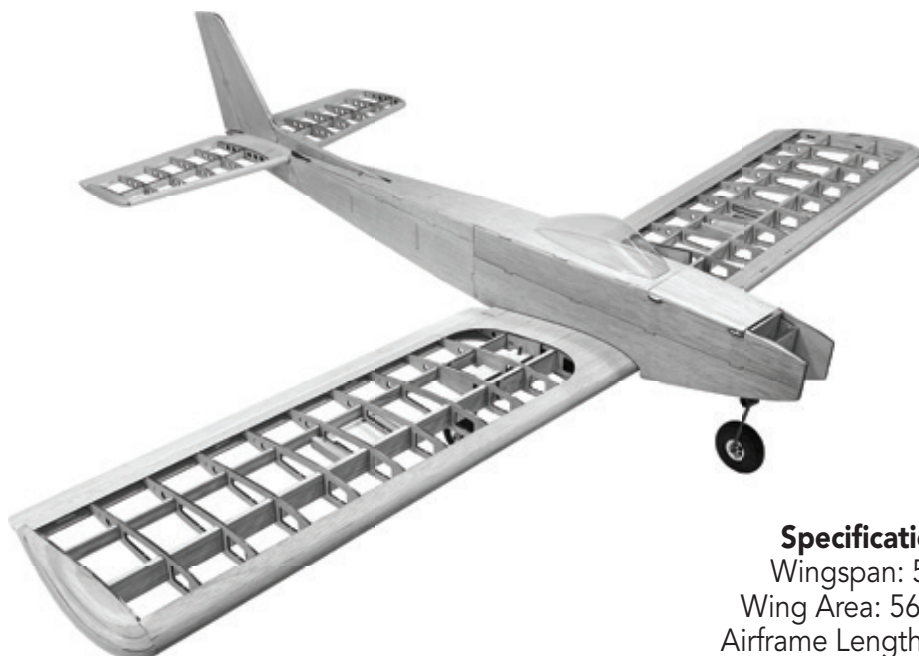


LARK



Specifications:

Wingspan: 56 in.
Wing Area: 560 sq in.
Airframe Length: 42.5 in.
Weight: 3.75 - 4.5 lb.

Using the Manual

Be sure to read each step thoroughly before you start the step. Test-fit the parts together to make sure they fit properly. If necessary trim to fit.

Beside each step you will notice a check box (or two). These are so you can keep track of your progress while building your kit. For steps that have two boxes, as in the construction of the left and right wing halves, these steps must be performed two times.

- Your **Old School Model Works** aircraft should not be considered a toy, but rather a sophisticated, working model that functions very much like a full-size airplane. Because of its performance capabilities, this model, if not assembled and operated correctly, could possibly cause injury to yourself or spectators, and damage to property.
- You must assemble this model according to the instructions. Do not alter or modify this model, as doing so may result in an unsafe or un-flyable model. In a few cases the instructions may differ slightly from the photos. In those instances the written instructions should be considered as correct.
- You must take time to build straight, true and strong.
- You must use a R/C radio system that is in first-class condition, a correctly sized power system and components (electronics, batteries, wheels, etc.) throughout the building process.
- You must correctly install all R/C and other components so that the model operates correctly on the ground and in the air. (Installation shown in the manual is a suggestion. You may have to adjust the mounting steps to accommodate the size of your radio equipment.)
- You must check the operation of the model before every flight to insure that all equipment is operating and that the model has remained structurally sound. Be sure to check clevises or other connectors often and replace them if they show any signs of wear or fatigue.



- If you are not an experienced pilot or have not flown this type of model before, we recommend that you get the assistance of an experienced pilot in your R/C club for your first flights. If you're not a member of a club, your local hobby shop has information about clubs in your area whose membership includes experienced pilots.
- While this kit has been flight tested to exceed normal use, if this model will be used for extremely high stress flying, such as racing, or if a power system larger than one in the recommended range is used, the modeler is responsible for taking steps to reinforce the high stress points and/or substituting hardware more suitable for the increased stress.

Remember: Take your time and follow the instructions to end up with a well-built model that is straight and true.



www.oldschoolmodels.com

CONSTRUCTION MANUAL

WARNING

**READ THROUGH THIS MANUAL
BEFORE STARTING CONSTRUCTION.
IT CONTAINS IMPORTANT WARNINGS
AND INSTRUCTIONS CONCERNING
THE CONSTRUCTION AND USE OF THIS
MODEL.**

***A Radio-Controlled aircraft is not a toy!
If misused, it can cause serious bodily harm
and damage to property. Fly only in open
areas, preferably at AMA (Academy of Model
Aeronautics) approved flying sites, following all
instructions included with your radio, powerplant,
electronics and batteries.***

- Inspect your model before every flight to ensure it is airworthy.
- Be aware of any other radio frequency user who may present an interference problem.
- Always be courteous and respectful of other users in your selected flight area.
- Choose an area clear of obstacles and large enough to safely accommodate your flying activity.
- Make sure this area is clear of friends and spectators prior to launching your aircraft.
- Be aware of other activities in the vicinity of your flight path that could cause potential conflict.
- Carefully plan your flight path prior to launch.
- Abide by any and all established AMA National Model Aircraft Safety Codes.

IMPORTANT!!! Two of the most important things you can do to preserve the radio controlled aircraft hobby are to avoid flying near full-scale aircraft and avoid flying near or over groups of people.



WARNING: This product can expose you to chemicals including lead, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

INCLUDED ITEMS

Wood parts included in this kit:

- 1 - LP1 - laser cut 1/8" x 5" x 24" ply
- 1 - LP2 - laser cut 1/8" x 5" x 24" ply
- 1 - LP3 - laser cut 1/8" x 2" x 24" ply
- 1 - LP4 - laser cut 1/8" x 5" x 24" ply
- 1 - LP5 - laser cut 1/8" x 5" x 24" ply
- 1 - LP6 - laser cut 1/8" x 2" x 24" ply
- 1 - LP7 - laser cut 1/16" x 5-3/4" x 3" ply
- 2 - BP1 - laser cut 1/8" x 4" x 24" balsa
- 1 - BP2 - laser cut 1/8" x 1" x 24" balsa
- 2 - BP3 - laser cut 3/32" x 4" x 24" balsa
- 2 - BP4 - laser cut 3/32" x 4" x 24" balsa
- 1 - BP5 - laser cut 3/32" x 4" x 24" balsa
- 2 - BP6 - laser cut 3/32" x 4" x 24" balsa
- 2 - BP7 - laser cut 3/32" x 4" x 24" balsa
- 2 - BP8 - laser cut 3/32" x 4" x 24" balsa
- 1 - BP9 - laser cut 3/32" x 4" x 24" balsa
- 1 - BP10 - laser cut 3/32" x 4" x 12" balsa
- 1 - BP11P - laser cut 1/8" x 4" x 12" balsa
- 1 - BP11S - laser cut 1/8" x 4" x 12" balsa
- 1 - BP12P - laser cut 1/8" x 4" x 12" balsa
- 1 - BP12S - laser cut 1/8" x 4" x 12" balsa
- 1 - BP13 - laser cut 1/8" x 4" x 12" balsa
- 2 - BP14 - laser cut 1/16" x 4" x 24" balsa
- 2 - BP15 - laser cut 1/16" x 4" x 24" balsa
- 1 - BP16 - laser cut 1/16" x 4" x 24" balsa
- 2 - BP17 - laser cut 1/16" x 4" x 12" balsa
- 2 - BP18 - laser cut 1/16" x 4" x 12" balsa
- 1 - 1/16" x 4" x 12" balsa sheet
- 2 - 1/2" x 1/2" x 36" balsa strips
- 2 - 1/4" x 1/2" x 36" balsa strips
- 2 - 1/4" x 1/4" x 36" balsa strips
- 4 - 3/16" x 3/16" x 36" balsa strips
- 4 - 1/8" x 1/8" x 36" basswood strips
- 4 - 1/4" x 1/4" x 36" basswood strips

- 2 - 5/16" x 1-1/4" x 36" tapered balsa strips
- 1 - 1/4" x 6" wooden dowel
- 1 - 3/16" x 4" wooden dowel

Hardware parts included in this kit:

- 8 - magnets
- 2 - pre-bent main gear wires
- 1 - nose gear assembly
- C/A type hinges for control surfaces
- 4 - control horns
- 2 - wheel collars 5/32" I.D.
- 4 - plastic gear straps
- 8 - 2-56 x 1/2" machine screws
- 20 - 2-56 x 3/4" self tapping screws

Other items included in this kit:

- 2 - Rolled plans (fuselage and wing)
- 1 - Construction Manual
- 1 - Formed Canopy

ITEMS NEEDED

Hardware needed (not included in the kit)

For some of these items there is more than one option which will require a bit of decision making ahead of time. There isn't a right or a wrong choice, so choose the items that work best for you.

We strongly recommended supporting your local hobby shop.

- Powerplant: .25-.40 sized 2-stroke glow engine (or similar electric system)
- Propeller
- Engine/Motor mount and mounting hardware
- 4-6 ounce fuel tank and fuel tubing (if glow)
- Receiver - (4 channel minimum)
- 4 servos (electric) or 5 servos (if glow) - we recommend standard servos all around, although you can use a smaller servo on the throttle, if using glow power).
- "Y" servo harness (for ailerons)

- Pushrods (two 5" for ailerons, two 26" for elevator & rudder, one 14" for nose gear steering, one 10" for throttle if glow.)
- Clevises for the pushrods.
- Wheels: one 2-1/4" for nose, two 2-1/2" for mains.
Sure there are a lot of wheels out there, but let's face facts. It's DuBro Chromies for the win here - it's just the right look.
- Covering (2 rolls typically)
- Optional 2-1/4" or 2-1/2" spinner

Additional Required Building Tools and Adhesives

- Drill & assorted drill bits
- Hobby knife and #10 blades
- Sandpaper: coarse (80 or 100 grit) & medium (150-200 grit)
- Pencil or pen
- Ruler
- T-Pins
- Waxed paper
- Building board
- 2-part epoxy (6 or 15 minute)
- Epoxy brushes and mixing sticks
- Wood adhesives of your choice. We use medium viscosity CA (cyanoacrylate), but aliphatic resin and/or carpenter's glues (used correctly) will work just as well and give longer working time.
- Thin CA for attaching the included hinges

Although an easy to build kit, our Lark kit is not for the novice builder. We are assuming the builder is used to constructing balsa kits and has the techniques and skills necessary to do so.

Closely inspect the supplied laser cut parts for damage. If you find any damaged or missing parts, contact us within 60 days of purchase.

When removing the laser cut parts from their sheets, you'll notice the parts are held in place by several small "tabs". These tabs are uncut pieces of wood and can sometimes make it difficult to remove a part. Rather than breaking and/or splintering the wood by forcing out the part, we recommend removing any laser cut parts from their sheets by using a hobby knife with a #10 blade. A quick cut of the tab will allow the piece to be removed with no damage. Sand any tab remainders flush with the part so there will be no problem aligning them later.

It's best to not remove parts from their sheets until they are needed. Refer to Appendix A of this manual as a reference to what all the laser cut parts look like and are called.

You'll notice a check box next to each step. Check these off as you go along so you don't miss a step. Note that some steps (in building the wing) have two boxes - this means that the step will be done twice - once for each wing half. There could be a step or two which leaves you a bit puzzled. If this happens, step back and study the photo(s) for that step - both in this manual and online.

All photos shown in this manual are of different Lark prototypes. Several pieces may have changed slightly with improvements we've made so parts may look a little different in some steps.

Online Supplementary Photos

We realize that the smaller black-and-white photos in this manual

might not show some of the steps as clearly as you might want. So we've anticipated this and made these photos available on our website. You can either scan the QR code or type this address into your browser:



www.oldschoolmodels.com/mpics/lark/

IT IS VERY IMPORTANT THAT YOU ASSEMBLE THE LARK KIT IN THE ORDER DESCRIBED. SKIPPING FORWARD IN THE STEPS COULD LEAVE YOU WITHOUT THE PROPER LENGTHS OF WOOD TO FINISH THE KIT. WE'VE INCLUDED ENOUGH WOOD TO EASILY COMPLETE THIS KIT, BUT YOU MUST TAKE CARE TO PROPERLY MEASURE AND NOT WASTE WOOD WHEN CUTTING.

Let's begin construction by working on the starboard (right) wing of your Lark.

☐ Prepare your work area

You'll need a flat building surface that is a minimum of 36" long. Position the starboard wing plan over the surface and tape into position. Tear off a length of waxed paper long enough to cover the port wing plan and tape that into position, over the plan.



☐ Alignment triangles

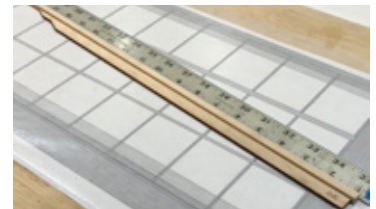
Pre-cut into LP1 is a 90° triangle. This can be used to vertically align any of the parts in the construction of your Lark. LP1 also includes a foot piece that can be used with the triangle to hold it vertically (hands-free).



☐ ☐ Step 1 - Wing Assembly (front spar)

These next few steps will create the front spar. It is recommended that you use a long, straight edge during these steps to ensure that the finished spar is straight and true.

Locate one of the 1/4" square x 36" lengths of basswood, and one SP2 from BP1. Glue the longer edge of SP2 to the basswood as shown here, with them lined up at one end. Make sure that SP2 is pressed up against the basswood along its entire length, and is also held flat against your building board as shown in this photo.



☐ ☐ Step 2 - Wing Assembly (front spar)

Locate one SP1 from BP1. This is glued in place to SP2 and the basswood by lining up the modified scarf joint pre-cut into the pieces. Again, make sure this is aligned straight with the straight edge, and flat along the entire length where it contacts the basswood strip.



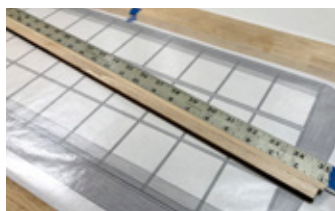
□ □ Step 3 - Wing Assembly (front spar)

Locate another SP2 from BP1 and this is now glued on top of the SP1 you just installed. This will allow the lower and upper scarf joints to overlap, rather than be aligned. Again, make sure that this SP2 is glued to the SP1 (and the overlapping portion of SP2) below it, as well as where it contacts the basswood strip. Make sure this joint is straight as shown here.



□ □ Step 4 - Wing Assembly (front spar)

Now locate another SP1 and glue in place, aligning the laser-cut scarf joints and making sure it is properly positioned as the glue cures.



□ □ Step 5 - Wing Assembly (front spar)

To complete this spar, locate another of the 1/4" square basswood strips. Glue this to the edge of the spar assembly, to the edges of the SP1 and SP2 pieces as shown here. Make sure it's flat and straight along its entire length.

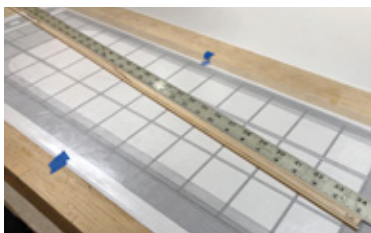


□ □ Step 6 - Wing Assembly (front spar)

Once the glue has cured in the spar assembly, remove it from the building board and lightly sand its surfaces to make sure they are flat and smooth, removing any glue bumps that may have formed during the assembly and curing. Don't go overboard - just make sure that you have a piece that is flat on all sides so it will slide smoothly into the ribs during the upcoming steps.

□ □ Step 7 - Wing Assembly (rear spar)

Now locate two of the 1/8" square basswood strips, one SP3 and one SP4 from BP1. Using these pieces you'll make the rear spar, using the same techniques as you did for the front spar. Start by gluing the long edge of SP3 to the basswood strip, making sure it's straight along its length. Then glue SP4 in place, lining up the scarf joint. Follow it all up with the other length of basswood glued to the exposed edges of SP3 and SP4. Lightly sand it flat in preparation for the upcoming steps.



□ □ Step 8 - Wing Assembly (R2/R2A, R4/R4A)

Now locate one R2 from BP1, one R4 from BP3, one R2A from LP3 or LP5 and one R4A from LP3 or LP4. Pay careful attention to the orientation when doing this as you'll be gluing R2A to the outside face of R2 (towards the wing tip) and R4A to the inside face of R4



(towards the wing root). When glued in place, R2A and R4A need to be perfectly aligned with top and bottom edges of their respective ribs. Also the rear edge should be just on the edges of R2A and R4A should be aligned with the rear spar cutouts in each rib.

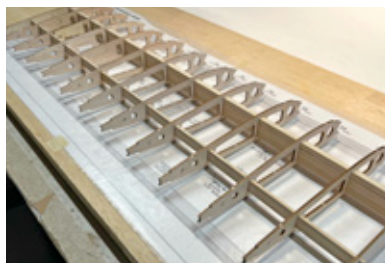
□ □ Step 9 - Wing Assembly (wing ribs)

Now locate one complete set of wing ribs. Stack them up in order by referring to the plans. Starting at the root: R1, R2, R2/R2A, R3, R4/R4A, R5, R6, R6, R5, R5, R5 and R7. Make sure you align them correctly with the under-side tabs all in the same direction. Double, triple, and quadruple check that you have them in the correct order, then when satisfied, push the front spar into the larger rectangular hole in each rib. The rear spar is pushed through the smaller rectangular hole towards the rear of the ribs.



□ □ Step 10 - Wing Assembly (wing ribs)

Now place this "assembly" onto the wing plan on your building board and start to carefully space the ribs apart so they align with the plans. Take your time and use a light touch so you don't break off any of the underside tabs, or crack any of the ribs. They don't need to be perfectly aligned yet, but get them close. Double check that all the ribs are in the right order one more time as in the next step everything is locked in place, making this the last time you'll be able to easily fix any mix-ups. *It's worth one more look now - trust me.*



□ □ Step 11 - Wing Assembly (wing ribs)

Starting at the tip rib (R7), it's time to start gluing things in place. I like to put a small drop of medium CA on the bottom of the underside tabs of this rib to help lock it in place to the waxed paper (or you can use pins if that's your thing). Also make sure to use the enclosed triangle that you should have at hand from the first steps of this build. This ensures that this rib is perfectly aligned at 90° to the building surface.



Also make sure that the front and rear spar protrude a little from R7 - maybe an 1/8" or so.

When satisfied, glue the two spars to R7.

□ □ Step 12 - Wing Assembly (wing ribs)

Now, slowly and methodically work your way towards the root rib, one rib at a time. Make sure each rib is precisely aligned - the spars are aligned, and that you firmly glue each rib to both spars. As you go along, you also might want to place a drop of glue on the underside tabs on every third or fourth rib to keep everything aligned with the plans. Continue with this until you have glued the R2/R2A rib in place. Stop there and move on to the next step.

☐ ☐ Step 13 - Wing Assembly (SPACER)

Locate SPACERS from LP1. These are just as the name implies - simply spacers and should NOT be glued into the airframe at any point.

Notice that the pre-cut rectangular spars holes in R3, both R2's and R1 are wider than the spars that are in them. This is to allow for the dihedral braces that will be attached later on. But you need to make sure the spacing is correct when gluing the spars in place, hence the use of the SPACERS.

Use one SPACER piece as a substitute for the front dihedral brace first, by sliding it into the holes on the R1, R2 and R3 ribs. This should push the spar towards the rear of the pre-cut slots. Then do the same with the other SPACER for the rear spar holes - again pushing the spar towards the rear of the cutouts in each rib.

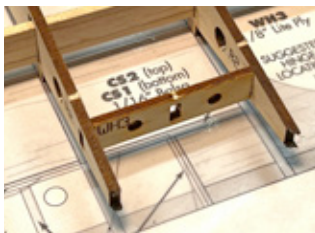


☐ ☐ Step 14 - Wing Assembly (R3)

With the SPACERS in place, carefully align rib R3 and the outermost R2 rib, then tack them in place to the spars (best to tack glue on the back side of the spars). Make sure that the SPACERS are not glued to spars or any of the ribs as they will be VERY hard to remove.

☐ ☐ Step 15 - Wing Assembly (WH3)

Locate one of the WH3s from LP1. Its outer tabs fit into the pre-cut slots on the back of the R2 ribs as shown here. Glue it to the outer R2 rib first, then properly align the inner R2 rib. Once aligned, glue that R2 rib in place by tacking it in place to the back of the spars, and then glue the WH3 to it as well.



☐ ☐ Step 16 - Wing Assembly (WH1, WH2, WH4)

Locate WH1, WH2, and WH4 from LP1. Note that WH1, WH2 and WH4 have a small circle engraved on one side. This designates the side that should face R1 because it has a small angle pre-cut into it. Glue each WH1, WH2 and WH4 to R2 making sure their tabs are completely inserted into the holes on the innermost R2 rib.



☐ ☐ Step 17 - Wing Assembly (R1)

Locate DH-JIG from LP1. This is used to help align R1 in this step. WH1, WH2, and WH3 already have this angle cut into them, but you can also use this DH-JIG to further aid the R1 alignment. Slide each of the tabs from those WH pieces into the pre-cut holes of R1, making sure they are completely inserted. When properly aligned you should be able to double-check it with the DH-JIG.

After everything is aligned, tack glue R1 to the back of the spars, then also glue R1 to WH1, WH2 and WH3.



☐ ☐ Step 18 - Wing Assembly (SPACER)

With the ribs all in place, carefully remove the SPACER pieces and then glue ribs R3, R2 and R1 to the spars. Make sure you do NOT

have any extra glue fouling the holes where the dihedral braces will slide into.

☐ ☐ Step 19 - Wing Assembly (R1A)

Locate two of the R1A pieces from LP1. These are glued into the center rectangular cutout in WH4 and WH3 as shown here, pointing towards the trailing edge of the wing. Make sure they are firmly seated as the glue cures.



☐ ☐ Step 20 - Wing Assembly (trailing edge)

Locate one 1/4" square length of balsa strip. This will be the trailing edge of the wing. Measure and trim it to length, leaving about an extra 1/4" or so. Then carefully slide it on to the back of each of the ribs and it should be held in place between the two "fingers/fangs/points" on the back of each rib. Working from one side to the other, glue the trailing edge to each of the ribs, making sure that the alignment of each rib is still spot on.



☐ ☐ Step 21 - Wing Assembly (leading edge)

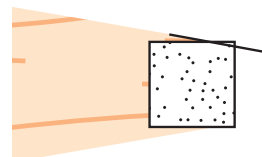
Locate one length of 1/2" square balsa strip. This is the leading edge of the wing. Measure and trim it to length, again, leaving about a 1/4" extra. Working from one end to the other, glue the leading edge in place to each of the ribs, making sure it is firmly seated into the pre-cut, angled slot of each rib.



☐ ☐ Step 22 - Wing Assembly (trailing edge sanding)

You'll now need to very lightly sand the trailing edge. Refer to this diagram to show what I'm on about. The trailing edge needs just a little sanded off the rear edge so it will continue the airfoil shape. Do this for the top and bottom surface of the trailing edge.

Sand this lip to match airfoil



☐ ☐ Step 23 - Wing Assembly (CS1, CS5)

Locate one CS1 from BP15 and one CS5 from LP7. CS5 fits into the pre-cut notch of CS1 as shown here. Before gluing it place, lightly sand the edges of CS5 where it will contact CS1, so you'll have a good fit. When happy with the fit, carefully apply glue to the two contacting edges of CS5 and attach it to CS1. Apply a bit of downward pressure along the seams to make sure the joint is flat along the edges as the glue cures.



☐ ☐ Step 24 - Wing Assembly (CS1, CS2, CS3)

Take CS1 from the previous step, and locate one CS2 from BP15 and one CS3 from BP16. After trimming, these will all be glued together to form the top sheeting of the wing's center section. Place the CS1 assembly in place on the rear section of the wing, then place the CS2 on the front edge, simulating how it will wrap around the leading edge rib curve (temporarily tape in place if that

helps). CS3 has purposely been cut a little long, so you'll need to trim it to get a perfect fit filling the gap between CS1 and CS2.

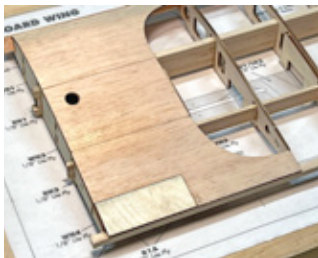
Also note that CS3 has a pre-cut hole in it. This is to allow the aileron servo wire to exit. This hole should be positioned so it's closer to the root rib (R1).

When satisfied with how it all looks, remove the pieces and it's time to glue them together into a single sheet.

When edge gluing the sheeting pieces together, first make sure the edges are flat (give a quick, swipe or two with a sanding block). Then tape the two pieces together with a piece of masking tape. As you lift the sheeting from the board you'll see that the tape will act as a hinge allowing you to put a small amount of adhesive into the joint. When the adhesive is applied, place the sheeting back down on the waxed paper, so that it's flat and apply pressure to the joint while it cures to make sure it's flat along its entire length. When cured, you'll now have a single, longer piece of sheeting.

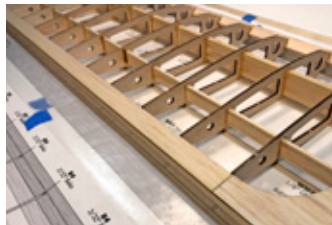


It's easier to join the shorter lengths of sheeting together on a flat surface. Then when the glue has cured, glue the sheeting in place on the wing. Start at the leading edge and gluing a little at a time. Press the sheeting firmly against the ribs and wait for the glue to cure before gluing the next section of sheeting - slowly working your way back to the trailing edge, being careful not to put a bend (warp) in the wing.



□ □ Step 25 - Wing Assembly (TE)

Locate one TE from BP14. This is the trailing edge sheeting. Glue this in place into the "groove" pre-cut into the rear of each rib as shown here. Be sure it is glued to each of the ribs, to the top of the trailing edge and to the center sheeting you just applied.



□ □ Step 26 - Wing Assembly (LE)

Locate one LE from BP14. This is the leading edge sheeting. Glue this in place into the "groove" pre-cut into the front of each rib as shown here. Be sure it is glued to each of the ribs and to the leading edge, and the center sheeting.



As the sheeting we get can vary in density, you might have to apply a bit of Windex® glass cleaner to loosen up the grain and allow it to bend without cracking. Soak the outer side of the wood to curvature needed, then use a hair dryer or covering heat-gun to help "set" the balsa's bend as it dries. Once dry, then you can glue it in position.

□ □ Step 27 - Wing Assembly (remove under-side tabs)

Once the glue has cured it's time to carefully remove the wing

assembly from the board. Once removed, flip it over and it's time to remove all the underside tabs that helped hold the ribs in place. There's one in the front and one in the back of each rib. On ribs R2-R7, these are balsa and easily cut away with a hobby knife. R1 ribs are lite ply and might need a bit more persuasion to remove. When trimming these tabs, make sure you cut them away just enough so that the airfoil shape of each rib is not interrupted. On the trailing edge, this will mean that each tab will be cut away so the trailing edge sits 1/16" proud of each rib.

□ □ Step 28 - Wing Assembly (LG1, LG2)

Locate one LG1 and three LG2s from LP1, LP5 and LP6.

The three LG2s are glued together, one on top of the other. Make sure that their pre-cut holes are lined up, and the three pieces are perfectly aligned while the glue cures.

Now LG1 is glued to this LG2 assembly.

Before gluing in place, note that the slot in LG1 is offset and the end of that slot will align with the hole in LG2, only if correctly positioned. When you know how it correctly aligns, apply glue to the back side of LG1, then glue it in position, making sure to keep excess glue out of LG1's slot.

Finally, test fit the LG assembly into the pocket between R2 and R4. Lightly sand LG's edges as necessary to insure a good fit, then glue it in position. Make sure it is fully inserted and resting on the cutouts of the R2A and R4A pieces.

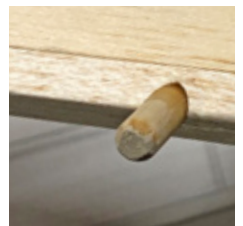


□ □ Step 29 - Wing Assembly (wing dowels)

Locate the 6" length of 1/4" dowel from the hardware bag. Cut it in half and round one end of each dowel, as shown in the photo. An easy way to do it is to chuck the dowel into a drill, then spin it against sandpaper, rounding it to a nice shape.



Now mark and cut a hole into the leading edge of the wing where the dowel should be inserted, making sure it is centered on the leading edge strip. Cut the hole a bit undersized, then gradually enlarge it until you get a nice, snug fit. Test fit the dowel and make sure that it also slips through the internal WH1 piece.



Place glue on the lower part of the dowel and insert the dowel through the leading edge and into WH1, leaving approximately 1/3"-1/2" of the dowel exposed.

□ □ Step 30 - Wing Assembly (CS1, CS2, CS4)

Locate one CS1 one CS2 and one CS4 from BP15, and one CS6 from LP7. These are used to create the center sheeting for the underside of the wing.

Use the same techniques that you used when forming the upper sheeting a few steps back. You'll need to trim CS4 to fit between the gap of the CS1 and CS2.

Also note that CS6 has a pre-cut hole in it. This is where the wing bolt will go through to attach the wing later on. This hole should be positioned so it's closer to the root rib (R1). When this assembly is completed, glue it in place using the same techniques as applying the top sheeting.



☐ ☐ **Step 31 - Wing Assembly (LE & TE)**

Locate one LE and one TE from BP14. These are the lower leading edge and trailing edge sheeting and should be applied in the same way as you applied the top side sheets.

☐ ☐ **Step 32- Wing Assembly (root, tip sanding)**

Take a few minutes to carefully sand away any extra wood that extends past the root (R1) and tip (R7) ribs. Cut and/or sand as necessary until any extra spar or sheeting material is perfectly flush with those ribs.

☐ ☐ **Step 33 - Wing Assembly (TP1)**

Locate one TP1 from LP1. This is glued in place to R7 as shown here. It should be at 90° to R7 (perpendicular) and all the TP1 tabs should fit completely into the pre-cut slots in R7.



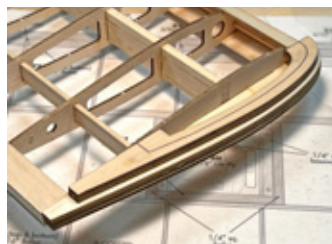
☐ ☐ **Step 34 -Wing Assembly (T2, T3, T4)**

Locate two T2s and T4s from BP11S as well as two T3s from BP12S.

Make sure you're using BP11S & BP12S for the starboard wingtip - NOT BP11P & BP12P.

Glue the two T2s together to make a thicker T2 - perfectly aligned of course. Then do the same for the T3s and T4s.

Note the etched lines on T2 and T3. These are alignment guides for the piece that fits on top of them. With the wing sitting upright, glue T2 on top of TP1 and up against R7. Then glue T3 on top of T2, aligning T3 with the edges guides and up-against R7. Then finally T4 on top of T3, aligned and up-against R7.



☐ ☐ **Step 35 - Wing Assembly (T5, T6)**

Locate both T5s and T6s from BP11S. Glue both T5s together, then both T6s together. Then these are glued to the underside of TP1, T5 first, then T6 using T5's etched lines as a guide.



☐ ☐ **Step 36 - Wing Assembly (aileron box)**

First we'll create the mounting rails for the aileron hatch by using leftover 1/4" square basswood you trimmed when creating the forward spars. Measure and cut two lengths that will span the distance between the forward and aft



spars. With the wing half laid on it's top, glue these two strips to the R6 ribs as shown on the plans. These strips should be flush with the lower-most pre-cut edges of the R6 ribs.

☐ ☐ **Step 37 - Wing Assembly (aileron box - SH1)**

Next locate two SH1s from BP15. These are glued to R6's small ledges just behind the front spar and ahead of the rear spar. Glue these, centered across the two R6 ribs as shown on the plans.

☐ ☐ **Step 38 - Wing Assembly (aileron box - SH)**

Locate one SH from LP5. This should now fit in the area between the SH1's you just installed. If not, lightly sand as necessary to obtain a good fit. Note that there are 4 holes precut into the corners. With a 1/16" bit, use SH as a guide to drill the 4 holes that will be used to attach SH to the wing using 4 of the supplied 2-56 self-tapping screws. Temporarily attach the hatch in place using these screws.

☐ ☐ **Step 39 - Wing Assembly (aileron box)**

Now locate some of the scrap 1/4" square balsa stock trimmed away from the trailing edge pieces. Cut two lengths that will run between the front and rear spars. Glue these in position as shown on the plans - flush with the top surface of SH1, and against the 1/4" square basswood mounts. Do NOT glue them to the SH hatch as that needs to be removable.

Set the starboard wing half aside and begin work on the port wing half. Tape the port wing plan and fresh wax paper on your board. Then follow steps 1 through 39 to complete the starboard wing half. Once finished, then move on to step 40.

Note that when building the port half that many of the parts will need to be glued to the opposite side (the WH1, WH2, and the wing tip pieces for instance). Always refer to the plans to make sure you're gluing the parts together in the correct way.

☐ **Step 40 - Wing Assembly (D1, D2)**

Locate D1 from LP3 and D2 from LP2. These are the dihedral braces. Test fit these by sliding them into both of the wing halves, as shown. They should smoothly push into the gap in the R1, R2 and R3 ribs until each brace is half way inserted. Also make sure that you insert them both in the same orientation - so they both point "up" when the wing is held upright.

Carefully sand as necessary so they both slide in as they should, and allow the root (R1) ribs on both halves to fit flat against each other, along their entire length.

Once satisfied with the fit, take the wing halves apart and remove D1 and D2.

Now it's time to mix up some epoxy and use it to coat the areas where the D1 and D2 pieces will contact the spars and ribs. Also coat the entire face of one of the R1 ribs.

When coated, slide all these pieces back together to form the completed wing assembly. Hold these together with some tape and/or clamps until the epoxy has cured completely.

While waiting for the glue to cure, wipe away any excess with a paper-towel soaked in a bit of denatured alcohol.



☐ **Step 41 - Wing Assembly (ailerons)**

Locate the two lengths of 5/16" x 1-1/4" tapered balsa sticks. These are used as the ailerons. Refer to the plan for the correct length, then cut one aileron from each piece. Also note the slight angle on the aileron tips and cut/sand that in as well.

Note - if you prefer to make your Lark a 3-channel system (without ailerons), you can glue these strips to the trailing edge of each wing to continue on the airfoil shape of the wing. We've not done this with any of the prototypes as we prefer ailerons, but there could be a couple of you out there that are aileron-phobic, so here's your chance to go really "old-school".

This completes the assembly of the wing. Now it's time for the tail surfaces, starting with the vertical fin.

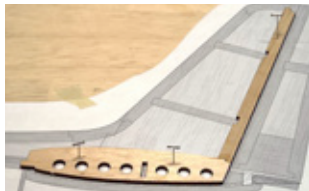
☐ **Step 42 - Vertical Fin Assembly (prep)**

Position the vertical fin plan over your building surface and tape into position. Tear off a length of waxed paper long enough to cover the plan and tape that into position.



☐ **Step 43 - Vertical Fin Assembly (VF1, VF5)**

Locate VF1 and VF5 from BP13. Pin VF1 in position, then glue VF5 to VF1 and pin it in position.



☐ **Step 44 - Vertical Fin Assembly (VF2)**

Locate VF2 from BP13. Glue VF2 to VF1 and pin it in position.



☐ **Step 45 - Vertical Fin Assembly (VF3, VF4A, VF4B)**

Locate VF3, VF4A, and VF4B from BP13. Glue VF3 to VF2 and pin it in position. Then glue VF4A and VF4B into position as shown.



☐ **Step 46 - Vertical Fin Assembly (VF6)**

Locate VF6 from BP13. Glue VF6 to VF3 and pin it in position.



☐ **Step 47 - Vertical Fin Assembly (VF7)**

Locate VF7 from BP13. Glue VF7 to VF6 and pin it in position.



☐ **Step 48 - Vertical Fin Assembly (VF9)**

Locate VF9 from BP13. Note that it has a small circle engraved, noting it's top edge. Glue VF9 to VF7 and pin it in position.



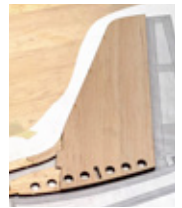
☐ **Step 49 - Vertical Fin Assembly (VF8)**

Locate VF8 from BP13. Glue VF8 to VF7 and VF9.



☐ **Step 50 - Vertical Fin Assembly (VF15)**

Remove the pins from the vertical structure and lightly sand the surface to make sure it's smooth. Now, locate one VF15 from BP18. Glue it in place over the rear section of the structure, making sure that it's perfectly aligned as shown here.



☐ **Step 51 - Vertical Fin Assembly (VF16)**

Locate VF16 from BP17. Glue this in place over the front of the structure, again, making sure it's perfectly aligned and fully inserted into the VF15 tab.



☐ **Step 52 - Vertical Fin Assembly (VF15, VF16)**

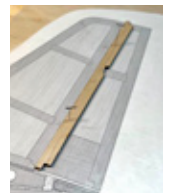
Remove the vertical fin assembly and flip it over. Again, lightly sand the structure so it's flat.

Then locate the other VF15 from BP18 and VF16 from BP17. Glue these in place over structure, just as you did for the fin's port side, making sure the pieces are perfectly aligned.



☐ **Step 53 - Rudder Assembly (VF10)**

Locate VF10 from BP13. Pin it in position.



☐ **Step 54 - Rudder Assembly (VF12)**

Locate VF12 from BP13. Glue it in place to the bottom part of VF10.



☐ **Step 55 - Rudder Assembly (VF11, VF13)**

Locate VF11 and VF13 from BP13. Glue them in and pin them in position.



☐ **Step 56 - Rudder Assembly (VF14)**

Locate VF14 from BP13. Glue it in position between VF10 and VF11.



☐ **Step 57 - Rudder Assembly (VF17)**

Remove the pins from the rudder structure and lightly sand the surface to make sure it's smooth. Now, locate one VF17 from BP17. Glue it in place over the rear section of the structure, making sure that it's perfectly aligned as shown here.



□ Step 58 - Vertical Fin Assembly (VF16)

Remove the rudder assembly and flip it over. Again, lightly sand the structure so it's flat.

Then locate the other VF17 from BP17 and glue this in place over the front of the structure making sure it's perfectly aligned.

□ Step 59 - Stab Assembly (S1 ribs)

Locate both S1 ribs from BP16.

These are glued to the bottom of the vertical fin assembly from the previous step, one on each side. Using the pre-cut holes as a guide, glue one S1 to the vertical fin piece, then flip it over and glue the other S1 to the other side.

Make sure these are properly aligned, and straight with each other. Refer to the drawing of this section shown on the side view of the fuselage plans.



Remove the fin plan from your building surface, then cutout and attach the plans for the horizontal stab and elevator. Cover it with wax paper and tape everything into place.

□ Step 60 - Stab Assembly (SP5, S2-S7 ribs)

Locate SP5 from BP2, and both sets of S2-S7 ribs from BP16. Slide the vertical fin assembly on to SP5, all the way to the middle. Then, slide one S2 on each side of SP5, noting the orientation (all underside tabs pointing the same way, and the leading edges also oriented correctly. Continue on with both S3s, S4s, S5s, S6s, and finally S7s. Place this "assembly down on to the plans and begin to carefully slide the stab ribs into their proper position.

□ Step 61 - Stab Assembly (stab ribs)

Using the 90° alignment triangle, it's time to start gluing the stab ribs to SP5. Start with the vertical fin, with it perfectly centered, 90° to the building surface and straight. Then work your way through one side of the stab, then the other. Take the time to make sure everything is aligned properly BEFORE you glue it in place, as it's just about impossible to fix if things are out of order and glued in place. When finished, you should have something that looks just about like this photo.



□ Step 62 - Stab Assembly (trailing edge)

Locate one length of the 1/4" x 1/2" balsa strip. Measure and cut this to length to form the trailing edge of the stab. Leave an extra 1/4" or so, then glue this in place, using the pre-cut "step" on the rear of each rib to help hold it correctly in place. Make sure you glue this piece to each of the stab's ribs.



□ Step 63 - Stab Assembly (leading edges)

Locate the other length of 1/4" x 1/2" balsa strip to use as the leading edge of the stab. This will need to be cut to length, and the root edges beveled slightly to join correctly at the stab's center. Again, using the "step" cut into the front of each rib, place these pieces in position and glue them to each of the ribs, and to each other.



□ Step 64 - Stab Assembly (center sheeting, top)

Using the uncut sheet of 1/16th balsa, it's time to measure, cut and form the center sheeting strips that will be attached to each side of the vertical fin. These sheets run from the top of the S1 ribs (up against the vertical fin), to cover the tops of the S2 ribs.

Using the same techniques that you used when forming the wing's center sheeting, measure and cut 3 total pieces to make each sheet. Take your time when measuring and cutting - especially against the tapered edge of the leading edge. What you want is a piece that fit snugly against the leading and trailing edges as shown here.

Once you have made a pair of these, glue these in place on each side over the S1 and S2 ribs, up against the vertical fin as we've shown here.



□ Step 65 - Stab Assembly

Remove the stab assembly from your building board and flip it over. Remove all the underside tabs by trimming them away, just as you did on the wing. Make sure to continue each of the rib's aerodynamic shape.

□ Step 66 - Stab Assembly (center sheeting, bottom)

Using the same techniques as you used on the top sheeting, measure, cut and form the two strips of 1/16th sheeting used on the bottom side. When you are satisfied with their fit, glue them in position as shown.



□ Step 67 - Stab Assembly (ST)

Sand the both ends of the stab assembly so there's no extra trailing edge, leading edge or spar material protruding past the S7 ribs.

Now locate 12 STs from BP12P and BP12S. Make 2 tip assemblies by gluing 6 of them on top of each other, aligned with each other. Then lightly sand the long edge so it's flat, then glue one assembly to each tip of the stab, making sure you've properly aligned and centered it on the S7 ribs.



□ Step 68 - Elevator Assembly

Locate the two extra pieces of 5/16" x 1-1/4" tapered edge stock, as well as the length of 3/16" dowel. Cut the dowel to length, as shown on the plans. Now measure and cut one elevator half from each tapered edge balsa piece. Mark and cut the notches into the leading edge of these elevator halves as shown on the plans. Then glue each elevator half to the dowel, making sure the entire piece is perfectly straight and flat.

This completes the assembly of the tail surfaces. Now it's time to assemble the fuselage. You won't need to tape down the fuselage plan to the board - simply use it as a reference. However, you may need to put down some fresh waxed paper as you'll need it for a few of the steps.

□ Step 69 - Fuse Assembly (WH5)

Locate four WH5s from LP4. These are glued together as shown here, one on top of the other and properly aligned.



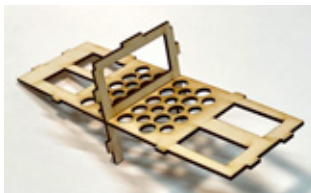
□ Step 70 - Fuse Assembly (F3, F3A)

Locate F3 from LP2 and F3A from LP1. Glue F3A to the bottom of F3 as shown here, making sure it is properly aligned.



□ Step 71 - Fuse Assembly (F5, TR1)

Locate TR1 and F5 from LP2. F5 is inserted into the slots on each side of TR1 as shown here, then rests against the cross-bar in F5. When satisfied on how this fits, glue this in place, making sure F5 is perpendicular to TR1.



□ Step 72 - Fuse Assembly (FSP, TR1 assembly)

Locate FSP from LP4. The TR1 assembly from the previous step is now attached as shown here. There are several tabs on the TR1 assembly that need to fit into the various slots cut into FSP, so test fit this first. When satisfied on how it all goes together, apply glue to the edges of the TR1 assembly, everywhere it will contact FSP. Glue these two pieces together, making sure that the tabs are fully inserted in each of FSP's slots.



□ Step 73 - Fuse Assembly (FSS)

Locate FSS from LP5. Just as you did for FSP, test fit this in place on the other side of the TR1 assembly.

When satisfied, remove FSS, apply glue and then make sure it is properly affixed to the TR1 assembly as shown here.



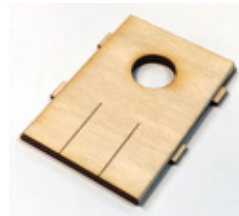
□ Step 74 - Fuse Assembly (F4, WH5)

Locate F4 from LP2 and the WH5 assembly you made earlier. These are both attached towards the rear of the fuselage box you are creating. You will have to carefully bend the sides a little to get them to fit into the pre-cut slots on the box sides. Glue these in place.



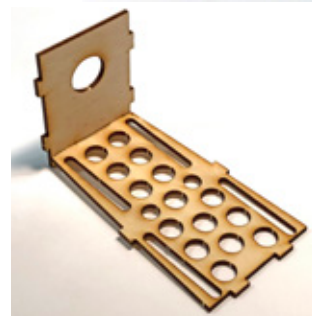
□ Step 75 - Fuse Assembly (F1/F2)

Locate F1 and F2 from LP4. These are glued together as shown to form the firewall. Make sure F1 is aligned with F2 and that the etched nose-gear alignment lines are visible. We recommend epoxy for this step.



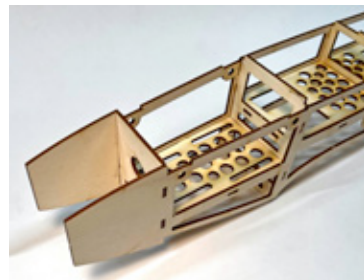
□ Step 76 - Fuse Assembly (TR2)

Locate TR2 from LP2 and F2 from the previous step. Note that TR2 has a small circle engraved on the top surface - this designates the starboard side of the fuselage. Both tabs on the front of TR2 should be inserted into the pre-cut holes in F2 as shown here. Also note that this piece is NOT glued perpendicular to TR1. Instead, use the DH-JIG guide you used during the wing construction to give the needed downthrust angle that will become apparent in the next few step.



□ Step 77 - Fuse Assembly (TR2)

The TR2 assembly is now glued in place inside the front of the fuselage box, between the fuselage sides and into F3A. To do this carefully bend the fuselage sides apart a bit, allowing the assembly to slide into place. When properly aligned, all of the tabs should pop into the pre-cut holes on both FSP and FSS.

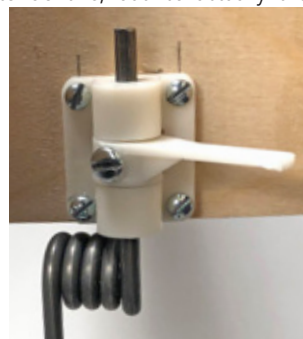


When satisfied with this dry fit, remove the tray, apply glue, and put in back in position. Make sure it's held in place and that the fuselage sides continue their gentle curvature that is cut into TR2.

□ Step 78 - Fuse Assembly (nose gear block)

This might seem like a strange time to do this, but it's actually the perfect time. Inside the hardware bag is a smaller bag which has all the components needed to make the nose gear assembly. In this group of parts is the nylon nose block, the 4 mounting screws, and the 4 t-nuts.

Using the etched lines on F1, you can easily locate this nose-block so it's straight, as the lines should appear inside each of the 4 block's four mounting holes. Using a 3/32" bit, drill



these four mounting positions into F1.

Then use the 4 screws and t-nuts to fasten this in position. You might want to use a bit of thread lock and cut away the extra length from interfering with the tank and/or battery installation later on.

☐ Step 79 - Fuse Assembly (FS1, FS2, FS3, FS4)

Locate both FS1s from BP8, both FS2s from BP7, as well as both FS3s and both FS4s from BP6.



Glue one FS1 to one FS2, making sure that all the tabs on FS1 are completely seated into the notches cut into FS2. Also make sure that the pieces are flat along this entire joint.

Then glue FS3 and FS4 together using the same technique. Make 2 matching fuselage assemblies.

☐ Step 80 - Fuse Assembly (fuse side prep)

Now glue one FS1/FS2 to one FS3/FS4 to make a completed fuselage side. Again make sure that all the tabs are completely seated into the notches. Also make

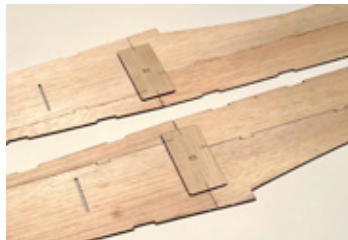


sure that the pieces are flat along this entire joint. Make the two fuselage sides.

☐ Step 81 - Fuse Assembly (FS5, FS6)

Position the fuselage sheets next to each other, one mirroring the other as shown here.

Lightly sand the center joint on each sheet, then locate FS5 and FS6 from BP9. These pieces act as supports for the fuselage side joints.



Note there are etched lines on these pieces. These lines are meant to line up with the joint lines of the fuselage sides and they will only align properly one way (FS5 port, FS6 starboard). When satisfied on how they align, glue them in place to the fuselage sides.

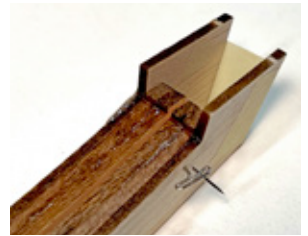
☐ Step 82 - Fuse Assembly (STS)

Locate four STSs from BP12S. Glue two STSs together to form a thicker STS, then do the same for the remaining two STSs so you end up with two thicker STSs. These stab supports are glued in place on the inside of the fuselage sides to "beef-up" those areas. Pay attention to the orientation and make sure that the curved edges of the STS pieces are matched up to the cutouts in the fuselage sides.



☐ Step 83 - Fuse Assembly (fuse sides)

Take both fuselage sides and align them. Using pins and/or tape, temporarily attach the rear of these two sheets together as shown here. This will guarantee that the alignment of the fuselage doesn't shift as work will now move towards the front of the fuselage.

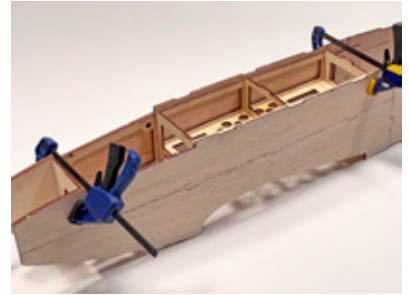


☐ Step 84 - Fuse Assembly (lite ply box install)

With the fuselage pinned together, it's now time to offer up the inner lite-ply box to the fuselage sides for a test fit.

It's best to do this on your work surface to make sure box and fuse sides are all flat with each other when doing this.

Test fit this first and use the wing saddle as one of the main alignment aids. Once you're



satisfied how these pieces go together, remove the plywood box and it's time to glue it in place. If you're using CA for this step, use slower curing viscosities as you might need a bit more working time to properly align the pieces. This is one step where you might want to use a different glue - aliphatic resin and/or carpenter's glue could give you a LOT more working time. Epoxy could be used, but it can add a bit too much weight with the amount of surface area to cover on each side of the fuselage box.

Take your time and you might want to use clamps as shown to aid in getting everything held firmly in place, and making sure that the fuse sides conform to the gentle curvature designed into the front of the fuselage.

☐ Step 85 - Fuse Assembly (F6, F7, F8)

Locate F6, F7 and F8 from BP5.

If you choose to, you can cut long-grain 1/4" wide strips from the scrap of BP17 and BP18 sheets. Then you can use glue a strip to each vertical side of these formers to strengthen them. Alternatively, you could use some thin C/A to wick into these pieces as well. Honestly, I didn't need to do either on the prototype builds, but if you think you might break these, now's the time.

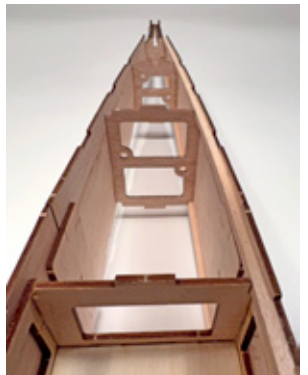
Also note that these formers have pushrod guides pre-cut into them. It makes absolutely no difference which way you choose to mount them inside the fuse, but whichever way you start with F6, make sure F7's and F8's holes are aligned the same way.

☐ Step 86 - Fuse Assembly (F6, F7, F8)

Now, carefully insert F6 into the fuselage first, making sure the "F6" etching is towards the top of the fuselage.

Do the same with F7 and F8. Glue these 3 formers in place, making sure that the fuselage remains aligned, with no twists or bows.

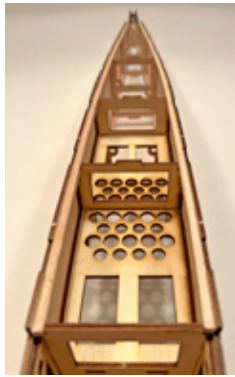
Again, make sure the pushrod guide holes are aligned for all formers.



You'll need to remove any pins/tape holding the rear of the fuselage together for the next few steps.

☐ **Step 87 - Fuse Assembly (top stringers)**

Place the fuselage upright on your work surface. Locate two of the 3/16" square x 36" balsa sticks. These will be glued to the inner edges of the fuselage sides, starting at F3 all the way to the back to F8. Trim them to length and glue them in place, making sure they are not only glued to the fuselage sides along their entire length, but also pressed down onto the plywood fuselage box and formers.



☐ **Step 88 - Fuse Assembly (bottom, rear stringers)**

Flip the fuselage over to work on the bottom side. Locate two of the 3/16" square x 36" balsa sticks. These will be glued to the inner edges of the fuselage sides, starting at F4 all the way to the back of the fuselage sheets. Trim them to length and glue them in place making sure they are not only glued to the fuselage sides along their entire length, but also pressed down onto the plywood fuselage box and formers.



☐ **Step 89 - Fuse Assembly (bottom, front stringers)**

Using leftover 3/16" square x 36" balsa sticks, measure and trim two lengths to fit between the back of F2 to cover the notches in F3. Glue them in place making sure they are not only glued to the fuselage sides along their entire length, but also pressed down onto the plywood fuselage box and formers, following the gentle curvature of the fuselage.



☐ **Step 90 - Fuselage Assembly (creating rear taper)**

Work now moves to the rear of the fuselage to shape the fuselage sides so they taper together. To do this, you'll need to sand away equal amounts of balsa on the internal stringers.



Using a ruler and straight-edge, measure and draw sanding-guides starting at the rear of the top and bottom stringers, tapering in about 1-1/2". These marks will show roughly how much wood should be sanded away on the insides of each fuselage side, so they will taper correctly. Although you can cut this with a saw or hobby knife, sandpaper makes quick work of this, but use caution not to remove too much.

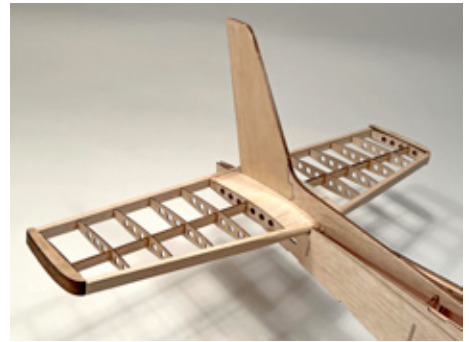
☐ **Step 91 - Fuse Assembly (sand the tail surfaces)**

It's time to attach the tail surfaces, but before you do, take the time to sand the leading edges of the stab and vertical fin as they'll be much easier to do now, than after installation. Make sure that the

leading edges are nicely rounded, and you might want to test fit them to the rear of the fuselage a few times as you sand, to get an idea of where you might need a bit more shaping. However, do NOT round the bottom edge of the fin as this is used to align the tail assembly to the fuselage.

☐ **Step 92 - Fuse Assembly (attach the tail surfaces)**

Once sanded, it's time to trial fit the tail surfaces to the fuselage. With the fuselage sitting upright and flat on your building board, you can then slip the tail surface assembly in place, making sure that the front of the stab is inserted into the cutouts in F7 and F8.



Now, if you take a measurement from the flat of the building board to tips of the trailing edges, they should be the same distance (giving you a nice, horizontal stab). If adjustment is needed, lightly sand the taller fuselage side to lower the higher side.

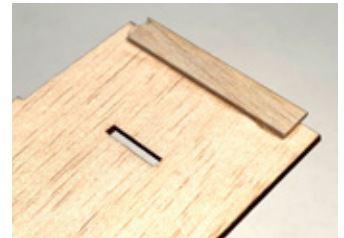
Once satisfied with the positioning, glue this in place. Again, use the proper amount of glue, but NOT too much as a little extra weight makes a huge difference when balancing the model later on. Slower curing CA, aliphatic resin and/or carpenter's glue is a better choice here.

☐ **Step 93 - Fuse Assembly (pushrods)**

Before installing the top and bottom sheeting, now might be a good time to think about installing the elevator and rudder pushrods. We typically use Dubro's Laser flexible pushrods the outer red tubing fits nicely into the pre-cut pushrod guides into each of the formers, as well as pre-cut pushrod exits on the rear of the fuselage sides. If you use Dubro's (or a similar type of pushrod system) don't forget to glue these tubes in place so they won't move.

☐ **Step 94 - Fuse Assembly (TS1)**

Locate TS1 from BP10. Cut a 1/2" wide strip of 1/16th balsa (from the scrap of BP17/18) that's about 2-1/2" long. Glue this as shown here - half off and half on the rear edge of TS1.



This will help strengthen TS1 as well as support TS2 (to be installed later).

Now test fit TS1 in place on top of the fuselage, and note how it fits into the tabs on F4 and F5, as well as resting on top of F3. The side tabs will fit into the notches cut into the fuselage sides and should be flush with the sides when installed correctly.



When satisfied on how this fits, remove, apply glue and then attach in place.

□ Step 95 - Fuse Assembly (TS2)

Locate TS2 from BP5. As you've done before, test fit this in place making sure all the tabs fit into the notches and all is flat, clean and neat. When satisfied with the fit, remove it, apply glue and attach it to finish the top sheeting.



□ Step 96 - Fuse Assembly (rudder pushrod exit)

While you still have access to the inside of the rear part of the fuselage, it's a good time to cutout the exit for the rudder's pushrod. Again, the side it exits will be dictated by how you installed the formers and pushrods earlier.



□ Step 97 - Fuse Assembly (rear cap sheeting)

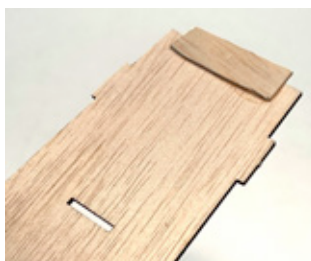
Locate scrap 3/32" balsa sheet, make a small cap piece to cover the upper part of the fuselage, just aft of the stab. Glue this in position.

You will need to cut a relief in this piece to allow the elevator joiner clearance. It can be done now, or later on when you are ready to hinge.



□ Step 98 - Fuse Assembly (BS1)

Locate BS1 from BP9. As you did earlier, cut a 1/2" wide strip of 1/16th balsa (from the scrap of BP17/18) that's about 2-1/2" long. Glue this as shown here - half off and half on the rear edge of BS1. This will help strengthen BS1 as well as support BS2 (to be installed later).



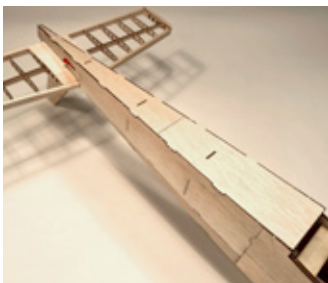
Now test fit BS1 in place on top of the fuselage, and note how it fits into the tab on F6, as well as resting on the bottom of F4. The side tabs will fit into the notches cut into the fuselage sides and should be flush with the sides when installed correctly.

When satisfied on how this fits, remove, apply glue and then attach in place.

□ Step 99 - Fuse Assembly (BS2)

Locate BS2 from BP9. As you've done before, test fit this in place making sure all the tabs fit into the notches and all is flat, clean and neat.

When satisfied with the fit, remove it, apply glue and attach it to finish the aft, bottom sheeting.



□ Step 100 - Fuse Assembly (lower, front sheeting)

While you have the fuselage on it's back, it's time to install the

sheeting between F3 and F2. This you will need to cut yourself from 3/32" sheeting scrap (plenty to choose from the various BP sheets).

This sheeting should be cross grained and will fit snugly between the fuselage sides - resting on the 3/32" square balsa longerons.

You can do this in sections, or make up a wider piece and do it all in one if you want.

When you're satisfied with the fit, glue this in place.



□ Step 101 - Fuse Assembly (H2, H3, H4)

Locate four H4s from LP4, as well as H2 and H3 from LP5.

Note the way the pre-cut holes in H2 and H3 are angled. They "pinch/angle" inward to match the slight curvature of the fuselage sides. Also H2 has a more significant angle because it also takes into account the right thrust built into the F1/F2 firewall.

Glue two H4 pieces into H3, making sure they are fully inserted into the slots, as well as being 90° to the surface of H3.

Now the same is done with H2, but H2 also has a top and bottom. The "H2" etching is the top, so flip it over and glue the H4 pieces in on the bottom side - again making sure they're completely inserted and at 90° to the surface of H2.



□ Step 102 - Fuse Assembly (hatch notch cutouts)

Use a hobby knife to cut a notch on each side of the fuselage just in front of F3 and just aft of F2. These notches are already pre-cut into the inner plywood box, but need to be cut into the fuselage sides. We don't do this in our laser-cutting to give a bit more support to this area while building.

When you've done that, you can then test fit the H2 and H3 assemblies in their proper spot and make sure they fit somewhat snugly. Lightly sand as necessary to get a proper fit. **BUT STEP AWAY FROM THE GLUE BOTTLE. DON'T PUT ANY GLUE ON THESE, or it's gonna be trouble.**

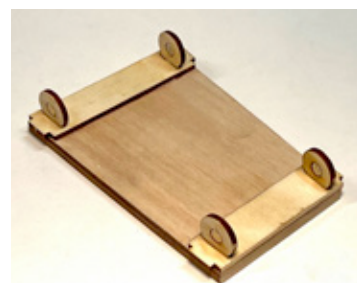


□ Step 103 - Fuse Assembly (H1)

Locate both H1s from BP12P.

Glue one on top of the other so they're perfectly aligned. Then you can test fit H1 into the hatch area, taking note that it will only properly fit one way. Lightly sand the front and aft edges of H1 to get a good fit, but don't worry about the port and starboard edges - those will be attacked later.

When satisfied with the fit of H1, put a few drops of glue on the top surfaces of H2 and H3 (which should have been sitting in the fuselage this whole time). Then press H1 down onto these pieces,



and when the glue cures, you can lift the finished hatch assembly away from the fuselage.

☐ Step 104 - Fuse Assembly (magnets)

Locate the 8 magnets from the hardware bag, as you'll use 4 of them in this step, and 4 in the next.

Inside the tank/battery area, you'll see 4 pre-cut holes in the plywood side-frames - two on the port side, two on the starboard. Place a drop of glue inside one of the holes, then push in a magnet - making sure it is completely flush the plywood side frame, but take care that you don't damage the outer balsa skin. Do the same for the other 3 pre-cut holes in this area.

Don't worry about positive/negative poles and attraction - that's in the next step.

☐ Step 105 - Fuse Assembly (H4)

Using the 4 left-over magnets, snap each one in place to the magnets already installed in the fuselage.

Hold the hatch assembly in the same orientation as the fuselage, then working with 1 magnet at a time, slide it away from its matching magnet, already installed in the fuselage. Take care of its orientation and push it into the corresponding H4 on the bottom of the hatch assembly. Each should be a nice, press fit that will hold them in place fairly well.

Once each of the magnets are pressed in place, dry fit the hatch to the fuselage and make sure each of the magnets are attracting, not repelling each other. Fix magnet orientation as necessary.

When you're good with everything, remove the hatch, then carefully glue each magnet in place, by noting its orientation, removing it, applying glue, then pushing it back in to place.

☐ Step 106 - Electric firewall spacer (E1)

If (and only if) you are powering your Lark with an electric power system, you'll need to also install the electric firewall pieces which position the motor a bit further out than a glow engine needs to be. Locate both E1s from LP2.

The E1's are probably a little long for most motor installations, but we wanted to make sure we covered as many options as possible. In the case of using the recommended Innov8tive Designs' Tempest power system, after measuring from the motor's cross plate to the back of the spinner, we ended up cutting about 1/2" off the length of each E1. *Your mileage may vary, so do your homework before mounting these in place.* Position these on each side of the front fuselage cheeks as shown in the photo. When gluing these in place, their notches should be fully inserted into the slots cut into the sides of F1. Both E1s should be clamped firmly up against the fuselage sides as well.



☐ Step 107 - Electric firewall (E2)

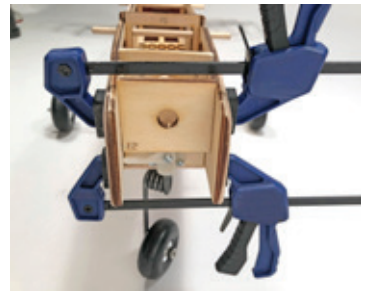
If (and only if) you are powering your Lark with an electric power system, you'll now need to locate both E2s from LP3 and LP5. These are glued together to form a thicker firewall.

Also take the time to drill and temporarily install whatever type of mount came with your motor. It's easier to install the t-nuts now, than after the firewall is installed.



☐ Step 108 - Electric firewall (E2)

If (and only if) you are powering your Lark with an electric power system, now is the time to install the electric firewall. It is glued into position as shown in the photo. You may want to slightly bevel the left and right edges to have a better fit to the curvature of the fuselage sides. We recommend epoxy for this step.



☐ Step 109 - Electric cooling scoop

If (and only if) you are powering your Lark with an electric power system, you may want to add an air-flow scoop to the bottom of the fuselage, just behind the firewall.

Refer the photo for how we did it. Simply mark and cut the bottom sheeting on the three sides. Gently lift the front edge and then fit two



small triangles to support the sides. You can cut the side triangles from scrap 3/32" balsa sheet.

Note that we found this sample scoop to be too large. It did a great job of cooling the batteries and ESC, but it also did a great job of providing enough airflow to consistently blow the hatch off at high speeds. Reducing the opening down to about a 1/3rd this width seemed to be the right size to keep this from happening and still keep everything cool.

☐ Step 110 - Electric air exits

If (and only if) you are powering your Lark with an electric power system, you'll also need to cut a few holes in the bottom of the fuselage for the cooling air to exit. We recommend this be down on the underside of the fuse, in the area between F7 and F8. Refer to this photo as how we setup our prototypes.



☐ Step 111 - Tank / Battery compartment fuel proofing

If you're using a glow engine to power your Lark, it is strongly recommended that you fuel proof the inside of the battery compartment. As you know, fuel has a nasty way of penetrating wood, causing it to disintegrate over time. Spray (or brush) this on, also remembering to protect the underside of the hatch and the engine compartment (firewall and inside of the fuselage cheeks).

☐ Step 112 - Sanding

Now is the time to get quite familiar with the sanding tools of your choice. Take the time to perform a good sanding, rounding the wing's leading edge and blending it into the wingtips. Go over the entire wing, making sure the sheeting is smooth, continuing the curvature of the wing. Pound out the extra time on those wing tips to make sure they are smooth, perfect works of art and match each other exactly.

Push the hatch in place then smooth out the edges of the fuselage. Because of the 3/32" sheeting and the 3/16" balsa supports

installed inside the fuselage's rear perimeter, you can put in a little effort to round the edges of the fuselage if you'd like. Just take care not to sand off the finger catches on each side of the hatch. Round the trailing edges of the ailerons, elevator, and rudder. Sand bevels into the leading edge of both elevator halves, the rudder, and the ailerons. And speaking of the ailerons, round off the back outer corners with a nice radius.

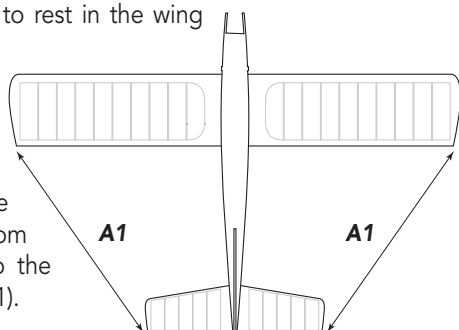
The idea is to spend some time caressing this airframe you've created, smoothing the rough edges until it's something so smooth that it will flow through the air with ease.

□ Step 113 - Airframe Assembly (wing alignment)

To align the wing properly on the fuselage, place the wing in position, by pushing the wing pins into the holes in F3/F3A. Sand the holes (not the pins) as necessary for a smooth fit.

Then allow the wing to rest in the wing saddle. The wing is

perfectly aligned when the distance from the left wing tip to the left stab tip is the same the distance when measured from the right wing tip to the right stab tip ($A1 = A1$).



□ Step 114 - Airframe Assembly (drill wing bolt holes)

With the wing aligned, drill two 3/16" holes for the wing bolts, using the pre-cut holes in CS6 as a guide. Carefully drill down through the wing through the WH5 assembly in the fuselage.

Use caution to make sure the wing does not move until both holes are drilled.

When drilling, take your time and make sure the drill is held so the bit is perpendicular with the wing's sheeting. This will make it so the wing bolt goes in at an angle, but the screw's head will be flat on the wing surface. Remove the drill, remove the wing and clean up around the new holes you drilled.

Run a 1/4x20 tap through the WH5 assembly so that the wing bolts will thread into this block. A few drops of thin CA will help strengthen and secure the threads you've cut.

But, if you prefer, you can also use 1/4x20 t-nuts (not included).

This completes assembly of the Lark airframe. These next few steps can be done in most any order - up until it's time to cover.

□ Step 115 - Fuse Assembly (attach main gear)

Locate both pre-bent main gear wires, two landing gear straps and four 2-56 self-tapping screws. Using a 5/32 bit, run those down through the holes in LG1 and LG2 to clear out any excess glue, then push the main gear wires into place.

To hold them in place, install the

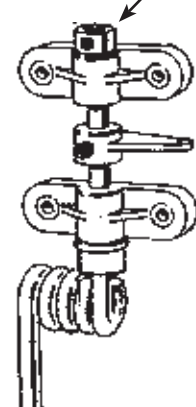


landing gear straps as shown in the photo. Use a 1/16" drill to make the mounting holes for the screws, and then attach the straps in position.

□ Step 116 - Fuse Assembly (nose main gear)

Everything you need to assemble the nose gear is in one package. Push the nose gear wire partially up through the block. Slip the steering arm in place, then push the nose gear wire all the way through the block and the arm.

Mark and cut off excess wire extending past collar.



With the nose gear positioned so the coil is towards the rear of the plane, position the steering arm at a 25-30° angle, then tighten the set-screw in the steering arm just tight enough so it should make a mark on the nose gear wire. Also, mark where the wire should be trimmed off, above the top collar.

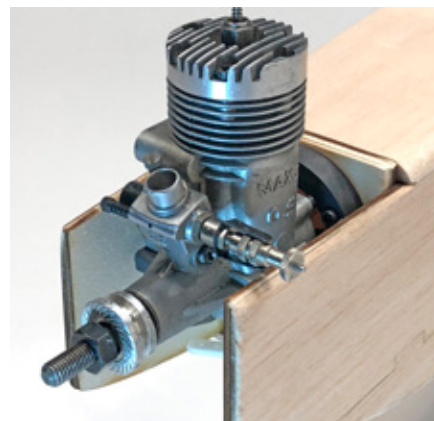
Loosen the screw and remove the wire. Grind a small flat on the nose gear where the screw made a mark, and trim the excess top wire, then re-attach. Use a touch of thread-locking compound on the screw to make sure it doesn't vibrate loose later on down the road (or more to the point - down the runway).

Power system

Installing your power system of choice is up next. Here's a couple photos showing sample electric and glow installations. Note that these are suggestions only as your power system might vary from our examples.

Glow power

Mounting the engine is a fairly simple thing. It should mount upright and use the thrust lines on the fuselage plans as a general guide. With the nose gear block in place, things are a little tight, so plan this out before drilling any holes. What you see in our prototype is an O.S. .30 mounted on a Dave Brown Products engine mount (now available from Ohio Superstar as of the time this manual was written). Other mounts will work just as well - use what's best for you.



A 4-6 ounce tank works well and gives a nice flight time. Again, plan this out before committing to anything permanent.

Electric power

There's a lot of choices out there for electric power, but we've reached out to Innov8tive Designs for their recommendations on power. You'll see those on our website for both their Cobra and Tempest brands. What's pictured here is their Tempest setup one of our prototypes.

Also, we're big believers in having an arming switch/plug when using electric powerplants of this size. There's plenty of options out there and it's something to think about. Remember, in case of an accident, your fingers probably don't grow back!



Battery Tray (TR4, TR5, TR6) - Optional

Located on LP6 are three parts that make up an optional battery tray. These pieces can be assembled to "raise" the tank tray up to the level of TR1. This allows for longer batteries to be installed.

Glue the tabs in TR5 and TR6 into the pre-cut slots in TR4 (they only fit one way), making sure they're 90° to TR4's surface.

Then this assembly can be glued to the top of TR2, with the tabs fitting inside TR2's circles (again, only fitting properly in one way). Before gluing this in place, we chose to install the ESC on TR2 first, then installing the TR4 tray.



☐ **Control horns, servo & pushrod installation**

Although you can install the servos and control hardware after covering your Lark, we find it easier to temporarily mount everything in place before covering. This way you have unblocked access inside the fuselage and wings to get the servos, extensions, and pushrods in place.

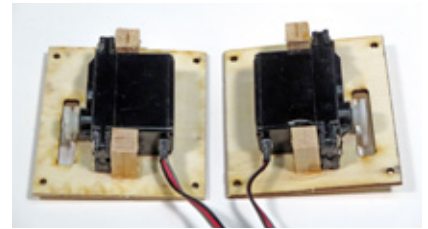
Shown in the following photo is an example of servo installation in one of the Lark prototypes. Glue TR3 strips (from LP2, LP4 and LP5) where the servos are mounted to thicken the mounting surface for the servo's screws. If using standard size servos for the elevator and rudder, you may need to stack the TR3's two-high so the servos will clear things that might interfere with the servo arms.



Take a bit of time to plan things out, including how you'll run the throttle and nose gear steering pushrods.

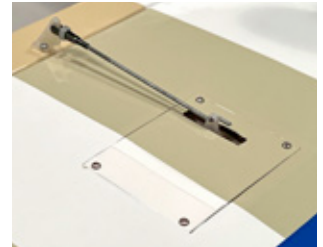
When mounting the servos to each of the SH's you'll need to cut eight 3/4" lengths of the 1/4" square basswood scrap. Make four thicker mounting posts by laminating two pieces together then sand the ends flat.

Position your aileron servo on the inside of the aileron hatch so the servo arm output shaft is centered in the opening. On the inside of each aileron hatch, glue one post on each side of the servo as shown in the photo.



Note that the left hatch is a mirror image of the right hatch.

Now fit the servo hatches into position on the bottom of the wing. Using the pre-cut holes as a guide, drill four 1/16" mounting holes into the basswood mounting posts you just installed. Harden the wood with a bit of thin CA and you can use the supplied 2-56 x 3/4" self tapping screws to secure the hatches in place.



Finish the layout of your radio gear by adding the receiver, flight pack battery and the switch. We mounted the receiver to the tray by using a bit of self-adhesive hook-and-loop (not included). The radio's switch should be mounted to the opposite side of the muffler (to help keep the goop out of it). Or, for an even cleaner installation, it could be installed inside the tank/battery compartment - hidden under the hatch - VERY NICE!

Covering

Now it is time to cover the Lark. Remove the powerplant, main gear, nosewheel assembly, pushrods, and any other components that would get in the way of applying the covering.

Double check that all surfaces are smooth and ready to cover. Sand as necessary, then cover the entire airframe with the covering/finish of your choice.

Note that if you're powering with an electric motor, you'll need to make a hole for the cooling air to escape the bottom of the fuselage, near the rear.

When the covering is complete, re-attach all the components you removed earlier in this step.

Logos, numbers, etc.

If you want to use graphics similar to the ones we used, Old School Model Works has teamed up with Callie Graphics as a supplier for pre-cut vinyl. They are a very well known provider of custom graphics for R/C models.

We have supplied them with the artwork needed to cut the correct size logos. You can order straight from them, choosing the colors that work for you.

Contact Callie Graphics at this link: <https://callie-graphics.com> or scan the QR code.



Note that Callie Graphics is not affiliated with Old School Model Works, nor does Old School Model Works generate any income from this partnership.

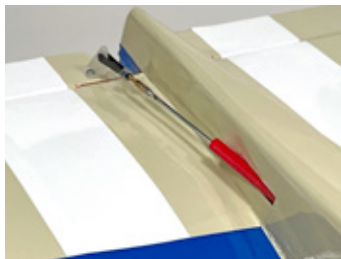
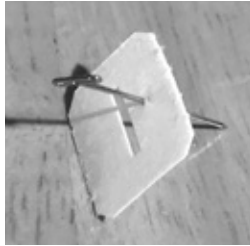
Attach the Control Surfaces

Now is the time to attach all the control surfaces to the airframe, by gluing the hinges in position with thin C/A. We've noted suggested hinge locations for each of the control surfaces on the plans.

When using the CA hinges, first push a pin through on side, at the center of the hinge as shown here. This will keep the hinge centered as it's pushed into the surfaces. When you've got all the hinges for a surface in place, then remove the pins and glue the hinges.

Make sure that you attach the elevator first, and make sure you cut away some clearance to allow the elevator joiner to rotate freely and not interfere with the fuselage.

When the elevator's in place, then attach the rudder. And don't forget the ailerons.



Attach wheels

Use the included 5/32" i.d. wheel collars to hold each wheel (not included) on the axles. For a maintenance free installation, file a small flat on the axle where the set screw of the wheel collar touches. Also use a touch of thread-locking compound to keep the screw from loosening over time.

Optional canopy

Included is a canopy and though it's certainly up to you if you choose to use it, the canopy is just a defining part of the Lark's' outline, so why not use it? The following steps will describe how to properly prepare and attach it.



- Trim along it's flat edge. You'll want to trim away the excess plastic and leave a smooth lip, roughly 3/16" wide around the it's perimeter.
- Place it on the fuselage and make sure it's lays flat on the top of the sheeting. Not all canopies are exactly identical, so a bit of trial and error is needed to get a good fit.
- If you're going to add a pilot figure (not included), now is the time to test-fit, then glue it in place.
- Give the canopy a quick wash in warm, soapy water.
- If you're going to tint or paint the canopy, do this on the inside now and allow it to dry.
- Use a bit of canopy glue to attach the canopy. So it doesn't

move while the glue cures, hold it in place with a bit of low-tack masking tape.

This completes the assembly of the Lark. Now you'll need to adjust the control throws and check for balance.

Recommended C.G. setting:

An important part of preparing the aircraft for flight is properly balancing the model. This is especially important because of the various motor/battery combinations that can be used.

CAUTION! DO NOT SKIP THIS STEP!

The recommended Center of Gravity (CG) range for the Lark is 3.1" from the leading edge of the wing, and you'll see this marked on the fuselage plan with this symbol.

If necessary, move the battery, receiver, and/or add weight to either the nose or the tail until the correct balance is achieved. Stick-on weights are available at your local hobby store and work well for this purpose.

We recommend balancing it at the forward point for the first flights, then moving it backward if you'd like it to be a little more maneuverable.

C.G. BALANCE POINT



Recommended Control Throws:

The amount of control throw should be adjusted as closely as possible using mechanical means, rather than making large changes electronically at the radio.

By moving the position of the clevis at the control horn toward the outermost hole, you will decrease the amount of control throw of the control surface. Moving it toward the control surface will increase the amount of throw. Moving the pushrod wire at the servo arm will have the opposite effect: Moving it closer to center will decrease throw, and away from center will increase throw. Work with a combination of the two to achieve something relatively close to these throws that are good for everyday sport flying. If competing in pattern, you'll probably want to dial these down a bit to give a smoother appearance to your maneuvers.

Aileron 3/8" up/down (25% expo)

Elevator 1/4" up/down (20% expo)

Rudder .75" left/right (15% expo)

(Expert tip: Once the control throws have been set, cut a few pieces of medium silicone fuel tubing (or heat shrink tubing) to go around each of the clevises. This will keep them from opening during flight.)

Preflight:

Charge both the transmitter and receiver pack for your airplane. Use the recommended charger supplied with your particular radio system, following the instructions provided with the radio. In most cases, the radio should be charged the night before going out flying.

Check the radio installation and make sure all the control surfaces are moving correctly (i.e. the correct direction and with the recommended throws). Test run the engine and make sure it

transitions smoothly from idle to full throttle and back. Also ensure the engine is tuned according to the manufacturer's instructions, and it will run consistently and constantly at full throttle when adjusted.

Check all the control horns, servo horns and clevises to make sure they are secure and in good condition. Replace any items that would be considered questionable. Failure of any of these components in flight would mean the loss of your aircraft.

Range check your radio before flying

Before each flying session, range check your radio. This is accomplished by turning on your transmitter with the antenna collapsed. Turn on the radio in your airplane, but do not attach the arming switch.

With your airplane on the ground, you should be able to walk 30 paces away from your airplane and still have complete control of all functions.

If not, don't attempt to fly! Have your radio equipment checked out by the manufacturer.

Warranty Information

Old School Model Works guarantees this kit to be free from defects in both material and workmanship at the date of purchase. This warranty does not cover any parts damage by use or modification. In no case shall **Old School Model Works'** liability exceed the original cost of the purchased kit. If you find any damaged or missing parts, contact us within 60 days from purchase to receive replacement(s).

Further, **Old School Model Works** reserves the right to change or modify this warranty without notice.

In that **Old School Model Works** has no control over the final assembly or material used for the final assembly, no liability shall be assumed nor accepted for any damage of the final user-assembled product. By the act of using the product, the user accepts all resulting liability.

Limit of Liability

In the use of this product, our only obligation shall be to replace such quantity of the product proven to be defective. The user shall determine the suitability of the product for his or her intended use and shall assume all risk and liability in connection therewith.

If the buyer is not prepared to accept the liability associated with the use of this product, the buyer is advised to return this kit immediately in new and un-opened condition.

As of this printing, you are required to register with the FAA if you own this product.

For up-to-date information on how to register with the FAA, visit

<https://registermyuas.faa.gov> .

For additional assistance on regulations and guidance of UAS usage, visit

<http://www.knowbeforeyoufly.org> .

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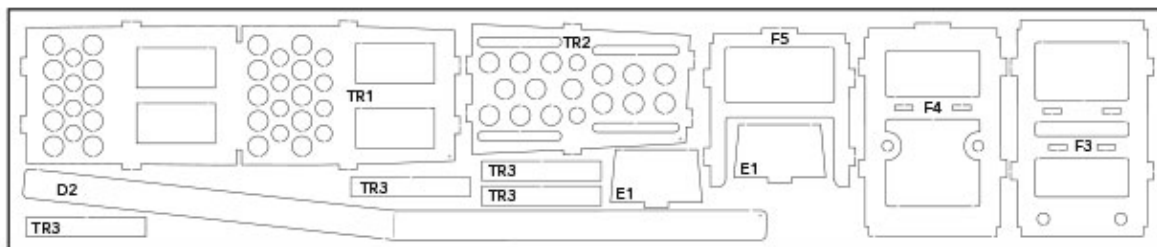
LP1

1/8" Lite Ply



LP2

1/8" Lite Ply



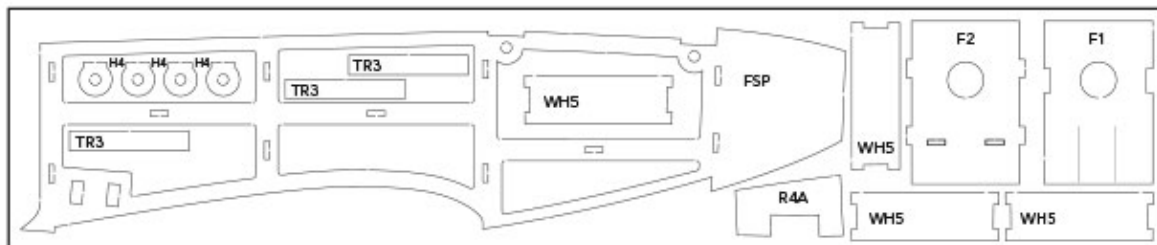
LP3

1/8" Lite Ply



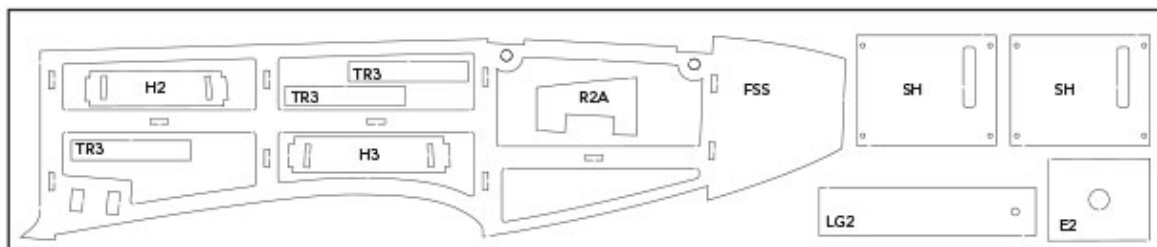
LP4

1/8" Lite Ply



LP5

1/8" Lite Ply



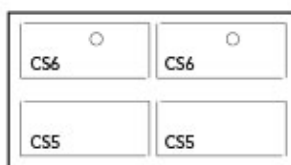
LP6

1/8" Lite Ply



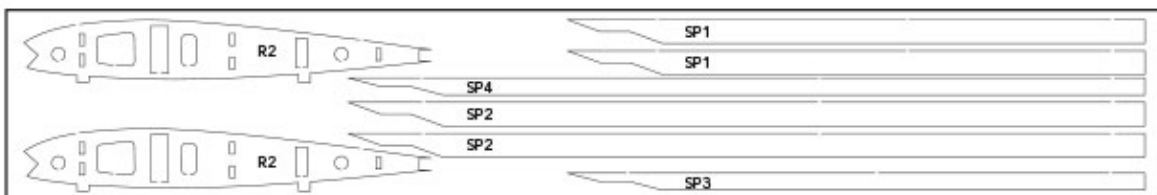
LP7

1/16" Ply



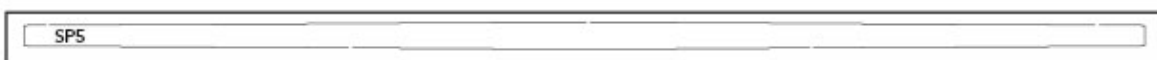
BP1

1/8" Balsa

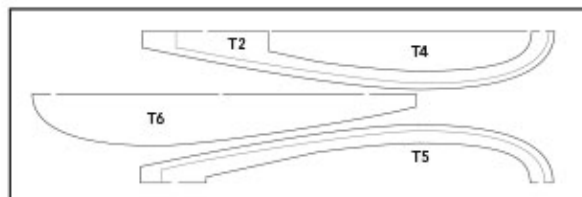


BP2

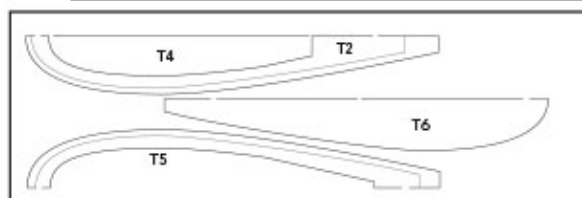
1/8" Balsa



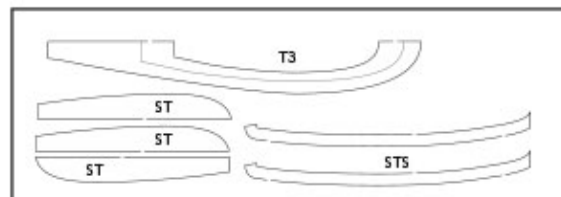
BP11S
1/8" Balsa



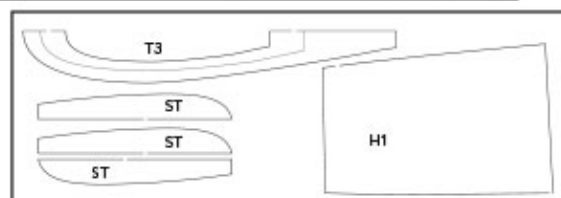
BP11P
1/8" Balsa



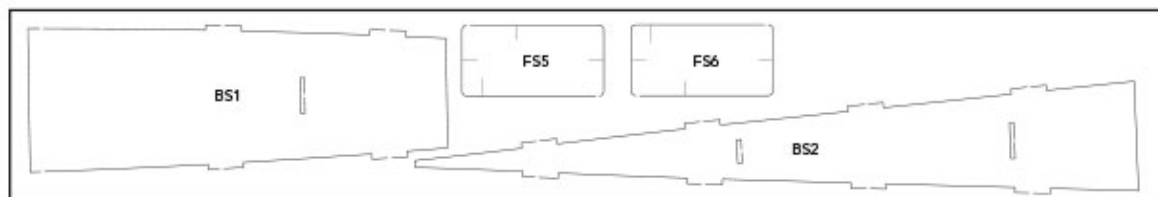
BP12S
1/8" Balsa



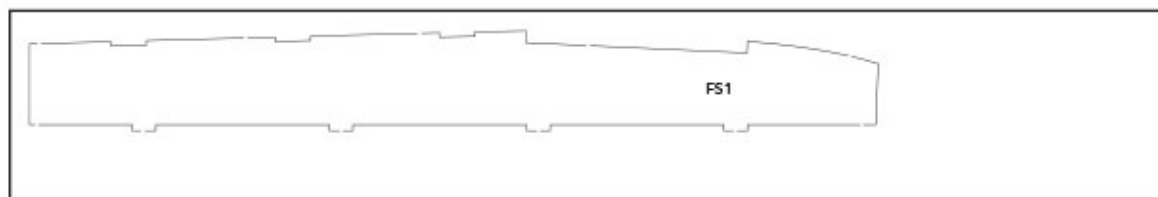
BP12P
1/8" Balsa



BP9
3/32" Balsa



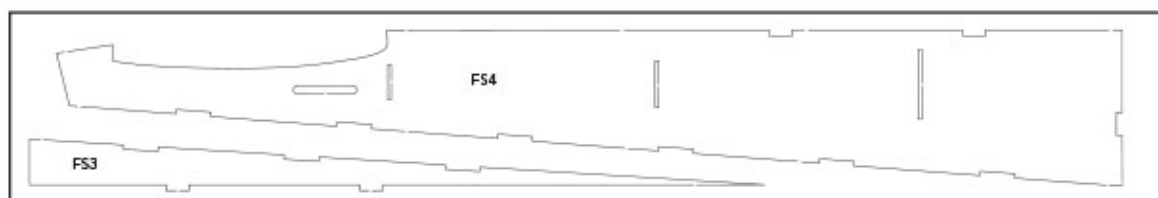
BP8
3/32" Balsa



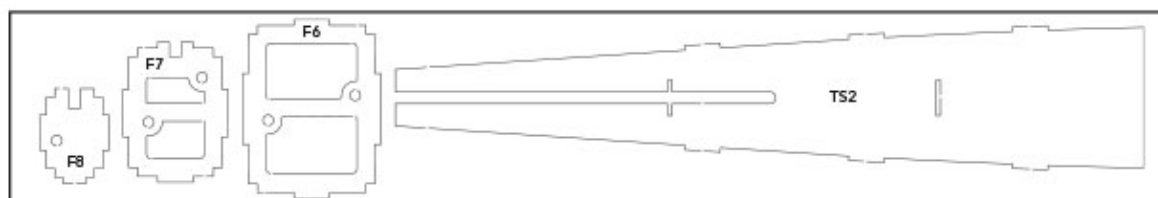
BP7
3/32" Balsa



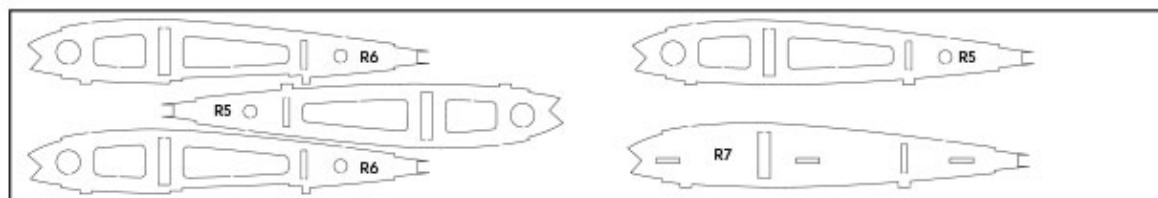
BP6
3/32" Balsa



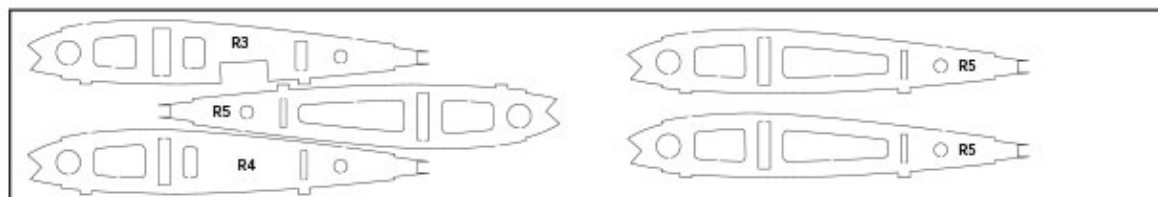
BP5
3/32" Balsa



BP4
3/32" Balsa

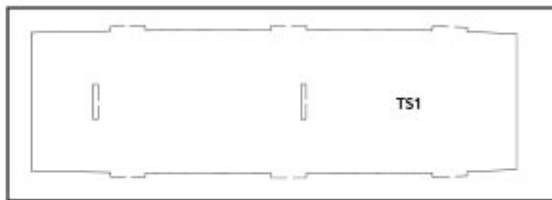


BP3
3/32" Balsa



BP10

3/32" Balsa



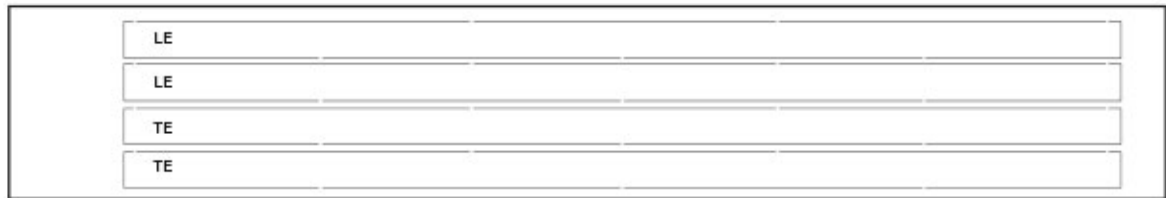
BP13

1/8" Balsa



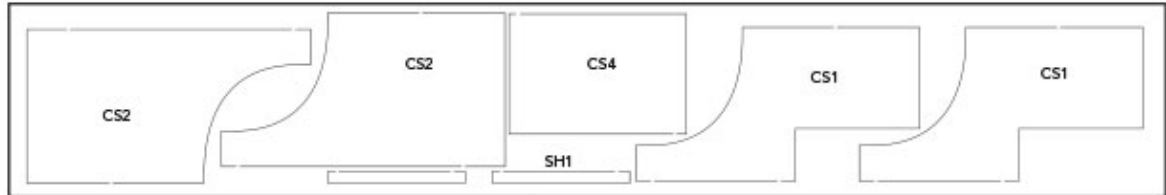
BP14

1/16" Balsa



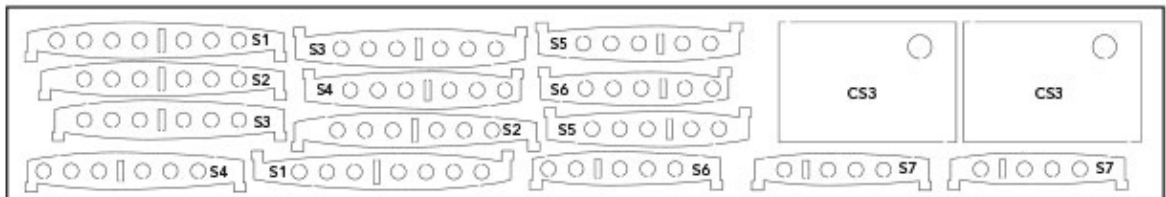
BP15

1/16" Balsa



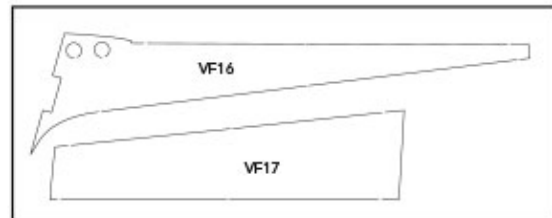
BP16

1/16" Balsa



BP17

1/16" Balsa



BP18

1/16" Balsa

