear
- 165189 Tail Drive Input Gear (Bevel)
- 165192 Tail Output Shaft - Round (Bevel)
- 165205 Shaft Bearings for V2 Tail Boom and Solid Drive Shaft



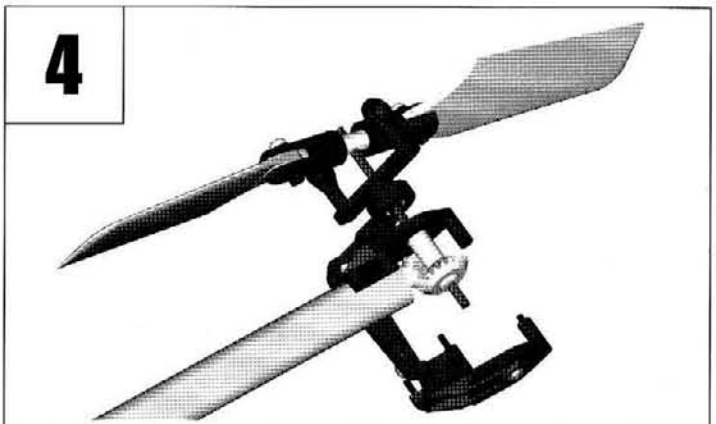
Slide the non-flanged bearing into the middle of the tail boom, then install the two flanged bearings into each end of the tail boom.



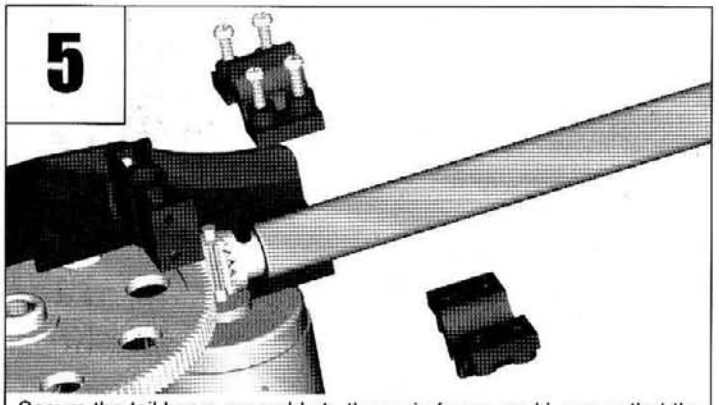
Use a punch and a small hammer to make a punch mark in the tail boom to secure the center bearing in place.



Slide the drive shaft into the tail boom, then secure the bevel gear to the front of the drive shaft, using a grub screw. Make sure to tighten the grub screw against the flat spot on the drive shaft.



Install the tail rotor and tail output shaft assembly, then install the gear case onto the tail boom, making sure that the tail output shaft and drive shaft gears line up correctly.



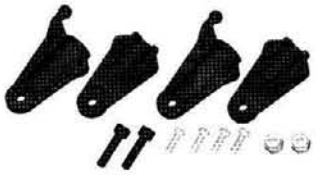
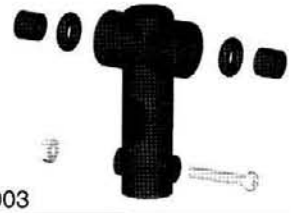
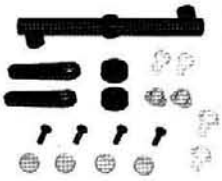
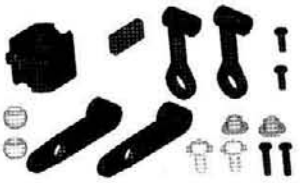
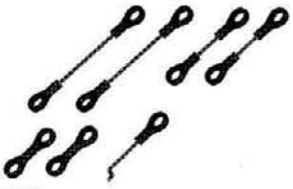
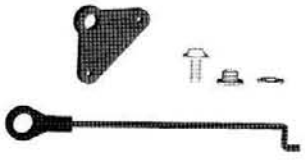
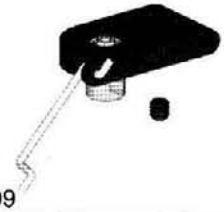
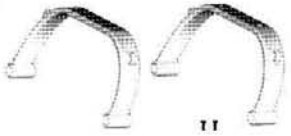
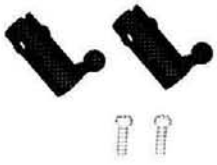
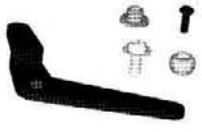
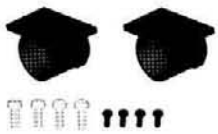
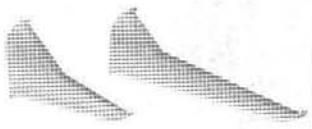
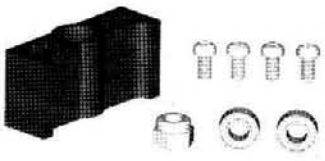
Secure the tail boom assembly to the main frame, making sure that the pinion and tail boom gears line up correctly. Move the tail boom assembly in or out slightly to adjust the gear mesh. When set properly, the gear-train should rotate smoothly with only a slight amount of backlash.

REPLACEMENT PARTS

We stock a complete set of replacement parts for your Shogun 400 V2 helicopter. Listed below are the replacement parts that are available along with their respective part numbers for easy ordering convenience. We suggest ordering directly from your local dealer.

If your dealer does not stock EF Helicopters products, you can order replacement parts directly from us, using the Customer Service Information on page # 2.

HOP-UP AND OPTION PARTS ARE SHOWN BEGINNING ON PAGE # 20

	 H001V2	 H002	 H003
165099 **Instruction Manual**	**165103** **Main Frame Set**	**165102** **Main Rotor Grip Set**	**165104** **Main Rotor Yoke**
 H004V	 H005V	 H006V	 H007V
165107 **See-Saw Set**	**165109** **Washout Base Set**	**165111** **Elevator Crank Set**	**165113** **Ball-End Control Rod Set**
 H008V	 H009	 H010	 H011V
165115 **Aileron Lever Set**	**165116** **Pitch Lever Joint Set**	**165118** **Swash Plate Assembly**	**165121** **Landing Gear Brace Set**
 H012	 H013	 H014V2	 H015V
165122 **Tail Rotor Grip Set**	**165124** **Tail Pitch Yoke**	**165127** **Tail Gear Case Set**	**165129** **Tail Pitch Control Lever Set**
 H016V2	 H017	 H018V2	 H019V2
165131 **Tail Boom Support Clamp Set**	**165132** **Stabilizer and Fin Set**	**165136** **Belt Gear Mount Set**	**165138** **Rudder Servo Mount Set**

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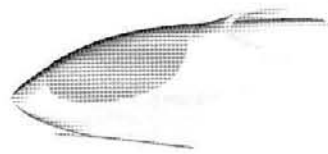
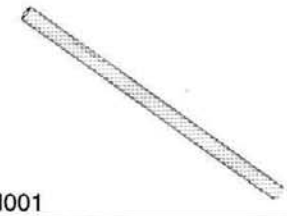
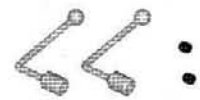
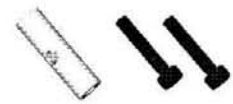
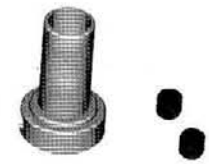
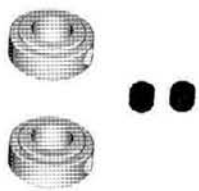
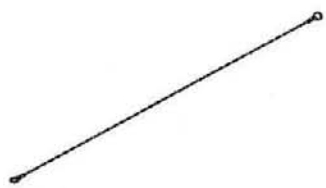
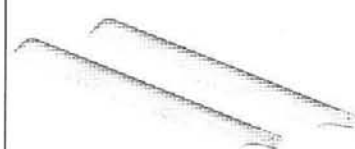
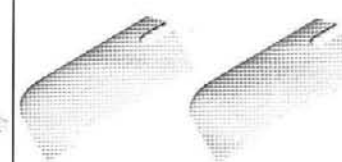
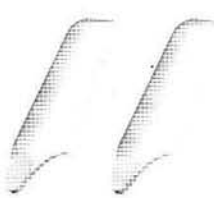
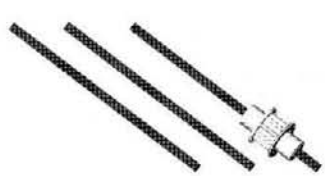
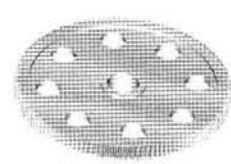
 H020V2	 H100V2	 M001	 M002
165139 **Antenna Support Tube**	**165133** **Body and Canopy Set**	**165140** **Main Shaft (Mast)**	**165142** **380 Motor with Pinion Gear**
 M002G	 M003	 M004	 M005V2
165143 **Motor Pinion Gear**	**165144** **Spindle Shaft**	**165146** **Stabilizer Arm Set**	**165149** **Tail Boom (with Bearing)**
 M006V	 M007V	 M008	 M009
165150 **Tail Boom Support Set**	**165153** **Landing Gear Set**	**165154** **Tail Rotor Hub Set**	**165156** **Auto-Rotation Sleeve Set**
 M010	 M011	 M013	 M014V
165158 **Main Shaft Stopper Set**	**165160** **HP Main Shaft (Mast)**	**165164** **Flybar**	**165167** **Flybar Adapter Set**
 M016	 M020V2	 P101	 P201
165170 **Collective Pitch Rod**	**165171** **Rudder Pushrod**	**165180** **Main Rotor Blade Set**	**165181** **Stabilizer Blade Set (Paddles)**
 P301	 G011V2	 G132	 G281V2
165184 **Tail Rotor Blade Set**	**165185** **Tail Output Shaft Set**	**165196** **Main Gear**	**165186** **Belt Gear Shaft**

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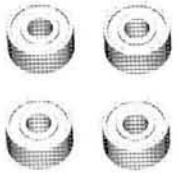
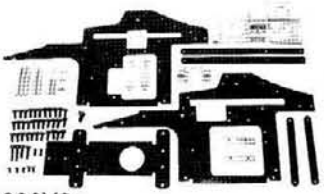
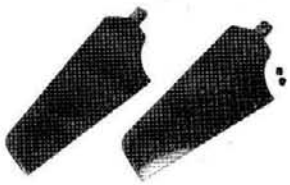
REPLACEMENT PARTS, CONTINUED....

 G371V2	 B106	 B252	 B384
165187 Tail Rotor Belt	**165200 One-Way Bearing**	**165202 Ball Bearing (2x5x2.5L)**	**165206 Ball Bearing (3x8x4L)**
 S001	 O802	 P000	**Sorry, No Photo Available**
165208 Screw Set	**165332 Battery Mount**	**165178 O-Rings for Spindle Shaft**	**165098 Decal Set**
 O503			
165470 Alum Main Rotor Yoke			

HOP-UP AND OPTION PARTS

 O005V2	 O006V2	 O010V2	 O012
165302 CF Tail Boom	**165308 CF Main Frame Set**	**165301 Gyro Tail Mount**	**165329 CF Main Frame Reinforcement**
 O013	 O102	 O202	 O302
165331 CF Pitch Lever Joint Set	**165322 CF Main Blade Set**	**165330 CF Stabilizer Blades (Paddles)**	**165334 CF Tail Rotor Blades**

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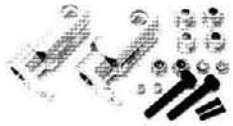
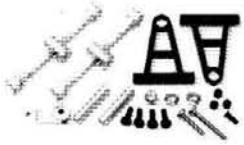
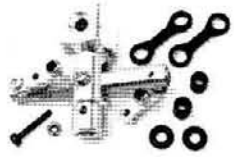
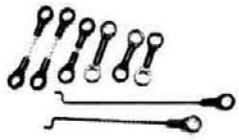
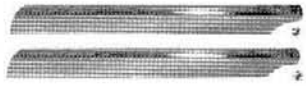
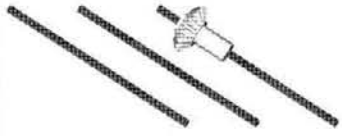
HOP-UP AND OPTION PARTS, CONTINUED....

 O001	 O101	 O502	 O505
165250 Training Gear Set	**165320 FG Main Rotor Blades**	**165323 Alum Main Rotor Grip Set**	**165326 Alum Washout Base Set**
 O506	 O510	 O534	 O801
165327 Alum Elevator Crank Set	**165328 Alum Swash Plate Assembly**	**165317 Alum Main Rotor Yoke Set**	**165309 Alum Aileron Lever Set**
 O701	 O702	 O601	 O402S
165333 Main Rotor Blades (3gr Weight)	**165319 Ball-End Linkage Set**	**165321 Wood Main Rotor Blade Set**	**165370 Brushless Motor with Pinion**
 Bell 222	 MD500E	 MD500R	 G02FV
165281 Bell 222 (Airwolf)	**165283 MD500 Edge Canopy Shape**	**165284 MD500 Round Canopy Shape**	**165189 Tail Input Gear (Bevel)**
 M012V	 G021V	 B383V	 M002G-10317
165161 Carbon Tail Drive Shaft (Bevel)	**165192 Tail Output Shaft-Round (Bevel)**	**165205 Shaft Bearings for V2 Tail Boom**	**165340 10T Pinion Gear (1/8" Shaft)**
 M002G-920	 M002G-0923	 M002G-0820	
165341 9T Pinion Gear (2mm Shaft)	**165342 9T Pinion Gear (2.3mm Shaft)**	**165343 8T Pinion Gear (2mm Shaft)**	