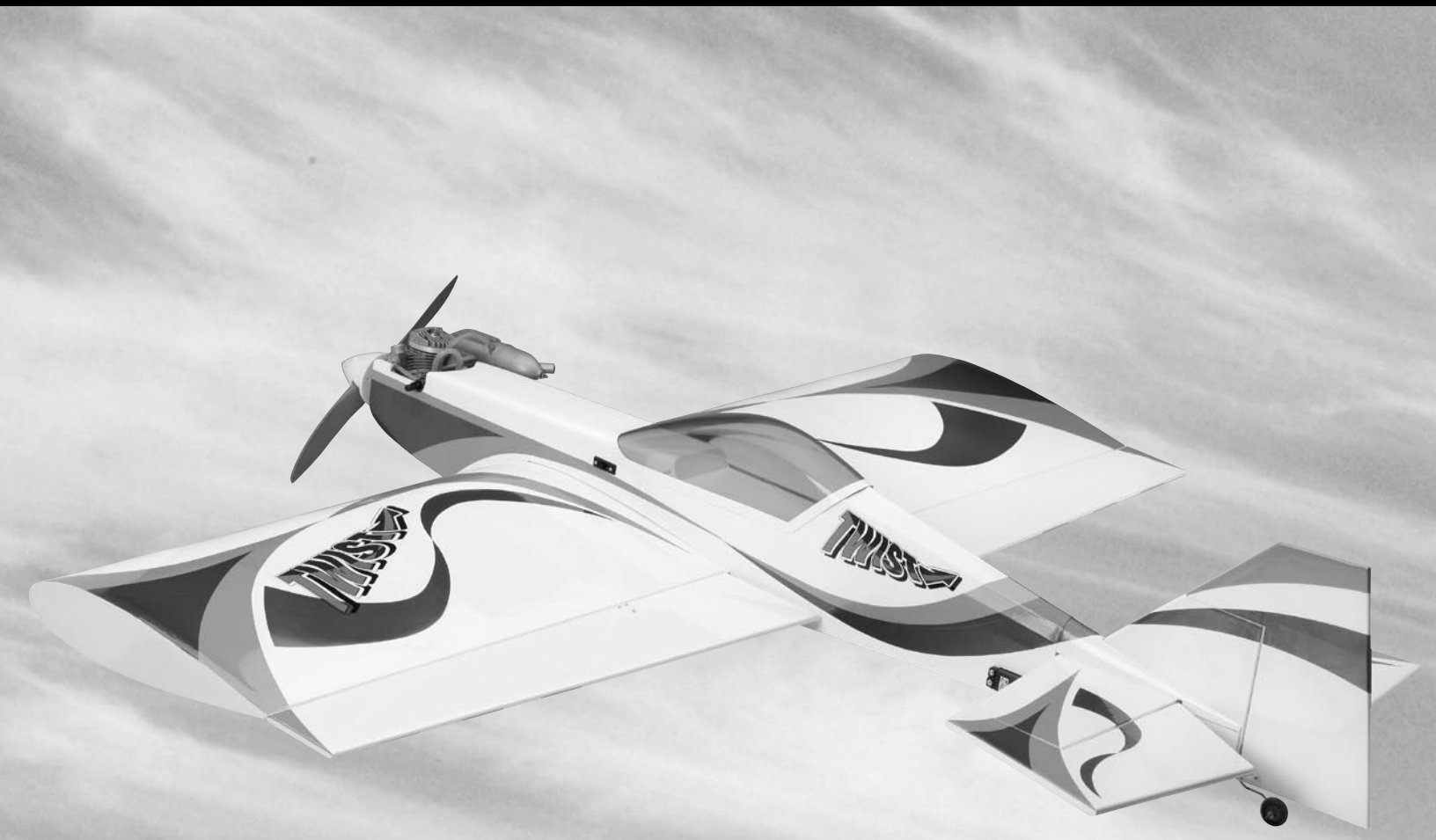
HANGAR 9

Twist™ Plug-N-Play™

ASSEMBLY MANUAL



Specifications

Wingspan: ..... 47.75 in (1212.85mm)	Weight: ..... 5.0–6.0 lb (2.27 kg–2.72 kg)
Length: ..... 48. 38 in (1228.73mm)	Radio: ..... 4-channel w/5 servos
Wing Area: ..... 747.37 sq in (48.2 sq dm)	Engine: ..... Evolution™ .46 NT

Table of Contents

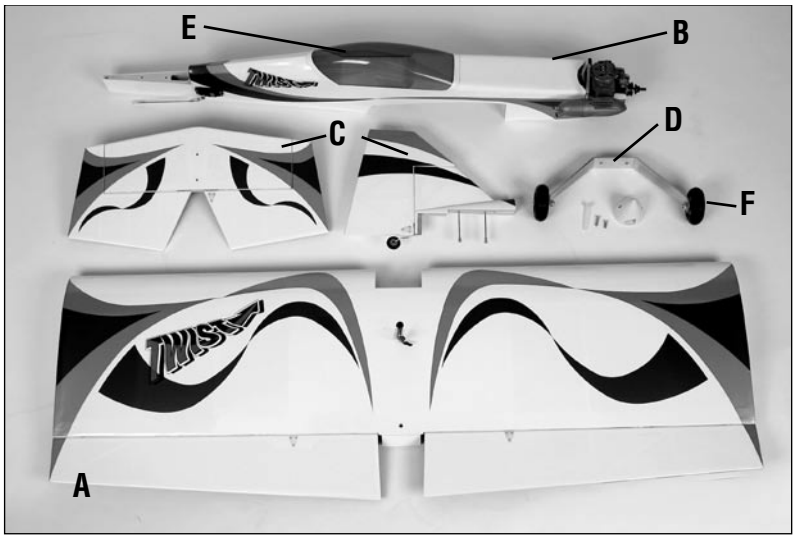
Covering Colors

- White HANU870
- Pearl Purple HANU847
- Pearl Green HANU844
- Transparent Violet HANU955

Additional Required Tools and Adhesives

- Flat blade screwdriver
- Phillips screwdriver (small)
- Pliers
- Ruler
- Threadlock

Contents of Kit



Replacement Parts

A. Wing w/Aileron	HAN2877
B. Fuselage	HAN2876
C. Tail Set	HAN2878
D. Landing Gear	HAN2654
E. Canopy	HAN2879
F. $2\frac{3}{4}$" Wheels	HAN305

Items Not Shown

Fuel Tank	HAN2479
Engine Mount	HAN40M
Decal Set	HAN2880

Field Equipment Required

- Propeller (APC 11x6)
- Fuel (10%–15% nitro content)
- Glow Plug Wrench (HAN2510)
- Glow Plug Igniter with Charger (HAN7101)
- Glow Plug (HAN3001/3006)
- Manual Fuel Pump (HAN118)
- Start-Up Field Pack (HANSTART)

Optional Field Equipment

- 4-Way Wrench (DUB701)
- Fieldmate (HAN117)
- Cleaner & towels
- Extra Glow Plugs (HAN3001/3006)
- Blue Block After Run Oil (EVOX1000)
- Power Panel (HAN106)
- 12V 7Ah Sealed Battery (HAN102)
- PowerPro 12V Starter (HAN161)

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 and engine.

Before Starting Assembly

Before beginning the assembly of your Twist™ Plug-N-Play™, 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.

If you find any wrinkles in the covering, use a heat gun or covering iron to remove them. Use caution while working around areas where the colors overlap to prevent separating the colors.

HAN100 – Heat Gun

HAN150 – Covering Glove

HAN101 – Covering Iron

HAN141 – Sealing Iron Sock

Using the Manual

This manual is divided into sections to help make assembly easier to understand, and to provide breaks between each major section. Remember to take your time and follow the directions.

Warranty Information

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

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

Once assembly of the model has been started, you must contact Horizon Hobby, Inc. directly regarding any warranty question that you have. Please do not contact your local hobby shop regarding warranty issues, even if that is where you purchased it. This will enable Horizon to better answer your questions and provide service in the event that you may need any assistance.

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.

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horizonhobby.com

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Section 1: Installing the Tail Section

Required Parts

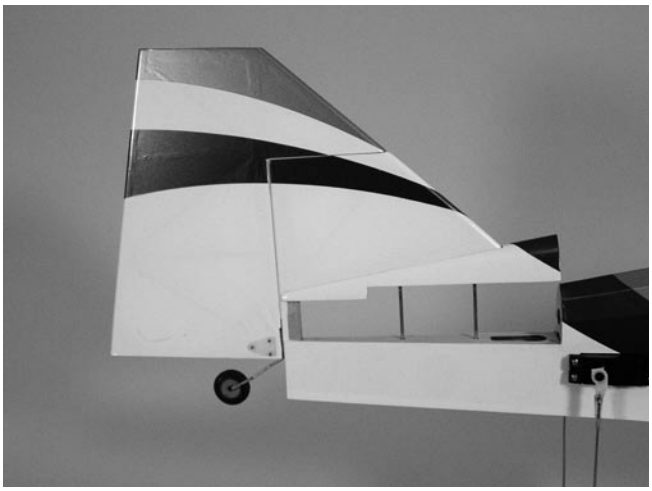
- Stabilizer assembly
- Rudder assembly
- Fuselage

Required Tools and Adhesives

- Crescent wrench
- 4-40 lock nut (2)
- Threadlock
- #4 washer (2)

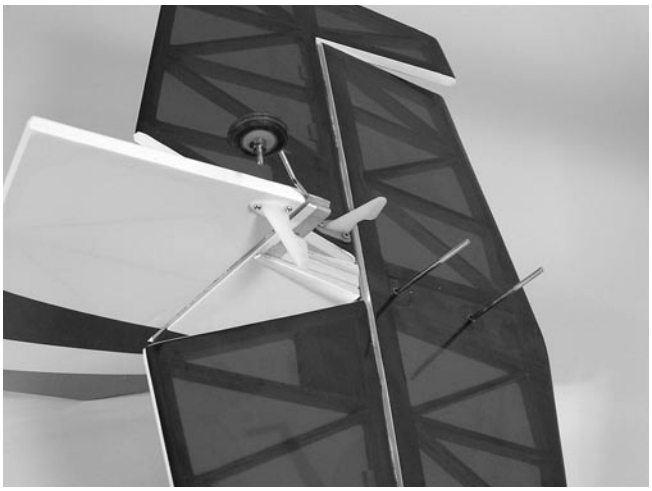
☐ Step 1

Loosen the nuts on the bottom of the fuselage that are holding the rudder/fin assembly onto the fuselage. Pull the rudder/fin assembly straight up to remove from the fuselage. Use care not to damage the lower portion of the fin or the fuselage fairing.



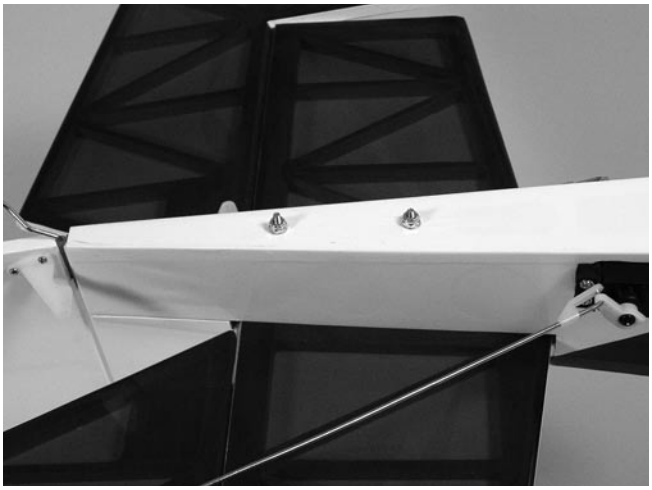
☐ Step 2

Locate the stabilizer/elevator assembly. Position the stabilizer/elevator assembly so the control horn will face down, away from the fin. The threaded rods from the rudder/fin assembly will slide into the two holes in the stabilizer. The fuselage fairing has been slid into position on the fin in the photograph.



☐ Step 3

Slide the rudder/stabilizer assembly onto the fuselage. Slide the #4 washers onto the threaded rods. Apply a drop or two of threadlock to the exposed threads of the threaded rods. Thread the nuts onto the rod, tightening them snugly against the bottom of the fuselage.



Section 2: Landing Gear Installation

Required Parts

- Fuselage assembly
- 8-32 x 1/2" screw (2)

Required Tools and Adhesives

- Phillips screwdriver (large)
- Threadlock

☐ Step 1

Locate the main landing gear and two 8-32 x 1/2" screws. Attach the main landing gear using the screws. The angle on the gear should be towards the rear of the plane. Apply threadlock onto the screws before installing them.

Section 3: Propeller and Spinner

Required Parts

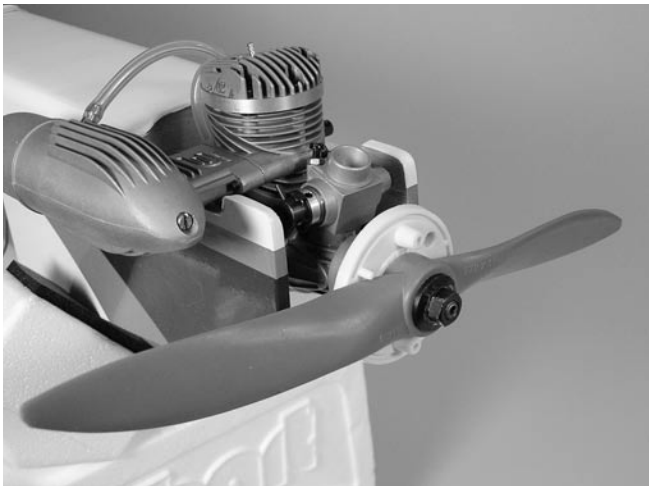
- Fuselage
- Propeller
- Spinner
- #4 x 5/8" sheet metal screw (2)

☐ Step 1

Remove the propeller nut and washer from the engine. Position the drive washer so it is keyed onto the engine shaft. Slide the spinner backplate onto the engine shaft, and then slide the propeller into position.

☐ Step 2

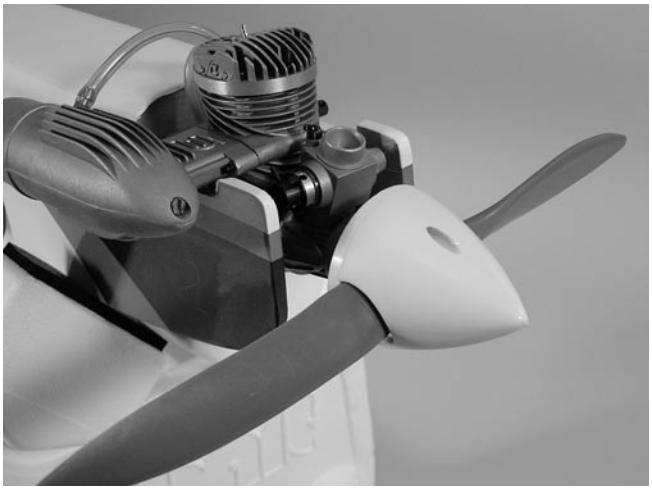
Slide the washer and thread the nut onto the engine shaft. Rotate the propeller clockwise so it is resting against the lugs of the spinner backplate. Use a crescent wrench to tighten the propeller nut. Do not use pliers, as the nut will not be tight enough, and could come loose.



Note: It is suggested to read the engine instructions included with your Twist™ Plug-N-Play™ at this time to learn more on the care and operation of your Evolution engine.

☐ Step 4

Locate the two #4 x 5/8" sheet metal screws. Position the spinner cone onto the spinner backplate, making sure it keys into the backplate. Use the screws and a Phillips screwdriver to secure the spinner cone to the backplate.



Section 4: Radio Installation

Required Parts

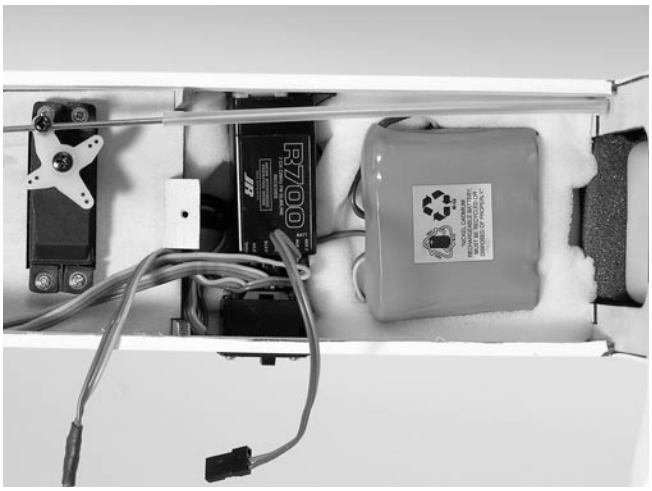
- Fuselage assembly
- Wing assembly

Required Tools and Adhesives

- Phillips screwdriver (small)

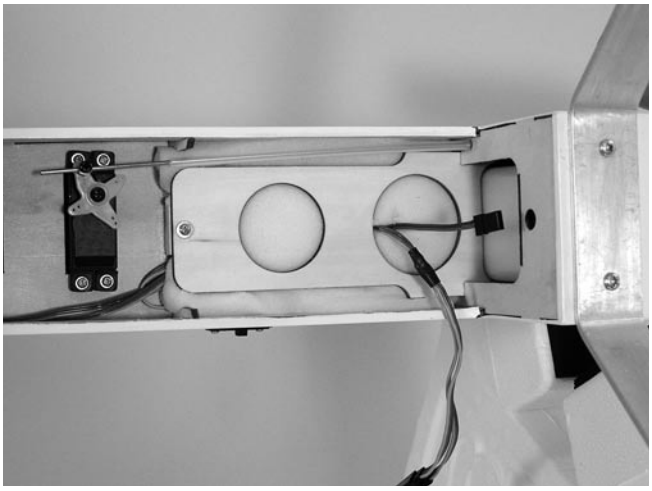
☐ Step 1

Remove the radio plate using a Phillips screwdriver. Place the receiver into the fuselage. Secure the location the receiver and battery using the radio plate. Plug in any servo leads or extensions at this time and connect any extensions necessary for the aileron servos.



☐ Step 2

Route the antenna to the rear of the fuselage through the installed tube. The tube is located on the left side of the fuselage right before the throttle servo tray. Secure the battery and receiver by reinstalling the radio plate.



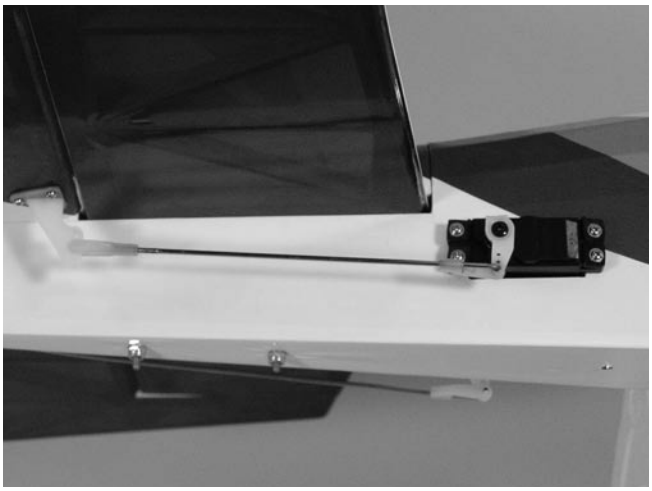
Section 5: Linkage Installation

Required Parts

- Fuselage assembly
- Wing assembly

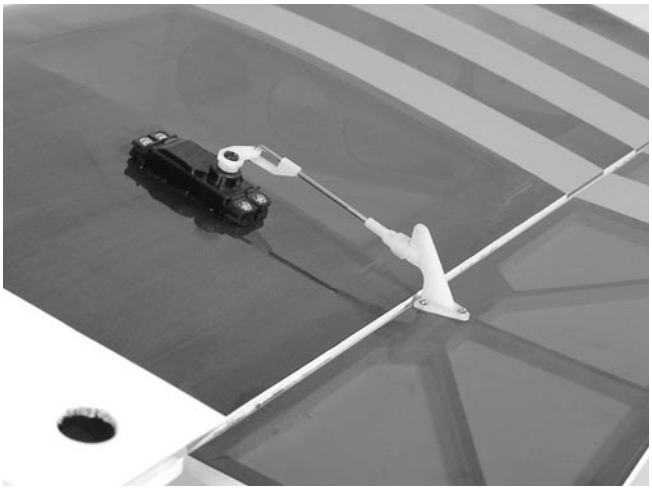
☐ **Step 1**

Center the elevator servo electronically using the radio system. Attach the pushrod with clevis to the control horn. Thread the clevis in or out so the elevator is in neutral with the radio on.



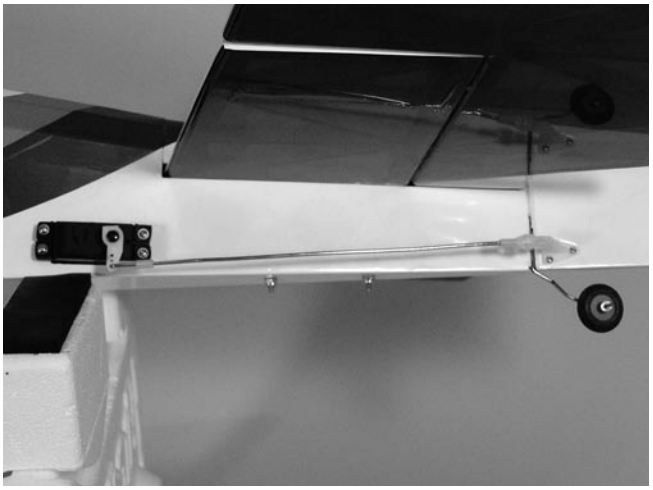
☐ **Step 2**

Center the aileron servo electronically using the radio system. Attach the pushrod with clevis to the control horn. Thread the clevis in or out so the aileron is in neutral with the radio on.



☐ **Step 3**

Center the rudder servo electronically using the radio system. Attach the pushrod with clevis to the control horn. Thread the clevis in or out so the aileron is in neutral with the radio on.



Section 6: Attaching the Wing to the Fuselage

Required Parts

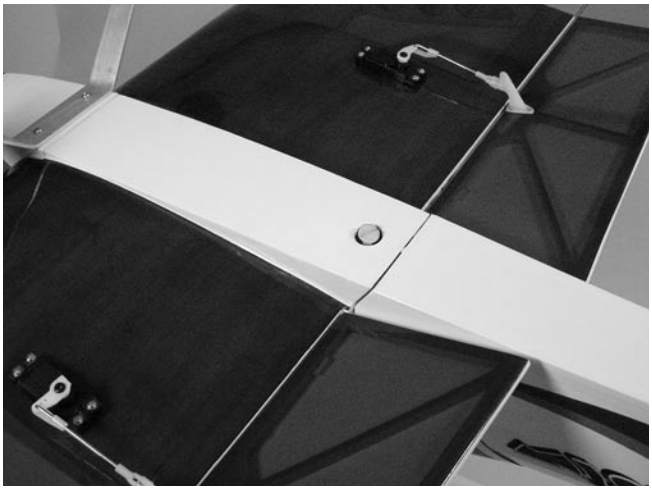
- Wing
- Fuselage
- 1/4-20 x 2" nylon bolt

Required Tools and Adhesives

- Flat blade screwdriver

☐ **Step 1**

Place the wing onto the fuselage. Secure the wing using the 1/4-20 x 2" nylon bolt.



Adjusting the Engine

☐ **Step 1**

Completely read the instructions included with your engine and follow the recommended Tuning and Safety Procedures.

☐ **Step 2**

At the field, adjust the engine to a slightly rich setting at full throttle and adjust the idle and low-speed needle so that a consistent idle is achieved.

Control Throws

☐ **Step 3**

Before you fly, be sure that your engine idles reliably, transitions and runs at all throttle settings. Only when this is achieved should any plane be considered ready for flight.

The amount of control throw should be adjusted as closely as possible using mechanical means, rather than making large changes electronically at the radio. By moving the position of the clevis at the control horn toward the outermost hole, you will decrease the amount of control throw of the control surface. Moving it toward the control surface will increase the amount of throw. Moving the pushrod wire at the servo arm will have the opposite effect: Moving it closer to center will decrease throw, and away from center will increase throw. Work with a combination of the two to achieve the closest or exact control throws listed.

	Low Rate	High Rate
Aileron	1" (15°) up	$1\frac{5}{8}$" (23°) up
	1" (15°) down	$1\frac{5}{8}$" (23°) down
Elevator	1" (14°) up	2" (25°) up
	1" (14°) down	2" (25°) down
Rudder	$1\frac{3}{4}$" (18°) left	2" (22°) left
	$1\frac{3}{4}$" (18°) right	2" (22°) right

Note: Control throws are measured at the widest part of the elevator, rudder, and aileron unless noted otherwise.

Use the following throws for 3D aerobatics:

Aileron	$2\frac{1}{2}$" (35°) up	$2\frac{1}{2}$" (35°) down
Elevator	$2\frac{3}{4}$" (35°) up	$2\frac{3}{4}$" (35°) down
Rudder	$2\frac{1}{2}$" (28°) right	$2\frac{1}{2}$" (28°) left

Recommended CG

An important part of preparing the aircraft for flight is properly balancing the model. This is especially important when various engines are mounted.

Caution: Do not inadvertently skip this step!

The recommended Center of Gravity (CG) range for the Twist™ Plug-N-Play™ is 4"–5" behind the leading edge of the wing against the fuselage. It is suggested to start at the forward end of the range until comfortable with the flight characteristics of your aircraft. If necessary, move the battery pack or add weight to either the nose or the tail until the correct balance is achieved. Stick-on weights are available at your local hobby shop and work well for this purpose.

Preflight

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.

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 engine and make sure it transitions smoothly from idle to full throttle and back. Also ensure the engine is tuned according to the manufacturer's instructions, and it will run consistently and constantly at full throttle when adjusted.

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.

Range Testing the Radio

Before each flying session, range-check your radio. This is accomplished by turning on your transmitter with the antenna collapsed. Turn on the radio in your airplane. With your airplane on the ground, you should be able to walk 30 paces 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.

Notes

2005 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 and 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.

7) I will not operate models with pyrotechnics (any device that explodes, burns, or propels a projectile of any kind) including, but not limited to, rockets, explosive bombs dropped from models, smoke bombs, all explosive gases (such as hydrogen-filled balloons), or ground mounted devices launching a projectile. The only exceptions permitted are rockets flown in accordance with the National Model Rocketry Safety Code or those permanently attached (as per JATO use); also those items authorized for Air Show Team use as defined by AST Advisory Committee (document available from AMA HQ). In any case, models using rocket motors as a primary means of propulsion are limited to a maximum weight of 3.3 pounds and a G series motor. (A model aircraft is defined as an aircraft with or without engine, not able to carry a human being.)

8) I will not consume alcoholic beverages prior to, nor during, participation in any model operations.

9) Children under 6 years old are only allowed on the flight line as a pilot or while receiving flight instruction.

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 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. (Only properly licensed Amateurs are authorized to operate equipment on Amateur Band frequencies.)

2005 Official AMA National Model Aircraft Safety Code

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.

Organized RC Racing Event

10) An RC racing event, whether or not an AMA Rule Book event, is one in which model aircraft compete in flight over a prescribed course with the objective of finishing the course faster to determine the winner.

A. In every organized racing event in which contestants, callers and officials are on the course:

1. All officials, callers and contestants must properly wear helmets, which are OSHA, DOT, ANSI, SNELL or NOCSAE approved or comparable standard while on the racecourse.

2. All officials will be off the course except for the starter and their assistant.

3."On the course" is defined to mean any area beyond the pilot/staging area where actual flying takes place.

B. I will not fly my model aircraft in any organized racing event which does not comply with paragraph A above or which allows models over 20 pounds unless that competition event is AMA sanctioned.

C. Distance from the pylon to the nearest spectator (line) will be in accordance with the current Competition Regulations under the RC Pylon Racing section for the specific event pending two or three pylon course layout.

11) RC night flying is limited to low-performance models (less than 100 mph). The models must be equipped with a lighting system that clearly defines the aircraft's attitude at all times.

HANGAR 9™

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