

Sukhoi SU-26MM SE

Assembly Manual



HANGAR 9[®]

Fly First Class[™]

Notice

All instructions, warranties and other collateral documents are subject to change at the sole discretion of Horizon Hobby, Inc. For up-to-date product literature, visit <http://www.horizonhobby.com> and click on the support tab for this product.

Meaning of Special Language

The following terms are used throughout the product literature to indicate various levels of potential harm when operating this product:

NOTICE: Procedures, which if not properly followed, create a possibility of physical property damage AND a little or no possibility of injury.

CAUTION: Procedures, which if not properly followed, create the probability of physical property damage AND a possibility of serious injury.

WARNING: Procedures, which if not properly followed, create the probability of property damage, collateral damage, and serious injury OR create a high probability of superficial injury.



WARNING: Read the ENTIRE instruction manual to become familiar with the features of the product before operating. Failure to operate the product correctly can result in damage to the product, personal property and cause serious injury.

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. Do not attempt disassembly, use with incompatible components or augment product in any way without the approval of Horizon Hobby, Inc. This 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 serious injury.

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Introduction

Congratulations on the purchase of your new Hangar 9 Sukhoi SU-26MM SE. As of right now, all that stands between you and your first flight with it is about a day's worth of final assembly. We've already installed five Spektrum A6030 digital high-torque servos and their linkages on the control surfaces. We've even installed a Spektrum A6000 throttle servo and the fuel tank for you. All you have to do is attach the tail, slide on the wings, install the engine and receiver, and put on the cowl.

Because the Sukhoi SU-26MM SE was designed by aerobatic champ Mike McConville, you can look forward to competition-level 3D performance. Its low wing loading and lightweight construction will let you fly extreme 3D maneuvers with power to spare using any of the most popular 80cc to 85cc gas engines. It's an excellent precision aerobatic plane, too.

We sincerely hope you have as much fun with the Sukhoi SU-26MM SE as we did testing it. If you get a chance, let us know how your experience was by visiting Hangar-9.com and clicking on the "Contact Us" section. We look forward to hearing from you.

Happy flying,

The Hangar 9 Team

Product Support

For technical assistance with this product, please contact the appropriate Horizon Product Support office. See warranty for more information.

Specifications

| | |
|-----------|---|
| Wingspan | 97.0 in (2.5m) |
| Length | 91.0 in (2.3m) |
| Wing Area | 1760 sq in (114 sq dm) |
| Weight | 21.5–24.0 lb (9.80–11.0 kg) |
| Radio | 4-channel (or greater) |
| Engine | 80cc–85cc Gas |
| Servos | Spektrum A6030 Digital High-Torque (5) Spektrum A6000 Digital Sport Servo (Throttle) |

Included Parts Listing

PACKAGED INDIVIDUALLY

| | | |
|--|---|-------------------------|
| Left wing with aileron | 1 | |
| Right wing with aileron | 1 | |
| Left stabilizer with elevator | 1 | |
| Right stabilizer with elevator | 1 | |
| Rudder | 1 | |
| Fuselage with hatch, canopy and pilot | 1 | |
| Cowl | 1 | |
| Landing gear | 1 | |
| Wheel pants | 2 | Left and right |
| Anodized aluminum tube, 1 ³ / ₄ x 35 ³ / ₄ -inch | 1 | Wing |
| Anodized aluminum tube, 1/2 x 14 ³ / ₁₆ -inch | 1 | Stabilizer/elevator |
| Landing gear hatch | 1 | Attached to fuselage |
| Decal sheet | 1 | |
| 2-inch wing bolts nylon thumb screw | 2 | Installed in wing panel |
| 2 ¹ / ₂ -inch wing bolt nylon thumb screw | 2 | Installed in wing panel |

MAIN LANDING GEAR

| | | |
|---|---|----------------------------------|
| 3 ¹ / ₂ -inch (90mm) wheels | 2 | 5-32 x 2-inch axles preinstalled |
| 8-32 x 3/4-inch socket head cap screw | 4 | Landing gear to fuselage |
| 8-32 lock nut 5/32 wheel collar with setscrew | 4 | Main wheels |
| 4-40 x 1/2-inch socket head cap screw | 4 | Preinstalled on wheel pants |
| #4 flat washer | 4 | Preinstalled on wheel pants |

TAIL GEAR

| | | |
|--|---|--------------------------|
| 3.5 x 18mm socket head wood screw | 2 | Tail wheel mount to fuse |
| 1 ³ / ₄ -inch tail wheel assembly with springs | 1 | |

MISCELLANEOUS

| | | |
|--|----|------------------------|
| Wire ties | 25 | |
| 3/4-inch x 12-inch hook and loop strap | 3 | Batteries and receiver |

TUNED PIPE MOUNT

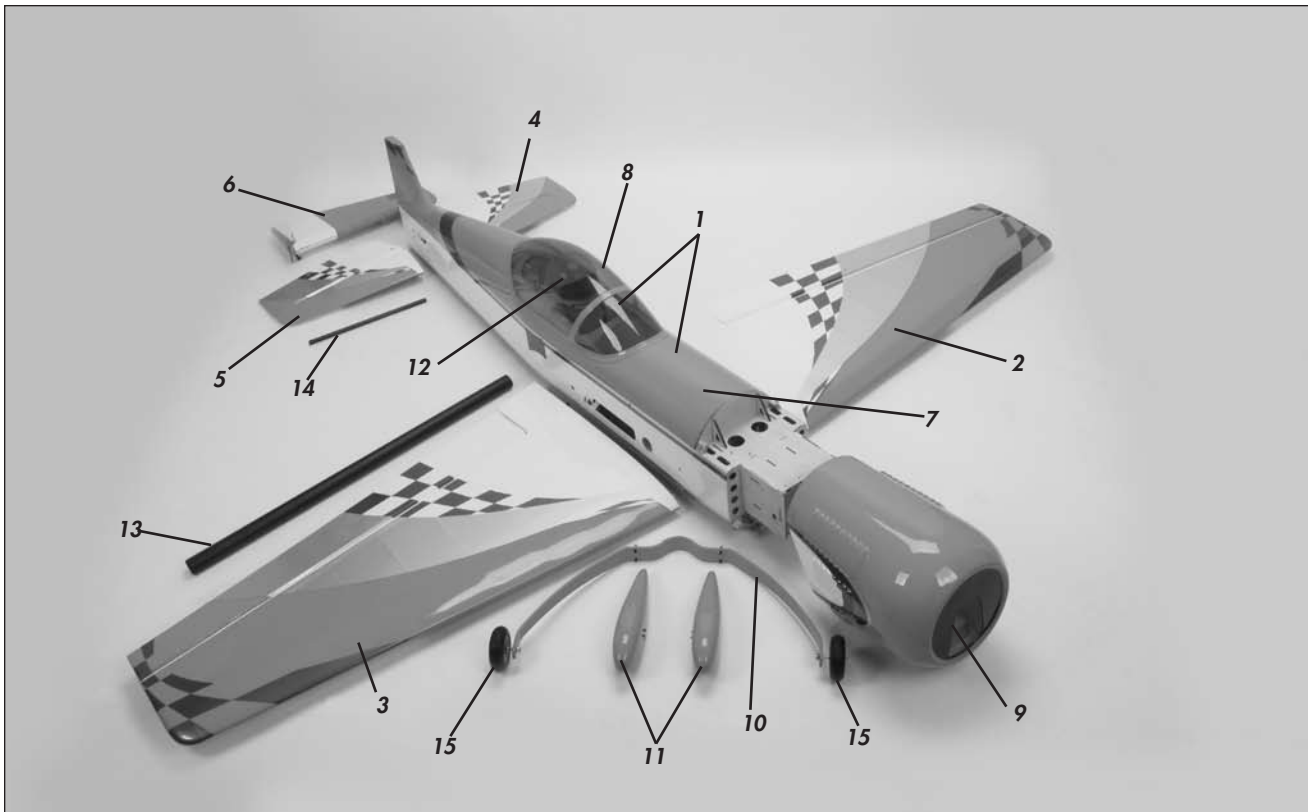
| | | |
|---------------------------------------|---|-------------------------|
| 6mm plywood former | 1 | Front tuned pipe mount |
| 6mm plywood former | 1 | Front tuned pipe mount |
| Plywood half former | 1 | Rear tuned pipe mount |
| 4-40 x 1/2-inch socket head cap screw | 2 | Rear tuned pipe mount |
| #4 flat washer | 2 | Rear tuned pipe mount |
| 24-inch medium silicone tubing | 2 | Tuned pipe mount |
| 1-inch medium silicone tubing | 4 | Canister mount |
| 2mm plywood horseshoe former | 2 | Extra fuel tubing mount |

ENGINE

| | | |
|--|---|------------------------|
| 1/4-20 x 1 ¹ / ₄ -inch socket head cap screw | 4 | Engine to firewall |
| 1/4-20 blind nut | 4 | Engine to firewall |
| 1/4-inch lock washer | 4 | Engine to firewall |
| 5mm aluminum spacers | 4 | Engine to firewall |
| 4-40 x 1/2-inch socket head screw | 3 | Ignition to engine box |
| #4 flat washer | 3 | Ignition to engine box |

THROTTLE

| | | |
|---|---|----------------------------|
| 4-40 x 14 ¹ / ₄ -inch pushrod | 1 | Choke pushrod |
| 4-40 x 15 ¹ / ₂ -inch pushrod | 1 | Throttle pushrod |
| 3mm plywood support former | 2 | Manual choke pushrod |
| 6mm plywood support former | 2 | Throttle and choke pushrod |
| 1/4-inch balsa triangle stock | 2 | Pushrod support |
| 4-40 x 2mm ball link with hardware | 2 | Throttle and choke |
| 90-degree pushrod keeper | 2 | Throttle and choke |
| 12-inch (305mm) nylon pushrod housing | 2 | Throttle and choke |



Contents of Kit and Parts Listing

Replacement items

| | | |
|-----|-----------|-----------------------------------|
| 1. | HAN124501 | Fuselage with Hatch |
| 2. | HAN124502 | Left Wing with Aileron |
| 3. | HAN124503 | Right Wing with Aileron |
| 4. | HAN124504 | Left Stabilizer with Elevator |
| 5. | HAN124505 | Right Stabilizer with Elevator |
| 6. | HAN124506 | Rudder |
| 7. | HAN124507 | Cockpit Hatch without Canopy |
| 8. | HAN124508 | Canopy |
| 9. | HAN124509 | Cowl |
| 10. | HAN124510 | Landing Gear without wheels |
| 11. | HAN124511 | Wheel Pants |
| 12. | HAN124512 | Pilot Figure |
| 13. | HAN124514 | Anodized Wing Tube |
| 14. | HAN124515 | Anodized Stab Tube |
| 15. | HAN308 | 3 1/2-inch (90mm) Pro-Lite Wheels |

Items not shown

| | |
|-----------|----------------------|
| HAN124513 | Landing Gear Hatch |
| HAN124516 | Decal Sheet |
| HAN124517 | Hardware Pack |
| HAN124518 | Wood Trays |
| HAN124519 | Painted Cowl Washers |
| HAN331 | Tail Wheel Assembly |
| HAN4110 | 2-inch Wing Bolts |
| | Nylon Thumb Screw |
| HAN321 | 2 1/2-inch Wing Bolt |
| | Nylon Thumb Screw |
| HAN3627 | Rudder Hinges |
| HAN124520 | 5/32 x 2-inch axles |

Safety Precautions and Warnings

Read and follow all instructions and safety precautions before use. Improper use can result in fire, serious injury and damage to property.

COMPONENTS

Use only with compatible components. Should any compatibility questions exist please refer to the product instructions, the component instructions or contact Horizon Hobby, Inc.

FLIGHT

Fly only in open areas to ensure safety. It is recommended flying be done at AMA (Academy of Model Aeronautics) approved flying sites. Consult local ordinances before choosing a flying location.

PROPELLER

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 as injury can occur.

BATTERIES



Notes on Lithium Polymer Batteries

When used improperly, lithium polymer batteries are significantly more volatile than alkaline or Ni-Cd/Ni-MH batteries used in RC applications. Always follow the manufacturer's instructions when using and disposing of any batteries. Mishandling of Li-Po batteries can result in fire causing serious injury and damage.

SMALL PARTS

This kit includes small parts and should not be left unattended near children as choking and serious injury could result.

Age Recommendation: Not for children under 14 years. This is not a toy.

Safe Operating Recommendations

- Inspect your model before every flight to make certain it is airworthy.
- Be aware of any other radio frequency user who may present an interference problem.
- Always be courteous and respectful of other users of your selected flight area.
- Choose an area clear of obstacles and large enough to safely accommodate your flying activity.
- Make certain this area is clear of friends and spectators prior to launching your aircraft.
- Be aware of other activities in the vicinity of your flight path that could cause potential conflict.
- Carefully plan your flight path prior to launch.
- Abide by any and all established AMA National Model Aircraft Safety Code.

Important Information Regarding Warranty

Please read our Warranty and Liability Limitations section on page 59 before building this product. 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.

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 box (☐) are performed once, while steps with two boxes (☐☐) indicate 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.

UltraCote® Covering Colors

| | |
|--------------|---------|
| White | HANU870 |
| Orange | HANU877 |
| Pearl Purple | HANU847 |
| Silver | HANU881 |
| Black | HANU874 |

Recommended Evolution Engine

| | |
|---|--------------|
| Evolution® 80GX | EVOE80GX |
| Spinner 4¼-inch 2-blade, predrilled | TRU4252BMEV |
| Spinner 4¼-inch 3-blade, predrilled | TRU4253BMEVL |
| Propeller, 26C (VESS) | VSS2603 |
| Propeller, 27 x 10TH (Mejzlik) (optional) | |
| Muffler, Inverted, with Smoke 80GX | EVO30073400 |
| JR Chargeswitch | JRPA004 |

DA 85 Engine

| | |
|---|--------------|
| Spinner 4¼-inch 2-blade, predrilled | TRU4252BMEV |
| Spinner 4¼-inch 3-blade, predrilled | TRU4253BMEVL |
| Propeller, 26C (VESS) | VSS2603 |
| Propeller, 27 x 10TH (Mejzlik) (optional) | |
| JR Chargeswitch | JRPA004 |
| In cowl muffler, Pitts style | |
| MTW header & MTW110 canister | |
| MTW RE-3 tuned pipe and header | |

Transmitter Requirements

This model requires a minimum of a 4-channel radio to operate all the functions of your aircraft. We suggest the following radio systems available through Horizon Hobby or your local hobby distributor.

| | |
|--------------------------|---------|
| Spektrum DX8™ | SPM8800 |
| JR® Systems X9503 2.4GHz | JRP2930 |
| JR Systems 12X 2.4GHz | JRP1200 |

Radio Equipment Requirements

The following items are recommended when installing the 9-Channel AR9100 receiver (SPMAR9100) in your aircraft:

| | |
|---|------------|
| VR6007 Voltage Regulator 7.5A, 6V (2) | SPMVR6007 |
| 12-Inch EC3™ Extension with 16AWG (2) | SPMEXEC312 |
| 7.4V, 2000mAh Li-Po Receiver Pack (3) | SPMB2000LP |
| RF Filter: Ring Style (2) (Throttle, Choke) | JRPA029 |
| JR Chargeswitch (ignition) | JRPA004 |
| 6-inch (152mm) Servo Extension (Regulators) | JSP98110 |
| 4-Pin Balance Connector Ext. (optional) (3) | THP4P10E |

Optional Choke Servo

| | |
|-------------------------|-----------|
| Spektrum Digital Servo | SPMSA6000 |
| 24-inch Servo Extension | JRPA102 |

Required Tools

| | |
|--|--------------------------|
| 1/4-inch ratchet drive | Covering iron |
| Cut-off wheel | Dish washing liquid |
| Drill | Felt-tipped pen |
| Flat file | Hobby scissor |
| Light machine oil | Medium sandpaper |
| Mixing cup | Mixing sticks |
| Paper towels | Phillips screwdriver: #1 |
| Pin vise | Plastic squeegee |
| Pliers | Razor saw |
| Rotary tool | Rubbing alcohol |
| Ruler | Sanding drum |
| Scissors | Side cutters |
| Silicone adhesive | Spray bottle with water |
| Tape or spray adhesive | Trim seal tool |
| 11/32-inch socket, 1/4-inch drive | |
| 3-inch (76mm) drive extension, 1/4-inch drive | |
| Adjustable wrench or linkage tool | |
| Drill bit: 5/64-inch (2mm), 3/32-inch (2.5mm), 5/16-inch (8mm) | |
| Hex wrench: 1.5mm, 3/32-inch, 2.5mm, 5/64-inch, 1/8-inch, 3mm, 3/16-inch | |
| Hobby knife with #11 blade | |
| Open end wrench: 10mm, 13mm | |

Required Adhesives

| | |
|-------------------------|-----------|
| Thin CA | (PAAPT08) |
| Medium CA | (PAAPT02) |
| Threadlock | (PAAPT42) |
| 5-minute Epoxy, 8 oz | (PAAPT38) |
| 30-Minute Epoxy, 8 oz | (PAAPT39) |
| Formula 560 Canopy Glue | (PAAPT56) |

Field Equipment Required

| | |
|--------------------------|-------------|
| Ultra Fuel Pump Glow/Gas | HAN155 |
| CM-6 Spark Plug | EVO30013309 |
| Evolution 2-cycle oil | EVOX1001Q |

Optional Field Equipment

Self-stick weights, 6 oz (HAN3626)
Cleaner and towels

Before Starting Assembly

Before beginning the assembly of your model, 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 – Sealing Iron

HAN141 – Sealing Iron Sock

Receiver Installation

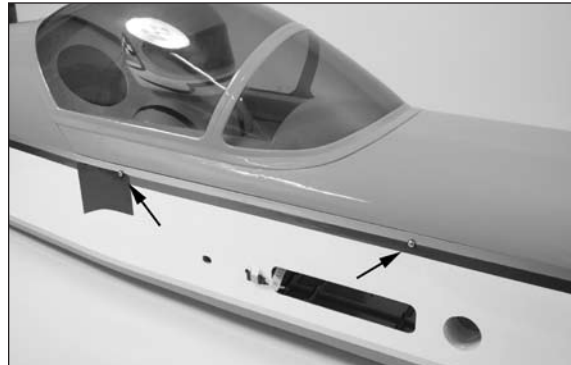
Required Parts

| | |
|---|---------------------------|
| Fuselage | Choke servo (optional) |
| RF filter coil | Receiver with accessories |
| Hook and loop tape (not included) | |
| 1/4-inch (6mm) foam rubber (not included) | |
| 24-inch servo extension (optional) | |

Required Tools and Adhesives

| | |
|--|--------------------------|
| Scissors | Phillips screwdriver: #1 |
| Hex wrench: 5/64-inch | |
| Thin CA (for choke servo mounting holes) | |
| Hobby knife with #11 blade | |

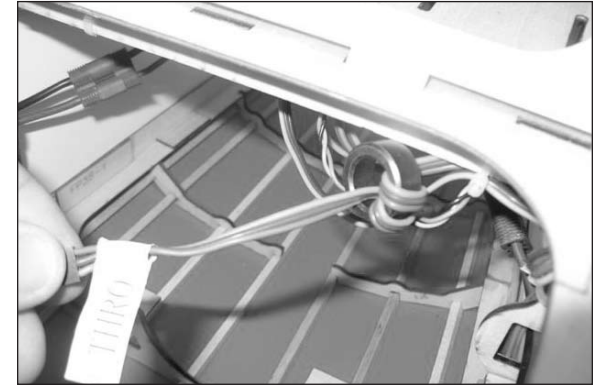
- 1. Remove the four screws securing the canopy hatch to the fuselage using a 5/64-inch hex wrench. Set the hatch and screws aside until they are required for installation.



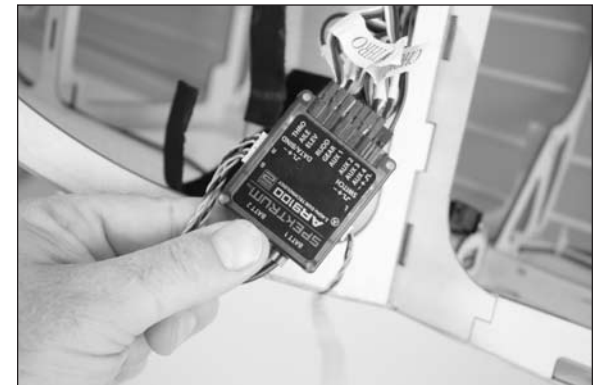
- 2. Use a #1 Phillips screwdriver to remove the servo horn from the throttle servo.



- 3. Use scissors to cut the tie wraps on the throttle lead to allow room to install the RF filter coil. Install the RF filter coil on the lead for the throttle servo to prevent feedback from the servo getting to the receiver. The lead will wrap through the coil three times for correct installation. Install the RF filter coil as close to the receiver as possible to be the most effective.

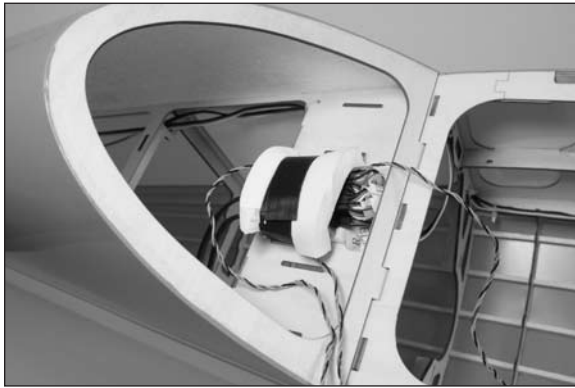


- 4. Plug the extensions in the receiver. Note the tags on the extensions so they can be plugged into the correct ports of the receiver.

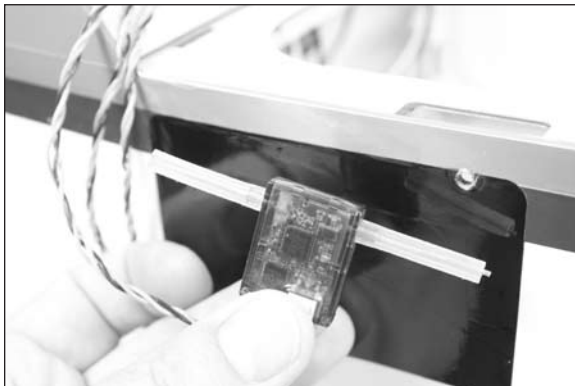


Hint: Plug the 6-inch (152mm) extension (included with the AR9100 receiver) in the bind/data port. This will be routed to the outside of the fuselage to allow binding of the receiver and flight log data to be accessed without the need to remove the receiver from the airframe.

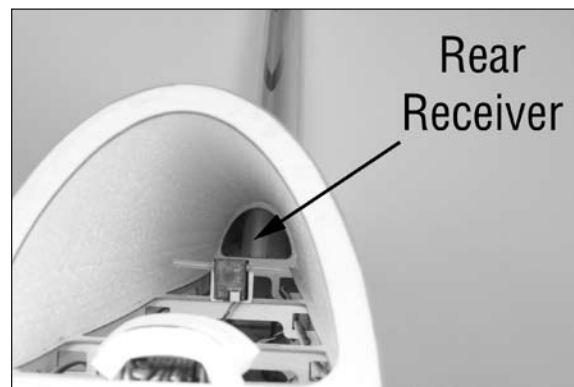
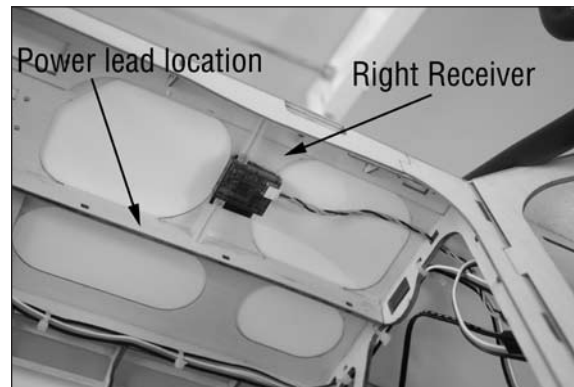
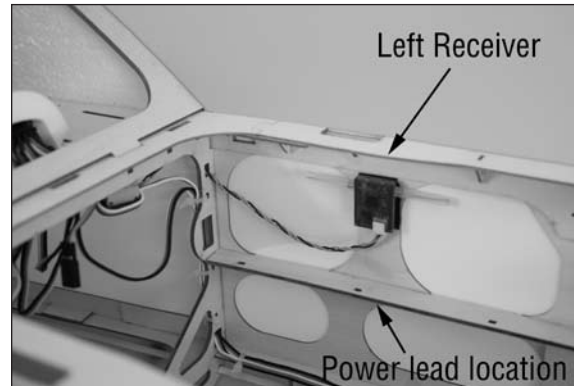
- 5. Use the hook and loop strap to secure the receiver in position. Make sure to use foam to isolate the receiver from the airframe.



Note: Use a small piece of fuel tubing on the receiver antenna to keep them straight and to isolate them from the airframe.



- 6. Use hook and loop tape to attach the remote receivers in the fuselage as shown. Make sure to route the leads for the receivers away from servo leads and battery leads. Holes have been laser cut to route the leads through the formers. Note the direction of the antenna on each receiver. This is done for the best reception from your radio system.



- 7. Pass a male/male charge lead into a charge jack mount. Use a hobby knife with a #11 blade to remove the covering in the side of the fuselage. Use the hardware included with the jack to mount the charge jack mount on the side of the fuselage. Connect the previously installed 6-inch (152mm) extension lead from the bind/data port to the male/male lead.



- 8. (Optional) Install the choke servo as shown using the hardware provided with the servo. Use a 24-inch (610mm) servo extension to connect the servo lead to the receiver. Make sure to secure the servo lead using string or a commercially available connector to the extension so it does not unplug inside the fuselage. Make sure to apply 2-3 drops on thin CA in each of the screw holes to harden the surrounding wood.



Note: Install an RF filter coil on the lead for the choke servo to prevent feedback from the servo getting to the receiver. The lead will wrap through the coil three times for correct installation. Install the RF filter coil as close to the receiver as possible to be the most effective.

Battery and Regulator Installation - 3D Flight

Required Parts

| | |
|--|-------------------------|
| Fuselage | Hook and loop strap (2) |
| 12-inch EC3 extension (2) | Tie-wraps |
| Battery (2) | Side mount plates (2) |
| 1/4-inch (6mm) foam rubber (not included) | |
| Regulator with accessories (2) | |
| #4 x 1/2 sheet metal screws (8) (not included) | |
| 6-inch (152mm) servo extension (2) | |

Required Tools and Adhesives

| | |
|----------------------------|----------------------------|
| 5-minute epoxy | Scissors |
| Pin vise | Drill bit: 5/64 inch (2mm) |
| Mixing cups | Mixing sticks |
| Phillips screwdriver: #1 | Paper towels |
| Hobby knife with #11 blade | |

We have tested two different locations for the receiver battery and regulator positions inside the fuselage. The following covers the installation of these components that are best suited for an aft CG and 3D flight.

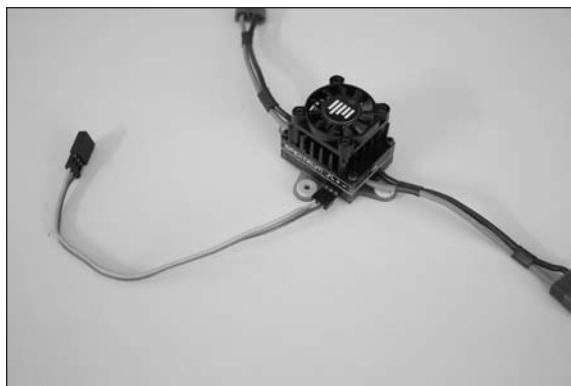
1. Use a hobby knife with a #11 blade to remove the covering on the fuselage for the two regulator switches on the right and left sides of the fuselage. Mount the switches using a #1 Phillips screwdriver and the hardware provided with the switches.



2. Use a hobby knife with a #11 blade to remove the covering on the fuselage for the charge jacks on the right and left sides of the fuselage. Install charge jacks in the larger cutouts below the switches.



3. Connect a 6-inch (152mm) servo extension to the regulator for the connection to the regulator switch.

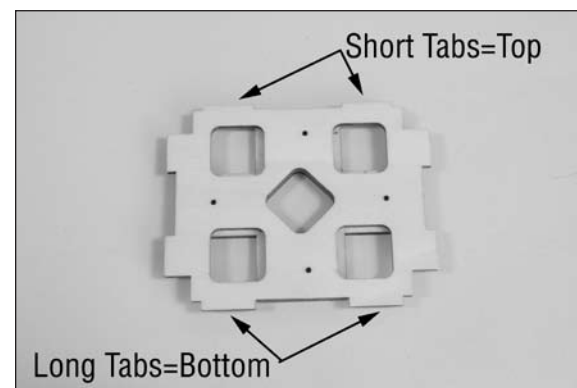


4. Repeat steps 1 through 3 to install a second switch and charge jack on the opposite side of the fuselage. Prepare the second regulator for installation at this time as well.

5. Secure the regulators in the fuselage next to the receiver. Use four #4 x 1/2-inch sheet metal screws (not included) and four #4 washers (not included) to secure each regulator. Make sure the regulators are far enough back that they won't interfere with the installation of the canopy hatch. Plug the regulators into the leads from the receiver, then route the remaining lead and servo extension from the regulators through the larger hole in the receiver floor, keeping the remote receiver leads separated from the power and servo wires.

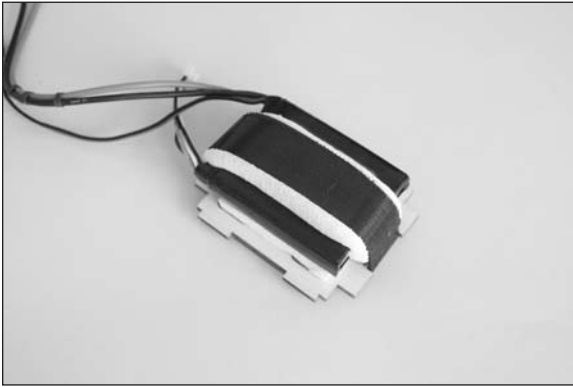


6. Locate the side mount plates. Note that the tabs on one side are longer than those on the opposite side. The longer tabs will face down into the fuselage when the plates are installed.



Note: Use the 4-pin balance connection (THP4P10E) on the receiver Li-Po batteries to make it easier to connect the charger. The receiver extension can be used on the charger balance lead for this purpose.

- 7. Wrap a piece of foam rubber around the receiver battery. Use a hook and loop strap to secure the receiver battery to the side mount plate. Note the direction of the leads: they will face to the rear of the fuselage. Prepare a right and left battery for installation at this time.



- 8. Attach the side mount plate in the fuselage using 5-minute epoxy. The tabs on the plate will key into the fuselage sides as shown. Install both the left and right plates at this time. Insert the extension into the jack on the side of the fuselage installed below the switch so the voltage of the battery can be checked without the need to remove the canopy hatch.



- 9. Connect the switch for the regulator to the 6-inch (152mm) extension from the regulator. Connect a 12-inch (305mm) EC3 extension to the power lead from the regulator and to the receiver battery. Route the lead through the openings in the formers. Use tie wraps to secure the leads inside the fuselage so they don't move during flight. Make sure the lead for the receiver is routed away from the power leads to avoid radio interference.



Notice: When storing your model, make sure to unplug the batteries from the regulators as the regulators draw a small amount of power even when in the off position. If left connected, they will drain the battery and leave it unusable.

- 10. Repeat steps 6 through 9 to install the second receiver battery and regulator in the fuselage. Make sure to route and secure the power leads in the fuselage so they are away from the servo and receiver leads.

Battery and Regulator Installation - Precision Aerobatics

Required Parts

| | |
|---|-------------------------|
| Fuselage | Hook and loop strap (2) |
| 12-inch EC3 extension (2) | Tie-wraps |
| Battery (2) | Side mount plates (2) |
| 1/4-inch (6mm) Foam rubber (not included) | |
| Battery Mount Plate (2) | |
| Regulators with accessories (2) | |
| #4 x 1/2-inch sheet metal screws (8) (not included) | |
| #4 washers (8) (not included) | |
| 6-inch (152mm) servo extension (2) | |

Required Tools and Adhesives

| | |
|----------------------------|---------------|
| 5-minute epoxy | Scissors |
| Mixing cups | Mixing sticks |
| Paper towels | Thin CA |
| Hobby knife with #11 blade | |

We have tested two different locations for the receiver battery and regulator positions inside the fuselage. The following covers the installation of these components that are best suited for a forward CG for precision aerobatics.

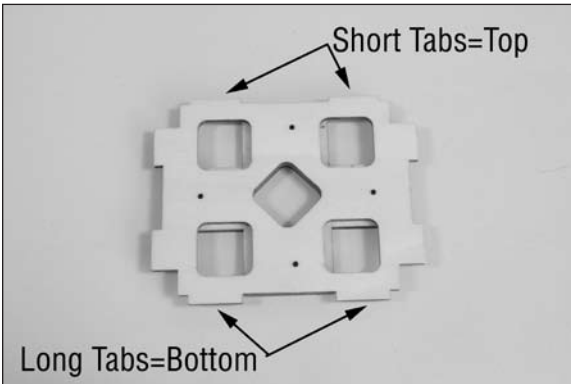
- 1. Use a hobby knife with a #11 blade to remove the covering on the fuselage for the two regulator switches on the right and left sides of the fuselage. Mount the switches using the hardware provided with the switches.



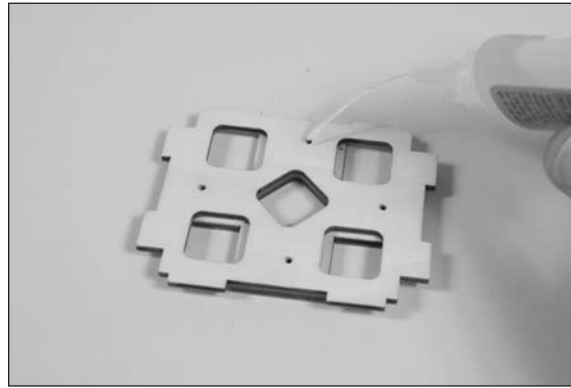
- 2. Use a hobby knife with a #11 blade to remove the covering on the fuselage for the charge jacks on the right and left sides of the fuselage. Install charge jacks in the larger cutouts below the switches.



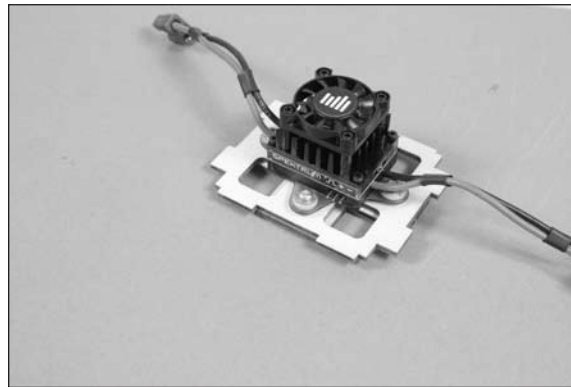
- 3. Locate the side mount plates. The tabs on one side are longer than those on the opposite side. The longer tabs will face down into the fuselage when the plates are installed.



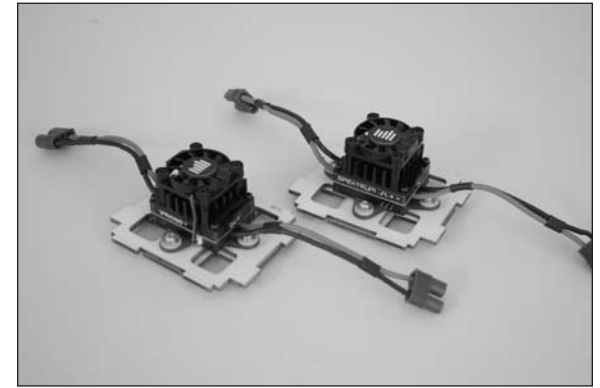
- 4. Apply 2–3 drops of thin CA in each of the mounting holes to harden the surrounding wood. This will keep the screws from backing out in flight.



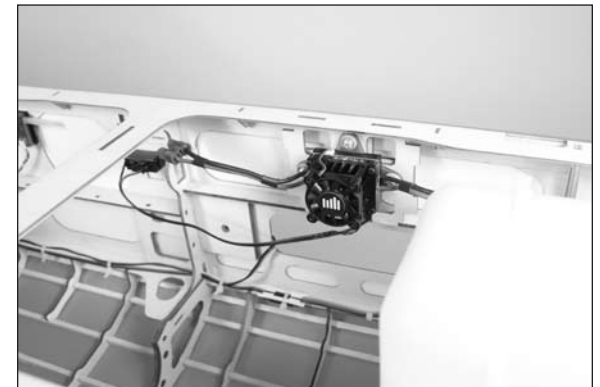
- 5. Attach the regulator to the side mount plate using four #4 x 1/2-inch sheet metal screws (not included) and four #4 washers (not included).



- 6. Repeat Steps 1 through 5 to prepare the second regulator for installation. Make sure to construct a regulator for the right and left side of the fuselage.



- 7. Connect the switch lead to the regulator. Attach the side mount plate in the fuselage using 5-minute epoxy. Note that the lead on the regulator for the battery input will face to the front of the fuselage. The tabs on the plate will key into the fuselage sides as shown. Install both the left and right plates at this time.

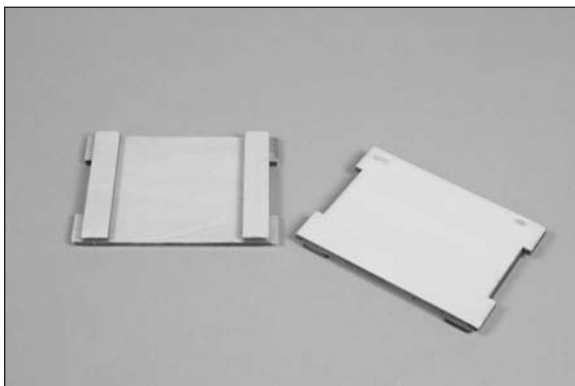


- 8. Connect the regulator to the receiver using a 12-inch (305mm) EC3 extension. Route the lead through the openings in the formers. Use tie wraps to secure the lead inside the fuselage so it doesn't move during flight. Make sure the lead for the receiver is routed away from the power leads to avoid radio interference.

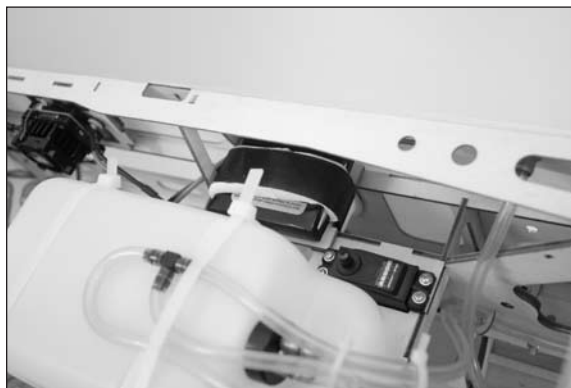


Important: Keep the power leads to the receiver remote antenna leads separated to avoid interference.

- 9. Connect a 6-inch (152mm) servo extension to the lead on the battery. Wrap the battery using foam rubber. Use a hook and loop strap to secure the receiver battery to the battery mount plate.



- 10. Use 5-minute epoxy to secure the battery mount plate in the fuselage next to the fuel tank and behind the servo as shown. Once the epoxy cures, connect the lead from the battery to the regulator. Use tie wraps to secure the leads so they don't move in the fuselage during flight.



- 11. Repeat Steps 7 through 10 to install the remaining battery and regulator on the opposite side of the fuselage.

Notice: When storing your model, make sure to unplug the batteries from the regulators as the regulators draw a small amount of power even when in the off position. If left connected, they will drain the battery and leave it unusable.

Engine Installation (Evolution 80GX)

Required Parts

| | |
|---|--------------------------|
| Fuselage assembly | 90-degree snap link (2) |
| 1/4-inch lock washer (4) | 1/4-20 blind nut (4) |
| Pushrod support (2) | Balsa triangle stock (2) |
| Engine | Muffler |
| Spinner | Propeller |
| Ignition switch | Ignition battery |
| #4 washer (3) | Hook and loop strap |
| Tie wraps | Fuel line |
| 5mm aluminum engine standoffs | |
| Choke pushrod wire, 14 ¹ / ₄ -inch (362mm) | |
| 4-40 x 1/2 socket head bolt (3) | |
| 2mm x 4-40 ball end with hardware (2) | |
| Throttle pushrod wire, 15 ¹ / ₂ -inch (394mm) (2) | |
| 1/4-20 x 3/4-inch socket head bolt (4) | |
| Manual choke wire support (2) | |
| (one extra included with kit) | |
| Nylon pushrod housing 12-inch (305mm) (2) | |
| (if using a choke servo) | |

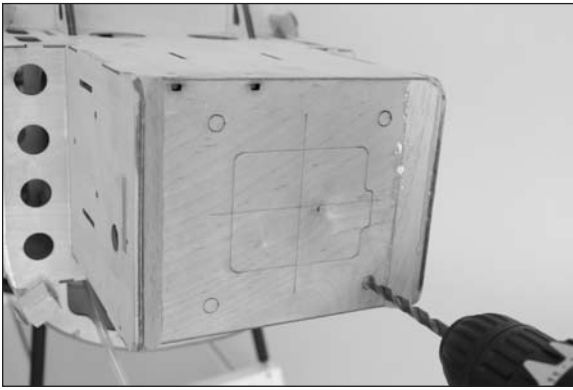
Required Tools and Adhesives

| | |
|--|-----------------|
| Threadlock | Drill |
| Pin vise | Felt-tipped pen |
| Hobby knife | Pliers |
| Rotary tool | Sanding drum |
| Cut-off wheel | Razor saw |
| Medium sandpaper | Side cutters |
| Silicone adhesive | Ruler |
| Hobby scissors | Canopy glue |
| Rotary tool with sanding drum | |
| Hex wrench: 1.5mm, 3/32-inch, 5/64-inch, 3/16-inch | |
| Phillips screwdriver: #1 | Medium CA |
| Drill bit: 3/32-inch (2.5mm), 5/16-inch (8mm) | |

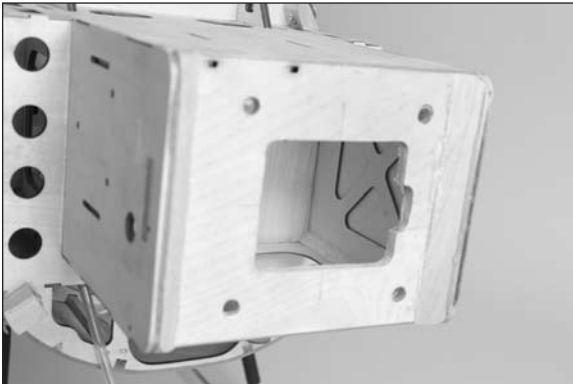
The laser etched markings on the firewall are used for the installation of the Evolution 80GX. If you are using a different engine, you will need to use the template included with your engine for locating any mounting holes and openings.

Important: The fuel vent line has been wrapped up and back around the tank to stop the fuel tank from siphoning fuel during flight.

- 1. Use a drill and 5/16-inch drill bit to drill the four mounting holes for the engine mounting bolts.



- 2. Use a razor saw and rotary tool with a sanding drum to remove the material from the firewall for the carburetor.

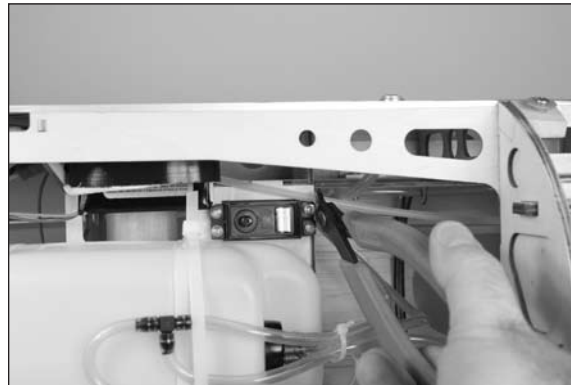


- 3. Lightly sand the outside of the 12-inch (305mm) clear pushrod tube. Insert the tube through the hole in the sub-firewall and direct it toward the throttle servo. Position the tube so 2 inches (52mm) of the tube extends forward of the sub-firewall. If you have installed the choke servo, install the second tube at this time as well.

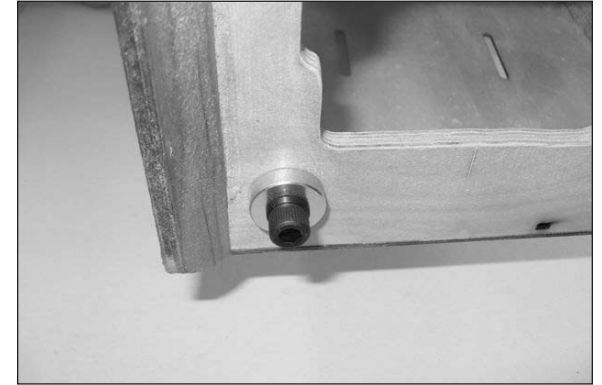


Note: The pushrod tubes may need to be relocated slightly depending on the style of carburetor on your engine. It is best not to glue the pushrod tube at this time.

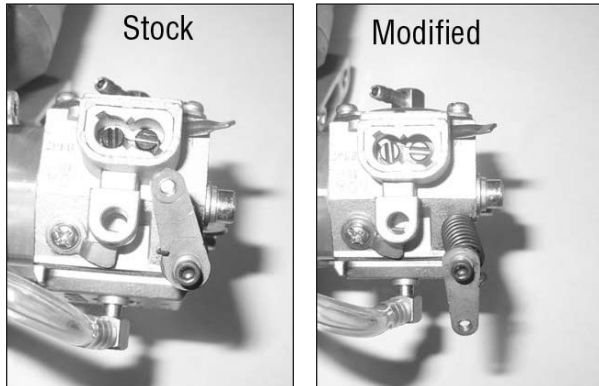
- 4. Use side cutters to trim the throttle (and choke) pushrod tubes at the front edge of the servos.



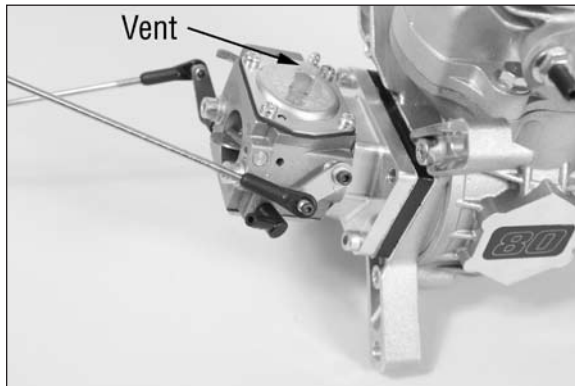
- 5. Install the 1/4-20 blind nut in the backside of the firewall. Use a 1/4-20 x 3/4-inch socket head bolt and 1/4-inch washer to draw the prongs of the blind nut into the firewall. Use a 3/16-inch hex wrench to tighten the bolts, drawing the blind nuts into the firewall. Install all four blind nuts at this time.



Note: It may be necessary to rotate the choke lever depending on how the choke will be operated. Make sure the position of the lever is such that the linkage can operate the lever from the open to closed positions.



- 6. Thread a ball link on the 4-40 x 15 $\frac{1}{2}$ -inch and 4-40 x 14 $\frac{1}{4}$ -inch threaded rods. Attach the ball link from the 4-40 x 15 $\frac{1}{2}$ -inch threaded rod to the throttle arm of the carburetor. Attach the ball link from the 4-40 x 14 $\frac{1}{4}$ -inch threaded rod to the choke lever.

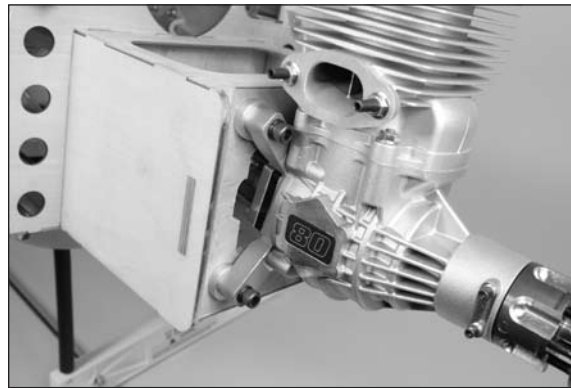


Optional: We recommended installing a piece of tubing to the atmosphere vent on the carburetor. Routing the tubing into the fuselage to help avoid any pressure differences that may cause the engine to stumble when transitioning from lo to hi throttle.

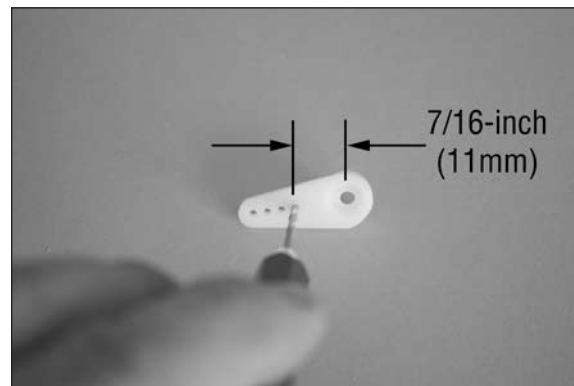
Refer to the engine instruction manual for carburetor adjustment and fuel line installation.

Note: Always use threadlock on metal-to-metal fasteners.

- 7. Slide the engine into position on the firewall. The throttle (and choke) pushrod will slide into the appropriate guide tube. Use four 3/16-inch (5mm) spacers, four 1/4-20 x 1 $\frac{1}{2}$ -inch socket head bolts, four 1/4-inch lock washers and four 1/4-20 blind nuts to secure the engine to the firewall. The order of items will be from the front: bolt, lock washer, engine mount, spacer, firewall, blind nut. Tighten the bolts, drawing the blind nuts into the backside of the firewall. Use a 3/16-inch hex wrench to tighten the socket head bolts.



- 8. Connect the fuel line from the tank to the carburetor.
- 9. Use a pin vise and 3/32-inch (2.5mm) drill bit to enlarge the hole of the servo arm that is 7/16-inch (11mm) from the center of the servo horn.



- 10. Attach the servo horn to the throttle servo using a #1 Phillips screwdriver. With the throttle servo and carburetor linkage in the closed position, use a felt-tipped pen to mark the linkage where it crosses the hole on the servo arm enlarged in the previous step.



- 11. Use pliers to bend the pushrod wire 90-degrees at the mark made in the previous step. Use side cutters to trim the excess wire so it does not interfere with the operation of the servo.



- 12. Secure the pushrod wire to the servo arm using a pushrod connector. Snap the connector on the pushrod wire to secure. Lightly sand the pushrod tube using medium sandpaper in the location of the plywood pushrod support. This will allow the CA to adhere the tube to the support.



Note: The servo arm may need to be trimmed to prevent it from hitting the receiver battery if they are mounted on the tray behind the servo for the precision aerobatic setup.

- 13. Use medium CA to glue the plywood pushrod support and the balsa triangle to the inside of the fuselage. Glue the balsa support between the fuselage side and pushrod support using medium CA. The pushrod tube is then glued to the plywood pushrod support using medium CA.



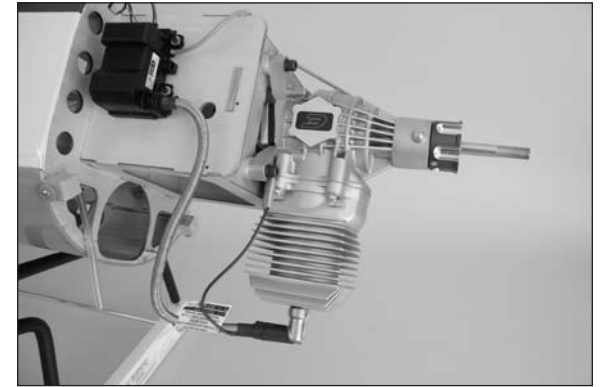
- 14. Repeat Steps 9 through 13 to connect the choke linkage to the choke servo. Note the servo and choke will be in the open position when connecting the linkage.

Note: If you attach the module to the engine box using screws, make sure to use threadlock on the metal-to-metal fasteners.

- 15. Mount the ignition module to the side of the fuselage. You can use a hook and loop strap or using a 3/32-inch hex wrench, install three 4-40 x 1/2 socket head bolts with three #4 washers.



- 16. Make the connections between the engine and ignition module following the instructions provided by the engine manufacturer. Secure any leads using tie-wraps to prevent them from interfering with the operation of the engine.



- 17. (Optional Ignition Light) Use a hobby knife and #11 blade to remove the covering in the side of the fuselage for the ignition light. Route the lead and LED through the fuselage and insert the LED in the hole. Use a small amount of silicone adhesive to glue the LED in the fuselage.



- 18. Use a hobby knife and #11 blade to remove the covering for the ignition switch. Mount the switch using the hardware provided with the switch. Route the leads from the switch to the front of the fuselage.



- 19. Use a hook and loop strap to secure the ignition battery to the top of the engine box. Connect the leads from the switch to the battery and ignition module. Secure the leads using tie-wraps so they don't interfere with the operation of the engine.



Note: The suggested muffler includes an option for a smoke system. The installation of the components for a smoke system is up to the discretion of the modeler and is not covered in this manual.

Note: Use the 4-pin balance connection (THP4P10E) on the ignition Li-Po battery to make it easier to hook up a charger. The extension can be left in place for accessibility. Use wire ties to route the extension into the radio compartment near the ignition switch.

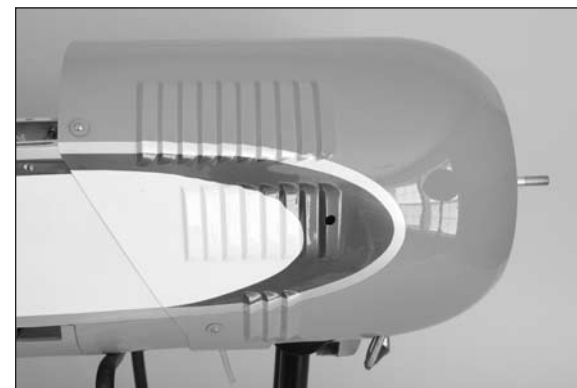
- 20. Attach the muffler to the engine following the manufacturer's instructions.



- 21. (Optional: Manual choke) Slide a plywood choke pushrod brace over the choke pushrod and glue the brace to the fuselage using medium CA. Make a 90-degree bend in the pushrod so it can be easily operated from underneath the fuselage.

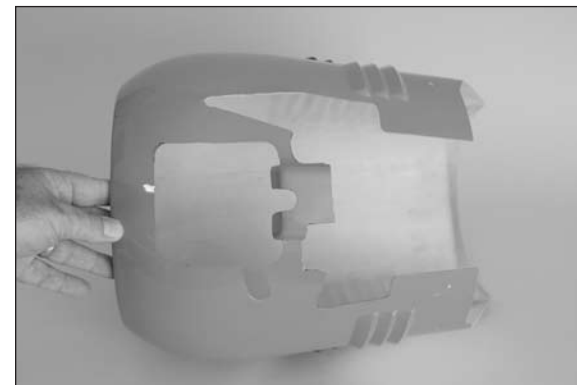


- 22. Use a 5/64-inch hex wrench to remove the four cowl mounting screws with the preinstalled painted washers and silicone tubing from their locations on the fuselage. Attach the cowling to the fuselage. Use a 5/64-inch hex wrench to tighten the screws that secure the cowl to the fuselage. Use a tapered reamer to make a 1/4-inch (6mm) hole in the side of the cowl to access the mixture screws on the carburetor.



Note: The distance from the firewall to the front face of the propeller drive washer is 6 1/2-inch (165mm).

- 23. It will be necessary to remove the material from the cowling to clear the exhaust system and to provide cooling air to pass over the engine. Use hobby scissors and a rotary tool with a sanding drum to trim the cowling. Check the fit of the cowl over the engine while making small adjustments to the fit of the cowling.



Note: A small of canopy glue on the threads of the cowl mounting screws will allow for easy removal, but help prevent the screws from vibrating loose in flight.



24. Mount the propeller and spinner on the engine. Make sure to balance the propeller to reduce any vibrations that may be transmitted to the airframe.



Optional Tuned Pipe Installation

Required Parts

| | |
|--|--------------------|
| Fuselage assembly | Tuned pipe |
| Tuned pipe header | Tuned pipe coupler |
| Medium silicone tubing | #4 washer (2) |
| 4-40 x 1/2-inch socket head screw (2) | |
| Tuned pipe mount, full, small inner diameter (2) | |
| Tuned pipe mount, full, large inner diameter (2) | |
| Tuned pipe mount, half | |

Required Tools and Adhesives

| | |
|----------------------------|-----------------|
| Covering iron | Trim seal tool |
| Hex wrench: 3/32-inch | 30-minute epoxy |
| Mixing stick | Mixing cup |
| Paper towel | Rubbing alcohol |
| Hobby knife with #11 blade | |

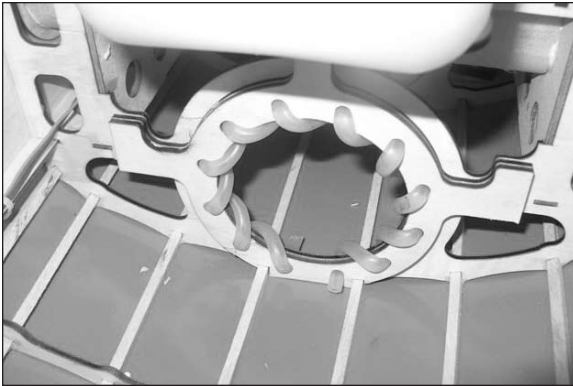
Note: We have designed the Sukhoi SU-26MM fuselage to allow for two sections of the fuselage to be removed for cooling. Our flying model only has the front section removed. Prepare the fuselage based on the need for your particular tuned pipe and particular flying situation.

1. Use a hobby knife with a #11 blade to remove the covering from the bottom of the fuselage to allow cooling air to pass through for the tuned pipe. Use a covering iron and trim seal tool to seal the covering in place on the fuselage.

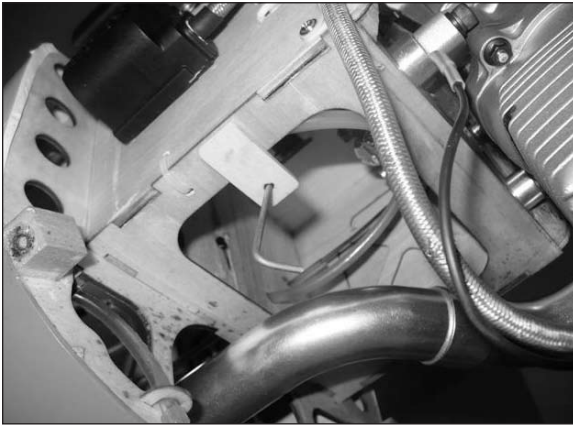


Note: The length of the opening in the bottom of the fuselage will be determined by your particular pipe selection. Check the pipe length before opening the bottom of the fuselage.

2. Pass the clear fuel tubing through the holes in the full tuned pipe mounts. Check the fit of the mount on your particular pipe, as there are different sizes provided to allow the installation of a variety of tuned pipes. Once the correct mount has been determined, use 30-minute epoxy to secure the mount in the fuselage as shown.



- 3. Attach the header to the engine using the hardware provided with the header or engine.



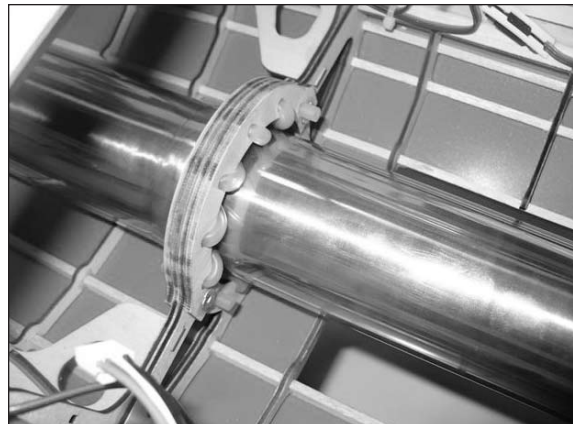
Note: Before installing the tuned pipe, you will want to install the landing gear as described in the section “Installing the Landing Gear” on Page 22.

- 4. Place the pipe in the fuselage, passing it through the full tuned pipe mount. Connect the tuned pipe to the header using a tuned pipe coupler.

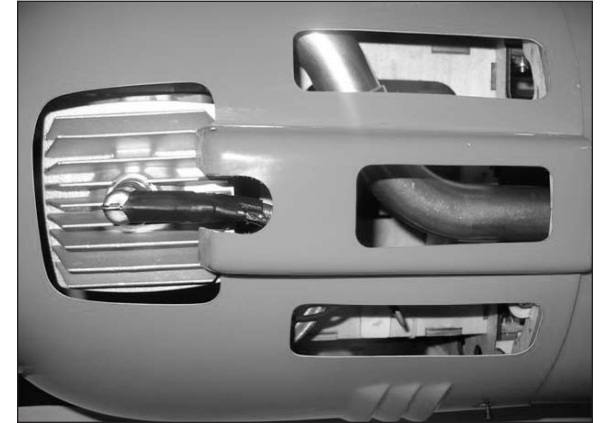


Note: Most tuned pipes can be installed from the hatch opening into the fuse by carefully positioning the inlet side of the pipe beside the tank during installation. There will be some tuned pipes that may need to be installed through the front opening in the fuselage prior to fitting the engine to the firewall.

- 5. Pass the clear tubing through the holes in the mount in the fuselage and through the holes in the half tuned pipe mount. The half mount will be secured in the fuselage using two 4-40 x 1/2-inch socket head screws and two washers. Use a 3/32-inch hex wrench to tighten the screws. This mount will secure the pipe in the fuselage.



- 6. Check the fit of the cowling over the tuned pipe. It may be necessary to trim the cowling slightly to provide clearance for the tuned pipe.



Note: A small of canopy glue on the threads of the cowl mounting screws will allow for easy removal, but help prevent the screws from vibrating loose in flight.

Engine Installation (DA85)

Required Parts

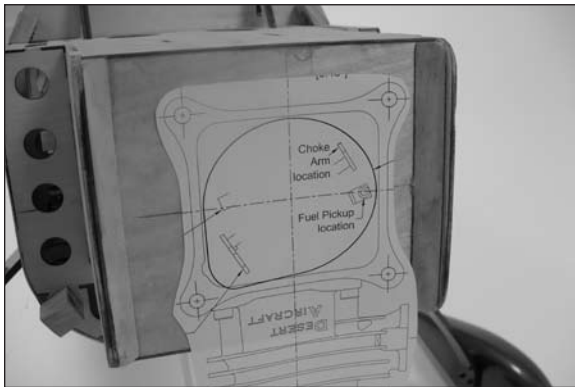
| | |
|--|----------------------|
| Fuselage assembly | 90-degree snap link |
| 1/4-inch lock washer (4) | 1/4-20 blind nut (4) |
| 2mm lock nut | |
| 2mm x 10mm socket head screw | |
| 2mm x 4-40 ball end with hardware | |
| Pushrod wire, 18 $\frac{1}{2}$ -inch (470mm) | |
| 1/4-20 x 3/4-inch socket head bolt (4) | |

Required Tools and Adhesives

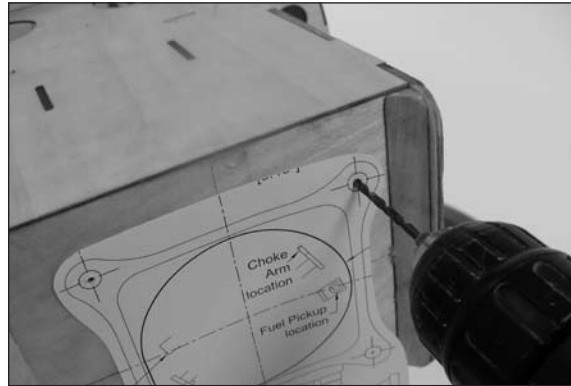
| | |
|---|-----------------|
| Threadlock | Drill |
| Pin drill | Felt-tipped pen |
| Tape or spray adhesive | Hobby knife |
| Rotary tool | Sanding drum |
| Cut-off wheel | |
| Drill bit: 3/32-inch (2.5mm), 5/16-inch (8mm) | |

The fuel vent line has been wrapped up and back around the tank to stop the fuel tank from siphoning fuel during flight.

- 1. Secure the template (located on Page 31) for the DA85 to the firewall using tape or spray adhesive. Make sure to align the horizontal and vertical center lines on the template with those on the firewall.



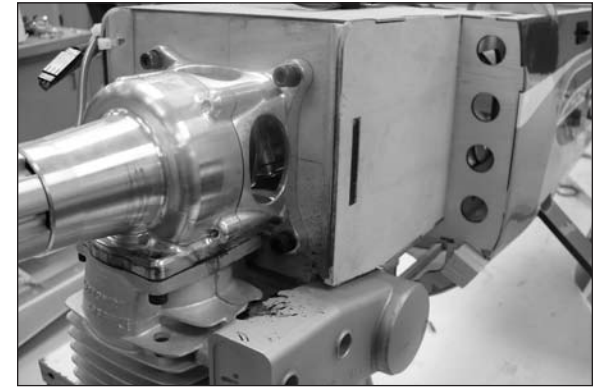
- 2. Use a drill and 3/32-inch (2.5mm) drill bit to drill the four locations for mounting the engine.



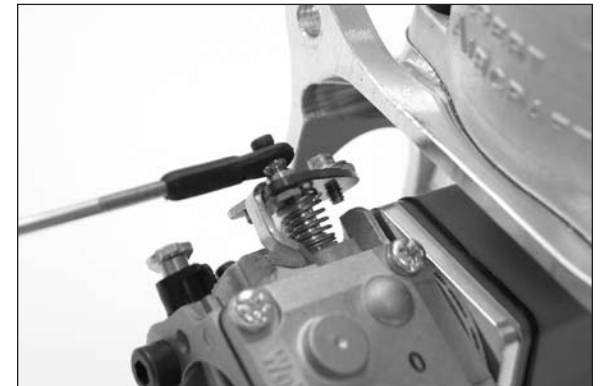
- 3. Use the template to remove the area of the firewall to allow the carburetor to extend into the engine box.



- 4. Mount the engine to the firewall using four 1/4-20 x 3/4-inch socket head bolts and four 1/4-inch lock washers. Make sure to use threadlock on the bolts as well as the lock washers to help keep them from vibrating loose.



- 5. Attach the throttle linkage to the carburetor using a 2mm x 4-40 ball link 2mm x 10mm socket head screw and 2mm nut.



- 6. Attach the servo horn to the throttle servo. With the throttle servo and carburetor linkage in the closed position, use a felt-tipped pen to mark the linkage where it crosses the hole on the servo arm that is 3/8-inch (9.5mm) from the center of the servo horn.



- 7. Bend the pushrod wire 90-degrees at the mark made in the previous step. Use a pin drill and 3/32-inch (2.5mm) drill bit to enlarge the outer hole of the servo arm.



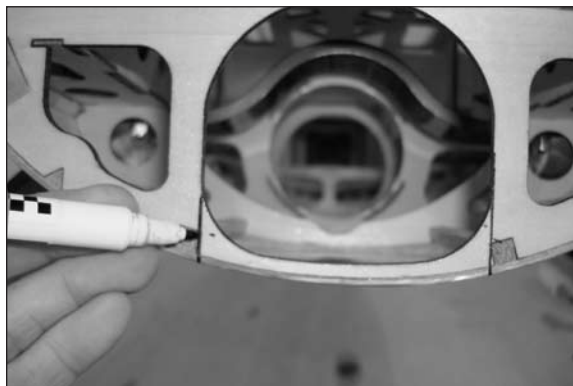
- 8. Secure the pushrod wire to the servo arm using a pushrod connector. Snap the connector on the pushrod wire to secure.



Installing the MTW 110 Canister and Header (Available from Desert Aircraft)

Note: Before installing the canister muffler, you will want to install the landing gear as described in the section “Installing the Landing Gear” on Page 22.

- A. Use a felt-tipped pen to draw lines vertically that connect the bottom of the fuselage to the sides of the opening.



- B. Use a rotary tool and cut-off wheel to cut the former along the lines made in the previous step.



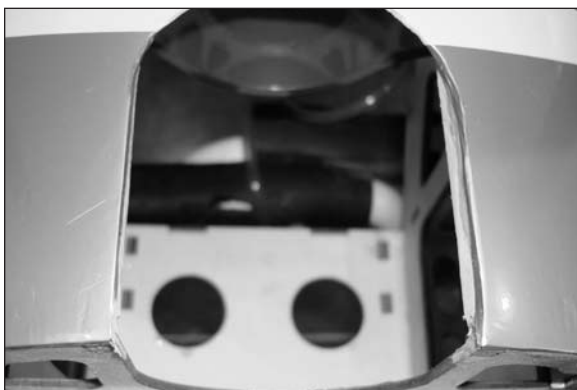
- C. Carefully remove the section from the fuselage.



- D. Use a hobby knife to trim the covering 1/8-inch (3mm) away from the edges of the opening. The excess material will be sealed back into position to fuel-proof the area and make a clean installation of the opening.



- E. Use a covering iron to seal the edges of the covering inside the fuselage.



- F. Remove the covering from the bottom of the fuselage and cut the stringers as shown. Repeat Steps D through F to seal the covering around the opening. This is necessary to allow cooling air to pass through the fuselage to cool the canister muffler.



- G. Remove the material from the cowling to clear the exhaust system and to provide cooling air to pass over the engine. Refer to the photos in the tuned pipe section regarding mounting the cowling.

Rudder and Tail Wheel Installation

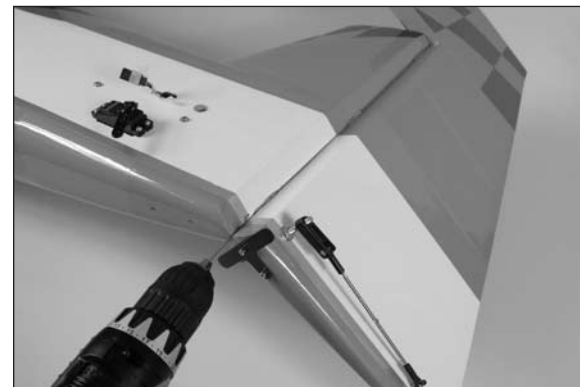
Required Parts

| | |
|--|---------------------|
| Fuselage assembly | Rudder |
| Rudder hinge wire | Tail wheel assembly |
| Tail wheel steering spring (2) | |
| 2.5mm x 18mm socket head sheet metal screw (2) | |

Required Tools and Adhesives

| | |
|------------------------------|------------|
| Thin CA | Drill |
| Hex wrench: 3mm | Ruler |
| Flat file | Threadlock |
| Hex wrench: 2.5mm, 3/32 inch | |

- 1. Use a flat file to sharpen one end of the rubber hinge wire. This will help the wire guide itself through the hinges. Line the hinges up between the rudder and fuselage. Insert the rudder hinge wire using a drill. The wire will insert slightly in the rudder balance tab so there is clearance for the tail wheel bracket installed later in this section of the manual. Once installed, the wire will extend 3/8-inch (9.5mm) below the bottom of the fuselage.



Note: Always use threadlock on metal-to-metal fasteners.

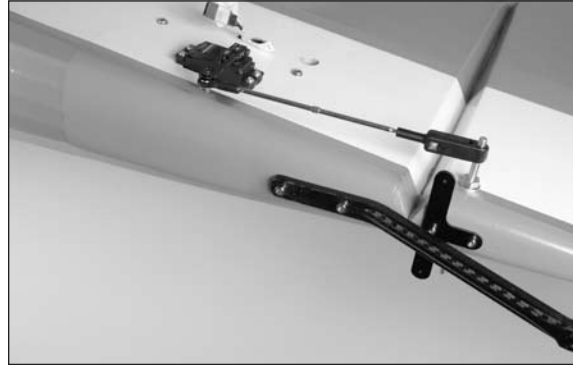
- 2. Attach the rudder servo arm onto the rudder servo using a 2.5mm hex wrench. Once installed, tighten the clamping bolts using a 3/32 hex wrench.



- 3. Apply 2–3 drop of thin CA in each of the holes for the tail wheel bracket mounting screws.



- 4. Check the fit of the tail wheel assembly on the bottom of the fuselage to make sure the rudder hinge wire does not interfere or make contact with the top of the tail wheel carbon leg during its installation. If the rudder hinge wire does interfere, use a drill as shown in step 1 to insert the wire slightly into the rudder balance tab or use side cutters to trim the excess wire. Attach the tail wheel assembly to the fuselage using two 2.5mm x 18mm socket head sheet metal screws. Use a 3mm hex wrench to tighten the screws.



Note: The tail wheel assembly will keep the rudder hinge wire from vibrating loose from the rudder hinges.

- 5. Connect the steering arm from the rudder to the steering arm on the tail wheel using two steering springs.



Stabilizer Installation

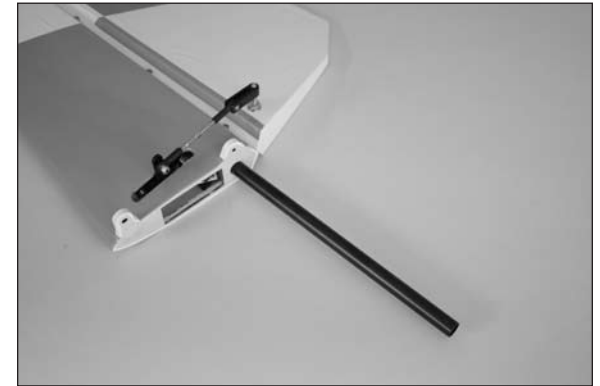
Required Parts

| | |
|-------------------|-------------------------|
| Fuselage assembly | Stabilizer/elevator (2) |
| Stabilizer tube | #4 nylon washer (4) |

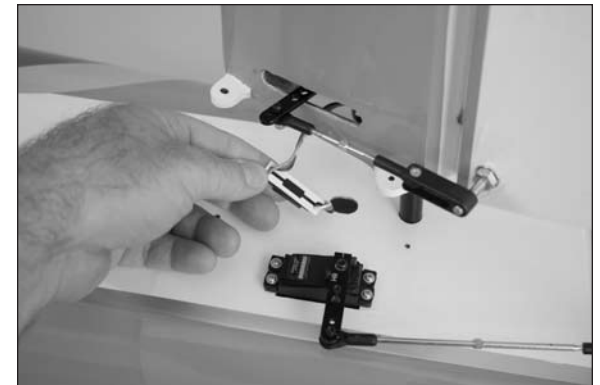
Required Tools and Adhesives

| | |
|-----------------------|-------------|
| Threadlock | Hobby knife |
| Hex wrench: 5/64-inch | Canopy glue |

- 1. Slide the stabilizer tube into one of the stabilizer halves.



- 2. Remove the two 4-40 x 1/2 inch button head screw and #4 nylon washers from the fuselage using a 5/64-inch hex wrench. Connect the lead from the stabilizer to the lead in the fuselage. Secure the extension using the supplied connector so it will not unplug.



- 3. Use the screws removed from the fuselage in Step 2 to secure the stabilizer to the fuselage.



Note: A small of canopy glue on the threads of the stabilizer mounting screws will allow for easy removal, but help prevent the screws from vibrating loose in flight.

- 4. Repeat Steps 2 through 3 for the remaining stabilizer.

Landing Gear Installation

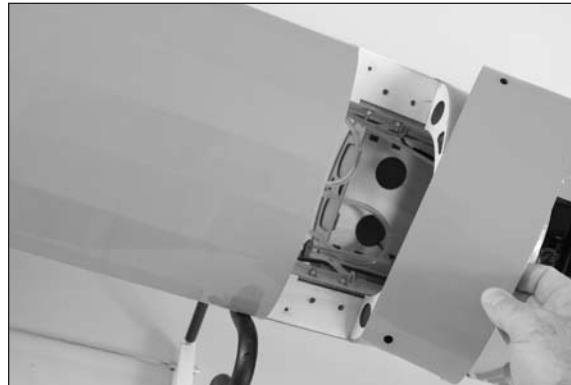
Required Parts

| | |
|---------------------------------------|-----------------------|
| Fuselage assembly | Landing gear assembly |
| Wheel pant (right and left) | 6-32 lock nut (4) |
| #8 washer (4) | #4 washer (4) |
| Wheel and axle assembly (2) | |
| 4-40 x 1/2-inch socket head screw (4) | |
| 8-32 x 3/4-inch socket head screw (4) | |

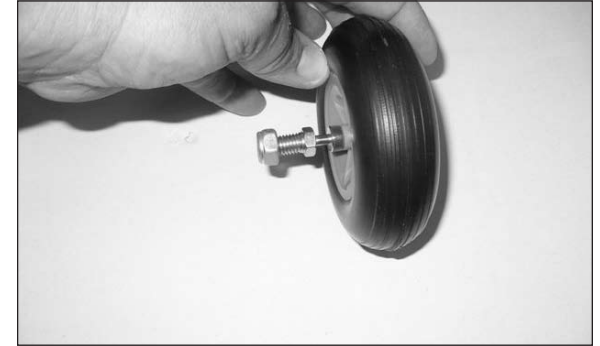
Required Tools and Adhesives

| | |
|---|-------------------|
| Threadlock | Light machine oil |
| Open end wrench: 10mm, 13mm | |
| 1/4-inch ratchet drive | |
| 11/32-inch socket, 1/4-inch drive | |
| 3-inch (76mm) drive extension, 1/4-inch drive | |
| Hex wrench: 3/32-inch, 1/8-inch | |

- 1. Use a 3/32-inch hex wrench to remove the 4-40 x 3/4-inch socket head screws securing the landing gear cover from the fuselage.



- 2. Remove the lock nut from the axle. Insert the axle in the large hole of the landing gear. Use a 10mm and 13mm open end wrench to tighten the lock nut, securing the axle to the landing gear. Install both wheels at this time.



- 2. Attach the landing gear to the fuselage using four 8-32 x 3/4-inch socket head screws, four #8 washers and four 8-32 lock nuts. Use a 11/32-inch socket wrench with extension and driver and 1/8-inch hex wrench. Note the gear will angle forward slightly when installed.



- 3. Use a 3/32-inch hex wrench and replace the 4-40 x 3/4-inch socket head screws securing the landing gear cover on the fuselage.



Note: Always use threadlock on metal-to-metal fasteners.

Note: Before installing the wheel pants, we suggest adding a small drop of light machine oil to the axles so the wheels will roll smoothly during takeoff and landing.

- 4. Use a 3/32-inch hex wrench to remove the two 4-40 x 1/2-inch socket head screws and two #4 washers from the wheel pant. Attach the wheel pant to the landing gear using the screws and a 3/32-inch hex wrench to tighten the screws. Attach both wheel pants at this time.



Wing Installation

Required Parts

| | |
|--------------------------------------|-----------------------------|
| Fuselage assembly | Wing panel (right and left) |
| Canopy hatch | #4 washer (4) |
| 4-40 x 1/2 inch button head bolt (4) | |
| Aluminum wing tube | |

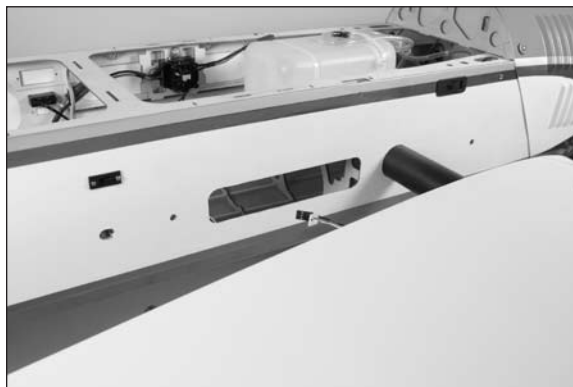
Required Tools and Adhesives

Threadlock
Hex wrench: 5/64-inch

- 1. Remove the preinstalled nylon wing bolts from the wing at this time. Slide the wing tube into one of the wing panels. The tube will slide in easily, so don't force it in farther than it will easily slide.

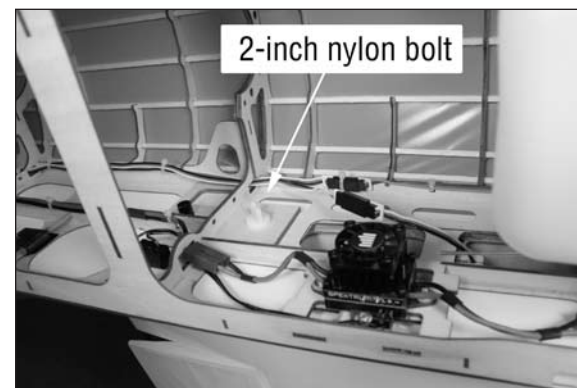


- 2. Slide the wing tube into the socket in the fuselage side. Slide the wing tightly against the side of the fuselage.



Note: The 2-inch rear wing bolts supplied can be shortened to make them easier to install. **Do not** trim the bolt any shorter than 1-inch in length. **Do not** shorten the front wing bolts from their original 2¹/₂-inch length.

- 3. Connect the lead for the aileron. Use the two nylon wing bolts to secure the wing to the fuselage. The shorter 2-inch bolt will be installed near the trailing edge, while the longer 2¹/₂-inch nylon bolt is installed near the leading edge.



Decal Placement

Required Parts

Decal sheet Completed airframe

Required Tools and Adhesives

Paper towel Spray bottle with water
Plastic squeegee Dish washing liquid
Hobby scissor
Hobby knife with #11 blade

When applying the decals for your model, use a spray bottle and a drop of dish washing liquid sprayed in the location of the decal to allow repositioning of the decal. Use a paper towel as a squeegee to remove excess water from under the decal. Allow the model to rest overnight so the remaining water can evaporate.



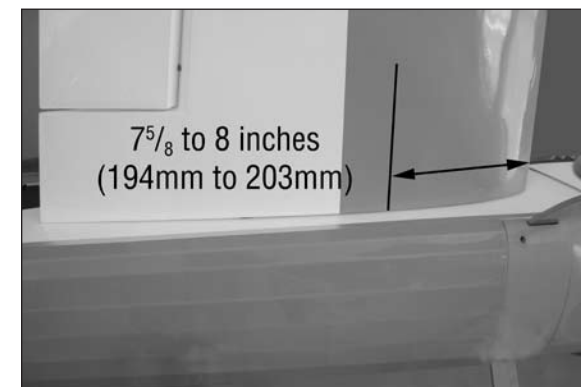
Center of Gravity

An important part of preparing the aircraft for flight is properly balancing the model.

⚠ CAUTION: Do not inadvertently skip this step!

The recommended Center of Gravity (CG) location for your model is 7⁵/₈-inch to 8-inch (194mm–203mm) located at the wing root near the fuselage. Measure back from the leading edge as shown and mark the location of the CG on the bottom of the wing with a felt-tipped pen.

With a helper, lift the aircraft with your index finger at the location marked on the wing. Make sure the aircraft is upright when checking the CG. If the nose of your aircraft hangs low, add weight to the rear of the aircraft. If the tail hangs low, add weight to the nose of the aircraft. Stick-on weights are available at your local hobby store and work well for this purpose.



After the first flights, the CG position can be adjusted for your personal preference.



- 4. Repeat Steps 1 through 3 to install the remaining wing panel.
- 5. Attach the canopy hatch to the fuselage using the four 4-40 x 1/2-inch button head screws and four #4 nylon washers that were removed at the beginning of the radio installation. Tighten the screws using a 5/64-inch hex wrench.



Checking the Control Linkages and Centering the Control Surfaces

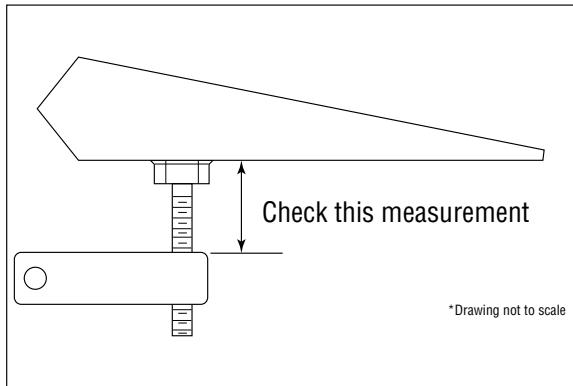
Required Parts

Assembled airframe Transmitter

Required Tools and Adhesives

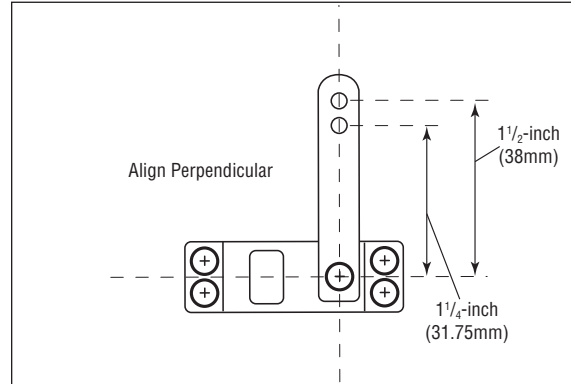
Ruler
Adjustable wrench or linkage tool

1. Check the position of the control horn using the diagram below. The measurements should be as follows:
Aileron: $1\frac{1}{16}$ -inch (26mm)
Elevator: $\frac{5}{8}$ -inch (16mm)
Rudder: $11\frac{1}{16}$ -inch (18mm)
If the measurements do not match, disconnect the linkage and thread the control horn up or down to achieve the correct measurement.



2. Check that the linkages have been connected to the correct holes in the servo arms. The measurements will be as follows:
Aileron: $1\frac{1}{4}$ -inch (31.75mm) (inner hole)
Elevator: $1\frac{1}{4}$ -inch (31.75mm) (inner hole)
Rudder: $1\frac{1}{2}$ -inch (38mm) (outer hole)
If the measurements do not match, disconnect the linkage and connect it to the correct hole as shown in the drawing in Step 3.

3. Turn on the radio system. Make sure the sticks and trims are centered for the ailerons, elevators and rudder. The servo horns for the rudder and elevator must be perpendicular to the servo. It may be necessary to use the sub-trim feature of your radio system to center these servos.



4. Check the alignment of the aileron servo horn. It must be aligned with the aileron hinge line. If not, use the radio sub-trim feature to correct its alignment.



5. Now that the servos are centered and the control horns set to the correct height, you can adjust the linkage length so the control surfaces are centered. Using a Hangar 9 linkage tool will make this process easier, but an adjustable wrench works just fine for this adjustment.

Control Throws

Setting the control throws for your Sukhoi does require some attention to detail. To correctly set the throws, it is highly suggested to use the following procedure to achieve the greatest mechanical advantage from your servos.

Determine the maximum amount of control surface throw from the throws listed. Use the high rate throws listed to set the maximum amount of throw, then use your computer radio for the lower rate listed.

Set the Travel Adjust (ATV on a Futaba transmitter) to about 15% under the max. (On a JR transmitter, that is 135%.) Make sure to set both directions during this process.

Adjust the position of the clevis on the control horn and position of the ball link on the servo arm to achieve the throw decided in Step 1. It is highly recommended not to change the position on the servo arm unless absolutely necessary. Use Travel Adjust (ATV) to finalize the throws. That is why we left a little margin in the percentages.

If setting a dual elevator or aileron, match the linkage locations. Increase or decrease the Travel Adjust (ATV) a few points as necessary to fine-tune the throws to match up left and right sides and up and down throws so all is symmetrical.

This is all necessary to tune the mechanical advantage as good as possible. When setting up a model for 3D, the mechanical advantage will be less because of the large throws, and thus the servo will work harder and wear faster. Using an insufficient servo for the job, or trying to get too much throw, will cause something to give, probably the servo.

There isn't an exact geometry to the linkage, as it depends on how much throw each individual modeler requires. The linkage geometry should always be maximized so the servo isn't working any harder than it has to.

Aileron:

High Rate:

| | | | |
|-------|--|------|------------|
| Up: | 3 ⁵ / ₁₆ -inches | 84mm | 35 degrees |
| Down: | 3 ⁵ / ₁₆ -inches | 84mm | 35 degrees |

Low Rate:

| | | | |
|-------|--|------|------------|
| Up: | 1 ¹ / ₁₆ -inches | 43mm | 16 degrees |
| Down: | 1 ¹ / ₁₆ -inches | 43mm | 16 degrees |

Elevator:

High Rate:

| | | | |
|-------|---------------------------------------|-------|------------|
| Up: | 5 ¹ / ₈ -inches | 130mm | 42 degrees |
| Down: | 5 ¹ / ₈ -inches | 130mm | 42 degrees |

Low Rate:

| | | | |
|-------|---------------------------------------|------|------------|
| Up: | 1 ¹ / ₂ -inches | 38mm | 11 degrees |
| Down: | 1 ¹ / ₂ -inches | 38mm | 11 degrees |

Rudder:

High Rate:

| | | | |
|--------|---------------------------------------|-------|------------|
| Right: | 7 ¹ / ₄ -inches | 184mm | 45 degrees |
| Left: | 7 ¹ / ₄ -inches | 184mm | 45 degrees |

Low Rate:

| | | | |
|--------|---------------------------------------|-------|------------|
| Right: | 4 ¹ / ₂ -inches | 114mm | 28 degrees |
| Left: | 4 ¹ / ₂ -inches | 114mm | 28 degrees |

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

Note: Travel Adjust, Sub-Trim and Dual Rates are not listed and should be adjusted according to each individual model and preference.

Note: We highly recommend re-binding the radio system once all the control throws are set. This will keep the servos from moving to their endpoints until the transmitter and receiver connect.

Preflight

For those of you who are veterans of large models, this is old news. But to you newcomers to the world of large models, this is very important information.

While many smaller models are not critical of proper battery use, and are tolerant of improper control linkage setups and flying techniques, large models are not. Don't let that scare you away from large models; they are truly one of the best flying experiences in RC that money can buy. However, please pay particular attention to the following areas.

Maintain the proper mechanical advantage on all control surface linkages.

Just as with unsealed hinge gaps, mechanical advantage is often another cause of flutter. Please follow the control horn and servo arm lengths recommended in this manual. Shorter arms on the servo or longer control horns on the elevator and ailerons are fine, but do not try to go the other way to increase throw. It can cause flutter or servo failure on the Sukhoi. The recommended linkage setups are more than adequate to achieve full 3D throws.

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.

Never attempt to make full throttle dives!

Large models perform much more like full-size aircraft than small models. If the airframe goes too fast, such as in a high-throttle dive, it may fail. The Sukhoi should be flown like a full-scale Sukhoi. Throttle management is absolutely necessary.

Hardware checks

Double-check the setscrews in all control horns to be sure they are very tight. Periodically check these to be sure they have not loosened over time. Always use threadlock on metal-to-metal fasteners.

Receiver battery selection

Be sure adequate batteries are used to power the receiver. It is STRONGLY recommended that two identical 6-volt receiver packs are used. Each pack must have a minimum of 2700mAh capacity. Use packs of 3000mAh when super high-torque servos are used.

Range check

Always range check the radio system per the manufacturer's instructions before the initial test flight and periodically afterward.

Check the voltage of the on-board packs

ALWAYS use an expanded scale voltmeter with a 1-amp load to check the receiver battery packs and the ignition pack before each and every flight. If there is any doubt that the packs are questionable, DO NOT FLY until the packs are recharged.

Range Test Your Radio

Before each flying session, and especially with a new model, it is important to perform a range check. It is helpful to have another person available to assist during the range check. If you are using a Spektrum transmitter, please refer to your transmitter's manual for detailed instructions on the range check process.

Safety Do's and Don'ts for Pilots

- Consult local laws and ordinances before choosing a location to fly your aircraft.
- Check all control surfaces prior to each takeoff.
- Do not fly your model near spectators, parking areas or any other area that could result in injury to people or damage of property.
- Do not fly during adverse weather conditions. Poor visibility can cause disorientation and loss of control of your aircraft. Strong winds can cause similar problems.
- Do not take chances. If at any time during flight you observe any erratic or abnormal operation, land immediately and do not resume flight until the cause of the problem has been ascertained and corrected. Safety can never be taken lightly.
- Do not fly near power lines.

Daily Flight Checks

- 1. Check the battery voltage of the transmitter battery. Do not fly below the manufacturer's recommended voltage. To do so can crash your aircraft.

When you check these batteries, ensure you have the polarities correct on your expanded scale voltmeter.

- 2. Check all hardware (linkages, screws, nuts, and bolts) prior to each day's flight. Be sure that binding does not occur and that all parts are properly secured.
- 3. Ensure all surfaces are moving in the proper manner.
- 4. Perform a ground range check before each day's flying session.
- 5. Prior to starting your aircraft, turn off your transmitter, then turn it back on. Do this each time you start your aircraft. If any critical switches are on without your knowledge, the transmitter alarm will sound a warning at this time.
- 6. Check that all trim levers are in the proper location.
- 7. All servo pigtailed and switch harness plugs should be secured in the receiver. Make sure the switch harness moves freely in both directions.

Warranty and Repair Policy

WARRANTY PERIOD

Exclusive Warranty- 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

Horizon reserves the right to change or modify this warranty without notice and disclaims all other warranties, express or implied.

(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 all warranty claims.

(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 Product by Purchaser must be approved in writing by Horizon before shipment.

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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).

Warranty Services

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 Product Support representative. You may also find information on our website at www.horizonhobby.com.

INSPECTION OR REPAIRS

If this Product needs to be inspected or repaired, please use the Horizon Online Repair Request submission process found on our website or call Horizon to obtain a Return Merchandise Authorization (RMA) number. 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. An Online Repair Request is available at www.horizonhobby.com <http://www.horizonhobby.com> under the Repairs tab. If you do not have internet access, please contact Horizon Product Support to obtain a RMA number along with instructions for submitting your product for repair. When calling Horizon, you will be asked to provide your complete name, street address, email address and phone number where you can be reached during business hours. When sending product into Horizon, please include your RMA number, a list of the included items, and a brief summary of the problem. A copy of your original sales receipt must be included for warranty consideration. Be sure your name, address, and RMA number are clearly written on the outside of the shipping carton.

Notice: Do not ship batteries to Horizon. If you have any issue with a battery, please contact the appropriate Horizon Product Support office.

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.

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. Horizon accepts money orders and cashiers checks, as well as Visa, MasterCard, American Express, and Discover cards. By submitting any item to Horizon for inspection or repair, you are agreeing to Horizon's Terms and Conditions found on our website under the Repairs tab.

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Champaign, Illinois
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productsupport@horizonhobby.com
877-504-0233

Online Repair Request visit:
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Compliance Information for the European Union



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

2010 Official Academy of Model Aeronautics Safety Code

A. GENERAL

A model aircraft is a non-human-carrying aircraft capable of sustained flight in the atmosphere. It may not exceed limitations of this code and is intended exclusively for sport, recreation and/or competition. All model flights must be conducted in accordance with this safety code and any additional rules specific to the flying site.

1. Model aircraft will not be flown:

- (a) In a careless or reckless manner.
- (b) At a location where model aircraft activities are prohibited.

2. Model aircraft pilots will:

- (a) Yield the right of way to all man carrying aircraft.
- (b) See and avoid all aircraft and a spotter must be used when appropriate. (AMA Document #540-D-See and Avoid Guidance.)
- (c) Not fly higher than approximately 400 feet above ground level within three (3) miles of an airport, without notifying the airport operator.
- (d) Not interfere with operations and traffic patterns at any airport, heliport or seaplane base except where there is a mixed use agreement.
- (e) Not exceed a takeoff weight, including fuel, of 55 pounds unless in compliance with the AMA Large Model Aircraft program. (AMA Document 520-A)
- (f) Insure the aircraft is identified with the name and address or AMA number of the owner on the inside or affixed to the outside of the model aircraft.
(This does not apply to model aircraft flown indoors).
- (g) Not operate aircraft with metal-blade propellers or with gaseous boosts except for helicopters operated under the provisions of AMA Document #555.
- (h) Not operate model aircraft while under the influence of alcohol or while using any drug which could adversely affect the pilot's ability to safely control the model.
- (i) Not operate model aircraft carrying pyrotechnic devices which explode or burn, or any device which propels a projectile or drops any object that creates a hazard to persons or property.

Exceptions:

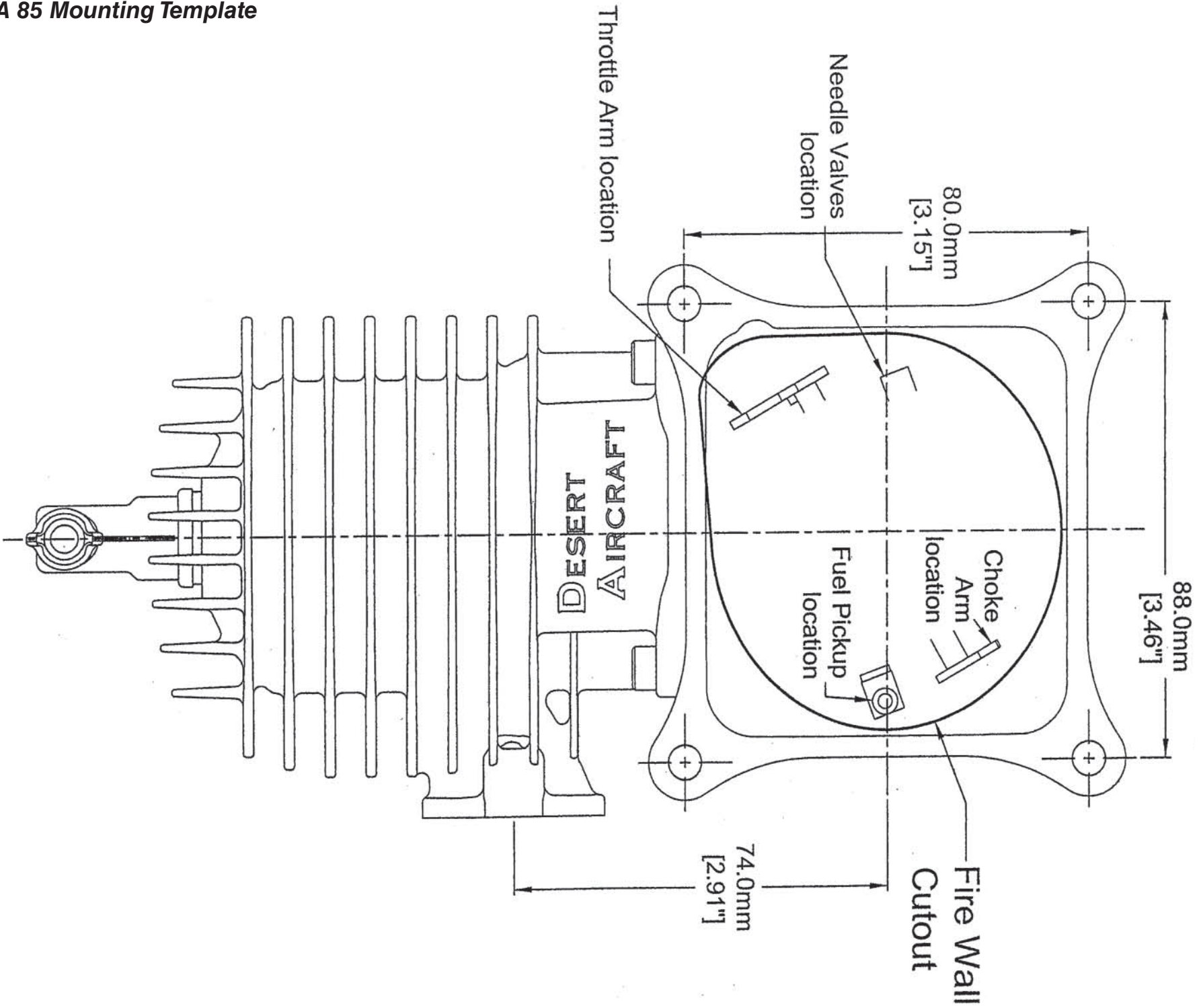
- Free Flight fuses or devices that burn producing smoke and are securely attached to the model aircraft during flight.
 - Rocket motors (using solid propellant) up to a G-series size may be used provided they remain attached to the model during flight. Model rockets may be flown in accordance with the National Model Rocketry Safety Code but may not be launched from model aircraft.
 - Officially designated AMA Air Show Teams (AST) are authorized to use devices and practices as defined within the Team AMA Program Document (AMA Document #718).
(j) Not operate a turbine-powered aircraft, unless in compliance with the AMA turbine regulations. (AMA Document #510-A).
- #### 3. Model aircraft will not be flown in AMA sanctioned events, air shows or model demonstrations unless:
- (a) The aircraft, control system and pilot skills have successfully demonstrated all maneuvers intended or anticipated prior to the specific event.
 - (b) An inexperienced pilot is assisted by an experienced pilot.
- #### 4. When and where required by rule, helmets must be properly worn and fastened. They must be OSHA, DOT, ANSI, SNELL or NOCSAE approved or comply with comparable standards.

B. RADIO CONTROL (RC)

1. All pilots shall avoid flying directly over unprotected people, vessels, vehicles or structures and shall avoid endangerment of life and property of others.
2. A successful radio equipment ground-range check in accordance with manufacturer's recommendations will be completed before the first flight of a new or repaired model aircraft.
3. At all flying sites a safety line(s) must be established in front of which all flying takes place (AMA Document #706-Recommended Field Layout):
 - (a) Only personnel associated with flying the model aircraft are allowed at or in front of the safety line.
 - (b) At air shows or demonstrations, a straight safety line must be established.

- (c) An area away from the safety line must be maintained for spectators.
- (d) Intentional flying behind the safety line is prohibited.
- 4. RC model aircraft must use the radio-control frequencies currently allowed by the Federal Communications Commission (FCC). Only individuals properly licensed by the FCC are authorized to operate equipment on Amateur Band frequencies.
- 5. RC model aircraft will not operate within three (3) miles of any pre-existing flying site without a frequency-management agreement (AMA Documents #922- Testing for RF Interference; #923- Frequency Management Agreement)
- 6. With the exception of events flown under official AMA Competition Regulations, excluding takeoff and landing, no powered model may be flown outdoors closer than 25 feet to any individual, except for the pilot and the pilot's helper(s) located at the flight line.
- 7. Under no circumstances may a pilot or other person touch a model aircraft in flight while it is still under power, except to divert it from striking an individual.
This does not apply to model aircraft flown indoors.
- 8. RC night flying requires a lighting system providing the pilot with a clear view of the model's attitude and orientation at all times.
- 9. The pilot of a RC model aircraft shall:
 - (a) Maintain control during the entire flight, maintaining visual contact without enhancement other than by corrective lenses prescribed for the pilot.
 - (b) Fly using the assistance of a camera or First-Person View (FPV) only in accordance with the procedures outlined in AMA Document #550.

DA 85 Mounting Template





Fly First Class™



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