

SENSEI™



Flyzone™
how high will you soar

AXR™
RECEIVER-READY

RTF
READY-TO-FLY

SPECIFICATIONS

Wingspan:	58 in [1475mm]
Wing Area:	566 in ² [36.5 dm ²]
Weight:	3.25 lb [1470 g]
Wing Loading:	13 oz/ft ² [40 g/dm ²]
Length:	48 in [1220 mm]
Radio:	6-channel (required)

INSTRUCTION MANUAL

WARRANTY

Hobbico guarantees this kit to be free from defects in both material and workmanship at the date of purchase. This warranty does not cover any component parts damaged by use or modification. **In no case shall Hobbico's liability exceed the original cost of the purchased kit.** Further, Hobbico reserves the right to change or modify this warranty without notice.

In that Hobbico has no control over the final assembly or material used for final assembly, no liability shall be assumed nor accepted for any damage resulting from the use by the user of the final user-assembled product. By the act of using the user-assembled product, the user accepts all resulting liability.

If the buyer is not prepared to accept the liability associated with the use of this product, the buyer is advised to return

this kit immediately in new and unused condition to the place of purchase.

To make a warranty claim send the defective part or item to Hobby Services at the address below:

Hobby Services

3002 N. Apollo Dr. Suite 1
Champaign IL 61822 USA

Include a letter stating your name, return shipping address, as much contact information as possible (daytime telephone number, fax number, e-mail address), a detailed description of the problem and a photocopy of the purchase receipt. Upon receipt of the package the problem will be evaluated as quickly as possible.

READ THROUGH THIS MANUAL BEFORE STARTING CONSTRUCTION. IT CONTAINS IMPORTANT INSTRUCTIONS AND WARNINGS CONCERNING THE ASSEMBLY AND USE OF THIS MODEL.

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INTRODUCTION

Thank you for purchasing the Flyzone Sensei. The best method to learn to fly an R/C plane is with a stable trainer. To make it even easier, the Sensei is electric. Just charge the batteries and you're ready fly. When you're done, just put the plane away until the next time. Assembly is quick and easy. In the RTF version, nothing else is needed to get you in the air. So take a few minutes to read the instructions and let's get this plane in the air.

For the latest technical updates or manual corrections to the Sensei visit the Hobbico web site at www.hobbico.com. Open the "Airplanes" link, then select "Sensei". If there is new technical information or changes to this model a "tech notice" box will appear in the upper left corner of the page.

AMA

If you are not already a member of the AMA, please join! The AMA is the governing body of model aviation and membership provides liability insurance coverage, protects modelers' rights and interests and is required to fly at most R/C sites.

Academy of Model Aeronautics

5151 East Memorial Drive
Muncie, IN 47302-9252

Ph. (800) 435-9262

Fax (765) 741-0057



Or via the Internet at: <http://www.modelaircraft.org>

IMPORTANT!!! Two of the most important things you can do to preserve the radio controlled aircraft hobby are to avoid flying near full-scale aircraft and avoid flying near or over groups of people.

SAFETY PRECAUTIONS

Protect Your Model, Yourself & Others... Follow These Important Safety Precautions

1. Your Sensei should not be considered a toy, but rather a sophisticated, working model that functions very much like a full-size airplane. Because of its performance capabilities, the Sensei, if not assembled and operated correctly, could possibly cause injury to yourself or spectators and damage to property.
2. You must assemble the model **according to the instructions**. Do not alter or modify the model, as doing so may result in an unsafe or unflyable model. In a few cases the instructions may differ slightly from the photos. In those instances the written instructions should be considered as correct.
3. If you are not an experienced pilot or have not flown an R/C plane before, we recommend that you get the assistance of an experienced pilot in your R/C club for your first flights. If you're not a member of a club, your local hobby shop has information about clubs in your area whose membership includes experienced pilots.

We, as the kit manufacturer, provide you with a top quality, thoroughly tested kit and instructions, but ultimately the quality and flyability of your finished model depends on how you build it; therefore, we cannot in any way guarantee the performance of your completed model, and no representations are expressed or implied as to the performance or safety of your completed model.

ADDITIONAL ITEMS REQUIRED

Radio Control System

The Sensei Rx-R (Receiver Ready) comes with the servos installed, so all that is required is a 6-channel transmitter and receiver. The Tactic™ TTX600 2.4GHz spread spectrum 6-channel radio control system (TACJ2600) is included with the RTF (ready to fly) version of the Sensei, so this same radio system is ideal for your Rx-R version, too.

- Tactic TTX600 2.4GHz 6-channel system (TACJ2600)
- (4) AA batteries will be required to operate the recommended transmitter (FUGP7308).

Battery and Charger

The Sensei RTF comes complete with a motor battery and charger. The Sensei Rx-R version requires a 2100mAh 11.1V LiPo battery and LiPo Charger. The Sensei was designed for the Flyzone 2100mAh 11.1V LiPo battery (HCAP6387). Other LiPo batteries similar in size with the same voltage and capacity may also work, but they may not fit properly in the battery compartment or have the same type of battery connector. In addition to a battery, a LiPo battery charger is also required and there are several that will work (depending on your budget and requirements). A safe, economical charger is the ElectriFly® 3S (3-cell/ 11.1V) LiPo Smart Charger (GPMM3318). The Smart Charger includes adapters to charge from a 110V wall outlet or a 12V DC outlet from a car. The Smart Charger will take approximately 4-1/2 hours to fully charge the battery. Some pilots prefer to have several batteries and charge them faster so they can fly more. For charging up to four batteries faster at the same time, the Great Planes PolyCharge4™ DC-powered LiPo charger (GPMM3015) is recommended. But unlike the Smart Charger, the PolyCharge4 does not have an internal LiPo cell balancer which is a critical component in making sure your LiPo batteries charge efficiently and evenly. So, for each LiPo battery you wish to charge simultaneously, one Great Planes Equinox™ LiPo Cell Balancer (GPMM3160) will also be required. Finally, the PolyCharge4 does not have AC capability, so if wall charging is a priority, a separate AC 12-Volt power source must also be purchased separately. A suitable power supply for the PolyCharge4 is the Great Planes 12V 12A DC power supply (GPMP0901)

Required Assembly Tool

Other than common hobby tools this is the list of building supplies that are required to finish the Sensei.

- Small needle-nose pliers (HCAR0625) or hemostats (SQUR2502)
- #1 Phillips screwdriver (DTXR0174)
- Small crescent wrench
- Great Planes stick-on lead weight (Optional, GPMQ4485)

ORDERING REPLACEMENT PARTS

Replacement parts for the Hobbico Flyzone Sensei are available using the order numbers in the **Replacement Parts List** that follows. The fastest, most economical service can be provided by your hobby dealer or mail-order company.

To locate a hobby dealer, visit the Hobbico web site at www.hobbico.com. Choose "Where to Buy" at the bottom of the menu on the left side of the page. Follow the instructions provided on the page to locate a U.S., Canadian or International dealer.

Parts may also be ordered directly from Hobby Services by calling (217) 398-0007, or fax at (217) 398-7721, but full retail prices and shipping and handling charges will apply. Illinois and Nevada residents will also be charged sales tax. If ordering via fax, include a Visa® or MasterCard® number and expiration date for payment.

Mail parts orders **Hobby Services**
and payments by 3002 N Apollo Drive, Suite 1
personal check to: Champaign IL 61822

Be certain to specify the order number exactly as listed in the **Replacement Parts List**. Payment by credit card or personal check only; no C.O.D.

If additional assistance is required for any reason, contact Product Support by telephone at (217) 398-8970, or by e-mail at productsupport@hobbico.com.

REPLACEMENT PARTS LIST

ORDER NO.	DESCRIPTION
HCAA6380	Fuselage
HCAA6381	Wing Set
HCAA6382	Stab/Elevator Set
HCAA6383	Vertical Fin
HCAA6384	Main Gear
HCAA6385	Nose Gear
HCAA6386	ESC
HCAA6387	LiPo Battery 2100mAh
HCAA6388	Brushless Motor
HCAA6389	Spinner
HCAA6390	Propeller 10x5
HCAA6391	Decal Set

KIT INSPECTION

Before starting to build, inspect the parts to make sure they are of acceptable quality. If any parts are missing or are not of acceptable quality, or if you need assistance with assembly, contact **Product Support**. When reporting defective or missing parts, use the part names exactly as they are written in the Kit Contents list.

Hobbico Product Support

3002 N. Apollo Drive, Suite 1 Ph: (217) 398-8970, ext. 5
Champaign, IL 61822 Fax: (217) 398-7721

E-mail: airsupport@hobbico.com

PREPARATIONS

Before starting to assemble the Sensei, we recommend charging the motor battery. Then, when you are ready to set up the radio system, the motor battery can be used to power the receiver.

Charge the Battery

The following is an overview of how to charge your motor battery using the ElectriFly Smart Charger. If you are using a different LiPo charger, carefully follow the instructions included with the charger.

1. Connect the input power to the charger. The GREEN LED will be lit, indicating standby mode. The RED LED will be OFF.
2. Connect the battery to be charged to the balance plug. The RED LED will also be lit, and remain RED during the charging. Both LEDs should be lit solid while charging.
3. If the battery was completely discharged, the RED and GREEN LEDs will start to flash after 2-hours and 40-minutes. The charger has a built in safety timer.

4. Disconnect the battery from the charger, wait for the GREEN LED to be lit, and then reconnect the battery to the charger.
5. It will take approximately 1-1/2 hours more to complete the charge. When the battery is fully charged, the GREEN LED will turn OFF. Remove the battery from the charger at this time.
6. Charging time depends on the level of discharge of the battery and if the battery cells were unbalanced.

LED SCHEME Use this table to determine charge action.

RED LED	GREEN LED	ACTION
OFF	Solid ON	No battery is connected
OFF	Flashing	Conditioning battery
Solid ON	Solid ON	Battery charging
Solid ON	OFF	Charge complete
Flashing	Flashing	ERROR*

*Possible sources of battery error may include a highly unbalanced pack, charger timed out, or one cell of the pack which is low voltage. In the case of a battery error, please remove the battery pack from the charger and inspect it carefully for swelling or any other damage, such as broken wires.

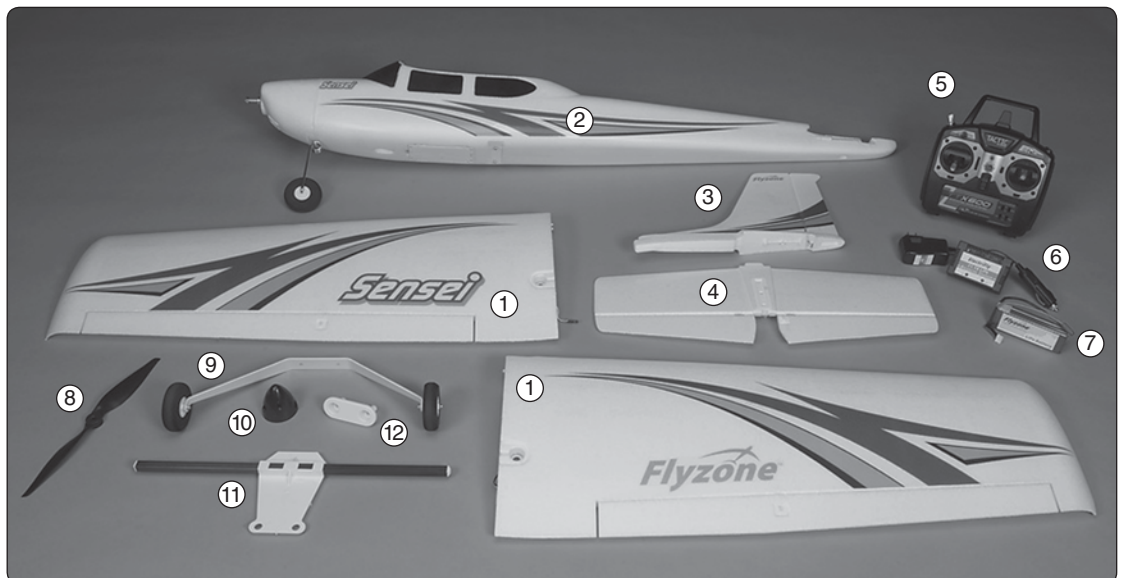
Battery Charging Precautions

- Be careful to avoid overcharging the battery. Only use a LiPo approved charger. Never use a NiCd/NiMH peak charger.
- Remember to check the temperature of the battery during the charge. The battery should not get hot. If it does, unplug the battery from the charger.
- Charge the battery at a maximum charge rate of 2.1 amps. A higher charge rate will cause the battery to get hot.
- Never place the battery on combustible material or leave it unattended while charging.

KIT CONTENTS

Kit Contents

1. Wing Halves
2. Fuselage
3. Vertical Stabilizer w/Rudder
4. Horizontal Stabilizer w/Elevators
5. Transmitter
6. Charger
7. LiPo Battery
8. Propeller
9. Main Landing Gear
10. Spinner
11. Wing Joiner
12. Wing Connector



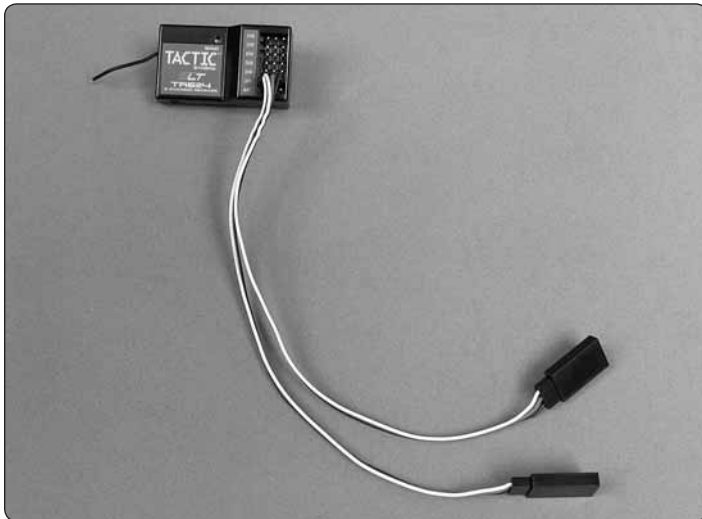
- Never charge the battery in the plane.
- We recommend that a balancing charger be used to charge the battery. A properly cared for battery will last a long time. If the battery pack is continually charged without balancing the individual cells, the life of the battery pack will be shortened.

Battery Recycling

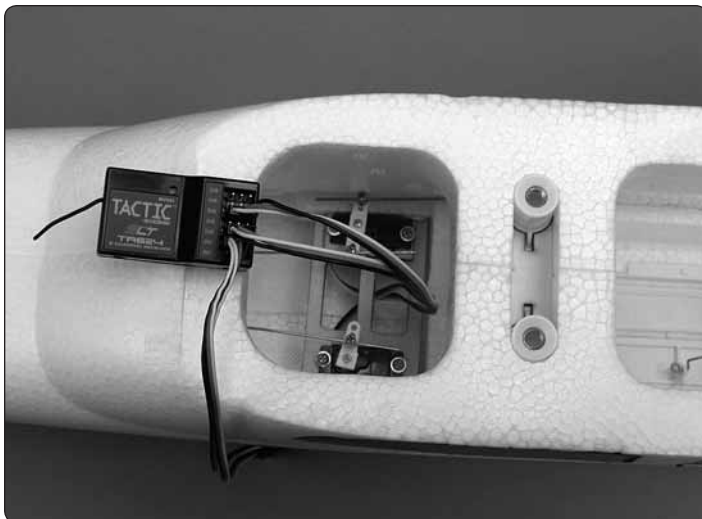
Attention: The Sensei is powered by a rechargeable battery. At the end of the battery's useful life, under various state and local laws, it may be illegal to dispose of the battery into the municipal waste system. Check with your local solid waste officials for details in your area for recycling options or proper disposal. We encourage contacting your local recycling center for more information.

Install the Receiver

If you are assembling the Sensei RTF, skip to the next column and start at **ASSEMBLE THE SENSEI**.

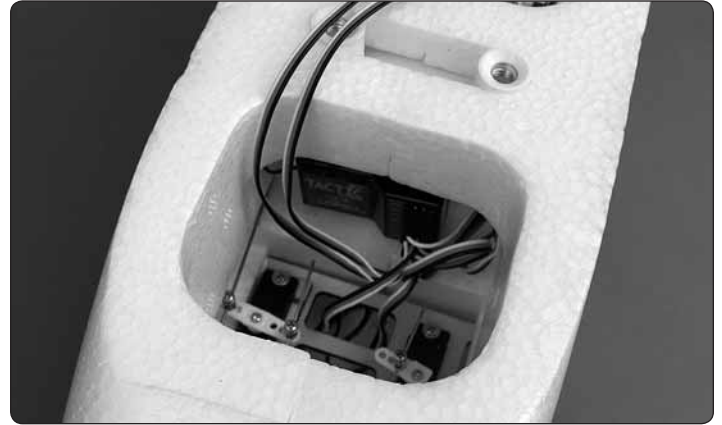


- ❑ 1. Plug the Y-harness into the aileron channel, channel-1 on the Tactic receiver.



- ❑ 2. Plug the elevator servo into channel-2 on the Tactic receiver. Plug the rudder servo into channel-4 on the Tactic receiver.

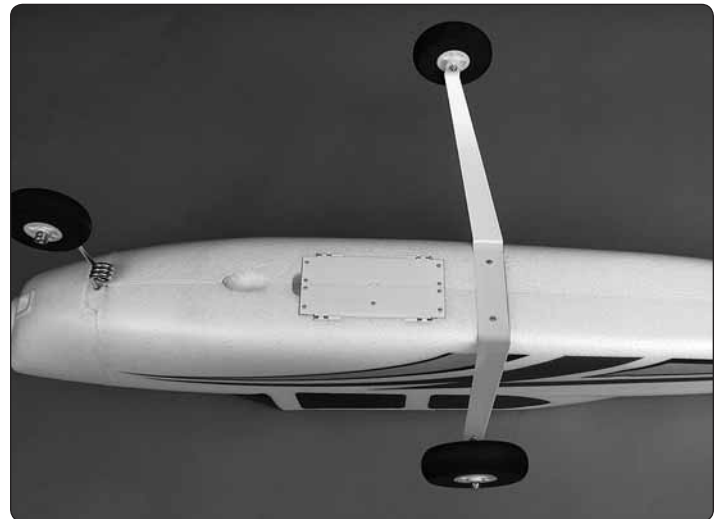
- ❑ 3. Plug the throttle into channel-3 on the Tactic receiver. If you will be using the drop doors, plug the servo into the receiver's retract channel or channel-5 on the Tactic receiver.



- ❑ 4. Peel the backing from one side of the double-sided tape. Attach it to the back of the receiver. Peel the backing from the other side of the double-sided tape and attach the receiver to the front of the servo compartment. Route the excess rudder and elevator servo wires under the servo tray. The throttle and drop door servo wires should be positioned so they do not interfere with the rudder and elevator control rods.

ASSEMBLE THE SENSEI

Install the Main Landing Gear

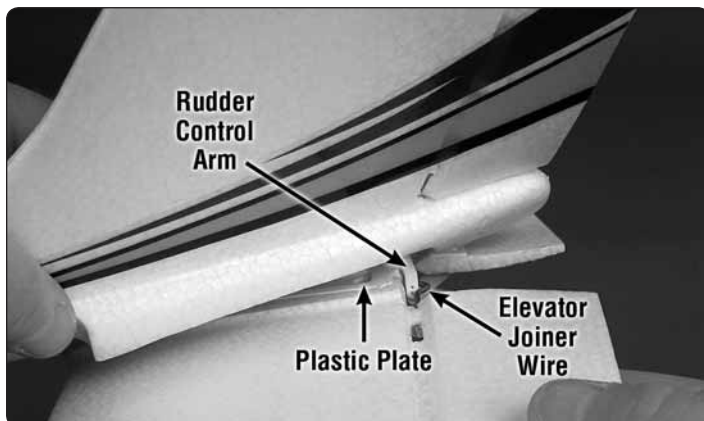


- ❑ Attach the main landing gear to the fuselage using two 3x16mm sheet metal screws. Note that the landing gear is angled forward.

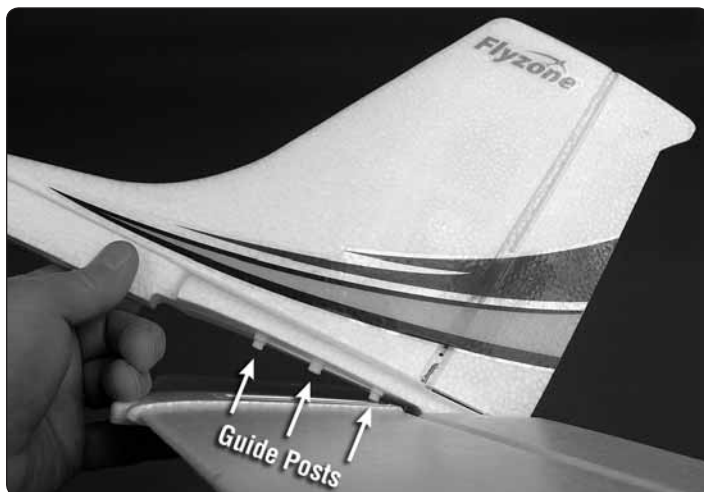
Install the Vertical and Horizontal Stabilizer



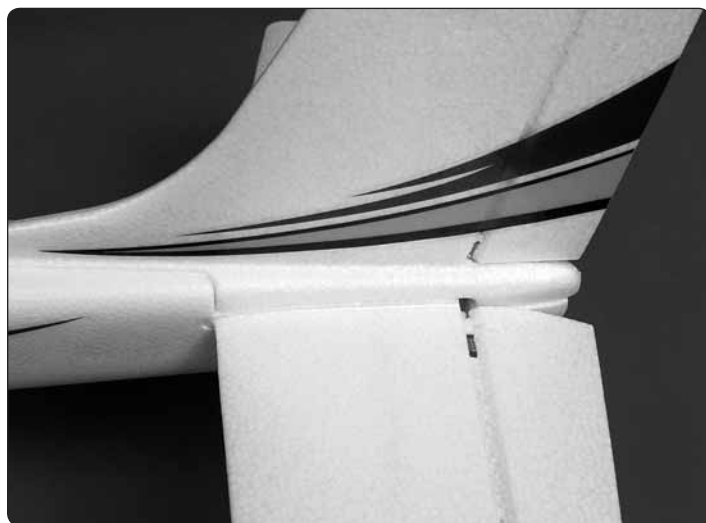
- ❑ 1. Flex the elevators up and down a few times to loosen them up so they move easier.
- ❑ 2. Repeat the process to loosen the rudder.



- ❑ 3. Insert the rudder control arm through the V-bend in the elevator joiner wire. Note that the plastic plate is on top of the stabilizer.



- ❑ 4. Insert the three guide posts into the three recesses in the top of the horizontal stabilizer.



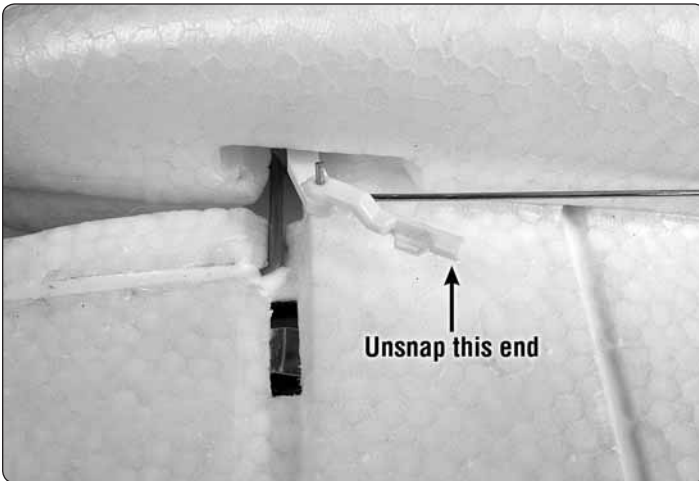
- ❑ 5. Slide the assembly into the recess in the top of the fuselage. Then, press the assembly down to seat it against the fuselage.



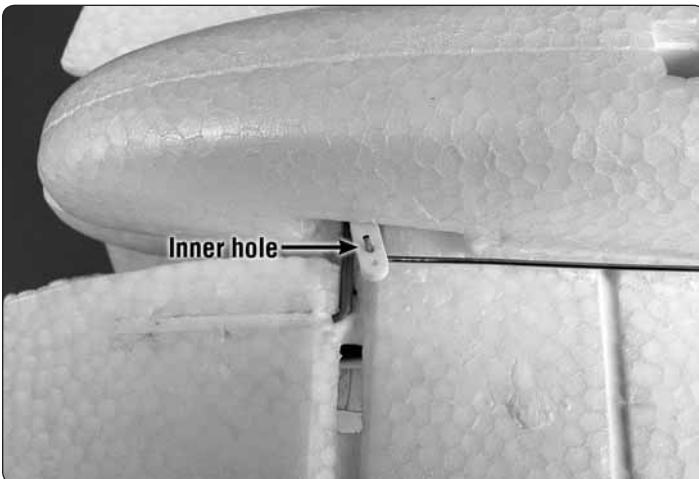
- ❑ 6. Insert the 3 x 25mm machine screw into the hole in the bottom of the fuselage. Thread the 3 x 25mm machine screw through the horizontal stabilizer and into the bottom of the vertical fin.

Connect the Rudder and Elevator Controls

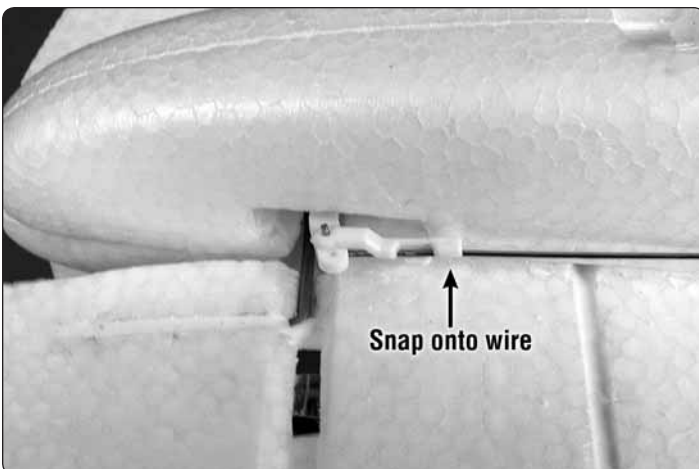
- ❑ 1. If you haven't yet done so, familiarize yourself with the Tactic TTX600 radio control system by reading the instructions starting on page 16.



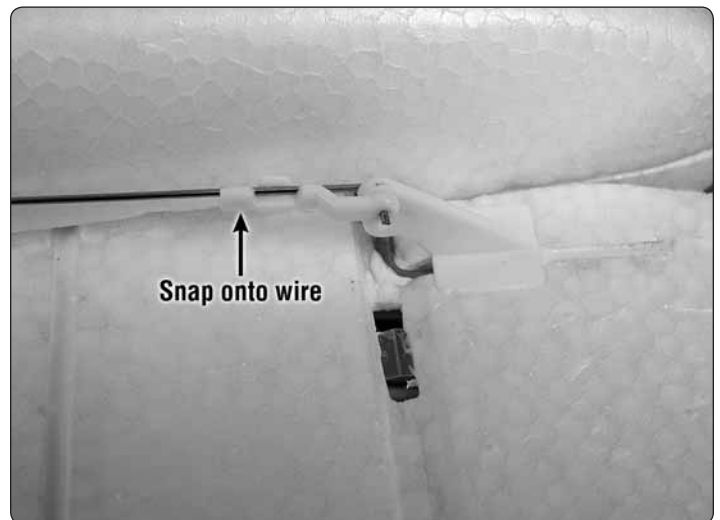
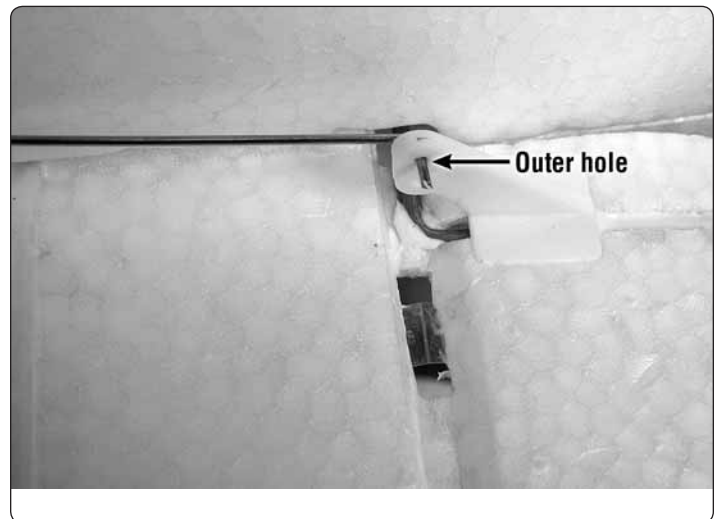
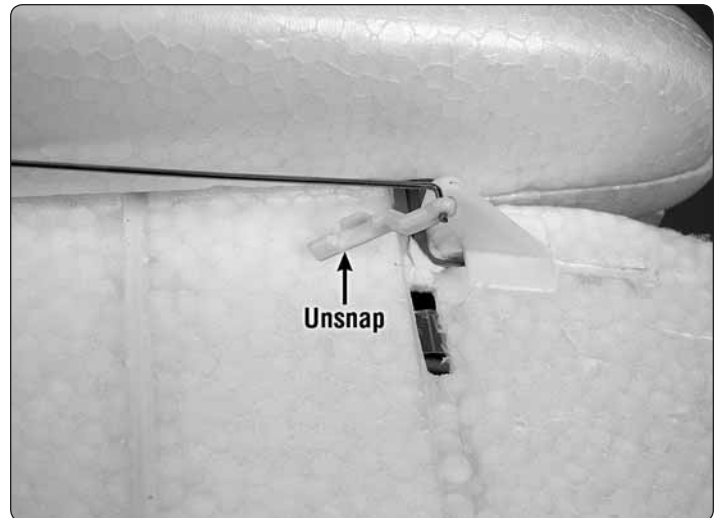
- ❑ 2. Use a needle-nose pliers to unsnap the Faslinks from the rudder pushrod.



- ❑ 3. Insert the pushrod in the inner hole of the rudder control horn.

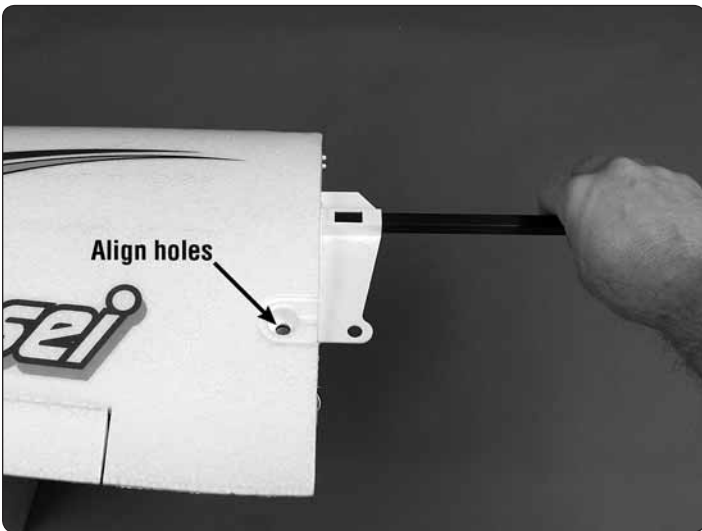
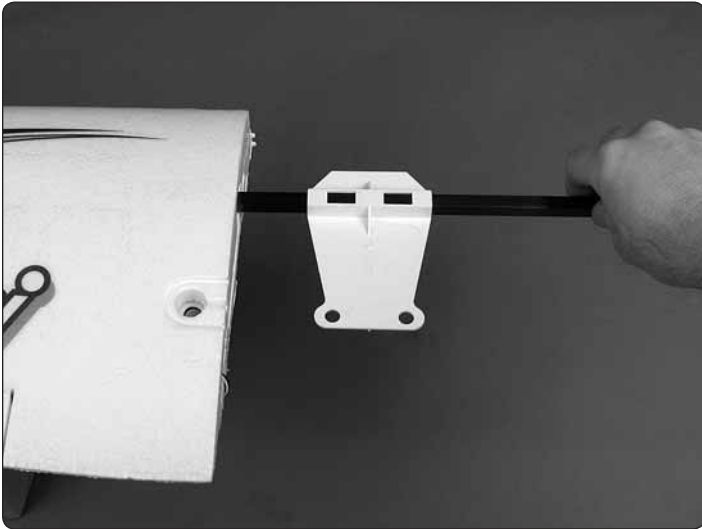


- ❑ 4. Re-install the Faslink on the pushrod. Use a needle-nose pliers to snap the Faslink onto the wire.

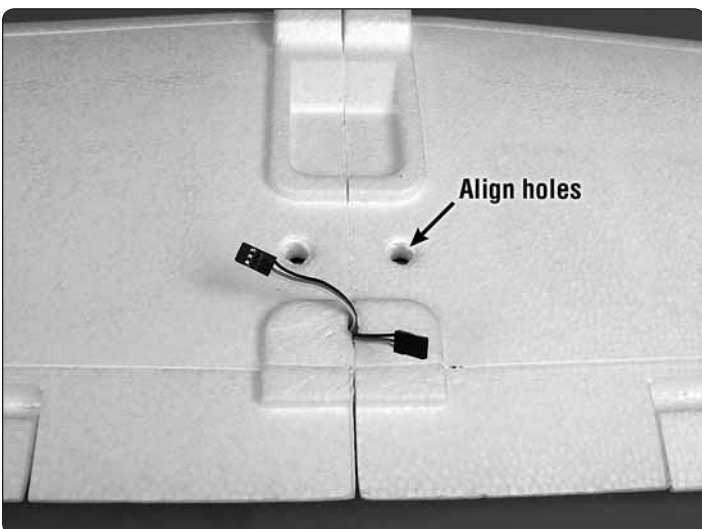


- ❑ 5. Repeat the process to install the elevator pushrod in the outer hole of the elevator control horn.

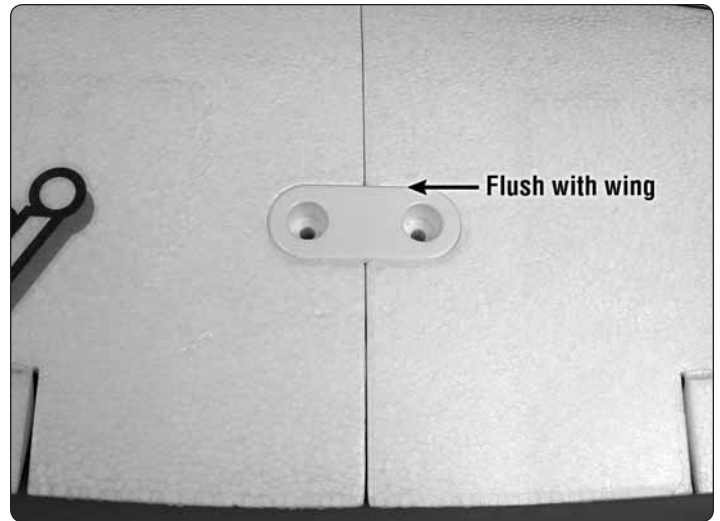
Install the Wing Joiner



❑ 1. Holding the left wing half upright, carefully insert the wing joiner into the wing half until the wing bolt hole in the joiner aligns with the wing bolt hole in the wing.



❑ 2. Insert the wing joiner in the right wing. Route the aileron servo wires out the bottom of the wing.

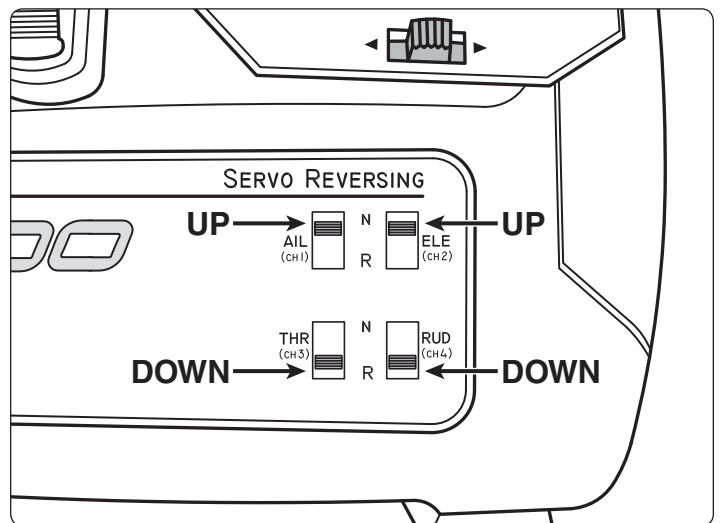


❑ 3. Insert the plastic wing connector in the top of the wing. Note that the connector is angled to match the angle of the top of the wing. When correctly installed, the connector should be flush with the top of the wing.

Check the Radio System

CAUTION: Do not install the propeller on the plane until instructed to do so.

❑ 1. If using the Tactic TTX600 radio system read the Radio System Instructions section on page 16 in this manual. Then, install the four AA alkaline batteries in the transmitter with the correct polarity.



❑ 2. Check that the servo reversing switches are configured as shown.



□ 3. Position the throttle stick (left stick) to idle (all the way down) and switch on the transmitter. The power indicator light should be glowing a steady red. A flashing red light and an audible tone indicates low voltage. If this happens, replace the batteries before connecting the flight battery.

□ 4. Center the aileron, elevator, throttle and rudder trims on the transmitter by listening to the beeps. You will hear a low, short beep each time you bump the trim. When you hear one high, short beep the trim is centered. Experiment running the trim to the limits a few times to familiarize yourself with the trims. When finished, return all the trims to center.



□ 5. With the transmitter still switched on, connect the LiPo motor battery to the electronic speed control. The motor will produce a low tone. Moving the right stick on the transmitter up and down will move the elevator on the plane up and down. If the motor does not beep and the elevator does not move, the receiver will need to be bound to the transmitter.

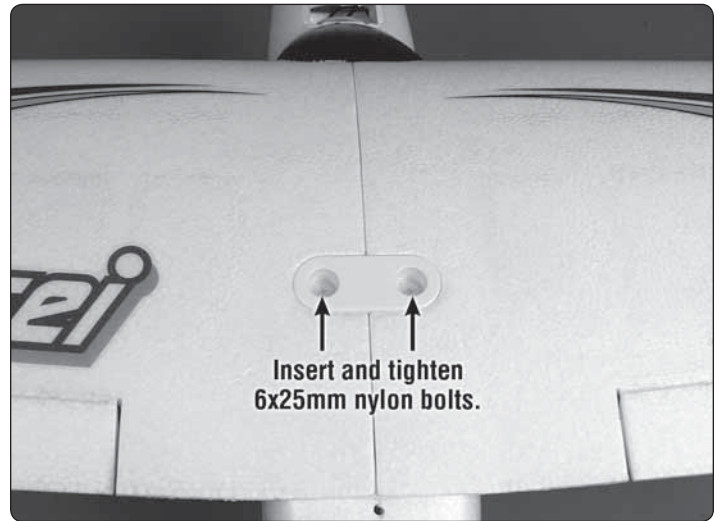
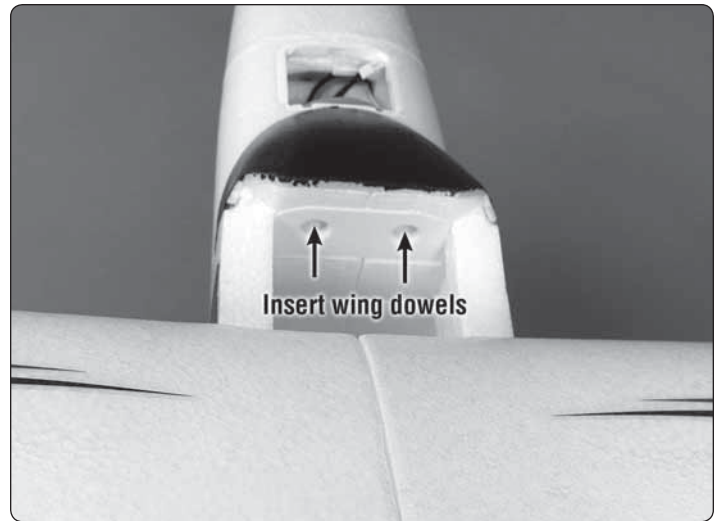
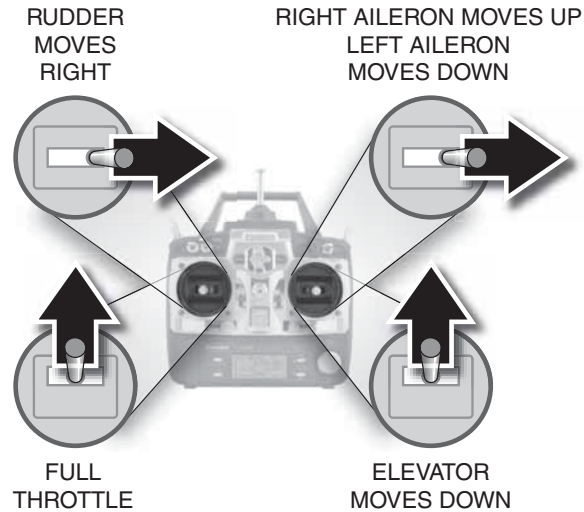


□ 6. To bind the receiver to the transmitter, remove the receiver from the plane. Make sure the throttle stick is down in the idle or off position and the transmitter is switched on. Insert a small screwdriver or paperclip through the hole marked "Bind" and press the pushbutton until the LED on the receiver glows red and then turns off after about one second. Then, release the bind button. If the binding is successful, the LED on the receiver will flash once and then remain ON.

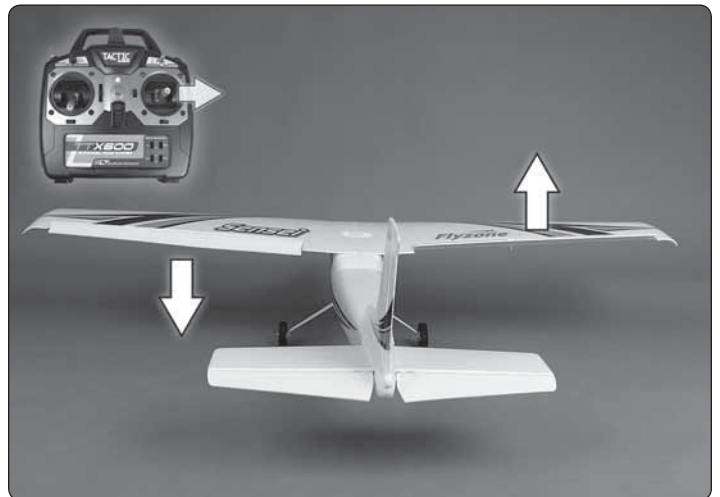
□ 7. Make sure the motor brake function in the ESC is deactivated. When you advance the throttle stick, the motor should turn. When you bring the throttle stick all the way back down, the motor should come to a coasting stop. If the motor stops quickly, the brake is on. To deactivate the brake, disconnect the motor battery, but leave the transmitter on. Advance the throttle stick and throttle trim all the way up. Reconnect the battery and listen for one beep. Bring the throttle stick and the throttle trim all the way back down and listen for one more beep. Now the motor brake function is disabled.

The procedure for activating the brake is the same, except the motor will beep twice instead of once.

4-Channel Radio Set Up (Standard Mode 2)

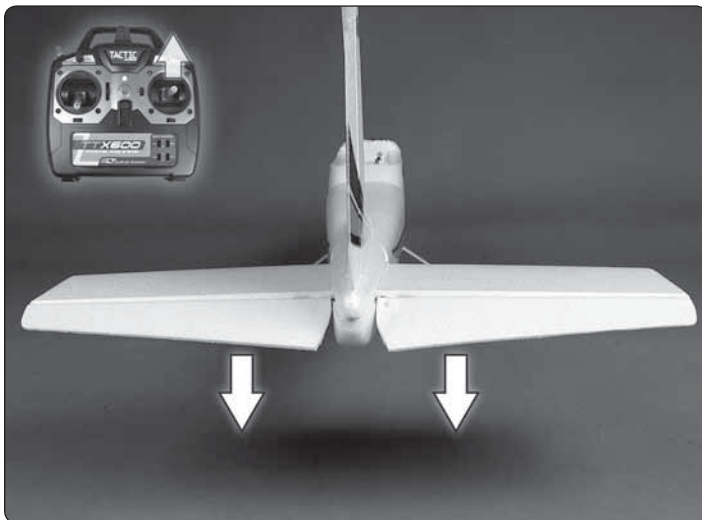
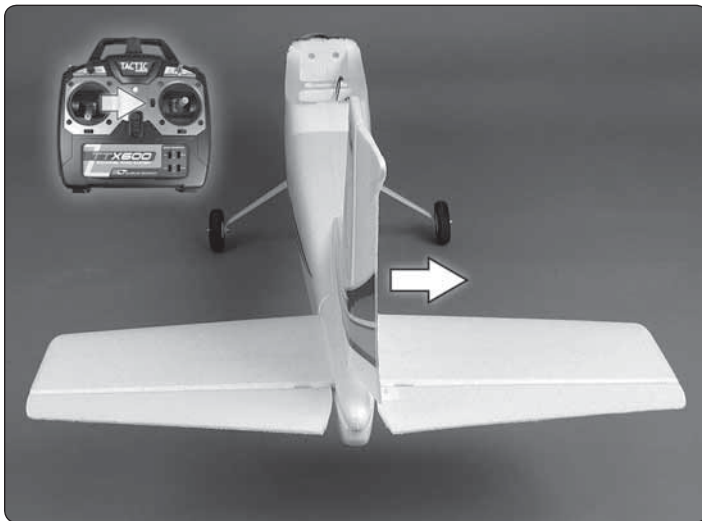


□ 9. Connect the aileron servo wires to the Y-harness from the receiver. Insert the two dowels in the leading edge of the wing into the two holes in the front of the wing saddle. Secure the wing to the fuselage with two 6x25mm nylon bolts.



□ 10. Move the aileron stick to the right. The right aileron will move up and the left aileron will move down.

If any of the control surfaces move in the wrong direction, use the servo reversing switches on the transmitter to change the direction.



□ 8. Move the rudder and elevator sticks on the transmitter making sure the controls respond in the correct direction. Moving the rudder stick to the right, the rudder moves to the right. Moving the elevator stick up, the elevator moves down.

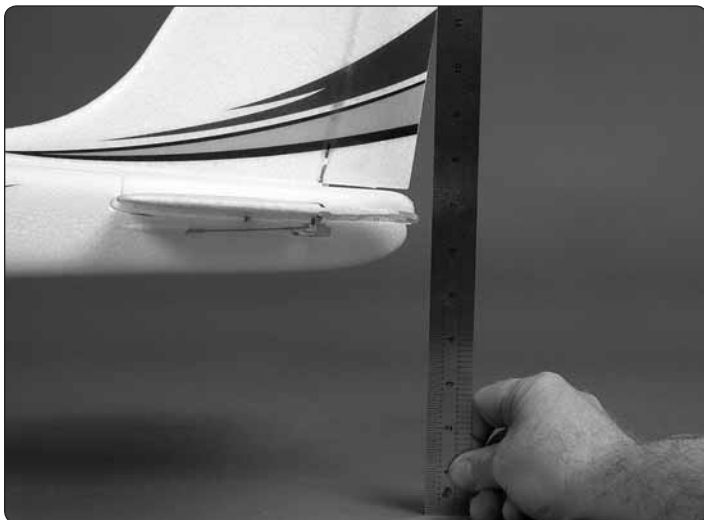
Check the Control Throws

One major factor that determines how an airplane handles in the air is the control surface throw, or how far each control surface (aileron, elevator and rudder) moves up and down or left and right. If the throw is too much, the plane will respond too quickly. If the throw is too little, the plane will respond too slowly. The control throws in the Sensei have already been determined by where the pushrods are connected to the servo arms and the control surfaces and by how far the servo arms rotate. But, if you are using a radio control system different than the Tactic TTX600, the servo arms could rotate more or less than anticipated, changing the throws. Therefore, it's a good idea to double-check the throws just to make sure they are acceptable. Follow the procedure below to make sure the control throws are properly set.

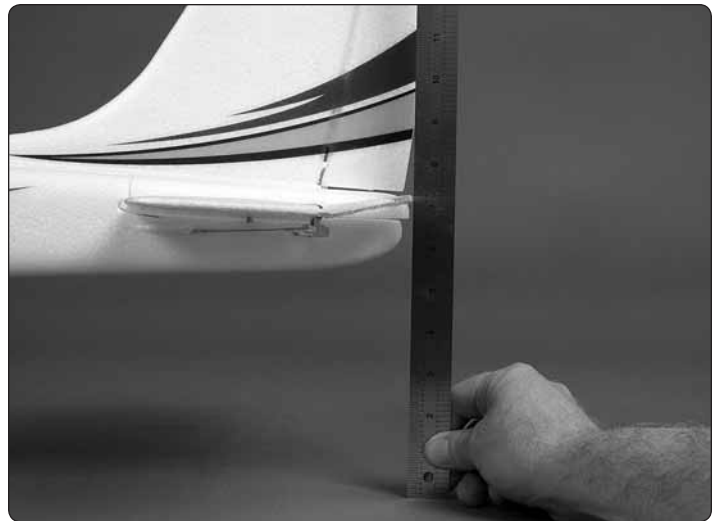
Measure the elevator throw first:



1. Still without the propeller mounted on the motor, switch on your transmitter and connect the motor battery. Check that the dual rate (D/R) switch is in the up position (high rate). With the switch in the up position the servo arm travel is 100%. This rate allows the plane to be more responsive in certain maneuvers. With the switch in the down position (low rate), the servo arm travel is 60% of full travel. This rate allows for smooth basic flying and is good for the beginner who is just learning to fly.



2. Place a ruler next to the trailing edge of the elevator at the widest part (from front-to-back).



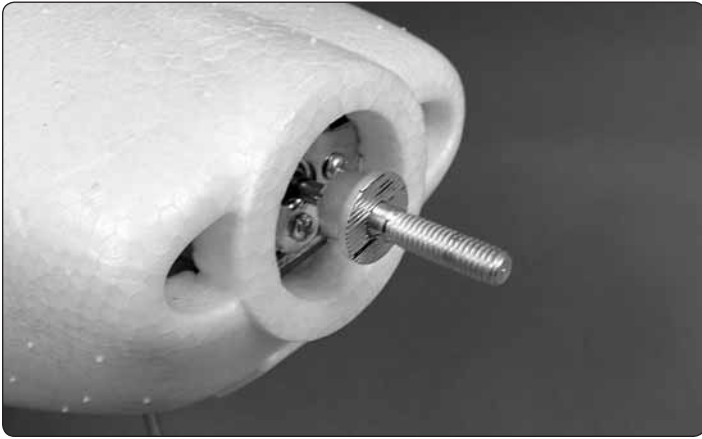
3. Use the transmitter to move the elevator up and measure the distance it moved from center. This is your "up" control throw. Measure the down elevator control throw following the same procedure. Compare the up and down elevator throw to the recommended elevator throw below. Measure and compare the rudder and aileron throws as well.

These are the recommended control surface throws:

ELEVATOR	RUDDER	AILERON
Up & Down	Right & Left	Up & Down
1/2" [15mm]	5/8" [16mm]	1/2" [15mm]

Note: If you ever install different servos in the plane or use a different radio control system, make sure you check that you still have the recommended control throws.

Mount the Propeller

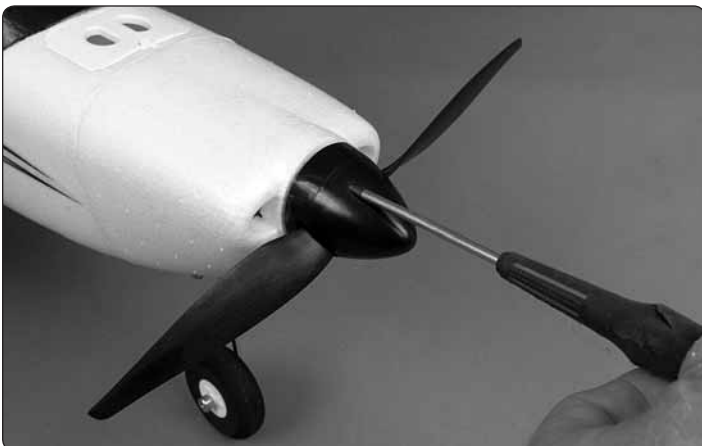


- ❑ 1. Slide the collet type prop adapter onto the motor shaft.



- ❑ 2. Install the spinner backplate on the prop adapter, followed by the propeller, prop washer and prop nut. **Caution:** The propeller blades are sharp. Do not slide your hand along the edge of the propeller.

- ❑ 3. Position the propeller in the slot in the front of the spinner backplate and tighten the prop nut. Use a small crescent wrench to tighten the prop nut securely. Sometimes, as the prop nut is tightened, the prop adapter turns with it causing the nut not to tighten. But, if the nut is turned quickly, it should tighten after another turn or two.

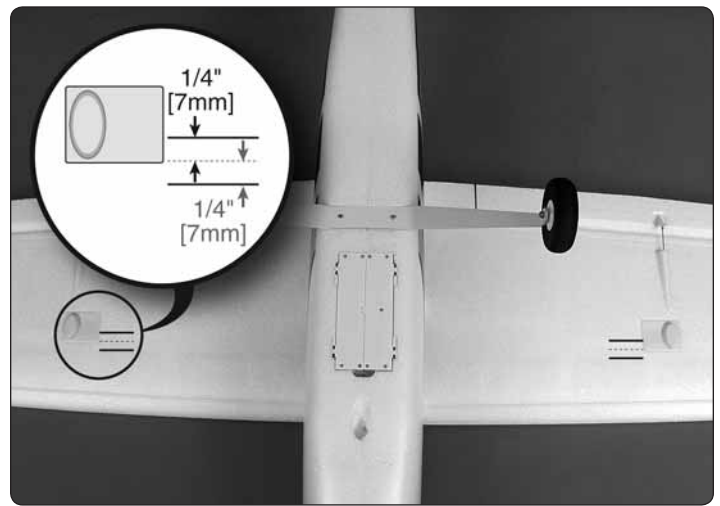


- ❑ 4. Attach the spinner cone to the backplate with the two 2.5x8mm self-tapping screws.

Check the C.G. (Center of Gravity)

The C.G. (Center of Gravity) is the location on the wing where the model balances and has a great effect on how the plane will fly. If the C.G. is too far aft (tail heavy), the model will be too responsive. If the C.G. is too far forward (nose heavy), the model will not be responsive enough. As provided to you, your Sensei should already be properly balanced, or very nearly properly balanced, but it's a good idea to check the balance just in case. Follow the instructions to make sure the model is balanced properly and the C.G. is in the correct location.

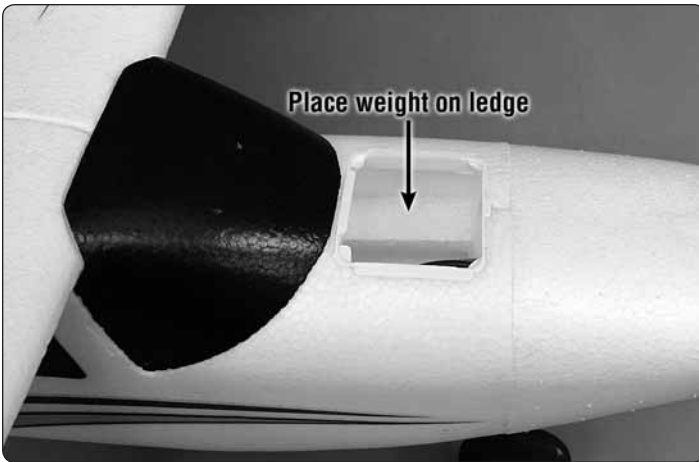
- ❑ 1. Install the motor battery, but do not connect it to the ESC. Also install the battery hatch. All the rest of the parts of the plane should already be installed, including the propeller and spinner.



- ❑ 2. Two plastic aileron servo covers can be found on the bottom of the wing. Draw a mark 1/4" [7mm] back and 1/4" [7mm] forward from the front of the aileron servo cover. The plane should balance between the two marks. Place your fingers between the marks and lift the plane. The fuselage should remain level – it may be helpful to have an assistant view the plane from the side. If the fuselage does not rest level, try moving your fingers under the wing. Your fingers can be moved between the marks. As long as the fuselage is level with your fingers between the marks, the balance range is acceptable, and the plane is ready to fly. However, if after moving your fingers forward past the front mark, the nose

remains low, tail weight will be required. Or, if after moving your fingers past the back mark, the tail remains low, nose weight will be required. Balance the plane as instructed below.

Note: Even if your Sensei balances perfectly, later you may wish to change its flying characteristics by moving the C.G. forward or aft. Moving the C.G. forward (nose heavy) will make the plane more stable which may be better for windier days, but this will also make it less maneuverable. Moving the C.G. back (tail heavy) will make the plane more maneuverable which is good for experienced pilots who wish to perform aerobatics. In any regard, never fly the model with the C.G. outside the recommended range.



3. If the Sensei does not balance between the lines, determine the amount of weight required to balance it by placing segments of Great Planes stick-on lead (GPMQ4485) or similar weight along the edge in the battery compartment or on the top of the stabilizer. Do not attach it yet.

4. Once the plane balances and you know how much lead will be required, permanently stick it into position. The best place to add nose weight is in the battery compartment. If tail weight is required, simply attach it to the side of the fuselage, under the horizontal stabilizer.

5. Once the weight is attached, recheck the C.G. to make certain the plane still balances at the correct C.G. Once finished, remove the battery. Never charge the battery while it is installed in the model.

Important ESC Information

- The ESC included with the Sensei has a safe start. If the motor battery is connected to the ESC and the throttle stick is not in the low throttle or off position, the motor will not start until the throttle stick is moved to the low throttle or off position. Once the throttle stick is moved to the low throttle or off position, the motor will give a short beep. The motor is now armed and will start when the throttle stick is moved.
- The motor and ESC come already connected and the motor rotation should be correct. However, if you have to disconnect the ESC from the motor and when you reconnect it, the motor is rotating in the wrong direction, reversing two of the motor wires will change the direction of rotation of the motor.
- The ESC in the Sensei can only be used with an 11.1V LiPo battery. The ESC has a set cutoff voltage and if a higher or lower voltage battery is used, the battery could be damaged.
- The ESC has a soft cutoff. Once the battery voltage has decreased to a set voltage, the power to the motor will be reduced. This is the signal that it is time to land. The motor will operate for a few seconds at the reduced power before it stops. You will still have power to the radio system and complete control of the plane.

GET THE MODEL READY TO FLY

Identify Your Model

No matter if you fly at an AMA sanctioned R/C club site or if you fly somewhere on your own, you should always have your name, address, telephone number and AMA number on or inside your model. It is required at all AMA R/C club flying sites and AMA sanctioned flying events and simply a “good idea” even if flying somewhere else. Write this information on a strip of masking tape and place it on the inside of the model. The bottom center of the wing also makes a good location for the information.

Find a Suitable Flying Site

Find a flying site clear of buildings, trees, power lines and other obstructions. Until you know how much area will be required and have mastered flying your Sensei in confined spaces, a site at least the size of two or three football fields should be adequate – a flying field specifically intended for R/C planes is best. Don't fly within five miles of R/C flying fields and never fly near people – especially children who can wander unpredictably into the flying area.

Know Your Frequency

CAUTION: This applies only to pilots flying their Sensei with a radio control system that broadcasts on 72MHz. **This caution does not apply to pilots flying their Sensei on 2.4GHz.**

Transmitters operating on 72MHz operate on one of several frequencies available. To find your frequency (or “channel”), look at the label on the transmitter. If your channel happens to be the same as another model that is being flown nearby (even within a few miles), one or both models will crash. Know your frequency and be aware of the frequency of other models that are flying nearby—especially if you are flying at a radio control flying site. All flying sites have some sort of frequency control system to avoid this kind of interference, so learn how to use their frequency control system. **Never** turn on your transmitter until you are certain that you will be the only one operating on your frequency.

Perform a Range Check

As a precaution, an operational ground range test should be performed before the first flight each time you go out. Performing a range test is a good way to detect problems that could cause loss of control such as low batteries, defective or damaged radio components or radio interference. This usually requires an assistant and should be done at the actual flying site you will be using.

First switch on the transmitter, then install the fully-charged battery into the fuselage. Connect the battery and install the battery hatch.

Remember, use care not to “bump” the throttle stick. Otherwise, the propeller will turn and possibly cause damage or injury.

To range check the Tactic TTX600 radio control system, switch on the transmitter and connect the motor battery to the ESC. Set the model on the ground and have an assistant hold the model. Walk 100' (90m) from the model and while pointing the transmitter at the plane, operate the controls ensuring that the plane's surfaces operate according to the transmitter inputs. Operate the motor at different rpms. Have your assistant alert you if the controls quit responding or move suddenly or erratically. If you are using a different radio control system, follow the instructions that came with your radio control system to perform a ground range check.

If the controls aren't working correctly or if anything seems wrong, don't fly the model until you find and correct the problem. Make certain all the servo wires are securely connected to the receiver and the transmitter batteries are in good condition.

Monitor Your Flight Time

Monitor and limit your flight time using a timer (such as one on a wrist watch or in your transmitter if yours has one). When the batteries are getting low you will usually notice a performance drop before the ESC cuts off motor power, so when the plane starts flying slower you should land.

To avoid an unexpected dead-stick landing on your first flight, set your timer to a conservative 4 minutes (in most conditions the Sensei will usually fly for approximately 5 minutes, but this can vary). When your alarm sounds you can either land right away, or if you are an experienced pilot you may continue to fly until the motor finally quits. Then, glide it in for a landing. If planning a “dead-stick,” circle your Sensei upwind of the landing area until the motor quits and note the run time.

When you learn how much flight time you are getting you can adjust your timer accordingly. Always be conservative so the motor won't quit unexpectedly and you will have enough battery to land under power.

FLYING

The Sensei is a great-flying trainer that flies smoothly and predictably. The Sensei does possess some self-recovery characteristics of a primary R/C trainer. However, if you have never flown an R/C plane before, we recommend you get some help from an experienced R/C pilot for your first few flights.

CAUTION (THIS APPLIES TO ALL R/C AIRPLANES): If, while flying, you notice an alarming or unusual sound such as a low-pitched “buzz,” this may indicate control surface *flutter*. Flutter occurs when a control surface (such as an aileron or elevator) or a flying surface (such as a wing or stab) rapidly vibrates up and down (thus causing the noise). In extreme cases, if not detected immediately, flutter can actually cause the control surface to detach or the flying surface to fail, thus causing loss of control followed by an impending crash. The best thing to do when flutter is detected is to slow the model **immediately** by reducing power, then land as soon as safely possible. Identify which surface fluttered (so the problem may be resolved) by checking all the servo grommets for deterioration or signs of vibration. Make certain all pushrod linkages are secure and free of play. If it fluttered once, under similar circumstances it will probably flutter again unless the problem is fixed. Some things which can cause flutter are; Excessive hinge gap; Not mounting control horns solidly; Poor fit of clevis pin in horn; Side-play of wire pushrods caused by large bends; Excessive free play in servo gears; Insecure servo mounting; and one of the most prevalent causes of flutter; Flying an over-powered model at excessive speeds.

Takeoff

Before you get ready to takeoff, see how the Sensei handles on the ground by doing a few practice runs at **low speed** on the runway. Note the amount of rudder steering required to turn the plane. If you need to calm your nerves before the maiden flight, bring the plane back to the pits, unplug and remove the battery and peak charge it.

It is best to make the first couple of flights with the sun at your back. With the sun directly overhead the bottom of the plane is in shadow and can sometime confuse the beginner pilot. Do not take the first flights with the sun in front of you. Experienced pilots that have better control of the plane can avoid flying into the sun. A beginner may not have the control. To takeoff, point the plane into the wind and gradually advance the throttle. Gain as much speed as your runway or flying site will allow before gently applying up elevator, lifting the model into the air. Be smooth on the elevator stick, allowing the model to establish a **gentle** climb to a safe altitude before turning into the traffic pattern.

Flight

Take it easy with the Sensei for the first few flights, gradually getting acquainted with it as you gain confidence. Adjust the trims to maintain straight and level flight. After flying around for a few minutes and while still at a safe altitude with plenty of battery power remaining, practice slow flight and execute practice landing approaches by reducing the throttle to see how the model handles at slower speeds. Gradually add power to see how it climbs. If you are a beginner, try to keep the plane at the same altitude through the turns. Do not allow the plane to get too far away from you or too high. The farther away it gets, the more difficult it is to see what it is doing.

Landing

With electric planes it is best to land with some battery power remaining. This will allow you to abort the landing and go around again if needed. To initiate a landing approach, lower the throttle while on the downwind leg (flying with the wind). Allow the nose of the plane to pitch down slightly to lose altitude. Continue to lose altitude, but maintain air speed by keeping the nose down as you turn into the crosswind leg. Make your final turn towards the runway (into the wind) keeping the nose down to maintain airspeed and control. Level the altitude when the model reaches the landing area, adjusting the throttle to maintain your glide path and airspeed. If the plane is coming in too high or too fast, slowly advance the throttle and climb out to make another attempt. Once the plane is a foot or so above the ground, smoothly increase the elevator while reducing the throttle, bringing the nose of the plane up slightly (flaring). This will reduce the airspeed and gently set the plane on the main wheels.

Some final thoughts for the beginner pilot. Before taking off, have a flight plan, determine which direction you're going to fly, how high, what do you want to work on, keeping the plane level through turns or flying coordinated turns with the rudder. You do not want to surprise yourself by trying a maneuver such as a loop and finding out you were not high enough. Learn the basic flying skills well. All maneuvers are based on having full control of the plane. So go out and practice, practice, practice.

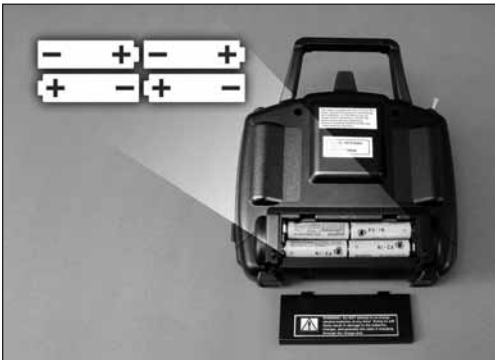


TACTIC TTX600 2.4 GHz 6-CHANNEL RADIO



Transmitter Batteries

Four "AA" batteries are required to power the Tx (not included). Non-rechargeable 1.5V alkaline, or 1.2V rechargeable nickel-cadmium (NiCd) or nickel-metal hydride (NiMH) cells, can be used. Do not mix cell types, or old and new cells, etc.



To install the batteries, slide the battery door down. Insert the cells as shown in the diagram, making sure to note proper polarity for each cell. Close the battery door.

POWER SWITCH, LED, and LOW BATTERY ALARM

The red power LED should light when the power switch is moved upwards to the "ON" position. The Tx should have adequate power for flight when the LED is on constantly. Anytime the LED begins to flash, accompanied by the sounding of an audible tone, the Tx battery voltage has dropped too low and operation of the model should NOT be attempted!



WARNING! Never operate an R/C model with weak Tx batteries! Reduced operational range and/or possible loss of control of the aircraft could result. Replace weak alkaline batteries, or re-charge NiCd or NiMH batteries, before attempting a flight!

If during a flight the Tx LED starts to flash, accompanied by the sounding of audible tones, it's a warning that the Tx batteries have become weak and the aircraft should be landed as soon as possible!

Adjustable Sticks



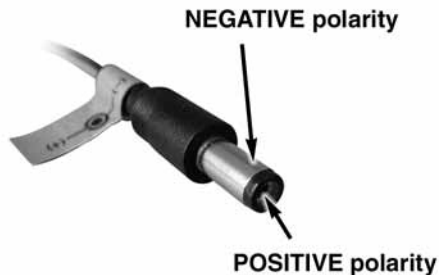
The length of both gimbal sticks can be adjusted as desired. Loosen the set screw inside the center of the stick with a 2mm hex wrench. Rotate the stick end counter-clockwise to lengthen the stick, or clockwise to shorten the stick. Once the desired stick length is found, tighten the set screw with the hex wrench.

Charge Jack



WARNING!! Do NOT attempt to recharge alkaline batteries! The charge jack should ONLY be used if rechargeable cells are used in the transmitter.

The TTX600 includes a built-in charge jack for convenient recharging of NiCd or NiMH batteries, and is compatible with charge leads designed for Futaba® brand transmitters (HCAP0101). This jack is NOT compatible with charge leads for Hitec®, Airtronics®, JR® or Spektrum® radios.



To use the charge jack with optional rechargeable batteries, first remove the sticker that covers the charge jack on the side of the Tx – making sure not to allow any object to be inserted inside the jack itself. Next, insert the cells inside the Tx's battery compartment noting proper polarity. Make sure the transmitter's power switch is in the OFF position. Connect a compatible charge lead to the jack and follow the instructions included with the charger for charging of NiCd or NiMH batteries that are rated at 4.8V.

Tactic's optional TACP1000 rechargeable battery and wall charger kit includes eight "AA" size rechargeable NiMH cells and 110V AC wall charger, which is compatible with this Tx and can be found at local retailers. Make sure to follow the instructions included with the charge kit.



WARNING!! It's not recommended to charge batteries at greater than 1 amp through this charge jack. Fast charging of NiCd and NiMH batteries should ONLY be done with chargers that are specifically designed to include the peak-detection function which can automatically stop charge when full charge is detected. Misuse, improper charging, or over-charging of rechargeable cells can result in damage to the cells that could include cell rupture, explosion, or fire!!

Trainer Function

The TTX600 Tx includes a built-in **wireless** trainer function – no trainer cable required! This trainer system connects a teacher's Tactic Tx to a student's Tactic Tx by wireless connection. Tactic's wireless trainer function is not compatible with trainer systems in any other brand radios.



IMPORTANT! Before attempting to fly the airplane, it's very important to make sure all reversing switches and trim lever adjustments on the student's Tx match the settings on the teacher's Tx! Otherwise, the airplane could suddenly veer off in an unwanted manner when the teacher's trainer switch is pressed. Proper matching of the student and teacher's Tx settings should ensure that no unexpected movements occur when the trainer switch is pressed. This is especially true of the throttle control!

1. The Tx that was used to set up the controls on the aircraft must be used by the TEACHER.
2. The student must use a separate Tactic Tx with wireless trainer function.
3. Place the teacher and student's transmitters within 1 meter of each other, and make sure the throttle stick for each Tx is set to idle.
4. Turn ON the power switch for the Tx being held by the student.
5. Pull and hold the trainer switch on the teacher's Tx, and then turn ON the teacher's Tx power switch.
6. The LED on the teacher's Tx will flash 3 times to indicate it has become bound with the student's Tx.
7. The teacher can then release his trainer switch.
8. Once both transmitters are bound together, power can be applied to the receiver to prepare for flight.

When the training session has ended, with the model on the ground and all power removed from the model, place both transmitters within 1 meter of each other and simply turn the power switch for both transmitters to the OFF position. This will terminate the wireless link between both transmitters. If additional training will be performed again, return to step 1 above to re-establish the wireless link between the teacher and student's transmitters.

Failsafe Function

The included TR624 receiver has a failsafe feature which engages in the event that the radio signal from the transmitter somehow becomes interrupted. If radio contact is broken, this safety feature causes the servos to automatically move either to a certain position, or hold their last position to prevent the model from moving in an erratic manner. Channels 1, 2, 4, 5, and 6 will enter a “hold” mode, whereby the servos will lock in their last recognized position.

The servo connected to channel 3, normally being the throttle control, will move to a pre-set position. The factory default failsafe position for channel 3 is to move to **0% throttle**. Motor/prop movement should stop if the receiver loses signal from the transmitter. The throttle servo’s failsafe position can be manually re-set to any other position if desired, as follows:

IMPORTANT NOTE: Before manually resetting the failsafe, make sure the servo reversing switches are in the correct position for the application.

1. Apply power to the Tx and Rx.
- 2a. If using an ESC, do NOT arm the ESC. Do NOT attempt to adjust the throttle’s failsafe position if the ESC is armed.
- 2b. If using a gas or glow powered engine, do NOT attempt to adjust the throttle’s failsafe position while the engine is operating.
3. Move the Tx throttle stick to the desired position for the throttle control to move if the Rx goes to failsafe.
4. Press and hold the “Bind” button on the receiver, and the Rx’s LED should blink twice. Release the Bind button, and the receiver’s LED should turn on (stop flashing). The Tx and Rx should now be bound, with the throttle failsafe in the new position as set above.

NOTE: If you’re using an ESC which has a signal loss feature, the pre-set failsafe position is irrelevant as the signal loss feature will cease the throttle operation if the signal is lost.

System Check and Operation

WARNING! During all pre-flight preparations with the aircraft on the ground, make sure the throttle stick remains at the minimum position and do not stand the Tx upright on the ground. Carefully lay the Tx on its back on the ground to prevent it from falling over and possibly dislodging the throttle stick from the low position which would create a safety hazard. Make sure all devices are properly mounted inside the model, and all wiring connections are solid to prevent them from easily becoming dislodged during normal flight. It’s best to check the system with the propeller removed from the aircraft.

1. Once all connections are made, check the general operation of the radio and all other components before attempting a flight.
2. Move the Tx throttle stick to the minimum (idle) position.
3. Turn on the Tx, and then the Rx.
4. Make sure all controls are operating in the proper direction. If any servo is turning in the wrong direction, change the position of the reversing switch for that particular channel.
5. With both sticks at center position, move the trim levers for the aileron, elevator, and rudder channels so each respective control surface is perfectly aligned with the main surface. For example: When the aileron trim lever is in the center position, it’s best that the trailing edge of the aileron is aligned with the trailing edge of the wing itself (not above or below the wing’s trailing edge).
6. Make sure that movements of the throttle stick result in an equal adjustment of the throttle in the model. Confirm that when the throttle stick is at maximum position the electronic speed control gives the appropriate indications (LED and/or audible indicators) for full forward flight. And, when the throttle stick is at minimum position the electronic speed control gives the appropriate indications for “off” or no motor rotation.
7. Anytime power is to be removed from the radio system, it’s important to shut down power in the aircraft **first**. Otherwise, the aircraft could become out of control and cause a safety hazard! Move the throttle stick and throttle trim lever to minimum position to stop the glow engine or shut down the ESC. Once the propeller has stopped rotating, shut off the ON/OFF power switch in the model, and disconnect the power battery from the ESC in electric airplanes. Then turn off the power switch in the Tx.

AMA Safety Code (Excerpts)

Read and abide by the following excerpts from the Academy of Model Aeronautics Safety Code. For the complete Safety Code refer to Model Aviation magazine, the AMA web site or the Code that came with your AMA license.

GENERAL

1. I will not fly my model aircraft in sanctioned events, air shows, or model flying demonstrations until it has been proven to be airworthy by having been previously, successfully flight tested.
2. I will not fly my model aircraft higher than approximately 400 feet within 3 miles of an airport without notifying the airport operator. I will give right-of-way and avoid flying in the proximity of full-scale aircraft. Where necessary, an observer shall be utilized to supervise flying to avoid having models fly in the proximity of full-scale aircraft.
3. Where established, I will abide by the safety rules for the flying site I use, and I will not willfully and deliberately fly my models in a careless, reckless and/or dangerous manner.
5. I will not fly my model unless it is identified with my name and address or AMA number, on or in the model. **Note:** This does not apply to models while being flown indoors.
7. I will not operate models with pyrotechnics (any device that explodes, burns, or propels a projectile of any kind).

RADIO CONTROL

1. I will have completed a successful radio equipment ground check before the first flight of a new or repaired model.
2. I will not fly my model aircraft in the presence of spectators until I become a qualified flier, unless assisted by an experienced helper.
3. At all flying sites a straight or curved line(s) must be established in front of which all flying takes place with the other side for spectators. Only personnel involved with flying the aircraft are allowed at or in the front of the flight line. Intentional flying behind the flight line is prohibited.
4. I will operate my model using only radio control frequencies currently allowed by the Federal Communications Commission.
5. **I will not knowingly operate my model within three miles of any pre-existing flying site except in accordance with the frequency sharing agreement listed [in the complete AMA Safety Code].**
9. Under no circumstances may a pilot or other person touch a powered model in flight; **nor should any part of the model other than the landing gear, intentionally touch the ground, except while landing.**

Specifications

TTX600 6-Channel Transmitter	
Channels	6
Frequencies	2.403 – 2.480GHz
Modulation	FHSS spread spectrum
Input power	Four “AA” alkaline, NiCd, or NiMH cells (3.8 – 8.0V, not included)
Output power	< 0.1W
Power indicators	LED, with low voltage alarm
Reversing switches	Slide switches, four channels
Trims	Analog for throttle, digital for aileron, elevator, rudder
Antenna	Built-in non-removable
Charge jack	Built-in (Futaba® compatible, for use with optional NiCd or NiMH cells)
Trainer function	Wireless (compatible with Tactic brand transmitters only)
Optional mixes	Elevon, V-Tail
Dual rates	100/60 % for aileron/elevator/rudder
Channel 5	Non-proportional on/off
Channel 6	Proportional

Tactic TR624 Receiver	
Channels	6
Frequencies	2.403 – 2.480GHz
Modulation	FHSS spread spectrum
Input power	Four “AA” alkaline, NiCd or NiMH cells (4.0 – 6.0V, not included)
Failsafe	Programmable throttle, all other channels hold
Dimensions	1.77 × 0.98 × 0.5" (45 × 25 × 13mm)
Weight	0.28 oz (8g)

OTHER ITEMS INCLUDED

- On/off switch harness with built-in charge lead
- 4 cell “AA” battery holder for receiver
- Neck strap

Important Warnings and Precautions



- **NEVER** allow water or moisture to make contact with the electronic components inside the transmitter, receiver, servos, switch harness, etc.! This could lead to failure or improper functionality of components and poor control of aircraft which could pose a safety hazard.
- **NEVER** operate R/C model aircraft near power lines, radio or cell phone towers, roads or automobiles, buildings, or pedestrians. Be very careful in locations where many R/C aircraft are being used simultaneously.
- **NEVER** operate R/C equipment if you are physically impaired as it could pose a safety hazard to yourself or others in the area.
- **NEVER** allow small children to operate/control model R/C equipment without the supervision of an adult.
- **NEVER** allow the transmitter's throttle stick to accidentally be moved away from the "off" or minimum position while the model's engine/motor is moving.
- **ALWAYS** range check the radio system before use.
- **ALWAYS** make sure that all transmitter stick movements operate all servos properly in the model. Check the proper operation of control surfaces before and after starting the engine/motor.
- **ALWAYS** make sure the transmitter antenna is unfolded entirely so that it's pointing upright to ensure max. range and control of the aircraft.
- Do not store your radio equipment in extremely hot or cold locations, in direct sunlight, or in locations with high humidity. Store R/C equipment in cool and dry locations.
- Do not allow chemicals to come in contact with any parts of the radio system. Substances such as glow fuel, gasoline, CA glue, etc. could permanently damage plastic parts of the radio system.
- If NiCd batteries were installed in the transmitter, remove the batteries before placing the radio in long-term storage.

Troubleshooting

RANGE IS SHORT

Interference – check Rx installation and servo connections.
Low Tx or Rx battery – replace the batteries or recharge if applicable. Rx may need to be located to a different position in the model for better reception. Crash damage – send the radio to Hobby Services for repair.

RUN TIME IS SHORT

Low Tx or Rx batteries – replace or recharge the batteries.
Obstructed servo linkages causing excess battery drain – free the linkages / pushrods.

Tx POWER SWITCH ON BUT SERVOS DO NOT FUNCTION

Tx or Rx batteries are low – replace or recharge the batteries. Rx switch is in the off position – turn on the ESC or switch harness. Switch harness or ESC is connected incorrectly – check all connections and the ESC instruction manual. Rx is not binded to the Tx properly – perform binding process again. Check Tx or Rx battery polarity.

INTERFERENCE OR SERVOS GLITCHING

Out of range – operate the model more closely to the transmitter. Outside radio interference from pagers, strong industrial or other commercial transmitters in the area - check your local R/C club regarding local operation. Rx located too closely to engine, motor, or servos or other moving mechanical parts which might be creating unwanted electrical noise – relocate the Rx inside the model or relocate the ESC.

CONTROL SURFACE MOVES IN THE WRONG DIRECTION

Reverse the position of the reversing switch for the appropriate channel.

ONLY ONE SERVO GLITCHES

Servo is bad – replace the servo or send to Hobby Services for repair.

FAILSAFE NOT WORKING CORRECTLY

Receiver is not properly binded to the transmitter – bind the Rx to the Tx and re-try. Contact Hobby Services for further details.

WIRELESS TRAINING FUNCTION NOT BINDING

Check to see that another Tactic 2.4GHz system is not on in your area. The teacher's and student's transmitters were not powered in the proper sequence. Carefully follow the instructions on page 17 for proper binding and operation for training.

RECHARGEABLE BATTERIES WON'T ACCEPT CHARGE THROUGH THE TRANSMITTER

Check the charger for proper setup and operation. Make sure the charge plug is inserted fully into the charge jack. Make sure the transmitter's power switch is in the OFF position. Make sure the cells are inserted inside the battery compartment in the proper direction.

FCC Statement

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions.

- (1) This device may not cause harmful interference.
- (2) This device must accept any interference received, including interference that may cause undesired operation.

FCC Rf Radiated Exposure Statement: The equipment complies with FCC Rf radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

Note: The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC ID: IYFTTX600

CE Compliance Information for the European Union

Instructions for Disposal of Waste Equipment by Private Users in the European Union:



This symbol on the product or its packaging indicates this product must not be disposed of with other household waste. Instead, it is the user's responsibility to dispose of their waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service or location where you purchased the product.

Declaration of Conformity:

Product: Tactic TTX600 2.4GHz 6-Channel Tx Rx

Item number: TACJ2600

Equipment class: 1



Tactic TTX600 transmitter and Tactic TR624 receiver:

The objects of the declaration described here are in conformity with the requirements of the specifications listed below, following the provisions of the European 2006/95/EC Low Voltage Directive:

EN 60950-1:2006

Safety

The objects of the declaration described here are in conformity with the requirements of the specifications listed below, following the provisions of the European R&TTE directive 1995/5/EC:

ETSI EN 300 328 V1.7.1

Technical requirements for radio equipment

ETSI EN 301 489-1 V1.8.1,

General EMC requirements for radio equipment

301 489-17 V1.3.2

Tactic

c/o Hobbico, Inc.

2904 Research Road

Champaign, IL USA 61826

CE COMPLIANCE INFORMATION FOR THE EUROPEAN UNION

The associated regulatory agencies of the following countries recognize the noted certifications for this product as authorized for sale and use.

UK	DE	DK	BG	SE	FI	
EE	LV	LT	PL	CZ	SK	HU
RO	SI	AT	IT	ES	PT	IE
NL	LU	MT	CY	GR		

TTX600 One Year Limited Warranty *U.S.A and Canada

Tactic warrants this product to be free from defects in materials and workmanship for a period of one (1) year from the date of purchase. During that period, Tactic will, at its option, repair or replace without service charge any product deemed defective due to those causes. You will be required to provide proof of purchase (invoice or receipt). This warranty does not cover damage caused by abuse, misuse, alteration or accident. If there is damage stemming from these causes within the stated warranty period, Tactic will, at its option, repair or replace it for a service charge not greater than 50% of its then current retail list price. Be sure to include your daytime telephone number in case we need to contact you about your repair. This warranty gives you specific rights. You may have other rights, which vary from state to state.

For service on your Tactic product, send it post paid and insured to:

HOBBY SERVICES Ph: (217) 398-0007
3002 N. Apollo Dr., Suite 1 (9:00am–5:00pm CST, M–F)
Champaign, IL 61822

E-mail: hobbyservices@hobbico.com
tacticrc.com

- This product is suitable only for people of 14 years and older. This is not a toy!
- **WARNING: CHOKING HAZARD** - May contain small parts. Keep away from children under 3 years. Please retain packaging for future reference.
- No part of this manual may be reproduced in any form without prior permission.
- The contents of this manual are subject to change without prior notice.
- Tactic is not responsible for the use of this product.



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