

Experimental Aircraft Models

“Enhancing the Homebuilt Experience”

Radio Control Scale Model

Vans RV-6/6A & RV-7/7A

Scale: 1= 4.62
Wingspan: 59 ³/₄” (1518 mm)
Wing Area: 746 sq. in (4814 dm²)
Flying Weight: 7.5-9.5 lbs (3.4-4.3 kg)
Wing Loading: 23 – 29 oz/ft²
Length: 52” (1321 mm)
Radio: 5 Channels with 7 servos
Engines: .61 – .75 cu in 2 Cycle
.70 – .91 cu in 4 Cycle



Warranty

Experimental Aircraft Models, LLC (EAM) guarantees this kit to be free from defects in material and workmanship. The warranty does not cover individual parts damaged by modification or abuse. In no case will EAM's responsibility or liability exceed the original purchase price of the kit. EAM reserves the right to change or modify this warranty at any time.

EAM assumes or accepts no liability for the manner in which this model aircraft is used by the user, in any condition of assembly. By the act of purchasing this kit, the purchaser and any subsequent user accepts full responsibility and all resulting liability.

If the purchaser is not willing to accept the above liability associated with the use of this model aircraft, the purchaser is advised to return this kit immediately to the source from where it was obtained.

Please read this manual thoroughly before starting assembly. It includes critical assembly instructions and warnings in regards to the safe and enjoyable use of this scale aircraft model.

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About Your Model: You have purchased 1 of a limited production run of RV-6/7A RC model kits in the world. You have a very unique model of an Experimental aircraft.

In the United States, 'Experimental Aircraft' are aircraft that are 51% or more built by an individual (usually at home) and fly under an FAA issued "Flight Permit", rather than "Certification". During the past 20 years the most advanced designs in civil aviation aircraft have come from the 'Homebuilt' arena where, without the burden of certification expense and manufacturers liability insurance, aircraft of amazing performance and safety could be designed and offered to the public.

In our mission to support the homebuilder with a scale model of an aircraft project that may have consumed hundreds/thousands of hours to complete, we have brought together full-scale aircraft kit airframe manufacturers with a state-of-the-art world class ARF (Almost Ready to Fly) model manufacturer. Our intent is to provide as scale a model as possible that is as ARF as possible - within the confines of limited production run sizes and knowledge that a builder will likely customize to match their own aircraft. In that sense, this product caters more to the full scale builders, and scale modelers, than it does 'out of the box' flyers. Some interesting details about the production of this model; We control the entire process of the model construction, starting with the direct import of balsa logs from Ecuador, to hand carving the fiberglass plugs and lay-up of the fiberglass components. The canopy molds are also hand carved and the vacuum forming is all done 'in-house'. Just as the homebuilder customizes their personal aircraft, we have offered this model to you including multiple landing gear configurations in the kit, so that you may choose between the full-scale configurations offered by the airframe kit manufacturer. Furthermore we have included the wing tips and vertical fin and rudder of the RV-6 and the RV-7. In addition our RV-7 model will also accommodate a lighting kit in the wing tip

A final point: Because the model is so special and the volumes (by model standards) so low, we need your help. We have tried our absolute best to get everything right the first time. If there is something during the construction and flying of the model that you feel could be done more easily or better, we'd like to know. This is how it's done in the full size experimental aircraft world, and we want to be sure that the same spirit is carried on in smaller scale. Builders are continually finding ways to improve the full size aircraft, and there is no reason why modelers should not have the same ability to contribute to a better product.

We sincerely appreciate your vote of confidence in purchasing our rendition of Vans Aircraft RV 6/7 and truly wish you the best of enjoyment. Please feel free to e-mail us with kit comments from our web site at www.rchomebuilts.com or call us toll free 888-968-7251.

Andrew Kondor
Managing Director – Experimental Aircraft Models, LLC

GENERAL ASSEMBLY NOTES

Just as the homebuilder customizes their personal aircraft, your Experimental Aircraft Models kit enables you to build *FOUR* variations of the full scale aircraft: by changing wing tips fin/rudder and landing gear, you may choose between the RV-6, RV-6A, RV-7, or RV-7A aircraft. For the complete lineage of the RV series see their website at www.vansaircraft.com.

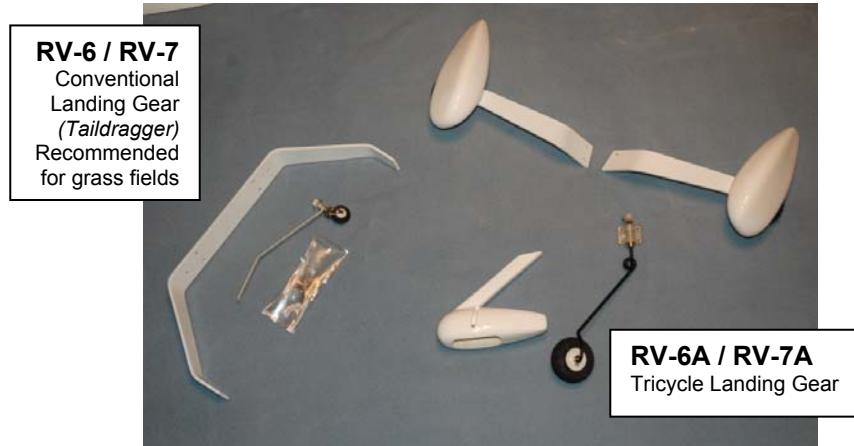


According to the Vans Aircraft website, the RV-6 was the first of the side-by side RV's and became the most popular homebuilt ever. Building on that popularity, the RV-7 has more room, better visibility, more payload, more range, more engine options, and a more advanced kit. In model form, there are cosmetic differences in the wing tips and vertical fin/rudder as shown below.



Note that the RV-7/7A model will also accommodate a lighting kit in the wing tip.

For those unfamiliar with the RV-6/6A and RV-7/7A designation, the RV-6/7 use the Conventional gear (Taildragger) version and the RV-6A/7A variants use the Tricycle gear. Unless your flying field is paved, or a putting green, the ruts in a grass field are about equivalent to an unimproved landing strip in full scale! Thus, as unique as the nose wheel fairing is on this model, *for those builders and modelers flying from grass fields, we recommend installing the Conventional gear.* Indeed, the model built for this manual will end up that way too.



Please note that we use aircraft terminology in our instructions. Specifically ‘Port’ is to Pilot’s left, ‘Starboard’ (or Strbd) is to Pilot’s right, ‘Forward’ is to the front and “Aft” is to the rear. No matter how you may have the model turned “Port” is always the left side of the aircraft as the pilot sits in the cockpit facing forward.

A note about the covering - Your RV-6 is covered in ‘Oracover’ – commonly known as ‘Ultracote’ in the U.S. This is a high quality material, but through temperature changes during shipping, the model may show wrinkles. This is normal. This symptom is also more visible in that the model is fully balsa sheeted. The material can easily be tightened by the application of heat from a hair dryer/heat gun or hot iron. If using an iron, a piece of lightweight cotton (e.g. sheeting) placed between the iron and the covering helps to even the heating. Pressing lightly will transfer the heat to the covering, shrinking the material. Piercing a bubble with a pin and rubbing the hot area with a cloth further helps remove the wrinkles.

Oracover is a very slippery finish that that resists adhesive bonding. It *must* be removed from any joint to be glued. Failure to remove the covering from glue

zones will result in failure of the affected glue joint and likely damage or destroy your model.

The recommended engines are a .61 to .75 two stroke or .70-.91 four stroke. Experimental Aircraft Models discourages the use engines larger than this range. The RV is a relatively light and aerodynamically clean design that simply does not require larger than the recommended engines. Some other notes on engines: most of the engines in the recommended size range weigh roughly the same - 23.5-25 ounces. Using a lighter engine will likely require making up the difference with lead weight. Using a larger/heavier engine might mean that lead will have to go in the tail.

For 2-stroke engines the standard muffler will be very difficult – or impractical to use because it will project way out of the cowl and might also require modifying the firewall for clearance. For this reason we recommend that 2-strokes should be fitted with a side mount or “Pitts Style” muffler to keep the installation simple and preserve clean line of the cowl. The muffler systems on 4-strokes are generally smaller and easier to package. However, 4-strokes are typically much taller than 2-strokes; using a 4-stroke engine will likely require cutting a rocker cover clearance hole. The throttle pushrod location in your kit works well for a 2-stroke, but the throttle arm location on a 4-stroke is substantially different and will require relocating the pushrod.

The RV-6/7 requires a 5 (or more) channel radio system with 7 standard size servos. Technically the RV-6/7 could be flown with a 4-channel radio with 5 servos and the flaps locked in the neutral position – *but where’s the fun in that?*

Additional components you may need from the hobby store:

- CA Adhesive (Thin)
- CA Adhesive (Medium)
- Epoxy (30 minute cure)
- (1) “Y” Long Servo wire harness (for ailerons) with JR Plug (recommended)
- (1) “Reversing” Y Harness (for flaps) with Futaba Plug (recommended)
- Remote glow plug lighter (optional)
- Fuel Filler valve (optional)
- 1 or 2 - 1/5 scale pilot busts (optional)
- Small jar fuel proof paint for under the cowl & touch-ups (optional)

On the Y-harnesses: if you get one of them with the JR plug and the other with a Futaba plug then they can be mated to the same style (either JR or Futaba) connector on the receiver end to prevent cross wiring. If both plugs are the same style, then you will have to mark each lead with a “flag” identifying its purpose.

Keep close track of all the little screws and hardware sets located within all the large component bags. It can be easy to misplace these items. Collect these items in a medium size plastic container or a zip-lock bag to keep them safe until used.

WING ASSEMBLY



Aileron Hinges

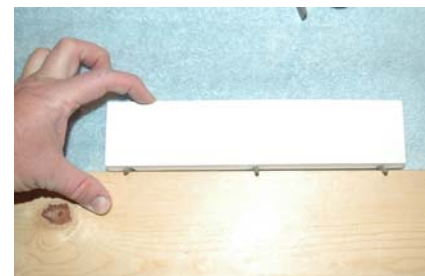
The flaps are already hinged and ready to go; however the hinge points in the ailerons must be seated and epoxied in. A “go slow” approach works best here. The best way to align the hinge points is to epoxy them into one surface, then after the epoxy cures, epoxy the hinges to the other surface.

1. Examine the installation of the aileron. There should be a gap to the wing of no more than $\frac{1}{32}$ ”, but even less is better. Next examine the position of the hinge points in the aileron – do they all appear to be the same depth? We strive to make this installation foolproof, but slight production variation tolerances in the depth of the drilled holes creep in.

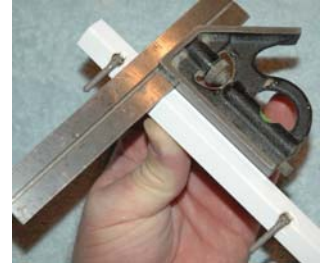
Port Aileron Hinges□, Starboard Aileron Hinges□

2. Remove the aileron and see if the hinge points are all bottomed out in their holes. If necessary us a small drill or even the tip of a small Phillips screw driver to deepen the hole slightly. **DO NOT DRILL TOO DEEP.** The deeper the hole the harder it will be to fill with epoxy and assure a good bond to the hinge point. It should be possible to push the aileron flush against a straight edge with the hinge points installed.

Port Aileron□, Starboard Aileron□



3. When satisfied with the fits, remove the hinge points. Mix a small batch of epoxy and using a toothpick drop some down into each hinge pocket, hold the surface with the hole pointing up so the epoxy can flow down into the hole. Put a second drop in each pocket if needed. One at a time, push the hinge points into their pockets if the epoxy purges out of the hole, then back out the hinge point, wipe the excess epoxy off, then reinsert it. Inspect each hinge to see that it is square to the surface. Then pivot the hinge, and check again to see it is square. Press the surface up against a straight surface to assure the hinges are all seated at the same depth – and the alignment should be assured.



Port Aileron□, Starboard Aileron□

4. When the epoxy is cured, carefully check the movement of each hinge point. You may have to (carefully!) pop the movable end of the hinge point loose from any stray epoxy that has gotten into it. Go slowly until each of the hinges moves freely. Your servos and your battery pack will thank you!

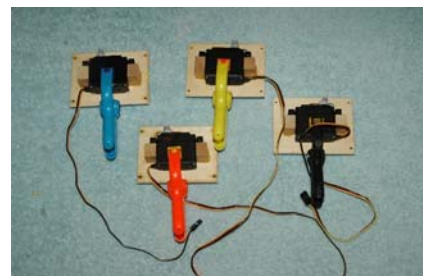
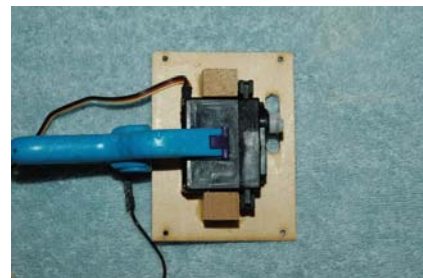
Port Aileron□, Starboard Aileron□

5. Next step is to install the aileron to the wing. The hinge points do not bottom out on the wing side, so it is important that the hinge pocket be wetted out nicely. Install the hinge points onto the wing side, set the hinge gap to no more than 1 mm ($1/32$ "). A good way to do this is by using a thin piece of balsa or thin cardboard as spacers to set the gap consistently. Use some tape on the aileron to hold the position, and then try to set the wing up on its trailing edge while the epoxy cures. That way, any excess epoxy inside the wing should flow back and help lock the hinge point in place. Set aside to cure.

Port Aileron□, Starboard Aileron□

Wing Servos

1. Locate the four servo covers and eight mounting blocks. Note that two of the servo covers have the pushrod slot offset to one direction and the other two to the other direction. The like-oriented covers will each be used on the SAME wing panel, one for the aileron and one for the flap.
2. Assemble all your servos with the output arms, the grommets and the eyelets that go inside the grommet (installed from the bottom of course!



3. For each of the four covers, start by positioning the servo by centering the servo arm in the center of the slot then use a spring clamp to hold it in position.

4. With the servos in position it is a pretty simple to epoxy the mounting blocks in close under the servo lugs.



5. When cured, pop the servos loose – it is likely that some epoxy from the mounting blocks stuck to the servo inadvertently.

6. Finally drill a 1.5mm ($1/16$ ") hole through each grommet and screw the servos to the mounting blocks.

Servo Cover 1□, 2□, 3□, 4□

7. Note again that two of there are two mirror-image “pairs” of wing servo plates. Match these so that each like pair will be used in the same wing panel. Orient the servo covers so that the slots are offset toward the wing tip and towards the leading edge of the wing. Slip the servo covers into place.



8. Use a 1.5 mm ($1/16$ ") bit to drill all four corner holes for the mounting screws. Give each hole a drop of thin CA and when dry drill it again.

Port Flap□, Starboard Flap□

Port Aileron□, Starboard Aileron□

9. Assemble the clevis onto the aileron & flap links, and install each link onto a control horn. Align the horn and link with the servo arm, align the horn as far forward as possible WITHOUT overhanging the beveled edge, then drill a 2mm ($3/64$ ") hole for each control horn screw.

Port Flap Horn□, Starboard Flap Horn□

Port Aileron Horn□, Strbd Aileron Horn□



10. Install the horns. Cut off the excess mounting screw length and file or grinding off the burr – it looks better than that extra bolt hanging out!

Port Flap Horn□, Starboard Flap Horn□
Port Aileron Horn□, Strbd Aileron Horn□



11. Drill out servo output arms to 2 mm ($\frac{5}{64}$ ") to accept the wire pushrods.

Port Aileron Servo□, Strbd Aileron Servo□

12. Before making the pushrods plug the servos into their respective channels and center them electronically. Use the Y-Harness for the aileron servos so both are working together. *This step is optional:* after the servos are centered, remove the output arms and displace them by rotating one or two splines FORWARD of the zeroed position. This will provide a small amount of differential throw and somewhat reduce the need for rudder input when turning & banking.

Put a shallow (roughly 10°) bend in the aileron links, 75mm (3") from the pin in the clevis. Where the link passes the output arm bend the link to 90° install the plastic retainer, then cut/file the end of the link to flush with the keeper. With the first link as a guide, bend a "mirror image" link for the opposite Aileron. Install and adjust the aileron to neutral. Check for freedom of motion: it may be necessary to widen or lengthen the slot in the servo cover to ASSURE unbinding movement.

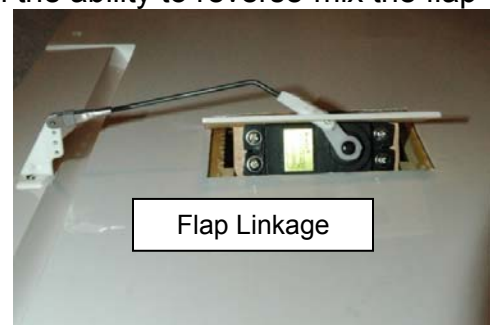
Port Aileron Servo/Linkage□, Starboard Aileron Servo/Linkage□



13. Drill out servo output arms to 2 mm ($\frac{5}{64}$ ") to accept the wire pushrods.

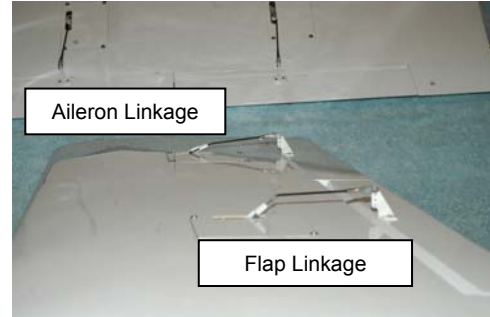
Port Flap Servo□, Starboard Flap Servo□

14. Unless you are using a computer radio with the ability to reverse-mix the flap servos, you will need a reversing Y-Harness for the flap servos. Frankly even with the computer, the reversing Y is the simplest means to get both servos moving the same direction. Plug both servos into the Reversing Y and make sure the servos are moving the same direction, then - if needed - remove the servo arm from one servo and reinstall it so it matches the position of the other servo. You might find this easier to do by temporarily plugging the flap harness into a centering channel, like the



Aileron, Rudder or Elevator channel, and then set both servo arms to neutral. When you plug the harness back into the flap channel you should see the servos working together throughout the range of flap settings.

Put a fairly abrupt (roughly 30°) bend in the flap links, 75mm (3") from the pin in the clevis. Where the link passes the output arm bend the link to 90° install the plastic retainer, then cut/file the end of the link to flush with the keeper. With the first link as a guide, bend a "mirror image" link for the opposite Flap. Install and adjust the flap to neutral. Check for freedom of motion: it may be necessary to widen or lengthen the slot in the servo cover to ASSURE unbinding movement.



Port Flap Servo/Linkage, **Starboard Flap Servo/Linkage**

15. The Y-harnesses do not have to be installed until AFTER the wing is joined, however, installing the harness in one wing prior to joining the halves, then the other wing after joining can make it a little easier to handle. Note there are strings to help pull the harness through to each servo connection. Begin by routing the port aileron servo cable through the wing until it reaches the flap servo bay. Tape one leg of the Y harness to the string and gently pull it through the wing to the flap servo bay. You should be able to connect the aileron servo to the Y without an additional cable extension. Secure the connection with a piece of electrical tape or shrink tubing; some folks simply tie the connection together using dental floss!

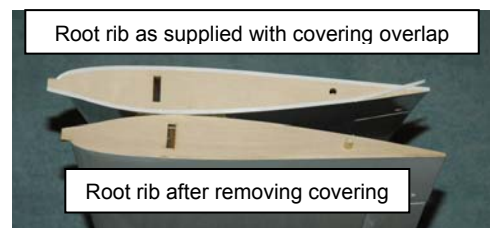
Port Aileron Servo Connection

16. Tape a small weight (like a #6 x 1" screw) to the end of the string and feed it back through the Port wing, from the center out to the flap servo bay. Use the string to pull 1 leg of the Reversing Y Harness through the wing to the flap servo bay. Connect the flap servo to the harness and secure the connection with a piece of electrical tape or shrink tubing – or dental floss.

Port Flap Servo Connection

17. Before joining the wing halves, make sure to remove the Ultracote that has been wrapped over the center rib at the edges. This is VITAL to the integrity of the center wing joint! Use a razor knife to lift/trim the overlapping material.

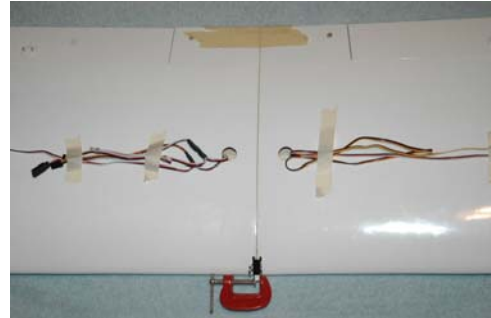
Port Wing Root **Starboard Wing Root**



18. Trial fit the wing joiner block in each wing half, and then slide the wing together over the joiner. It should close up the gap nicely.

Wing Joint Trial Fitted□

19. Mix a batch of 30 minute epoxy using a popsicle stick. Use the stick to reach into the each wing pocket and wipe with epoxy. DO NOT OVER DO IT each of the pockets is sealed. If you over-fill the joiner pocket with epoxy it will have a tough time running back out and could prevent the joiner block from fitting all the way in. Finally give each side of the wing root rib a wet (but do not puddle it) coat of epoxy. Slide the wing together. Use a clamp on the front tab, and tape at the back to hold the two halves together.



Use a paper towel wetted with acetone, lacquer thinner, or alcohol to clean off the excess epoxy around the center joint. Clean up any inadvertent “epoxy fingerprints” you may have left along the way. Let the epoxy cure, preferably overnight

Wing Joint Epoxied□

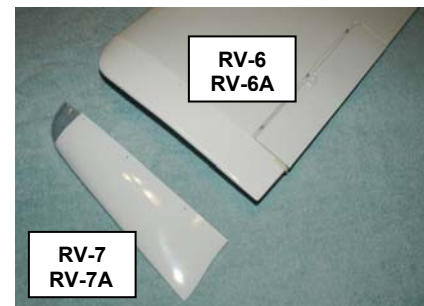
20. Complete the installation of the Aileron Y-harness in the Starboard wing. Begin by routing the Starboard aileron servo cable through the wing until it reaches the flap servo bay. Tape one leg of the Y harness to the string and gently pull it through the wing to the flap servo bay. You should be able to connect the aileron servo to the Y without an additional cable extension. Secure the connection with a piece of electrical tape or shrink tubing, or dental floss!

Starboard Aileron Servo Connection□

21. Tape a small weight (like a #6 x 1” screw) to the end of the string and feed it back through the Starboard wing, from the center out to the flap servo bay. Use the string to pull the second leg of the Reversing Y Harness through the wing to the flap servo bay. Connect the flap servo to the harness and secure the connection with a piece of electrical tape or shrink tubing – or dental floss.

Starboard Flap Servo Connection□

22. Now for the first big decision – RV-6 or RV-7 wingtips? The RV-6 wingtips are the straight tips molded of fiberglass and can be expected to be a bit more durable. They will require some sanding and fitting on the inner edges. The RV-7 tips were formed in clear plastic and have a clear lens for a light.



For either tip the installation is the same. Fit it in place and mark the attachment screw locations. Remove the tip; drill each of those mounting holes with 1.5mm ($1/16$ ") drill by 10mm ($3/8$ ") deep. Put a drop of thin CA in each hole. Slip the tip back into position and install the retaining screws.

Port Wing Tip Starboard Wing Tip



23. Install the two plywood patches that reinforce the wing attachment bolts. Remove the Ultracote from the area where the patches will be glued. Use the wing bolts to align the holes with those in the wing, and glue down the patches using medium CA.

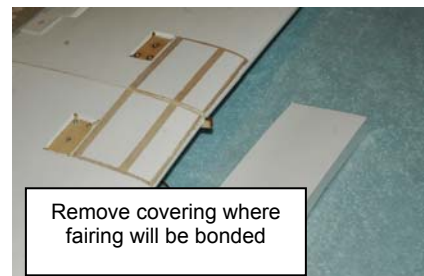
Port Bolt Support Starboard Bolt Support



24. Last piece to install will be the fairing under the leading edge. Begin by marking the location of the fairing. Install the wing and locate the fairing so it aligns side to side with the fuselage. Mark the position the remove the Ultracote from the gluing surfaces by using a small soldering iron like a hot knife.

MEMO: This picture also shows the covering removed from the main gear for the trike installation – that will be covered in more detail later. These bays to NOT have to be opened up to install the wing fairing.

Wing Prepped for Fairing



25. With the wing installed on the fuselage, install the wing fairing using medium CA. The fairing should align side to side with the fuselage, and preferably will have a SMALL (1 mm) gap to the bulkhead – allowing for sealing material to be added later on

Wing Fairing Installed



FUSELAGE & TAIL ASSEMBLY

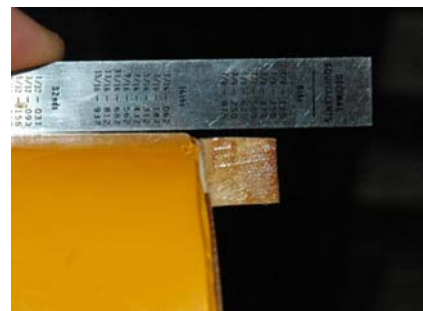


Certain details of the engine installation will vary depending on whether you use a 2 stroke or 4-stroke engine. We will cover both installations, noting any peculiarities encountered. Luckily the engines we will use as our examples have the same mounting dimensions so we can switch back and forth fairly painlessly.



1. Using a straight edge, check the contouring of the cowl mounting blocks relative to the line of the fuselage. In the picture to the right the block has been sanded and tapered to match the fuselage. Check/correct all six mounting blocks. IF you have to sand the surface then re-seal the wood afterwards with a few drops of thin CA.

Cowl Mounting Blocks (x 6) fitted



2. This step is optional and cosmetic. Before starting the installation of the engine, paint the front end to cover up the wood; after all the RV's are all-metal airframes! Use fuel proof dope (like Sig or Brodak) or polyurethane paint in the color of your choice. While you are at it try to fuel proof the inside of the fuselage too. Spray clear works well inside to reach some of the unreachable nooks and crannies.

Front End Painting Completed



3. Slide the cowl into position all the way back against the fuselage. Measure the distance from the firewall to the nose ring of the cowl – in this example the distance was measured as $5 \frac{1}{8}$ " (130.2 mm)

Measured Cowl Length _____



4. Install the engine mounts to the firewall using the 4mm x 30mm bolts. Install these loosely enough to allow adjustment in width to fit the intended engine. Slip the engine into the mounts and hold in place with a rubberband. Align a straight edge with the front of the drive washer. Slide the engine fore or aft on the mount until the distance from the firewall to the drive washer is 1.5 mm ($\frac{1}{16}$ ") greater than the cowl length measured in Step 3. For this example, the cowl length was measured as $5 \frac{1}{8}$ " (130.2 mm) so the target dimension: firewall to drive washer is $5 \frac{3}{16}$ " (131.7 mm)

Firewall to Drive Washer Target: _____ and Actual _____



5. When the engine position has been set, spot mark the location of the engine mounting holes on the mounts. The engine mount can be drilled either in place, or the mounts can be removed and set-up in a Drill Press Vise for drilling. Drill the mounts for the 4mm x 30 mm engine mounting bolts. OPTIONAL: If you have the proper tools, drill and tap the mount for the 4mm engine mounting bolts. In either case the supplied 4mm nuts must be used to lock down the engine to the mounts.

Engine Mount Drilled



6. Mount the engine in preparation for cowl fitting. Omit the muffler for now.

Engine Mounted

7. Slide the cowl over the engine. The 2-stroke should be easy, but for a 4-stroke you will probably have to remove the rocker cover for the cowl to fit.

Cowl in Position



8. Install the spinner backplate. Use a spacer or a prop and “finger tighten” the prop nut to hold the backplate in place. Double check alignment of the spinner to the cowl – it should be OK but if it is not you may be able to sand the back of the cowl to make it fit better. With the cowl aligned to the spinner backplate, slip



some shims (scrap balsa or cardboard works great) between the cowl and the spinner backplate. Use a 1.5 mm ($1/16$ ”) bit to drill the 6 cowl mounting blocks for the mounting screws. Install the screws as you go to help keep things aligned while the next hole is drilled. Remove the cowl and harden each drilled hole with a drop of thin CA.



Cowl in Position

9. THIS STEP IS FOR 2-STROKE INSTALLATION ONLY. This is also a step where the old adage to “measure twice before cutting once” will come into play! Start by installing the Pitts-style muffler. Measure from the main firewall forward to the exhaust pipes, at the outermost and forward most positions for each pipe. Remove the muffler and slip the cowl into place. Transpose the dimensions you took onto the lower cowl. Drill or grind some roughly 7mm ($1/4$ ”) holes in the cowl somewhat short of and inboard of the expected final position for the exhaust pipes. Use tin snips to cut from the back of the cowl to the exhaust tube holes - this gets you close.



Reinstall the muffler, slip the cowl into place and start filing, sanding, or grinding the cowl opening to fit the muffler. A Dremel grinding tool with a sanding drum used

with care and patience will help you finish the job quickly. Strive for a minimum 2 mm (1/8") clearance between the exhaust tube and the cowl. In an effort to maintain a cleaner line, note that the sides of the cut follow the sides of the lower cowl scoop.

Cowl Fitted Over Muffler



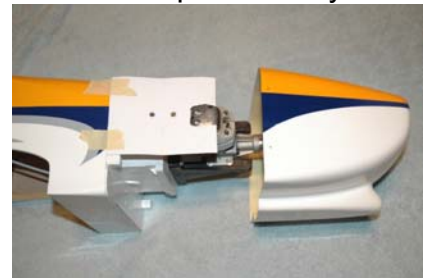
10. THIS STEP IS FOR 2-STROKE ONLY. In order to use the Throttle pushrod in the location provided you must first loosen and relocate the throttle arm on your engine into an "overshoot" position. This will allow the throttle pushrod to come over the top of the muffler and then dip down to the throttle arm. Confirm that pushrod does not foul anything throughout its range of motion, and that the movement is free from binding – adjust to suit.

Throttle Arm Relocated, Pushrod Checked

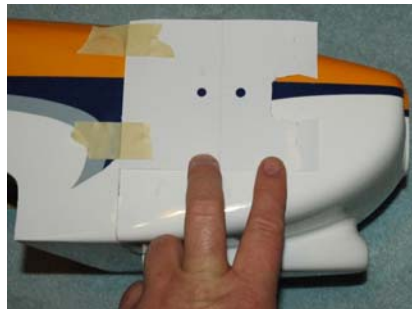


11. THIS STEP IS FOR 4-STROKE INSTALLATION ONLY. A quick survey of available 4-strokes indicates that all but one (the RCV91-CD) is too tall to fit under the cowl. A cut-out is needed in the cowl to clear the rocker cover. First step in this process will be to make a card stock template of the shape required to fit around the rocker cover. Make this temple "tight" as we will adjust the cut-out in the cowl to the final dimension. Tape it in place on the fuselage behind the cowl line.

Rocker Cover Template Made



12. THIS STEP IS FOR 4-STROKE INSTALLATION ONLY. Remove the engine (or just the rocker cover) and install cowl. Trace the template onto the cowl.



Template Transferred to Cowl

13. THIS STEP IS FOR 4-STROKE ONLY. Using drills, scissors, or your grinding tool cut a hole in the cowl per your template line. Slip the cowl into place, and note any interferences. Continue shaping the opening until you have roughly 2mm (1/8") clearance to the rocker cover.

Cowl Rocker Cut-Out Completed



14. Note that the muffler opening cut for the 2-Stroke earlier in Steps 9-10, is also workable for the 4-stroke.

Use the paper template method as shown in steps 11-13 to locate any other holes needed: Needle valve, Glow plug (more on that later), or other.

All Cowl Cut-Outs Completed



15. THIS STEP IS FOR 4-STROKE ONLY. Because the throttle arm on a 4-stroke is in a vastly different location than it is on a 2-stroke, it will be necessary to relocate the throttle pushrod. Start by repositioning the throttle arm in an "overshoot" orientation, then use a long drill to reposition the throttle pushrod to the proper location.

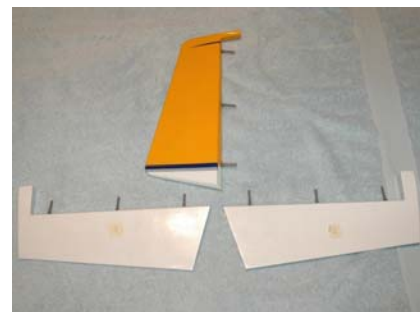
Throttle Pushrod Relocated



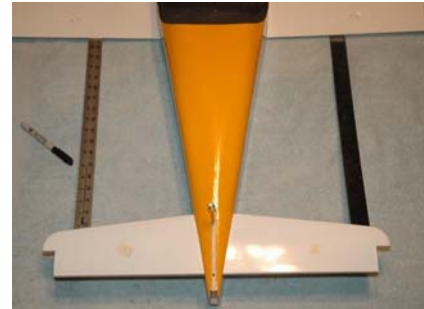
Tail Assembly

1. Mark the elevators on each side with either a # 1 or #2. Use a felt tip pen, or write the numbers on a piece of tape FIRST then transfer to each surface. Intent is to not lose track of which elevator is mated to which side of the stab. After marking remove the elevators. While you are at it, remove the rudder from either the RV-6 or RV-7 assembly – which ever you have chosen. The RV-7 (with the counterbalance) is shown here. Remove, then epoxy the hinge points into just these surfaces. After the epoxy cures, check the hinges for free motion, chip away any excess epoxy and set these aside until they are needed again.

Hinges Epoxied to Movable Surfaces



- Slide the horizontal stabilizer into the fuselage. Note that there is a hole for a bolt that passes from the vertical fin through the stab just behind the leading edge. For now, slip a small screwdriver through this hole to make sure it is centered. Install the wing. align the stab to the wing by measuring from the trailing edge of the wing to the hinge line of the stab. If you have two yardsticks or rulers (24" minimum) you can tape the rules to the bottom of the stab with their edges aligned with the hinge line of the stab. Then just keep wiggling the stab back and forth until the measurement to the trailing edge of the wing is the same on both sides.



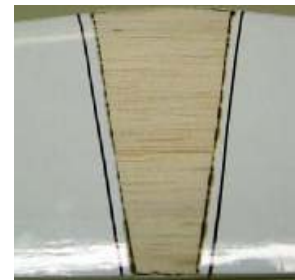
Stabilizer Aligned

- Use a felt tip pen to mark the position of the aligned stabilizer with the fuselage. The Ultracote covering MUST be removed between these two lines. Install the vertical fin and mark its intersection with the top of the fuselage. Again, this is where the Ultracote must be removed from the bottom of the fin and the top of the fuselage to assure a great bond.



- Use the small soldering iron to burn & seat the covering along the marker lines, remove the covering from the center of the stabilizer and from the fuselage under the base of the fin.

Covering Removed



- It will be a little easier to install the elevator and rudder pushrods now, before the stab is in the way – not that it cannot be done later. Start with the double-output elevator pushrod, then install the rudder pushrod. Install the clevis's on the outside to keep the rods from sliding back into the fuselage, then tape the



front end of the rods down to keep them from rattling about.



Elevator and Rudder Pushrods Installed □

6. Install the horizontal stab using 30 minute epoxy and CA. Begin by applying a wet but not gloppy coating of epoxy inside the top of fuselage – the top block that contacts the stab. Next apply a wet coat to the top of the stab not the bottom. Carefully slip the stab to just before the epoxied area. Lay a bead of epoxy on the previously wetted stab, next to where it is ready to enter the fuselage. Slide the stab in, that bead of epoxy should spread itself out along the way. When you get the stab all the way in place, slip that screwdriver back into the hole to make sure it will pass. The area where you cut the covering should guide you to aligning the stab. But measure it anyway. Use some paper towels soaked with alcohol or acetone to clean up an excess epoxy on the surface of the stab.

Flip the fuselage over. Again making sure the stab is aligned, wet the bottom stab to fuselage joint with thin CA. Then go back over the joint with medium CA. This will lock the stab into position and hold it while the epoxy cures.

Coat the bottom of the fin with epoxy, remove the screwdriver from the front fin bolt hole, and slip the fin into position. Install the washers and lock nuts onto the screw threads that protrude from the bottom of the fuselage, and carefully snug them up. This should pull the fin down into its slot. Back on top use any extra epoxy to fill in any remaining gaps around the stab or between the fin and the fuselage. Clean up the excess epoxy again, then let it sit until the epoxy cures out.

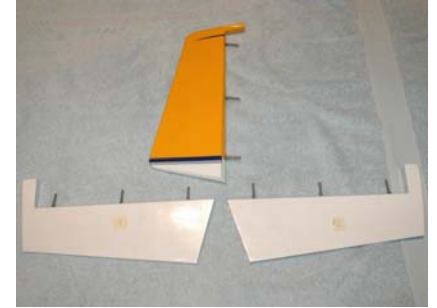
Stabilizer and Fin Installed □

7. Install the tail fairing at the base of the fin and top of the stab using the 4 provided screws. Trim if/as required. HINT: you can hold the fairing tight to the surface and “wick” in some thin CA along the joint to fix any gapping.



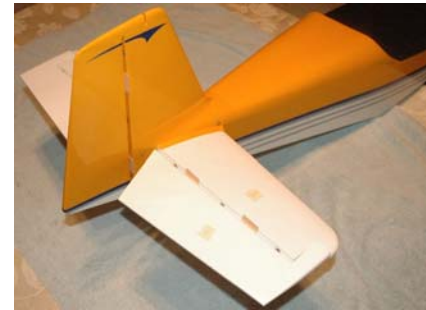
Tail Fairing Installed □

8. Back in step 1 we epoxied the hinge points to the movable surfaces. Now its time to finish the job. If you have not done so already, check out EVERY HINGE and make sure it moves freely and is free of excess epoxy. Remember the tape markers we put on the elevators - match them all up. Pre install and make sure every thing fits well in preparation for the final installation



Movable Control Surfaces Prepared

9. Mix a batch of 30 minute epoxy. Using a toothpick, wet out and put a drop on each hinge point hole. Carefully install each control surface. Use $\frac{1}{32}$ " balsa or thin cardboard shims to assure a uniform and close hinge gap on each surface. Allow to cure, preferably overnight. When cured, wiggle each control surface and inspect EVERY hinge for signs of globs of epoxy that could be interfering with free motion of the control surface.



Movable Control Surfaces Epoxied On

10. Next install the control horns. For the rudder, start by installing the horn on the clevis on the rudder pushrod. This will align it at the correct height. Next slide the base of the horn on the fore and aft on the rudder until the pushrod holes align with the hinge line. Put a pin in one hole to locate it while you drill the other. Then put a screw into the hole you just drill, remove the pin and drill the second hole. Install the backing plate. When snug, clip off the excess bolt length and file off the burr.



Rudder Horn Installed

11. When using a double ended pushrod it is imperative that the elevator horns be installed correctly and exactly opposite each other in order to assure that the elevators always move in complete unison. Start by loosely taping the FRONT of the pushrod to the center of the servo mounting bar up front. Better still; use a small piece of plastic over the wire so the pushrod will still move. Install an elevator horn on each clevis. Use some clamps or tape to hold both elevators in the neutral position. Position the horns an equal distance from the centerline of the fuselage, i.e., offset from the edge of the elevator by 12-16mm ($\frac{1}{2}$ " to $\frac{5}{8}$ "



from the edge of the elevator. Use a pin in one of the horn mounting holes to hold its position on the elevator then drill. Install the bolts and back plates, snug down and cut/file the excess length of the bolt.

Rudder Horn Installed

Fuel Tank – Build & Install

1. Locate all the tank hardware. Bend two of the tubes into a gentle radius bend. When installed one of the tubes (overflow, capped during flight) will go the top of the tank, the other (muffler pressure) goes to the bottom. The engine fuel feed clunk line should be just about 10mm ($\frac{3}{8}$ ") short of the back of the tank. Install the tubes and stopper, align the tubes and carefully tighten the screw to expand the rubber stopper – do not over tighten but the stopper should be snug. When completed use a permanent marker to show which tube is which.

Fuel Tank Assembled



2. Before installing the tank, reach-up into the tank compartment and feel in any of the engine mount bolts will project back into the fuel tank. The lower Starboards side bolt will come into play, If it is projecting through either cut it to a shorter length or add some shims, like 5 extra washers shown here) to keep the bolt from sticking through the firewall and puncturing the tank. Trial fit the fuel tank into the hole in the firewall to make sure it clears everything,



Excess Engine Mount Bolt Length Secured

3. Shown here are some of the materials we will be using to install the tank:
 - Tank
 - 7mm (1/4" foam pad
 - Double sided foam tape
 - Silicon Seal
 - Plastic tie straps (2)



4. Put a layer of double stick tape on the bottom of the tank; use it to attach the foam pad to the tank.

Foam Tape Installed



5. Reach up inside the tank compartment, you will find that the bottom of the platform has lightening holes cut into it that we will use to VERY LOOSELY install the two tie straps. Intent is to get them into position with plenty of room to slide the tank in.

Fuel Tank Tie Straps Positioned ☐



6. Liberally coat the front of the tank with silicone seal, being sure to get a bead right around the tank stopper.

Slip the tank into position, with the stopper sliding into the hole cut in the firewall. Using needle nose pliers or forceps, pull the tie straps snug – no need to over do it



When finished, the tank should be secured; sealed to the firewall, and “floating” on the just slightly compressed foam pad.

Tie Straps Snug, Fuel Tank Installed ☐



Under Cowl Installation Detailing

The RV cowl makes for a super clean installation, but access is blocked for simple things like fuel filling and glow plug access. To be sure, it is possible to simply cut access holes for the glow plug and it is possible to route some of the fuel tubing outside the cowl, but that can detract from the clean appearance. Thus we will install these features to improve accessibility.

1. Shown here is a Great Planes Easy Fueler Valve (similar products also available from other sources) shown installed on a plastic bracket made from an old large control horn. The valve was positioned so that is roughly flush with the surface of the cowl.



It is shown on the Starboard side but could have just as easily been put on the bottom (where it would be hard to see or access or on top of the fuselage).

The valve will be used to fill the tank through the Muffler Pressure line. Another fuel line is needed to run the fuel tank overflow out of the cowl. Although not really necessary, you might find it beneficial to get a couple different colors of silicone tubing to use for the fuel feed, the muffler pressure lines and the fuel tank overflow.

After installing, use the paper template method to locate a cut-out in the cowl side
Fuel Filler Valve Installed □

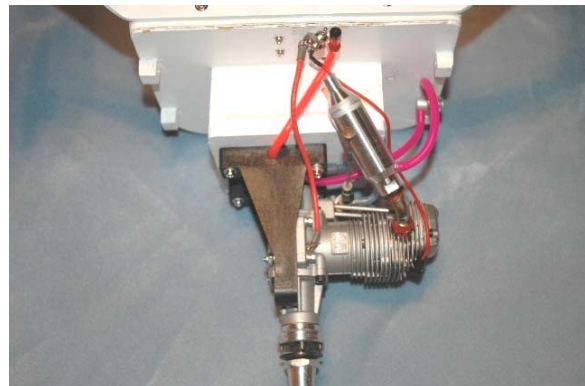


2. No matter whether you install a 2-stroke or a 4-stroke engine, access to the glow plug will be restricted. Rather than cut a large access hole, try installing a remote glow access point. The unit shown was mounted to the firewall using one of the unused nose gear block screw points. In that position it will be protected, and not hard to find by touch.

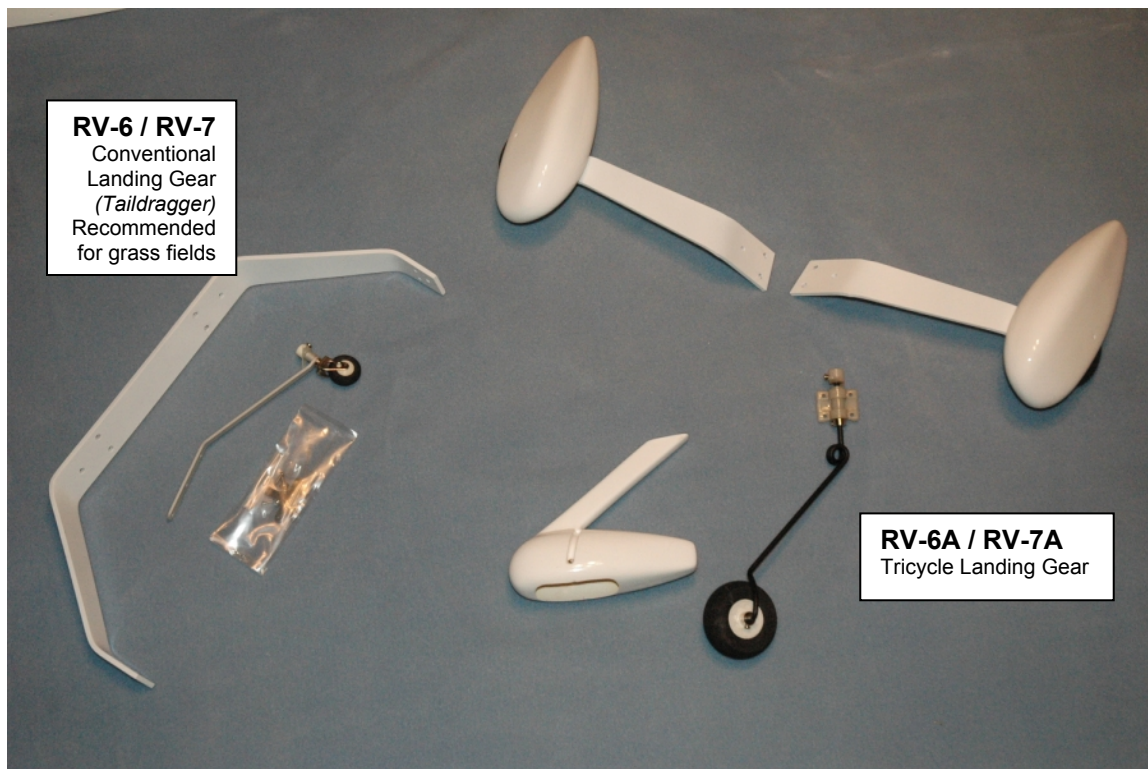
Fuel Filler Valve Installed □



3. Some other pictures for review: an exhaust diverter will be installed but is not shown here so as not to block the view of the remote glow. Also note the overflow tube (capped for flight) and needle valve extension...



LANDING GEAR INSTALLATION



Trike Gear Set-up



1. Locate the nose gear fairing, wire, wheel, collars and straps. Take the wheel and colors off the wire.
 - Slip the wire into the fairing part way
 - Then slip a collar onto the wire
 - Then slip the wheel over the wire
 - Then slip the second collar over the wire.
DO NOT tighten anything yet.



2. Fit on of the metal brackets over the wire and onto the fairing near the top. Drill the two 1.5mm ($1/16$ ") holes into the fairing where the bracket goes, and install the bracket screws.

Repeat for the second bracket to be located somewhere midway along the wire and fairing juncture.

Wire to Fairing Brackets installed



3. Center the wheel in the fairing and lock down the collars to hold it in position. Allow enough clearance for the wheel to spin freely

Wheel Centered & Secured



4. The RV is supplied with a double-arm steering arm. Cut off the unneeded arm as it will restrict movement in that direction.

Steering Arm Cut Off



5. Install the Nose gear pivot block onto the firewall using the 3mm bolts provided.

Nose Gear Block Installed



6. Install the nose wheel pushrod with the Z-Bend to the firewall side. slip the nose gear arm over the Z-Bend

Steering Arm installed

7. Slip the nose gear through the Nose Gear Block and the Steering Arm. Lock down all the set screws.

Nose Gear Installed



The Main Gear mounts are located under the covering just aft of the lower wing fairing. Cut away the covering to expose the mounts, and seal the edges of the covering.

OPTIONAL: fuel proof the mounts with a coat of paint before installing the gear using the 4mm bolts provided.

[Main Gear Installed](#) □



Taildragger Set-up



1. One of the features of this kit is the ability to build it as either a trike or tail dragger, and to switch back and forth if you choose. If you intend from the outset to build yours as a Taildragger than this step will not be necessary. If you removed the covering (Step 7 under "Trike Gear") then use the supplied landing gear covers to cover over the trike gear landing gear mounts.

[Main Gear Covers Installed](#) □



2. The tail dragger uses the one-piece landing gear. Move the wheels and wheel pans to that gear and use the 4mm bolts to attach the gear to the fuselage just behind the firewall.

[Main Gear Covers Installed](#) □



3. One of the signatures of the full size Taildragger RV's is the extended tail wheel – mimicked on our model. Begin by installing the metal bellcrank on the bottom of the rudder. It should be located on center and as far forward as possible without interfering with the movement of the rudder. Locate & drill pilot holes, put a drop of thin CA in each, then screw the bellcrank down

Tail wheel Bellcrank Installed



4. The tail wheel bracket is attached at three points. We will use the one of the long bolts from the Fin at the center position of the bracket with screws in the front and rear attach points. Locate & drill the front and back holes, treat with a drop of CA then install the bracket

Tail wheel Bracket Installed



5. The tail wheel control arm is connected to the rudder via two springs. It is important these be the same length without a lot of stretch. Measure the distance from the bellcrank mounted in step 2 to the steering arm on the bracket. Bend a right angle on one end of both springs, hold them together (forceps work nice) next to the bend, measure back to where the other bend should be and bend both springs together.

Target Length for Springs: _____, Springs Bent



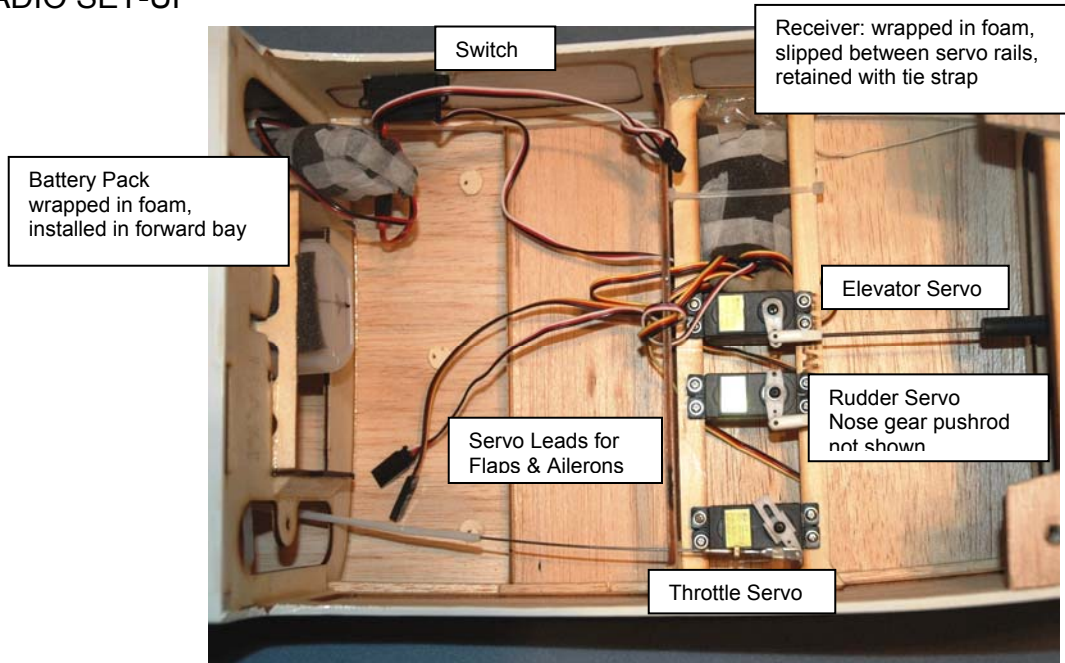
6. Install the springs connecting the bellcrank on the rudder to the tail wheel steering arm. Wrap the loose ends around in such a way to prevent them from coming off. Loosen the setscrew in the steering arm, align the tail wheel with the rudder (both straight) then lock down the setscrew, with a drop of loctite or thin CA to help safety it

Tail wheel Springs Installed

Tail wheel Centered & Loctited



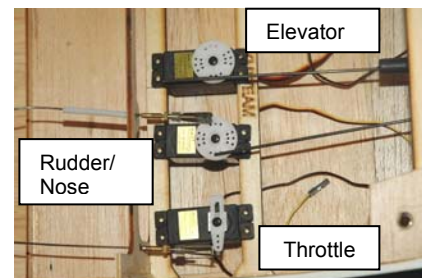
RADIO SET-UP



1. The dual outputs on the elevator work best when the pushrod runs straight down the center of the fuselage. Some compromise versus “perfection” must be tolerated, but can be minimized. Start by measuring from either side and drawing a line locating the center of the fuselage on the two servo rails.

Loosely fit all three servos into place:

- Align one side of the side of the elevator servo even with the centerline on the fuselage
- If you are using the nose gear align the rudder servo to that pushrod
- Align the throttle servo with its pushrod



With the three servos aligned, drill pilot holes and mount the servos.

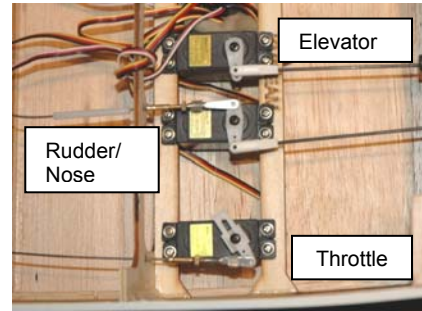
Fuselage Servos Installed

2. Neutralize the elevator; bend the elevator pushrod to length. In order to use the swing-arm keeper you will need to replace the servo wheel with an arm. Install keeper and clip the excess wire.

Elevator Pushrod Installed

3. Neutralize the rudder, bend the rudder pushrod to length. In order to use the swing-arm keeper you will need to replace the servo wheel with an arm. Install keeper and clip the excess wire.

Rudder Pushrod Installed



4. If you are using the nose gear, then route the pushrod through the plastic tube installed in the firewall, the pre-bent Z-bend stays on the firewall side – see Step 6 under “Trike Gear Set-up”. At the servo end, install the adjustable clevis half way onto the threaded brass coupler, run it parallel to the wire pushrod, and with everything center determine where to clip the wire. Solder the brass coupler to the wire rod, install and adjust. A note on steering: use the innermost available servo output – a little nosewheel steering goes a LONG way! Too much steering motion will make the RV6A/7A hard to control.

Nose Gear Pushrod Installed

5. Thread the throttle pushrod through its plastic tube with the Z-bend. on the engine side. At the servo end, install the adjustable clevis half way onto the threaded brass coupler, run it parallel to the wire pushrod, and with both the servo and carburetor set to high throttle, determine where to clip the wire. Solder the brass coupler to the wire rod, install and adjust.

Throttle Pushrod Installed

6. The RV kit provides a place on the forward Port side of the fuselage to mount the radio switch. Cut away the covering and install the switch.

Switch Installed



FINAL ASSEMBLY

1. **CANOPY INSTALLATION:** The canopy is very large and if installed early it could take a lot of abuse as the model is rolled over and such. Beside the cabin floor provides a nice place to rest the fuselage without it rolling over! All that should be done by now. The mounting holes are pre-drilled in the canopy. Slip the canopy into position and make sure that it covers the complete cockpit opening and is reasonably centered from side to side and hold it in place with spots of tape.



Drill pilot holes, harden with CA and install the canopy.

Canopy Installed

2. WEIGHT AND BALANCE - This is probably the most critical assembly step you do! It is likely that you will have to add nose weight to the model. This would not be unusual as the full-scale aircraft is designed to carry over a third of its empty weight forward of the firewall. It's a 'price' we pay for being scale. We recommend setting the balance of the model at 3 ¼" aft of the leading edge, which is approximately the 25% chord line. Moving the balance point further forward, up to ½", will increase the pitch stability of the model. Err in that direction for the first few flights. Moving the balance point aft will decrease the pitch stability, giving a livelier feel - at the risk of being able to easily over-control the aircraft. Try our setting and then feel free to experiment. The RV-6 is a wonderfully stable and responsive model.

BENCH PRE-FLIGHT

We recommend the following control surface movement for the initial flights. If your transmitter has dual rates use these as a guide:

- Rudder, measured at the top of the Rudder trailing edge, each side of center: 15mm – 22mm ($\frac{5}{8}$ " – $\frac{7}{8}$ ")
- Elevator, measured at the trailing edge near the rudder, each direction from center: 10mm – 16mm ($\frac{3}{8}$ " - $\frac{5}{8}$ ")
- Ailerons, measured at the wing tip end, each side of center: 10mm – 16mm ($\frac{3}{8}$ " - $\frac{5}{8}$ ")
- Flaps, measured at the trailing edge from top of flap to top of wing: $\frac{7}{8}$ " (22mm) Try using about 7mm-10mm ($\frac{1}{4}$ " to $\frac{3}{8}$ ") for Takeoff and up to full deflection for landing. **THE FLAPS WILL SLOW THE BIRD DOWN** be ready to keep some throttle on.
- Make sure all clevises have their silicone keeper rings in place and as close to the servo or control arm as possible.
- Make sure all servos have their output arms held in place by the center screw
- Be sure the steering arm has been tightened – consider using loctite to secure
- Check that all control surfaces move freely
- Check that control surfaces are at the same relative angles – i.e. in line with the flying surface to which they are attached.
- Check that all control horns are firmly attached
- Check that all control surfaces are firmly hinged by tugging on them
- Put some fuel in the tank and make sure the plumbing is correct
- Check correct operation of control surfaces with your radio – that left is left, etc. Better still, have a flying buddy check it TOO!
- Go have fun and enjoy safely!

