Mini Ultra Stick PNP

E-flite™

Assembly Manual

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Large Replacement Parts:

EFL2251	Wing w/Ailerons
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EFL2256	Firewall Set
EFL2257	Hatch

Small Replacement Parts

EFL2254	Pushrod Set
EFLA200	Micro Control Horns
EFLA201	Micro Pushrod Keepers
EFLA203	Micro Control Connectors
EFLA213	E-flite/JR/Horizon Decals
EFLP1070	10 x 7 Slow Flyer Prop (1 only)
EFLAEC303	EC3 DEV & BATT, Male/Female

Required Radio Equipment

The Mini Ultra Stick PNP requires a 4-channel transmitter (7-channel w/mixing for quad flap option) and micro receiver. Users of Spektrum's DX6 2.4GHz park flyer system will need an AR6000 6-channel park flyer receiver (SPM6000). Users of standard FM systems should try JR SPORT's 6-channnel UltraLite receiver (JSP30610-positive shift, JSP30615-negative shift).

You may wish to install the optional quad flaps, in which case you will need a 7-channel radio and receiver on 72 MHz with mixing and two additional sub-micro servos.

The Spektrum radio transmitter will not work for the quad flap option.

Transmitter

We recommend the crystal-free, interference-free Spektrum DX6 2.4GHz DSM 6-channel transmitter and receiver.

Or

JRP9240**	9303 FM Air w/R770 Rx (no servos)

Or Purchase Separately

SPM6000	AR6000 DSM 6CH Park Flyer Rx
Or	
JSP30610	6-Channel UltraLite Rx w/o Crystal, Positive Shift JR/Air (72 MHz)
Or	
JSP30615	6-Channel UltraLite Rx w/o Crystal, Negative Shift Fut/HRC (72 MHz)
JRPXFR**	FM Receiver Crystal (not required for Spektrum)

Optional Quad Flaps

EFLRS75	7.5 Gram Sub-Micro Servo (2)
JSP98100	Servo Extension, 3" (6)
JSP98030	Servo Extension, 12" (2)
JRPR700	R700 7CH Slimline FM Rx

Introduction

Thank you for purchasing the E-flite™ Mini Ultra Stick PNP™. The Mini Ultra Stick PNP is an electric park flyer version of the popular Hangar 9® Ultra Stick™ series and has similar flight characteristics as the larger version. It is ideal for those transitioning into aerobatic park flyers who do not want a higher performance 3D airplane. We include two firewall options for you to decide if you want to install a brushless outrunner motor or an inrunner motor.

Specifications

Wingspan:	38.75 in (985mm)
Length:	34 in (865mm)
Wing Area:	325 sq in (21 sq dm)
Weight w/o Battery:	19 oz (545 g)
Weight w/ Battery:	22–25 oz (625–710 g)

Battery and Charger

THP21003SPL	2100mAh 3-Cell 11.1V Li-Po, 16GA
or	
EFLB1035	11.1V 2100mAh 3-Cell Li-Po, 16GA
EFLC3005	Celectra™ 1–3 Cell Li-Po Charger

Required Tools and Adhesives

Tools & Equipment

EFLA250	Park Flyer Tool Assortment, 5-piece

Or Purchase Separately

EFLA257	Screwdriver, #0 Phillips (or included with EFLA250)
EFLA255	Nut Driver, 5.5mm (or included with EFLA250)
EFLA251	Hex Wrench: 3/32" (or included with EFLA250)
Square	Wire cutters
Ruler	String

Hobby knife (for optional Quad Flaps)

Adhesives

Thick CA	(for optional Quad Flaps)

Optional Accessories

EFLA110	Power Meter
EFLP1080E	10x8 Electric Prop

Warning

An RC aircraft is not a toy! If misused, it can cause serious bodily harm and damage to property. Fly only in open areas, preferably at AMA (Academy of Model Aeronautics) approved flying sites, following all instructions included with your radio.

Keep loose items that can get entangled in the propeller away from the prop, including loose clothing, or other objects such as pencils and screwdrivers. Especially keep your hands away from the propeller.

Before Starting Assembly

Before beginning final assembly of your Mini Ultra Stick PNP, remove each part from its bag for inspection. Closely inspect the fuselage, wing panels, rudder and stabilizer for damage. If you find any damaged or missing parts, contact the place of purchase.

> ***Note***: For your convenience and to speed the assembly process, the hinges have already been installed and glued. We suggest that you take a minute before beginning assembly of your model to check them.

Grasp the wing and aileron at each hinge location, then gently pull on the aileron to ensure the hinges are secure and cannot easily be pulled away from either surface. Use caution when gripping the wing and aileron to avoid crushing or damaging the structure. Repeat this process for the elevator and rudder.

If, however, you find that the hinges pull away, simply wick thin CA into the hinge slots and re-install the hinges/surfaces.

Note on Lithium Polymer Batteries

Lithium Polymer batteries are significantly more volatile than alkaline or Ni-Cd/ Ni-MH batteries used in RC applications. All manufacturer's instructions and warnings must be followed closely. Mishandling of Li-Po batteries can result in fire. Always follow the manufacturer's instructions when disposing of Lithium Polymer batteries.

Using the Manual

This manual is divided into sections to help make assembly easier to understand, and to provide breaks between each major section. In addition, check boxes have been placed next to each step to keep track of each step completed. Steps with a single circle (❍) are performed once, while steps with two circles (❍ ❍) indicate that the step will require repeating, such as for a right or left wing panel, two servos, etc.

Remember to take your time and follow the directions.

Limited Warranty Period

Horizon Hobby, Inc. guarantees this product to be free from defects in both material and workmanship at the date of purchase.

Safety Precautions

This is a sophisticated hobby product and not a toy. It must be operated with caution and common sense and requires some basic mechanical ability. Failure to operate this product in a safe and responsible manner could result in injury or damage to the product or other property. This product is not intended for use by children without direct adult supervision.

The product manual contains instructions for safety, operation and maintenance. It is essential to read and follow all the instructions and warnings in the manual, prior to assembly, setup or use, in order to operate correctly and avoid damage or injury.

Limited Warranty & Limits of Liability

Pursuant to this Limited Warranty, Horizon Hobby, Inc. will, at its option, (i) repair or (ii) replace, any product determined by Horizon Hobby, Inc. to be defective. In the event of a defect, these are your exclusive remedies.

This warranty does not cover cosmetic damage or damage due to acts of God, accident, misuse, abuse, negligence, commercial use, or modification of or to any part of the product. This warranty does not cover damage due to improper installation, operation, maintenance, or attempted repair by anyone other than an authorized Horizon Hobby, Inc. service center. This warranty is limited to the original purchaser and is not transferable. In no case shall Horizon Hobby's liability exceed the original cost of the purchased product and will not cover consequential, incidental or collateral damage. Horizon Hobby, Inc. reserves the right to inspect any and all equipment involved in a warranty claim. Repair or replacement decisions are at the sole discretion of Horizon Hobby, Inc. Further, Horizon Hobby reserves the right to change or modify this warranty without notice.

REPAIR OR REPLACEMENT AS PROVIDED UNDER THIS WARRANTY IS THE EXCLUSIVE REMEDY OF THE CONSUMER. HORIZON HOBBY, INC. SHALL NOT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES.

As Horizon Hobby, Inc. has no control over use, setup, final assembly, modification or misuse, no liability shall be assumed nor accepted for any resulting damage or injury. By the act of use, setup or assembly, the user accepts all resulting liability.

If you as the purchaser or user are not prepared to accept the liability associated with the use of this product, you are advised to return this product immediately in new and unused condition to the place of purchase.

Inspection or Repairs

If your product needs to be inspected or repaired, please call for a Return Merchandise Authorization (RMA). Pack the product securely using a shipping carton. Please note that original boxes may be included, but are not designed to withstand the rigors of shipping without additional protection. Ship via a carrier that provides tracking and insurance for lost or damaged parcels, as Horizon Hobby, Inc. is not responsible for merchandise until it arrives and is accepted at our facility. Include your complete name, address, phone number where you can be reached during business days, RMA number, and a brief summary of the problem. Be sure your name, address, and RMA number are clearly written on the shipping carton.

Warranty Inspection and Repairs

To receive warranty service, you must include your original sales receipt verifying the proof-of-purchase date. Providing warranty conditions have been met, your product will be repaired or replaced free of charge. Repair or replacement decisions are at the sole discretion of Horizon Hobby.

Questions, Assistance, and Repairs

Your local hobby store and/or place of purchase cannot provide warranty support or repair. Once assembly, setup or use of the product has been started, you must contact Horizon Hobby, Inc. directly. This will enable Horizon to better answer your questions and service you in the event that you may need any assistance.

Questions or Assistance

For questions or assistance, please direct your email to productsupport@horizonhobby.com, or call 877.504.0233 toll free to speak to a service technician.

Non-Warranty Repairs

Should your repair not be covered by warranty and the expense exceeds 50% of the retail purchase cost, you will be provided with an estimate advising you of your options. You will be billed for any return freight for non-warranty repairs. Please advise us of your preferred method of payment. Horizon Hobby accepts money orders and cashiers checks, as well as Visa, MasterCard, American Express, and Discover cards. If you choose to pay by credit card, please include your credit card number and expiration date. Any repair left unpaid or unclaimed after 90 days will be considered abandoned and will be disposed of accordingly.

Electronics and engines requiring inspection or repair should be shipped to the following address (freight prepaid):

Horizon Service Center
4105 Fieldstone Road
Champaign, Illinois 61822

All other products requiring inspection or repair should be shipped to the following address (freight prepaid):

Horizon Product Support
4105 Fieldstone Road
Champaign, Illinois 61822

Landing Gear Installation

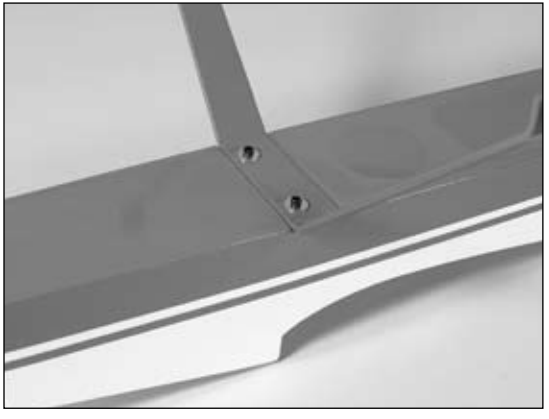
Required Parts

- Fuselage
- Landing gear assembly with wheels
- 4-40 x 1/2" socket head screw (2)
- #4 washer (2)

Required Tools

- Hex wrench: 3/32"

❍ 1. Locate the landing gear assembly. Attach the landing gear assembly to the fuselage using two 4-40 x 1/2" socket head screws and two #4 washers.



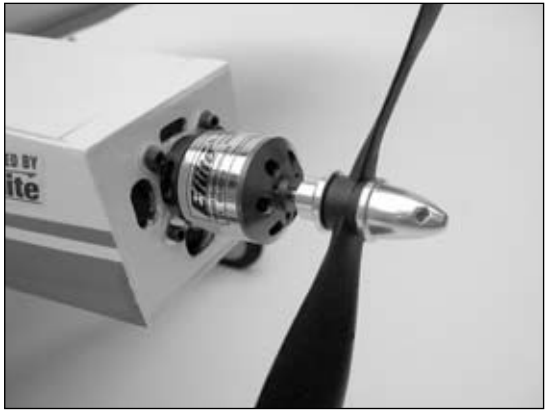
Note: The landing gear will only fit one direction for the holes to line up properly. Also, check that the wheel will rotate freely. If not, loosen the nuts and retighten.

Installing the Propeller

Required Parts

- Fuselage w/motor
- Prop adapter
- Propeller

❍ 1. Slide the propeller adapter onto the motor. Place the propeller onto the adapter, then a spinner cone onto the adapter and secure.



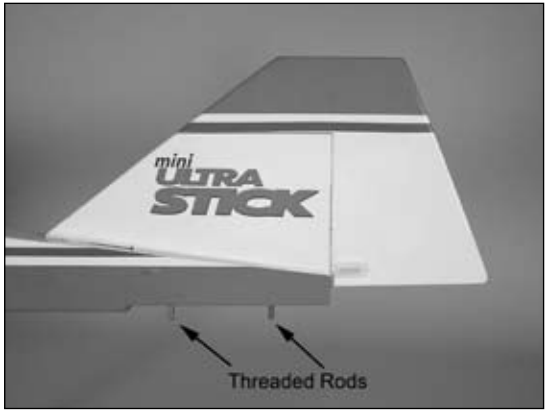
Note: It is very important that you check to be sure the propeller is balanced before installing onto the shaft. An unbalanced propeller will cause performance issues. Some propellers will need the center hole drilled out to fit the shaft size of your outrunner. It is very important the hole is drilled concentric or it can cause the propeller to be unbalanced.

Tail Installation

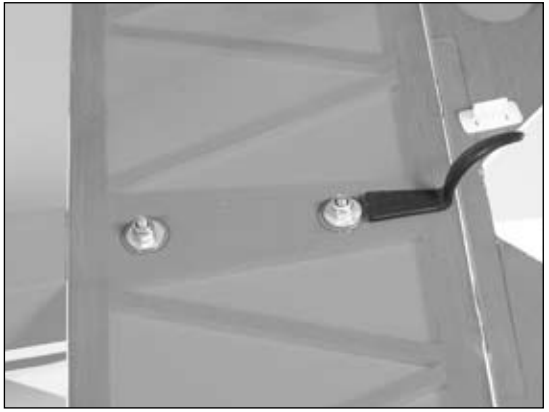
Required Parts

- Fuselage
- Rudder/Fin
- Stabilizer/Elevator
- 3mm locknut (2)
- 3mm washer (2)

❍ 1. Slide the rudder into position on the fuselage. The threaded rods extend through the bottom of the fuselage.



❍ 2. Attach the stabilizer using two 3mm washers and two 3mm locknuts. Do not tighten the locknuts all the way until after the wing is installed and you check the alignment.



Note: The tail section is removable for easy transporting if needed. When re-attaching, always check your alignment before flight to make sure the tail is square with the wing before tightening the locknuts completely. See instructions on page 22.

Wing Preparation

Required Parts

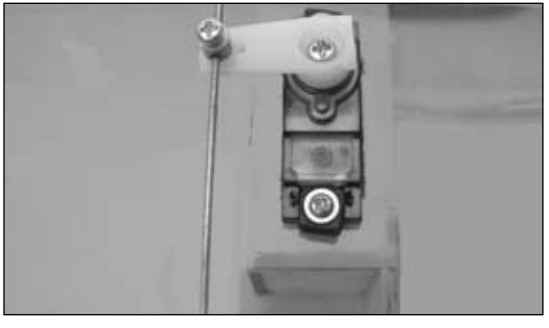
- Fuselage
- Wing
- 6-channel receiver
- 4-40 x 3/4" socket head screw (2)
- 3mm washer (2)

Required Tools and Adhesives

- Screwdriver, #0 Phillips

Note: For the optional Quad Flap modification, please refer to information in the following section.

❍ 1. Detach the servo arm from the servo by loosening the servo screw. Temporarily plug the Y-harness connecting the two servos into the receiver With the radio on, center the servo. Re-install the aileron servo arm onto the servo and secure with the servo screw. Loosen the control connector screw. Physically center the aileron so it lines up with the wing. Re-tighten the 2mm x 4mm screw in the micro control connector to secure the aileron wire.



❍ 2. Repeat Step 1 for the remaining aileron linkage installation.

Quad Flap Modification (Optional)

Optional Parts (for Quad Flaps)

- Servo w/hardware (2 additional needed)
- Servo extension, 12" (2)
- Servos extension, 3" (6)
- 7-channel receiver
- 7-channel or greater transmitter
- Micro control connector (2 additional)
- 2mm x 4mm screw (2 additional)
- Micro control connector backplate (2 additional)
- 5" pushrod wire (2 additional)
- Control horn (2 additional)

Required Tools and Adhesives

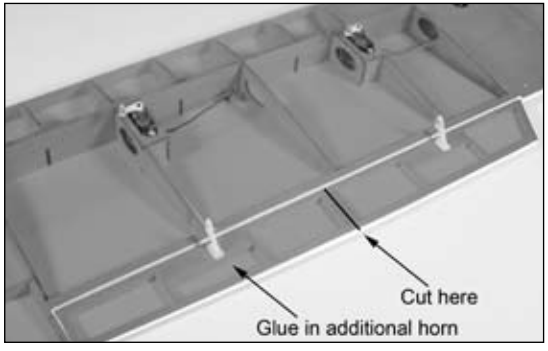
- Hobby knife
- Covering iron
- Thin CA

The Mini Ultra Stick PNP wing is designed with optional quad-flaps. The ailerons have been designed with the option of cutting in half using a hobby knife. White covering has been supplied to cover the cut ends. Installing the servos is similar to that of the aileron instructions above. There are some additional changes.

Note: You must use a separate BEC or an onboard receiver battery pack when utilizing the quad flap option due to the higher number of servos used in the aircraft and higher current load. Brushless speed controls are not rated to handle more than four servos under load. Please consult the brushless speed control instructions for details and how to disable the BEC on your speed control.

Replace with a separate BEC, such as the UBEC, available from www.koolflightsystems.com or use a separate 4.8V receiver battery pack.

First, you will need at least a 7-channel or greater transmitter and receiver with servo reversing capability. Each servo should be connected separately to the 7-channel receiver. This will mean you should use two 12-inch servo extensions to connect the two outer servos. You will also need two 3-inch extensions to connect the two inner servos. We suggest you use four additional 3-inch servo extensions that will connect each servo to the receiver. This way, depending on the receiver location, you will not have to disconnect wires directly from the receiver each time you remove the wing.



Note: See our Mini Ultra Stick website page for radio tips for quad flap operation using this setup. There are also options listed if you use a 6-channel transmitter and receiver. However, this method will require the purchase of a reversed servo and the use of a Y-harness to connect your two inner location servos.

Radio Installation

Required Parts

- Fuselage
- Receiver
- Hook and loop material
- Micro pushrod keeper (2)

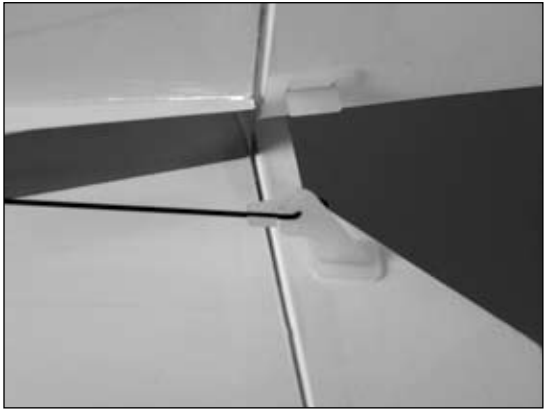
Required Tools and Adhesives

- Screwdriver, #0 Phillips
- Wire cutters

❍ 1. Plug in the servos and ESC into the receiver. Mount the receiver to the side of the fuselage using hook and loop material. Route the antenna wire through the bottom of the fuselage to the rear.

Note: Do not cut the antenna wire, as this will reduce the range of your radio system.

❍ ❍ 2. Install the pushrod into the elevator control horn. Secure the pushrod wire using a micro pushrod wire keeper.



❍ ❍ 3. Detach the servo arm from the servo. With the radio on, center the servo first. Install the elevator servo arm onto the servo and secure with servo screw. Physically center the elevator so it is in line with the stabilizer. Re-tighten the 2mm x 4mm screw in the micro control connector to secure the pushrod wire.

Note: We suggest you cut off some of the excess pushrod wire using wire cutters so that only approximately 1/4" (6mm) remains beyond the control connector.

❍ 4. Repeat Steps 2 and 3 for the rudder pushrod wire.

Final Assembly

Required Parts

- Fuselage w/motor and ESC
- Wing
- Battery
- Battery hatch
- 4-40 x 3/4" socket head bolt (2)
- #4 washer (2)
- Hook and loop tape
- Hook and loop strap
- EC3 battery connector

Required Tools and Adhesives

- Hex wrench: 3/32"

Soldering EC3 Lead to Your Battery

We have included our E-flite™ EC3 battery connector for your convenience. This will allow your battery to connect to the EC3 lead on the included speed control.

❍ 1. Carefully solder your positive red battery lead to the gold connector while keeping the black lead covered to avoid shorting.

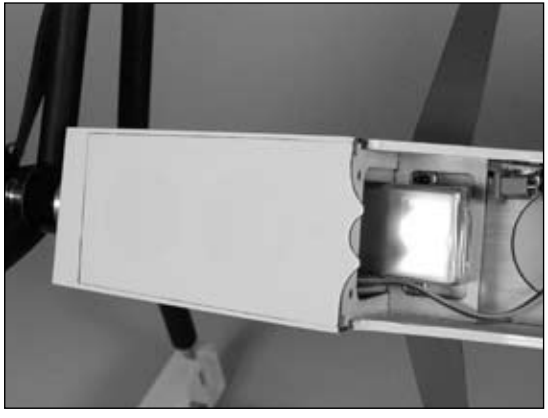
❍ 2. Push the positive wire with gold connector into the positive side of the blue housing until is snaps in place. This process may take some moderate and careful force.

❍ 3. Repeat these steps for the negative side.

❍ 4. With the aircraft fully assembled, install the battery into the battery compartment. Secure the battery using the hook and loop tape and a hook and loop strap.

Note: Place a piece of hook and loop tape on the bottom of the battery and on the fuselage where the battery rests. This will keep the battery from shifting forward or backward during extreme maneuvers.

❍ 5. Install the battery hatch to the top of the fuselage. The magnet will hold the battery hatch in place.



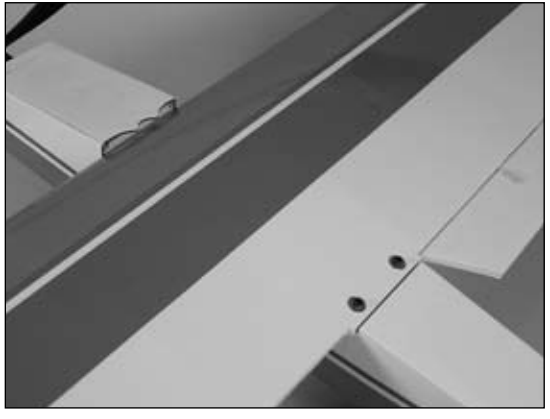
Important Information About Your Brushless ESC

Make sure your ESC brake is programmed to Off. Also, be sure to use an ESC with the proper 9V cutoff when using 3-cell Li-Po packs, or 6V cutoff when using 2-cell Li-Po packs.

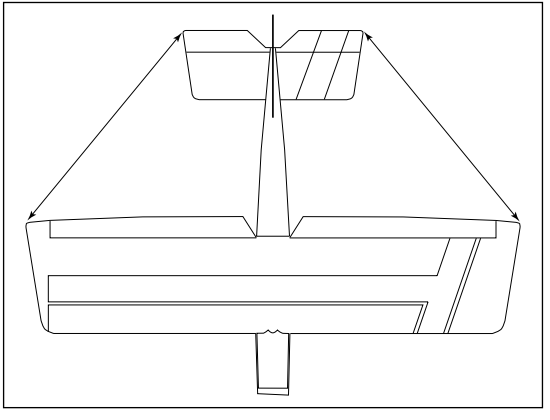
❍ 6. Connect the ESC to the motor.

Note: Now would be a good time to check the operation of the motor. It should rotate counter-clockwise when viewed from the front of the fuselage. Once the operation of the motor has been checked, unplug the battery and attach the battery hatch. If it rotates in the wrong direction, simply swap two of the wires. Always use caution around the propeller to avoid injury.

❍ 7. Plug in the aileron (and flap) servo leads. Slide the wing dowels into the holes at the front. Use the two 4-40 x 3/4" socket head screws and two #4 washers to secure the wing.



❍ 8 Check your alignment of the wing to the horizontal stabilizer at this time. You should have some play in the stab holes. Measure the stab tip to the wing tip. Adjust the stab until the measurements are equal. Now you can tighten the 3mm locknuts at the stabilizer.



Center of Gravity

Caution: Do not inadvertently skip this step!

The recommended Center of Gravity (CG) location for the Mini Ultra Stick PNP is 2 1/2" (63mm) behind the leading edge of the upper wing against the fuselage. After the first flights the throws can be adjusted for your personal preference.

Control Throws

❍ 1. Turn on the transmitter and receiver of your Mini Ultra Stick PNP. Check the movement of the rudder, elevator and ailerons using the transmitter. Reverse the direction of the servos at the transmitter if necessary.

❍ 2. Use a ruler to adjust the throw of the elevator, ailerons and rudder. Adjust the position of the pushrod at the control horn to achieve the following measurements when moving the sticks to their endpoints.

Measurements are taken at the widest point on the surface.

	Low Rate	*High Rate*
Ailerons:		
Up/Down	1/2" (15mm)	5/8" (19mm)
Elevator:		
Up/Down	9/16" (18mm)	7/8" (23mm)
Rudder:		
Right/Left	7/8" (23mm)	1 1/4" (32mm)

These are general guidelines measured from our own flight tests. You can experiment with higher rates to match your preferred style of flying.

Range Testing the Radio

❍ 1. Before each flying session, be sure to range check your radio. This is accomplished by turning on your transmitter with the antenna collapsed. Turn on the receiver in your airplane. With your airplane on the ground and the engine running, you should be able to walk 30 paces (approximately 100 feet) away from your airplane and still have complete control of all functions. If not, don't attempt to fly! Have your radio equipment checked out by the manufacturer.

❍ 2. Double-check that all controls (aileron, elevator, rudder and throttle) move in the correct direction.

❍ 3. Be sure that your transmitter batteries are fully charged, per the instructions included with your radio.

Preflight

Check Your Radio

Before going to the field, be sure that your batteries are fully charged, per the instructions included with your radio. Charge both the transmitter and receiver pack for your airplane. Use the recommended charger supplied with your particular radio system, following the instructions provided with the radio. In most cases the radio should be charged the night before going out flying.

Before each flying session, be sure to range check your radio. See your radio manual for the recommended range and instructions for your radio system. Each radio manufacturer specifies different procedures for their radio systems. Next, start the motor. With the model securely anchored, check the range again. The range test should not be significantly affected. If it is, don't attempt to fly! Have your radio equipment checked out by the manufacturer.

Note: Keep loose items that can get entangled in the propeller away from the prop. These include loose clothing, or other objects such as pencils and screwdrivers. Especially keep your hands away from the propeller.

Double-check that all controls (aileron, elevator, rudder and throttle) move in the correct direction.

Check the radio installation and make sure all the control surfaces are moving correctly (i.e. the correct direction and with the recommended throws). Test run the motor and make sure it transitions smoothly from off to full throttle and back. Also ensure the engine is installed according to the manufacturer's instructions, and it will operate consistently.

Check all the control horns, servo horns, and clevises to make sure they are secure and in good condition. Replace any items that would be considered questionable. Failure of any of these components in flight would mean the loss of your aircraft.

2006 Official AMA National Model Aircraft Safety Code

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 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 or deliberately fly my models in a careless, reckless and/or dangerous manner.

4) The maximum takeoff weight of a model is 55 pounds, except models flown under Experimental Aircraft rules.

5) I will not fly my model unless it is identified with my name and address or AMA number on or in the model. (This does not apply to models while being flown indoors.)

6) I will not operate models with metal-bladed propellers or with gaseous boosts, in which gases other than air enter their internal combustion engine(s); nor will I operate models with extremely hazardous fuels such as those containing tetranitromethane or hydrazine.

RADIO CONTROL

1) I will have completed a successful radio equipment ground range 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 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. (Only properly licensed Amateurs are authorized to operate equipment on Amateur Band frequencies.)

5) Flying sites separated by three miles or more are considered safe from site-to-site interference, even when both sites use the same frequencies. Any circumstances under three miles separation require a frequency management arrangement, which may be either an allocation of specific frequencies for each site or testing to determine that freedom from interference exists. Allocation plans or interference test reports shall be signed by the parties involved and provided to AMA Headquarters.

Documents of agreement and reports may exist between (1) two or more AMA Chartered Clubs, (2) AMA clubs and individual AMA members not associated with AMA Clubs, or (3) two or more individual AMA members.

6) For Combat, distance between combat engagement line and spectator line will be 500 feet per cubic inch of engine displacement. (Example: .40 engine = 200 feet.); electric motors will be based on equivalent combustion engine size. Additional safety requirements will be per the RC Combat section of the current Competition Regulations.

7) At air shows or model flying demonstrations, a single straight line must be established, one side of which is for flying, with the other side for spectators.

8) With the exception of events flown under AMA Competition rules, after launch, except for pilots or helpers being used, no powered model may be flown closer than 25 feet to any person.

9) Under no circumstances may a pilot or other person touch a powered model in flight.

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