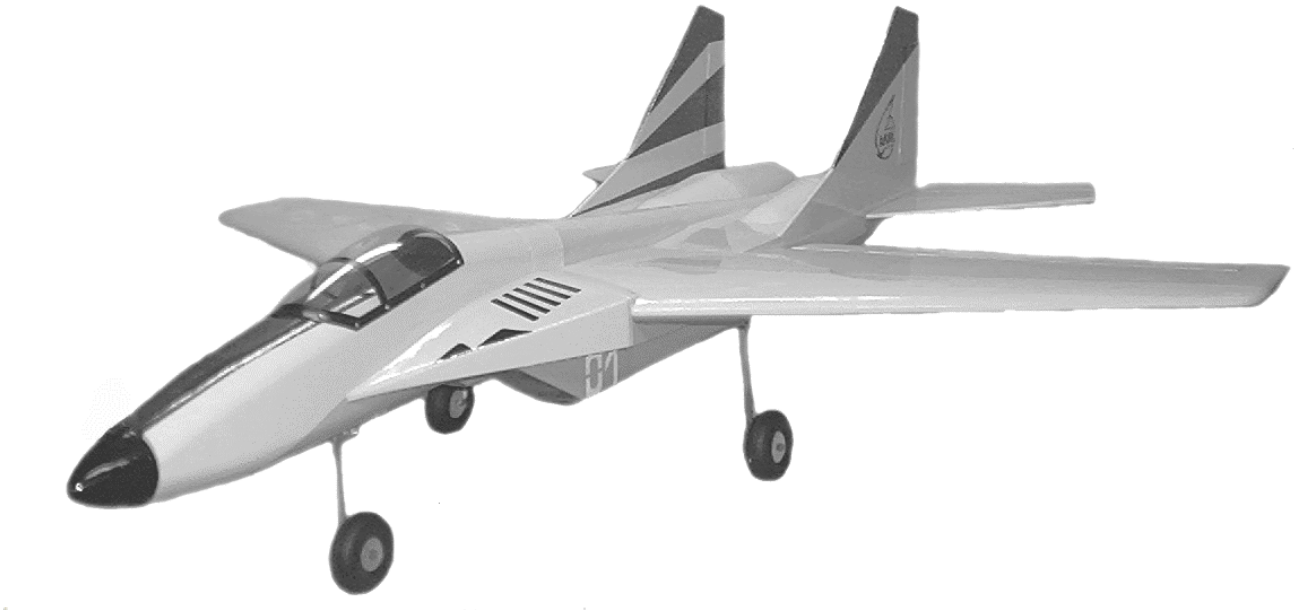
AK Models

Legendary MIG-29 Fulcrum.

A High Performance Jet-Like Model that Flies like a sport plane.



This booklet divides the construction into sub-assemblies: fuselage, wing, etc. Read each section carefully and identify all of the parts before starting on particular sub-assembly. There is a complete description of all kit parts under "Kit Contents". Please check to be sure that your kit is complete; that it is not missing any parts. If you do find that parts are missing, or if you are having trouble identifying parts please let us know. The pictures in this manual clarify and detail many of the assemblies shown on the plan, and the two should be used together during construction.

Should you experience a problem with this kit feel free to call or write:

Thank you for choosing AK Models.

Good luck to you and have fun building and flying

MIG-29 Fulcrum.

AK Models

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This product is sold with exclusion of all warranty expressed or implied, statutory or otherwise. Buyer assumes all risk of use.

NOTES BEFORE BEGINNING CONSTRUCTION

Any references to right or left refers to your right or left as if you were seated in the cockpit.
To build good flying models, you need a good straight building board. Crooked models do not fly well! The Building board can be a table, a workbench, a reject "door core" from the lumberyard, or whatever - as long as it is perfectly flat and untwisted. Cover the top surface of the building board with a piece of celotex-type wallboard or foam board, into which pins can be easily pushed. Do not hesitate to use plenty of pins during assembly to hold drying parts in their correct position. When pinning and gluing parts directly over the full-size plans, cover the plan with wax paper to prevent gluing the parts to the plans. Do not use a ballpoint pen for making marks on the model during construction. If not sanded off, these ink marks will show through the model's final finish. Use pencil instead of a pen. The laser-cut balsa and plywood parts can be identified using the plans and the "KEY TO LASER-CUT PARTS". Mark the identification or the corresponding parts before removing them from the laser-cut sheets.

DO NOT AD LIGHTNING HOLES TO ANY PARTS! IT WILL JEOPARDIZE STRUCTURAL STRENGTH AND MAKE BALANCING MODEL DIFFICULT.

To build MIG-29 Fulcrum you will also need:

- Engine 2-Stroke .60 - .75
- Engine mount w. hardware (Dave Brown 60FS-6004)
- 2 1/2" Spinner (GreatPlanes GPMQ4521)
- Front Landing Gear Bracket and steering arm
- (3) - Wheels: 3" (Du-Bro 300T)
- (1) - Front Landing Gear wire (Du-Bro 154)
- (1) Axle for Front gear (Du-Bro 615)
- (6) - 5/32 wheel collars (Du-Bro 598)
- (1) - 14 oz Fuel tank (Du-Bro 414)
- (1 set) Sullivan Push-rods (Blue/Gold #506)
- (9) 2-56 - 12" Push-rods (Du-Bro 801)
- (4) 4-40 - 12" Push-rods (Du-Bro 802)
- (2) 10-24x4" bolts with blind nuts
- 2 Rolls of Covering
- 4 Channels Radio w. 6 Servos
- (2) 1/2A Control Horns (Du-Bro 107)
- 2" Nylon Reinforcing Tape (GreatPlanes LXK255**)**
- (2) Nylon Torque Bearings (GreatPlanes GPMQ4270)
- (4) E/Z Adjust Horn Bracket (Du-Bro 557)
- (6) L.G. Retaining Straps (Du-Bro 158)
- Medium Fuel Tubing (Du-Bro 222)

PREPARE TO BUILD.

- Remove all puzzle tabbed parts from their sheets. Keep all other parts in their sheets until needed.

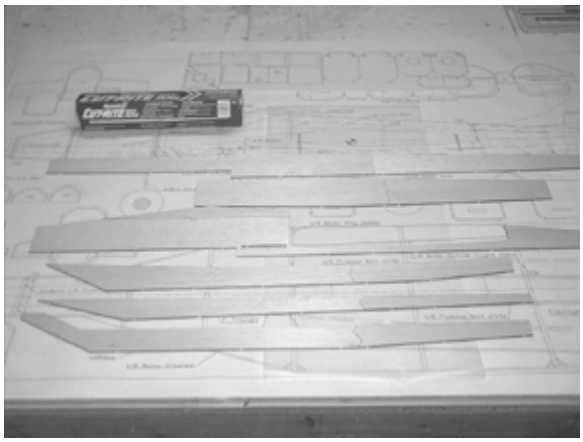
Fuselage sides (2)

Fuselage bottom (1)

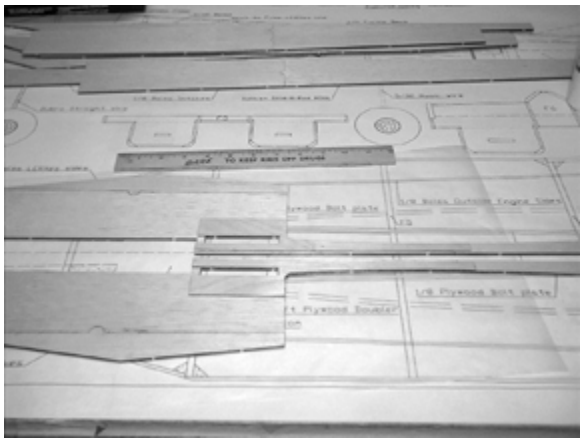
Engine sides (inside and outside) (2) of each

Engine bottom (2)

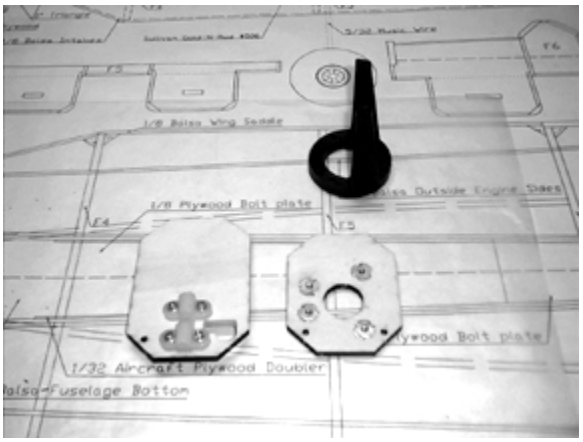
Fuselage outside-bottom (2)



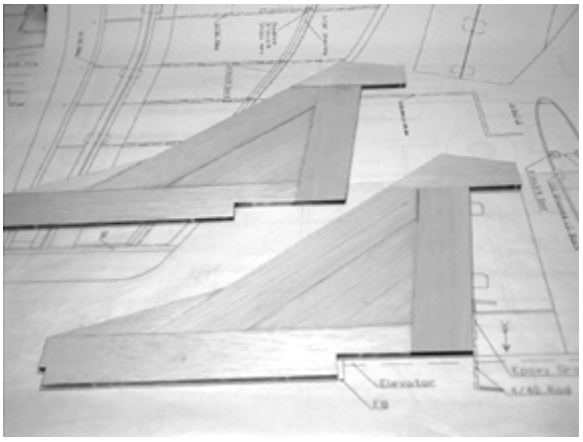
- Glue all parts together with Thick CA and ruler to keep part's side straight. Glue 1/16 doublers to fuselage side making right and left sides.



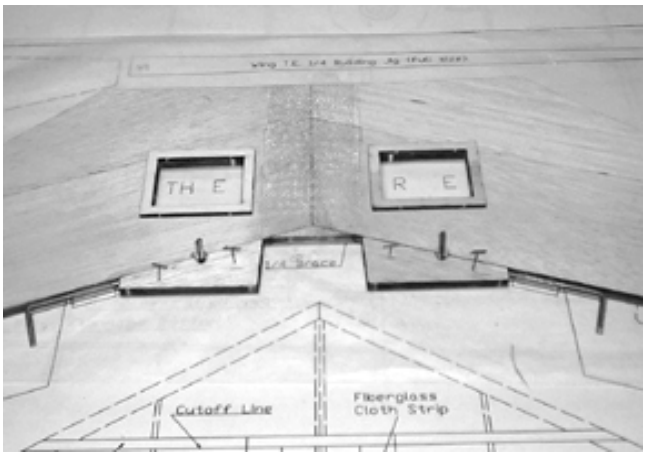
- Remove F1 & F2, epoxy together.
- Remove ribs W2, W4 and their plywood doublers, epoxy together making right and left sets.
- Mark center and thrust lines on F1, install engine mount hardware. Install front L.G. hardware on to F2. Make necessary openings for steering arm on the left side as if you sit in the cockpit.



- Build vertical fins. Glue all parts together except rear part that holds torque rod. You will do it later.

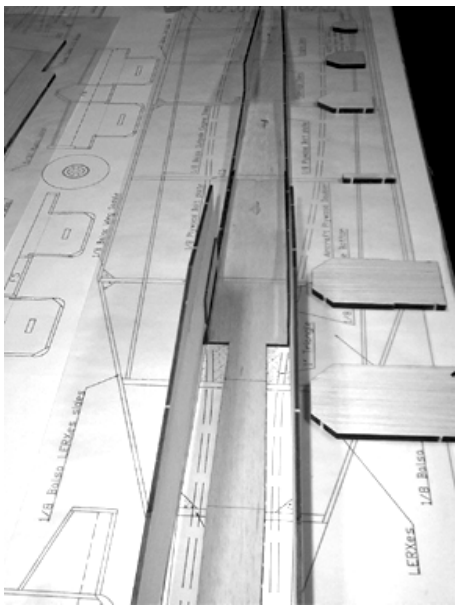


- Build stabilizer and place fiberglass cloth over the center line (top and bottom). Glue servo trays. Round leading edge and sides of the stabilizer.
- Slide nylon bearings on to 4/40 torque rods and make bends as per plans (note that they are slightly different), also cut slots in to stabilizer for nylon bearings.
- Pin stabilizer to building board (BB), with servo trays on top.
- Use Chap Stick to lubricate torque rods where they will be placed in epoxy. Glue nylon bearings in with epoxy.
- Cut grooves in to tailpipe base on the side that holds torque rods. Trim stabilizer and tailpipe base for rod clearance (see plans). Fill grooves with 15 min. epoxy and place over the torque rods as per plan. Wipe off any extra epoxy. Wait 15-20 min. and move rods back and forth to brake loose from epoxy.

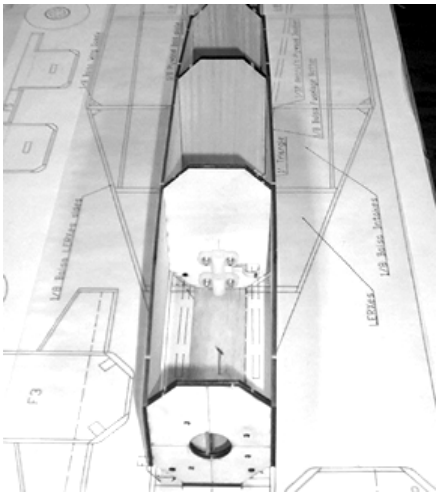


FUSELAGE.

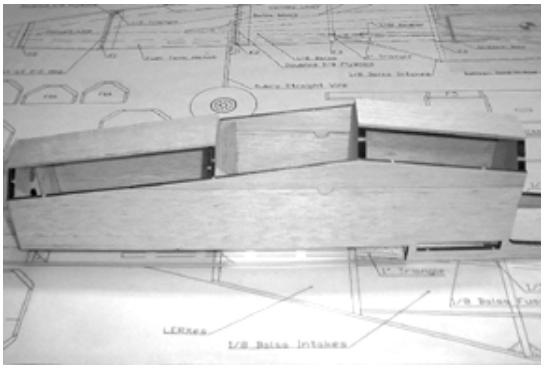
- Cover plans and pin down fuselage bottom. Draw former lines over fuselage bottom. Place fuselage sides vertical to BB; align sides with bottom and tack glue sides to bottom.



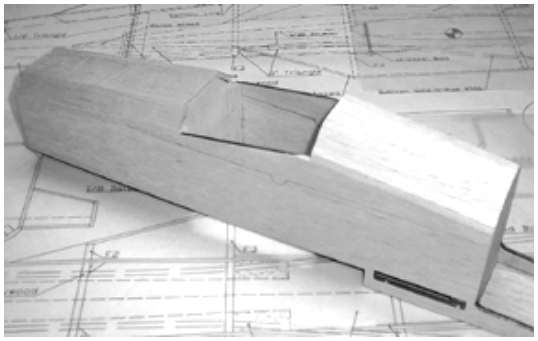
- Place and tack glue F4 through F8 and then F3, F and F1. Use former guide (F.G.) by placing it behind all formers while applying glue.



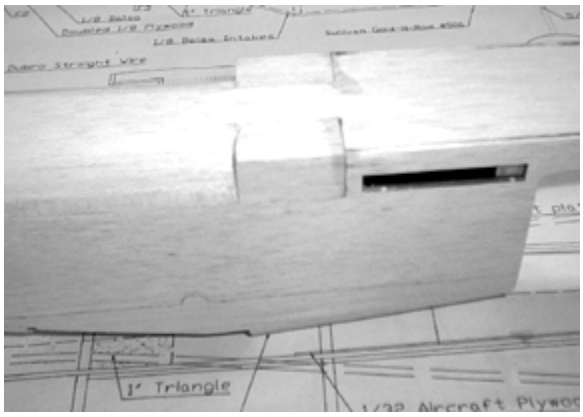
- Go back and permanently glue all formers and sides together using thin CA on formers and Med. CA on fuse sides and bottom.
- Measure and cut 1/2 triangle to be placed behind F1 and F2. Epoxy triangles in.
- Make a top fuselage sheeting for F1-F2, F3-F4 and F6-F8. Measure and cut from hard 1/8x2x36 balsa. Glue top sheeting in. Sand top & sides for 3/16 corners.



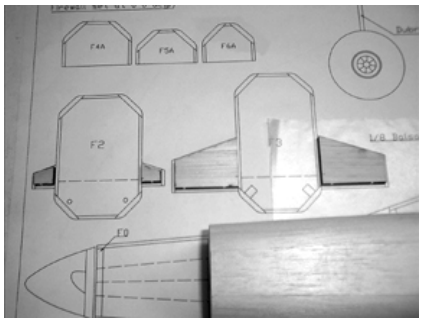
- Measure, cut from 3/16x2x48 and glue top corners to F1-F2, F3-F4 and F6-F8. Sand flush with top and sides.



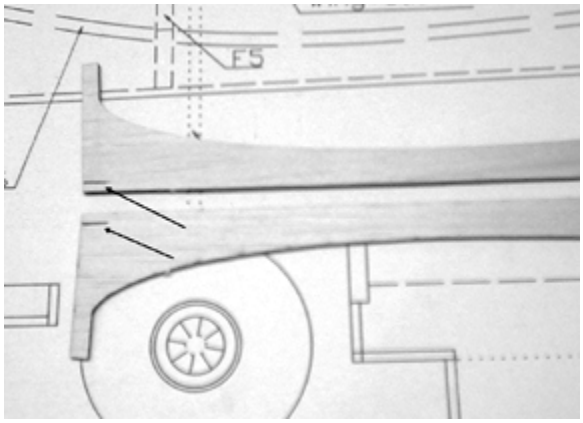
- Remove fuse from BB and flip over. Sand sides and bottom for 3/16 bottom corners. Cut 1" triangle to fit next to fuselage corner and half way on to F3. Glue in place.
- Glue 3/16 bottom corners. Round well all 3/16 corners as per plans, do not trim triangle at this time.



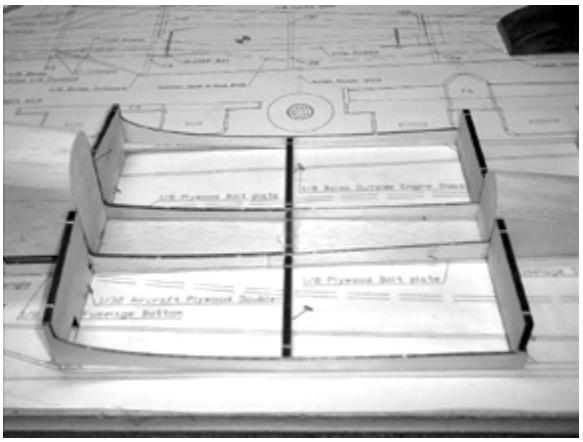
- Pin fuse back to plans. Draw vertical and thrust line for F2 and F3 on the side of the fuselage. Mark thrust line on F2 and F3.



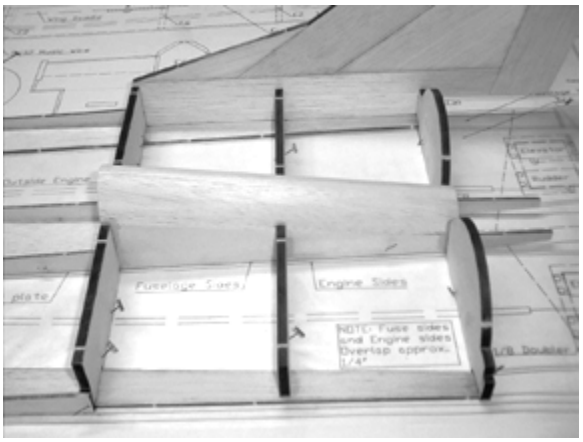
- Glue all formers from F2 to F8 in place.
- Mark 1/8 on bottom inside of wing saddle.



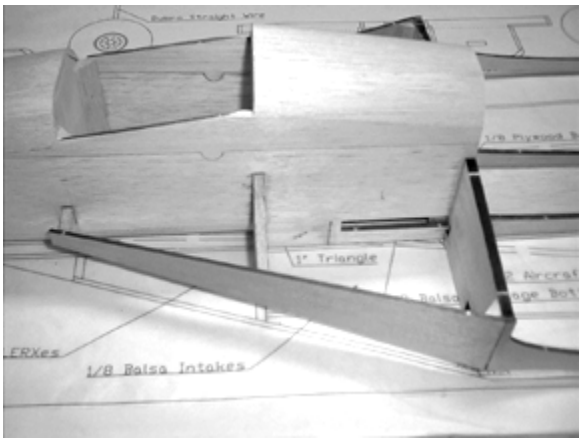
- Glue wing saddle to F4, F5 and F6 keeping it flat on BB between F5 to F6.



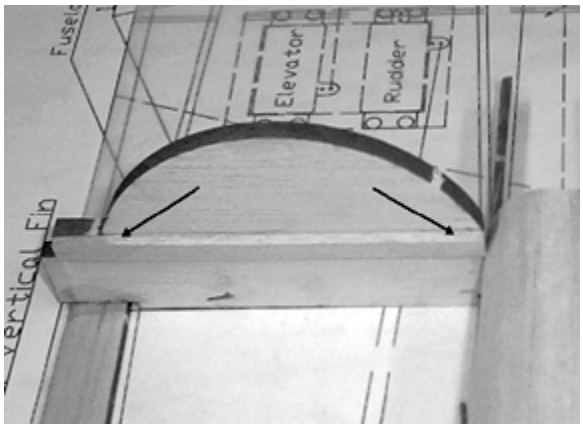
- Slide Fuselage outside-bottom starting at F4. Align it at rear of F8, wing saddle and lines on the plan. Use vertical fins to perfectly space F6 and F8. Glue Fuselage outside-bottom in place.



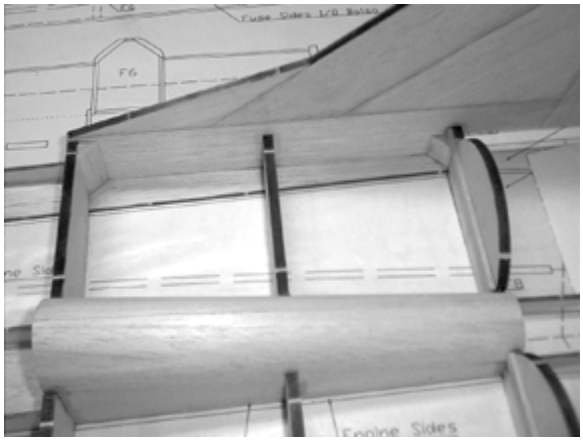
- Trim sides of F2 and F3 to except LERXes sides. Glue LERXes sides aligning them at the top of formers; trim 1/2 triangle to fit at F4 joint.



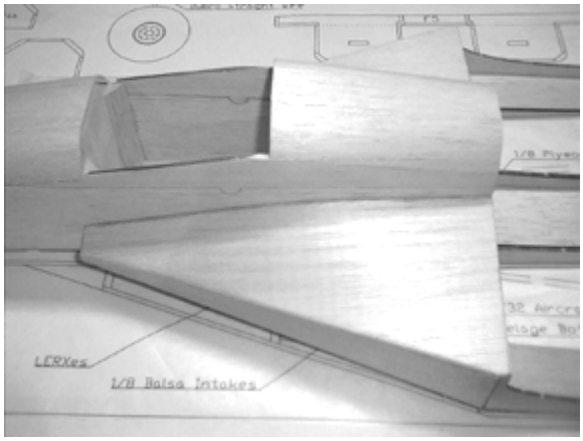
- Cut 1/8x1/4 to make sheeting rails for F8. Glue them on the front side of F8.



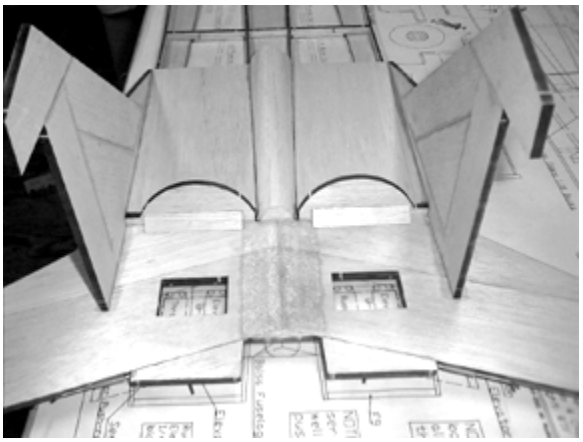
- Glue in vertical fins, keeping them vertical to BB and tight to formers. Glue 1/2 triangles where indicated on the plan.



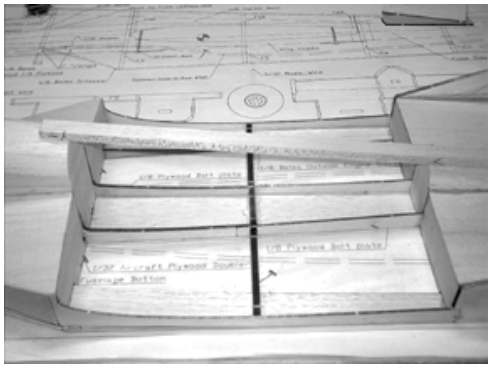
- Cut out patters from Wing plan, cut 3/32 sheeting using them. Remove all pins from area to be sheeted. Fit and glue rear-top sheeting in place.
- Glue in place top LERXes. Trim front and sides us necessary.



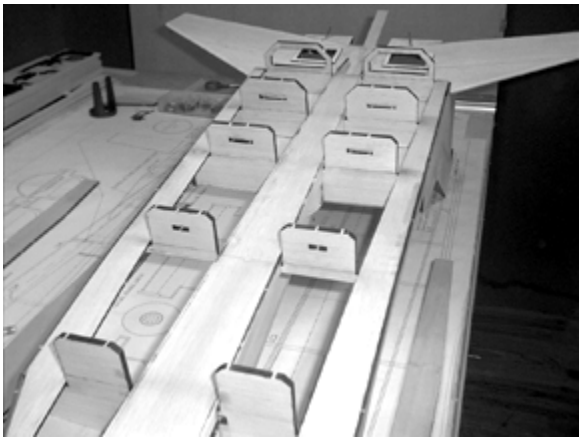
- Slide stabilizer assembly in place; check alignment and glue to vertical fins and F8. Also ad 1/2" triangles as shown on the picture.



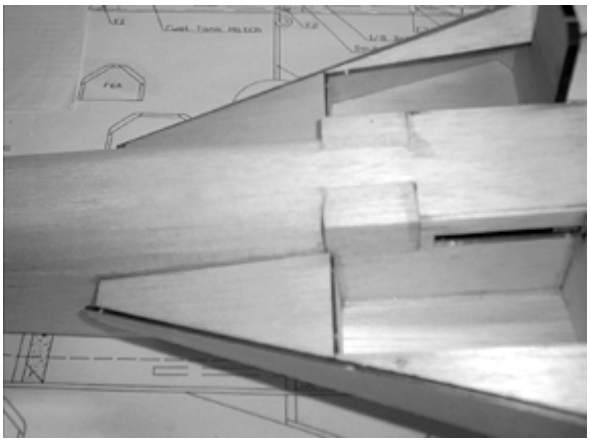
- Pin 3/8x1X36 stick (that will be used as a Leading edge for the wing) to the top of F4, F6 and F8. Put pins so they go in to formers. See picture.



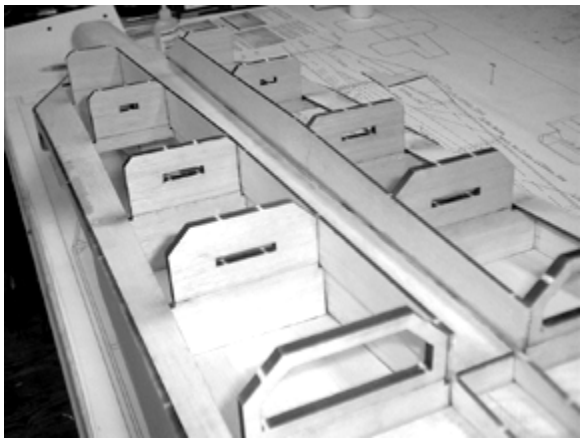
- Unpin fuselage and flip it over placing it on the BB. It will be seating on vertical fins and nose section.
- FUSELAGE IS NOT STRONG ENOUGH AT THIS POINT TO HOLD TOO MUCH PRESSURE. NEXT FEW STEPS BE CAREFUL NOT TO PUSH DOWN TOO HARD. IF YOU NEED TO PUSH DOWN USE HAND TO HOLD FROM UNDERNEATH OF FUSELAGE.
- Glue all bottom parts of all formers in places using a Med. CA.



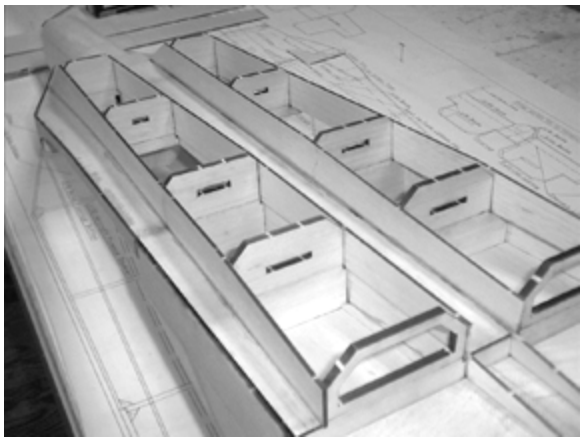
- Trim bottom LERXes and glue in place.



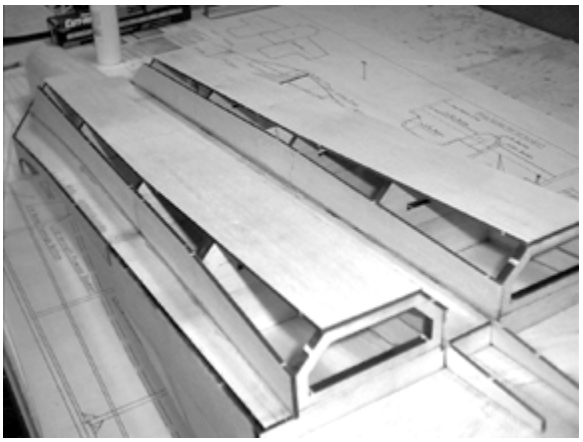
- Place inside engine side in a position. Align with formers corners and glue first to formers and then to center section of the fuse. Tip: “Sharpen” the edge that goes in to slots by sanding it VERY lightly.



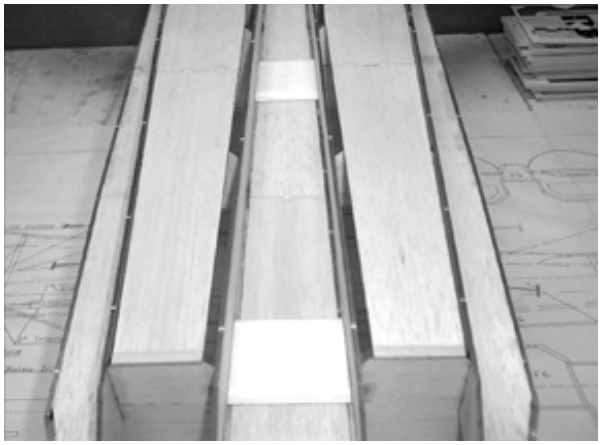
- Follow step above to install outside engine side.



- Glue in place bottoms of the engines.



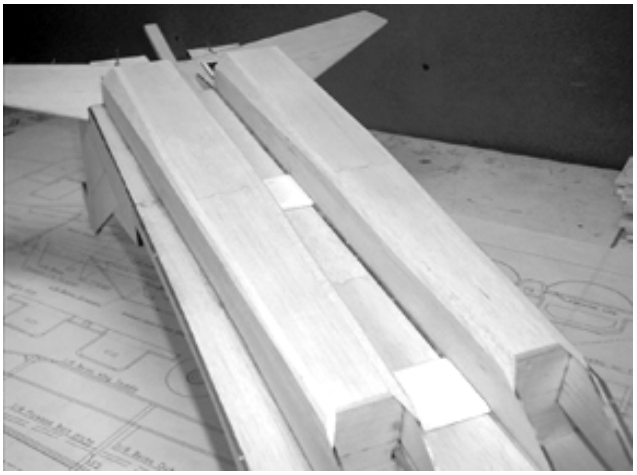
- Epoxy wing bolt plates making sure they placed on to former below at one end.



- It is a best time to install pushrods (throttle and steering). Install, measure, cut outer pushrods and epoxy them only to F7 at this time. Keep pushrods housing pointed to sides of servo trays. See picture.

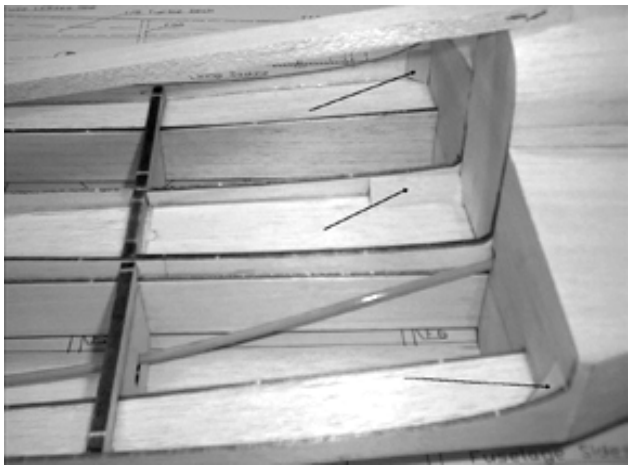
- Glue 2” long 1/2 triangles to bottom and sides of the fuselage to support wing bolt plates. In addition, install 1/2 triangles to all joint indicated on the plans.

- It is recommended to use some kind of Airplane stand for next steps, as it will require plenty of sending.
- Sand engine sides and bottoms to except 3/16 corners. Engine corners are made of two parts; front and rear. Cut two 15” long 3/16x2 and four 10” pieces. Cut 15” long pieces in half-length way.
- Glue rear corners in, placing them flush with F8. Install front corners. Trim corners flush with engine bottoms and sides. Also, sand corners at F8 and match intakes angle.

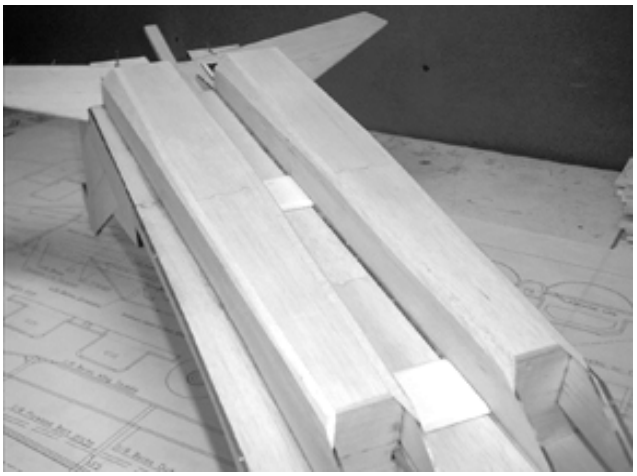


- Use 1/8 balsa to sheet intakes making sure grain goes from side to side.

- Glue 2” long 1/2 triangles to bottom and sides of the fuselage to support wing bolt plates. In addition, install 1/2 triangles to all joint indicated on the plans.



- It is recommended to use some kind of Airplane stand for next steps, as it will require plenty of sending.
- Sand engine sides and bottoms to except 3/16 corners. Engine corners are made of two parts: front and rear. Cut two 15” long 3/16x2 and four 10” pieces. Cut 15” long pieces in half-length way.
- Glue rear corners in, placing them flush with F8. Install front corners. Trim corners flush with engine bottoms and sides. Also, sand corners at F8 and match intakes angle.

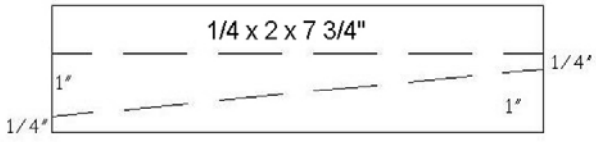


- Use 1/8 balsa to sheet intakes making sure grain goes from side to side.

- Cut off fuse extensions flush to F8. In addition, cut off 1" from front part of extensions. Put them aside.
- Mark Tail pipe base lines on F9s over the plans so grain goes vertical. Glue them in place keeping 90 deg. to tail pipe base.
- Cut four 7 1/4" long 1/8x1 balsa. Position in place and glue to F8, stabilizer and F9. Once glued to stabilizer, make a relief cut (not all the way through) approximately 2" long in the middle of sheeting starting from the F9 end. It will make it easier to round it over F9. See picture.

- Cut opening (1/2" high by 1" long) for servo wires in inboard sides only. See picture above.
- Cut four 7 1/2" long 1/8x1 balsa, trim end contacting F8 and glue to F8 first and then to F9. Make a relief cut once again. Sand seams, fill it with Med. CA, and sand over while it is curing.

Make 4 Parts

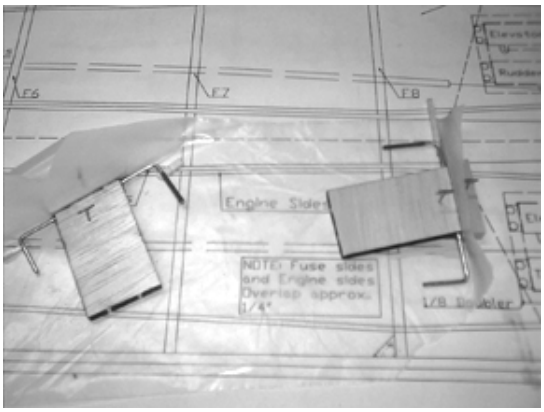


- From 7 3/4" long 1/4x2, mark and cut as in picture above make four parts. Trim **inside** of 1/8 sheeting this time. Glue parts made above to F8 and F9, sand seams and fill with Med. CA. Also, run Med. CA on the inside through servo tray opening.

- Sand structure smooth and round. Place 1/4 Balsa Hatch centered over the tail cone and mark it's position with pen. Cut out hatch opening keeping it as close as possible for good fit.

- Glue 2” long 1/4x3/8 hatch rail to F8 (let hatch stick out a little); also trim F9 so hatch can be lowered to match sides (see picture above). Install hatches and drill holes for mounting screws (two in front and one at rear). Screw hatches down and sand to make a good transition.

- Take previously cut off fuse extensions and place them next to tail cone wire opening, try-fit 1/8 rear sheeting. Trim as needed and glue in place, extensions and sheeting.
- Use building pin to mark through openings for rudder torque-rods. Make 1/4 opening with rotary tool working from the bottom of stabilizer.
- Take rear part of vertical fin and cut groove to epoxy torque-rod. Bend rods as per plans and lubricate as you did before. Place them in epoxy filled groove, pin it to wax paper covered BB, fold wax paper over and pin scrap wood next to epoxy groove. It will hold epoxy in place giving you good surface. Push rods toward the scrap wood and place 1/8 shims under the rod to help it center in epoxy Let it dry 15-20 min. and move rods to brake them loose from epoxy.



- While epoxy is curing, take a ruler and mark a straight line to help locate positioning of the torque-rod assembly.
- Epoxy torque-rod assembly in place keeping it tight to vertical fin and stabilizer. Also, make sure you pin it in place vertical to stabilizer.
- Plank sheet tail pipes. You will need 36 strips 7- 1/2” long 1/8 x 5/16. It is very simple if you follow few rules. Start from the bottom; glue one strip at a time. Tip: always glue it first to F8 until you come to angle ended strips (you would want to place all strips half way on to F8 and keep them aligned, except bottom row). Second: tack glue it in the middle and finally to F9. Third: Use CA accelerator to move along faster. Do not worry about small imperfections at this time, you will correct it later.

- Once angled strips needed, place them over the area, mark and cut. Then push slightly in tack glue angled end and then glue to F8.

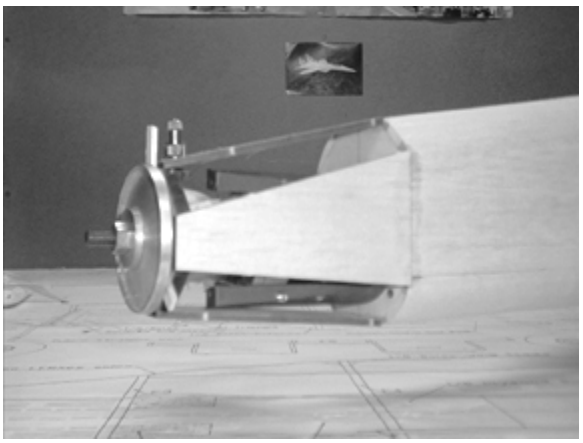
- Once all strips are in place, sand first and run Thin CA at seems. Sand once again and trim ends of strips at F9.

- Make filler blocks. Cut of 6 1/2" from 1x3/8x36 (Wing L.E.). Use plans as a guide, but keep in mind rounded surface of tail pipes. Trim little at time until it fits well. Round rear part of filler block.

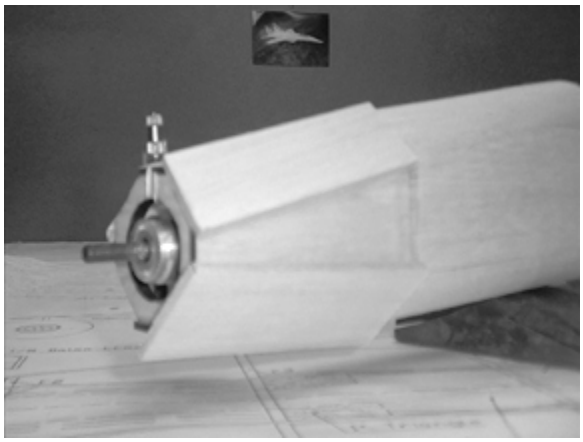
- Glue blocks in place. Use 30 min. Epoxy. Keep blocks in place tight to vertical fins, pin down and check vertical fins for 90 deg. to stabilizer.
- From one 1/2x3/4x5 1/2" balsa block make tailbone using plan and picture as a reference. Do not glue until tail and tailbone is covered.

- Using plans make fuselage transition from 1x1x7 balsa block. Make them by diagonally cutting block in halves. Trim as needed, create rod clearance, glue in place. Also, glue in 1/8 scrap wood below vertical fins where they meet bottom sheeting.

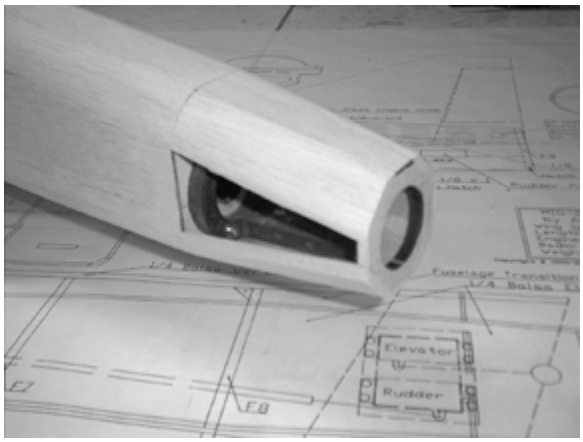
- Install engine mount and engine, also use 3/32 scrap wood to space spinner from F0 by tack gluing 3 strips to back of spinner and centering F0 on it. Install back plate with F0 on to engine. See next picture.
- Install Top, left side and bottom of cowl. Trim them for 3/16 corners.



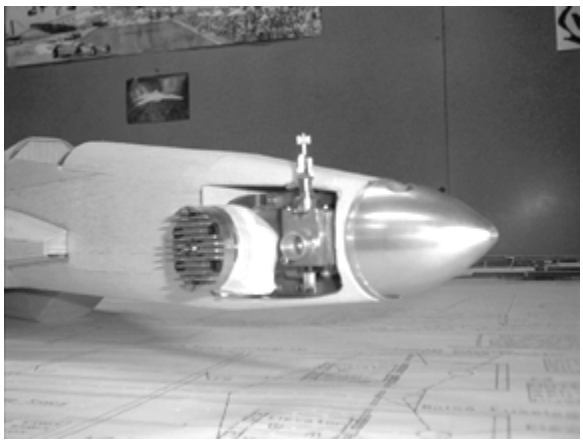
- Measure and cut 3/16 corners, glue in place to top-left and bottom left of F0 and F1. See picture.



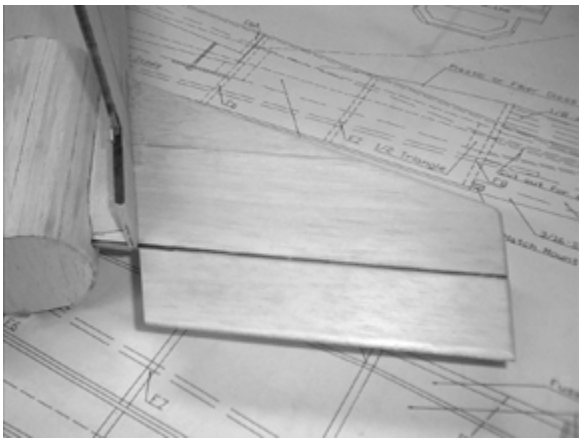
- Remove engine glue 1/8 scrap wood to right side of F0 and install 3/16 corners on the right side. Trim corners to form cowl.



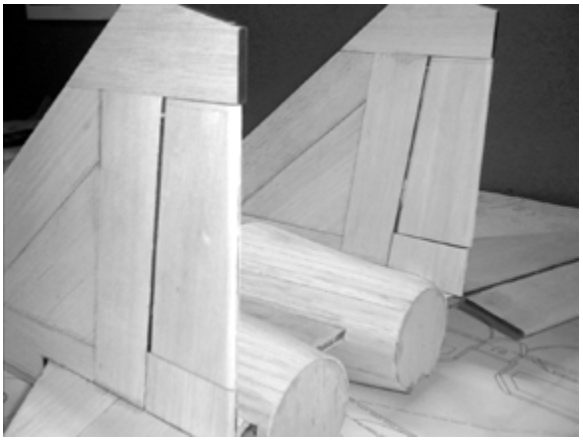
- Enlarge opening for your engine. It will take approximately half of 3/16 corners. Sand sheeting around F0 to match spinner.



- Hinge and install elevators as per plans. Sand L.E. as well as round outer side and T.E.



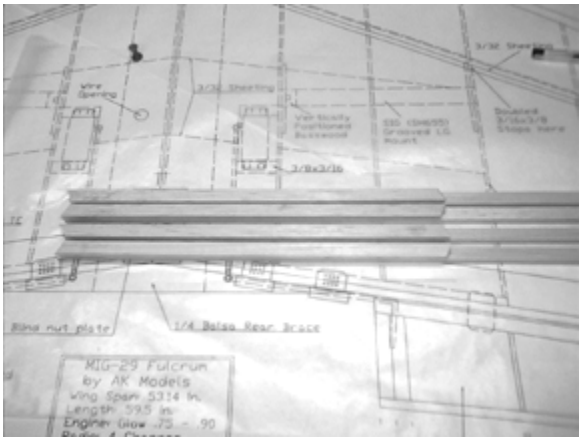
- Hinge and install rudders as per plans. Sand L.E. as well as round L.E.



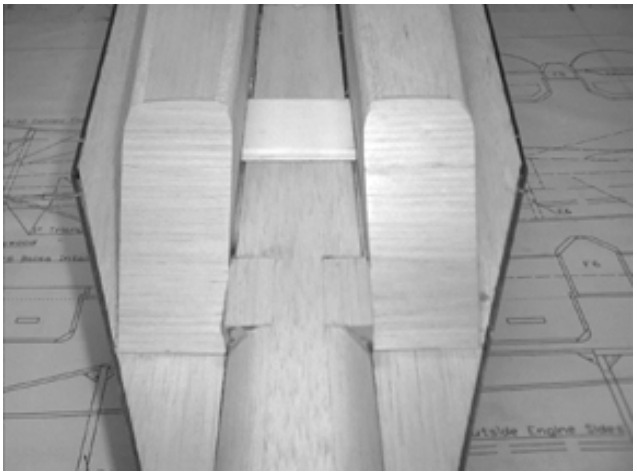
- Make push-rod openings on sides of tail cone. Cut them at the seam and up. Do not make them too big at this time; you can enlarge them later during actual rod installation.
- Finish sending fuselage to shape using plans.

Wing construction.

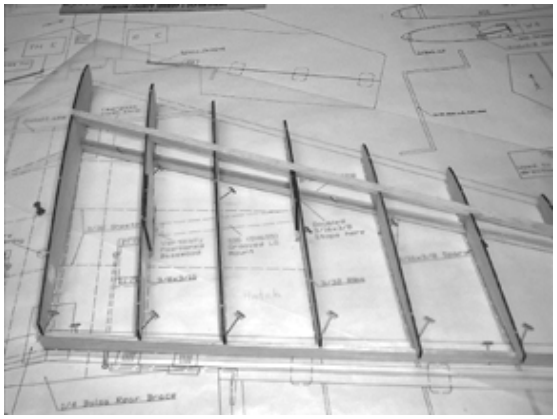
- Measure and cut four wing spars from harder 3/16x3/8x36 sticks. Measure and cut four spar doublers from 3/16x3/8 sticks. Glue together making top and bottom, left and right spars.



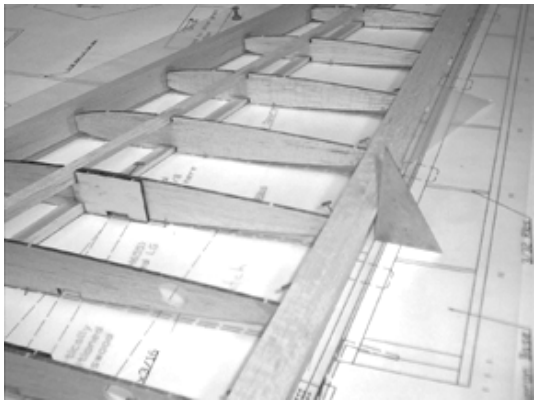
- Cover plans with wax paper and pin bottom spar to BB. Using a straight edge assemble a wing jig from laser parts. Pin down wing jig with wider end at W1 rib. Place all ribs and pin down. Place top Spar in place. Adjust all ribs (except W1) so they vertical to BB and glue to bottom spar first and then to top spar. Use W1 Guide placing it by W1 rib in W1-W2 bay.



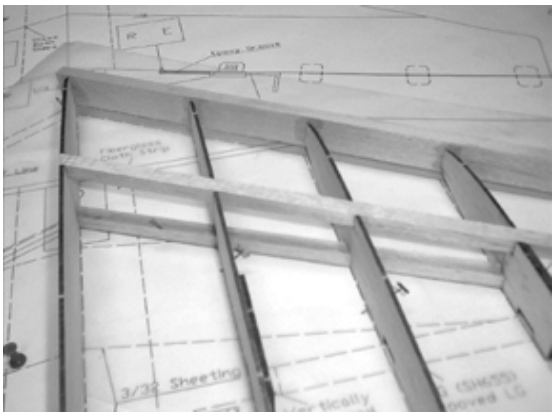
- Cut off fuse extensions flush to F8. In addition, cut off 1" from front part of extensions. Put them aside.
- Mark Tail pipe base lines on F9s over the plans so grain goes vertical. Glue them in place keeping 90 deg. to tail pipe base.
- Cut four 7 1/4" long 1/8x1 balsa. Position in place and glue to F8, stabilizer and F9. Once glued to stabilizer, make a relief cut (not all the way through) approximately 2" long in the middle of sheeting starting from the F9 end. It will make it easier to round it over F9. See picture.



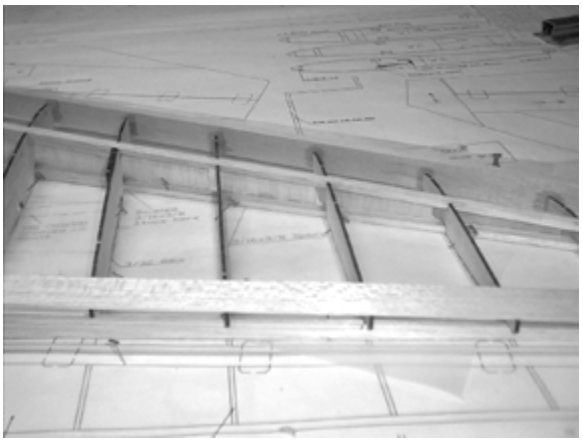
- Pin 3/32x1x36 to all ribs, use straight edge to determine placement. Glue in place with thin CA running it from rib and front of rear sheeting.



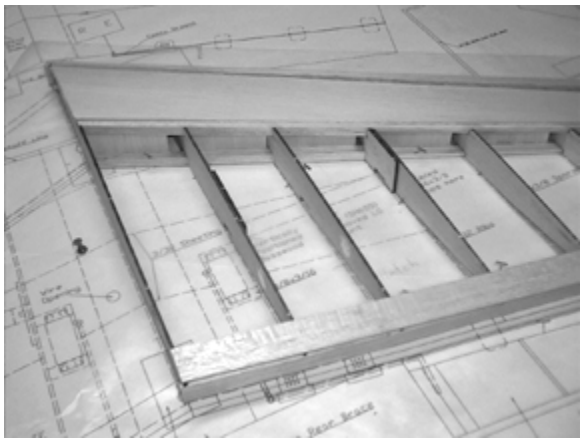
- Sand front of ribs as needed to install 3/8x1 L.E. Place it on BB at W9 and centered on W1. Glue in place. DO NOT TRIM LEADING EDGE UNTIL WING IS COMPLETED. IT WILL SET WASHOUT ANGLE ONCE WING IS TURNED OVER.



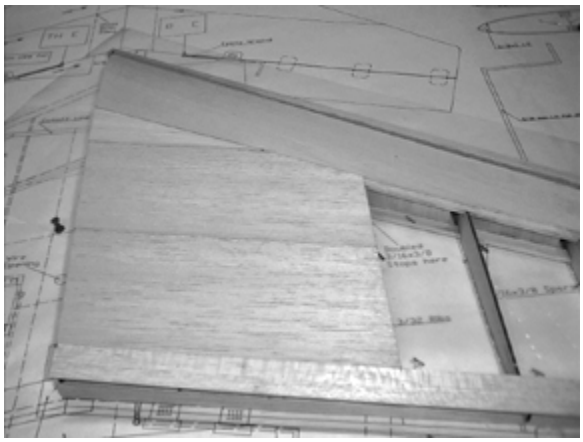
- From 1/16x3x36 sheet cut sheer webs for all rib bays. Glue in place, trim tops if needed.



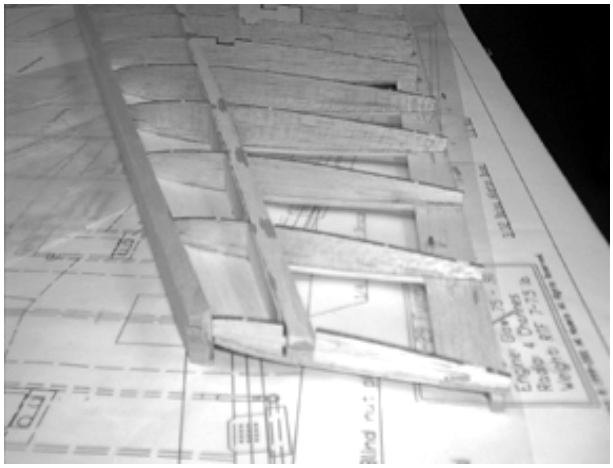
- From 3/32x4x36 sheet measure and cut L.E. sheeting. Use thin CA to glue to L.E. first, then run Med. or Thick CA on all ribs and main spar. Use long sending bar to push down along main spar to let glue set.



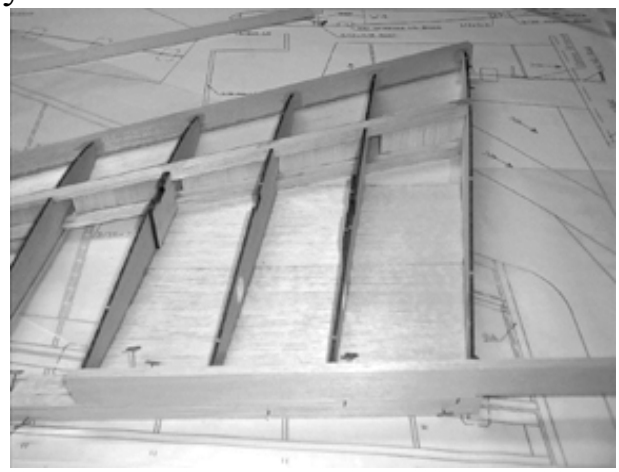
- From 3/32x4x36 cut center sheeting starting from rear sheeting going forward. Use scrap 3/32 from L.E. sheeting to finish front part. Glue in place one at a time.



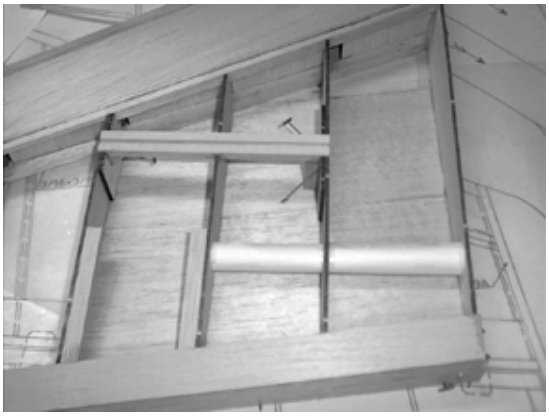
- Cut 3/32 rib caps and glue in place. Sand sheeting and caps, as well as trim sheeting at W1 and W9.
- Unpin wing and flip it over. Pin building jig to BB, place wing and pin securely down. You will need to force wing down a little at W9 to pin it to building jig.



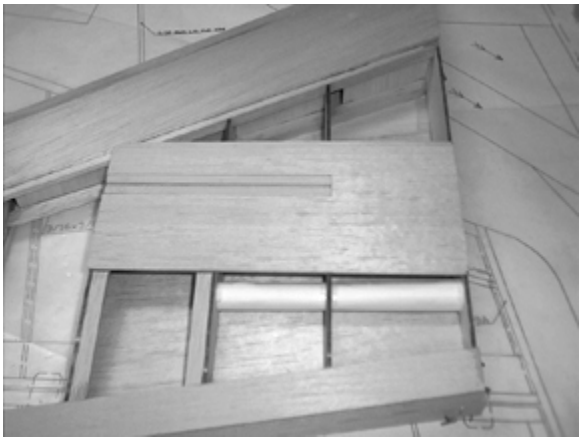
- Place 1/4x1x36 as shown in picture. Mark its length as well as rib's height. Cut as marked and glue in place. Sand to match ribs profile.

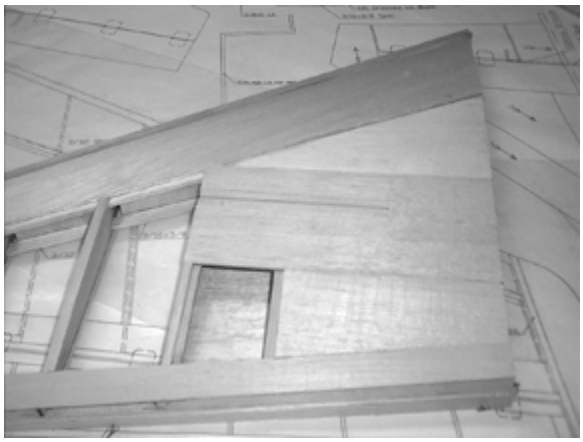


- From 3/32, make L.E. sheeting and glue in place as you did before. Glue 3/32x1 sheeting in place. Epoxy vertical Bass block to W2 as well as grooved L.G. mount. Use plans to cut 3/16x3/8 leftovers to make hatch support rails and glue them to W3 and W4. Also, make (from half of 8x11 sheet) paper tube and glue it to ribs.

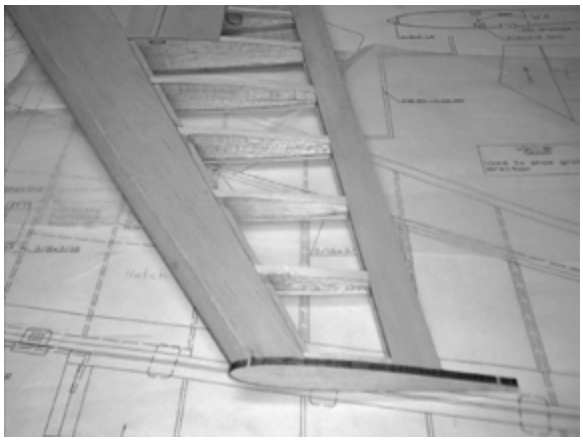


- Sheet center starting over the L.G. mount. Then rear of it and in front. Glue cap strip next to hatch side.



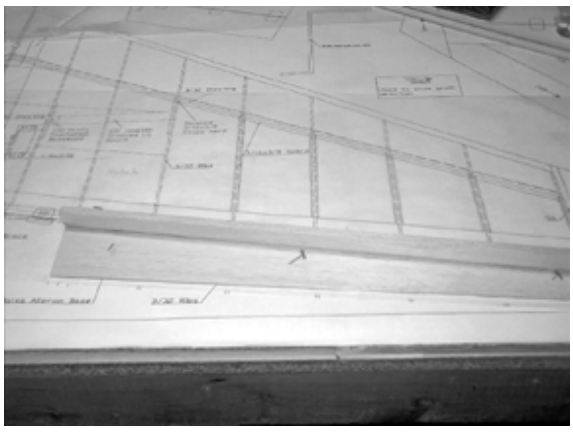


- Use long sending bar, to sand slightly rear sheeting and ribs. Glue 1/4x1" T.E. to rear of the wing.
- Trim L.E. and T.E. at this time. Glue oversized W9A to W9 rib placing it centered over the W9 rib. Do not trim it at this time.

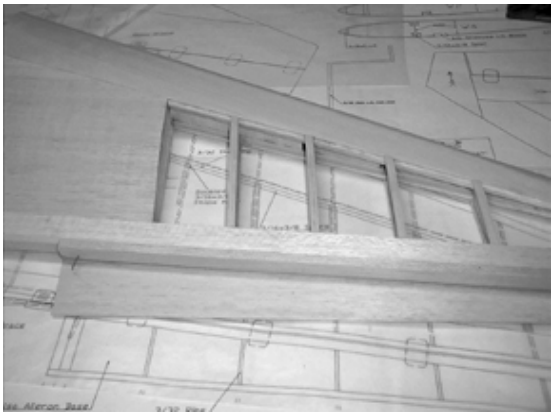


Ailerons.

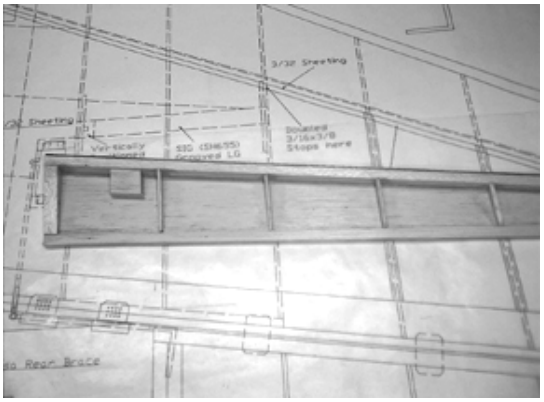
- Cut Aileron Base from 3/32x4x36 sheet. Pin it over the plan. Measure and cut 3/8x3/4x36 to make a L.E. Pin in place and glue with Thin CA.



- Unpin Aileron from BB and pin it to wing. Mark L.E. of aileron to be cut. Place aileron on the edge of the table or BB and cut as marked.



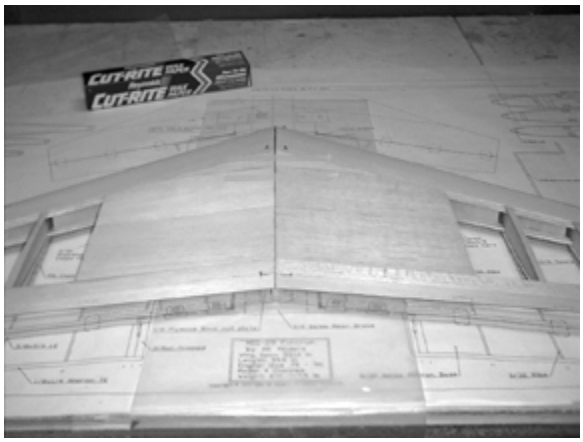
- Pin it back to plans and glue 1/8x1/4 L.E. to aileron base. Cut all ribs from scrap wood as per plan and glue in place. Also, make a horn block from aileron's L.E. leftovers, glue in place.



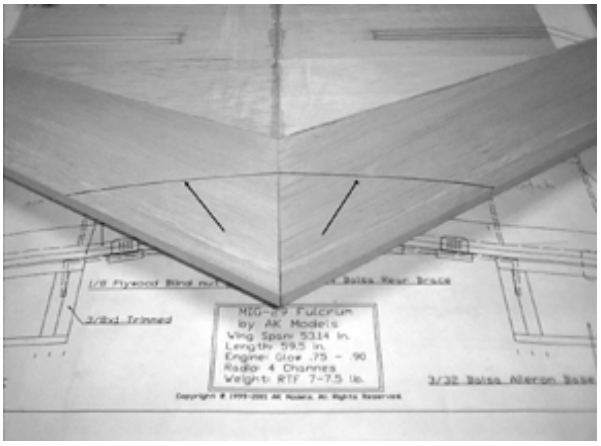
- Sand aileron to shape using a long sending bar. Temporary hinge aileron to wing. Trim aileron's L.E. as per plan as well as T.E.
- **<u>REPEAT ALL STEPS ABOVE FOR LEFT WING</u> (EXCEPT: PAPER TUBE SHOULD ONLY BE PLACED FROM W2 TO W3).**

Join wings.

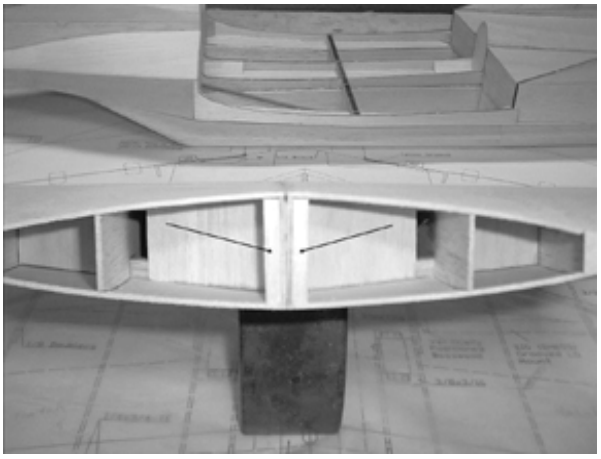
- From 3/8x3/4, leftovers cut three 1" long blocks. Trim two of the to 5/8 high. Pin them as shown on the wing plans at W9's and at W1 T.E.
- Try-fit wing halves together. Sand as required to get good contact between W1's. Use plenty of 30-minute epoxy on both W1's and place wings together. Pin L.E. crossway as well as T.E. Ad masking tape to keep wings tight to each other. Place wing assembly over the plans making sure it sits nicely on all three blocks. Let dry before moving.



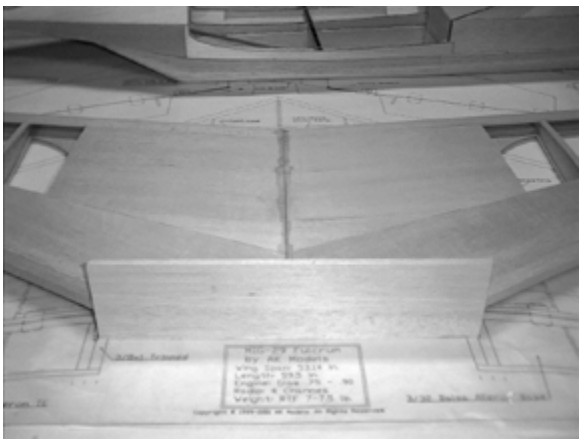
- Measure and draw Cutoff line on both wings, top and bottom. Use razor saw to cut 1/8 in front of drawn line half way through the wing. Flip wing over and finish the cut. If you do not get it cut completely off, carefully brake off some sheeting from cutoff part, so you can see what is holding it.



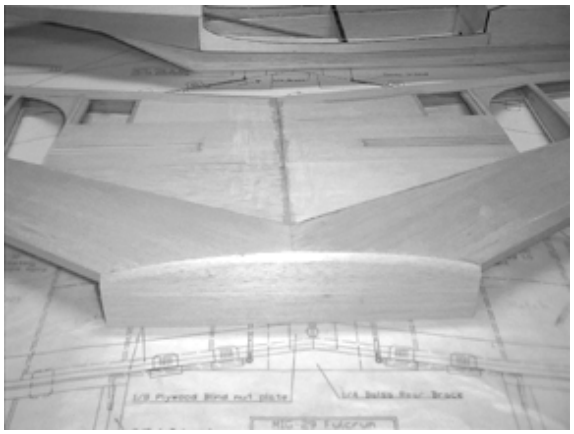
- Test fit wing to fuselage. Use 1/4x3x12" balsa sheet to figure out exactly how much to trim off. Finish trimming. You should be able to place wing on to fuselage and place what will be front brace in place between wing and F4. Before you glue front brace, cut 1/4x1 to fit as shown: next to W1's and tight to top and bottom sheeting.



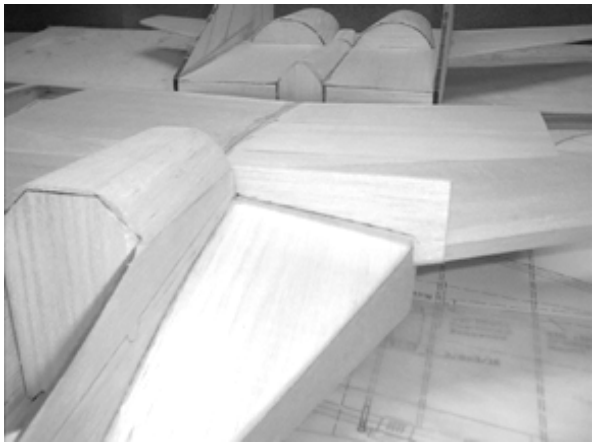
- Permanently glue 1/4x3x12 1/2" (front brace) in place by placing wing right side up and flat on BB.



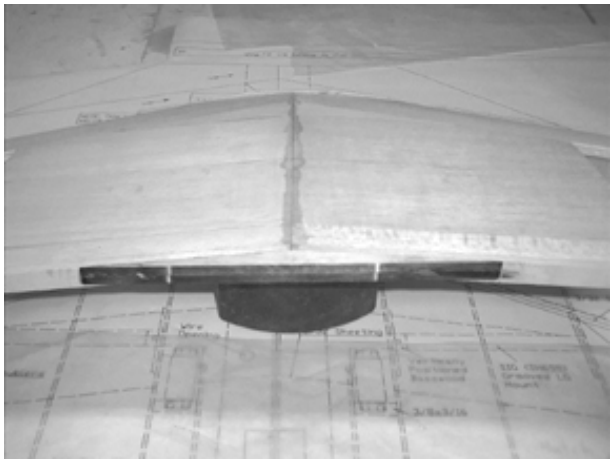
- Flip wing over and trim **bottom** part of the front brace only also round edges to fit well in to wing saddle. Do not trim topside of front brace.



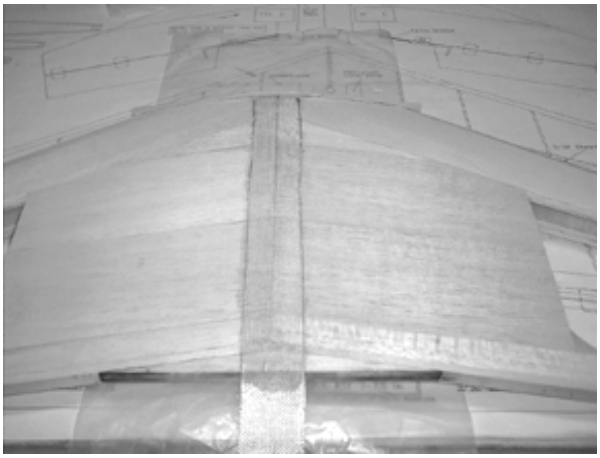
- Place wing on to fuselage; check for good fit trim as needed. Draw LERXes lines on front brace. Remove wing and connect ends of both lines at F4. Cut as marked and leave untrimmed.



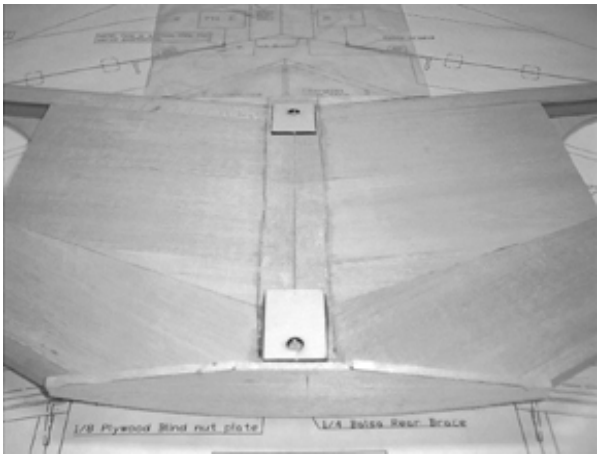
- Glue rear braces as per plans placing it even with top wing sheeting at outside ends.



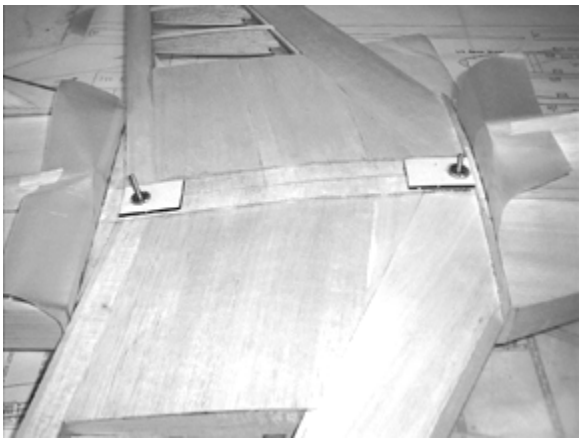
- Apply fiberglass cloth to top and bottom of the wing.



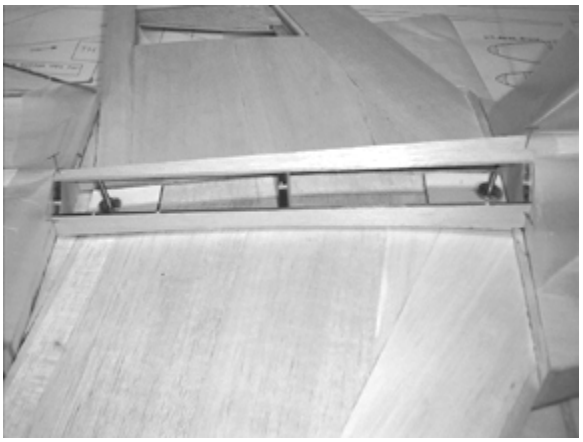
- Epoxy wing bolt plates as per plans (note the difference).
- Drill 3/8 holes using wing bolt plates as a guide. Place something under the wing so you do not damage the bottom sheeting.



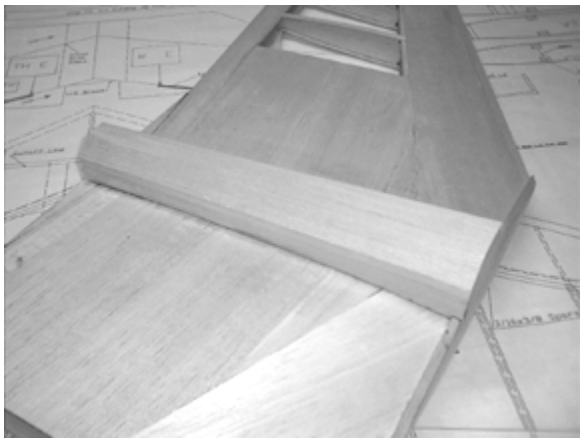
- Push blind nuts in place to leave impression from 3 teeth on wing bolt plates. Drill at this marks 1/16 holes.
- Center the wing on fuselage, check for perfect alignment with stabilizer. Double check and pin wing down to fuselage.
- Push blind nuts back in place and screw bolts until bolt hits bottom sheeting of fuselage from the top to determine where to drill holes in bottom wing bolt plates.
- Center the mark on fuselage bottom (side to side). Drill using 3/16 bit at this marks.
- Insert bolts from fuselage bottom this time, place wax paper as shown and place wing in place. Apply epoxy around blind nuts (you do not want to get them loose!) and tighten the bolts. Mark bolts length to be cut. **NEVER USE POWERED SCREWDRIVER TO TIGHTEN THE BOLTS.**



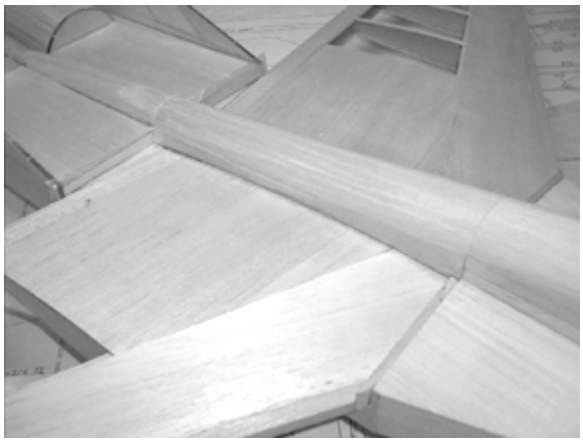
- Place F4A and F6A in place and trim as needed (trim bottoms). Glue F4A and F6A right next to F4 and F6.
- Measure and cut top 1/8 sheeting and pin in place. Place F5A in the middle of top sheeting. Pin sides in place and move F5A to where it fits best. Glue everything in place.



- Remove wing from fuselage. Trim 1/8 top and sides for 3/16 corners. Measure and cut corners, glue them in place aligning at the bottom for easy trimming. Sand corners flush with top and sides as well as flush with F4A and F6A.

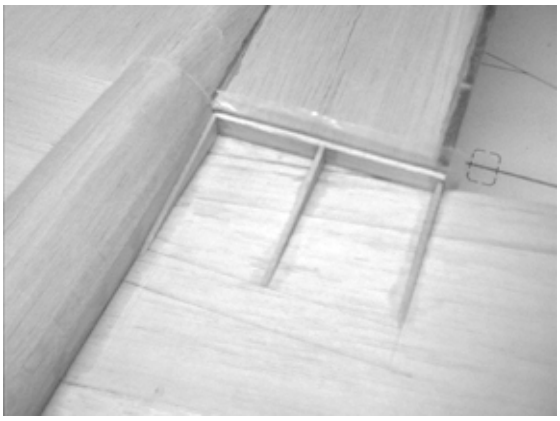


- Position wing back to fuselage with wax paper at front and rear of the wing and round corners to match front and rear of fuselage.



- Using scrap 3/32x1 from rear wing sheeting cut sheeting support to be placed next to F6's and go up to 3/32-fuselage sheeting.

- Measure 4" from F6 going forward and mark with line. Also Use ruler to draw line as extensions of vertical fins. Cut 3-1/4" long ribs from 3/32 scrap. Place them as shown in the picture and glue in place.

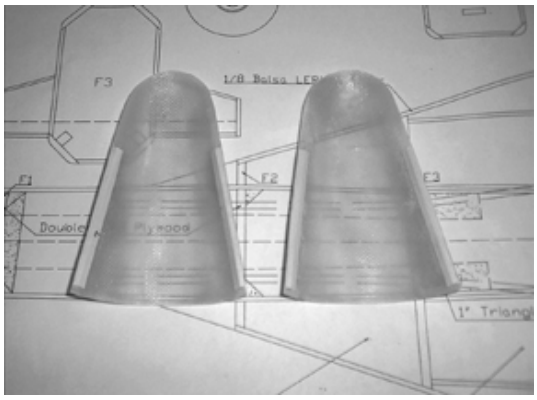


- Use 3/32x4" wide scrap from wing's front sheeting, fit in place and bevel 3/4" at bottom side. Glue in pace.

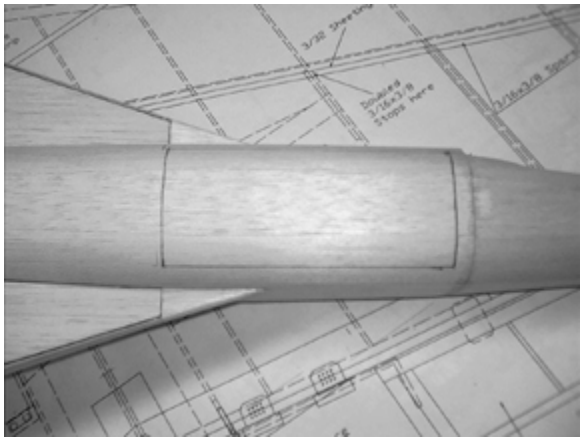
- From 3/32" scrap wood, cut front transition. It should be 3/4" on outer side and 1-3/4" on inner side. You can ad very small piece of scrap wood to make a rib at outer end.

- Trim plastic humps to fit well on to no-sheeted parts of F8's and on 3/32 fuselage sheeting. Then hold humps down and trim tail pipes sheeting to make smooth transition. Do not go too far sending, 1/2 - 3/4 should be enough to round up.

- Glue 1/4x1/8x4 rails along bottom of humps; trim them so they would lay flat on the sheeting. It will help gluing humps to the fuselage sheeting. Do not glue them in place yet.

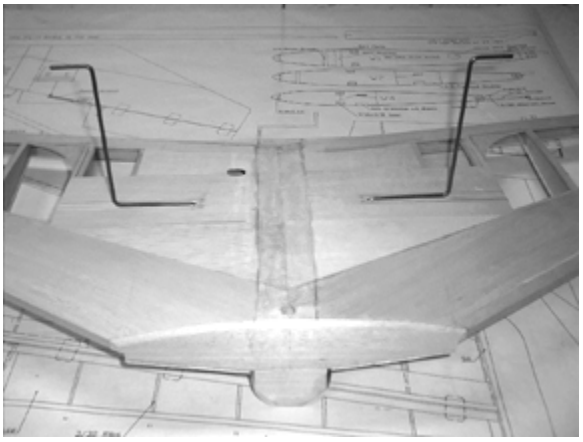


- Mark 1/8 back from F1 to indicate hatch's front, mark 1/8 forward of F2 as well. Than using seems as a reference line mark centers of 3/16 corners to make hatch's sidelines.

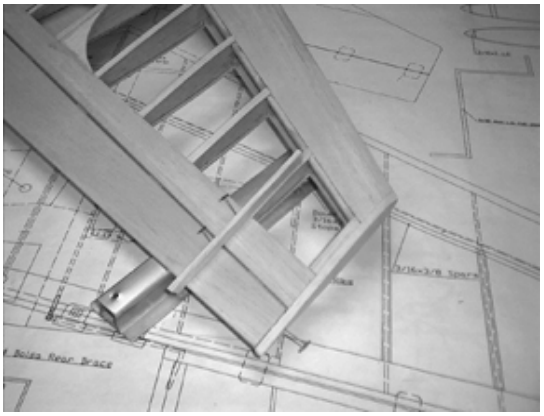


- Carefully cut out hatch using razor saw for front and rear line cuts and knife for sides, cut sides vertical to 3/16 corners. Glue hard balsa support for front of the hatch. Note foam insert that holds fuel tank parallel to thrust line and in alignment to carburetor.

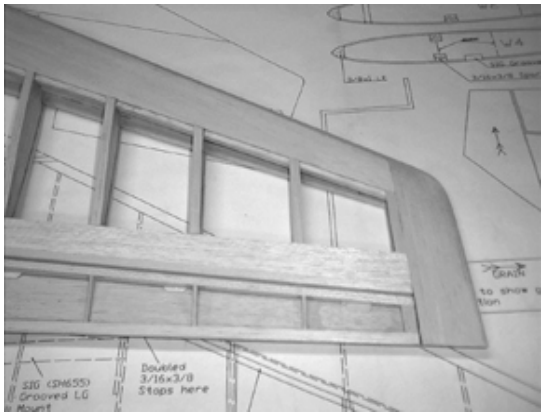
- Measure 5/16 from inboard end of L.G. mount and drill 5/32 in to vertically positioned bass wood block.



- Also, make an opening for servo wires on the bottom of left wing as shown on the picture above.
- Temporary install ailerons and pin straight piece of scrap wood to ailerons and rear wing sheeting at W8.



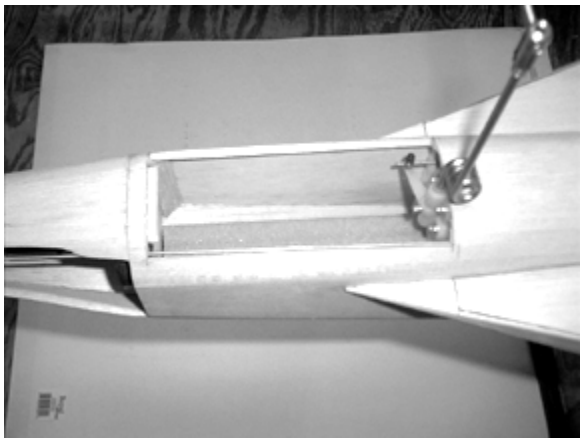
- Trace ailerons to W9A, and trim as needed. Place wing tips in place, pin and trace W9A on to it. Remove and trim as needed. Glue them in place and sand to final shape.



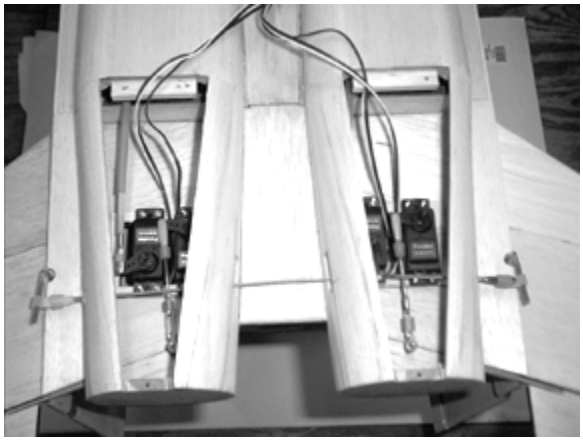
- Glue support rails flush to insides of cockpit area and sheet with 3/32 scrap wood keeping grain crossways.
- Basic construction is complete at this point. Go back and final sand everything.

HARDWARE INSTALLATION

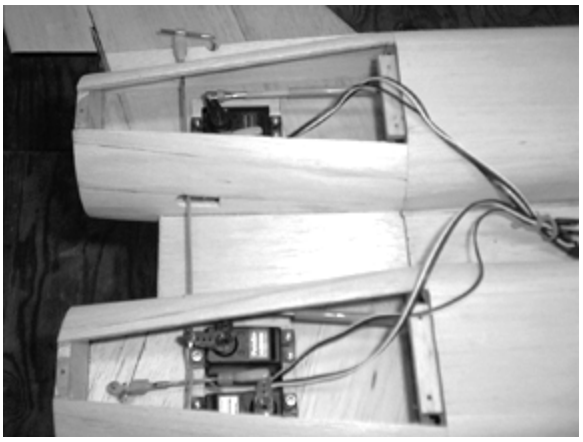
- Install front gear wire and steering arm with easy connector. Install pushrods with 2/56 rods on both ends of flex inner rods for steering and throttle control.



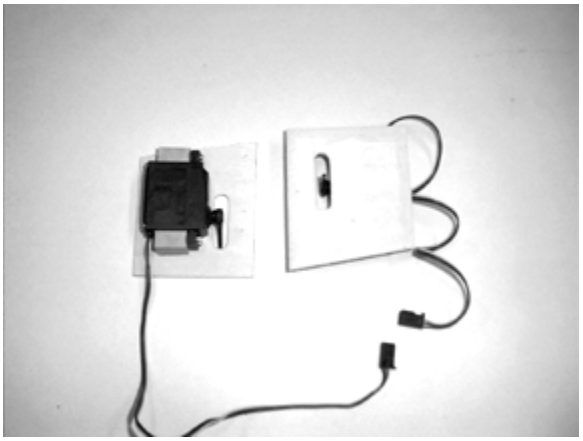
- Install elevator servos and make their push rods.



- Install rudder servo and connect it to rudder torque rods with one 2/56 rod. Use SIG easy connector. Also make Z-connection to steering push-rod (cut two of "four way" servo arms off) leaving one that closer to tail pipe sheeting.



- Connect throttle servo to throttle push rod with adjustable cleaves.
- Epoxy push rods housing to all formers they go through.
- Use basswood from L.G. installation to make servo blocks for aileron servos. Glue them to servo hatches and install servos.
- Install hatches with servos, install control horns on ailerons and make push rods.



- Before you install engine, do not forget to fuel proof nose section, firewall and fuel tank area.
- Install engine and connect throttle push rod. Check for smooth operation.
- Install fuel tank, use foam around it to reduce vibration as well as to keep it in-line with thrust line.
- Trim and install canopy. Use eight screws to hold it in place. Also, use electric tape to outline edges of the canopy.
- BALANCE your plane once all the hardware is installed. Move battery pack around to determent best position to achieve correct balance. Once correct CG is achieved, balance model laterally (side to side). CG location on the plan is best for a test flight and getting used to the model

and its flying characteristics. Once flown to know it well, you could move CG forward to make model more responsive, BUT be careful and make small adjustment at a time! If you push it too far, it will make plane difficult to fly or not possible to fly at all!

Covering your Model.

- There are many types of covering on the market. As well as many color schemes for the MIG-29. Pick your favorite covering and decide on the color scheme. Just keep in mind that MIG-29 will be fast flying plane and color scheme you pick should be well visible to help you with orientation.
- Follow covering manufacturer recommendations and cover the model always working from the bottom up and from rear to the front.
- Be sure to apply covering to control surfaces gaps. It will increase effectiveness of controls as well as to ad security and improve looks.

Final assembly.

- Trim engine humps as needed to fit well on to F8 and sheeting below. Paint them in the color that matches your color scheme. Hold engine humps in place with 2 pieces of masking tape (front and back) and carefully trace them on to covering below with a sharp knife while holding them down (be careful not to cut in to wood too dip). Remove covering and permanently glue engine humps in place.
- Reassemble all the hardware and make final check on all components. Permanently hinge all control surfaces, using 30 min. epoxy on rudder and elevator torque rods.
- Check radio operation and control throws
- Ailerons - 1/2" UP and DOWN
- Elevator - 1-1/8" UP and DOWN
- Rudder - 3/4" LEFT and RIGHT
- Throttle: Full range of carburetor.
- Use thin CA to harden screw holes on all hatches.
- **CHECK BALANCE AS PER PLANS.**

PRE-FLIGHT CHECKOUT

Make sure the servos are securely mounted and that the servo arms have their retaining screws in place. It is also a good idea to re-check all the push-rod connectors, fuel tank mounting, fuel lines, wheels; engine mounting bolts and tighten the prop and spinner. Range check the radio as per the manufacturers instructors and make sure it is fully charged.

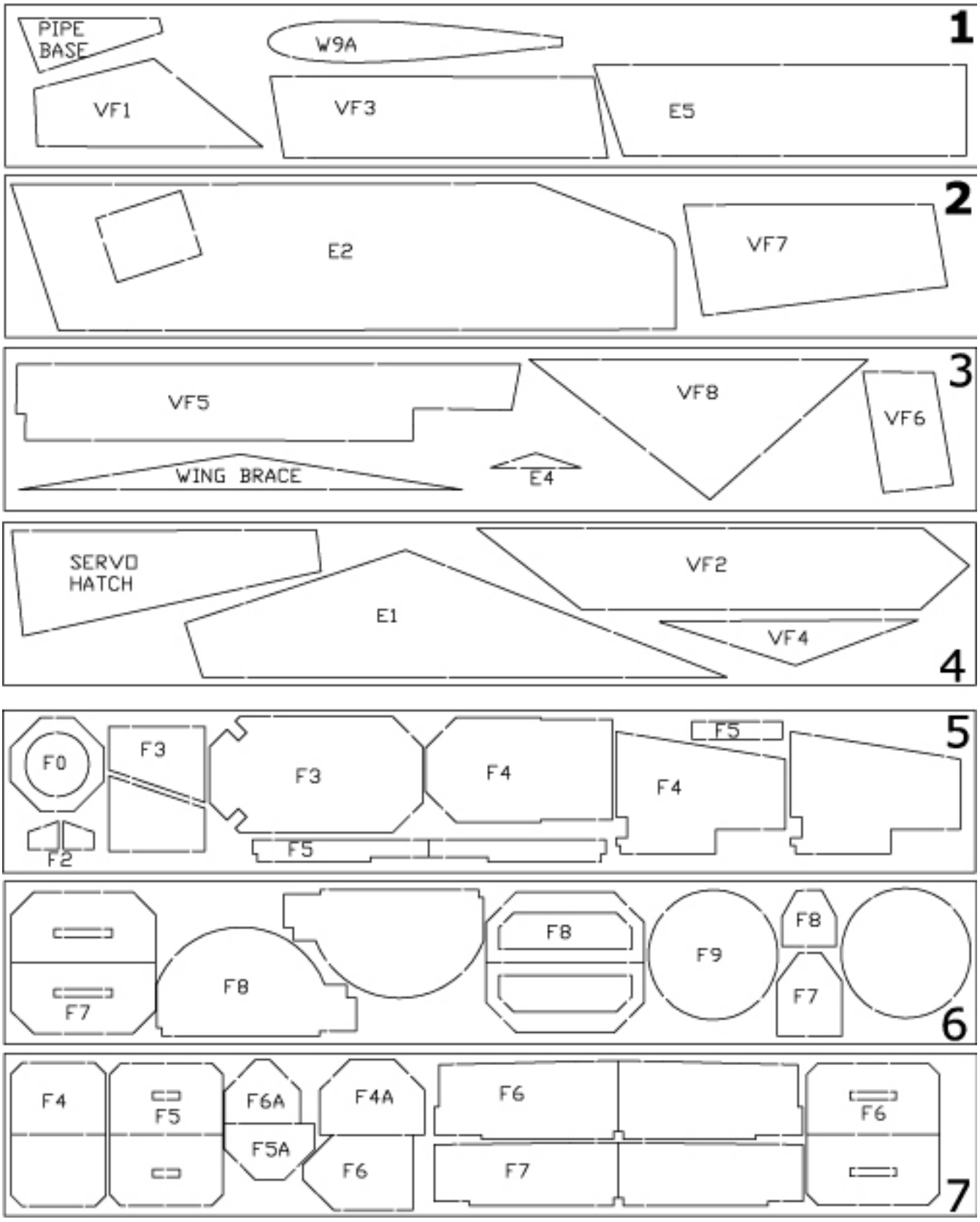
DOUBLE CHECK EVERYTHING YOU CAN THINK OF!

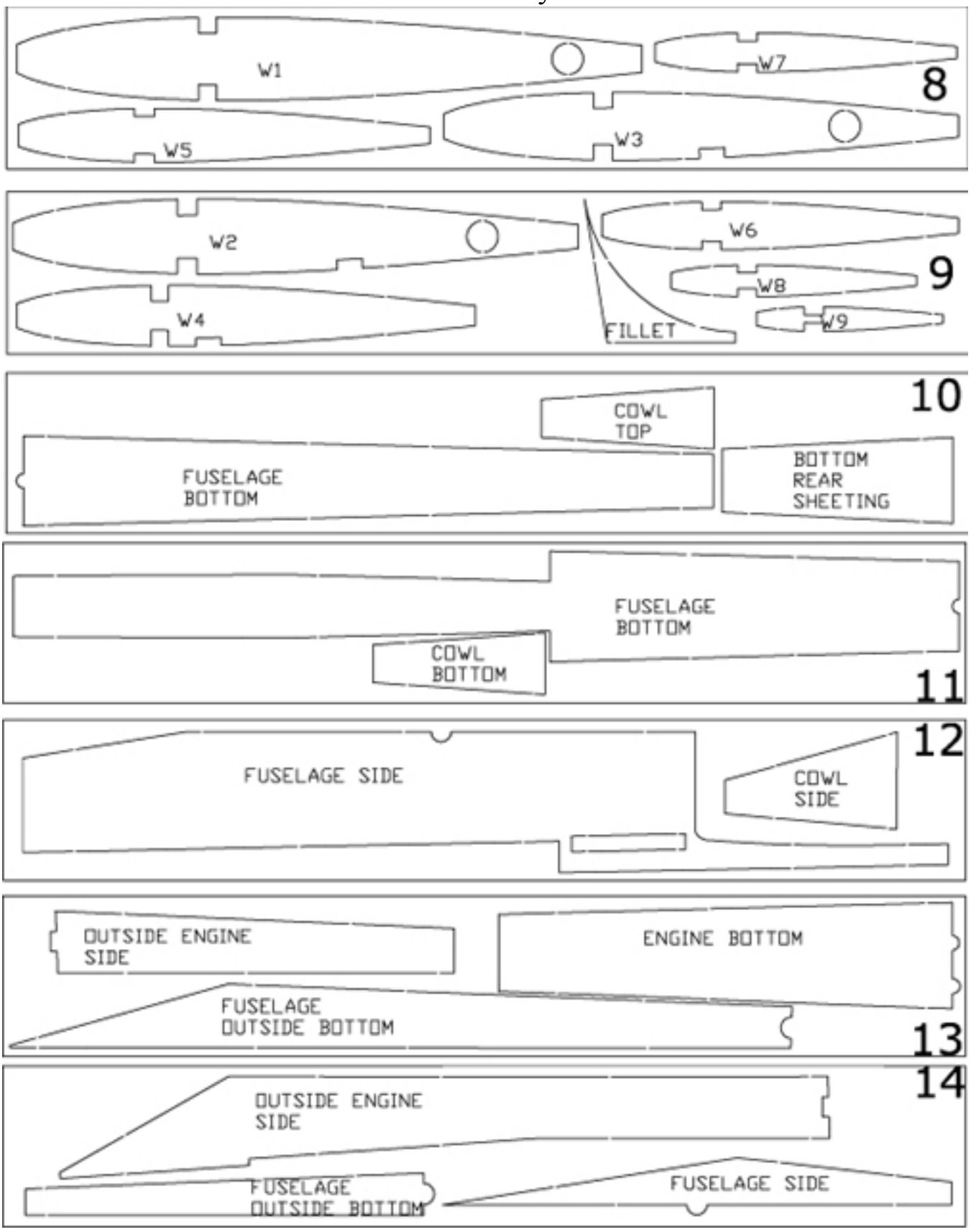
A model and radio that is not prepared and working properly on the ground before take off will not improve in the air IT WILL GET WORSE! There is no point in attempting to fly until everything is 100% correct.

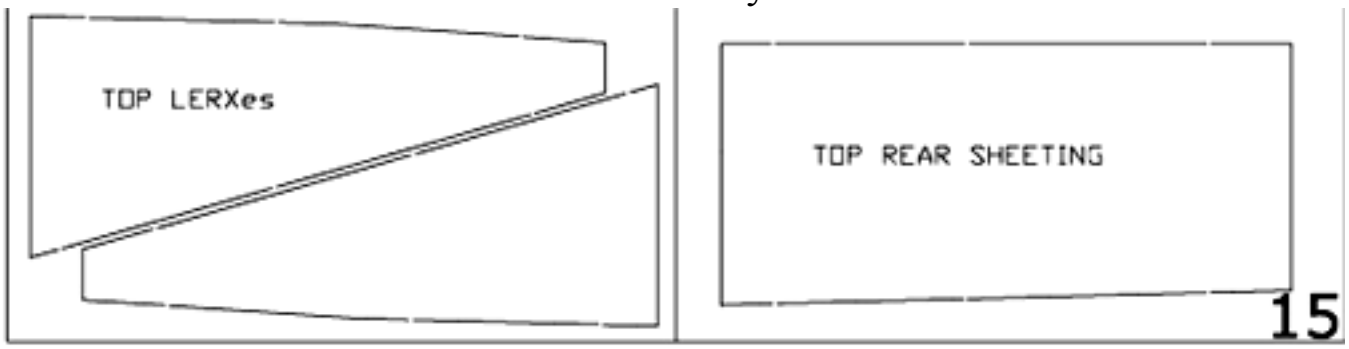
FLYING

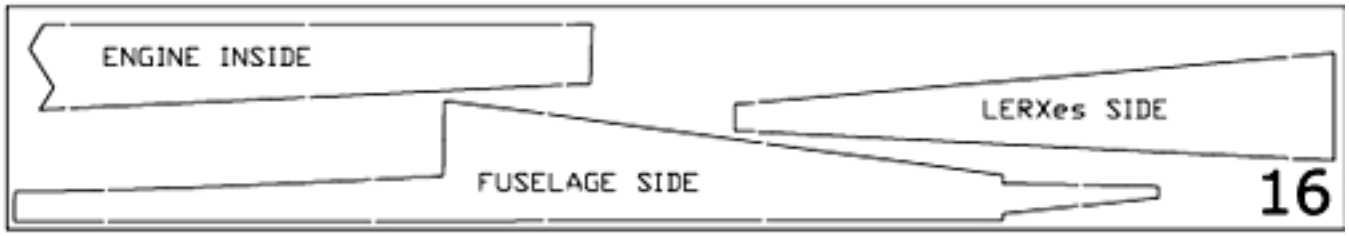
The MIG-29 was designed for R/C pilots who can keep up with aerobatics models. Lower time pilots are encouraged to seek out the help of a more experienced pilot during the first few flights. Keep the control throws on the low rate settings and stay at least three mistakes high. Once you get the feel for the model try a few simple maneuvers like rolls, loops, stall turns and knife-edge flight. Caution. Until you are familial with the response time and the shape of the MIG-29 leave yourself plenty of room for recovery. Recovery is never much of a problem, it can be done as fast as you got in trouble, but you do need to leave room and time until you've got it together. One other warning, it is very easy to get in the habit of frying it very close in the deception of "slow speed" and fast response time combined with a minor mistake during recovery can get the MIG-29 behind you faster than you can read thins sentence You can endanger yourself, other flyers and any spectators very easily. Get a little practice and you will not believe how much fun you will have while still frying safely.

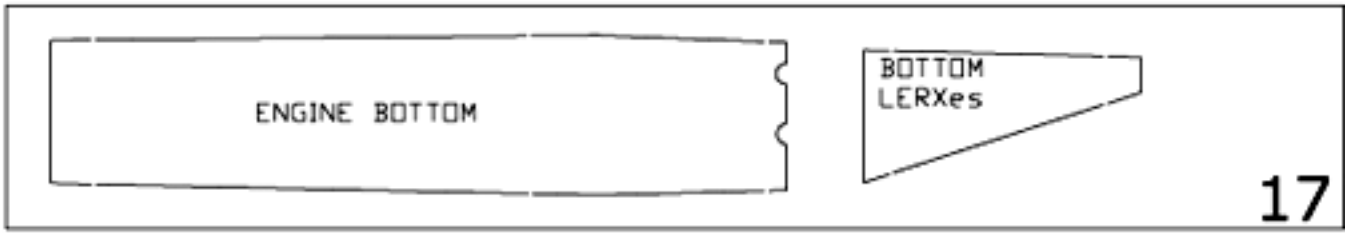
" KEY TO LASER-CUT PARTS"

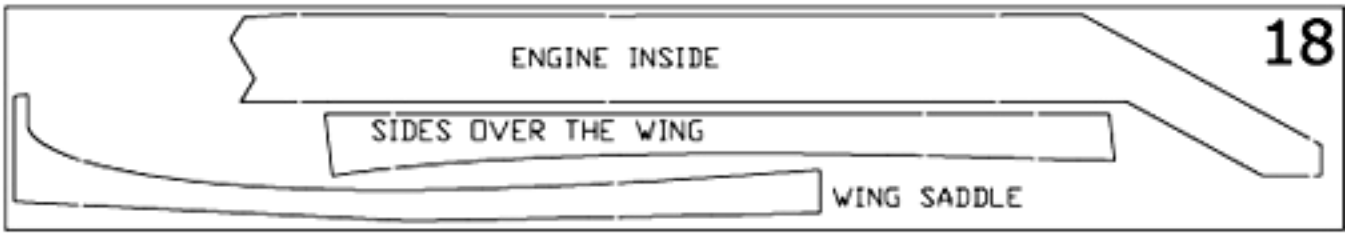


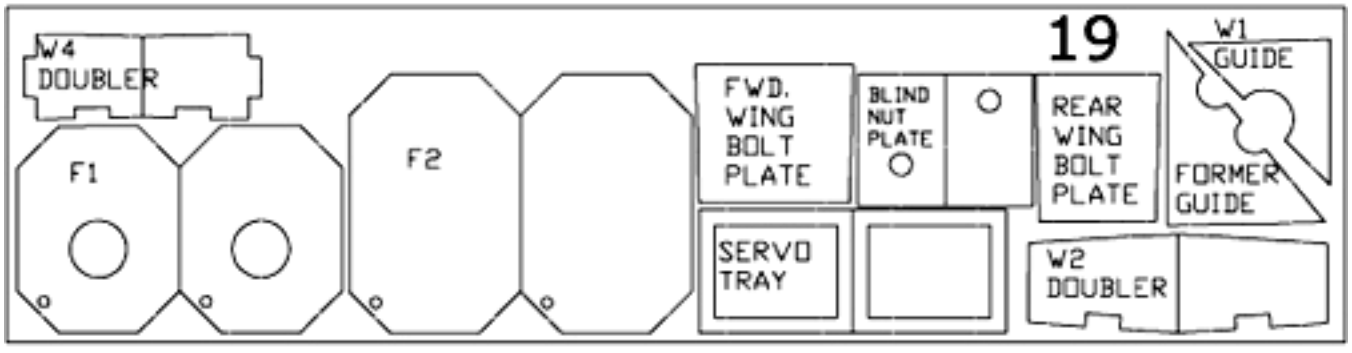

W1
W7
8
W5
W3
W2
W6
9
W8
W4
FILLET
W9
10
COWL
TOP
FUSELAGE
BOTTOM
BOTTOM
REAR
SHEETING
FUSELAGE
BOTTOM
COWL
BOTTOM
11
12
FUSELAGE SIDE
COWL
SIDE
OUTSIDE ENGINE
SIDE
ENGINE BOTTOM
FUSELAGE
OUTSIDE BOTTOM
13
14
OUTSIDE ENGINE
SIDE
FUSELAGE
OUTSIDE BOTTOM
FUSELAGE SIDE

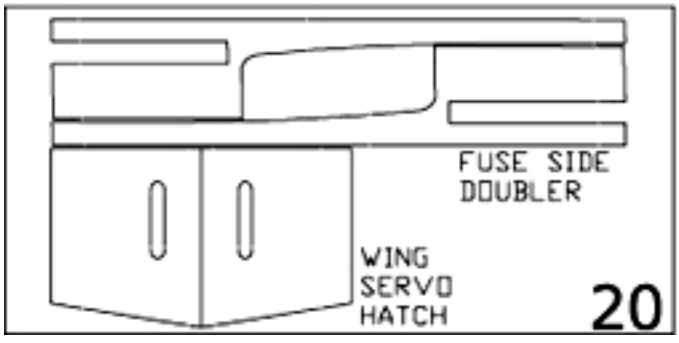

TOP LERXes
TOP REAR SHEETING
15


ENGINE INSIDE
LERXes SIDE
FUSELAGE SIDE
16


ENGINE BOTTOM
BOTTOM LERXes
17


18
ENGINE INSIDE
SIDES OVER THE WING
WING SADDLE


19
W4 DOUBLER
F1
F2
FWD. WING BOLT PLATE
BLIND NUT PLATE
REAR WING BOLT PLATE
W1 GUIDE
FORMER GUIDE
SERVO TRAY
W2 DOUBLER


FUSE SIDE DOUBLER
WING SERVO HATCH
20

MIG-29 FULCRUM by AK Models.

KIT CONTENT

(9) Balsa Sheet 3/32x4x36 Wing sheeting, cockpit floor, aileron ribs.
(1) Balsa Sheet 1/16x3x36 Sheer web.
(8) Balsa Sheet 3/16x2x36 Corners.
(1) Balsa Sheet 1/8x2x36 Fuselage top sheeting.
(2) Balsa Sheet 1/8x1x36 Tail Cone Bottom sheeting.
(4) Balsa Sheet 3/32x1x36 Wing Rear sheeting.
(3) Balsa Stick 1/4x3/4x36 Wing Trailing Edge, Wing Jig.
(2) Balsa Stick 3/8x1x36 Wing Leading Edge.
(2) Balsa Stick 3/8x3/4x36 Aileron Leading Edge.
(8) Balsa Stick 3/16x3/8x36 Spars
(14) Balsa Stick 1/8x1/4x36 Rib Caps, Top Tail Pipes, Aileron Trailing Edge, Sheeting rail.
(1) Balsa 1/2x36 Triangle
(1) Balsa Block 1x3x24
(1) L.G. Mount

(2) Balsa 1x6 Triangle
(1) Balsa Sheet 1/4x3x12 Front Center Wing Brace
(2) Pre-Bent Main Landing Gear
(1) Clear Plastic Canopy
(2) ABS Plastic Engine Humps
(1) Instructions Book with Parts List & Key to Laser cut
(2) CAD drawn Full size Plan – 2 sheets

Laser Cut Sheets

(35) Sheets of laser cut parts