BANDIT arf

Assembly and Operation Instructions Manual

Limit Maximum Speed to 200 MPH and Max Thrust to 20lbs

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BOB VIOLET MODELS

Bandit ARF

Assembly and Operation Manual

INTRODUCTION

This instruction package is extensive, not because the model is difficult to build but because it represents a thorough effort to make the Bandit ARF assemble easily and allow the factory prototypes to be duplicated.

WARNING

This model is designed to safely operate with model turbine engines in the 13-20lb thrust range. The prototypes are powered with a JetCat P-60 and P-70 engines. Limit the thrust of any engine installed in this model to 20lbs of thrust.

1) A larger, more powerful engine could cause excessive speed and possible control problems or structural fatigue.
2) Any change on the exterior of the engine will cause cooling flow problems inside the By-Pass duct.
3) Installations that are not professionally engineered and tested can cause overheat problems inside the model.

The privilege of operating a turbine powered model aircraft carries with it an increased responsibility. Adherence to the manufacturer's specifications and the AMA regulations are included in this responsibility.

The BVM Bandit ARF is offered in this completely engineered, manufactured and flight-tested format. Please give serious thought before trying to modify or "improve" any facet of this power and airframe package.

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 the purpose of insurance.

A PERFECT FINISH?

Well-almost.

The color finish on the BVM Bandit ARF model is applied utilizing both paint in and out of the mold processes.

Sometimes, because of human error, the paint is patched and polished. The resulting appearance is better than 95% of what is accomplished by modelers in their shops and better than competitive ARFs on the market.

Should the finish be damaged, BVM stocks the color paint and hardener required for the repair. This is PPG paint, which is compatible with many urethane thinners.

If not experienced in the use of these paints, it will be best to seek the assistance of one who is.

COLOR BLEED

The model has been buffed at the factory. If any color bleed is noticed, such as red into white it can be removed easily. Use a small amount of auto polish on a clean white cloth and hand wipe the white area. The best polishing compound BVM has found is 3M Perfect-it 3000

THE SUN AND HIGH SKIN TEMPERATURES

The areas of dark blue or black trim will reach temperature as high as 180°F if the ambient temperature is 90°F. Usually, the dark color paint will show some reaction to these extreme temps. Shrinkage of the paint and epoxy glass is a reality with composite sandwich structure. That is why some home built (full size) aircraft of composite structure are limited to only white, yellow, or aluminum paint.

FINISHING YOUR ALL WHITE BANDIT ARF

If black, dark blue or similar dark colors are applied and if the model will be exposed to direct sun at ambient temps above 80°F, follow this 2-step procedure.

1. Apply the dark color and allow to cure for 7 days. Then, expose the area to 160+ degrees F for one hour. This can be done with heat lamps or the sun. Use a laser thermometer to check the skin temperature.
2. Repair any problem areas and then repaint and polish, Of course, to be safe, avoid using these dark colors especially over large areas of the tops of the wings and tails.

BVM's tests have shown that a black surface exposed to direct sunlight at midday in the southern regions of the USA would reach temps about twice that of the ambient temperature.

GUARD AGAINST SCRATCHES AND DENTS

WINGS & TAILS

These are very flight worthy structures. They are light and extremely strong in tensile strength, however, they will dent if mishandled. Always support these structures on clean soft foam rubber.

We have found that auto body fender stands (available at auto paint and parts suppliers) are very helpful in supporting and assembling models such as the Bandit ARF.

WAX THE COLOR PAINTED MODEL BEFORE ASSEMBLY

It is a good practice to apply (2) coats of automotive wax (such as Meguiars) to all of the painted surfaces before beginning to work on the model. This will help protect the finish from a fingerprint of epoxy glue that sometimes occurs. CA glues will eat through any waxed surface, so be extra careful when handling these adhesives.

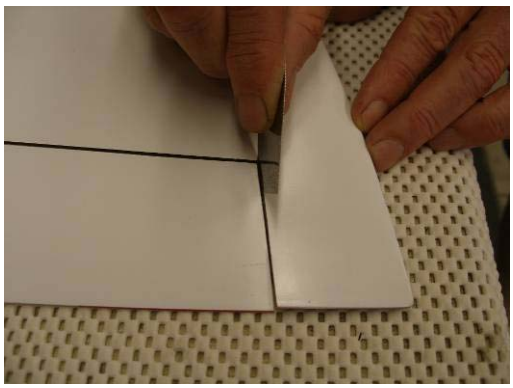
Following each glue application, always check the handled areas for glue residue. Remove any traces with Isopropyl alcohol and wax again.

CONTROL SURFACE FLEX HINGE TUNE-UP

Many ARF models utilize this system of hinging control surfaces because it is a very strong hinge system and is accomplished at the factory.

Occasionally, because of climatic changes, the bottom surfaces may “catch” or interfere with control travel surface actuation.

Should this happen, use a Perma-Grit FXT-103 fine abrasive strip to further bevel the LE of the control surface. Here the grit side is down. The TE of the main surface could also be adjusted by using the FXT-103, grit side up.



NOTE: When the model is not in use, allow the control surfaces (Ailerons and Elevator) to droop down. This helps to prevent the thin TE from curling inward.

CAUTIONS: DO NOT apply any primer or paint to the underside of the main surface trailing edge.

Very Important: Prior to each flight, check that the ailerons and elevators actuate properly, up and down.

PERMA-GRIT AND SOME OTHER USEFUL TOOLS

Perma-Grit tools are sold in the USA by BVM. These are very high quality, tungsten carbide grit abrasive tools that will make modeling easier.

TOOL LIST

2-56 tap
4-40 tap 2-flute
.050 Hex Driver BVM#2157
Perma-Grit small files BVM#NF-1
Large files are also handy (#LNF-1)
(2) X-Acto Razor Saw #235
Carbide Cutters (5/pk) BVM #2142
Set of ball end hex wrenches
Dremel drum sander
Dremel #409 cut-off discs and mandrel
A good set of small Phillips and slot end screwdrivers
12" steel ruler with 1/10th inch scale
#43 (.089”) 4-40 tap drill
1/16” drill
Pin vise to hold 1/16” drill bit
Perma-Grit cut off Disc RD-2
Perma-Grit FXT-103

ABBREVIATIONS USED IN THIS MANUAL

CA	Cyanoacrylate Adhesive	LE	Leading Edge
SHCS	Socket Head Cap Screw	TE	Trailing Edge
SMS	Sheet Metal Screw	F/G	Fiberglass
SHSS	Socket Head Set Screw	CG	Center of Gravity
CF	Carbon Fiber	C/L	Centerline
SHSMS	Socket Head Sheet Metal Screw	LC	Laser Cut
BHSMS	Button-Head Sheet Metal Screw	BHMS	Button-Head Machine Screw

WARNINGS

Use a particle mask such as 3M #6985 (available at auto paint stores) to protect from inhaling the glass or carbon fiber dust. Use this mask whenever sanding or cutting fiberglass or carbon fiber materials.

Use a professional charcoal filter paint mask (available at auto paint supply stores) when spraying any primer or paint. Spray out of doors or in a properly vented spray booth.

Use safety glasses any time rotary tools, such as Dremel #409 disc or Perma-Grit cutters, are being used.

GENERAL ASSEMBLY TECHNIQUES

THINK LIGHT

Extra glue, extra paint, extra resin will add up to a heavy model. Since 75% of the area of the model is behind the CG, a heavy model will only get heavier with the addition of nose weight.

ABOUT THE PACKAGING

The individual parts of the model have been packaged according to assembly groups. Labels on the plastic bags identify each group of parts.

FIBERGLASS PREPARATION

The rough side (glass cloth side) of these parts should be sanded with fresh #80 grit paper for best glue adhesion and surface preparation for the internal finishing.

Sand the sharp edges of the fuselage flanges on the hatch, cockpit, etc., then apply masking tape to these edges to protect hands and arms before sanding the entire inside of the fuselage. It is best to use rubber gloves and wear a long sleeve shirt to protect skin from abrasion. Sand these surfaces to remove the shine and loose fibers. Use goggles and a fine particle mask. Final trim of fuselage flanges will be dictated by equipment installation.

Support the fuselage on foam pads fore and aft of the area where a former is being fitted and glued in place. This will allow the F/G fuselage to retain its molded shape.

BVM's Scuff Boards are a handy addition to any project. They are especially convenient during the building of the Bandit ARF.

TRIAL FITTING PARTS

BVM makes every attempt to insure that the parts in our kits have the best possible fit. However, due to manufacturing tolerance accumulation, some parts may fit a little tight. Always trial fit parts with mating parts and if necessary adjust the part perimeter with Perma-Grit hand tools.

INTERNAL SEALING OF A JET

It is a safety consideration and investment protection to properly seal the inside of a jet model against inevitable oil soaking of the wood parts and glue joints. Certain areas must be treated during construction before they are rendered inaccessible.

The bare wood surfaces can first be sealed with CA glue or epoxy resin then use a completely fuel proof paint, such as PPG K-36 Prima and hardener (available at auto paint supply stores), and brush two coats on wood and one coat on the fiberglass and glue joints.

Drill a few drain holes in the bottom of the model to allow any accumulated oil to drain out between flying sessions.

GLUE, ZAP AND BVM AEROPOXY

Using high quality adhesives such as the ZAP products from Pacer Technology will help protect the investment made in this model. Through experience BVM has found these adhesives to be the best available to modelers, therefore they are referred to in this manual. Low quality glues deteriorate with time and could render the model unsafe.

For extremely high stress areas, such as the wing and tail mounting former to fuselage joints, BVM has made available a thixotropic, slow cure, aerospace grade, 2-part epoxy system that has been dubbed “AeroPoxy.” It is the strongest and best gripping adhesive we have found. Always squeeze a small amount from the nozzle into waste bin when first starting to apply the glue or if the nozzle has not been used for more than a few minutes.

GLUING TECHNIQUES

Except for bare balsa and plywood, scuff all mating surfaces to be joined with #80 grit paper. This gives “tooth” for the glue to form a mechanical bond. If paint is on the surface, sand through it. If fuel or grease are on the surface, first clean with acetone or thinner, then scuff. Clean off all excess glue - no globs or puddles - excess glue is excess weight.

For laser-cut plywood parts, use #80 grit paper to scuff the burned edges of these parts before applying glue.

AeroPoxy is best applied using an auto mix nozzle. Most applications can be accomplished with the 3-inch nozzle. Small, no nozzle hand mixes can be used where appropriate.

Once applied to a bulkhead-to-fuselage joint, use a finger or cotton Q-tip to make a neat smooth fillet, while removing any excess glue. Puddles of glue add weight and do not contribute to strength.

Always check the outside skin of the model to look for any glue residue and remove it with Acetone before it cures. AeroPoxy is tough to remove once it has thoroughly cured.

GLUE CHART

Surfaces to be joined	**Glue preferences**
epoxy glass to epoxy glass	ZAP CA, epoxy, AeroPoxy
balsa to balsa	ZAP CA
plywood to balsa	ZAP-A-GAP
poly ply strips to fiberglass	ZAP-A-GAP
carbon fiber to wood	ZAP-A-GAP
carbon fiber to fiberglass	ZAP-A-GAP, AeroPoxy
composite formers to fiberglass	AeroPoxy
plywood formers to fiberglass	AeroPoxy
hardwood to plywood	AeroPoxy

CAUTION: USE ADEQUATE VENTILATION FOR ALL GLUING PROCEDURES. IF YOU ARE SENSITIVE TO CA GLUES, USE THE ODORLESS VARIETY.

MOLDED CARBON FIBER PARTS

Canopy hooks, hatch latches, etc. should be scuffed first, then glued to the F/G with a thin bead of ZAP-A-GAP, then mechanically trapped with AeroPoxy lapped over flanges and onto F/G.

FILLER MATERIAL

Use sandpaper to prepare the surfaces for filler.

Surfaces to be filled	**Filler material preferences**
balsa	hobby spackling
fiberglass	microballoon/resin mix or polyester glazing putty such as Evercoat #400

RADIO EQUIPMENT WARNING

STOP!!! Failure to use the recommended servos, output arms, extensions, and hardware may result in a loss of control!

A list of the recommended servos and corresponding output arms can be found at the end of this manual. Use a JR “Matchmaker” or radio system to set neutral of each servo and install the proper control horns, in the proper orientation as outlined in each servo’s respective flight control installation section. Always center and install the correct output arms while on the bench, once the servo is in the aircraft access to the servo arm screw is sometimes limited. The JR Matchmaker makes this task very easy without using the complete radio system on the workbench.

Warning!! Damage to the transmitter module may result if the radio system is used on the bench for an extended amount of time with the antenna down. BVM uses a “Shop module” which is used for aircraft setup; this module never leaves the shop.

TIRES AND CONTROL LINKAGES

ASSEMBLING THE WHEELS, STRUTS, AND AXLES

- The sequence in the photo is the axle, wheel, brake, and strut is assembled. The two nylon washers prevent the tire from rubbing the strut under compression and side loads. After the assembly is completed, snug down the setscrew on the bottom of the strut with a 1/16" Allen wrench just enough to leave a faint mark on the axle.

TRIMMING THE AXLE

- Remove the excess axle protruding from the lower strut assembly. It is not necessary to make this flush; just enough to prevent interference with optional gear doors or extend beyond the wing's lower skin.

AXLE FLAT SPOT

- Disassemble the wheel and brake from the strut.
- Use a Dremel with a #409 cut off disk to make a flat spot on the axle.

TIRE SCREWS

These screws are necessary for good ground handling and proper braking.

- Use the supplied drill bit in a drill press or Dremel tool to drill the through holes for the tire mounting screws. Start from the smaller, threaded side and drill through to the larger hole on the opposite side of the rim.

Helpful Hint: If the bit misses the larger hole while drilling from the threaded hole or if the screw will not press completely through during final assembly, drill again partially from the opposing larger hole. The two drill paths will intersect to guide the screw through.

- From the larger hole, press the screws into the tire using the end of a Whia screwdriver. The cupped end will not allow the screw to slip. We like to press them in a criss-cross manner, start at 12 o'clock, then 6 o'clock, 1 o'clock to 7 o'clock, etc; this helps to keep the drilled holes from shifting.

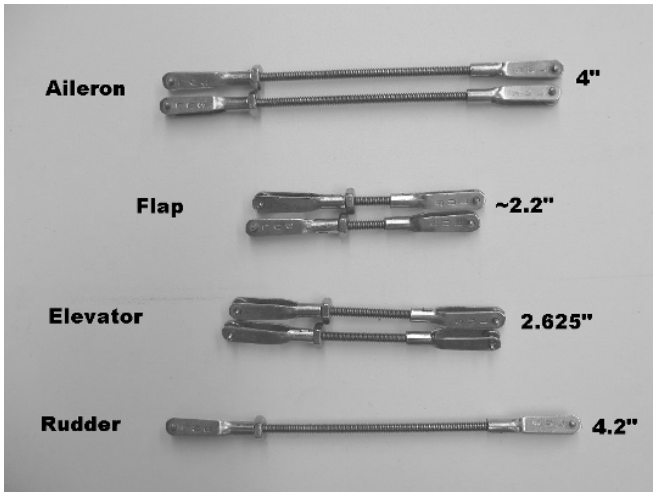
- Before tightening the tire screws, apply a drop of blue Thread Locker to the threaded holes. This prevents the screws from backing out under the vibrations of braking. Carefully tighten the screws, avoid stripping the threads.

LUBING THE BRAKES AND AXLES

- Apply a large drop of Super O Lube BVM #5779 to the brake drum surface of the wheel. Wipe this in until an even coat is distributed; apply an equal amount to both main wheels. At this time apply axle grease BVM #5784 to the wheel bushings and reinstall the wheels onto the struts as described earlier. Now the main wheels and brakes are complete.

CONTROL LINKAGES

All control linkages are assembled using threaded rods, nuts, clevises, and safety clips. The picture below shows the completed linkages with the appropriate pin-to-pin dimensions.



- Assemble each linkage by threading one nut onto each threaded rod. Next apply one drop of thread locker to the threads of the clevis, install the 4-40 clevis, and tighten the jam nut against the clevis. Repeat this for all (6) threaded rod linkages and set aside to dry.

- Trim the bare ends of the threaded rods to the proper length to allow full engagement of the clevis, while maintaining the respective pin-to-pin length.

WINGS

Helpful Hint: Before working on the painted composite parts, obtain a roll off bedding (Egg Crate) foam. Cut the foam to cover the work area; even allow it to roll over the edges of the table. BVM uses the type with many raised and lowered points; these points help to protect the model from wayward nuts and bolts. This simple precautionary step will minimize hangar rash.

WING MOUNTING

- Set wings onto the fuselage and insert the (6) 10-32 x 5/8" SHCS though the forward CF spars and thread them into the aluminum inserts in the forward bulkhead.

NOTE: It may be necessary to loosen the 4-40 x ¾" SHCS in the "C" channels mounted to the AFT bulkhead.

- Center the wing (top to bottom) at the flap LE relative to the wing fillets on the fuselage. Then tighten the 4-40 SHCS.

- Once satisfied with the fit of the wings, apply AeroPoxy or V-Poxy to the molded "c" channels to lock them to the AFT CF former.

To make the project move along very efficiently we choose to work on the left and right wings simultaneously. This means, complete 2 or 3 steps on the left wing, then do the same to the right wing. This method helps keep the mind fresh on the procedures and techniques learned the first time, plus the appropriate tools will already be selected and ready to use.

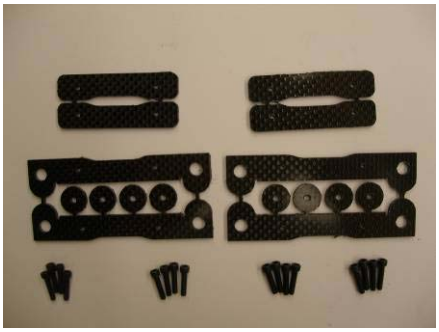
- Use a 4-40 tap to prepare the (4) flex plate mounting holes. Apply a drop of Thin ZAP to each tapped hole, then tap again.

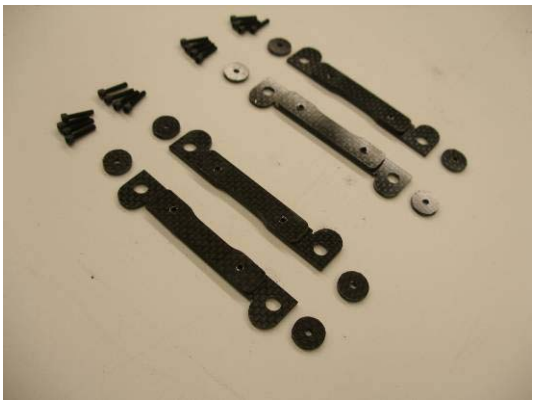
Important Note:

For additional strength, apply additional AeroPoxy or V-Poxy to all of the wood ribs junctions with the skin and other structural joints connected to the landing gear. To help protect the top skin, AeroPoxy or V-Poxy 2.75" x 2.75" squares of .020" polyply to the inside of the wing skin above the retract mechanism.

FLEXPLATES

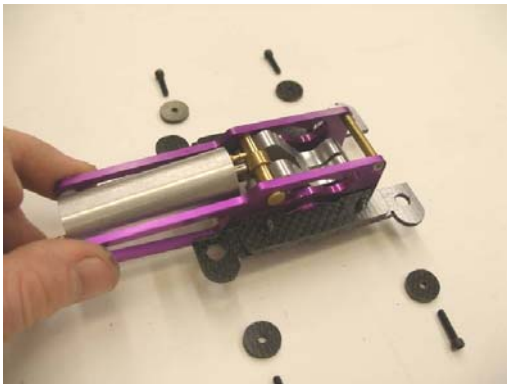
- Separate the CF flexplates, doublers and washers using a saw and finish with a sanding block.

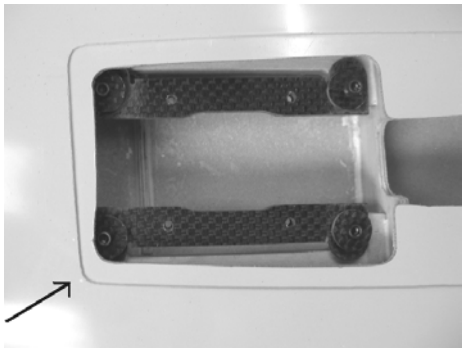




- Scuff the CF flex plates at the doubler and CF washer locations and one side of the CF washers. Glue the doubler to the flex plate.

- Assemble the flex plates to the CF doublers. Use a sharp 4-40 tap for the (4) 4-40 x ½" SHCS.

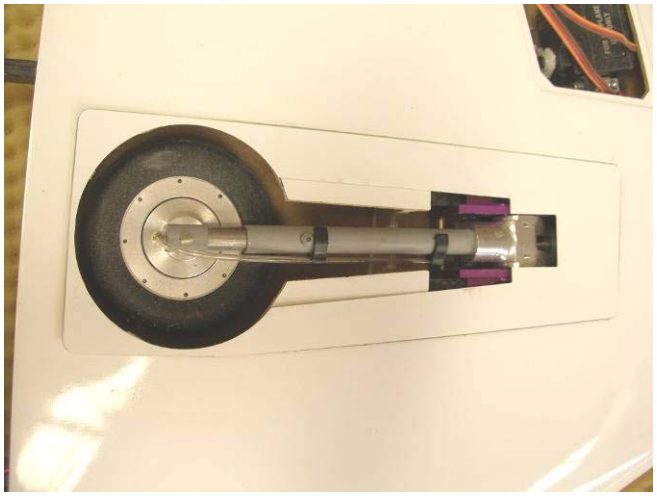




- Install the flex plates into the wing using four 4-40 x ½" SHCS. It is necessary to remove a little of the F/G flange for clearance of the driver.

ALIGNING THE MAIN GEAR

Due to the nature of “building in the mold” and the possibility of minor differences in production wing panels, the flex plates have been designed to allow the position of the main retracts to be adjusted. As one can see the outer holes on the flex plates are oversized, but the CF washers are drilled for the 4-40 bolts, this allows the retract unit to be positioned correctly without shimming, re-drilling, or sanding.

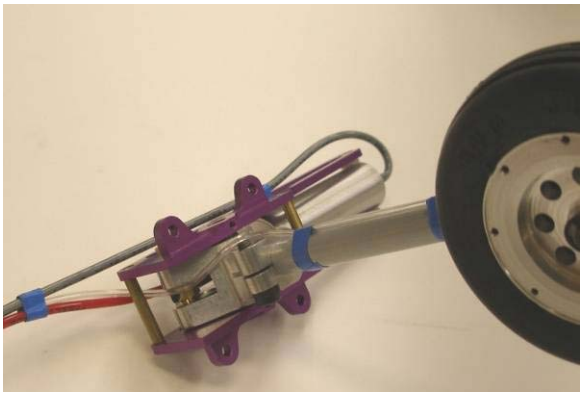


- The final position is set by the CNC Machined cover plate.
- Once satisfied with the alignment of the main gear and the wheel retracting into the wheel well, simply tighten the (4) screws and add a drop of ZAP to the CF washer and the flex plate.
- Adjust the main wheel toe-in to be between ½°-1° for good ground handling.

INSTALLING THE MAIN GEAR

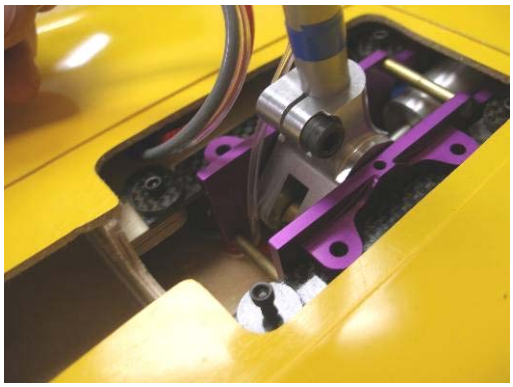
- Temporarily fit and remove the landing gear assembly into the wing. It will be necessary to open the flanges around the retract unit and the wheel well a small amount to allow easy installation and removal. Use a Dremel sanding drum for this task.

- Cut and install (2) sets of 20” red, gray, and clear airlines onto the retract assembly. The red line is for “Retracts up”, gray is for “Gear down”, and the clear is for the brake line in the wing. (Blue brake line will be used in the fuselage.) The photo shows a left retract unit, the gray line is always kept on the front of the retract unit. The clear brake line is also adjacent the front side of the strut and over the round brass frame cross member of the retract unit.

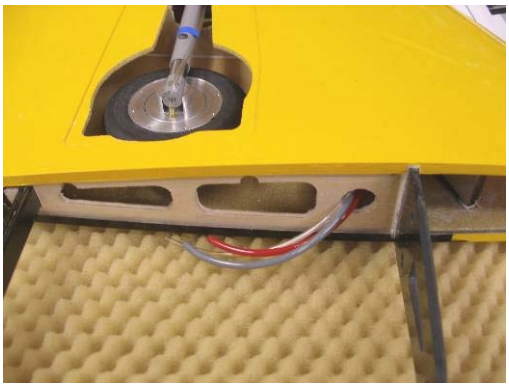


Helpful hint: To aid in the installation of the airline over the brass nipple; two methods work well:

1. **Gently chew on the end of the tubing, the saliva also acts to lubricate the tube as it slides over the nipple.**
2. **Carefully warm the end of the tube with a lighter, then spray a small amount of CA kicker in the tube and press it on the nipple.**



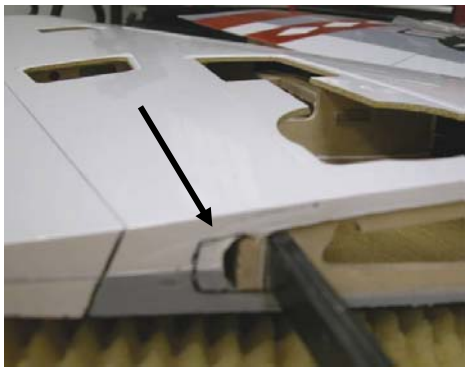
- Route the clear and red lines through the front landing gear plate as shown. Keep the gray line on the front side of the retract unit.
- Route the (3) airlines through the slot in the rib R2.



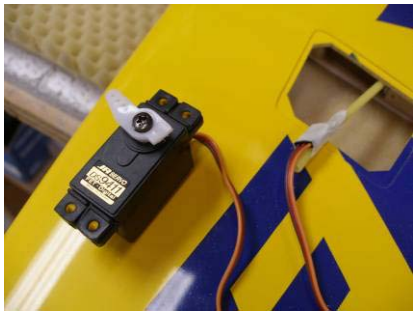
- Pull the (3) airlines through the circle hole just behind the main spar. Trim the airlines as shown and install the twist lock connectors. Put the male end on the red line and the female end on the gray line. This will help to avoid confusion while assembling the model at the field. Use the smaller twist connector for the brake line.

INSTALLING THE WING CONTROLS

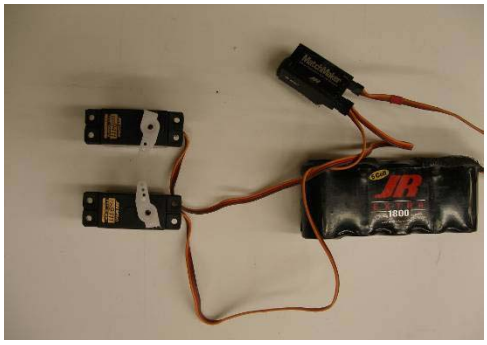
Aileron Servos



- Use a Dremel drum sander to remove enough material as outlined. The aileron and flap servo leads exit the wing root here.

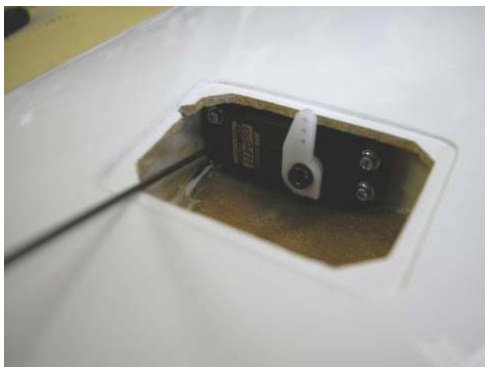


Helpful hint: A piece of yellow Nyrod makes a very good tool for pulling servo leads through composite structures. Simply bend the last (1) inch very slightly to allow a spinning action to help guide through formers and ribs. Use masking tape to temporarily attach the Nyrod to the servo connector, pull gently through the structure to avoid damage to the servo lead.



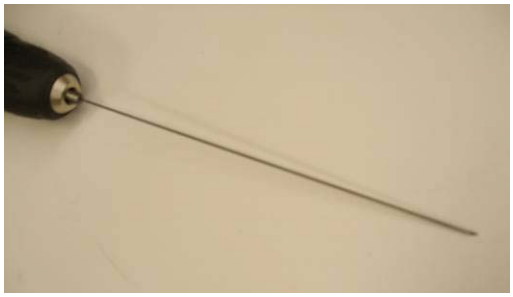
- Use a JR Matchmaker or a radio system to center the aileron servos and install trimmed double-arm, three holed servo arms. The linkage system is designed such that the servo arms are offset one tooth, or 10-12 degrees forward while the servo is centered.

- Use a 12” long 1/16” drill to allow the front servo screws to enter at a slight angle. See the Helpful Hint below if a long reach drill is not available.



- After routing the aileron servo lead to the flap servo pocket, install the four #2 servo screws. Use a high quality ball driver to avoid stripping the head of the screws. A small notch can be made in the servo cover flange to allow more motion if an “L” wrench is used.

Helpful Hint: If a long reach 1/16” drill is not available, one can be made using the piece of 1/16” music wire (included in the nose gear door package) with a flat point ground on the tip. Use a belt sander to grind an angled flat point; the sharp edges will act as the drill cutters.



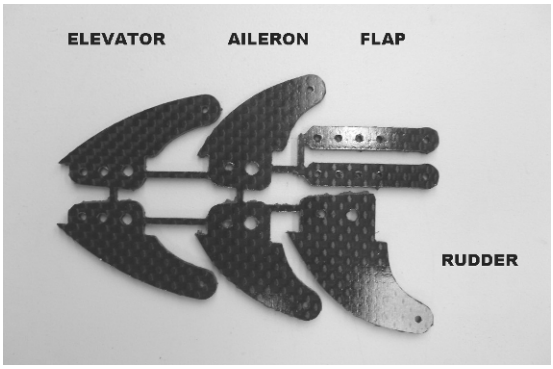
This is the completed aileron servo and control horn installation. Note that the servo arm is rotated forward one tooth, approximately 10 degrees.

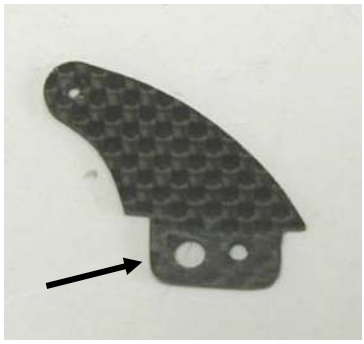
NOTE: The following section covers the installation of the CF control horn.

Helpful Hint: If two channels for aileron operation are used, sub trim can be used to fine-tune the aileron servos independently. The amount of differential can be adjusted by simply adjusting ATV.

AILERON CONTROL HORNS

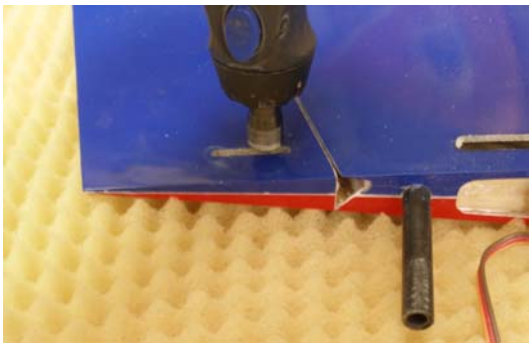
- The control horns are router cut carbon fiber. They are easily distinguished by the number of holes in the base and outline shape. Use a cut-off disk to separate the parts.

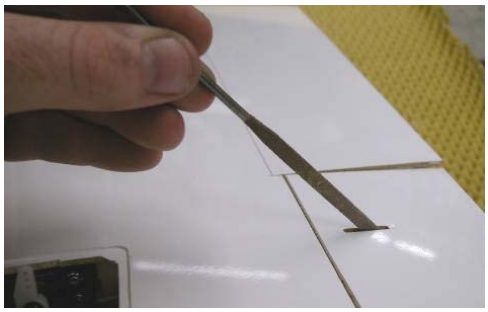




- Always scuff the gluing surfaces, and clean the clevis hole with a sharp 1/16” drill prior to installation.

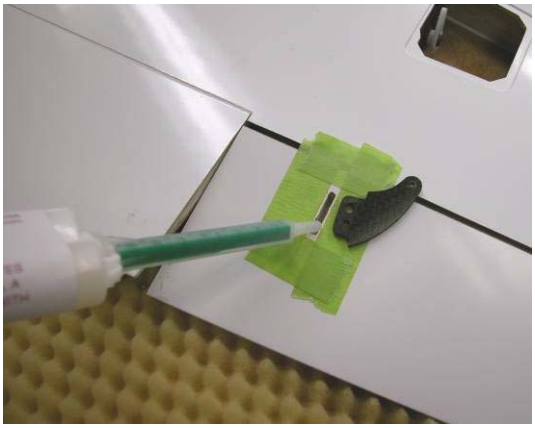
- Use a 1/16” carbide cutter BVM #2142 to make a slot in the control surface as indicated by the pen mark. Set the carbide cutter to the appropriate depth by comparing it to the length of the control horn’s base. The photo shows the elevator, but the process is similar.



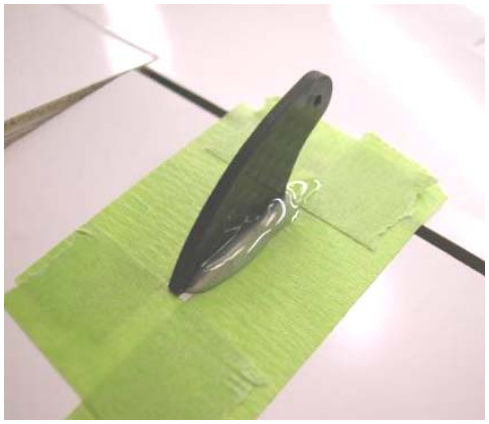


- Use a small Perma-Grit flat file to adjust and fine-tune the control horn slot.

- The trailing edge of the aileron horn is designed to be 1.7” from the trailing edge of the aileron. Make sure the horn flange sits flat on the skin surface.



- Place masking tape around the perimeter of the slot; leaving a 1/16” gap on the sides to allow for a fillet of AeroPoxy.

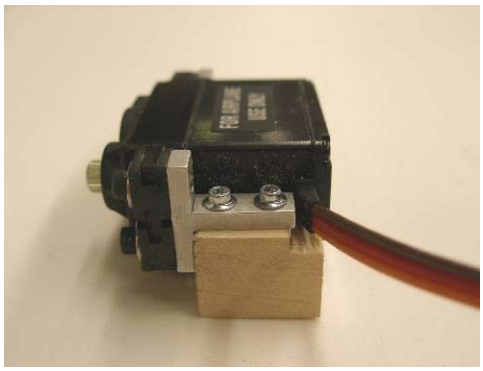


- Apply AeroPoxy into the slot and the holes on the base of the control horn. Push the scuffed control horn into the surface, and wipe the excess glue away leaving a small fillet.

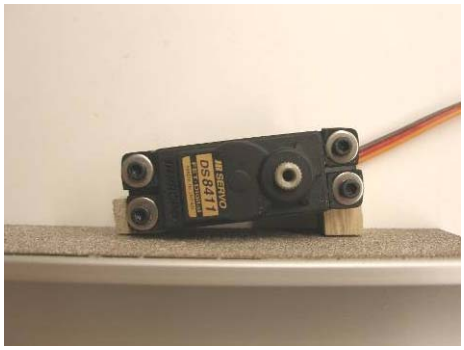
- Pull the surrounding tape from the control horn and clean glue residue from the painted surface. Use a long piece of masking tape stretched over the center of the control horn to hold in position while the AeroPoxy cures.

FLAP SERVOS

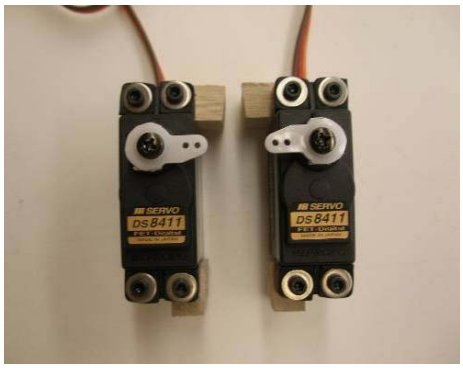
- Assemble the servo to the aluminum servo mounts as shown using (4) 4-40 bolts and #4 washers. Use one drop of thread locker to prevent loosening.



- Use (4) #2 servo screws to attach the servo mount to the maple blocks. Notice that there is one tall block and one short block. The tall block goes on the servo output side and is the front block. Make a small notch to clear the servo wire.



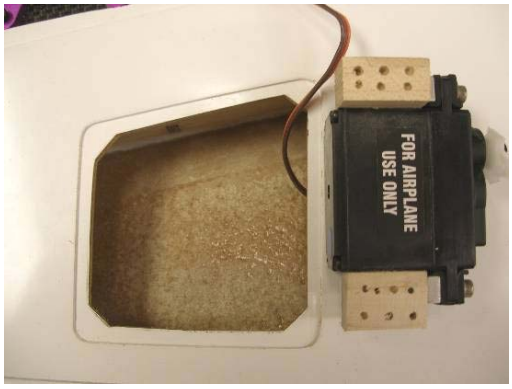
- Sand the maple blocks as shown to allow proper seating. The servo will be mounted in the pocket such that the servo is near flush with the bottom wing skin.



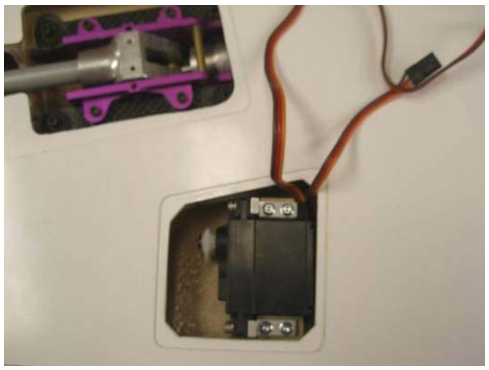
- Use a JR Matchmaker or a radio system to center the flap servos and install trimmed four-way arms; the clevis will use the outside hole of the short arm. The linkage system is designed such that the servo arms are centered, while the flap is in or near the mid position.

- Drill random 1/16” holes in the maple blocks for better glue adhesion.

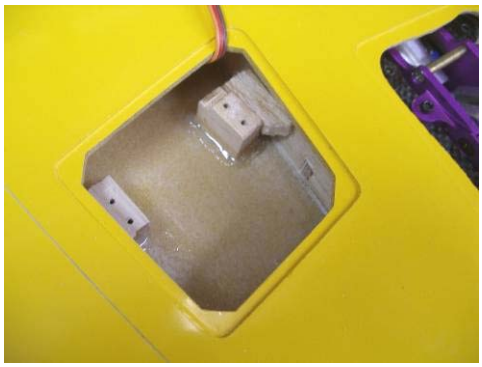
- Use #80 grit to sand the wing skin in preparation for the flap servo mounting blocks.



- Apply SLO-ZAP to the maple servo mounting blocks and hold the servo in place until the glue has cured.



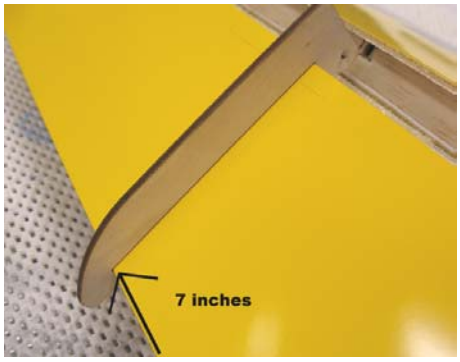
- Align the flap servo in the pocket as shown.



- Remove the servo and use scrap balsa to reinforce the front maple block. Apply AeroPoxy to create fillets around the blocks.

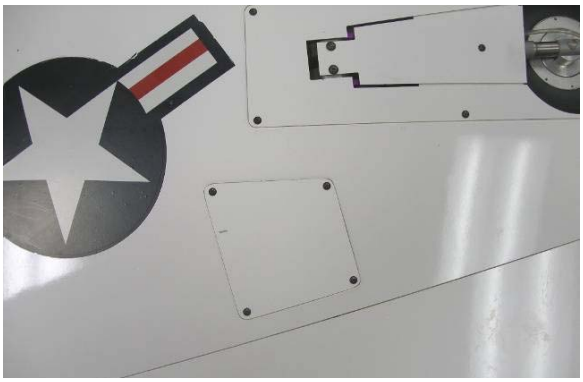
FLAP CONTROL HORNS

- Use a 1/16” cutter and a Perma-Grit file to create the pocket for the control horn at the marked location.
- The rear of the flap horn locator should be positioned 7” out from the wing root at the trailing edge.

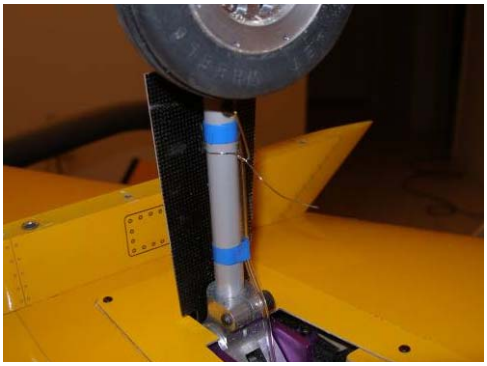


- Use a piece of 1/16” music wire to locate the CF control horn. The music wire slips though the laser cut hole.
- Use AeroPoxy to hold the control horn in place. A strip of masking tape can be used to hold the ply locator while glue cures.

SERVO COVERS AND GEAR/STRUT COVERS



- Position covers in place, masking tape can be helpful to hold the correct position. Use a 1/16” drill to make the pilot holes for the 3/8” button head screws.



- Use safety wire to attach the CF strut door attach block to the strut.

Wing FWD Pin

This carbon fiber leading edge pin should be installed on Bandit ARF’s that are intended for high performance i.e. 19 + pound thrust engines. This pin and receptacle should be checked for security following a hard landing.

- Use a ball end Perma-Grit cutter (BVM #RF-8C) to flatten the bead of glue from this area. A 90° Dremel tool is required.

- Make a notch to accept the pin and shape the pin base as necessary to allow the pin to protrude at 90° to the wing flange, check front and top views. Center of pin is located 1” aft of the leading edge. The location is not critical. The hole in the fuse will be according to the pin location. Trim away any protrusion of flanges on wing root that interferes with fit to fuse side.

- Use Zap-A-Gap to tack the pin in position.

- Apply Aeropoxy generously to the pin base and wing root and allow to cure.

- Apply black ink to the point of the pin, install wing onto fuse and allow the inked pin to mark the fuse side.

- Drill a 1/8” hole at ink mark, then enlarge with a Perma-Grit rotary tapered cone and round file. Adjust hole to allow the wing leading edge to center on the fuse fairing.

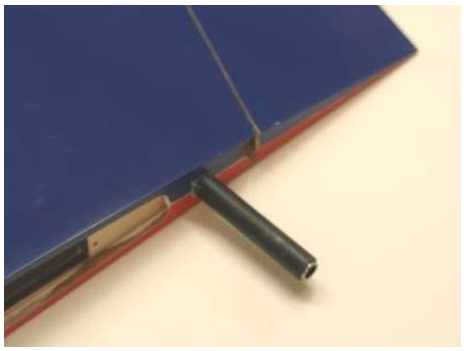
- Test fit the carbon fiber rectangle (with hole) onto the pin. Apply Vaseline to the pin (wing off) , then use Slo-Zap to tack glue the CF part to the inside fuse skin while assuring that the wing leading edge is centered.

- Remove the wing and apply Aeropoxy to the CF part to secure it to the fuse.

STABILIZERS

STABILIZER MOUNTING TUBE; Carbon Fiber Varity

- Trial fit the steel tube inserts into the carbon spar tubes. The steel tubes are held in place with epoxy. Rotate the steel tube while inserting to distribute the glue until the inboard ends are flush.



NOTE: There have been a few occurrences of the gauling of the Carbon Fiber tube in the aluminum stab mount. The problem occurs if the setscrew (in the aluminum stab mount bracket) is not backed out sufficiently, or there is a raised burr around the setscrew-threaded hole.

How to prevent this

NOTE: The steel rod insert in the CF tube should be glued in place prior to this procedure. Note that one end of the steel rod is flush with the inboard end of the CF tube.

- Back the set screw out a few turns and visually check that it is not protruding into the stab tube-receiving hole.
- Make a hone from a ¼" dowel and band saw a 2" slot in one end, then wrap it with #600 or #800 grit.

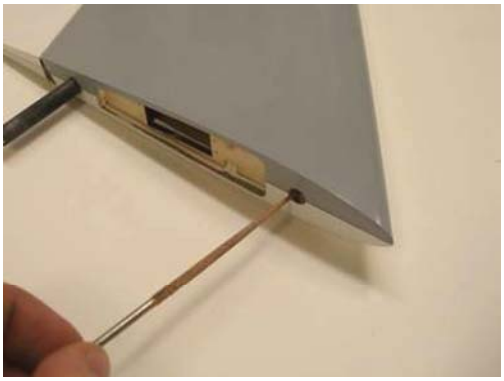
- Burnish the hole in the aluminum brackets, especially in the area of the setscrew. Blow out any aluminum dust.
- Use the same grit sandpaper to deburr the end of the Carbon tube.
- Apply Vaseline to the hole and the Carbon tube with a cotton Q-tip.

- Carefully insert stab mount tube into the aluminum bracket allowing for the designed-in stab anhedral.
- During final assembly, snug the setscrews to retain the stabs.

Note: As of September 2009 the tubes in the Bandit ARF were changed from carbon fiber tubes with a steel insert, to steel tubes with a carbon fiber insert.

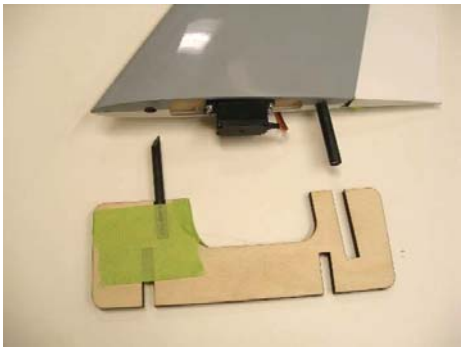
For the latter, test fit the carbon fiber rod into the steel tube, then apply Slow Zap or epoxy and fully insert the rod until inboard ends are flush

- Use a round Perma-Grit file to fine-tune the front hole to fit the anti-rotation pin.



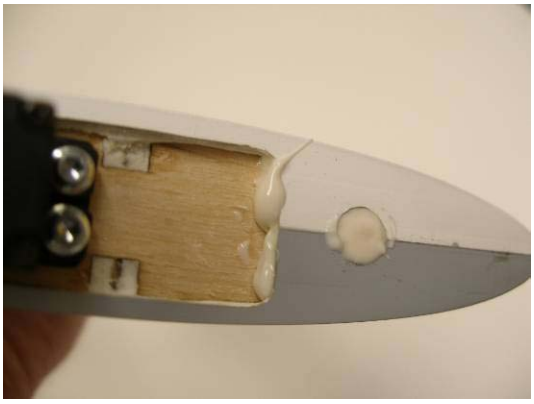
- Bevel one end and round the other of the CF anti-rotation pin.

- Trial fit the front pin in place using the ¼" ply alignment fixture.

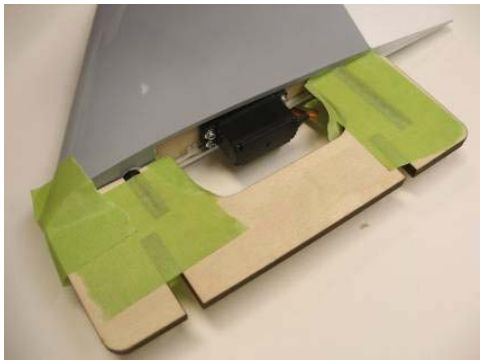


- Tape the CF pin to the ¼" ply fixture after setting the depth that the pin must be inserted.

Hint: Scrap plywood can be glued in place of the masking tape to the fixture to align rods.



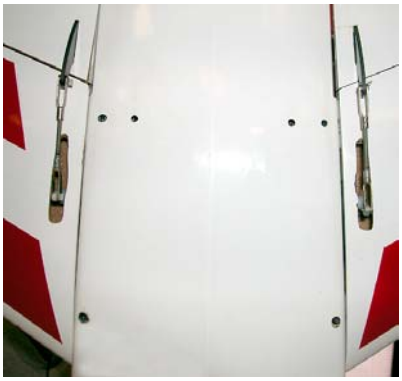
- Apply AeroPoxy into the front hole allowing glue to flow on to the leading edge of the stab. Also, fill the hole and area between the root rib and fiberglass skin for increased bonding strength. Wipe excess glue.



- Insert the taped CF pin into the front hole. Tape the rear spar to hold in position, and allow AeroPoxy to cure.

- Use AeroPoxy to glue the molded CF anti rotation pin receptacle to the inside of the fuselage. Align the stabilizers such that the leading edges are in line with the dots on the fuselage. A 6-32 bolt is used to secure the front pin.

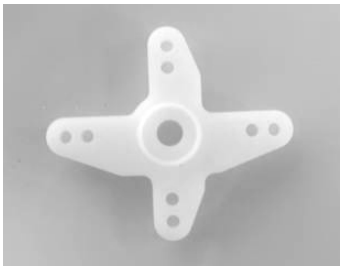
NOTE: This procedure is repeated for both stabs and the vertical fin.



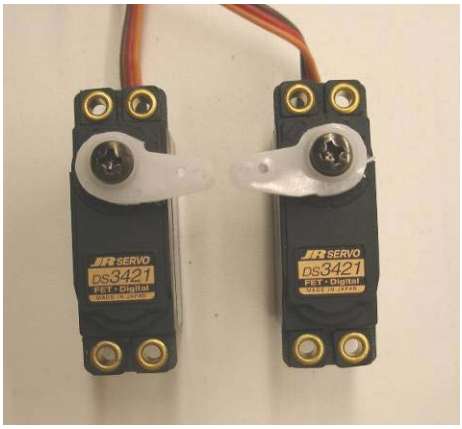
- Setscrews tightened through holes in bottom of the fuselage.

INSTALLING THE ELEVATOR SERVOS

- Use a Perma-Grit file to trim the gussets off of the elevator servos as shown.

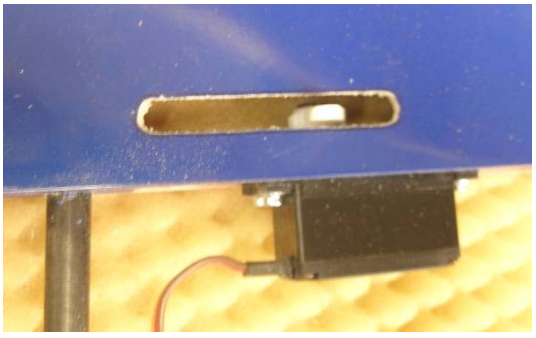


- Use the long arm of the standard 4-way servo arm. This length is very important; the elevator linkage system has been designed to provide sufficient elevator surface travel and the required amount of power for 200 MPH flight. Using alternative servos or arms may unnecessarily risk the plane.

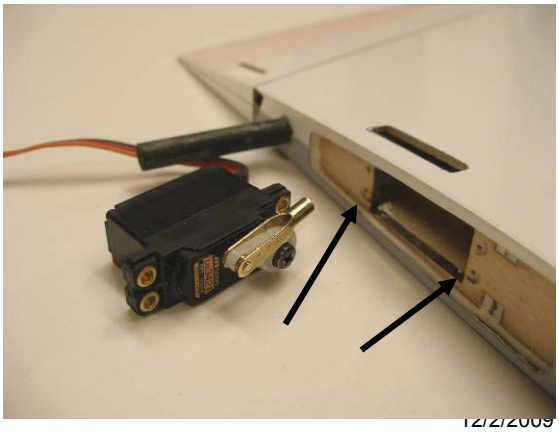


- Use the JR Matchmaker to orient the servo arms to be slightly forward from perpendicular. Install the grommets and eyelets from the top of the servo as shown.

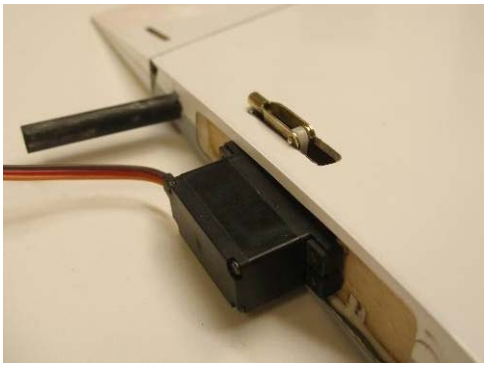
NOTE: To make installing the clevis easy, install only the clevis to the outer hole of the standard 4-way arm before adding the threaded push rod.



- Cut the slot for the servo arm as marked on the bottom skin. Adjust for proper clearance once the servo is installed and linkage connected.



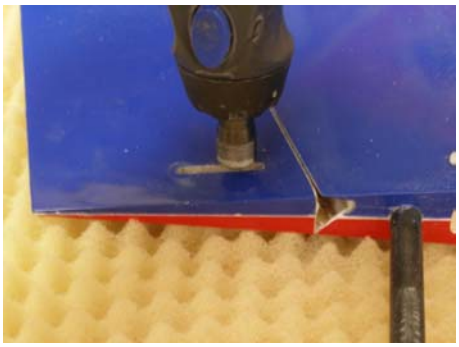
- Drill the (4) servo mounting holes with a 1/16” bit.



- Install the servo with the servo arm as shown, once in place rotate the arm through the stabilizer skin.

ELEVATOR CONTROL HORNS

- Always scuff the gluing surfaces, and clean the clevis hole with a sharp 1/16” drill prior to installation.
- Use the base of the carbon fiber control horn to set the depth of a 1/16” carbide cutter. Cut the slot for the control horn as indicated by the pen mark.



- Use a Perma-Grit flat file to adjust and fine-tune the control horn slot.

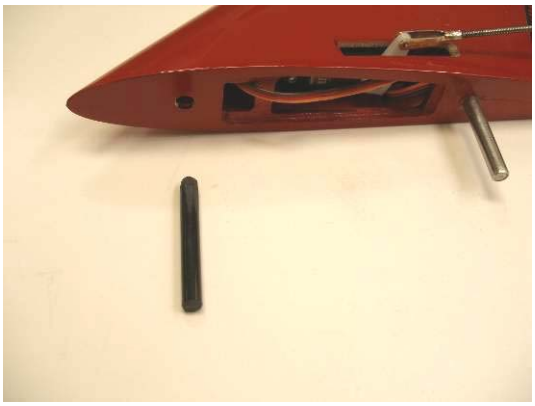
- The trailing edge of the elevator horn is designed to be 1.5” from the trailing edge of the elevator. Make sure the horn flange sits flat on the skin surface.
- Once the fit and alignment of the control horn is established, place masking tape around the perimeter of the slot; leaving a 1/16” gap on the sides to allow for a fillet of AeroPoxy.
- Apply AeroPoxy into the slot and the holes on the base of the of the control horn. Push the scuffed control horn into the surface, and wipe the excess glue away leaving a small fillet.

- Pull the surrounding tape from the control horn and clean and glue residue from the painted surface. Use a long piece of masking tape stretched over the center of the control horn to hold in position while the AeroPoxy cures.

SWEPT FIN

NOTE: The swept fin assembly is very similar to the stabilizers.

- Use a round file to clean the hole for the front pin. Bevel one end and round the other of the CF anti rotation pin.
- Trial fit the front pin in place using the ¼" ply alignment fixture (opposite side as the stab fixture used earlier). The pin should protrude both ply formers and touch the leading edge of the fin.



- After setting the depth the pin must be inserted, tape the CF pin to the ¼" ply fixture.
- Insert the taped CF pin into the front hole. Tape the rear spar to hold in position, and allow AeroPoxy to cure.

INSTALLING THE SWEPT FIN RUDDER SERVO

- Use the long arm of the JR Heavy Duty 2-way servo arm. This length is very important; the rudder linkage system has been designed to provide sufficient rudder travel and the required amount of power for 200 MPH flight. Using alternative servos or arms may unnecessarily risk the plane.

- Use the JR Matchmaker to orient the servo arm to be slightly forward from perpendicular. Install the grommets and eyelets from the bottom of the servo as shown.
- Use a Perma-Grit file and a 1/16" cutter to open the servo arm slot in the vertical fin skin. Open this up to the marked line and adjust for proper clearance once the servo is installed and linkage connected.

- Use a 1/16” drill bit to drill the (4) servo mounting holes

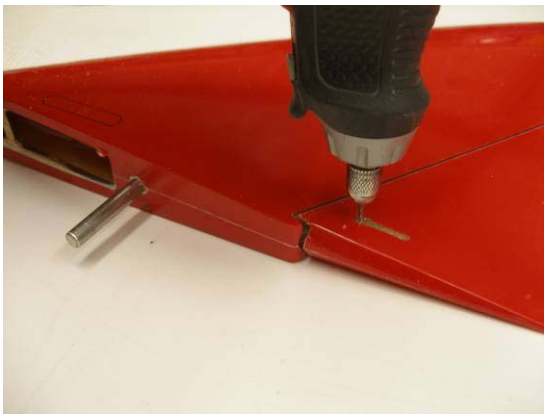
- Install the servo with the servo arm rotated forward back on itself. Once in place rotate the arm through the stabilizer skin.

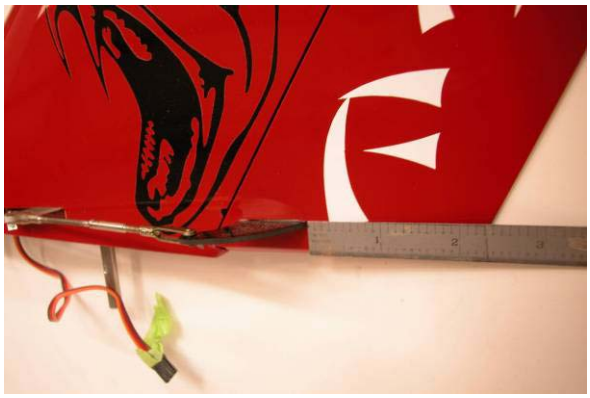
RUDDER CONTROL HORN

- Always scuff the gluing surfaces, and clean the clevis hole with a sharp 1/16” drill prior to installation.

- Use a 1/16” carbide cutter to make a slot in the control surface as marked. Set the carbide cutter to the appropriate depth by comparing it to the length of the control horn’s base similar to the elevator control horn.

- Use a Perma-Grit flat file to adjust and fine-tune the control horn slot.





- The trailing edge of the rudder horn is designed to be 2-3/8” from the trailing edge of the rudder. Make sure the horn sits flat on the skin surface

- Once the fit and alignment of the control horn are established, place masking tape around the perimeter of the slot; leaving a 1/16” gap on the sides to allow for a fillet of AeroPoxy.

- Apply AeroPoxy into the slot and the holes on the base of the of the control horn. Push the scuffed control horn into the surface, and wipe the excess glue away leaving a small fillet.

- Pull the surrounding tape from the control horn and clean and glue residue from the painted surface. Use a long piece of masking tape stretched over the center of the control horn to hold in position while the AeroPoxy cures.

CANOPY AND ENGINE COMPARTMENT HATCHES

BVM designs our jets for easy access to the engine, fuel system, and electronic components from the topside of the model.

This design philosophy minimizes having to flip the model upside down for simple servicing items; such as changing the igniter plug, checking wire harness and fuel system connections, inspecting the fuel system for air bubbles etc.

LAPPING THE JOINTS FOR AN IMPROVED FIT

The fit of these parts to the fuselage is important to the overall appearance of the model. The factory installed plywood frame gives rigidity to the fiberglass molding and allows the edges of the hatches to be "Lap-Fitted" to the fuselage.

NOTE: The factory has accomplished a preliminary hatch-to-fuselage fitting. The following procedures will enable the modeler to fine-tune the mating of these parts.

- Before installing the hatch retention devices, study how the parts mate together and carefully trim the edges of the hatch for the best fit possible. Start with the aft round corners of the engine access hatch.

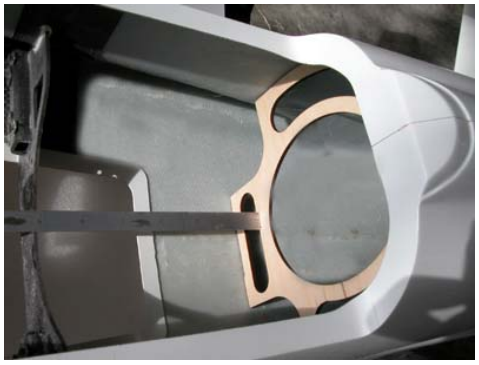
NOTE: It is helpful to have an assistant to hold the fuselage while fitting and adjusting the hatch edges. Remove only very small amounts of material at a time.

- Proceed to the forward end of the hatch and adjust the mating surfaces there.

- Use a strip of paper between the hatch and fuselage to locate the tight spots.

- After the ends fit as good as possible, use a piece of sand paper (#180-#220 grit) to lap the side edges.

NOTE: Properly accomplished, good fitting hatches appear as scale-like panel lines.



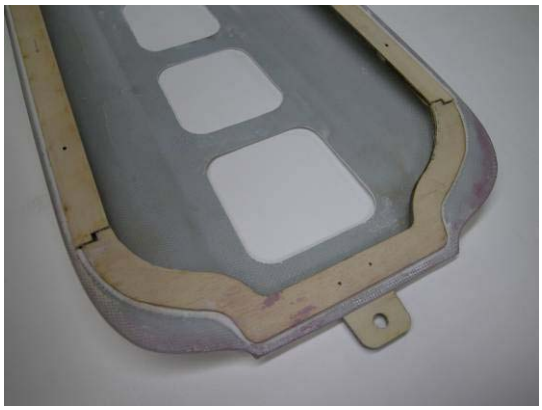
F-6 is a mushroom shaped 1/8" ply former. It is installed 6" aft of F-5 (the rear wing mount former). Sand the edges for a relaxed fit and glue it in place with AeroPoxy.

NOTE: The F-6 location is not critical, it functions as a fuselage stiffener.

ENGINE HATCH

NOTE: The installation of the rear pins should be accomplished one at a time and care should be taken that the hatch-to-fuselage fit is maintained.

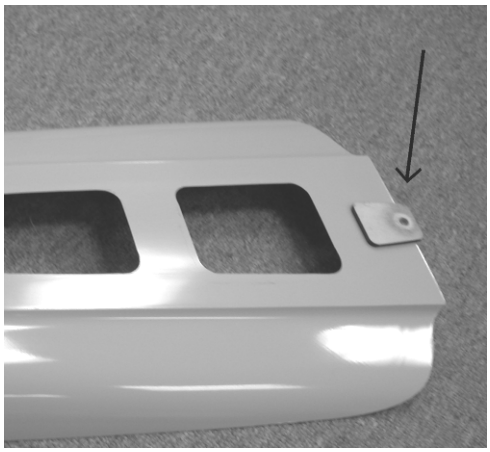
- Use CA to tack glue each pin in place. After the hatch is fitted to the fuselage, apply a fillet of AeroPoxy. The large diameter portion of the pin should not protrude past the fiberglass edge.
- Optional balsa shim blocks can be used to keep the hatch pushed forward leaving an equal panel line around the perimeter.



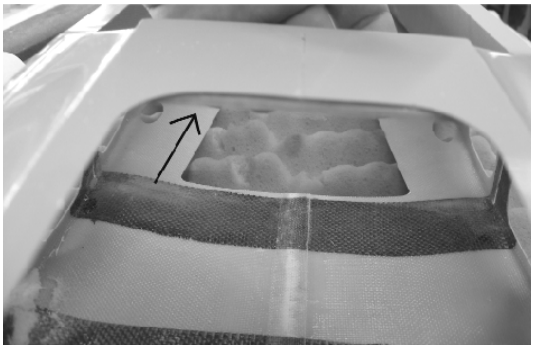
NOTE: Early kits will need the front and rear former of the engine hatch relieved to clear the engine by-pass as shown.

- While holding the engine hatch in place use a fine point marker to trace the location of the receptacle hole.

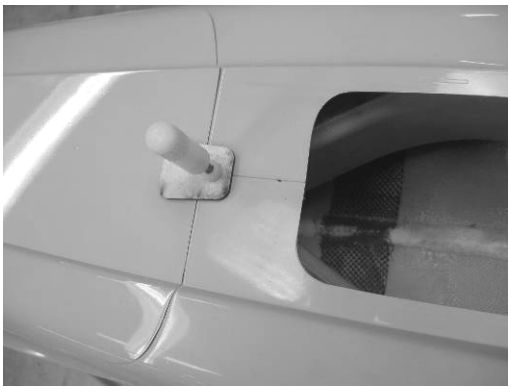
- Drill these receptacle holes small, then use a Perma-Grit round file to adjust the size and location necessary to achieve a proper fit.



- Trim the fiberglass as shown, these openings allow visual reference to the fuel system when the canopy hatch is removed and to serve to lighten the part.
- Scuff the area marked on the engine hatch and use SLO-ZAP to attach the 1/8" ply engine hatch mounting tab.



- Use 5-min epoxy to glue the 1/8" ply engine hatch reinforcement. Do not force this in place; allow the epoxy to conform to the fuselage's natural shape.
- A ¾" x ¾" maple block is added to the 1/8" ply to capture the nylon bolt.



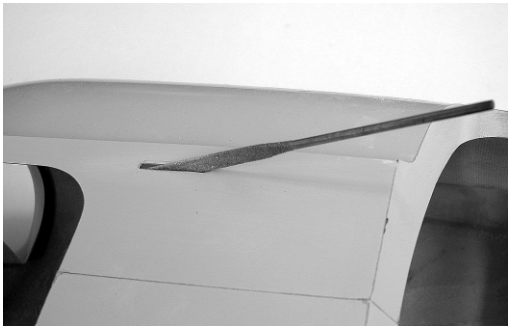
- A ¼-20 x 5/8" nylon bolt secures the forward end of the engine access hatch.
- Tape the hatch in place, drill and tap the hole. Start with a small drill; then use a 3/16" bit. Tap the block ¼-20.

CANOPY HATCH

The same techniques used for the engine hatch can be applied to fitting the canopy hatch. Again install one "Canopy hook" at a time and adjust it and the slot in the fuselage flange for the best fore/aft and side-to-side fit possible before proceeding to the next hook.

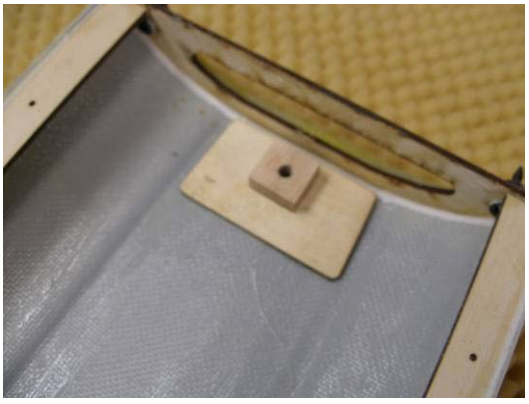
- Trim the (4) hooks as shown make (2) left and (2) rights. Install one untrimmed hook in the front. As before, maintain side-to-side alignment.

- Install the (4) molded side canopy hooks into the canopy hatch frame one at a time.



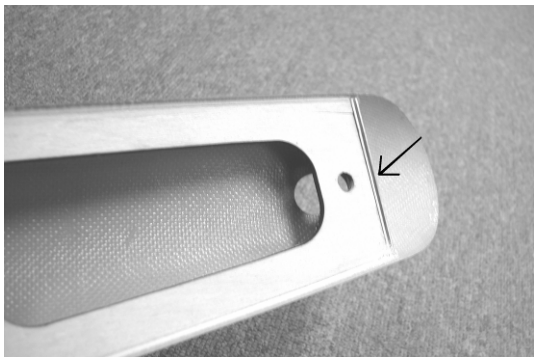
- Make slots for the canopy hooks into the fiberglass fuselage flange. Use a Dremel cut-off wheel to make the initial opening. Fine tune with a Perma-Grit small flat file.
- The scribed marks on the fuselage canopy hatch flange are the starting locations. Lengthen the slots to set the forward position of the canopy hatch.

- Enlarge the hole in the AFT end of the canopy hatch per marking. This allows access to the nylon bolt and a finger to properly engage the hatch to the fuselage.



- Use 5-min epoxy to glue the 1/8” ply canopy hatch block reinforcement to the engine hatch. Do not force this in place; allow the epoxy to conform to the engine hatch’s natural shape. Do not glue the ¾” x ¾” maple block in place at this time.

- Drill the hole through the canopy hatch into the 1/8” ply plate.
- Drill and tap ¾” x ¾” maple block for the rear ¼-20 nylon hold down bolt. Glue in place on the 1/8” ply plate using the nylon bolt for proper alignment.



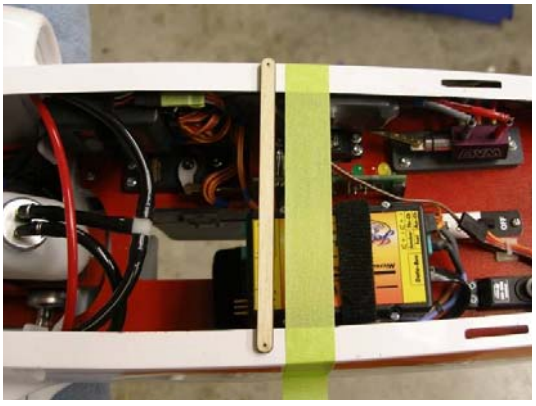
- Glue the 1/8” ply rear canopy former in place. This maintains the shape of the canopy hatch.

- Sand paper lap the edges of this hatch for a perfect fit.

FUSELAGE SPREADER

Over time unsupported lightweight fiberglass structures can change shape. Some Bandit ARFs need to have the fuselage flanges pulled together under the canopy hatch. Install this fuselage support to maintain the proper width and fit in the canopy hatch area.

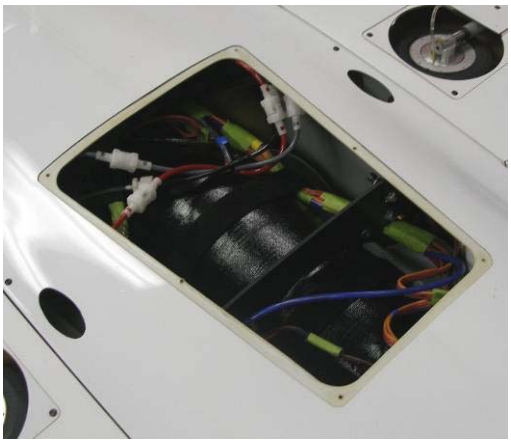
- Use masking tape to pull the fuselage together to match the canopy hatch outline.



- Remove the hatch and line up the wood support in a location that does not interfere with normal maintenance procedures.

- Drill the fiberglass flange and wood support stick with a 1/16” drill. Install the wood support using #2 x 3/8” button head screws.

BELLY HATCH

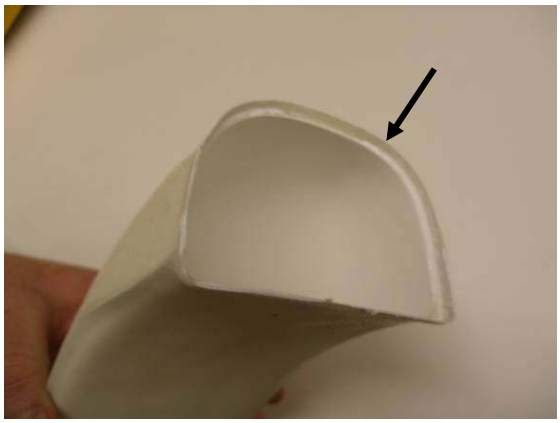


- Trim and fine-tune the fit of the belly hatch to the opening in the bottom of the fuselage.

- Glue (6) 1/8” ply doubler tabs to the inside of the fuselage in the locations of the (6) attachment screws. Use a 1/16” bit to drill (6) evenly spaced holes through the fiberglass hatch and plastic mounting frame. Finish the fiberglass hatch using a clearance drill for the (6) button head attachment screws.

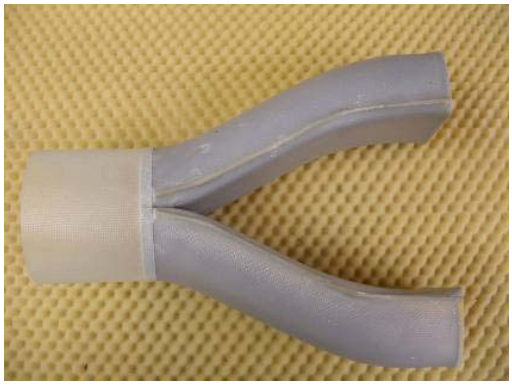
FUSELAGE

INLETS



- Remove the paint on the overlapping flange of each inlet. A small diameter drum sander works well.

- Remove 1/4'' of the seam joint on the top and bottom of both inlets as shown. This allows the inlet extension to slip over the inlets. Make sure to scuff all gluing surfaces in the fuselage and on the inlets.



- Trial fit the inlet extension over the inlets, some additional sanding on the circumference of the inlets may be needed; the extension should be a snug fit.

- Fit the inlets to the fuselage. If necessary, use some #80 grit sand paper on a small block to adjust the aft edge of the inlet lip on the fuselage.
- Once the inlets have been trial fit, apply a bead of slow ZAP to glue the inlets to the fuselage one at a time. Make sure the inlet is tight up against the fuselage before adding kicker.

- The bottom of the inlets should be 2.15” from the bottom of the fuselage. Measure at the centerline. Use the supplied 1/8” ply template for a quick reference.

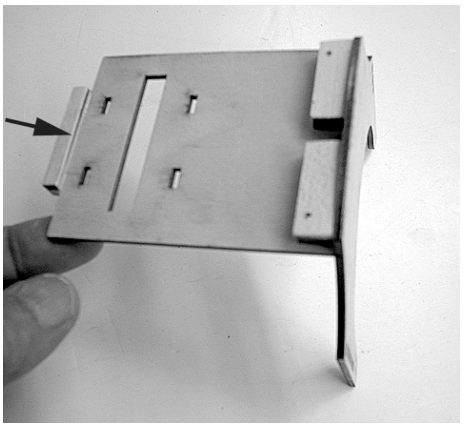
- After both inlets are installed, temporarily fit the inlet extension over the rear of the inlets. Add a few drops of SLO-ZAP to hold the rear of the inlets together. Be careful to not glue the inlet extension to the inlets; the extension will be glued to the bypass later.

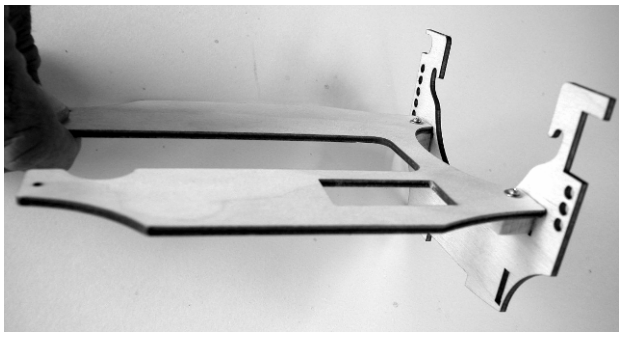
- Apply additional SLO-ZAP to help secure the inlet to fuselage joint. Allow the glue to run around the inlet.

NOSE GEAR STEERING SERVO TRAY, PUMP MOUNT, F2, AND F3

Use the following photos to assemble and position these parts.

- #2 screws are used to hold the fuel pump mount to F3.
- #2 servo screws are used to hold the steering servo tray in to F1 and F2

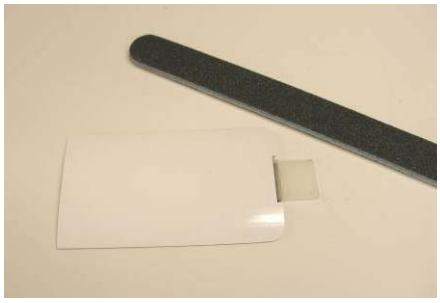




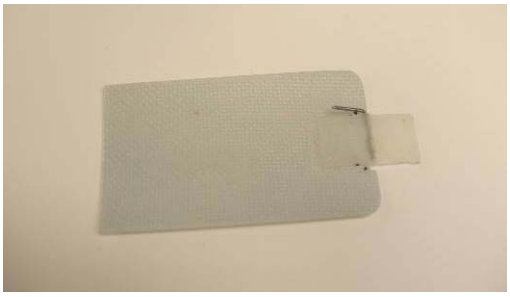
- The receiver is attached using sticky back Velcro.
- Note the steering servo is installed from the underside of the steering servo tray.

NOSE GEAR DOOR

- Carefully cut the front nose gear door from the rear nose gear door. Use masking tape as a guide to prevent scratching the paint.

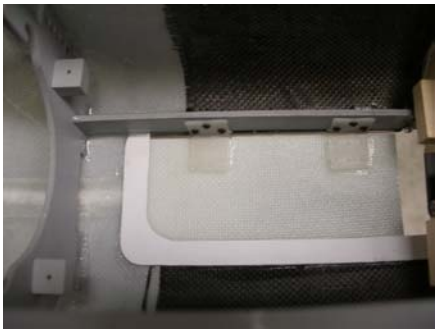


- Make a notch 3/32” x 7/8” in the front end of the forward nose gear door to accept the hinge pivot boss.



- Make a hinge pin from .047” music wire bent in the shape of an “L”.
- Remember to scuff all gluing surfaces, and glue the nose gear door hinge in place with SLO-ZAP.

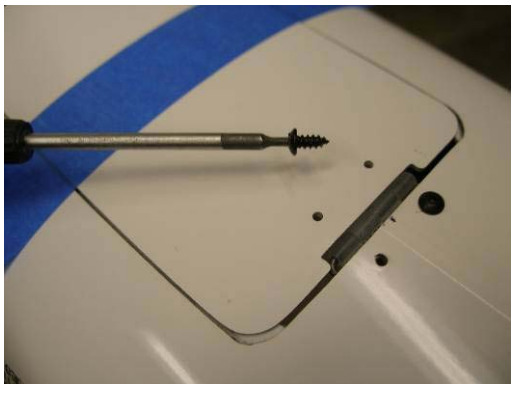


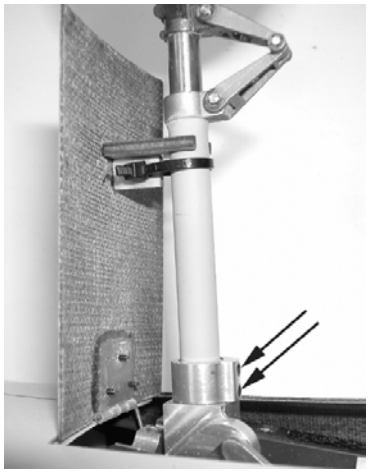


- Trim the white ABS plastic as shown to fit the perimeter of the nose gear opening.
- Scuff the plastic with #320 grit and glue in place with ZAP-A-GAP.

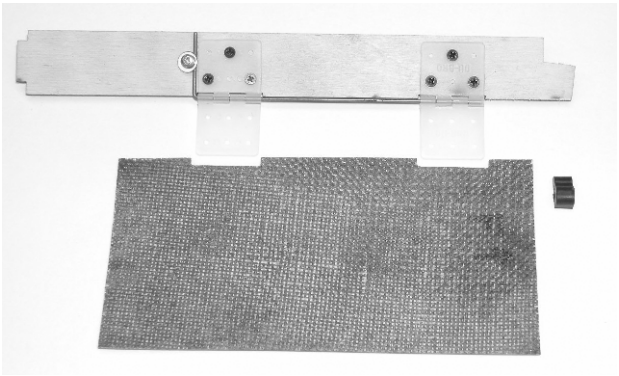
- Tape the front nose gear door in position.
- Apply SLO-ZAP to the hinge location in the fuselage and set the nylon hinge in position to cure.

- Check the position and motion of the door then drill and screw the door hinge using #2 x 3/8” button head screws.



- Attach the front door to the strut using the laser cut ply parts.



- Install the rear nose gear door similar to the front door.

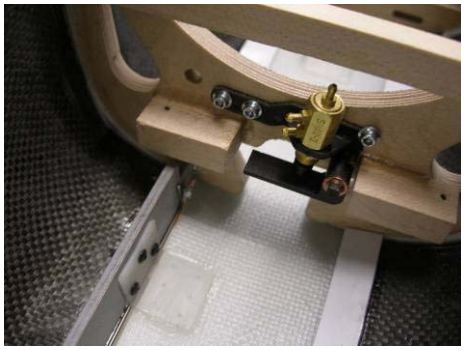
- Begin by screwing the nylon hinges to the plywood nose gear door hinge mount.

NOSE GEAR DOOR AIR CYLINDER

- Trim the maple stick to approximately 5”. Bevel the front corners to clear the glue fillet of F-1. The maple stick is glued to the rear of F-1 flush with the top edge.

- Assemble the nose gear door cylinder mount and doubler, glue in position on the maple stick such that the nose gear door opens completely and the strut clears the air cylinder when the gear and door are up. The left edge of the doubler measures approximately 1.25” from the left side of the fuselage.

NOTE: The red airlines connected to the brass micro air switch are reversed. Please refer to the Air System Diagram for proper orientation.

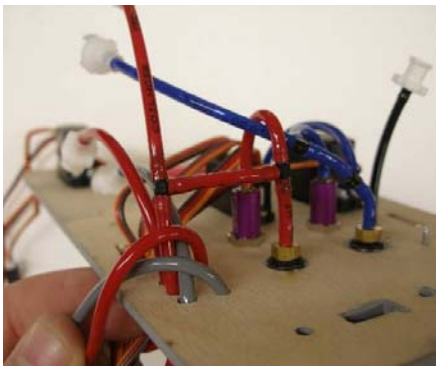
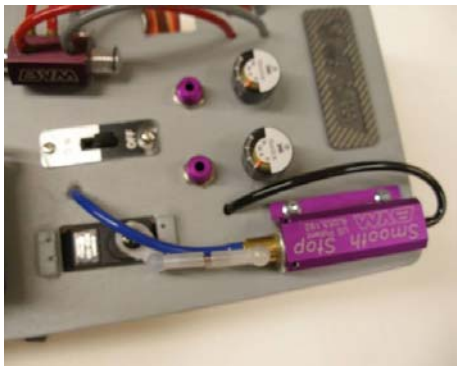


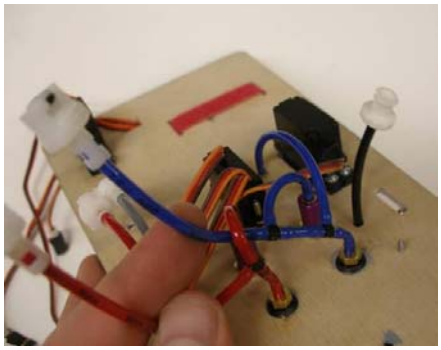
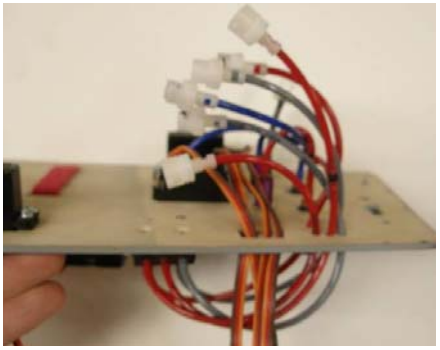
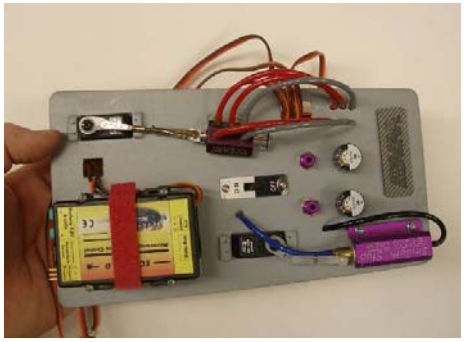
- Trim the plastic arm as shown and orient the air fittings for the best possible routing as shown in the photo.

MOUNTING THE NOSE GEAR

- Mount the retract unit to the flex arms with 4-40 x 5/16” flat head screws.

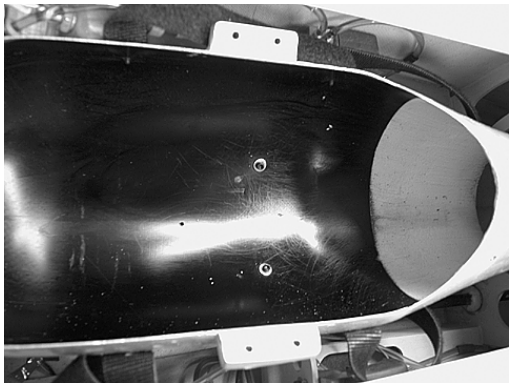
FORWARD COMPARTMENT BOARD

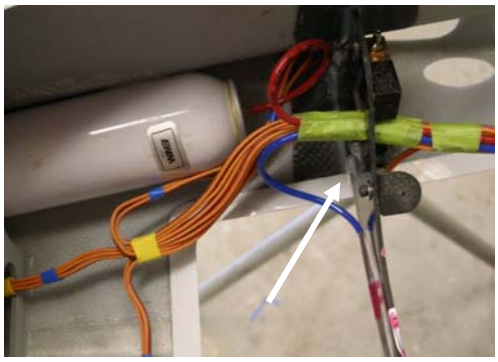




BYPASS

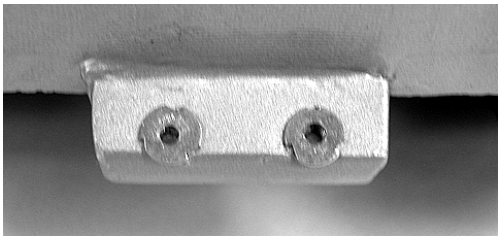
NOTE: Use the 3" fiberglass extension for the smaller P-60/P-70 bypass. Trim the 3" fiberglass extension to 2" for the larger P-80/P-120 bypass.

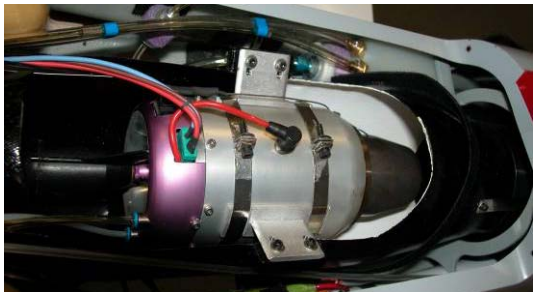


- The aft 3-4 inches of the bypass is treated with 3 brushed-on coats of BVM's heat shield (#1940). Two 4-40 x ½" SHCS with washers hold the bypass to CF angle brackets mounted to F-5.



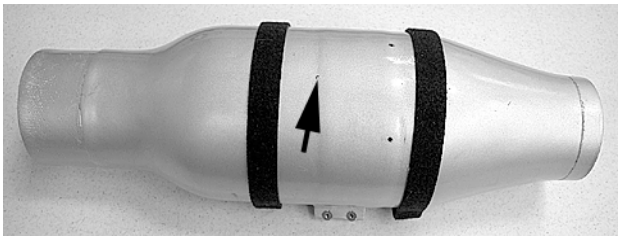
- The P-60/P-70 bypass has a .4" gap between it and the CF F-5 former. The P-80/P-120 bypass will rest on the former.
- Bolt (2) molded CF mounts using 4-40 bolts and washers. Tap the CF mounts using a 4-40 tap.
- For the P-60/70 by-pass; bolt the bottom hole of the CF mount to the top hole of the carbon former. (2 bolts)
- For the P-80/120 Bypass use both holes of the CF mount bolted to the carbon former (4 bolts)
- Glue ¼" ply parts are glued to the bottom of the bypass flanges with AeroPoxy to hold the 4-40 "T" nuts.





- JetCat P-60 is mounted as shown. Note the position of the glow plug. Use a strap around the engine nozzle to lift it to center of the bypass while tightening the 6-32 screws in the metal straps.

Bypass is shown with the 2” extension (for P-80/P-120) and Velcro straps screwed to the bottom using 4 #2 BHSMS. Drill a 3/32” drain hole in the bottom of the bypass.

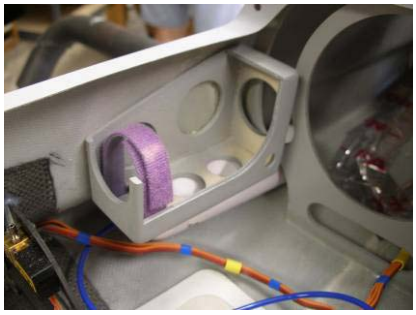


Finish the Bypass and cover using the following steps:

- Sand with #80 grit
- Apply pin hole filler (BVM #1925)
- Brush prime with K36
- Sand with #220, spray primer.
- Sand with #400, apply color and clear.

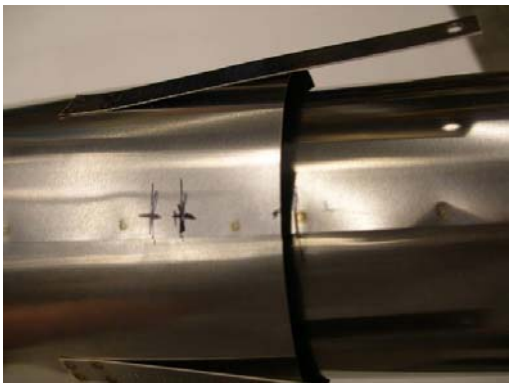
MOUNTING THE UAT

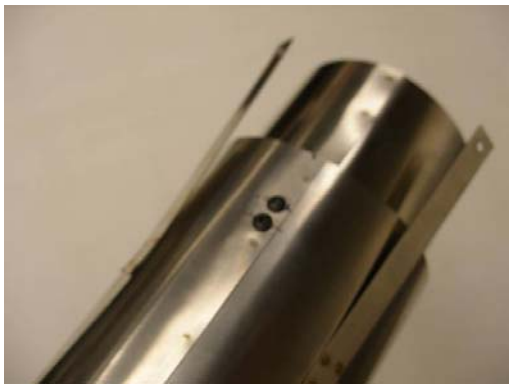
- ☐ Assemble the wood UAT mount and install similar.
- ☐ Use Velcro strap for easy removal of the UAT.



TAIL PIPE

- ❑ The end of the inner pipe should be positioned ¾” in from the end of the outer pipe.





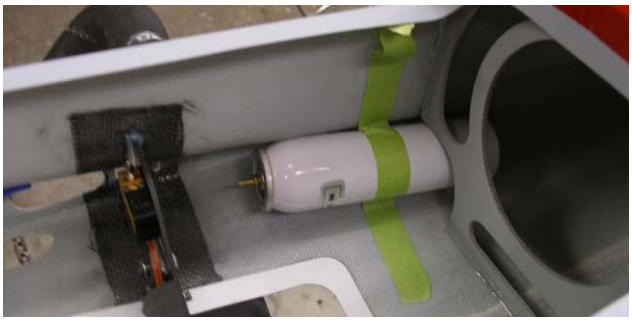
- ❑ The distance between the inner pipe and the tail cone of the JetCat P-60 is 1.5”

TAIL PIPE FORMER

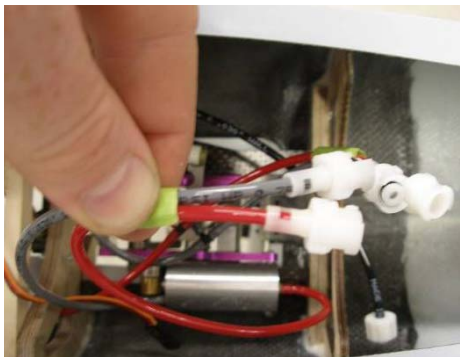
- ❑ Glue the tail pipe former in place approximately 4” from the end of the rear fuselage. This positions and holds the outer tube of the tailpipe.

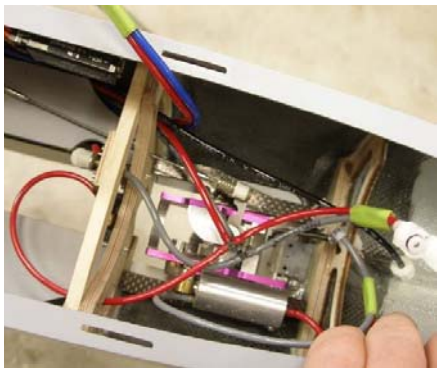
AIR SYSTEM

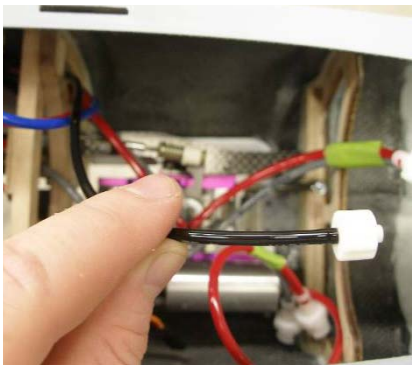
- Mount the two air tanks behind the rear wing former. Use two dabs of ZAP-A-GOO, hold in place with masking tape until cured.

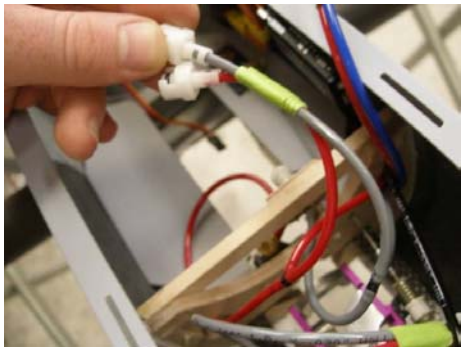


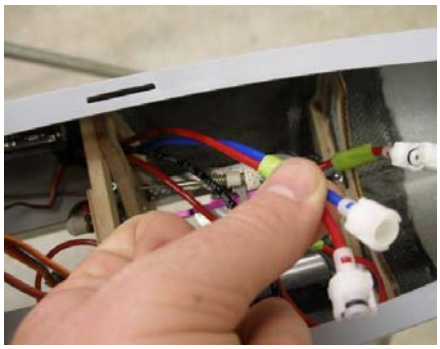
- Below are a series of photos that can be used for ideas to route air lines. On our first prototype, BVM used additional air quick disconnects to allow the ECU tray to be removed quickly and easily without cutting airlines.

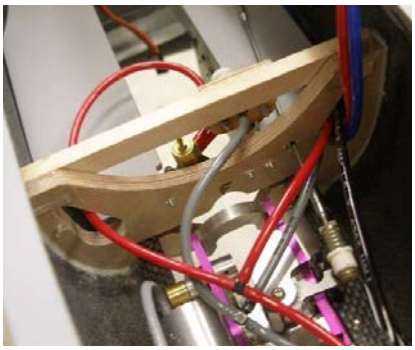




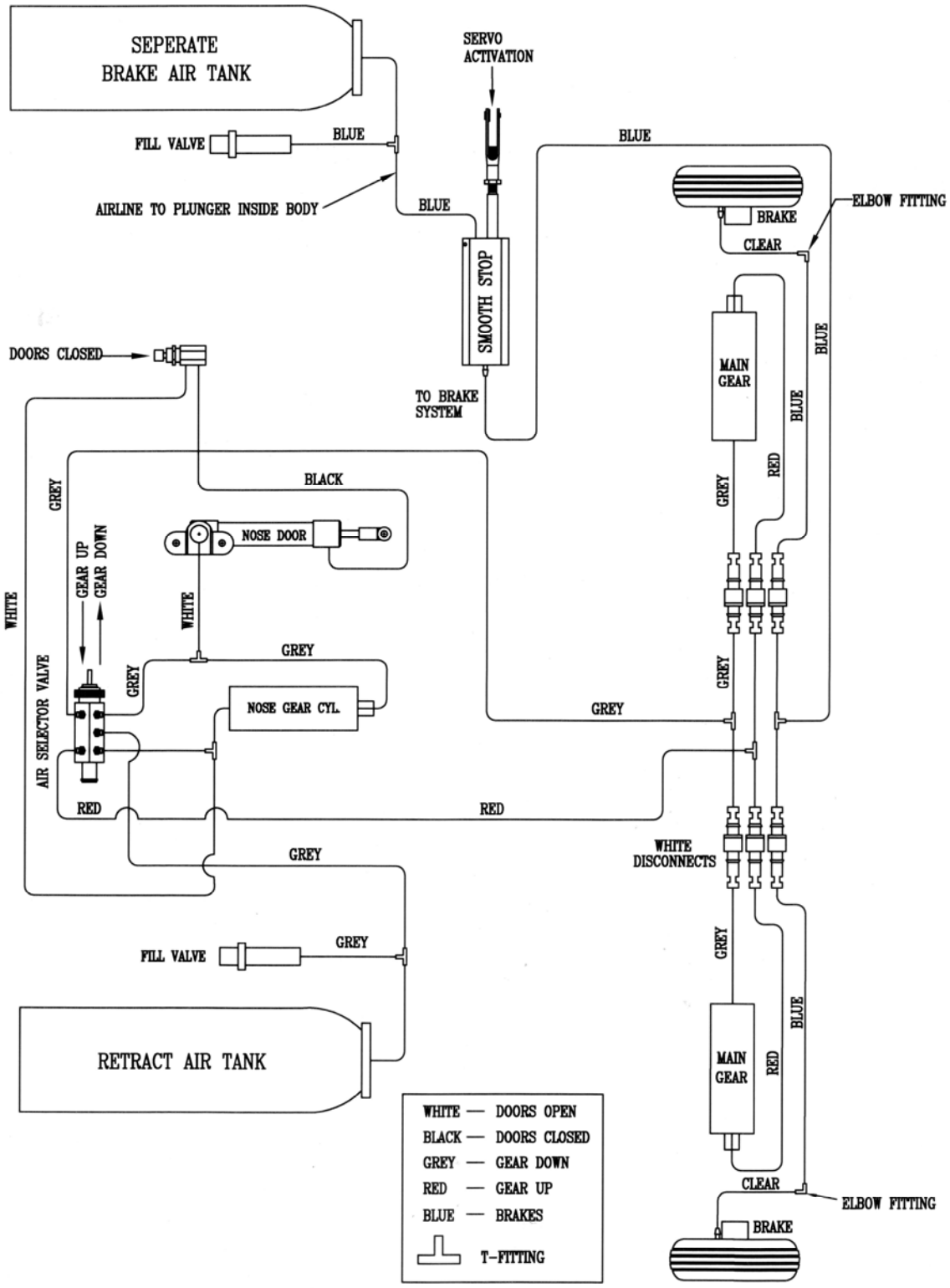








AIR DIAGRAM


SEPERATE
BRAKE AIR TANK
SERVO
ACTIVATION
FILL VALVE
BLUE
AIRLINE TO PLUNGER INSIDE BODY
BLUE
BLUE
BRAKE
ELBOW FITTING
CLEAR
SMOOTH STOP
TO BRAKE
SYSTEM
DOORS CLOSED
MAIN
GEAR
BLUE
BLUE
BLACK
GREY
NOSE DOOR
GREY
RED
GREY
GEAR UP
GEAR DOWN
WHITE
WHITE
GREY
GREY
NOSE GEAR CYL.
GREY
AIR SELECTOR VALVE
RED
RED
GREY
WHITE
DISCONNECTS
GREY
FILL VALVE
GREY
BLUE
RETRACT AIR TANK
MAIN
GEAR
RED
CLEAR
ELBOW FITTING
BRAKE
WHITE — DOORS OPEN
BLACK — DOORS CLOSED
GREY — GEAR DOWN
RED — GEAR UP
BLUE — BRAKES
T-FITTING

FUEL CELL ASSEMBLY

NOTE: BVM uses AeroPoxy for tank assembly as well as major stress areas of model assembly. It is slow curing, very strong, has great adhesion and is thixotropic - it stays where it is applied. Always check the nozzle by discarding a 2" stream of glue when nozzle is first used or has been sitting idle for more than 30 minutes. If another glue is used, be sure it has these properties.

SADDLE TANKS AND HOPPER TANK

- ❑ Wash tank parts to remove mold release - use detergent and hot water.
- ❑ #80 grit sand areas close to fitting holes inside and out for best glue adhesion.
- ❑ Sand mating flange areas of brass parts to be glued.
- ❑ Clean fittings in acetone.
- ❑ Check the accessibility of the fuel outlets and vent fittings.
- ❑ Glue vent fitting into tanks; orient the vents as indicated in drawing.
- ❑ Glue brass receptacle in as shown.
- ❑ Allow glue to set.
- ❑ Do not sand outside of tanks, this could break the surface coat seal.

NOTE: The 6mm fuel tubing must be installed on saddle tanks before permanent installation into model.

- ❑ Use a Dremel drum sander to scuff the lap joint of rear sections and mating surface of forward section. Remove epoxy build up on edge of non lap joint section.
- ❑ Trial assemble tanks, mark the overlap with pen, sand 1/8" beyond this line for glue adhesion.
- ❑ Clean tank halves one more time and apply AeroPoxy to mating surfaces, wet the frayed edges of Kevlar on edge of front section, then fit halves together. Use masking tape to form border for glue. Pull tape while glue is still soft. Use a generous seal of glue on the outside surfaces. Flex tank slightly to observe any voids, then finger wipe to form a filleted joint. Allow to cure thoroughly (24 hours).
- ❑ See drawings for installation of tubing and clunks.
- ❑ Check tanks for leaks by submerging in water and using only lung pressure, blow into tank through fuel line. Pinch off ends and check for bubbles. If a leak is detected, scuff the area and patch with AeroPoxy.

FUEL PICK-UP TUBING

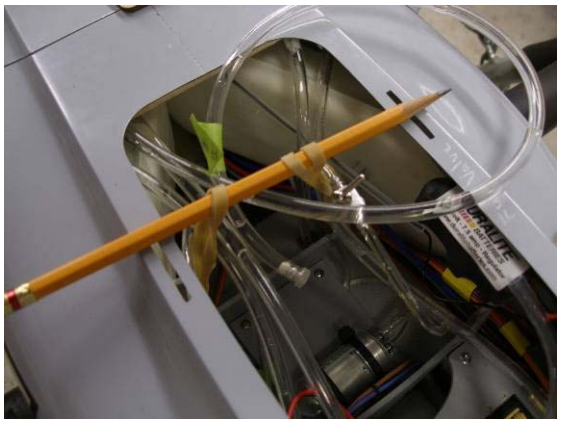
- ❑ Install the clear tubing (provided), attach to clunks and aluminum stopper. Wrap each with a piece of safety wire. Install into tanks and check freedom of clunk movement. Hand tighten knurled disc.

NOTE: This urethane internal tubing will expand ½" per 5" of length after Kerosene soaking.

FUEL EQUIPMENT INSTALLATION

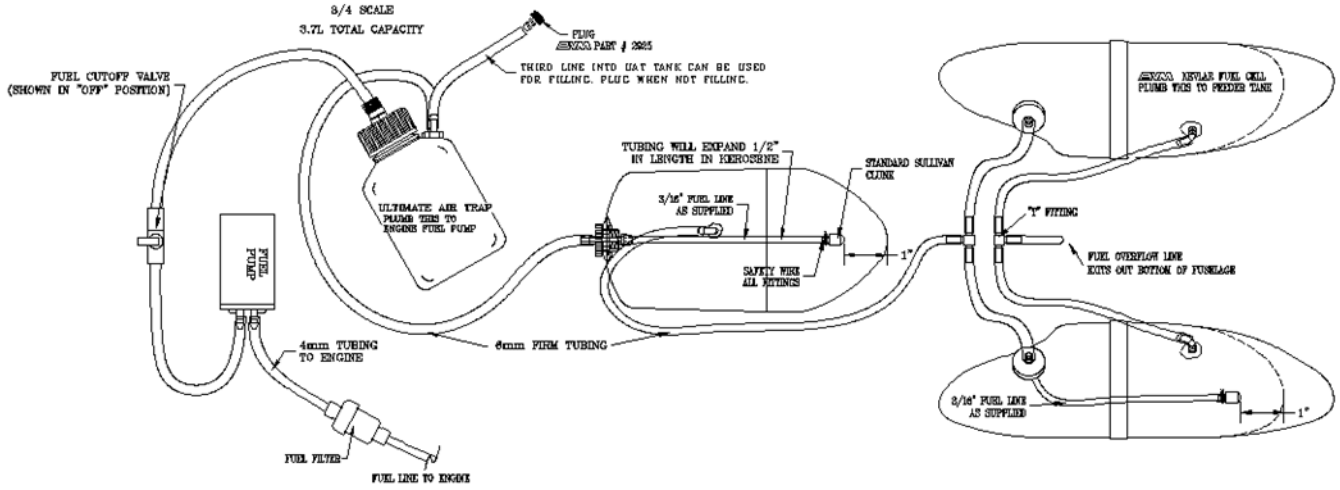
- Trim length of inboard wing mounting bolts such that they do not press against the tanks.

- Use a square piece of foam to block in the main fuel cells.



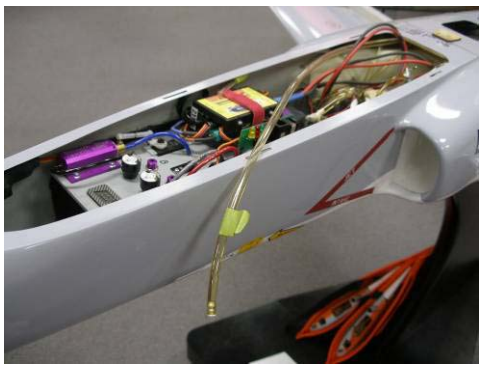
- Secure the header tank with (2) #64 rubber bands.

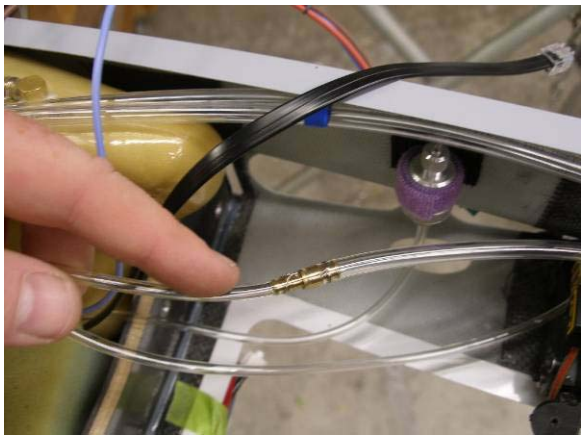
FUEL SYSTEM DIAGRAM



PLUMBING THE FUEL SYSTEM

- Use a 6mm to 4mm brass reducer to step the supply line from the UAT to the fuel pump.





- Plumb the two main tanks together with a “T” fitting connected to the vent of the 8 oz center hopper. The center hopper feeds the UAT through one of the brass fittings. The second brass fitting is for the refueling line. The 6mm line from the blue aluminum fitting of the UAT goes to a 6mm to 4mm brass reducer and finally to the input of the fuel pump.

- Add the fuel system vent in a convenient location on the bottom of the aircraft. Plumb the two vent lines from the main tanks through a “T” connected to the final vent fitting.

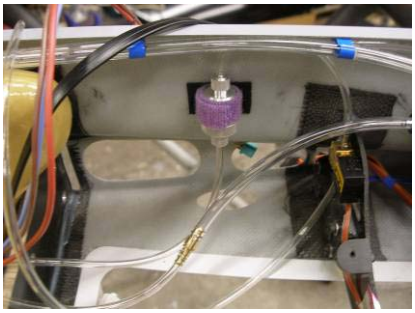
MOUNTING JetCat ENGINE ACCESORIES

ECU

- Use sticky back Velcro to hold the ECU in position to the left side of the fuselage. A loop of double sided Velcro will prevent movement.

FUEL PUMP

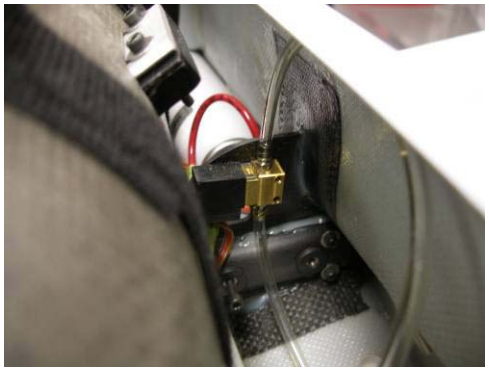
FUEL FILTER



- Mount the fuel filter using a scrap of sticky Velcro on the fuselage, and a wrap of double sided Velcro around the filter.

Hold filter up right to allow bubbles to pass.

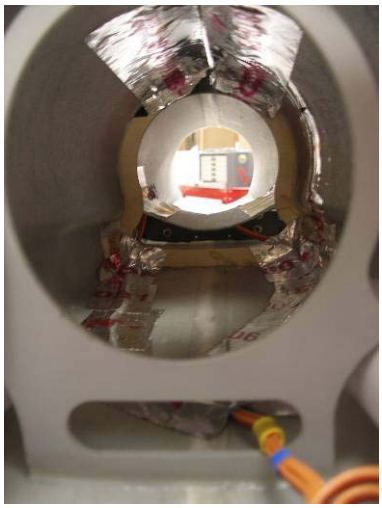
SOLENOID VALVES



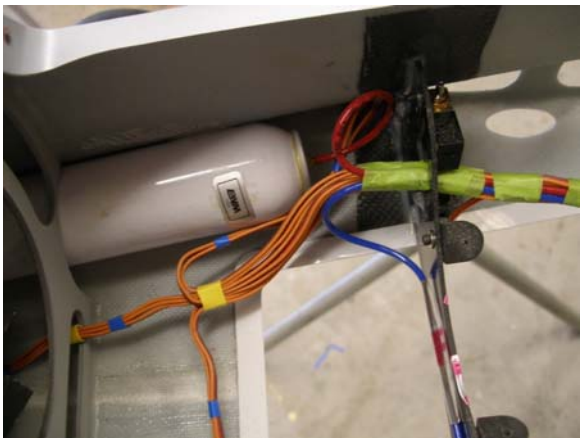
STARTING GAS TANK

- Use an external tank. Use a one-way Festo check valve on 4mm line connected to the propane tank.

PROTECTING THE FUSELAGE SERVO LEADS



- Use aluminum tape to hold the servo wires away from the tailpipe. Check the condition of all heat blankets and servo wire protectors periodically to prevent damage from heat.



- Use tape to prevent chaffing on sharp edges.

- Install heat blanket over the elevator servos and under the rudder servo. Use aluminum tape to hold in position.

INSTALLING THE CANOPY AND COCKPIT DECK

BEFORE YOU FLY

This section contains notes on radio, turbine, tailpipe, fuel system, and retract installation and operation.

It is assumed that the builder of this kit has acquired the basic skills and knowledge necessary to make a safe and functional radio control installation into a model. Therefore, these notes are intended only to assist that experience.

Important note: Securely glue or fasten all components. This jet can reach speed of over 200 mph. It is ***your responsibility*** to operate it safely.

AILERON CONTROL TRAVEL

Refer to the installation section of this manual and note that the servos are properly secured and the surrounding structure is sufficiently glued to the wing skins.

Surface travel should be: High Rate 1-1/8" up
1" down
Low Rate 9/16" up
3/8" down
Measured at the Aileron/Flap junction.

NOTE: The aileron differential travel is achieved with he angle of the servo arm with the aileron in the neutral position. Additional programming can be accomplished if two channels are used in the radio setup.

RUDDER CONTROL TRAVEL

Refer to the installation section of this manual and note that the servo is properly secured and the surrounding structure is sufficiently glued to the fin skins.

Surface travel should be: ¾" both directions measured at the tip

ELEVATOR CONTROL TRAVEL

NOTE: Check elevator linkage and servos for damage should the model get handled improperly and there is a possibility that the elevators got jarred.

Refer to the installation section of this manual and note that the servos are properly secured and the surrounding structure is sufficiently glued to the stabilizer skins.

Surface travel should be: 1-1/8" up
1" down
Measured at the root.

FLAP CONTROL TRAVEL

The use of flaps for slow flight and landing is essential for the proper operation of a turbine-powered model. Flaps should be deployed below about 70-80 mph. No pitch trim change is necessary.

The 15 degrees down flap position is used for take-off and the first phase of the landing pattern or when safe, slow flight is desired. At this angle of deflection, the flaps provide a significant increase in lift with only a slight increase in drag. Take-off distance will be reduced.

The full flap position of 45 degrees is used for landing. A further increase in lift is available along with aerodynamic drag that is necessary to overcome the idle thrust of the turbine engine. In strong winds reduce to 35 degrees for landing.

It is **not recommended** that the flaps be used with greater than the above max full flap deflection. Use the 3-position "land" switch will select "flaps up", "flaps take-off", and "flaps landing".

Important note: The flaps must be rigged to deflect equally. This is easily accomplished with a JR matchbox.

RECEIVER BATTERY

If a 5-cell pack is used, install a 5.2 voltage regulator. Our prototype used 14000 mAH Duralite "stick" pack and regulator; 6+ flights are achievable.

Place both the ECU and receiver batteries either next to the hopper tank or in the nose as need by the C.G.

THE RECEIVER

BVM flies our Bandit ARF with the 955s or s2000 receiver to accommodate the digital servos.

- Use sticky back Velcro to hold the receiver in position to the left side of the fuselage.

ROUTING THE ANTENNA

- Route the antenna down the top of the fuselage as shown.

<u>It is your responsibility to be certain that the equipment you use has been thoroughly tested under these conditions for interference free and long range operation</u>

RANGE CHECK

- Range check the model with the engine off. Note the distance.
- Set the failsafe function for the throttle to “engine off” as per the engine manufacturer’s instructions and about 1/8” up elevator.
- Range check the model again with the engine running at ½ power and full power. The engine should go to the commanded failsafe position at the extremity of the range check. If the distance is less than the radio manufacturer’s recommended minimum or less than 90% of the engine off range, the antenna must be re-routed away from the ECU, fuel pump, and associated wires.

Warning: Do not attempt to fly the model until the “engine running” range check is sufficient.

- Accomplish a range check prior to each flying session.

CENTER OF GRAVITY

Balance the Bandit ARF with the gear down and fuel only in the UAT. The balance point should be 9” aft of the L.E. at the wing-to-fuse junction.

Note: This is a change from earlier practice. Your Bandit ARF may have 1/16” holes drilled in the fuse forward of this 9” point. Drill 2 new holes at the 9” position, install 2 small button head screws to mark the C.G. position.

Balance the wings by weighing them individually. Add weight to the light wing as follows – example – right wing is 1 oz heavier than the left, add 1 oz of lead in the aileron servo pocket of the left wing. Glue the lead in securely.

RECOMMENDED THRUST AND SPEED LIMIT

Not to exceed 200 MPH! Use 20 lb max thrust.

FINISHED WEIGHT

19-21 lbs

SET YOUR TIMER

For the first flight set the timer for 7 minutes, check amount of fuel consumed and adjust accordingly. The BVM prototype with the JetCat P-60 flies for 9 min and the JetCat P-70 for 7-8 min with proper throttle management using the standard 8 oz nylon header tank.

The Jet Take-Off

When the propulsion force is applied at the rear of a vehicle, it is destabilizing. The slower the forward speed, and the higher the thrust-to-weight ratio, the more problematic this effect is. A high powered model jet during the early stages of taking off is exemplary of this phenomenon.

The Proper Technique

A narrow, paved runway that has obstructions on the sides requires the best techniques. The first flights should be made in light wind conditions and preferably little or no crosswind. With good piloting techniques, most jets will handle a 10-15mph crosswind, but save that for later.

Set the wing flaps to the take-off position and taxi into the take-off position on the centerline and nose into the wind. Apply about 1/2 up elevator, release the brakes and slowly advance the throttle to about the 1/2 position. Direction control is primary, first with nose gear steering, and then as the speed increases, the primary control is with the rudder. Once the rudder authority is dominate and the model is headed straight down the runway, advance the throttle to full power. The model will lift off when it has sufficient airspeed.

Retract the gear and climb to a safe altitude and then retract the flaps.

For the first flight, keep the airspeed at a medium level and concentrate on trimming the model and deciding whether or not the center of gravity is optimum.

The published C.G.'s for BVMJets is on the conservative side - a place to start. You may want to ease it back on subsequent flights.

TAKE-OFF

The first flights should be made in light wind conditions and preferably little to no crosswind. With good piloting technique, the Bandit ARF will handle 10-15 mph crosswind, but save that for later.

Set the flaps at the take-off position. (Input 2 clicks of up trim for the first take-off). Hold full up elevator for the take-off roll until rudder authority is established. The Bandit ARF is a bit nose heavy with fuel on take-off, so expect about a 200 ft roll and a fair amount of up elevator (3/4”) to rotate.

After unstuck, retract the gear and climb to a safe altitude, retract the flaps and reduce power to cruise speed of about 100 mph.

SLOW FLIGHT

Most of the first flight should be utilized to get familiar with the slow speed flight characteristics.

Select the flaps to the take-off position; there should be no pitch change. Extend the gear and select full landing flaps; adjust the power to maintain level flight and a speed of about 70-80 mph.

Climb to a safe altitude and slow the model to the edge of a stall to know where that edge is. A good landing speed will be 10-15 mph above stall. Fly race track patterns at that speed and about 200 ft altitude to become familiar with the power setting required to maintain level flight.

LANDING

A good landing follows a power controlled, constant speed, and constant sink rate approach from the 180 degree position. The Bandit ARF will require about a quarter to half throttle during the turn to final. On final approach, reduce the power a few clicks more and fly a 2-3 degree glide slope.

Once over the end of the runway and within a few feet of the ground, reduce the power to idle and flare for landing. If runway length is limited, preset (in the landing pattern) the brakes to ¾ on, adjust on roll out.

If there is a crosswind component, put the ailerons into the wind and maintain heading with opposite rudder for the roll out. Braking on a hard surface runway should be gentle. Come to a complete stop before turning for taxi back.

EMERGENCY PROCEDURES

GO AROUND

- Apply full power and rotate nose up to 5-10 degrees
- Flaps to the take-off position, retract the speed brake.
- Gear up
- Climb to a safe altitude and re-enter the landing pattern.

NOTE: If fuel is very low, delay full flaps and landing gear until on final approach. Use speed brake as needed.

FLAME OUT

- Select take-off flaps
- Land into the wind
- Land gear up in the grass if runway is out of range.
- Glide and landing speed will be determined by the weight of fuel remaining.

LOSS OF CONTROL

Shut the engine down. Pre-flight you helper on how to do this; you may be too busy trying to fly. Shutting down the engine before impact is the most important procedure to prevent a fire.

LANDING GEAR WILL NOT EXTEND

Burn off excess fuel and land with take-off flaps. Shut the engine down prior to touchdown.

SPLIT FLAP CONDITION

Always extend the flaps at a safe altitude. If a violent roll occurs, retract them immediately. Fly a faster than normal approach (about 10-15 mph) and shutdown the engine prior to flare out for landing.

JR SERVO AND EXTENSION REQUIREMENTS

CONTROLS	QTY		SERVO TYPE	QTY	Channel	LEAD EXT
Ailerons	2		JR 9411	2	AIL AUX 2	12”
				2		36”
Elevators	2		JR 3421	2	ELEV GEAR	48”
Rudder Swept or Std Fin	1		JR 9411	1	RUDD	36”
Nose Steering	1		JR 9411	1	RUDD	“Y” Harness
Retract Valve	1		JR 351		AUX 5	N/A
Flaps	2		JR 8411	1	AUX 1	Match Box
				2		36”
				2		3”
Smooth Stop	1		JR 368BB		AUX 3	N/A
Battery	1		SPMB4000LP			
	1		SPMVR6010			

NOTE: IF EQUIPMENT OTHER THAN JR IS USED, CONSULT THE MANUFACTURER FOR SIMILAR COMPONENTS.

To make the Bandit ARF very easy to rig, we chose to put each servo on it’s own channel. This allows easy adjustments and servo reversing to each flight control.

Simply download the JR data safe file if you plan to use our program layout.

The only difficult mix involved moves the gear channel to Aux 5.

*NOTE: Reverse servos and Y-harnesses are not required when 2 servos are used with a JR Match Box.

The JR Match Box can also be used on rudder and nose gear steering to avoid any need for reversed servos.

Radio manufacturers are constantly improving their equipment - consult their representatives or BVM (JR only) for the latest and best servos.

KIT CONTENTS

K5300	******* BANDIT ARF **********	
Qty Needed	**Component ID**	**Component Description**
1	K5300A-01	BANDIT ARF KIT
1	K5300A-02	BA- BVM HARDWARE
1	K5300A-21	CANOPY/DECK PACKAGE
1	I5300	BANDIT ARF INSTRUCTION MANUAL
1	VF3917	SUPER BANDIT CLEAR CANOPY
1	T314	BY-PASS F/G EXTENSION

K5300A-01	FIBERGLASS KIT PARTS	
Qty Needed	**Component ID**	**Component Description**
1	K5300A-05-X	LEFT WING
1	K5300A-06-X	RIGHT WING
1	K5300A-07-X	LEFT STAB
1	K5300A-08-X	RIGHT STAB
1	K5300A-09-X	CANOPY/ENGINE HATCHES
1	K5300A-10-X	FIN - SWEPT

K5300A-02	BA- BVM HARDWARE PACKAGES	
Qty Needed	**Component ID**	**Component Description**
1	K5300A-18	BA FLEX PLATES
1	K5300A-20	BA SERVO/EQP INSTALL PACKAGE
1	K5300A-22	BA NOSE GEAR DOOR ATTACH PKG
1	K5300A-23	BA COVER PLATE PKG
1	K5300A-24	BA CANOPY HATCH PKG
1	K5300A-25	BA TAIL GROUP
1	K5300A-26	BA FUSELAGE PARTS
1	K5300A-27	BA LINKAGE PACKAGE
1	K5300A-28	BA NOSE GEAR INSTALL
1	LP4075	CLEAR NYLON TUBE

K5300A-18 BA FLEX PLATES

Qty Needed	Component ID	Component Description
2	K5300M-RC019	CF, .084,Main Flexplate w/wash
2	K5300M-RC020	CF, .084, Main Flexplate Dblr
16	4029	BOLT 4-40 X 1/2 SHCS

K5300A-20 BA SERVO/EQP INSTALL PACKAGE

Qty Needed	Component ID	Component Description
8	4021	#4 FLAT WASHER
1	2865	#2 X 7/16" SSSH bag of 75
8	4138	BOLT 4-40 X 3/8 SHCS BLACK
2	W3381	3/8 X 5/8 X 3/4" MAPLE
2	W3386	3/8 X 1/2 X 3/4" MAPLE
4	PS-SP-0009	TEES FOR SERVOS

K5300A-21 CANOPY/DECK PACKAGE

Qty Needed	Component ID	Component Description
1	1727	SUPER BANDIT DASHBOARD
1	VF3006	BOBCAT COMP EJECTION SEAT
1	LC3294	1/8 BALSA SEAT BACK
1	4074	O-RING 1/16X1-1/4 BUNA
1	8049	I BEAM PLASTIC 8"
1	I7245	S BANDIT CANOPY/DECK INSTRUCTI
1	VF3918	SUPER BANDIT COCKPIT DECK

K5300A-22 BA NOSE GEAR DOOR ATTACH PKG

Qty Needed	Component ID	Component Description
1	2961	1/16 x 10" WIRE
1	2988	SPRING 1/8 x 1-1/4" EXT
1	W3418	1/4 X 3/8 X 5" MPL STICK
6	4051	DUBRO HINGE & PINS
1	4121	DOMED SMS 3/8 SOCKET
18	4121A	#2 X 3/16 BUTTON HD SMS
2	MC5045	BVM STRUT DOOR ATTACHMENT
1	LC3297	1/8 5PLY NG DOOR ACTUATOR

1	LC3298	1/8 L PLY BG DOOR ACTUATOR
1	LCF11041	1/8 B.PLY MAIN DOOR CLY MT""
1	LCSB1011	AIR CYL MT

K5300A-23 BA COVER PLATE PKG

Qty Needed	Component ID	Component Description
34	4121	DOMED SMS 3/8 SOCKET
2	4121A	#2 X 3/16 BUTTON HD SMS
4	2801	4-40 X 3/16" BHCS
2	MC5045	BVM STRUT DOOR ATTACHMENT

K5300A-24 BA CANOPY HATCH PKG

Qty Needed	Component ID	Component Description
1	2932	3/16 HEX DRIVER TOOL-BVM
3	4030	NYLON BOLT 1/4 X 20 X 5/8"
1	8047	PP .020 1 X 6"
2	MC5012	HATCH ALIGN PIN
5	MC5127	CANOPY HOOK CF-MOLDED
2	W4380	3/8 X 3/4 X 3/4" MAPLE BLOCK
1	K5300M-LC024	BALTIC, 1/8",
1	K5300M-LC030	BALTIC, 1/8", TAB

K5300A-25 BA TAIL GROUP

Qty Needed	Component ID	Component Description
2	2966	1/4 X 4-1/4 4130 STL TUBE
3	4127	BOLT 6-32 X 3/8" SHCS
3	MC5025	C BODY MT BRKT
1	K5300M-MA005	CF,.248 X 2-1/8" T.E. ALGN PIN
2	K5300M-MA004	CF, .248 x 2.850" ROD
1	K5300M-LC025	ITPOP, 1/4", STAB/FIN PIN GAUG

K5300A-26 BA FUSELAGE PARTS

Qty Needed	Component ID	Component Description
1	4013A	2/56 BALL THROTTLE-181 DUBRO
2	4061	BOLT 6-32 X 1/2 SHCS

2	4121A	#2 X 3/16 BUTTON HD SMS
2	4130	#4 X 3/8 SMS
6	4273	BOLT 10-32 X 3/4" SHCS
2	MC5090	FLUSH WING SERVO ANGLES
1	T110	1/2" X 30" VELCRO
2	W3345	3/8 X 1/2 X 1/2" MAPLE
1	W4321	MAPLE 1/4X1/2X1/2"
2	W4337	1-1/8 X 3/8 X 1/4 MAPLE""
1	K5300M-LC027	BALTIC, 1/8", ECU TRAY
1	K5300M-LC028	BALTIC, 1/8", STEERING TRAY
1	K5300M-LC029	BALTIC, 1/8", FUEL TANK FORMER
1	K5300M-LC031	BALTIC, 1/8", REAR FORMER

K5300A-27 BA LINKAGE PACKAGE

Qty Needed	Component ID	Component Description
4	2884	4-40 X 2-1/2" FULL THREAD STUD
7	4023	4-40 HEX NUT
14	4093	SULLIVAN 4-40 CLEVIS
14	4014B	SULLIVAN KEEPER
3	PS-FS-0009	STUD, SS, 4-40 3 " FULL THREAD
1	K5300M-LC033	BALTIC,1/8", FLAP HORN LOCATOR
1	K5300M-RC018	CF, .084, CONTROL HORNS AEFR
2	PM-RC-0001	CF, .020, STAB TIP PROTECTOR

K5300A-28 BA NOSE GEAR INSTALL

Qty Needed	Component ID	Component Description
1	2961	1/16 x 10" WIRE
4	4133	BOLT 4-40 X 5/16 PHIL
2	4013A	2/56 BALL THROTTLE-181 DUBRO
2	4013B	2-56 NUT
1	4025	BALL LINK-NYLON
2	4183	BVM 2-56 STEEL COUPLER