BVM PNP F-18C

1/5 Scale





Length: 121", Wing Span: 85.5" with Missile Rails

For transportation convenience: Length without Pitot Tube, Nose Cone, & Nose Cone Formers attached 106"

Weight: 54# single 59# twin Dry Fuel Capacity: 6L, Smoke Capacity: 2L

ASSEMBLY AND OPERATING MANUAL

Version 2 April 2024

Vne: Speed to Never Exceed= 160 MPH

Use a Speed Limiting System

Limit Engine Thrust to 72lbs

Equipped with HV Servos and should not be operated below 7.4 volts

CCU Pressure should be 75 PSI MAX



K9500 BVM-2024

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INTRODUCTION

Thank you for purchasing the BVM 1/5 scale PNP F-18. This model represents the latest in manufacturing technology and completion for the R/C jet enthusiast. The factory has built your model for you. Please inspect all aspects of your model. The two fuselage halves have been joined by the factory. Only a small amount of work is required to complete the assembly of your F-18.

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 a "Turbine Waiver" for operation in the U.S.A.

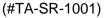
This is a sophisticated jet model aircraft. It must be operated with caution and common sense and requires some basic mechanical ability. Failure to operate this product in a safe and responsible manner could result in injury or damage to the product or other property.

Notice: Do not use incompatible components or alter this product in any way outside of the instructions provided by BVM, Inc. The BVM F-18 has been designed and flight tested around 120-160N class engines as a twin and 250-310N as a single. Damage to the aircraft may result from exceeding this thrust limitation (72 lbs).

Recommended Accessories

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

- ☐ Twin 120-160N engine of your choice or Single 250-310N.
- □ BVM Hi-Flow U.A.T.(2) for Twin Version
- □ BVM Hi-Flow OverFlow Tank
- ☐ Spektrum 20310T PowerSafe Receiver
- ☐ (2) 7.4v Batteries 3600 mAh RX
- ☐ BVM "O Clips"
- □ BVM Velcro Package
- □ Safety Wire
- ☐ Bavarian Demon Aero CortexPro Gyro
- ☐ (2)12" battery extension wire
- □ BVM Over Flow Tank (for Smoke System)
- ☐ Flush Mount Vent Fitting (For Over Flow Tank)
- ☐ Flush Mount Vent Plug (For Over Flow Tank)



(#TA-SR-1013)

(#VJ-SPMAR20310T)

(#V-PLURX15-36002)

(#PA-SR-0026)

(#PA-SR-0081

(BVM# 3030)

(#V-DA-BD-CortexPro)

(#VJ-SPMEXEC312)

(BVM# 6037)

(#PS-SP-0301)

(#PS-SP-0302)



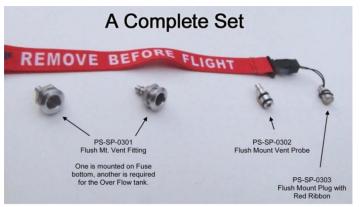
Safety Wire











A Smoke System will require a complete second set of the parts.



BVM # 6047 Fuel Over Flow Tank
Can be used with Flush Mount fittings or Standard fittings.

Required Tools

A combination of Metric and SAE hex socket and drivers along with a small standard and Phillips head drivers will be necessary.

- □ 9/64" Long Ball Driver
- ☐ 2MM Wrench
- □ Philips Screw Driver
- □ 5.5MM Nut Drive
- □ 3/32 Ball Driver

List of Adhesives/Lubricants Available at BVMJets.com

BVM Aeropoxy		# 9566
BVM Qt Poxy		# 9580
Zap-A-Goo		# PT12
Pacer Z-42		# PT42
Super O-Lube		BVM #5779
	" ~ " ~ "	

- □ BVM Thin Lube for "O" Rings□ Axle Super LubeBVM # 1945BVM #5784
- □ Dry Lube BVM# 1947

















Available Options Available at BVMJets.com

1/5th Pilot (15") BVM# V-WB 1/5 Pilot

Bavarian Demon Aero CortexPro Gyro (#V-DA-BD-CortexPro





WING PREPERATION

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.

☐ The wing is shipped without the Aileron and Flap assembled. Using a 2mm socket wrench and a 5.5mm nut driver remove the nut and bolt that are through the Aileron and Flap hinge blocks . Slide the Aileron and Flap back into place and put the bolts back in place.



Option

We moved the Aileron Ball Link down one hole position for better resolution. Achieving the proper control throw was not an issue.



☐ A small amount of BVM Dry Lube should be applied to the hinges.

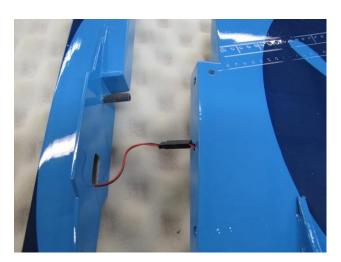


☐ A small BVM Dry Lube on the Ball Link will also help make a smoother movement.



MISSILE RAIL INSTALLATION

☐ The Missile Rail has an LED light on the tip. It's a simple connection and you're done. Tape or a keeper can be used to secure the connection.



☐ The Missle Rail is held to the wing with two carbon dowel pins and a clamp inside the wing tip. A 3/32nd driver is used to tighten the clamp.

NOTE: Asmall amount of Medium CA can be wiped on the carbon dowels to make the fit a bit more snug if needed.



STABILATOR PREPERATION

☐ There is a small nylon washer that simply slides onto the pivot shaft.



☐ If you have to take the Stabilators off for transportation, it is a good idea to use some Zap goo to hold them to the root. A couple of small dabs is all that is needed.



☐ The nylon washer will not sit flush to the root. It will have a small gap in the front.



CANOPY AND SERVO REMOVAL

☐ Remove the bolt and nut that holds the ball joint between the carbon arms. You will need a 2mm hex wrench and 5.5mm nut driver.

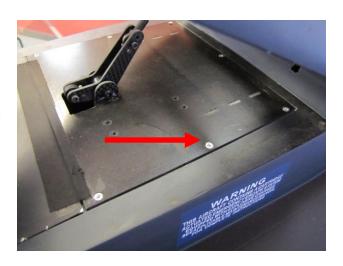


☐ This part is a little tricky. You need to reach your hand inside the fuse towards the back of the canopy. There is a small metal rod with two pieces of tubing on it. You have to slide the rod to one side and it will slip out of the frame, then back to the other side and the rod will come out of the frame and the canopy will come off.



SERVO PLATE REMOVAL

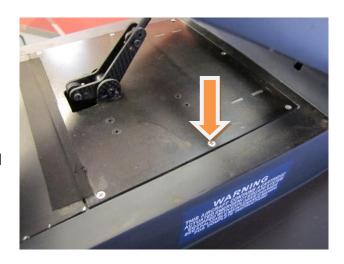
☐ Once the canopy is off of the model you can remove the 7 screws from the servo plate and remove it from the model. This will give you acess for the next steps.



CANOPY AND SERVO INSTALLATION

☐ When satisfied with everything inside you can put the servo / canopy mount back in the model with the 7 screws you took out before. There will also be a servo lead to plug in that controls the canopy.

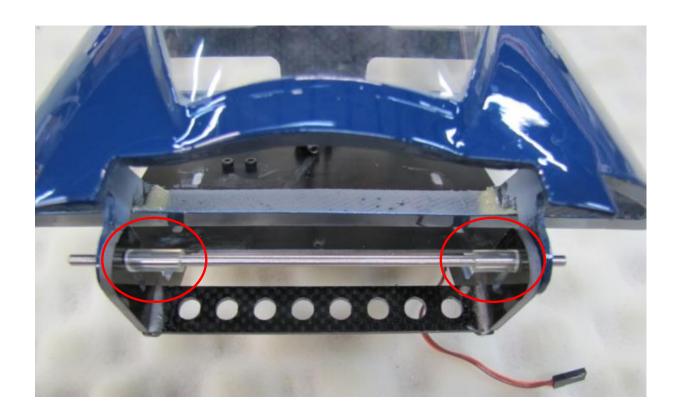
NOTE: A small drop of Thin CA in the holes will make for a nice tight screw fit. Repeat for all 7.



CANOPY FRAME INSTALLATION

□ Like before, this is a bit tricky. Just take your time during this step. Take the small pieces of tubing that are circled in the photo and slide them towards the middle of the rod. Then place the canopy on the model and with the rod in the other hand reach inside the model and put the rod back into the canopy mount one side at a time. After that is completely take the small pieces of tubing and push them back out till they contact to the inside of the canopy mount.

NOTE: The canopy does pivot as well as slide up and down in the back.



☐ The ball link can now be put back into place with the bolt and nut you took out before.

NOTE: The connection rod from the canopy to the actuator arm can be adjusted if you need to fine tune your opening and closing.



ADJUSTING THE CANOPY

☐ The servo actuator arm is what holds the canopy in place. It moves forward to close the canopy and pulls it down at the same time. To check to see if the canopy is properly set, pull up on the back of the canopy frame from both sides at the same time. The frame should move a little, but you should not be able to pull it up. The actuator arm is just about as far forward as it can go when canopy is fully closed.

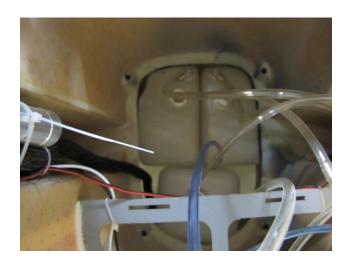


FUEL SYSTEM

☐ Removing the tray it will give you better access to the main tanks as well as the header tank mount.



☐ Remove both tank caps and check that the hoses are secured with safety wire or your favorite clamp.



☐ We use safety wire to secure the hose to the fittings. The clunk side and the cap side are both done the same way. BVM uses two wraps around the fitting. Once done they can be put back into the tanks.

NOTE: Also check that the hoses do not hit the back of the tanks. They should be about 1/2 inch from the back. The BVM demo model was spot on.



- ☐ There are some fuel line adapters that will come with the twin engine version. This will allow you to adapt your hoses to 6mm to fit the BVM UAT. These need to be safety wired in place.
- □ **NOTE:** The single engine version will differ slightly and will not have adapters.



HEADER TANK MOUNT AND INSTALLATION

☐ The header tank mount will have to be glued into place. Scuff the area inside the fuse with a BVM scuff board and wipe clean with a rag and some denatured alcohol. The header tank plate has a cutout in the front. The Velcro strap is put on before installing in the fuse and held in place with medium ca glue. The tank mount is glued into the fuse using BVM Vpoxy. This plate will come with the header tank kit and will be the same for twin or single.



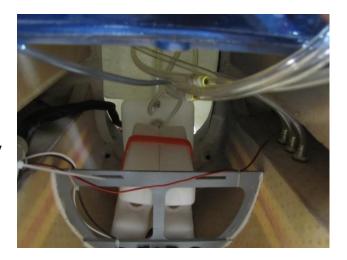
☐ Your header tank or tanks will have their own manual for assembly. With the twin remember to build a left and right tank.

NOTE: The tank in the photo is the right header tank. Also, safety wire or use your favorite clamp to secure hoses in place.



Once the header tank or tanks are done, they will sit in the model as you see here. You can also pack foam around them as well.

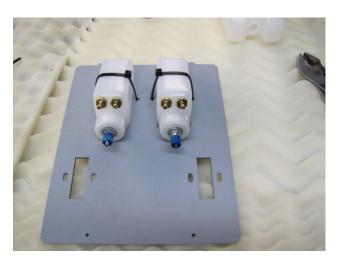
NOTE: The fittings in the photo will vary slightly from single to twin. This is a twin version so there are three vents. Two for the fuel and one for the smoke.



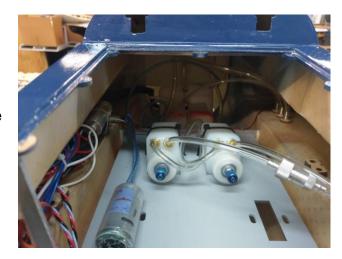
UAT MOUNTING TRAY

☐ The UAT tray is very straight forward. Insert the UAT or UAT's into the tray and secure with a zip tie. This will also hold the smoke pump and can be used for the ECU and fuel pumps as well.

NOTE: Follow your turbine manufacturers recommended mounting procedure for the ECU and the fuel pump.



☐ After the UAT or UAT's are mounted you can hook up the fuel hoses coming from the header tanks and put the tray back into the model. Remember to safety wire all fuel hoses in place.



TURBINE MOUNTING FOR TWIN

☐ To make things a bit easier to work with. You can remove the screws from the tailpipe and slide it back out of the way.

NOTE: The stock turbine rails are set for a larger can size turbine. BVM does have rails for other turbines and can make custom rails if needed.

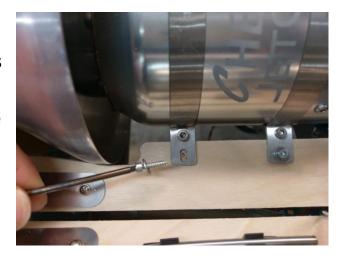


☐ Turbines should be mounted per engine manufactures specification. Make sure to have the turbines centered left and right as well as up and down in the tailpipe. When happy with engine placement secure the tailpipes back into place.



☐ The BVM demo model uses a #4x1/2 SHCS and a #4 washer to hold the engines in place. BVM uses a small drop of Thin CA in each hole before putting the screw in for the final time.

NOTE: Please use your preferred mounting hardware that you are comfortable with.







☐ Make sure to secure all wires and hoses in the landing gear bays. The two photos above show the left and the right landing gear bays where cables and hose have been secured out of the way. A small block of wood or cable mount with a zip tie will do.

☐ On the twin model we used Jet Central Cheetahs. The ECU's would not fit on the front ECU tray, so we mounted them on a vertical mount in front of the turbines. This is a mount that BVM has as an option if you wish to use it.

NOTE: Mount the ECU's per manufacture specs.



☐ The fuel supply hoses from the ECU's are routed through an opening in the former.



☐ After hoses from the ECU's are routed, they are connected to their proper locations.

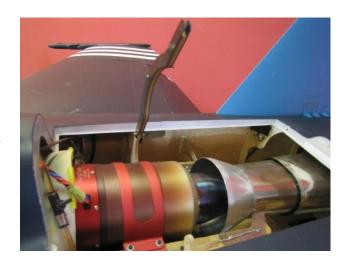


☐ The main supply hoses from the UAT's are routed down under the main tanks and exit into the engine bay. All the power wires and Rx connections can fit here as well.



TURBINE MOUNTING FOR SINGLE

☐ Remove the bolts holding the cross brace using a 2.5mm driver and 5.5mm nut driver.



☐ Remove the screws holding the tailpipe in place and slide the tailpipe aft. This will allow for easier placement of the turbine in the model.

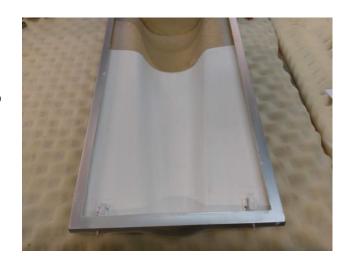


☐ Once the turbine is in the model slide the tailpipe back into position. Use the manufacturers specs on tailpipe spacing to set your engine in place. The BVM demo model uses #8 sheet metal screws to hold the engine in place. A drop of Thin CA is used in the screw hole before final tightening.

NOTE: Like before making sure to center your engine left to right and up and down.



☐ On both engine versions it is a good idea to paint the top of the hatch with BVM Heat Shield (# PA-MA-1940). The BVM demo model uses three coats on the hatch for protection in case of a flash fire.



WHEEL AND BRAKE PREPERATION

☐ Remove the nut that holds the main wheel in place and slide the wheel off. This is the same for both sides.



 $\hfill \square$ Use Super lube on the axle.

NOTE: Check the wheel bushings for grease after about 50 flights.



☐ Use a generous amount of Super O'Lube on the inside of the rim.



☐ For the best braking results, you want to use Super O'Lube on the brake O-ring as well.



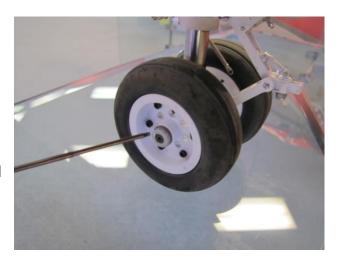
☐ If you want to remove the O-ring from the brake hub, use a popsicle stick that has been sanded down on one side to help remove the O-ring from the hub.

NOTE:DO NOT USE ANYTHING METAL THAT MAY SCRATCH THE INSIDE OF THE HUB.



☐ Remove the screws that hold the nose wheels in place using a 2mm driver.

NOTE: When putting the screws back in a small amount of blue Loctite should be used.

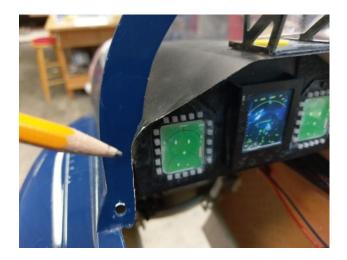


☐ Use a small amount of Super Lube on the axle for the nose wheel. This will be done for both left and right.



RX MOUNTING TRAY AND BATTERY LOCATION

☐ To access the RX mounting tray, you will need to pull the anti-glare shield out of the way. The shield is held in place by Velcro and will easily come out.



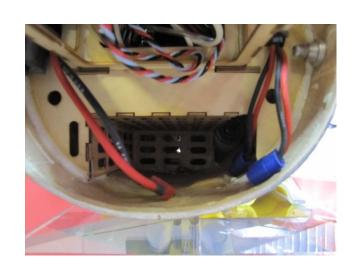
□ Once the glare shield is out of the way you will be able to access the two screws that hold the tray in place. The landing gear solenoids are mounted to the front of the tray as well. You should be able to pull the tray back where it is easy to work on. Mount your RX and Gyro per manufacture specs. The BVM demo model uses an AR 20310TRX and a Demon Cortex Pro gyro. All your servo wires and connections will be in this area as well. This is also an alternate spot for ECU and RX batteries.



NOTE: You will have to use battery extensions to get to the Spektrum RX and the ECU.

BATTERY LOCATION

☐ We made extensions to get our battery leads to the front; we have two for the RX and one for the ECU.

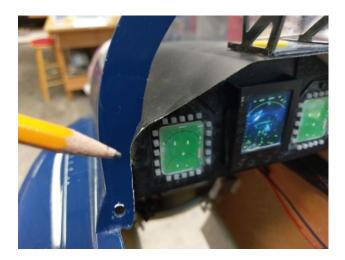


☐ Here the batteries are shown in place without the small amount foam we use to hold them from sliding around. The compartment is tight and will not need much to hold them.



COCKPIT MOUNTING AND PILOT

☐ Trimming the flange will help in allowing the glare shield to sit back slightly for a better fit The glare shield is held in place by small tabs of Velcro from the factory and has worked very well.



☐ The cockpit tub sits on a molded flange and can be secured into place by a couple of small screws in the corners.

NOTE: When the canopy closes it does pinch the flange a small amount.



PILOT MOUNTING

☐ To use a full-size pilot in the cockpit seat it will have to have the top of the seat cut out for clearance and the feet of the pilot will have to be removed.

NOTE: The pilot is held in with a patch of Velcro on his backside.



☐ The front of the cockpit tub is cut for clearance to allow it slip around a part that is mounted to the glare shield.



INSTALLATION OF THE WINGS AND TAIL

WINGS

☐ The wings slide into the fuse and have three connectors that must be hooked up. The connectors are polarized so they will only go one way.

NOTE: Use tape or servo locks to hold connections together.



☐ The wings are retained by two screws in the back and one in the front. A 9/64th driver is all you need to put the wings on.

NOTE: You do not have to make these super tight. A snug twist is all that is needed.



STABILATORS

☐ The Stabilators plug into the side of the fuse and are retained by a single clamp from the bottom. It uses a 9/64th driver to tighten the screw.

NOTE: A small amount Super Lube can be applied to the shaft coming out of the Stabilator. This will help it where it passes through the body.



Torque Drive Pocket Reinforcement Check

Check the torque drive pockets.

One early kit had a Stab drive pocket improperly installed.

Because you cannot see inside these structures, this very simple procedure will ensure that the factory workers did not overlook another one.

Stabilators

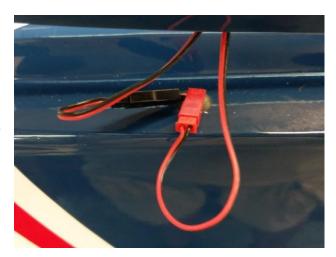
Drill .8" deep into the stab. The drill should engage balsa and/or glue. At the .8" depth there is a 1/8" plywood rib.

If there is a need for more glue, use the syringe to inject.



VERTICAL FINS

☐ The vertical fins have two connectors on one side and one on the other. They have two colors on the plugs because they do two different things. This is the right side of the model.



☐ The left vertical has only one connector.



☐ Verticals are retained in two spots. The front is in the engine bay area and the other is outside on the body.



☐ The rear vertical mount is through the side of the body. Both use a 9/64th driver to secure them in place.



NOSE CONE INSTALLATION (Old Style)

☐ The nose cone is held to the body with a pre- bent wire. You will squeeze the wire in the middle and line it up to the holes in the hinges on the nose cone and the body and release the wire.

NOTE: Please check the glue joints on the nose cone hinges.



NOSE CONE LOCK

(Old Style)

☐ There are two fiberglass molded parts that go on the nose of the F-18. The one on the right is glued to the body and the one on the left will be used to make the release for the nose cone. Drill a hole in the part to allow a 3mm bolt to pass through it.

NOTE: Once the lock is assembled you can use a small amount of QT poxy to help support the bolt in the fairing.

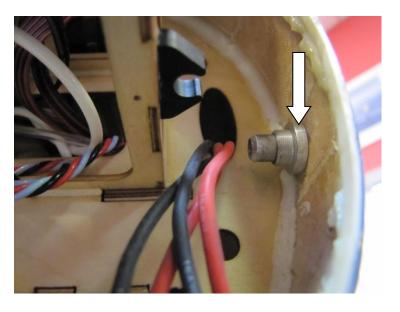


☐ Add a small piece of wire to the back of the fairing to stop it from spinning in flight.



☐ The nose lock has three parts. The 3mm bolt and spring and the lock itself. The spring slides into the lock body that is molded into the fuse and the lock slides on top of the spring and the 3mm bolt holds it all together. A small amount of blue Loctite on the screw will keep it from coming loose.

NOTE: The arrow is pointing at the lock body.



Control Surface Deflections and Expo Settings

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

Control	High Rate	Expo
Stabilator (measured at the	Up 2.25"	Up 20%
L.E.)	Down 1.6"	Down 20%
Aileron (measured at the Flap	+/- "1.25"	20% / 20%
Aileron joint)		
Flaps- (Take-Off & Landing)	Take Off	Landing
(measured at the Flap Aileron		
joint)	.75"	2.25"
Rudder (measured at the Bot.)	+/- 1.5"	20% / 20%

Stabilator Neutral position



The stabilator neutral position is .25 inches below the panel line measured at the L.E.

The takeoff Stabilator trim is .25 below neutral point measured at L.E.

The Landing Stabilator trim is .30 below neutral point measured at L.E.

Flush Mount Vent and Overflow System

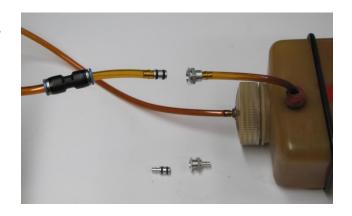
☐ A flush mounted vent system is used on both the fuel and smoke systems. A magnetic vent plug with red "Remove Before Flight" tag and BVM Overflow/Taxi tank conversion fittings are provided. (Tank not included)

NOTE: The Smoke system vent is located on the starboard (right) side of the fuse, while the Fuel System vent is located on the port (left) side.



☐ 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.



The vent plug is installed.



Center of Gravity

The center of gravity marked on the plane is what the factory demo aircraft used. You can also use the front spar should you want a more nose heavy aircraft.

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.

DX18-20 Connection Chart						
RX Port	Throttle	Aileron	Elevator	Rudder	CH 5	Aux1
Surface	Throttle	Right Ail	Right Elev	Rudder	Left Flap	Left Ail
		(Ail 2)	(Elev 2)	Right		(Ail 1)
RX Port	Aux2	Aux3	Aux4	Aux5	Aux6	Aux7
Surface	Right	Left	Left Elev	Gyro	Canopy	Nose Wheel
	Flap	Rudder	(Elev 1)			
RX Port	X-1	X-2	X-3	X-4	X-5	X-6
Surface	Leave	Leave	Smoke	Lights	Speed	Gear
	Open	Open			Brake	
RX Port	X-7	X-8				-
Surface	Brakes					

DX18, DX18QQ, DX 20 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.

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

Switch/Lever/Trimmer	Channel	Output
Switch A	X+6/Gear Flight Timer	(0) Gear Down
		(1) Gear Up/ Timer Starts
Switch B	X+4/	(0) Lights Off
		(1) Nav Lights On
		(2) Nav and Landing Lights On
Switch C	X+3 Smoke	(0) Off
		(1) Medium
		(2) Full
Switch D	Flaps Chanel 5/ Aux 2	(0) is Normal flight
		(1) is FlapsTake Off w/ up elevator mix
		(2) is Flaps Landing w/ up elevator mix
1		
L. Trim	Steering Trim/Aux 7	Down for Right Steering Trim
		Up for Left Steering Trim
Switch F	Aileron Rates	Up (0) is High
Switch G	Gyro Aux 5	(0) Off
		(1) Mid Rate 50%
		(2) High Rate 60%
R Knob	Aux 6 Canopy	Left Open/ Right Closed
Right Lever	X+5 Speed Brake	Up/Away – Brake Closed
		Down/Pulled – Brake Open
Switch E	X+7 Brakes	(0) Brakes Off
		(1) Brakes Mid/ Pulsing
		(2) Brakes Full Stop

First Flight Profile

Make the first Take Off with the gyro "off". See also BVM article "Gyro Sense".

Flight Time

The BVM demo model's transmitter timer is 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 remove any trapped air bubbles in the fuel system. Check the fuel line to the engine for "no bubbles".

Takeoff

Begin the takeoff roll by slowly advancing the throttle. Maintain runway center while holding about 1/2 stick up elevator; the F-18 will rotate when it is ready. It there is a cross wind, hold a small amount of aileron into the wind, be prepared with opposite rudder.

Trim

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

Practice Approaches

Save a few minutes at the end of your first flight to practice approaches and go arounds. It is beneficial to become familiar with the low-speed handing of the aircraft.

Landing

The landing is like most jets, "power on" during the approach. The F-18 does not stall easily, it is best to land nose high, touching the main wheels first.

The majority of the first flight should be spent trimming and practicing for the first landing. Save the aerobatics and air show stuff for later flights.

RX Battery Consumption

The average flight using the lights the entire flight consumes 500 mAh. We recommend two 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. BVM recommends (2) 3600 mAh batteries.

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:		