

F-35 Lightning II

World's First 360-degree Multi-Vectored Thrust EDF Jet

Product officially licensed by

LOCKHEED MARTIN



Main Specifications (receiver ready version)

Wingspan:	31-1/2" [800mm]
Length:	47-1/4" [1200mm]
Weight:	35oz [1000g]
Motor System:	Outrunner brushless motor (B2839/2750Kv)
Speed Control:	45A w/Switch Mode BEC
Servos:	9g, (10pcs)
Battery:	4-Cell 14.8V 2200mah 20C Li-poly battery
Radio Required:	7-channel radio (2.4GHz recommended)

R/C Fun ... for over 44 years



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Product Introduction

The F-35 is the first foam jet model that uses 360-degree vectored thrust control. Through controlling the direction of the thrust nozzle, you will be able to imitate all kinds of thrilling maneuvers that are possible in the Full-Scale F-35 Lightning II.

Before Beginning Assembly

This model is designed for assembly and operation by experienced modelers. Make sure you read through the illustrated instructions before beginning the assembly process. Please contact Hobby Lobby if you have any questions regarding the assembly or operation of your model, to discuss any potential problem areas of assembly, or the possibility of returning the unassembled model if you feel you cannot complete it as described in this manual.

Parts Included in Kit (receiver ready version)

- Fuselage (painted and decorated)
- Rudder
- Retractable landing gear set
- 70mm Ducted fan (installed)
- Brushless 45A ESC (installed)
- Canopy
- Two-part 5-minute epoxy
- Main wing set (painted and decorated)
- Elevator
- 4-Cell Li-poly Battery 20C
- Outrunner Brushless motor (installed)
- 360-degree Vectored Thrust Nozzle (installed)
- Decals (applied)
- Instructions



Read Before Flight (general safety guidelines)

1. Before each flight, please check the aircraft using the radio system. Check the operation of all control surfaces and the motors to make sure they are operating properly and that none of the clevises or connectors are damaged.
2. This aircraft is not a toy! Its operation is quite different from RC cars and RC boats. Before flying, please read the user manual carefully and obey the regulation in order to enjoy a safe and pleasant flight.
3. Before flying your model, make sure there are no other pilots using the same frequency within 1.2 miles of your model if flying using a 72MHz radio system. Please refrain from flying until you have discussed who flies when so your plane does not become damaged from stray radio signals.
4. If you find any parts included with this model that are defective, contact Hobby Lobby before starting assembly.

Safety Instructions for Charging and Using Li-Poly Batteries

- Do not put the battery on, or near anything, that can catch fire when charging.
- Always charge the battery on a non-flammable base i.e. a metal tray.
- Do not disassemble the battery.
- Do not short-circuit the battery.
- Do not use, or leave, the battery nearby a fire, stove or heated place.
- Do not immerse the battery in water or seawater, do not get it wet.
- Do not charge the battery near a fire or under the blazing sunlight.
- Do not drive a nail into the battery, strike it with hammer or apply excessive weight to the battery.
- Do not impact or throw the battery.

Safety Precautions

1. Please do not change any part of the plane without checking with Hobby Lobby. You will be responsible for any damages caused by these changes.
2. Your flying area should be wide-open and free of obstacles. Never fly near highways, railways, airports, power lines or in residential areas.
3. To avoid personal injury, never fly your model near or facing people, or throw the plane in their direction.
4. Do not fly your model in strong winds or severe weather.
5. Do not allow loose objects, tools or body parts to get near the intake of your model. Items can be pulled in and can damage the model or cause personal injury.
6. Never dispose of batteries or parts of your model in a fire as it could lead to an explosion and personal injury.

General Safety Statements

1. This aircraft is not a toy. It has been designed for the experienced modeler and pilot. You are responsible not to cause damage to other's personal property or cause personal injury.
2. Please follow the instructions provided to build, adjust and operate your model. Use caution not to get hands, hair or other body parts near the fans. Doing so could cause personal injury.
3. Hobby Lobby and our dealers are not responsible for any economic or law liability for any improper usage or operation of this model.
4. This model is designed for use by modelers age 14 and over. This model is not recommended for unsupervised modelers under 16 years of age.
5. Never use the model or associated electronics in damp or rainy conditions.
6. This model is made from EPS and Polystyrene, which can be damaged by excessive heat. Keep you model away from excessive heat or out of direct sunlight for extended time periods or it can become warped and affect the flight performance of the model.
7. Never attempt to catch your model while in flight.
8. Never leave the battery connected while the model is unattended. Accidental operation can occur and cause personal injury.
9. Before operating the model, make sure to turn on the radio system and check the functions before beginning flight.
10. Always make sure the throttle at the transmitter has been moved to the low or off position before connecting the motor battery.

Battery Precautions

- Do not use the battery if it is damaged or deformed.
- Do not solder the motor leads directly to the battery.
- Do not reverse charge or over discharge the battery.
- Do not reverse charge or connect the battery in reverse to the speed control.
- Do not connect the battery to the ordinary charger socket or car cigarette jack.
- Do not use the battery for unspecified equipment.
- Do not touch the leaking battery directly. Wash your skin or clothes with water if they come in contact with a damaged battery.
- Do not mix the Li-Po battery with other unchargeable battery.
- Do not continue charging the battery over the prescribed time.
- Do not put the battery into a microwave oven or high-pressure container.
- Do not use an abnormal or damaged battery.
- Do not use or store a battery under the sunlight.
- Do not use the battery near any sources that generate static electricity (over 64V)
- Do not charge the battery when the environmental temperature is under 32 degrees or over 130 degrees.
- If you find the battery leaking smelling or abnormal, stop using it.
- Keep the battery away from children.
- Use the specified charger and observe charging requirement provided by the battery manufacturer.
- Parental supervision is required when charging or operation is done by minors.
- Never charge the battery at a rate greater than specified by the battery manufacturer.
- Never discharge the battery at more than 25C and never take the voltage lower than 12V as this will damage the battery.
- For full flight time it is recommended to cycle the battery a minimum of three cycles before use in your model.
- Never charge the battery on a carpet floor as this can cause a fire.

Mixing Epoxy

When mixing epoxy, make sure to use equal amounts of Part A and Part B. Mix the epoxy thoroughly. You will have about 3 minutes before the epoxy begins to cure after mixing so work quickly. Do not mix epoxy until you fully understand the assembly procedure.



Wing Install

Read through the following steps before attaching the wings to the fuselage. You will need to complete these steps before the epoxy begins to cure.

Mix some epoxy to glue the wings to the fuselage. Apply a thin layer of epoxy to the wing root and fuselage to glue the wings to the fuselage.



Plug the aileron servo into the lead coming from the fuselage.



Attach the wing panels one at a time. Make sure each panel is tight to the side of the fuselage and the upper surface of the wing is flush with the adjoining fuselage surface. Allow the epoxy to fully cure before continuing the assembly of your model.

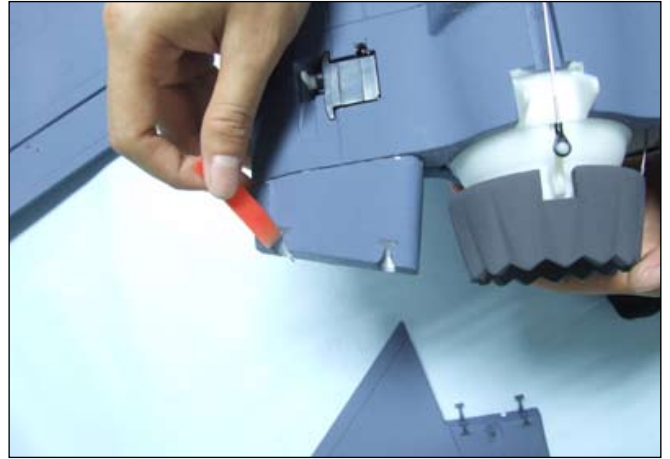


Stabilizer Install

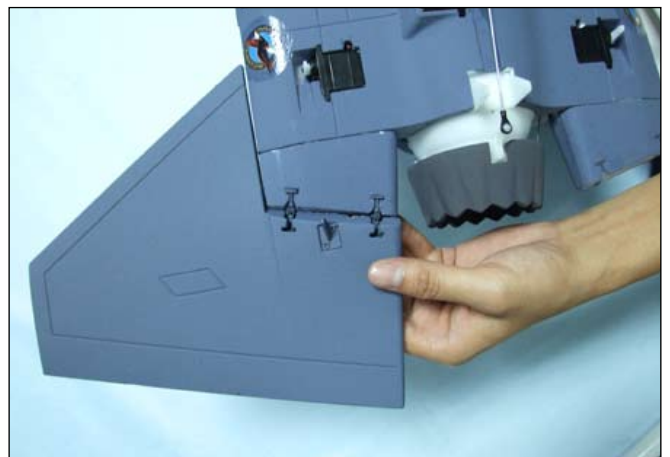
Read through the following steps before attaching the hinges and elevators to the fuselage. You will need to complete these steps before the epoxy begins to cure.

Before installing the hinges, it is recommended to apply a small amount of light oil to the hinge point of all four hinges. This will help prevent the epoxy from entering the hinge point which could glue the hinge, preventing it from operating correctly.

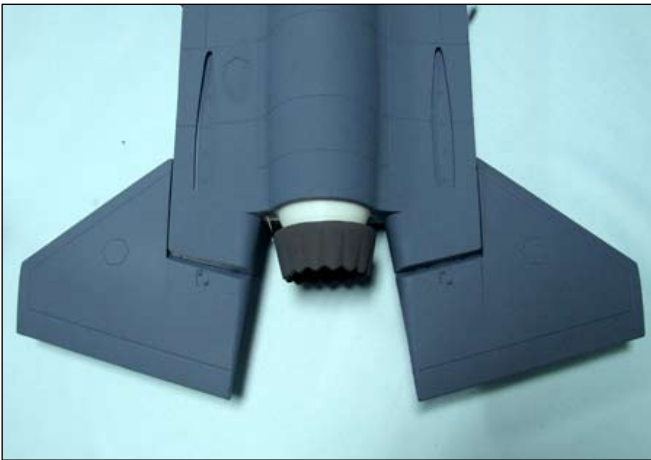
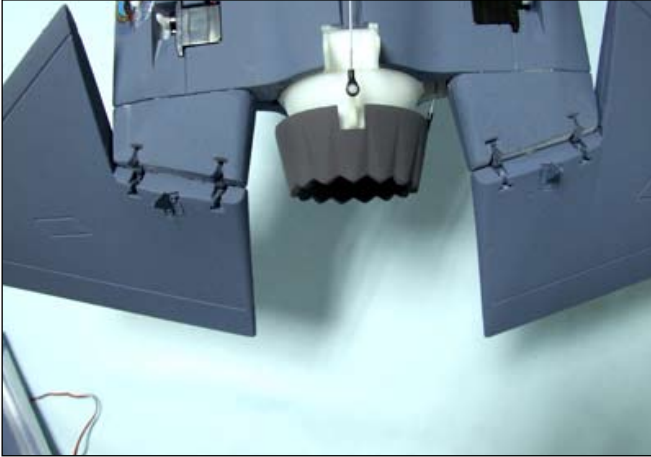
Mix a small amount of epoxy. Apply epoxy into the T-shaped hinge pocket in the fuselage for the hinge. Also apply epoxy to the hinge pocket for the adjoining elevator.



Position the hinge half into the T-shaped pocket in the fuselage. Use a small flat screwdriver to press the hinge fully into the pocket. The elevator can now be positioned on the hinge to complete the assembly.



Repeat the procedure to attach the second elevator half to the fuselage using two hinges. Allow the epoxy to fully cure before continuing with the assembly of your model.



Rudder Install

Gluing the rudders follows the same procedure as gluing the wings. Make sure to align each part equally on each side of the fuselage.



Press the rudder firmly into the fuselage.



Install both rudders at this time. Allow the epoxy to fully cure before continuing with the assembly of your model.

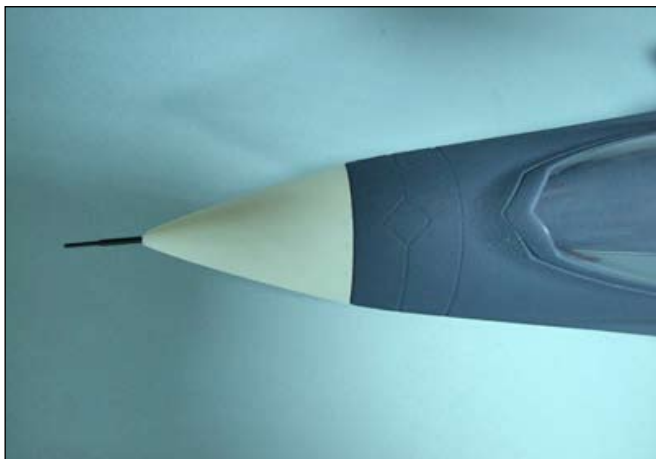


Nose cone Install

Use epoxy to glue the nose cone to the fuselage. Make sure the nose cone fits tight on the fuselage.

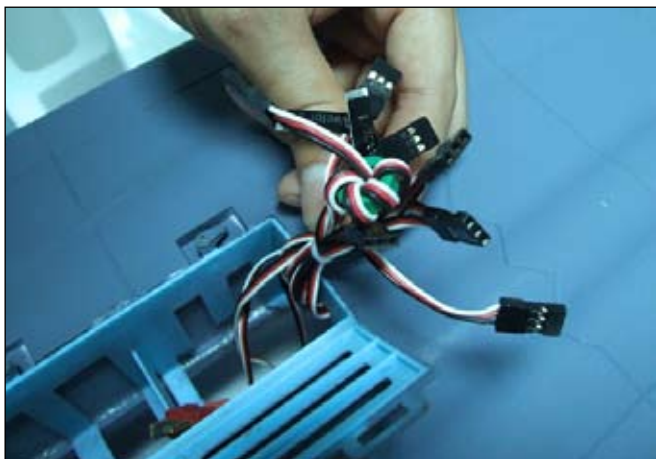


Make sure the pitot tube on the nose cone is aligned with the center line of the fuselage before the epoxy cures.



Receiver and Battery Install

Locate the leads for the servos. Each lead is marked with its function. Plug the leads into the appropriate ports of the receiver. The elevator thrust vectoring plugs into the AUX2 location and the rudder thrust vectoring plugs into AUX1. Place the receiver in the fuselage.



Place the battery in the fuselage. Don't forget to connect the battery lead to the speed control lead before closing the battery door. Always make sure to have the transmitter on when connecting the battery to avoid the receiver from picking up stray radio signals.

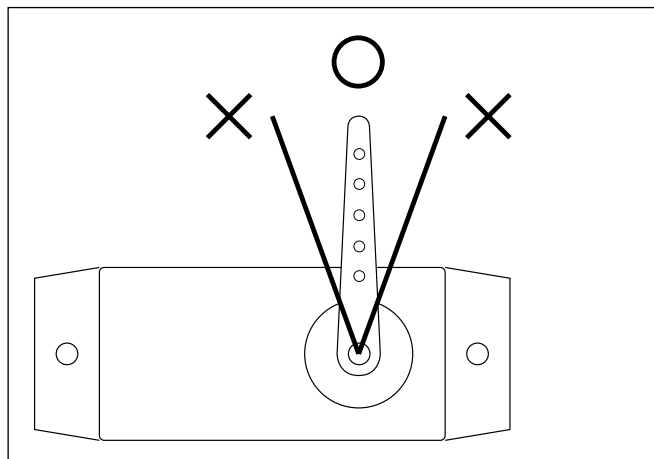


Close the battery door. Turn the latches 1/4-turn to secure the door closed.

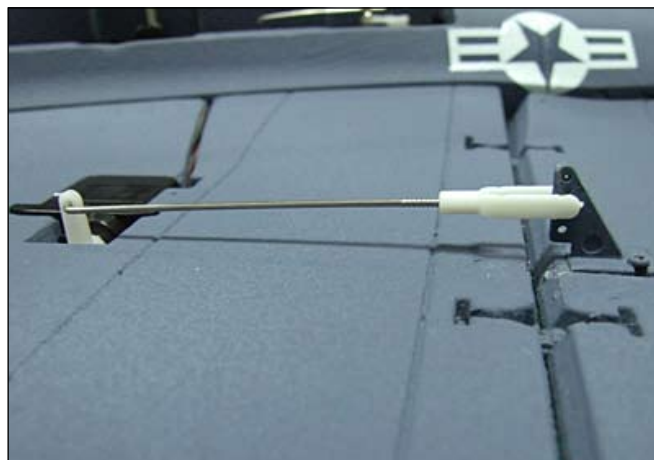


Linkage Install

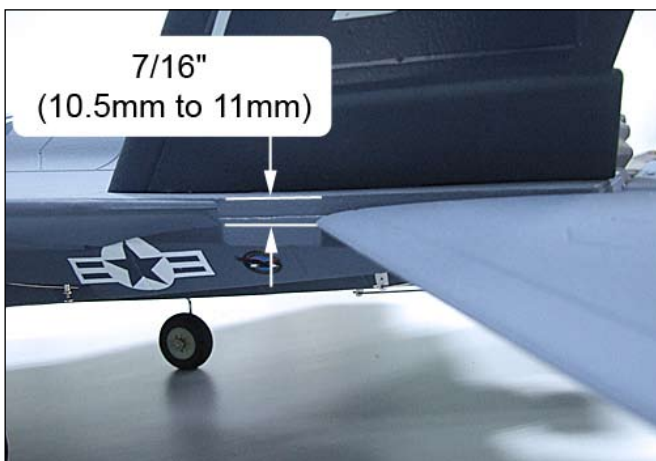
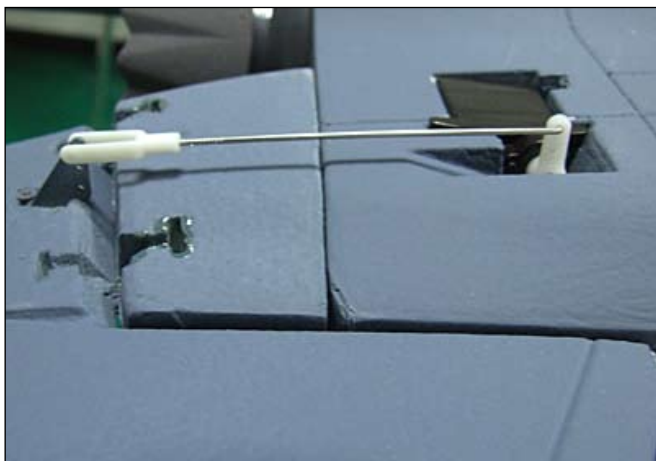
Before installing the linkages to the control surfaces and vectored nozzles you will need to center the servos. Use the sub-trim feature of your radio system to center each servo.



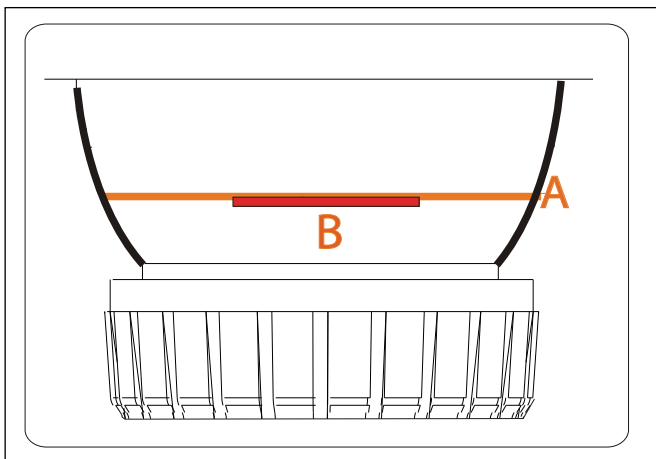
Adjust the length of the elevator and aileron linkages. When the servo is centered the control surfaces must be centered at the same time.



Align the stabilizer so it is 7/16" (10.5mm to 11mm) below the edge of the fuselage as shown.



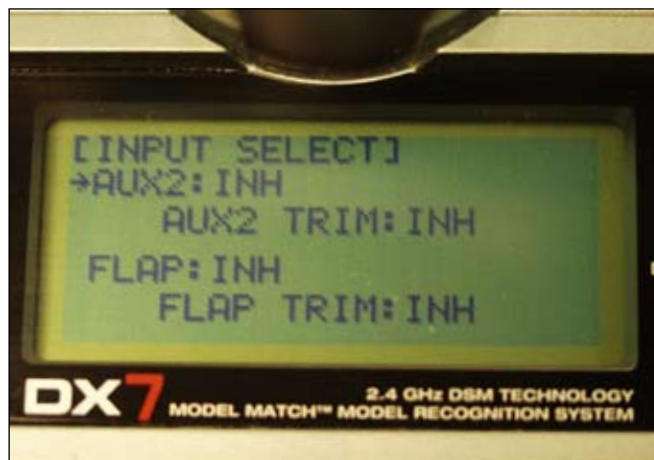
Adjust the linkages to the thrust nozzle so it is aligned as shown in the drawing. The reference lines are molded into the thrust nozzle assembly.



Programming Your Radio System

The following describes the mixing necessary to operate the thrust vectoring of your model. Use this information to program your radio to operate the thrust vectoring.

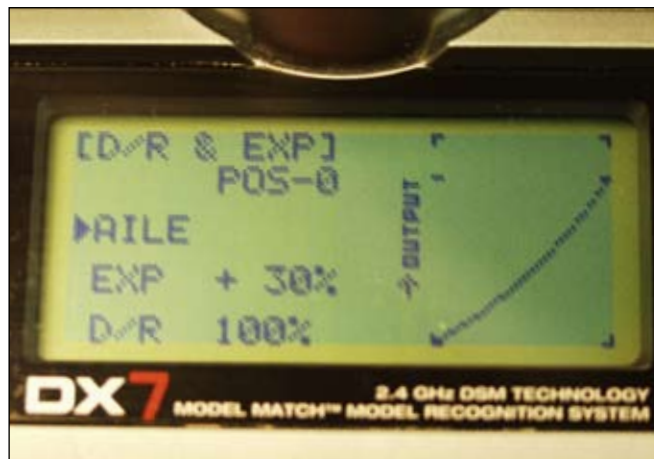
From the INPUT SELECT screen, inhibit AUX2 and FLAP.



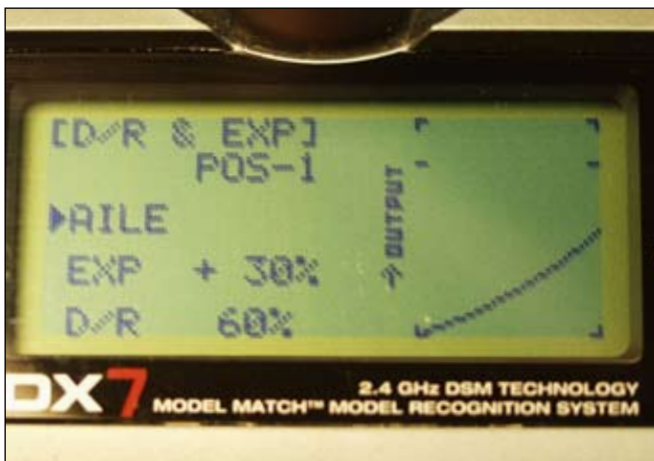
From the WING TYPE screen, make sure that all the selections are set to OFF.



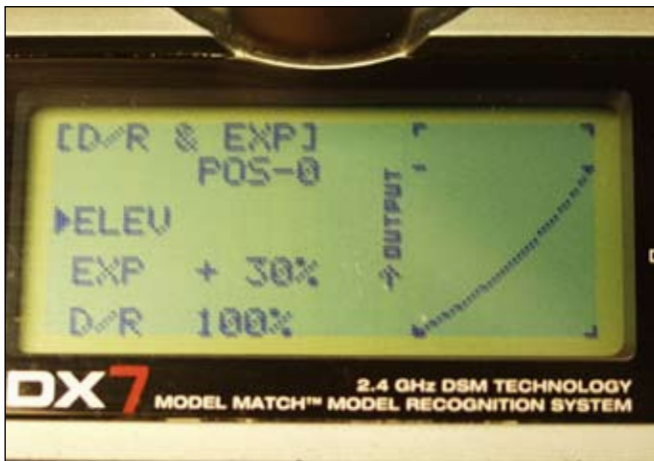
From the D/R & EXPO screen, select the AILE function. Set the dual rate switch for the ailerons to the "0" position. Set the EXPO for +30% to make the ailerons less response around the stick center.



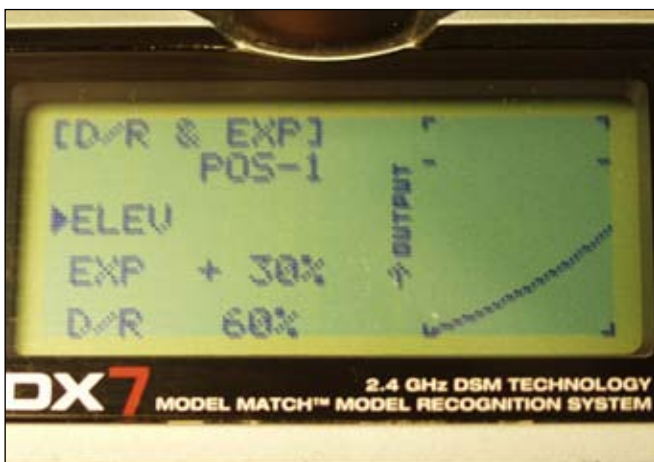
From the D/R & EXPO screen, select the AILE function. Set the dual rate switch for the ailerons to the "1" position. Set the EXPO for +30% to make the ailerons less response around the stick center. Set the D/R to 60% for the low rate for the ailerons.



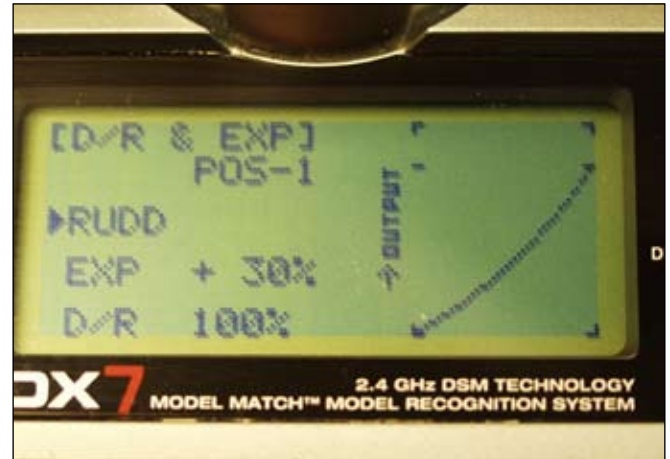
From the D/R & EXPO screen, select the ELEV function. Set the dual rate switch for the elevator to the "0" position. Set the EXPO for +30% to make the elevator less response around the stick center.



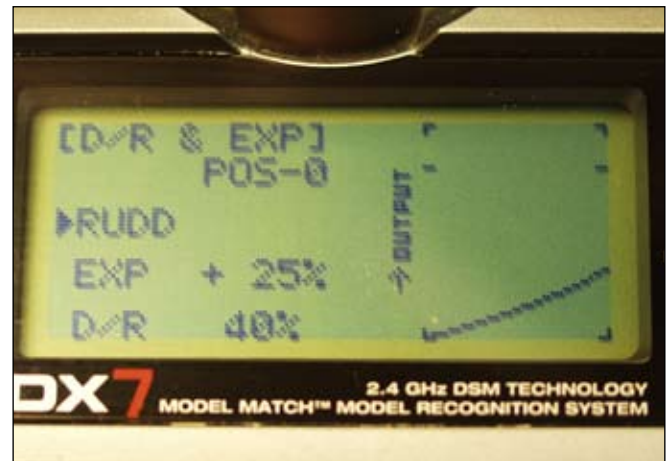
From the D/R & EXPO screen, select the ELEV function. Set the dual rate switch for the elevator to the "1" position. Set the EXPO for +30% to make the elevator less response around the stick center. Set the D/R to 60% for the low rate for the elevator.



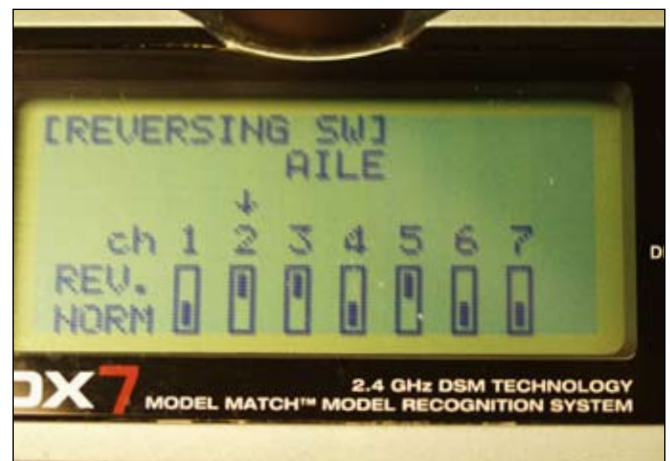
From the D/R & EXPO screen, select the RUDD function. Set the dual rate switch for the rudder to the "0" position. Set the EXPO for +30% to make the steering less response around the stick center.



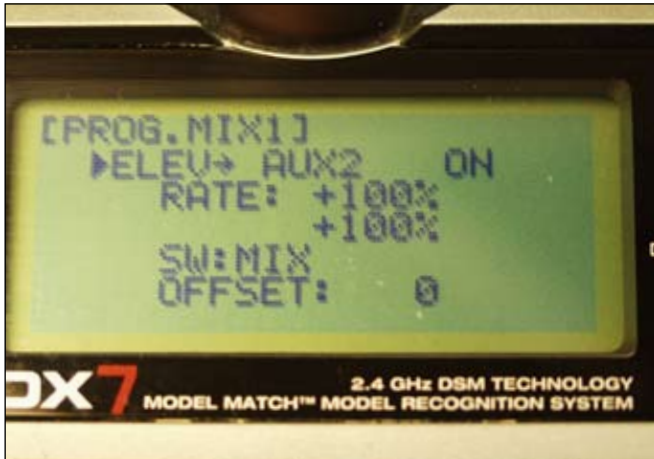
From the D/R & EXPO screen, select the RUDD function. Set the dual rate switch for the rudder to the "1" position. Set the EXPO for +30% to make the steering less response around the stick center. Set the D/R to 60% for the low rate for the steering.



The image below shows the positions for the servo reversing. Select REVERSING SW from the radio menu and set channels 2, 3 and 5 to reverse (REV). All other channels will be in the NORM position.



Select PROG.MIX1 from the radio menu. Set the mix for ELEV to AUX2. Make sure the rates are both at +100%, and that the switch is set to MIX. There should be no offset for this mix.



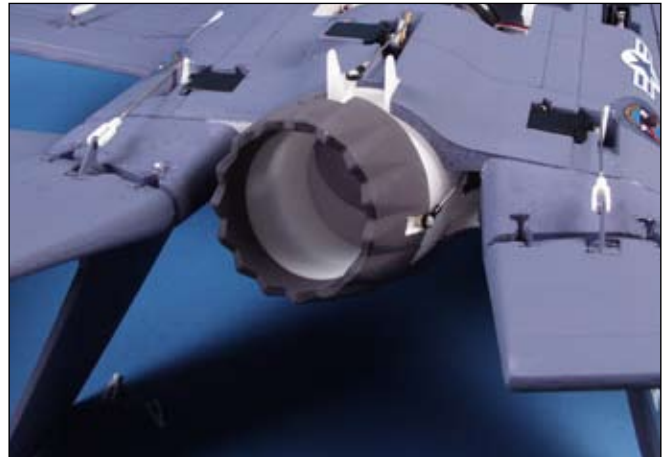
Thrust nozzle shown with left thrust mixing activated.



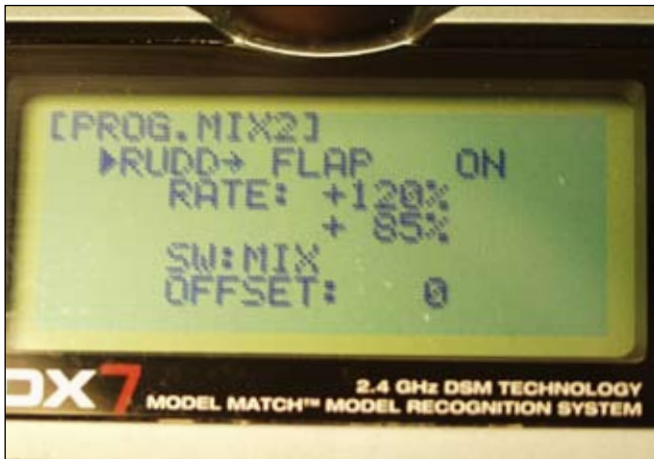
Thrust nozzle shown with up thrust mixing activated.



Thrust nozzle shown with down thrust mixing activated.



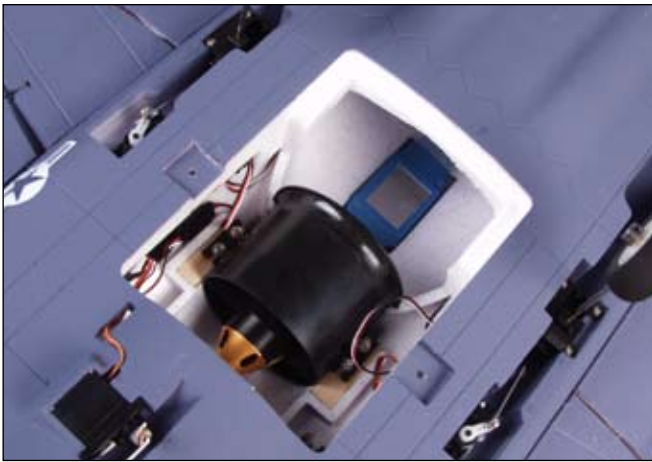
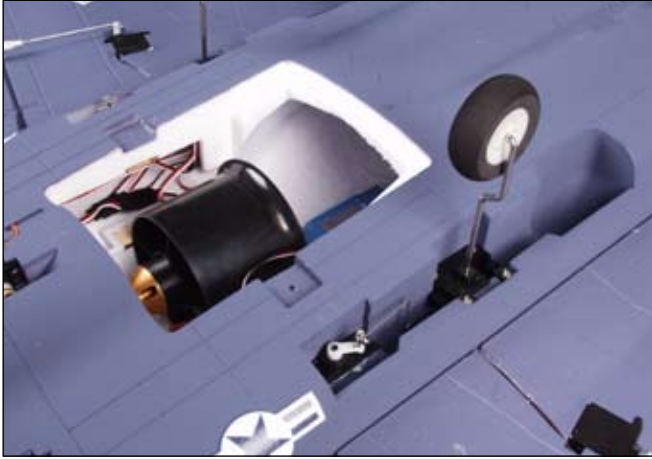
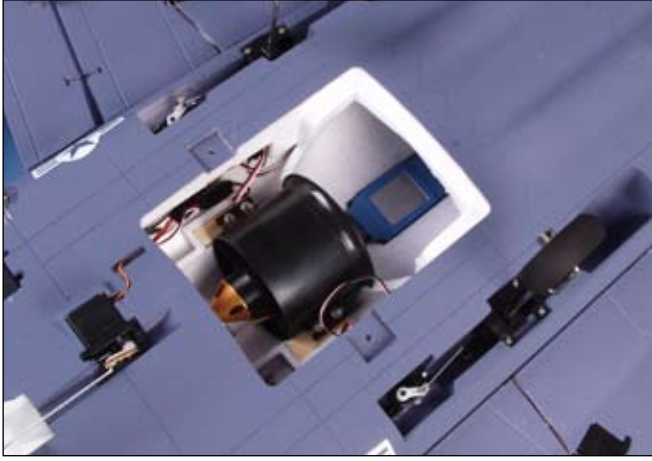
Select PROG.MIX2 from the radio menu. Set the mix for RUDD to FLAP. Make sure the rates are set at +120% and 85% as shown, and that the switch is set to MIX. There should be no offset for this mix.



Thrust nozzle shown with right thrust mixing activated.



Replacing or Inspecting the Ducted Fan Unit.



Setting the Control Throws

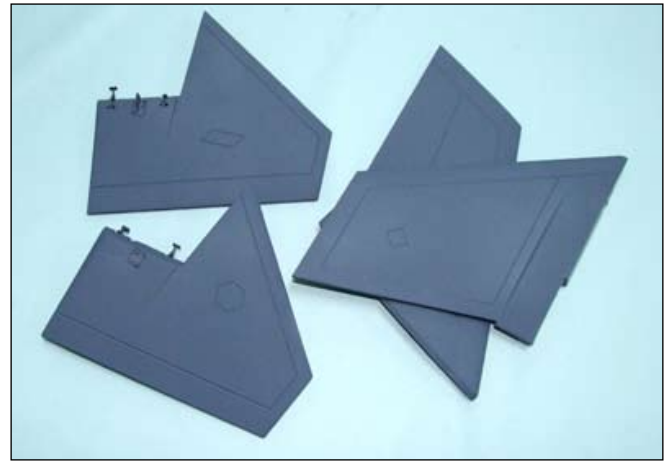
Use the following to set the high and low rate throws for the ailerons and elevators. If you have used our mixing suggestions, the throws for the thrust vectoring will be correct once the control surface throws are set.

Low Rates: General flying without thrust vectoring
Elevator 1/2" up and down
Ailerons 1/2" up and down

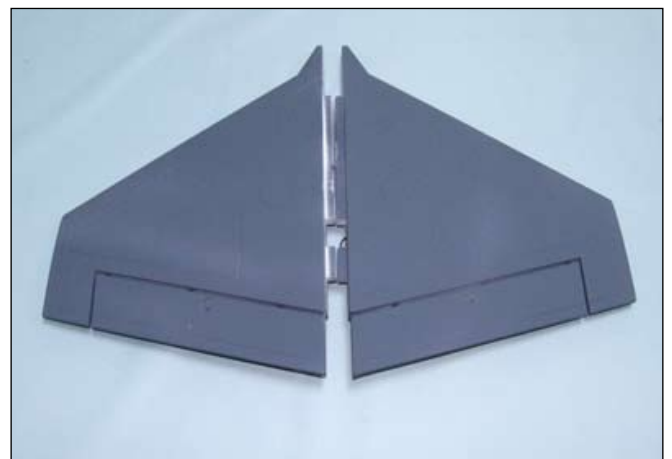
High Rates: Thrust vector flying
Elevator 1" up and down
Ailerons 3/4" up and down

These are the rates that we use when flying the F-35 and are a good starting point. You may find that you prefer to change these to suit your flying style.

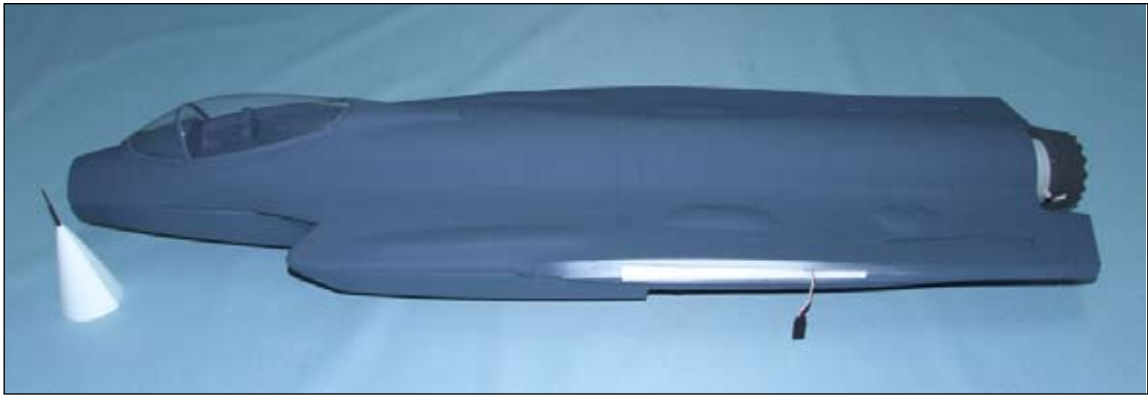
Replacement Parts



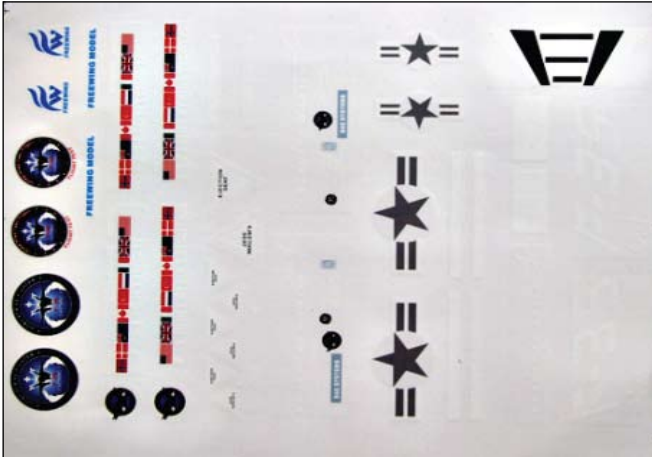
HLI350002
Elevators and Rudders



HLI350003
Wings



HLI350004
Fuselage and Nose Cone



HLI350007
Decals



HLI350010
Brushless Motor 2750Kv



HLI350008
Canopy and Nose Cone



HLI350011
4S Lipoly Battery 2200mAh (Genuine
Deans Ultra Conns)



HLI350009
70mm Ducted Fan Unit



HLI350012
45A ESC w/Switch Mode BEC



HLI350013
Brushless Power System
(70mm Fan, Motor 2750Kv, 45A ESC)



HLI350014
Retractable Landing Gear Set



HLI350015
9g Servo 90 degree Normal rotation
(Ailerons, Elevator)

HLI350016
9g Servo 90 degree Reverse rotation
(Ailerons, Elevator)

HLI350017
9g Servo 120 degree Normal rotation
(Retracts, Thrust Vectoring)

HLI350018
9g Servo 120 degree Reverse rotation
(Retracts, Thrust Vectoring)



HLI350019
360 Degree Thrust Vector Nozzle

Items not shown:
HLI350006

Flying the F-35 Lightning II

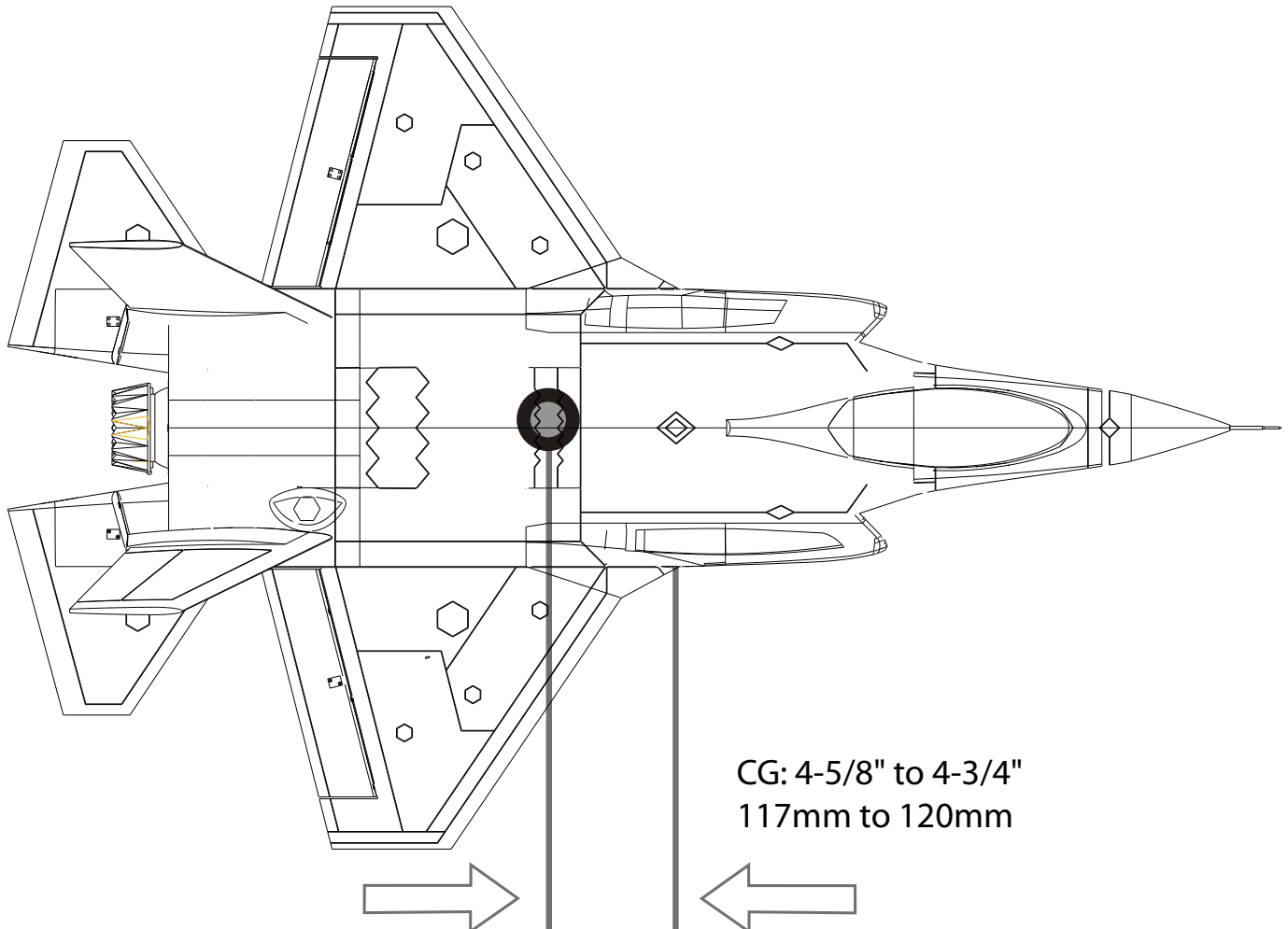
The F-35 Lightning II has solid flight performance when flown as a conventional electric ducted fan model (without using the vectored thrust). It is quick and responsive and the 70mm fan on 4 cells provides nearly 1 to 1 thrust. When the multi-vector 360 degree thrust vectoring is activated the excitement really starts.

The side-to-side vector action provides powerful rudder response even at nearly no forward speed. High alpha flight at very low speed is fully controllable. Falling leaf spins are possible both upright and inverted. The thrust vectoring combined with elevator makes impossible flips easy to do. The key to great flights are in the initial setup of the model, follow our recommendations on control throws and center of gravity and set up the dual rates with expo and you will be rewarded with a great flying model with unique abilities.

The retractable landing gear is best suited to smooth runways. If flying from taller grass, hand launching is easily accomplished. There are a couple of techniques that are helpful to learn. The model can be successfully landed with the thrust vectoring turned on by landing in a "high alpha" attitude. The ground speed will be very slow using this method and the combined use of throttle and vectored thrust makes for a smooth soft landing. The model can be landed with the thrust vectoring turned off in a conventional manner. A smooth nose high approach with just a little throttle at the end to arrest the decent right before touchdown is the best method.

Center of Gravity

If you use our recommended equipment you will not need to adjust the balance of your model. If your equipment does not match our suggestions, or you change the airframe, you will need to balance your model. The balance point of the F-35 Lightning II is as shown in the drawing.



Use this page to take notes on building, programming your radio and flying your Lockheed Martin F-35 Lightning II.

R/C Fun ... for over 44 years



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Have Fun!

***We hope that you have many pleasant flights with your
Lockheed Martin F-35 Lightning II.***

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