Nieuport 17 40”

R/C Scale Model Instructions

CONTACT INFORMATION

The Nieuport 17 was designed by M.K. Bengtson
Prototype by Steven Perry

Manufactured and Distributed by:
Bengtson Company
e-mail: sales@aerodromerc.com
Web Site: www.aerodromerc.com

NIEUPORT 17

Thank you for purchasing the Nieuport 17 40″ model for electric flight.

SPECIFICATIONS

More than 250 laser cut parts

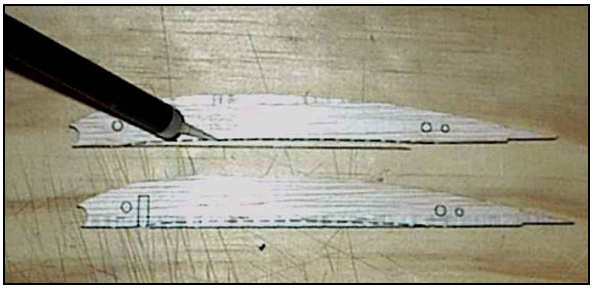
Scale:	1/8
Channels:	R/E/A/T
Wingspan:	40"
Wing Area:	380 sq in
Weight:	32 oz
Power System:	AXI 2217/20 brushless outrunner
Prop:	11x4.7
Wheels:	Balsa & plywood, Neoprene foam tires
Airfoil Type:	Under cambered
Cowl:	Built up balsa and plywood
Spinner:	Optional
Covering:	Litespan, Coverlite or Polyspan
Decals:	Available on the website

BUILDING THE MODEL

Before Starting

A note about the photos: The photos were taken of a prototype and the parts supplied may look slightly different from them. However, the concepts illustrated are the same.

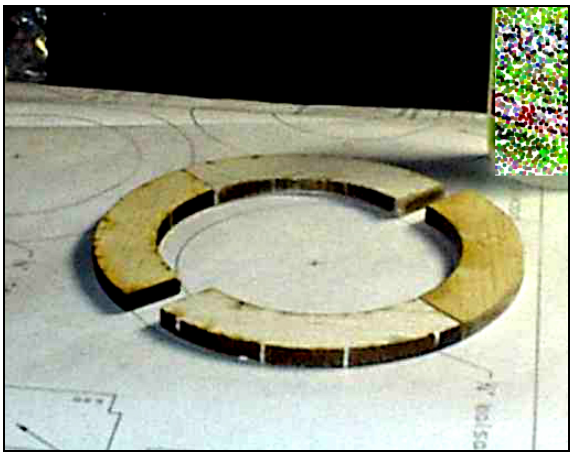
- The first thing to do, and what every set of model instructions you have looked at since your first kit has told you, STUDY THE PLANS!
- The kit provides the option of undercambered wings by printing a dotted line along the bottom edge of each rib. This must be cut along with a good sharp #11 blade.



Cutting Undercambered Wing Detail

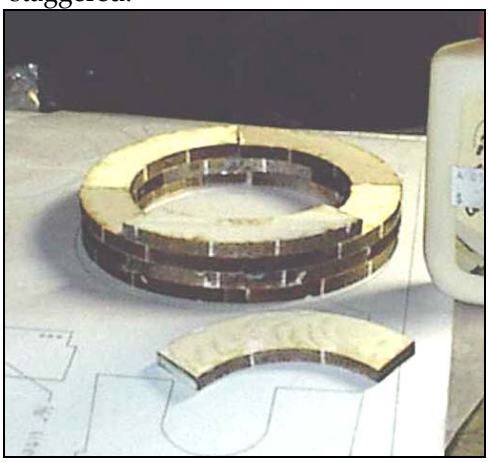
COWL

I glued the first ring together using medium CA on the edges.



Cowl Construction Detail

I used Tightbond aliphatic to glue the rest since I was mating flat sides and edges. I staggered the pieces on each ring so that each edge-to-edge joint was under the center of the piece on top of it. Each subsequent ring was similarly staggered.



Cowl Construction Detail

The rear part of the cowl comes next. I used 1/64" ply strips cut 1 1/16" wide. I started by CAing the ply strip to the edge of C2. I glued about 1/2" and then let that set up. I was very careful to align the edges precisely. Then I bent the strip around the former a couple of inches keeping the edges aligned and gluing with medium CA on the inside edge. I worked around the circumference this way a few inches at a time and concentrating on aligning the edges.

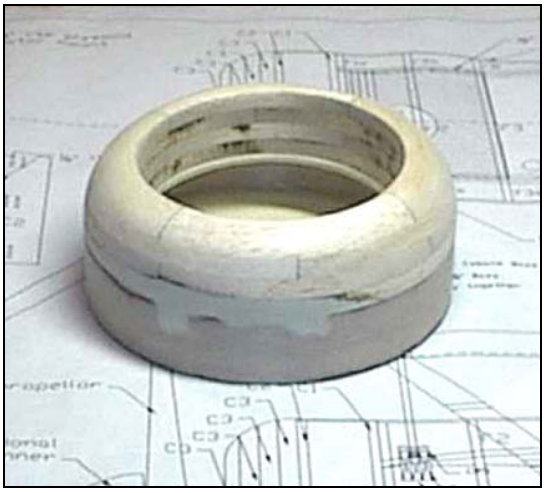
I joined the ends of the strip by cutting a piece of 1/64 ply about an inch long and CAing it inside the ring overlapping and reinforcing the joint.

Next I fitted C1 inside the ply and aligned the edges flush. Take the time to fiddle it exactly right. I ran CA around the inside of the ring along the C1 / ply joint.

The next step is to join the front and rear cowl rings. Use a slow curing glue like Titebond and NOT CA. You need the extra time to ensure the pieces are aligned as perfectly

as possible. The better the alignment, the less sanding and filling you will need to do. Align it, weigh it down, check alignment, double check alignment and let it dry well.

When the glue has fully cured, remove the weights. Sand the whole ring into a smooth cylinder. I used a bit of Squadron White putty to fill in some low areas. Only when I was sure I had a reasonable approximation of a smooth cylinder, did I start the rounding off process. Taking a cue from John Alcorn's book "Scratchbuilt" I had at it with a knife. "Had at it" being defined as carefully whittling away most of the wood that wasn't supposed to be there. I got rid of the rest of the unwanted wood with progressively finer grades of sandpaper. Note: An alternate approach is to use a bench or belt sander for this step.



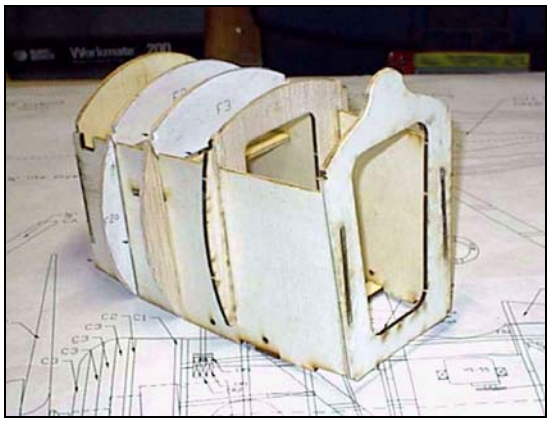
Cowl Construction Detail

Front Fuselage Box

After the cowl, I moved aft and began construction of the front fuselage box. I started by gluing, lightly, the box sides into the slots in former F5.

I then fitted the motor plate into it's slots. Be sure you orient it correctly so the large slot cut for the motor slants to the RIGHT. Don't glue it in place just yet.

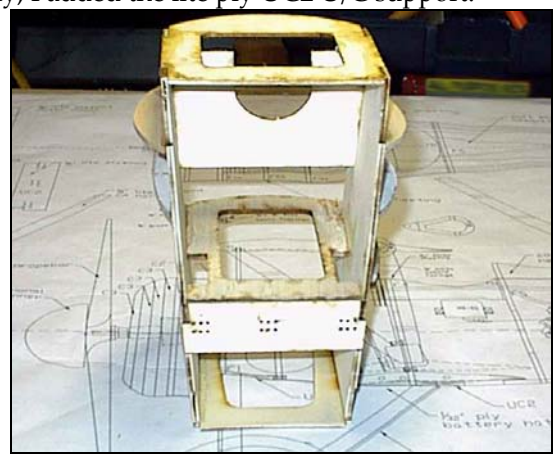
I next fitted former F1 in place on the front of the box. I used some angle aluminium and weight bags to line up the box and ensure it stayed square and true. With the box secure, I carefully tack glued F1 and the motor plate to the sides, being careful to pinch each joint tight while the drop of CA dried. With the box tacked together square and true, I then ran CA along each side of each joint to firm up the structure.



Front Fuselage Box Construction

With the box glued up square and true, add the formers at stations F2-F4. There are three pieces for each station. The sidepieces form the asymmetrical bulges on the fuselage sides. I also added former F5a to F5.

Finally, I added the lite ply UC2 U/C support.



Front Fuselage Box Construction

Mounting the Motor & Gearbox

Mounting the motor & gearbox is going to depend on the motor and gearbox that you decide to use. This is an area where you may have to do a bit of freestyle modelling to get everything located properly and secured there.

Servo Mounting

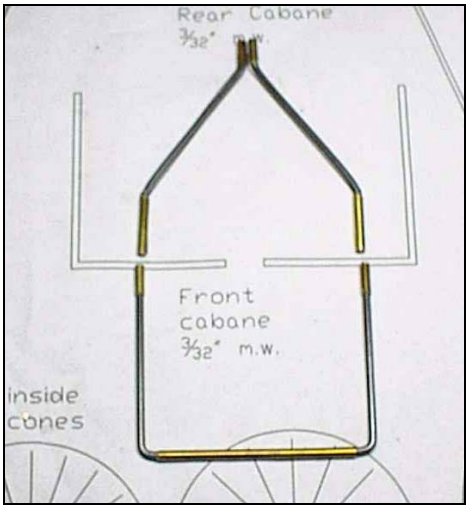
The elevator and rudder servos mount on traditional rails across the width of the fuselage box. I used balsa sticks CAed to the lite ply fuselage sides located exactly where indicated on the plans.

Once all the supports are in place, mount the servos. Do so with the arms in place so you can insure proper clearance. This is a good time to hook up all four servos to a receiver and turn them on to center them. Adjust the positions of the arms if necessary.

Wire Bending

The cabane struts are made of 3/32" piano wire. I find a Dremel tool with a cut-off wheel essential to the process.

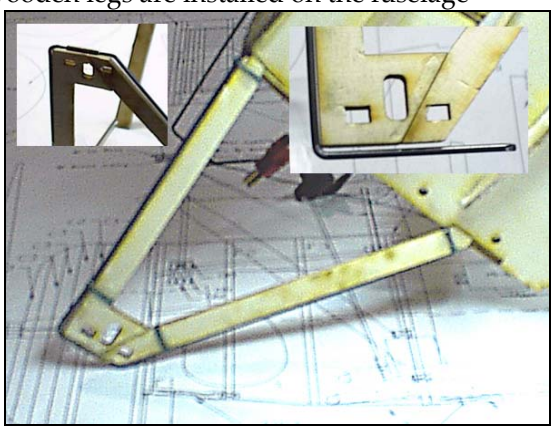
NOTE: Another technique for bending music wire is to use a hammer and bench vise.
The front cabanes are simple 90-degree bends. Cut off the wire somewhat longer than necessary and bend a good 90 in the middle. Now place the bend over the plans and then mark and cut to length as shown. The cabanes should be able to fit into a piece of brass tube embedded in the CR1 - CR3 structure far enough so the vertical ends are the correct width apart.
Cut a piece of 1/8" brass tube to the approximate length shown in the photo.
Fit the pieces together and line them up with the plans to ensure they are acceptable in size and shape. Wire & tube are cheap, don't be afraid to pitch the piece and do it over if it isn't right.
The rear cabanes are made by making the two bends, adjusting the angles to match the plans and then cutting off the ends to the length shown on the plans. Cut and dress the ends of four pieces of tube as shown in the photo.



Cabane Construction Detail

The U/C wires will also need to be bent up before finishing the front fuselage box. This time the wire is 1/16" and the bending and cutting is easier. Start with pieces of wire several inches longer than needed. Measure and bend the wire to match the drawings, but do not make the bend at the lower ends yet.
Make the plywood U/C legs over the plans; these will be used as bending patterns.
Hold the wire up to the wooden leg. Match the top of the wire with the bottom of the notch in the leg. Mark and make the bend at the bottom of the leg.
Leave a slight gap at the bottom of the leg. This is so the brass tube joining the front and back wires will rest flush on the bottom of the wooden leg.

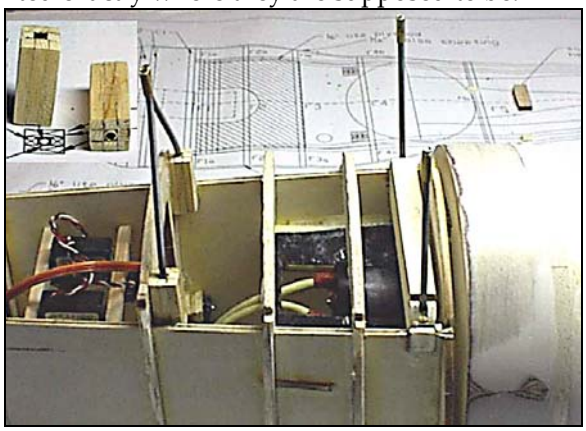
When you have made good bends in all wire U/C legs, cut them off so there is 1/16" - 1/8" gap when they are taped to the wooden legs. Cut and dress two pieces of brass tube and use them as joiners. Don't glue or solder until the wire and wooden legs are installed on the fuselage



Undercarriage Construction Detail

Mounting the Cabane struts

Make a three-sided box out of the two CR1 and the CR2 pieces. Ensure the pieces are all lined up in all dimensions. Sand all edges evenly especially the top.
Insert the brass tube you prepared when you made the front cabanes. Keep it evenly centered and below or exactly even with the top edges of the slot.
Now glue the top CR3 piece over the tube in the slot. Take care not to fill the tube with glue... Sand the whole assembly square.
Glue the finished front cabane mounting assembly into the notches in the fuselage sides close behind the F1 former.
The rear cabanes require two mounting blocks. Build these up using the pieces provided around the brass tubes you made when you bent the cabanes. Again ensure you do not get any glue inside the tubes.
Take your time to get the rear cabane mounting blocks mounted exactly where they are supposed to be.



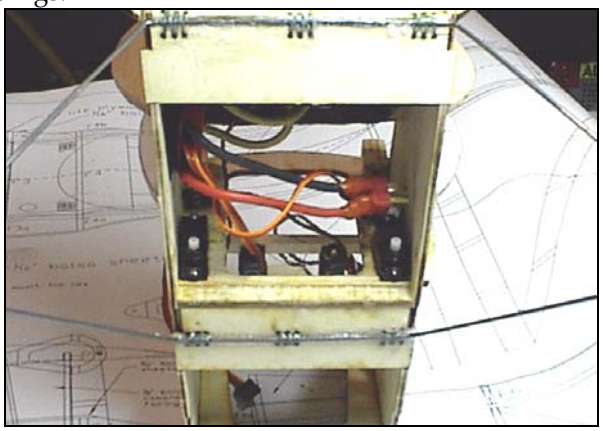
Rear Cabane Construction Detail

Mounting the UC

Install the front U/C mount, UC1. Glue it firmly in place and not filled with glue. Keep the notch formed by F1 and UC1 also clear of glue.

Tack glue the wire U/C legs in their exact position on the U/C supports UC1 and UC2. Now bind the wire U/C legs to the fuselage. I used 30 lb test Spiderwire fishing line. I sewed hole-to-hole straight across the wire and then went back and sewed Xs between the holes.

After the binding of front and rear legs are done, CA the bindings.



Mounting Undercarriage Detail

Sand a tapered cross section in the wooden U/C legs and spreader bar. Leave enough flat surface where the wire legs contact the wooden legs. NOTE: Soak the wooden U/C legs and spreader bar in thin CA. Let it soak in a bit before applying any kicker. Use epoxy at the apex of the U/C legs and the little legs on the ends of the spreader bar. When cured, sand the all pieces smooth.

Fit the wooden U/C legs to the fuselage and wire legs. Trim the upper ends of the wooden legs and or their respective notches as well as the corners on the lower end of the legs as necessary to ensure a correct fit. Check everything for alignment in all dimensions.

Next Epoxy the wooden legs into their notches. Bind the wooden legs to the wire legs a few turns at the top and a few more at the bottom. Glue the bindings. Epoxy the wire legs to the edges of the wooden ones along the entire length. Do not neglect this step.

Insert the spreader bar between the U/C legs. Trim to get the ears on the spreader bar to fit correctly into the holes in the U/C legs. Be sure everything is all lined up before gluing it solid. Coat the joint with epoxy.

Bind the axle to the spreader bar and epoxy only the binding. Leave the ends free to flex.

Make the Battery Hatches

I made two hatches, one in between the U/C and the other behind the U/C. The rear one allows access to the rudder and elevator pull/pull servos. I made them out of 1/64 ply laminated to 1/16 balsa. This procedure prevents warping, but the main reason is that it facilitates mounting the magnets used to hold hatches shut.

After laminating the balsa and ply, cut the hatches to size. The ply side is the outside. Out of the remaining laminated material, cut two strips no more than 1/2" wide. Trim the edges to exactly match the rear of each hatch. These strips will support one of the magnets.

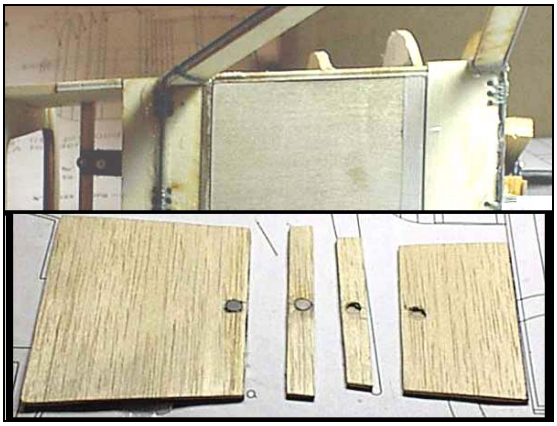
Find the center of each strip and mark it. I use Radio Shack Rare Earth magnets. They are 1/4" in dia and 1/16" thick. Place one of the magnets on the center mark on the balsa side of the strip. Press it into the balsa so it leaves a circular mark. Now carefully cut the circle down to the ply without going through the ply. CA one of the magnets into the hole and sand flush.

Put the other magnet on top of the embedded one. Now turn the strip over and align it carefully with the rear edge of the hatch. When it is aligned, press to mark the balsa. Again carve out the hole. Now here's a good place to mess up.

You have to get the second magnet glued in the hole right side up or the two magnets will repel each other.

To mount the support strips, place a bit of wax paper or clear plastic wrap between the strip and hatch. Place the hatch in the opening and fiddle with it until it is flush on all sides. Turn the model over and tack glue the strip in place. When the glue sets, pry the hatch up and firmly glue the strip in place. Be sure not to get blobs of glue between the hatch and strip as it will keep the hatch from closing flush.

Finally hinge the hatch. I use strapping tape with a small amount of CA to make sure it holds.



Hatch Construction Detail

Rear Fuselage Frame

The Nieuport 17uses the "front box / rear frame" method of construction with some differences. First there is the matter the different distances between the two top

longerons and the two bottom ones. Top cross pieces are going to be longer than the corresponding bottom ones. Also the top longeron curves all the way forward to the F1 former. Great care will be needed when joining the front and rear fuselage sections.

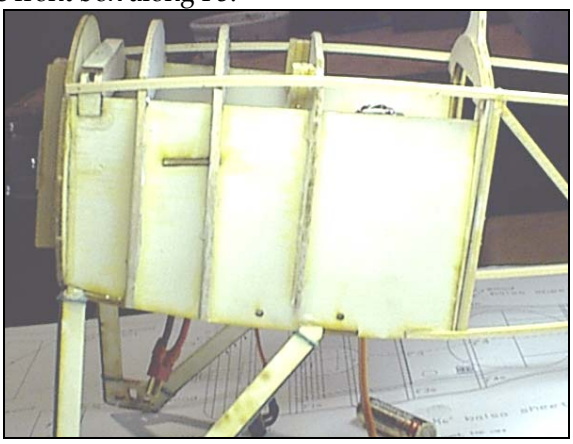
I began the rear frame by laying out the top and bottom longerons. NOTE: Hard balsa longerons are recommended.

Next I added the vertical struts and the diagonal braces, finishing the side frame by adding F9 and f10 at the tail. Be sure to take extra pains to locate the vertical strut just aft of the F5 former exactly even with the rear edge of F5 on the drawing.

To state the obvious, make another frame as identical to this one as possible. It doesn't matter what technique you use to make it identical, just that is as close to that as you can make it.

In conventional front box/rear frame construction, you build up both structures and then mate them. The slanted sides of the Nieuport rear fuselage make it hard to follow that procedure. The solution is to add each side separately and then form up the rear girder after the sides are attached.

Start by dry fitting each side frame to the front box. Trim and fiddle until you get a flush join between F5 and the vertical strut immediately aft of F5. This establishes the correct side angle. When you get a good fit, glue the side to the front box along F5.



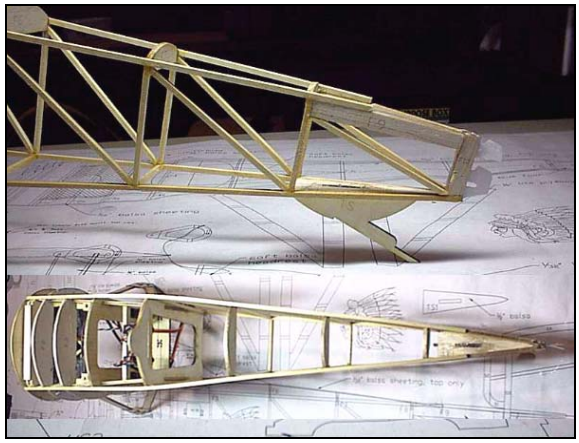
Rear Fuselage Frame Construction Detail

Now glue the lower longeron end into the notch on the front box. Finally glue the long upper longeron to each notch in formers F1 - F5, forming a curve. Do the other side the same way.

I found it best to add the rudder hinges before the joining the frames at the tail post. With the rudder hinges in place, pull the tail posts together. Ensure they are even on the top, bottom and ends and then tack glue them together.

Check to see the sides are even, untwisted and true. Secure with CA and then add the tail skid support TS1 between the lower longerons.

Add the turtledeck formers, F6 - F8 between the upper longerons at the stations located on the plans. Finally add the cross struts between the lower longerons at their respective stations.



Tail Skid Construction Detail

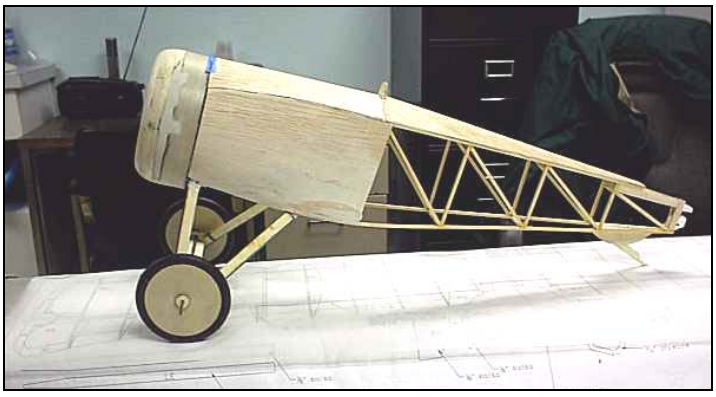
Sheeting the Fuselage

Next up is sheeting the fuselage. Use soft balsa.

Make up templates for the sheet pieces by cutting and fitting construction paper to the fuselage. Make adjustments until you are sure you have the best approximation of the needed shapes that you can get. Make no allowance for the lower wing roots, we'll deal with that area later.

Now lay out the templates on the wood and cut the parts. Ensure the grain of the wood is oriented fore and aft relative to how the part sits on the airframe. This ensures the part will bend in the direction required.

When you apply the sheeting pieces, depending on your wood, you may have trouble getting them to bend. If so, you can spray a little household ammonia on the outside of the bend. This relaxes the wood grain and greatly facilitates the bend. When all the pieces are in place, trim, sand and fill if necessary to get a good smooth, even surface.

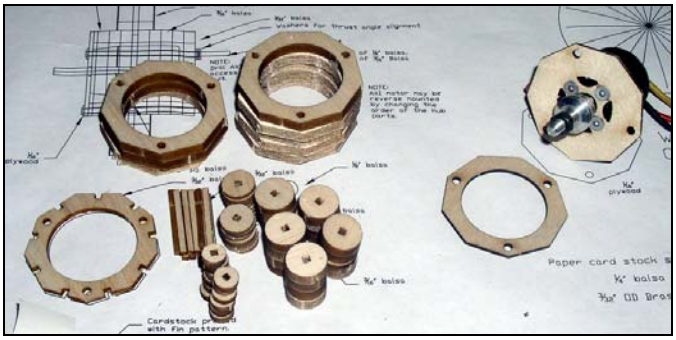


MOTOR MOUNT/DUMMY ENGINE

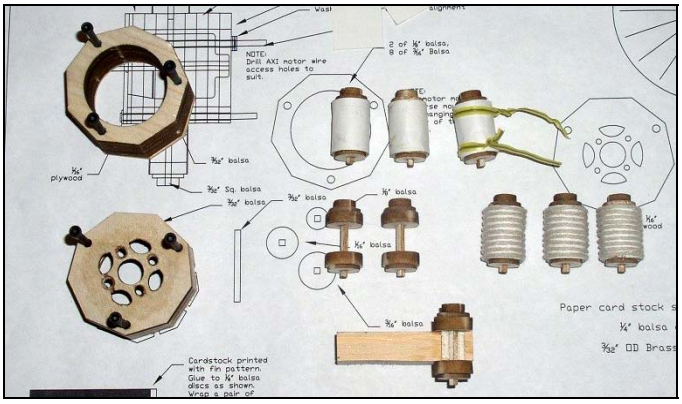
Items needed to finish the motor mount:

3 – 2-56 x 2″ machine screws
Heavy Card Stock paper
String
1/32″ music wire, for push rods
The motor that will power this model

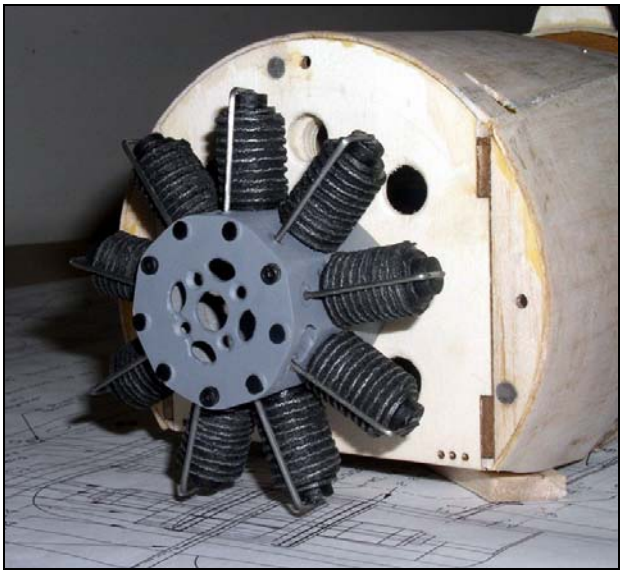
Find the two 1/16″ plywood motor mounts plates. Compare the mounting pattern on the plate to your motor. Adjust the holes if necessary. Laminate the two plates together. Find the 8 3/16″ balsa motor core pieces. Laminate them together – one section of 5 pieces and another section with 3 pieces. Check the plans for correct order of pieces. Use the 2-56 screws to line up the pieces properly. Laminate the 1/16″ ply pieces to the 3-unit section, with the 1/8″ notched piece between the 5-piece section. Mount your motor inside the core unit. A hole for the three motor wires to exit will need to be fashioned. Find the three different sized circular pieces for the engine cylinders as well as the 3/32″ square balsa center sticks. This builder made a small fixture to glue the pieces square and proper distance apart.



Assemble the 9 cylinder cores. Cut 9 pieces of heavy paper from the pattern in the lower left corner of the plans. Cut the paper so the grain allows the paper to be rolled. This builder pre-rolled the paper around a Sharpie pen. Glue the rolled paper around the cylinder cores. Cut 2 pieces of string about 18″ long, glue one end of the string to the top or bottom of the paper cylinders. Wind both pieces of string around the cylinder. Glue the other end of the glued string and unwind the unglued string. You have evenly spaced cylinder fins. Paint with dope or polycrylic to fix the string. Repeat for 8 more cylinders. Glue the cylinders onto the motor core using the 1/8″ notched piece for proper spacing.

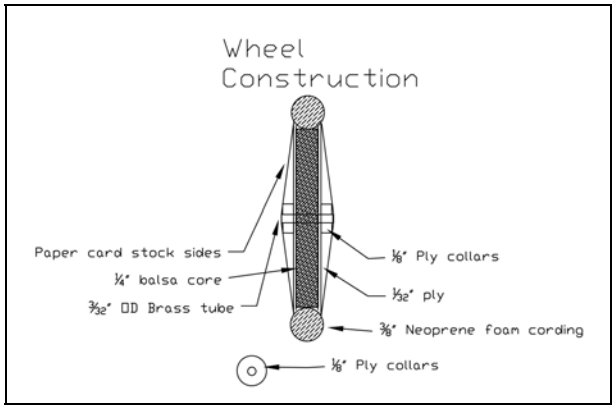


Paint the motor unit and add whatever detail you wish. Add some wire push rods to finish off the unit. Add washers to the top and left screws to get the proper down and right thrust for the motor. There is lots of room behind the cylinders to mount the ESC and nose weights.



WHEELS

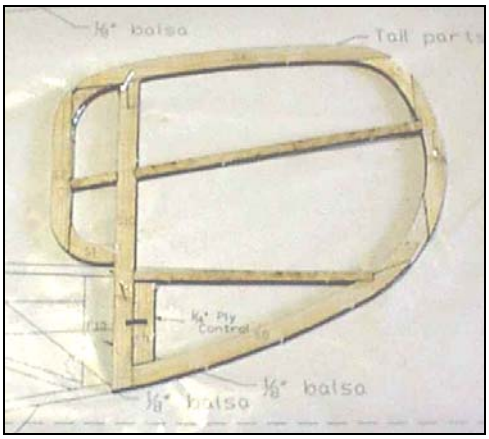
Gluing the ply sides on the 3/8″ balsa core makes the basis for the wheels. Use the brass hub for alignment. Epoxy the hubs in place and add a sufficient amount of epoxy around the base of the hub to reinforce the connection of the hub to the ply. Plywood reinforcing hubs are provided that are to slip over the brass tubing as shown.
Next, CA glue the neoprene cording together to from a "tire". Use thin CA sparingly as the CA bonds very aggressively to the rubber. Press the CA wetted ends together for an instant bond. The best way to align the ends is to glue them while they are in place on the wheel. Then attach the tires to the wheels and CA in place. A thin bead of CA around the rim makes for a secure tire.



Wheel Construction Detail

Rudder

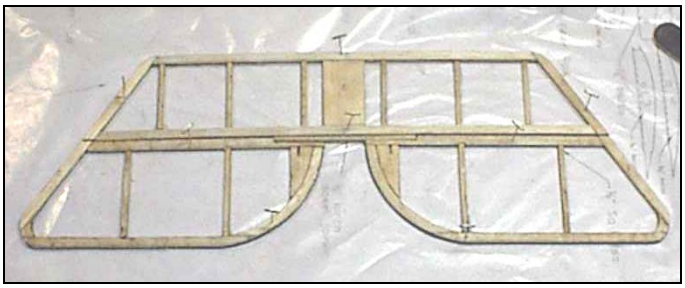
The kit provides laser cut cross pieces instead of making you cut them out of strip wood.



Rudder Construction Detail

Stabilizer / Elevator

The construction is as described above.



Stabilizer Elevator Construction Detail

I added a piece of 1/8 " balsa sheet where the upper elevator control cable passes through the stabilizer.

Lower Wing Panels

Start laying out the panels by pinning the lower TE piece to the plans. Note: Wooden dowels may be substituted for the 1/4" carbon fiber tubing, leading edges.

String the ribs on the spar rod at he locations you marked previously. Be sure to do a left and a right panel.... also make sure you get the L1 and L4 1/8" ply ribs in the proper locations.

Carefully glue the root and tip ribs exactly in place on the ply TE piece. Use the RAG to set the dihedral angle of the root rib.

Now glue each rib in the correct place on the TE and at the correct angle shown on the plans. Ensure the spar is located exactly and glue each rib to the spar. Finally locate the LE in exactly the correct position and glue to each rib..

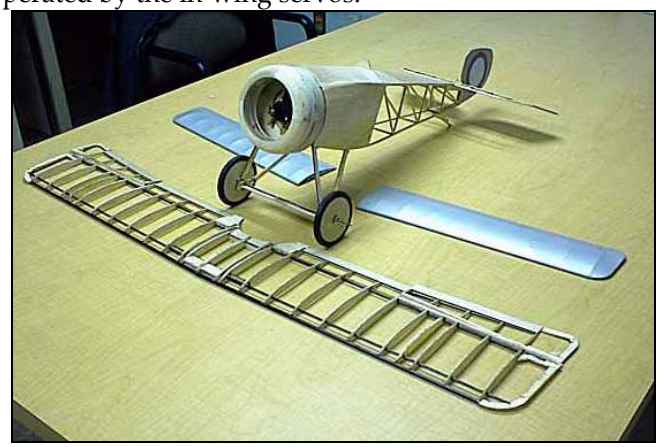
Finish the panel by adding the tip you constructed earlier, the ply sheeting between the root and first rib and the strut notch support pieces. I made the strut notch support pieces out of 1/8" basswood.

Construction Detail

Building the Upper Wing

There are a lot of parts to the upper wing; many are pairs or sets of four identical parts. Laying them out in numerical order, will save you time later

The prototype kit featured working scale aileron linkages with servos in the fuselage operating the pushrod/belcrank/torque rod scale linkage. The initial prototype fabrication, revealed that the two aileron servos in the fuselage, left inadequate room for wires and battery, which has been corrected by moving the servos to the wing. This arrangement is better since those interested in building the model as sport scale can simply ignore the scale aileron linkages and those who desire something more scale can still use the designed torque rod to cause the aileron cranks to move in unison with the ailerons operated by the in-wing servos.

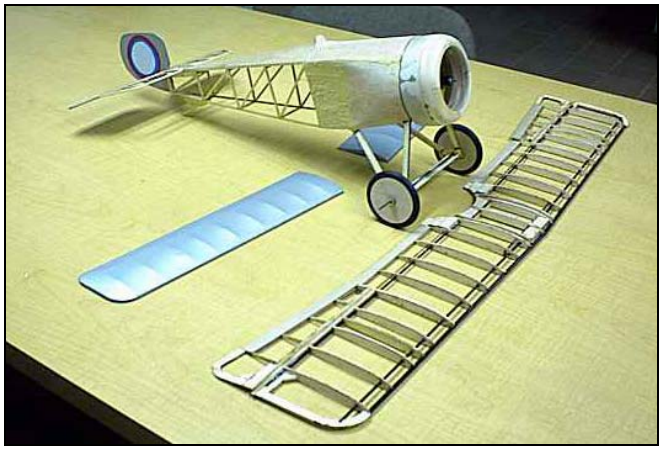


Upper Wing Construction Detail

If you want the belcranks to move with the ailerons, start by bending up the torque rods. Otherwise skip this step and build on. Put a 90 deg bend in one end. slide on the brass bushing tubes and then make the 90 deg bend at the other end. Be sure to make them mirror images. Carefully consult the drawings to get it right

Now lay out the trailing edge pieces, TRB & TLB. Next add the R11 pieces. Now string ribs R3, R4a, 3xR4 and R5 on the torque tubes. Again make a left and right assembly. Inboard of the R3 ribs, attach the R12 pieces and then the R15 pieces. Glue the two R1 ribs together matching them up exactly. These go in between the two R14 pieces. Add the R2 ribs. Omit the two ply braces for now. Glue in the

R21 pieces between R2 & R3 to support the front spar like R15 does for the rear one.
Now feed the spars through the ribs, a gentle twist while you support the rib with your fingers works. Each pair of spars meets at the center of the two R1 ribs. Position each rib exactly and glue to the spars.
Use the R13, R14 and the other R15 pieces to build up a support around the rear spars. Do the same for the front spar with the pieces called out on the drawings. See why I said to lay out all the pieces in numerical order?
Pin down the balsa TE piece and carefully feed the R6 and R7 ribs on the spars. Locate each rib exactly and glue to the TE and spars. Now add the LE tubes and glue to each rib.



Upper Wing Construction Detail

Add R8 and R10. R10 is flat on the board and R8 is centered on the LE tube and front spar, which raises it off the board. Connect the two with R9 and brace with R29. Glue the upper TE pieces in place.
Take the 1/32 ply aileron servo hatch and lay it in place between the two ribs and take care that it is flush with the bottom of the adjoining ribs. Now cut two hardwood or ply strips the exact width of the bay. Slide these pieces down between the ribs until they touch the hatch. Now carefully tack glue them in place. Do not glue the strips to the hatch, only to the ribs. When the wing is removed from the plans, separate the hatch pieces and firmly glue the strips to the ribs. This should provide recessed supports that allow the hatch to sit flush with the bottom of the wing. Servos are attached directly to the hatch with epoxy or double sided foam tape. NOTE: Alternate method for servo mounting is to use small wooden blocks and #0 wood screws. Use small wood screws to attach the hatch/servo assembly to the bay.
This completes the upper wing. The ailerons are built separately.

The aileron construction is straightforward. Lay out the TE and LE pieces, add the ribs and build the tip. Glue some scrap balsa next to the inboard rib to make a solid place to drill a hole for the torque rod end. Add similar support for the aileron horn lined up with the linkage from the in-wing servo. All linkage and horns for the in-wing servo are on the bottom surface.

COVERING

I chose to cover the Nieuport 17 with aluminium colored Coverlite by Coverite. My model is finished as a Russian machine from about mid 1917, serving the Krensky government against the Germans and Austrians during the period between the Tsar's abdication and Lennin's November Revolution.
This was a chaotic time and shiny new airplanes were few and far between in those parts. Coverlite has a less shiny finish than the usual iron-on plastics.
Coverlite requires the builder to paint on Balsarite wherever the material is to be attached. It has no stick itself. Coverite makes a product called Balsarite, like thick clear dope. It is painted it on the frame initially and, in later stages, on the edge of already covered sections.
When dry, you can seal the covering material to the Balsarited portions with a sealing iron. Pay heed the old saw, "Work out as many wrinkles as possible when attaching the material."
Finally when all was done and checked out, I closed up the bottom of the fuselage. I did not cover the sheet balsa front of the bottom, instead I painted it with Rustoleum® Bright Metal. The cowl sanded, filled and painted.

Pull / Pull Controls

The Nieuport 17 is prone to a tail-heavy condition. This condition necessitates the use of pull/pull controls for the rudder and elevator. I use Du Bro Mini servo connectors. These are little barrels that clip on a servo arm and have a hole drilled through so a straight wire can pass through. The wire is held in place with a setscrew.
I make up four pieces of straight wire about 3" long with a loop bent in one end. I tie two control wires, (30# test Spiderwire fishing line), to each of two of the wire loops. I tie one each to the other two wires.
The whole key to a successful pull/pull installation is the ability to immobilize the control surfaces in dead neutral. The Nieuport rudder will need an assistant to hold it gently but firmly in place while you work. The elevator can be locked in neutral by taping two strips of 1/8" x about 1" strips at one end Slide the open end over the stab and elevator and then tape that end together where it projects past the elevator TE. This will hold the stab and elevator straight as a board.

Mount the wires in the connectors with room to adjust in either direction. Mount the wires with two cables on the elevator servo arm and the others on the rudder servo arm. Turn the set screws firmly, but don't strip the screws
Now take a loose piece of Spiderwire, hold it taught over the rear fuselage and make straight lines from each loop in the servo wires to the control horns. This will establish where the cables will exit the fuselage sides and in the case of the upper elevator wires, where it will pass through the stab LE.
Cut a piece of 1/8" balsa and glue it in place to cover the cable exit areas. Drill angled holes and insert plastic tubing that had been roughed up on the outside with sandpaper. CA the tubes in place from the inside and trim flush on the outside.
Now run the wires tied to the loops to the appropriate control horn and tie it securely and tightly to the horn. A drop of CA will keep it that way. Don't worry about too tight; you can loosen it at the servo connectors later. What you want is an even strain and straight runs.
That's about it for pull/pull controls. Don't forget to take the bracing strips off before you fly it.

Upper Wing Mounting
Before covering the upper wing you need to mount it on the cabanes, establish the correct incidence and secure the mounting tubes. Start by opening up the decking where each of the cabanes go through. I punched a small locater hole with a piece of wire inserted through the bottom for the rear mount tubes. The front ones required measuring back from the firewall and opening up a small hole with a sharp blade.
With the decking opened up, I inserted the cabanes in their fuselage mounting tubes and DID NOT GLUE them. The notches built into the upper wing structure to receive the upper cabane mounting tubes need to be cleaned up and whittled out a bit to accept the tubes.
The plans show the bottom of the upper wing to be exactly 1.5" from the top decking at both cabane mount stations. I cut two pieces of balsa stick exactly 1.5" long. These were placed as spacers between the deck and wing bottom.
With the upper wing resting on the spacers, I adjusted the wing to be true in all views and ran just a small drop of thin CA into fuselage mounting tubes to secure the cabanes in the correct position.
After securing the lower ends of the cabanes tack the upper mounting tubes into place in the upper wing structure without gluing the cabanes into the tubes. Double check alignment and adjust if necessary while you still can. Remove the top wing and secure the tacked in place mounting tubes. Keep glue out of the tubes. The upper wing is ready to cover.

Mounting the Ailerons
Mount fiber hinges in the aileron LE. Trim the hinges to project only 1/4" past the LE of the ailerons. You need to do this because the CF rear spar is glued to the rear of the TE pieces and you can only cut a slot 1/4" deep.

Mounting the Lower Wing
The lower wing is mounted by cutting an airfoil shaped opening in the side sheeting and gluing the root rib to the fuselage side. Incidence and position are determined by locater holes in the root ribs and fuselage sides. Pay special attention to getting the lower wing panels at the SAME incidence. Dihedral is determined by the mainplane struts, which are first attached to the underside of the top wing. (Be sure to apply the under surface markings before you attach the struts).
Simple enough, the trick being to cut away the sheeting only where you want it cut away. I used a Tee pin and from the inside, I ran it through the locater hole and poked a hole through the sheeting. From the outside I ran a 1/8" drill bit through the sheeting and the locater hole.
So happened that sections of CF spar I had cut off served as perfect locater dowels. With the dowels in place I worked the wing on to the locater's and snugged it up to the fuselage side. With the wing snugged up to the side, draw an outline on the sheeting all around the root rib. Remove the wing and cut out the opening in the sheeting. Cut a bit inside the line and trial fit the wing. Trim the opening as needed until it is just big enough for the wing root.
Before attaching the mainplane struts to the underside of the upper wing, install rigging anchors. I use small brass safety pins with the latch part nipped off leaving a brass loop and two legs. Pairs of holes drilled with a #75 bit allow the legs to be inserted, nipped close and bent over on the back side. A drop of CA secures it.
Open up the holes in the bottom of the top wing and fit the mainplane struts. Trim the hole and or the strut ends to ensure a good fit. Be sure you mount the struts with the rigging anchors on the inside.
Finally, spread a coat of epoxy along the root ribs and locater dowels. Work the wing panel on over the dowels and ensure it is flush to the sides of the inner front fuselage box. Insert the lower mainplane strut ends into the opened up holes in the upper surface of the bottom wing. CA in place to hold the lower panels at the correct dihedral angle while the epoxy on the root ribs sets up. Strengthen the joint with epoxy when the CA sets.

Once I got the model assembled, I installed the rest of the gear, balanced it and got ready for the maiden flight.
I set up the controls using separate channels for each aileron. To reduce adverse aileron yaw, I set the EPA to give 50% less down than up. I also mixed in 15% rudder with the ailerons. I believe I over propped it with a twelve inch prop and on the second flight I used an 11x4.7 APC slow flyer.
Allan did the maiden flight, a much more experienced pilot. The model trundled across the soccer field and finally lifted off. Allan had to correct a tendency to roll left with a good bit of aileron trim. A little up elevator trim was also needed. Once trimmed Allan handed me the transmitter and I flew it around a bit. It looped well, but I tried no other aerobatics. At this point the over propping became noticeable as I began to loose power. Allan brought it in to a very scale like landing. The motor was quite hot, so we decided to use the 11 inch prop on subsequent flights.
On the second flight with the 11x4.7 prop, the model took off an asphalt runway in slightly less distance than it took off from the grass with the 12 inch prop. It cruised around at 3/4 throttle where it had done the same at half throttle with the 12 inch prop. On the other hand the motor was warm rather than HOT after the flight. Seems a 2100 mAh 3 cell pack, the long can 400, 3.5:1 GB and an 11x4.7 prop is a good combination
I maidened her as soon as the model was flyable. This left a list of detailing and finishing chores to do now that I know she's airworthy. Most of this is done to taste by the individual builder and as a static scale building buddy says "Each modeller rises to his own level of masochism". Since you've gotten this far, I assume you have your own list of final touches, so knock yourself out dress up your Nieuport.

Additional notes from Designer, M.K. Bengtson

Steven provided a wealth of feedback to me during the build of this model. I made significant changes in the design as a result of this excellent information. In this manual, I have added notes to Steven's text that present alternative approaches or details.
Initially, we felt that a truly scale mechanism for aileron actuation was practical and Steven's model did use a scale mechanism. However, it was obvious that the average modeller would not appreciate this level of detail and I added in wing servo driven aileron actuators. I left the crank mechanism in place so that it still can be used in the model. It is recommended that the cranks be able to move but not be attached to an internal servo inside the fuselage.
Also, it was obvious that the fuselage has significant strength to allow nearly all balsa construction. Steven's model incorporates a few formers and other parts that were initially made from lite plywood. Production units have balsa instead.
Many small details were added to help keep the model light and especially to avoid the tail heavy condition. Particularly keep this in mind when choosing longeron material. Hard balsa or laminated 1/8x1/16th stock is preferred over basswood. Also, use light blue/pink foam and 1/16" music wire or thinner stock for the tail skid fairing.
Decal outlines for this model are available on www.aerodromerc.com/decals in Adobe Acrobat pdf format for printing out on decal paper.

Aileron Servos

Aileron servos are mounted in wing and attached with short threaded rods to the ailerons. Use a "Y" wiring harness connector to wire the servos to a single radio connection. If differential ailerons throws are desired, rotate each servo horn forward about 20 degrees, while maintaining the neutral position of the aileron. This should counter any adverse aileron yaw.
Windsock Datafile #20 "Nieuport 17" publication has details on placement and markings.

Finished Model

FLYING

Let the model gain altitude slowly off the runway. Applying too much up elevator at slow speeds risks a stall. Make your turns gently as tight turns risk tip stalling in any model. Don't expect the elevator to make the model climb. Think of the elevator as a device to change the attitude of the model. The wing and airspeed ultimately make the model climb. Often down elevator

applied at stalling can avoid a major crash. The most important details for proper flight operations are:

CG location. Tail heavy models never fly well or at all.
Down and right thrust
Straight and non warped wings.

Finished Model

CONTACT INFORMATION

Distributed by:
Bengtson Company
e-mail: sales@aerodromerc.com
Web Site: www.aerodromerc.com