BANDIT arf Mk II

Assembly and Operation Instructions Manual

Describes: Pneumatic Retract Installations.
See BVM Document I-K5700-17 For E Purple Retract Installation.
See also:www.BVMJets.com/Pages/Addendums/bandit_arf_ads.htm

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

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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 Mk II assemble easily and allow the factory prototypes to be duplicated.

WARNING

This model is designed to safely operate with model turbine engines in the 13-20 lbs thrust range. The prototypes are powered with a JetCat P-60, P-80, and Jet Central “Rabbit” engines. Limit the thrust of any engine installed in this model to 20 lbs 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 Mk II 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.

See Also: BVMJETS.COM Bandit ARF page for updates / addendums.

SERVO’S

Because of advances in technology and the separation of JR from Horizon / Spektrum, radio control components such as servos are being deleted from inventory and / or replaced.

In all cases, the replacement products reflect improvements such as metal gears, high voltage capability, and stronger metal cases.

It has been BVM's practice to list the appropriate servo for each control device in the printed instruction manuals for all BVM jets and certain Skymaster airframes that we enhance with "BVM Success Packs". The BVM Manuals will be updated as time allows, however, we recommend that you consult your Radio Manufacture's Representative for the most recent information

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 Mk II 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.

See Also: BVMJETS.COM Tips and How To's for information on paint, patching, and blending.

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 Mk II

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 Mk II.

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

50 (.070) 2-56 tap drill
.050 Hex driver BVM #2157
1/16” x 6” long drill
2-56 tap
A good set of small Phillips and slot end
Carbide Cutters (5 pack) BVM #2142
Dremel #409 disks
Dremel 90º adapter
Perma-Grit cone – BVM #RF-1F
Perma-Grit cut off Disc RD-2
Perma-Grit small files BVM #NF-1
Large files are also handy (#LNF-1)
Q-Tips
Screwdrivers
Set of ball end hex wrenches
Vaseline
Zap Debonder Z7- BVM part #PT-16
Zap Thin – PT-07
Zip Kicker – BVM # PT-15
Zap Debonder Z-7 – BVM # PT-16
43 (.089”) 4-40 tap drill
Set of small drill bits
12" steel ruler with 1/10th inch scale
4-40 tap 2-flute
Screw drivers
Dremel #409 cut-off discs and mandrel
Dremel drum sander
Masking tape
Perma-Grit countersink tool - BVM #RF9UF
Perma-Grit BVM #FXT-103
Perma-Grit inverted cone BVM # RF7C
Pin vise to hold 1/16” drill bit
Safety wire – BVM #2800
Scuff boards – BVM #2175 (pack of 10)
Stay Bright silver solder kit – BVM # 5786
X-Acto Razor Saw #235 (2)
Zap Z end glue tip – BVM # PT-18 (pack)
Zap-A-Gap – BVM # PT-02
Slo-Zap – BVM # PT-20
Pacer Z-42 Thread Locker – BVM #PT-42

(**1**) Razor saw (fine tooth X-Acto #X235)– Use when a perfect straight line is required such as for the bottom hatch cover and nose gear doors.
(**2**) Razor saw*****, (blade only) – Use in conjunction with the razor saw, this will allow perfect corners to be cut in the removable panels and doors.
(**3**) 1/8” carbide cutter – This bit works great to quickly cut through fiberglass, but only for “rough” cuts.
(**4**,**5** & **7**) These Perma-grit and Dremel bits are used to “clean up” edges and corners.
(**6**) Cutting disk – This tool is also a “roughing” bit, but it allows a straight line to be cut quickly – Works great for cutting out the canopy opening.
(**8**,**9** &**10**) Perma Grit files (flat, round and pyramid) Use these tools to get precise angles and corners.
(**11**) Perma Grit RF9UF Countersink.
*****NOTE: Grip the saw blade in a vise and pull the handle off with a pair of pliers, then grind the dimples off. Wrap one end with masking tape.

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
LC	Laser Cut		
BHMS	Button-Head Machine Screw		
SHSMS	Socket Head Sheet Metal Screw		
BHSMS	Button-Head Sheet Metal 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 Mk II.

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.

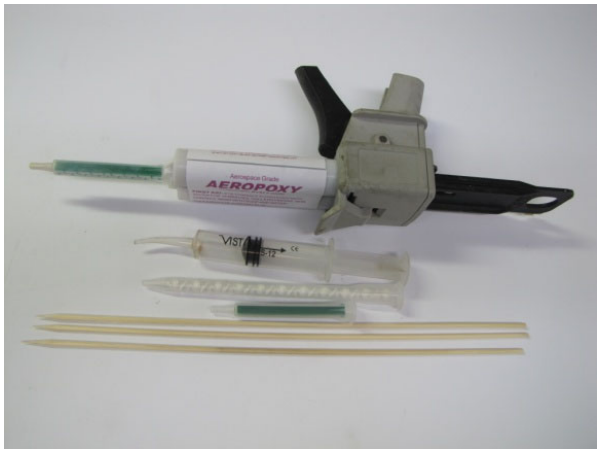
GLUE, ZAP AND BVM AEROPOXY

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. For a quicker setting (5 min.) thixotropic aerospace grade glue, BVM offers QT Poxy. It is almost as strong as Aeropoxy. 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 and QT Poxy are 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.For hard to reach areas in the fuse such as the wing and tail mountings, use a combination of Aeropoxy glue nozzles, Aeropoxy injected into a disposable plastic syringe, and bar-b-que skewer sticks. Another technique is to put a
3/16” x 9” brass tube extension onto the mix nozzle.

The BVM #PA-SR-0072 plastic syringes are very helpful, hold the tube horizontal, apply Aeropoxy to the lower portion, apply the plunger then allow air to rise to the tip.

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.

BVM “Q” Poxy (BVM P/N PA-SR-0025) can also be dispensed from the Aeropoxy glue gun. The cure time of “Q-Poxy is about 5 minutes.

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.

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.

WHEELS 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.

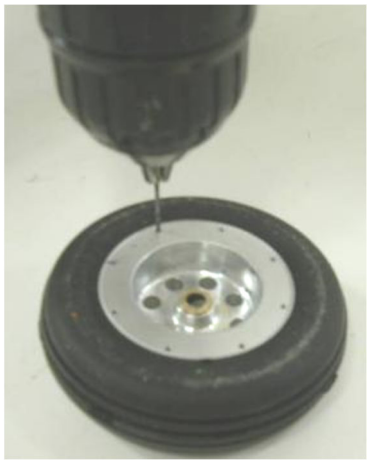
AXLE FLAT SPOT

- 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 Wiha 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.

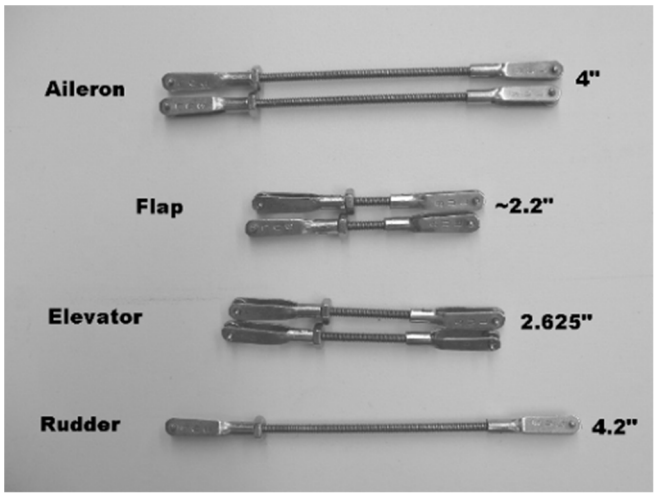
- Before tightening the tire screws, apply a drop of blue Thread Locker to the threaded holes. This prevents the screws from backing out under the vibrations of braking. Carefully tighten the screws, avoid stripping the threads.

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.

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.

Notice: The extended use of the Bandit ARF's (both Turbine and Electric Power) on some grass fields has prompted this reinforcement kit.

The application of the carbon fiber reinforcement pieces to the backside (top) of the 12 layer plywood bracers offers a much stronger base for the 4-40 thread bolts. Install these parts during original assembly of the kit (those shipped post 06/01/2012). These same CF parts can be retrofitted to finished models. See Part II of these instructions that accompany the retro fit kit.

PREPARING THE CF TABS FOR INSTALLATION

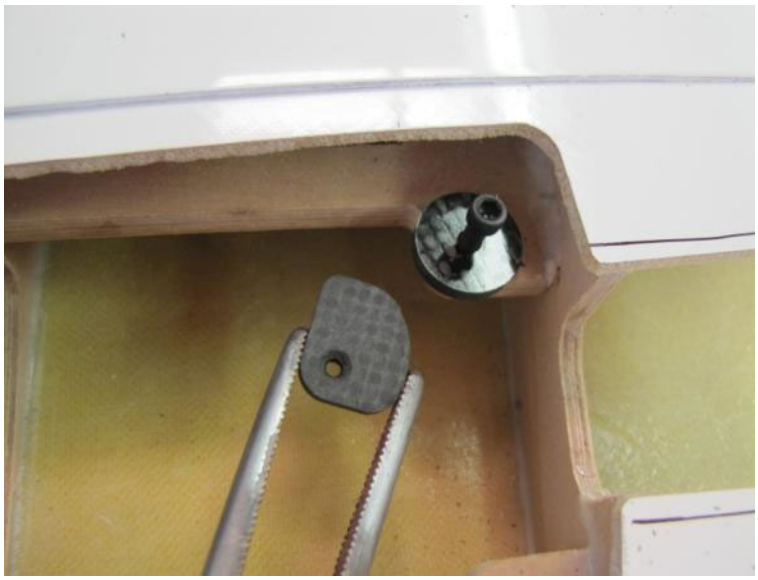
- Use a fiber reinforced cut-off disc to separate the parts. The round discs function as large flat washers during the installation sequence. They do not remain in the model.

- Use a suitable Channel Lock tool to hold the CF reinforcement tab to 1st drill out the hole with a #43 bit.
- Chamfer the hole with a Perma Grit (RF9UF) countersink tool.
- Tap the hole with #4-40 a few times. Test fit the 4-40 bolts (be sure to use a sharp, 2 flute tap)
- Repeat the above steps on each of the 4 holes in the plywood mounts in the wing.

- Drill the (4) holes in the plywood mounts in the wing with a #33 drill bit.

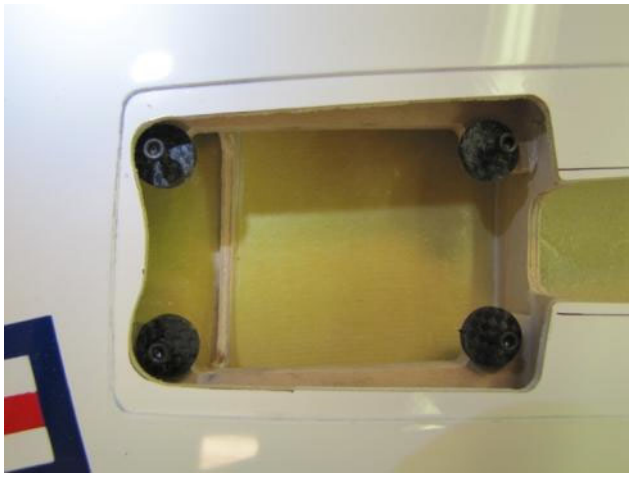
- Each 4-40 bolt must have a point ground on the end. Thread on a 4-40 nut and hold with a vice grip. Spin the bolt against a grinding wheel or belt sander. Removal of the nut helps to clear the threads.

INSTALLING THE CF TABS

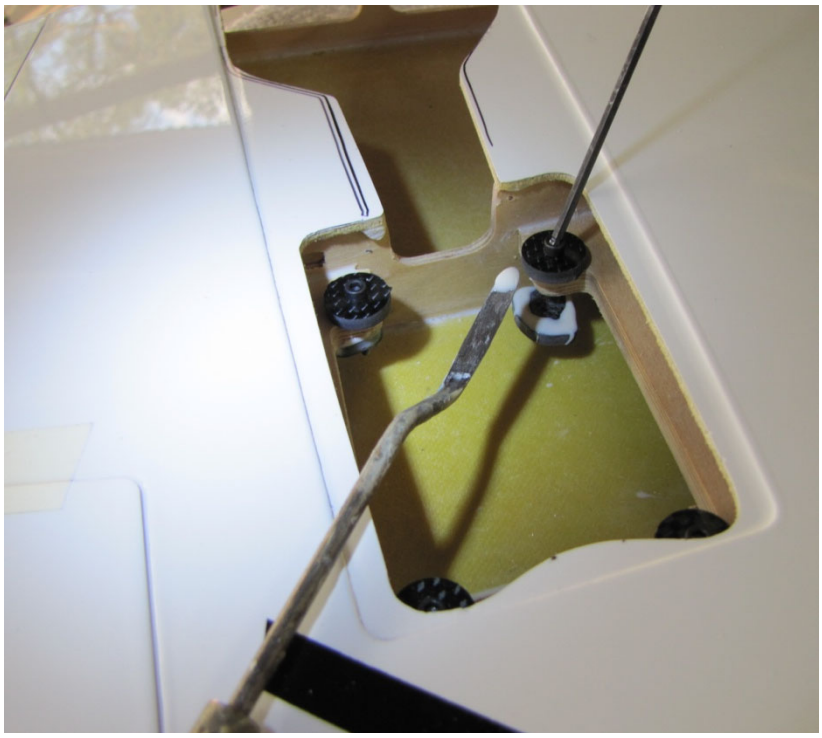


- The CF tabs fit under the plywood mounts, but must be scuffed before gluing. A coat of paste wax on the CF discs and the 4-40 bolts before installation will protect them from glue.

- Install (4) CF washers, and 4-40 bolts. Push the bolts into the plywood until end of bolt is flush with the backside of plywood surface.



Before Applying Glue, test thread each 4-40 bolt into each CF tab while holding it in place on the backside of the plywood.



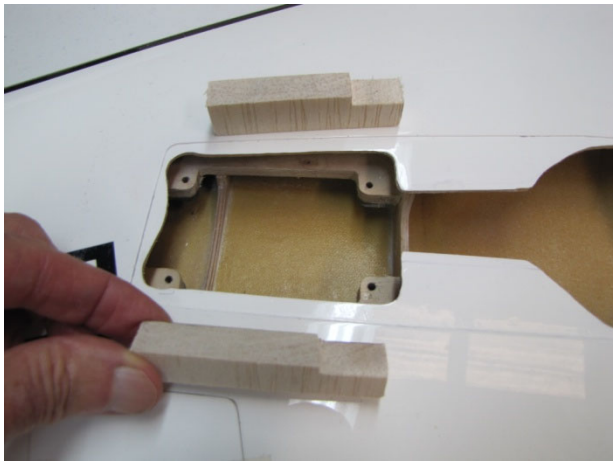
- Install all CF tabs, CF washers, and bolts.
- Loosen each bolt a couple of turns to allow the tab to swivel. Apply BVM Aeropoxy to the exposed surface of the tab. Tighten the bolt with the tab swiveled back into its proper alignment.

  A small hand mixed batch of Aeropoxy applied with a blade spatula works well.
- Use Isopropyl Alcohol and paper towels to clean fingers and check the surrounding wing skin for glue prints.

- After the glue cures, remove the bolts and CF washers.

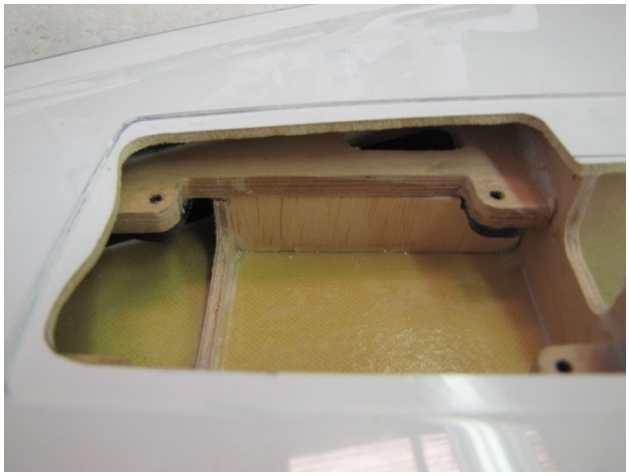
- Use a band saw and an 80 grit sanding block to trim the 1/2” x 3/4” x 3” end grain balsa block to fit between the top skin and the plywood mounts. Notice the notch at the inboard end to clear the CF tabs and rounded corners to allow for the glue joints at the #2 and #3 ribs. Use Aeropoxy to glue in place. They are structural pieces that help distribute landing loads.

NOTE: The aft block will be 1/2” tall and 2.9” long while the forward block will be .70” tall and 2.9” long.

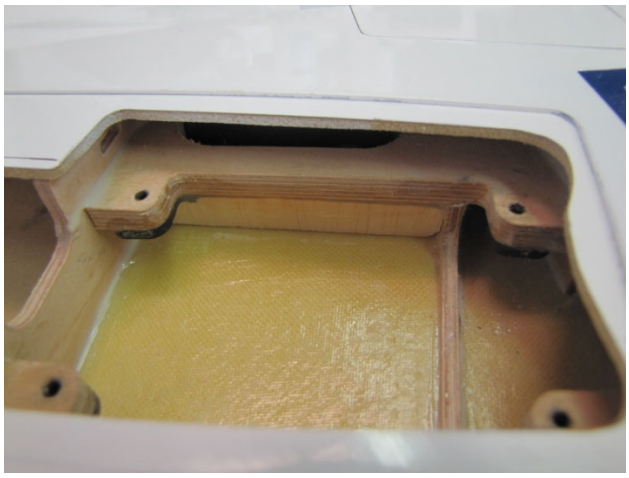


- End grain balsa blocks are shown here glued in place.

FWD

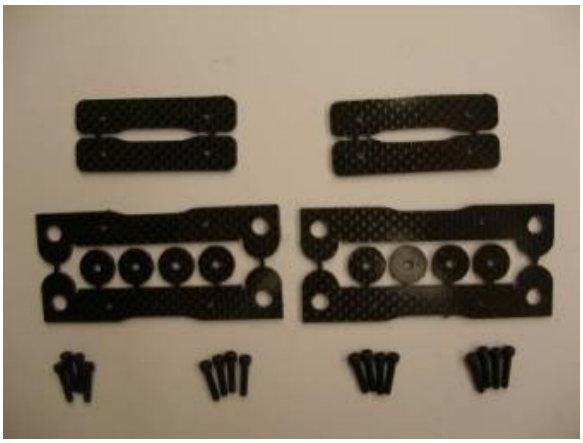


AFT

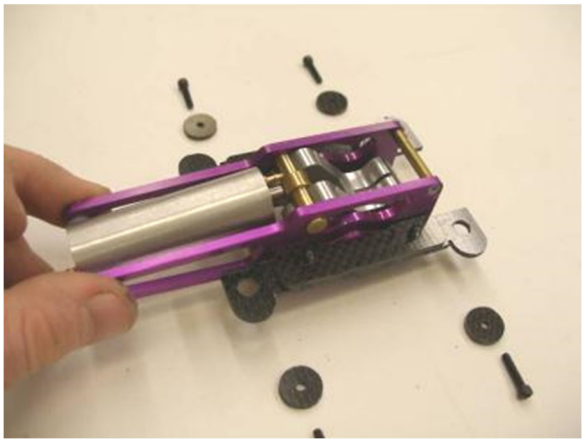


FLEXPLATES

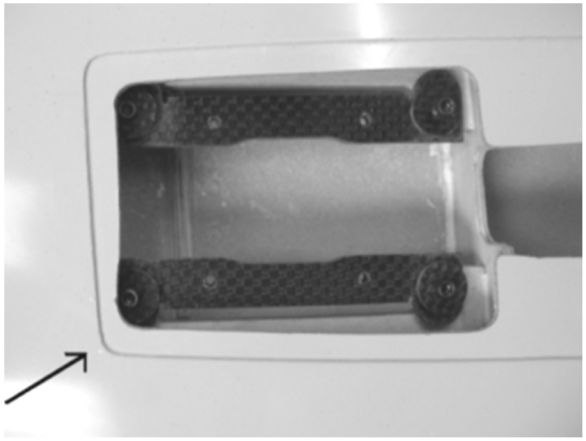
- ☐ Separate the CF flex plates, doublers and washers using a saw and finish with a sanding block.



- ☐ 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.



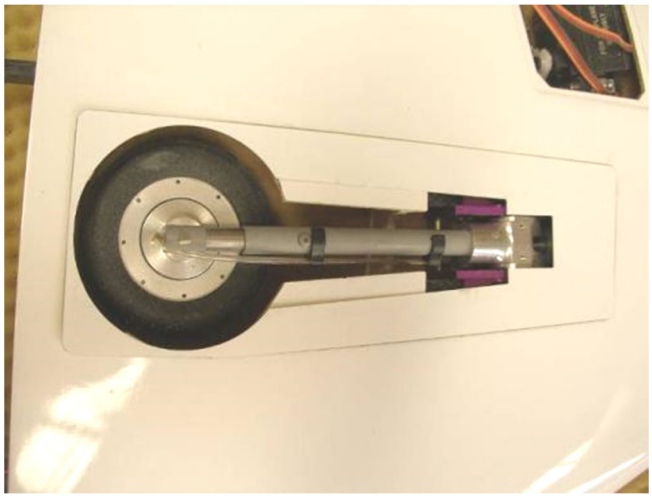
- ☐ Install the flex plates into the wing using four 4-40 x ½" SHCS. It is necessary to remove a little of the F/G flange for clearance of the driver.

NOTE:

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.

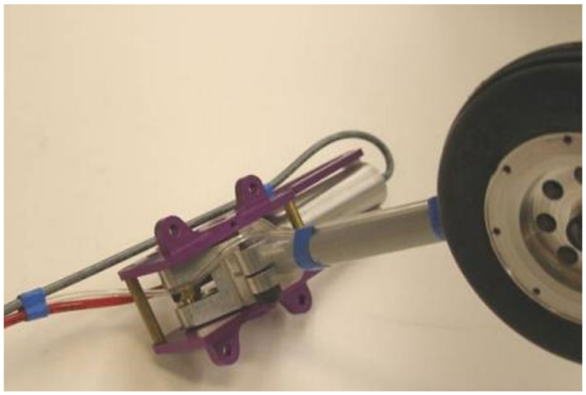
INSTALLING AND ALIGNING THE MAIN GEAR

- Temporarily fit and remove the landing gear assembly into the wing. It will be necessary to open the flanges as marked 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.



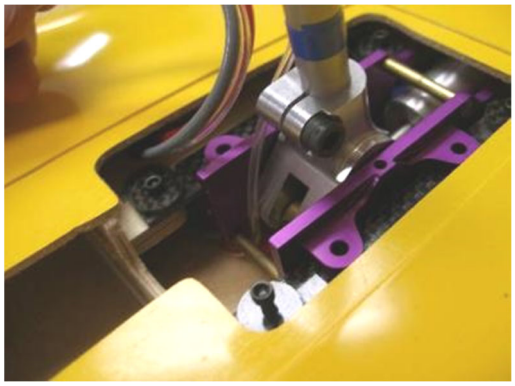
- The final position is set by the CNC Machined cover plate.
- Once the alignment of the main gear is correct and the wheel retracting into the wheel well, simply tighten the (4) screws and add a drop of ZAP to the CF washer and the flex plate.
- Adjust the main wheel toe-in to be between ½° and 1 °for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

- 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; this method work well:

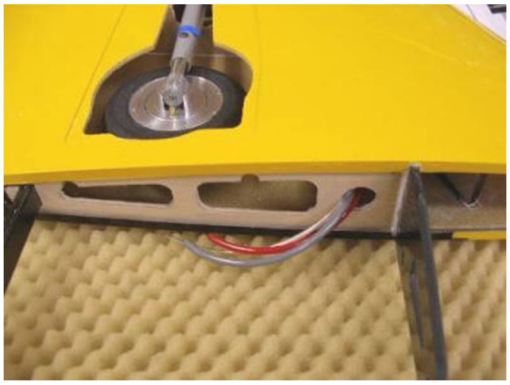
1. **Carefully warm the end of the tube with a heat gun.**
2. **Spray a small amount of CA kicker in the tube.**
3. **Press it on the nipple.**



- 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.

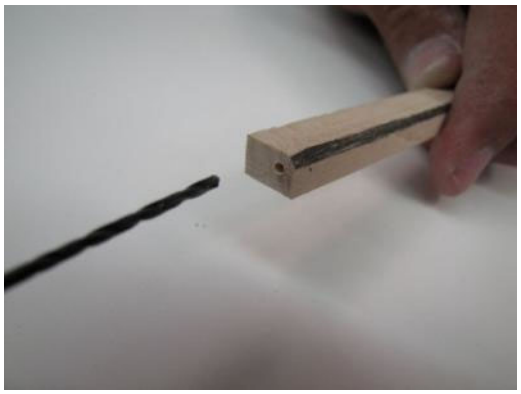
- Pull the (3) airlines through the circle hole just behind the main spar. Trim the airlines as shown and install the twist lock connectors. Put the male end on the red line and the female end on the gray line. This will help to avoid confusion while assembling the model at the field. Use the smaller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



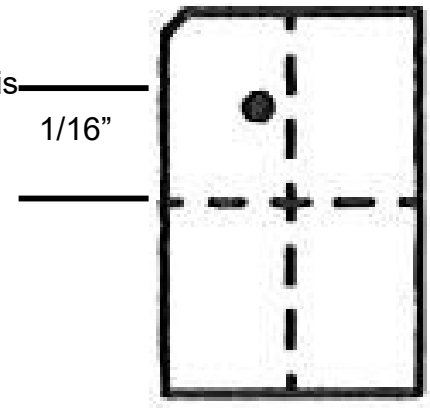
MAIN GEAR DOOR INNER HINGES

- Cut the ¼" x 3/8" x 3 ¼" basswood block to a length of 2 5/8".

- Bevel one edge lengthwise so the block will have clearance for the glue joint in the wing.



- Drill a 1/16" hole in both ends of the block located toward the beveled corner. The hole should be 1/16" above the short axis centerline (refer to diagram). Harden holes with thin CA.



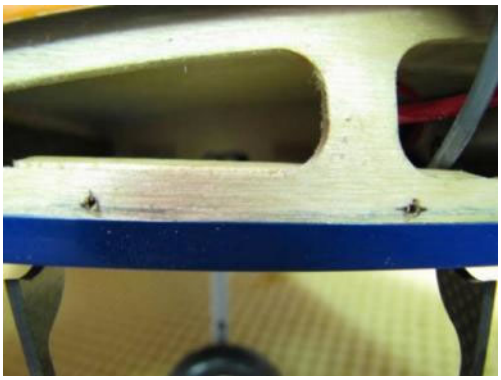
- Install the carbon hinges using #2 x 7/16” SHCS. Install the driving hinge on the forward end.

  NOTE: It may be helpful to block sand the upper edge (next to the bevel) to improve the door-to-hinge fit.

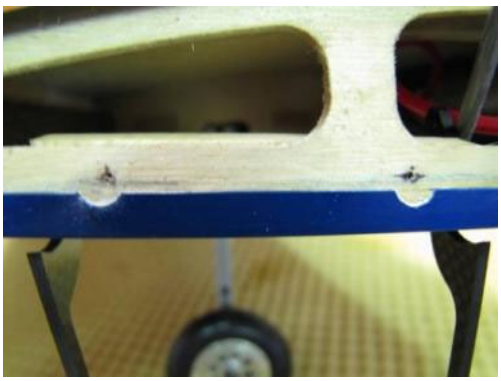
  NOTE- The correct CF Hinges are supplied in either the Air Install or E-Purple Retracts Package.

NOTE: The wheel well door is removable with its hinge block following the next few steps.

- Apply 2 small drops of Slo-Zap to the hinge block and tack glue to the root rib.



- Measure on the root side .500” towards the center of the hinge block on either end, and .200” from the skin. Drill a 1/16" hole at these locations.



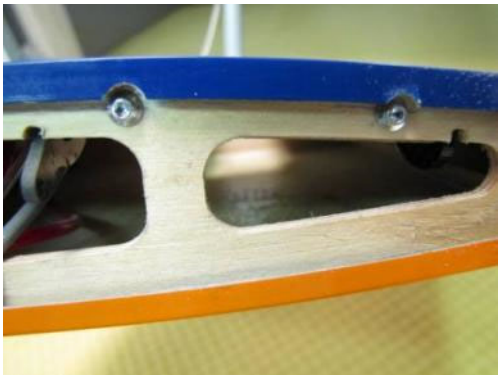
- Use a Perma-Grit cone on a Dremel to create a clearance in the flange for the screw heads to clear.

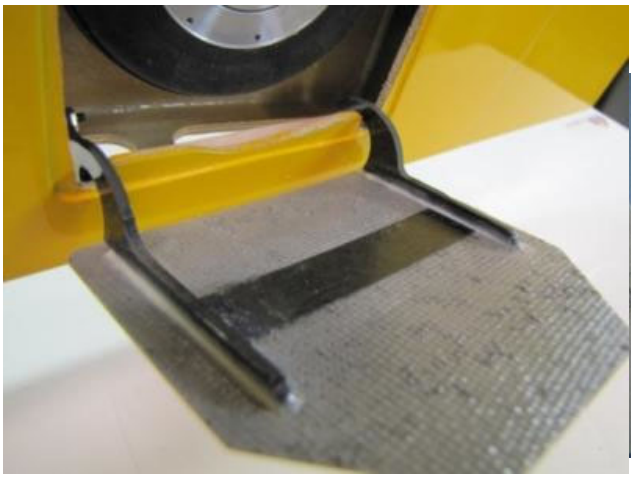
- ☐ Install (2) #2 x 7/16” SHCS.

- ☐ Remove the hinge block and harden the (2) holes with thin CA.

- ☐ Sand the sides of the carbon hinges in preparation for the application of AeroPoxy later.

- ❑ Reinstall the hinge block. Mark on the root rib where the hinges come into contact. Make small notches in the rib using a flat Perma-Grit file.

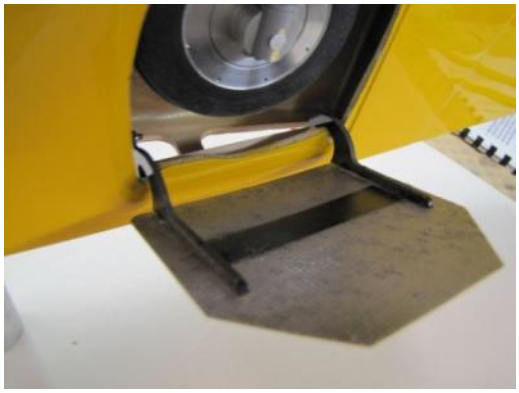




MAIN WHEEL WELL DOORS/COVERPLATES/STRUT COVER INSTALLATION

- ❑ Sand the backside of the wheel well doors with # 80 grit.
- ❑ Cut carbon strips to length as shown.
- ☐ Mark the door 3/8’ from either edge and 1.5” from the bottom.
- ☐ Place a Popsicle stick beneath each side of the door.
- ☐ Glue the carbon strip with Zap-A-Gap and press the strip down while the glue is curing to create the proper curve of the door to match the airfoil.
- ☐ Apply a small bead of SLO- ZAP to the hinges, then place the wheel well cover in position, leaving a 1/16” gap at the root to allow the door to open. Press or tape the door against the hinges and allow to cure.

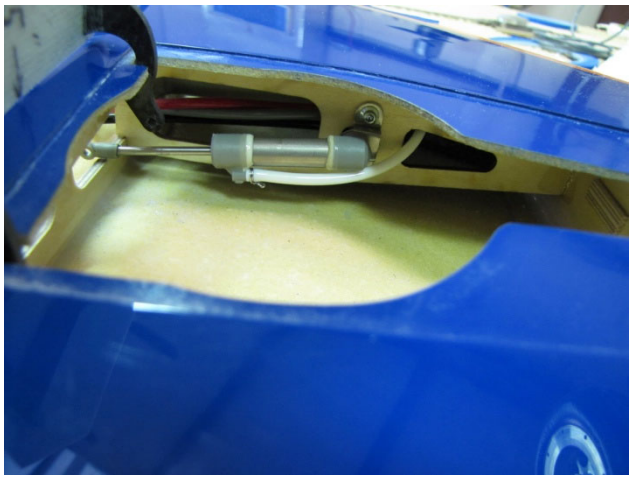
- ☐ Test the door, and if the gap at the root was too tight, remove the hinge block/cover assembly and remove a small amount of material from the edge of the door. Reinstall and test again.



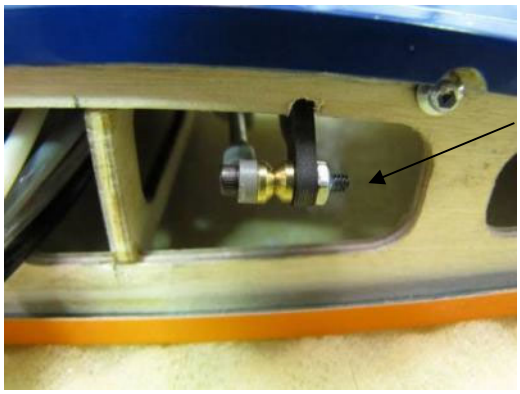
- ☐ When the door fit and operation are correct, add a small fillet of Aeropoxy to both sides of each hinge.

- Make two pencil marks .600” aft of the wing root rib opening. This marks where the air cylinder mount will be placed.

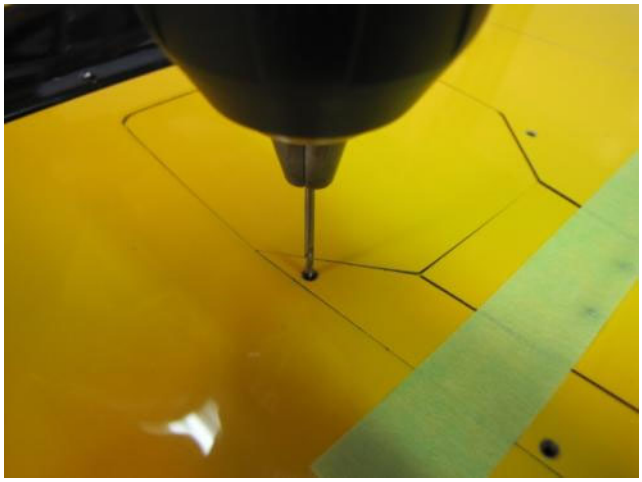
- Glue the 1/8” plywood air cylinder mount into position with the cylinder attached. Use Slo-Zap to hold for now. Later it will be glued into place with AeroPoxy. Make sure the cylinder does not interfere with the retraction of the wheel.



- Attach the cylinder to the hinge with the #2-56 SHCS, (2) brass spacers, and #2-56 nuts as shown. Be sure to not over tighten, thus hindering the operation of the door. Apply a drop of Pacer Z-42 Thread Locker to the end of the bolt thread protruding beyond the nut.



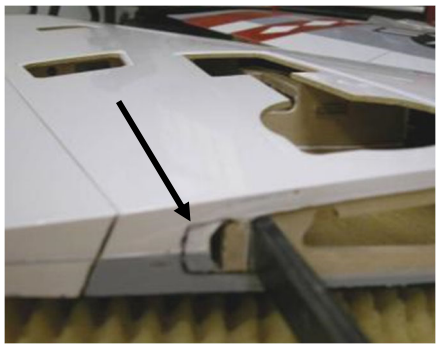
- When the the cylinder and wheel well door operation is correct, Aeropoxy the cylinder mount in place at the root and tip ends.



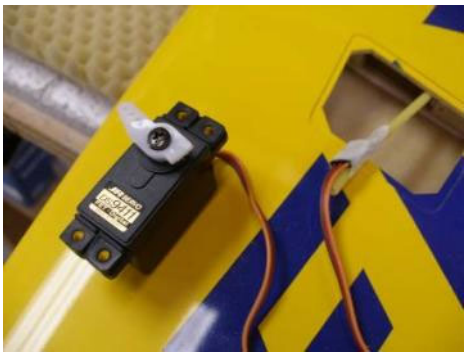
- The cover plate is held into place with (9) countersunk panel screws. Use a Perma-Grit countersink tool on the cover plate. Harden the holes in the wing with thin CA.

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.

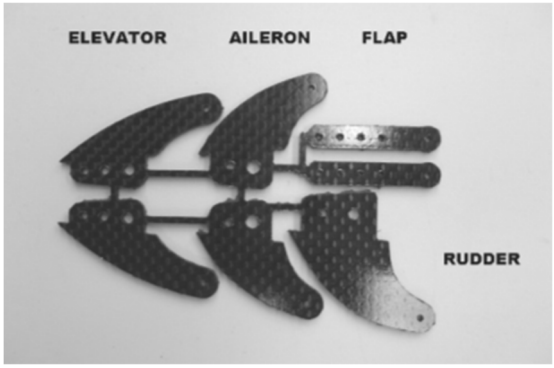
- This is the completed aileron servo and control horn installation. Note that the servo arm is rotated forward one tooth, approximately 10 degrees.

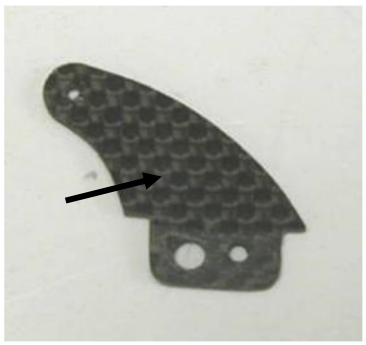
NOTE: The following section covers the installation of the CF control horn

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.

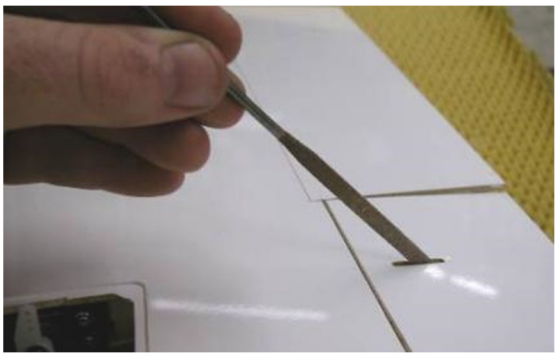




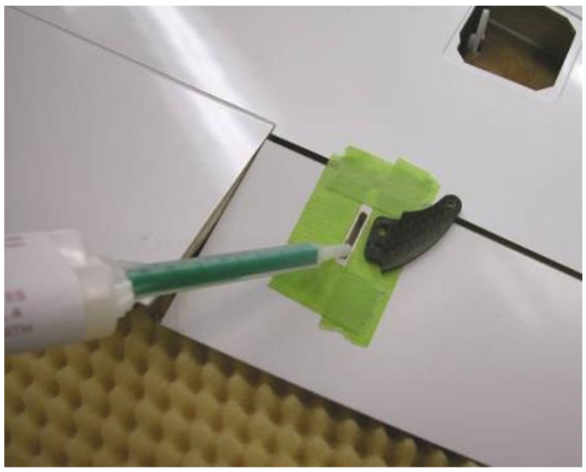
- Always scuff the gluing surfaces, and clean the clevis hole with a sharp 1/16” drill prior to installation.

- 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. See next page.

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

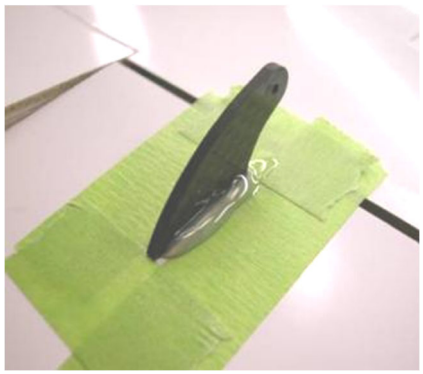


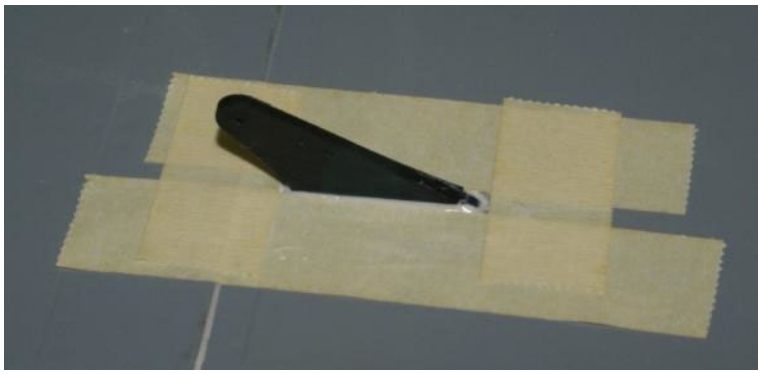
- The trailing edge of the aileron horn is designed to be 1.7” from the trailing edge of the aileron. Make sure the horn flange sits flat on the skin surface.



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

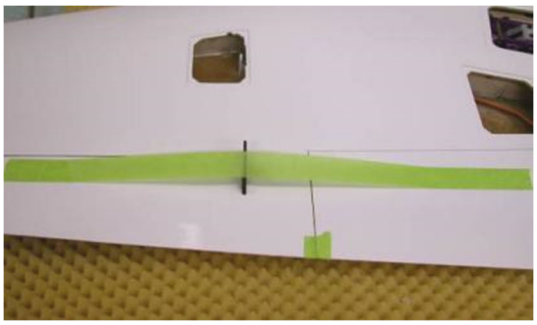
- Apply AeroPoxy into the slot and on the base of the control horn. Push the scuffed control horn into the surface and wipe the excess glue away leaving a small fillet.





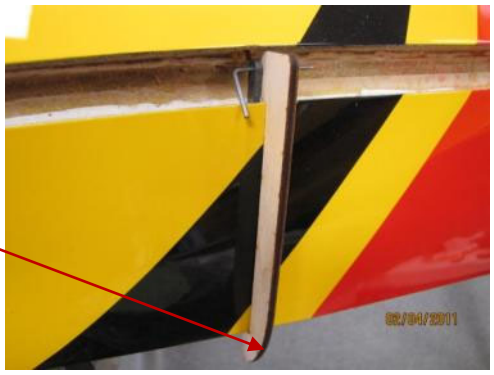
- Before the glue cures, pull the surrounding tape away from the horn and clean glue residue from the painted surface.

- Use a long piece of masking tape stretched over the center of the control horn to hold in position while the AeroPoxy cures.



FLAP 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.

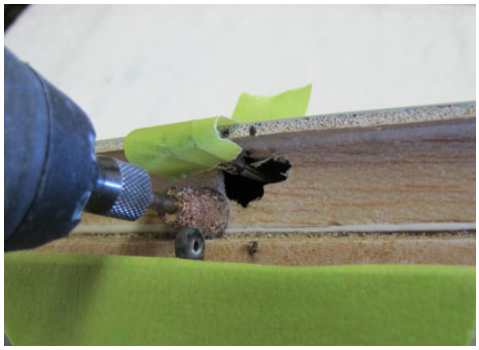
Use AeroPoxy to glue the control horn in place. A strip of masking tape can be used to hold the ply locator while glue cures.

Wing Trailing Edge Enhancement

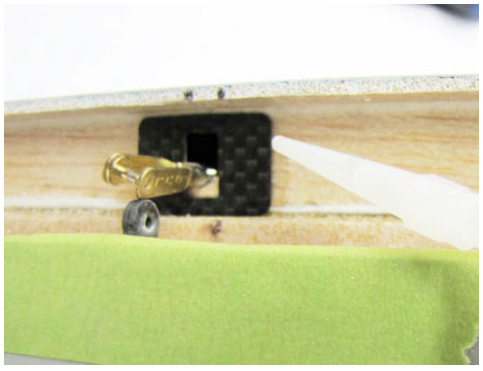
This simple addition adds integrity to the wing trailing edge at the flap control rod exit point.

If the model is finished/flown:

- Disconnect the clevis from the control horn. Use a inverse tapered cone PermaGrit tool #RF7C to clear away the glue fillet as necessary to allow the CF Brace to seat against the balsa trailing edge.

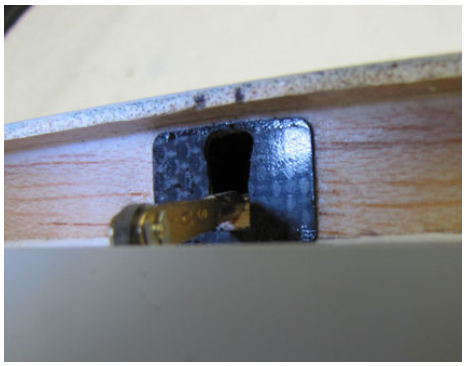


- Trail fit then use Zap-A-Gap to secure the CF plate to the T.E.



- Use a PermaGrit file to relieve the top of the slot for the flaps up position.

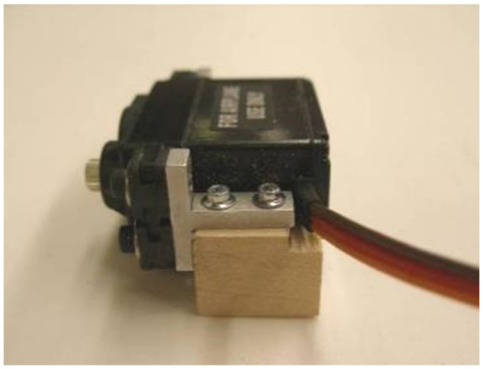
- The finish opening will look like this.



FLAP SERVOS

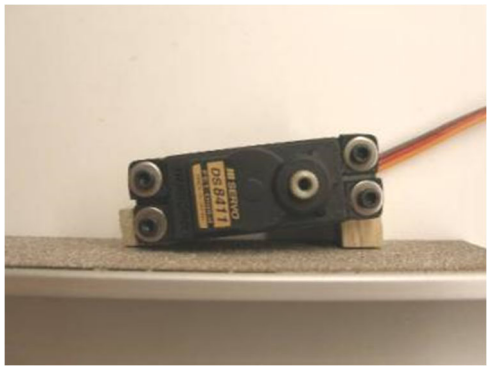
- Assemble the servo to the aluminum servo mounts as shown using (4) 4-40 bolts and #4 washers. Use one drop of thread locker to prevent loosening.

Note: The flap servo output shaft is oriented inboard and forward in the servo pocket.



- Drill the maple blocks with a 1/16” drill to match the aluminum tees. Notice that there is a tall block and a short block. The tall block goes on the output end of the servo and is the front block. Make a small notch to clear the servo lead.

- 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.

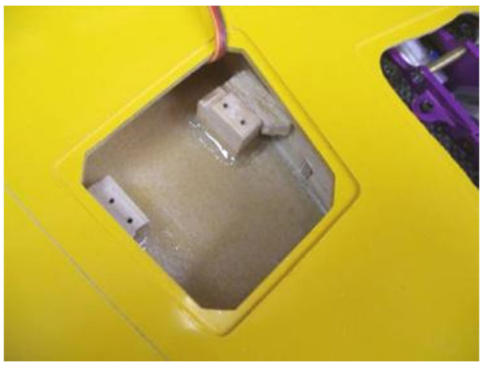
- Drill random 1/16” holes in the maple blocks for better glue adhesion.

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

- Install the previously assembled flap linkage to the flap servo arm with the 4-40 nut on the servo end.

- ❑ Locate the flap servo in the pocket. Hook up the linkage to the flap horn and align the servo to prevent the linkage from binding. Notch the pocket flange as required to ease servo installation.

- ❑ When the alignment is correct, mark the location of the blocks on the wing skin. Apply SLO-ZAP to the bottom of the mount blocks. Re-install the servo and hold in position until the adhesive cures.

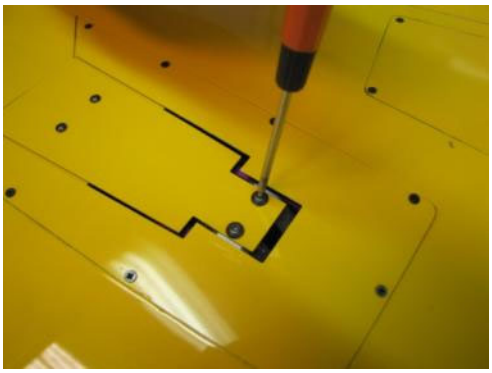


- ❑ Remove the servo and use scrap balsa to reinforce the front maple block. Apply AeroPoxy to create fillets around the blocks.

- ❑ After the AeroPoxy cures, re-install the servo and attach the linkage.

SERVO COVERS AND GEAR / STRUT COVERS

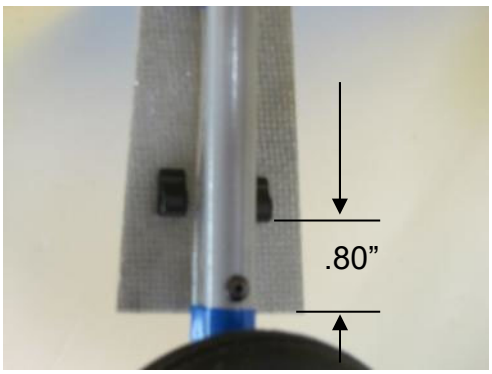
- ❑ Trial fit gear cover plates and tape to wing to locate the strut cover.



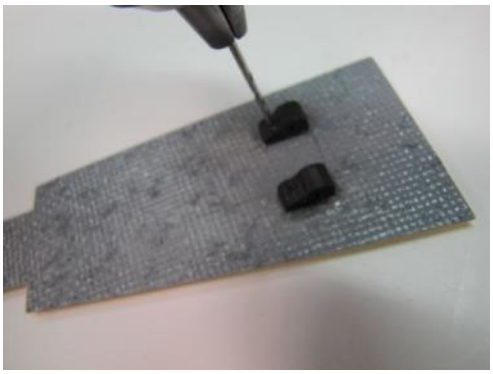
The strut cover is attached to the LG trunnion with (2) 4-40 X 3/16” BHSHCS.

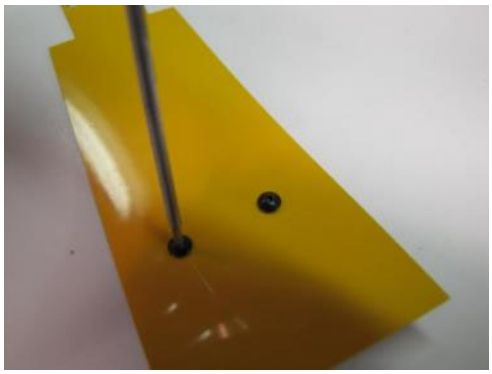
- ❑ Carefully align the strut cover so it is centered within the cover plate before tightening the screws.

- ❑ Position a CF strut door attach block on each side of the Duro Strut, .80” above the lower strut cover edge.

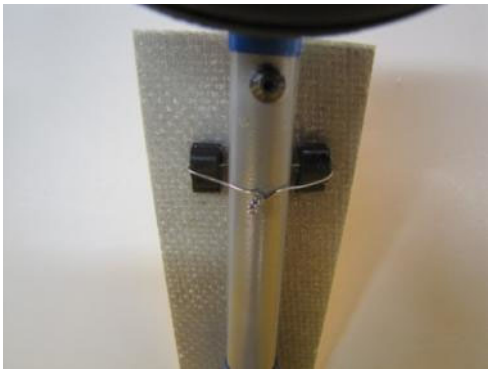


- Remove the door and drill a 1/16” hole through each of the strut door attach blocks.





- Install a #2 x 3/16” BHSMS to retain each block.

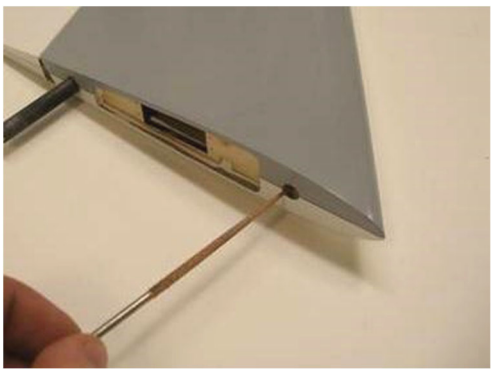


- Re-install the strut cover, and retain with a loop of BVM .020 safety wire P/N 2800. Adjust the tension of the wire to snug the cover when the gear is retracted.

STABILIZER
STABILIZER MOUNTING TUBE

- Test fit the carbon rod into the steel tube, then apply Slow Zap or epoxy and fully insert the rod until inboard ends are flush.

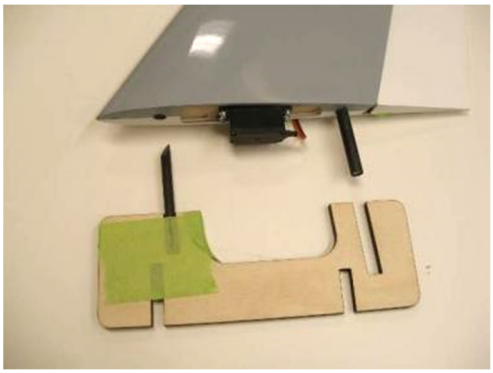
- Use a round Perma-Grit file to fine-tune the front hole to fit the anti-rotation pin.



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

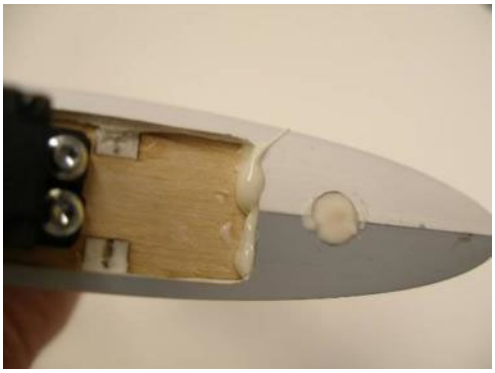
- Trial fit the front pin in place using the ¼" ply alignment fixture.

NOTE: Servo is shown installed here out of sequence. Its installation is covered on the following page.

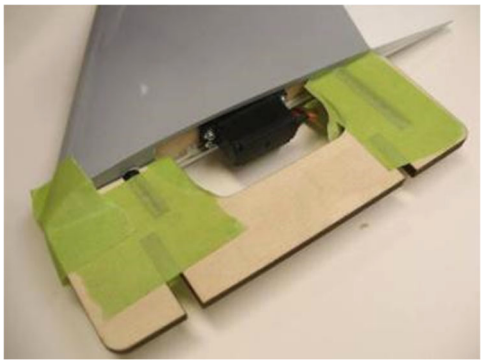


- Tape the CF pin to the ¼" ply fixture after setting the depth that the pin must be inserted.

- 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 the AeroPoxy to cure.



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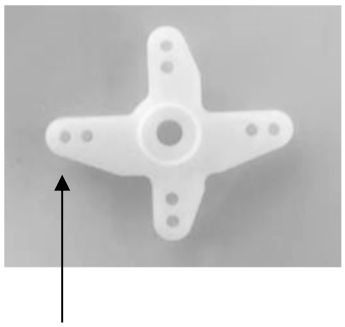
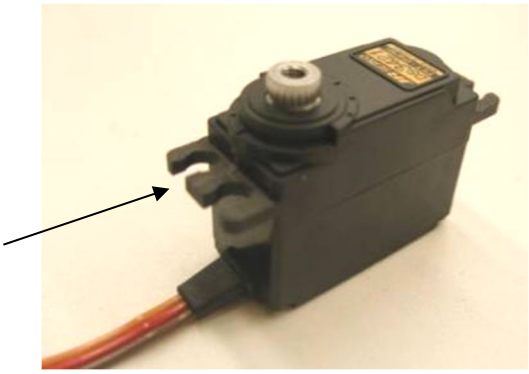
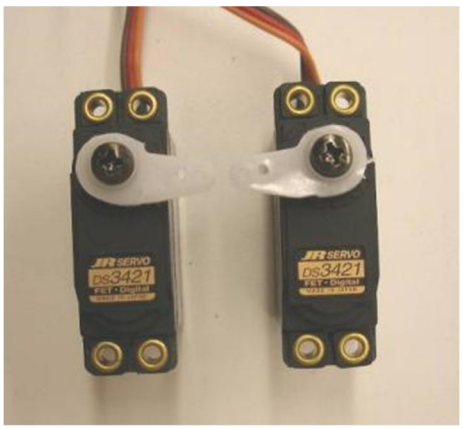
- Trial fit the CF bracket onto the forward pin. It will be glued inside the fuselage in a future operation.

INSTALLING THE ELEVATOR SERVOS





- 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.

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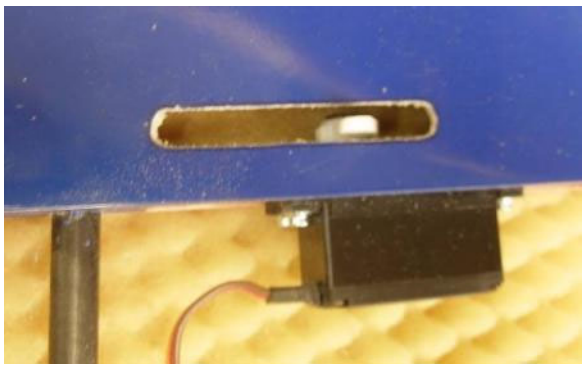
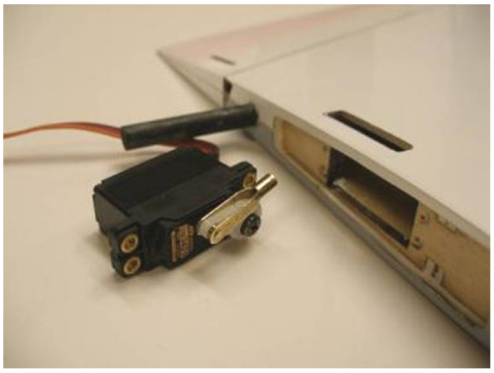
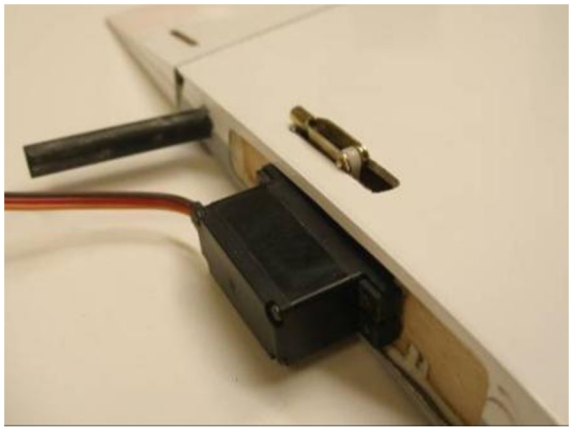
- Cut the slot for the servo arm as marked on the bottom skin. Adjust for proper clearance once the servo is installed and linkage connected.



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.

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

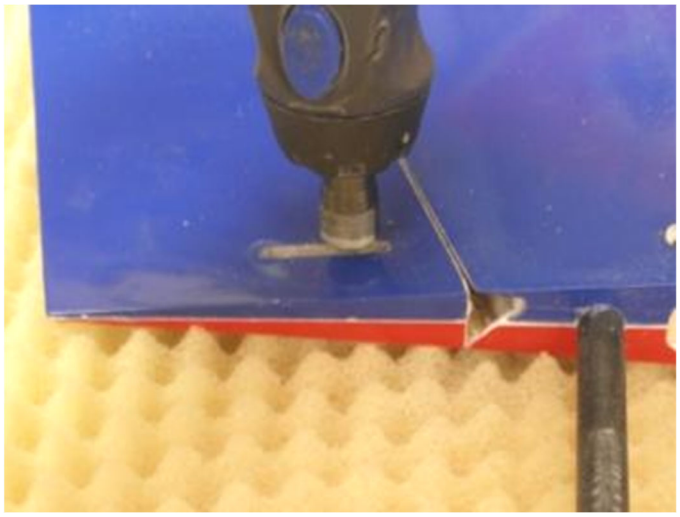




- Install the servo with the servo arm as shown, once in place rotate the arm through the stabilizer skin.

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.

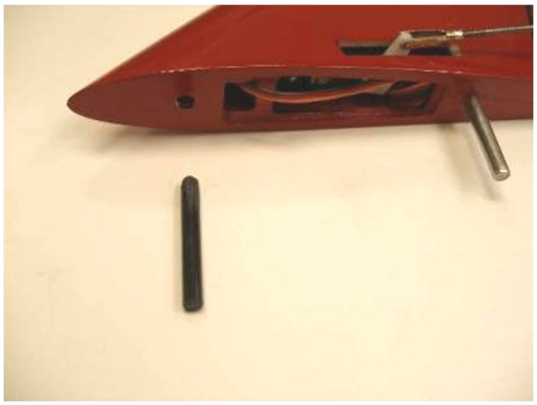
- Once the fit and alignment of the control horn is established, place masking tape around the perimeter of the slots, as per the aileron horn instructions, leaving a 1/16” gap on the sides to allow for a fillet of AeroPoxy.

- 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.

- Before the glue cures, 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.

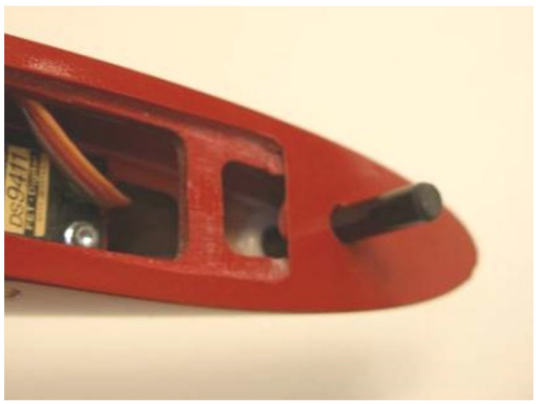
VERTICAL FIN

NOTE: vertical 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 of the pin, it must be inserted into the plywood fixture. Tape the CF pin to the ¼” ply fixture.

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

INSTALLING THE 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.

- 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.

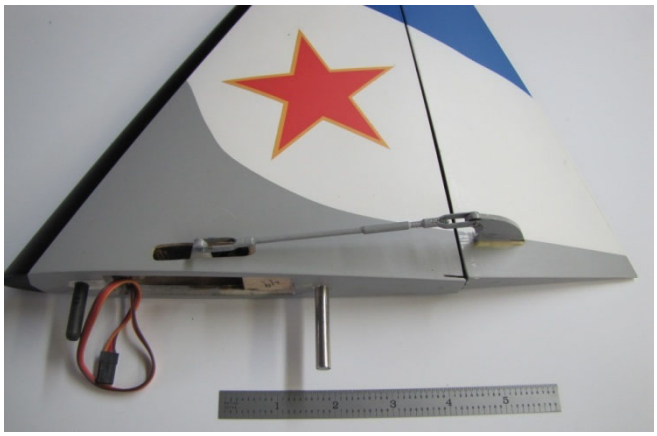
- Use a Perma-Grit file and a 1/16” cutter to open the servo arm slot in the vertical fin skin. Open this up to the marked line and adjust for proper clearance once the servo is installed and linkage connected.

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

- Install the servo with the servo arm rotated forward. Once the servo is in place, rotate the arm through the stabilizer skin.

Note: The servo screws are provided in a bulk package of 75 pieces.

STANDARD FIN/RUDDER LINKAGE

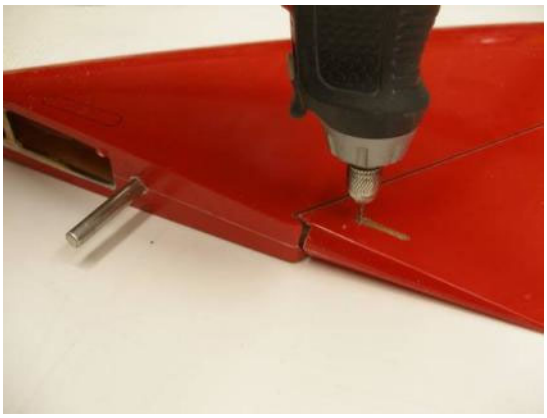


Make the rudder linkage from the 4-40 x 3.5” threaded rod and (2) 4-40 Sulivan clevises. The pin to pin length should be 4.6”.

After final adjustment, apply Z-42 to the threads at both ends and apply the safety clips. To improve the cosmetics of your model, brush paint the linkage and control horn with the appropriate Model Master’s paint.

RUDDER CONTROL HORN

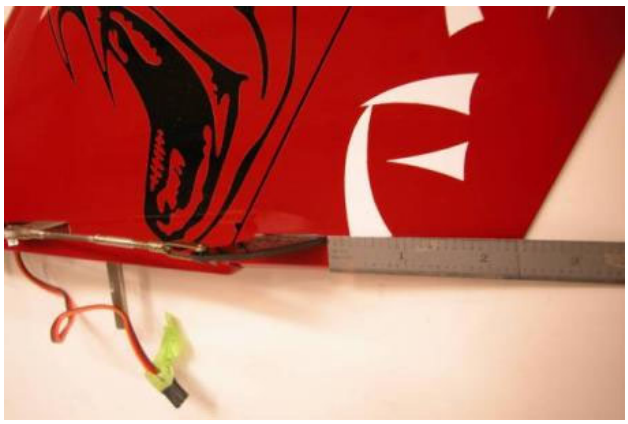
- Always scuff the gluing surfaces of the horn and clean the clevis hole with a sharp 1/16” drill prior to installation.



- 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.

FUSELAGE

WING MOUNTING

NOTES:

- F-5 and F-6 are symmetric formers.
- The aluminum brackets face aft in the fuse.

❑ Use the 6-32 x 3/8” SHCS and washers to affix the aluminum brackets to F-5. Insert the phenolic tube into the brackets before final tightening of the bolts to assure alignment. Use a drop of Z-42 Thread Locker on each bolt before insertion.

During the fitting of the wing to the fuse, it may be necessary to trim these areas (arrows) with a Dremel drum sander. The wing root should fit the molded fillet very closely top and bottom.

NOTE: There are left and right “C” channels brackets. The Heli-Coil insert faces up and defines the inboard end.

❑ Sand both sides of F-6 with #180 grit before mounting the “C” channels.

❑ Assemble the “C” channels to the front face of F-6 with the 4-40 x 5/8” SHCS and lock nuts. Just barely snug tighten the nuts, then back them off ½ turn.

NOTE: The “C” channels face forward in the model. Chamfer the inboard ends of the C.F. blade spars to ease entry into these channels. Block sand all sides of the blade spars with #180-200 grit.

FORWARD WING PIN

This carbon fiber leading edge pin should be installed on Bandit ARF Mk II'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.

- Make a notch in the wing root close to the LE as shown. The internal seam has a bead of glue. Remove it with a Perma-Grit inverted cone tool (RF7C) in a 90º adapted Dremel tool.

  A Perma-Grit 3/4" diameter (not shown) cutting disk RD-3 is also handy.

- Shape the CF pin base as required allowing it to fit inside the wing.

- Trial fit, and then use Slo-ZAP to secure. Back up the glue joint with Aeropoxy.
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- Use a black marker on the end of the CF pin and slide the wing in to transfer the pin point location to the fuselage fairing.

  NOTE: Review the steps on the next 3 pages to coordinate all of the steps.

  It will require multiple fittings and minor adjustments on most of the mating parts to get a smooth fitting, easy on/off wing attachment.

  BVM has fitted the phenolic tubes to the aluminum wing tubes. It may be necessary to further hone the phenolic tubes. Wrap #220 or #180 grit sand paper on a 5/8"-3/4" dowel.

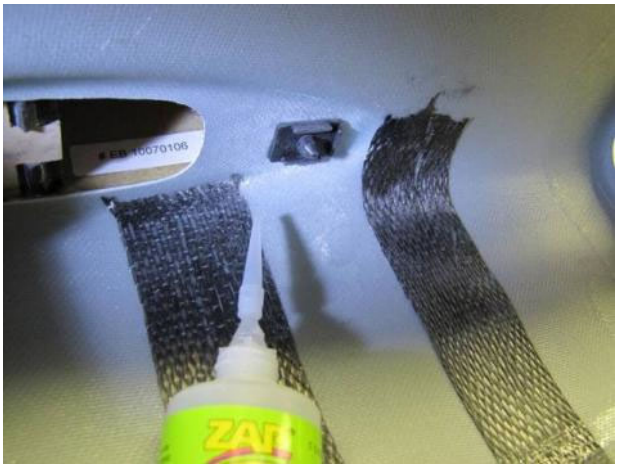
- Remove the wing and use a Perma-Grit rotary cone (RF1C) to make a loose fitting hole in the fuse side fairing while the ink is wet. The CF receptacle will be installed inside the fuselage to define a perfect wing LE fit.

NOTE: After the F-5 and F-6 are permanently glued in place, apply Vaseline to the mating parts allowing the wings to slide on and off easily.

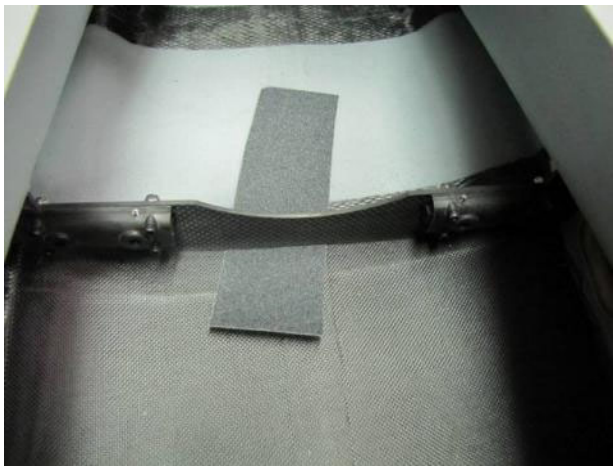
NOTE: The correct dihedral is set by F-5 and F-6. The wing root should match the fuselage fairing at the LE and the wing trailing edge at the flap hinge line .There will be a slight gap on the bottom where the wing root joins the fuselage.

- After the wing trial fitting and clearance holes have been adjusted, hold the wing LE to the fuselage fairing.

- Apply Vaseline to the C.F. pin then Zap glue the CF pin receptacle to the fuselage internal skin. Add Aeropoxy after removing the wing.

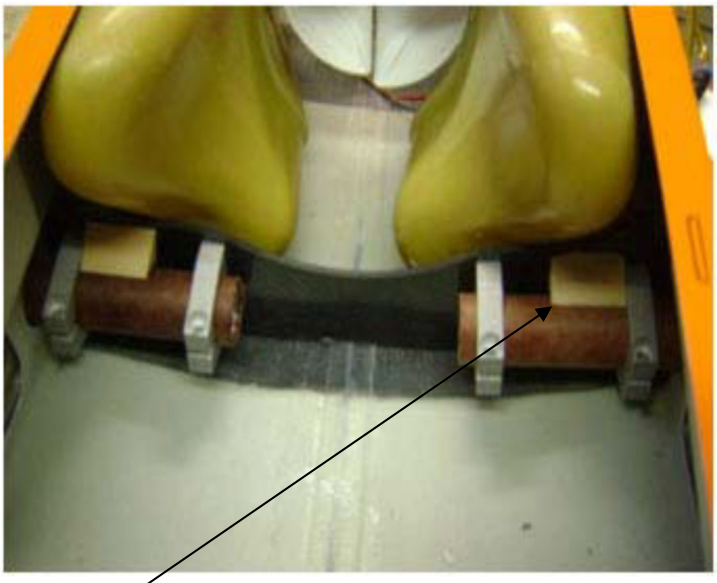


- Suspend the fuselage on foam strips fore and aft of the wing. Use a strip of #80 grit sandpaper to be sure formers F-5 and F-6 have a relaxed fit.



- Position F-5 and F-6 into the fuse. The phenolic tube extends 3/32" outside of the fuselage wing fairing. See the photo on the next page. Trial fit the wings to the fuselage. It may be necessary to adjust the wing tube and blade spar openings with Perma-Grit tools for a proper fit of the wing to the fuselage fairing. These should all be loose fitting clearance openings.

Note: The CF former must be positioned on the front of the assembly, the 10-32 clamp bolts must be to the aft.



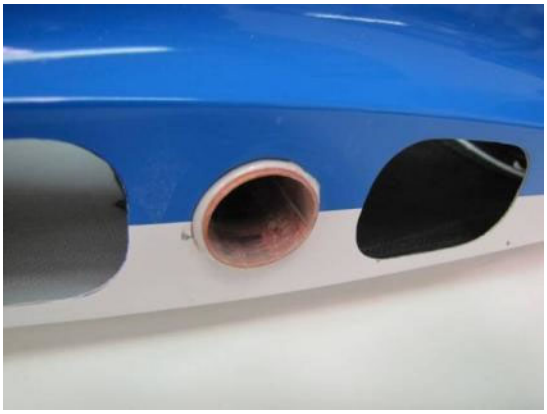
- Cut (2) 1-1/8" long ½" x ½" triangle balsa blocks and CA glue them as shown. This holds the phenolic tubes in place while the wings are slid on and off.

- Taper one end of the 1/8” balsa strips and insert them between the outboard ends of F-6 and the fuselage to hold the wing T.E. even with the wing root fairing. Flaps can be taped to the fuselage to help hold the wing.

- View the model from the front to be sure that the wings are properly set. The dihedral is set by F-5 and F-6.

- F-5 and F-6 are glued to the fuselage with AeroPoxy in two stages. Apply it where access allows, being careful to not glue the wing or spars to the fuselage and allow to cure.
- **NOTE:** BVM has supplied a strip of emery cloth to keep the aluminum tube polished smooth. Use a shoe shine action. Apply Vaseline to the wing tubes and carbon fiber spars.

- Remove the wing and then apply AeroPoxy where appropriate in a second gluing step. Apply glue to the phenolic tube as it exits the fuselage fairing and to the forward pin receptacle. Finger wipe away all excess glue, then use Isopropyl alcohol to keep the paint clear of glue prints.



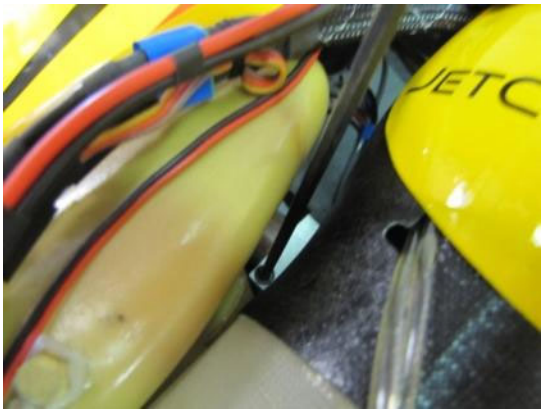
WING RETENTION

- The Wings are retained by a set screw in the rear “C” channel and by snugging the pinch bolts in the aluminum brackets on F-5.

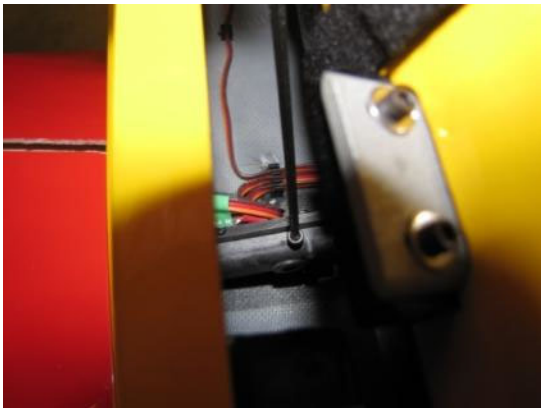
- Place the wings on the fuselage and install the 6-32 x ¼” set screws into the steel threads in the “C” channel. Tighten these set screws with a 1/16” hex. Use a square Perma-Grit file to make a notch about 1/32” deep at the set screw mark.

Note:
The outboard bolt on each mount tube is difficult to access because of fuel cell location. Since they are accessible at this stage of construction, apply a drop of ZAP Z-42 Threadlocker to the threads of each outboard bolt, and lightly snug them into place, making sure the outboard clamps are free enough to allow the wings to be slipped into place. This will prevent the outboard tubing clamp from deforming under flight loads.

The (2) inboard clamp bolts and the (2) aft spar 6-32 bolts are more than adequate to retain the wings during flight.



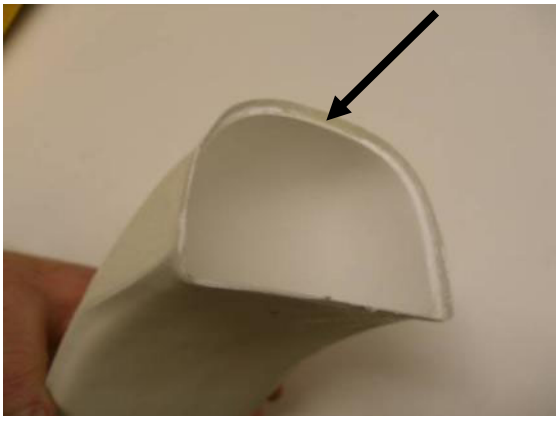
Use a high quality 5/32” ball end hex wrench to secure the forward spar clamp bolts.



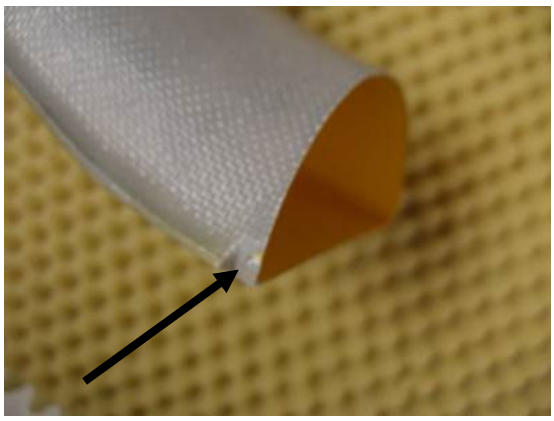
Use a high quality 7/64” ball end hex wrench to secure the aft spar bolts.

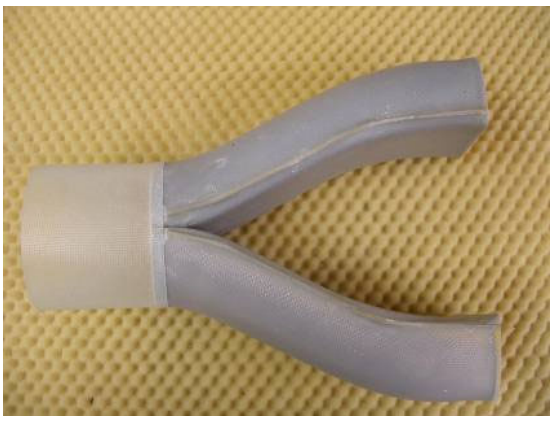
INLETS

- ☐ Remove the paint on the overlapping flange of each inlet. A small diameter sanding 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.





- ☐ 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.

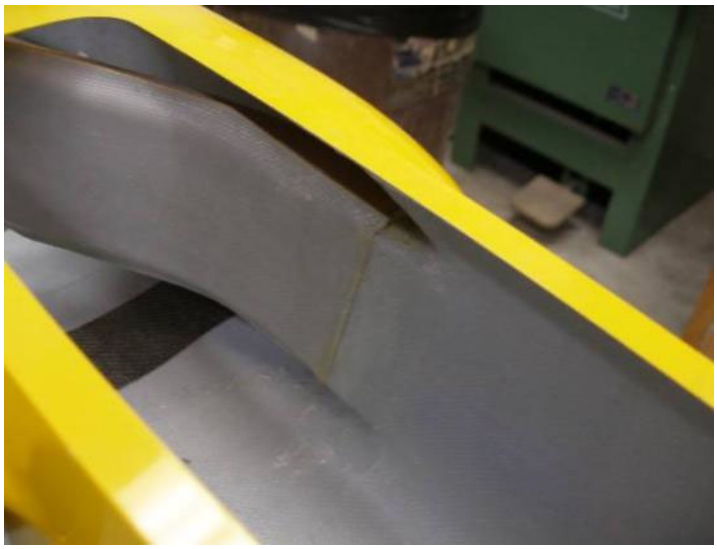
Make sure to scuff all gluing surfaces in the fuselage and on the inlets.

Note: It is very important that the aft end of the inlet is centered left to right in the fuselage. Make equal length sticks to use as fixtures.

- ❑ 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.

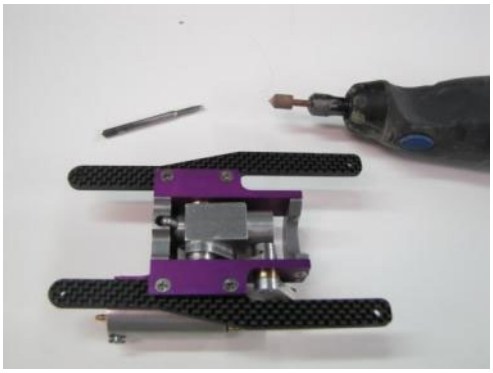
- ❑ Once the inlets have been trial fitted, apply a bead of slow ZAP to glue the inlets to the fuselage one at a time. Make sure the inlet is tight up against the fuselage before adding kicker.

- 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 FLEX PLATES, F-1, F1A AND F-2 ASSEMBLY



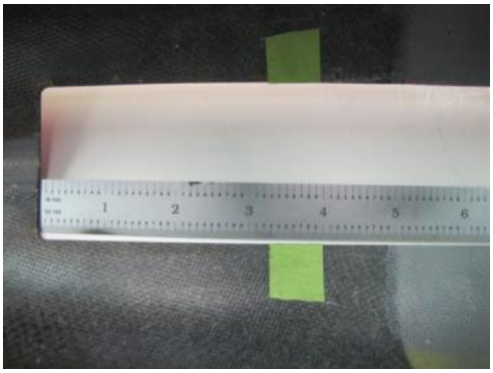
- Use a Perma-Grit RF9UF countersink tool to chamfer both sides of the gear mounting holes in the CF arms. Tap these holes 4-40. Mount the retract unit with (4) #4 x 3/8” flat head screws.

- Chamfer all the edges of the flex arms to ease the insertion into F-1 and F-2. This also makes changing the flex arms much easier.

- Be certain to sand (scuff) all joint surfaces with #80 grit before gluing, including the perimeter of the bulkheads.
  Note: When it matters, the front of F-1 is marked with an “F”.

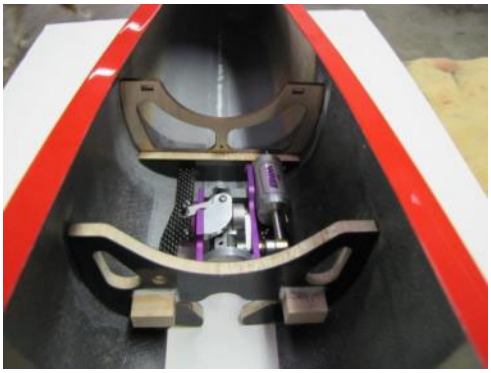
- With the flex arms bolted to the retract unit, make this set-up to glue the 3/8” x ½” x ¾” maple blocks to the aft side of F-2. Notice the location of the blocks to the aft ends of the flex arms. Use ZAP-A GAP to attach the blocks to F-2. Follow up with AeroPoxy.

- Drill 3/32 holes in the block to match the flex arms. Install the (2) #4 x 3/8” SMWS.



- Measure 3 ¼” aft of the forward edge of the nose gear door opening and mark with masking tape. This denotes the location of the aft side of F-2.

NOSE GEAR INSTALLATION



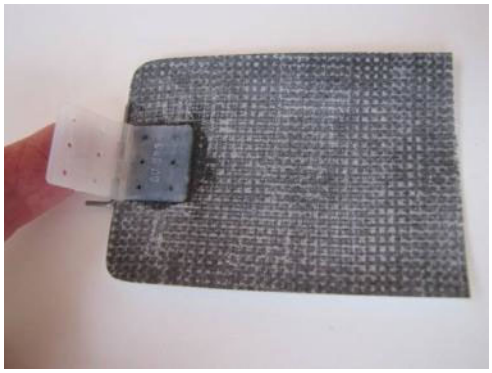
- Trial fit this assembly into the fuse as shown. Check that the nose wheel strut is straight up and down relative to the fuselage.
- The flex arms butt up against F-1A. The aft side of F-2 is flush with masking tape edge. The small notches in F-2 coincide with the fuse cut out.
- When all is correct, tack glue F-1A to F-1. Check that the top edges of F-1A are equal depth from the fuselage flanges.

- When all checks are complete, inject AeroPoxy into the joints of the formers and fuselage. Apply a few drops of thick CA to the tops of F-1A and F-2 to hold them to the fuselage for cure.
- After the cure, remove the retract unit and flex arms and finish the AeroPoxy fillets.

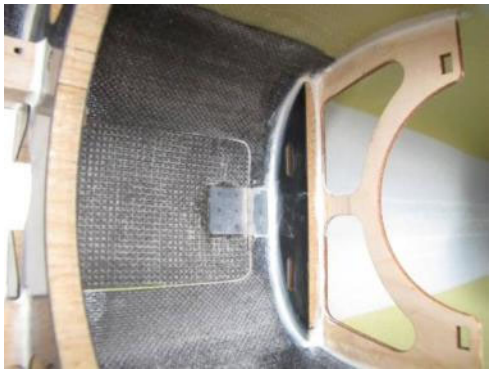
- Make the wheel / axle assembly as follows: Install an e-clip on the end of the axle, (1) nylon washer, wheel, and (1) nylon washer. Insert into the strut boss, cut the axle flush, mark the axle with the set screw, make a flat spot on the axle where the set screw mark was using the same cutoff wheel used to cut the axle, and then lube the axle with BVM #5784 axle grease.

FORWARD NOSE GEAR DOOR
See Partial Cut Doors Addendum.

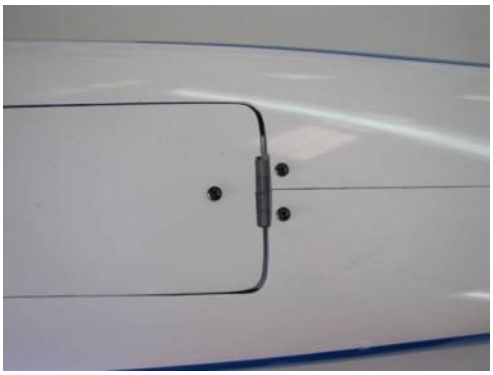
- Use a razor saw to separate the forward from the aft door. Block sand the edges.



- Make a 1” long hinge pin with a 90° bend as shown from .047 wire provided.
- Make a ¾” x .10 deep notch on the forward end of the forward door. Center the notch on the door.
- The hinge body is fully recessed into the notch in the forward door. Use ZAP-A-GAP to glue the hinge to the inside of the door.
- Check that the door will swing fully open.
- Use masking tape on the outside surface to hold the door in position.
- Trim the hinge length if needed and then CA to the fuselage and follow-up with Aeropoxy.

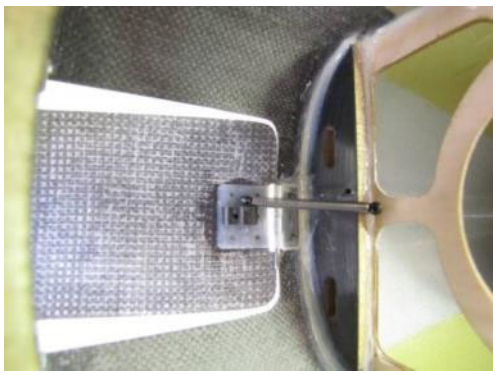


- ☐ Use a 6” long 1/16” drill bit to drill (3) holes from the inside of the model using the holes in the hinges as a guide.



- ☐ Install (3) 3/16” button head screws as shown.

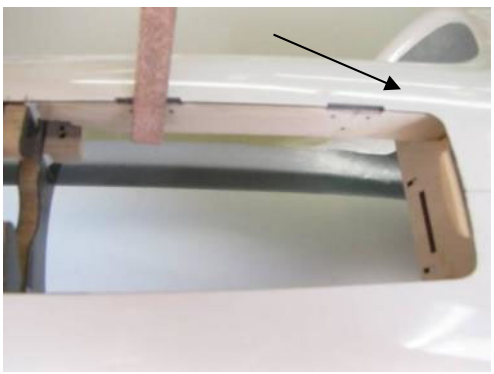
- ☐ Drill a 1/16” hole in the strut door attachment part and use the screw through the hinge and a bit of Zap to retain it.



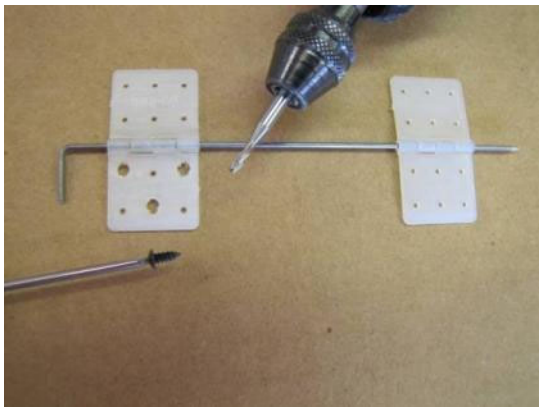
- ❑ Drill a 1/16” hole in F-1A as shown. Anchor one end of the spring with a 5/16” button head screw and the other with a 3/16” screw as shown.

NOSE WHEEL WELL DOOR

- ☐ Shape a 1/4“x 3/8” x 1” basswood block to function as a top for the aft end of the large door. See arrow.

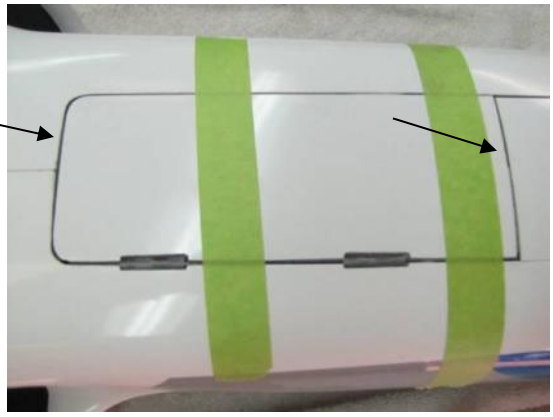


- ☐ Use a Perma-Grit flat file to bevel ¾” wide recesses to clear about ½” of the hinge pivot body.
- ❑ Lay the door into position and transfer these notch locations to the door edge.
- ❑ Make .10” x ¾” notches to clear the full width of the hinge pivot bosses.

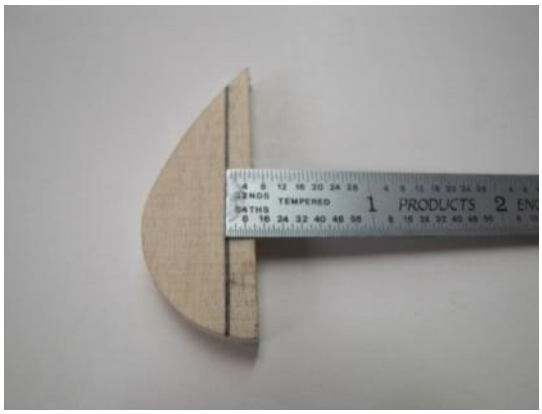


- Make a hinge pivot from .047” wire. Sharpen one end and make a 90^0 bend at 4” with a ½” handle.

- Secure the hinges to the plywood rail mount with 3/16” button head screws.



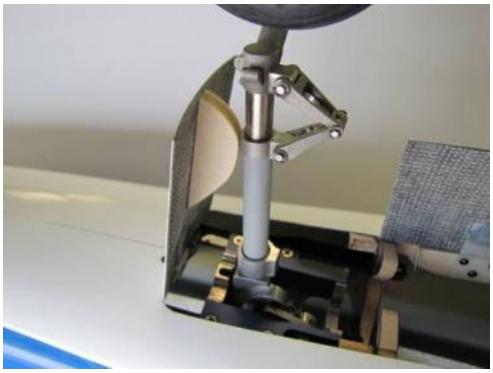
- Test fit the door to the opening. It may be necessary to enlarge (oblong) the 3 holes in the hinge for a slight adjustment of the door to the fuselage skin.
- Use #180 grit on a block to bevel these edges (see arrows) a bit for clearance. Tape the door in position with a minimum gap on the side opposite the hinges.
- Glue the hinges to the inside of the door skin.



NOSE GEAR DOOR “BUMPER”

- Modify the supplied “bumper” by removing 3/16” from the mounting surface (straight edge).

- Install the flex arms and nose gear unit with the strut. Tack glue the nose gear “bumper” to the door as shown. Check for proper operation open and closed and then add glue. Seal the open grain edge of the bumper with CA.



NOSE WHEEL WELL DOOR ACTUATION

- Chamfer the edges of the 1/4“ x 3/8” x 5” maple stick to allow for a glue fillet and glue it as shown. Its top edge should be flush with the top corners of F-2.

  The 3/8” dimension is vertical.

WHEEL WELL DOOR CYLINDER MOUNT

- One of the three cylinders supplied, has a “RED” dot on it. Use this “reverse” cylinder for the nose door. Attach a 6” length of grey airline to the brass nipple and use (2) servo screws to mount it to the plywood cylinder mount shown. Make (2) holes in the top of the plate and screw it to the ¼” x 3/8” maple cross brace.

- Attach the cylinder shaft fitting to the strut door attach fitting with a 3/16” button head screw. Position the shaft about 1/16” less than full extension and ZAP the fitting to the door in its full open position.

- Pressurize the cylinder to be certain that the door is fully open to clear the nose wheel and then drill a 1/16” hole through the base of the fitting and through the door skin.
- Use a Perma-Grit countersink to make a seat for the flathead panel screw and install it.

F-3, F-4, PUMP MOUNT AND NOSE GEAR STEERING TRAY.

- Note: All parts in this section are found on a laser cut plywood sheet. Prior to assembly, sand the laser cut edges of these parts to enhance glue adhesion.

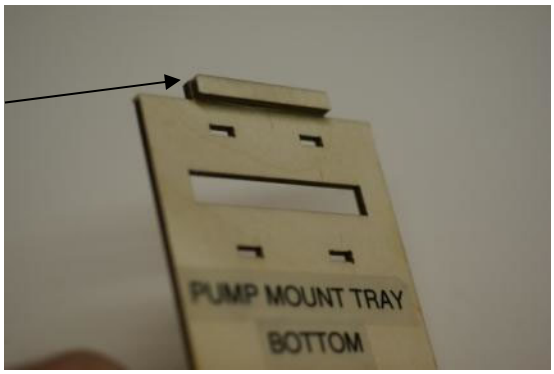
- Assemble F-3 by gluing the 3/8” x 1/2” x 1/2” maple blocks within the laser position marks. The forward side is identified by the position of the vertical slot as indicated in the photo.

Note: The ruler in the photo indicates proper block alignment. The nose gear steering tray will be attached to these blocks later.

- Assemble F-4 by gluing the 1/4” x 3/8” x 1 1/8” maple blocks within the laser position marks. Align the blocks as previously done on F-3.

Note: The forward side of F-4 can be identified by six holes on the left upright. These holes correspond to the hole pattern of F-3.

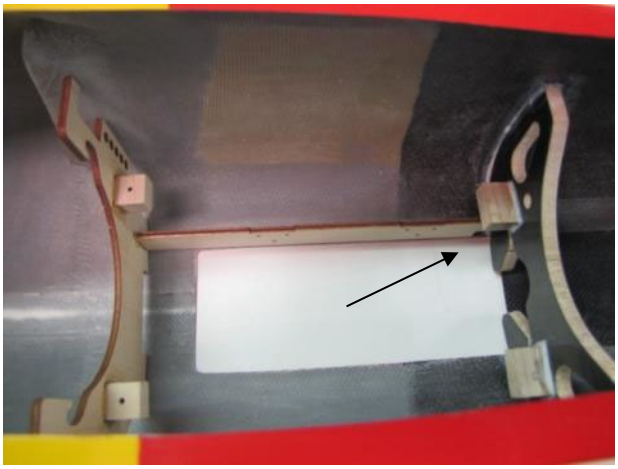
- Assemble the pump mount by gluing the laser cut tab to the bottom of the mount plate as shown. In a future operation, this tab will key into the slot on the bottom of F-3, locating F-4 in its proper position in the fuselage.



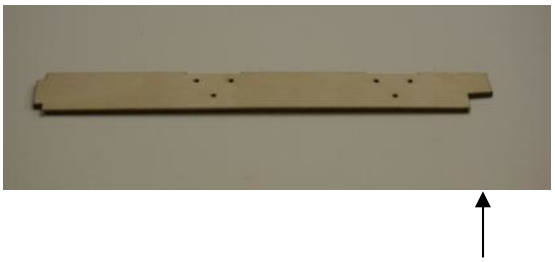
- **Note**: The pump mount tray is symmetrical.

- Use the pump mount tray as a guide, drill (2) 1/16” holes through the blocks on F-4. To ensure a correct fit, make sure the tray is right side up when drilling the holes. Temporarily attach the pump tray to F-4 with (2) servo screws found in the 75 piece bulk package.

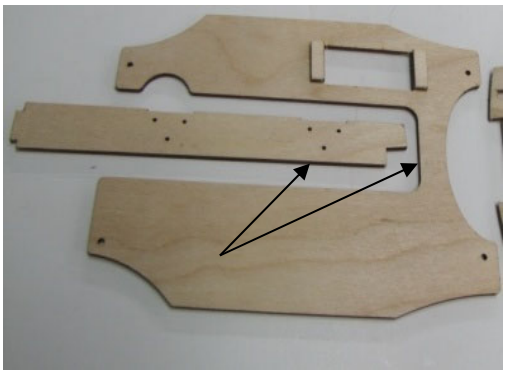
- ❑ The nose gear door hinge mount determines the position of F-3 aft of F-2. Trial fit as shown, and trim the edges for a relaxed fit.

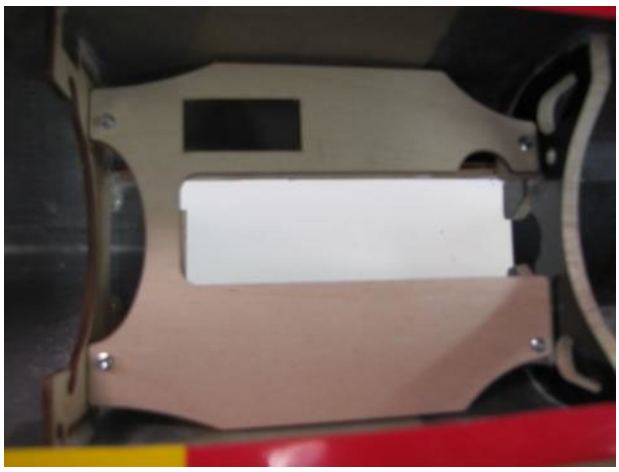


Note: The notch in the bottom forward end gives access to the left hand nose gear flex plate screw.

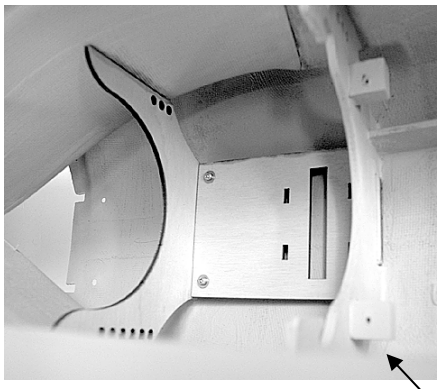


Remove the tabs from the nose gear steering servo tray, and glue them to each end of the servo cut-out on the bottom surface of the tray. The tray is designed to accept a JR 9411 servo.





- ❑ Trial fit the nose gear steering tray onto F-3 and F-4 maple blocks.



- ❑ Spot glue F-3 and the hinge mount to the fuselage with Zap-A-Gap and follow up with Aeropoxy.

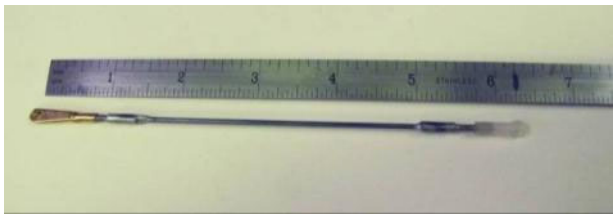
- ❑ Install the fuel pump mount tray/F-4 assembly behind F-3. The pump mount tray serves as a spacer to locate F-4.

- ❑ Tack glue F-4 to the inlet ducts and fuselage floor using Zap-A-Gap.

- ❑ Remove the fuel pump mount tray, and Aeropoxy F-3 and F-4 in place. Do not allow any excess adhesive within the tab relief slot at the bottom of F-3.

NOSE GEAR STEERING

- Make the linkage from the 1/16” wire and fittings supplied. The center-to-center length is 6 ¼” long. Use Stay Bright Silver Solder.

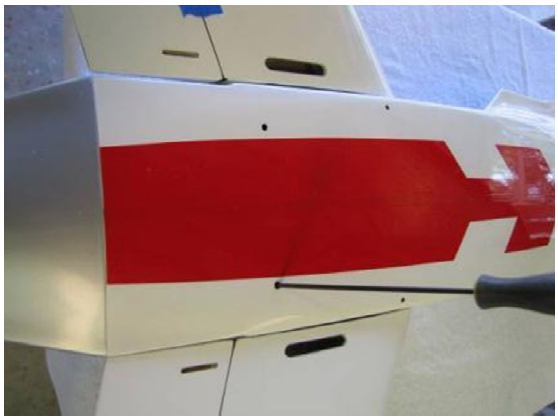


- Mount a JR 9411 (or similar) as shown, center it electronically, then adjust linkage as necessary and install. The plywood mount is secured with (2) servo screws.

STAB/FIN

STAB MOUNTING HOLES

- The bottom of the fuse has the screw access hole locations marked by BVM. Drill 1/16” holes first and then adjust, as necessary to fit the hex wrenches and to perfect the location during the stab mounting process.



- Enlarge and adjust positions of the holes slightly for the best wrench access to the 10-32x1/4” socket head set screws. The holes are best enlarged with a Perma-Grit tapered cutter.

The hole diameter will be about 1/4” to allow the 10-32 set screw to pass through.

NOTE: If a set screw gets cross threaded, remove it and clear threaded holes with a 10-32 Tap.;

STAB / FIN MOUNTING

For Bandits that are to be fitted with both swept and standard fins.
There are very slight differences in the standard and swept fin mounting. Mount the swept fin to the fuse former first.

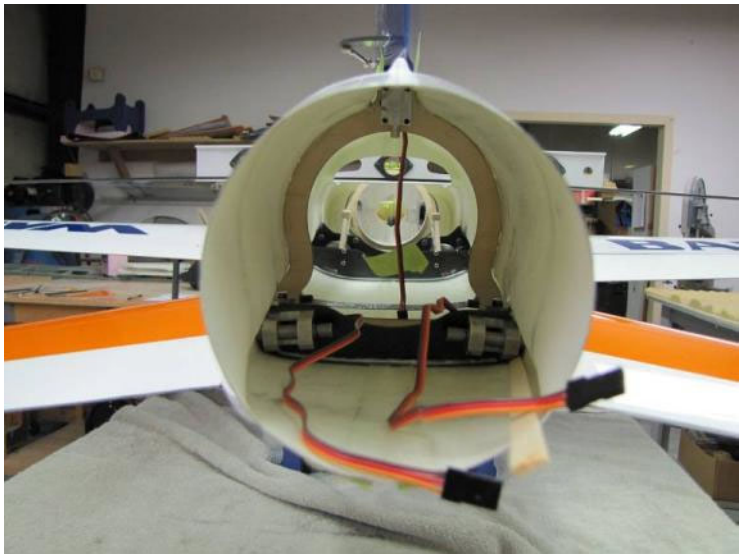
NOTE: The stab and fin mounting formers are symmetrical.

- Assemble the aluminum stab mounting brackets onto the aft side of the carbon fiber former. The set screws that retain the stabs define the bottom and inboard end of the bracket. Use washers under heads of the #4-40 SHMS. Apply a drop of Pacer Z-42 Thread Locker to each.

NOTE: Test fit the aluminum brackets on to the stab steel tubes. If fit is a bit snug, make a simple ream with a 1/4" dowel and one wrap of #180-#200 grit sandpaper. A few twisting strokes will suffice.

- Glue the CF doubler # F8A to the front side of F8 with Slo-Gap or epoxy. Transfer the .070" (# 50 drill) holes through the ply and tap #2-56. Bolt the aluminum fin mount to the aft side of this assembly with the setscrew oriented as shown. Do not apply Thread Locker to a carbon fiber tapped hole.

NOTE: The holes in the aft fuse for the stabs and fin tubes/rods should be opened up as necessary to be loose fitting clearance holes.



- Mount the wings to the fuse so that they can be used to level the stabs. Place a carpenter's level on the fuse flanges above the wing and level the set-up when sited from a front view.

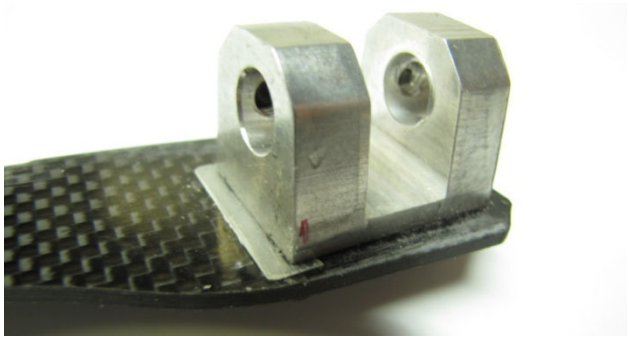
- Check the fit of the fin post into its metal bracket and do the same for the steel tubes in the stabs. Deburr/chamfer ends of metal tubes if necessary, polish with fine emery cloth and apply Vaseline. Make the fits trouble free.

- Test fit these formers into the fuse and insert the fin and stabs brackets. The angle of F8 is set by the fin tube. A Dremel drum sander is handy for this adjustment.

- Make (2) 1/4”x3/4”x3/4” balsa blocks from scrap and tack glue them to the front side of F-8 adjacent to the notches as shown.

The CF former F9 should be close to vertical or “normal” to the thrust line.

- Mount the wings to the fuse so that they can be used to level the stabs. Place a carpenter’s level on the fuse flanges above the wing and level the set-up when sited from a front view.

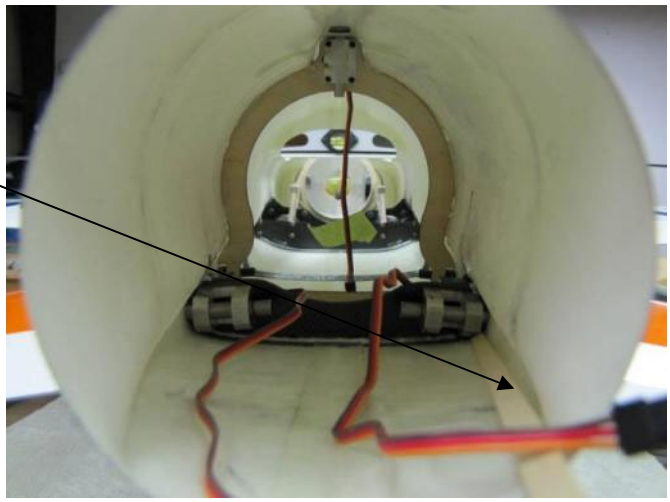


- Tape elevator to stab tips to hold neutral. The L.E. of stab should be centered on the molded or marked dot (line). The elevator T.E. should center on the aft fairing edge.

- If a stab does not fit properly against the fuse side. Shim the appropriate side of the aluminum bracket with a .010” polyply shim. After a proper fit is achieved, apply a drop of C.A. and tighten the 4-40 SHCS.

- Site the assembly and use tape to hold for former gluing. Check that fin is vertical.

Note that this model required a balsa shim on the right side under the CF Former to make the stab tips perfectly level with the top of the wing surfaces.



- Apply a small amount of Aeropoxy with a long thin stick to set these formers properly to the fuse inside skin. Allow to thoroughly cure.

- Remove the stabs and fin and apply Aeropoxy in a smooth even fillet to securely glue the formers to the fuse.

STAB / FIN FORWARD PIN MOUNTS

- Test fit these parts onto the CF rods of the stabs and fin. Apply Vaseline to the pins and holes in these retainers.

- With the stabs taped in place, apply a thickened quick epoxy to the CF part flange and hold them in place for cure.

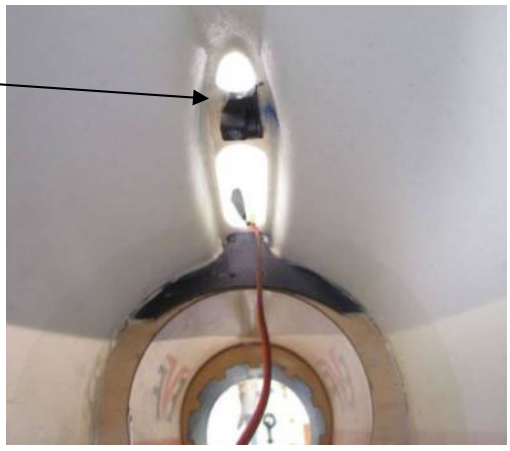
This view is through the opening in the fin base.

Note that the set screw heads face downward on the stabs and to the left side of the fuse for the fin.

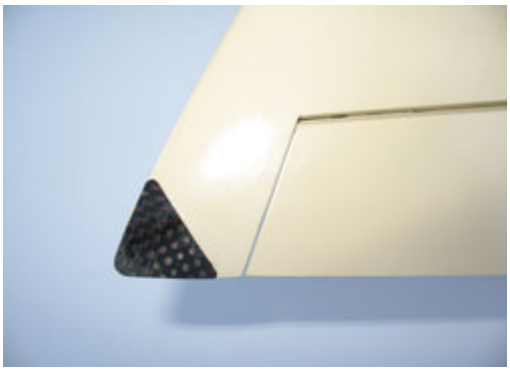
- Remove the stabs and fin.

- After the glue cures, the excess flanges on the fin retainer can be cut away with a rotary carbide cutter from top access.

- Apply Aeropoxy to the CF retainer-to-fuse joints.



STAB TIP SKIDZ



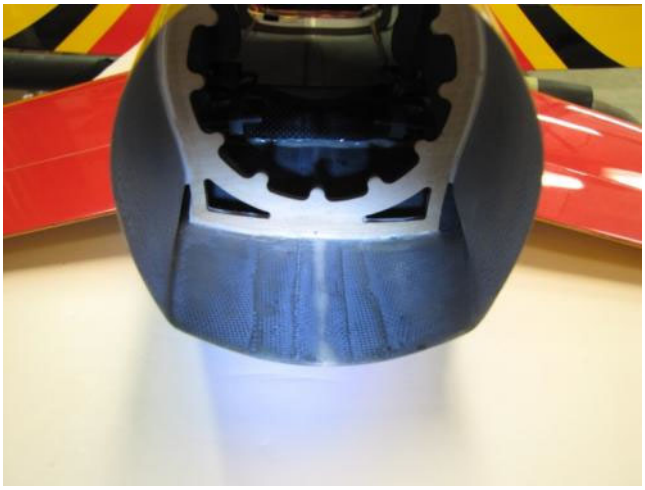
- ❑ Cut the Skidz apart and use either a scuff board or #80 grit sandpaper to deburr the parts.
- ❑ Use #120 grit sandpaper to thoroughly sand the tips where the SKIDZ will be placed.
- ❑ Apply Slo-Zap to the SKIDS and carefully place onto the stab.

FIN MOUNTING ACCESS HOLES

- ❑ Make access holes in the left side of the fin base by projecting the center of the fin mount holes from the top of the fin base and measure down from this surface.60” for the aft pin and .30” for the forward pin. See the photo on the following page.
- ❑ Make a 1/16" pilot hole and check for alignment with the setscrew, then enlarge the hole to fit the 3/32” hex driver.

TAIL PIPE FORMER

NOTE: The P-80, P-120, Jet Central “Cheetah” tail pipe former is glued approximately 4” from the end of the fuselage.



The P-60, P-70, P-100, Jet Central “Rabbit” tail pipe former is glued approximately 3” from the end of the fuselage.

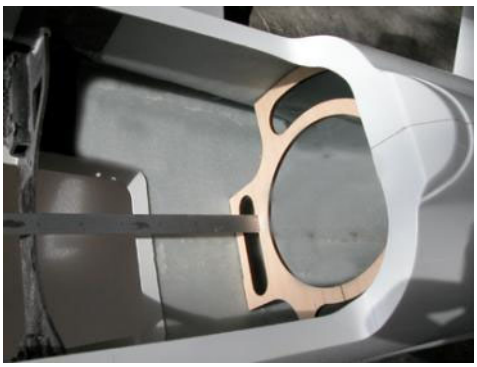
- ❑ To install the tail pipe centering former F10, make (3) balsa strips (from scrap) to the appropriate length and tack glue at 12, 5, and 7 o’clock positions using the aft end of the fuselage as a reference.
- ❑ Install the former from the engine access opening and tack glue in position.
- ❑ Apply Aeropoxy to the periphery and remove balsa sticks.

CANOPY AND ENGINE COMPARTMENT HATCHES

F-7 INSTALLATION

- ❑ Glue a ½ x ½ x 1” balsa spacer block to one side of F-7 as shown. This defines the front side. Sand the laser burn from the periphery of the former to enhance the glue joint.

- ☐ Sand the inside of the fuselage in this area. Trial fit F-7 in place. Make the receiving hole for the canopy hatch “S” rod and trial fit. This hole gives access to tack glue the balsa block to the fuselage flange. Make sure the balsa block contacts the fuselage flange. Use Aeropoxy sparingly to glue F-7 to the fuselage.



- ☐ F-7 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-7 location is not critical, it functions as a fuselage stiffener.

CANOPY FRAME “S” ROD AND HOOKS

- ☐ Trial fit and then tack glue (Zap-A-Gap) the “S” rod as shown. Test fit it to the fuselage, adjust the “S” rod position and hole in the fuselage as necessary and tack glue again. Apply AeroPoxy here when the position of the “S” rod is correct.

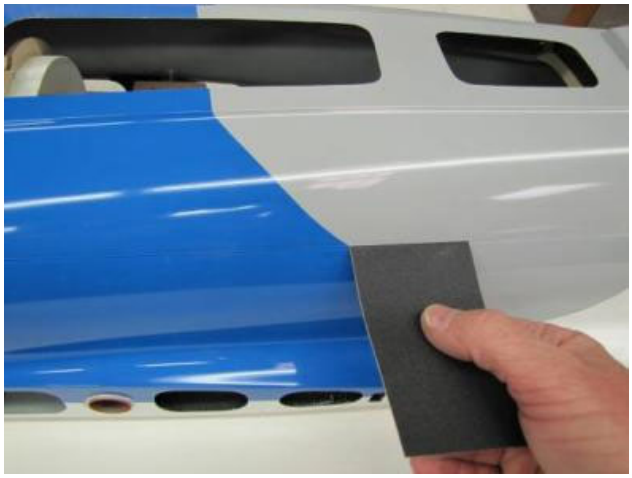
BVM designs our jets for easy access to the engine, fuel system, and electronic components from the topside of the model.
This design philosophy minimizes having to flip the model upside down for simple servicing items; such as changing the igniter plug, checking wire harness and fuel system connections, 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 if any improvement can be accomplished.

- 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.

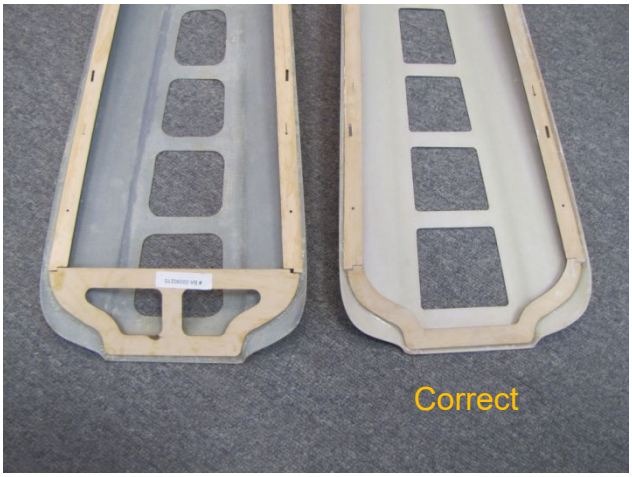


- Proceed to the forward end of the hatch and adjust the mating surfaces there.
- Use a strip of paper between the hatch and fuselage to locate the tight spots.
- After the ends fit as good as possible, use a piece of sand paper (#180-#220 grit) to lap the side edges.

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

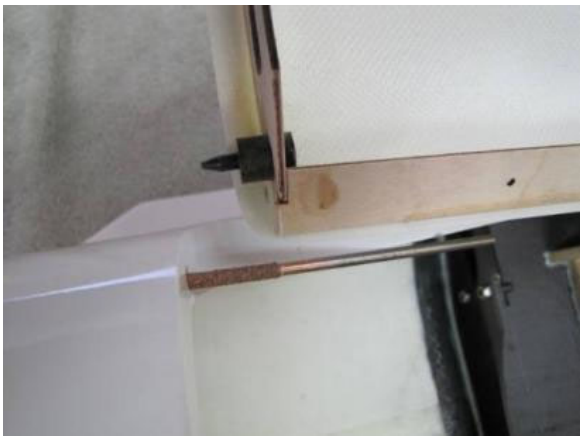
ENGINE HATCH FRAME
To properly clear fuel tank tubing and wires, the forward cross member in the Engine Hatch Frame should look like the sample on the right.

Some kits may have the part as pictured on the left.



- Use Dremel tools and a drum sander to modify if necessary.

- The Power Access Hatch is retained by the two CF pins and two CF hooks. The Canopy Hatch captures and holds the Power Access Hatch in place.



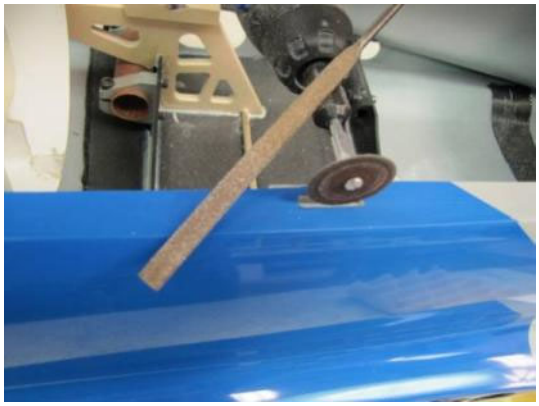
- Tack glue a hatch pin boss into the plywood frame. Notice that sufficient pin protrudes aft-ward for a good engagement into the fuselage flange.

- Put black ink on the pin tip and fit the hatch in position to transfer pinpoint location to the fuselage flange. Use a 1/16” carbide cutter in a Dremel tool at low speed to start a hole in the flange, then adjust with a small Perma-Grit round file to allow the best hatch to fuse fit. Make very small adjustments multiple times.

- Repeat this process for the second pin.
- Apply Aeropoxy to secure the pins to the hatch.

  NOTE: All Hatch Hooks point to the rear of the model

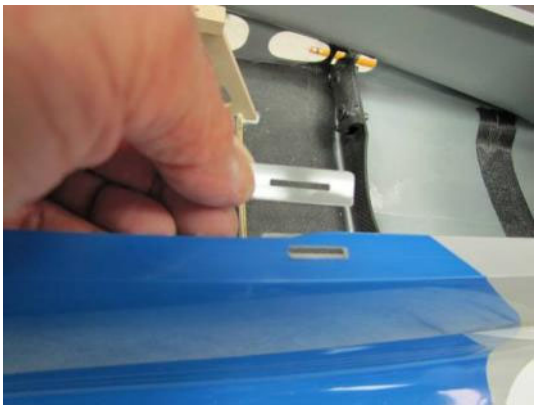
- Chamfer the bottom edge of each Power Access Hatch Hook (both sides). Use a Dremel sanding drum and BVM Scuff Board. This will ease the entry of each hook into the ply frame and the F/G flanges. Use a small Perma-Grit flat file to open slots in the ply frame, if required.



- Install one CF Power Access Hatch Hook in the plywood rail. The hook points to the **aft** end of the hatch. Trial fit and then hold the hook vertical to the ply flange for tack gluing. It may be necessary to file the slot a bit wider to get the hook in place.
- The slot locations for the “Hooks” are marked on the flange. Use a Dremel # 409 disk to cut on the inside of the ink marks. Use a Perma-grit small flat file to finish the slot. Test fit the hatch and adjust the sides of the slot in or out as needed to produce a perfect hatch-to-fuse fit.

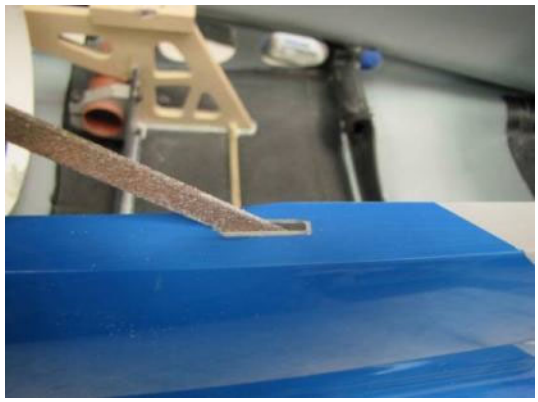
Note: The plywood structure shown is from the e-Bandit.

- BVM provides “Canopy Hook” polyply shims to strengthen the F/G flange and aid in aligning the hooks. If the slot is filed oversize, to get the proper fit, these shims are positioned and glued under the flange to correct the hatch to fuse fit. Of course, scuff the mating surfaces.

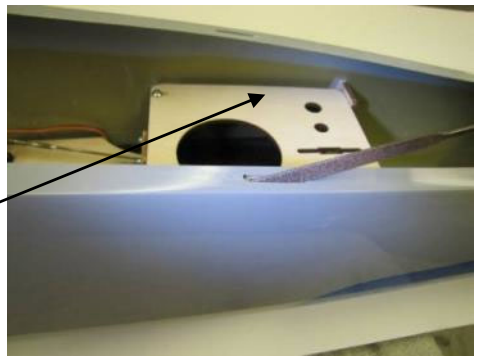


Note: The plywood structure shown is from the e-Bandit.

- Now you can make the final adjustments with a flat file.
- Again, working with one hook and slot at a time is important. Move on to the next hook only after you have perfected the fit of the preceding hook.
- Apply Aeropoxy to permanently glue the hook bases to the ply frames.
- Use the same procedures for the Canopy Hatch.

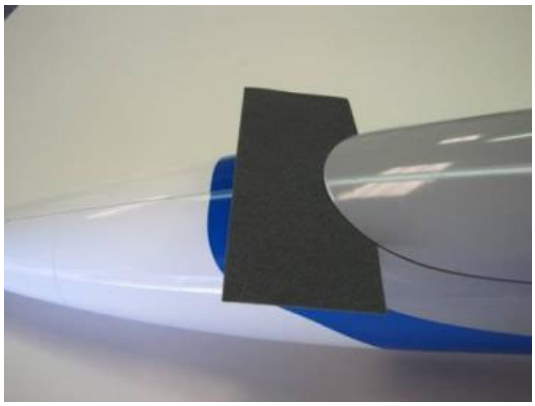


CANOPY HATCH INSTALLATION

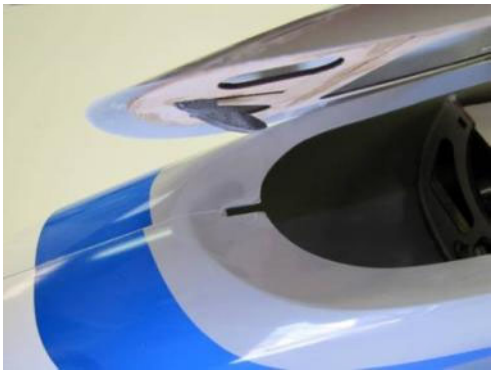


- Use the same techniques and tools as with the Power Access Hatch hook installation. Again, install one hook at a time and fit it into the fuselage flange adjusting the slots and shims for the best fit possible.

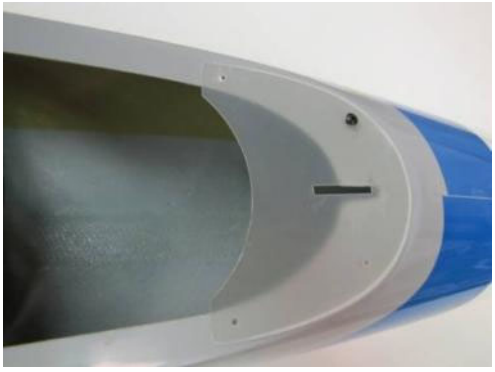
Note: The plywood tray shown is for the e-Bandit.



- Before cutting the slots in the F/G flanges, check for proper fore/aft location relative to the hook in the ply frame.
- After the poly ply shim is glued under the F/G flange, use a Perma-Grit small flat file to bevel the forward edge of each slot to ease hook entry and make very fine adjustments.
- If the canopy hatch does not fit flush with the fuselage in this area, lap it to fit with # 150 - #220 grit sandpaper with grit up as shown.



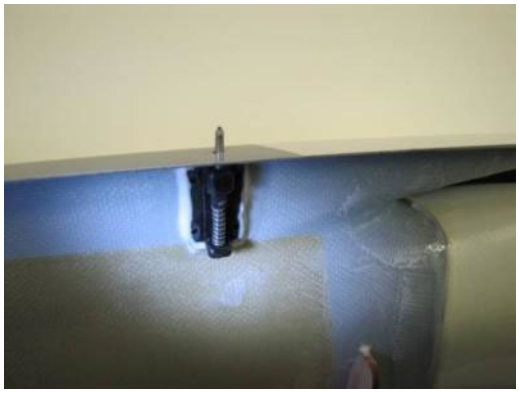
- After the 4 side hooks are installed, glue the forward (5th) hook into the ply frame.
- Make a matching clearance slot in the fuselage flange to allow this hook to insert.



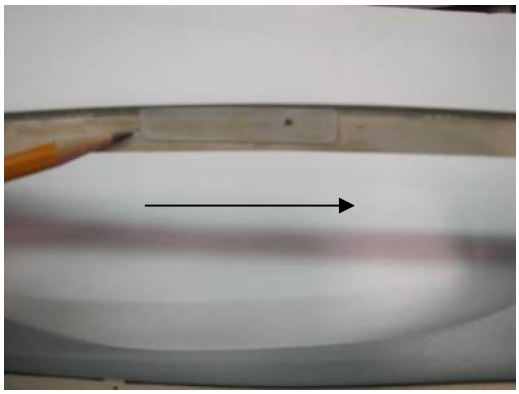
- This poly ply plate serves to capture the forward hook. Position it on top of the fuselage flange, as shown. Position the slot, left or right, to best accept the hook.
  Use the plate to drill (4) 1/16” holes in the flange. Insert the plate on the inner surface and secure it with 3/16” SHSMS. Trial fit the canopy, adjust the slot if necessary, and then glue the poly ply doubler on the bottom side. Adjust the slot again with a Perma-Grit flat file.

  This plate remains removable to allow access to the forward fuselage area.

- Make the slot and hole in the fuselage flange as marked to accept the “Hatch Latch.” Use Zap-A-Gap to glue it in. Apply a bead of Aeropoxy to the flanges of the Hatch Latch to secure it in place.



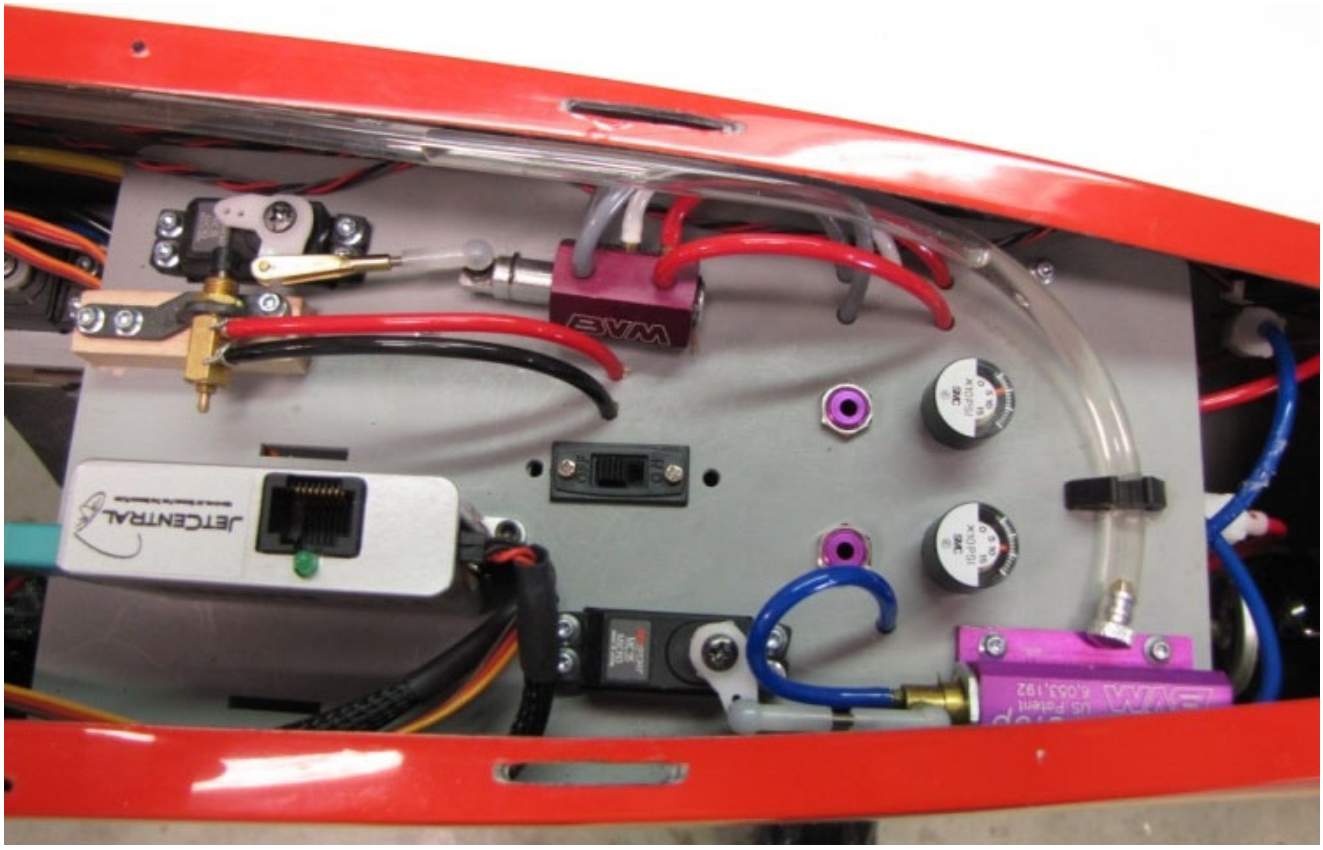
- Use black ink on the pin point to transfer its location to the ply frame of the canopy hatch.

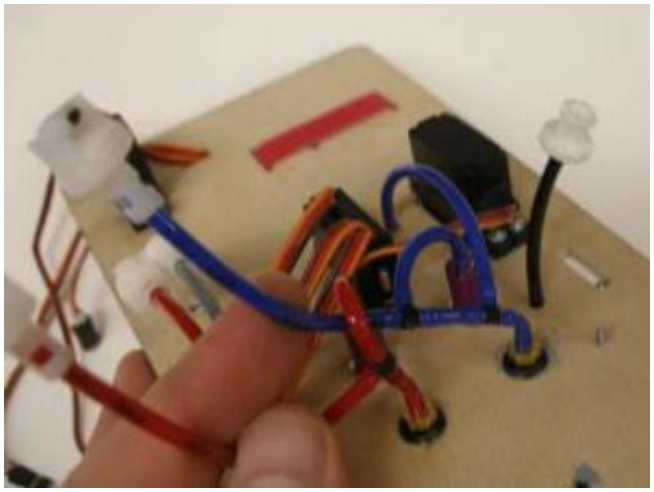


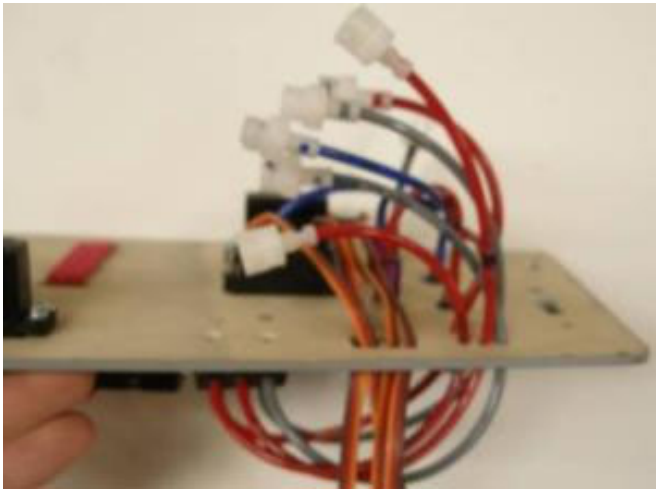
- Drill a 3/32” hole then add this .020” poly ply strip with a matching hole to the ply frame. The arrow points toward the forward end of the canopy hatch.

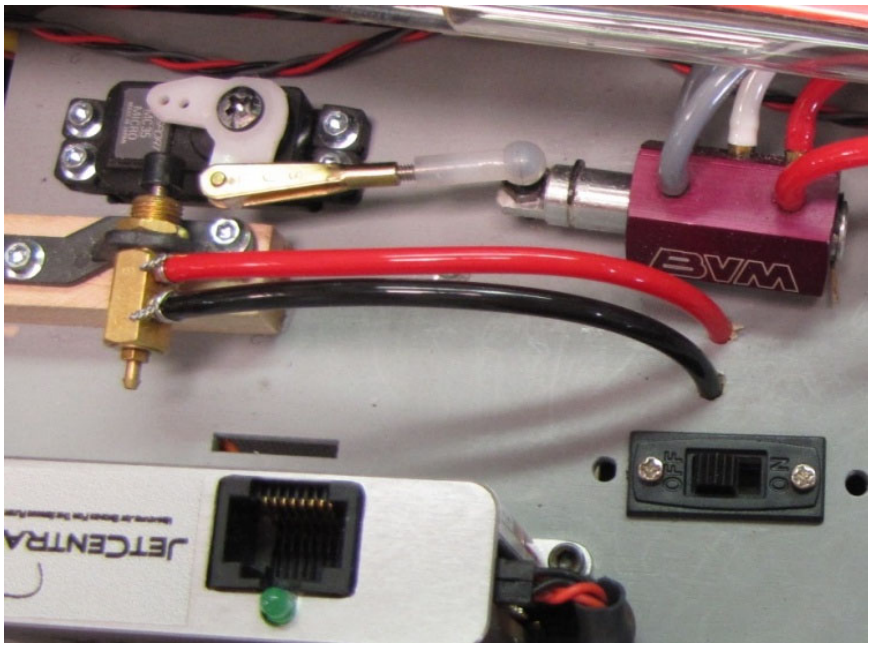
- To make the Canopy Hatch easier to grip and remove, install a 3/16” SHSMS on each side about 5½” - 6” aft of the forward end as shown. Drill the 1/16” holes ¼” above the flange joint.
  Apply a drop of CA inside after the screws are installed.

FORWARD EQUIPMENT BOARD / AIR SYSTEM

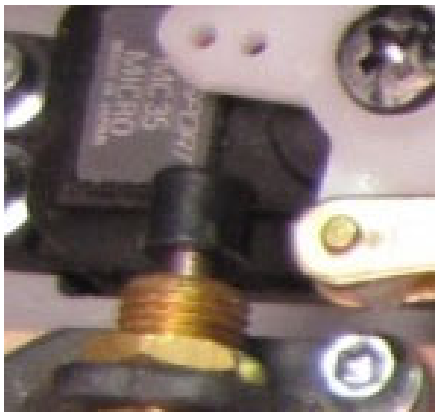


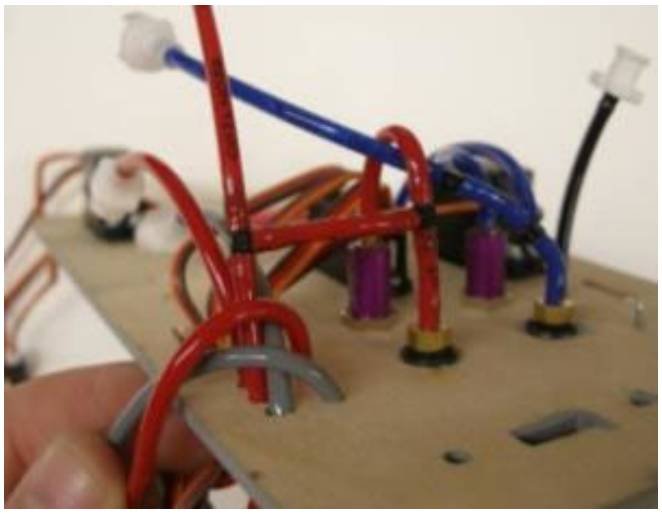


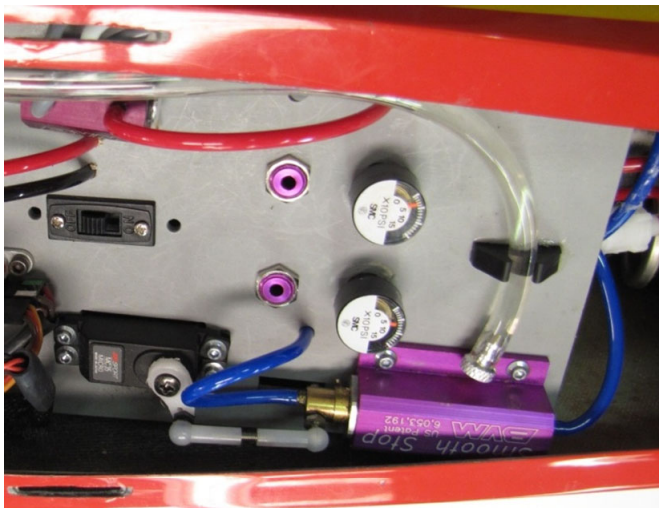




Adjust the height of the Button Valve Mount such that the Servo Arm contacts the button on center.





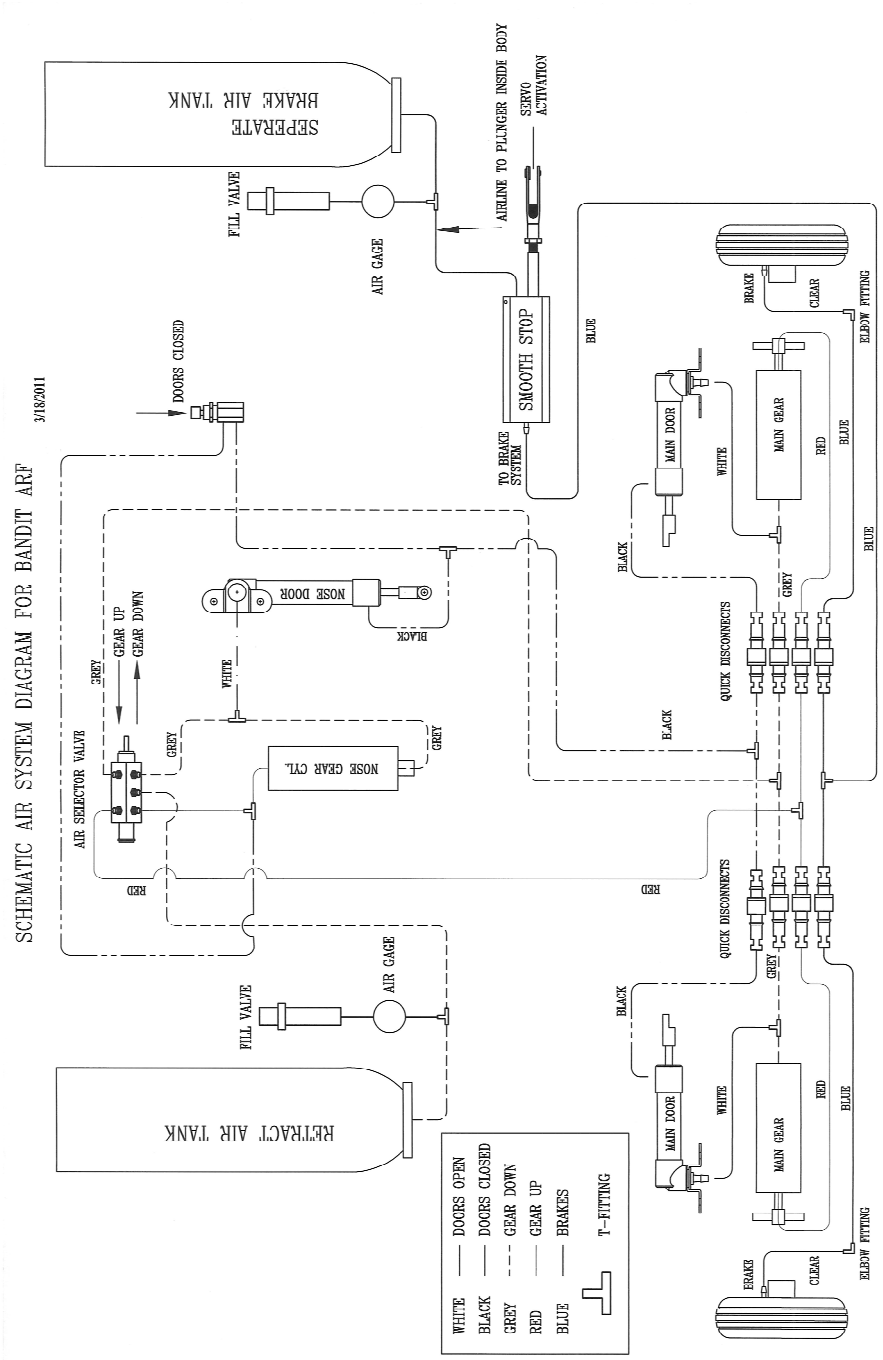


The air storage tanks are mounted in the nose. Secure them to the fuselage with small dabs of ZAP-A-DOO.

See the air system diagram for the air line routing and color code.

The prototype model uses quick disconnects under the forward equipment board to allow removal of the forward equipment board quickly and easily without cutting air lines.

AIR SYSTEM DIAGRAM



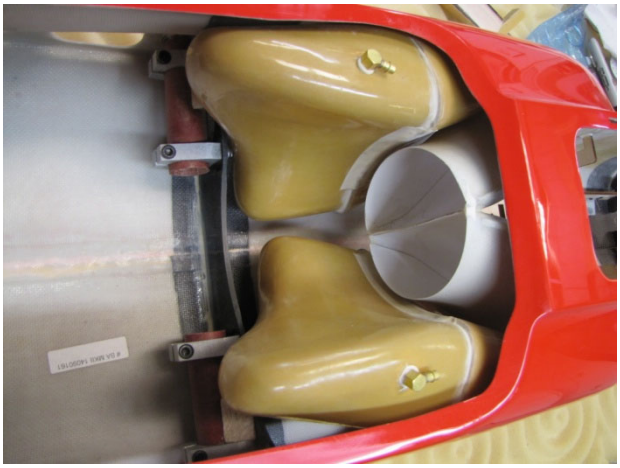
FUEL CELL ASSEMBLY

Refer to the comprehensive instructions that are furnished with the Kevlar fuel cell package.

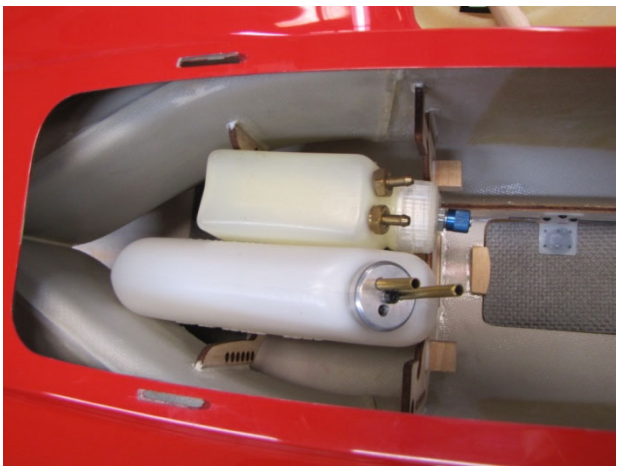
FUEL SYSTEM DIAGRAM
See BVM Drawing Sheet IK5300-30-1 dated June 2016

Note: The header tank in the “Rabbit” powered model is an 8 oz. oval tank.

Saddle tanks are shown in place. It may be necessary to use a drum sander on the top edge of the fuselage CF former and trim the FG flange a bit.



The 8 oz. Header and the U.A.T. can be located as shown. Use Velcro straps to retain.



BVM prefers to not use “push to install” fittings on the suction side of the fuel system, where a tight bend radius at the fitting could allow air into the system. We use barbed fittings and safety wire all connections with BVM #2800 safety wire.

The “Festo” fittings shown in the image to the right are installed on the pressure side of the fuel system at the engine disconnect point.

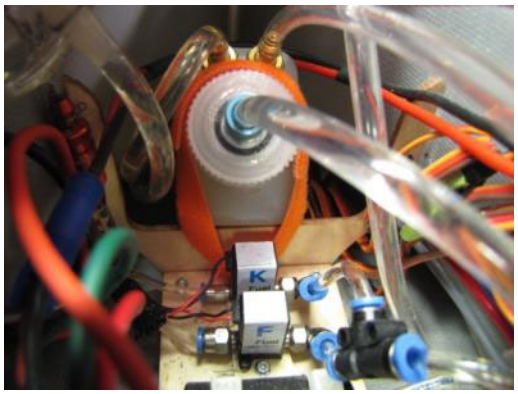
FUEL SYSTEM VENT

- 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 as shown in the fuel system diagram and fuel cell instructions. The vent fitting is also used as the connection point for the BVM #6047 Overflow/Start-up Tank. Or BVM Flush Mount Vent Fittings are available (#PS-SP-0301)

FUEL PUMP, SOLENOID VALVE MOUNTING

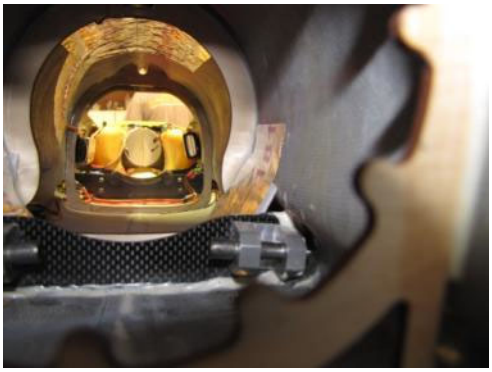
The prototype is powered with a Jet Central “Rabbit” kero start engine.
The fuel pump and both solenoid valves mount easily on the pump mount board.
Mount the pump with two tie wraps.
The UAT is mounted directly behind the solenoid valves, and is held in position by a short Velcro strap that is screwed to the aft end of the pump mount board.
JetCat solenoid valves will also fit in this location.

Locating the valves close to the ECU, tanks and engine simplifies the installation, minimizing the need for extended wiring and long tubing runs. It also eliminates clutter, making a neat installation.



NOTE: *Some brands of Turbines have solenoid valves inside the engine cowling.*

PROTECT THE AFT FUSELAGE SERVOS AND LEADS FROM TAILPIPE HEAT



- 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.

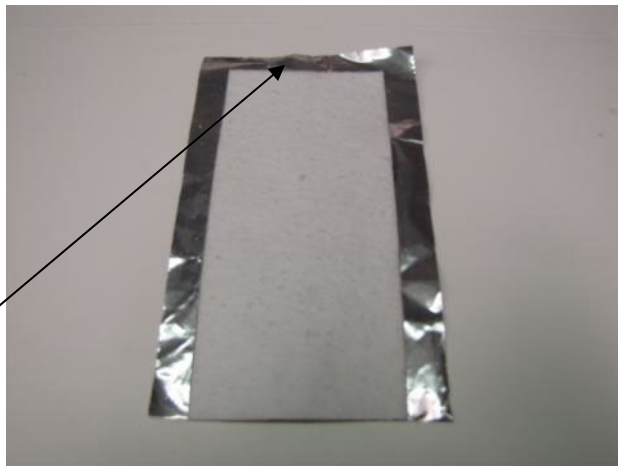
- Install heat blankets over the elevator servos and under the rudder servo. Use aluminum tape to hold in position.

Full size heat blanket templates are printed on the last page of this manual.

See the following page for Ceramic Heat Blanket fabrication instructions.

- Cut a piece of BVM #1710 Ceramic Heat Blanket to produce a rectangle that is 3 3/8" x 7 ¼" in size.

- Apply (2) strips of BVM # T105 2 1/2" aluminum foil tape to the smooth side of the ceramic blanket material leaving an exposed border about ¾" in width on three sides of the material as shown.
  This will be the rudder servo blanket.



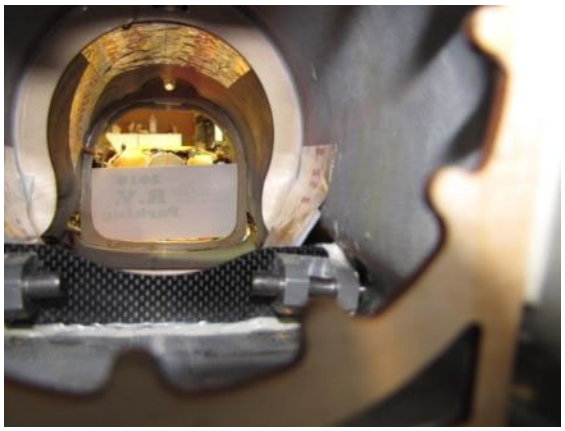
The "arrow" indicates the forward end of the heat blanket.

- Cut two blankets using the elevator servo blanket template. Make one right hand, and one left hand blanket. The smooth side of the ceramic material should be on the side facing the tailpipe.

The shape should be trapezoidal"….(Two of the four sides are parallel).

- Place a 4" long piece of the aluminum foil tape over the smooth side of the ceramic material leaving excess on the top and the bottom to adhere to the fuselage skin above and below the elevator servo. The "arrow" indicates the forward end of the blanket.

- Install the elevator ceramic heat blankets as shown.

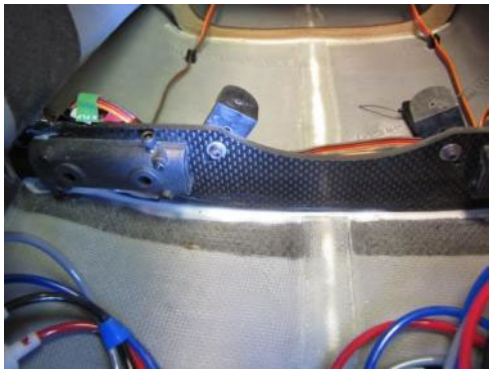


Both of the following images are looking forward.

BYPASS

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

- The P-60/P-70/P-100/“Rabbit” bypass has a .4” gap between it and former F-5 .
  The P-80/P-120 bypass will rest on the former.



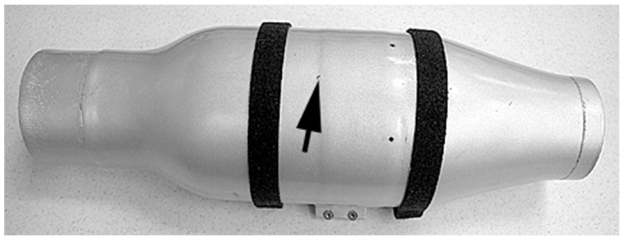
- Tap the CF mounts using a 4-40 tap. Bolt (2) molded CF mounts to the aft surface of F-6 using (2) 4-40 bolts and washers.
- For the P-60/P-70/P-100 by-pass; bolt the bottom hole of the CF mount to the aft surface of F-6 using the top hole of former F-6 (2 bolts).
- For the P-80/120 Bypass use both holes of the CF mount bolted to the aft surface of F-6 (4 bolts).

BYPASS FINISHING

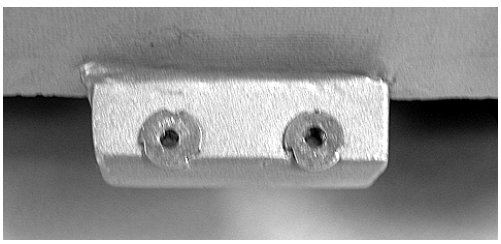
Bypass is shown with extension and Velcro straps screwed to the bottom using 4 #2 BHSMS. Drill a 3/32” drain hole in the bottom of the bypass.

Finish the Bypass and cover using the following steps:

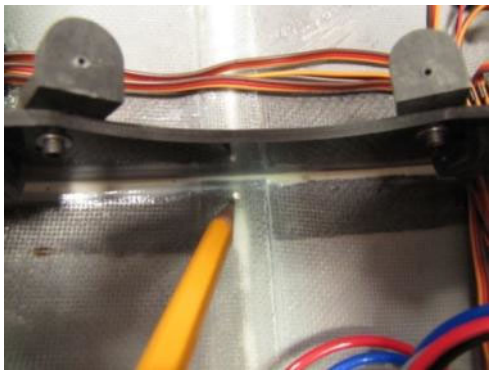
- Sand with #80 grit.
- Apply pin hole filler (BVM #1925).
- Brush prime with K36.
- Sand with #220, spray primer.
- Sand with #400, apply color.



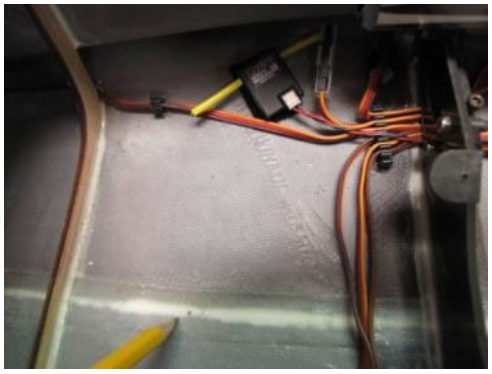
- Glue ¼” ply strips are glued to the bottom of the bypass flanges with Aeropoxy to hold the 4-40 “T” nuts.



FUSELAGE DRAIN HOLES



- ☐ Drill a 3/32” drain hole on the fuselage center line 3/8” in front of former F-6 as indicated.



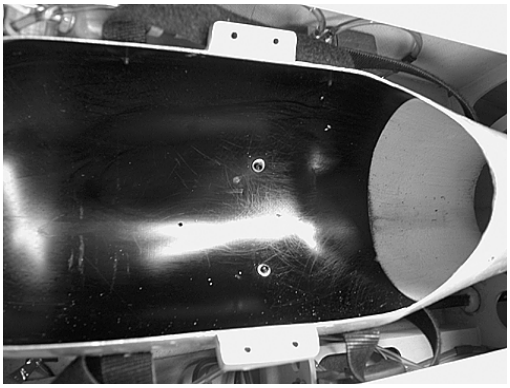
- ☐ Drill another 3/32” drain hole on the fuselage center line between formers F-6 and F-7 as indicated.

TAIL PIPE

- ☐ Secure the inner pipe to the outer with (2) 4-40 X ¼” SHCS as marked.

.

- ☐ The aft end of the inner pipe should be positioned ¾” in from the aft end of the outer pipe.
- ☐ The distance between the forward end of the inner pipe and the aft end of the exhaust nozzle of the JetCat P-60, P-70, P-100, and Jet Central “Rabbit” is 1.5”.



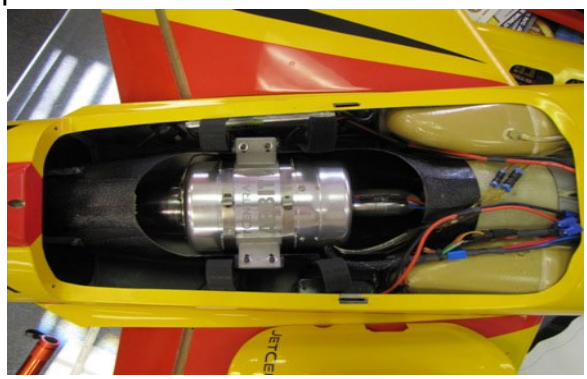
- ❑ The aft 3-4 inches of the bypass is treated with 3 brushed-on coats of BVM’s heat shield (#1940).
- ☐ Two #2 x 7/16” servo screws with #2 washers hold the bypass to the CF angle brackets mounted to F-5.

TURBINE MOUNTING

- The tailpipe can be inserted through the power system hatch before installing the bypass tube.

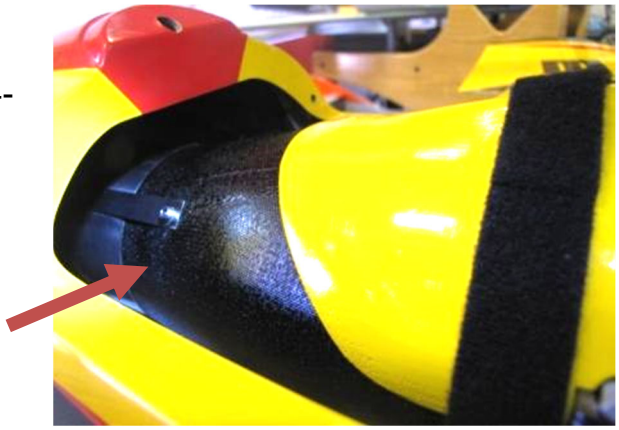
See also page 52 for tailpipe former.

- The Jet Central “Rabbit” is mounted as shown. Use a strap around the engine nozzle to lift it to the center of the bypass while tightening the 6-32 screws in the metal straps.



Top View of “Rabbit” installation.

- Attach the tailpipe to the bypass tube with (2) 4-40 x 3/8” SHCS, (2) 4-40 hex nuts and (2) #4 flat washers located at the 11 and 1 o’clock positions.



INSTALLING THE CANOPY AND COCKPIT DECK

See detailed instruction manual that is included in the Clear Canopy and Cockpit Deck package BVM # IK5700-50.

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 speeds 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 the 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.

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.

Surface travel measured at the root T.E. should be: **TAKE-OFF - 1 ¼" LANDING - 2 3/4".**

The take-off flap position is used for both 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.

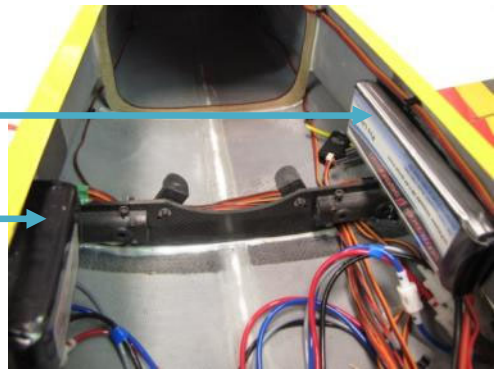
The full flap position is used for landing. A further increase in lift is available along with aerodynamic drag that is necessary to overcome the idle thrust of the turbine engine.

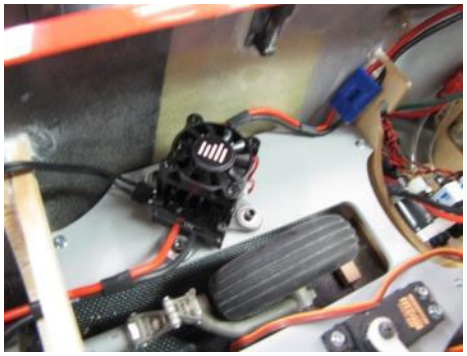
It is **not recommended** that the flaps be used with greater than the above max full flap deflection. Use the 3-position "land" switch to select "flaps up", "flaps take-off", and "flaps landing".

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

RECEIVER BATTERY

Our prototype used 2600 mAh LiPo pack and regulator; 6+ flights per charge are achievable. The receiver and ECU batteries are mounted to the fuselage sides with sticky back Velcro.





The voltage regulator is located on the right hand side of the nose gear steering tray. Make sure that there is no interference with nose gear retraction or extension.

Note: This Spektrum regulator should be disconnected from the battery at the end of each flying session.

THE RECEIVER

BVM flies our Bandit ARF Mk II with the JR 1221 receiver.

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

It is your responsibility to be certain that the equipment you use has been thoroughly tested under the following conditions for interference free and long range operation:

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.

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.

- ☐ Drill (2) 1/16" 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 lbs 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 Jet Central "Rabbit" flies for 9 min and the JetCat P-80 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 take 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 dominant 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.

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.
- 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.

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.

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JR HV SERVO AND EXTENSION REQUIREMENTS

For Pneumatic Retract System.

CONTROLS	QTY		SERVO TYPE	EXT LEAD	QTY	Channel
Ailerons	2		JR 9411HV	12” 36”	2 2	AIL AUX 2
Elevators	2		JR 3711HV	48”	2	ELEV GEAR
Rudder Swept or Std Fin	1		JR 9411HV	36”	1	RUDD
Nose Steering	1		JR 9411HV	“Y” Harness	1	RUDD
Retract Valve	1		Spektrum A4030	N/A		AUX 5
Flaps	2		JR 8411HV	Match Box 36” 3”	1 2 2	AUX 1
Smooth Stop	1		Spektrum A4030	N/A		AUX 3
Battery	1		Duralite Mag-Ion 3000 mAh			

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

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

*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.

NOTE: As of 2015, most of these components are obsolete and not available. Consult your R/C manufacture for current and equivalent components. High voltage systems are now prevalent.

JR SERVO AND EXTENSION REQUIREMENTS

For Electric Retract System.

CONTROLS	QTY		SERVO TYPE	QTY	Channel	LEAD EXT
Ailerons	2		JR 9411HV	2	AIL AUX 2	12”
				2		36”
Elevators	2		JR 3711HV	2	ELEV AUX 5	48”
Rudder Swept or Std Fin	1		JR 9411HV	1	RUDD	36”
Nose Steering	1		JR 9411HV	1	RUDD	
Flaps	2		JR 8411HV		AUX 1 AUX 4	
				2		36”
				2		3”
Gear doors	3		Spektrum A4030	2		24”
E-Brake	1		SPMA6265	1	AUX 3	36”

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

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

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

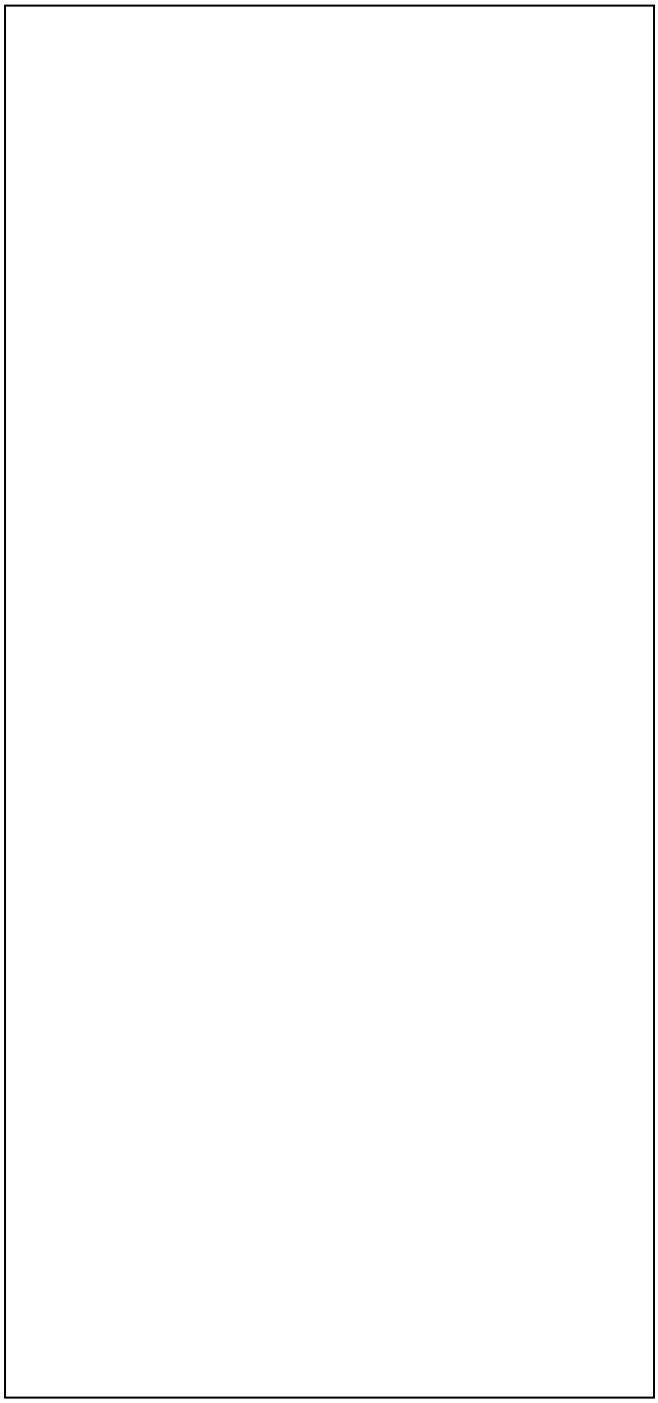
Additional servo extensions will be required for connecting the electric landing gear and gear door servos. Your install may require different lengths of servo extensions due to variations of routing and component placement.

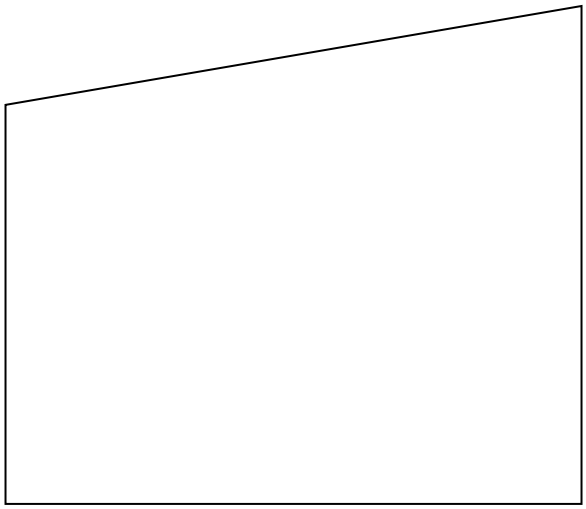
Radio manufacturers are constantly improving their equipment - consult their representatives or BVM (JR only) for the latest and best servos.

NOTE: As of 2015, most of these components are obsolete and not available. Consult your R/C manufacture for current and equivalent components. High voltage systems are now prevalent.

RUDDER AND ELEVATOR CERAMIC HEAT BLANKET TEMPLATES

RUDDER SERVO HEAT BLANKET. SIZE IS 7.25” X 3.375” (1) REQUIRED





ELEVATOR HEAT BLANKET (2) REQUIRED.
MAKE (1) LEFT HAND AND (1) RIGHT HAND.
(Material has one smooth side, one rough side.)

SIZE IS 3.00” X 2.60” X 2.20”

CUT FROM BVM #1710 CERAMIC HEAT BLANKET.

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