MODEL TECH
ARF

Magic Extra
300L 46 ARF

INSTRUCTIONS FOR FINAL ASSEMBLY

The Modeltech Magic Extra 300L ARF is distributed exclusively by Global Hobby Distributors 18480 Bandilier Circle, Fountain Valley, CA 92708

GLOBAL
SERVICES

Kit Product Number 123739

Specifications:

- **Wing Span:** 49.5 Inches
- **Wing Area:** 700 Square Inches
- **Wing Loading:** 15-17 Ounces Per Square Foot
- **Length:** 49.5 Inches
- **Weight RTF:** 4.5 - 5.1 Pounds / 72 - 82 Ounces
- **Functions:** Ailerons, Elevator, Rudder and Throttle
- **Power:** .46 2-Stroke (recommended) or .61 4-Stroke
- **Radio:** 4 Channel w/4 Standard Servos

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SAFETY WARNING

This R/C airplane is not a toy! If misused or abused, it can cause serious bodily injury and/or damage to property. Fly only in open areas and preferably at a dedicated R/C flying site. We suggest having a qualified instructor carefully inspect your airplane before its first flight. Please carefully read and follow all instructions included with this airplane, your radio control system and any other components purchased separately.

FOR YOUR INFORMATION

To make your modeling experience totally enjoyable, we recommend that you get experienced, knowledgeable help with assembly and during your first flights. Your local hobby shop has information about flying clubs in your area whose membership includes qualified instructors. If there is no hobby shop in your area, we recommend that you contact the AMA at the address below. They will be able to help you locate a flying field near you.

<div align="center">
Academy of Model Aeronautics
5151 East Memorial Drive
Muncie IN 47302-9252
(800) 435-9262
www.modelaircraft.org
</div>

INTRODUCTION

Thank you for purchasing the new Modeltech Magic Extra 300L ARF. Before completing the final assembly of your new airplane, please carefully read through this instruction manual in its entirety. Doing so will ensure your success the first time around!

Modeltech Magic Extra 300L Features:

- Completely Prebuilt from High-Quality Balsa and Light Plywood
- Covered with Real Heat-Shrink Covering Material
- Lightweight Airframe and Over-sized Control Surfaces for Exciting 3D Aerobatics
- Durable Aluminum Main Landing Gear
- Clear Molded Canopy and Blow-Molded Wheel Pants
- Includes All Hardware - Spinner, Wheels, Fuel Tank, Engine Mount, Etc.
- Fast & Easy Assembly - Over 50 High-Resolution Digital Photos Guide You

This instruction manual is designed to guide you through the entire final assembly process of your new airplane in the least amount of time possible. Along the way you'll learn how to properly assemble your new airplane and also learn tips that will help you in the future. We have listed some of our recommendations below. Please read through them before beginning assembly.

- Please read through each step before beginning assembly. You should find the layout very complete and straightforward. Our goal is to guide you through assembly without any of the headaches and hassles that you might expect.

- There are check boxes next to each step. After you complete a step, check off the box. This will help prevent you from losing your place.

- Cover your work table with brown paper or a soft cloth, both to protect the table and to protect the parts.

- Keep a couple of small bowls or jars handy to put the small parts in after you open the accessory bags.

- We're all excited to get a new airplane in the air, but take your time. This will ensure you build a straight, strong and great flying airplane.

- If you come across this symbol ☞, it means that this is an important point or an assembly hint.

Visit Our Website
http://globalservices.globalhobby.com

If you should find a part missing or damaged, or have any questions about assembly, please contact us at the address below:

Global Services
18480 Bandilier Circle
Fountain Valley CA 92708

Phone: (714) 963-0329   Fax: (714) 964-6236   E-mail: service@globalhobby.net

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SECTION 1: OUR RECOMMENDATIONS

This section describes our recommendations to help you in deciding which types of accessories to purchase for your new Modeltech Magic Extra 300L ARF. These suggestions are not set in stone, but they should provide you with a good starting point.

What Engine Should I Use?

The Magic Extra will accept a wide variety of engines, so which engine you choose really depends on how you want to fly the airplane. For general sport flying, a .40 to .53 2-stroke engine with a 10 x 6 propeller (for .40) or an 11 x 6 propeller (for .46) would be perfect. If you wanted to use a 4-stroke engine, a .61 4-stroke with a 13 x 5 propeller would be a good choice, too.

For 3D style aerobatics, you want to focus more on using lightweight, but powerful, engines with large diameter, low pitch propellers. There are many engines that fit this criteria, so it really depends on how much money you want to spend. For good 3D performance and a low price, a good sport .46 size engine with an APC 12.25 x 3.75 propeller would be perfect.

What Radio System & Servos Should I Use?

For typical sport-flying and general aerobatics, a standard 4 channel radio system will be more than adequate. Since the ailerons use separate aileron servos, you will need to use a servo Y-harness to join them. The Magic Extra is not a big, heavy airplane, so it's not necessary to use high-torque servos. Five standard size servos will work fine.

For 3D aerobatics, a four or more channel computer radio with mixing capabilities will be required. Since there are two separate aileron servos used, they can be plugged separately into the receiver, allowing you the capability of flaperon or spoileron mixing and differential. For 3D aerobatics, we still recommend standard size servos, but we strongly suggest using ball bearing servos on the control surfaces.

What Else Do I Need?

The Magic Extra includes all the hardware you'll need to finish the airplane. You will need some basic building materials, such as adhesives, protective foam rubber for your radio gear, and fuel tubing. We've provided a list below of the items we used on the airplane shown in this instruction manual.

Here's a List of What We Used to Finish Our Magic Extra 300L:

QTY. 1	210756	Magnum XLS .46 2-Stroke Engine
QTY. 1	608684	APC 12.25 x 3.75 Composite Propeller
QTY. 1	115493	Thunderbolt R/C Long Glow Plug
QTY. 1	115923	Global XX Silicon Fuel Tubing
QTY. 1	868638	Dubro 1/4" Protective Foam Rubber
QTY. 4	444110	Cirrus CS-71 BB Standard Servos
QTY. 1	444107	Cirrus CS-71 Standard Servo
QTY. 1	444728	Cirrus Servo Y-Harness (optional)

IMPORTANT

The part numbers listed for the Cirrus servos and the Cirrus Y-Harness are compatible with Hitec and JR radio control systems. These items are also available with connectors that are compatible with Futaba and Airtronics radio control systems.

SECTION 2: TOOLS AND SUPPLIES REQUIRED

The tools and supplies listed below will be necessary to finish the final assembly of your Magic Extra 300L. We suggest having these items on-hand before beginning assembly.

- ❏ Kwik Bond Thin C/A # 887500
- ❏ Kwik Bond Thick C/A # 887510
- ❏ Kwik Bond 30 Minute Epoxy # 887565
- ❏ Kwik Bond C/A Debonder # 887545
- ❏ Pacer Formula 560 Canopy Glue # 339176
- ❏ Pacer Z-42 Threadlocker # 339162
- ❏ # 1 Phillips Head Screwdriver
- ❏ # 2 Phillips Head Screwdriver
- ❏ Adjustable Wrench
- ❏ Wire Cutters
- ❏ Needle Nose Pliers
- ❏ Excel Modeling Knife # 692801
- ❏ Promax Canopy Scissors # 361120

- ❏ Electric Drill
- ❏ Assorted Drill Bits
- ❏ Dubro T-Pins # 567685
- ❏ Ernst Airplane Stand # 223977
- ❏ Ruler
- ❏ Pencil
- ❏ Builder's Triangle
- ❏ 220 Grit Sandpaper w/Sanding Block
- ❏ Masking Tape
- ❏ Paper Towels
- ❏ Rubbing Alcohol
- ❏ NHP Epoxy Mixing Sticks # 864204
- ❏ NHP Epoxy Mixing Cups # 864205

SECTION 3: KIT CONTENTS

We have organized the parts as they come out of the box for easier identification during assembly. Before you begin assembly, group the parts as we list them below. This will ensure that you have all of the parts before you begin assembly and it will also help you become familiar with each part. If you find any parts missing or damaged, please contact us below:

AIRFRAME ASSEMBLIES

- ❏ (1) Fuselage w/Hatch Covers & Belly Pan
- ❏ (1) Right Wing Panel w/Aileron
- ❏ (1) Left Wing Panel w/Aileron
- ❏ (1) Horizontal Stabilizer w/Elevator Halves
- ❏ (1) Vertical Stabilizer w/Rudder

TAIL WHEEL ASSEMBLY

- ❏ (1) Preassembled Tail Wheel Bracket
- ❏ (1) Tail Wheel
- ❏ (1) Wheel Collar w/3mm x 5mm Set Screw
- ❏ (3) 3mm x 12mm Wood Screws

AILERON CONTROL SYSTEM

- ❏ (2) 3" Threaded Wires w/90º Bend
- ❏ (2) Nylon Control Horns w/Backplates
- ❏ (4) 2mm x 12mm Machine Screws
- ❏ (2) Nylon Clevises
- ❏ (2) Nylon 90º Snap Keepers
- ❏ (8) C/A Style Hinges

THROTTLE CONTROL SYSTEM

- ❏ (1) 26-1/4" Pushrod Wire w/Z-Bend
- ❏ (1) Adjustable Servo Connector Assembly

LANDING GEAR ASSEMBLY

- ❏ (1) Prebent Aluminum Main Gear Strut
- ❏ (2) Blow-Molded Wheel Pants
- ❏ (2) Main Gear Wheels
- ❏ (2) 4mm x 16mm Machine Screws
- ❏ (2) 4mm x 35mm Smooth-Shank Machine Screws
- ❏ (8) 4mm Flat Washers
- ❏ (2) 4mm Nylon Spacers
- ❏ (6) 4mm Lock Nuts
- ❏ (2) 2mm x 10mm Wood Screws

ELEVATOR CONTROL SYSTEM

- ❏ (1) 14-1/2" Threaded Wire w/90º Bend
- ❏ (1) 13-1/2" Threaded Wire
- ❏ (2) Nylon Control Horns w/Backplates
- ❏ (4) 2mm x 12mm Machine Screws
- ❏ (2) Nylon Clevises
- ❏ (1) Nylon 90º Snap Keeper
- ❏ (2) Wheel Collars w/3mm x 8mm Set Screws
- ❏ (6) C/A Style Hinges

FUEL TANK ASSEMBLY

- ❏ (1) 240cc Fuel Tank
- ❏ (1) Large Diameter Metal Plate
- ❏ (1) Small Diameter Metal Plate
- ❏ (1) Rubber Stopper
- ❏ (1) Fuel Pick-Up "Clunk"
- ❏ (1) 3mm x 25mm Machine Screw
- ❏ (1) Silicon Fuel Tubing
- ❏ (2) Aluminum Tubing

RUDDER CONTROL SYSTEM

- ❏ (2) 16-5/8" Threaded Wires w/90º Bend
- ❏ (2) Nylon Control Horns
- ❏ (4) 2mm x 15mm Machine Screws
- ❏ (4) 2mm Hex Nuts
- ❏ (2) Nylon Clevises
- ❏ (2) Nylon 90º Snap Keepers
- ❏ (3) C/A Style Hinges

ENGINE MOUNT ASSEMBLY

- ❏ (2) Engine Mounting Beams
- ❏ (4) 3mm x 16mm Machine Screws
- ❏ (4) 3mm Blind Nuts
- ❏ (4) 3mm x 25mm Machine Screws
- ❏ (8) 3mm Flat Washers
- ❏ (4) 3mm Lock Nuts

MISCELLANEOUS WING PARTS

- ❏ (1) Hardwood Wing Joiner
- ❏ (1) Plywood Wing-Screw Doubler
- ❏ (2) 4mm x 35mm Machine Screws
- ❏ (2) 4mm Flat Washers
- ❏ (2) 4mm Blind Nuts

MISCELLANEOUS FUSELAGE PARTS

- ❏ (1) Clear Molded Canopy
- ❏ (1) Spinner Assembly w/Wood Screws
- ❏ (2) 2mm x 10mm Wood Screws
- ❏ (1) 2mm x 12mm Wood Screw
- ❏ (1) Length of Clear Tubing
- ❏ (1) Decal Sheet

SECTION 4: METRIC CONVERSION CHART

To convert inches into millimeters: Inches x 25.4 = mm

To convert millimeters into inches: Millimeters / 25.4 = in

1/64"	=	.4mm	3/16"	=	4.8mm	1"	=	25.4mm	21"	=	533.4mm
1/32"	=	.8mm	1/4"	=	6.4mm	2"	=	50.8mm	24"	=	609.6mm
1/16"	=	1.6mm	3/8"	=	9.5mm	3"	=	76.2mm	30"	=	762.0mm
3/32"	=	2.4mm	1/2"	=	12.7mm	6"	=	152.4mm	36"	=	914.4mm
1/8"	=	3.2mm	5/8"	=	15.9mm	12"	=	304.8mm			
5/32"	=	4.0mm	3/4"	=	19.0mm	18"	=	457.2mm			

Visit our website at http://modeltech.globalhobby.com or for Customer Service at http://globalservices.globalhobby.com

SECTION 5: REPLACEMENT PARTS

Global stocks a complete line of replacement parts for your Modeltech Magic Extra 300L ARF. Listed below are the replacement parts that are available along with their respective part numbers for easy ordering convenience. We suggest ordering directly from your local dealer. If your dealer does not stock Modeltech products, you can order directly from us at the address shown below:

Global Services
18480 Bandilier Circle
Fountain Valley CA 92708

Phone: (714) 963-0329   Fax: (714) 964-6236

On the Web
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Modeltech Magic Extra 300L - Complete	-	123739	Fuel Tank Assembly	-	170807
Instruction Manual	-	170800	Aluminum Landing Gear Bracket	-	170808
Wing Set	-	170801	Decal Sheet	-	170809
Fuselage Set	-	170802	Tail Wheel Assembly	-	170810
Stabilizer Set	-	170803	Spinner Assembly	-	170811
Clear Molded Canopy	-	170804	Engine Mount Assembly	-	170812
Blow-Molded Wheel Pants	-	170805	Belly Pan	-	170813
Hardware Set	-	170806			

SECTION 6: A NOTE ABOUT COVERING

The covering material used on the Magic Extra 300L ARF is real iron-on heat-shrink covering material, not cheap "shelf paper." Because of this, it is possible with heat and humidity changes that the covering on your airplane may wrinkle or sag. This trait is inherent in all types of heat-shrink material. To remove any wrinkles that might be visible you will need to purchase, or borrow from a fellow modeler, a heat iron. If you need to purchase one, the **Global Heat Sealing Iron # 360900** is recommended.

Follow this simple procedure to remove the wrinkles:

❑   Plug in and turn on the sealing iron to the medium-high temperature setting. Allow the iron to heat up for approximately 5 - 7 minutes.

❑   After the iron has reached temperature, lightly apply the iron to the wrinkled section of the covering. Move the iron slowly over the wrinkled section until the covering tightens and the wrinkles disappear. You will notice that the color of the covering will darken when it is heated. When the covering cools back down, it will return to its normal color.

☞   If the color layer smears from any of the seams the temperature of the iron is too hot. Turn the temperature dial down and wait about 5 minutes for the iron to adjust to the lower temperature. You can remove any excess color streaks using a paper towel soaked with a small quantity of Acetone.

WARNING

We do not suggest storing your airplane in an extremely hot environment (like the back of your car in direct sunlight) for any length of time. The extreme heat could cause the covering material to wrinkle or sag and possibly damage the clear canopy, and the fragile components of the radio system.

SECTION 7: WING ASSEMBLY

**YOU'LL NEED THE FOLLOWING PARTS FROM THE KIT:**

❏   (1) Right Wing Panel w/Aileron
❏   (1) Left Wing Panel w/Aileron
❏   (1) Hardwood Wing Joiner

YOU'LL NEED THE FOLLOWING TOOLS AND SUPPLIES:

❏   Kwik Bond 30 Minute Epoxy
❏   Excel Modeling Knife
❏   Ruler
❏   Pencil
❏   220 Grit Sandpaper w/Sanding Block

❏   Masking Tape
❏   Paper Towels
❏   Rubbing Alcohol
❏   NHP Epoxy Mixing Sticks
❏   NHP Epoxy Mixing Cups

Step 1: Installing the Wing Joiner

❏   Remove the aileron and hinges from each of the two wing panels and set them aside for now.
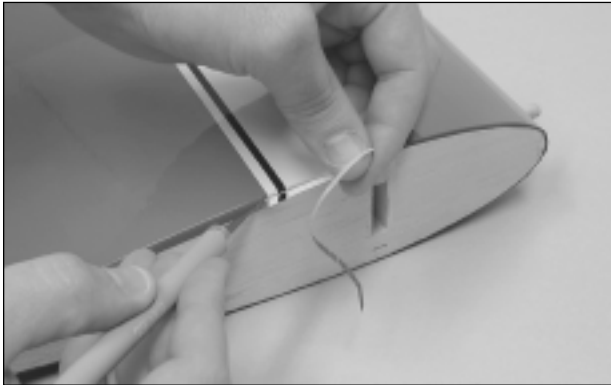
❏   Using a modeling knife, cut away and remove the excess covering material that overlaps onto the root ribs of each wing panel, leaving about 1/16" overlapped so it does not pull away.

IMPORTANT

It's very important to the integrity of the wing center section joint that you remove as much covering material from the root ribs as possible.


❏   Use a ruler and a pencil to locate and draw a vertical centerline on each side of the hardwood wing joiner.
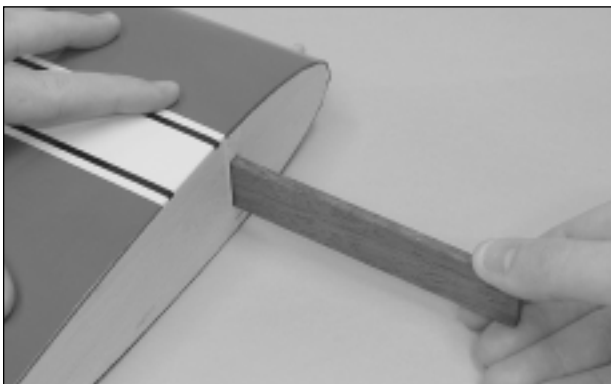
❏   Test-fit the wing joiner into each wing panel. It should slide easily into each panel up to the centerline you drew.

☞ If it does not fit properly, use 220 grit sandpaper with a sanding block to lightly sand the edges and tips of the joiner, until you are satisfied with the fit.
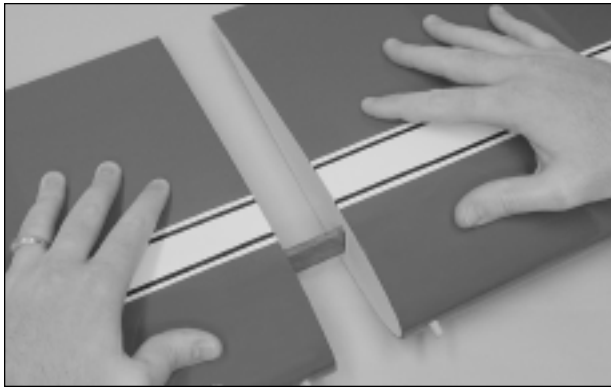
❏   Slide both wing panels together with the wing joiner temporarily installed (without using glue).

❏   Look carefully at the center section joint: the wing panels should fit together tightly with few or no gaps in the joint.

☞ If the wing panels do not fit together properly, remove the wing joiner and use 220 grit sandpaper with a sanding block to lightly sand the edges and tips of the joiner, until you are satisfied with the fit.

❏   When satisfied with the fit, pull the wing panels apart and remove the wing joiner.

Step 2: Joining the Wing Panels
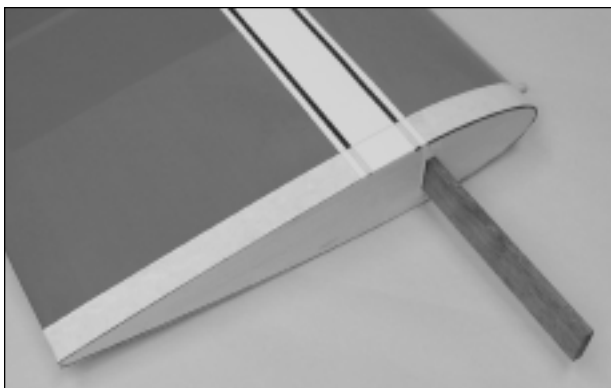
❏   Apply a long strip of masking tape to the top and bottom edges of the root rib on each wing panel.

☞ The masking tape will prevent excess epoxy from getting onto the wing panels when you join them.

❏   Mix a generous amount of 30 minute epoxy. Working with only one wing panel for now, apply a thin layer of epoxy inside the wing joiner box and to only half of the wing joiner. Make sure to cover the top and bottom, as well as the sides, and use enough epoxy to fill any gaps.

❏   Slide the wing joiner into the wing panel up to its centerline. Quickly remove any excess epoxy using a paper towel and rubbing alcohol, and allow the epoxy to set up before proceeding.

❏   After the epoxy has set up, test-fit both wing panels together again to double-check that they still fit together properly. Check the leading and trailing edges, too. It's important that they be even with each other.

❏   Mix a generous amount of 30 minute epoxy and apply a thin layer to the exposed half of the wing joiner, the inside of the wing joiner box in the second wing panel, and the **entire surface of BOTH root ribs**. Make sure to use enough epoxy to fill any gaps.

❏   Slide the two wing panels together and realign them. Quickly wipe away any excess epoxy using a paper towel and rubbing alcohol, and use pieces of masking tape to hold the two wing panels aligned until the epoxy fully cures.

Step 3: Checking the Center Section Joint

❏   Once the epoxy has fully cured, remove the masking tape and double-check the center section joint. If any gaps are present, mix a small amount of 30 minute epoxy and carefully fill any remaining gaps. Quickly remove any excess epoxy using a paper towel and rubbing alcohol, and allow the epoxy to thoroughly cure.

SECTION 8: WING MOUNTING

YOU'LL NEED THE FOLLOWING PARTS FROM THE KIT:

❏ (1) Fuselage w/Hatch Covers & Belly Pan

❏ (1) Plywood Wing-Screw Doubler

❏ (2) 4mm x 35mm Machine Screws

❏ (2) 4mm Flat Washers

❏ (2) 4mm Blind Nuts

YOU'LL NEED THE FOLLOWING TOOLS AND SUPPLIES:

❏ Kwik Bond Thick C/A

❏ # 2 Phillips Head Screwdriver

❏ Excel Modeling Knife

❏ Electric Drill

❏ 11/64" & 15/64" Drill Bits

❏ Ernst Airplane Stand

❏ Ruler

❏ Pencil

❏ Masking Tape

Step 1: Aligning the Wing
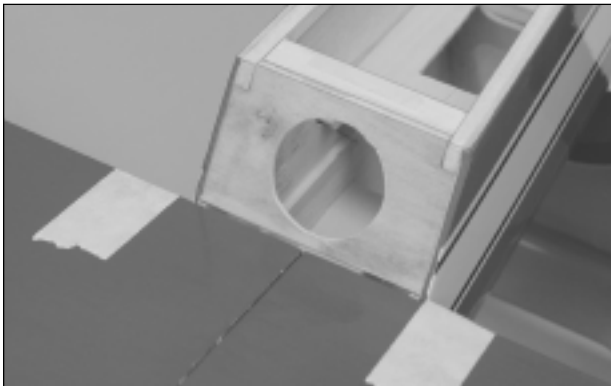
❏   Remove the belly pan and the rear hatch cover from the bottom of the fuselage and set them aside.

❏   With the fuselage upside down, place the wing into the wing saddle and push the trailing edge down firmly into place.

❏   Carefully align the centerline of the wing (the center joint) with the centerline of the fuselage, at the back of the wing saddle.

❏   Use a couple of pieces of masking tape to temporarily hold the wing aligned.

When the wing is aligned properly, A should equal A-1.
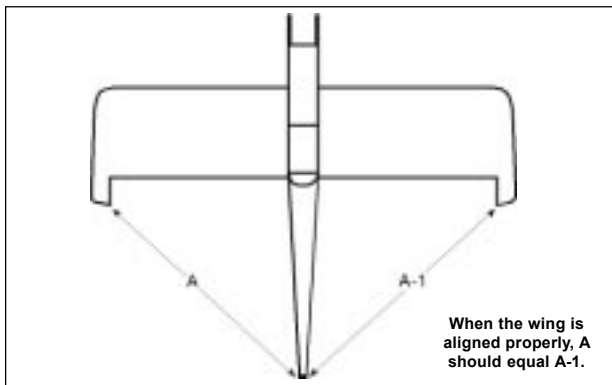
❏   With the wing held in place and aligned, use a ruler to measure from each wing tip to the back edge of each side of the fuselage. Move the trailing edge of the wing in the wing saddle until both measurements are equal.

❏   When satisfied with the alignment, hold the wing firmly in place using pieces of masking tape.
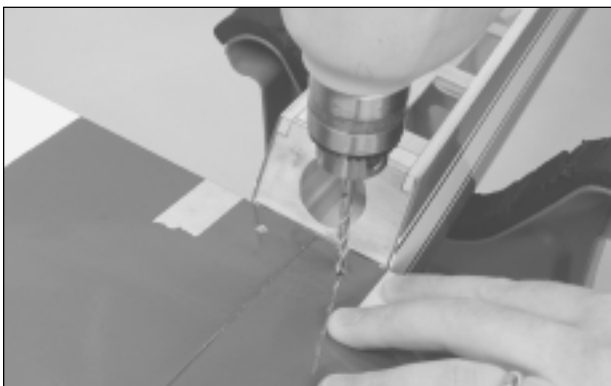
❏   Using an 11/64" diameter drill bit, drill two holes into the wing and through the plywood wing hold-down block inside the fuselage. Locate one hole in each wing panel, 3/4" out from the centerline and 1/2" in front of the trailing edge.

IMPORTANT

Drill the two holes parallel to the bottom surface of the wing.

Step 2: Installing the Blind Nuts

❑   Remove the wing from the fuselage and enlarge **only** the two holes in the plywood wing hold-down block using a 15/64" diameter drill bit.

☞ Enlarging the holes will make it much easier to install the blind nuts.

❑   Install the two blind nuts into the bottom of the plywood block, using one of the wing mounting screws and washers to draw the blind nuts firmly up into place.

❑   After installing the blind nuts, carefully apply a bead of thick C/A around the flange of each blind nut to prevent them from popping loose.

Step 3: Mounting the Wing

❑   Using a ruler and a pencil, draw a vertical centerline on one side of the plywood wing-screw doubler.
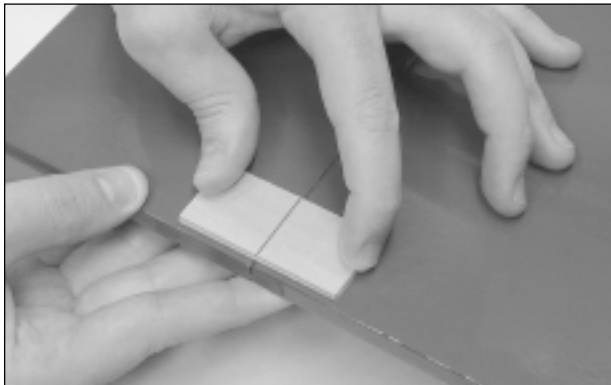
❑   Using thick C/A, glue the wing-screw doubler to the **bottom** of the wing, making sure that the centerline you drew lines up with the centerline of the wing, and that the back of the doubler is about 1/8" in front of the trailing edge of the wing.

☞ The wing-screw doubler must be centered on the wing so that the belly pan will line up when it's installed later.

IMPORTANT

Remove the covering from the wing where the wing-screw doubler will be glued into place.

❑   Using an 11/64" diameter drill bit, drill open the holes in the wing through the wing-screw doubler. Use the existing holes in the wing as a guide.
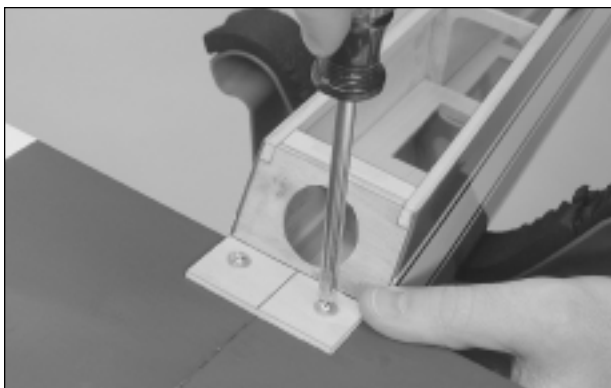
❑   Set the wing back into the wing saddle and realign it.

❑   Secure the wing into place using two 4mm x 35mm machine screws and two 4mm flat washers.

☞ Don't overtighten the screws. You don't want to crush the wing.

SECTION 9: BELLY PAN INSTALLATION

**YOU'LL NEED THE FOLLOWING PARTS FROM THE KIT:**

❑ (1) Belly Pan

YOU'LL NEED THE FOLLOWING TOOLS AND SUPPLIES:

❑ Kwik Bond 30 Minute Epoxy   ❑ Paper Towels
❑ Excel Modeling Knife   ❑ Rubbing Alcohol
❑ Ernst Airplane Stand   ❑ NHP Epoxy Mixing Sticks
❑ Pencil   ❑ NHP Epoxy Mixing Cups
❑ Masking Tape

Step 1: Aligning the Belly Pan

❑   Using a modeling knife, cut away and remove the covering material from over the precut wing-screw access holes in the bottom of the belly pan.
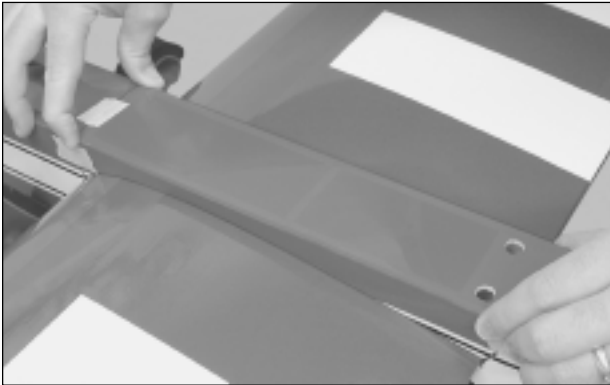
❑   Mount the wing to the fuselage.

❑   Set the belly pan into place and push it down firmly. Align both the front and back of the belly pan with the sides and bottom of the fuselage and use several pieces of masking tape to hold the belly pan firmly in place.

❑   With the belly pan held firmly in place, use a pencil to outline the sides of the belly pan onto the wing.

Step 2: Installing the Belly Pan
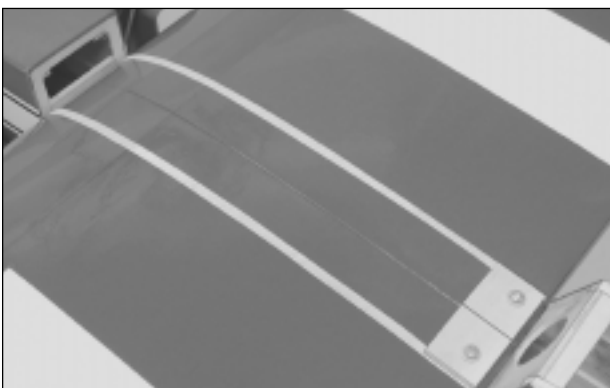
❑   Remove the belly pan. Using a modeling knife, carefully cut away and remove a strip of covering from just inside each outline you drew. Also, cut away and remove the covering from the bottom edges of the belly pan.

❑   Mix a small quantity of 30 minute epoxy and apply a thin layer to only the gluing surfaces of the belly pan.

❑   Set the belly pan back into place and realign it. Use pieces of masking tape to hold it securely in place and remove any excess epoxy using a paper towel and rubbing alcohol.

❑   After the epoxy has fully cured, remove the masking tape, but leave the wing in place for now.
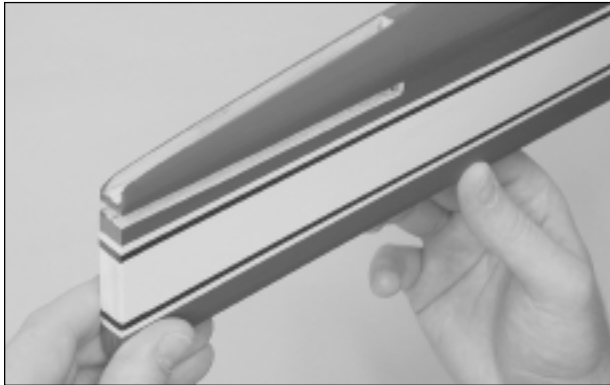
SECTION 10: STABILIZER INSTALLATION

Step 1: Aligning the Horizontal Stabilizer

❏ Using a modeling knife, cut away and remove the covering material from over the stabilizer mounting slots in the back of the fuselage.

❏ Remove the two elevator halves and the hinges from the horizontal stabilizer and set them aside for now.
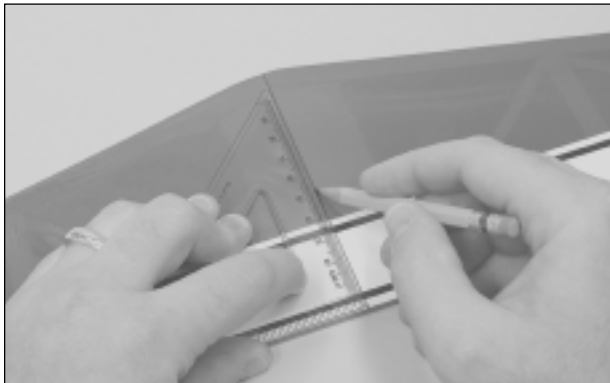
❏ Using a ruler and a pencil, measure and draw a centerline mark on the trailing edge of the stabilizer.

❏ Using a builder's triangle, extend this centerline mark vertically across the **top** of the stabilizer.
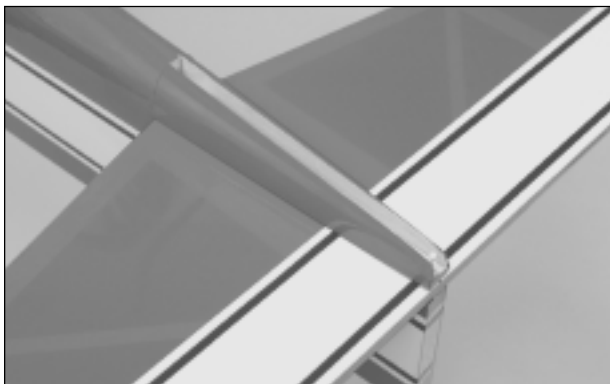
❏ Slide the stabilizer into the mounting slot and temporarily align it. The stabilizer should be pushed forward completely and the centerline mark you drew on the trailing edge should be centered with the back edge of the fuselage.

❏ When satisfied with the alignment, hold **only** the trailing edge of the stabilizer in position using a T-Pin.

☞ The front of the stabilizer should be able to pivot from side to side and the back should stay firmly in place and aligned.

When the stabilizer is aligned properly, B should equal B-1.
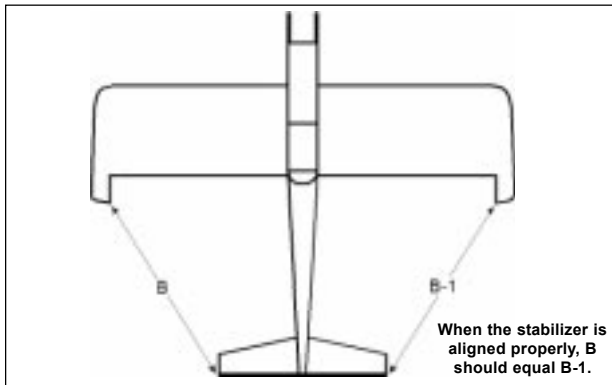
❏ With the wing mounted to the fuselage, use a ruler to measure the distance between the tips of the stabilizer and the tips of the wing. Pivot the front of the stabilizer until both of these measurements are equal.

❏ When you are satisfied that the stabilizer is square to the wing, use a pencil to draw a couple of marks on each side of the front of the stabilizer where it and the fuselage sides meet, then use a couple of pieces of masking tape to hold the stabilizer firmly in place and aligned.


When the stabilizer is aligned properly, C should equal C-1.
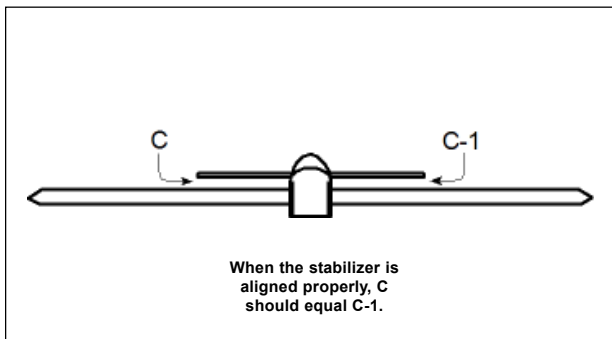
❏ With the stabilizer held firmly in place, look from the front of the airplane at both the wing and the stabilizer. When aligned properly, the stabilizer should be parallel to the wing.

☞ If the stabilizer is out of alignment, remove it and use 220 grit sandpaper with a sanding block to sand down the higher side of the stabilizer mounting slot, then reinstall the stabilizer and check the alignment once more. Repeat this procedure until you are satisfied with the alignment.

Step 2: Installing the Horizontal Stabilizer

❏ With the stabilizer properly aligned, use a pencil to draw a line on each side of the stabilizer where it meets the fuselage sides. Do this on both the top and bottom.
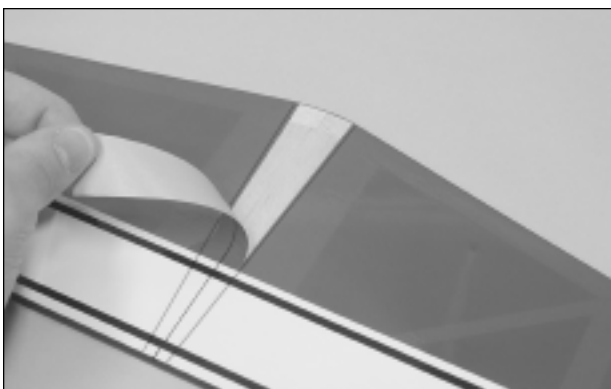
❏ Remove the stabilizer. Using a modeling knife, carefully cut away and remove the covering material from between the lines you drew. Do this on both the top and the bottom.

WARNING

When cutting through the covering to remove it, cut with only enough pressure to cut through only the covering itself. Cutting down into the balsa structure could weaken the stabilizer and cause it to fail during flight.

❏ Mix and apply a generous amount of 30 minute epoxy to the top and bottom gluing surfaces of the stabilizer and to the top and bottom gluing surfaces of the stabilizer mounting slot in the fuselage.

❏ Push the stabilizer back into place and realign it, double-checking all of your measurements once more before the epoxy sets up. Quickly remove the excess epoxy and use pieces of masking tape to hold the stabilizer in place until the epoxy has fully cured.

❑   After the epoxy has fully cured, remove the masking tape and look closely at the glue joint. If there are any gaps between the stabilizer and the fuselage, fill them using 30 minute epoxy for added strength. Again, before the epoxy sets up, remove any excess using a paper towel and rubbing alcohol.

Step 3: Aligning the Vertical Stabilizer

❑   Remove the rudder and hinges from the vertical stabilizer and set them aside for now.

90°

When aligned properly, the vertical stabilizer should be 90º to the horizontal stabilizer
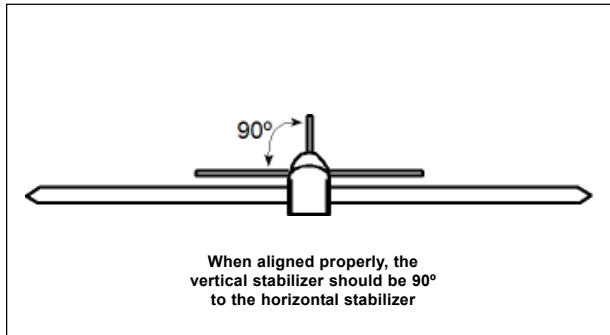
❑   Push the vertical stabilizer down into place. To align it properly, the stabilizer should be even with the back edge of the fuselage and it should be pushed down firmly.

❑   Using a builder's triangle, check to make sure that the vertical stabilizer is aligned 90º to the horizontal stabilizer.

Step 4: Installing the Vertical Stabilizer

❑   While holding the stabilizer firmly in place, use a pencil to draw a line on each side of the stabilizer where it meets the top of the fuselage.

❑   Remove the stabilizer. Using a modeling knife, carefully cut away and remove the covering material from below the lines you drew. Carefully remove any covering material from the base of the stabilizer, too.
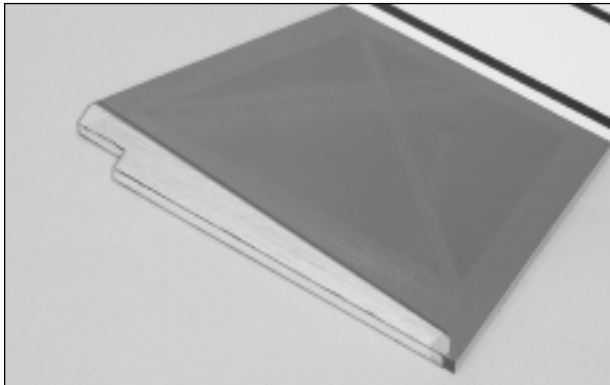
WARNING

When cutting through the covering to remove it, cut with only enough pressure to cut through only the covering itself. Cutting down into the balsa structure could weaken the stabilizer and cause it to fail during flight.

❑   Apply a generous amount of 30 minute epoxy to the gluing surfaces of both the stabilizer and the stabilizer mounting slot in the top of the fuselage.

❑   Push the stabilizer down into place and realign it, double-checking all of your measurements once more before the epoxy sets up. Quickly remove the excess epoxy and use pieces of masking tape to hold the stabilizer in place until the epoxy has fully cured.

SECTION 11: CONTROL SURFACE HINGING

YOU'LL NEED THE FOLLOWING PARTS FROM THE KIT:

❏ (1) Preassembled Tail Wheel Bracket
❏ (3) 3mm x 12mm Wood Screws
❏ (1) Tail Wheel
❏ (17) C/A Style Hinges
❏ (1) Wheel Collar w/3mm x 5mm Set Screw

YOU'LL NEED THE FOLLOWING TOOLS AND SUPPLIES:

❏ Kwik Bond Thin C/A
❏ Ruler
❏ Kwik Bond 30 Minute Epoxy
❏ Pencil
❏ Kwik Bond C/A Debonder
❏ 220 Grit Sandpaper w/Sanding Block
❏ # 1 Phillips Head Screwdriver
❏ Paper Towels
❏ Excel Modeling Knife
❏ Rubbing Alcohol
❏ Electric Drill
❏ NHP Epoxy Mixing Sticks
❏ 5/64" Drill Bit
❏ NHP Epoxy Mixing Cups
❏ Ernst Airplane Stand

Step 1: Hinging the Ailerons

For flutter-free control surfaces it is imperative that the hinges be glued in properly. This includes both having a tight hinge gap and using plenty of thin C/A glue.

☞ Each aileron is hinged using four hinges.
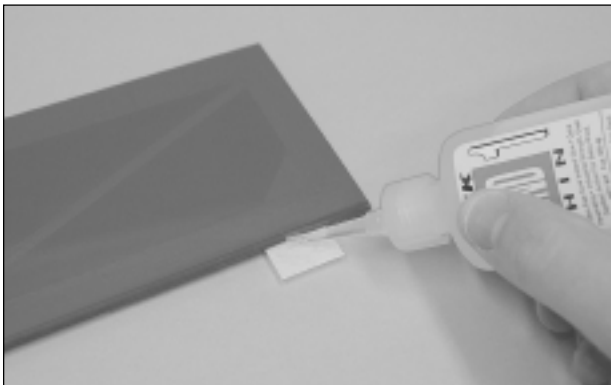
❏ Center each hinge within its precut slot in both ailerons. If you can't push the hinge in halfway, carefully cut the slot deeper using a modeling knife.

❏ Carefully glue each hinge into place using 5-6 drops of thin C/A on each side of the hinge. **Do not use thick C/A or epoxy. Use only thin C/A for proper adhesion.**

☞ If any C/A gets onto the aileron, it can be removed promptly using a paper towel soaked with a small quantity of C/A Debonder.

❏ Working with one aileron and wing panel for now, slide the aileron and its hinges into the precut hinge slots in the trailing edge of the wing panel, making sure that the leading edge of the aileron is pushed firmly up against the trailing edge of the wing panel and that the outer end of the aileron does not rub against the wing tip.

❏ While holding the aileron tight against the wing panel, pivot the aileron down about 45º and apply 5-6 drops of thin C/A to the exposed area of each hinge. Turn the wing panel over and repeat for the other side of the hinges.

☞ Remove any C/A that may run down the hinge line using C/A Debonder.

❏ Allow the C/A to dry for about 15 minutes, then pivot the aileron up and down to free up the hinges.

❑   Repeat the previous procedures to hinge the second aileron to the other wing panel.

IMPORTANT

After the C/A has fully cured, gently grasp each aileron and pull on it like you are trying to pull out the hinges. The hinges should hold securely. If one or more hinges feels loose, apply more C/A to the hinge(s) and allow it to completely cure.

Step 2: Hinging the Elevator Halves

❑   Hinge the two elevator halves using the same techniques as hinging the ailerons. Each elevator half is hinged using three hinges and the outer ends of the elevator halves should be even with the tips of the elevator. Remember, after allowing the C/A to fully cure, pull on each elevator half to check the integrity of the hinges.

Step 3: Installing the Tail Wheel Bracket
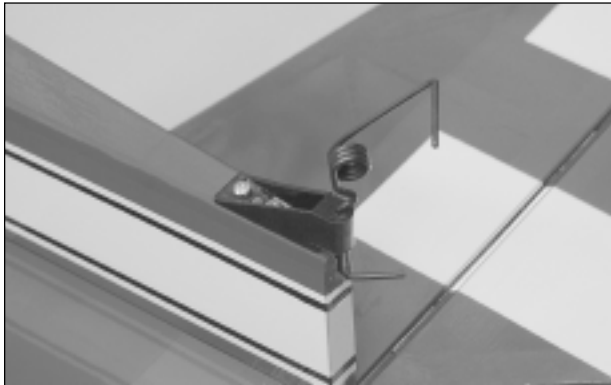
❑   Set the tail wheel bracket into place and align it. The tail wheel wire should be up against the back edge of the fuselage and the bracket should be centered between the fuselage sides.
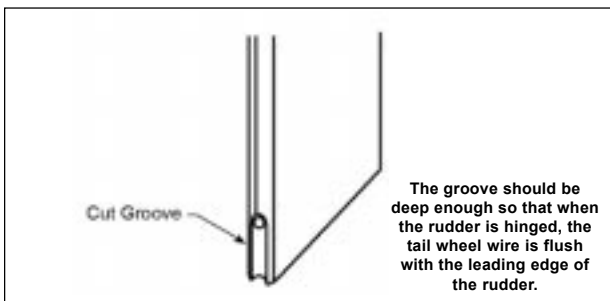
❑   When satisfied with the alignment, drill three 5/64" diameter pilot holes through the fuselage and secure the bracket into place using three 3mm x 12mm wood screws.

Step 4: Hinging the Rudder

❑   Using a drill with a 5/64" drill bit, carefully drill a shallow hole into the leading edge of the rudder, 3/8" up from the bottom of the rudder.

☞ Drill the hole perpendicular to the leading edge.

Cut Groove →

The groove should be deep enough so that when the rudder is hinged, the tail wheel wire is flush with the leading edge of the rudder.

❑   Using a modeling knife, carefully cut a shallow groove in the leading edge from the base of the hole down to the bottom of the rudder.

❏ Using 220 grit sandpaper, lightly sand the end of the tiller arm wire to roughen the metal.

❏ Mix a small quantity of 30 minute epoxy. Apply a thin layer to the end of the tiller arm and pack more into the hole and the groove in the leading edge of the rudder.

❏ Hinge the rudder using the same technique as the ailerons and elevator halves, making sure that the tiller arm fits firmly into the hole and groove in the leading edge of the rudder. After making sure the top of the rudder is even with the top of the vertical stabilizer, remove any excess epoxy using a paper towel and rubbing alcohol.

❏ After the epoxy fully cures, install the tail wheel using the wheel collar and 3mm x 5mm set screw provided.

SECTION 12: MAIN LANDING GEAR INSTALLATION

YOU'LL NEED THE FOLLOWING PARTS FROM THE KIT:

❏ (1) Prebent Aluminum Main Gear Strut
❏ (2) Blow-Molded Wheel Pants
❏ (2) Main Gear Wheels
❏ (2) 4mm x 16mm Machine Screws
❏ (2) 4mm x 35mm Smooth-Shank Machine Screws

❏ (8) 4mm Flat Washers
❏ (2) 4mm Nylon Spacers
❏ (6) 4mm Lock Nuts
❏ (2) 2mm x 10mm Wood Screws

YOU'LL NEED THE FOLLOWING TOOLS AND SUPPLIES:

❏ Kwik Bond Thin C/A
❏ # 1 Phillips Head Screwdriver
❏ Adjustable Wrench
❏ Needle Nose Pliers
❏ Excel Modeling Knife
❏ Electric Drill

❏ 5/32" Drill Bit
❏ Ernst Airplane Stand
❏ Ruler
❏ Pencil
❏ 220 Grit Sandpaper w/Sanding Block

Step 1: Installing the Main Gear Strut

❏ Align and mark the two holes to mount the main gear strut to the bottom of the fuselage. The strut should be centered over the sides of the fuselage and the back edge of the strut should be 5/16" in front of the wing saddle opening.

☞ The straight edge of the strut should be toward the back of the fuselage.

❏ Drill two 5/32" diameter holes through the fuselage at the marks you drew.

❏ Install the main gear strut using the two 4mm x 16mm machine screws, four 4mm flat washers and two 4mm lock nuts.

☞ To make it easier to install and tighten the lock nuts, remove the hatch cover from the top of the fuselage.

Step 2: Installing the Wheels and Wheel Pants

❑   Using a modeling knife, very carefully cut the wheel opening in each of the two wheel pants, as shown.

❑   Use 220 grit sandpaper with a sanding block to sand the edges of the openings smooth.
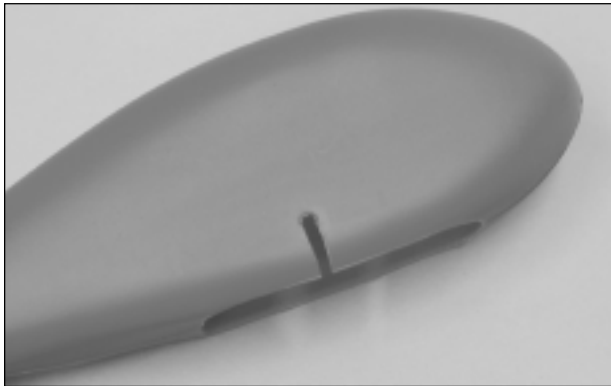
❑   Using a 5/32" diameter drill bit, drill out the molded dimple on the inside edge of the wheel pant.

❑   Using a modeling knife, cut a slot from the base of the hole, down to the opening in the wheel pant.

❑   Slide one main gear wheel (flat side first) onto one 4mm x 35mm smooth-shank machine screw.

❑   Slide one 4mm nylon spacer up against the wheel and install one 4mm lock nut onto the machine screw. Thread the nut into place so that it is as tight as possible, but still allows the wheel to spin freely.

❑   When satisfied with the fit, apply a couple of drops of thin C/A to the lock nut, to secure it into place permanently.

☞ Be careful not to get C/A on the axle portion of the screw.

❑   Slide one 4mm flat washer up against the lock nut and slide the axle assembly into the slot in the wheel pant, making sure that the washer is on the **inside** of the wheel pant.

❑   Slide the axle assembly through the predrilled hole in the main gear strut and secure in place using one 4mm flat washer and one 4mm lock nut. Tighten the lock nut completely while holding the inner lock nut in place with a pair of needle nose pliers.

❑   Double-check that the inner lock nut has not moved and that the wheel does not bind when rotated.

❑   Repeat the previous procedures to install the second wheel and wheel pant assembly.

Step 3: Adjusting the Wheel Pants

❏   With both wheels and wheel pants installed, set the airplane on its wheels on a level surface.   Adjust the wheel pants so that the bottom rear portion of the wheel pants are level with the ground.   Double-check that both wheel pants are level with each other.

❏   When satisfied with the alignment, carefully secure the wheel pants into place by installing one 2mm x 10mm wood screw through the predrilled hole in the landing gear strut and into the side of the wheel pant.

☞ To make it easier to install screws, first make a small pilot hole in the wheel pant using the tip of your modeling knife.

SECTION 13: ENGINE INSTALLATION

YOU'LL NEED THE FOLLOWING PARTS FROM THE KIT:

❏ (2) Engine Mounting Beams
❏ (4) 3mm x 16mm Machine Screws
❏ (4) 3mm Blind Nuts

❏ (4) 3mm x 25mm Machine Screws
❏ (8) 3mm Flat Washers
❏ (4) 3mm Lock Nuts

YOU'LL NEED THE FOLLOWING TOOLS AND SUPPLIES:

❏ Kwik Bond Thick C/A
❏ Pacer Z-42 Threadlocker
❏ # 1 Phillips Head Screwdriver
❏ Adjustable Wrench
❏ Electric Drill

❏ 7/64", 1/8" & 5/32" Drill Bits
❏ Ernst Airplane Stand
❏ Ruler
❏ Pencil

Step 1: Aligning the Engine Mount Beams

The references in the next few procedures are taken from the consideration that you are looking at the front of the airplane with the airplane right-side up.
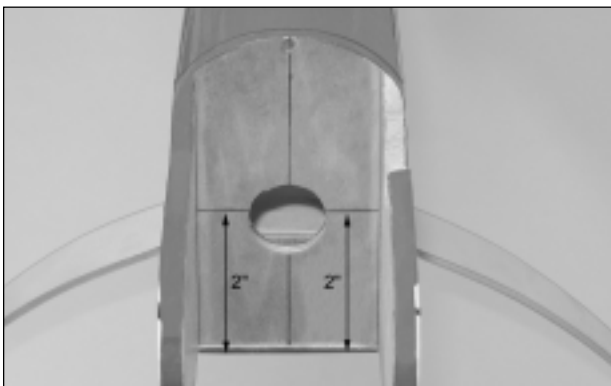
❏   Using a ruler and a pencil, draw a vertical centerline on the firewall.

❏   Using a ruler and a pencil, measure **up** 2" from the **bottom** of the firewall and draw a horizontal line. This will be referred to as the "horizontal centerline."
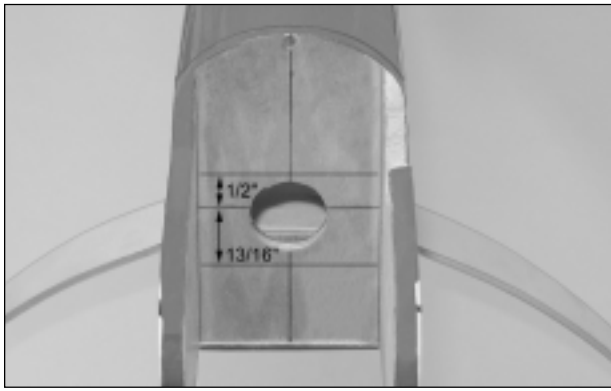
❑ Using a ruler and a pencil, measure and draw one horizontal line 1/2" **above** the horizontal centerline and one horizontal line 13/16" **below** the horizontal centerline.
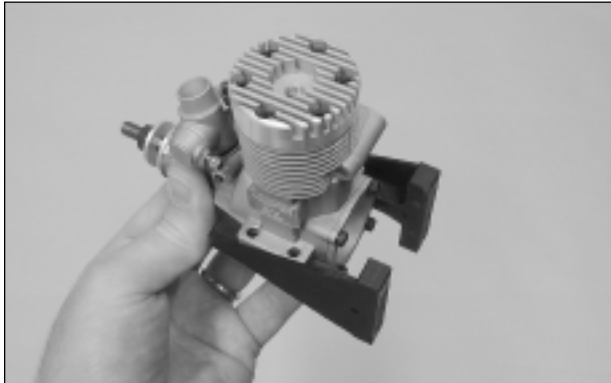
❑ Temporarily glue the two engine mounting beams to your engine's mounting lugs using a couple of drops of thick C/A.

☞ The location of the engine is not important at this time.

❑ Using a ruler, measure the distance between the holes in the two engine mounting beams. As an example, for the Magnum XLS .46 engine used in this model, the distance between the holes in the two beams is 1-11/16". Your measurement may differ if you are using a different size engine. It depends on the width of the crankcase.
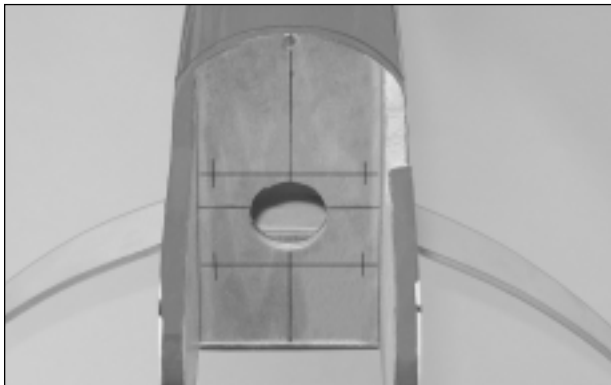
❑ Divide the measurement found in the procedure above in half.

❑ Measure this resulting distance from the vertical centerline and draw one intersecting line across the upper and lower horizontal lines.

☞ As an example, if using the Magnum XLS .46, you would draw the intersecting lines 27/32" to the right and 27/32" to the left of the vertical centerline.

Step 2: Installing the Engine Mounting Beams
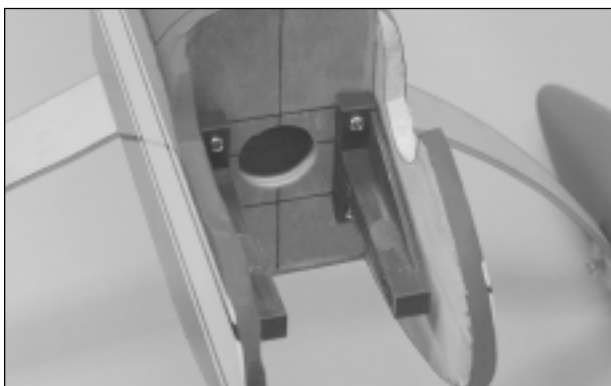
❑ Using a drill with a 5/32" diameter drill bit, drill a hole through the firewall at each of the four intersecting lines.

❑ Remove your engine from the mounting beams and install them using four 3mm x 16mm machine screws and four 3mm blind nuts. Tighten the screws firmly to draw the blind nuts into the back of the firewall.

☞ We suggest applying threadlocker to the screws to prevent them from coming loose during flight.

Step 3: Aligning and Installing the Engine
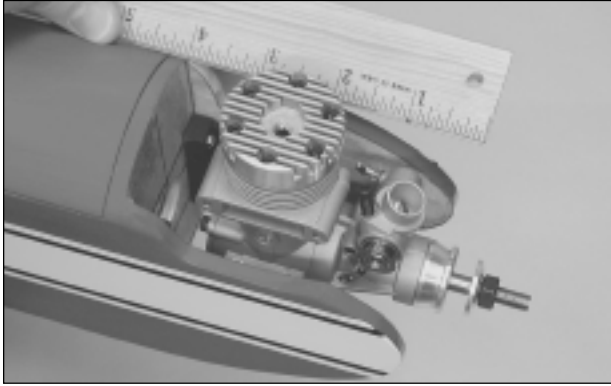
❑   Set the engine onto the engine mounting beams.

❑   Using a ruler, measure the distance from the firewall to the front of the engine's thrust washer. Adjust the depth of the engine so the measurement is 4".

❑   Using a pencil, mark the locations of the engine mounting holes onto the mounting beams. Remove the engine and drill the holes through the beams using a 1/8" diameter drill bit. Be careful to drill the holes straight down and not at an angle.

Before mounting your engine in the next procedure, drill a 7/64" diameter hole through the firewall for the throttle pushrod wire. Drill the hole near the side of the fuselage so it does not interfere with the fuel tank when it's installed later. The hole should be about 3/4" below the top of the fuselage, at the fuselage side.

❑   Install the engine using four 3mm x 25mm machine screws, eight 3mm flat washers and four 3mm lock nuts.

SECTION 14: FUEL TANK ASSEMBLY & INSTALLATION

YOU'LL NEED THE FOLLOWING PARTS FROM THE KIT:

❑ (1) 240cc Fuel Tank   ❑ (1) Fuel Pick-Up "Clunk"
❑ (1) Large Diameter Metal Plate   ❑ (1) 3mm x 25mm Machine Screw
❑ (1) Small Diameter Metal Plate   ❑ (1) Silicon Fuel Tubing
❑ (1) Rubber Stopper   ❑ (2) Aluminum Tubing

YOU'LL NEED THE FOLLOWING TOOLS AND SUPPLIES:

❑ # 1 Phillips Head Screwdriver   ❑ Ruler
❑ Excel Modeling Knife   ❑ 220 Grit Sandpaper w/Sanding Block

Step 1: Assembling the Rubber Stopper

❑   Using 220 grit sandpaper, carefully smooth and deburr each end of the two aluminum tubes. This will prevent the fuel tubing from being accidentally cut when it is installed later.

❑   Push the two aluminum tubes through the rubber stopper. Slide the large diameter metal plate over the tubes at the front of the stopper and slide the small diameter metal plate over the tubes at the rear of the stopper.

❑   Using a ruler, measure the distance that the two aluminum tubes protrude from the front of the stopper assembly. This distance should be 3/8". If it is not, adjust the tubes by pushing them forward or backward until you are satisfied with the alignment.

❑   Carefully bend the longer of the two aluminum tubes up at a 45º angle, being careful not to "kink" the tubing as you bend it.

☞ When the stopper assembly is installed in the fuel tank, the top of the vent tube (the tube you just bent) should rest just below the top of the tank.
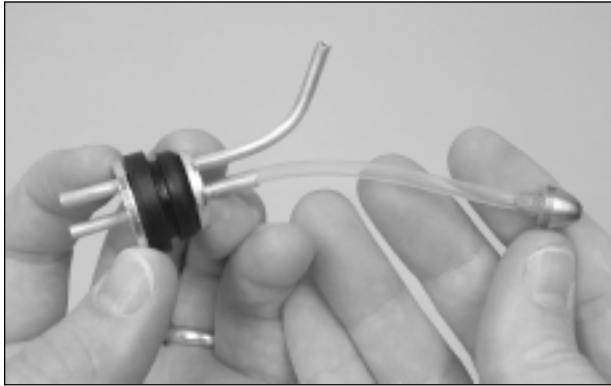
❑   Secure one end of the silicon fuel tubing onto the end of the fuel pick-up.

❑   Slide the silicon fuel tubing, with the fuel pick-up attached, onto the end of the aluminum fuel pick-up tube (straight tube). While holding the aluminum tube in place, adjust the length of the silicon tubing until the fuel pick-up is 3-1/4" back from the rear of the stopper assembly.

❑   Push the 3mm x 25mm machine screw through the stopper assembly, from the front, and partially thread it into the small diameter metal backplate.

Step 2: Installing the Stopper Assembly

❑   Carefully push the stopper assembly into the molded hole in the front of the fuel tank. Gently rotate the stopper assembly until the aluminum vent tube rests just below the top of the fuel tank.

☞ If you have trouble seeing the vent tube, hold the fuel tank assembly up to a bright light. This will illuminate the inside of the tank.

❑   When satisfied with the alignment, tighten the machine screw until the rubber stopper expands and seals the fuel tank opening. Do not overtighten the screw. This could cause the front of the fuel tank to split.

Step 3: Installing the Fuel Tank Assembly

❑   Cut two pieces of silicon fuel tubing to a length of 8" and install them to the aluminum tubes at the front of the tank.

☞ For your convenience, we suggest marking the ends of the tubing "vent" and "pick-up" so you don't confuse them when it comes time to connect them to the engine later on.

❑   Feed the ends of the fuel tubing through the predrilled hole in the firewall and slide the fuel tank down into position, making sure that the stopper assembly lines up and engages the predrilled hole in the firewall. When aligned properly, the tank should be pushed forward as far as possible and the back of the tank should rest on the fuel tank floor.

IMPORTANT

Make sure that the top of the fuel tank is toward the top of the fuselage.
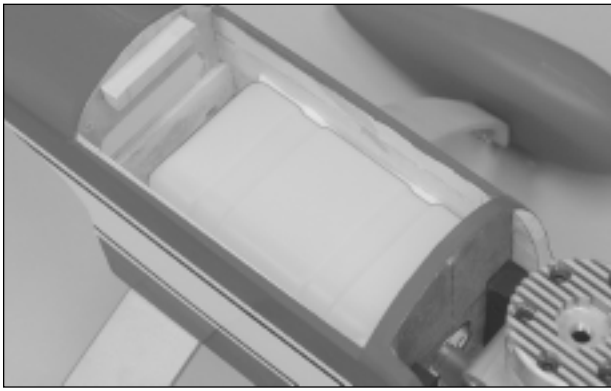
❏   Cut and install several pieces of foam rubber between the fuel tank and the fuselage sides to secure the fuel tank into place. When you install the hatch cover later on, put a piece of foam on top of the tank so the hatch cover will hold the tank down in place.

☞ Make sure the foam will not interfere with installation of the throttle pushrod wire.

SECTION 15: SERVO INSTALLATION

YOU'LL NEED THE FOLLOWING TOOLS AND SUPPLIES:	
❏ # 1 Phillips Head Screwdriver	❏ 5/64" Drill Bit
❏ Excel Modeling Knife	❏ Ernst Airplane Stand
❏ Electric Drill	❏ Ruler

Step 1: Installing the Elevator, Rudder, Throttle & Aileron Servos

❏   Install the rubber grommets and brass collets onto your elevator, rudder , throttle and two aileron servos, making sure to install the collets with the flanges toward the bottom of the servo.

❏   Install the servos into the fuselage servo tray as shown. Note the position of the servo output shafts. They should all be toward the **back** of the fuselage.

☞ To make it easier to run the servo leads into the wing saddle, install the two rear-most servos first.

❏   Cut away and remove the covering material from over the servo lead exit holes in the top of the wing. One exit hole is located in each wing half, 4" in front of the trailing edge and 1/2" out from the centerline.
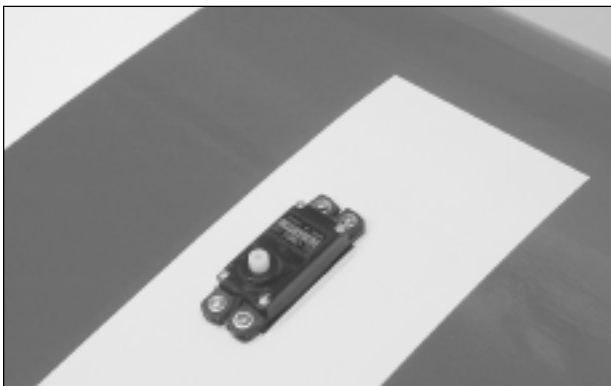
❏   Using a modeling knife, cut away and remove the covering material from over the aileron servo cutouts. One cutout is located in each half of the wing, 5-1/4" out from the side of the belly pan and 4-1/4" in front of the aileron hinge line.

❏   Install the servos and pull the servo leads out through the exit holes in the top of the wing. Note the position of the servo output shaft. It should be toward the trailing edge of the wing.

SECTION 16: THROTTLE LINKAGE INSTALLATION

YOU'LL NEED THE FOLLOWING PARTS FROM THE KIT:

❑ (1) 26-1/4" Pushrod Wire w/Z-Bend　　　　❑ (1) Adjustable Servo Connector Assembly

YOU'LL NEED THE FOLLOWING TOOLS AND SUPPLIES:

❑ Kwik Bond Thin C/A　　　　　　　　　　❑ Excel Modeling Knife

❑ # 1 Phillips Head Screwdriver　　　　　　❑ Electric Drill

❑ Wire Cutters　　　　　　　　　　　　　❑ 5/64" Drill Bit

❑ Needle Nose Pliers　　　　　　　　　　❑ Ernst Airplane Stand

Step 1: Installing the Throttle Pushrod Wire

❑　Remove the throttle arm from your engine and install the Z-Bend in the pushrod wire into the outermost hole in the throttle arm.

☞ You may need to enlarge the hole in your engine's throttle arm using a 5/64" diameter drill bit.
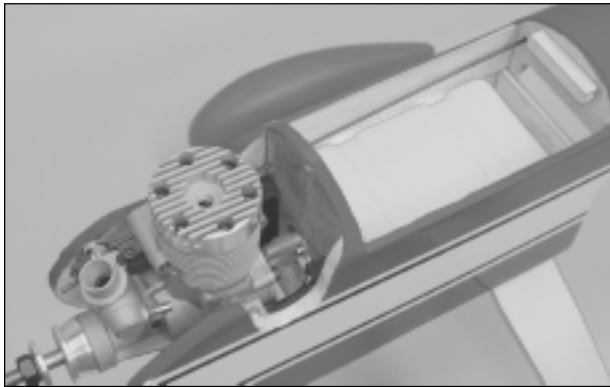
❑　Slide the pushrod wire through the hole you drilled in the firewall and on through the predrilled holes in the forward bulkhead and the center bulkhead.
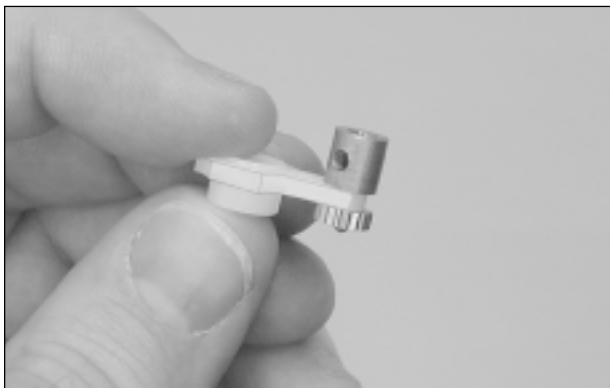
❑　Reinstall the throttle arm onto your engine.

IMPORTANT

Depending on where you drilled the hole in the firewall, you may need to bend the pushrod wire to line it up better with the throttle arm.

Step 2: Installing the Adjustable Servo Connector

❑　Using a modeling knife, cut away all but one arm from a small "4-point" servo horn.

❑　Enlarge the **third hole** out from the center of the servo arm using a 5/64" drill bit.

❑　Install the adjustable servo connector into the servo arm.

IMPORTANT

When threading on the connector nut, don't tighten the nut completely. You don't want the connector loose, but you do want it to be able to rotate without binding.

❑　To prevent the connector nut from loosening during flight, apply a drop of thin C/A to it. Allow the C/A to dry before proceeding.

❑　Connect your radio system and plug the throttle servo (forward-most servo) into the receiver. Check to ensure that the throttle servo output shaft is rotating in the correct direction. When the throttle control stick is moved forward, from the idle to the full throttle position, the servo output shaft should rotate clockwise. If it doesn't, flip the servo reversing switch on your transmitter.

❑ Position the throttle control stick and the throttle trim lever on your transmitter at their lowest positions. Slide the adjustable servo connector/servo horn assembly over the plain end of the throttle pushrod wire.

❑ After making sure that the carburetor is in the fully closed position, angle the servo horn back about 45º from center and attach it to the servo output shaft. The servo connector should be facing the side of the fuselage.

❑ While holding the carburetor barrel fully closed, install and tighten the set screw in the top of the adjustable servo connector.

❑ Use wire cutters to cut away and remove the excess pushrod wire.

❑ Install and tighten the servo horn retaining screw to hold the servo horn securely to the servo.

SECTION 17: ELEVATOR CONTROL SYSTEM INSTALLATION

YOU'LL NEED THE FOLLOWING PARTS FROM THE KIT:

❑ (1) 14-1/2" Threaded Wire w/90º Bend
❑ (2) Nylon Clevises
❑ (1) 13-1/2" Threaded Wire
❑ (1) Nylon 90º Snap Keeper
❑ (2) Nylon Control Horns w/Backplates
❑ (2) Wheel Collars w/3mm x 8mm Set Screws
❑ (4) 2mm x 12mm Machine Screws

YOU'LL NEED THE FOLLOWING TOOLS AND SUPPLIES:

❑ Kwik Bond Thin C/A
❑ 5/64" Drill Bit
❑ # 1 Phillips Head Screwdriver
❑ Ernst Airplane Stand
❑ Needle Nose Pliers
❑ Ruler
❑ Excel Modeling Knife
❑ Pencil
❑ Electric Drill
❑ Masking Tape

Step 1: Assembling the Elevator Pushrod

❑ Using a modeling knife, cut away all but one arm from a large "4-point" servo horn.

❑ Enlarge the **fourth hole** out from the center of the servo arm using a 5/64" drill bit.
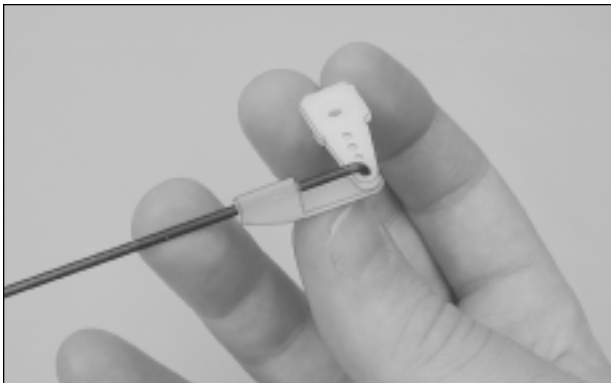
❑ Install the 90º bend in the 14-1/2" long elevator pushrod wire into the hole that you just enlarged, using the snap keeper provided. When installing the snap keeper, make sure it "snaps" firmly into place over the pushrod wire.

☞ The pushrod wire should be on top of the servo arm as shown.

❑ Partially thread the 3mm x 8mm set screws into the wheel collars. Slide the wheel collars onto the elevator pushrod wire and up against the snap keeper.
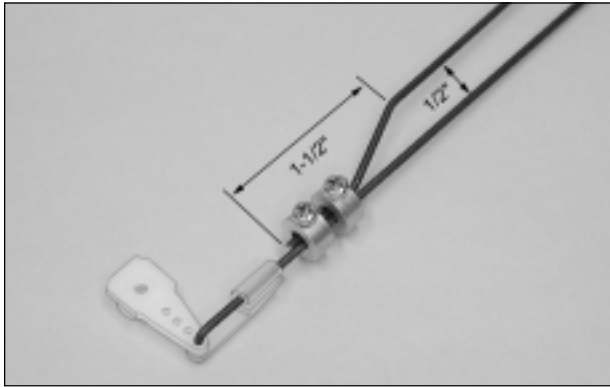
❑ Make a shallow bend 1-1/2" from the plain end of the 13-1/2" long pushrod wire and slide the pushrod wire through the wheel collars as shown. The bend should be deep enough to separate the pushrod wires by 1/2".

❑ Adjust the pushrod wire so both pushrod ends are even with each other. When satisfied with the alignment, tighten the set screws in both wheel collars.

☞ When tightening the set screws, make sure both pushrods stay flat and don't twist up.

Step 2: Installing the Elevator Pushrod Assembly

❑ Using a modeling knife, cut away and remove the covering material from over the elevator pushrod exit holes in each side of the fuselage. They are located 5-1/4" in front of the rudder hinge line and 1-7/8" above the bottom of the fuselage.

❑ Connect your radio system and plug the elevator servo (rear-most servo) into the receiver. Double-check that the elevator trim lever on your transmitter is centered.
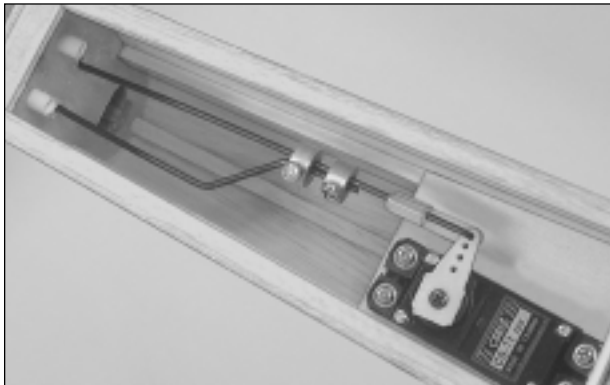
❑ Carefully slide the pushrod wires into the preinstalled pushrod housings in the rear bulkhead - the two that are higher up in the fuselage and are at the same height as the servo.

❑ Install the servo horn, making sure it's centered and pointing toward the middle of the fuselage as shown.

❑ Install the servo horn retaining screw to secure the servo horn to the servo.

Step 3: Installing the Control Horns & Clevises

❑ Use a couple of pieces of masking tape to hold the elevator halves centered.

❑ Position one nylon control horn onto the bottom of one elevator half, aligning the centerline of the control horn with the pushrod wire. The centerline of the control horn should be approximately 7/8" out from the side of the fuselage.

❑ Angle the control horn about 1/16" toward the fuselage side so it will line up better with the pushrod wire and adjust the control horn so that the clevis attachment holes are directly over the hinge line.

❑ Mark the positions of the control horn mounting screws, then remove the control horn and set it aside.

❑ Drill the holes through the elevator for the mounting screws using a 5/64" diameter drill bit.

❑ Install the control horn and backplate using two 2mm x 12mm machine screws, being careful not to overtighten them.

❑ Repeat the previous procedures to install the second control horn and backplate on the other elevator half.
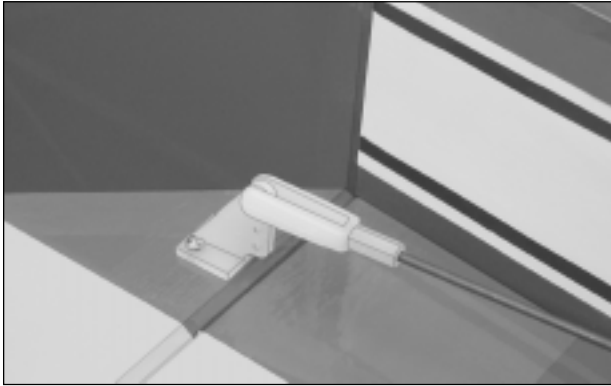
❑ Thread the clevises onto the pushrod wires and snap them into the third hole out from the base of the control horns.

☞ Hold the pushrod wires with a pair of pliers to prevent them from turning while installing the clevises.

❑ With both elevator halves and the elevator servo horn centered, double-check that the set screws in the wheel collars are tight.

VERY IMPORTANT

After you tighten the set screws, apply a couple of drops of thin C/A to the threads. This will prevent the screws from loosening during flight. Do not omit this procedure or failure of the elevator control system could result!

SECTION 18: RUDDER CONTROL SYSTEM INSTALLATION

YOU'LL NEED THE FOLLOWING PARTS FROM THE KIT:

❑ (2) 16-5/8" Threaded Wires w/90º Bend ❑ (4) 2mm Hex Nuts
❑ (2) Nylon Control Horns ❑ (2) Nylon Clevises
❑ (4) 2mm x 15mm Machine Screws ❑ (2) Nylon 90º Snap Keepers

YOU'LL NEED THE FOLLOWING TOOLS AND SUPPLIES:

❑ Kwik Bond Thin C/A ❑ 5/64" Drill Bit
❑ # 1 Phillips Head Screwdriver ❑ Ernst Airplane Stand
❑ Adjustable Wrench ❑ Ruler
❑ Needle Nose Pliers ❑ Pencil
❑ Excel Modeling Knife ❑ Masking Tape
❑ Electric Drill

Step 1: Installing the Rudder Pushrod Wires

❑ Using a modeling knife, cut away and remove two arms from a large "4-point" servo horn.
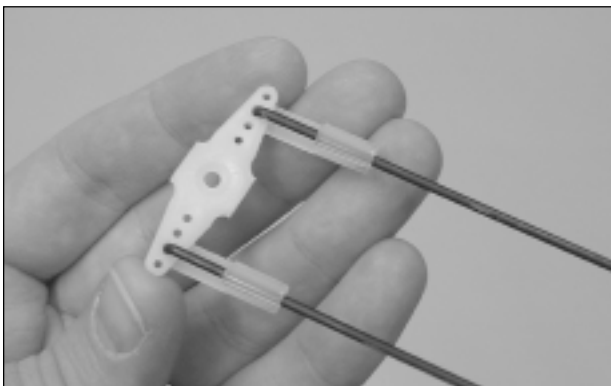
❑ Install the 90º bend in each 16-5/8" long rudder pushrod wire into the **third hole** out in the servo arms, using the snap keepers provided. When installing the snap keepers, make sure they "snap" firmly into place over the pushrod wires.

☞ The pushrod wires should be on top of the servo arms as shown.

❏   Using a modeling knife, cut away and remove the covering material from over the rudder pushrod exit holes in each side of the fuselage. They are located 5-1/4" in front of the rudder hinge line and 1-1/4" above the bottom of the fuselage.

❏   Connect your radio system and plug the rudder servo into the receiver. Double-check that the rudder trim lever on your transmitter is centered.
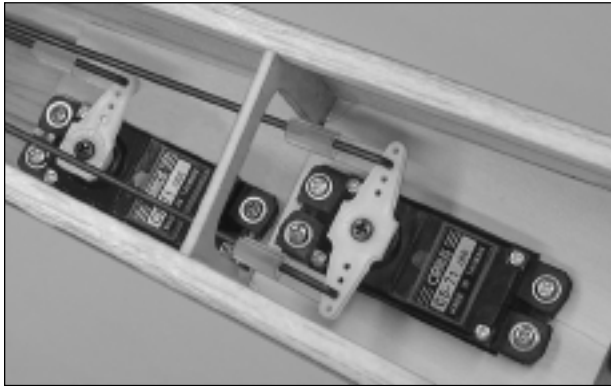
❏   Carefully slide the pushrod wires into the preinstalled pushrod housings in the rear bulkhead and install the servo horn, making sure it's centered.

❏   Install the servo horn retaining screw to secure the servo horn to the servo.

Step 2: Installing the Control Horns & Clevises

❏   Use a couple of pieces of masking tape to hold the rudder centered.
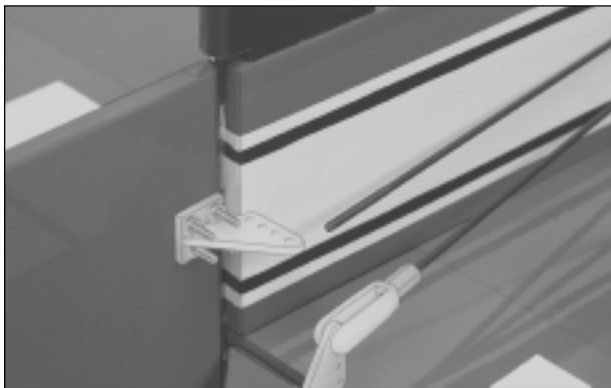
❏   Position one nylon control horn onto one side of the rudder, aligning the centerline of the control horn with the pushrod wire. The centerline of the control horn should be approximately 1-1/4" up from the bottom of the rudder.

❏   Adjust the control horn so that the base is parallel with the hinge line and the clevis attachment holes are over the hinge line.

❏   Mark the positions of the four control horn mounting screws, then remove the control horn and set it aside.

❏   Drill the holes through the rudder for the mounting screws using a 5/64" diameter drill bit.

❏   Install one control horn on each side of the rudder using four 2mm x 15mm machine screws and four 2mm hex nuts, being careful not to overtighten them.

❏   After tightening the hex nuts, apply a drop of thin C/A to the threads of each hex nut to prevent them from coming loose during flight.
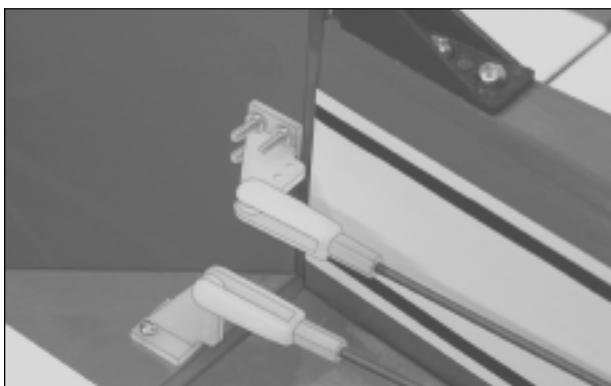
❏   Thread the clevises onto the pushrod wires and snap them into the outermost hole out from the base of the control horns.

☞ Hold the pushrod wires with a pair of pliers to prevent them from turning while installing the clevises.

IMPORTANT

Adjust the clevises equally so you don't run into problems with the rudder centering or binding.

SECTION 19: AILERON CONTROL SYSTEM INSTALLATION


YOU'LL NEED THE FOLLOWING PARTS FROM THE KIT:

❑   (2) 3" Threaded Wires w/90º Bend   ❑   (2) Nylon Clevises

❑   (2) Nylon Control Horns w/Backplates   ❑   (2) Nylon 90º Snap Keepers

❑   (4) 2mm x 12mm Machine Screws

YOU'LL NEED THE FOLLOWING TOOLS AND SUPPLIES:

❑   # 1 Phillips Head Screwdriver   ❑   5/64" Drill Bit

❑   Needle Nose Pliers   ❑   Ruler

❑   Excel Modeling Knife   ❑   Pencil

❑   Electric Drill   ❑   Masking Tape

Step 1: Installing the Aileron Pushrod Wires

❑   Using a modeling knife, cut away all but one arm from a large "4-point" servo horn.

❑   Enlarge the **fourth** hole out from the center of the servo arm using a 5/64" diameter drill bit.

❑   Install the 90º bend in one 3" long aileron pushrod wire into the hole that you just enlarged, using the snap keeper provided. When installing the snap keeper, make sure it "snaps" firmly into place over the pushrod wire.

☞ The pushrod wire should be on top of the servo arm as shown.
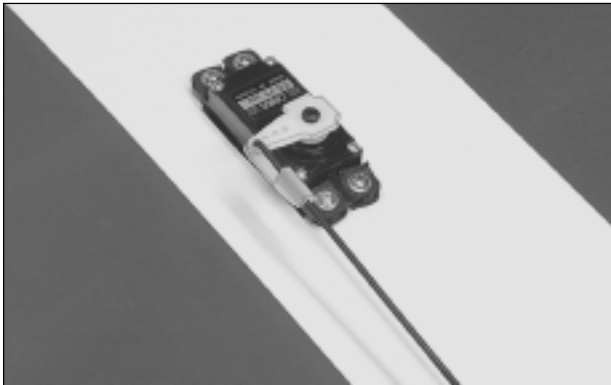
❑   Center the aileron servo and install the servo arm assembly making sure the servo arm is centered and the pushrod wire is toward the wing tip.

❑   Install and tighten the servo arm retaining screw.

Step 2: Installing the Control Horns & Clevises

❑   Use a couple of pieces of masking tape to hold the aileron centered.
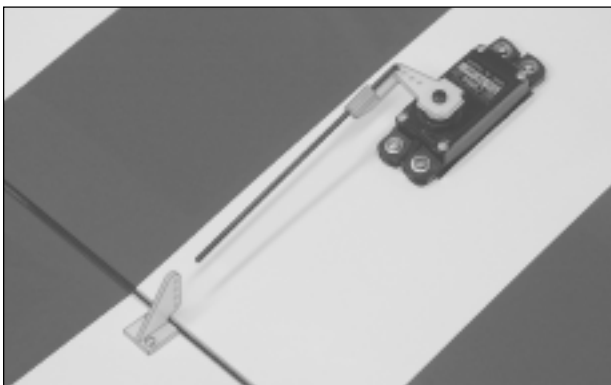
❑   Mount the control horn to the aileron, directly behind the pushrod wire, using two 2mm x 12mm wood screws. Make sure the control horn is parallel to the hinge line and that the clevis attachment holes are lined up over the hinge line. The centerline of the control horn should be approximately 5" out from the inside edge of the aileron.
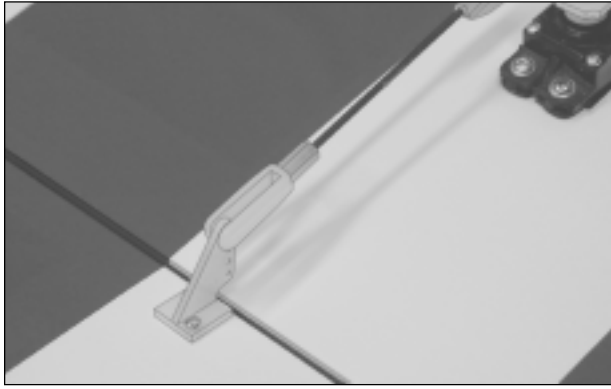
❑   Thread the clevis onto the pushrod wire and snap it into the outermost hole from the base of the control horn.

❑   Repeat the previous steps to install the second aileron pushrod assembly on the opposite wing panel.

SECTION 20: FINAL ASSEMBLY

YOU'LL NEED THE FOLLOWING PARTS FROM THE KIT:

❑ (1) Clear Molded Canopy

❑ (1) Spinner Assembly w/Wood Screws

❑ (2) 2mm x 10mm Wood Screws

❑ (1) 2mm x 12mm Wood Screw

YOU'LL NEED THE FOLLOWING TOOLS AND SUPPLIES:

❑ Pacer Formula 560 Canopy Glue

❑ # 1 Phillips Head Screwdriver

❑ Promax Canopy Scissors

❑ 220 Grit Sandpaper w/Sanding Block

❑ Masking Tape

❑ Electric Drill

❑ 5/64" Drill Bit

❑ Ernst Airplane Stand

❑ Ruler

❑ Pencil

Step 1: Installing the Clear Canopy

❑   Using a pair of scissors, carefully cut out the canopy along the molded scribe line.

❑   Using 220 grit sandpaper with a sanding block, carefully sand the edges of the canopy smooth and straight.

☞ Be careful not to scratch the surface of the canopy when sanding its edges.
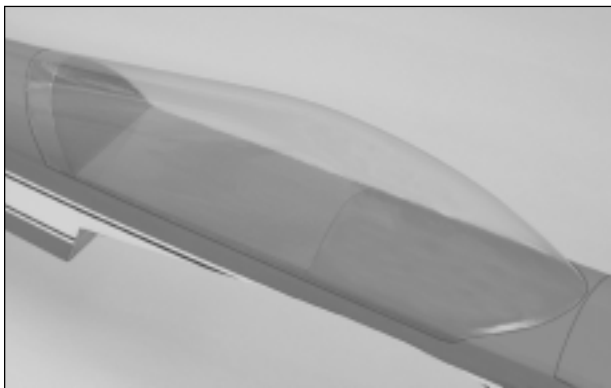
❑   Set the canopy onto the fuselage and align it. The canopy should be centered over the middle of the fuselage and the front edge of the canopy should be 1/16" behind the back edge of the hatch cover.

❑   When satisfied with the fit, remove the canopy and carefully apply a thin bead of Pacer Formula 560 Canopy Glue around the inside edges of the canopy.

❑   Set the canopy back into place and realign it. Use pieces of masking tape to hold the edges of the canopy firmly in place and remove any excess adhesive using a paper towel soaked with **water.**

Step 2: Installing the Hatch Covers

❏ Set the fuel tank hatch cover into place and align it with the fuselage.

❏ Drill one 5/64" diameter hole into the hatch cover and through the preinstalled mounting block in the fuselage 1/8" in front of the back edge of the hatch cover. Make sure to drill the hole straight and not at an angle.

☞ If you drill the hole farther than 1/8" in front of the back edge of the hatch cover, you will miss the preinstalled block inside the fuselage.

❏ Install the hatch cover using the 2mm x 12mm wood screw.

❏ Install the servo hatch cover on the bottom of the fuselage using the same technique. It is held in place using two 2mm x 10mm wood screws - one at the front of the cover and one at the back of the cover.

Step 3: Installing the Spinner Assembly & Engine Accessories

❏ Install the needle valve and muffler assembly onto your engine, then cut to length and install the fuel lines to the muffler pressure nipple and the carburetor (or remote needle valve).

❏ Install the spinner backplate and the propeller onto your engine and tighten the propeller nut firmly.

❏ Test-fit the spinner cone over the propeller. Depending on the size of the propeller you are using, the spinner cone may not fit over it. If this is the case, use a modeling knife to very carefully enlarge the two cutouts in the spinner cone.

☞ It is important that the spinner cone not touch any part of the propeller when it is in place.
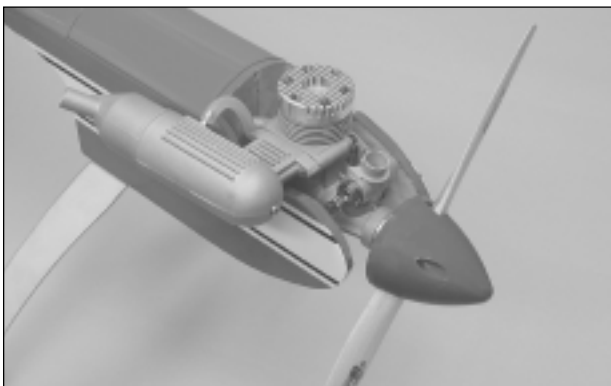
❏ When satisfied with the fit, slide the spinner cone over the propeller.

❏ Install and tighten the two 3mm x 12mm wood screws to secure the spinner cone into place.

Step 4: Installing the Receiver & Battery

We don't suggest permanently installing the receiver and battery until you have balanced the airplane. Depending on how the airplane initially balances will determine where you need to mount the receiver and battery.

❏ Wrap the receiver and battery in foam rubber to protect them from vibration. Use masking tape or rubber bands to hold the foam in place.

☞ Do not wrap the foam rubber too tightly or the vibration dampening quality will be reduced.

❏   After you've found the final location of the receiver and battery, mount them into the fuselage using your favorite method. Strips of Velcro® work good or sandwich them in place using a couple of scraps of balsa wood glued between the fuselage sides. We mounted the receiver to the fuselage floor, right in front of the wing mounting block and we mounted the battery right behind the forward bulkhead.
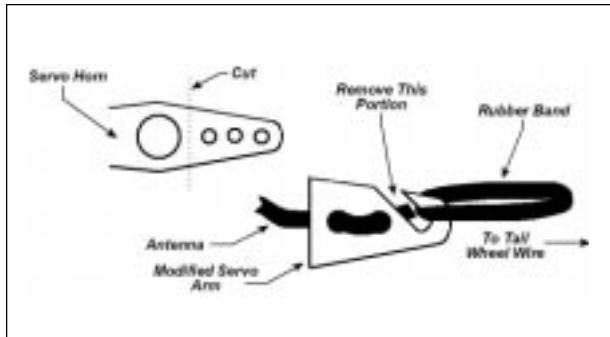
❏   After you have the receiver installed, drill a 5/64" hole in the fuselage for the antenna to exit. Unwrap the receiver antenna and feed it out through the hole.

❏   Using a modeling knife, carefully make an antenna mount out of an extra servo horn. Remove one of the arms and cut it into the shape shown.

❏   Use the modified servo arm and a rubber band to secure the end of the antenna to the tail wheel wire.

❏   Mount the switch to the fuselage and connect the battery lead to the switch, and the switch and servo leads to the receiver. You can mount the switch either to the top of the fuselage or, better yet, mount it inside the fuselage to the sub-bulkhead. Attach a piece of scrap wire to the switch that runs out the side of the fuselage. You can then turn the switch on and off by pushing and pulling the piece of wire.

SECTION 21: BALANCING THE MAGIC EXTRA 300L

YOU'LL NEED THE FOLLOWING TOOLS AND SUPPLIES:

❏   # 1 Phillips Head Screwdriver   ❏   Masking Tape

❏   Ruler

IMPORTANT

It is critical that your airplane be balanced correctly. Improper balance will cause your airplane to lose control and crash!

Center of Gravity Location:

3" to 3-3/4" back from the leading edge of the wing, at the fuselage sides.

WARNING

This is the recommended C.G. range. For test-flying we suggest you start with the C.G. in the middle of the range, then move it farther back as you become familiar with the flying characteristics of the airplane. It is not recommended that the C.G. be located any farther back than 3-3/4".

☞ Always balance the airplane with the fuel tank **empty.**

❏   Install the wing onto the fuselage. Apply two short pieces of masking tape onto the **top** of the wing, 3-3/8" back from the leading edge, at the fuselage sides.

❏   Turn the airplane upside down and place your fingers on the masking tape, and carefully lift the airplane. If the nose of the airplane falls, the airplane is nose heavy. To correct this, move the battery pack and/or receiver back far enough to bring the airplane into balance. If the tail of the airplane falls, the airplane is tail heavy. To correct this, move the battery pack and/or receiver far enough forward to bring the airplane into balance. When balanced correctly, the airplane should sit level or slightly nose down when you lift it up with your fingers at the C.G. location.

☞ Once you have flown and become familiar with the flight characteristics of the airplane, the C.G. can be moved fore or aft within the C.G. range to change the flight performance. Moving the C.G. back will cause the airplane to be more responsive, but less stable. Moving the C.G. forward will cause the airplane to be more stable, but less responsive.

Do not fly the airplane beyond the recommended balance range or an uncontrollable crash could result!

SECTION 22: LATERAL BALANCING THE MAGIC EXTRA 300L

☞ Lateral balancing will make the airplane easier to trim and will make it track straighter in the air. It is strongly recommended.

❑   Turn the airplane upside down and tie one length of string to the propeller shaft and one length of string to the tail wheel wire.

❑   With someone helping you, carefully lift the airplane up by the two pieces of string. Watch how the wing reacts. If one side of the wing drops, that side is heavier than the other. To correct this condition, stick a small piece of self-adhesive lead weight to the bottom of the lighter wing half (the one that doesn't drop).

❑   Repeat the procedure a couple of more times to double-check your findings. When done properly the wing should stay level when you lift the airplane.

SECTION 23: CONTROL THROWS

We recommend setting up the Magic Extra 300L using the control throws listed below. These control throws are suggested for initial test-flying because they will allow the airplane to fly smoother and make it easier to control.

TEST-FLYING

Ailerons:	**5/8" Up**	**5/8" Down**
Elevator:	**3/4" Up**	**3/4" Down**
Rudder:	**1-5/8" Right**	**1-5/8" Left**

☞ When measuring the control throws, measure from the widest point of the control surfaces.

VERY IMPORTANT!

After you are finished adjusting the pushrods and control throws, we strongly suggest cutting 1/4" lengths of the clear tubing provided and sliding one piece over each clevis. The tubing will prevent the clevises from popping open during flight.

Once you're familiar with the flight characteristics of the airplane, you might want to increase the control throws to the aerobatic flying settings listed below. These control throws will make the airplane more responsive and allow you to do aerobatics with ease.

AEROBATIC FLYING

Ailerons:	**1" Up**	**1" Down**
Elevator:	**1-5/8" Up**	**1-5/8" Down**
Rudder:	**1-3/4" Right**	**1-3/4" Left**

We do not suggest increasing the control throws beyond the recommended Aerobatic Flying settings unless you are a very proficient flyer. Higher control throws will cause the airplane to be extremely control-sensitive and result in a possible crash if you are not careful.

SECTION 24: PREFLIGHT CHECK & SAFETY

- Completely charge the transmitter and receiver batteries before your first day of flying.

- Check every bolt and every glue joint in the airplane to ensure that everything is tight and well-bonded. This should include all of the control surface hinges as well.

- Double-check that you've installed and tightened all of the servo horn retaining screws.

- Double-check that the receiver and battery are properly secured in the fuselage. There nothing worse than the battery pack coming loose during a violent aerobatic maneuver.

- Double-check the balance of the airplane. **Do this with the fuel tank empty.**

- Check the control surfaces. They should all move in the correct direction and not bind.

- Make sure that you've installed 1/4" long pieces of clear tubing over the clevises to prevent any chance of them opening during flight.

- If your radio transmitter is equipped with dual rate switches, double-check that they are on the low-rate setting for your first few flights.

- Check to ensure that all of the control surfaces are moving the proper amount in both low and high rate settings.

- Check the receiver antenna. It should be fully extended and not coiled up inside the fuselage.

- Properly balance the propeller. A propeller that is out of balance will cause excessive vibration, which could lead to engine and/or airframe failure, and it will reduce engine efficiency and power.

The following are our general guidelines for your safety and the safety of others. Please read and understand these safety guidelines before going out to the flying field for the first time.

- Do not test-fly your model for the first time without first having it safety-checked by an experienced modeler.

- Do not fly your model higher than approximately 400 feet within 3 miles of an airport without having an observer with you. The observer should tell you about any full-size aircraft in your vicinity and you should always give the right-of-way to full-scale aircraft.

- When flying at a flying field with established rules, you should abide by those rules. You should not deliberately fly your model in a reckless and/or dangerous manner.

- While flying, you should not deliberately fly behind the flight line. If your model should inadvertently fly behind the flight line, you should change course immediately.

- You should complete a successful range check of your radio equipment prior to each new day of flying, or prior to the first flight of a new or repaired model.

- You should perform your initial turn after take- off away from the flightline and/or spectator area.

- You should not knowingly operate your R/C radio system within 3 miles of a preexisting model club flying field without a frequency sharing agreement with that club.

SECTION 25: FLYING THE MAGIC EXTRA 300L

The Magic Extra 300L ARF is designed for those pilots who are experienced at flying sport models. It is not a trainer. If you do not feel comfortable about test-flying the airplane, don't hesitate to ask someone more experienced for help.

When set up for test-flying, the Magic Extra 300L is much like flying any other sport aerobatic airplane. It's a nimble flyer that has a low wing loading. This makes it predictable during slow flight and landing. Because it uses very large control surfaces you need to remember not to over-control. For general sport flying, we recommend you use the "Test-Flying" control throws - and even then, you will not need to move the sticks very far.

> **WARNING**
>
> Because of the extremely large control surfaces and high power-to-weight ratio, control surface flutter is a possibility. To prevent any chance of control surface flutter, always reduce engine power during down-leg maneuvers. Never fly the airplane at full throttle in a downward attitude. Doing so can over-speed the airplane and cause control surface flutter, which can quickly lead to airframe damage and/or a crash.

TAKE-OFF

Because the Magic Extra 300L is light and has a lot of power, it sometimes seems like it wants to take off by itself. Do be aware that it's still important to let the airplane get up to flying speed before lifting off the ground. Lifting the airplane off the ground too fast will cause the airplane to stall and crash. You should allow the airplane to roll out until the tail is completely off the ground and flying, and then gently pull the airplane off the ground and into a shallow climb.

Because of the torque of the engine, the airplane will have a natural tendency to pull to the left when it is accelerating down the runway. You will need to compensate for this by applying and holding right rudder during the takeoff roll. Once the airplane lifts off the ground, you can release the right rudder. Because of the wide landing gear stance and long tail moment you will find the ground handling of the Magic Extra 300L very smooth and predictable.

IN THE AIR

In the air the Magic Extra 300L is as smooth and docile or as wild and aerobatic as you want it to be. With the control throws set to the "Test-Flying" settings, the airplane is smooth throughout the entire flight envelope, even while moving the control sticks to the corners. Most flyers interested in sport-flying will probably want to keep the control throws set to the "Test-Flying" settings for most maneuvers.

Setting the control throws to the "Aerobatic Flying" settings opens up a whole new dimension to the airplane. With these settings the airplane becomes extremely responsive in all attitudes, even at very low rates of speed. Thanks to the extremely large control surfaces, 3D style manuevers can be performed without hesitation. We suggest that if you use the "Aerobatic Flying" settings, you make these your "high rates" and make the "Test-Flying" settings your "low rates." This way, for take-off, general flying and landing you can use low rates, and for 3D flying you can flip to high rates.

LANDING

Just because the Magic Extra 300L is so aerobatic doesn't mean it's difficult to land. We've designed the airplane so it will slow down to a practical crawl without tip stalling. Because of this design, landings are quite slow and predictable. There is no tendency to tip stall, but we do recommend that you land with a small amount of power. It's not good practice to just chop the power and dive the airplane to the runway.

On your initial upwind leg, reduce power and allow the airplane to begin slowing down. Follow your normal landing procedure, allowing the airplane to gradually lose altitude and speed. When turning onto final approach the airplane should have a slightly nose-down attitude and you should be carrying a small amount of power to control your descent.

Just before touch-down, reduce power to idle and let the airplane settle onto the main gear. If you flair too much or try for a three point landing, the airplane will have a tendency to balloon up and possibly stall if it's too slow. As always, when landing be careful not to over-control. Over-controlling leads to excessive oscillations which don't make for good landings.

SECTION 26: MAGIC EXTRA 300L TRIMMING CHART

After you have test-flown and done the initial trim changes to the airplane, use this trimming chart to begin trimming your airplane. Following and adhering to this chart will result in the ability to diagnose trim problems and correct those problems using the simple adjustments shown below. Making these observations and related corrections will result in a straighter and truer flying airplane.

TRIM FEATURE	MANEUVER	OBSERVATION	CORRECTION
Control Centering	Fly general circles and random maneuvers	Try for hands off straight and level flight	Readjust linkages so the transmitter trim levers are centered
Control Throws	Fly random maneuvers	A) Controls are too sensitive or airplane feels "jerky" B) Controls are not sensitive enough or airplane feels "mushy"	If A) Adjust linkages to reduce control throws If B) Adjust linkages to increase control throws
Engine Thrust Angle*	From straight and level flight, quickly chop the throttle for a short distance	A) Airplane continues in a level attitude for a short distance B) Airplane pitches nose up C) Airplane pitches nose down	If A) Engine thrust angle is correct If B) Decrease engine down thrust If C) Increase engine down thrust
Center of Gravity	From level flight, roll to a 45º bank and neutralize the controls	A) Airplane continues in the bank for a short distance B) Nose pitches up C) Nose pitches down	If A) Center of gravity is correct If B) Add nose weight If C) Remove nose weight or add tail weight
Yaw**	Into the wind, perform inside loops using only elevator. Repeat test performing outside loops from an inverted entry	A) Wing is level throughout B) Airplane yaws to right in both inside and outside loops C) Airplane yaws to left in both inside and outside loops D) Airplane yaws to the right in inside loops and yaws to the left in outside loops E) Airplane yaws to the left in inside loops and yaws to the right in outside loops	If A) Trim settings are correct If B) Add left rudder trim If C) Add right rudder trim If D) Add left aileron trim If E) Add right aileron trim
Lateral Balance**	Into the wind, perform tight inside loops using only elevator	A) Wing is level and airplane falls to either side B) Airplane falls off to the left. Worsens as loops tighten C) Airplane falls off to the right. Worsens as loops tighten	If A) Lateral balance is correct If B) Add weight to right wing tip If C) Add weight to left wing tip
Aileron Control System	With the wing level, pull to a vertical climb and neutralize the controls	A) Climb continues along the same path B) Nose tends to go toward an inside loop C) Nose tends to go toward an outside loop	If A) Trim settings are correct If B) Raise both ailerons very slightly If C) Lower both ailerons very slightly

*Engine thrust angle and center of gravity interact. Check both.
**Yaw and lateral balance produce similar symptoms. Note that the fin may be crooked. Make certain both elevator halves are even with each other and that they both produce the same amount of control deflection throughout the complete deflection range. Right and left references are as if you were in the cockpit.

PRODUCT EVALUATION SHEET

Telling us what you like and don't like determines what model kits we make and how we make them. We would appreciate it if you would take a few minutes of your time to answer the following questions about this kit and your modeling interests. Simply fold this form on the dotted lines, seal with tape and mail it to us. *Do not use staples and make sure our address faces out*.

Global Hobby Distributors will not disclose the information it collects to outside parties. Global Hobby Distributors does not sell, trade, or rent your personal information to others. Your privacy is important to us.

1) Kit: **Modeltech Magic Extra 300L ARF # 123739**

2) Where did you learn about this kit?
   ❏ Magazine Ads   ❏ Friend
   ❏ Hobby Shop   ❏ Other
   ❏ Internet

3) What influenced you the most to buy this kit?
   ❏ Magazine Ads   ❏ Price
   ❏ Type of Model   ❏ Box Art
   ❏ Recommendation   ❏ Other
   ❏ Internet

4) Did you have any trouble understanding the written instructions? If yes, please explain.
   ❏ Yes   ❏ No
   _____
   _____
   _____
   _____

5) Did you have any trouble understanding any of the photographs? If yes, please explain.
   ❏ Yes   ❏ No
   _____
   _____
   _____
   _____

6) Were any of the kit parts:
   ❏ Damaged   ❏ Wrong Size
   ❏ Missing   ❏ Wrong Shape

   If you checked any of the boxes above, did you contact our Customer Service Department to resolve the problem?
   ❏ Yes   ❏ No

7) Was any of the assembly difficult for you? If yes, please explain.
   ❏ Yes   ❏ No
   _____
   _____
   _____
   _____

8) What did you like most about this kit?
   ❏ Assembly Manual   ❏ Parts Fit
   ❏ Hardware Supplied   ❏ Price
   ❏ Other
   _____
   _____
   _____

9) What did you like least about this kit?
   ❏ Assembly Manual   ❏ Parts Fit
   ❏ Hardware Supplied   ❏ Price
   ❏ Other
   _____
   _____
   _____

10) Are you satisfied with the finished model? If no, please explain.
   ❏ Yes   ❏ No
   _____
   _____
   _____
   _____

11) How does this kit compare to similar kits by other manufacturers?
   ❏ Better   ❏ As Good

What is Your Age Group:
❏ 10 & Under   ❏ 11 - 20   ❏ 21 - 30   ❏ 31 - 40   ❏ 41 - 50   ❏ 51 - 60   ❏ 61 - 70   ❏ 71 +

How Many Years Have You Been in the Hobby?
❏ Less than 1   ❏ 2 - 4   ❏ 5 - 7   ❏ 8 - 10   ❏ 11 - 15   ❏ 16 - 20   ❏ 20 or More

How Many Models Have You Purchased In the Last Year?
❏ 0 - 1   ❏ 2 - 4   ❏ 5 - 7   ❏ 8 - 10   ❏ 10 or More

Please List any Other Modeling Interests or any Additional Information about This Product: _____
_____
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