Mini Pulse PNP

Assembly Manual

Specifications

Wingspan:	42.5 in (1080mm)
Length:	37.5 in (875mm)
Wing Area:	330 sq in (21.5 sq dm)
Weight w/o Battery:	21–22 oz (710–820 g)
Weight w/ Battery:	25–27 oz (795–965 g)

E-flite®

ADVANCING ELECTRIC FLIGHT

Table of Contents

Introduction

Thank you for purchasing the Mini Pulse XT PNP®. Designed from the beginning for electric power, the Mini Pulse XT PNP is developed from the Hangar 9® Pulse™ XT with the same flight characteristics as the 40-size version. It is a perfect transitional airplane for beginners who want to learn aerobatics and for sport flyers who want an easy, comfortable sport flyer. All flight control surfaces, hinges, and control horns have been installed at the factory to help speed up the building time.

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.

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)

Contents of Kit/Parts Layout

Large Replacement Parts:

EFL2376	Wing w/Ailerons
EFL2377	Fuselage
EFL2378	Tail Set
EFL2380	Main Landing Gear
EFL2381	Cowling
EFL2382	Wheel Pants

Small Replacement Parts:

EFL2379	Pushrod Set
EFL2383	Motor X-Mount
EFLA200	Micro Control Horns
EFLA203	Micro Control Connectors
EFLA219	Steerable Tailwheel Assembly
EFLA223	Foam Park Wheels, 2"
EFLA213	E-flite/JR/Horizon Decals

Required Radio Equipment

The Mini Pulse PNP requires a 4-channel transmitter 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).

Complete Radio System

SPM2460	DX6 DSM 6CH Park Flyer w/4-S75 Servos

Note: We recommend the crystal-free, interference-free Spektrum® DX6 2.4GHz DSM® 6-Channel System.

Note: If you purchase a new complete radio system, you will not use the servos since four servos are installed.

Or Purchase Separately

SPM6000	AR6000 DSM DualLink™ 6-Channel Park Flyer Rx

Or

JSP30610	6-Channel UltraLite Rx w/o Crystal, Positive Shift JR/AIR (72MHz)

Or

JSP30615	6-Channel UltraLite Rx w/o Crystal, Negative Shift FUT/HRC (72MHz)
JRPXFR**	FM Receiver Crystal

Battery and Charger

THP21003SPL2100mAh 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

Optional Accessories

EFLA110	Power Meter

Required Tools and Adhesives

Tools & Equipment

EFLA250	Park Flyer Tool Assortment, 5-piece

Or Purchase Separately

EFLA257	Screwdriver, #0 Phillips (or included with EFLA250)
EFLA251	Hex Wrench: 3/32" (or included with EFLA250)
EFLA263	Nut driver: 1/4"
Needle-nose pliers	

Note Regarding Hinges

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 reinstall 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.

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.

Warranty Period

Horizon Hobby, Inc., (Horizon) warranties that the Products purchased (the "Product") will be free from defects in materials and workmanship at the date of purchase by the Purchaser.

Limited Warranty

(a) This warranty is limited to the original Purchaser ("Purchaser") and is not transferable. REPAIR OR REPLACEMENT AS PROVIDED UNDER THIS WARRANTY IS THE EXCLUSIVE REMEDY OF THE PURCHASER. This warranty covers only those Products purchased from an authorized Horizon dealer. Third party transactions are not covered by this warranty. Proof of purchase is required for warranty claims. Further, Horizon reserves the right to change or modify this warranty without notice and disclaims all other warranties, express or implied.

(b) Limitations- HORIZON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, ABOUT NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF THE PRODUCT. THE PURCHASER ACKNOWLEDGES THAT THEY ALONE HAVE DETERMINED THAT THE PRODUCT WILL SUITABLY MEET THE REQUIREMENTS OF THE PURCHASER'S INTENDED USE.

(c) Purchaser Remedy- Horizon's sole obligation hereunder shall be that Horizon will, at its option, (i) repair or (ii) replace, any Product determined by Horizon to be defective. In the event of a defect, these are the Purchaser's exclusive remedies. Horizon 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. 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 Horizon. Return of any goods by Purchaser must be approved in writing by Horizon before shipment.

Damage Limits

HORIZON SHALL NOT BE LIABLE FOR SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR PRODUCTION OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCT, WHETHER SUCH CLAIM IS BASED IN CONTRACT, WARRANTY, NEGLIGENCE, OR STRICT LIABILITY. Further, in no event shall the liability of Horizon exceed the individual price of the Product on which liability is asserted. As Horizon 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.

Law: These Terms are governed by Illinois law (without regard to conflict of law principals).

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.

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 directly. This will enable Horizon to better answer your questions and service you in the event that you may need any 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.

Inspection or Repairs

If this 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 is not responsible for merchandise until it arrives and is accepted at our facility***. A Service Repair Request is available at www.horizonhobby.com on the "Support" tab. If you do not have internet access, please include a letter with your complete name, street address, email address and phone number where you can be reached during business days, your RMA number, a list of the included items, method of payment for any non-warranty expenses and a brief summary of the problem. Your original sales receipt must also be included for warranty consideration. Be sure your name, address, and RMA number are clearly written on the outside of the shipping carton.

Warranty Inspection and Repairs

To receive warranty service, you must include your original sales receipt verifying the proof-of-purchase date. Provided 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.

Non-Warranty Repairs

Should your repair not be covered by warranty the repair will be completed and payment will be required without notification or estimate of the expense unless the expense exceeds 50% of the retail purchase cost. By submitting the item for repair you are agreeing to payment of the repair without notification. Repair estimates are available upon request. You must include this request with your repair. Non-warranty repair estimates will be billed a minimum of ½ hour of labor. In addition you will be billed for return freight. Please advise us of your preferred method of payment. Horizon 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. ***Please note: non-warranty repair is only available on electronics and model engines.***

Electronics and engines requiring inspection or repair should be shipped to the following address:

Horizon Service Center
4105 Fieldstone Road
Champaign, Illinois 61822

All other Products requiring warranty inspection or repair should be shipped to the following address:

Horizon Product Support
4105 Fieldstone Road
Champaign, Illinois 61822

Please call 877-504-0233 with any questions or concerns regarding this product or warranty.

Safety, Precautions, and Warnings

As the user of this product, you are solely responsible for operating it in a manner that does not endanger yourself and others or result in damage to the product or the property of others.

Carefully follow the directions and warnings for this and any optional support equipment (chargers, rechargeable battery packs, etc.) that you use.

This model is controlled by a radio signal that is subject to interference from many sources outside your control. This interference can cause momentary loss of control so it is necessary to always keep a safe distance in all directions around your model, as this margin will help to avoid collisions or injury.

- Always operate your model in an open area away from cars, traffic, or people.
- Avoid operating your model in the street where injury or damage can occur.
- Never operate the model out into the street or populated areas for any reason.
- Never operate your model with low transmitter batteries.
- Carefully follow the directions and warnings for this and any optional support equipment (chargers, rechargeable battery packs, etc.) that you use.
- Keep all chemicals, small parts and anything electrical out of the reach of children.
- Moisture causes damage to electronics. Avoid water exposure to all equipment not specifically designed and protected for this purpose.

Landing Gear Installation

Required Parts

Fuselage
Main landing gear
Wheel pant (L&R)
2" (50mm) wheel (2)
4-40 x 1/2" socket head bolts (2)
#4 black washers (2)
4-40 nut (2)
4-40 locknut (2)
4-40 x 1 1/4" socket head bolts (2)
#4 steel washers (4)
2mm x 6mm wood screws (2)

Required Tools and Adhesives

Hex wrench: 3/32"
Phillips screwdriver (small)
Nut driver: 1/4"
Needle-nose pliers

Note: You may consider using a larger diameter wheel, such as 2 1/4" (58mm), if your flying site has rough terrain. By using a larger wheel, you will not be able to use the included wheel pants.

❍ 1. Place the landing gear onto the bottom of the fuselage. They will angle back slightly when installed in the correct direction. Attach with two 4-40 x 1/2" socket head bolts and two #4 black washers.

❍ ❍ 2. Slide the 4-40 x $1\frac{1}{4}$" socket head bolt through one of the 2" wheels. Slide a #4 steel washer so it fits against the wheel. Next secure a 4-40 nut against the washer. Make sure the wheel still spins freely. Slide a second #4 steel washer onto the bolt. This washer will fit inside the wheel pant.

❍ ❍ 3. Fit the assembly in Step 2 into the wheel pant and insert the bolt into the landing gear. With the fuselage level to the work surface, rotate the wheel pant so it is also level to your work surface and secure the pant to the landing gear with a 2mm x 6mm wood screw. Secure the bolt with a 4-40 locknut while using needle-nose pliers to hold the head of the bolt inside the pant.

❍ 4. Repeat Steps 2 and 3 for the remaining wheel and wheel pant.

Propeller Installation

Required Parts

Fuselage w/motor installed
Propeller
Spinner
Prop adapter (for outrunner motor)

Important Information About Your Propeller

It is also very important to check to be sure the propeller is balanced before installing onto the shaft. An unbalanced propeller may strip the gears or cause poor flight characteristics.

❍ 1. Slide the propeller adapter through the hole in the propeller.

❍ 2. Slide the 1/2" (13mm) washer onto the adapter.

❍ 3. Slide the spinner backplate onot the adapter. Thread the propeller nut onto the adapter, but do not tighten it at this time.

❍ 4. Install the propeller assembly onto the motor shaft. Tighten the propeller nut using a hex wrench slipped through the hole in the propeller nut.

Note: Make sure to check the balance of the propeller after enlarging the hole in the propeller.

❍ 5. Snap the spinner cone onto the spinner.

Tail Installation

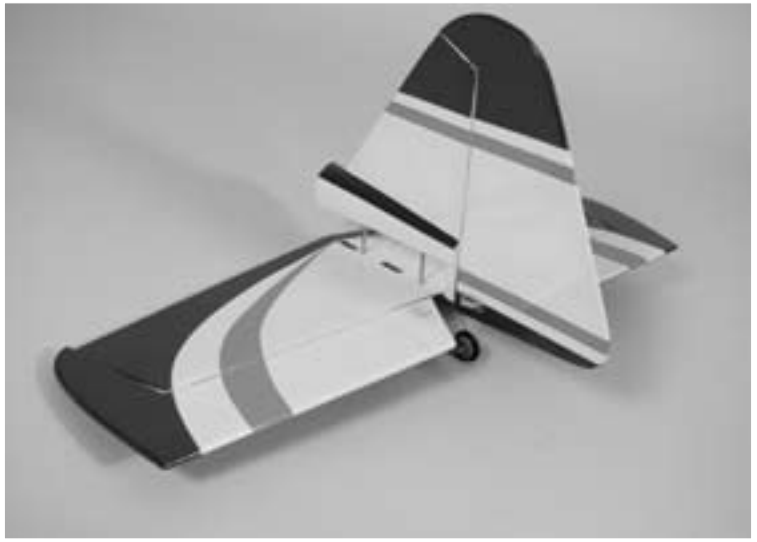
Required Parts

Fuselage
Rudder/Fin
Stabilizer/Elevator
2mm x 4mm screw (2)
4-40 locknut (2)
#4 washer (2)
Linkage wire, 4" (102mm) for elevator
Linkage wire, 5 1/2" (140mm) for rudder

Required Tools and Adhesives

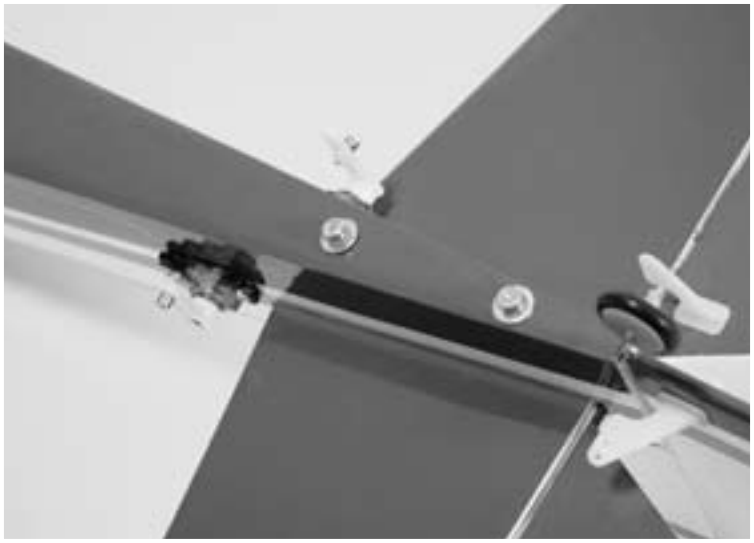
Nut driver: 1/4"
Screwdriver, #0 Phillips

❍ 1. 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.



❍ 2. Slide the rudder/stabilizer assembly onto the fuselage.

❍ 3. Slide the #4 washers onto the threaded rods. Thread the nuts onto the rod, tightening them snugly against the bottom of the fuselage.



Note: The tail section is removable for easy transporting if needed.

❍ 4. Locate the 4 in (102mm) linkage wire. Slide the "Z" bend into the center hole of the elevator control horn. Pass the linkage through the pushrod connector on the servo arm. Turn on the radio and plug the elevator servo into the receiver. Center the elevator trim and stick, and check that the sub-trim (if a programmable radio) has been set to 0. Install the servo horn back onto the elevator servo. Use a 2mm x 4mm screw to secure the linkage.

❍ 5. Repeat Step 4 for the rudder linkage.

Final Assembly

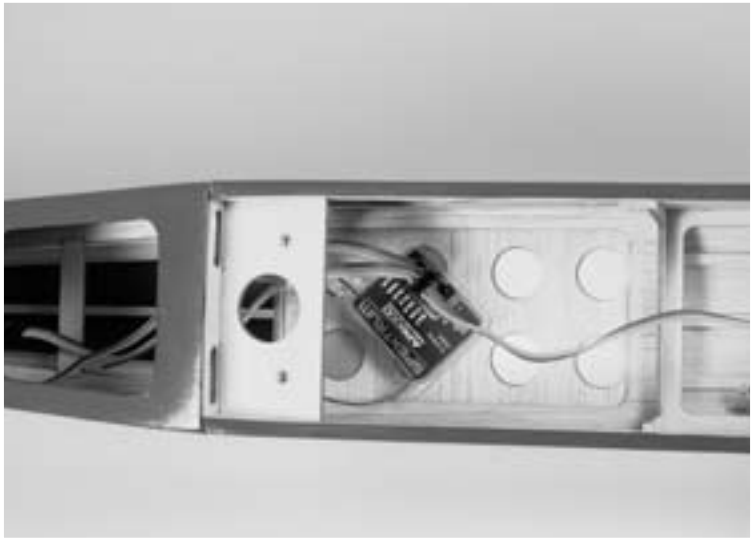
Required Parts

Fuselage
Wing
Receiver
Battery
Battery hatch
4-40 x 1" socket head bolt (2)
#4 washer (2)
Hook and loop tape
Hook and loop strap

Required Tools and Adhesives

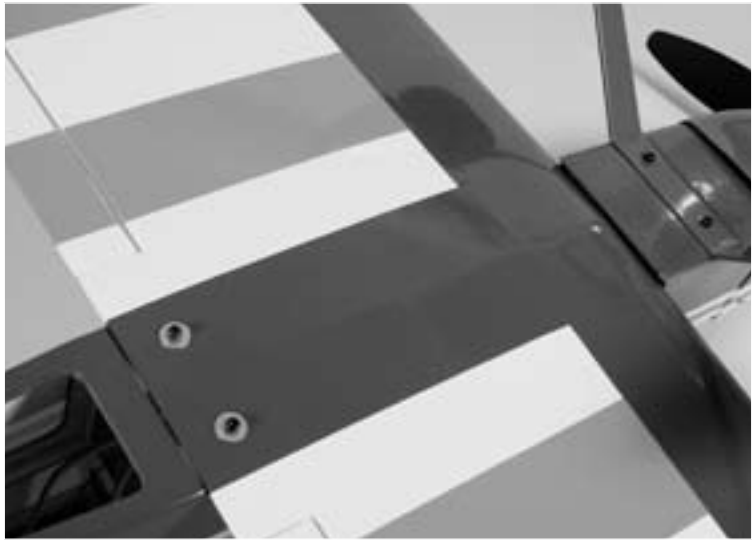
Hex wrench: 3/32"

❍ 1. Plug in the elevator and rudder servos and ESC into the receiver. Mount the receiver to the inside of the fuselage using hook and loop material. Route the antenna wire through the bottom of the fuselage to the rear, or as directed by your radio instruction manual.



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

❍ 2. Plug the Y-harness for the aileron servos into the receiver. Attach the wing to the fuselage using two 4-40 x 1" socket head screws and two #4 washers.



❍ 3. 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.

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

Control Throws

- 1. Turn on the transmitter and receiver of your aircraft. Check the movement of the rudder using the transmitter. When the stick is moved right, the rudder should also move right. Reverse the direction of the servo at the transmitter if necessary.

- 2. Turn on the transmitter and receiver of your aircraft. Check the movement of the ailerons using the transmitter. When the stick is moved right, the right aileron will move up and the left aileron will move down. Reverse the direction of the servo at the transmitter if necessary.

- 3. Check the movement of the elevator with the radio system. Moving the elevator stick down will make the airplane elevator move up.

- 4. Use a ruler or throw gauge 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	3/8" (9mm)	1/2" (13mm)
Elevator:		
Up/Down	1/4" (6mm)	1/2" (13mm)
Rudder:		
Right/Left	$1\,^{1}/_{4}$" (32mm)	$1\,^{1}/_{2}$" (38mm)

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. Be sure to range check your radio before each flying session. 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.

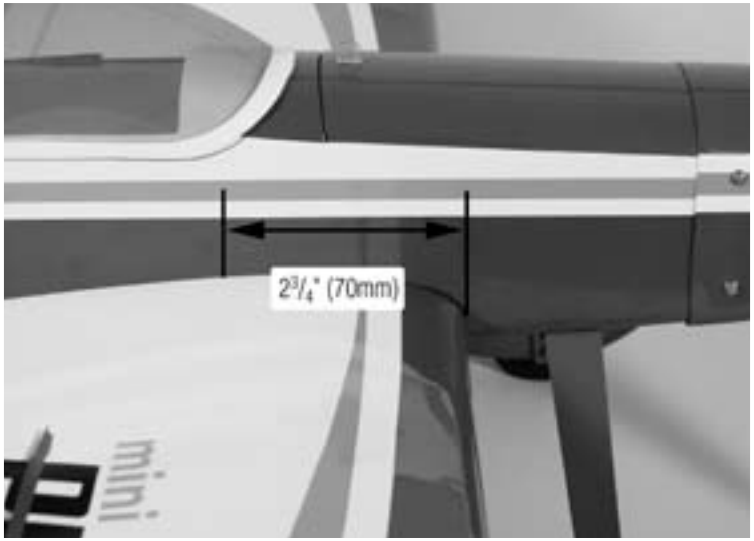
- 2. Double-check that all controls (aileron, elevator, rudder and throttle) move in the correct direction.

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

Center of Gravity

Caution: Do not inadvertently skip this step!

The recommended Center of Gravity (CG) location for the Mini Pulse XT PNP is $2^{3}/_{4}$" (70mm) behind the leading edge of the upper wing against the fuselage. After the first flights, the throws can be adjusted for your personal preference.



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.

2007 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.

Building and Flying Notes

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