KADET LT-40

SIGRC67

INSTRUCTION BOOK

Sig Mfg. Co., Inc...401-7 S Front St ...PO Box 520....Montezuma IA 50171-0520

Welcome to the sport of Radio Control flying, and thank you for choosing the SIG KADET LT-40.

We understand how anxious you are to get started building and flying your KADET LT-40, but please take a few minutes right now to study the full-size plans while you page through these instructions. This will familiarize you with the general layout of the airplane and the building sequence, making the entire project easier in the long run.

Introduction

In order for your KADET LT-40 to fly as well as it was designed to, it must be carefully assembled. A model airplane that is not built properly will not fly properly! Remember to work slowly and follow the instructions exactly. SIG, as the kit manufacturer, can provide you with a proven aerodynamic design, quality materials, and detailed instructions, but ultimately the flyability of your finished model depends on how well YOU put it all together.

Customer Service

SIG Mfg. Co., Inc. is totally committed to your success in building and flying the KADET LT-40. Should you encounter any problem building this kit, or find any missing or damaged parts, feel free to contact us by mail or phone.

SIG MFG. CO., INC.
401-7 S Front St
P.O. Box 520
Montezuma, IA 50171-0520

SIG MODELER'S HOTLINE: 1-641-623-0215 Weekdays, 7:00am - 4:30pm Central

WARNING! THIS IS NOT A TOY!

Flying machines of any form, either model-size or full-size, are not toys! Because of the speeds that airplanes must achieve in order to fly, they are capable of causing serious bodily harm and property damage if they crash. IT IS YOUR RESPONSIBILITY AND YOURS ALONE to assemble this model airplane correctly according to the plans and instructions, to ground test the finished model before each flight to make sure it is completely airworthy, and to always fly your model in a safe location and in a safe manner. The first test flights should be made only with the assistance of an experienced R/C flyer.

The governing body for radio-control model airplanes in the United States is the ACADEMY OF MODEL AERONAUTICS, sometimes referred to as the AMA. The AMA SAFETY CODE provides guidelines for the safe operation of R/C model airplanes. While AMA membership is not mandatory, it is a good idea and we encourage all new R/C fliers to join the AMA. Membership in the AMA provides you with important liability insurance protection in case your R/C model should ever cause serious property damage or personal injury to someone else.

For more information, contact:
ACADEMY OF MODEL AERONAUTICS

5161 East Memorial Drive
Muncie, IN 47302
Phone: 765-287-1256

Limit of Liability

The craftsmanship, attention to detail, and actions of the builder/flyer of this model airplane kit will ultimately determine the flight performance and safety of the finished model. SIG MFG. CO.'s only obligation shall be to replace those parts of the kit proven to be defective or missing. The user shall determine the suitability of the product for his or her intended use and shall assume all risk and liability in connection therewith.

COMPLETE KIT PARTS LIST							
Die-Cut Balsa Wood Sheets							
2	Sheet No. 1: wing ribs W1, W2	2	Sheet No. 2: wing ribs W3, W4	8	Sheet No. 3: wing ribs W5	2	Sheet No. 4: wing sheeting WS-T1, WS-B1
1	Sheet No. 5: wing sheeting WS-T2, WS-B2	1	Sheet No. 6: wing sheeting WS-T3, WS-B3				
Die-Cut Plywood Sheets							
2	Sheet No. 7: FS-R fuselage side rear, F8 fuselage former	2	Sheet No. 8: FD fuselage doubler, HATCH TONGUE	1	Sheet No. 9: FB-F fuselage bottom front, FB-R fuselage bottom rear	1	Sheet No.10: FT-R fuselage top rear, HATCH, WINDSHIELD
1	Sheet No.11: F4 fuselage former, F5 fuselage former, DTG dihedral tip gauge, DRG dihedral root gauge	1	Sheet No.12: F7 fuselage former, TANK FLOOR	2	Sheet No.13: FS-F fuselage side front, WTP wing tip plate	1	Sheet No.14: ASM aileron servo mount, FSM fuselage servo mount
Sawn Balsa Wood Parts							
1	5/16"x6"x3" STAB CENTER SECTION						
Sawn Plywood Parts							
2	1/16"x1"x3-5/16" TRAILING EDGE STIFFENER						
Laser-Cut Parts							
2	1/8" thick balsa wood SW-1, SW-2, SW-3 shear webs	1	5/16" thick balsa wood STAB L.E. JOINER	2	1/8" thick birch plywood MADB main dihedral brace	1	1/4" thick birch plywood F1 firewall
1	1/8" thick lite-ply F2 fuselage former	1	1/8" thick lite-ply F3 fuselage former	1	1/8" thick lite-ply F6 fuselage former		
Balsa Wood Sticks							
4	1/4"x3/8"x36" REAR SPARS, TOP & BOTTOM	4	1/4"x1/2"x10-1/8" SPAR DOUBLERS, TOP & BOTTOM	2	5/16"x5/16"x36" STABILIZER PARTS, FIN PARTS	3	5/16"x1/2"x36" STABILIZER PARTS, FIN PARTS
2	3/8"x3-13/16" BALSA TRIANGLES for firewall support						
Special Pre-Shaped Balsa Wood Parts							
2	TRAILING EDGES	2	LEADING EDGES	2	AILERONS	2	CENTER SECTION TRAILING EDGE
1	RUDDER	1	ELEVATOR				

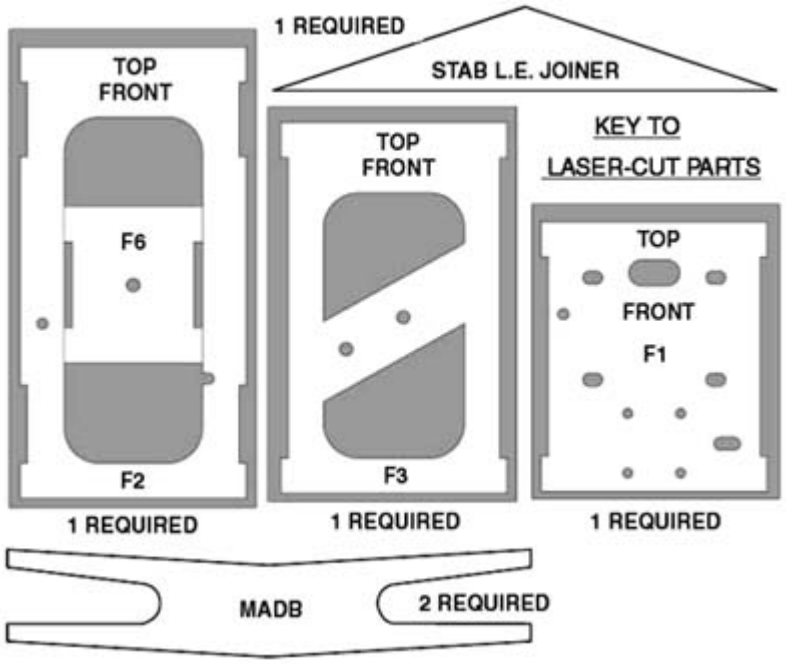
Hardwood Parts							
4	1/4"x1/2"x36" MAIN WING SPARS, TOP & BOTTOM	1	3/8"x1"x3-1/2" GROOVED LANDING GEAR BLOCK	2	1/2"x1"x1" L.G. ANCHOR BLOCKS (in Hardware Pack #1)	2	5/16" dia. x5-1/2" DOWELS (in Wire Parts Pack)
Wire Parts Pack							
2	MAIN GEAR WIRES, pre-bent	1	NOSE GEAR WIRE, pre-bent	1	RIGHT AILERON TORQUE ROD w/BRASS BEARING, pre-bent	1	LEFT AILERON TORQUE ROD w/BRASS BEARING, pre-bent
2	1/16" dia. x18" STRAIGHT MUSIC WIRE	6	10" THREADED STEEL RODS (threaded one end)				
Hardware Pack #1							
4	4-40 x1/2 MOUNTING BOLTS (Slotted Round Head)	4	4-40 x1 MOUNTING BOLTS (Slotted Round Head)	4	6-32 x3/4 MOUNTING BOLTS (Slotted Round Head)	4	4-40 AIRCRAFT LOCK NUTS
4	4-40 BLIND NUTS	4	6-32 BLIND NUTS	1	6-32 x1/4 SELF-TAPPING SCREW (Slotted Panhead)	5	#2 x1/2 SHEET METAL SCREWS (Slotted Panhead)
4	#4 x1/2 SHEET METAL SCREWS (Slotted Panhead)	1	#2 FLAT METAL WASHER	1	NYLON NOSE GEAR BEARING	1	NYLON STEERING ARM
1	NYLON CONTROL HORN, MEDIUM	1	NYLON CONTROL HORN, SMALL	2	NYLON LANDING GEAR STRAPS	2	NYLON AILERON CONNECTORS
6	NYLON R/C LINKS	2	R/C SOLDER LINKS				
Hardware Pack #2							
2	GLASS-FILLED ENGINE MOUNTS	1	Bag of 4 complete PUSHROD CONNECTORS	1	Bag of 6 complete 5/32" WHEEL COLLARS	1	Bag of 15 SIG EASY HINGES
Miscellaneous Parts							
1	FIBERGLASS CLOTH TAPE, 1"x24"	1	SILICONE FUEL LINE, 12" long	2	SMALL DIA. NYLON PUSHROD TUBING, 1/8" O.D. x12" long	2	SMALL DIA. NYLON PUSHROD TUBING, 1/8" O.D. x38" long
2	LARGE DIA. NYLON PUSHROD TUBING, 3/16" O.D. x26-5/8" long	1	2" dia. SIG SPINNER, complete	1	8 ounce DU-BRO FUEL TANK, complete	2	3" dia. KAVAN MAIN WHEELS
1	2-3/4" dia. KAVAN NOSE WHEEL	1	LEFT DECAL SHEET, DKM#267A	1	RIGHT DECAL SHEET, DKM#267B		
Documenation							
1	PLAN SHEET 1	1	PLAN SHEET 2	1	"INSTRUCTION BOOK"	1	"TIPS ON USING SIG CA"
1	"THE BASICS OF RADIO CONTROL"						

Wood Parts Identification

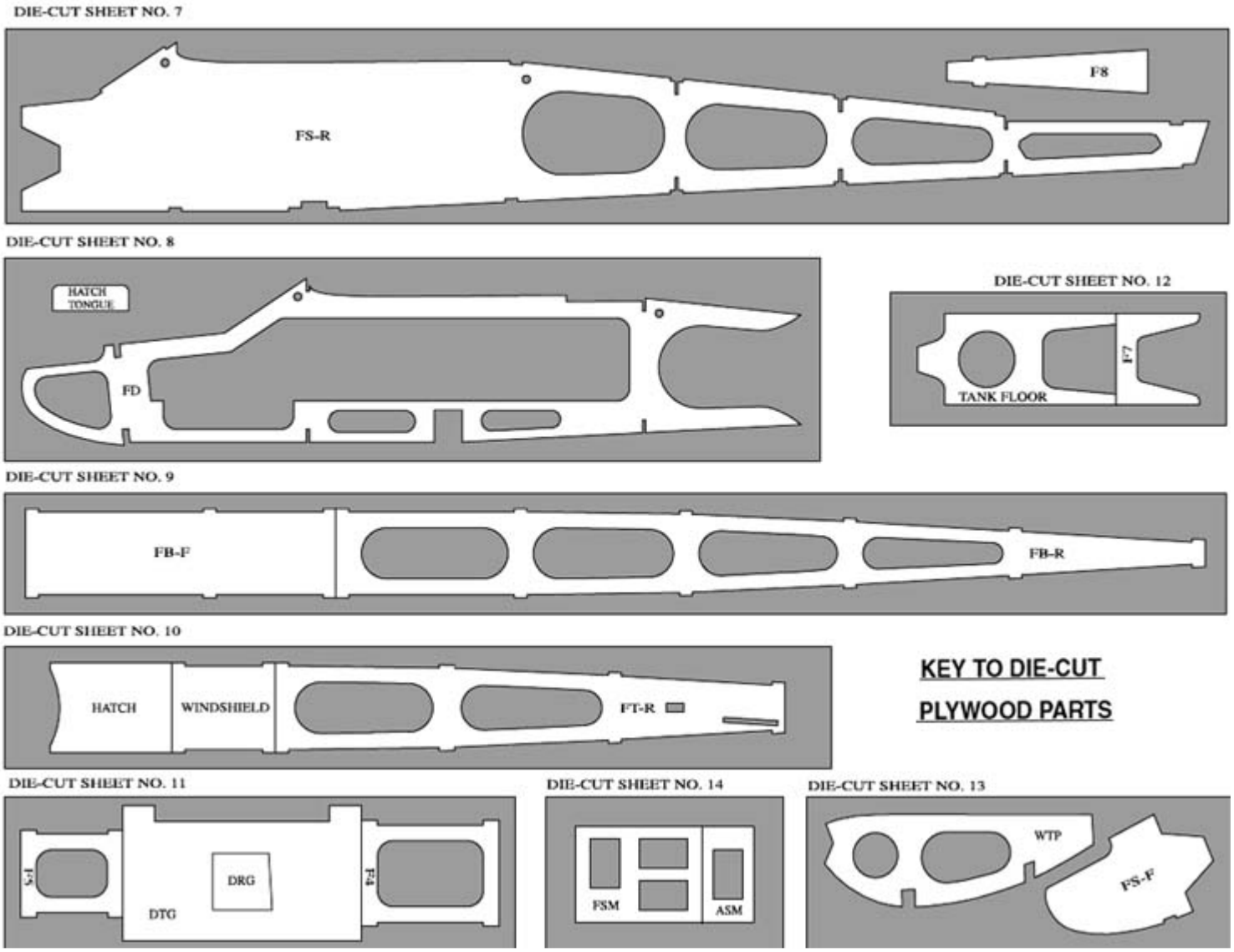
Wood parts such as standard stick and sheet stock, leading edges, trailing edges, ailerons, elevator, etc., are all easily identifiable by comparing their shape and dimensions to the plans and the KADET LT-40 COMPLETE PARTS LIST; therefore we did not feel that there was any need to label these parts. On the other hand, proper identification of the different wing ribs, wing sheeting, fuselage formers, etc., can be confusing because some of them are very similar looking, but in fact they are quite different. Wherever possible, we have labeled (printed) these parts. The die-cut plywood parts are not labeled. They can be identified using the plans and the KEY TO DIE-CUT PLYWOOD PARTS.

Use a pencil to label each part with its name or number, before removing the parts from the die-cut sheets. Use the KEY TO LASER-CUT PARTS to identify and label the following laser-cut parts: STAB L.E. JOINER, MADB, F1, F2, F3, and F6. Use the SHEAR WEB IDENTIFICATION DIAGRAM to identify and label the sawn balsa wood SHEAR WEBS SW-1, SW-2, and SW-3.

Be careful when removing parts from die-cut sheets. If difficulty is encountered, do not force the part from the sheet - use a modeling knife to cut it free. Handle the removed parts carefully, as long parts (such as the fuselage sides) are fragile until glued into a structural unit. Sort the different parts into individual piles to avoid confusion during building. Save all scrap wood until the model is finished. You never know where a small piece of scrap wood may come in handy during construction.



NOTE: The edges of all the laser-cut parts have a "burnt" appearance varying from light brown to dark black, depending upon the thickness and type of material the part is made of. Our tests indicate that a slight discoloration of the edges does not significantly affect the bonding ability of these parts. The lightly discolored parts F2, F3, F6, MADB, and Stab L.E. Joiner can be installed as is, without any need to try to clean the edges. However we recommend that the black edges of former F1, made of 1/4" thick plywood, be lightly sanded with an 80 grit sanding block to remove the loose black soot. It's not necessary to sand every bit of black off (you don't want to change the size of the part). Sand until you can run your finger lightly over the edge without picking up any black color (see photos of sanded F1 in the fuselage section).

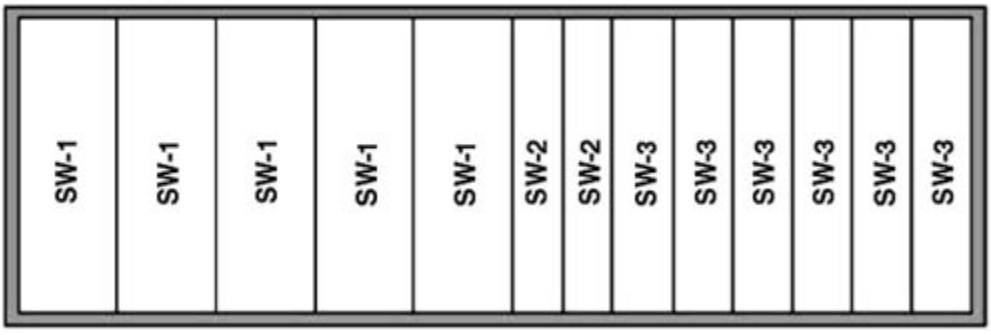


SHEAR WEB IDENTIFICATION DIAGRAM

2 - 1/8" x 3-1/4" x 10" laser cut balsa sheets contain the wing Shear Webs SW-1, SW-2, and SW-3. Use a pencil to mark each of the Shear Webs according to these diagrams, before removing them from the sheets.

Totals Needed:

SW-1: 10 required
SW-2: 4 required
SW-3: 12 required



About The Wood In The Kit

We strive to supply good quality materials in all SIG kits. However wood is a highly variable material (unlike man-made plastic or metal), so every single wood part in a kit will probably not have flawless appearance. Often things that look like an imperfection are actually quite acceptable when you consider the function the part will serve. Mineral stains and tiny knots do not seriously affect balsa wood strength. Also, there is a natural tendency for some balsa sticks and sheets to immediately bow upon being cut off from a perfectly square block due to internal stresses in the wood. In most cases, bows in wood parts (such as leading edges) readily straighten out as they are glued into a structural unit. Likewise Lite-Ply fuselage sides, formers, and doublers that are warped will usually straighten right out when they are glued in place. If you are in doubt about the suitability of any part in your kit for it's intended purpose, call or write to us for assistance and/or a replacement part.

Additional Components Needed

The following items are not supplied in this kit but are needed to complete the KADET LT-40. Because of the wide variety of brands available and the influence of personal preferences, the choice of these items is left to the builder to select.

- **.30 to .40 cu. in. 2-Stroke Glow R/C Engine w/Muffler, or .40 to .50 cu. in. 4-Stroke Glow R/C Engine w/Muffler**

  Engines larger than those listed are not recommended! Use of oversize engines will cause balance problems and may overload the structure of the airplane. The KADET LT-40 has a light wing loading and does not need a super "hot" engine to fly well! Any normally ported .40 2-stroke glow R/C engine will provide adequate power to fly the KADET LT-40. We believe that the .40 2-stroke glow R/C engine will be the most commonly used engine in the KADET LT-40, so that is what we've shown on the full-size plans and in this instruction book.

- **Propeller**

  Propellers are a subject that can fill a book all by themselves! There are a large variety of propeller sizes available, and selecting the best one to use on your KADET LT-40 will depend mostly on which engine you end up buying. Refer to the instruction sheet that comes with your engine for a recommended propeller size. If the engine manufacturer lists several possible sizes, pick the one that sounds like it is for a slower flying model - choose "sport or scale" instead of "pattern or racing". Also, be sure to read "THE BASICS OF RADIO CONTROL" book for more tips on propellers. As a general rule, if you are going to use a normal .40 2-stroke glow R/C engine in your KADET LT-40, you will undoubtedly use a 10-6 propeller, as noted on Plan Sheet 1.

- **Radio Control System**

  You will need a (minimum) 4-channel radio control system with 4 servos to operate the ailerons, elevator, rudder, and engine throttle of your KADET LT-40. The KADET's fuselage is spacious enough that any common brand of radio equipment with standard size servos and battery pack can be used. Be certain that your radio system transmits on one of the FCC-approved frequencies for R/C model aircraft. See "THE BASICS OF RADIO CONTROL" book for more information on radio equipment and frequencies.

- **1/2"x8"x12" Soft Foam Rubber (such as SIGRF-240)**

  Used to protect your radio receiver and battery pack from damaging engine vibration. Also used as packing around the fuel tank and radio components to keep them from shifting around in flight.

- **#67 Rubber Bands (such as SIGSH-747)**

  Used to hold the wing on the fuselage. Always use at least 12 rubber bands when flying. Replace any bands that have stretched out or have become oil soaked.

- **3 Rolls of Covering Material (such as SIG AEROKOTE COVERING)**

  Although the KADET LT-40 can be finished with a wide variety of covering materials (some which need to be painted and some which don't), this instruction book assumes that the beginner will use one of the popular pre-finished iron-on plastic film coverings. In the Covering and Finishing section of these instructions you will find a "COVERING CUTTING DIAGRAM" which shows how to cut 3 standard (26" wide x 6 ft. long) rolls of iron-on film covering to fit the KADET LT-40.

- **4 oz. of Fuel-Proof Paint (such as SIG SUPERCOAT DOPE)**

  For fuel-proofing the engine compartment, tank area, wing saddle, and ends of the wing dowels.

- **Light-Weight Wood Filler**

  For filling holes, nicks, and dents after assembly of the model, but before covering. Regular household "wall repair" or "spackling" compound (3M, Red Devil, DAP, etc.) works well for this. There are also several excellent "model fillers" available at the hobby shop. Just make sure whatever you use is light weight and sands easily. Do not use household patching plaster - it's way too heavy!

- **Glue**

  There are so many different types of glue available today for model airplane construction that it can be confusing to even the experienced modeler. To simplify matters, most model airplane glues can be classified as one of four basic types:

  1. **Cyanoacrylate Adhesives**, such as SIG CA, are very strong and bond in just seconds. Dramatically speeds up building time! Different vicosity's and cure times are available to suit all areas of model construction.

  2. **Two-Part Epoxy Glues**, such as SIG-KWIK-SET (5-minute cure) and SIG EPOXY (3-hour cure), are super strong but too heavy for general construction. Often used in high stress areas such as the firewall, landing gear, and wing joiners.

  3. **Water-Based Glues**, such as SIG-BOND (aliphatic resin), are very safe and easy to use. Excellent for general construction, although somewhat slow drying.

  4. **Solvent-Based Model Cement**, such as SIG-MENT, is the oldest form of traditional model airplane glue. Still used for general construction by some modelers - especially when building super light weight free flight models.

You could build the KADET LT-40 using any of these four basic types of glue. Each type has different characteristics and advantages, and all of them will result in a bond that is stronger than the wood materials being glued together. Often times the choice of which type to use boils down to a matter of personal preference based on past experience. However, if you want to get your KADET LT-40 into the air as quickly as possible, we recommend that you use CA glue for the majority of the assembly of this kit. CA glue is not only fast and strong, but it also makes it possible to do some unique things in the construction sequence. For instance, since CA glue has the ability to penetrate into an already assembled joint, we can first assemble the interlocking fuselage parts "dry" (without glue), then check and adjust the alignment, and finally apply CA to the pre-assembled joints. This makes it very easy to build a straight and true fuselage in a very short time. If the use of CA glues is new to you, please read "TIPS ON USING SIG CA", included in this kit.

> NOTE:
> The instructions in this book are written assuming the use of MEDIUM CA glue for all steps, unless otherwise noted. In other words, if an instruction simply says "glue" part A to part B - use MEDIUM CA! If THIN CA, SLOW CA, EPOXY GLUE, or SIG-BOND GLUE would work better in a specific instance, we will call for it.

Workshop Tools And Supplies

As the old saying goes, "Having the right tool makes the job easy". That certainly holds true with building model airplanes as well as anything else. Below is a list of the tools we feel are the minimum required to speedily and accurately assembly this kit, and to build other model airplanes in the future. Some of them are common household tools that you probably already have, while some are special "modeling" tools that you will have to purchase at the hobby shop. While there are many more special modeling tools available, and they all do a wonderful job in certain areas, these are the basics with which to get started in the hobby. Like the rest of us, eventually you will add others to your workshop as the need arises.

- **Building Board - 12"x36" minimum size**- This can be any flat surface that will accept and hold pins - such as insulation board, foam board (cardboard laminated to both sides of a foam sheet), cork bulletin board, soft plywood, a reject "door core" from the lumber yard, etc. The most important thing is that **the board must be perfectly flat and untwisted!** Your wings and tail surfaces will be built on this board, and if the board is twisted or bowed, the parts you build on it will assume the same shape and your model will not fly properly.

> NOTE:
> The building board you'll see us using in the photos in this book is an 18" x 48" piece of 3/4" thick plywood (perfectly flat!), with a same sized piece of 1/4" thick foam board stuck down on top of the plywood with double-sided sticky tape. The plywood provides the rigidity and flatness we need, and the semi-flexible foam board lays flat on the plywood and gives us a surface to push pins into. All materials were obtained from the local lumber yard. Insulation board or cork sheet would make a good substitute for the foam board, if that is not available.

- **Wax Paper**
  Used to cover the plans so that parts are not accidentally glued to them.

- **A Few Dozen T-Pins (such as SIGSH-310)**
  For holding parts together during construction.

- **Masking Tape or Scotch Tape**
  For holding parts together during construction.

- **#32 or #64 Rubber Bands (such as SIG #SH-364 or SIG #SH-366)**
  Used to hold the fuselage parts together during initial assembly.

- **Scissors**

- **Ruler or Tape Measure**

- **Pencil**
  Do not use a ball-point or felt-tip pen for making marks on the model during construction. If not sanded off, ink marks may show through the model's final finish. Use a pencil instead of a pen.

- **Modeling Knife (such as X-Acto #1 knife with extra #11 blades)**
  For general cutting.

- **Razor Saw (such as X-Acto #75300 or Zona #500)**
  For cutting thicker wood pieces.

- **1/2-Dozen Single-Edge Razor Blades (such as SIG #SH-283)**
  For cutting and trimming covering material.

- **Long Metal Straight Edge (such as SIG #SE-236)**
  To aid in making long straight cuts in wood and covering material.

- **Triangle (such as metal SIG #TR-036 or plastic draftsman's triangle)**
  For squaring up parts during assembly and to aid in making short straight cuts in wood and covering material.

- **Assorted Screwdrivers**

- **Assorted Hex "Allen" Wrenches**

- **Regular Pliers**

- **Drill and 1/16", 3/32", 1/8", 5/32", 5/16" Drill Bits**

- **Needle-Nose Pliers with cutting jaws**

- **Flat File**
  For cutting, bending, and shaping pushrod wires. For removing burrs and sharp edges from wire parts.

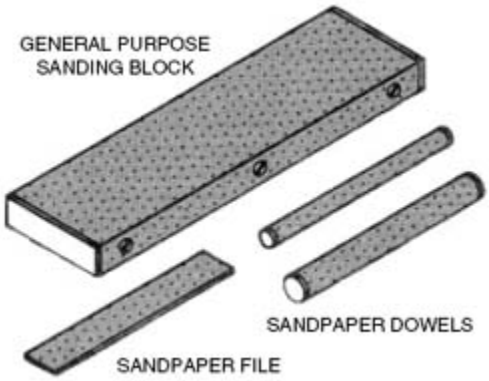
- **Soldering Iron, Rosin Core Solder, and Soldering Paste Flux**
  There is one part in this kit that needs to be soldered. (If you don't have a soldering iron, perhaps you can borrow one for this part of the construction.)

- **Covering Iron**
  For applying iron-on covering material. Although a household iron can be used to apply covering, smaller easier-to-use irons specifically designed for model covering are available at the hobby shop. (Like the soldering iron, perhaps you can borrow one from another modeler if you are covering your first airplane.)

- **80 and 220 Grit Sandpaper**
  We prefer either garnet or silicone carbide type open-coat sandpaper. Use the 80 grit to rough sand and shape parts. Use the 220 grit to fine sand the entire model prior to covering. Sand with the grain of the wood whenever possible. Always use fresh, sharp sandpaper. Sharp sandpaper will cut through glue and hard materials easily, giving an even surface. Dull sandpaper will require more pressure and may gouge the surface.

- **Sanding Blocks**
  The instructions will call for you to sand some parts of the model using a "sanding block", which is simply a piece of sandpaper backed up by a solid, flat block of wood, plastic, or whatever. A sanding block will give you a much flatter, truer result than you would get with an unbacked, limp piece of sandpaper held in your fingertips. An assortment of different size sanding blocks are indispensable tools for all model construction. There are many styles of commercially made sanding blocks available in hobby shops, or you can make your own.

A good general purpose sanding block can be made by wrapping a full-size standard 9"x11" sheet of sandpaper around a piece of hardwood or plywood, as shown below. This is the most commonly used sanding block in our workshop! Use screws or thumbtacks along one edge to hold the overlapped ends of the sandpaper in place. Put 80 grit sandpaper on the block during general construction, and then switch to 220 grit sandpaper for final sanding just before covering (or make yourself two of these blocks, one for each grit sandpaper). There will be other times when a slightly smaller sanding block is easier to manage. Also, you can make a small sandpaper "file" by simply gluing a strip of 80 grit sandpaper onto a scrap plywood stick. Sandpaper glued or taped to different size hardwood dowels are great for sanding inside curves and holes.



Last but not least, for sanding really large areas, glue 80 grit sandpaper onto a 24" or 36" long piece of aluminum "channel" or "T-Bar" stock (most hardware stores carry a rack of aluminum extrusions in various sizes and shapes).

How To Use These Instructions

Like a full-size airplane, the KADET LT-40 is built by first constructing several basic structures - the FUSELAGE, WINGS, STABILIZER, FIN, etc. - which are then assembled into a completed airplane. These instructions will take you step-by-step through the construction of each basic structure and then the final assembly.

How To Use The Plans

There are two sheets of Plans included in this kit. The plans will be used in several ways. They will help you identify all the parts and determine the relationship of all the parts to each other. They will also be used as a building pattern for the Wing Panels, Stabilizer, and Fin - which will be assembled directly on top of the plans. The plans also show how we would install a typical radio and engine in the KADET LT-40. By referring to the examples shown on the plan, you should be able to properly install your radio and engine, even if they are not exactly the same as what is shown on the plan.

Everything on the plans is drawn FULL-SCALE, or ACTUAL SIZE (except for the Wing Front view which is half-size) to show the correct size, shape, and relationship of all the parts to each other.

The plans show the model completely assembled. Unfortunately this often covers up the important parts inside the model, making it hard to understand how things fit together. In normal drafting practice, parts hidden inside the model would be shown with dashed lines, and you will find many areas of the plan that do use this method. However in areas where there are so many hidden parts that it would be confusing to use so many dashed lines, we have elected to use "cutaway views". Cutaway views make it appear as if a portion of a part has been cut out and removed. This is done to clearly show the parts that are immediately under the cutaway part. For instance, on Plan Sheet 1 we have used a cutaway to completely remove almost all of the left fuselage side (starting between Formers F4/F5 and going forward) so that the details inside the fuselage could be clearly seen. On Plan Sheet 2 there are several small cutaways in the wing sheeting to allow details underneath to be clearly seen.

NOTE: The cutaways on the plan do not mean that the parts should actually be shaped that way!

Whenever building a structure directly on top of the plans (like the Wing Panels, Stabilizer, or Fin), you must first tape or pin the plan onto your building board and then cover it with a layer of wax paper. The wax paper will keep excess glue from sticking the model parts to the plans. As you add parts to the structure, any parts which naturally come in contact with the plans should be firmly pinned to the plan/building board with T-Pins. Take a look at the photos in these instructions of the wing construction and you will see what we mean. In the pictures you will see that lots of T-Pins have been used to anchor the parts firmly in position on the plans.

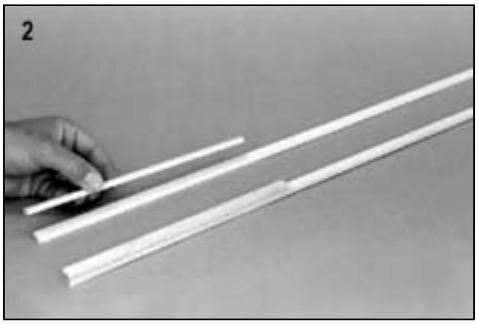
WING PANEL CONSTRUCTION

The KADET LT-40's wing is designed to be built in two halves - called the LEFT WING PANEL and the RIGHT WING PANEL (see full-size Plan Sheet 2). Each wing panel should be built directly on top of its own plan, using the plan as a pattern to position the parts. It's best to work on just one wing panel at a time. Occasionally you will find as you are working on one wing panel that the parts you have already installed will be covering up some of the plan lines and text that you are looking for in a subsequent step. In that case, simply refer to the other wing panel plan (the one you are not using) to see what is covered up.

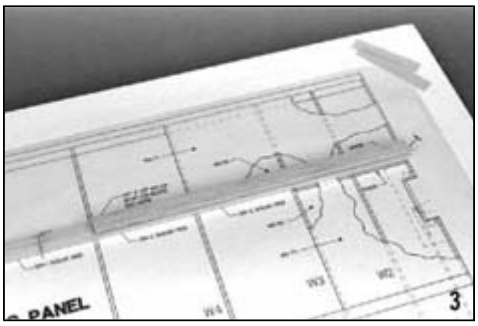
Let's get started by building the LEFT WING PANEL first!

> REMEMBER:
> These instructions are written assuming the use of MEDIUM CA glue for all steps, unless otherwise noted. In other words, if an instruction simply says "glue" part A to part B - use MEDIUM CA!

1. Cut the drawing of the LEFT WING PANEL loose from the rest of Plan Sheet 2. Tape or pin it on top of your building board. Then cover the plan with a sheet of wax paper, also taped down. This will keep excess glue from sticking to the plan when you are gluing the parts in place.



2. Locate two 1/4"x1/2"x36" hardwood pieces for the Main Wing Spars and two 1/4"x1/2"x10-1/8" balsa pieces for the Spar Doublers (see the wing cross-section drawings on Plan Sheet 2 to understand the location of the Spar Doublers). Use Slow CA to glue a Spar Doubler onto one end of each Main Wing Spar, making sure that the sides of the pieces are flush with each other before the glue dries.

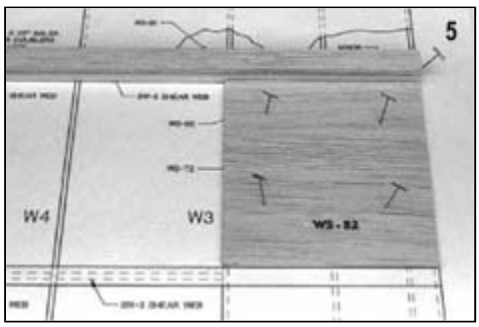


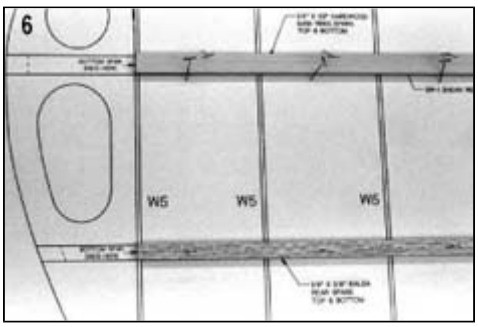
3. Pin one of the Main Wing Spar assemblies from the previous step in position on the plan. This assembly will now be referred to as the Bottom Main Spar. IMPORTANT: Position the Bottom Main Spar on the plan precisely by lining up the inboard end of the Spar Doubler flush with the location of the first W5 wing rib (look for note on plan that says "1/4"x1/2" BALSA SPAR DOUBLERS END HERE).

4. Use a razor saw to cut off the excess tip end of the Bottom Main Spar flush with the outside edge of the last W5 wing rib (see note on plan, "BOTTOM SPAR ENDS HERE").

5. Pin die-cut balsa wing sheeting piece WS-B2 in place on the plan, gluing its front edge to the back of the Bottom Main Spar at the same time.

6. Locate one 1/4"x3/8"x36" balsa stick for use as the Bottom Rear Spar and pin it in place on the plan, gluing it to the rear edge of WS-B2 at the same time. Cut off the tip end of the Bottom Rear Spar flush with the outside edge of the last W5 wing rib (see note on plan, "BOTTOM SPAR ENDS HERE").

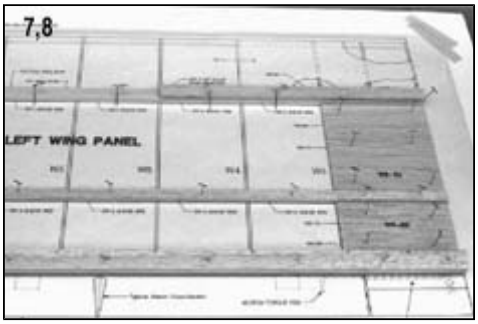




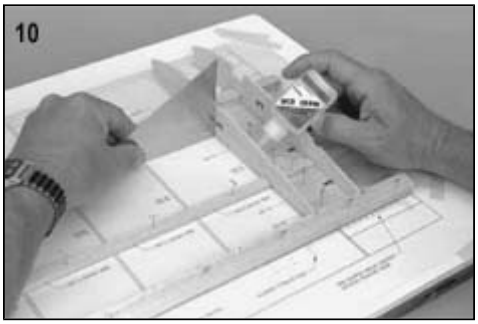
7. Pin die-cut balsa wing sheeting piece WS-B3 in place on the plan, gluing its front edge to the back of the Bottom Rear Spar at the same time.

8. Pin the pre-shaped balsa Trailing Edge in place on the plan, gluing it to the back edge of WS-B3 at the same time. Be sure to align all of the notches in the Trailing Edge with the wing rib locations on the plan.

NOTE: It is possible for plan paper to shrink or expand slightly with humidity changes. If it has, this is where you will notice it! You may find that the rib notches in the Trailing Edge do not exactly match the rib locations on the plan. Nonetheless, they should be very close, not off by more than the thickness of a rib. A slight difference is nothing to worry about! The machine-cut notches in the Trailing Edge are correct, and you should build your wing according to them. To install a wing rib in the steps coming up, simply put the rear end of the rib in the notch, and then align the rest of the rib parallel with the rib lines on the plan. Do not alter the notches in the Trailing Edge!



9. Carefully remove all the wing ribs (W1 through W5) from die-cut sheets #1, #2, and #3. Take time to familiarize yourself with the ribs and how they differ. You will notice that ribs W1, W2, W3, and the front of rib W4 are smaller than the W5 ribs to all allow for the 3/32" thick balsa wing sheeting pieces. There are also some differences between the size of the spar cutouts in each rib.



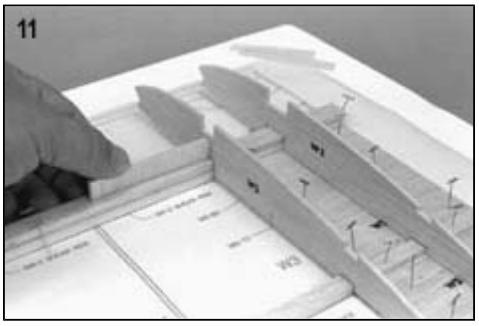
10. Glue wing ribs W2 and W3 in place. They should be glued to the Bottom Main Spar, the Bottom Rear Spar, the WS-B2 and WS-B3 wing sheeting, and the Trailing Edge. Make sure the ribs are sitting up straight, perpendicular to the building board before the glue dries.

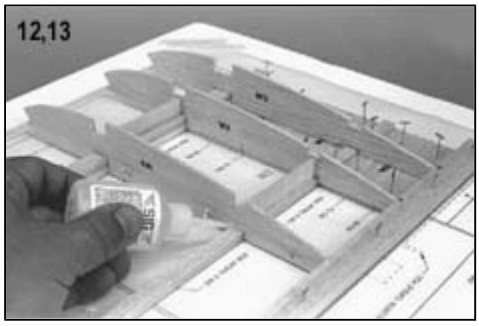
11. Glue one SW-2 Shear Web in place on top of the Bottom Main Spar, and up tight against rib W3.

12. Glue one SW-3 Shear Web in place on top of the Bottom Rear Spar, and up tight against rib W3.

13. Glue rib W4 in place, gluing it to the Bottom Main Spar, the Bottom Rear Spar, the Trailing Edge, and to the ends of Shear Webs SW-2 and SW-3.

14. Glue another SW-2 Shear Web to the Bottom Main Spar and another SW-3 Shear Web to the Bottom Rear Spar, also gluing them against rib W4.





15. Next glue the first W5 rib in place, followed by a SW-1 Shear Web on the Bottom Main Spar and a SW-3 Shear Web on the Bottom Rear Spar. Continue this procedure of gluing in a rib, followed by the adjoining Shear Webs, until all the remaining W5 ribs and Shear Webs are glued in place.

    NOTE: There are no SW-1 Shear Webs called for in the last two rib bays nearest the wing tip, nor any SW-3 Shear Webs in the last three rib bays nearest the wing tip.

16. Now trial fit the other Main Wing Spar assembly (that you made back in step 2) in place in the top front notches in the wing ribs. This is now referred to as the Top Main Spar. Make sure that the end of the balsa Spar Doubler lines up flush with the side of the first W5 wing rib. When satisfied with the fit, glue the Top Main Spar assembly permanently to all the wing ribs.

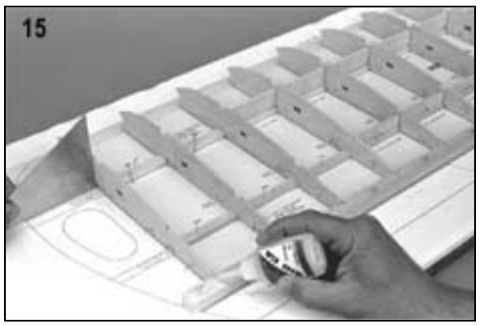
17. Locate a 1/4"x3/8"x36" balsa stick for the Top Rear Spar and glue it in place in the top rear notches in the wing ribs. NOTE: The tip end of the Top Rear Spar is also extra long. Do not cut it off at this time - we will do that later, after the wing tip is installed.

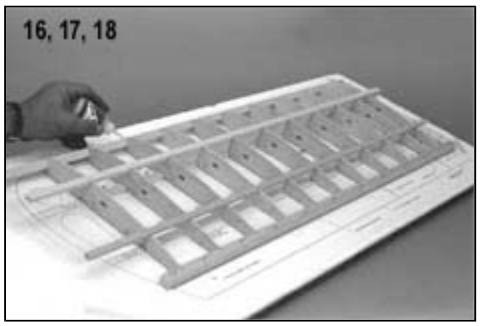
18. Glue the pre-shaped balsa Leading Edge in place in the notches in the front of the wing ribs.

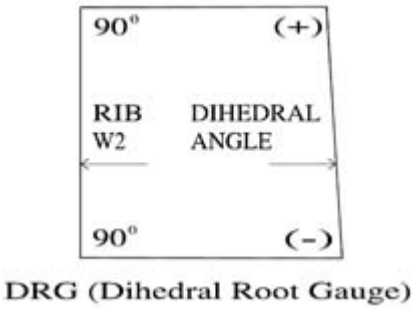
> CAUTION: Take a close look at the end of the Leading Edge before gluing it in place! Notice that it is not symmetrical! Hold the Leading Edge against one of the wing cross-section drawings on Plan Sheet 2, and after you are sure that you have it matched up correctly, mark an "up" arrow on one end. Then make sure you glue it into the wing right side up!

NOTE:
By the way, you've probably already noticed that the tip end of the Leading Edge is also too long, just like the Top Main Spar & Rear Spar! Guess what? Do not cut the Leading Edge off at this time - we will do that later, after the wing tip is installed.

19. Remove part DRG (dihedral root gauge) from die-cut lite-ply sheet #11. Match it up to the full-size pattern (left) and mark the correct edges as indicated - TOP, BOTTOM, DIHEDRAL ANGLE, and RIB W2.

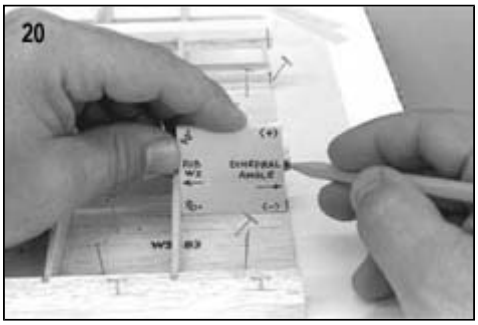




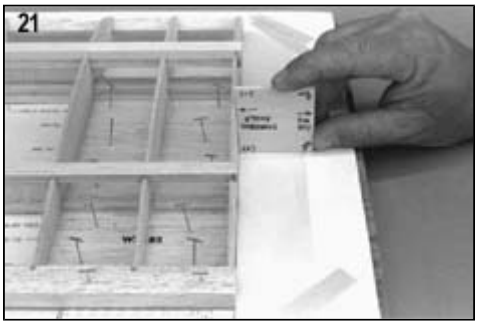


DRG (Dihedral Root Gauge)

20. Hold DRG up against the Top & Bottom Main Spars, with the bottom edge of the gauge down tight against the wing sheeting and the "RIB W2" edge up tight against rib W2. Use a pencil to draw along the "DIHEDRAL ANGLE" edge onto the Top & Bottom Main Spars. Next mark the Top & Bottom Rear Spars in the same manner. These lines represent where the outside face of rib W1 will be installed.

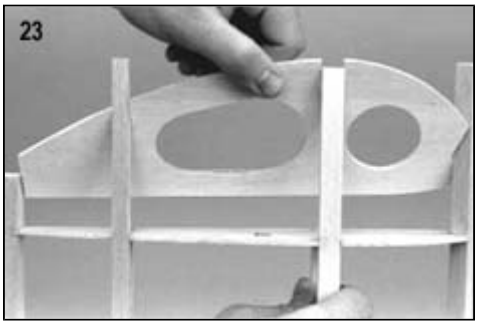


21. Carefully slide wing rib W1 into position in the root end of the wing panel. Notice that W1 should not be installed straight up and down like all the rest of the wing ribs, but rather it must have its top tilted slightly towards the wing tip to provide the finished wing with the proper amount of dihedral angle (see Wing Front View on Plan Sheet 2). Before you glue W1 to any of the wing structure, eyeball it from several different angles to verify that it is in the correct position. Use DRG and the line up marks you put on the spars in the last step, as guides for getting the tilt of W1 exactly right. To double check the alignment, look straight down on the W1 rib from directly above to make sure its bottom edge is properly aligned with the edge of the wing sheeting. If it is, go ahead and tack glue the bottom of W1 to the wing sheeting with a couple small drops of Thin CA glue. Next, use DRG in the manner shown here (notice it's upside down compared to step 20) to keep W1 tilted at the proper angle while you glue it to the Top Spars, the Leading Edge, and the Trailing Edge with Thin CA. After W1 is secured into correct position, go back and re-glue the entire bottom of the rib to the wing sheeting.



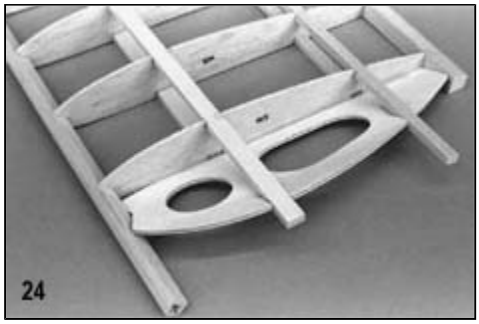
22. Once all the glue joints are dry, you can unpin the Left Wing Panel from the building board!

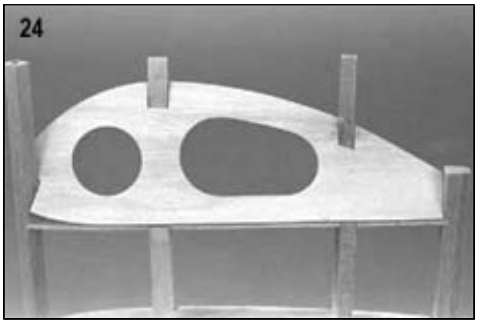
23. Now we can add the wing tip! The only way to get the die-cut lite-ply WTP (wing tip plate) in place is to slide it over the ends of the Top Spars, Leading Edge, and Trailing Edge - all at the same time.
It's a little tedious, but with a bit of careful wiggling and pushing, you should be able to get it to slide on OK.



24. Once in position, securely glue WTP to all the other parts it comes in contact with.

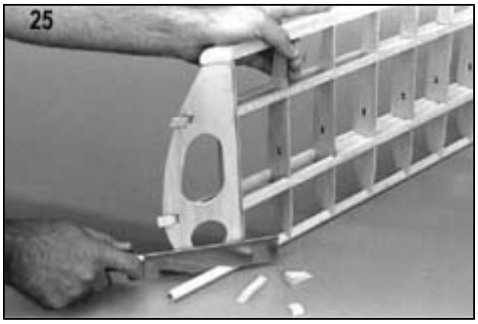
    NOTE: Practically everywhere that WTP comes in contact with another part there are angles involved. This means there will naturally be some unavoidable small gaps between the parts. For instance, underneath both of the Top Spars there will be a gap. Also, around the backside of the Leading Edge there will be some gaps. All of these gaps can be filled with light-weight wood filler later on during preparation for covering.

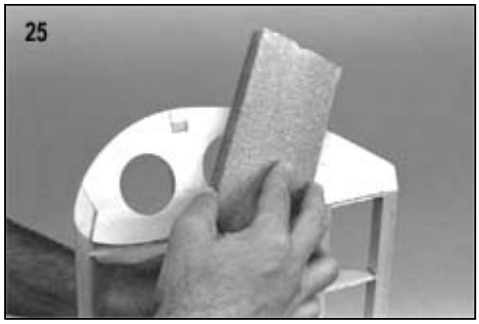


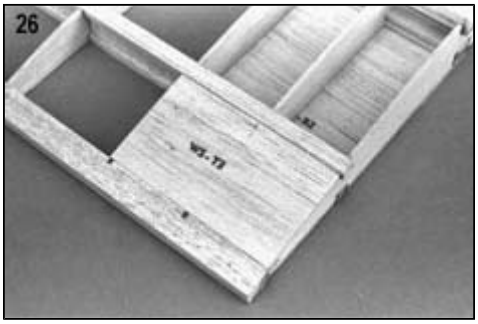


25. Cut off the Leading Edge, Trailing Edge, Top Main Spar, and Top Rear Spar flush with the flat bottom surface of WTP. NOTE: It's best to first make a "pretty close" cut with a razor saw to quickly remove the bulk of the part, and then use a sanding block to get everything perfectly flat and flush.

26. Glue die-cut balsa wing sheeting piece WS-T3 in place on the top of the wing, between the Top Rear Spar and the Trailing Edge.



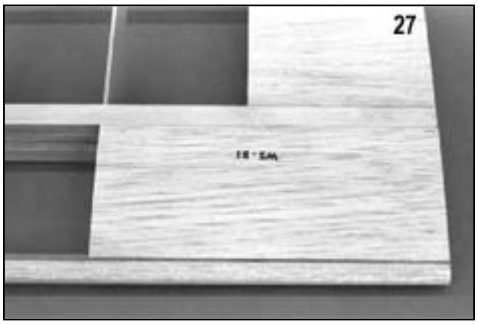


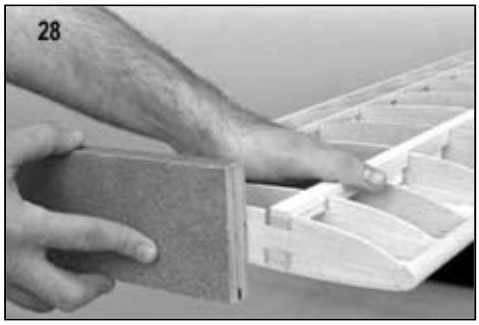


27. Glue die-cut balsa wing sheeting piece WS-B1 in place on the bottom of the wing, between the Bottom Main Spar and the Leading Edge.
    NOTE: There will be a wedge-shaped gap where WS-B1meets the Leading Edge. This is normal! Simply run a bead of Slow CA in the gap and let it dry - this will secure WS-B1 to the Leading Edge. Fill the rest of the gap with light-weight wood filler before covering.

28. Carefully saw off, and then block sand, the root ends of the Spars, Leading Edge, and Trailing Edge flush with the pre-angled W1 wing rib. Use a large sanding block and sand slowly to keep the end of the wing panel straight and true. Try not to sand into W1.

29. Look closely at rib W1 and you'll see that a cutout for the aileron servo has been partially pre-cut in the rib - it's a large inverted "U" shape, located aft of the main spars. Also notice that the vertical legs of the cutout stop 1/4" from the bottom of the rib. In this step, you will complete the aileron servo cutout in rib W1! First lay the wing panel flat on the workbench and use a modeling knife to cut straight down through the last 1/4" of rib on both vertical legs. Stop cutting when you get to the bottom wing sheeting. Then carefully break out the portion of the rib inside the cutout area.

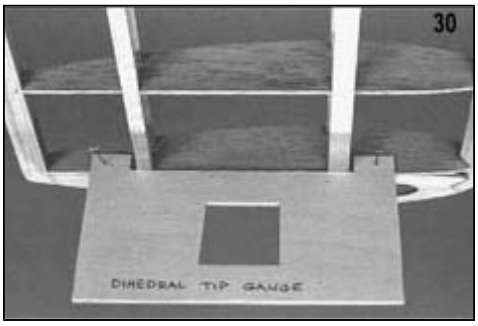




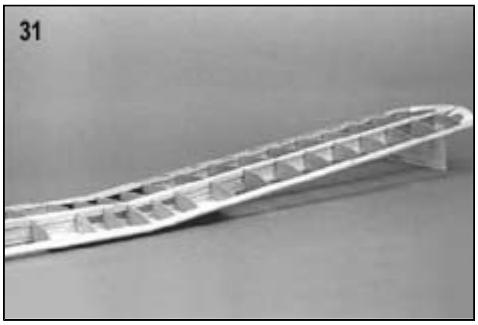
The LEFT WING PANEL is now complete!
Repeat Steps 1 through 29 to build the RIGHT WING PANEL!

JOINING THE WING PANELS

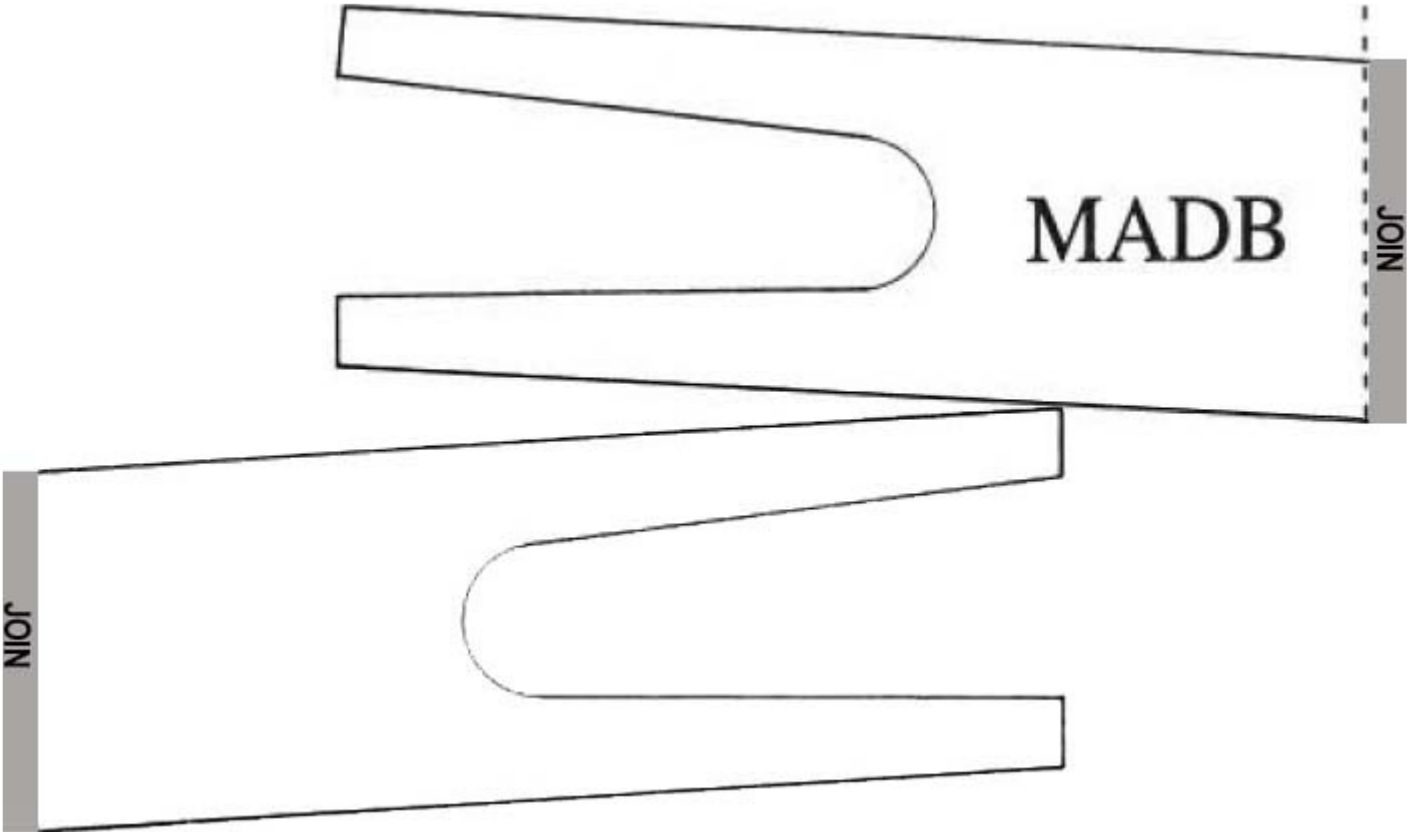
30. The first thing you need to do is check the fit of the two wing panels to each other - WITHOUT GLUE! Start by locating die-cut lite-ply part DTG (dihedral tip gauge) and pinning it to the underside of the last W5 rib (nearest the wing tip) in the Left Wing Panel. The notches in the DTG should straddle both bottom wing spars.



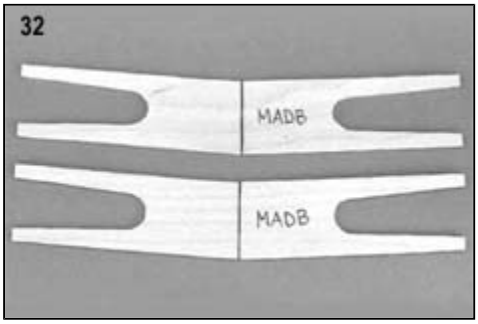
31. Lay the Right Wing Panel on a large flat surface, such as a big table or on the floor. Mate the root end of the Left Wing Panel up against the root end of the Right Wing Panel. The DTG (pinned to the wing tip of the Left Wing Panel) will set the proper dihedral angle by holding the left wing tip up 3-3/4" off the table (see halfsize Wing Front View on Plan Sheet 2). Make sure the leading and trailing edges of both wing panels are perfectly aligned with each other so that there is no twist between the panels. Look for gaps between the W1 root ribs. If you installed both W1 ribs at the correct angle, and you sanded all the spars, etc. perfectly flush with the W1 ribs, then you should not have any significant gaps. A small gap of 1/16" or less is insignificant and will be OK. If you have a larger gap, you will have to figure out how it happened and correct it before going on to the next step.



32. Locate the two laser-cut plywood MADB (main dihedral braces). Using the full-size pattern of MADB as a guide, mark a center-line on the front and back of both braces.



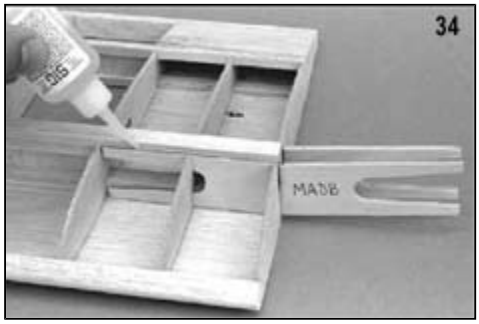
33. Use a modeling knife or razor saw to cut out the portions of the W1 root rib where the MADBs will go. Do this to the W1 rib in both wing panels. TIP: Use a pencil and straight edge to mark guidelines on the rib before cutting. Make repeated short shallow cuts until you get all the way through the wood, whether you are using a knife or saw. This will help avoid splintering the rib!



34. Carefully slide both MADBs into position in the Right Wing Panel. Push them in slowly, being careful not to snag and break the W1 or W2 ribs. Position both MADBs carefully before gluing them to the spars.
Check:

    1. that the MADBs are tight against the front and back of the Top & Bottom Main Spars;
    2. that the MADBs are exactly halfway in the Left Wing Panel - the center lines you drew on the MADBs should line up with the outside face of W1;
    3. that the bottom edges of the MADBs are down tight against the bottom wing sheeting;
    4. that the exposed ends of the MADBs line up with each other from the front view. When all of these checks are OK, glue the MADBs to the main spars with Thin CA glue. Mop up any excess Thin CA with a rag. Let dry.

35. WITHOUT GLUE, slide the Left Wing Panel onto the exposed ends of the MADBs, again being careful not to break the W1 or W2 ribs. Once again set-up the entire wing assembly on a large flat surface with the Right Wing Panel flat on the table and the Left Wing Panel propped up by the gauge DTG - just as you did in step 31.

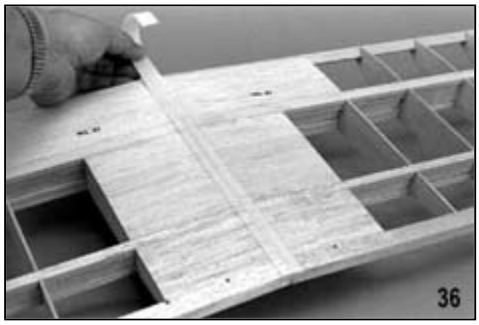


(If the MADBs are preventing the wing panels from fitting like they did before, trim or sand the MADBs where necessary to eliminate the problem.)

Make sure the opposing Leading and Trailing Edges are lined up with each other so there is no twist between the wing panels. Use plenty of pins to hold the wing panels tightly together in correct alignment. Once everything looks good, use Thin CA to glue the MADBs to the main spars in the Left Wing Panel. Do not apply glue anywhere else yet! When dry, you should be able to pick up the entire wing assembly without fear of the wing panels shifting. The glued MADBs and the pins should hold everything together adequately for the next step.

36. Pick up the wing assembly, turn it over, and put a strip of masking tape along the entire center joint on the bottom of the wing. Now turn it back over and flow Thin CA glue into the center joint from the top. Run the glue in along the entire length of the W1 ribs. Use just enough glue to flood the entire joint, but not so much that it runs all over the place. The masking tape should keep the glue from running out the bottom. Have a rag handy to mop up any excess glue. If you have some gaps that the Thin CA won't fill in, switch to Medium CA or Slow CA to fill them. Let dry! Then remove the masking tape and all the pins.

37. Before you can put on the rest of the top wing sheeting, you must go back and re-glue ALL the joints that will be inside the sheeted area. Make sure there is a visible, but small, fillet of glue in every joint. Don't let any excess glue get on top of the ribs, or along the spars, where the WS-T1 and WS-T2 wing sheeting pieces will go.



38. Glue the two WS-T2 die-cut balsa wing sheeting pieces in place between the top rear spars and the top main spars.

39. Glue the two WS-T1 die-cut balsa wing sheeting pieces in place between the top main spars and the leading edges.

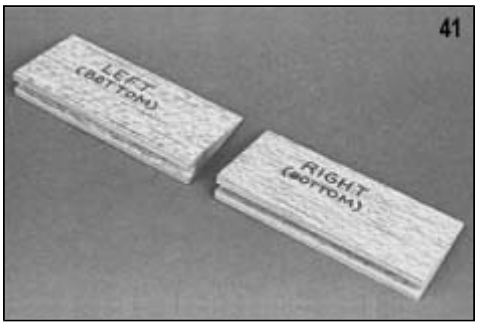
40. Now go back and re-glue every joint in the wing with Medium CA or Slow CA glue! Make sure there is a visible, but small, fillet of glue in every joint. Take your time and don't miss any joints! Each and every one of them contributes to the finished strength of the wing.

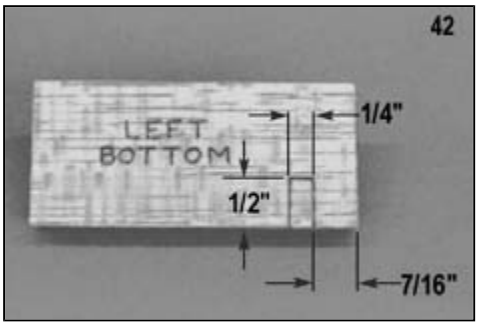
AILERON INSTALLATION

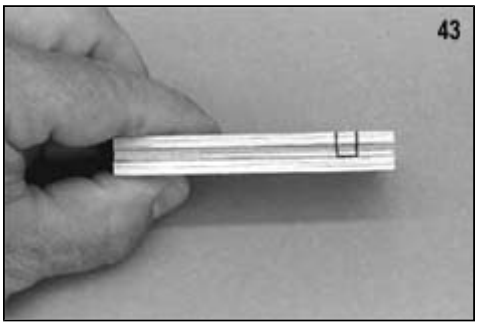
41. Locate the two pre-shaped balsa Center Section Trailing Edge pieces. They are identical to each other at this point, but by the time you finish the next step they won't be - so mark LEFT (BOTTOM) on one piece and RIGHT (BOTTOM) on the other.

42. On the LEFT (BOTTOM) Center Section Trailing Edge piece, draw a box 1/4" wide x1/2" deep, exactly 7/16" from the end.

43. Continue the lines down the front of the piece, until you reach the bottom of the pre-cut groove in the front.





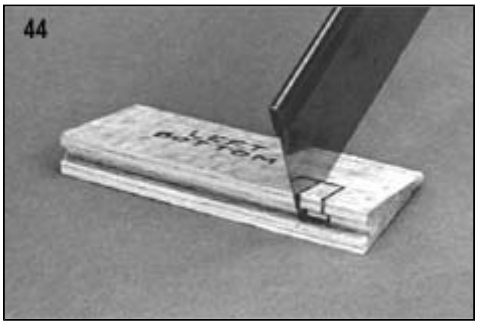


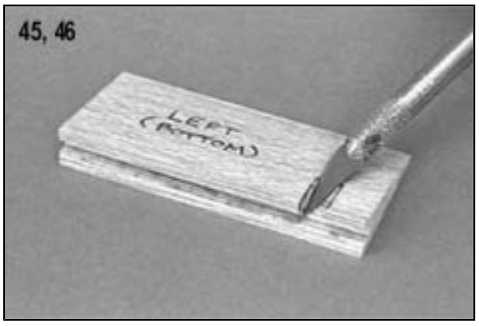
44. Using a razor saw, carefully cut along the side lines of the box, stopping when the blade is deep enough to reach across to both end lines.

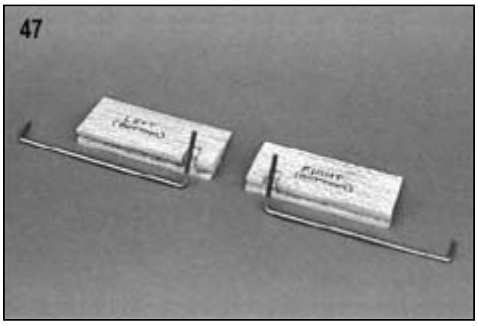
45. Use a modeling knife to "chip" the wood out between the saw cuts until you have a notch the full depth of the box you drew originally.

46. Repeat steps 42 through 45 to make the RIGHT (BOTTOM) Center Section Trailing Edge a mirror image of the Left one.

47. Familiarize yourself with the pre-bent Aileron Torque Rods w/Brass Bearings. Note that there is a Left and a Right Torque Rod. Study their positions on the full-size plans to help you identify which one is Left and which is Right. Notice that when the Torque Rods are in position in the wing, the threaded end of the torque rod will come out the bottom of the wing and the shorter unthreaded end will face back into the aileron.

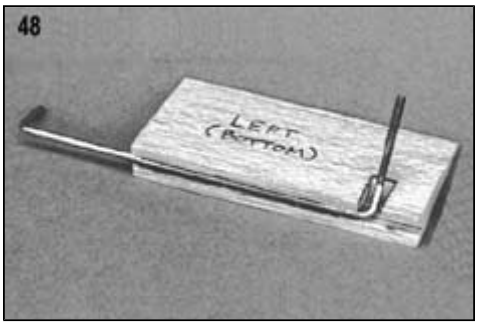






NOTE: The threaded portion of the Torque Rods should lean back slightly towards the rear of the airplane when the ailerons are in neutral position. That rearward lean provides the KADET LT-40 with a small amount of "differential" movement in the ailerons (more up than down), which makes for smoother turning.

48. Use a small amount of Slow CA to glue the Brass Bearing portion of the Left Aileron Torque Rod into the groove in the front of the Left Center Section Trailing Edge piece. GLUE ONLY THE BRASS BEARING, NOT THE WIRE PORTION OF THE TORQUE ROD! The wire portion of the Torque Rod must be completely free to rotate inside the Brass Bearing.



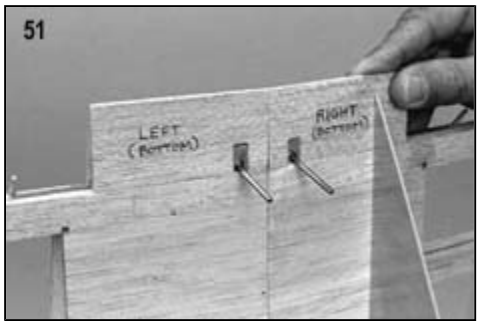
TIP: It's not necessary to apply glue along the full length of the Brass Bearing. Keep all glue 1/8" away from the ends of the Brass Bearing to minimize any chance of glue seeping inside the bearing and causing a bind in the movement of the Torque Rod.

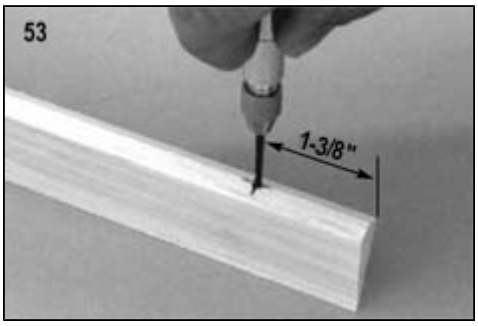
49. Repeat step 48 to glue the Right Aileron Torque Rod into the groove in the front of the Right Center Section Trailing Edge.

50. Apply a bead of Slow CA to the leading edges of the Left Center Section Trailing Edge piece. Keep the glue on the balsa - do not get any glue on the Torque Rod or the Brass Bearing! Hold the Center Section Trailing Edge assembly in position on the trailing edge of the wing until the glue dries. Use a straight edge to confirm that the bottom surface of the part is flush with the bottom surface of the wing. Let dry.

51. Repeat step 50 to glue the Right Center Section Trailing Edge in place on the back of the wing, also gluing it to the Left Center Section Trailing Edge at the same time.

52. Double check to verify that both Aileron Torque Rods will pivot freely. If they don't, you must find the problem and correct it now, before going on to the next step.



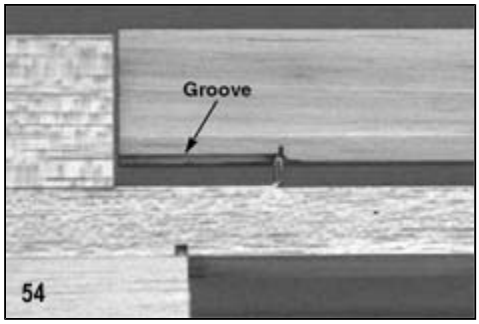


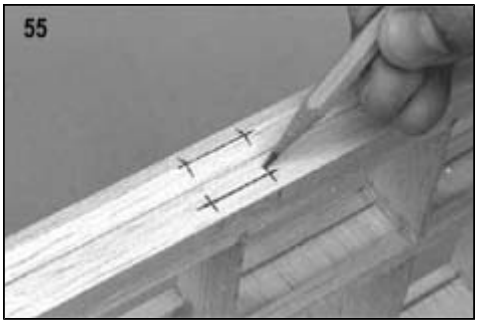
53. Locate the two pre-shaped balsa wood Ailerons. Using a 3/32" dia. drill bit, drill a hole in one end of each aileron to accept the Aileron Torque Rod wire. The location of the hole must be centered on the leading edge of the aileron, and it should be 1-3/8" from the end of the aileron. The path of the hole must travel straight into the core of the aileron, centered equal distance from both sides. The hole should be 5/8" deep.

54. Use a modeling knife to cut a (3/32" wide x3/32" deep) groove in the leading edge of each aileron to accept the Aileron Torque Rod wire. The groove should go from the 3/32" hole you drilled in the last step to the root end of the aileron. Trial fit (without glue) the aileron over the end of the Torque Rod wire to check the fit.

55. Mark the locations for the Sig Easy Hinges (4 per aileron) on the leading edge of the ailerons and on the trailing edge of the wing.

56. Cut slots for the hinges in the Ailerons and Wing following the instructions "INSTALLING SIG EASY HINGES" at the end of this wing construction section (perform steps 1 and 2).

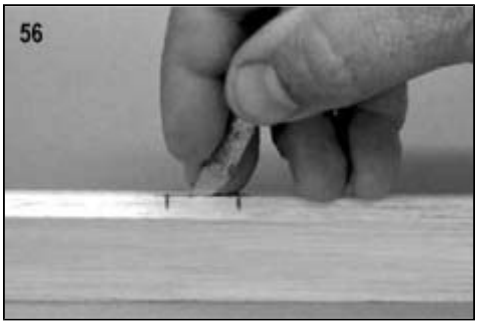


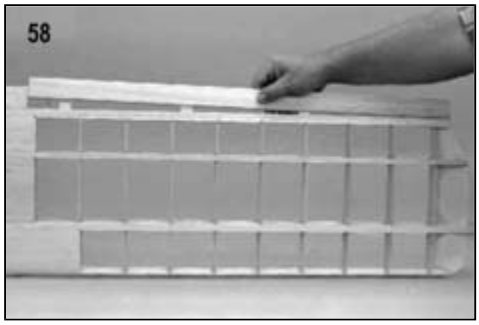


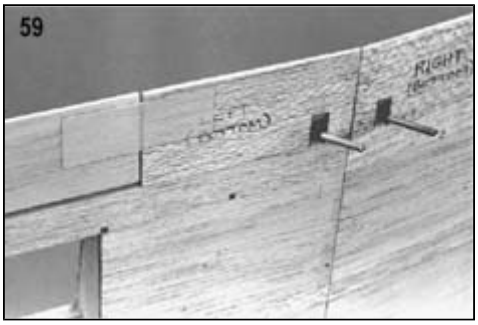
57. Once all the slots have been cut, insert a single Easy Hinge halfway into each slot in the trailing edge of the wing. DO NOT GLUE THE HINGES IN AT THIS TIME!

58. Now carefully slide the ailerons onto the exposed half of the Easy Hinges, and onto the exposed arm of the Torque Rod, all at the same time. You will find it easiest to slide the ailerons onto the hinges at angle, one hinge at a time, starting from the tip end, instead of trying to push it straight onto all the hinges at once. ONCE AGAIN, DO NOT GLUE THE HINGES IN AT THIS TIME!

59. Tape the ailerons into neutral position, with the root end in perfect alignment with the fixed Center Section Trailing Edge pieces.



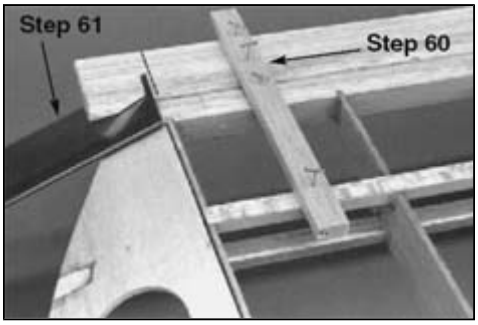


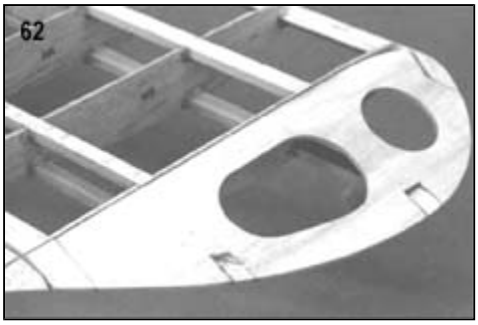


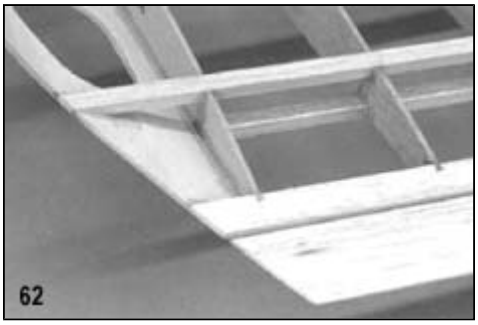
60. Pin a piece of scrap balsa or plywood to the bottom surfaces of both the aileron and the wing, out near the wing tip, to hold this end of the aileron securely in neutral position.

61. Razor saw and block sand the end of the aileron to match the shape of the wing tip. Here are a couple different views showing the proper final shape of the wing tip/aileron tip area.

62. Remove the ailerons and hinges from the wing and set them aside until "COVERING THE KADET LT-40" .

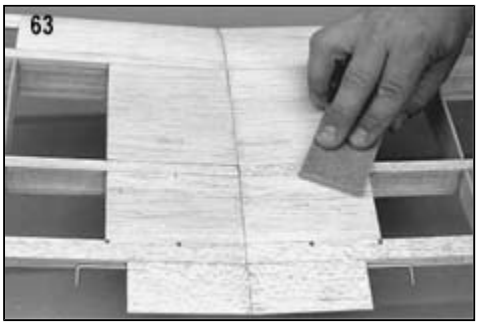


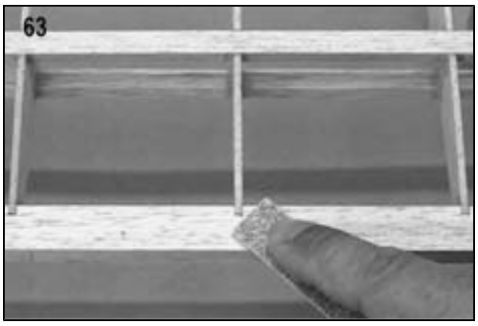




COMPLETING THE WING

63. Use a sanding block with fresh 80 grit sandpaper to give the entire wing a final sanding. Sand just enough to take off any prominent high spots and to smooth out any mismatched joints between parts.





Be sure to block sand all the WS-* wing sheeting pieces down flush with the spars, leading edges, and trailing edges. Avoid sanding into the spars, leading edges, and trailing edges themselves as much as possible - just sand the wing sheeting pieces down to them! If you've got sheeting that is lower than the spars, etc., then fill in the low spot with light-weight wood filler and sand that smooth.

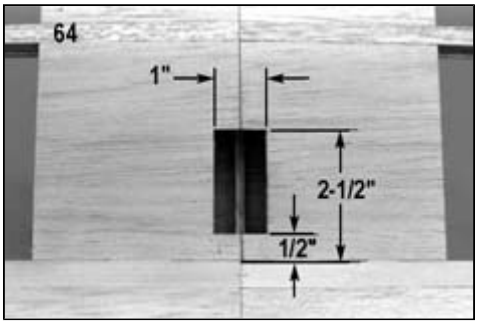
You shouldn't have to sand the edges of the wing ribs at all - they should already be level with the surface of the spars, etc. However, you may need to use a small sanding block to touch up any excess glue on the rib-to-spar joints, the rib-to-leading edge joints, and the rib-to-trailing edge joints. Excessive sanding of the ribs themselves may distort the airfoil shape.

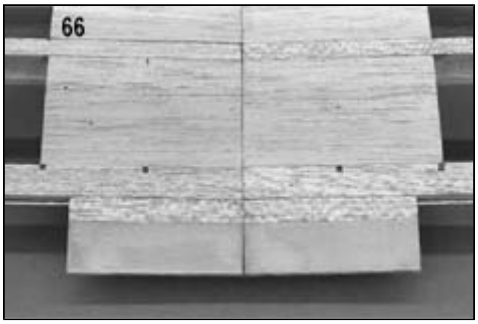
64. Make an opening (1" wide x2" long) in the bottom wing sheeting for the aileron servo. Mark and cut out the opening according to the dimensions shown here:

- Front edge of the cutout = 1/2" aft of the main spar.
- Rear edge of the cutout = 2-1/2" aft of the main spar.

65. Remove part ASM aileron servo mount from die-cut plywood sheet #14. Use Slow CA to glue ASM in place on the bottom of the wing. Make sure the cutout in the middle of ASM is centered over the opening in the bottom wing sheeting. Use enough glue to fill in the gap under each side of ASM, caused by the dihedral angle.

66. Glue both 1/16"x1"x3-5/16" plywood Trailing Edge Stiffeners in position along the top trailing edge of the wing.





REINFORCE WING CENTER JOINT

67. A 1" wide x 24" long piece of fiberglass cloth tape is supplied to reinforce the joint between the Right & Left Wing Panels. Cut the 24" long tape into one 18" long piece and one 6" long piece.

68. Lay the 18" long piece of fiberglass tape over the center joint on top of the wing. Using a small amount of Thin CA, tack glue the end of the tape to the balsa Center Section Trailing Edge, right in front of the 1/16" plywood Trailing Edge Stiffeners. Make sure the width of the tape is overlapping 1/2" onto the Right Wing Panel and 1/2" onto the Left Wing Panel.

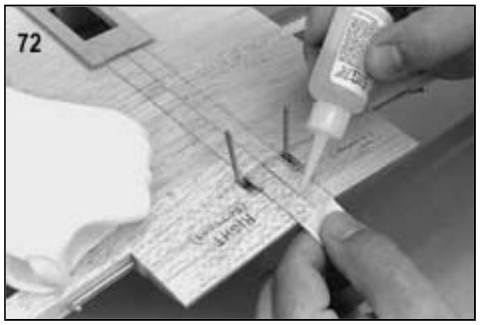
69. After the Thin CA dries, pull the other end of the tape completely around the Leading Edge and down onto the bottom surface of the wing. The tape should lay nice and flat, tight against the top surface of the wing. Again make sure the tape is centered over the joint - half on the Right Wing Panel and half on the Left Wing Panel. Then tack glue the tape to the Leading Edge.

70. Now carefully flow Thin CA glue onto the tape on top of the wing. Use just enough glue to saturate the tape - too much glue will run outside the tape and get all over the place. If you do get too much glue on the tape, take a clean rag and quickly wipe off the excess before it dries (don't rub too hard and disturb the positioning of the tape). By working slowly and gluing small (3" long) sections of tape at a time, you should be able to glue the entire length of tape in place without any major wrinkles or bumps.

    CAUTION: Do the gluing in a well ventilated area to avoid breathing the fumes from the Thin CA glue!

71. After you've finished gluing the fiberglass tape on the top of the wing, turn the wing over and glue the remainder of the original 18" long piece to the bottom front of the wing. Cut it off right in front of the plywood ASM part.

72. Using the same techniques, glue the 6" long piece of fiberglass tape to the bottom of the wing. It goes from the back of plywood part ASM, all the way off the end of the wing. When dry, cut it off flush with the end of the wing.
NOTE: Be very careful when gluing the tape in the area of the Torque Rods! If you get too much Thin CA in that area, the excess could seep into the Torque Rods, binding them up permanently.



73. After all the glue is dry, lightly sand the fiberglass cloth with a piece of 220 grit sandpaper to remove any lumps or high spots. Be careful not to sand through the fiberglass cloth.

The basic wing construction is now complete! Set the wing aside until "COVERING THE KADET LT-40"

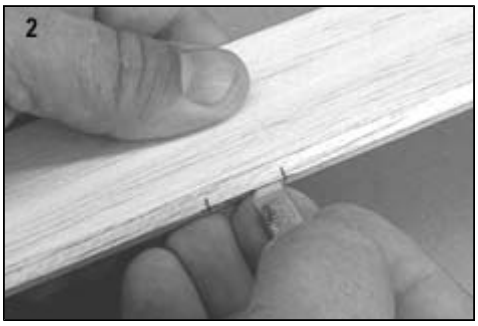
INSTALLING SIG EASY HINGES

> WARNING:
> SIG EASY HINGES are designed to be used in conjunction with Thin CA glue. Thin CA (any brand) is the ONLY type of glue that can be used on EASY HINGES - do not use epoxy or any other type of glue on EASY HINGES!

Each ultra-thin EASY HINGE is actually a 3-part laminate - a tough plastic inner core sandwiched between 2 layers of absorbent wicking material. They have been chemically treated to slow down the drying time of Thin CA (which is normally instant), to allow the glue time to soak all the way to the ends of the hinge and into the wood surrounding it. Once the glue has dried, the hinge cannot be pulled from the structure without tearing wood out with it.

1. Begin by carefully cutting a very shallow slit at the hinge location using a fresh, sharp #11 blade in your modeling knife. This first slit should be very shallow so you can better control the direction of the knife. It's main purpose is to establish your hinge slot in the right place, so concentrate on staying on the hinge line and don't try to cut too deep.
NOTE: Make the slit slightly wider than the actual hinge.

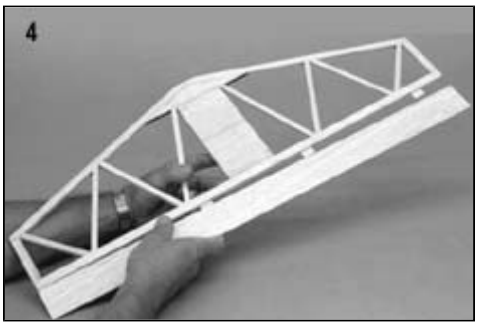
2. Now make 3 or 4 more cuts in the exact same line, going slightly deeper each time. As you make these additional cuts, concentrate on staying in the slit and keeping the blade headed straight into the center of the wood so that it won't come out the side of the part. You will find that as the blade gets deeper into the wood, it will become harder to move it along the slot. Try "wiggling" the knife handle in the slot to make it cut, instead of trying to "slice" the blade along in one continuous motion. Continue making additional cuts until the slot is approximately 1/2" deep.



CAUTION: You must use extreme care to avoid cutting yourself while cutting the hinge slots. If the balsa wood breaks while you are pushing on the knife, the blade could go into your hand before you can stop it. A good precaution is to wear a leather glove on the hand that is holding the model part while you are cutting the slots.

3. After all the slots have been cut, insert a single Easy Hinge halfway into each hinge slot in the stabilizer (or fin, or wing, as the case may be). If the hinge is difficult to push in, re-insert the knife and move it back and forth in the slot a few more times and then try again. DO NOT GLUE THE HINGES IN AT THIS TIME!

4. Now carefully slide the elevator (or rudder, or aileron) onto the exposed half of the Easy Hinges. You will find it easiest to slide the part onto the hinges at angle, one hinge at a time, instead of trying to push it straight onto all the hinges at once. Don't be overly concerned if the hinges don't end up perfectly straight or centered in the slots - they do not have a center line.
ONCE AGAIN, DO NOT GLUE THE HINGES IN AT THIS TIME!



5. To set the proper amount of gap between the model parts, simply deflect the control surface to the maximum amount of travel needed. This will automatically set the proper hinge gap! Keep in mind that for best control response the gap should be kept as small as possible, but big enough to allow full movement of the control surface. If everything appears to function properly, remove the parts and take the hinges out of the slots. Set everything aside until after the model has been covered.

THE MODEL PARTS SHOULD BE COMPLETELY COVERED BEFORE PROCEEDING TO THE NEXT STEP!

6. After the model parts have been covered, use the X-Acto knife to re-open the hinge slots by cutting through the covering that went over them. Re-install the hinges and re-adjust the hinge gap.

7. Place three or four drops of Thin CA glue directly onto the Easy Hinge in the gap. You will notice that the glue is quickly wicked into the slot as it penetrates both the wood and the hinge. Turn the part over and glue the other side of the Easy Hinge. Continue this process until you have glued both sides of all the Easy Hinges! Keep a rag handy to wipe off any excess Thin CA. (CA glue residue can be cleaned from most iron-on plastic covering materials with CA Debonder).

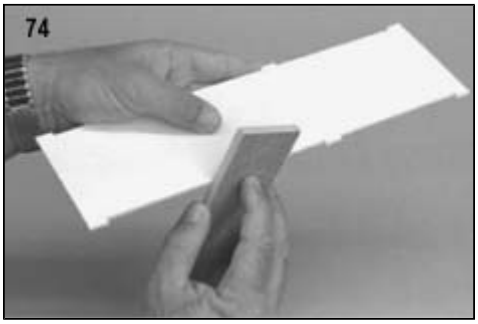
VERY IMPORTANT: Make only one application of glue to each side of an Easy Hinge! If you apply additional glue to the hinge after the first application of glue is already dry, the second application of glue will merely puddle in the hinge gap and make the hinge too stiff to operate properly. The excess glue could also weaken the hinge! When properly glued, the portion of the Easy Hinge that you can see in the hinge gap should have a dry appearance, not wet. A dry appearance indicates that almost all of the glue has properly soaked into the hinge slot. A wet appearance indicates that excess glue is puddled in the hinge gap. Three to four good size drops of Thin CA should be about the right amount.

NEVER USE CA ACCELERATOR ON EASY HINGES!

8. Let the glue dry a minimum of 3-5 minutes before flexing the hinges. At first you might notice a little stiffness in the joint. This will go away after the hinges have been flexed back and forth a couple dozen times.

FUSELAGE CONSTRUCTION

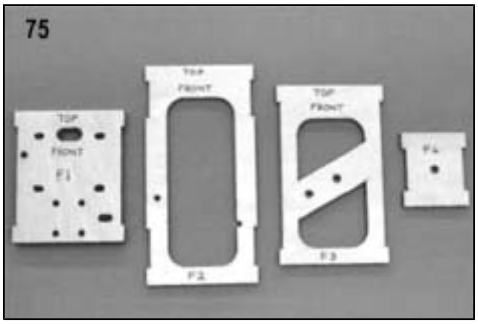
74. Use a sanding block to very lightly sand the edges of all the die-cut plywood fuselage parts to remove any burrs or rough spots. Hold the sanding block at a 90 angle to the part while doing this. Remember, sand very lightly! You only want to smooth the edges of the parts, not change their size or shape.

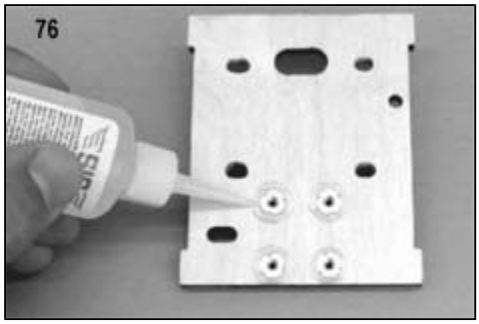


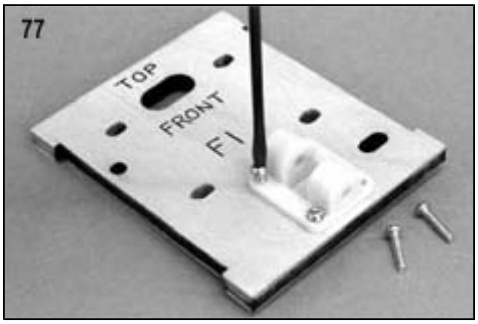
75. Fuselage formers F1, F2, F3, and F6 are laser-cut plywood, and they do not have their part name/number pre-printed on them. Use a pencil to mark each of these formers with their proper name/number. Also mark TOP and FRONT on formers F1, F2, and F3, after making sure that the holes in those three formers are oriented EXACTLY as shown.

76. The group of four holes located at the bottom center of former F1 are for the mounting of the Nose Gear Bearing. Turn F1 over, and use a hammer to gently tap a 4-40 Blind Nut into each of those four holes from the backside. Tap the Blind Nuts in until the flange is flush against the back surface of F1. Apply a little Medium CA around the flanges of the Blind Nuts to keep them from coming loose. Be careful not to get any glue in the threads of the Blind Nuts.

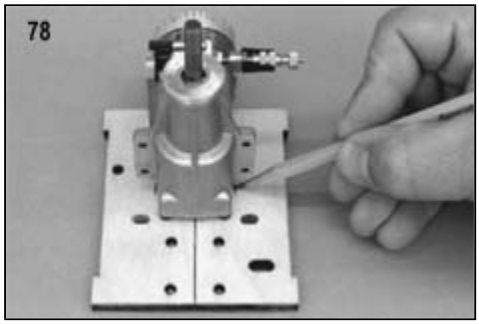
77. Trial mount the nylon Nose Gear Bearing to the front of F1 using the four 4-40 x1/2" Mounting Bolts provided. Then remove the Nose Gear Bearing and the four Mounting Bolts and store them away until needed later.

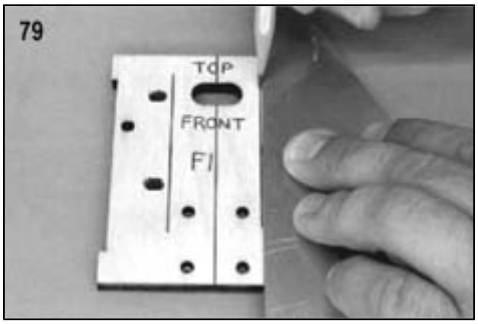






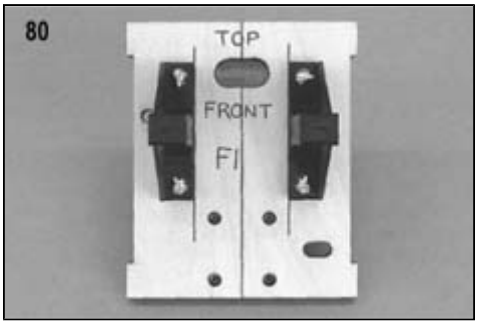
78. Draw a vertical center line on the front of F1, exactly equal distance from each side. Then set your engine on the front of F1 as shown in the photo, with the crankshaft of the engine directly in line with the vertical center line. Finally, make two pencil marks on F1, one on each side of the engine's crankcase, to indicate where the inside of the two Engine Mounts should be.





79. Draw a vertical line through both of the pencil marks you made in the previous step. Make sure that both lines are exactly parallel to the vertical center line.

80. Bolt the Engine Mounts onto the front of F1 as shown, using the four 6-32 x3/4" Mounting Bolts and the four 6-32 Blind Nuts provided.

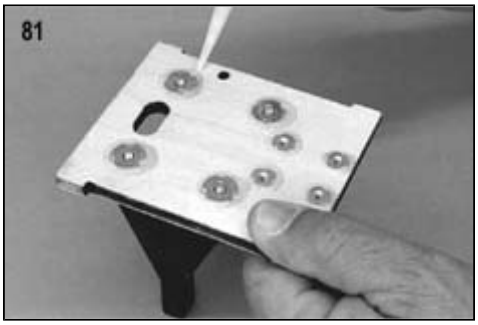


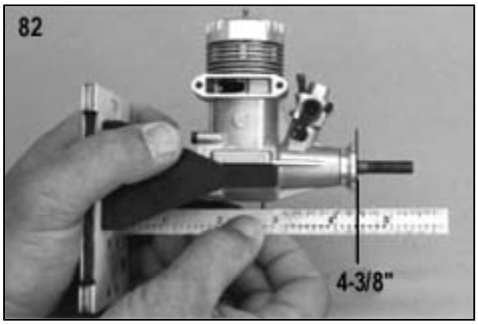
NOTES:
The holes in F1 for the bolts are oblong, to allow the Engine Mounts to be shifted sideways to accommodate engines with different width crankcases. Thus, we can't just hammer the Blind Nuts in as we did for the Nose Gear Bearing. Instead, first assemble the Mounts, Bolts, and Blind Nuts loosely in place on F1.
Then as you begin to tighten down the Bolts and Blind Nuts for the first time, line up the inner sides of the Mounts with the two lines that you drew in the last step. Continue tightening down the Mounting Bolts until the prongs of the Blind Nuts start to get a grip on the back of F1. Double check that the sides of the Mounts are still lined up with the lines, and then continue tightening the Bolts. Keep tightening the Bolts until the prongs of the Blind Nuts are drawn all the way into the wood, with the flange flush against the back of F1.

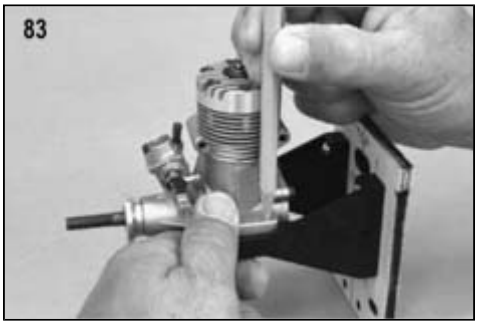
81. Apply a little Medium CA around the flange of the Blind Nuts to keep them from coming loose. Be careful not to get any glue in the threads of the Blind Nuts.

82. Position your engine on the Engine Mounts, with the front face of the engine's prop washer approximately 4-3/8" away from the front of F1.
Note: This measurement is not critical - 1/8" further forward or back is OK!

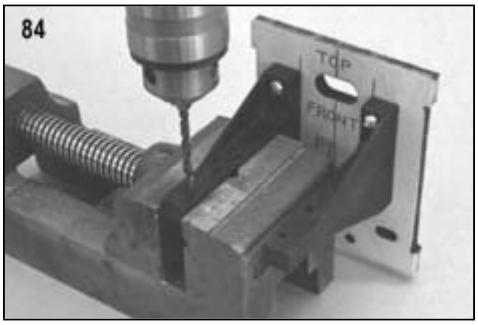
83. View down on the engine from above to make sure that the engine is pointing straight ahead, without any left or right side thrust. Hold the engine in correct position on the Engine Mounts, while you use a pencil to mark the locations of the engine's mounting holes onto the Mounts.
Note: Zero degree side thrust is the ideal! However a slight amount of right thrust would also be OK, but under no circumstances should you have left thrust!







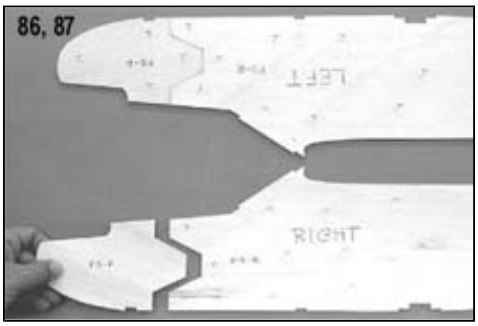
84. Drill down vertically through the beams of the Engine Mounts, on the pencil marks, with a 1/8" dia. drill bit.



85. Mount the engine to the Engine Mounts with the four 4-40 x1" Mounting Bolts and the four 4-40 Aircraft Lock Nuts provided. Unbolt the Engine Mounts from former F1, leaving the engine bolted to the Mounts. Set the engine/engine mount combination aside until needed later.

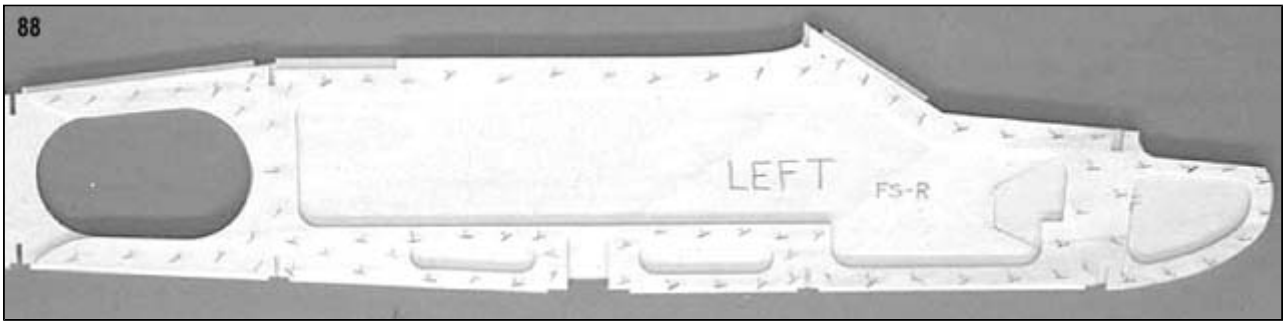
86. Cover your building board with wax paper, and pin both of the die-cut plywood FS-R (fuselage side rear) pieces down on top of it. Make sure you have them situated as shown in the photo so that you will end up with both a left and a right fuselage side.

NOTE: It's a good idea to permanently mark the inside surface of the fuselage sides with the words LEFT and RIGHT, as shown, to avoid any chance of confusion.



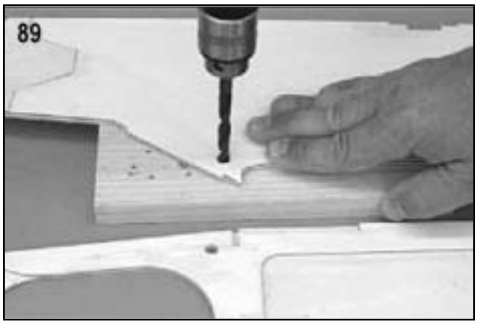
87. Glue a die-cut plywood FS-F (fuselage side front) onto the front of each FS-R. Wipe off any excess glue before it dries so that there won't be any lumps in the glue joint.

88. Glue a die-cut plywood FD (fuselage doubler) in place on top of each Fuse Side (FS-F/FS-R assembly). Use a slow drying glue, such as Sig Epoxy Glue or Sig-Bond aliphatic resin glue, for this step to allow you plenty of time to accurately position FD before the glue dries.



NOTES: Study the full-size plan to make sure you know exactly where FD should go before you apply the glue. Notice that there are some places where the edges of FD should be flush with the edges of the Fuselage Side (like the wing, hatch, and nose areas, etc.), and that there are other places where FD is inset 1/8" away from the edge of the Fuselage Side (like the windshield area, and along the entire bottom). Then spread a layer of glue on the bottom side of FD (a small wire, stick, or throw-away brush works best for spreading on the glue). Make sure the entire bottom surface of FD has glue on it! Then lay FD down against the Fuselage Side and slide it into correct position. Press FD down tight against the Fuselage Side and use lots of pins to insure that it stays down tight without any gaps. Wipe off any excess glue that oozes out of the joints before it dries!

89. You may have already noticed that small "dimples" have been pressed into parts FD and FS-R to indicate where the 5/16" dia. Dowels will go. We aren't going to glue the Dowels in at this time, but it is easiest to drill the holes for the dowels right now, before we continue with the fuselage construction. Locate the dimples on your assembled Left and Right Fuselage Sides - they will be on the doubler side of the Left Fuselage Side and on the outside of the Right Fuselage Side. Drill straight down completely through the fuselage side and doubler, on the dimple marks, with a 5/16" dia. drill bit. Be sure to use a hardwood (2x4 or similar) backing block while drilling, to avoid splintering the edges of the holes.

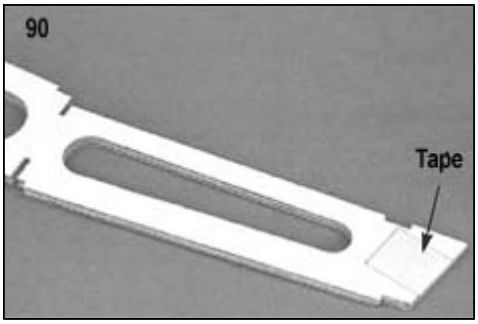


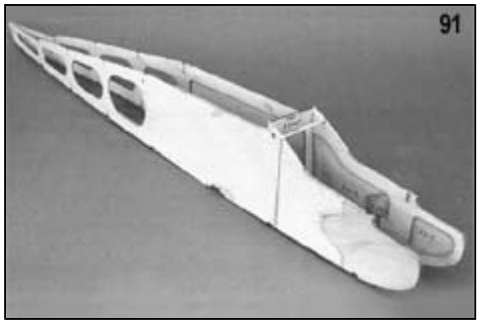
In the following steps 90 through 97, the fuselage parts will be assembled with rubber bands and tape. Do not glue any parts until told to do so in step 98!

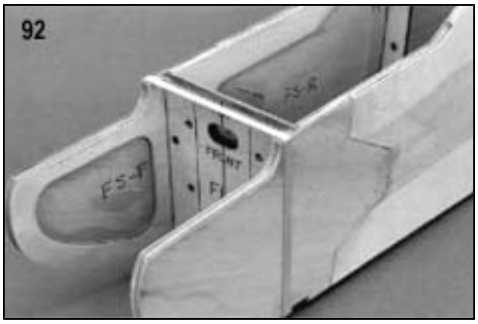
90. Stack the Left and Right Fuselage Sides on top of each other with the doublers touching. Align all the edges, and then tape the tail ends of the sides together.

91. Spread the fuselage sides apart at the front and plug former F2 into position, inserting the taps on the sides of F2 into the notches in the doublers. Loop a rubber band over both fuselage sides to hold them together against F2.
CAUTION: Make sure you install F2 with the words TOP and FRONT properly oriented towards the top and front of the airplane.

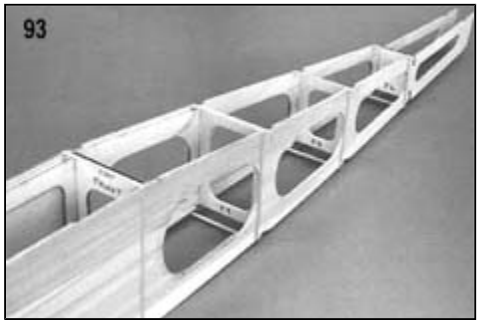
92. Plug former F1 in place and loop a rubber band over both fuselage sides to hold them together against F1.

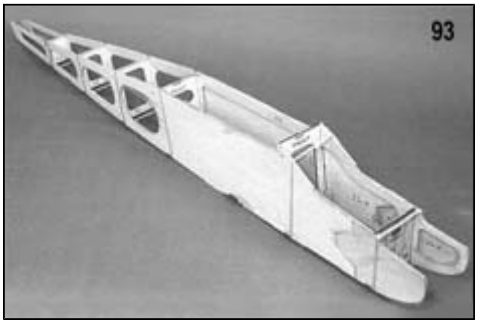






93. Starting at the rear and working forward, carefully spread the fuselage sides apart just enough to plug formers F6, F5, F4, and F3 in place, one at a time. Use a rubber band at each former location to hold the fuselage sides together against the formers. When finished, remove the tape from the tail end.

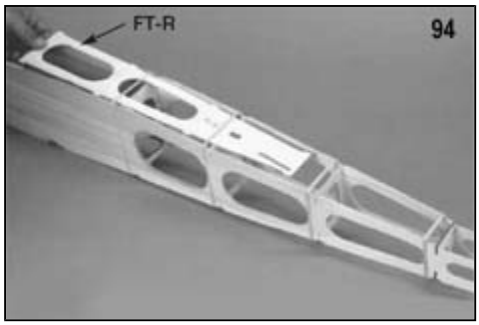


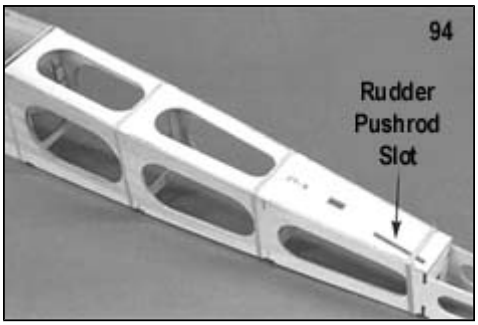


NOTE: The tabs on the sides of formers F3, F4, and F5 are oversize and will protrude past the fuselage sides slightly. These will be sanded off after the fuselage has been completely assembled.

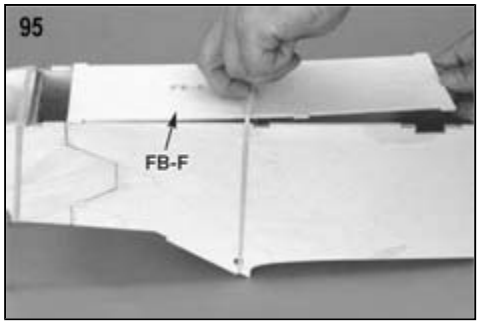
At this point your fuselage should look like this, with all the formers installed between the fuselage sides, and the entire assembly being held together with rubber bands only. DO NOT APPLY ANY GLUE TO THE FUSELAGE STRUCTURE YET!

94. Slide die-cut plywood part FT-R (fuselage top rear) underneath the rubber bands at formers F3, F4, F5, and F6, and work it towards the tail, into final position between the fuselage sides. Lock the tabs on the sides of FT-R into the corresponding notches in the fuselage sides.
NOTE: Be sure to install FT-R with the slot for the rudder pushrod on the left side of the airplane, as shown in the Fuselage Top View on Plan.



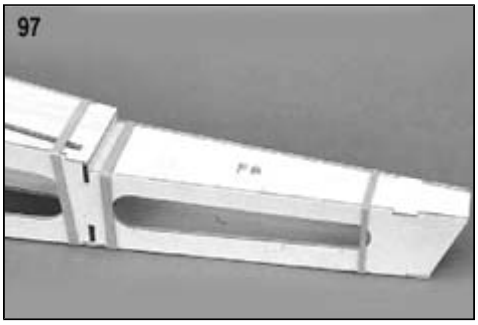


95. Turn the fuselage assembly upside down on the workbench and slip die-cut plywood parts FB-F (fuselage bottom front) and FB-R (fuselage bottom rear) into place. Lock the tabs on the sides of FB-F and FB-R into the corresponding notches in the fuselage sides.



96. Slip die-cut plywood parts F7 and Tank Floor in their correct locations. Notice that both these parts should sit on shelves provided by the cutouts in doubler FD.

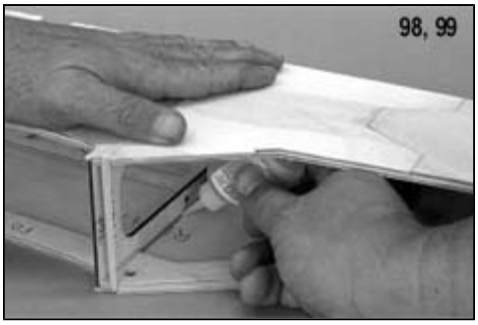
97. Slip die-cut plywood part F8 in place between the fuselage sides at the tail end of the structure. Use rubber bands and/or tape to hold the fuselage sides together against F8. Make sure the top surface of part F8 is level with, or just slightly below, the edges of the fuselage sides - not above!



Now you will start gluing the fuselage parts together!

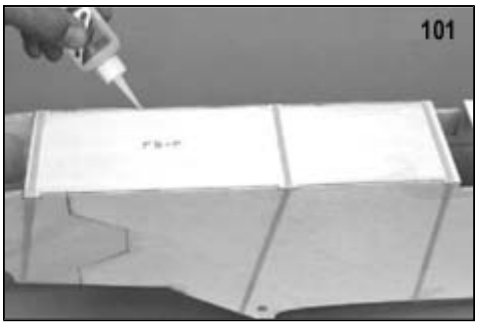
98. Lay the fuselage on its side on the building board, and press down firmly on the fuselage side directly above former F2. This should cause the former and the fuselage sides to lock tightly together in square alignment. Be sure you are pushing straight down - not off to one side, which would cause a twist in the structure. If everything looks good, run a bead of Medium CA along the side of F2 to glue it permanently to the fuselage side. When dry, turn the fuselage over and repeat the process to glue the other side of former F2 to the other fuselage side.

99. Repeat the process described in the last step to glue formers F1 and F3 to both fuselage sides.



100. Glue the Tank Floor and part F7 to the fuselage sides. Also glue the front of the Tank Floor to the back of F1.

101. Set the fuselage upside down on the building board, and double check that part FB-F (fuselage bottom front) is in correct position. Make sure the bottom of FB-F is flush with the fuselage sides, and that the fuselage sides are pulled in tight against the sides of FB-F. Use more rubber bands and/or masking tape if necessary to hold the parts in correct position. Then flow Thin CA into the side joints.



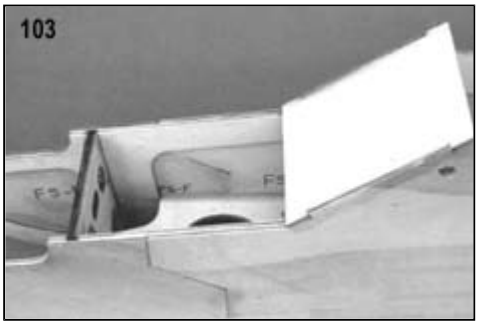
102. Turn the fuselage over and use Medium CA to glue FB-F to the bottom of formers F1 and F2. When dry, remove all rubber bands and tape from the front of the fuselage, in the area of parts F1, F2, and FB-F.

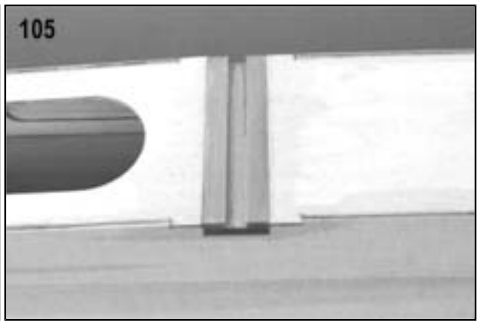
103. Glue the die-cut plywood Windshield in place.

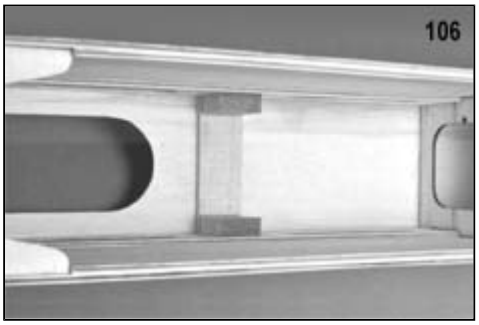
104. Double check to see that the rear of the fuselage structure, the area from former F3 all the way back to the tail end, is in correct alignment. Make sure that the structure is square and that all the parts are tightly held together without any significant gaps between parts. When satisfied with the alignment, permanently glue all of the parts together with Medium CA. Start with small applications of glue in the corners of the formers, constantly checking the fuselage alignment as you go. After you've got everything tacked glued together in the corners, go back and finish gluing the rest of the joints. Glue FT-R and FB-R to the fuselage sides. Glue formers F3, F4, F5, and F6 to the fuselage sides and to FT-R and FB-R. Glue F8 to the fuselage sides and to the back of former F6. Remove the rubber bands and tape after you have glued all the joints and the glue has dried.

105. Glue the 3/8"x1"x3-1/2" Grooved Landing Gear Block in place.

106. Glue the two 1/2"x1"x1" L.G. Anchor Blocks in place inside the fuselage. Glue them securely to the top of the Grooved Landing Gear Block and to the fuselage sides.





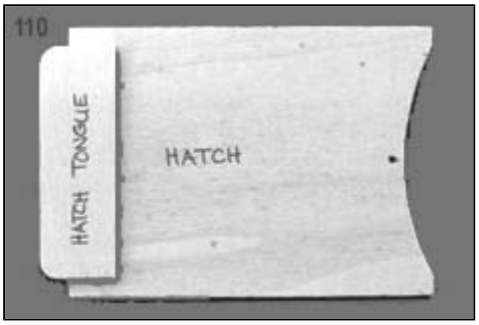


107. Two pieces of 3/8" Balsa Triangle stock are provided to reinforce the firewall-to-fuselage joint. Cut notches in the Balsa Triangles where necessary to clear the blind nuts and pushrod holes, and then glue the Balsa Triangles in place on the back of F1.

108. Now go back and re-glue every joint in the fuselage with Medium CA! Use enough glue to fill up the joint, plus leave a visible, but small, reinforcing fillet in every joint. Take your time and don't miss any joints! Each and every one of them contributes to the finished strength of the fuselage. Work on small sections at a time to avoid having excess glue running all over the place. Let dry thoroughly.

109. Carefully block sand the Hatch area to remove any bumps, glue spots, or mismatch between the fuselage sides, the doublers, and the top of F1. Be careful not to sand a curve in the fuselage sides which would cause an unsightly gap when the Hatch is installed.

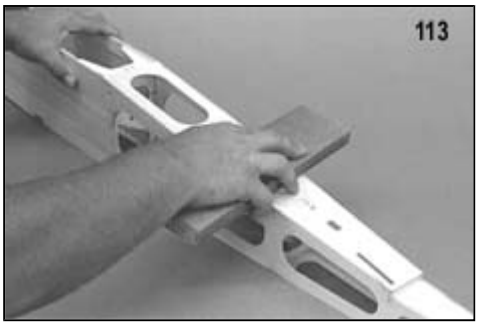
110. Locate the die-cut plywood Hatch. Inspect both sides and choose the best looking side for the top. Draw guidelines on the bottom of the Hatch for the location of the Hatch Tongue. The guidelines should be 1/4" in from each side, and 5/8" down from the square end of the Hatch (see Plan Sheet 1). Glue the die-cut plywood Hatch Tongue in place on the bottom of the Hatch.



111. There is a small dimple near the curved end of the Hatch which indicates the location for the screw that will be used to hold the front of the Hatch on the airplane. Drill completely through the Hatch, on the dimple mark, with a 3/32" dia. drill bit.

112. Put the Hatch on the fuselage (the Hatch Tongue should slide underneath the front lip of the Windshield). Drill a 1/16" dia. pilot hole into the top of F1, locating the pilot hole right in the middle of the 3/32" hole already in the Hatch. Screw the Hatch down with the #2 x1/2" Sheet Metal Screw and #2 Flat Metal Washer provided.

113. The fuselage is now ready for final sanding. Use a sanding block with fresh 80 grit paper to sand smooth all the exterior glue joints on the sides, top, and bottom of the fuselage. Sand all protrusions (tabs, glue, etc.) until they are level with the surface. After leveling everything with the 80 grit sanding block, go over the entire fuselage with hand held 220 grit sandpaper.



OPTIONAL: Block sand the main exterior corners of the fuselage slightly round for a more pleasing shape, as shown in the fuselage cross-section drawings on Plan Sheet 1. Do not round the corners in the areas where the wing and stabilizer will be mounted, or in the Hatch area.

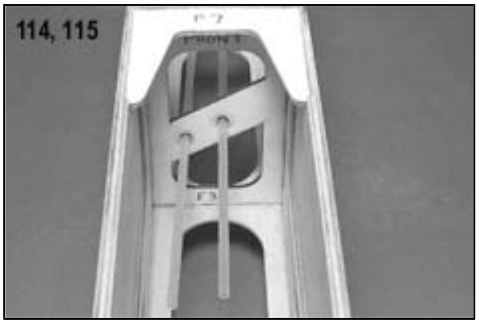
114. Two pieces of Large Dia. Nylon Pushrod Tubing (3/16" O.D. x26-5/8" long) are provided for making the outer sleeves of the Elevator and Rudder Pushrods. It's easiest to glue these two tubes into the fuselage structure at this time, before the fuselage is covered, even though the radio equipment won't be installed until later. Study all the views on Plan Sheet 1 to familiarize yourself with the proper location for each pushrod. Then slide the tubes in place.
NOTE: The elevator pushrod tube should go through the right hole in F3 and through the hole in the middle of F6. The rudder pushrod tube should go through the left hole in F3 and through the slot in FT-R just in front of F6.

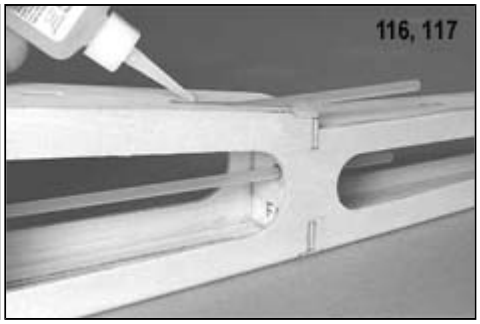
115. Notice that the servo end of both pushrod tubes should stick forward about 4-3/4" in front of former F3. When you've got the tubes properly positioned, glue them permanently to former F3 with Slow CA.

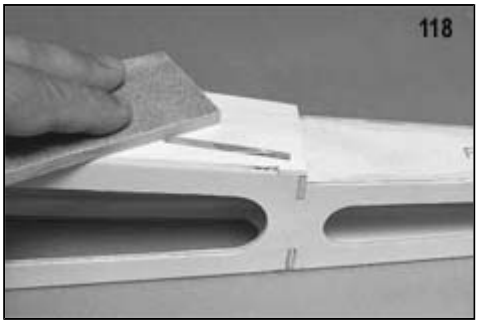
116. Glue the tail end of the elevator pushrod tube to former F6.

117. Apply glue liberally (either Slow CA or epoxy) to the rudder pushrod tube where it exits the slot in FT-R. Apply glue from both the outside and inside of the fuselage.

118. Use a razor saw to cut off the excess rudder pushrod tube as close as you can to the top of the fuselage. Then block sand the tube, and any excess glue, flush with the top.







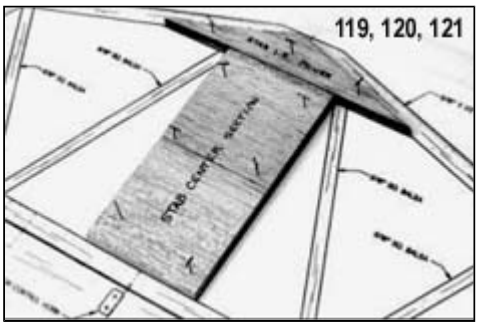
The basic fuselage construction is now complete! Set the fuselage aside until "COVERING THE KADET LT-40"

STABILIZER AND ELEVATOR

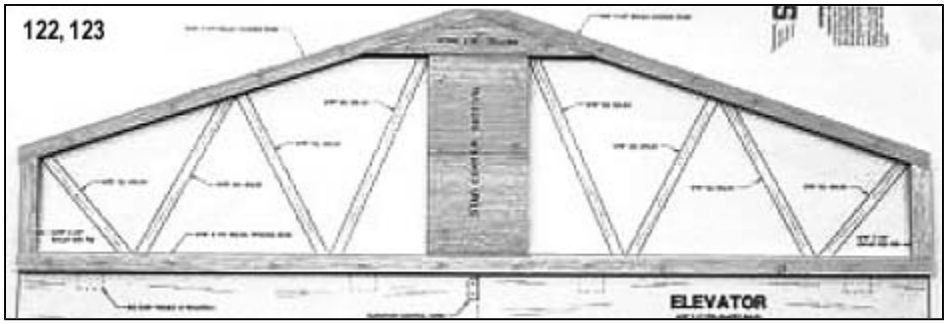
119. Cut the drawing of the STABILIZER and ELEVATOR loose from the rest of Plan Sheet 2. Tape or pin it on top of your building board. Cover the plan with wax paper.

120. Locate the 5/16" x 6" x 3" balsa Stab Center Section and pin it in exact position on the plan.

121. Pin the laser-cut balsa Stab L.E. Joiner in place on the plan, gluing it to the front of the Stab Center Section at the same time.

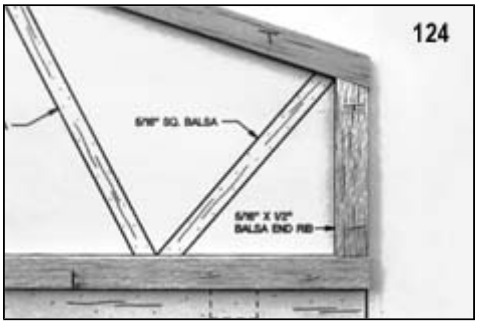


122. Three 5/16"x1/2"x36" balsa sticks are provided for making the Leading Edge, Trailing Edge, and End Ribs of the Stabilizer (plus some parts of the Fin). Inspect all three of the sticks to determine which one is the straightest, and use that one to make the Stabilizer Trailing Edge. Cut it to 27" long with a razor saw, and then pin it in place on the plan, gluing it to the back of the Stab Center Section at the same time. (Save the leftover 9" long piece of wood for step 124.)



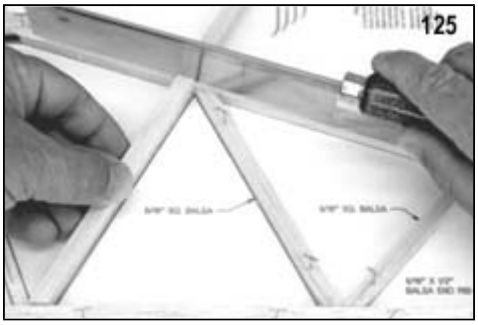
123. Use the next straightest 5/16"x1/2"x36" balsa stick to make both Stabilizer Leading Edges. Cut the ends of the Leading Edges at angles matching the exact shapes on the plan. Then pin the Leading Edges in place, gluing them to the front of the Stab L.E. Joiner at the same time. (You should end up with about 6" of wood leftover for step 124.)

124. Use the 5/16" x 1/2" balsa pieces leftover from the last two steps to make the Stabilizer End Ribs. (Do not cut into the third 5/16"x1/2"x36" long balsa stick for this step - it is for building the Fin later in steps 134, 135, 136, and 138.) Cut the End Ribs carefully to fit snugly between the leading and trailing edges. Then glue and pin them in place.



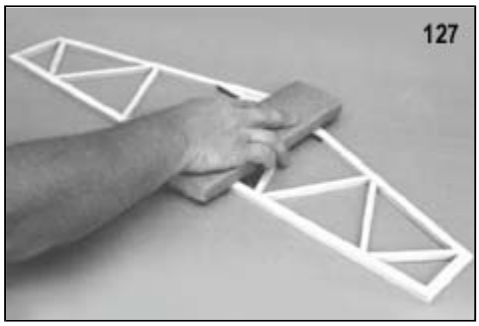
125. Two 5/16"x5/16"x36" balsa sticks are provided for making the rest of the parts for the Stabilizer (plus some parts of the Fin). From both sticks, cut the eight 5/16" Sq. Balsa diagonal ribs required for the Stabilizer. (Be sure to save all the leftover wood for building the Fin later in step 137.) Work on one rib at a time. Cut the rib to exact size over the plan, angling the ends to fit well against the leading and trailing edges. Glue and pin the first rib in place before going on to the next one.

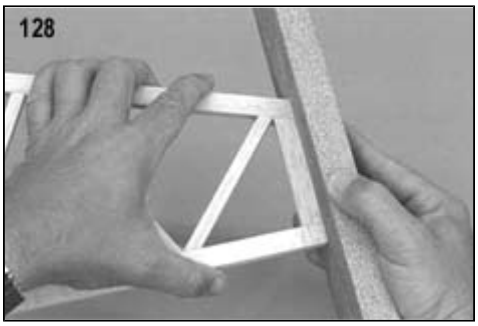
126. Once the glue is dry, unpin the Stabilizer from the plan and re-glue all the joints with additional Medium CA. Use just enough glue to completely fill the joint, plus leave a visible, but small, fillet of glue between the parts. Take your time and don't miss any joints! Each and every one of them contributes to the finished strength of the Stabilizer.



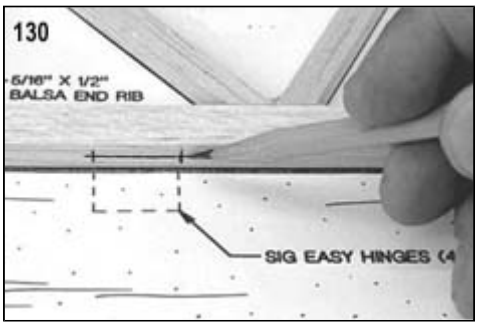
127. Lay the Stabilizer flat on the building board and lightly block sand the entire structure just enough to smooth out all the glue joints. Do this to both sides of the Stabilizer.
CAUTION: Do not sand so much that you thin down the Stabilizer more than 1/32" under its original 5/16" thickness.

128. Block sand the tip ends of the leading and trailing edges flush with each End Rib.





129. Mark a center-line on the front of the Stabilizer Leading Edges. Using the center-line as a guide, carve and sand the front of the Leading Edges to a round shape.
NOTE: Leave the End Ribs and Trailing Edge of the Stabilizer flat and square.



130. Lay the Stabilizer back on the plan and mark the locations for the Sig Easy Hinges (4 total) on the trailing edge.

131. Locate the pre-shaped balsa Elevator and mark the hinge locations on its leading edge. Also compare the overall length of the Elevator to the overall length of the Stabilizer. They should already be very close to the same length, if not exactly the same. If they aren't, block sand the ends of the Elevator until it matches the Stabilizer.

132. Cut slots for the hinges in the Stabilizer and Elevator following the instructions on "INSTALLING SIG EASY HINGES" (perform steps 1 through 5). Then set the Stabilizer and Elevator aside for covering.

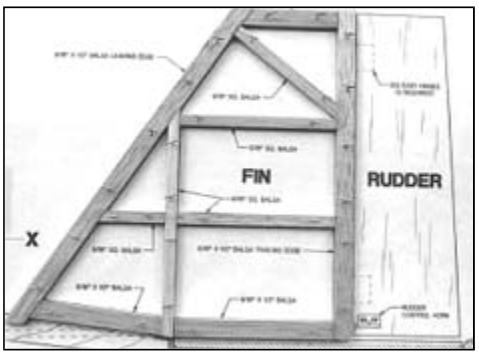
FIN AND RUDDER

133. Cut the rear portion of the Fuselage Side View (the part that includes the Fin and Rudder) loose from Plan Sheet 1. Tape or pin it on top of your building board. Cover the plan with wax paper.

134. You should have one 5/16"x1/2"x36" balsa stick left for making parts for the Fin. The first part to cut from that stick is the Fin Leading Edge. Use a razor saw to cut the ends of the Leading Edge at the same angles shown on the plan. Notice on the plan that the bottom end of the Fin Leading Edge extends down into the top of the fuselage about 1/4" - be sure to cut to the correct line! Then pin the Leading Edge in place on the plan.

135. Next cut the 5/16"x1/2" Fin Trailing Edge. Note that the ends of the Trailing Edge should be cut 90° square. Pin the Trailing Edge in place on the plan.

136. Cut a piece of 5/16"x1/2" balsa for the top of the Fin. Pin it in place on the plan, gluing it to the leading and trailing edges at the same time.



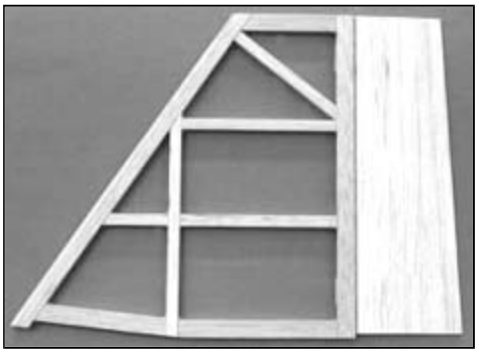
137. Locate the 5/16" x 5/16" balsa leftover from making the Stabilizer. There should be enough left to make the five pieces of 5/16" Sq. Balsa called for in the Fin. Work on one piece at a time, cutting it to exact shape over the plan, angling the ends to fit well against the adjoining pieces. Glue and pin the pieces in place.

138. Cut two pieces of 5/16" x 1/2" balsa for the bottom of the Fin. Glue and pin them in place.

139. Once the glue is dry, unpin the Fin from the plan and re-glue all the joints with additional Medium CA. Use just enough glue to completely fill the joint, plus leave a visible, but small, fillet of glue between the parts. Take your time and don't miss any joints! Each and every one of them contributes to the finished strength of the Fin.

140. Lay the Fin flat on the building board and lightly block sand the entire structure just enough to smooth out all the glue joints. Do this to both sides of the Fin.
CAUTION: Do not sand so much that you thin down the Fin more than 1/32" under its original 5/16" thickness.

141. Block sand the top end of the Fin to make the leading and trailing edges flush with the top 5/16" x 1/2" Balsa.



142. Mark a center-line on the front of the Fin Leading Edge. Using the center-line as a guide, carve and sand the front of the Leading Edge to a round shape.
NOTE: Leave the trailing edge, top end, and bottom of the Fin flat and square.

143. Lay the Fin back on the plan and mark the locations for the Sig Easy Hinges (2 total) on the trailing edge.

144. Locate the pre-shaped balsa Rudder and mark the hinge locations on its leading edge. Also compare the overall height of the Rudder to the overall length of the Fin's trailing edge. Notice on the plan that the Rudder should be 1/8" shorter in height than the Fin's trailing edge. This is to provide a gap between the bottom of the Rudder and the top of the Stabilizer after the model is assembled. Sand the end of the Rudder slightly if necessary to achieve an adequate gap.

145. Cut slots for the hinges in the Fin and Rudder following the instructions on page 23 "INSTALLING SIG EASY HINGES" (perform steps 1 through 5). Then set the Fin and Rudder aside for covering.

COVERING

146. In this step you need to cover all the parts of your model with the covering material of your choice, before proceeding on to Final Assembly of the model.

General Notes

There are many different covering materials available for finishing model airplanes. They range from raw coverings that must be bonded to the structure with adhesive and then painted; to iron-on plastic materials that have the color and finish built right in. The choice of which type of covering material to use on your KADET LT-40 is a matter of personal choice. However, if this is your first model airplane, we recommend that you chose one of the popular pre-finished iron-on plastic film coverings. This type of covering material provides a high gloss, durable finish that is easy to apply and repair. It goes on relatively quick and is not near as messy or smelly as using a covering material that must be painted. All of the KADET LT-40 prototypes built here at the SIG factory were finished with SIG SUPERCOAT IRON-ON PLASTIC COVERING.

Since all iron-on plastic covering materials come with detailed step-by-step instructions on how they should be applied, we will not go into a repetitive step-by-step sequence here. We will instead outline some ideas that are specific to the KADET LT-40. Be sure to read all the instructions that come with your covering material and follow them carefully.

> NOTE: There are also complete books and video tapes available on applying iron-on covering materials. These sources can be very helpful, providing a lot more tips than we can cover in this instruction book. Often times, the video tapes can be rented or borrowed from your local hobby shop or model airplane club.

Choice of Color Scheme

One of modeling's pleasures is the chance to decorate your model to suit your own taste. There are a huge variety of after-market items available in the hobby shops to dress up your airplane. Striping tapes and trim sheets in every color of the rainbow, stick-on decals and markings, are all available and easy to apply. You can go for a military look, a Cessna-like civil aviation look, or something totally wild in vivid neon colors. Your imagination is the only limit!

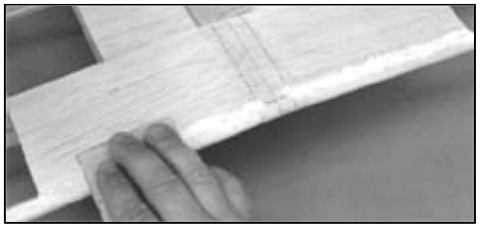
If this is your first model, our advice is to keep the color scheme simple and visible. The most economical way to go is to choose one primary color for the entire model (see "COVERING CUTTING DIAGRAM"). Choose a light color! Covering the entire model in black, dark blue, gray, etc., is not a good choice. In the air a dark colored model will quickly turn into a black silhouette, and it will be difficult to distinguish which way the airplane is going. A light color is more visible at greater distances! White, yellow, orange, cream, and neon colors are excellent choices for a trainer model.

Kit Color Scheme

The KADET LT-40 kit includes two sheets of stick-on decals to duplicate all the markings on the fuselage and fin of the model shown on the kit box label. Whether or not you use these decals is your choice. We think they give the KADET LT-40 a "civil aviation" look, and that's what we wanted. You may want something totally different!

No decals are included in the kit for the wing. On our kit box model, we covered the back part of the wing with white covering material, and then covered the front part of the wing with black covering. The black covering overlaps (3/8") onto the white covering on top of the main spar. Red striping tape was used for an accent stripe. If you want to make your KADET LT-40 wing look the same as ours, it will cost you one more roll of covering material (black) and take more time than if you make the wing all one color. The choice is yours! The wing covering instructions further on will assume that you are covering your wing the most economical way - in all one color.

Surface Preparation



A good covering job starts with good surface preparation! Regardless of what type of covering material you use, it won't hide poor workmanship. Finish sand the entire model with 220 grit sandpaper. Fill any holes, gaps, nicks, or dents on the surface of your model with a light-weight filler. After the filler dries, sand off any excess flush with the surface. Regular household "wall repair" or "spackling" compound (3M, Red Devil, DAP, etc.) works well for this, or you may find a suitable "model filler" available in your hobby shop. Just make sure that whatever filler you use is light weight and sands easily.

Fuel Proofing

Since it's very difficult to apply iron-on covering material inside the engine compartment, this area should be made fuel proof by painting it with a fuel-proof hobby paint, before the covering material is applied. We prefer to use SIG SUPERCOAT BUTYRATE DOPE. It's an excellent fuel proofer, and it also acts as a glue to improve the adhesion of the edges of the covering material that overlaps it. Choose a color paint that closely matches the color of the covering you will be using. Use a small (1/2" wide) brush to apply 2-3 coats of paint to the engine compartment, letting it dry between coats.

Paint the entire front surface of firewall F1, plus the inside of the engine compartment "cheeks". Run the paint around the edges onto the outside of the fuselage sides, far enough that the iron-on covering material will overlap the painted areas at least 1/8" when it is applied. Also paint the edges of the hatch area and partway inside the tank compartment with fuel proof paint.

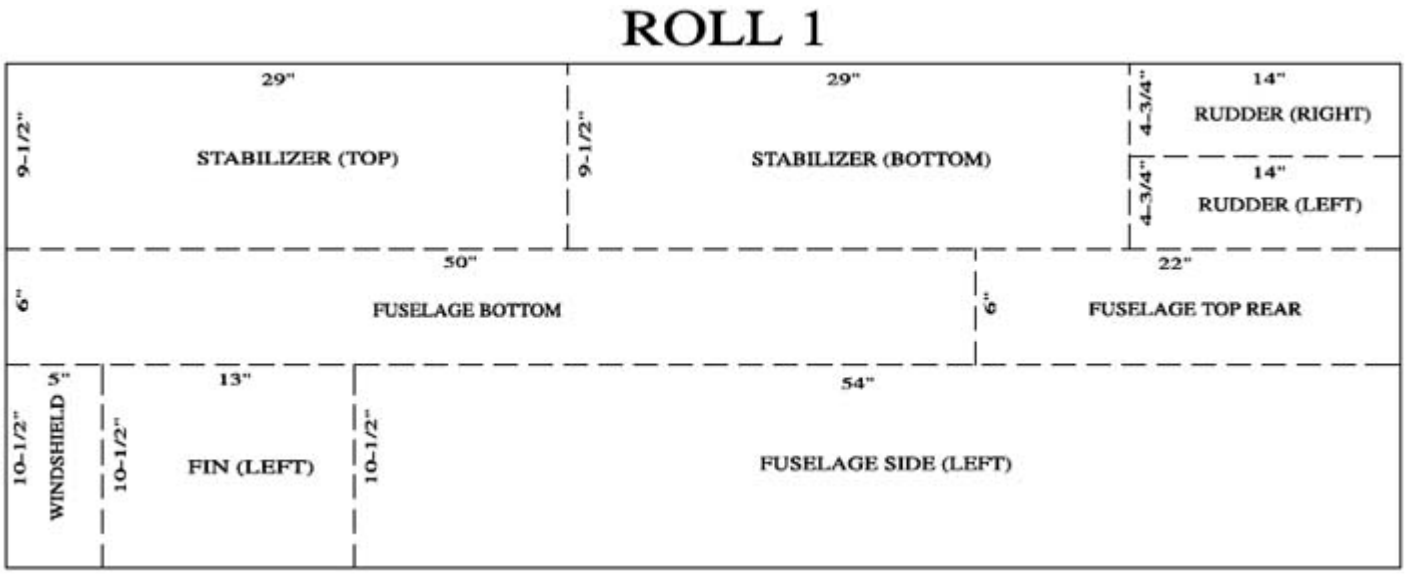
Paint the area of the fuselage where the wing will sit with fuel proof paint.
Paint the bottom of the grooved landing gear block with fuel proof paint.

Covering Cutting Diagram

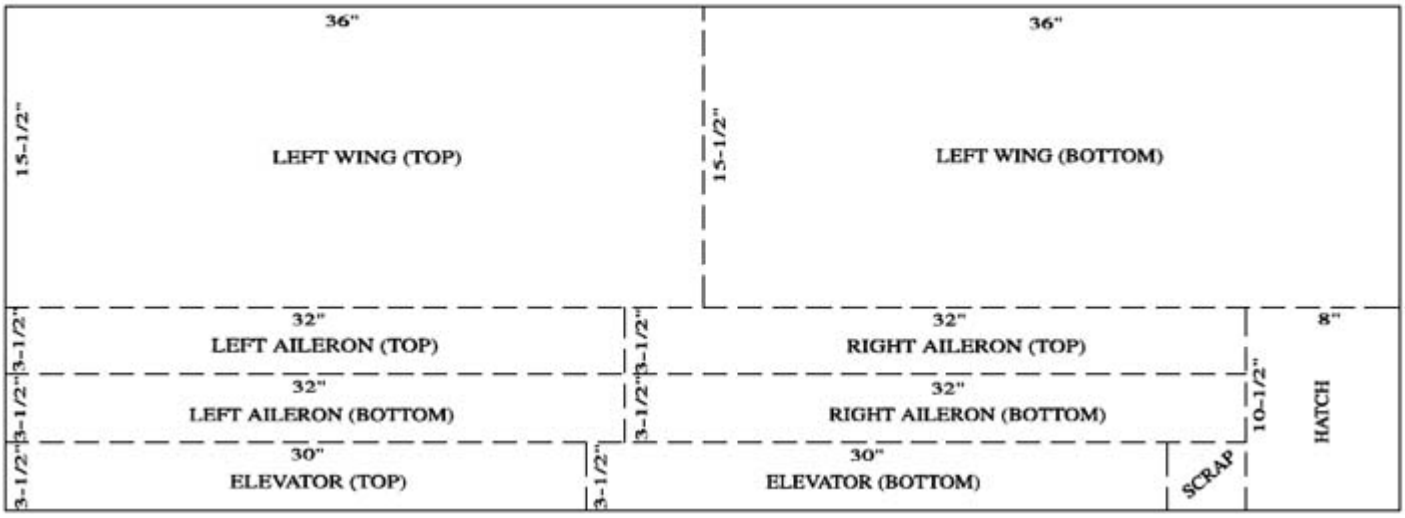
The diagrams below suggest how to cut 3 standard size rolls (26" x 6 ft.) of iron-on covering material for the KADET LT-40.

We recommend that you take the time to layout each roll on a large, clean surface and cut it to the sizes shown in the diagram. Use a pen to label each piece along one edge. Save the areas marked "scrap" for use in covering the ends of the control surfaces. Once you get started covering, save any large "trimmings" for possible use later.

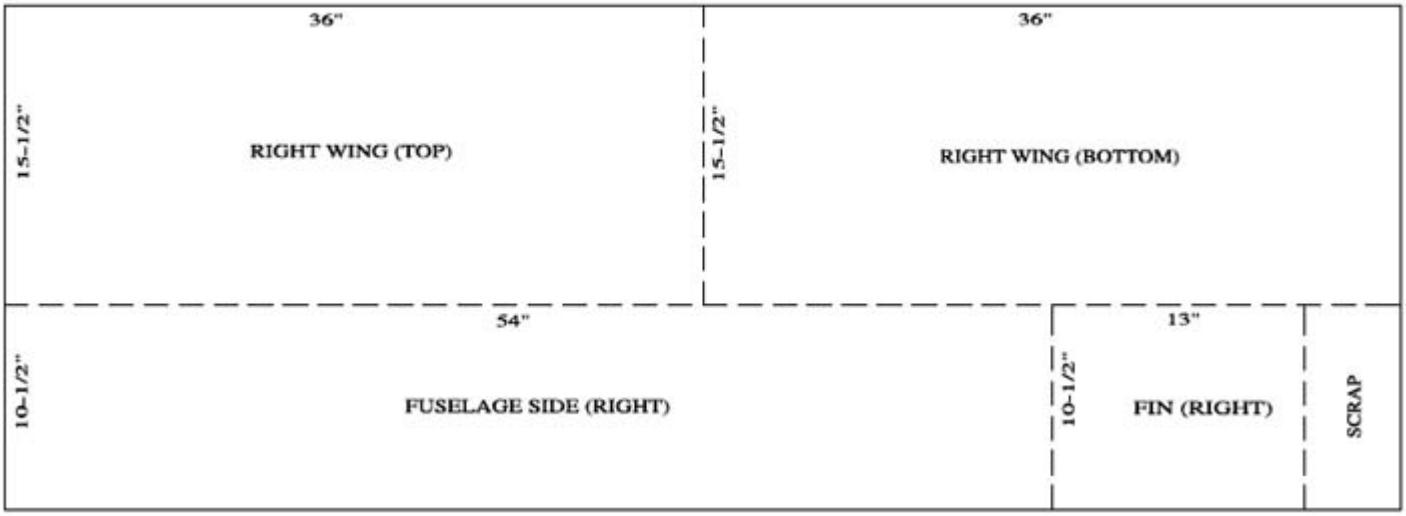
NOTE: If you decide to cover your KADET LT-40 with more than one base color (for example: wings one color, fuselage another), you will probably need more than 3 rolls of covering material.



ROLL 2



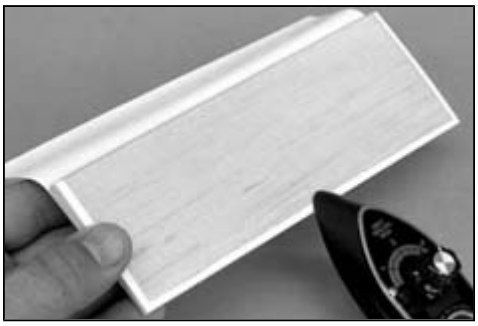
ROLL 3



Cover The Rudder

First cover both ends of the Rudder with small pieces of scrap covering material before covering the sides. Run the end covering "around the corner" about 1/8" onto the sides and front of the Rudder. Trim off excess.
NOTE: Always be careful when trimming excess covering material off of wood parts that you don't "score" or cut into the wood. Scoring a critical structural component of the airplane could seriously weaken its strength and possibly cause an in-flight failure.

Cover the left side of the Rudder with a separate piece of covering material. Run the left side covering completely around the leading and trailing edges, far enough so that there will be at least 1/8" overlap with the right side covering when it is applied. Trim the side covering flush with the top and bottom ends of the Rudder.



Cover the right side of the Rudder in the same manner you did the left side, making sure that it overlaps all other pieces of covering material at least 1/8" and that no areas of wood are left exposed.

NOTE: When applying covering to a large solid surface, like the sides of the Rudder, it's best to start ironing in the center and work towards the outer edges, to avoid trapping air bubbles. If you do end up with a bubble of air under the covering material, puncture the bubble with a small pin hole, and then re-iron the loose covering towards the pin hole.

Cover The Fin

Cover the top end of the Fin with a small piece of scrap covering material before covering the sides. Run the top covering around the corners about 1/8" onto the sides, front, and back of the Fin. Then cover the left and right sides of the Fin with separate pieces of covering material, just like you did the Rudder. Overlap the left and right side coverings at least 1/8" along the leading and trailing edges of the Fin. Do not cover the bottom of the Fin, where it will be glued onto the fuselage.

NOTE: When applying covering to an open structure, like this Fin, you should completely adhere the covering to all the outside edges of the structure first. Then go back and shrink the middle of the covering tight.

Cover The Elevator

Covering the Elevator is virtually the same as covering the Rudder. First cover the ends of the Elevator with small pieces of scrap covering material. Then cover the top and bottom of the Elevator with separate pieces of covering material. Iron the top and bottom covering pieces on from the center out to the edges to avoid air bubbles. Overlap all seams at least 1/8".

Cover The Stabilizer

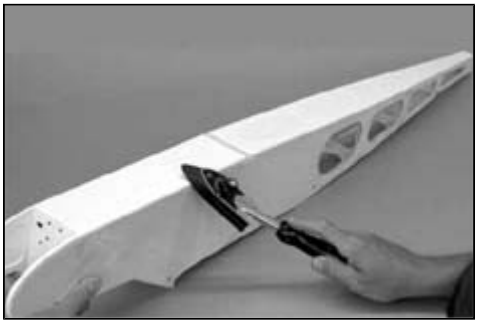
Covering the Stabilizer is virtually the same as covering the Fin. First cover the ends of the Stabilizer with small pieces of scrap covering material. Then cover the top and bottom of the Stabilizer with separate pieces of covering material. Adhere the top and bottom covering pieces around the edges first, then shrink the middle tight. Overlap all seams at least 1/8".

Cover The Ailerons

Covering the Ailerons is virtually the same as covering the Rudder and Elevator. First cover the ends of the Ailerons with scrap, then cover the top and bottom with separate pieces. Overlap all seams at least 1/8". After the Ailerons are covered, use a sharp new blade to trim away the covering material over the slot and hole for the torque rods.

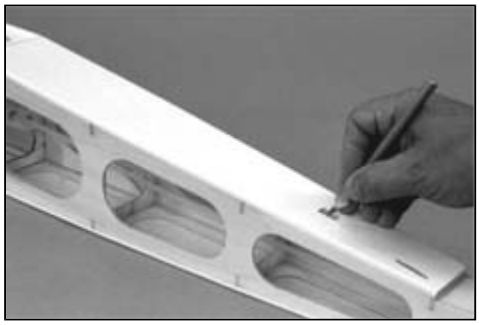
Cover The Fueslage

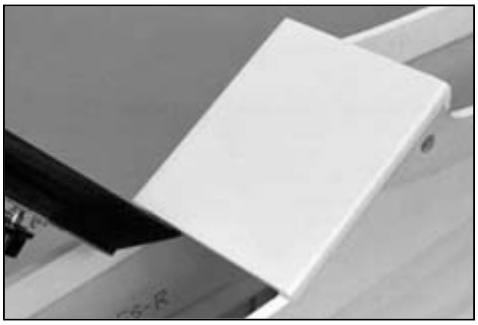
The fuselage should be covered with five separate pieces of covering material (bottom, top rear, windshield, left side, right side). Start by covering the entire bottom of the fuselage with one piece. Run the sides of the covering up around the corners about 1/8" onto the sides of the fuselage. Trim the front of the covering flush with the front of F1. Trim the rear end of the covering flush with the tail end of FB-R. Cut away the covering over the groove in the Grooved Landing Gear Block.



Next cover the top rear of the fuselage with one piece of material. Run the sides of the covering down over the corners about 1/8" onto the sides of the fuselage. Trim the front and rear ends of the top covering flush with the ends of FT-R. Don't forget to cut open the holes where the rudder pushrod and the Fin leading edge go through FT-R.

Next cover the windshield with a single piece of covering. Run the sides of the covering down over the corners about 1/8" onto the sides of the fuselage. Tuck and iron the front and rear edges of the covering around the ends of the windshield.





Finally, cover the sides of the fuselage with separate right and left pieces of covering material. These are the largest pieces of covering material you've worked with so far. Don't hurry! You can't cover a fuselage side in 10 minutes like you did the smaller parts. Be patient and work slowly! Your patience will be rewarded by a better covering job. Overlap all seams at least 1/8" onto other covering material or onto the pre-painted areas. At the engine compartment, try to work the covering material around the first corner of every edge, and then trim off the excess covering flush with the inside corners. Do the same for the wing saddle area. Do not apply any covering material to the area (F8) where the Stabilizer will be glued on! When you've finished, cut open the holes in the fuselage sides for the wing dowels.

Cover The Hatch

This little gem will fool you! Because it's so small, you'd think it could be covered pretty fast. However, that's not the case! There are so many corners and edges, that it takes some time to get all of the Hatch covered. And because the Hatch will be directly exposed to a lot of engine exhaust, it is very important to get it all covered.

Do not leave any exposed wood! Start by applying an oversize piece of covering to the top of the Hatch. Then turn it over and cut out the corners of the excess covering to make it easier to wrap and seal the covering around the edges.

Continue wrapping and sealing the covering around the edges and onto the Hatch bottom.

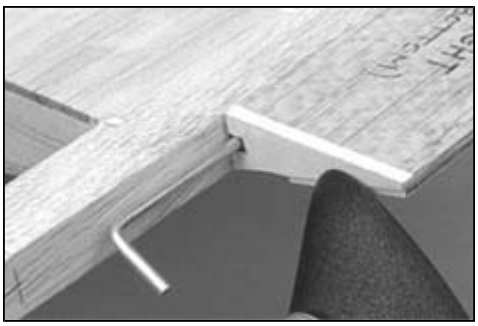
Make slits in the covering to make it easier to work around the curved end of the Hatch and around the Hatch Tongue. Use patience and do the best you can to get the entire Hatch (top, bottom, and edges) covered. What you can't get covered with iron-on covering, you should paint with fuel-proof paint.


Cover The Wing

Begin by covering the ends of the Center Section Trailing Edge with scrap covering material. Run the covering around onto the top and bottom. Slit the covering to lay down smoothly in front of the plywood Trailing Edge Stiffeners.

Next cover the entire bottom of the Left Wing Panel with one piece of covering material. Like all open structures, you should seal the covering down all along the outside edges of the structure first. (Do not shrink the center of the covering tight at this time - see "CAUTION ON SHRINKING WING COVERING" below) At the root of the wing panel, seal the covering down about 1/4" past the center joint. Cut a hole in the covering to allow the aileron torque rod to stick through. Also, it's not necessary to cover over plywood part ASM (aileron servo mount) - merely cover up to it.

At the front of the wing panel, seal the covering material completely around the Leading Edge and trim it off flush with the top corner of the Leading Edge.

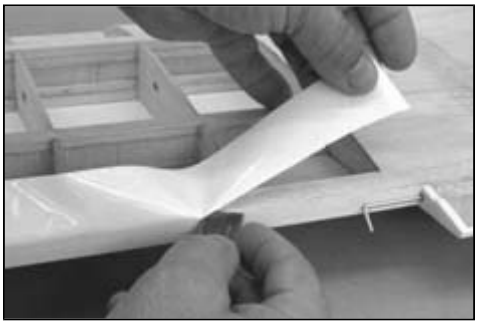
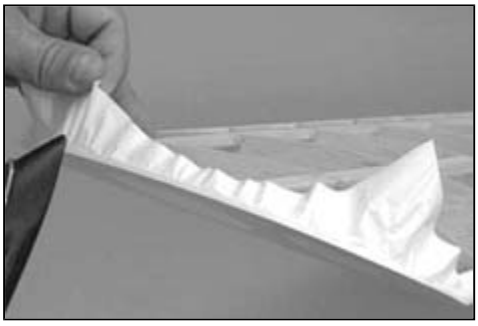
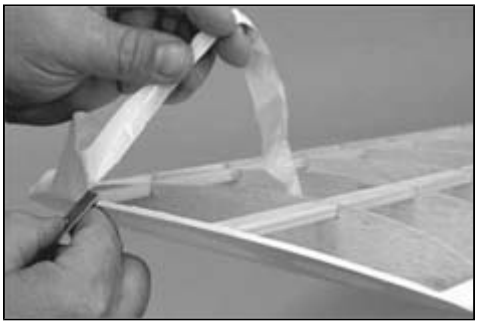


At the back of the wing panel, slit the excess covering at the end of the Center Section Trailing Edge, then run it around the corner and seal it onto the back of the Trailing Edge. Trim off flush with the top rear corner of the Trailing Edge.

At the tip end of the wing panel, seal the bottom covering to the last W5 wing rib. Then continue on, working the covering material down smoothly onto the bottom of the wing tip WTP. Wrap and seal the covering completely around the edges of WTP. Trim off flush with the top surface of WTP.

Now cover the bottom of the Right Wing Panel in the same manner you just did the bottom of the Left Wing Panel.

Then cover the top of both wing panels with separate pieces of covering material. Remember to overlap all seams at least 1/4" onto other pieces of covering material.

CAUTION ON SHRINKING WING COVERING

Wait until all four major pieces of wing covering (bottom left, bottom right, top left, top right) have been completely sealed down around their edges before shrinking the middle areas of the covering. When shrinking the middle, do not completely tighten one side of the wing first. It's best to alternate between the top and bottom wing surface, shrinking each side a little at a time, to avoid uneven shrinking which could cause a warp.

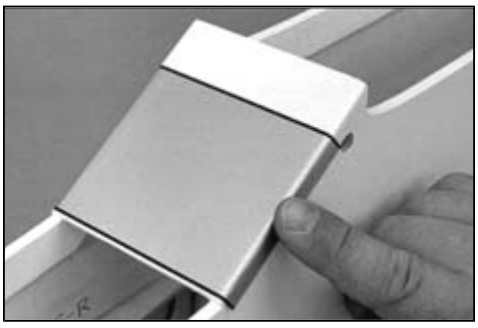
Apply Trim Colors And Decals

You can apply your trim colors and decals now before the model is completely assembled, or you can do it later, whichever you prefer.

Putting large sticky-back decals (like the ones included in this kit) on a model often leaves unsightly air bubbles trapped underneath the decal. Here's a little trick that eliminates that problem entirely! First cut out the marking you wish to apply with a sharp modeling knife and straight edge. Trim as close to the image as possible. Next spray the surface of the model where the decal will be placed with water mixed with a small amount of dish soap (you can also use "Sig Pure Magic Model Airplane Cleaner", "Fantastic", "Windex", or "409" type cleaners). Peel the paper backing sheet completely off the decal, being careful not to let the sticky side double over and adhere to itself. Place the decal onto the wet surface of the model. The soapy water solution will keep the decal from actually sticking to the model until you have had time to shift it around into exact position. Once you have it in position, use a paddle of scrap sheet balsa wood to squeegee the excess soapy water out from under the decal. Mop up the water with a dry cloth or paper towel. Squeegee repeatedly to get as much of the soapy water out from under the decal as possible. Allow to dry overnight! When completely dry, wash off the soap smears with a clean wet rag.

Kit Decals

The following sequence is recommended for applying the window decals supplied in this kit.



a. Apply the front windshield decal first. This piece is small enough that you can apply it dry, without using any soapy water. Note in the picture that it should go on flush with the bottom of the plywood windshield. Also notice that there is approximately 1/4" overhang on each side of the front decal. Wrap this overhang down onto the sides of the fuselage.
b. Apply the left side windows in one piece. Do not cut them apart! Applying them as a single piece will allow you to keep them lined up with each other. Use the soapy water method to allow you to slide the side windows into perfect alignment with the windshield. Then squeegee the soapy water from underneath the side windows.
c. Apply the right side windows in the same manner you did the left side windows.

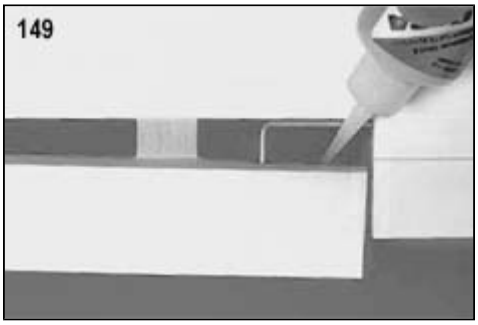
The rest of the decals in the kit should be applied wet, in basically the same manner as the window decals. Both the fin and the fuselage decals can be applied in one piece - do not cut apart the red and black sections. Apply the rear section of the fuselage decal first - then apply the front section, overlapping it about 1/8" onto the rear section.

Warning: Do not try to paint over the kit decals! Butyrate dope, lacquer, enamel, and many other paints will dissolve the decals. If you wish to top coat your decals, be sure to test for compatibility on a scrap decal before applying the paint. Frankly, SIG MFG. CO. does not recommend top coating the decals in this kit. They are already fuel-proof!

FINAL ASSEMBLY

147. Insert the two 5/16" dia. x5-1/2" Dowels through the holes in the fuselage. The Dowels should protrude 1" from each side of the fuselage. Glue the Dowels in place.

148. Paint the exposed portion of the Dowels with a couple coats of fuel-proof paint. Let dry.

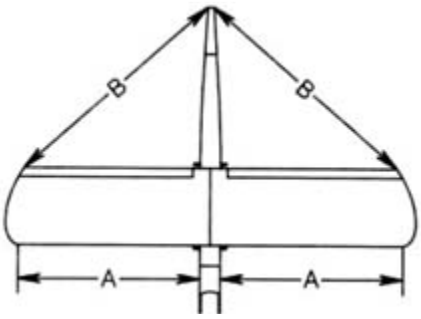


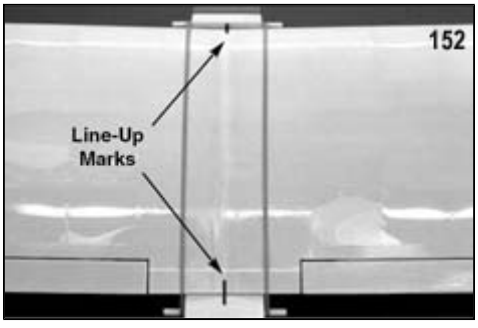
149. Re-install the Easy Hinges in the Stabilizer/Elevator and the Fin/Rudder. Return to the instructions on "INSTALLING SIG EASY HINGES", and perform steps 6 through 8 to glue the hinges permanently in place.

150. The ailerons will be hinged exactly like the tail surfaces, except that the torque rods must be glued in before the Easy Hinges are glued. Start by completely re-assembling the ailerons and Easy Hinges back onto the wing without any glue. Next, working with one aileron at a time, pull the root end of the aileron back away from the wing until the first Easy Hinge is just barely still in its slot and the torque rod is exposed as shown in the photo. Slide a small piece of wax paper between the front of the torque rod and the wing trailing edge. Apply a coat of Slow CA glue in the hole and slot in the aileron leading edge. Quickly slide the aileron back into position against the back of the wing. Remove the wax paper and wipe off any excess glue that oozes out of the slot with a rag. If any glue remains between the front of the torque rod and the wing trailing edge, slide a piece of paper through there to mop up the excess. Let dry!

151. Return to the instructions on "INSTALLING SIG EASY HINGES", and perform steps 6 through 8 to glue the hinges permanently in place.

152. Mount the wing on the fuselage with two #67 rubber bands. Using a tape measure, carefully measure from the fuselage sides out to the wing tips (measurement "A") to be sure that the wing is centered on the fuselage. Then measure from the wing tips back to tail end of the fuselage (measurement "B") to make sure the wing is square with the fuselage.



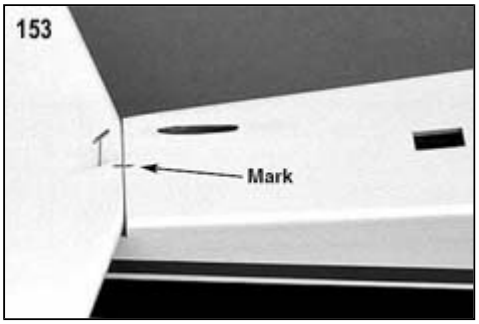


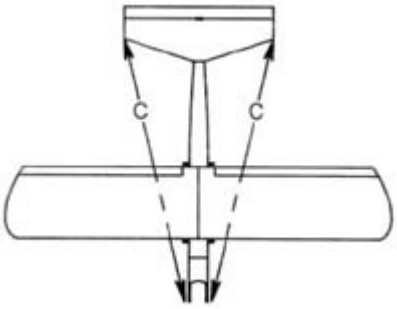
Once the wing is properly located, put some form of line-up marks on both the wing and fuselage so that you can easily re-locate the wing the next time you put it back on the fuselage. You can see in the photo that we've used short pieces of 1/8" wide striping tape on both the wing and the fuselage to mark the center joint and serve as line-up marks.

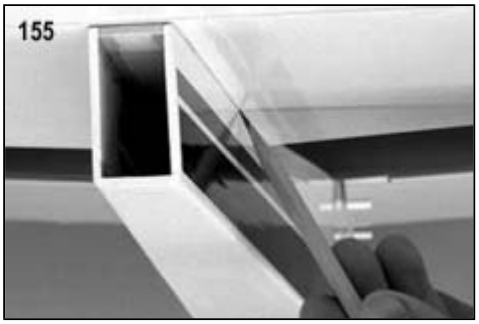
153. Put a center mark on the top of the fuselage, right above former F6. Also put a center mark on the front of the Stabilizer. Using no glue, trial fit the Stabilizer onto the fuselage. Line up the center marks at the front and use one T-Pin to secure the front of the stab, as shown. Push the pin completely through the stab and into the fuselage.

154. Carefully measure from the stab tips to the fuselage front (measurement "C"), to make sure the Stabilizer is square with the fuselage. Pivot the back of the stab until both measurements are exactly the same! Then push another T-Pin through the stab, into the fuselage, to secure it in position.

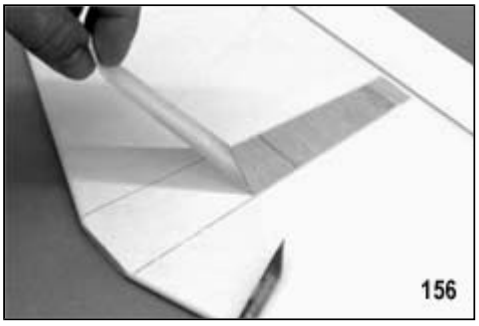
155. Lift the rear of the fuselage up, without jarring the stab loose, enough to enable you to mark the location of both fuselage sides on the bottom of the stab with a pencil.





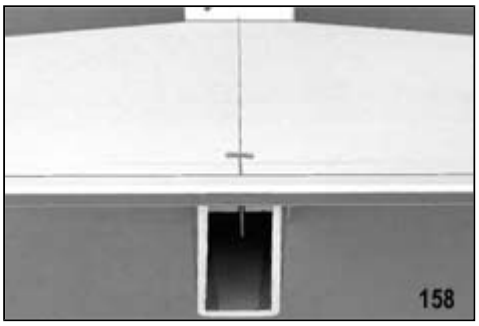


156. Remove the Stabilizer from the fuselage and very carefully strip away the covering material on the bottom, between the two lines, where the stab will be glued to the fuselage. CUT THE COVERING LIGHTLY ALONG THE LINES! AVOID CUTTING THE WOOD UNDERNEATH THE COVERING MATERIAL!
HINT: For a better finished appearance, cut about 1/32" inside the lines so that the stab covering will appear to be "tucked" inside the glue joint.

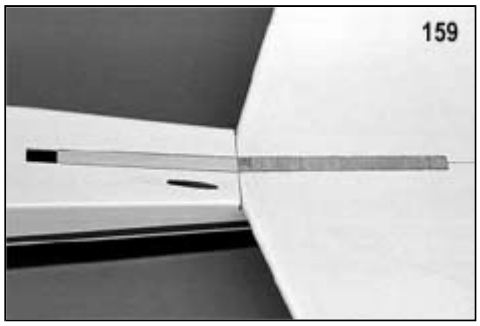


157. Gluing the Stabilizer to the Fuselage: First apply a coat of Slow CA glue to the area of the fuselage where the Stabilizer will go (the top surface of part F8 and the top edges of the fuse sides). Use enough glue to completely wet the entire surface of the joint. Quickly remount the Stab onto the fuselage, using the edges of the cutaway covering on the bottom to get the Stab back into correct alignment on the fuselage. Press the Stab down firmly into contact with the fuse while you wipe off any excess glue that oozes out of the joint with a rag. Hold tight until the glue dries.

158. Draw a center-line on top of the stab, running from the center mark above former F6 (step 153) to a point above the center of the rear end of the fuselage.
NOTE: In the photo you'll see that we have temporarily stuck a T-Pin through the hinge gap to give us a visual alignment with the middle of the end of the fuselage. Use a straight edge to draw the line from the mark above F6 to the pin.



159. Place the Fin/Rudder assembly on the fuselage, sticking the leading edge of the fin through the hole in the top of the fuse. Carefully line up the trailing edge of the fin using the center-line on top of the stab as a guide. Draw along both sides of the fin, marking its location on the top of the fuselage and stab. Take the fin/rudder assembly off the fuse and strip away the covering material inside the lines.



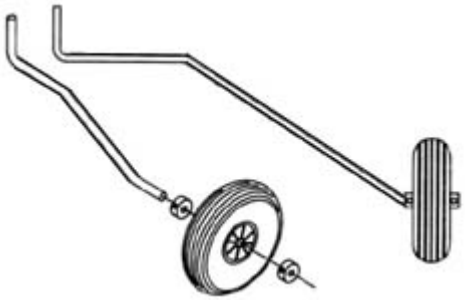
160. Gluing the Fin to the Fuselage: Apply a coat of Slow CA glue to the area where the Fin will go. Remount the Fin onto the fuselage, line it up as before, and hold it firmly in place until the glue dries. Hold a 90° triangle against the Fin to insure that it dries perpendicular to the Stab.

FINAL ASSEMBLY

161. Locate the two pre-bent Main Gear Wires and the pre-bent Nose Gear Wire. Inspect the ends of all the wires for burrs. If any are found, use a file or sandpaper to remove them.

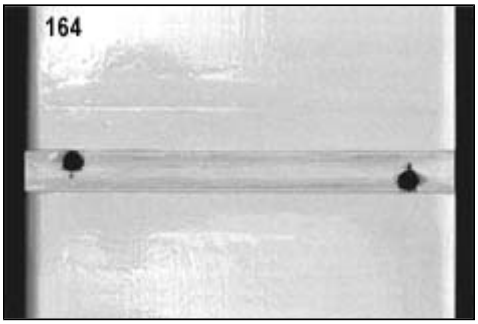
162. Find the plastic bag containing: six 5/32" Wheel Collars, six Set Screws, and one Hex Wrench. Thread a Set Screw halfway into each Wheel Collar.

163. Install one 3" dia. Main Wheel and two 5/32" Wheel Collars on the axle of each Main Gear Wire as shown: a Wheel Collar first, then the Wheel, then the other Wheel Collar.

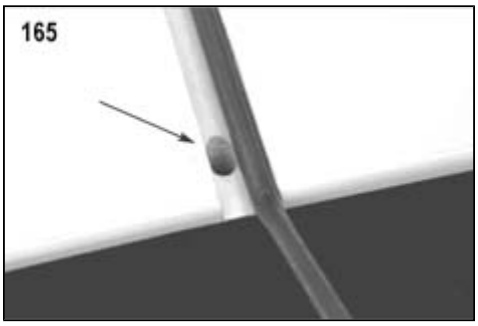


Slide the first Wheel Collar on as far as it will go (up tight against the bend of the wire) and tighten its Set Screw. Slide the outer Wheel Collar up tight against the Wheel, then back it up about the thickness of a piece of paper (to allow the wheel to turn freely), and tighten its Set Screw.

164. To install the Main Gear Wires in the Grooved Landing Gear Block, you first need to drill two 5/32" dia. holes in the block to accommodate the torsion arms of the wires. Be sure to drill the holes in the exact locations shown - one at the front of the groove and one at the rear, both holes exactly 3/8" in from the fuselage side (in order to hit the middle of the L.G. Anchor Block). Drill completely through the Grooved Landing Gear Block and on into the L.G. Anchor Block. Continue drilling until you have gone completely through the L.G. Anchor Block also.

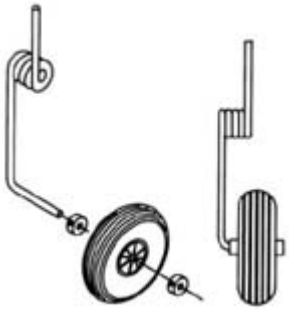


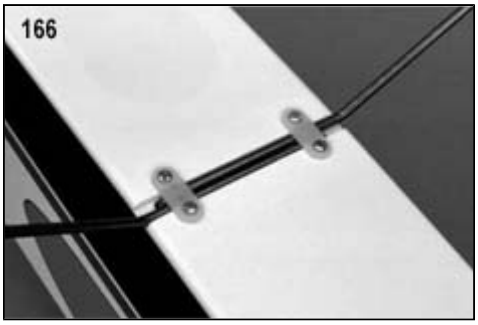
NOTE: Even though the plan calls out a "LEFT" and "RIGHT" Main Gear Wire, it actually makes no difference which wire sits in the front or back of the groove - they are interchangeable at this point. The Left Main Gear Wire could go to the back of the groove and the Right Main Gear Wire to the front, or vice versa - it doesn't matter - the gear will function properly either way!



165. In order for the Main Gear Wires to fit completely down into the groove of the Grooved Landing Gear block, it is necessary to remove a little material from the inside edge of the 5/32" holes to allow for the bends in the wire. Do this with a round file or a modeling knife. Then insert the torsion arm of the Main Gear Wires into the holes and push the wires down tight into the groove.

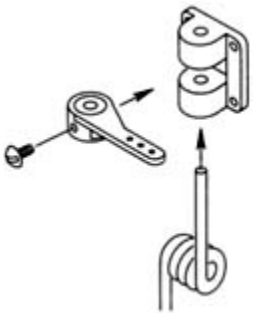
166. Place the two nylon Landing Gear Straps over the Main Gear Wires as shown in the picture. Mark, then drill four 1/16" pilot holes for the screws. Use four #4 x1/2" Sheet Metal Screws to mount the straps.

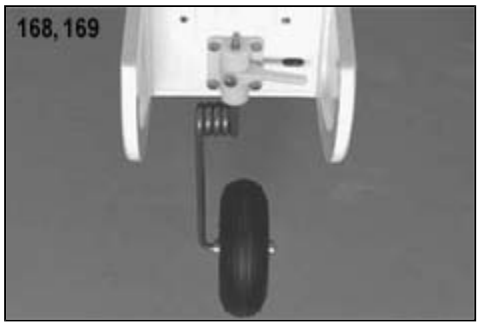


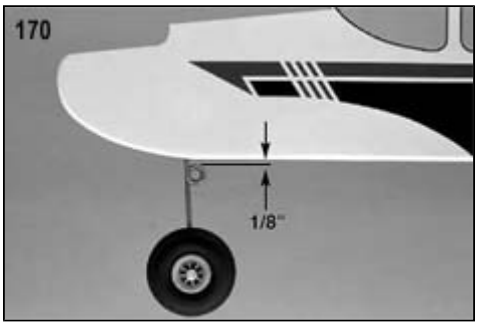


167. Install the 2-3/4" dia. Nose Wheel and two 5/32" Wheel Collars on the axle of the Nose Gear Wire (in the same manner you did the Main Gear in Step 163). Make sure the wheel turns freely

168. Re-install the Nose Gear Bearing back on the front of firewall F1 with four 4-40 x1/2" Mounting Bolts..





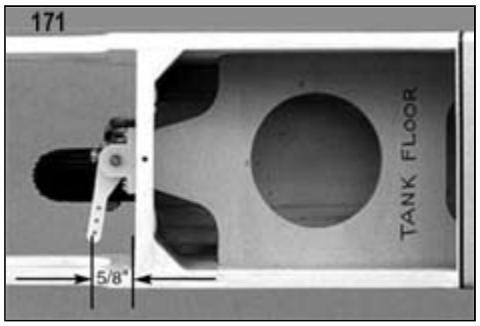


169. Thread the 6-32x1/4" Self-Tapping Screw part way into the hole in the front of the nylon Steering Arm.

170. Hold the Steering Arm in position in the Nose Gear Bearing while you insert the top end of the Nose Gear Wire up through the holes in the bearing and steering arm. Push the wire in until the top of the coil is about 1/8" away from the bottom of the fuselage. Snug up the Self-Tapping Screw in the Steering Arm just enough to get a slight grip on the Nose Gear Wire (keep it loose enough that you can adjust the steering arm position in the next step).

171. Align the Nose Wheel so it points straight ahead. Adjust the Steering Arm position on the Nose Gear Wire so that the outer hole in the arm is about 5/8" away from the front of the firewall when the wheel is pointed straight ahead. Then tighten the Self-Tapping Screw on the Steering Arm securely!

    NOTE: This slightly forward angle to the Steering Arm is necessary to allow the steering arm to turn to the left without hitting the front of the firewall.

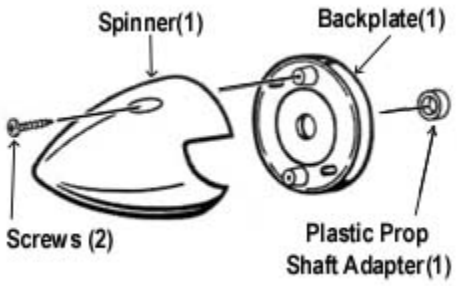


ENGINE, PROPELLER, SPINNER

172. Re-install your engine and mounts onto the front of firewall F1 with four 6-32 x3/4" Mounting Bolts.

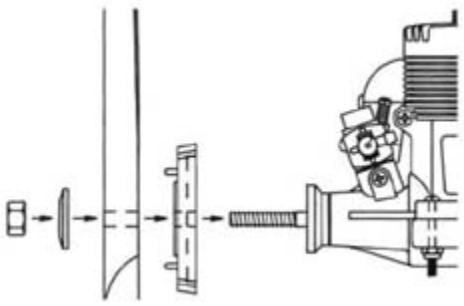
173. Refer to the instructions that came with your engine, and also to the chapter on "PROPELLERS" in "THE BASICS OF RADIO CONTROL" book, to select the correct size propeller to use on your KADET LT-40. As noted on the plan, a 10-6 prop will usually be the best choice for a standard .40 size R/C 2-stroke engine.

174. A 2" dia. SIG Spinner is included in this kit, packed in a plastic bag. Inside the bag you will also find two 4-40 socket-head bolts and a group of four molded plastic "adapter rings". Pull the nose cone portion of the spinner off of the back plate. Choose the correct diameter adapter ring to fit your engine's crankshaft, and press the ring into the hole in the middle of the back plate. Insert the socket-head bolts into the holes in the nose cone.



175. Mount the Propeller and Spinner onto the engine in the order shown. First slip the back plate onto the engine crankshaft, then the propeller, then the prop washer, and finally the prop nut. Position the propeller so it lines up with the bulges on the edge of the back plate (the bulges indicate where the openings in the nose cone will be). Tighten the prop nut finger tight for now.

176. Slip the nose cone on and check to see if the propeller clears the openings. If necessary, loosen the prop nut, reposition the propeller, re-tighten the prop nut, and then check again. Adjust as many times as necessary to make sure that the propeller comes out the center of the openings.
    THE PROPELLER MUST NOT TOUCH THE NOSE CONE!
    When you have it in the right position, tighten the prop nut securely.



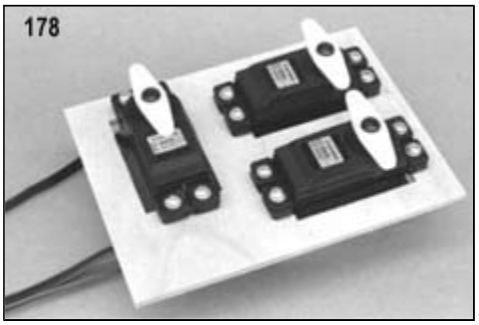
177. Install the nose cone and tighten the socket-head bolts with a hex "allen" wrench.

RADIO INSTALLATION

NOTE: The receivers and servos of different brand radios are not all the same size! Consequently, it is practically impossible for us to guarantee that every word and picture in this next sequence will pertain exactly to your installation. As you go along, you may notice some differences between your radio equipment and ours! Nonetheless, most of the radio system components will be close enough in size and appearance that you should be able to figure out for yourself how to handle any minor differences. Follow the instructions as closely as possible. If you have any questions, seek the advice of an experienced modeler. The installation of the control system in your new model is very important! It must be done correctly in order for your airplane to fly successfully and safely.

Mounting The Fuselage Servos

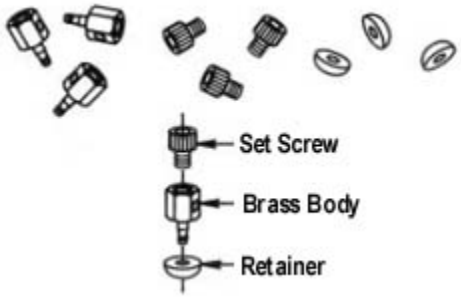
178. Locate the die-cut plywood part FSM (fuselage servo mount). Mount your throttle, elevator, and rudder servos in FSM using the screws, washers, and rubber grommets that came with your radio system. Be sure to orient the servos in FSM as shown in the Fuselage Top View.
CAUTION: The rubber grommets act as shock absorbers and prevent engine vibration from damaging the electronics in the servos. Do not over tighten the servo mounting screws to the point where they compress the rubber grommets so far that the grommets loose all shock absorbing ability. Tighten the screws just enough to make contact with the grommets and keep the servos in place.



179. Set FSM in place inside the fuselage, on the "shelf" provided by the fuselage doublers. Slide FSM fore or aft until its front edge is 1-7/8" behind former F2. (Do not locate FSM further aft unless you are using an abnormally heavy engine!) Flow Medium CA glue into the joints between the edges of FSM and the fuselage sides. Be careful to not get any glue on the servos or servo wires.

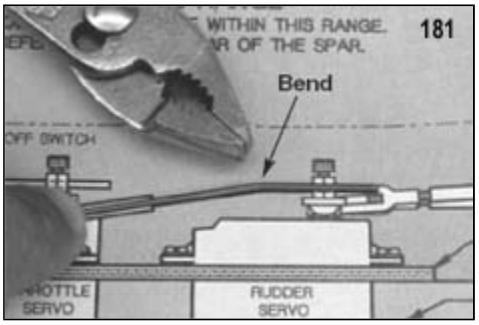
Nose Gear Control

180. Locate the plastic bag containing four complete Pushrod Connectors.
(NOTE: A Pushrod Connector consists of a brass connector body, a 4-40 set screw, and a nylon retainer - see drawing).
Open the bag and assemble one Pushrod Connector in the innermost hole on the left side of the Rudder servo control arm. Assemble another Pushrod Connector in the outermost hole of the nose gear Steering Arm (notice on the plan that this connector goes on upside down).



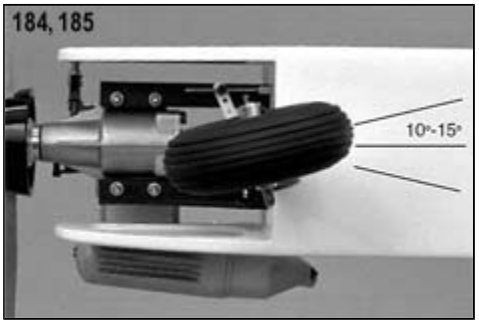
181. Locate one piece of Straight Music Wire 1/16" dia. x18" long to make the nose gear pushrod. Use the cutting jaws of a needle nose pliers to cut the piece to 14-1/2" long. Put a slight bend in one end of the wire, matching the angle on the plan at the rudder servo.

182. Locate one piece of Small Dia. Nylon Pushrod Tubing (1/8" O.D. x12" long). Use a sharp modeling knife to cut the piece to 11-1/4" long.



183. Slide the music wire inside the nylon pushrod tubing. Then insert the pushrod assembly into the fuselage from the rudder servo area, through the nose section of the model, under the tank floor, and out the hole in the bottom left corner of the firewall, to the steering arm. Insert the front end of the wire into the pushrod connector on the steering arm. Insert the angled end of the wire into the pushrod connector on the rudder servo. Point the nose wheel straight ahead, check that the rudder servo is in neutral position, and then tighten the set screws in both pushrod connectors.

184. Adjust the position of the nylon pushrod tubing on the music wire until only about 1/16" of tubing is sticking out past the front of the firewall. Use Slow CA to glue the nylon pushrod tubing permanently in the notch in the left side of former F2.

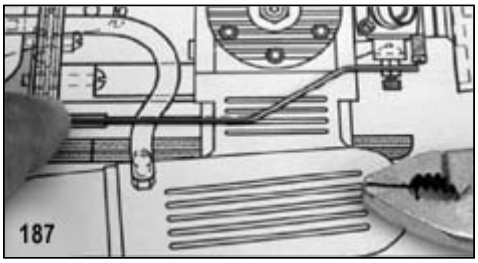


185. Temporarily plug the rudder servo into the receiver and test the operation of the nose gear pushrod. If you sense any binding in the nose gear movement, find the cause and fix it now. With full right movement of the transmitter's rudder control stick, the nose wheel should pivot right approximately the amount shown here. The same amount for left.

NOTE: The exact amount of maximum nose wheel travel is not as critical as the other flight control surfaces will be. A good rule of thumb, especially for new pilots, is that less travel is better than more! You do not need any more than 10o-15o of travel each way! Too much travel can cause over controlling on the takeoff and landing roll, often leading to model damage! If you put the pushrod connectors in the outermost hole of the steering arm and the innermost hole of the servo, as instructed above, you should end up with about the correct amount of travel.

Throttle Control

186. Assemble one Pushrod Connector in the middle hole of the throttle servo control arm. Assemble another Pushrod Connector in the bottom hole of the engine's carburetor control arm.



187. Locate one piece of Straight Music Wire 1/16" dia. x18" long to make the throttle pushrod. Use the cutting jaws of a needle nose pliers to cut the piece to 15" long. Make two bends in one end of the wire, matching the angles shown on the plan top view of the throttle pushrod.

(NOTE: This offset in the throttle pushrod wire may need to be changed slightly depending upon the exact location of your engine's carburetor control arm. Some arms may be a little closer to the fuselage side, while some may be closer to the engine's center-line. For most 2-stroke .40 R/C engines it will simply be a matter of increasing or decreasing the angle of the two bends to change the total distance of the offset in the wire. If you need to change the bends, change both bends the same amount, always keeping the two legs of the wire parallel to each other.)

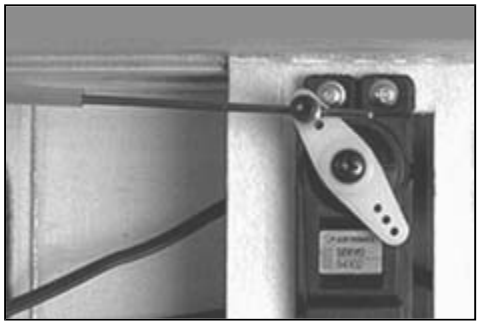
188. Locate one piece of Small Dia. Nylon Pushrod Tubing (1/8" O.D. x 12" long). Use a sharp modeling knife to cut the piece to 9-1/4" long.

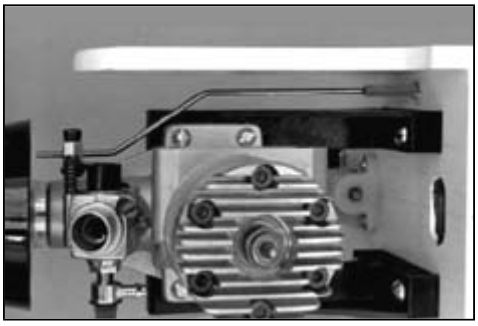
189. Slide the music wire inside the nylon pushrod tubing. Then insert the straight end of the pushrod assembly into the fuselage from the front, through the hole in F1, through the nose section of the model, through the hole in F2, and finally into the hole in the throttle servo pushrod connector. Insert the angled end of the wire into the pushrod connector on the carburetor control arm. Put the carburetor control arm in high throttle position, put the throttle servo in high throttle position, and then tighten the set screws in both pushrod connectors.

190. Adjust the position of the nylon pushrod tubing on the music wire until only about 1/2" of tubing is sticking out past the front of the firewall. Use Slow CA to glue the nylon pushrod tubing permanently in the holes in F1 and F2.

191. Temporarily plug the throttle servo into the receiver and test the operation of the throttle pushrod. If there is any binding in the throttle movement, find the cause and fix it now. Make adjustments to the throttle pushrod setup until you can achieve these results:

TX Stick	Trim Lever	Carburetor	Result
Forward	Forward	Fully Open	High Speed
Back	Forward	Slightly Open	Good Idle
Back	Back	Fully Closed	Kill Engine

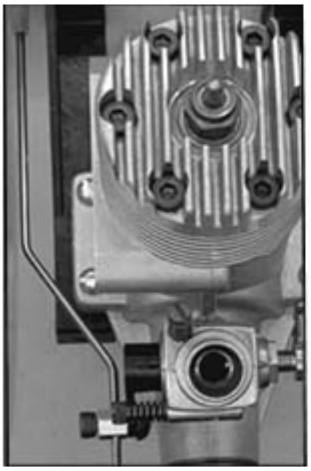




Stick Forward

Trim Forward

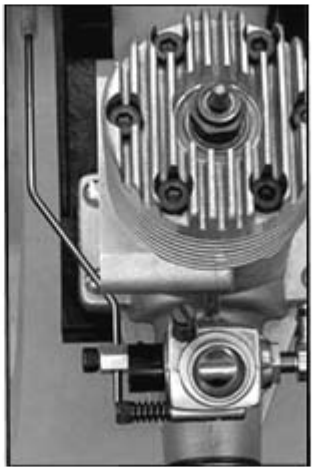
High Speed



Stick Back

Trim Forward

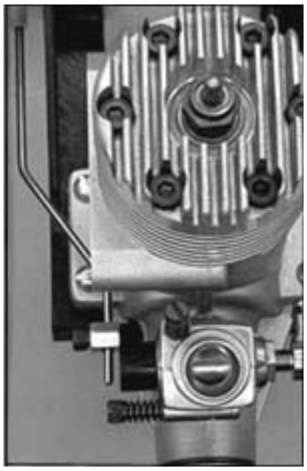
Good Idel



Stick Back

Trim Back

Kill Engine



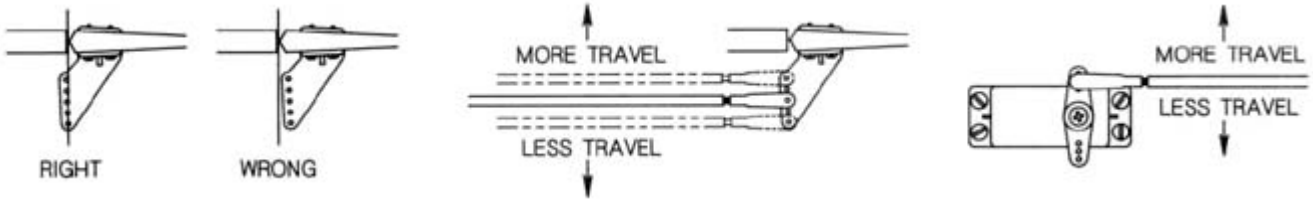
NOTE: Adjusting carburetor linkage can be a little tricky! If you have binding, check for an incorrect amount of offset (bend) in the pushrod wire at the carburetor. If necessary, re-bend the wire to eliminate the bind. If the throttle servo is binding or "stalling" because it has too much travel compared to the carburetor travel, you will need to move the pushrod connectors to different holes in the servo or carburetor arms. You may also have to loosen one of the pushrod connectors to re-adjust the overall pushrod length. All or some of these things may need to be adjusted to get the carburetor working properly. Refer to "THE BASICS OF RADIO CONTROL" book for additional help.

Control Horn Basics

1. Sometimes the holes in molded plastic control horns and servo arms end up being a little undersize, making it very hard to install the R/C Links and Pushrod Connectors that attach to them. All of the R/C Links and Pushrod Connectors in this kit have a pin size of 1/16" dia. If you have difficulty getting the pins to go into the holes in the control horns or servo arms, open up the holes with a 1/16" dia. drill bit. DO NOT USE A BIT LARGER THAN 1/16" DIAMETER!

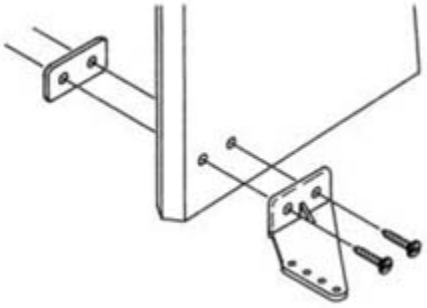
2. Nylon control horns should always be mounted so that the adjustment holes in the control arm line up with the hinge line of the control surfaces! If not, the control surface will have unequal travel in one direction.

3. Some radios have a feature called "End Point Adjustment" (sometimes called "Adjustable Travel Volume") that allows the user to electronically adjust the total travel of the servos, and thus, the total travel of the control surfaces. This is a very handy feature! If you do not have this radio feature, you can still make control surface travel adjustments by mechanical means. Move the linkages in the directions shown to get more or less travel.



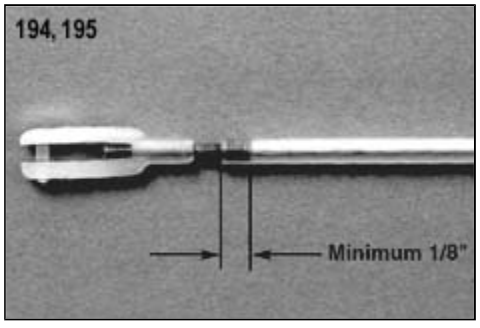
Rudder Control

192. Locate the Small Nylon Control Horn (4 holes) and two #2 x1/2" Sheet Metal Screws for the Rudder. Cut the Control Horn and the Retainer Plate apart. Hold the Control Horn in exact position (see plan) on the left side of the rudder and mark the location of the mounting holes. Drill pilot holes through the rudder with a 1/16" dia. drill bit (turn the bit with your fingers, a drill is not necessary). Mount the Control Horn onto the rudder with the Sheet Metal Screws and Retainer Plate. NOTE: Turn the screws down until both the control horn and retainer plate make firm contact with the balsa. Then, turn each screw in 1/2 turn further. By tightening the screws in this manner, the control horn will not crush the balsa.



193. Cut one of the 10" Threaded Steel Rods to 7" overall length. Cut the plain end of the rod, not the threaded end!

194. Locate one piece of Small Dia. Nylon Pushrod Tubing (1/8" O.D. x38" long). Slide the plain end of the 7" long threaded steel rod inside the tubing, all the way up to the beginning of the threads. Now get a good grip on the threaded portion of the steel rod, and on the nylon tube, and start screwing the threads into the tubing. Keep turning the rod until a MINIMUM of 1/8" of threads are inside the nylon tubing (3/16" is even better).



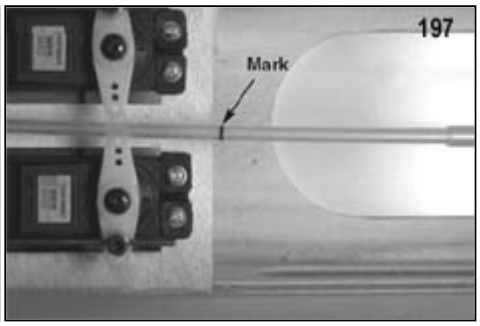
195. Screw one of the Nylon R/C Links onto the threads remaining outside the nylon pushrod tube. Screw it halfway onto the exposed threads - until there are the same amount of exposed threads in front and back of the R/C Link.

196. Slide the rudder pushrod (from the rudder end) inside the larger nylon pushrod tube that is already in the fuselage. Slide it in until the nylon R/C link is even with the rudder control horn. Pry open the R/C link, clip it into the outermost hole of the control horn, and then snap it shut. Now reach into the fuselage and try operating the rudder pushrod from the servo end. It should work smooth and easy. If not, figure out why and fix it.

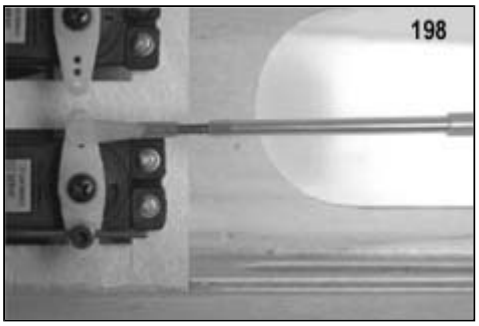
197. Set the rudder in neutral position. Mark the servo end of the smaller (inner) nylon pushrod tube exactly 1" from the hole in the rudder servo arm. Cut off the nylon tube at the mark.

198. (Recall steps 193, 194, 195.) Cut another 10" Threaded Steel Rod to 7" overall length. Slide the plain end of the rod inside the servo end of the inner nylon pushrod tube, and screw a minimum of 1/8" of threads into the tubing. Screw a nylon R/C link halfway onto the exposed threads of the steel rod. Clip the R/C link into the rudder servo arm.


196



197


198

199. Temporarily plug the rudder servo into the receiver and test the operation of the rudder. If you sense any binding in the rudder movement, find the cause and fix it now. With full right and left movement of the transmitter's rudder control stick, the rudder should move approximately 1" right and 1" left.

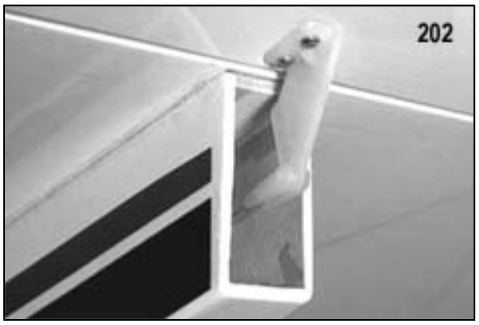
NOTE: If you are not getting the correct amount of rudder travel, try moving the nylon R/C link to a different hole in the servo arm. Also, fine tune the overall length of the rudder pushrod, by screwing one or both of the nylon R/C links further in or out, until the rudder is exactly neutral when the transmitter stick (and trim lever) is neutral.

Elevator Control

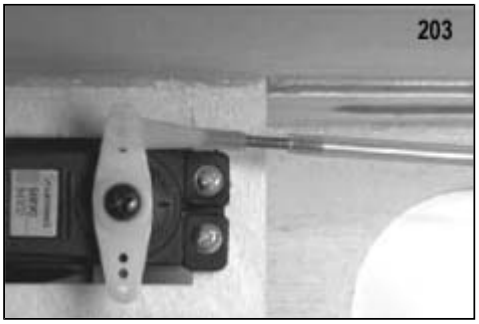
200. (Recall step 192.) Mount the Medium Nylon Control Horn (5 holes) on the bottom of the Elevator using two #2 x1/2" Sheet Metal Screws. NOTE: The control arm of the Elevator Horn should be exactly in the center of the tail opening so that the R/C link won't scrape on the sides of the fuselage.

201. (Recall steps 193, 194, 195.) Cut a 10" Threaded Steel Rod to 7" overall length. Slide the plain end of the steel rod inside a piece of Small Dia. Nylon Pushrod Tubing (1/8" O.D. x38" long), and screw a minimum of 1/8" of threads inside the tubing. Screw a Nylon R/C Link halfway onto the exposed threads of the steel rod.

202. Slide the elevator pushrod (from the elevator end) inside the larger nylon pushrod tube that is already in the fuselage. Slide it in until the nylon R/C link can be snapped into the bottom hole of the elevator control horn. Now reach into the fuselage and try operating the elevator pushrod from the servo end. It should work smooth and easy. If not, figure out why and fix it.


202

203. Set the elevator in neutral position. Cut off the servo end of the smaller (inner) nylon pushrod tube exactly 1" from the hole in the elevator servo arm. Cut another 10" Threaded Steel Rod to 7" overall length. Slide the plain end of the rod inside the servo end of the inner nylon pushrod tube, and screw a minimum of 1/8" of threads into the tubing. Screw a Nylon R/C Link halfway onto the exposed threads of the steel rod. Clip the R/C Link into the elevator servo arm.


203

204. Temporarily plug the elevator servo into the receiver and test the operation of the elevator. If you sense any binding in the elevator movement, find the cause and fix it now. With full up and down movement of the transmitter's elevator control stick, the elevator should move approximately 9/16" up and 9/16" down.

NOTE: If you are not getting the correct amount of elevator travel, try moving the nylon R/C link to a different hole in the servo arm. Also, fine tune the overall length of the elevator pushrod, by screwing one or both of the nylon R/C links further in or out, until the elevator is exactly neutral when the transmitter stick (and trim lever) is neutral.

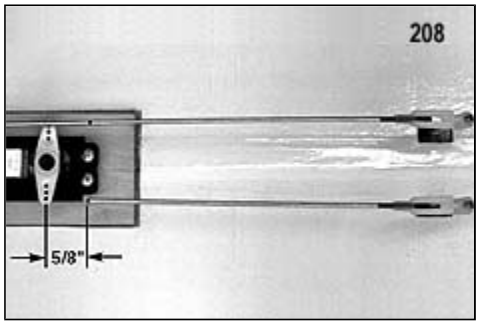
Aileron Control

205. (Recall step 178.) Mount your aileron servo in plywood part ASM (aileron servo mount), which is already installed on the bottom of the wing. REMEMBER: Do not over tighten the servo mounting screws to the point where they compress the rubber grommets too far.

206. Locate the Nylon Aileron Connectors and cut them apart. Thread one Nylon Aileron Connector onto the end of each Aileron Torque Rod. Screw the connectors on until they are about 1/8" past the tip of the torque rods (see Plan Sheet 1, Fuselage Side View).

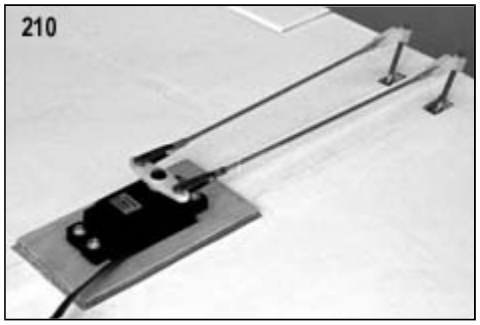
207. The aileron pushrods are made from two 10" Threaded Steel Rods. Screw a Nylon R/C Link halfway onto the threaded end of each rod. Then clip the R/C Links into the holes in the Nylon Aileron Connectors and line up the pushrods with the servo arms.

208. Tape the ailerons in neutral position (the bottom of the ailerons and the wing should be flush). Mark and cut the plain end of the pushrod wires 5/8" short of the holes in the aileron servo arm.



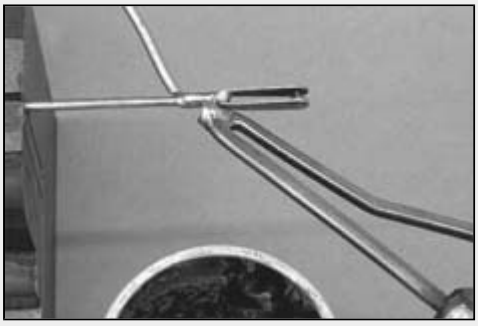
209. Solder an R/C Solder Link onto the end of each pushrod wire.
NOTE: It's best to take the pushrods off for soldering. You wouldn't want to drop a piece of hot solder and burn a hole through the wing. Also, make sure the pushrod wire sticks completely inside the barrel of the solder link.

210. When done soldering, untape the ailerons and install the aileron pushrods between the servo and the torque rods. It will probably be necessary to re-adjust the overall length of the aileron pushrods, by screwing the Nylon R/C Links further in or out, to get both ailerons into neutral position at the same time (make sure the aileron servo is neutral while doing this).



211. Temporarily plug the aileron servo into the receiver and test the operation of the ailerons. If you sense any binding in the aileron movement, find the cause and fix it now. With full right and left movement of the transmitter's aileron control stick, the ailerons should move approximately 3/8" up and 3/8" down.
NOTE: If you are not getting the correct amount of aileron travel, try moving the nylon R/C links to a different hole in the servo arm. You can also screw the Aileron Connectors up or down on the Torque Rods to increase or decrease the amount of travel.

Why Solder Links



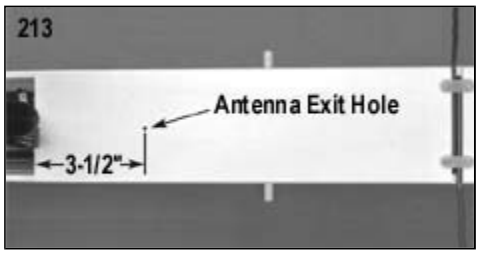
You may be wondering why we provided R/C Solder Links for the servo ends of the aileron pushrods, when all the rest of the control system installation is solderless! Why didn't we use more Pushrod Connectors, or maybe just a "Z" bend in the wire? Well first off, "Z" bends are a good alternative, but we felt that they are too difficult for a beginner to make correctly on his first try. Second, Pushrod Connectors are great, but not in all situations. They are more than adequate for non-aerodynamic controls like the throttle and nose gear. However the set screw in a Pushrod Connector can come loose! If that happens to the throttle or nose gear, it most likely won't cause any serious problem. But if it happens to the ailerons, elevator, or rudder, the airplane will most likely crash! That's why you don't see any Pushrod Connectors on the ailerons, elevator, or rudder pushrods of the KADET LT-40!
If you have never soldered before, don't worry, it's not difficult. The hardest part will probably be coming up with a soldering iron (or gun). If you don't want to purchase one at this time, seek the assistance of someone who already has one and knows how to use it. The secret to easy soldering is to use plenty of heat! You need a heavy-duty soldering iron to do this job, not one of the little "pencil" style irons that are only intended for soldering small electrical wires and components. It will take a soldering iron of at least 75 watts (100w or 200w is better) to solder the R/C Solder Links and pushrod wires in this kit. Use ROSIN CORE SOLDER (60% tin, 40% lead) and a good brand of SOLDERING PASTE FLUX. Put the wire in a vise. Coat the end of the wire with soldering paste flux. Slide on the R/C Solder Link. Press the tip of the soldering iron firmly to the outside of the barrel of the R/C Solder Link. Let it heat! Keep the iron against the barrel while you touch the tip of your solder to the joint (not to the soldering iron). When the two parts get hot enough, the solder will melt and flow into the joint. Continue flowing solder into the joint until it is full. Let cool. Wipe the solder joint clean with a rag.

Receiver Battery Pack

212. Wrap the battery pack with a single layer of 1/2" thick soft foam rubber to insulate it from engine vibration and shock. Use tape or rubber bands to hold the foam around the battery. Install the wrapped battery pack inside the nose of the model, under the fuel tank floor, in the position shown on the plan (fuselage side view). Try to keep the battery pack as far to the right side of the fuselage as possible to avoid interfering with the nose gear pushrod.

Receiver

IMPORTANT: Do not cut the antenna wire coming out of the receiver or attempt to fly your model with the antenna wire folded or coiled up! The antenna length is predetermined by the radio manufacturer for best signal reception. Shortening or lengthening the antenna wire can detune the receiver.



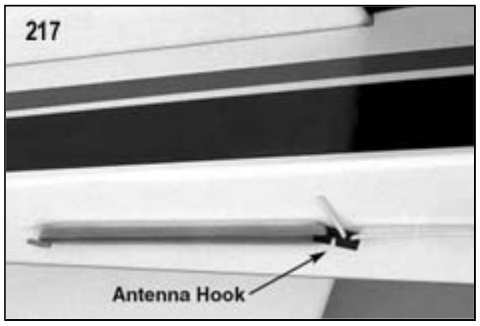
213. Drill a 1/16" dia. hole completely through the bottom of the fuselage, about 3-1/2" behind the firewall. This hole is for the receiver antenna wire to exit the fuselage. Make sure the hole will miss the battery pack before you start drilling! Put a single drop of Thin CA glue on the hole to keep the covering from coming loose.

Let dry completely! NOTE: These instructions describe running the antenna outside along the bottom of the fuselage. There are a lot of other ways to handle the routing of a receiver antenna. If you prefer a different method, by all means use it. The main thing to keep in mind is that you should always strive to keep the antenna as far away as possible from all the servo and battery wires.

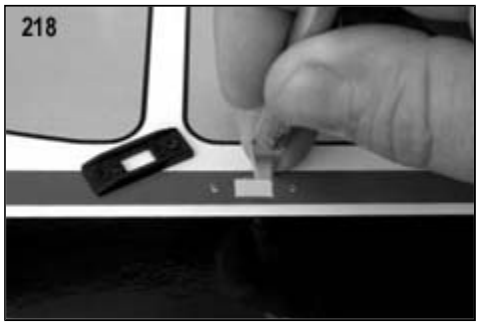
214. Wrap the receiver with a single layer of 1/2" thick soft foam rubber to insulate it from engine vibration and shock. Use tape or rubber bands to hold the foam around the receiver.

215. Following the radio manufacturer's instructions, plug all the wires for the servos, battery pack, and switch harness into the receiver so the radio system is fully operational. Double check to be sure that each servo is plugged into its correct receiver terminal and that it is responding properly.
NOTE: Since the receiver will be hard to get at, you should use a short "extension" wire (available from the radio manufacturer) for the ailerons. Plug the extension wire into the receiver's aileron terminal. Whenever you take the wing on/off the model, you can connect/disconnect the ailerons at the plug-in between the extension wire and the servo wire, leaving the extension wire itself permanently plugged into the receiver.

216. Install the wrapped receiver inside the nose of the model, right behind the battery pack. Before you get the receiver completely in place, poke the antenna wire down through the hole in the bottom of the fuselage (use an "antenna strain relief" fitting if one came with your radio). Make sure the antenna wire is not tangled up in the servo and battery wires! Continue pulling the antenna out the bottom of the fuselage as you slide the receiver forward against the battery pack. If the receiver seems loose in the nose of the model, pack additional pieces of foam rubber around it to make sure it cannot move around in flight.

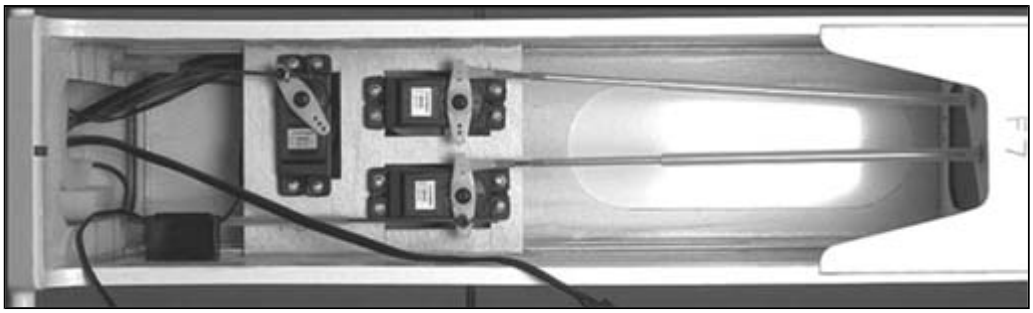


217. Anchor the loose end of the antenna on the outside of the model near the rear of the fuselage using a small rubber band and a T-Pin (an "antenna hook" is also handy if one came with your radio). Stick the T-Pin into the bottom of the fuselage at an angle, as shown. Put a drop or two of Slow CA glue on the pin to keep it in place. Tie the rubber band to the antenna (or the antenna hook) and then loop it over the T-Pin. The antenna should be just taught, not tight! The rubber band allows a certain amount of give in case the antenna is snagged by accident.



218. Cut an opening in the left side of the fuselage (the side away from the exhaust) to accommodate the radio's on/off switch. Use the switch cover plate as a guide to mark the location and size of the opening and the two holes for the mounting screws. Install switch.

CAUTION: Make sure the opening you cut for the switch's on/off lever is just slightly bigger than the lever, so that the switch will operate safely, without catching or binding on the wood.



Fuel Tank

219. Pull the stopper cap out of the front of the fuel tank. Inside the tank there should be two brass tubes, one brass clunk weight, and a short piece of fuel line tubing. Shake the tank to get these parts out through the hole. You may have to reach inside the tank with a tweezers or needle nose pliers to get a hold of the fuel line tubing and pull it out (CAUTION: Don't squeeze too hard and put a hole in the tubing). Now shake the tank a few more times to make sure there is no dirt or plastic shavings inside!

220. Take a close look at the stopper cap. Rotate the front plastic cap, the middle rubber stopper, and the rear plastic cap until the holes line up. You should be able to see daylight through two of the three holes. NOTE: We will only be using two of the holes. Leave the third hole closed.

221. Cut one of the brass tubes to 1-1/2" long - this will be the Fuel Feed Tube. Cut the other brass tube to 2" long - this will be the Vent Tube. A razor saw works well for cutting the brass tubing. Clean up the sawn end of the tubing with 220 grit sandpaper to remove any burrs or sharp edges that might cut the fuel line tubing later.

222. Carefully poke the brass tubes through the two open holes in the stopper cap. Keep pushing the tubes in until 3/8" of tube sticks out in front of the stopper cap. (PLAN AHEAD: The two brass tubes should end up horizontally opposed to each other at the bottom of the stopper cap. The short fuel feed tube should be on the left side, and the long vent tube on the right.)

223. Put the plain end of a 3/32" dia. drill bit about 1/4" inside the back end of the vent tube. Using the drill bit for leverage, slowly bend the back end of the vent tube upwards about 45º, or until the end of the tube is even with the top of the stopper cap.

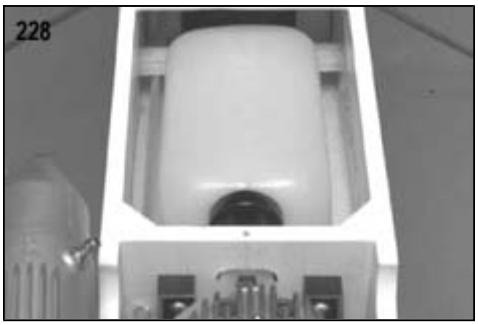
224. Cut the piece of fuel line tubing that came with the tank to 3-1/4" long. Slide one end of the tubing onto the brass clunk weight. Slide the other end of the tubing over the back end of the fuel feed tube.

225. Insert completed assembly into the neck of the fuel tank. Rotate the stopper cap so the brass tubes are horizontal at the bottom of the stopper. Hold the tank up to a strong light and look inside to see if the vent tube is close to the top of the tank. Also check to see if the brass clunk weight inside the tank swings freely from side-to-side, whether the tank is right side up or upside down. If the clunk weight is hitting the back wall of the tank, take the stopper cap back out, shorten the length of the fuel line tubing a little, and then test again. When everything is right, tighten the screw in the stopper cap until the cap is snug in the neck of the tank.

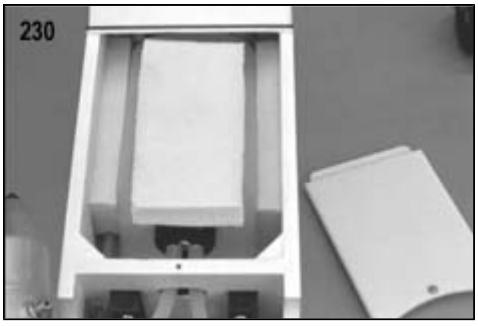
226. Test the fuel tank for leaks! Fill your kitchen sink with water. Slip the 12" long piece of Fuel Line Tubing that came in the kit onto the tank's vent tube. Submerge the tank in the water, holding your thumb firmly over the fuel feed tube. Blow air into the other end of the fuel line tubing and watch for air bubbles coming around the cap of the tank. If it's leaking, tighten the screw in the cap a little at a time until the leaking stops.

227. Cut the piece of 12" long Fuel Line Tubing into two 6" long pieces. Slip one piece onto the tank's fuel feed tube and the other onto the vent tube. Run the loose ends of the fuel line tubing through the hole in the firewall at the same time that you are placing the tank in the fuselage.

228. Slide the fuel tank up against the back of the firewall. Cut a piece of scrap wood 3-1/4" long (can be stick or sheet, balsa or plywood) to use as a rear tank brace. Reach in through the servo area and wedge the brace between the fuselage sides, right up tight against the back end of the tank. Spread some Slow CA glue on the ends of the brace to glue it to the fuselage sides. (HINT: Put some glue on the end of a long stick or nail, then reach in and dab the glue on the ends of the brace.) This brace will insure that the tank cannot shift backwards in flight.

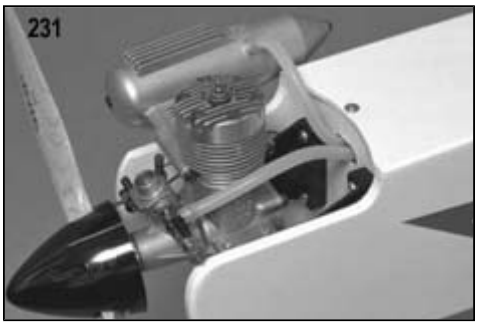


229. Cut two strips of 1/2" thick soft foam rubber (like you wrapped the receiver and battery pack with) to fit along the sides of the fuel tank, between the tank and the fuselage sides. This is to keep the tank from shifting sideways in flight.



230. Cut another strip of 1/2" thick soft foam rubber to lay on top of the tank, filling the space between the tank and the Hatch. Screw the Hatch in place.

231. Attach the fuel feed line to the engine's carburetor and the vent line to the pressure fitting on the muffler. (NOTE: Trim off any excess length of fuel line tubing. The fuel lines should be kept as short as possible for best fuel draw, but not so short that there is danger of them coming off in flight. Leave a little slack in the lines.)



Filling The Fuel Tank

To fill a fuel tank with this vent arrangement, first remove the fuel lines from the carburetor and the muffler pressure fitting. Pump the fuel into the tank through the fuel feed line (carb line). When the tank is full, fuel will begin to run out the vent line (muffler line). Stop pumping when you see the fuel start to come out the vent line! Reconnect the fuel lines and you are ready to start the engine.

BALANCE YOUR AIRPLANE

We know that your KADET LT-40 looks done and you're real anxious to go out and fly it, BUT WAIT A MINUTE - IT'S NOT REALLY DONE YET! It must be balanced! All airplanes, model or full-size, must be accurately balanced in order to fly successfully. An airplane that is not properly balanced will be unstable and will most likely crash!

PRELIMINARY: To balance your KADET LT-40, all of the parts and components must be installed in their correct positions on the model. The battery pack and receiver must be installed in their correct locations; the propeller, spinner, and muffler must be installed on the engine; the fuel tank and fuel lines must be installed and connected; and every other piece of essential equipment must be installed, ready for flight. ALWAYS BALANCE THE KADET LT-40 WITH THE FUEL TANK EMPTY!

232. Attach the wing to the fuselage with twelve #67 rubber bands, six per side.

233. Familiarize yourself with the balance range shown on fuselage side view plan. Three possible balance points are represented in this range, and your KADET-40 will behave differently in flight at each of these three balance points. You should choose the balance point that fits your experience level.

	Inches	% Of Wing Chord
Distance Aft Of Wing L.E.	3-1/2"	27%
	3-7/8"	30%
	4-1/4"	33%

3-1/2", 27% THE BEST BALANCE POINT FOR BEGINNERS!
At this balance point the KADET LT-40 will have its best trainer qualities! It will be super stable in flight and will have strong "hands off, self correcting" tendencies. If this is your first R/C airplane, we strongly recommend that you use this balance point!

3-7/8", 30%
A good middle of the road balance point for modelers who already know how to fly R/C, or for beginners who have progressed far enough that they no longer get disoriented and loose control. The KADET LT-40 will still be perfectly stable, but it won't return to level flight quite as quickly as it would at the forward balance point.

4-1/4", 33% THIS BALANCE POINT IS DEFINITELY NOT RECOMMENDED FOR BEGINNERS!
The most rearward balance point is only recommended for experienced fliers who want the most aerobatic performance they can get out of a high-wing trainer. This balance point, in conjunction with increased control surface throws, will enable the KADET LT-40 to do advanced aerobatics like spins and snap rolls. With this balance point, the KADET LT-40 takes a long time to self correct.

234. Using a ruler, measure back from the leading edge of the wing to the balance point you want to use (3-1/2" for beginners). Make a pencil mark at this point on the bottom of the wing, next to the fuselage. Make the same mark on the other side of the fuselage.

235. Place a fingertip on each pencil mark and lift the airplane up in the air. No part of the model should be touching anything except your fingertips! If the KADET LT-40 will sit on your fingertips in a level or very slightly nose down attitude, then it is properly balanced and ready to fly.

236. If the airplane sits on your fingertips in an extreme nose down attitude, then it is nose heavy. You will have to add weight to the rear of the airplane to get it to balance. NOTE: Before adding additional weight to the model, try simply moving the battery pack to a further aft location. The battery pack is relatively heavy and therefore makes a good balancing tool. You might try switching places between the battery and receiver; or move the battery right in front of the servos; or in extreme situations, move it behind the servos. If you can't get your model balanced simply by re-locating the battery pack, then you will have to purchase lead weights from your hobby dealer and glue them into the tail end of the fuselage.

237. If the airplane sits on your fingertips with the tail down, it is tail heavy. DO NOT ATTEMPT TO FLY IT! A tail heavy model is very dangerous and will most likely crash!! Lead weight will have to be added to the nose of the model to bring it into balance. The weights can be glued to the inside of the fuselage "cheeks" in front of the firewall; or inside the fuselage alongside the fuel tank. There are also "spinner weights" available for tail heavy models. Wherever you put the balancing weight, make sure it cannot loose in flight!

If you ever change any major components in your KADET LT-40, such as the engine, muffler, battery pack, etc., be sure to re-balance the model!

WHY MODELS MUST BE INDIVIDUALLY BALANCED

It is impossible to produce a model airplane kit that will automatically have the correct balance point. Not everyone uses the same engine, or muffler, or radio, or covering material - and all those items can vary in weight! You might be surprised to know that .40 size 2-stroke R/C model engines can vary in weight from 11 oz. to 18 oz. - that's almost a half pound difference, way out on the nose of your model! There can even be as much as a 3/4 oz. difference in weight between different brands of 10-6 props! So, that's why every model must be balanced before flying. Don't feel that whatever the balance point your model came out at is "good enough". Check carefully and make whatever adjustments are required. Trying to fly an out of balance model is dangerous!

PRE-FLIGHT CHECKOUT

Be certain to range check your radio equipment according to the manufacturer's instructions before attempting to fly.

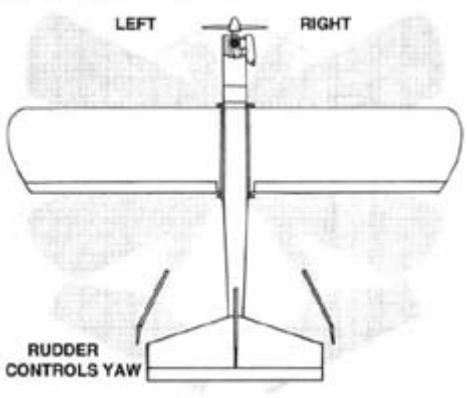
Run your engine for the first time on the ground. A lot of problems can be avoided if your new engine has been "broken in" by running at least two tanks of fuel through it on a test stand before you attempt to fly.

Double check the alignment and movement of all the controls one more time! Make sure the control surfaces move in the proper direction when you move the sticks. You'd be amazed to know how many models have been destroyed on takeoff with one of the controls reversed. If you're in this hobby for very long, you will see it happen. Don't let it happen to you! It's a good idea to get into the habit of checking for proper control response every time you get ready to fly.

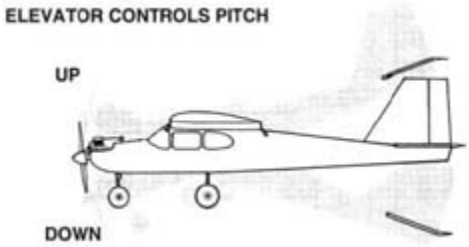
Adjust all of your pushrod linkages so that the control surfaces are in their neutral position when the transmitter sticks and trim levers are centered. When you get to the flying field, don't be surprised is the elevator and rudder are suddenly misaligned after you had them perfect at home. Temperature and humidity changes can cause nylon pushrods, like those on the KADET LT-40's elevator and rudder, to shrink or expand slightly. If they are just slightly out of neutral, use the trim levers on the transmitter to neutralize them again right before flying.

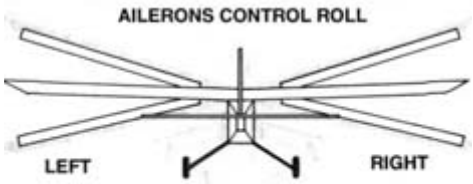
Adjust your pushrod linkages as necessary to provide the prescribed amount of control surface travel. Make sure all of the R/C Links are securely snapped shut.

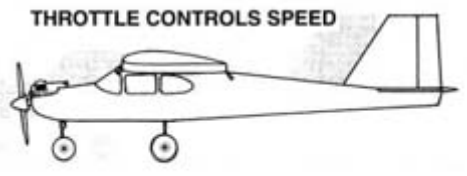
ELEVATOR	9/16" UP, 9/16" DOWN		**RECOMMENDED CONTROL SURFACE TRAVEL**	
RUDDER	1" LEFT, 1" RIGHT			
AILERONS	3/8" UP, 3/8" DOWN			
THROTTLE	**Tx Stick**	**Trim Lever**	**Carb**	**Result**
	Forward	Forward	Fully Open	High Speed
	Back	Forward	Slightly Open	Good Idle
	Back	Back	Fully Closed	Kill Engine



Make sure none of the pushrods are binding or the servos stalling.







Make sure all of the screws and bolts on your model are tight. Double check to see that all of the servos are secure and all of the servo control arms are screwed on firmly.

ALWAYS USE AT LEAST TWELVE #67 RUBBER BANDS TO HOLD THE WING ON THE KADET LT-40!

Charge your radio batteries before every flying session!

Be sure to read "THE BASICS OF RADIO CONTROL". It contains many more valuable tips and ideas to help make your first R/C flight a success.

Find A Safe Place To Fly

Don't try to fly your KADET LT-40 in your backyard, at the local school yard, or in any other heavily populated area! If you have never seen an R/C airplane fly before, you probably don't realize how much room you really need. It's more than most people think! A school yard may look inviting, but it is too close to people, houses, power lines, and possible radio interference.

The best place to fly your model is at a designated model airplane club flying field. Ask your hobby shop dealer if there is a model club in your area and join. Not only will you have access to a large, safe place to fly, but you will enjoy being around all types of R/C model airplanes and talking to their builders.

Learning To Fly RC

The KADET LT-40 is designed to give you the best possible chance to succeed in learning to fly R/C. However, learning to fly model airplanes is not a skill you can learn overnight. It's very similar to learning to fly a real airplane in that you should go through a learning phase with an instructor before you try to pilot the airplane yourself. A lot of things can go wrong with these machines, and if you are not prepared to deal with them instantly, you will loose your brand new airplane in a crash. To practically eliminate any chance that your first flight will end in disaster, we strongly recommend that you seek the assistance of a competent R/C pilot to help you with your first flights.

An instructor serves two purposes. First, he will take your model up for its first test flight to make sure it is performing properly before you try to fly it. When a brand new R/C model takes off for the first time, there is no way of knowing which way it is going to go. Some models will try to climb steeply, while others may want to go down.

Some will try to turn left, other right. Some models will be doing both at the same time! It doesn't mean that there is anything wrong with the model, but these minor differences must be "trimmed out" in order for the model to fly "hands-off" straight and level. An experienced pilot can instantly correct for out of trim conditions before the model crashes into the ground. An inexperienced beginner has almost no chance of saving an out of trim model!

The second reason for an instructor is to be there to correct any mistakes you make when you take over the controls for the first time. Let the instructor get the model airborne and flying straight and level at a safe attitude ("several mistakes high" as the old saying goes) before he turns the transmitter over to you. You will quickly find out that it is very easy to over control an R/C model and to get disoriented - EVERYONE DOES IT AT FIRST! If you get out of control on your first flight, quickly hand the transmitter back to your instructor so he can rescue the airplane. He will get it leveled off and then let you try it again. Without an instructor, you would not get a second chance!

In addition to not over controlling, another problems beginners need to overcome is the left/right control reversal that happens when a model is flying towards you one minute, away from you the next. For example, if you were seated in the cockpit of a full-scale airplane and moved the control stick to the right, the airplane would always turn to your right. Moving the control stick to the left, the airplane would always turn to your left. Well that's not always true with an R/C airplane! If the model is flying away from you, the controls are normal - right stick makes the airplane go right, left stick makes the airplane go left. But when the model is flying towards you, the controls are reversed - now when you move the stick to the right, the model turns to its right, but that means it turns to your left! This control reversal is very confusing to all first time R/C pilots! More than a few licensed full-scale pilots have found out that flying R/C airplanes is a lot different than flying full-scale airplanes because of this phenomenon.

It's not that learning to fly R/C is difficult, it's just a lot different than anything you have ever done before. Anyone can learn to fly the KADET LT-40 if they are willing to listen and learn! Remember the first time you tried to ride a bicycle? It seemed completely awkward the first time, but once you learned how, it quickly became very easy. Learning to fly R/C model airplanes also comes quickly to many people.

Fly your KADET LT-40 as often as possible. After you get a few flights under your belt with an instructor at your side, you will begin to feel more comfortable at the controls. Soon you will be flying "solo" with little thought of the moves required. It will just come naturally! Don't get discouraged if you have a minor crack-up. Repair the damage and get back into the air as soon as possible.

GOOD LUCK AND SAFE FLYING!

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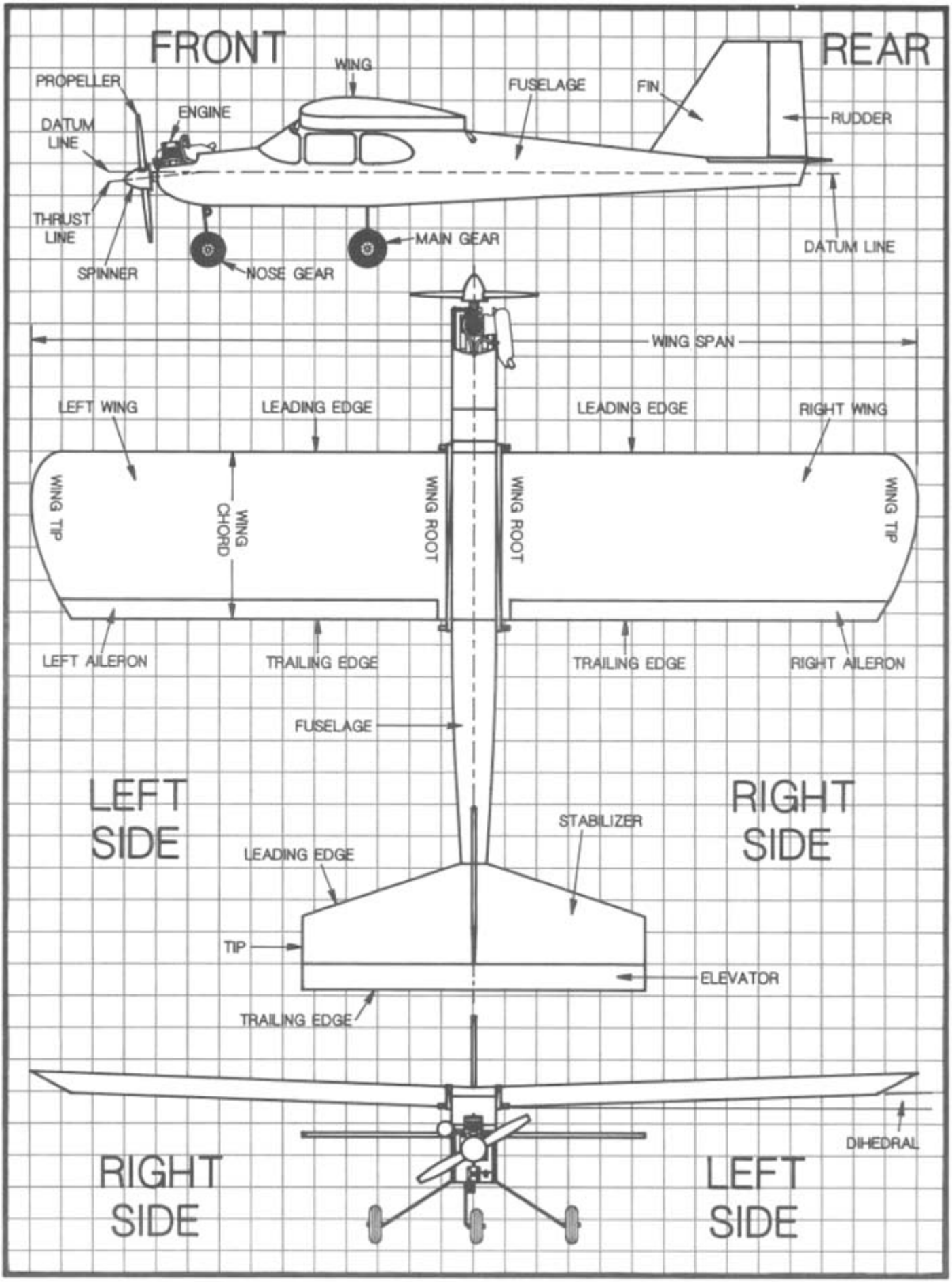
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STABILIZER
LEADING EDGE
TIP
ELEVATOR
TRAILING EDGE
DIHEDRAL
RIGHT SIDE
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