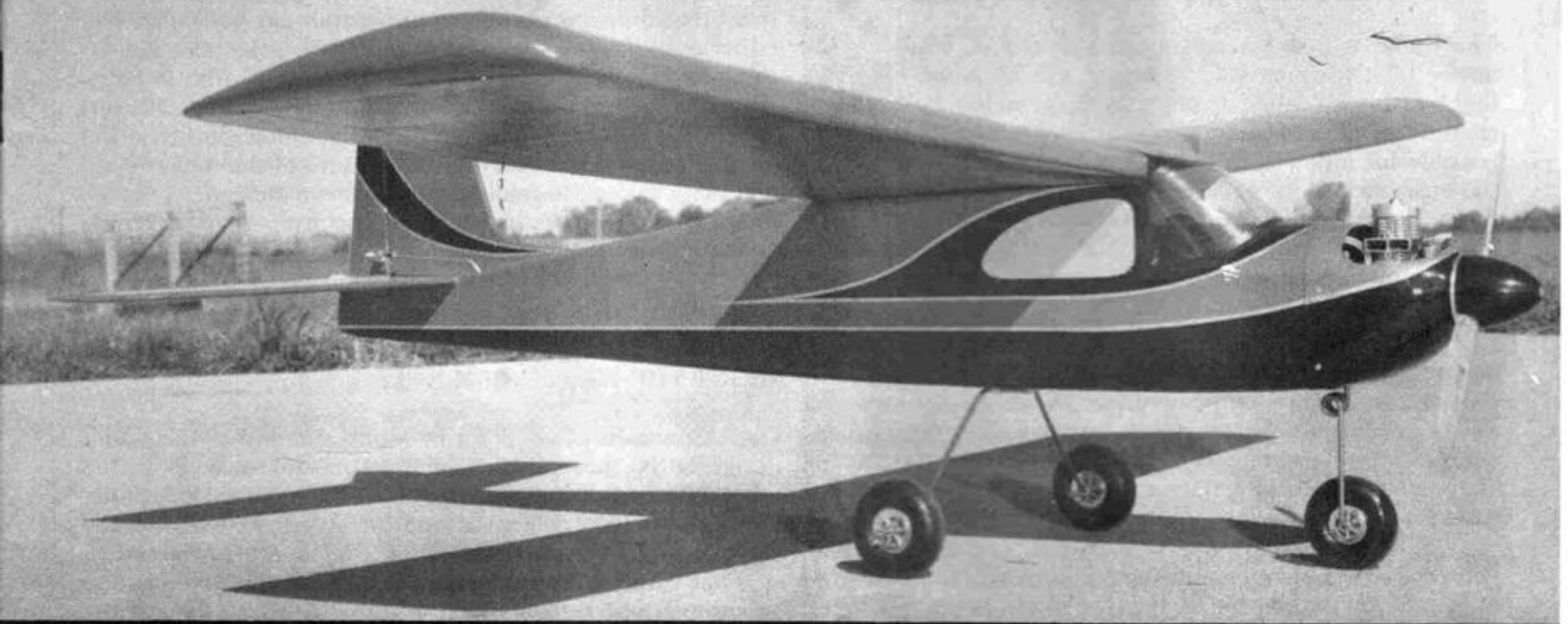
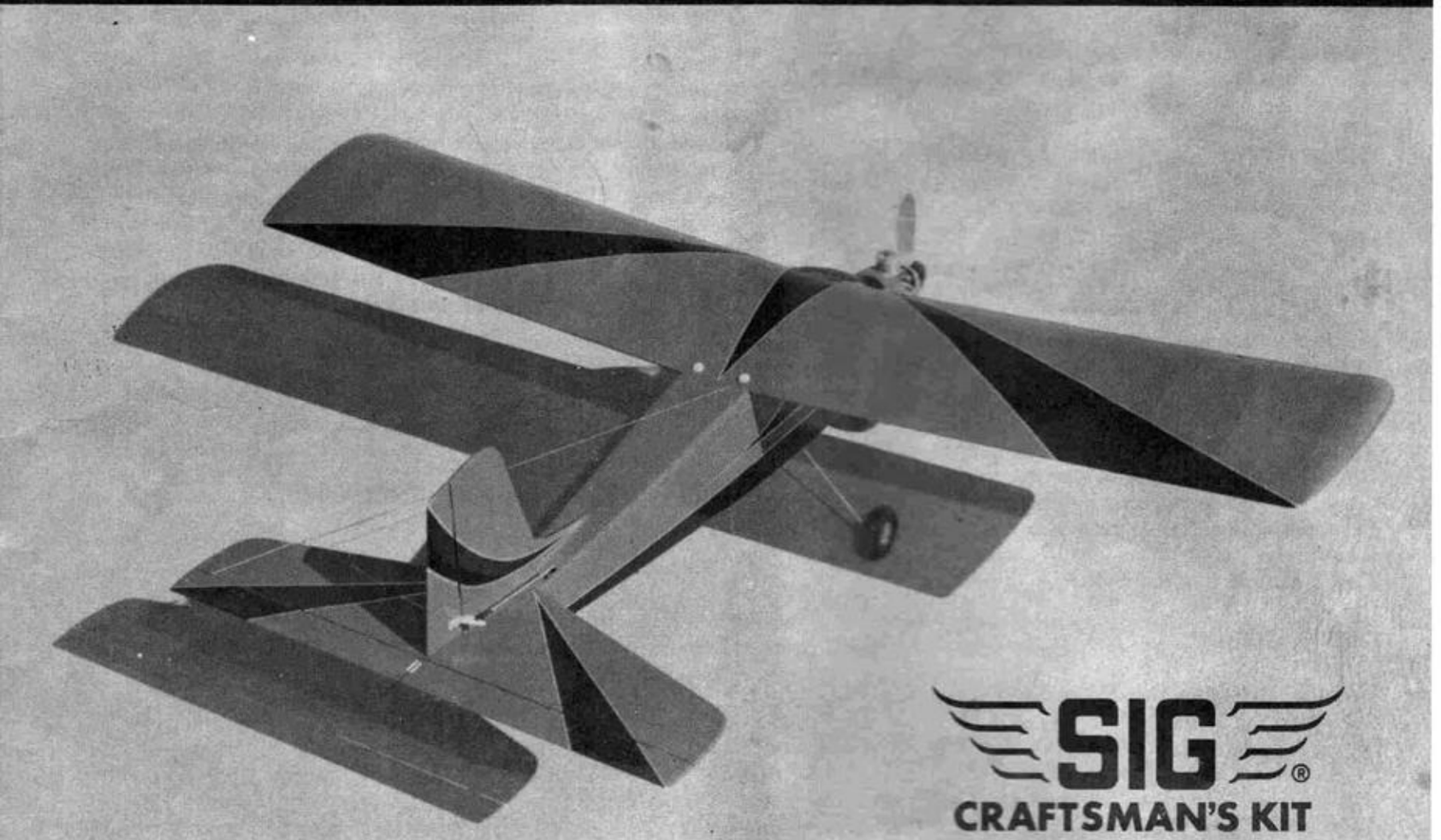
SIG KADET

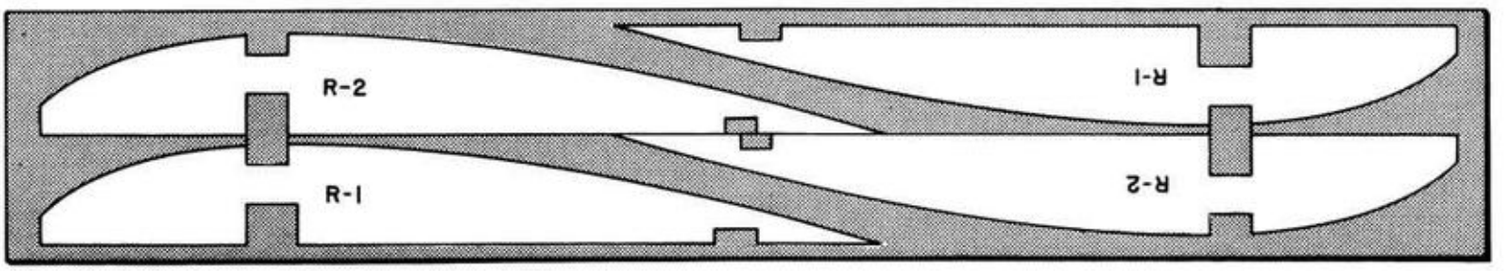


BUILDING AND FLYING INSTRUCTIONS

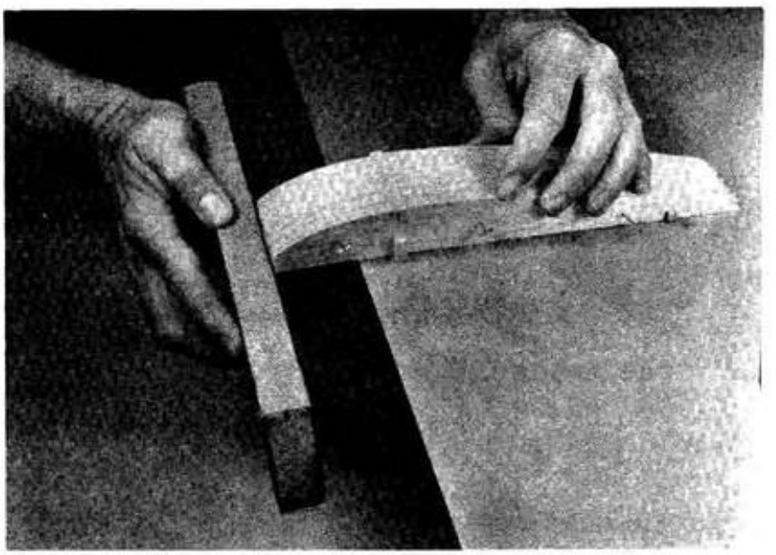


SIG®

CRAFTSMAN'S KIT

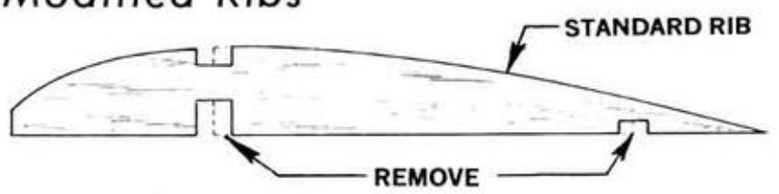


(e.) Stack the wing ribs, using scrap wood and pins to hold them together evenly, as shown in the accompanying photos. Use the sanding block to smooth and match them. Note that the ribs are about 1/32" overlong on the front as



they come from the die cut sheets. This is to allow tolerance for sanding the rib fronts to match each other and remove any cutting roughness so they will all join the leading edge evenly.

Modified Ribs



MAKE MODIFIED RIB FROM STANDARD RIB, USING AN R-2 RIB AS A PATTERN.

(f.) The die cut sheets of ribs are all the same except for the sheet carrying the centersection ribs R-1 and R-2. The accompanying drawing shows the layout of this sheet, which can be detected by the wider spar holes. Two more R-2 ribs are needed, so take an R-2 rib and, using it for a pattern, cut out the spar holes of two of the standard ribs to match.

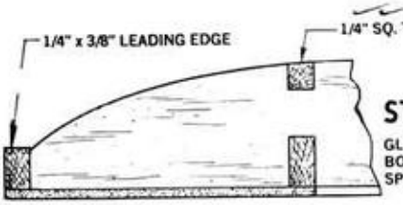
Leading Edge – Step-By-Step

STEP ONE

GLUE THE BOTTOM FRONT SPAR - AND THE REAR SPAR AT THE SAME TIME – TO THE BOTTOM PLANKING SHEETS.

STEP TWO

GLUE THE RIBS IN PLACE ON THE SPARS AND TO THE BOTTOM PLANKING AND THE CAP STRIPS.

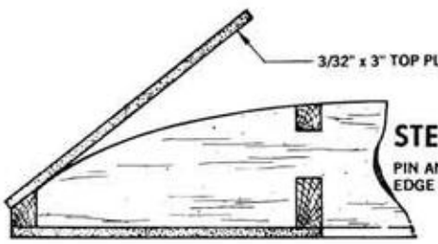


STEP THREE

GLUE THE 1/4" x 3/8" LEADING EDGE TO THE BOTTOM PLANKING. GLUE THE 1/4" SQ. TOP SPAR INTO THE RIBS.

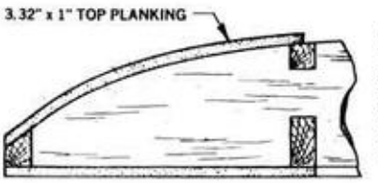
STEP FOUR

TRIM THE LEADING EDGE AS SHOWN. MOVE THE BUILDING BOARD TO THE EDGE OF THE WORK TABLE FOR EASY ACCESS TO THE LEADING EDGE. WORK DOWN WITH A WHITTLING KNIFE OR RAZOR PLANE. FINISH WITH A SANDING BLOCK.



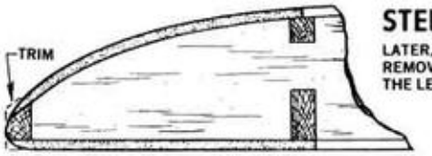
STEP FIVE

PIN AND GLUE THE PLANKING TO THE LEADING EDGE FIRST. USE PLENTY OF PINS.



STEP SIX

BEND THE PLANKING SHEET DOWN TO THE RIBS AND THE TOP FRONT SPAR. USE PINS TO HOLD IT DOWN. IF NECESSARY, WET THE TOP OF THE WOOD WITH A SPONGE TO MAKE IT PLIABLE. DON'T USE WATER UNLESS REQUIRED TO GET THE WOOD IN PLACE.



STEP SEVEN

LATER, WHEN THE WING IS COMPLETED AND REMOVED FROM THE BUILDING BOARD, SHAPE THE LEADING EDGE TO AIRFOIL CONTOUR.

SIG KADET

BY CLAUDE McCULLOUGH

The Kadet is a stable and easy-to-fly model, ideal for the novice pilot learning R-C. Since it will fly hands-off - free flight fashion - when trimmed out, a buddy box type of transmitter is not required to instruct beginners. It is even possible for a new flier to teach himself how to fly without the assistance of an expert. A fine sport model for Sunday fliers, the rugged balsa construction allows it to take the punishment of every day flying. The structure resists fatigue and vibration damage.

RADIO EQUIPMENT REQUIREMENTS:

For best results, install 3 channel equipment in the Kadet. One or two channel equipment can be used with less flexibility in control. Also you can install 4 or more channel equipment and use only 3 of the channels. The fuselage is large enough to carry a standard battery pack and standard size servos.

Selection of radio equipment should be based on the amount of money you wish to spend, the type of airplanes you intend to be flying and your future goals. If you plan to stay in the hobby and work up to larger airplanes with complete controls, it might be best to consider purchase of a four, or more, channel set in the beginning. It could be used with three servos to fly the Kadet and later installed in an intermediate aileron trainer like the Sig Komander with the simple addition of another servo. This would eliminate the necessity of disposing of a initial investment in beginner's equipment of less than 4 channels and buying a new set when your flying skills are ready for an advanced model.

IMPORTANT: If the Kadet is flown with 4 channel radio equipment, plug the rudder servo into the receiver outlet marked "aileron". This will enable you to develop the proper left and right reactions that will later be needed when advancing to an aileron-controlled model. On an aileron model, the rudder is used only for ground steering and some specialized aerobatic maneuvers. Getting used to this extra function, using your other hand, is a much easier transition from three to four channel operation than would be the case if you had to change hands on the primary turning function. (Which would be required if you had been flying the Kadet with the rudder servo plugged into the "rudder" output socket of the receiver.) The important thing you are learning is an automatic left and right reaction on a particular transmitter stick with a particular hand. Forget which control surface is doing the turning on the Kadet, assume that the rudder is an aileron.

ENGINE SIZE:

The original Kadet was flown with a muffled Fox .25. A .19 would be adequate on a light Kadet, or one with less than three channels. Remember that a muffler will reduce engine power and allowance should be made for this. Beginners should fly .29 to .35 powered Kadets with the motor throttled back to 1/2 or 3/4 power until they are familiar with the airplane and have some flying time.

ENGINE THRUST OFFSETS:

One of the purposes of a flat-bottomed high wing trainer is to be self righting when control goofs are made. With a Kadet built as the plan indicates, if the flier gets disoriented or accidently puts the Kadet into a dangerous position, simply let the control sticks return to neutral and the Kadet will either right itself or partially do so and give the pilot time to think and apply a correct control signal. It is safer, in situations like this, if the Kadet continues to gain altitude. Later, as piloting skill is acquired, you may add downthrust to the engine, if desired, or use the trim feature of the radio equipment to introduce a small amount of down elevator. Practice in the use of the trim levers is a necessary part of becoming an expert flier.

Right thrust offset is not required in the Kadet.

ABOUT THE WING INCIDENCE:

One of the safety factors for hands-off stability in the Kadet design is the incorporation of some incidence angle in the wing. After you learn to fly, or if, as many modelers do, the Kadet is used as a sport and fun flying model, you may want to reduce the amount of wing incidence so the model will not climb much under power and has less tendency to zoom upon fast recovery from a turn. A 3/32" shim at the wing trailing edge will reduce the wing to zero incidence. Fill in the gap in the top of the cabin with a long, wedge-shaped piece of wood so that there will be no oil leakage into the cabin.

DO NOT tamper with the incidence unless you are an experienced flier. Beginners should build the Kadet as specifed by the plans.

WOOD SIZE SUBSTITUTIONS:

Due to the balsa wood shortage, it is sometimes necessary to supply alternate sizes of 3/32" planking sheets. For example, 2" or 2-1/2" wide sheet may be substituted for part of the 3" wide sheets usually supplied. Use the 3" wide sheets for the leading edge of the wing. Use the narrow widths for the fuselage top and bottom planking, wing center section and wing trailing edge lower sheet.

It is also necessary at times to supply 24" lengths of 1/16" x 3" sheet for the stabilizer instead of 36" lengths. However, since the stabilizer planking instructions require that the 36" lengths be cut into 24" and 12" lengths, the substitution of 24" lengths causes no change in actual construction.

BEFORE BEGINNING CONSTRUCTION:

We have listed step-by-step assembly instructions, keyed by paragraph to the isometric drawings. It is suggested that you read the entire instruction book and study the plans carefully before beginning to build. You may wish to work on several parts at the same time and this is possible in many cases.

Wax paper may be used to protect the plan during building when the glue used is Sig Epoxy or an aliphatic resin such as Sig Bond. If a model cement like Sig-Ment is selected, use plastic wrap to protect the drawing because this glue will dissolve the wax out of the wax paper and will not set up properly.

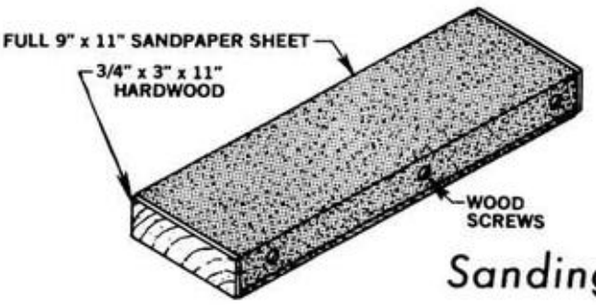
The plan paper can shrink and expand with temperature and humidity changes, as much as 1/4" the long way. This will cause minor mismatching but will not seriously affect fit of the parts, patterns for which were taken from the original ink drawings.

A jig saw is best for cutting out the printed sheet parts. Cut just outside the lines, leaving all of the line on the part. When fitting into place in the structure or joining with an adjacent part, use the sanding block to being the edges to an exact fit. If an X-Acto knife is used, don't cut too close to the lines but leave enough margin to true up and finish the edge with a sanding block. It is easier to cut at an angle with a knife so more tolerance may be needed for final fitting with the block.

Leave the die-cut parts in the sheet until needed for construction so that they will not be lost or broken. Remove the pieces from the sheets carefully. If difficulty is encountered, do not force the part from the sheet. Use a modeling knife to cut it free.

The framework may be glued with either Sig-Bond resin type glue or Sig-Ment solvent type cement. In any joint involving plywood or hardwood, Sig-Bond is the best choice. Areas subjected to unusual strain, exposed to fuel or oil, or including metal pieces, should be epoxied with Sig Epoxy Glue or Sig Kwik-Set 5-minute type epoxy.

Make a large sanding block that will take a full sheet of sandpaper. Use several wood screws on one edge to hold the sheet in place and be easily removable when required for replacing the sandpaper. This will be found a valuable tool during construction.



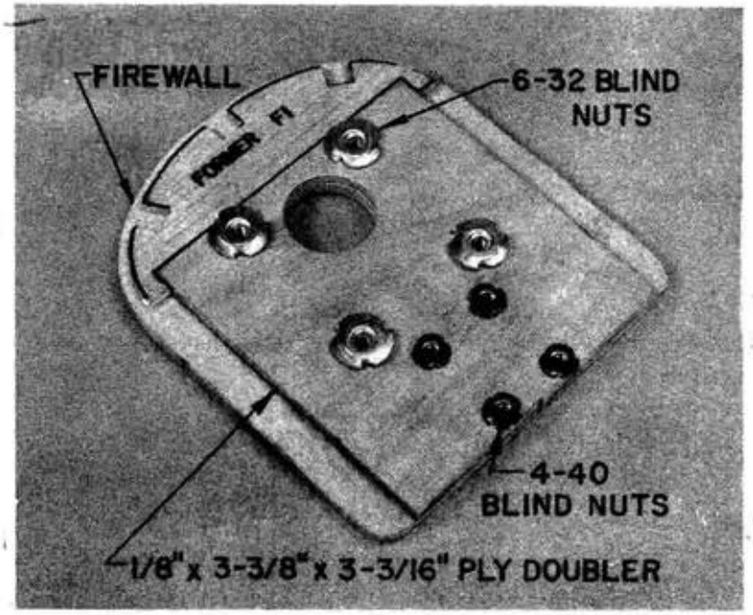
Sanding Block

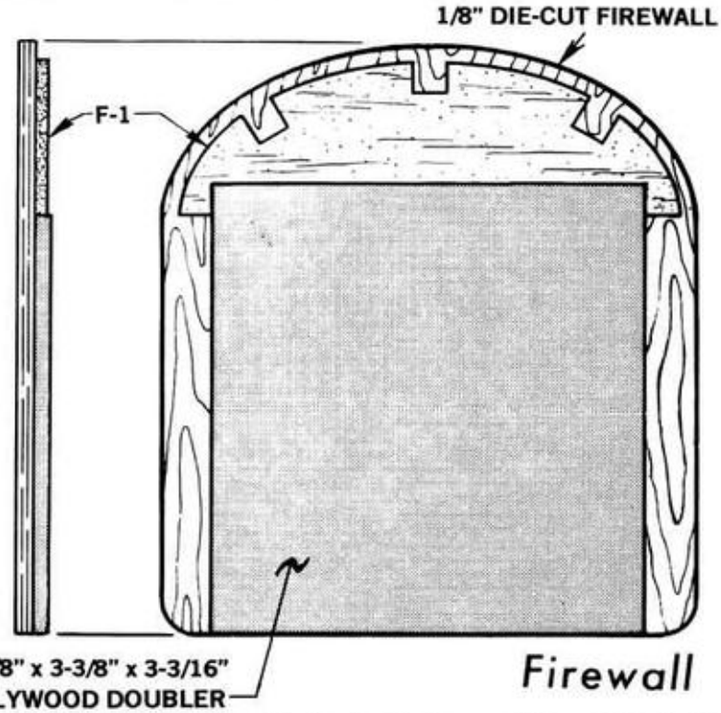
A piece of Celotex-type wallboard makes a handy building board, into which pins can easily be pushed. Lay the building board on a table with a flat and untwisted top. Pins can be pushed through all pieces of balsa in the kit without any lasting damage. The holes on the outside will fill up during sanding and doping. Don't be afraid to use plenty of pins, particularly when gluing planking on the top curve of the wing or the round top of the fuselage front. Have a box of at least 200 available during construction.

(1.) FIREWALL ASSEMBLY

The original Kadet and many others have been built using no offset in the engine thrust line and this setup has given good results. Some fliers using large engines in Kadets for sport flying have added several degrees of down thrust to reduce the climbing tendencies under full power and some add right thrust. If your preference is for use of down thrust or right thrust, it should be taken into account when fitting the cowl and spinner as described in this section. Putting washers or shims on the top motor mount bolt, between the mount and the firewall, is the easiest way to add downthrust to the engine. (Be sure and read the section called "Engine Thrust Offsets" in the introduction to this booklet.)

(a.) Sand the die-cut plywood firewall if required, so





Firewall

that it fits snugly into the back of the cowling. The back of the cowling is flush with the back of the firewall.

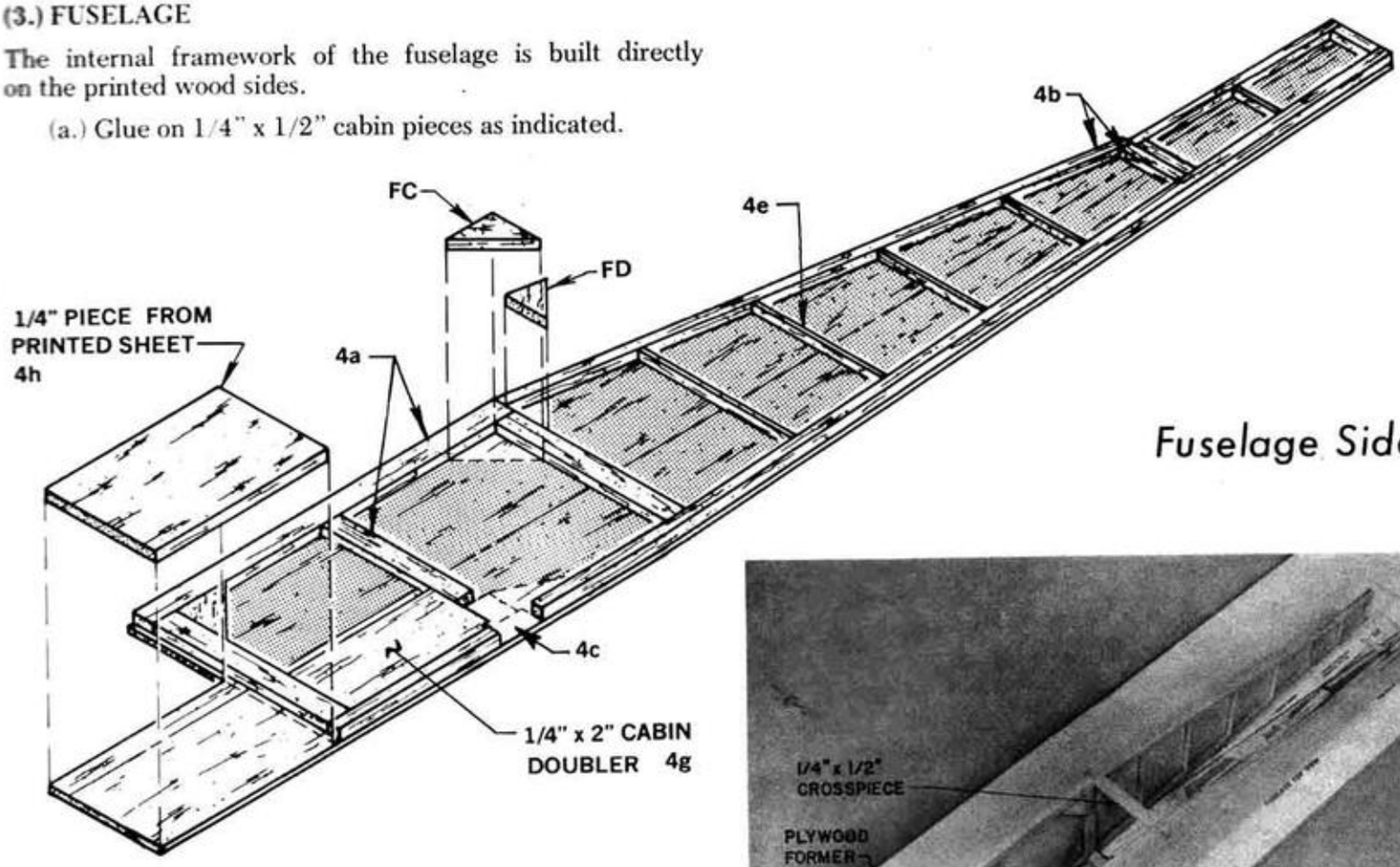
(b.) A piece of 1/8" x 3-3/8" x 3-3/16" plywood is included in the kit. Epoxy this to the back of the die-cut 1/8" firewall, as shown in the accompanying drawing. Also epoxy balsa former F1 to the firewall.

(c.) It is best to install the engine mounts and landing gear bracket before the firewall is attached to the fuselage. The engine should be mounted on the aluminum mounts so that the spinner backplate is about 3/32" to 1/8" ahead of the cowling front. Use epoxy to tack glue the engine approximately in place on the mounts. Using this mount-engine unit, follow instruction (2.a) before proceeding.

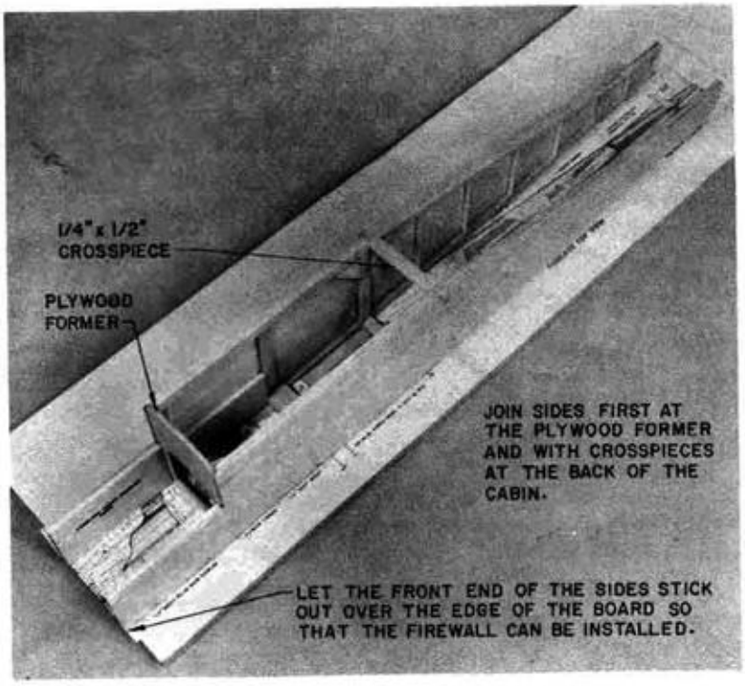
(3.) FUSELAGE

The internal framework of the fuselage is built directly on the printed wood sides.

(a.) Glue on 1/4" x 1/2" cabin pieces as indicated.



Fuselage Sides



(b.) 1/4" square forms the top and bottom of the frame and several of the uprights.

(c.) Note gap left for landing gear blocks.

(d.) Note gap left between the front 1/4" x 1/2" upright and the 1/4" sheet nose doubler. This is left for installation of the plywood former.

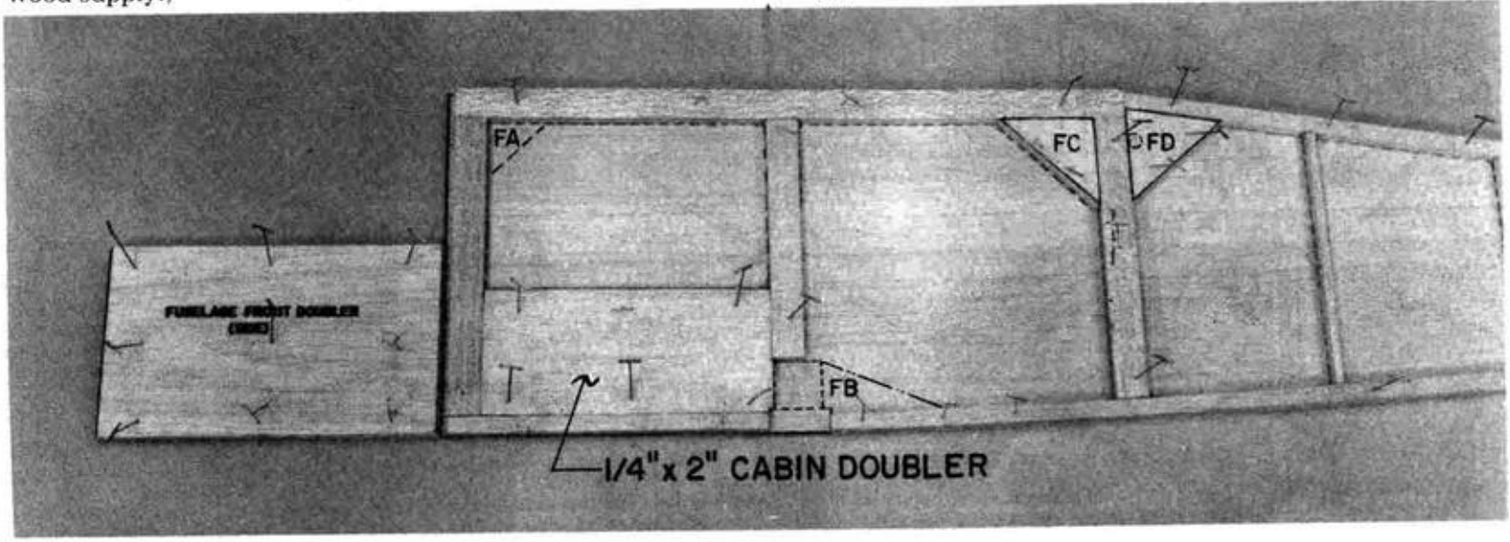
(e.) Add the remaining uprights from 1/8" x 1/4".

(f.) 1/4" sheet gussets reinforce the cabin corners. These are on the 1/4" printed sheet.

(g.) The cabin doubler is 1/4" x 2" sheet balsa. (At times, wider wood may be furnished, depending on the wood supply.)

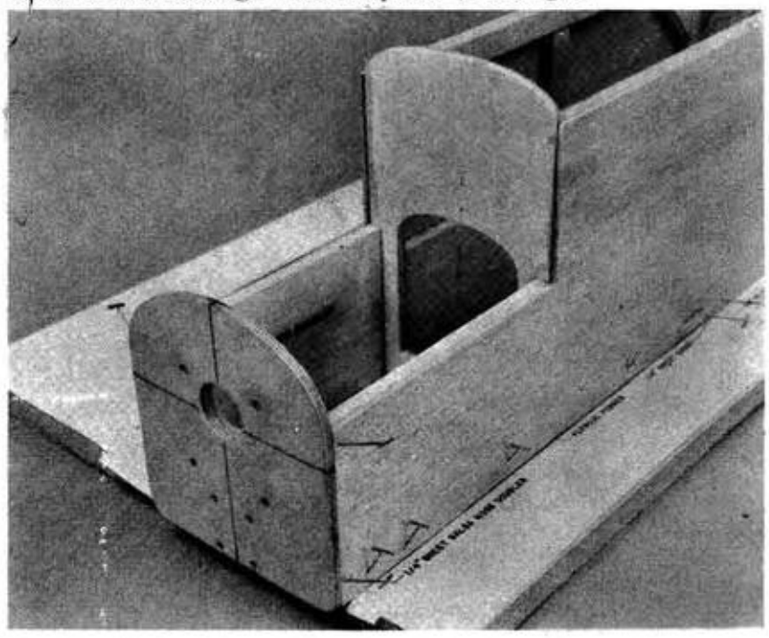
(h.) The nose doubler is 1/4" x 3" sheet balsa.

(i.) Pin the fuselage sides in place over the top view. Join at three points: (1.) The plywood former, inserted into the gap between the 1/4" sheet nose doubler and the front



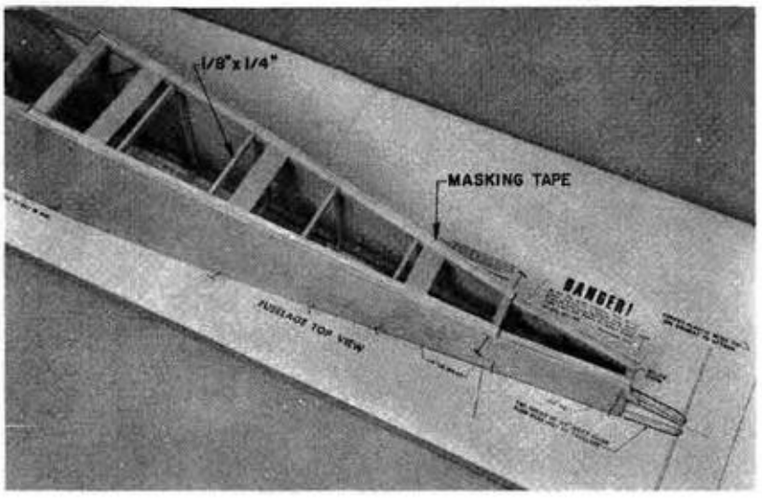
The cabin doubler is cut to fit from the 1/4" x 2" x 18" sheet of wood provided in the kit.

1/4" x 1/2" cabin upright. (2.) The 1/4" x 1/2" top and 1/4" square bottom at the back of the cabin. (3.) The firewall assembly (use epoxy glue on the firewall.) Check the sides of the fuselage with a square or triangle.



The firewall sticks down 3/32" below the fuselage sides to allow for the bottom planking. Pin the sides to the building board with the front protruding over the end of the board. This allows the firewall to be epoxied on while the sides are being joined over the plan.

(j.) The grooved hardwood landing gear block is epoxied in place between the fuselage sides.



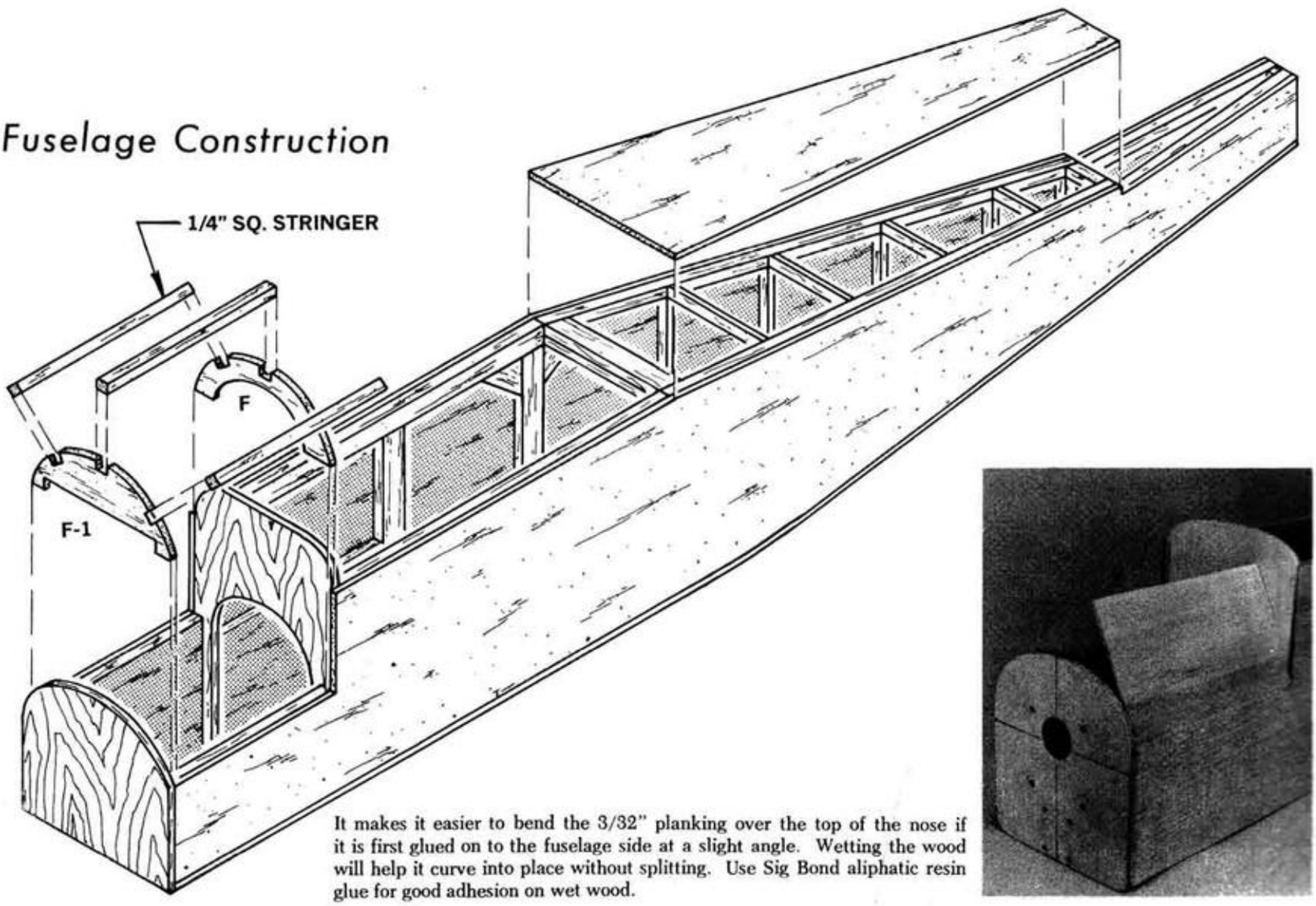
(k.) Unpin the sides at the front and tilt the back part of the fuselage sides down onto the plan. (See photo.) Join the sides at the back with 1/4" sq. crosspieces and pins.

(l.) Add the remaining crosspieces on the top and bottom, using strips of masking tape to hold the sides together until the crosspieces are dry.

(m.) The floor of the nose is made from pieces of 1/4" sheet balsa, inset between the fuselage sides.

(n.) Glue two 3/32" x 2" x 36" pieces of sheet balsa together to form a 4" wide sheet. Use this to cover the bottom of the fuselage. Some builders like to cover the bottom (and top) with the grain running crosswise instead

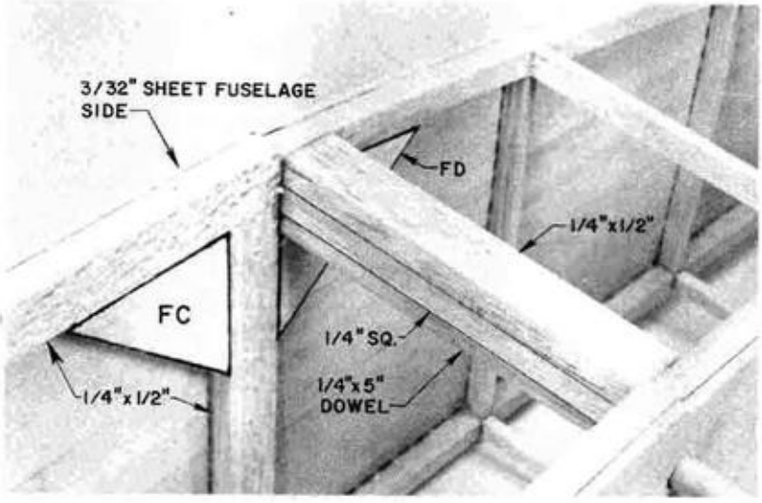
Fuselage Construction



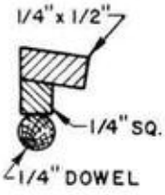
It makes it easier to bend the 3/32" planking over the top of the nose if it is first glued on to the fuselage side at a slight angle. Wetting the wood will help it curve into place without splitting. Use Sig Bond aliphatic resin glue for good adhesion on wet wood.

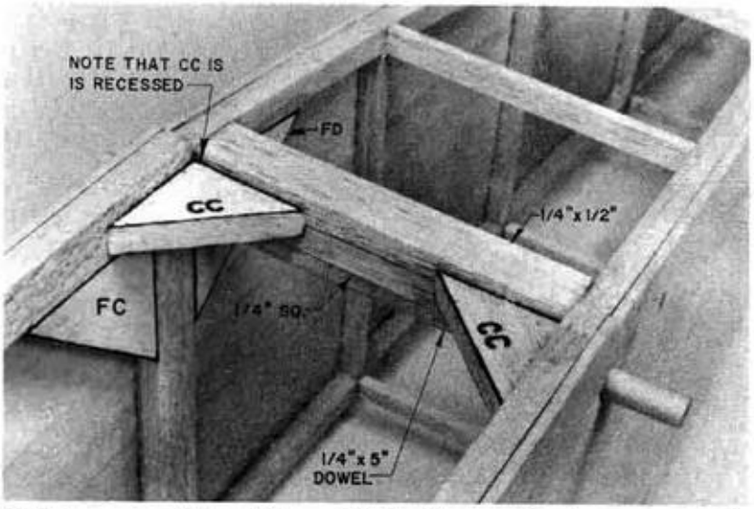
of lengthwise. In this case glue and pin pieces on to the fuselage one at a time. This makes the fuselage a bit stiffer than when the grain is running lengthwise but takes a little longer to do and has more glue seams. Whichever method is used, be sure and mark the groove in the landing gear block so it can be located, or do not cover it with planking.

(o.) Glue two 3/32" x 2" x 16" pieces of sheet balsa together to form a 4" wide sheet. Use this to cover the top of the fuselage behind the wing opening. Or as noted above in (n.) it may be sheeted with the grain crosswise.



The above photo shows the construction at the rear of the wing mounting area. A 1/4" sq. crosspiece is glued to the bottom of the 1/4" x 1/2" crosspiece. Drill a 1/4" hole just below the 1/4" sq. crosspiece so that the 1/4" dia wing attachment dowel will be against the crosspiece. Also see cross-section drawing at right.





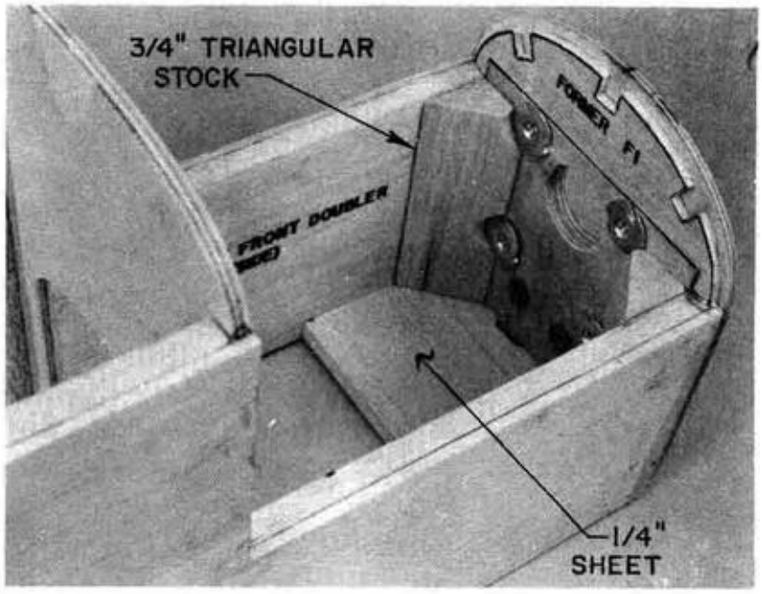
All four corners of the cabin are fitted with strengthening gussets "CC". The photo shows the same rear dowel area shown in the preceeding picture.

(p.) 3/4" triangular stock is epoxied in the corners to strengthen the firewall.

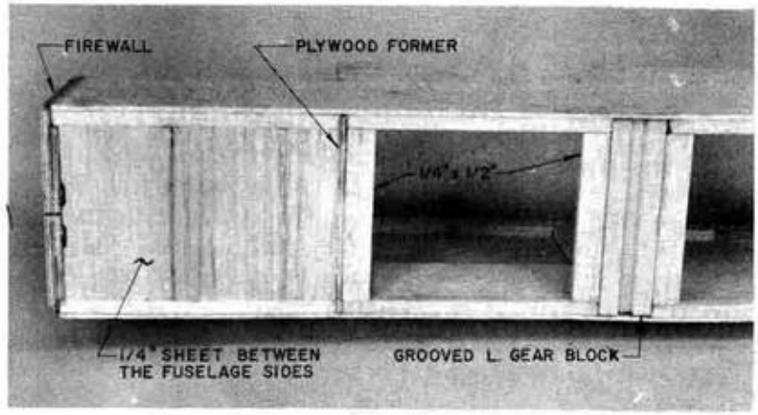
(q.) Cut Former F from the printed sheet and glue it to the front of the plywood cabin former.

(r.) Glue 1/4" square balsa stringers into the notches of the formers.

(s.) Instructions for installing FY, FX and the front wing hold-on dowel are given later in the section called "Fitting The Windshield".

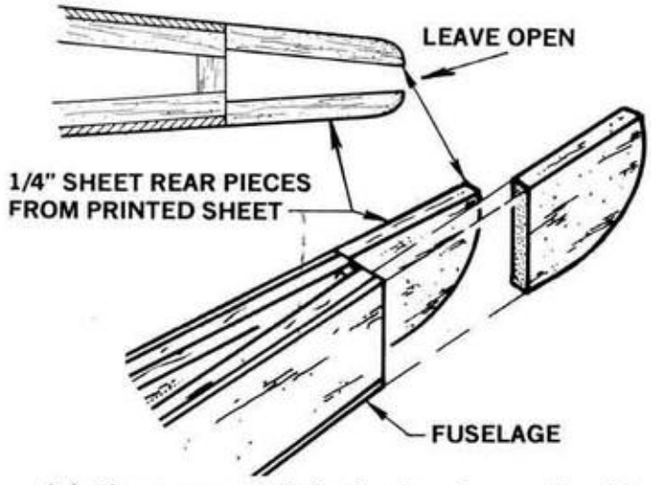


Cut openings for the motor mount blind nuts in the 3/4" triangular stock braces on the back of the firewall. Also notch the 1/4" sheet floor to clear the nose gear bearing blind nuts. Use epoxy glue in the firewall area. When the nose compartment is completed, it is a good idea to fuel proof the interior against any accidental fuel seepage or leakage by painting it dope, fiberglass resin or epoxy glue.



Bottom view of the front part of the fuselage, showing 1/4" sheet floor in the nose and the 1/4" x 1/2" crosspieces behind the plywood former and on each side of the grooved landing gear block.

Fuselage Rear Pieces



(t.) The rear part of the fuselage is completed by adding the two end pieces that are on the 1/4" printed sheet. Leave the rear end open to pass the pushrod connection to the elevator horn.

(u.) The stringers on the fuselage nose are covered with 3/32" sheet balsa. See photo on page 6, that shows attaching a sheet to cover half of the nose. Dampen the 3/32" top planking sheet with a sponge on the outside surface so it can be easily curved into place. Pin and glue the sheet down to the stringers. After it is dry, trim off the sheet on the center line of the top 1/4" sq. stringer. This leaves room to fasten the other half of the top planking to the stringer.

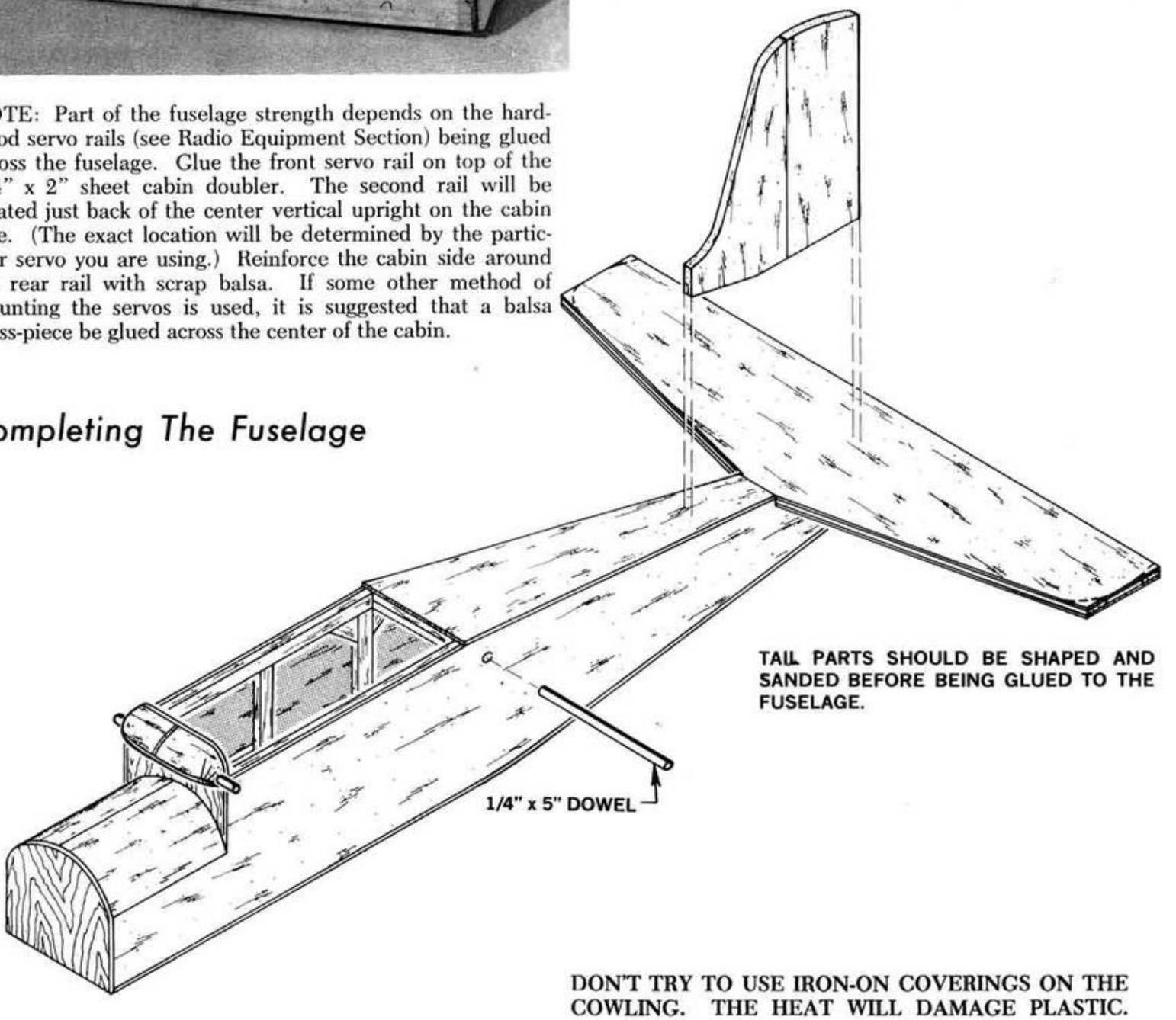
(v.) Repeat the process on the other side, except this time bend the wet sheet down and trim the edge so that it fits onto the top stringer before gluing. Don't try to cut off too much of the edge at once, but trim and trial fit a little at a time to achieve a neat seam along the top stringer.

NOTE: All references to left and right in this booklet are pilot's left and right, as if seated in the cabin of the model.

CUTTING THE STABILIZER PLANKING

NOTE: Part of the fuselage strength depends on the hardwood servo rails (see Radio Equipment Section) being glued across the fuselage. Glue the front servo rail on top of the 1/4" x 2" sheet cabin doubler. The second rail will be located just back of the center vertical upright on the cabin side. (The exact location will be determined by the particular servo you are using.) Reinforce the cabin side around the rear rail with scrap balsa. If some other method of mounting the servos is used, it is suggested that a balsa cross-piece be glued across the center of the cabin.

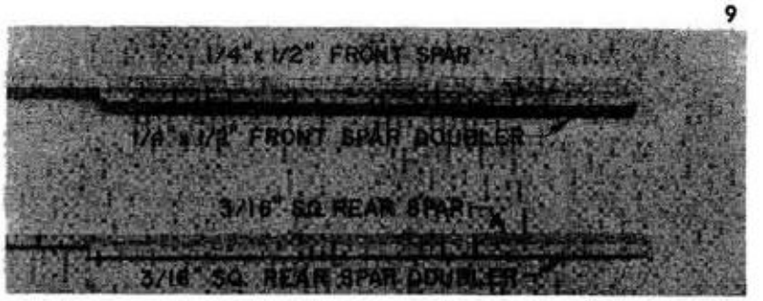
Completing The Fuselage



TAIL PARTS SHOULD BE SHAPED AND SANDED BEFORE BEING GLUED TO THE FUSELAGE.

DON'T TRY TO USE IRON-ON COVERINGS ON THE COWLING. THE HEAT WILL DAMAGE PLASTIC.

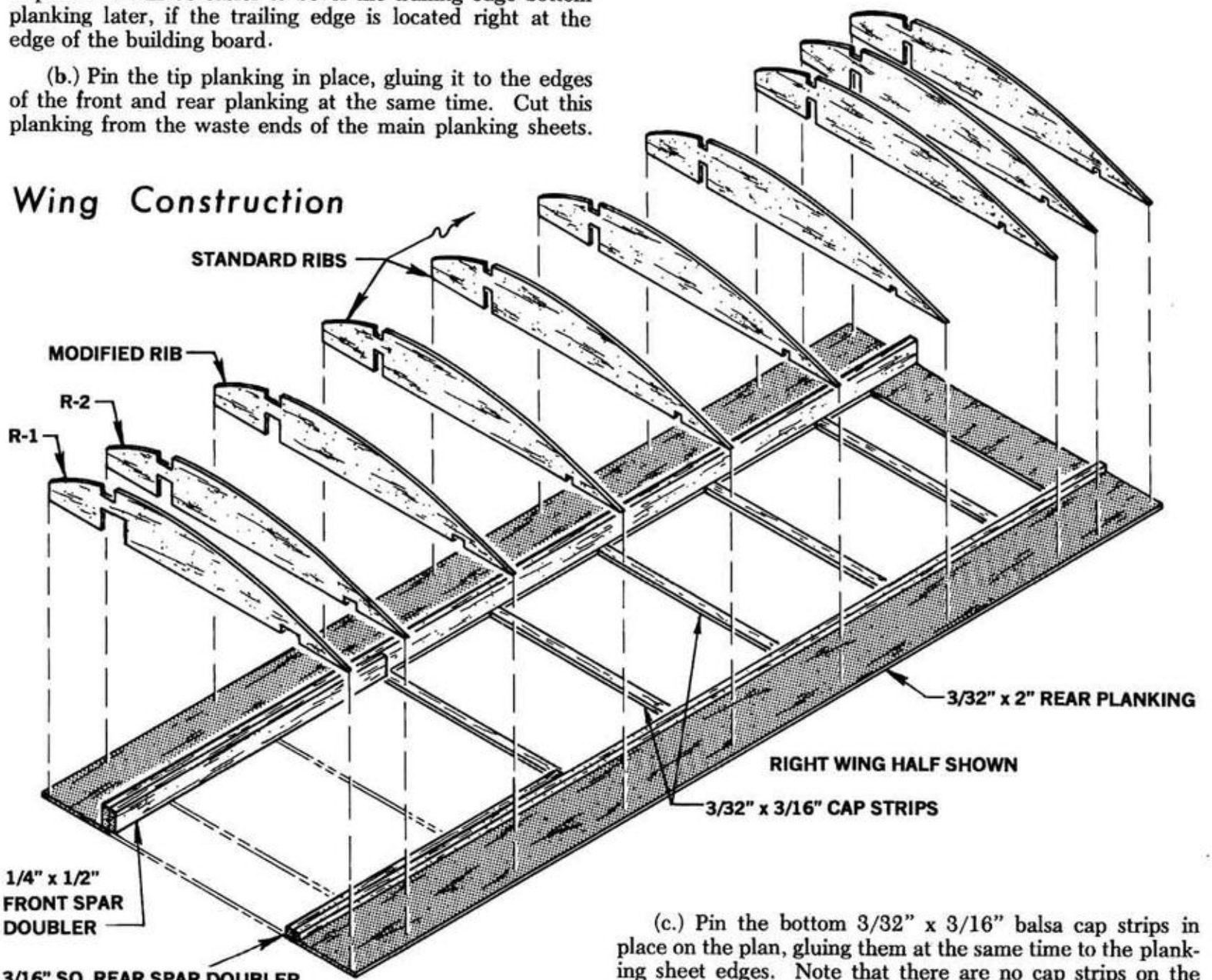
(4.) WING CONSTRUCTION



The wing is constructed on the full size plan, in halves, in the following steps:

(a.) The front planking is 3/32" x 3" sheet wood. The rear planking is 3/32" x 2" sheet wood. It may be found that the sheets are slightly wider than the plan or they may be bowed out of line. Trim the edges, using a metal straight-edge, to the correct size to fit the plan before pinning them in place. It will be easier to bevel the trailing edge bottom planking later, if the trailing edge is located right at the edge of the building board.

(b.) Pin the tip planking in place, gluing it to the edges of the front and rear planking at the same time. Cut this planking from the waste ends of the main planking sheets.

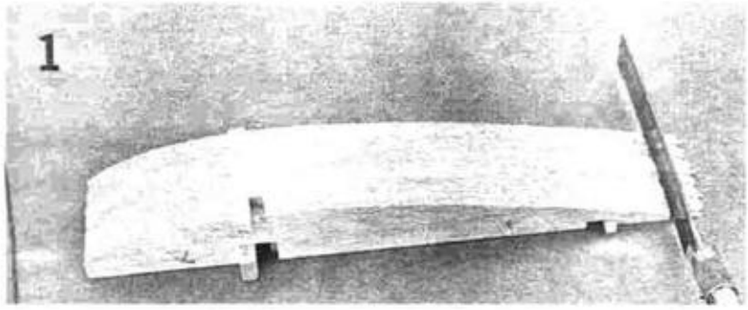


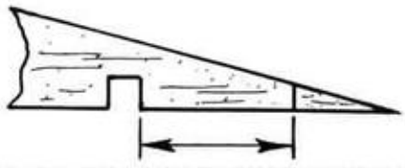
(c.) Pin the bottom 3/32" x 3/16" balsa cap strips in place on the plan, gluing them at the same time to the planking sheet edges. Note that there are no cap strips on the first three ribs from the wing center. These will later be planked with 3/32" sheet balsa instead.

(d.) The main spars are cut from the 1/4" x 1/2" x 36" wood provided in the kit. The top front spars are cut from 1/4 x 1/4" x 36" wood. The bottom rear spar is cut from 3/16" x 3/16" x 36". Cut all of the spars exactly to length on the full-size plan. This will leave waste pieces slightly less than 9" long. Use the waste end pieces of 1/4" x 1/2" in the fuselage construction. Use the waste end pieces of 1/4" x 1/4" for the top front spar doubler. Use the waste end piece of 3/16" x 3/16" for the bottom rear spar doubler. Cut two doublers, exactly 9" long, for the main spar from one of the other full pieces of 1/4" x 1/2" that are provided in the kit. Glue the doublers to the spars.

BUILDING A KADET AILERON WING

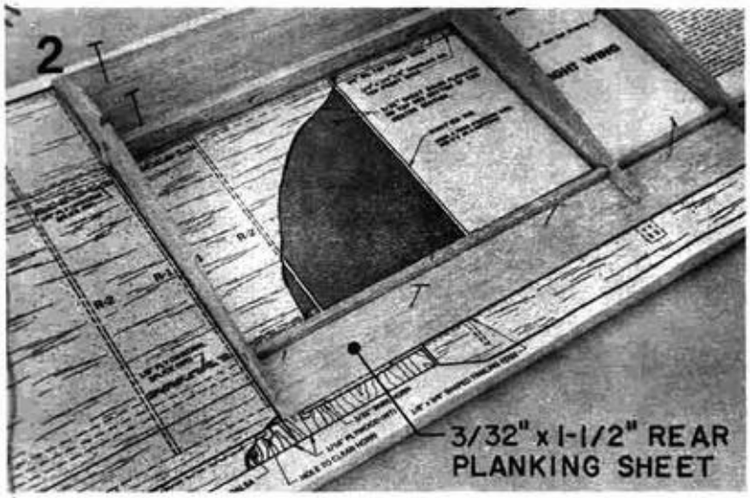
The directions in the Kadet instruction book on pages 9 through 11 up to and including Paragraph (m.) apply to the aileron wing also except for the following changes:



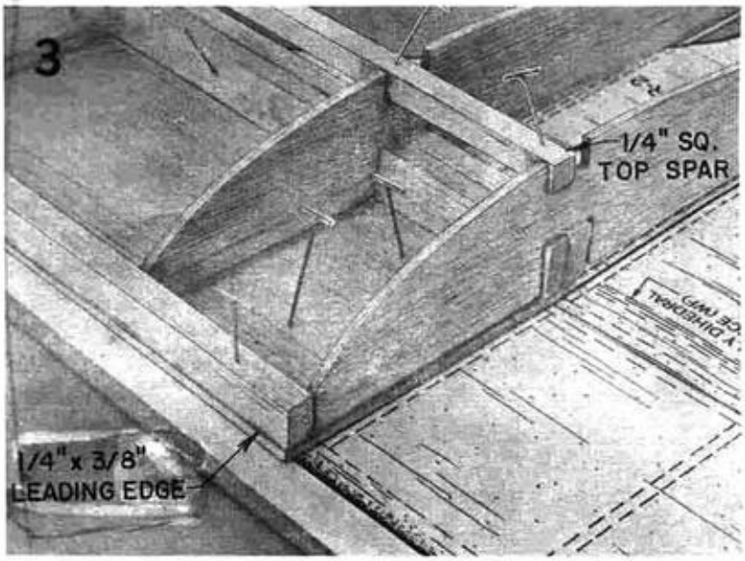


MEASURE 15/ 16" FROM BACK OF SPAR HOLE.

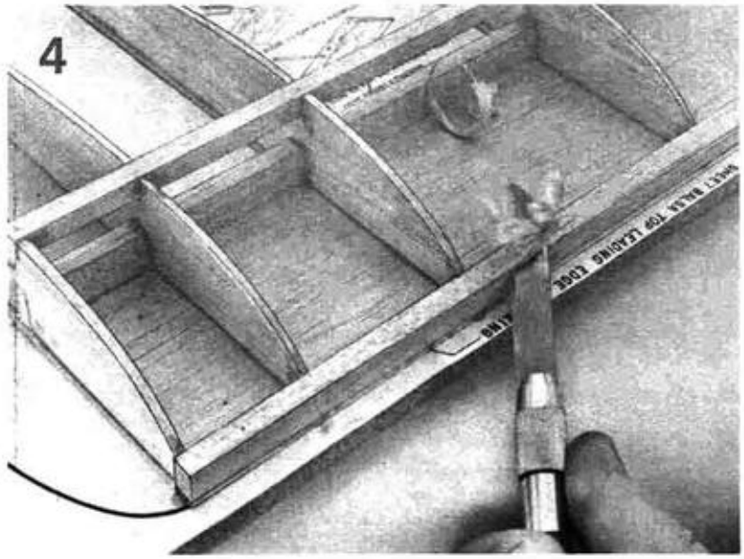
Measure and mark the rib stack. Saw off the ends.



2. Instead of a 3/32" x 2" piece of rear planking, a 3/32" x 1-1/2" piece of balsa is required. Take the 2" (or it may sometimes be 2-1/2") piece of wood supplied in the kit and trim it down to 1-1/2" wide with a knife and straightedge. Fasten it down to the plan and proceed as directed in the Kadet book up to and including Paragraph (m.) on Page 11.

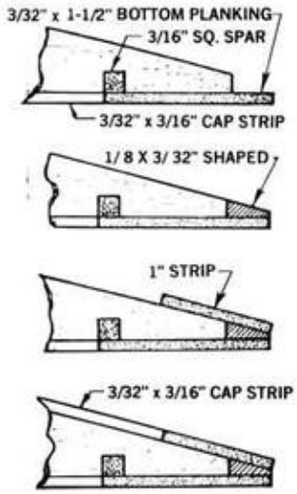


3. Photo 3 is a new picture illustrating Step (k.) and Step (l.) in the Kadet book and applies to both the standard wing in the book and the aileron wing also.



4. Photo 4 is a new picture illustrating Step (m.) in the Kadet book. The carving is easiest to do if the wing leading edge has been put on the edge of the building board.

AILERON WING TRAILING EDGE



STEP ONE

GLUE THE RIBS TO THE SPARS, THE BOTTOM PLANKING AND THE CAP STRIPS.

STEP TWO

GLUE THE 1/ 8 X 3/ 8 SHAPED TRAILING EDGE IN PLACE ON THE BOTTOM PLANKING AND AGAINST THE BACK OF THE RIBS. SAND EVEN.

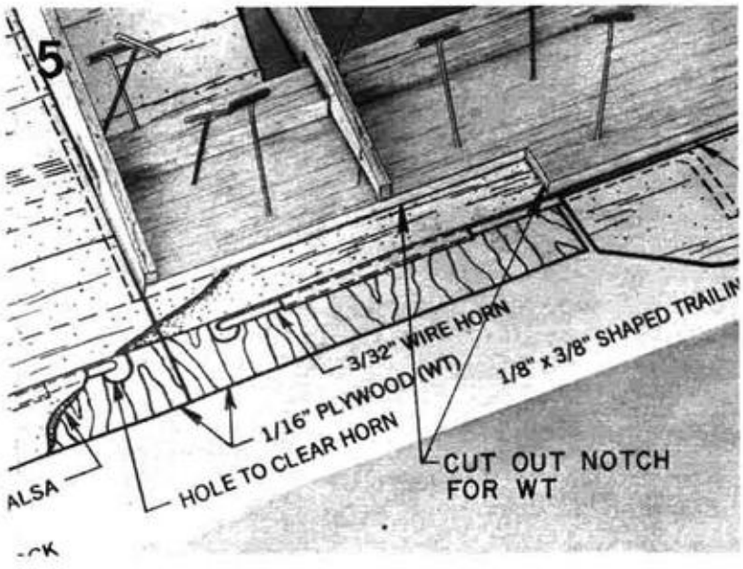
STEP THREE

PIN AND GLUE THE 1" WIDE TOP PLANKING STRIP TO THE RIBS AND THE 1/ 8 X 3/ 8 TRAILING EDGE.

STEP FOUR

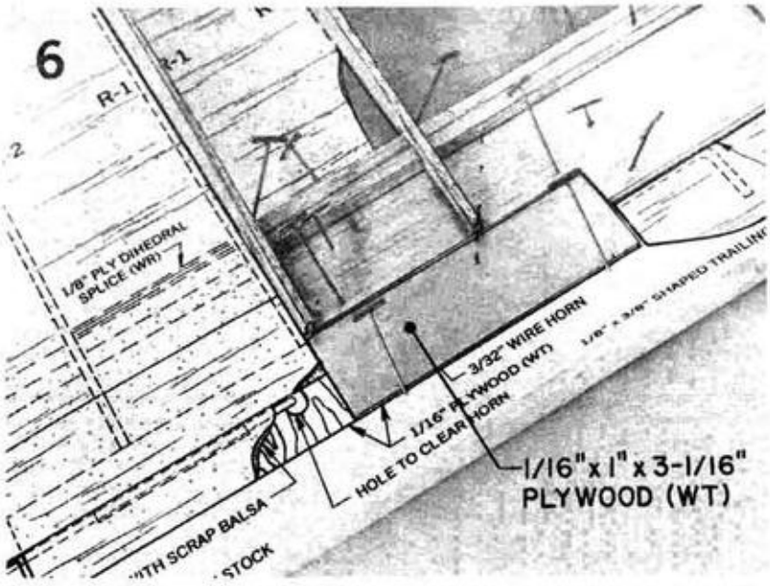
ADD THE TOP 3/32" x 3/16" CAP STRIPS.

SEE PHOTO SEQUENCE FOR SPECIAL CENTER SECTION TRAILING EDGE STEPS.

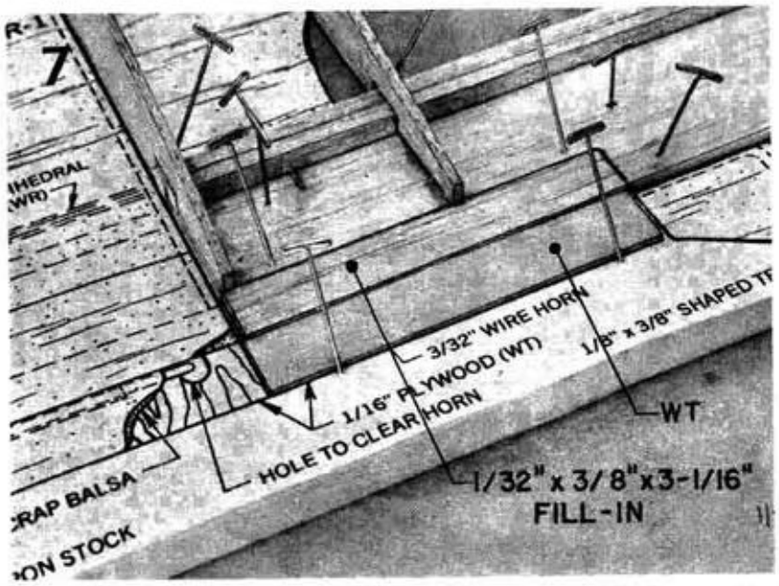


Ignore Paragraph (n.) on page 11 of the Kadet book and the photo above it. Instead, do the following:

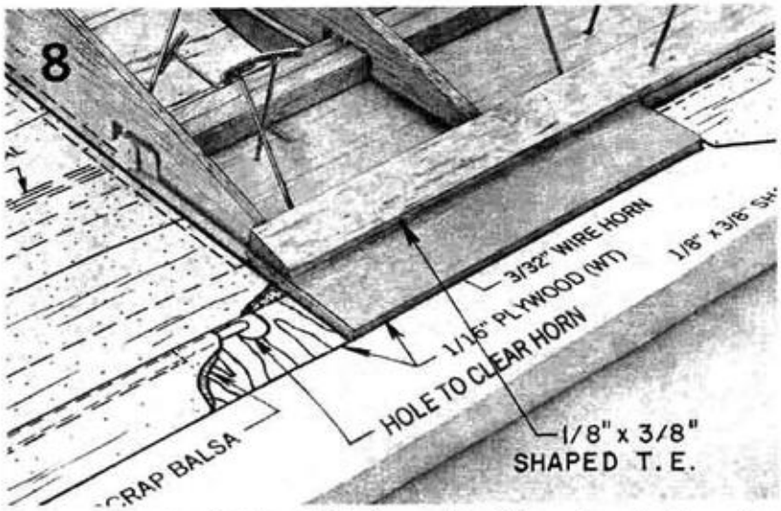
5. Cut a 3/8" x 3-1/16" notch in the 3/32" x 1-1/2" rear planking sheet to accommodate plywood piece WT.



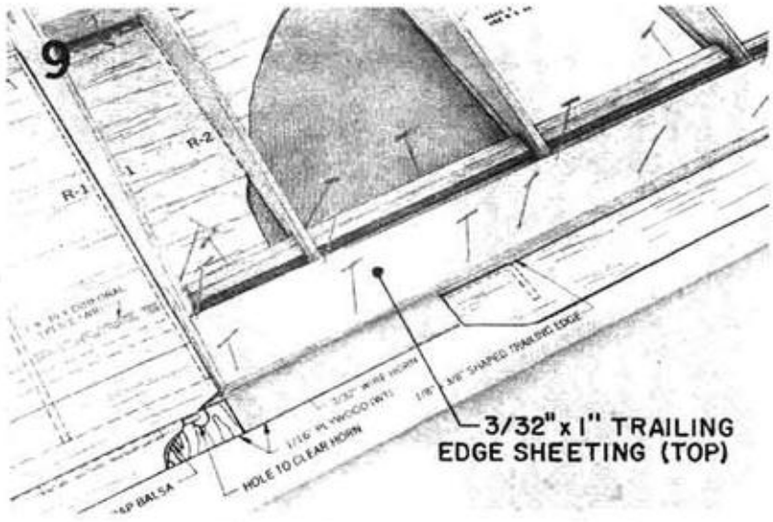
6. Use epoxy to glue WT into the notch in the 3/32" x 1-1/2" rear planking sheet.



7. Glue a piece of 1/32" x 3/8" x 3-1/16" balsa to WT. This will provide a level surface for the next step.

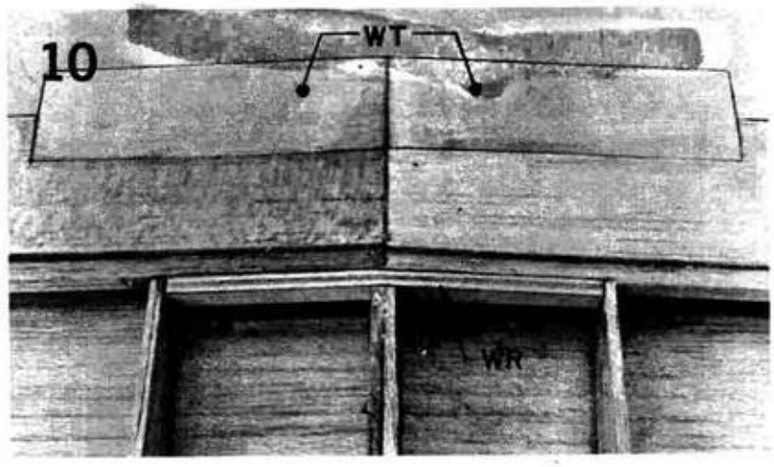


8. Glue the 1/8" x 3/8" shaped trailing edge stock against the rib and on the back edge of the 3/32" x 1-1/2" rear planking sheet.



9. Glue the 3/32" x 1" top rear planking on the shaped trailing edge and to the ribs.

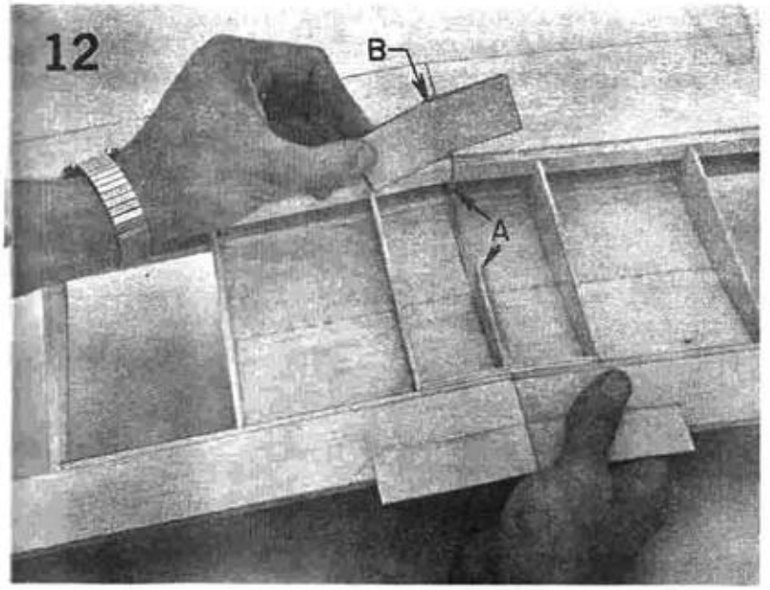
Next - Perform steps (o.), (p.), (q.) and (r.) of the Kadet book, pages 11 and 13.



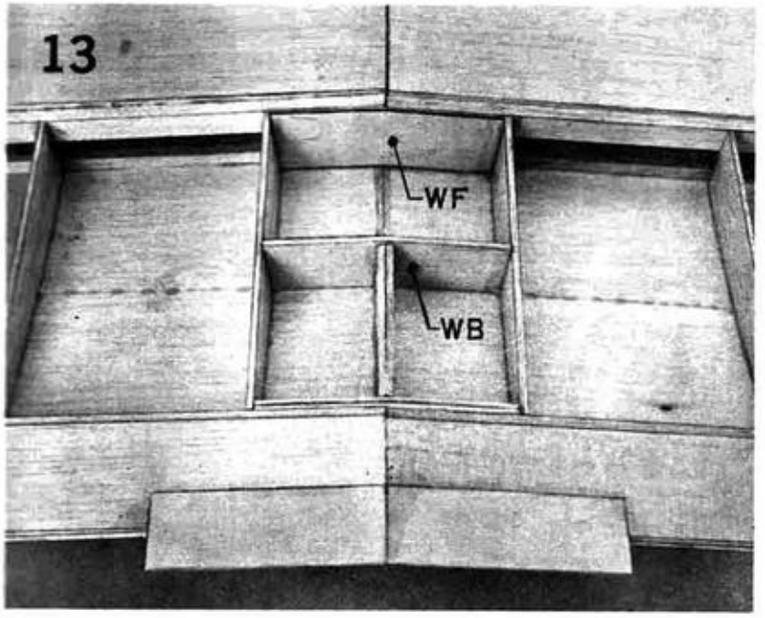
Ignore the first 3 photos on page 13 and paragraphs (s.) and (t.). Instead, do the following:

10. When the glue has set, turn the wing over. Glue the small plywood dihedral brace WR to the rear spar doubler. Epoxy is recommended.

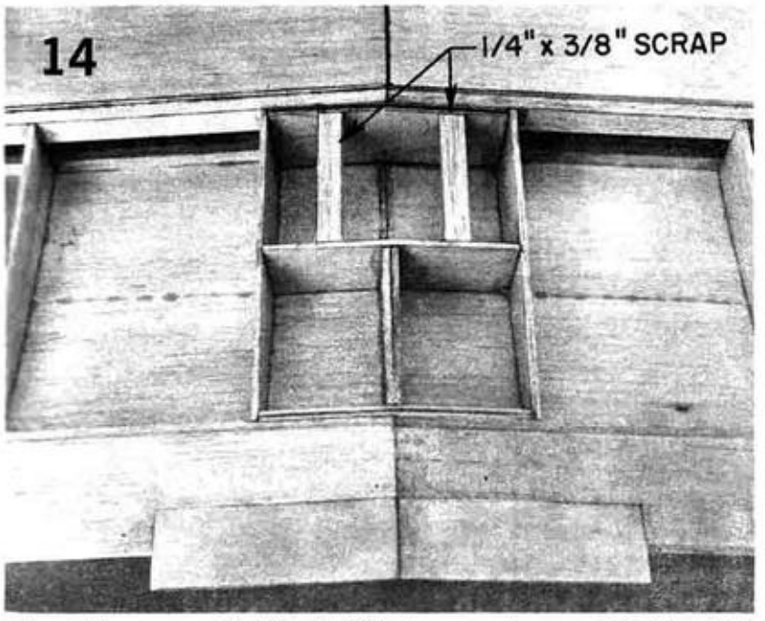
11. Measure the length required for the servo mount or servo you will use, adding 1/4". Saw through the center ribs. (IMPORTANT NOTE: The hole size shown is for an EK SM servo. Other brands may require a different spacing.)



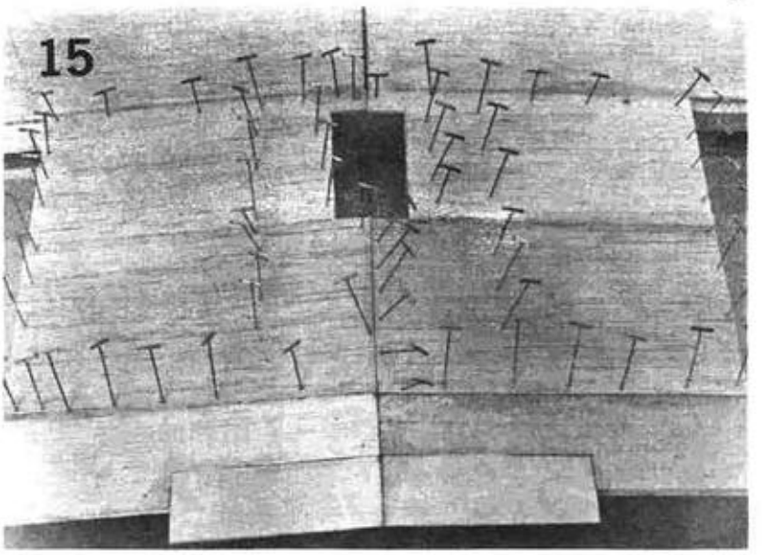
12. A.) Remove the center ribs from the saw cut to the front doubler. B.) Fit plywood dihedral brace WF into place.



13. Glue balsa brace WB and plywood brace WF into place. Use epoxy for WF.



14. Glue scrap 1/4" x 3/8" balsa as shown. Width of the opening is determined by servo used.



15. Plank the bottom of the wing center section, leaving the servo hole open.

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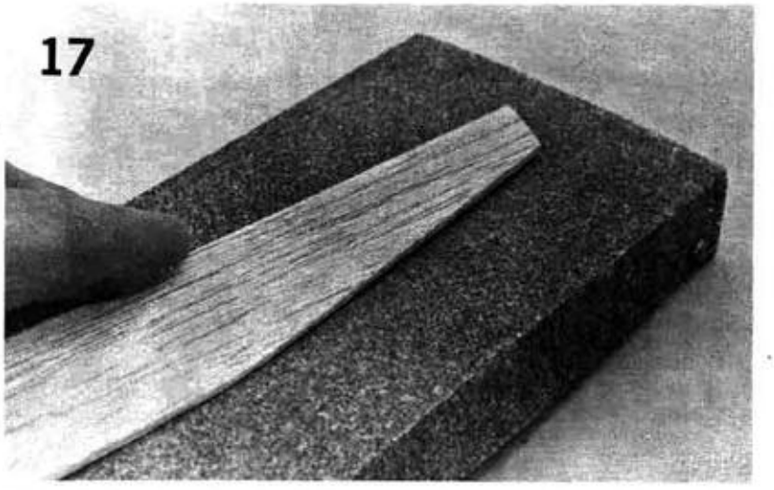
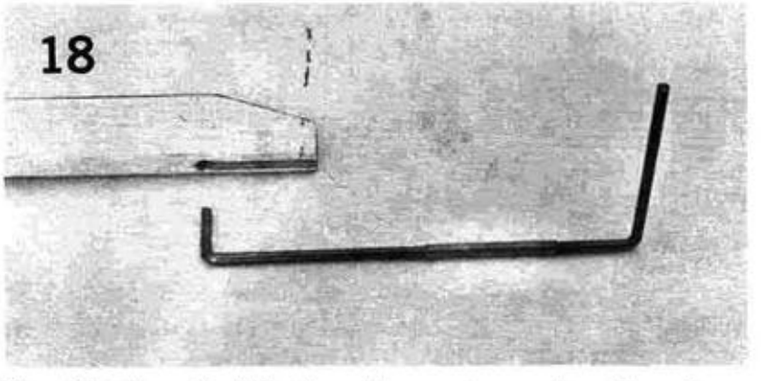
Montezuma, Iowa 50171
Printed in U.S.A. 1978

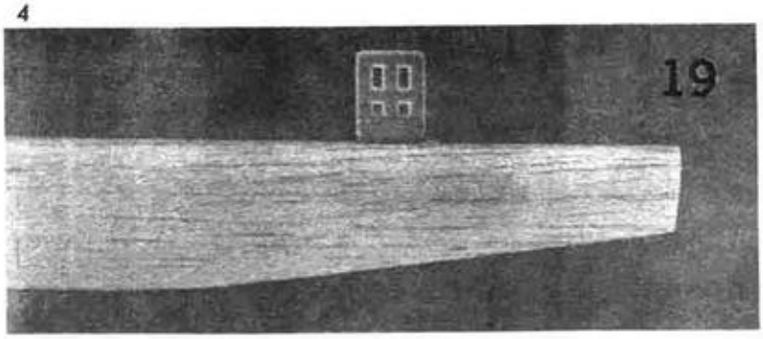
16. Glue scrap hardwood mounts into the hole to serve as mounting rails for the servo or plastic servo mount. An EK AM-4 vertical servo mount is shown.



17. Trim the 1/4" x 1" shaped aileron stock to the outline shown on the Kadet aileron option plan and sand.

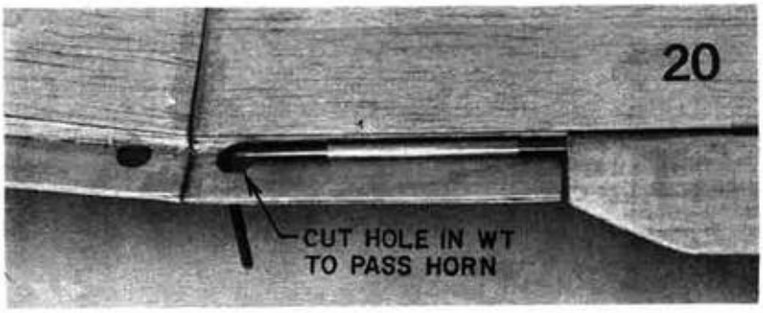


18. Notch and drill the ailerons to receive the aileron horns. Use epoxy glue on the horns.



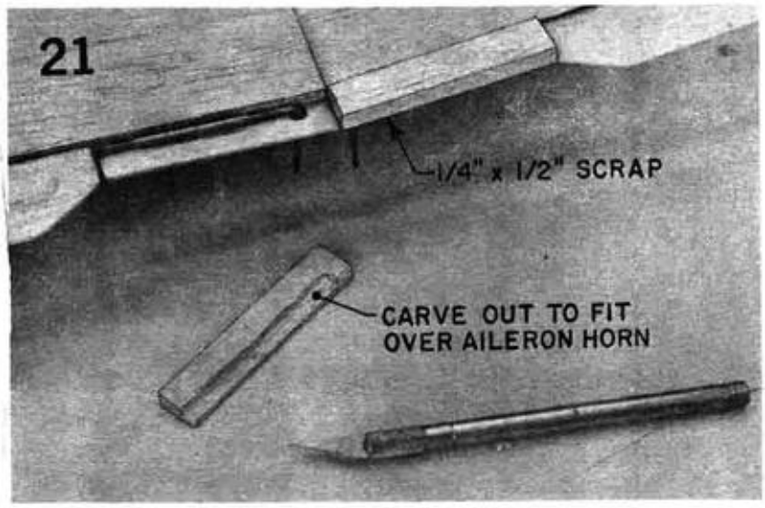
19. Glue the hinges into the ailerons.

Match the ailerons to the wing. Cut slots into the wing to receive the aileron hinges.



20. Cut a hole in WT to pass the aileron horn.

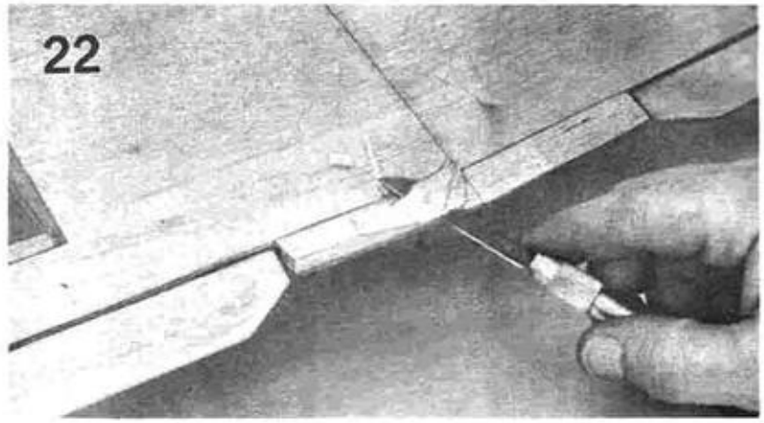
Glue the aileron hinges into the wing slots and align the aileron before the glue sets. Do not glue the brass tubing on the horn to the wing at the same time as the aileron hinges. Wait until the hinge glue sets and then glue the tubing to the back of the wing and to WT. The aileron positioning and alignment may be such that the brass tubing is not actually touching the back of the wing. This is not a problem. Just fill the slight gap with epoxy glue. Be careful not to get glue inside the tubing.

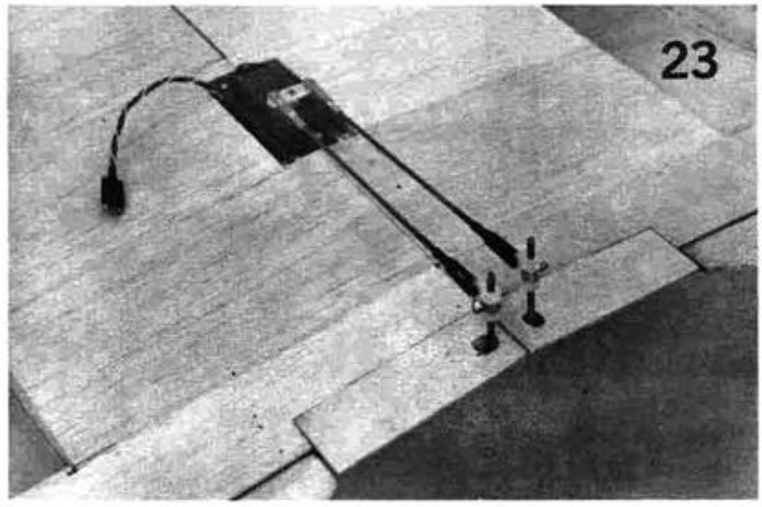


21. Cut a piece of scrap 1/4" x 1/2" balsa to fit over the aileron horn on WT.

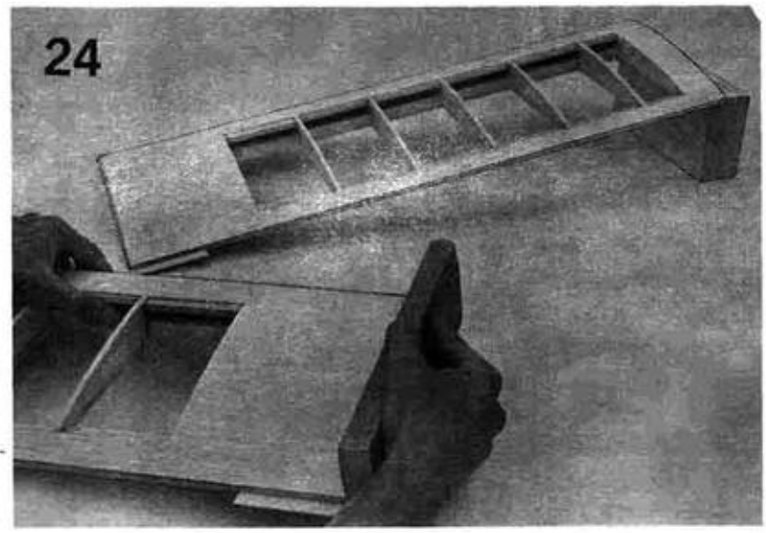
To prevent glue from sticking to the aileron horn, coat the wire with warmed vaseline or oil, using a small brush. Also coat the last 1/16" on each end of the brass tubing, but do not coat the rest of the tubing. The tubing should be epoxied to the scrap piece. Be careful to apply the epoxy sparingly so that large amounts are not squeezed around the wire. After the glue has partially set and before it has fully cured, flex the aileron back and forth to make certain it is not binding.

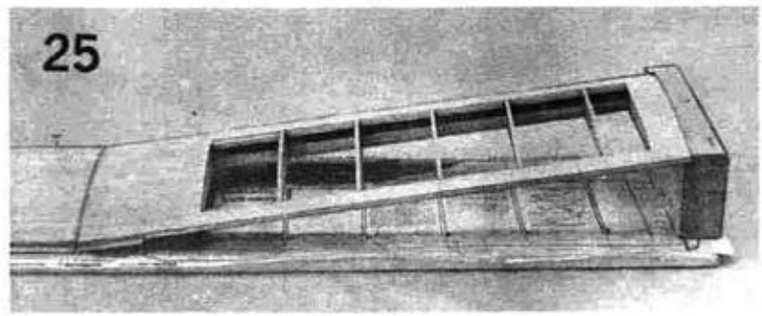
22. Trim down the scrap pieces with a knife and sand to airfoil shape.





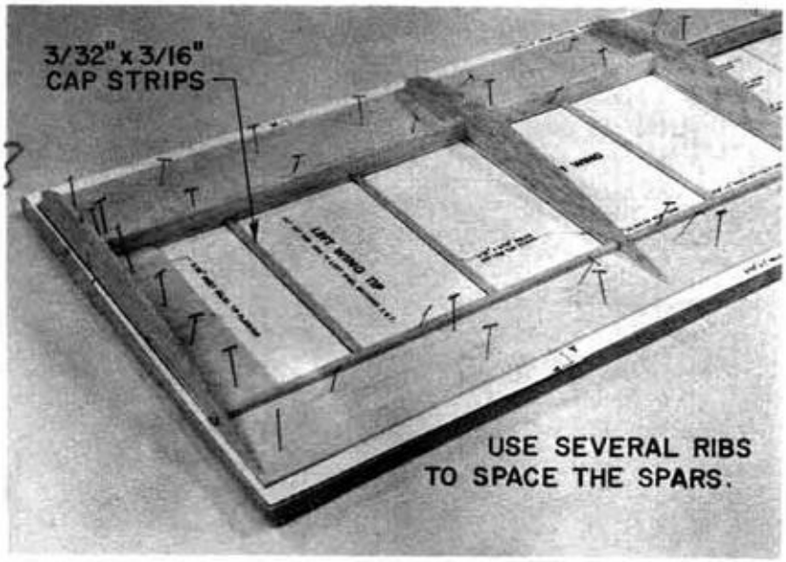
23. Recommended servo hookup hardware: Solder clevises RC links and Du Bro #103 aileron horn connectors.





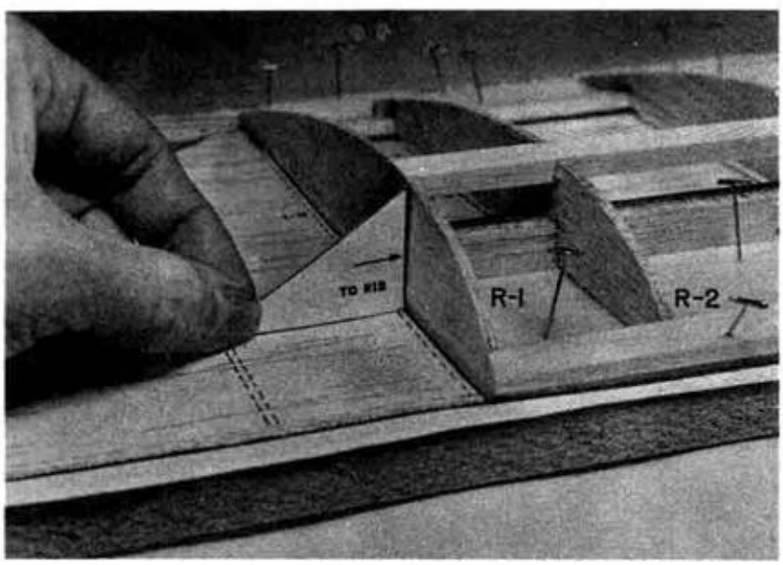
24. & 25. DIHEDRAL HINTS: Use a big sanding block for easy fitting the wing halves together. Block up one half 4" and keep checking the match while sanding. Then use the same block while gluing the halves together with epoxy.

(g.) Glue the front spar in place on the bottom planking. Note that the spar is flush with the back of the planking.



(h.) Glue the rear spar in place on the planking. Use a wing rib at each end to gauge the exact location of the spar on the planking so that all of the ribs will fit down evenly between the two spars when the ribs are added.

(i.) Glue a wing rib to each bottom cap strip and to the spars and planking at these locations. The 3 modified end ribs without cap strips are glued just to the planking and spars at their locations.



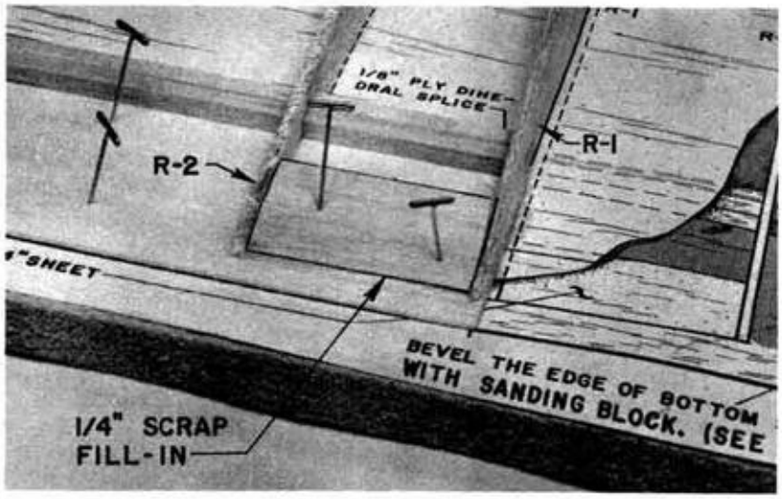
(j.) The center end rib on each wing half is installed at an angle to allow for the dihedral. Glue the dihedral gauge pattern to a piece of lightweight cardboard and use the gauge to set the angle of the rib. Use pins to hold the rib in place until the glue dries.

(k.) Glue the 1/4" square balsa top front spar into the rib notches.

(l.) The leading edge is pinned and glued to the bottom planking and to the rib ends.

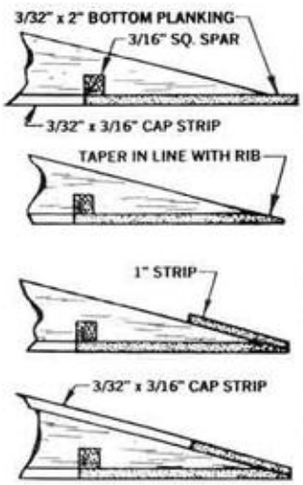
(m.) Carve the leading edge to the proper angle for installation of the top planking. Finish with a sanding block. The 3/32" sheet leading edge top planking is pinned and glued to the top spar, the leading edge and ribs. Dampening the top surface will aid in curving it into place. Use plenty of pins to insure it is glued securely in place on each rib. Note that the planking begins at the center of the top spar rather than at the back edge of the spar as does the bottom planking on the bottom spar. This provides a shoulder to make it easier to pin and glue the cap strips on to the top surface of the wing.

NOTE: Use water on the front planking sheet only if the grain of the wood requires it to bend down onto the ribs without cracking. More pliable sheets, that will go down on the ribs dry, should not be dampened.



(n.) Shape some 1/4" scrap sheet to fill in between Ribs R-1 and R-2 in the wing center section. Glue in place as shown in the above photo.

Trailing Edge – Step-By-Step



STEP ONE

GLUE THE RIBS TO THE SPARS, THE BOTTOM PLANKING AND THE CAP STRIPS.

STEP TWO

TAPER THE TRAILING EDGE AS SHOWN. MOVE THE BUILDING BOARD TO THE EDGE OF THE TABLE FOR EASY ACCESS. USE THE SANDING BLOCK TO FINISH THE EDGE.

STEP THREE

PIN AND GLUE THE 1" WIDE TOP PLANKING STRIP TO THE RIBS AND THE BOTTOM PLANKING.

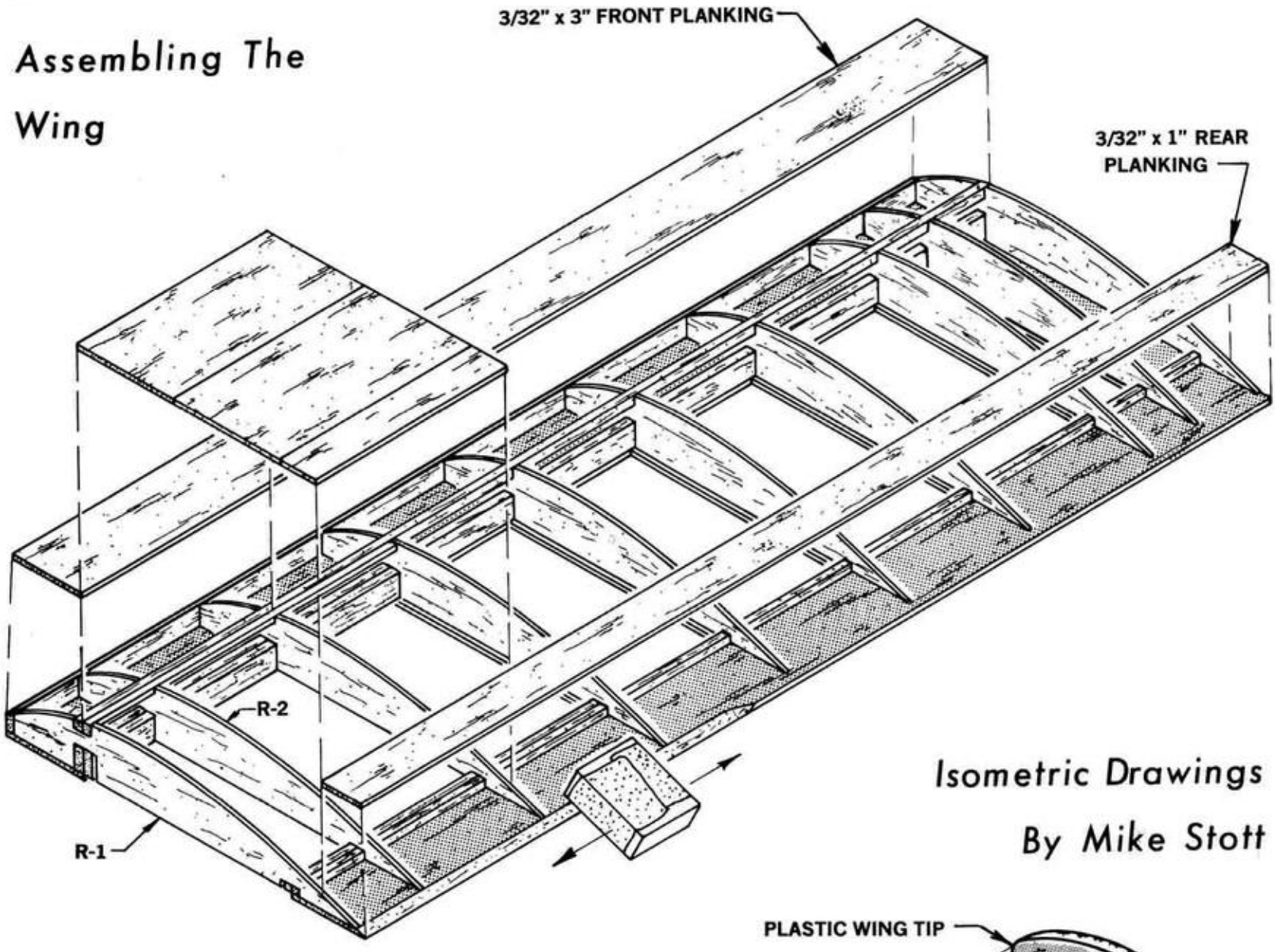
STEP FOUR

ADD THE TOP 3/32" x 3/16" CAP STRIPS.

(o.) Add the wing tip 3/32" planking.

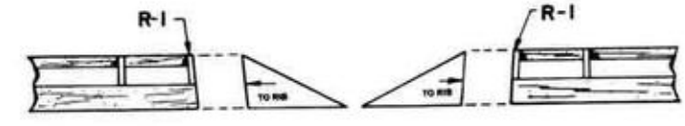
(p.) Glue 3/32" x 3/16" cap strips to the rib tops.

Assembling The Wing



Isometric Drawings By Mike Stott

Joining The Wing Halves

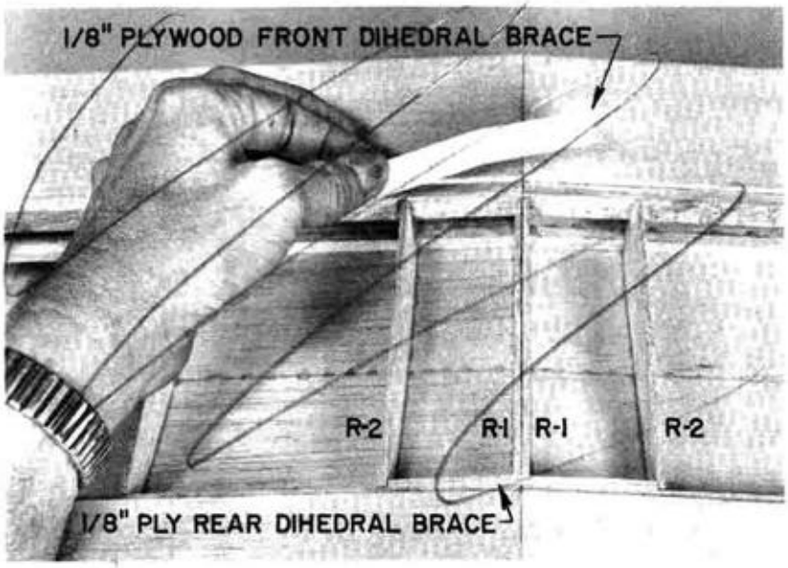


Dihedral Gauge Pattern

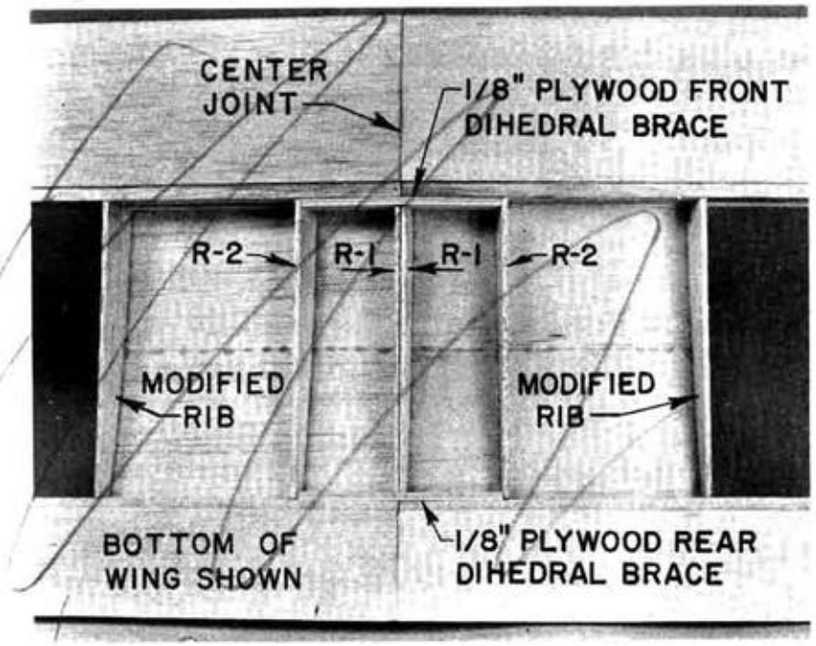
GLUE DIHEDRAL GAUGE TO CARDBOARD.
USE TO SET ANGLE OF CENTER RIBS.

(q. Add the top center section 3/32" sheet planking.

(r.) Fit the two wing halves together. Sand the center ribs with the sanding block so they match at the joint. Punch some small holes in the ends of the spars and leading edge on both halves. When gluing, these holes will fill with glue and help "nail" the parts together. Coat the center ribs with epoxy glue. Lay one half flat on a piece of wax paper on the building board and prop up the other end with a block, as shown on the full size plan drawing.

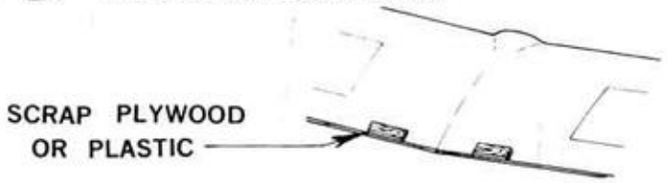


(s.) When the glue has set, remove the wing from the board and turn it over. Glue the large plywood dihedral brace to the front spar doubler and the small dihedral brace

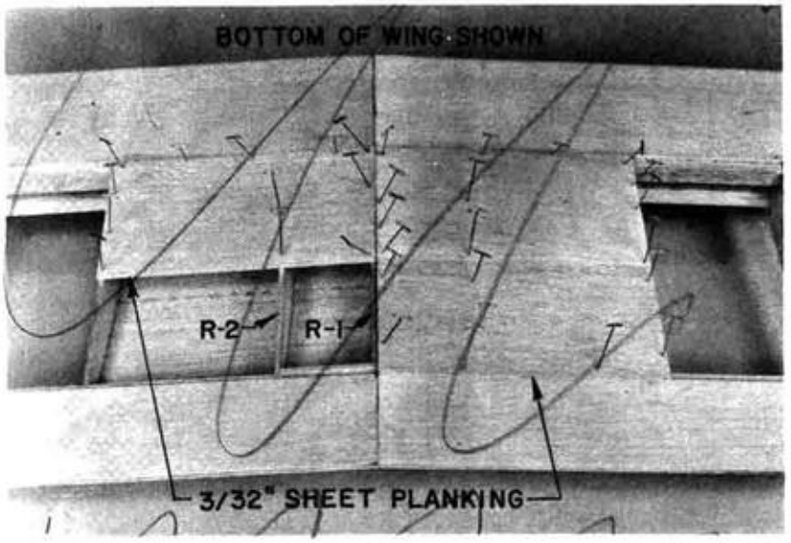


to the rear spar doubler, as shown in the accompanying pictures.

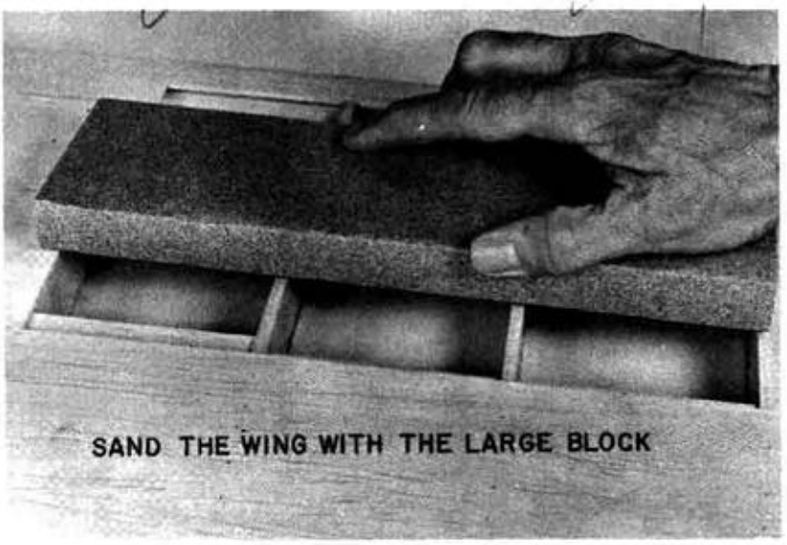
T. E. Reinforcement



NOTE: Glue a piece of thin scrap plywood or plastic on the trailing edge at the point the wing rubber bands go over the edge to keep them from cutting into the wing.



(t.) Plank the bottom of the center section with 3/32" sheet balsa.



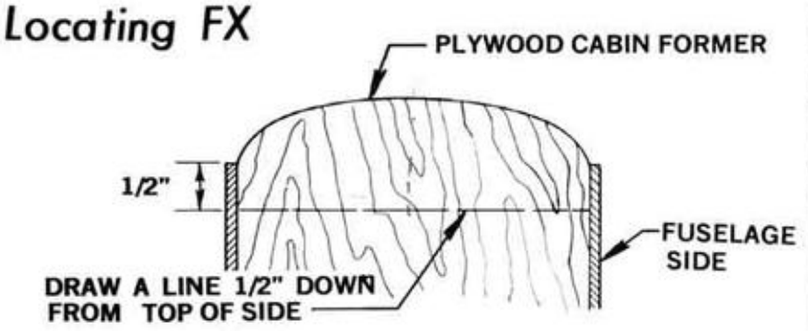
(u.) Sand the wing with the large sanding block, bridging from rib to rib to even them. Shape the trailing and leading edges with the block. Sand the planking seams in the center section and wing tip to level and smooth them together.

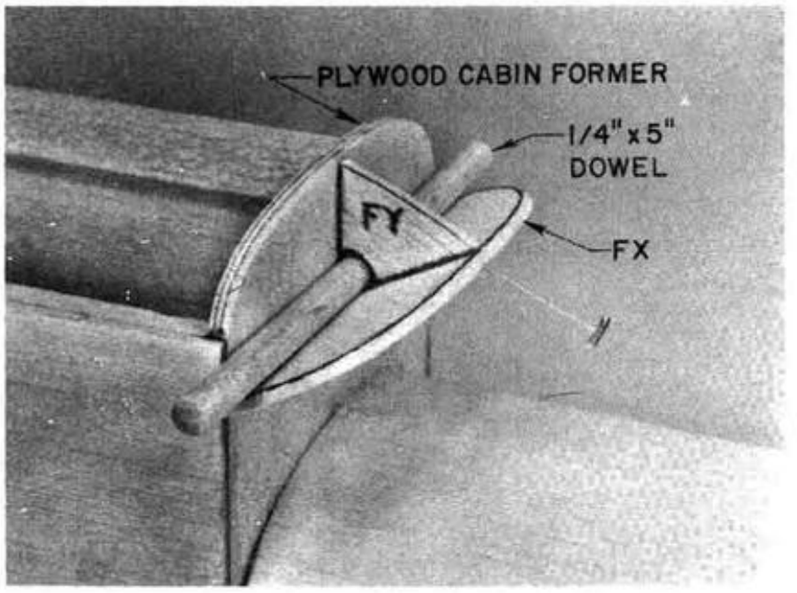
SPECIAL NOTE ABOUT WING ATTACHMENT:

The kit has been provided with 1/4" dowels in the fuselage to permit strapping on the wing with No. 64 rubber bands. Use a minimum of 6 bands, two on each side and one strapped diagonally each way on top from right front corner to left rear corner and one from the left front corner to the right rear corner. For stunting and large engines, add several more bands after test flights. However, do not overstrap the wing so that it is on too tightly. The rubber band method of attachment was chosen because the most common type of beginner's landing mistakes and rough ground landings result in cartwheels. A rubber band mounted wing can more easily shift and avoid damage. For sport flying, experienced fliers may prefer to install 1/4-20 nylon wing bolts at the rear and dowels at the front. Be sure and place the rear bolts so that they go through the center section trailing edge 1/4" scrap fill in. Replace the planking around the bolt holes with 3/32" plywood to keep the heads of the bolts from pulling into the wing. Imbed two 1/4" dowels in the leading edge of each wing panel, about 1-1/2" out from the center line. Drill matching holes into the plywood cabin former.

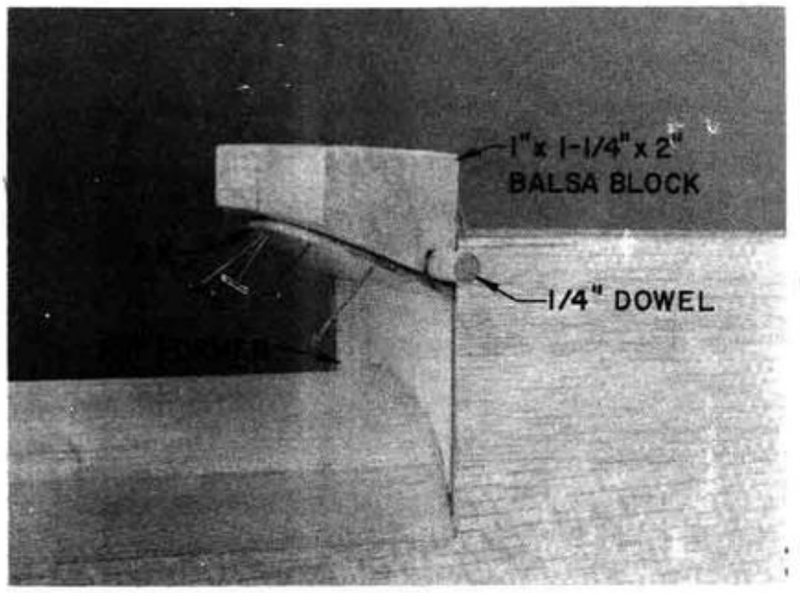
(5.) FITTING THE WINDSHIELD

(a.) Draw a line across the front of the plywood cabin former, 1/2" down from the top of the cabin side. Glue and pin former FX along this line, using former FY to set the angle.



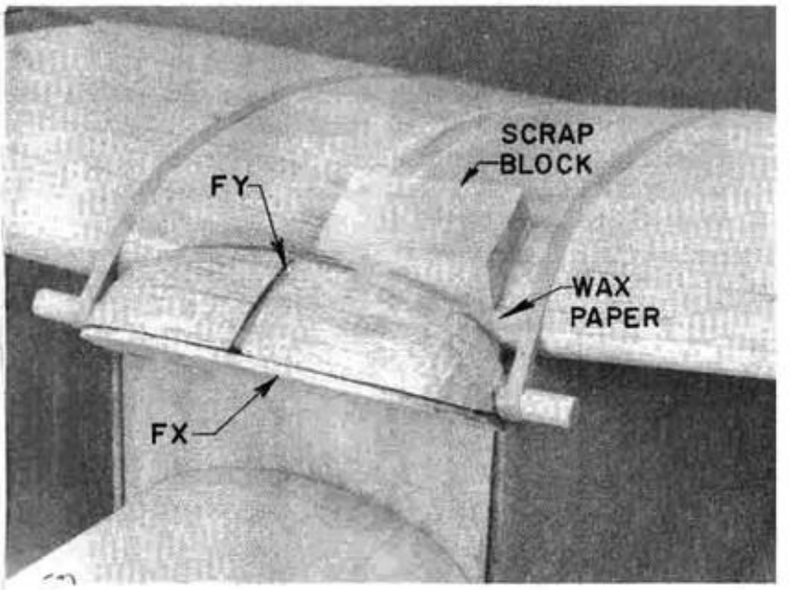


(b.) Slide the 1/4" dowel into the "V" formed by FX & FY and glue it in place.

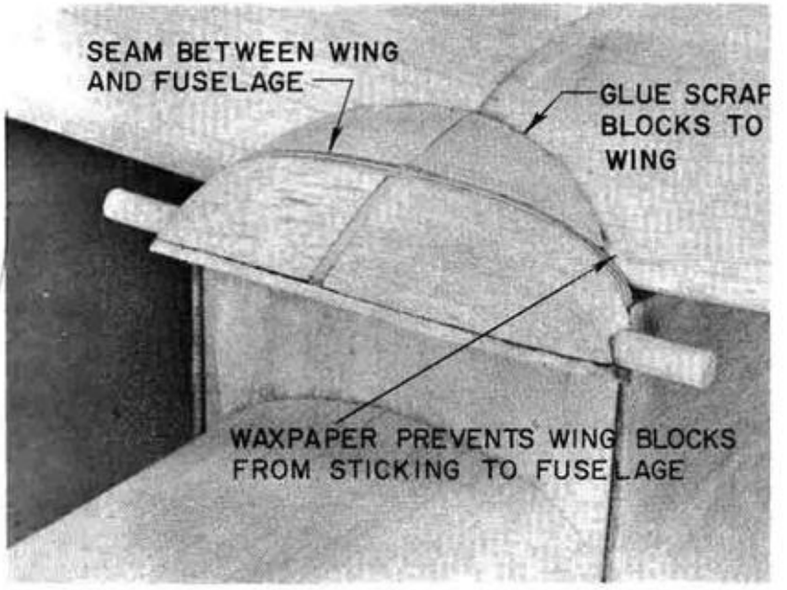


(c.) Cut the 1" x 1-1/4" x 4" balsa block provided in half. Carefully cut and fit the pieces into the "V" formed by FX & FY. Pin and glue in place.

(d.) Roughly shape the blocks, using FX & FY and the plywood cabin former as guides. Don't trim closely, but leave some wood for later sanding to blend the windshield contours into the block fairing on the wing center sectio leading edge.



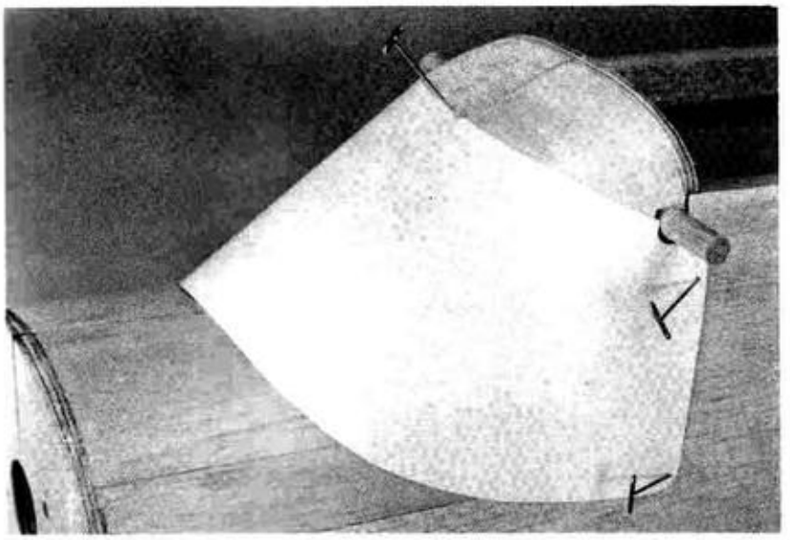
(e.) Mount the wing on the fuselage with a piece of wa paper between the plywood cabin former and the wing leac ing edge. Fit some scrap balsa blocks or pieces of shee into the area directly behind the plywood former. The ger eral shape is shown on the full-size plan. Carve and san both the block on the front of the plywood former and th one on the back at the same time so their contours wi blend smoothly. Hold the paper pattern for the windshiel in place from time to time while shaping the blocks to mak sure the lines of the front block blend into the lines of th windshield.



(f.) If the paper windshield pattern does not fit yo particular model exactly, modify it as may be necessa before using the pattern to cut the windshield out of tl clear plastic furnished.

(g.) Do not mount the windshield permanently un after the model is covered and at least partially painte It may be glued on with a small amount of Sig-Ment. Tl new cyanoacrylate "super" type glues are also very hanc for attaching the windshield.

(h.) Protect the looks of the windshield by not allowi raw fuel to discharge on it. Vent the tank out the botto of the cowl with Sig Heat Proof Tubing. Fuel residue cor ing from the exhaust is not as harmful to the windshiel



Cut out a duplicate of the windshield pattern from heavy paper or lightweight cardboard. Don't cut the windshield out of the clear plastic until you are satisfied with the fit of the paper pattern.

(6.) TANK INSTALLATION

(a.) A circular 6 oz. Sig plastic tank or equivalent is recommended.

(b.) Drill a 7/8" hole through the firewall to receive the gas tank top. Or you may prefer to just run the fuel line tubes through the firewall.

(c.) Temporary cross pieces from scrap plywood may be glued across the fuselage to support the rear and back of the tank or it may be kept in place by stuffing foam rubber or wadded paper under and around it and stowing the battery pack under it. Sig Heat-Proof fuel tubing will not harden in fuel, so if this is used as the pickup line, the tank will seldom have to be removed from the fuselage.

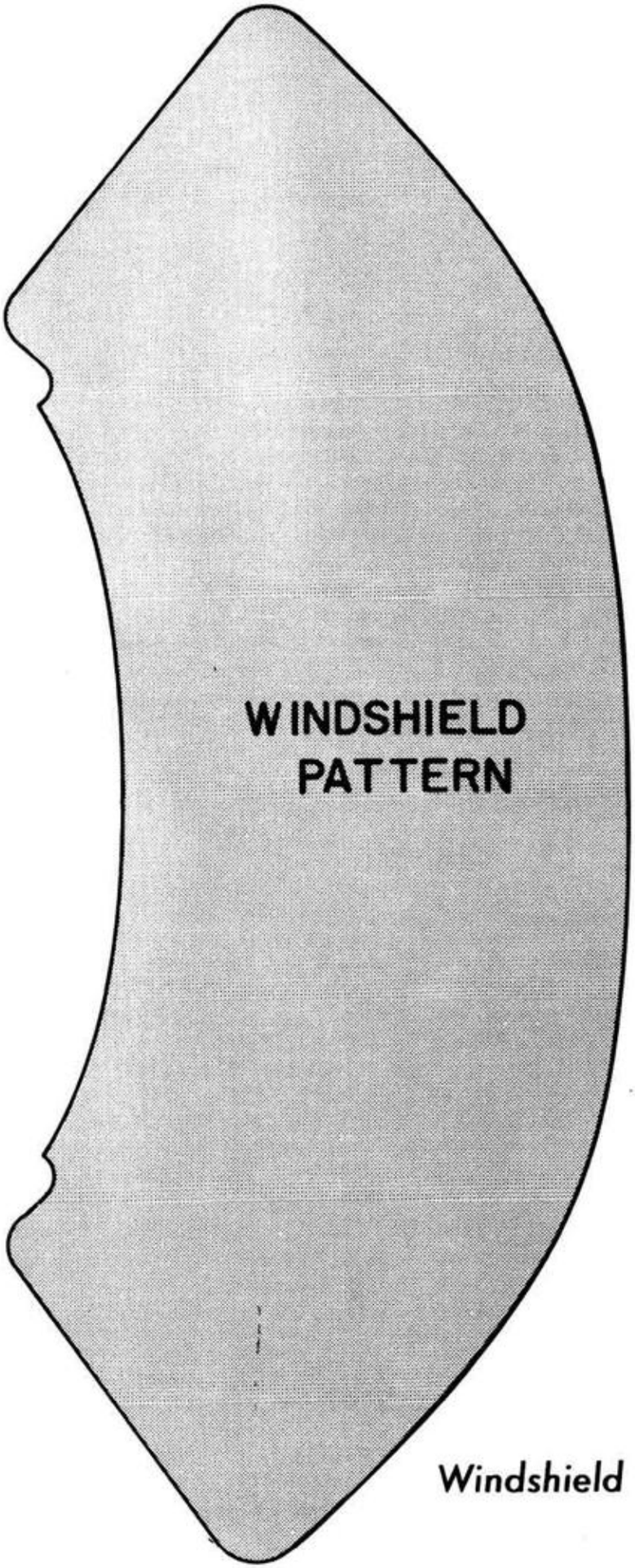
(d.) Use G.E. Silicone Seal or equivalent (obtainable at hardware stores) to plug the holes in the firewall and prevent fuel seepage into the fuselage. Should it be necessary to remove the tank from the fuselage, the silicone can be broken loose and replaced when the tank is put back in. The firewall should be completely oilproofed by painting it on the outside with Sig Epoxy Glue (Regular, not Kwik-Set). Warm the epoxy up to make it thin enough to brush, but use it up quickly, it sets up much faster when warm.

(7.) TAIL ASSEMBLY

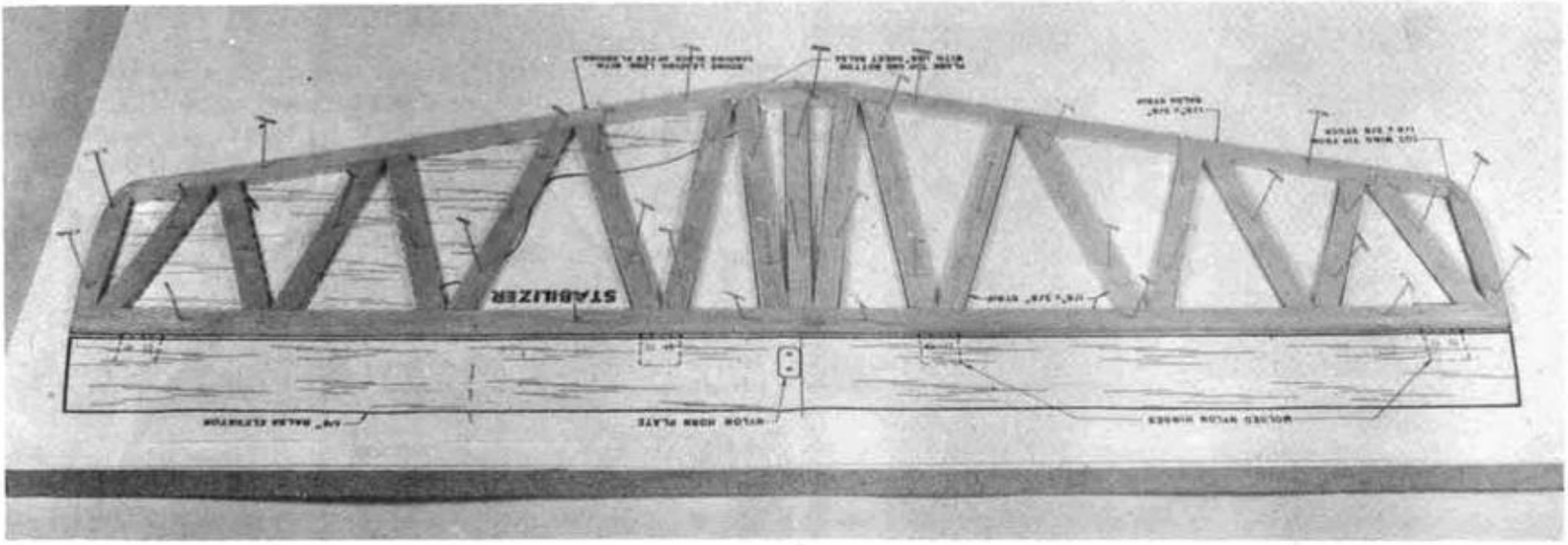
The stabilizer frame is constructed from 1/8" x 3/8" strip balsa and is detailed in an isometric view on the plan. The planking is from 1/16" x 3" x 36" sheet stock. Cut off two 24" long pieces of balsa. Cut the two remaining 12" long pieces diagonally to obtain the rest of the planking sheets for the stabilizer. Control surfaces are attached with the molded hinges provided in the hardware pack. It is generally easier to cover the surfaces with silk or equivalent covering before they are hinged.

The elevator is made from the 1/4" x 1-1/2" x 24" piece of balsa. Sand it to the airfoil shape shown on the plan.

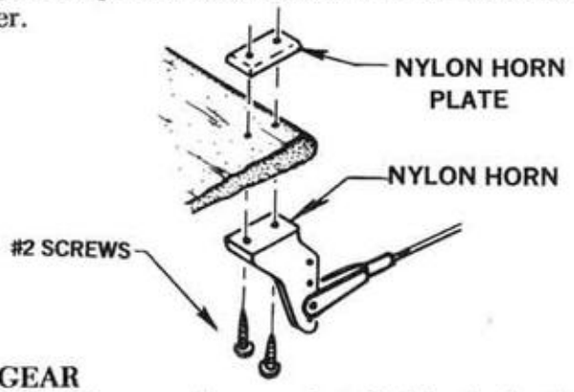
The fin and rudder are cut from the printed sheet. Cut them out a little oversize and work them down to exact shape with a sanding block. Three pieces must be glued together to form the fin. Sand the leading edge of the fin round with a sanding block. Shape the rudder to an airfoil shape similar to that shown on the plan for the elevator.



Windshield



If the tail parts are covered before being fastened to the fuselage, remove the covering in the areas that must be covered so that there will be wood-to-wood contact between the stab and fuselage and between the fin and stab. In addition, punch some 1/16" holes at a slight angle into the wood that will be mated together. Carefully work the epoxy into the holes when gluing the parts together. The glue in the punched holes will "nail" the parts together and make the joints very strong. It is also suggested that a small filler of epoxy glue be put on each side of the fin to brace it to the stabilizer.



Nylon Control Horns

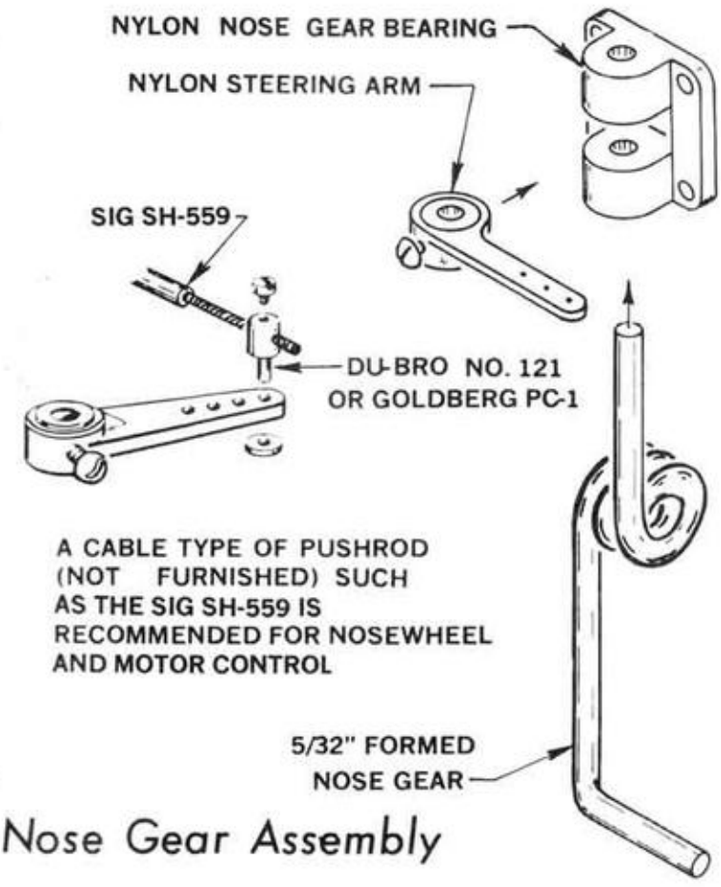
(8.) LANDING GEAR

(a.) The main landing gear legs are installed in the landing gear block, side by side. (See the isometric drawing on the plan.) Drill a 5/32" hole for the torsion bar arm located against the front edge of the groove in the landing gear block, the other against the back edge. Drill through the landing gear block and on through the anchor blocks above them. Insert the torsion bar arms into the holes and clamp the landing gear in the block with the landing gear retaining straps. Make the straps from the 1/32" x 1/4" x 1" strips of aluminum provided in the hardware pack.

(b.) The nose gear is held in the nylon bearing by the steering arm. Angle the arm forward so that when the servo pulls it back for a right turn, the arm will clear the face of the firewall.

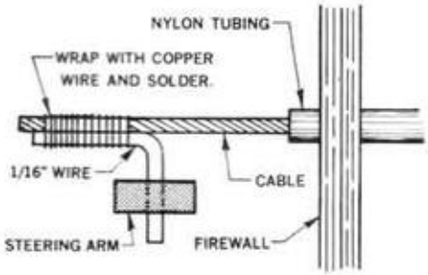
(c.) A flexible steel cable pushrod with nylon outer tubing (not furnished) is recommended for the hookup of the nose gear, such as the SIG SH-559 Flexible Cable Pushrod. Run the nylon outer tubing through the firewall at the right spot to connect the inner cable to the nylon steering arm. Epoxy around the tubing end so that no oil will leak back into the fuselage.

(d.) Hold the wheels on the axles with 5/32" diameter wheel collars such as the Du-Bro 140 or equivalent. Or you can solder a washer on the end of the axle. Protect the wheel with a shim of light cardboard that can be torn and removed after the soldering operation. "Low Bounce" type wheels are recommended. There are a number of different brands available.

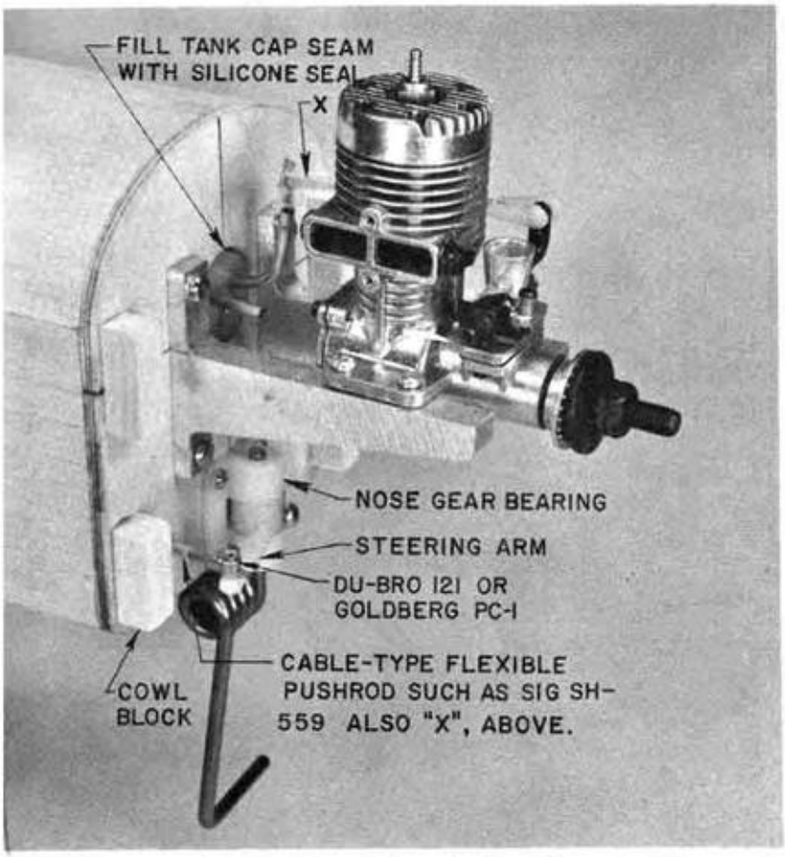


Nose Gear Assembly

(e.) For the actual hookup of the cable to the steering arm, we recommend the Du-Bro E-Z Connector 121 (formerly EC-98) or the Goldberg Pushrod Connector PC-1. Or you can make a fitting from 1/16" wire as shown here in the accompanying drawing.



Alternate Steering Hookup



After all parts are fitted and installed on the firewall, remove the mounts, tank and landing gear and oil proof the entire nose with a coat of epoxy glue or other fuel proof finish. Fill the seam around the tank cap with silicone bathtub seal.

MUFFLERS: Fox mufflers will not fit the Kadet. Semco mufflers, Tatone Extended Peace Pipes, Tatone Calumet, Tatone Muff-L-It, Du-Bro Muff-L-Aires and Mini-Muff-L-Aires will fit the Kadet.

(9.) COVERING AND FINISHING

IMPORTANT: Don't skip covering the fuselage and tail just because they are solid wood. They will be much more resistant to splitting and breaking on hard impacts if they are covered with something — silk, silkspan or iron-on covering material.

We feel that stretched and doped silk covering adds more strength to the model than any other type of covering. However, many Kadets have been built and flown using iron-on plastic or cloth materials such as Monokote or Silkspun Coverite. Follow the manufacturers directions when using these types of covering.

A good finish begins at the framework. Sand carefully with fine sandpaper.

Brush a coat of clear Sig Supercoat or Sig Lite-Coat Dope over all parts of the framework that will contact the covering. When dry, re-sand with fine sandpaper. Brush on a second coat of clear and allow to dry and again sand.

Silk (either light weight or heavy weight) is hard to beat as a model covering material. The bottom of the wing is a good place to start. Cut a piece of silk about 1" larger than half of the wing, with the grain running lengthwise (grain of the silk runs parallel to the finished bias edge). Dip in water and apply. Work around the edges, pulling out all of the wrinkles and stretching it smooth. Brush around the outside edge with clear dope. It will soak through the silk and adhere to the dope already dried on the framework. Let dry and trim off the edges with a sharp, double-edged razor blade. Go over any areas that have not completely adhered with more dope. The top half is done in identical fashion except that the silk should be brought down over the edges and lapped over the silk on the bottom at the leading edge and over the back at the trailing edge.

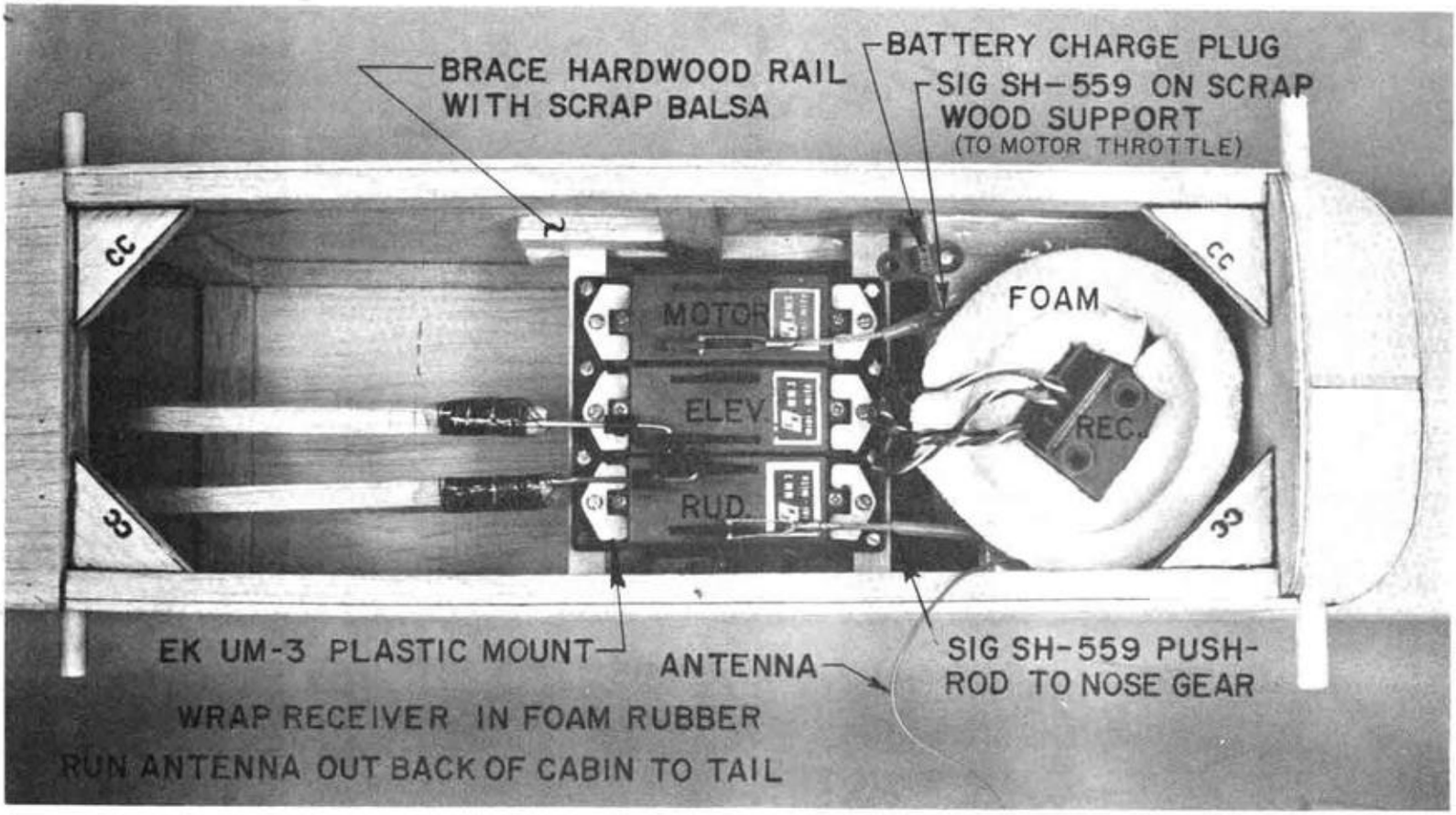
Use the same process on the tail section and fuselage. Silkspan could be substituted for silk on the tail and fuselage if desired but they should be covered with some material to avoid splitting and cracking.

The first coat of clear dope over the entire silk surface must be brushed on sparingly. As the brush rubs across the ribs on the open sections, dope is rubbed off the brush and through the silk and runs down the inside of the ribs. An excessive amount will run completely through the framework and puddle against the covering surface on the other side. When these puddles dry, the large amounts of dope solids in them cause more shrinkage than the rest of the covering and a scarred area results. So apply dope very lightly the first time over. A second coat will seal most of the pores of the silk and from this point, running through will not be a problem.

Use one or two coats of regular Supercoat clear on the wing to shrink the covering. After that, unless the covering is still not tight and unwrinkled, Sig Lite-Coat low shrink clear dope is recommended to help prevent warping. The solid wood fuselage and tail can have Sig Lite-Coat from the beginning if desired. Sig Supercoat Color Dope has low shrink qualities.

A third coat of clear should provide a good base for color. Sand lightly when dry with 220 grit 3-M Tri-M-Ite no-load paper. Don't bear down on the edges of the ribs or the silk fibers will be cut through. The color dope may be brushed or sprayed. The original Kadet was given two coats of Sig Light Red Supercoat. The decoration scheme was traced on with a light pencil and outlined with masking tape. Two coats of black were sprayed on from trim. Two coats of Sig Lite Coat clear dope should be sprayed over the red and black before the pin stripes are applied. The silver pin striping was applied with a mechanical drawing ruling pen. Thin the silver dope slightly with blush retarder to slow the drying process and aid the flow of dope through the pen points. Clean the pen frequently with dope thinner and wipe on a cloth before reloading with fresh dope. Don't try to draw a thick line with the dope and pen but instead draw a thin line on each side of the desired pin stripe (about 1/8" wide were used on the original) and fill in between the lines using the pen free hand and opened up for a wider flow. Use a French curve to outline the curved decorations on the fuselage and tail. The side cabin windows are painted on with silver dope.

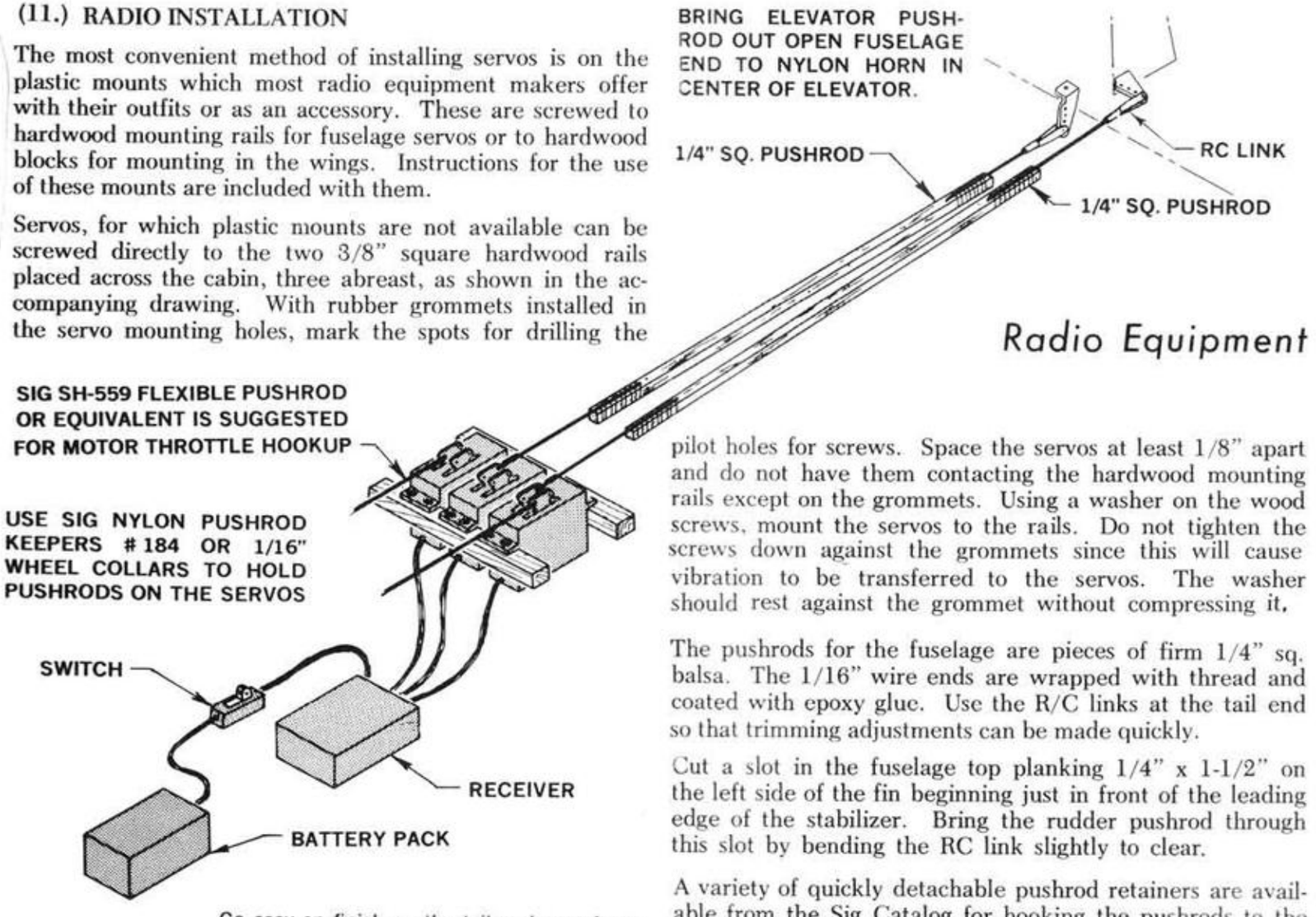
The formed plastic wing tips and cowling can be sanded with very fine sandpaper and painted with Sig Supercoat dope, epoxy paints or enamels. Don't use coarse sandpaper. Test other products on a scrap before using. Apply light coats and allow them to dry thoroughly before a second coat. Be especially careful with spray cans not to wet the plastic too much. Spray several light, dusting coats with adequate drying time between coats.



(11.) RADIO INSTALLATION

The most convenient method of installing servos is on the plastic mounts which most radio equipment makers offer with their outfits or as an accessory. These are screwed to hardwood mounting rails for fuselage servos or to hardwood blocks for mounting in the wings. Instructions for the use of these mounts are included with them.

Servos, for which plastic mounts are not available can be screwed directly to the two 3/8" square hardwood rails placed across the cabin, three abreast, as shown in the accompanying drawing. With rubber grommets installed in the servo mounting holes, mark the spots for drilling the pilot holes for screws. Space the servos at least 1/8" apart and do not have them contacting the hardwood mounting rails except on the grommets. Using a washer on the wood screws, mount the servos to the rails. Do not tighten the screws down against the grommets since this will cause vibration to be transferred to the servos. The washer should rest against the grommet without compressing it.

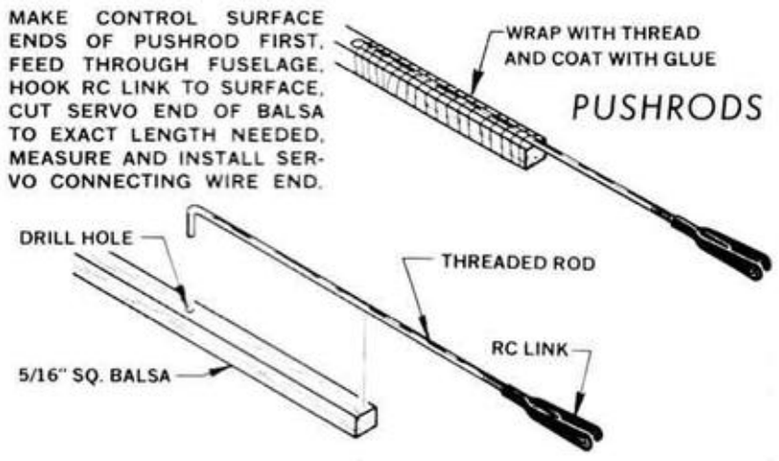


Go easy on finish on the tail and rear fuselage. An extra ounce here takes several ounces on the nose to counterbalance.

The pushrods for the fuselage are pieces of firm 1/4" sq. balsa. The 1/16" wire ends are wrapped with thread and coated with epoxy glue. Use the R/C links at the tail end so that trimming adjustments can be made quickly.

Cut a slot in the fuselage top planking 1/4" x 1-1/2" on the left side of the fin beginning just in front of the leading edge of the stabilizer. Bring the rudder pushrod through this slot by bending the RC link slightly to clear.

A variety of quickly detachable pushrod retainers are available from the Sig Catalog for hooking the pushrods to the servos. Avoid metal-to-metal contact in linkages because this may produce harmful radio interference.



A flexible cable pushrod with nylon outer tubing (not furnished) is recommended for hookup of the throttle to the motor control servo.

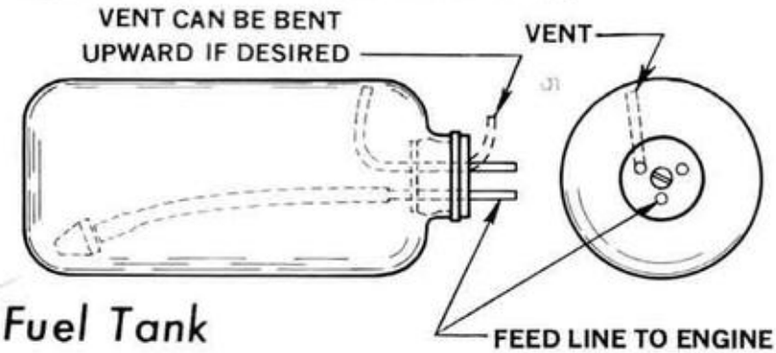
The switch may be mounted wherever convenient on the side of the model, preferably the side away from the engine oil.

The receiver battery pack should be wrapped in foam rubber sheet, held on with rubber bands and placed as far forward as possible, under the tank. It is a good idea to put the package in a small plastic bag, taped shut around the battery cable to protect the battery from accidental fuel leakage.

The receiver should be similarly wrapped up in foam rubber to protect if from engine vibration. Cover it with a plastic bag also. Stow this package under, or just in front of, the servos. Make certain that the receiver will stay in place during aerobatic maneuvers.

WHICH SIDE FOR THE RUDDER PUSHROD?

This depends on the position of the control arm on the carburetor of the engine used. If it is on the right (most common), use the servo nearest the right side of the fuselage for motor control. Use the servo nearest the left side of the fuselage for the rudder, with the rudder pushrod coming out on the left side of the rudder and the nose wheel steering hooked up on the left side of the nylon gear bearing. If your engine has a left throttle hookup, reverse all of the preceeding positions given for a right throttle hookup.



FILL TANK BY REMOVING ENGINE FEED LINE FROM NEEDLE VALVE FITTING.

(10.) BALANCING

The Center of Gravity position shown on the plan is the rear limit. Do not balance any farther back than this. For test flying and training move the batteries all the way forward or add lead to the nose (if necessary) so that the C.G. will be 1/2" to 3/4" farther forward than the plan black triangle. Don't worry about adding lead, if necessary – the model can carry it easily. Trying to fly with the C.G. too far back is much more dangerous than the slight increase in wing loading caused by adding nose weight. Balance with an empty fuel tank. When slightly nose heavy the model will be a great deal more stable and less likely to stall or snap roll. The reaction to control movements is also less sensitive with a forward C.G. so it is not so easy to over control. Some aerobatic ability may be sacrificed with a forward C.G. so you may wish, after test and familiarization flights, to move it rearward. Do this gradually and check results and control response in the air at a good altitude.

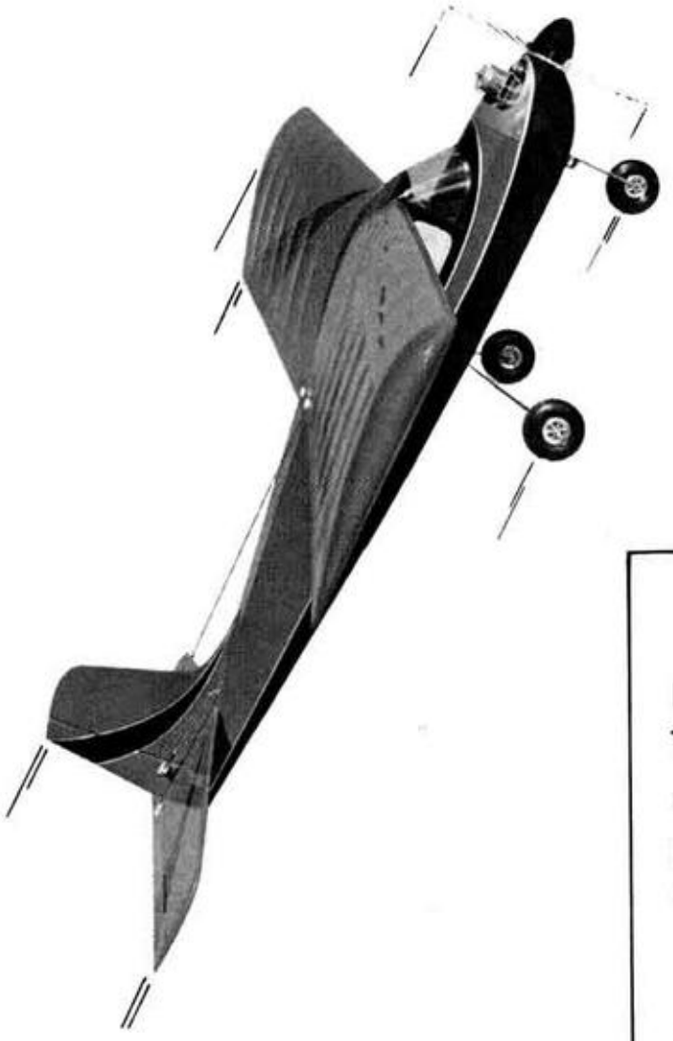
(11.) FLYING

If you are a newcomer to model flying it is suggested that you not attempt flying without the assistance of a modeler with experience. Contact your local model club or ask your hobby dealer for the names of good fliers in your vicinity and a suitable location for flying. Many hours of work are involved in the construction of a model and it can all be lost in a moment of beginner's indecision. A skilled flier can help you get past the first critical test and trimming flights without damage to the model

Be certain to carefully range check your radio equipment and see how it operates with the engine running before attempting test flights. A lot of problems can be avoided if the engine has been well broken-in and the idle adjustment perfected on a test block or in another airplane before installation in the model.

If a good, smooth take-off surface is not available, the model can be hand launched by the pilot's assistant. (Do not attempt to hand launch by yourself — instant action on the transmitter may be required.) Holding the front part of the fuselage with the left hand and under the tail with the right, run into the wind at a fast trot and thrust the model forward with the nose slightly up in a spear throwing motion. It is not necessary to achieve a lot of velocity in the launch-it is more important that it be released smoothly and with the wings level. The model may dip slightly and then should begin climbing at a slight angle. If it does not begin to climb after about fifty feet of flight, apply a small amount of up elevator to lift the nose.

Use the rudder to keep the wings level and headed straight into the wind until about 75 feet of altitude is obtained. Keep first turns gentle and not steeply banked. Stay up wind of the transmitter. Use trim levers on your radio equipment where necessary to obtain straight and level flight with the control sticks in neutral position but don't attempt to make these adjustments until the model is at a good altitude. Throttle back at altitude to find out the model characteristics in a gliding condition so that some indication is seen of what to expect during the landing approach. It is a good idea to make several practice landing approaches at a good altitude to get the feel of the model for this approaching critical maneuver. Make your final and complete landing approach while your engine still has plenty of fuel remaining so that the engine is not liable to stop before completion of the flight. This will allow application of power if the approach is being under shot. Notice the percentage of missed landings at an R/C field. Those undershot greatly outnumber those missed by overshooting. So if an approach that looks a little high is maintained, chances are good that a spot-on landing can be made.



DANGER!
Important: Read These Warnings:

Do Not fly control line or towline models within 300 feet of electric power lines. Instant death from electrocution can result from coming near them. Direct contact is not necessary.

A model airplane motor gets very hot and can cause serious burns. Do not touch the motor during or after operation. Keep clear of the propeller. It can cut off a finger or put out an eye. Make sure the propeller is securely fastened in place and is not cracked. Model airplane fuel is flammable and poisonous. Take the same precautions while transporting and using it that you would with a can of gasoline or a bottle of poison.

Remember that it is possible to lose control of a model airplane. Do not fly in locations where the model may hit people or damage property if loss of control occurs. Check your model and equipment regularly to insure it is in safe operating condition.

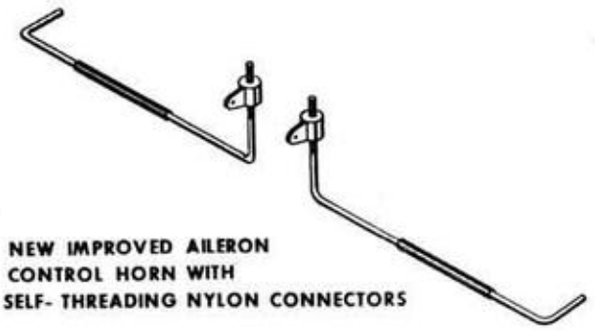
31978

NOTE ABOUT WING SHEETING

Two 3/32" x 3-1/4" x 36" pieces of sheet wood are provided to plank the top front of the wing from the leading edge to the top spar. Sort these pieces out for this use only. (The end pieces cut off from these sheets are used for planking elsewhere.)

NEW AILERON HORNS

A new item has been added to the Kadet kit so that it is no longer necessary to buy servo connectors for the aileron horns:



NEW IMPROVED AILERON CONTROL HORN WITH SELF- THREADING NYLON CONNECTORS

Additional Materials List

IN ADDITION TO THE KIT CONTENTS YOU WILL NEED THESE ITEMS TO COMPLETE THIS MODEL.

ENGINES: .19 to .40 Cu. In.

2" Spinner

4-40 or 6-32 Engine Mounting Screws
(Depends on engine. Bolts and nuts can be used in untapped holes or (recommended) socket head bolts used with tapped mount holes. 4 required.)

Propeller: 9" -4" for .19 Engines 9" -5" for .25 Engines
9" -6" for .29 Engines 10" -6" for .35 Engines

Tank: 6 oz. Round Plastic Clunk Tank

Sig Heat Proof Fuel Line to Fit Engine Used.

2 - 2-3/4" Dia. Wheels, 1 - 2-1/4" Dia. Nose Wheel

3-5/32" Wheel Collars
(Wheel can also be retained by soldering a washer on the axle.)

Sig #64 Rubber Bands for Wing Attachment

Radio Equipment - 2 Channels Minimum
(If two channel, control of rudder and elevator are recommended and .19 engine.)

Servo Mounting Materials
(Refer to radio equipment manual for specific instructions.)

1/4" Foam Rubber Sheet for Wrapping Receiver and Battery Pack.

3/8" Sq. x 8" Hardwood for Servo Mounts

Flexible Pushrod for Nose Gear Steering

Throttle Pushrod
(See Landing Gear Section Page 16, for recommendations on pushrods for nose gear and throttle.)

Covering and Finishing Materials
(Recommended: 3 yards of Sig Silk, 2 Qt. of Sig Supercoat or Lite Coat Clear Dope, 8 oz. Supercoat Basic Color and 4 oz. Supercoat Trim Color.)

Sig Bond Glue for General Construction

Sig Epoxy or Kwik-Set for Firewall Area

Basic Modeling Tools - Pins, Modeling Knife, Drill, Sandpaper, etc.

Sig Manufacturing Co.
Montezuma, Iowa 50171

 Printed in U.S.A.