

MILLENNIUM Master

INSTRUCTION MANUAL



Flyzone[™]
how high will you soar

SPECIFICATIONS

Wingspan: 41 in [1040 mm]	Weight: 26.8–28.8 oz [760–815 g]	Motor: 37mm, 1000kV outrunner, 30A ESC, 9 x 4.5 Slow-Flyer propeller included
Wing Area: 268 in ² [17.3 dm ²]	Length: 38.5 in [980 mm]	
Wing Loading: 14.4–15.5 oz/ft ² [44–47 g/dm ²]	Radio: 4 channel	

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.

TABLE OF CONTENTS

<p>INTRODUCTION2</p> <p>AMA2</p> <p>SAFETY PRECAUTIONS2</p> <p>REQUIRED FOR COMPLETION3</p> <p style="padding-left: 20px;">Radio Control System3</p> <p style="padding-left: 20px;">Battery3</p> <p style="padding-left: 20px;">Charger3</p> <p style="padding-left: 20px;">Glue, Tools, and Building Supplies3</p> <p>KIT INSPECTION4</p> <p>ORDERING REPLACEMENT PARTS4</p> <p>CONTENTS4</p> <p>ASSEMBLY5</p> <p style="padding-left: 20px;">Mount the Wing and Tail Surfaces5</p> <p style="padding-left: 20px;">Final Assembly7</p>	<p>GET THE MODEL READY TO FLY9</p> <p style="padding-left: 20px;">Check the Controls9</p> <p style="padding-left: 20px;">Set the Control Throws9</p> <p>PREFLIGHT10</p> <p style="padding-left: 20px;">Balance the Propeller10</p> <p style="padding-left: 20px;">Balance the Model Laterally11</p> <p style="padding-left: 20px;">Identify Your Model11</p> <p style="padding-left: 20px;">Charge the Transmitter Batteries11</p> <p style="padding-left: 20px;">Charge the LiPo Battery11</p> <p style="padding-left: 20px;">Range Check11</p> <p>AMA SAFETY CODE11</p> <p style="padding-left: 20px;">General11</p> <p style="padding-left: 20px;">Radio Control11</p> <p>FLYING12</p>
---	---

INTRODUCTION

Thank you for purchasing the Flyzone *Millennium Master*. The full-size Millennium has a wingspan of 26'-1" making this model 1:7.6-scale (or 13%). We absolutely fell in love with the Millennium the moment the first prototype left the ground! Its sleek lines, steady ground handling, neutral feel and "racy" speed make it an absolute necessity for any pilot who understands that pure, real, R/C entertainment doesn't have to come from imposing, complex airplanes.

NOTE: This instruction manual applies to both the **Rx-R™** (receiver-ready) version and the **Tx-R™** (transmitter-ready) version of the Millennium Master. If assembling the Tx-R version simply skip steps that do not apply.

For the latest technical updates or manual corrections to the Millennium, visit the Hobbico web site at www.hobbico.com. Open the "Airplanes" link, then select the Millennium ARF. 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 Millennium 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 Millennium, if not assembled and operated correctly, could possibly cause injury to yourself or spectators and damage to property.
2. You must assemble the Millennium **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. You must use an R/C radio system that is in good condition. All components must be correctly installed so that the model operates correctly on the ground and in the air. You must check the operation of the model and all components before **every** flight.
4. If you are not an experienced pilot or have not flown this type of model 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.
5. While this kit has been flight tested to exceed normal use, if the plane will be used for extremely high stress flying, such as racing, or if a motor or battery larger than ones in the recommended range is used, the modeler is responsible for taking steps to reinforce the high stress points and/or substituting hardware more suitable for the increased stress.

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.

Remember: Take your time and follow the instructions to end up with a well-built model.

REQUIRED FOR COMPLETION

Radio Control System

The Rx-R version of your Millennium requires you supply your own 4-channel transmitter and receiver. The Tx-R version comes equipped with a Tactic™ TR624 6-Channel 2.4GHz receiver, so you'll need either a Tactic TX600 6-channel 2.4GHz transmitter or any other 4-channel (or more) transmitter compatible with the Tactic *AnyLink*™ 2.4GHz radio adapter (TACJ2000)*. Using the *AnyLink* allows any compatible transmitter to work with the Tactic receiver.

* Visit Tx-Ready.com to see the *AnyLink* compatibility chart or contact Product Support at the contact information on page 4.

Battery

The motor and propeller combination included with the Millennium are matched to work with an 11.1V (3S) 1800mAh 20C LiPo battery such as the Flyzone battery (HCAA6430) included with the Tx-R. Any other LiPo with similar specifications should also be suitable, but keep in mind that at approximately 5.5 oz. [160g] an 1800mAh battery is the "sweet spot" for the Millennium. While a larger, 2100mAh battery is a perfectly suitable alternative and has more capacity for theoretically longer flight times, the heavier weight can be detected in flight requiring slightly higher throttle settings for the same performance and only marginally longer flight times. On an 1800mAh battery the Millennium should fly for at least seven minutes. **Technical Info:** At full-throttle with the included propeller the motor draws approximately 24A on the ground and approximately 20A in-flight. The *average* current draw in flight is approximately 12A for an average current consumption of approximately 205mAh per minute. Battery condition, flying style and weather conditions may cause performance to vary.

Note: LiPo batteries that come with a Deans® Ultra Plug® connector will require a SuperTigre-to-Deans Ultra Male adapter (SUPM0040) so the battery can be connected to the SuperTiger® connector on the ESC.

Charger

The Tx-R comes equipped with a Great Planes® 3S LiPo balancing *Smart Charger*. The Smart Charger is a safe way to charge your LiPo battery, but it's very basic and just enough to get you started. The Smart Charger charges at a rate of .8 Amps, so it will take at least one-and-a-half hours or more to charge your battery. Eventually you'll want to get more

batteries and an advanced charger so you can charge faster and fly more! For the most versatility, convenience and faster charging, the Great Planes *ElectriFly*® Triton™ EQ AC/DC Charger (GPMM3155) is highly recommended for the Rx-R and as an upgrade charger for the Tx-R and perfect for batteries used with the Millennium. The Triton EQ may be powered either by an external DC power source (such as a 12V battery), or a 110V AC outlet and can charge your batteries in as little as a half-hour or less (depending on the condition of your batteries and the manufacturer's specified charge rate). The Triton EQ also has an LCD digital display screen so you can see how much capacity it took to charge the battery (handy for making calculations including flight time). The Triton EQ is a charger you can "grow into" because in addition to charging the LiPo batteries that will be used in your Millennium, it can also charge many other types and sizes of batteries.

Note: For use with the Triton EQ, LiPo batteries that come with a Deans® Ultra Plug® connector will require a Charge Lead with banana plugs/Deans Ultra Male charge lead (GPMM3148). Batteries that come with SuperTigre connectors will require a Charge Lead banana plugs/SuperTigre Charge Lead (SUPM0070).

Glue, Tools, and Building Supplies



Other than common hobby tools the only requirements for getting your Millennium airborne are medium or thin CA for attaching the tail surfaces and threadlocker for some of the screws that should be checked before flying. CA gluing applicator tips are also recommended when using CA:

- 1/2 oz. Great Planes Medium CA (GPMP6007)
- Hobbico CA applicator tips (HCAR3780)
- Great Planes Pro™ Threadlocker (GPMP6060)

NOTE: The stabilizer and wing incidences and motor thrust angles have been factory-built into this model. However, some technically-minded modelers may wish to check these measurements anyway. To view this information visit the web site at www.greatplanes.com and click on "Technical Data." Due to manufacturing tolerances which will have little or no effect on the way your model will fly, please expect slight deviations between your model and the published values.

KIT INSPECTION

Before starting to build, take an inventory of this kit to make sure it is complete, and 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

ORDERING REPLACEMENT PARTS

Replacement parts for the Flyzone Millennium ARF 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 via facsimile 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

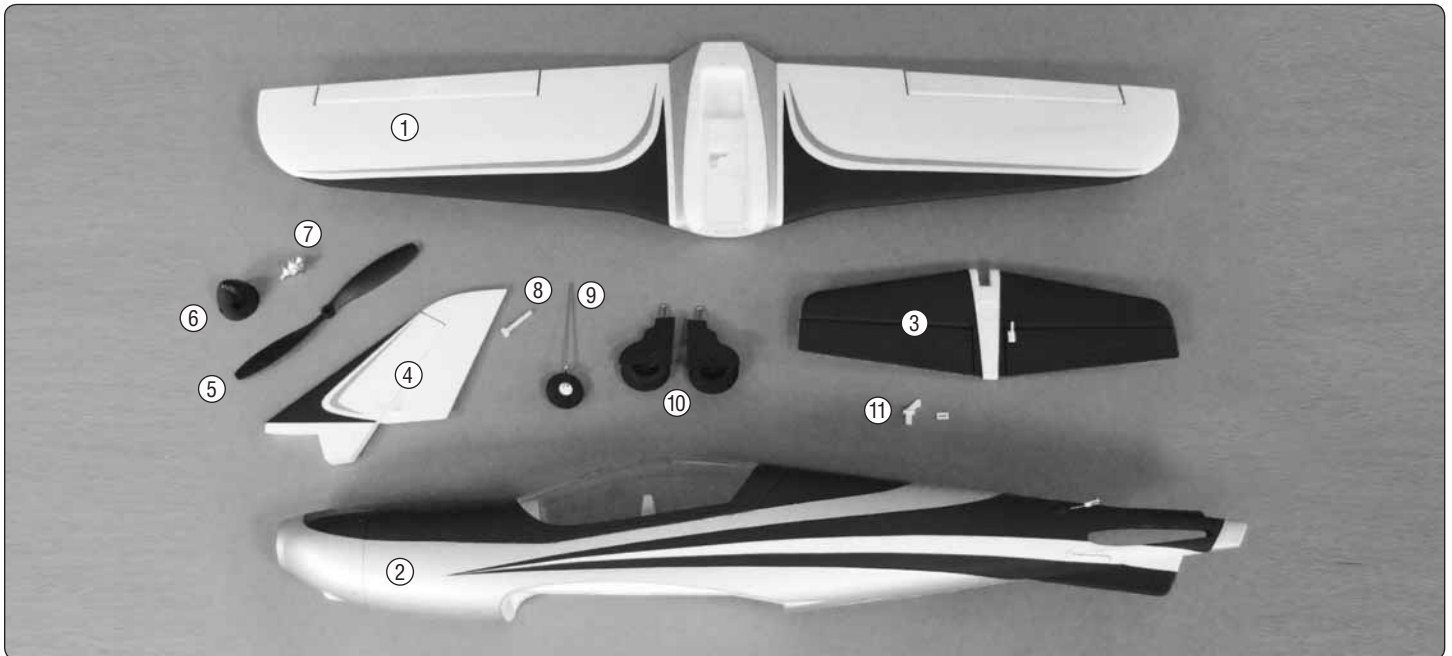
Be certain to specify the order number exactly as listed in the **Replacement Parts List**. Payment by credit card or personal check only; no C.O.D.

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

REPLACEMENT PARTS LIST

Order No.	Description	Order No.	Description
FLZA6205	Wing	FLZA6212	Decal
FLZA6206	Fuselage	FLZA6213	Wing Bolt
FLZA6207	Tail Surfaces	FLZA6214	Propeller Adapter
FLZA6208	Canopy	FLZA6215	Hardware
FLZA6209	Cowl	FLZA6216	Motor
FLZA6210	Landing Gear Set	FLZA6217	30a ESC
FLZA6211	Spinner	GMPA4224	Servo
GPM3318	AC/DC 3S LiPo Balancing Smart Charger		
HCAA6430	3S 11.1V 1800mAh 20C LiPo Battery		
GPMQ6630	Great Planes 9x4.5 Power Flow Slo-Flyer Elec Prop (2)		

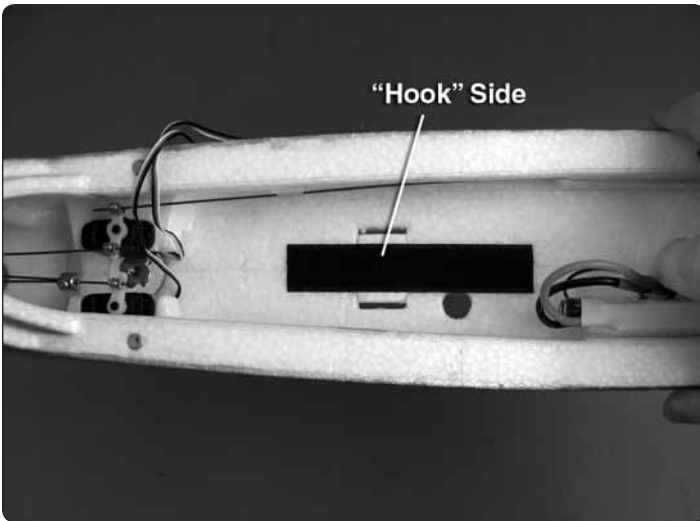
CONTENTS



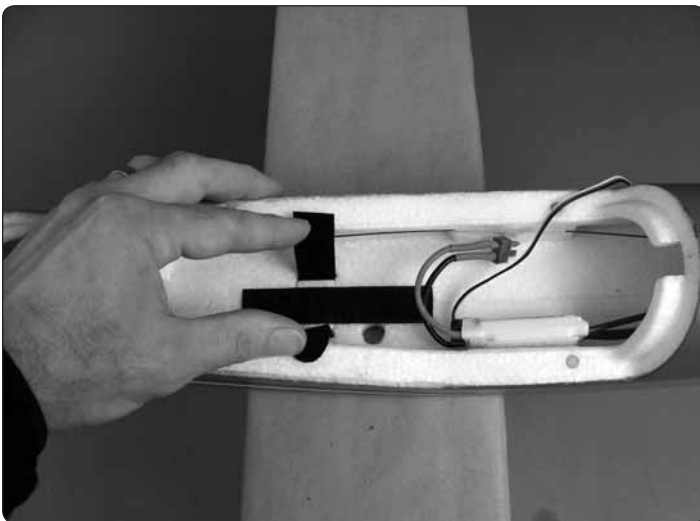
- | | | |
|--------------------------|----------------------|---------------------------|
| 1. Wing | 5. Propeller | 9. Nose Wheel |
| 2. Fuselage | 6. Spinner | 10. Main Landing Gear |
| 3. Horizontal Stabilizer | 7. Propeller Adapter | 11. Elevator Control Horn |
| 4. Vertical Stabilizer | 8. Wing Bolt | |

ASSEMBLY

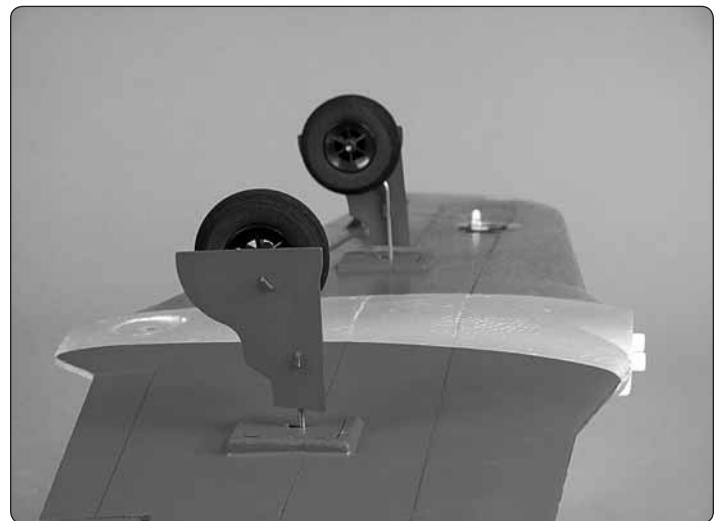
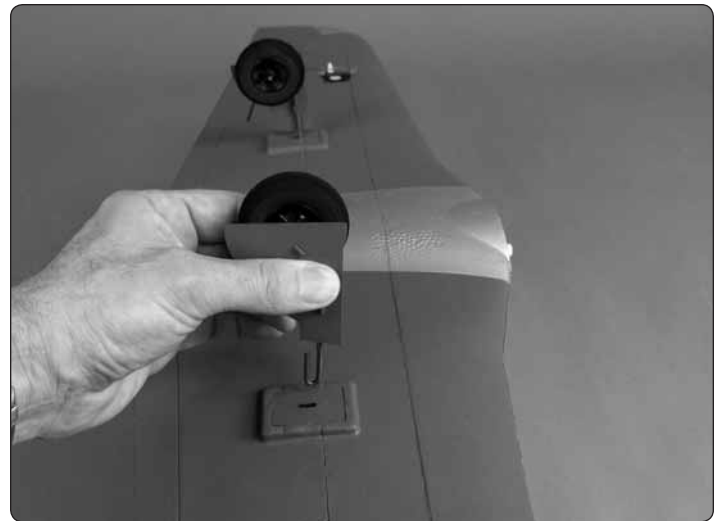
Mount the Wing and Tail Surfaces



❑ 1. Attach the rougher, “hook” side of the included adhesive-back Velcro strip to the fuselage floor where shown. Attach the softer, “loop” side to your battery. If more Velcro is required for additional batteries use Great Planes 1" x 6" adhesive-back Velcro strips (GPMQ4480).



❑ 2. Test-fit your battery in the fuselage and cut the included Velcro battery strap to the correct length to fit around your battery (a photo of the battery installed appears on page 8). Round one end of the strap (making it easier to unhook later) and install the strap in the fuselage.



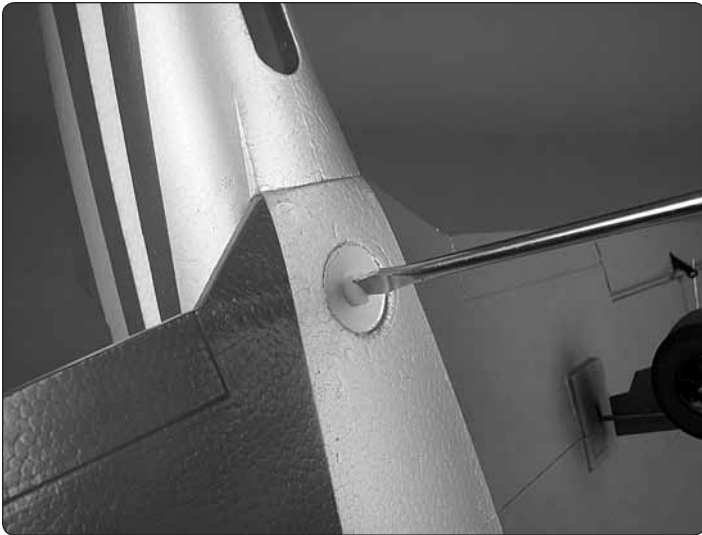
❑ 3. Press the main landing gear into the mounts in the bottom of the wing as shown.



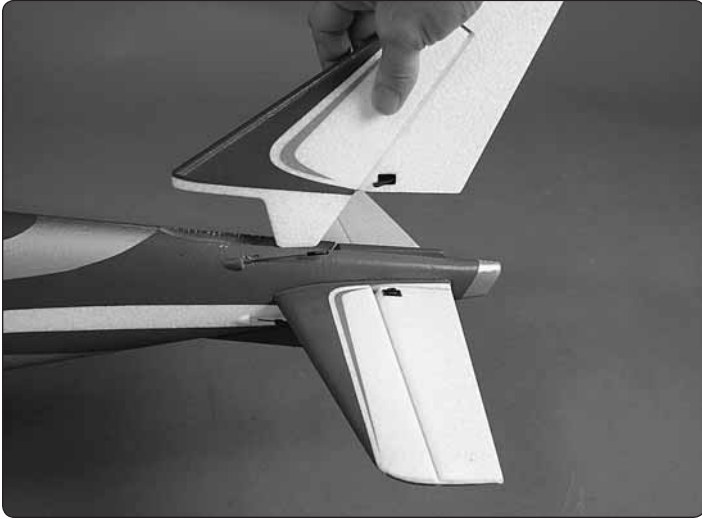
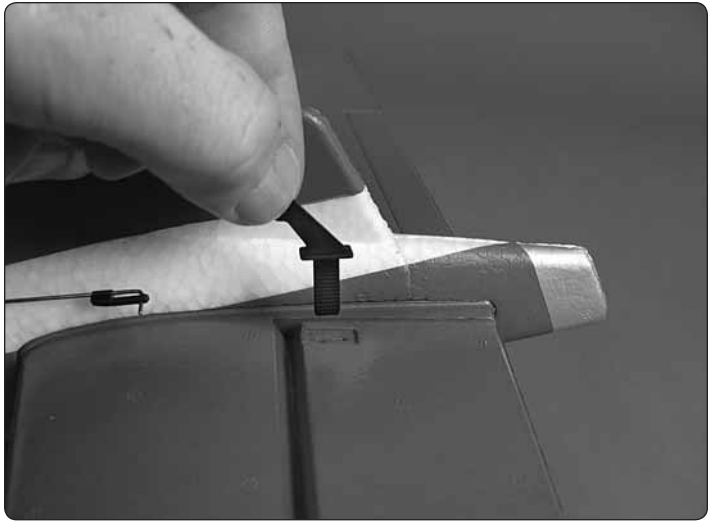
❑ 4. Guide the aileron servo wire up through the hole in the fuselage floor and mount the wing with the included 5mm nylon wing bolt.

See “Identify Your Model” on page 11.

AMA Number	
Phone Number	
City, State, Zip	
Address	
Name	
This model belongs to:	



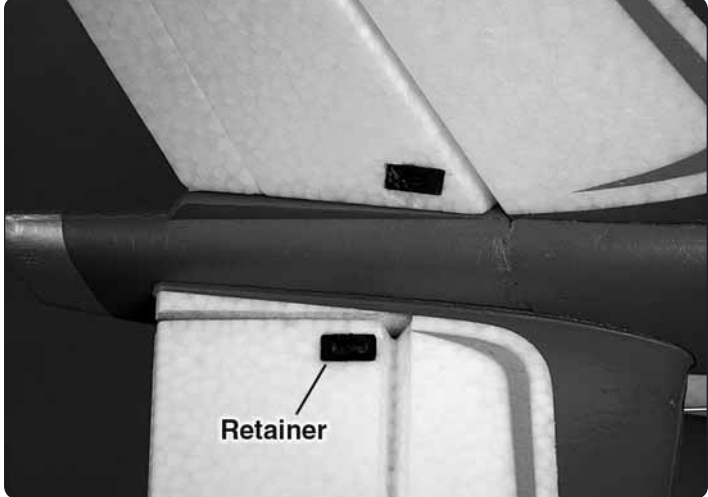
Tighten the bolt finger tight, then use a screw driver to turn it an additional half-turn.



❑ 5. Slide the horizontal stabilizer (stab) into the fuselage, then key in the vertical stabilizer (fin). The fin self-aligns, but view the stab from above to make sure it is centered and aligned too.

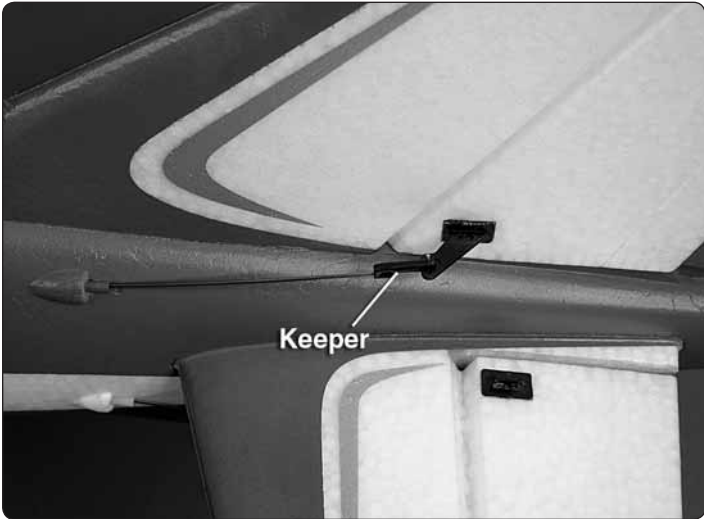
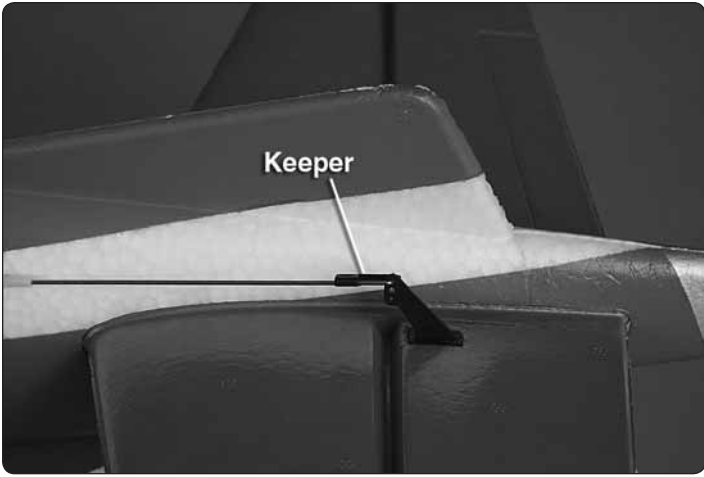


❑ 6. Apply medium or thin CA all the way around the stab and fin to glue them to the fuselage.



❑ 7. Mount the control horn to the right elevator with the retainer on the other side. Cut off the excess part of the horn that protrudes through the retainer, then add a few drops of CA.

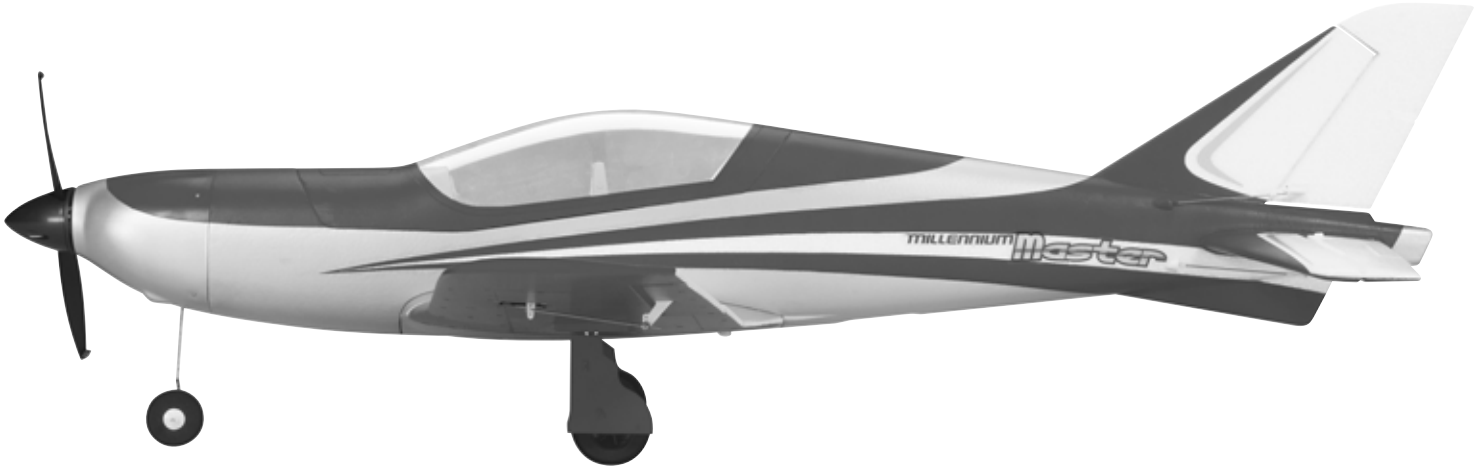
Final Assembly



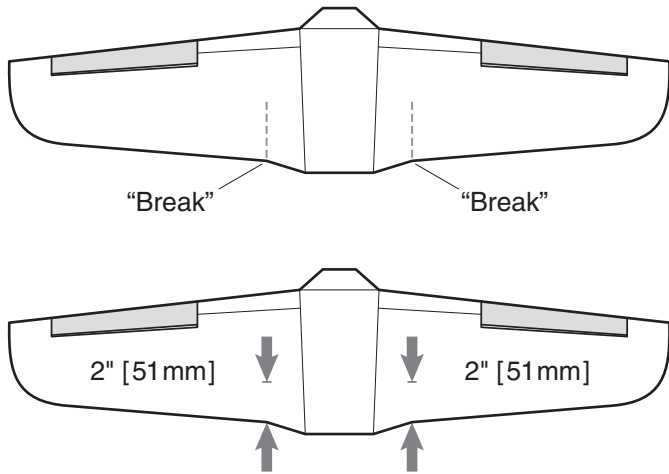
8. Connect the elevator and rudder pushrods to the horns with the keepers—the elevator pushrods connect to the **outer** holes in the horns and the rudder pushrod connects to the **middle** hole in the horn.



1. Temporarily mount the prop adapter, spinner and propeller.

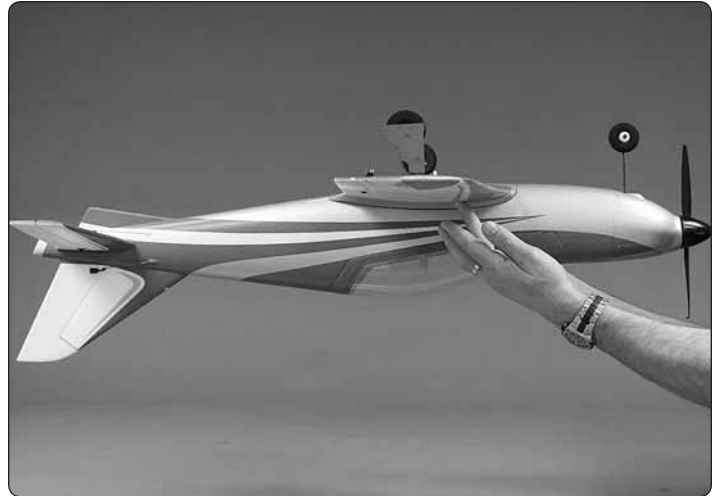


❑ 2. Mark the C.G. on the top of the wing. Usually this would be done with small strips of tape so you can feel the C.G. locations with your fingers while suspending the model upside-down, but tape can peel off the paint, so another method has to be used for marking the C.G. that you can still feel with your fingers.



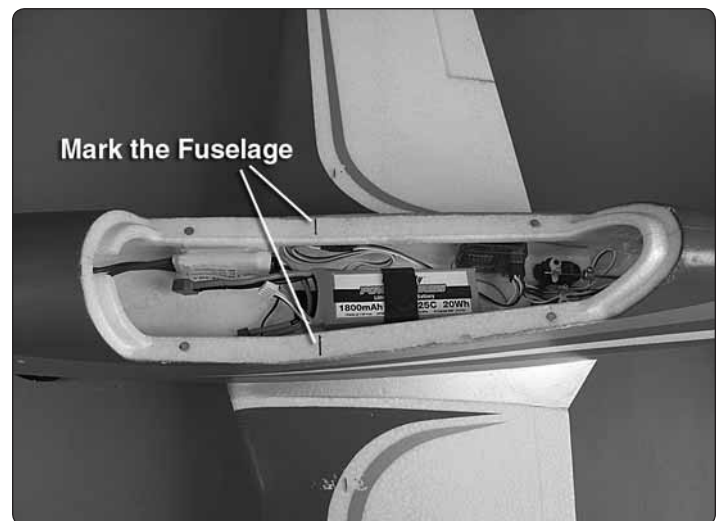
❑ 3. Insert a pin into both sides of the top of the wing 2" [51mm] back from the leading edge at the "break." After the C.G. has been checked the pins will be removed.

NOTE: This is where your model should balance for the first flights. Later, you may experiment by shifting the C.G. 1/4" [6mm] forward or 1/4" [6mm] back to change the flying characteristics. Moving the C.G. forward will improve the smoothness and stability, but the model will then be less aerobatic (which may be fine for less-experienced pilots). Moving the C.G. aft makes the model more maneuverable and aerobatic for experienced pilots. In any case, **start at the recommended balance point** and do not at any time balance the model outside the specified range.



❑ 4. Mount your battery in the fuselage. Place the cockpit hatch onto the fuselage, then turn the model upside-down lifting it with your fingers at the pins that mark the balance point. If the fuselage doesn't balance level as shown in the photo, reposition the battery as necessary until you can get the fuselage level.

❑ 5. Once you know where the battery goes mount the receiver with the included adhesive-back Velcro patches, or double-sided adhesive foam tape (not included). Re check the C.G.



❑ 6. Once the battery location has been finalized, you could mark the fuselage so you will always know where to mount the battery.

❑ 7. Connect the servos and ESC to their respective channels in the receiver and secure the receiver antenna(s) with tape.

GET THE MODEL READY TO FLY

Check the Controls

The next few steps will require working on the model with the radio turned on and power to the motor. To prevent an accident or possible injury, temporarily remove the spinner cone and propeller.

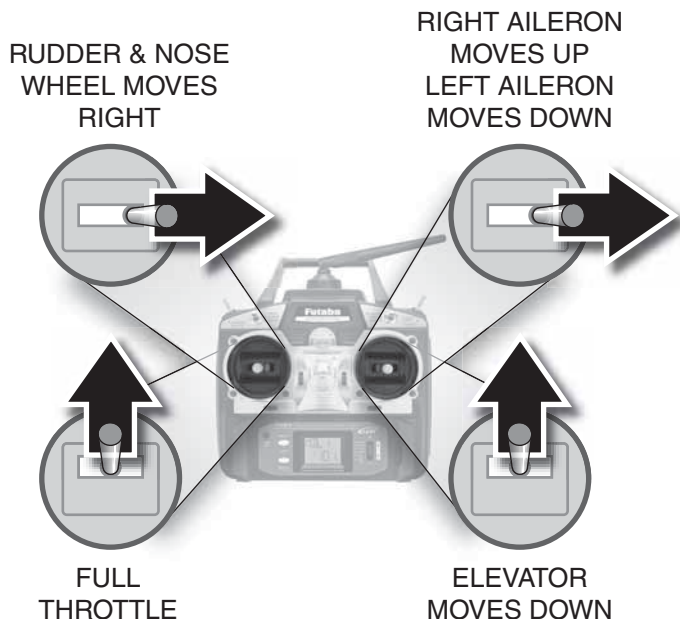
❑ 1. Turn on the transmitter and lower the throttle stick all the way. Center all the trims and connect the battery to the ESC. If everything is working correctly you should hear one, low-pitch beep from the ESC (“beep”). This signals that the motor is not yet “armed,” but is ready to be armed and is receiving a signal from the receiver. To arm the motor when ready to fly, advance the throttle stick all the way, listen for another, single beep (“beep”), then return the throttle stick to off and hear two more beeps (“beep, beep”). Now the motor will turn whenever the throttle stick is advanced.

If, when you connect the battery you hear consecutive, higher-pitch beeps (“BEEP. BEEP. BEEP. BEEP...”) this indicates that the throttle stick is not all the way down to the “off” position, or that the throttle servo direction is reversed. To fix this, return the throttle stick to off, or disconnect battery and reverse the throttle servo direction in transmitter.

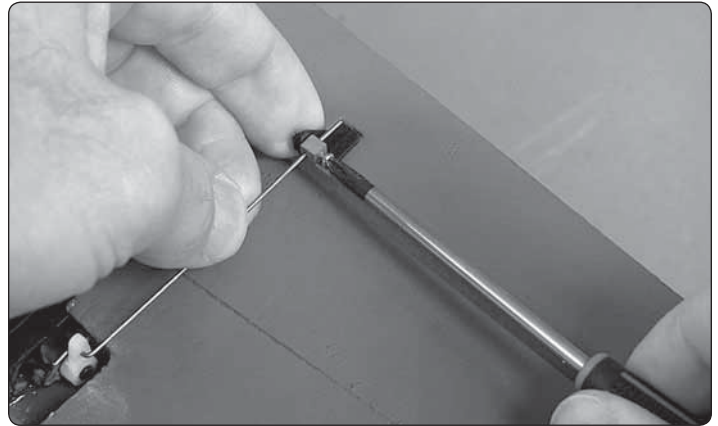
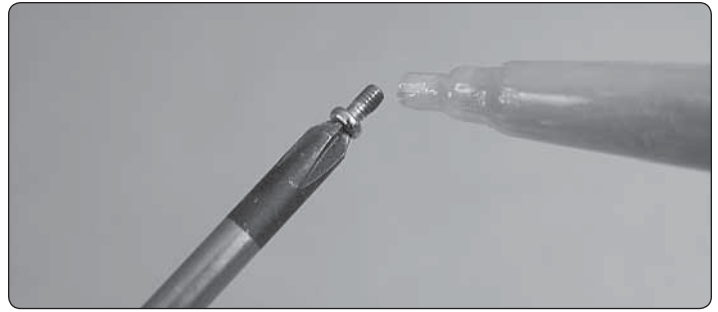
If you hear consecutive, fast, loud beeps (“BEEP! BEEP! BEEP! BEEP!...”), this indicates that the ESC not receiving a signal from the receiver. Either the receiver is not bound to the transmitter, or the transmitter is off.

Once you have the motor figured out and set correctly continue to set up the rest of the controls:

4-CHANNEL RADIO SETUP (STANDARD MODE 2)



❑ 2. Use the transmitter to make sure all the controls respond in the correct direction.



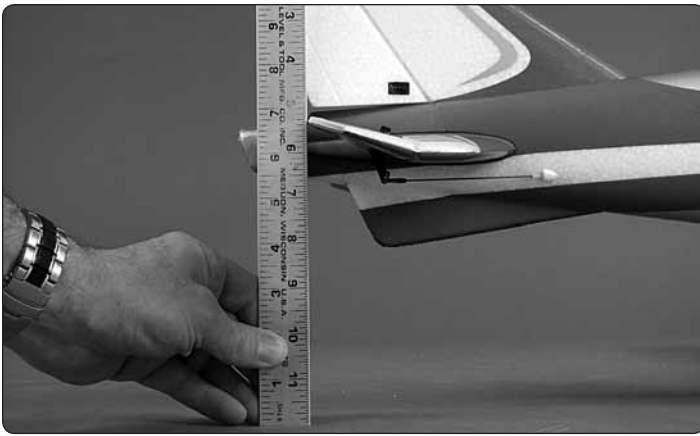
❑ 3. Take each screw out of the screw-lock connectors on all the pushrods and **lightly** “wet” the threads of the screws with threadlocker. With the radio on and the controls centered, reinstall and tighten the screws with the control surfaces and nose wheel centered.



❑ 4. Also remove the screw in the collar that locks the elevator pushrods together, add threadlocker to the screw, reinstall it in the collar, center the elevators and securely tighten the screw.

Set the Control Throws

To ensure a successful first flight, set up your Millennium according to the control throws specified in this manual. The throws have been determined through actual flight testing and accurate record-keeping allowing the model to perform in the manner in which it was intended. If, after you have become accustomed to the way the Millennium flies, you would like to change the throws to suit your taste, that is fine. However, too much control throw could make the model too responsive and difficult to control, so remember, “more is not always better.”



Use a ruler at the widest part (front to back) of the trailing edge of each control surface to measure the throws, then adjust as necessary to get the measurements in the following chart.

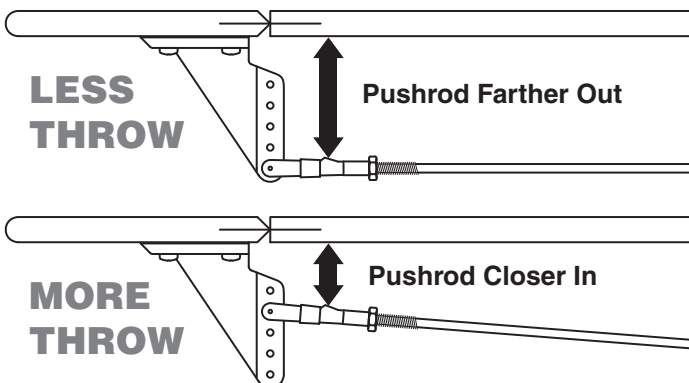
If your radio does not have dual rates, we recommend setting the throws at the low rate, or between the high and low rates.

NOTE: The throws are measured at the **widest part** of the elevators, rudder and ailerons.

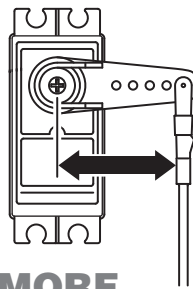
These are the recommended control surface throws:

	LOW RATE		HIGH RATE	
	Up	Down	Up	Down
ELEVATOR	5/16" [8mm] 9°	5/16" [8mm] 9°	7/16" [11mm] 12°	7/16" [11mm] 12°
RUDDER	Right 5/8" [16mm] 13°	Left 5/8" [16mm] 13°	Right 1" [25mm] 21°	Left 1" [25mm] 21°
AILERONS	Up 1/4" [6mm] 9°	Down 1/4" [6mm] 9°	Up 3/8" [10mm] 14°	Down 3/8" [10mm] 14°

If you don't get the throws specified you can use the programming in your transmitter to adjust the servo travel, and/or adjust the throws mechanically by changing the mounting location of the pushrods in the servo arm and control surfaces as shown:

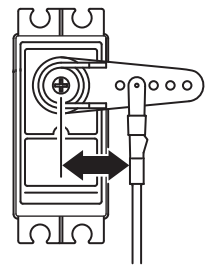


Pushrod Farther Out



**MORE
THROW**

Pushrod Closer In

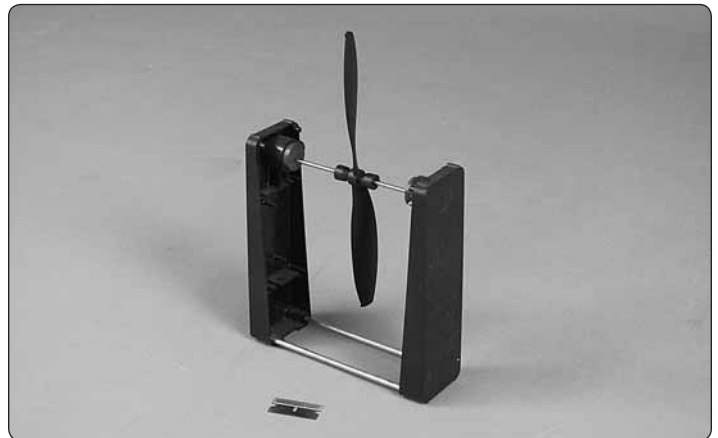


**LESS
THROW**

PREFLIGHT

Balance the Propeller

An unbalanced prop can cause enough vibration to damage parts or break glue joints. At the least, an unbalanced prop reduces motor performance.



1. Use a Top Flite® Precision Magnetic Prop Balancer (TOPQ5700) to balance your propeller and spare propellers. Use a single-edge razor blade or sandpaper to remove material from the heavy blade until the prop balances.
2. Once you have all the control throws set and are done working on the model with your radio system turned on, remount the propeller and spinner to the motor.

Balance the Model Laterally

1. With the wing level, have an assistant help you lift the model by the motor propeller shaft and the bottom of the fuse under the tail skid. Do this several times.
2. If one wing always drops when you lift the model, it means that side is heavy. Balance the airplane by adding weight to the other wing tip. **An airplane that has been laterally balanced will track better in loops and other maneuvers.**

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. Fill out the identification tag on page 5 and place it on or inside your model.

Charge the Transmitter Batteries

Follow the battery charging instructions that came with your radio control system to charge the batteries in your transmitter. You should always charge your transmitter batteries the night before you go flying, and at other times as recommended by the radio manufacturer. If your transmitter uses non-rechargeable, dry-cell batteries, make sure they are in good condition.

CAUTION: Unless the instructions that came with your radio system state differently, the **initial** charge on **new** transmitter and receiver batteries should be done for 15 hours **using the slow-charger that came with the radio system**. This will “condition” the batteries so that the next charge may be done using the fast-charger of your choice. If the initial charge is done with a fast-charger the batteries may not reach their full capacity and you may be flying with batteries that are only partially charged.

Charge the LiPo Battery



If you haven't yet done so, charge your LiPo battery. If uncertain of the state-of-charge of your battery, you can either reconnect it to your charger, or use a battery checker (HCAP0275) to check the condition of the battery. A battery checker is the best way to check the condition of your batteries at the flying field to make sure you don't inadvertently try to fly your plane with a discharged battery.

Note: LiPo batteries require special care and handling. Be certain to follow the instructions that came with your LiPo battery and charger to charge and handle them correctly. If using the **Smart Charger**, refer to Smart Charger instructions for charging. Note that the Smart Charger has an internal timer that automatically discontinues the charge after 160 minutes (2 hours, 40 minutes). Some larger batteries in the 2100mAh range that are deeply discharged may require longer than 160 minutes to charge, prompting the Smart Charger to shut off. If this happens, simply disconnect the battery from the charger, wait for the GREEN LED to illuminate, and then reconnect the battery to the charger to continue charging.

Range Check

Most radio systems have a procedure for ground-checking the operational range. This usually involves something such as the pilot walking a distance away from the model while operating the controls with an assistant holding the model confirming that everything is operating correctly. Follow the manufacturer's instructions that came with your radio to perform this check with the motor off and with the motor running at various speeds. If the radio does not pass the range check **do not fly!** Find and correct the problem first.

AMA SAFETY CODE

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.**

FLYING



Before taking your Millennium to the air, reduce your takeoff work load by making sure the plane rolls straight ahead. Taxi the Millennium back and forth a few times under its own power—do this over a paved surface if possible. If the Millennium doesn't roll straight adjust the nose steering pushrod in the screw-lock connector on the rudder servo arm until you can get it to roll straight.

In the air, the Millennium doesn't exhibit any particular characteristics that you need to be made aware of ahead of time, other than it may help to carry a "click" or two of throttle when landing. Otherwise, the Millennium responds as you would expect and flairs nicely for soft landings. It handles well at reduced throttle settings, but also flies rather "zippy" at full-throttle! The Millennium flies inverted well and can just about

hold knife-edge at full-throttle. It will exhibit a slight amount of down pitch with rudder, but that can easily be mixed out if desired with a small amount of elevator-to-rudder mixing. Like most models, the Millennium also benefits from approximately 30% negative exponential on the high-rate throws for the elevator and ailerons.

Flying "normally," the Millennium consumes approximately 205mAh/minute which should provide approximately 7 minutes of motor run time on an 1800mAh battery—of course, the run time you can expect depends on several factors such as the condition of your batteries, your flying style and even the wind conditions (flying on windy days typically consumes more power than when flying on calm days).

To find out for yourself how long you can fly, set your timer to 5 minutes. Fly until the timer sounds, then land. Use a charger with a digital display to find out how much capacity it took to recharge the battery (indicating how much capacity was used). The target is to use 80% of your battery's capacity, so multiply your battery's capacity by .8 to find out how much you have available. Compare the capacity used to 80% of your battery's capacity and adjust your flight time accordingly.

For example: If using the recommended 1800mAh battery, to prevent over-discharging your target capacity available is 1440mAh ($1800\text{mAh} \times .8 = 1440\text{mAh}$). If you fly for five minutes and it takes 1000mAh to recharge your battery, you still have 440mAh to go before you should land, so adjust your timer to increase your flight time accordingly until you reach your 1440mAh target. (You could also divide 1000mAh by five minutes to figure a current consumption rate of 200mAh/minute. Divide 1440mAh by 200mAh/minute to conclude that you can fly for 7.2 minutes [7 min. 12 sec.]—but round down to 7 minutes.)

One final note about flying your model. Have a goal or flight plan in mind for **every** flight. This can be learning a new maneuver(s), improving a maneuver(s) you already know, or learning how the model behaves in certain conditions (such as on high or low rates). This is not necessarily to improve your skills (*though it is never a bad idea!*), but more importantly so you do not surprise yourself by impulsively attempting a maneuver and suddenly finding that you've run out of time, altitude or airspeed. Every maneuver should be deliberate, not impulsive. For example, if you're going to do a loop, check your altitude, mind the wind direction (anticipating rudder corrections that will be required to maintain heading), remember to throttle back at the top, and make certain you are on the desired rates (high/low rates). A flight plan greatly reduces the chances of crashing your model just because of poor planning and impulsive moves. **Remember to think.**

**Have a ball! But always stay in control
and fly in a safe manner.**

GOOD LUCK AND GREAT FLYING!