Grumman F-9F Cougar

1/5.8 Scale

GO FLY GOLD

Length: 84”, Wing Span: 72”

Weight: 26-27lbs Dry

Fuel Capacity: 3.0L,

Smoke Capacity: 2.0L

CONSTRUCTION AND OPERATING MANUAL

Version 2

April 2024

Vne 165 MPH **Limit Thrust to 25 lbs.**

Equipped with HV Servos and should not be operated below 7.2 volts

CCU Pressure should be 75 PSI MAX

BVM

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Contents

INTRODUCTION

Thank you for purchasing the BVM F-9F Cougar. This model represents the latest in manufacturing technology and completion for the R/C jet enthusiast. The factory has expertly crafted and thoroughly inspected all aspects of the model. Only a small amount of work is required to complete the assembly of your Cougar.

This manual contains instructions for safety, operation and maintenance. It is essential to read and follow all of the instructions and warnings in the manual. Please read the entire manual to become familiar with the processes and procedures before you begin to assemble your aircraft.

DISCLAIMER

Bob Violett Models Inc. assumes no liability for the operation and use of these products. The owner and operator of these products should have the necessary experience and exercise common sense. Said owner and operator must have a valid Academy of Model Aeronautics license and an AMA Turbine Waiver.

This is a sophisticated jet model aircraft. 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.

If you do not have recent and successful experience operating and flying a turbine powers model, contact your local BVM Rep (http://bvmjets.com/Pages/fieldreps.htm) or call BVM for assistance 407-327-6333.

Notice: Do not use with incompatible components or alter this product in any way beyond the instructions provided by BVM, Inc. The BVM Cougar has been designed and flight tested around 100N class engines. Damage to the aircraft may result by exceeding this thrust limitation (25 lbs).

Recommended Accessories

You may have some of these products in your shop, but if not, refer to this list.

- 10" Warbird jet pilot figure
- BVM UAT
- Spektrum 12120 Power Safe Receiver
- Spektrum X+8 Expansion Module
- (2) 7.4v Batteries 3,000 mAh each.
- 100N engine of your choice, with FOD screen
- (2) EC3 Extension Lead 6” for RX BVM# VJ-EFLAEC311
- Gyro System
- Fuel Pump/Filter Mount for Jet Cat fuel filter. BVM# PA-SR-0064

Required Tools

- Metric Allen wrench set
- Needle nose Pliers
- 9/64 Ball Driver
- Perma Grit Large Flat File
- 6” long 1/16th drill

List of Adhesives/Lubricants

- Pacer Z-42 # PT42
- Super O-Lube BVM #5779
- Axle Super Lube BVM #5784

Available Options

#V-WB 10" JET PILOT

Touch Up Paint

Model Master paints:

FS15042 Gloss Sea Blue

Unpacking

Carefully remove items from the box. Open each package and inspect for shipping damage. After reading this entire manual, get familiar with the major kit components.

Note: Damaged parts must be reported to BVM within 7 days of receiving your kit.

Become familiar with the work completed at the factory. It is important that you inspect and approve this work now.

Preparing to work

- ☐ Support the fuselage on a stand. Be sure to use foam padding to prevent scratching and denting.
- ☐ Fill air system to around 50 Psi, use a piece of scrap air line pressed into the BVM Fill Valve (typical).

  Note: There may be sufficient air pressure from the factory.

- ☐ Remove the masking tape securing the gear doors and body flaps in closed position.

NOTE: The electronic valves can be operated manually by depressing the small orange buttons on the valves that correspond to the action desired. Label the valves for easy reference. Fill the air system to around 50 psi.

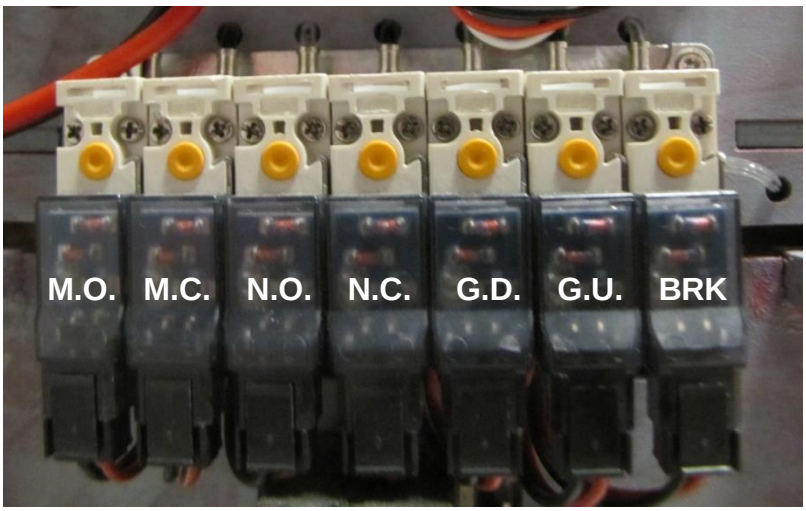
- ☐ Manually extend the landing gear by pressing the small orange buttons located on the front of the electronic valves, follow the sequence below.

To Extend the Gear

1. Main Door Open (M.O.)
2. Nose Door Open (N.O.)
3. Landing Gear Down (G.D.)
4. Main Door Close (M.C.)

To Retract the Gear

1. Main Door Open (M.O.)
2. Landing Gear Up (G.U.)
3. Nose Door Close (N.C.)
4. Main Door Close (M.C.)



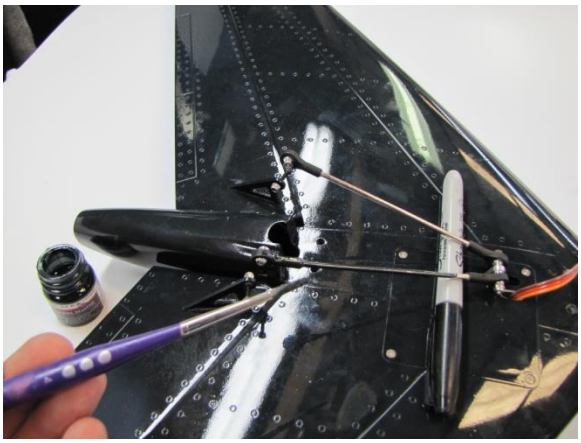
Note: Now the fuselage can rest on the landing gear if you prefer versus using a work stand.

Tail section

Painting Rudder and Elevator Linkages

☐ Apply Pacer Z-42 to the rudder pushrod clevises.

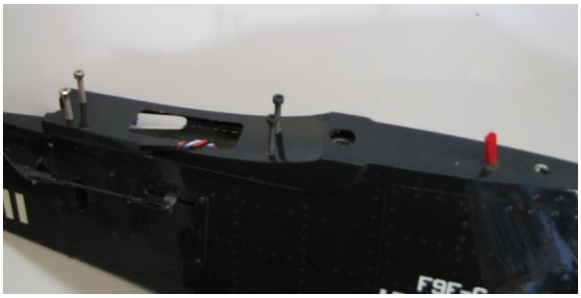
An easy cosmetic improvement for your Cougar is to brush paint the external rudder and elevator linkages. Use the appropriate color and a small brush. Avoid getting paint on the clevis pins or the ball links. The servo cover screw heads can be hidden with paint as well.



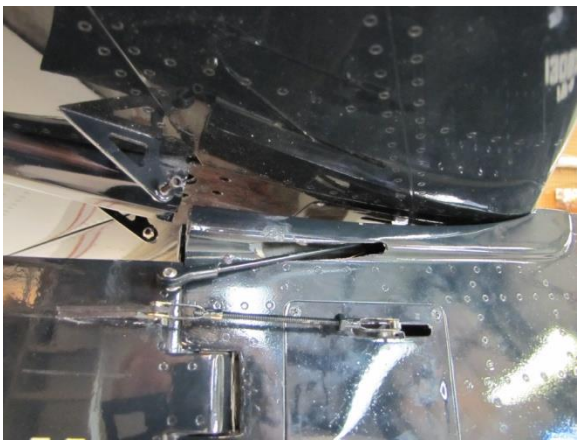
NOTE: The color paint on your BVM Cougar is blended to match U.S. Federal Standard (F.S.) Numbers. These F.S. number paints are available from Testor's "Model Master" plastic model paints.

I.e. the dark blue on this prototype Cougar is identified as F.S. 15042 Gloss Sea Blue.

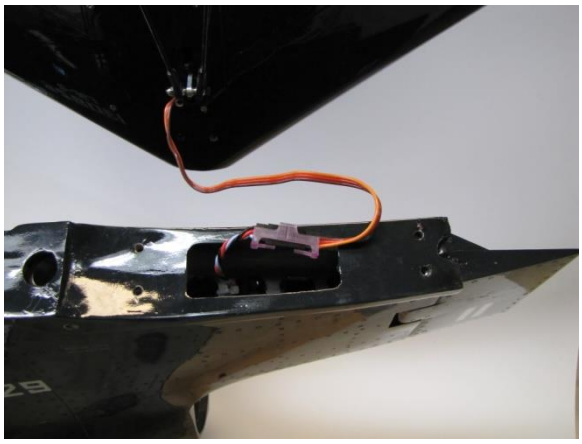
Installing the Horizontal Stabilizer



- ☐ Remove the (4) 4mm bolts. The front bolts are 30mm long and the rear bolts are 25mm long.



- ☐ Use a 2mm Allen wrench and pliers to hold the nut to disconnect the elevator pushrods from the control horns.
- ☐ Install the stabilizer by carefully routing the pushrods through the openings.



NOTE: Secure the elevator servo connection with a plastic clip or tape.

- ☐ Apply a drop of Pacer Z-42 to the (4) stabilizer bolts and secure the stab to the fuselage with a 3mm Allen wrench.

☐ Use a Perma Grit Flat File if required to achieve full elevator deflection.

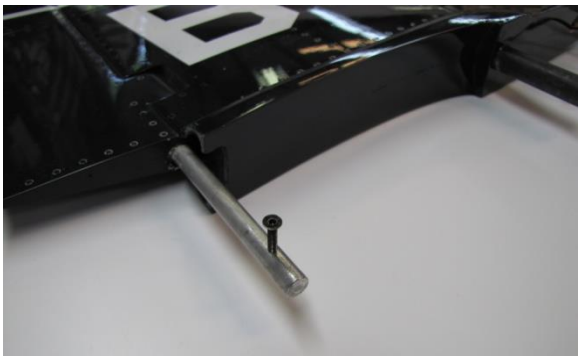
See Control “Travels” at end of this manual.

☐ Reconnect the (2) elevator ball links.

☐ Apply a drop of Z-42 on the end of the bolt that protrudes beyond the nut.

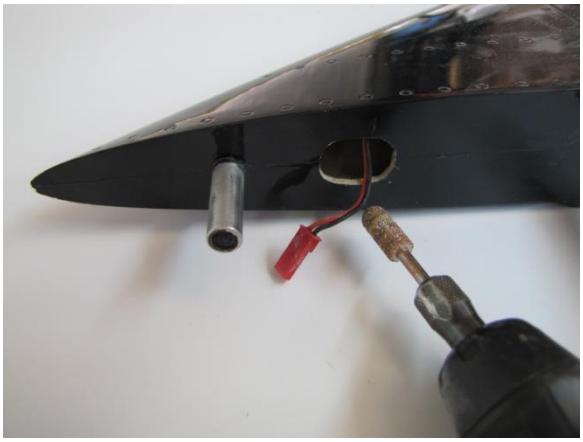
Installing the Vertical Fin

- ☐ Remove the 2 mm bolt from the bottom of the rear aluminum rod.



NOTE: This will use a 1.5mm driver.

- ☐ You may wish to enlarge the hole for the wire and connector to pass through.



NOTE: If the fin tubes (3) fit a bit tight when installing onto the fuselage, follow the (2) steps below.

- ☐ Use a Drum Sander to chamfer the ends of the three tubes/rods.
- ☐ Use 320 grit sandpaper to stroke the rods in the long direction. The grain should be the same as the direction of insertion.

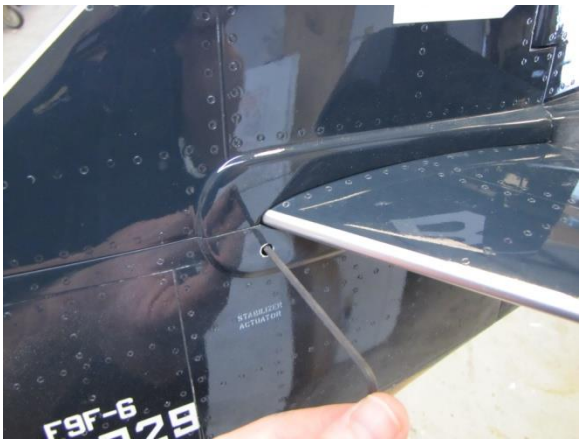
- ☐ Apply a small amount of Lube to three tubes.

- ☐ Connect Fin strobe light connection.
- ☐ Insert wires into the fin while installing the fin onto the fuselage.

- ☐ Hold the front of the fin down firmly while tightening the front clamp bolt; use a 9/64 Allen wrench.

Important! The clamping bolt has an “E” clip on the end of the bolt to prevent the bolt from falling out during transportation. Do not continue to loosen the bolt once you feel the resistance of the “E” clip, you will damage and lose the “E” clip.

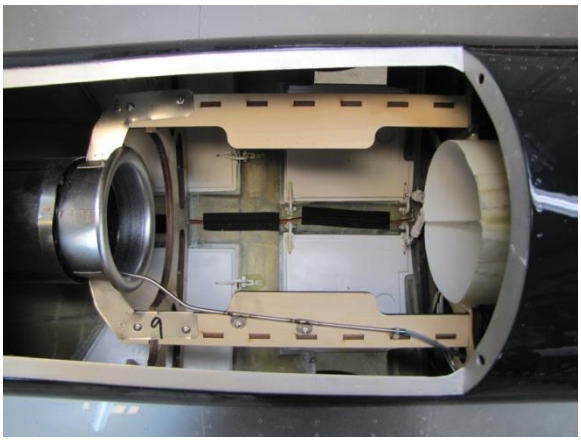
NOTE: Older models will use a 3mm.



- ☐ Install the rear rudder post bolt through the lower rudder using a 1.5mm Allen wrench.

Mid Fuselage Section

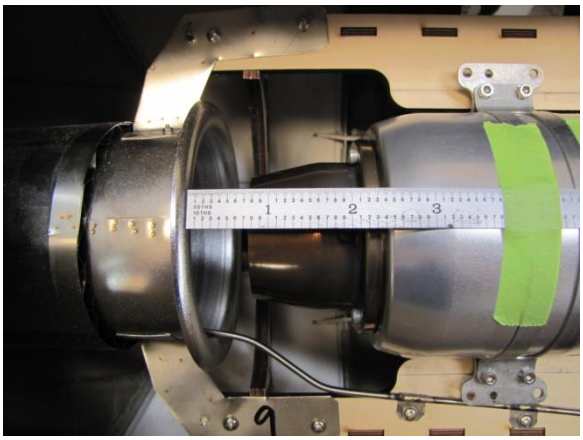
Installing the Engine



The engine bay comes with the engine rails, tailpipe, and smoke tube factory installed. The rails are made to accept various engine installations with minor trimming. This installation features the Jet Cat P-100RX, other installations will be accomplished using the same steps with minor variations.

- ☐ Prepare the engine and engine mount. The standard P-100RX mount supplied with the engine is used in this prototype. Use the #6 Truss Head screws provided from BVM to secure the engine.

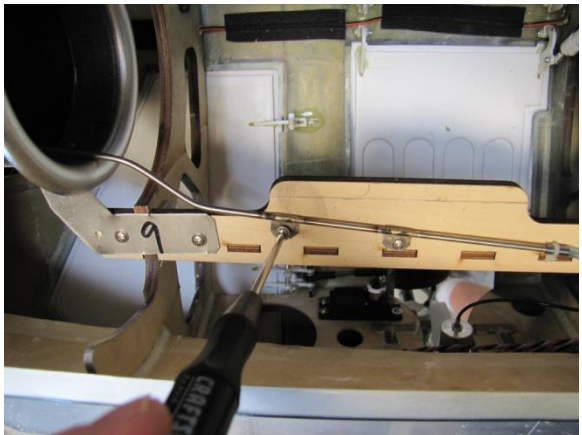
- ☐ Set the engine and mount in place, get familiar with the next few steps before proceeding.



- ☐ Consult your engine manufacturer for the distance between the bellmouth and the tailcone of the engine. A distance of 5/8” is used with the P-100RX as shown.

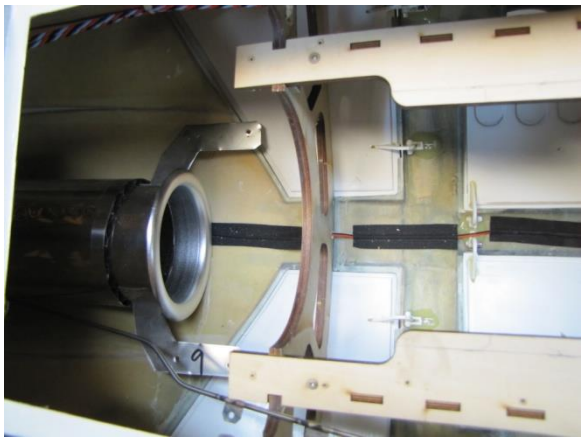
  Note: The engine mounting rails will require trimming for the engine mount to sit on the rails.

- ☐ Not shown in these steps but use a F.O.D. screen.

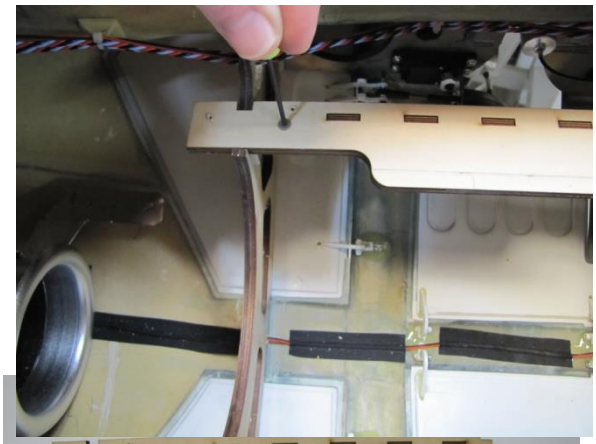


- ☐ Remove the smoke tube.

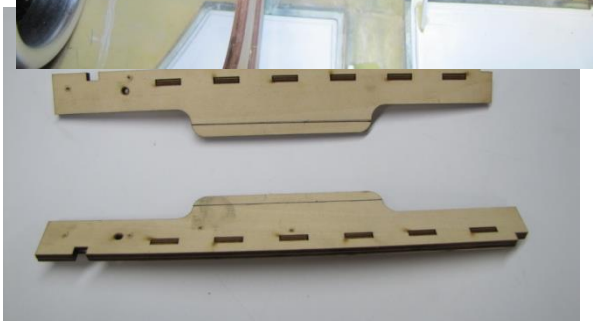
☐ Remove the tail pipe screws and slide the tailpipe aft to allow access to the engine mounting rail bolts.



☐ Remove the engine mounting rail bolts with a 2mm Allen wrench.

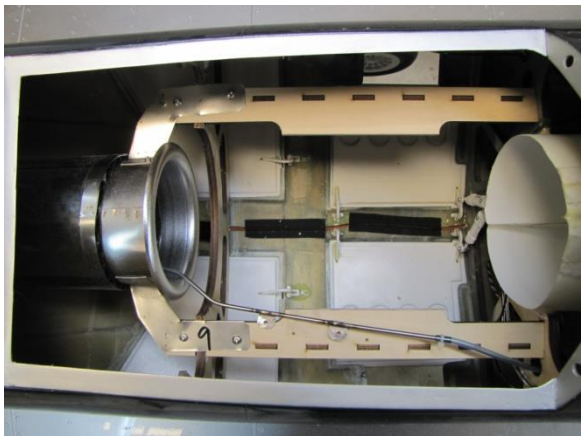


☐ Mark and trim the rails at a distance of .3” as shown.

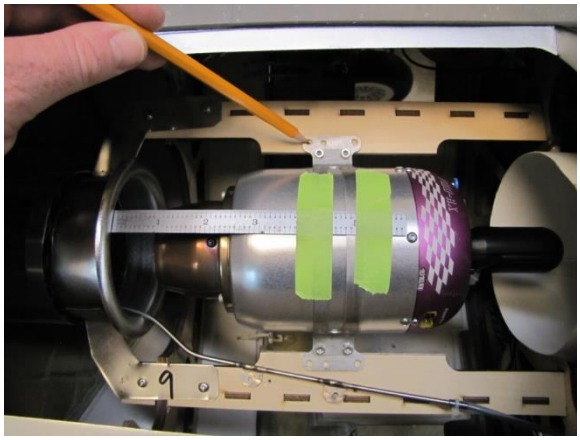


This sample accommodates a Jet Cat P-100RX.

Note: When installing a King Tech K-100G Mark and trim the rails at a distance of .4”.



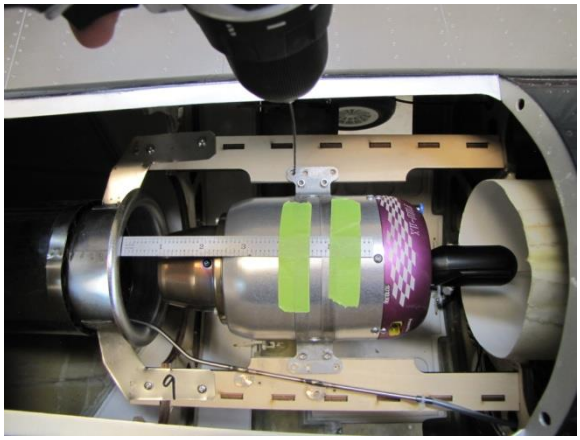
☐ Reinstall the rails and the tail pipe. The smoke tube will be reinstalled after the engine is mounted.



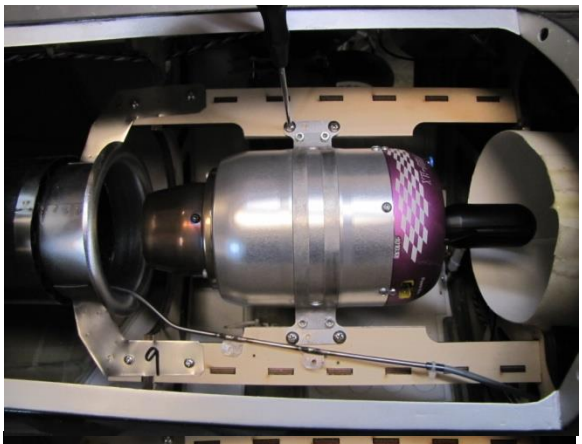
☐ With the engine set at the appropriate distance and centered within the tail pipe, mark the (4) mounting holes.

JetCat P-100RX distance from bellmouth = 7/8”

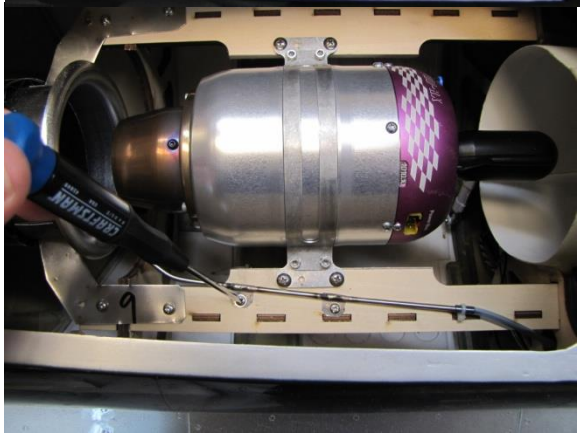
KingTech K-100G distance = 7/8”-1”



☐ Use a 6” long 1/16” drill to make the (4) holes for the #6 Truss Head wood screws.



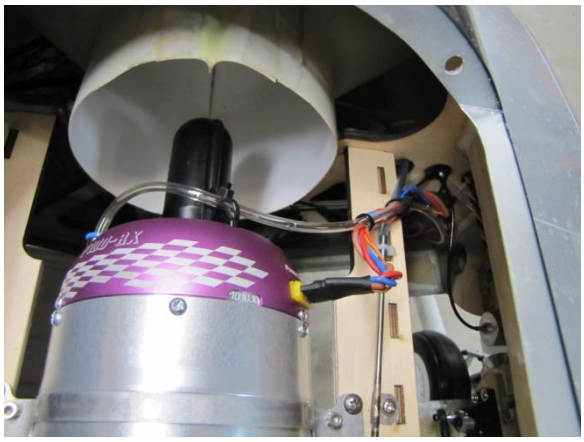
☐ Install the #6 Truss Head wood screws.



☐ Reinstall the Smoke Tube.

Note: If your engine mount interferes with the smoke tube, see the section titled Relocating the Smoke Tube.

- ☐ Route the engine fuel and electrical lines. Use small zip ties to maintain security and an organized installation. Not shown here, but use a F.O.D. screen.



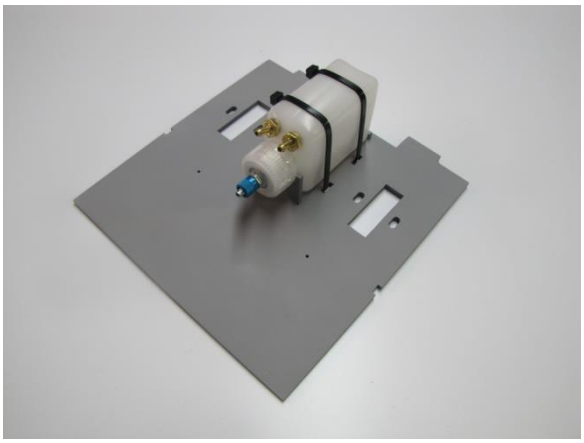
Front Fuselage Section

General Preparation

- ☐ Un-wrap and familiarize yourself with the fuselage servo wires.
- ☐ Arrange servo wires, fuel line, light system, and air line neatly into groups. Keeping an organized installation can help diagnose problems down the road.
- ☐ Check fuel tank installation and factory plumbing. Blow through the main supply line. It should not be blocked or restrictive.
- ☐ Remove the front radio/ECU tray to ease installation of components. Two Phillips head screws secure the tray into position.

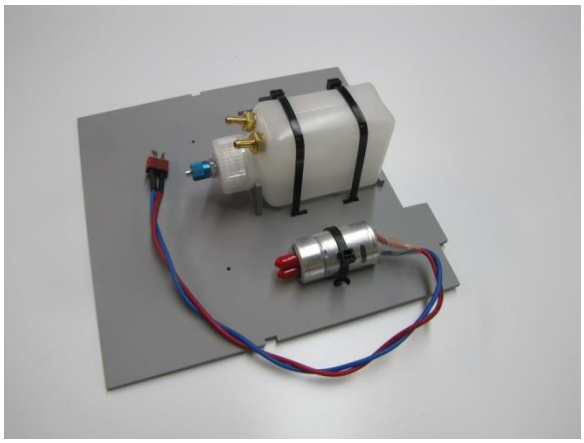
Mount the BVM UAT

- ☐ Two 11” zip ties are used to secure the BVM UAT between its mounts.

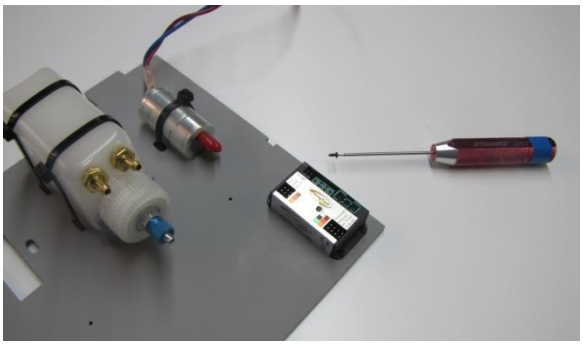


Mount the Fuel Pump

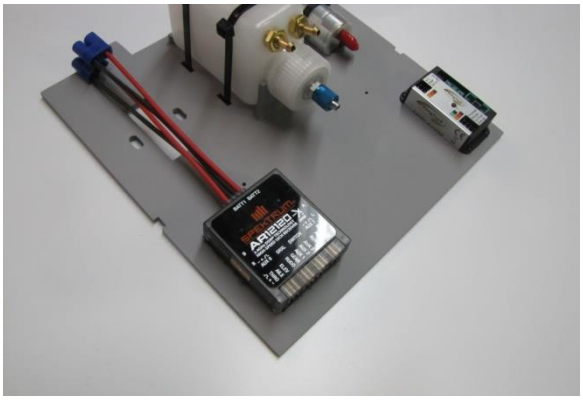
- ☐ Secure the fuel pump using an 8” zip tie. (King Tech fuel pump shown)



Mount the ECU

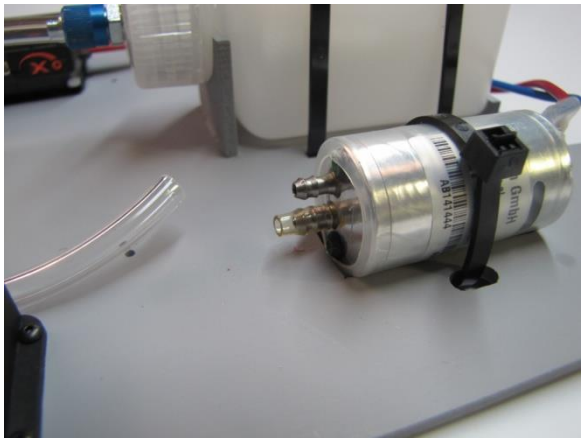


- ☐ Secure the ECU in place with wide “Sticky” Velcro; supplied with the BVM Manual packages. If your ECU allows for screws, they could be used as well.

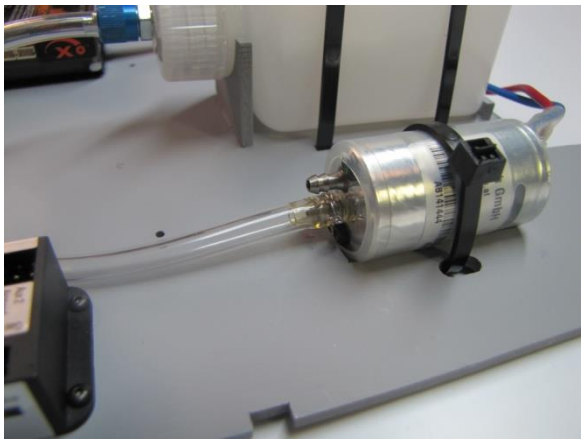


Mount the Receiver

- ☐ Secure the receiver in place with wide “Sticky” Velcro.

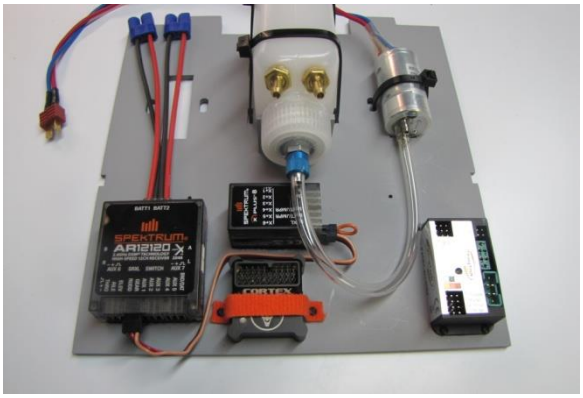


- ☐ Use a 7” length of 6mm fuel tubing to connect the UAT output to the input of the fuel pump.
- ☐ Use a short piece of 4mm fuel tubing as an adaptor for the larger 6mm tubing on the pump input barb.



- ☐ Use safety wire to secure the connection.

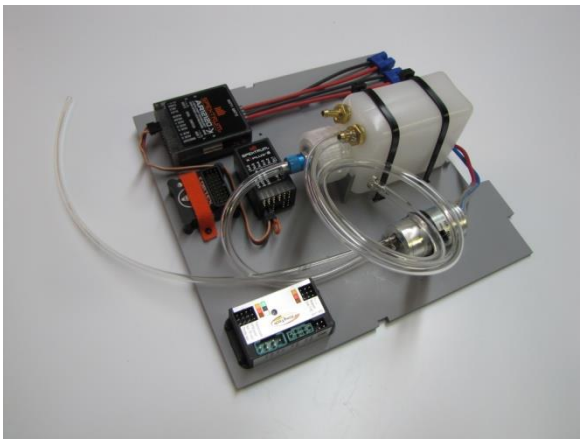
X+8 Xpander and Optional Gyro



- ☐ Use sticky back Velcro to secure the X+8 Expansion Module.
- ☐ Refer to your gyro manufacturer's recommendations for mounting your (optional) gyro.
- ☐ BVM adds a Velcro strap for security.

  The Cortex gyro is shown. The gain values used are 40% for normal flight and 60% for landing.

  Important!!! DO NOT use heading mode unless you are experienced with this mode.



Misc Fuel Lines

- ☐ Add a 13" length of 4mm fuel line to the fuel pump and an 18" length of 6mm to the UAT fill barb.

The remaining brass barb will be connected to the fuel tank after the tray is installed.

Use safety wire to secure and prevent leaks.

Reinstall the Radio/ECU Tray

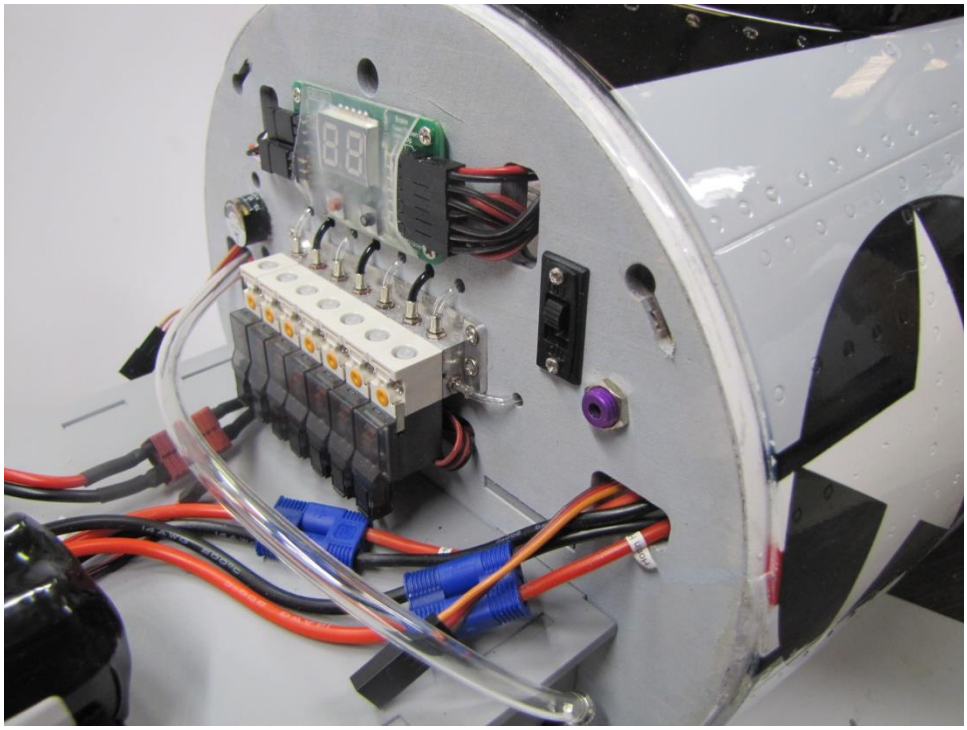
Note: These photos are from an earlier prototype. The UAT was mounted pointing forward on this model.

- ☐ Slide the tray through the opening as shown. Once in position, check for pinched wires or air tubing.
- ☐ Reinstall the smoke pump after the tray is in position. An 8" zip tie can be started with the tray out of the aircraft.

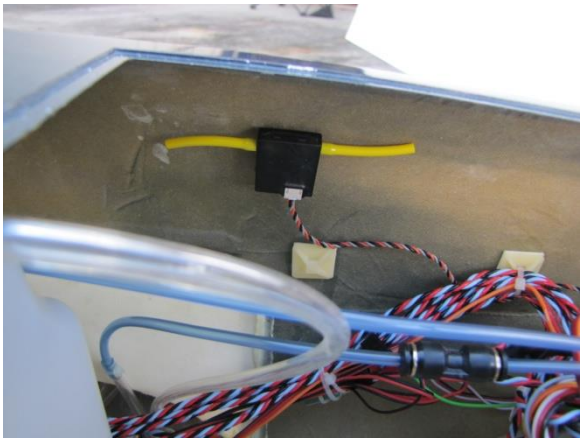
☐ Reinstall the (2) Phillips head screws to secure the tray.

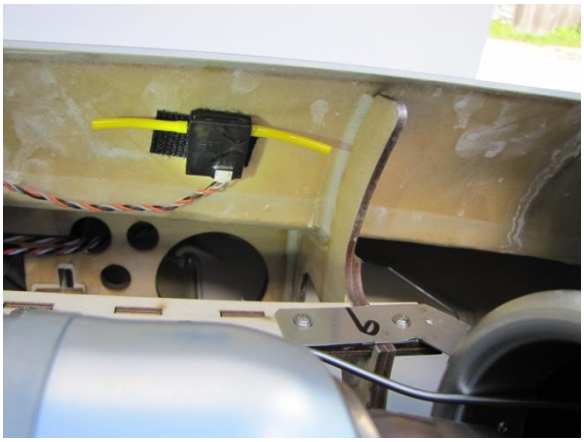
Switch

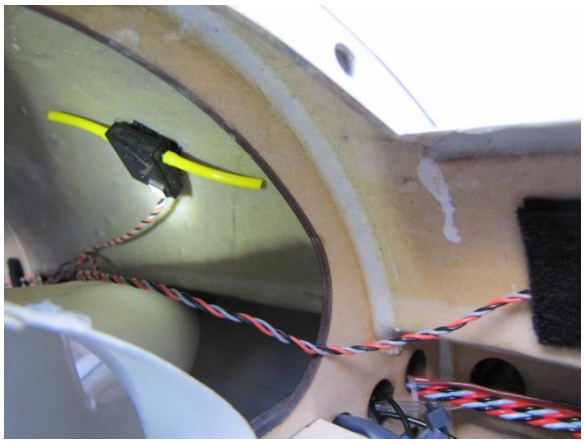
☐ Mount the Receiver's switch in the location provided.



☐ Mount Remote Receivers in various positions, follow the recommendations for your particular receiver. Use Aluminum Tape to secure the wires.

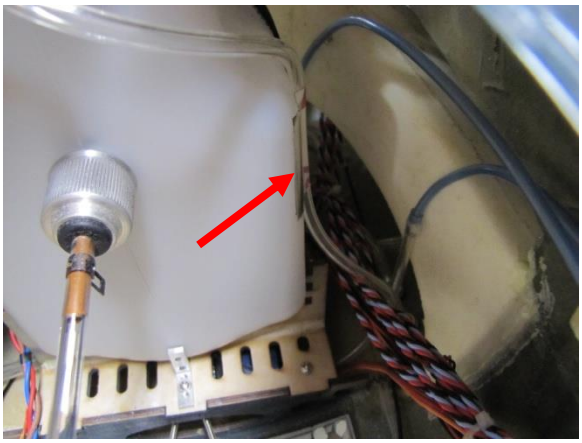






Final install Photos

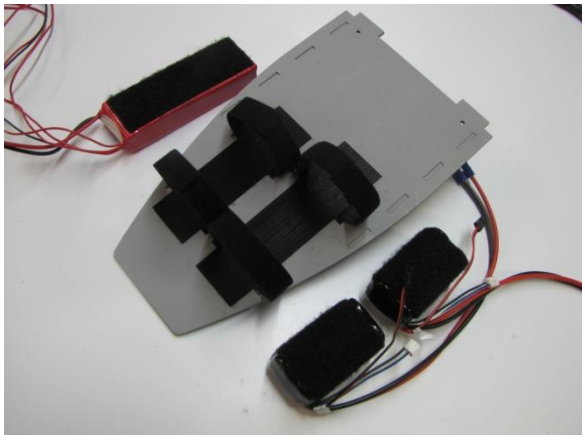
☐ Mount the fuel filter vertical; a BVM Fuel Pump Mount BVM# PA-SR-0064 was used.



☐ A piece of aluminum tape (arrow) secures the vent hose to the side of the fuel tank.

Nose Cone Section

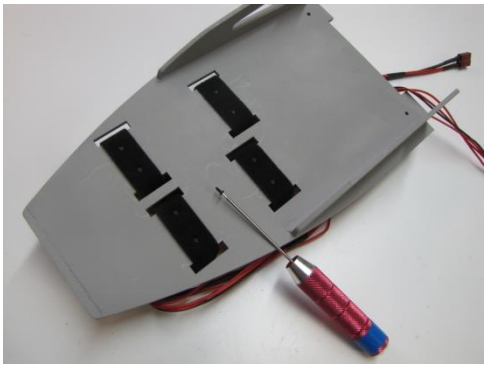
Mount RX Batteries

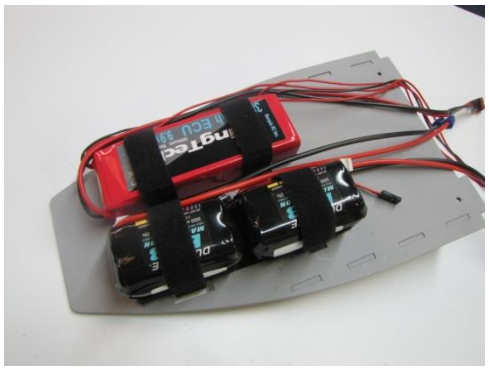


- ☐ Use sticky back Velcro and Velcro strap to mount the batteries as shown.

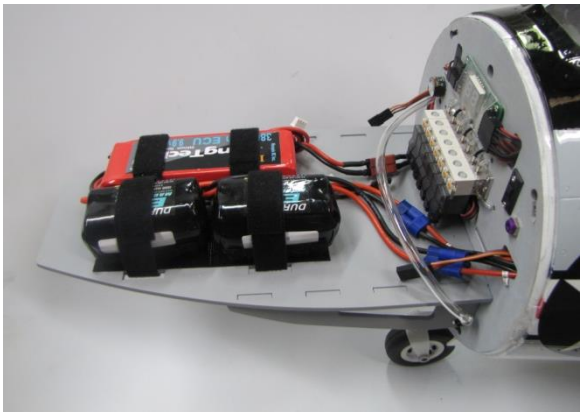
If using the recommended batteries, cut to length (2) 7.75” (ECU battery) and (2) 8.5” (Receiver Batteries) pieces of 3/4” wide double-sided Velcro.

- ☐ Use (8) #2 x 3/16” Button Head Screws to secure the Velcro straps to the bottom of the tray.



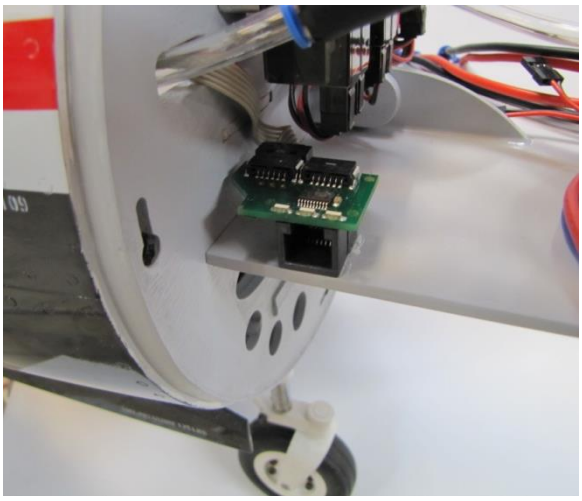


Front Battery Tray

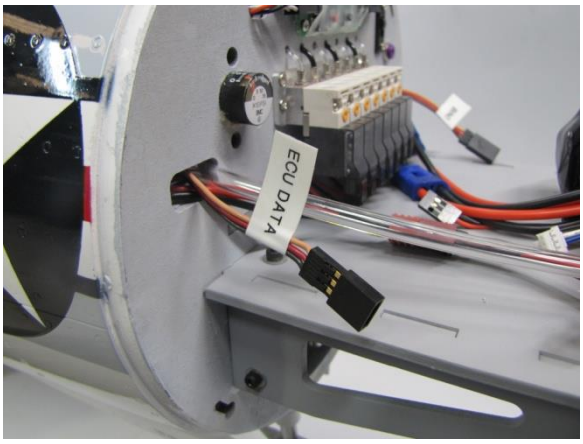


- ☐ Remove the (4) bolts and washers from the nose of the aircraft.
- ☐ Assemble the plywood nose formers to the fuselage as shown.
- ☐ Reinstall the bolts and washers.

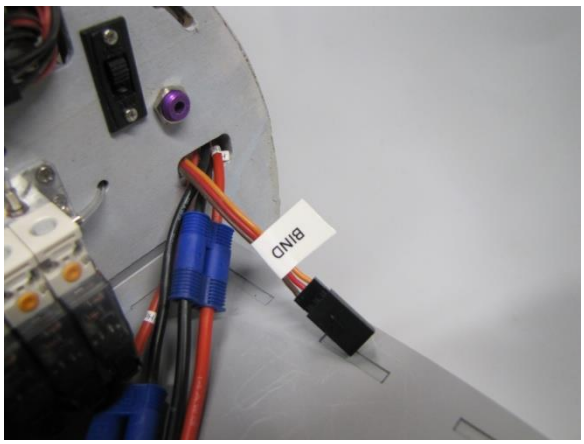
Miscellaneous Equipment



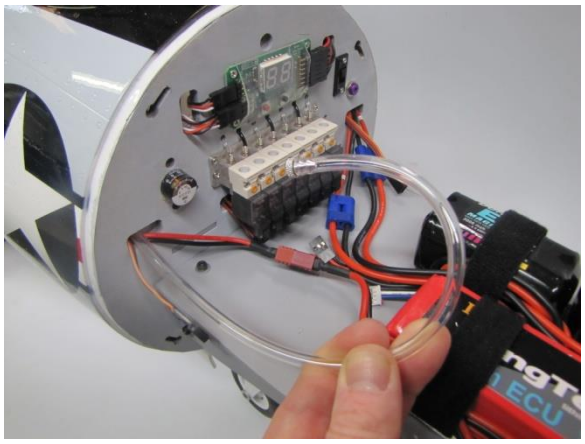
☐ The Jet Cat Mini I/O Board is tack glued in place. This area is a convenient location for the I/O board, Mini GSU, or Mini HDT.



☐ The KingTech Data connection is brought to the front using a 9” extension.



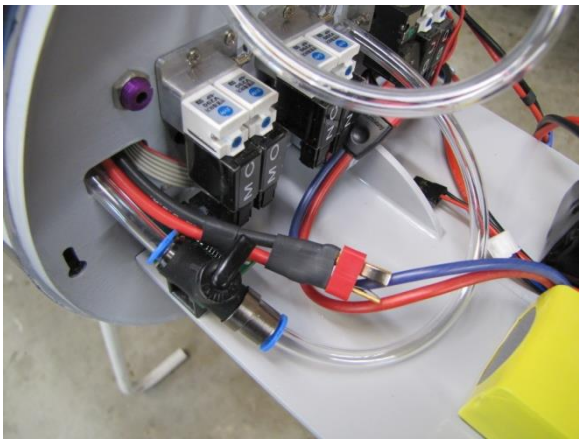
☐ The receiver’s bind connection is brought to the front using a 12” extension.



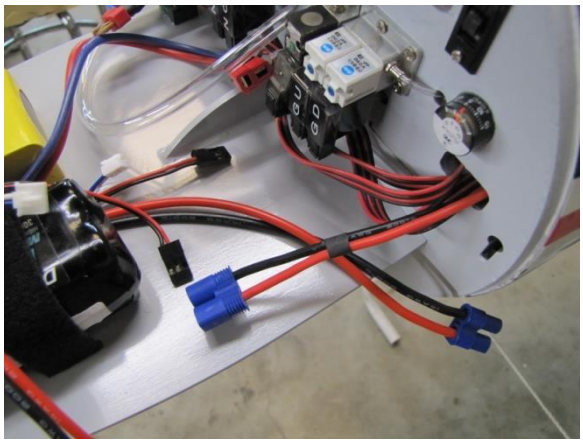
☐ Fuel system “fill line” is routed from the BVM UAT as shown. Trim end occasionally to keep aluminum plug fitting tight. A suction leak would cause a flame out.

Battery Extensions

- ☐ Because a larger ECU battery was used for ballast and capacity reasons. A 9” extension “Multiplex to Male Deans” adapter was made for the battery to reach the Jet Cat ECU. This adapter also made the battery connections more convenient. The standard battery will reach the ecu, but the connection will be less convenient. (prototype shown)



- ☐ (2) 6” EC3 to EC3 extensions are required to connect the batteries to the receiver. BVM# VJ-EFLAEC311 (prototype shown)



Nose Cone

☐ Apply Z-42 to prevent the bolts from moving inadvertently.

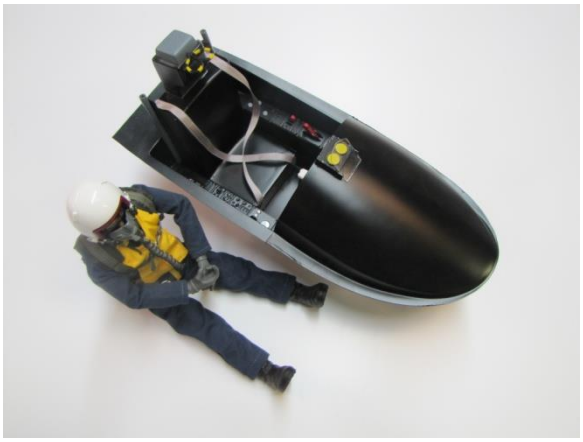
☐ Install the (4) 3mm bolts as shown.

☐ Set the final depth of each bolt, one at a time. Install the nose cone by twisting the nose cone a few degrees clockwise. Once each bolt is set, move to the next.

☐ Adjust the length of the four bolts to a suitable amount of friction.

BVM factory demo Cougars have never had a problem with this method of attaching the nose cone. It is very convenient.

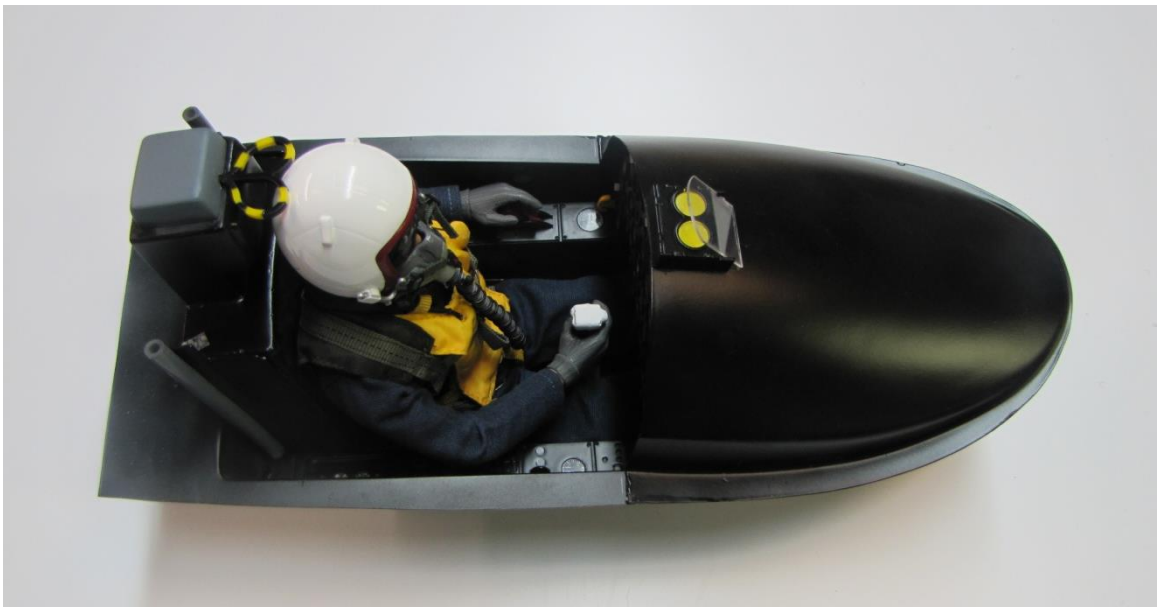
Cockpit/Pilot

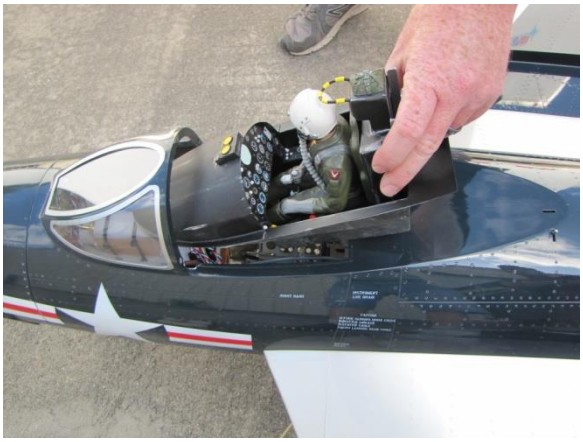


- ☐ Use a Dremel and various bits to remove the base of the seat. This will allow the 10" pilot to sit at the correct height.
- ☐ Remove the pilot's legs at the knees. It is not necessary to cut his pants.

See www.shopbvmjets.com/Pilots for pilot options.

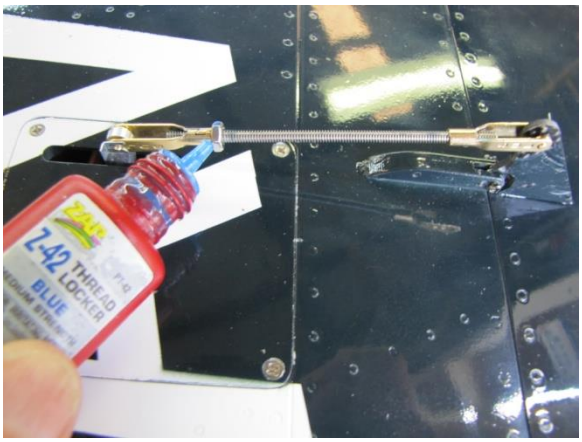
10" Jet Pilot shown BVM # V-WB-10" Jet Pilot





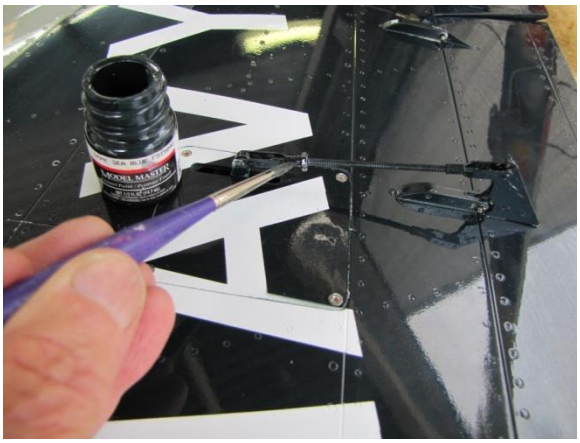
Wing Section

Painting Aileron and Flap Linkages



☐ Apply Pacer Z-42 to the flap and aileron pushrod clevises and hardware.

See previous note about the painting in “Rudder and Elevator Linkage” section.



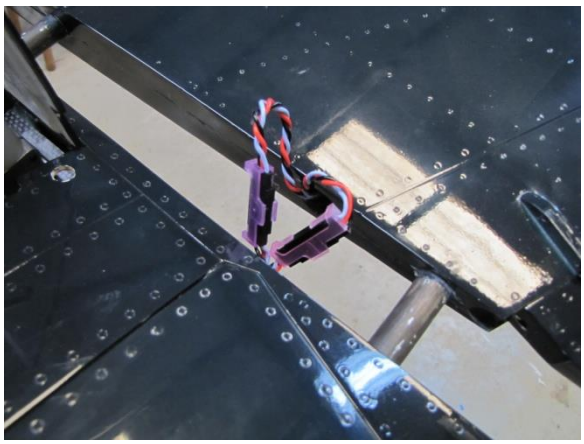
☐ Brush paints the external aileron and flap linkages. Use the appropriate color and a small brush. Avoid getting paint on the clevis. The servo cover screw heads can be hidden with paint as well.

Secure Flap Hinge Bolts

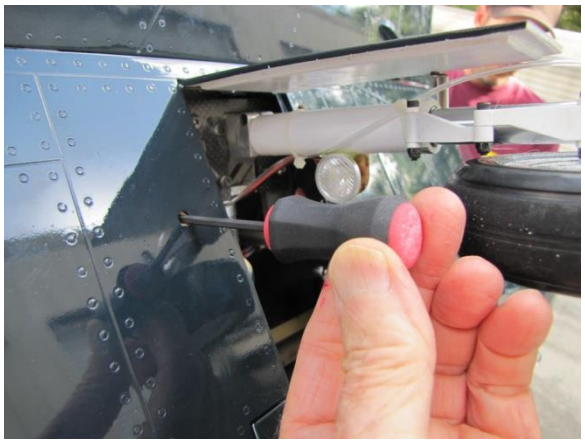
☐ Use Pacer Z-42 to secure the flap hinge bolts. A drop on the extended threads is sufficient.

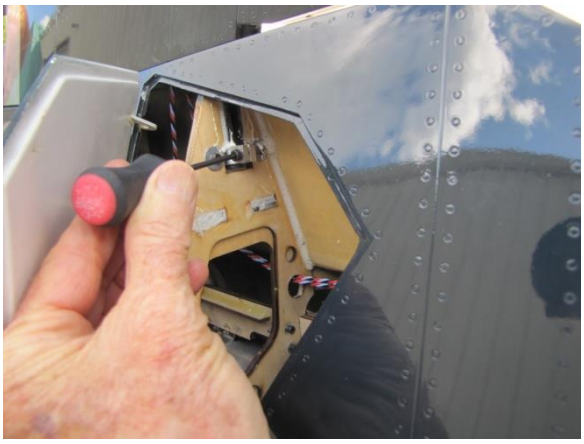
Installing wings

- ☐ Use a drum sander to open the hole in the wing if the connectors fit too tight. This oblong hole is 1-1/4” long. Be very careful not to injure servo wires.



- ☐ Connect Aileron and flap servo connection and install a servo clip or tape to secure.
- ☐ Connect NAV and strobe light connections.
- ☐ Insert wires into the wing while installing onto the fuselage.





- ☐ Tighten front and rear clamp bolts using the shortened 3mm ball end wrench.
- ☐ Reverse these steps to remove the wings for transport.

Important! The clamping bolts have “E” clips on the ends of the bolts to prevent the bolt from falling out during transportation. Do not continue to loosen the bolt once you feel the resistance of the “E” clip, you will damage and lose the “E” clip.

Lubing the Brakes

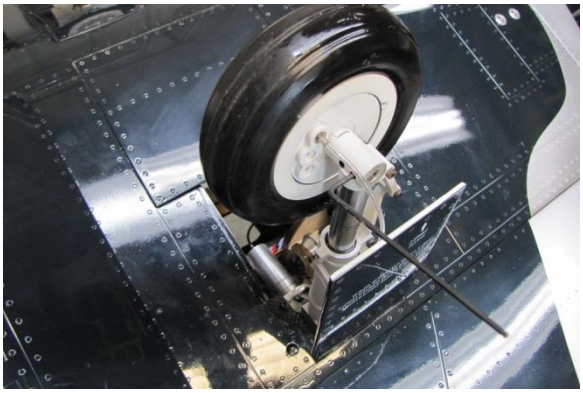
Your aircraft’s brakes have been lubed at the factory. If the braking action is not to your liking, add or remove O-ring Lube as required.

Note: The main wheel brakes on earlier versions are activated by a simple on/off control. Later models with the black control box use a pulsing action.

Sufficient lubrication applied to the wheel drum and the brake “o” ring allows smooth, straight stops. At 60+ flights, the prototype model’s tires show little wear.

- ☐ Remove the wheel by removing the axel set screws using a 2.0mm hex wrench.

Important: Do not lose the Nylon washers.



- ☐ Apply a generous amount of Super O-Ring lube BVM# BVM5779 to the wheel drum surface.

NOTE: Some early models have inflatable tires with small air fill nipples on the outside of the rim. Inflate to 30-40 psi for good ground handling.

Wheel Bearing Maintenance

- ☐ Apply Super Lube BVM# 5784 into the wheel bushings.

- ☐ Reinstall the axel, wheel, and brake.

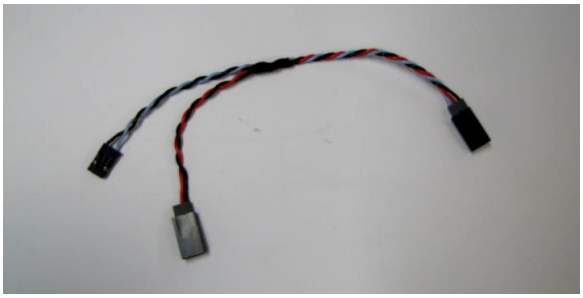
Systems Information

The Systems Information section of this manual serves to explain the installed systems in your aircraft. These systems have been Factory Tested; this section is here to guide you in the event trouble shooting is required. Additional information can be found for the proper setup of your radio system.

Smoke Pump

A single connection to the receiver is all that is required for operation. The pump draws power from the receiver so a proper receiver with adequate power distribution is required. Our prototypes use the Spektrum SPM12120 Power Safe receiver. The speed of the pump is variable based on the travel adjustment on the radio. BVM uses a simple on/off switch to turn smoke on and off. The “on” travel adjustment is reduced to 65%. This allows a sufficient smoke trail without wasting smoke fluid.

Note: A special “Y” cable is available if you prefer to use a second battery for the smoke pump. A 7.4 2 cell lipo is recommended.



Connections from left to right as pictured:

“To RX”, “Batt Input”, “To Smoke Pump”

CAUTION: The use of a Smoke System in any jet model requires extra vigilance of fuel accumulation in the fuselage and the possibility of an internal fuselage fire.

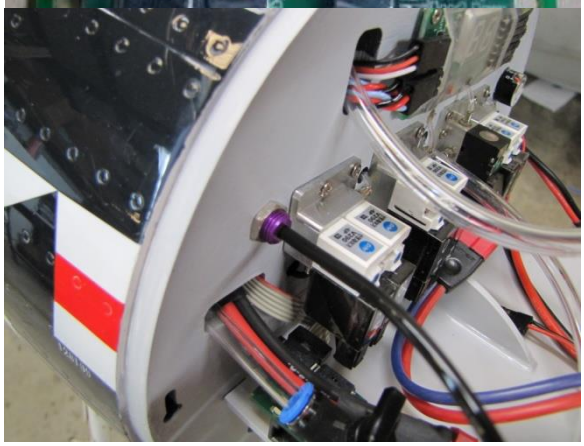
Relocating the Smoke tube

Note: Your aircraft comes with the smoke tube pre-installed. If your engine requires the smoke tube to be relocated, follow the steps below.

- ☐ Make a slight bend in the smoke tube using two pliers (if required).
- ☐ Aim the outlet of the smoke tube down the center of the tail pipe. The long smoke tube reduces the chance of igniting the smoke oil.
- ☐ Use a 6” long 1/16” drill to make the holes for the smoke tube mount.
- ☐ Reconnect the smoke line from the pump.

Air System and Electronics (For Models shipped prior to September 2015)

The aircraft is fitted with high quality electronic air actuation valves. These valves are controlled by the sequencer board shown. The sequencer features a digital display that displays the air pressure (bar) in the system. A low pressure failsafe is set to extend the gear if the pressure falls below 3 bar in flight. The sequencer comes pre-programmed with sequencing delay. See the section titled “Landing Gear/Door /Brake Sequencer Instructions” if adjustments are required. The set of two valves are connected to the gear doors, open and closed. The set of three are connected to the landing gear; Brakes, gear Up, and gear Down. The brake valve is non-proportional, either on or off. Use BVM Super O-Lube on the main wheel brake drums to prevent skidding. See the section titled “Lubing the Brakes” for instructions.



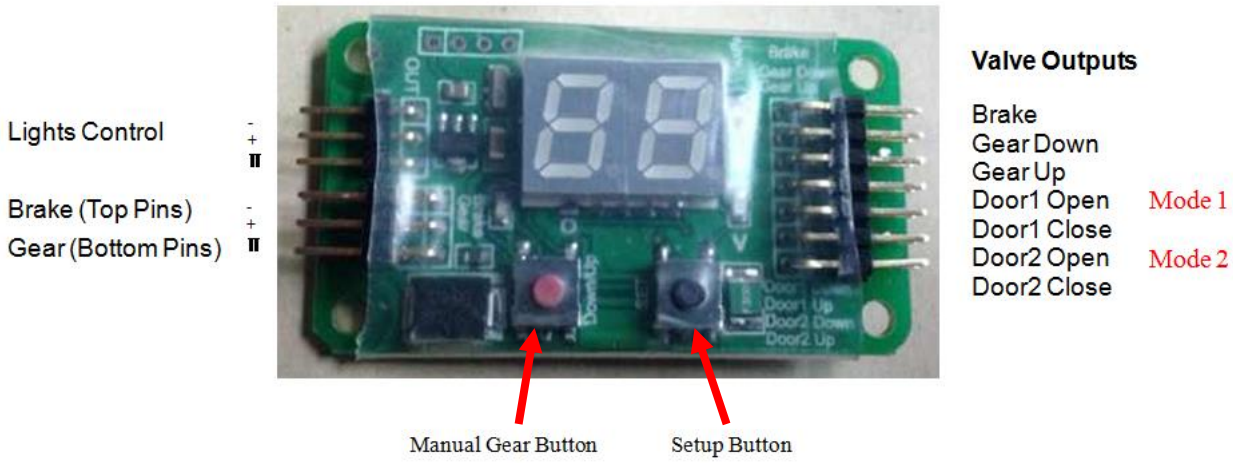
Fill the Air system to 70 psi, or 4.8 bar before each flight.

Helpful Tip: Use a scrap piece of BVM Air Line inserted into the fill valve; chamfer the end for easy insertion.

PSI to BAR Conversion Table

PSI	BAR
50	3.4
60	4.1
70	4.8
80	5.5
90	6.2
100	6.9
110	7.6
120	8.3

Landing Gear/Door /Brake Sequencer Instructions



This extremely simple sequencer includes 2 modes of gear/doors sequence, and brake and landing light control. The sequencer features push button programming operation for sequence timing and low pressure failsafe protection.

Door Modes:

The Cougar uses Mode 1 and Mode 2.

Mode 1 (Nose Doors Stay Open)	**Mode 2 (Main Doors Close w/ Gear Down)**
Gear Up: gear up→door close **Gear Down:** door open→gear down	**Gear Up:** door open→gear up→door close **Gear Down:** door open→gear down→door close

Black Button:

Pressure/Voltage Display: Press black button to toggle between Pressure and Voltage. Values will display on LCD display.

Low Pressure Failsafe Adjustment: Hold the black button when Pressure is displayed to enter the “low pressure failsafe” set up. Increasing 0.2 bar for each press (we recommend 3 bar), maximum 5 bar. Value will restart when toggled over 5 bar.

Gear/Door Timing Adjustment: Hold the black button when Voltage is displayed to enter sequence timing setup. Increasing 1 second for each press, maximum 16 seconds, program will restart when over 16 seconds. The value sets only the time between “gear retraction and door closing” and “gear extension and door closing”.

The Cougar works well using a value of “2”.

Sequencer Instructions Continued

Red Button: (never used)

Red button: Manual gear up/down button when radio is off but system powered (no signal detected), and inoperative when radio is on or low pressure safe mode is activated. A battery could be connected, during aircraft setup, to the Gear input to power the system without a radio system connected. This button will not be used by most users.

LEDs: (Visible with power on)

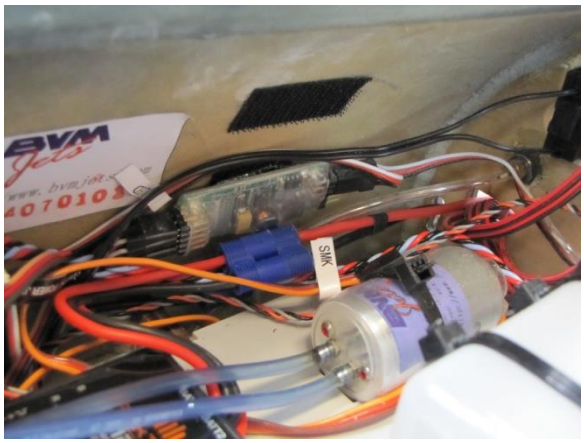
Blue LED: The blue LED displays the commanded landing gear position from the receiver. When the blue LED is “on”, the gear is down; while the blue LED is off the gear is up. The blue LED will flash when no signal or incorrect gear switch position is received from the radio when the system is turned on.

Notice: When the landing gear is down, the blue LED must be on; this is the default gear down signal for system. Otherwise the landing gear will be commanded “up” when low pressure safe mode is activated. Verify your landing gear is extended when pressure is below the failsafe value.

Red LED: The red LED indicates for pressure warning, LED will flash when low pressure safe mode is activated. Re-pressurize the air system above the safe pressure to resume operation.

Green LED: The green LED indicates receiver voltage is displayed on LCD screen.

Light System



NOTE: Your Aircraft comes with the light system pre-installed with only one connection to the receiver required. If you decide to relocate or modify the system, see below.

- ☐ Use sticky back Velcro to secure the Light Controller to the side of the fuselage.

  Note: The light controller has a plug labeled “LED” that plugs into the light channel on the RX. A second wire labeled “GEAR” connects to the landing gear sequencer. This allows the landing lights to turn off when the gear is up.

  Note: “Thro” input is not used. There should be one set of open pins on the output side of the light controller, these are unused.

  The light channel coming from the RX has three positions, Off, NAV Only, and NAV and Landing lights.

Central Control Unit Instructions

A) ON/OFF (Power Switch): Hold this button down to turn on the power.

Caution: even if power is turned off, the LED remains on which indicates power is connected to this controller. Make sure to always disconnect the Receiver Battery after a day of flying; otherwise the battery will be exhausted by this control unit!

NOTE: The **BATT** connection is only used for set up and testing the Black Box when no Receiver Battery is connected. It is not intended to be used in normal operation.

B) Manual button
B-1) Long press- Holding this button down will retract the gear.

NOTE: this function only works when the transmitter is not connected. This is very useful for bench operation, etc.

B-2) **Short press**-Tap this button to turn the landing gear Failsafe on or off. When it's turned on, failsafe (F/S) LED is green and height is displayed in screen.

Example: When the screen displays 002, the height setting is at 2 meters. Press again to turn off this function. Screen reads "OFF".

NOTE: Refer to "C-4" to change this value.

The landing gear failsafe is a method of protecting your airplane from an accidental retract of the gear while it is sitting on the ground below the setting (ex: 002: below 2 meters). If the plane is sitting on the ground and a retract command is given, the gear will not retract. If you want to bypass this feature, toggle the F/S off by tapping the "Manual" button, this will turn the F/S LED red.

C) Setup button
C-1) Short press- Tap this button and the screen will display "PSI", Voltage ("V") and "RPM". The corresponding LED of each function will be on when it is displayed.

C-2) Long press- Holding this button down when "**PSI**" is displayed will enter the "Pressure Loss Protection Setup". This feature will deploy the landing gear in the event of a leak. Increase the feature by 10PSI with each press, max. is 60PSI. Hold the "SETUP" button down and the setting will be saved. Press the "SETUP" button and "V" will be displayed.

C-3) Long press- Holding this button when "**V**" is displayed will enter the "gear door time-lapse setup". Increase 1 second with each press, max setting is 15s.
Function: The gear door time lapse setting indicates to the nose wheel steering servo when to be on or off. When gear is up, the nose wheel steering servo is not active. When gear is down, nose wheel steering servo is active.
This procedure is on a time-lapse. The lapsed time is N-3 seconds. N is lapsed time of the gear door. When it's set up at 8 seconds, the recovery time of nose wheel is 8-3=5 seconds. Control recovers in 5 seconds after sending gear down command. Change the time-lapse of nose wheel by changing time-lapse of gear door. Hold the "SETUP" button down and the setting will be saved. Press the "SETUP" button and "RPM" will be displayed.

C-4) Long press this button when "RPM" is displayed to enter the height setting for the Landing Gear Failsafe (F/S) setup. If the airplane is below your height setting, the landing gear will not retract to protect your airplane from an accidental retract of the landing gear. The minimum setting is "002" which means 2 meters, max is "010" which means 10 meters. Hold the "SETUP" button down to save the setting and exit the menu or it will automatically exit in 5 seconds.

LED's Definition

Blue LED: Corresponds to the landing gear.
ON: Landing gear is deployed.
OFF: Landing gear is retracted.
FLASHING: Sequencer is not receiving transmitter signal or the gear switch is not in the correct position. Turn on or check the transmitter, make sure switch is in the correct position to eliminate the flashing.

IMPORTANT! : When the blue LED is on, make sure the landing gear is deployed! This is how the controller identifies the status of gear. Failure to do so will result in the landing gear retracting when Pressure Loss Protection is commanded. If the direction of gear down and corresponding gear door is incorrect, reverse it by switching the polarity of the appropriate gear and door 2-wire connections.

Red LED: Corresponds to PSI.
FLASHING: "Pressure Loss Protection" feature has been commanded. The landing gear will deploy automatically; the "Manual" button or transmitter switch will become deactivated and will not work. The pressure will have to be raised to a pressure higher than the previously set value **(Refer to C-2).** Resetting the value to "000" will eliminate the flashing.

Green LED: corresponds to Landing gear Fail-Safe (F/S).

When this function is on (Green LED), height protection is activated. If the airplane is sitting ground level while a retracting command is sent from transmitter, the controller will not execute this command until the plane flies up to an altitude of set value. If you need to test your landing gear on the ground, short press the manual button **(Refer to B-2)** to turn this function off. When the LED is red, the function is deactivated.)

Servo Wire Ports
Nose OUT- Steering servo connects to this port.
Nose IN- Connects to the steering channel of your receiver.

Air brake- Air brake outlets: Not used
Brake-Landing gear brakes: Connects to the brake channel of your receiver.

Light-Light control outlets- Connects to the light channel of your receiver.
Gear- Connects to the Gear channel of your receiver.
NOTE: A 3-step switch needs to be defined for the lights. First step- navigation lights on; second step-gear lights on. Third step is all lights off.

LED outlets
Both are for the light system.

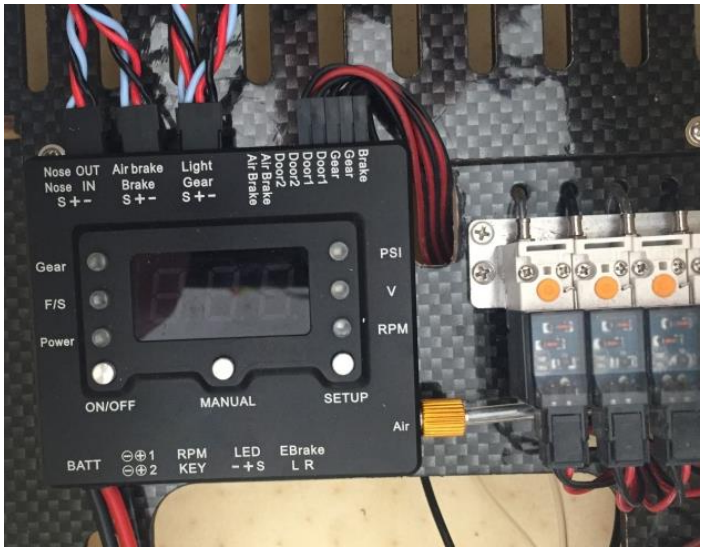
Light Connections (New Style Controller-September 2015)

If your F9F has the Central Control Unit Shown here, follow the “new style” instructions accordingly.

Note: The lights receive power through all leads from the RX to the Central Control Unit (Nose IN, Brake, Light, Gear)

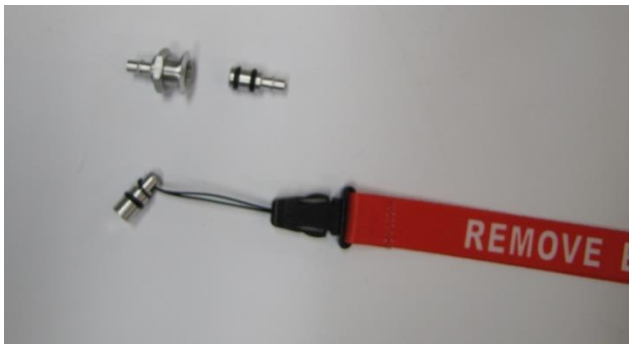
An optional battery can supply power through the “BATT” lead.

NOTE: Verify the polarity of all connections before applying power.

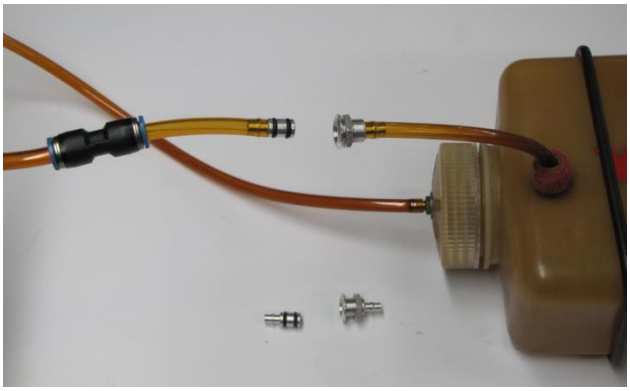


Flush Mount Vent and Overflow System

- ☐ A flush mounted vent system is used on both the fuel and smoke systems. A magnetic vent plug with red “Remove Before Flight” tag and BVM Overflow/Taxi tank conversion fittings are provided.



- ☐ Install the fittings to your overflow/taxi tank. Use an overflow tank while fueling to prevent spillage and to ensure fuel tanks are full before flight.



Use BVM Overflow tank Part #BVM6037

Below, the overflow/taxi tank is connected. Install the vent plug for transport.

Center of Gravity

☐ Measure aft of the Leading Edge (LE) at the wing/fuse joint 9.25”. Drill a 1/16” hole in the fuselage skin 1/4” inboard from the wing root and install a #2 button head screw on each side. This location is very forgiving; there is no need to move it forward.

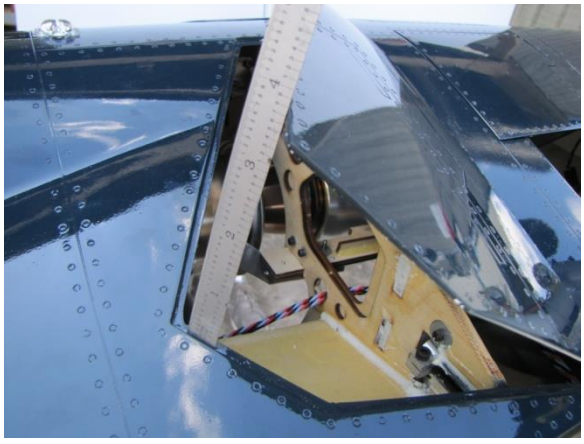
Balance the model fully assembled, empty fuel tanks, gear down, and a full UAT. With the correct CG, the model should balance level.

Control Surface Deflections and Expo Settings

Control	High Rate	Expo	Medium Rate	Expo	Low Rate	Expo
Elevator (measured at the Root)	Up 1” Down 1”	Up 7% Down 7%	Up 15/16” Down 15/16”	Up 4% Down 4%	Up 7/8” Down 7/8”	Up 2% Down 2%
Aileron (measured at the Ail/Flap Junction)	Up 1-7/16” Down 1-1/8”	12% / 12%	Up 1-1/4” Down 1-1/16”	5% / 5%	Up 1-1/8” Down 1”	3% / 3%
Rudder (measured at the Bottom of the top rudder)	+/- 1-1/8”	10% / 10%				
Control	**Take-Off Position**	**Landing Position**				
Flaps	1/2”	7/8”	**measured at the Ail/Flap Junction**			
Body Flaps	1-7/8”	3-3/4”	**See Photo Below**			
Elevator Mix with flaps	1/8” Up	3/16” Up	**measured at the Root**			
	Mid Position	**Full Position**				
Speed Brake	1-1/2”	3”	**Measured at the outside corner**			

Note: The BVM Demo plane is setup using the above Expo percentages. Positive values are used on Spektrum and JR radios, Futaba uses negative.

☐ The body flap measurement is made from the furthest aft point.



Connecting RX wires

The wires are labeled from the factory. If you are using the DX18, the program is available from BVM. Follow the chart below to connect the servos.

DX18 Connection Chart								
RX Port	**Throttle**	**Aileron**	**Elevator**	**Rudder**	**Gear**	**Aux1**	**Aux2**	**Aux3**
Surface	Throttle	Right Ail	Elev	Rudder	Left Flap	Left Ail	Right Flap	Left Body Flap
RX Port	**Aux4**	**Aux5**	**X+1**	**X+2**	**X+3**	**X+4**	**X+5**	**X+6**
Surface	Right Body Flap	Nose Steering	Gyro Gain	Speed Brake	Gear Seq.	Wheel Brake	Lights	Smoke

DX18 and DX18QQ Transmitter File

The BVM Demo models are setup on Spektrum DX18 transmitters. The file, if requested, has all the mixes, rates, expos, and settings done for you. Setting the sub trim and travel adjustment must be accomplished by the modeler for the specific aircraft. Each aircraft is tested at the factory using a similar program.

Important!!! Check the directions of all flight controls before each flight.

Switch/Lever/Trimmer	Channel	Output
Switch A	X+3	Landing Gear, Down is Down
Switch B	X+5	Lights, Down is off, Up is on
Switch C	Elevator Rates	Up (0) is High
Switch D	Flaps and Body Flaps	Up is Normal flight Mid is Take off Flap Down is landing flap
Button I	Throttle Cut	Throttle Cut
L. Trim	Steering Trim/Aux 5	Down for Right Steering Trim Up for Left Steering Trim
Switch E	X+2/Speed Brake	Up is speed brake up
Switch F	Aileron Rates	Up (0) is High
Switch G	Rudder Rates	Down/Away (0) is High
Switch H	X+6/Smoke	Down (0) Smoke off Up (1) Smoke on
Right Lever	X+2/Brakes	Up/Away – Brakes off Down/Pulled – Brakes on

First Flight Profile

Flight Time

The BVM demo model's transmitter timers are set for 7 min. On the first flight, land a few minutes early to check fuel consumption. Adjust the flight timer accordingly.

Taxi Test/Engine Run Up

A taxi test should include a radio range check with the engine running at various power levels. Check that the wheel brakes are adequate and the stopping action is without skidding or pulling left or right. Be sure to shake the aircraft and push fore and aft with the engine at half power, this will help remove any trapped air bubbles in the fuel system.

Takeoff

Begin the takeoff roll by slowly advancing the throttle. Maintain runway center while holding about 1/2 stick up elevator; the Cougar will rotate when it is ready. It there is a cross wind, hold a small amount of aileron into the wind, apply opposite rudder as necessary.

Trim

Once in the air, use a medium cruise speed to set the trims. The aircraft should fly straight and level when "hands off". When the landing gear come down, a few clicks of up trim will be needed. This can be mixed in, or use flight modes to trim automatically.

Practice Approaches

Plan to allow at least one half of the first flight to practice approaches and go arounds. It is beneficial to become familiar with the low speed handing of the aircraft at altitude first. Save the aerobatics and air show stuff for later flights.

Landing

Landing is like most jets, "power on" during the approach. The Cougar is very resistant to stall, it is best to land nose high, touching on the main wheels first.

RX Battery Consumption

The average flight using the lights the entire flight consumes about 500 mAh. We recommend three flights and recharge. Use this data to calculate how many flights you can achieve from your system. The use of the smoke pump will consume more mAh per flight. 3000 mAh combined capacity is the minimum BVM recommends.

BVM is synonymous with "Success Jets." It is very important to us that you are successful with our products. This extensive manual reflects our sincerity. As always, your comments and suggestions on BVM products are appreciated.

Pilot’s Notes: