MODEL TECH

ARF

EXCITE 90

INSTRUCTIONS FOR FINAL ASSEMBLY

The Modeltech Excite 90L ARF is distributed exclusively by Global Hobby Distributors 18480 Bandilier Circle, Fountain Valley, CA 92708

GLOBAL G

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Kit Product Number 123751

Specifications:

- **Wing Span:** 61 Inches
- **Wing Area:** 1,100 Square Inches
- **Wing Loading:** 14.5 - 16 Ounces Per Square Foot
- **Length:** 68 Inches
- **Weight RTF:** 7 - 7.5 Pounds
- **Functions:** Ailerons, Elevator, Rudder & Throttle
- **Power:** .60 - .91 (Small Block) 2-Stroke
- **Radio:** 4 Channel w/4 High-Torque Servos & 1 Standard Servo

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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.

Academy of Model Aeronautics
5151 East Memorial Drive
Muncie IN 47302-9252
(800) 435-9262
www.modelaircraft.org

INTRODUCTION

Thank you for purchasing the new Modeltech Excite 90L 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 Excite 90L Features:

- Completely Prebuilt from High Quality Balsa and Light Plywood
- Covered with Transparent & Opaque Heat-Shrink Covering Material
- Extremely Lightweight Airframe and Over-Sized Control Surfaces for Exciting 3D Aerobatics
- Durable Aluminum Main Landing Gear
- Prepainted Molded Fiberglass Cowling
- Molded Clear Canopy
- Includes Most Hardware - Wheels, Fuel Tank, Pushrods, Engine Mount, Etc.
- Fast & Easy Assembly - Over 50 High-Resolution Digital Photos & Drawings 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 Excite 90L ARF. These suggestions are not set in stone, but they should provide you with a good starting point.

What Engine Should I Use?

The Excite 90L flies great with a strong .61 size two stroke engine. The airplane is designed around this size engine, so just about any brand .61 two stroke will fit easily within the cowling, even using the standard muffler that is included with the engine. No after-market muffler will be necessary. For general sport-flying and basic aerobatics, we suggest using the Magnum XLS .61 two stroke engine.

For extreme 3D and freestyle aerobatics, we suggest using a small block .91 two stroke engine. These engines have a small footprint, so they will fit within the cowling and won't require an after-market muffler, and they are very lightweight for the power they produce. Using this engine will result in an airplane that has an enormous power-to-weight ratio, so extreme 3D and freestyle aerobatics can be flown. If you decide to use a .91 small block two stroke, we suggest using the Magnum XLS .91A two stroke engine.

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 Excite 90L ARF is a big airplane with large control surfaces, so using high-torque ball bearing servos is a must. We strongly recommend that the servos used on the control surfaces produce no less than 65 ounce/inches of torque each.

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. Again, we strongly recommend using high-torque ball bearing servos on all of the control surfaces.

What Else Do I Need?

The Excite 90L ARF includes most of the hardware you'll need to finish the airplane. You will need to purchase separately a spinner, two aileron extension cables, one Y-Harness, an in-cowl fueling valve and some basic building materials, such as adhesives, protective foam rubber for your radio equipment, 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 Excite 90L ARF:

QTY.	Part No.	Description	QTY.	Part No.	Description
QTY. 1	210806	Magnum XLS .91 Two Stroke Engine	QTY. 1	444728	Cirrus Servo Y-Harness (optional)
QTY. 1	237154	Magnum 2-1/2" Chrome Spinner*	QTY. 1	115493	Thunderbolt R/C Long Glow Plug
QTY. 1	609560	APC 14 x 6 Composite Propeller	QTY. 1	115923	Global XX Silicon Fuel Tubing
QTY. 4	759394	Hitec HS-605BB High-Torque Servos	QTY. 1	237500	Magnum In-Cowl Fueling Valve
QTY. 1	444107	Cirrus CS-71 Standard Servo	QTY. 1	868638	Dubro 1/4" Protective Foam Rubber
QTY. 2	444713	Cirrus 12" Servo Extensions			

IMPORTANT

The part numbers listed for the Hitec and Cirrus servos, and the Cirrus accessories 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.

*Includes 5/16 - 24 shaft adapter

SECTION 2: TOOLS AND SUPPLIES REQUIRED

The tools and supplies listed below will be necessary to finish the assembly of your Excite 90L ARF. 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
- ❏ 3mm Hex Wrench
- ❏ 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
- ❏ Rotary Tool w/Cutting Disc & Sanding Drum
- ❏ 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:

Global Services
18480 Bandilier Circle
Fountain Valley CA 92708

On the Web
http://globalservices.globalhobby.com

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

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

THROTTLE CONTROL SYSTEM

- ❏ (1) 21-3/4" Pushrod Wire w/Z-Bend
- ❏ (1) Adjustable Servo Connector Assembly

TAIL WHEEL ASSEMBLY

- ❏ (1) Nylon Tail Wheel Bracket
- ❏ (1) Nylon Tail Wheel Tiller Arm
- ❏ (1) Prebent Tail Wheel Wire
- ❏ (1) Tail Wheel
- ❏ (2) Wheel Collars w/Set Screws
- ❏ (1) Nylon Spacer
- ❏ (1) M2.5 x 12 Wood Screw
- ❏ (3) M3 x 12 Wood Screws

LANDING GEAR ASSEMBLY

- ❑ (1) Prebent Aluminum Main Gear Strut
- ❑ (2) Main Gear Wheels
- ❑ (2) M4 x 16 Machine Screws
- ❑ (2) M4 x 35 Smooth-Shank Machine Screws
- ❑ (8) M4 Flat Washers
- ❑ (4) M4 Lock Nuts

AILERON CONTROL SYSTEM

- ❑ (2) 3-7/8" Threaded Wires w/Z-Bend
- ❑ (2) Nylon Control Horns w/Backplates (Small)
- ❑ (4) M2 x 15 Machine Screws
- ❑ (2) Nylon Clevises
- ❑ (8) C/A Style Hinges

ELEVATOR CONTROL SYSTEM

- ❑ (1) 19-1/8" Threaded Wire w/90º Bend
- ❑ (1) 18" Threaded Wire w/Plain End
- ❑ (2) Nylon Control Horns w/Backplates (Small)
- ❑ (4) M2 x 15 Machine Screws
- ❑ (2) Nylon Clevises
- ❑ (1) Nylon 90º Snap Keeper
- ❑ (2) Wheel Collars w/Set Screws
- ❑ (6) C/A Style Hinges

MISCELLANEOUS FUSELAGE PARTS

- ❑ (1) Prepainted Molded Fiberglass Cowling
- ❑ (1) Molded Clear Canopy
- ❑ (2) M2 x 10 Flange-Head Wood Screws
- ❑ (4) M3 x 5 Wood Screws
- ❑ (4) M3 Flat Washers
- ❑ (1) Length of Clear Tubing
- ❑ (1) Decal Set

RUDDER CONTROL SYSTEM

- ❑ (2) 21-1/2" Threaded Wires w/90º Bend
- ❑ (2) Nylon Control Horns (Large)
- ❑ (4) M2 x 17 Machine Screws
- ❑ (4) M2 Hex Nuts
- ❑ (2) Nylon Clevises
- ❑ (2) Nylon 90º Snap Keepers
- ❑ (3) C/A Style Hinges

ENGINE MOUNT ASSEMBLY

- ❑ (2) Engine Mounting Beams
- ❑ (4) M4 x 20 Socket-Cap Screws
- ❑ (4) M4 x 25 Socket-Cap Screws
- ❑ (4) M4 Lock Nuts
- ❑ (12) M4 Flat Washers

FUEL TANK ASSEMBLY

- ❑ (1) 320cc Fuel Tank
- ❑ (1) Large Diameter Metal Plate
- ❑ (1) Small Diameter Metal Plate
- ❑ (1) Rubber Stopper
- ❑ (1) Fuel Pick-Up "Clunk"
- ❑ (1) M3 x 20 Machine Screw
- ❑ (1) Silicon Fuel Tubing
- ❑ (2) Aluminum Tubing

MISCELLANEOUS WING PARTS

- ❑ (1) Hardwood Wing Joiner
- ❑ (1) Plywood Wing-Screw Doubler
- ❑ (2) M6 x 40 Machine Screws
- ❑ (2) M6 Flat Washers

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			

SECTION 5: REPLACEMENT PARTS

Global stocks a complete line of replacement parts for your Modeltech Excite 90L 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

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http://globalservices.globalhobby.com

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Modeltech Excite 90L ARF - Complete 123751		Belly Pan 170821
Instruction Manual 170815		Hardware Set 170822
Wing Set 170816		Fuel Tank Assembly 170823
Fuselage Set 170817		Main Landing Gear Assembly 170824
Stabilizer Set 170818		Tail Wheel Assembly 170825
Fiberglass Cowling 170819		Decal Set 170826
Clear Canopy 170820		

SECTION 6: A NOTE ABOUT COVERING

The covering material used on the Excite 90L 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 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.
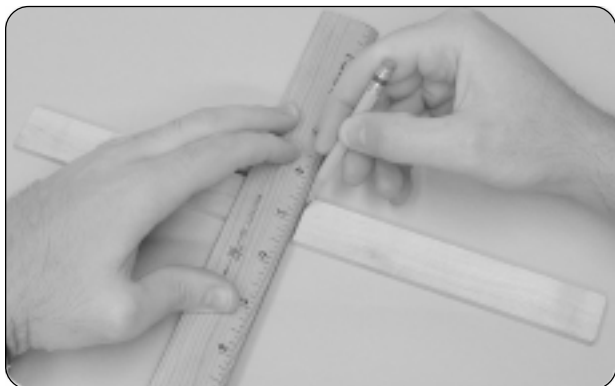

❑   Use a ruler and a pencil to locate and draw a vertical centerline on each side of the hardwood wing joiner.

❑   Test-fit the wing joiner into each wing panel. It should slide easily into each wing 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.
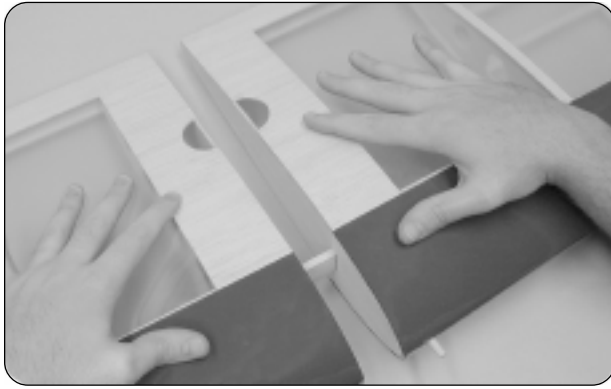
❑   Slide both wing panels together with the wing joiner temporarily installed (without using glue).

❑   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.

> **WARNING** Use only 30 or 45 minute epoxy to install the hardwood wing joiner and to join the wing panels together. **DO NOT USE 5 MINUTE EPOXY. It is not strong enough.**

❑   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.

> **IMPORTANT** It is of the utmost importance to the integrity of the wing center section joint that you apply a generous amount of epoxy to **both center section root ribs** and the wing joiner. Not using enough epoxy can result in wing failure.

❑   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 quantity 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 & BELLY PAN INSTALLATION

<div>

YOU'LL NEED THE FOLLOWING PARTS FROM THE KIT:

❑ (1) Fuselage w/Hatch Covers & Belly Pan   ❑ (2) M6 x 40 Machine Screws

❑ (1) Plywood Wing-Screw Doubler   ❑ (2) M6 Flat Washers

YOU'LL NEED THE FOLLOWING TOOLS AND SUPPLIES:

❑ Kwik Bond Thick C/A   ❑ Pencil

❑ Kwik Bond 30 Minute Epoxy   ❑ 220 Grit Sandpaper w/Sanding Block

❑ # 2 Phillips Head Screwdriver   ❑ Masking Tape

❑ Excel Modeling Knife   ❑ Paper Towels

❑ Electric Drill   ❑ Rubbing Alcohol

❑ 1/4" Drill Bit   ❑ NHP Epoxy Mixing Sticks

❑ Ernst Airplane Stand   ❑ NHP Epoxy Mixing Cups

❑ Ruler

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Step 1: Installing the Wing-Screw Doubler

❑ Using a modeling knife, cut away and remove the covering material from over the top and bottom of the two predrilled holes in the trailing edge of the wing. The holes are located 1/2" in front of the trailing edge and 7/8" out from the centerline.

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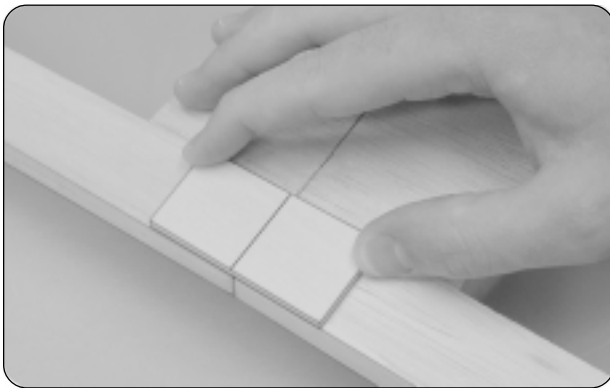
❑ Using thick C/A, glue the wing-screw doubler to the **bottom** of the wing, making sure that the centerline you drew lines up with the centerline of the wing, and that the back of the doubler is even with the trailing edge of the wing.

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

IMPORTANT Cut away and remove the covering from the wing where the wing-screw doubler will be glued into place.

❑ Using a 1/4" 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.

Step 2: Mounting the Wing

❑ Remove the two hatch covers and the belly pan from the fuselage and set them aside for now. With the fuselage upside down, place the wing into the wing saddle and push the trailing edge down into place.

IMPORTANT Make sure that the wing is pushed as far forward as possible. There will be a gap between the trailing edge of the wing and the back of the wing saddle. This is normal and will be covered by the belly pan when it's installed later.
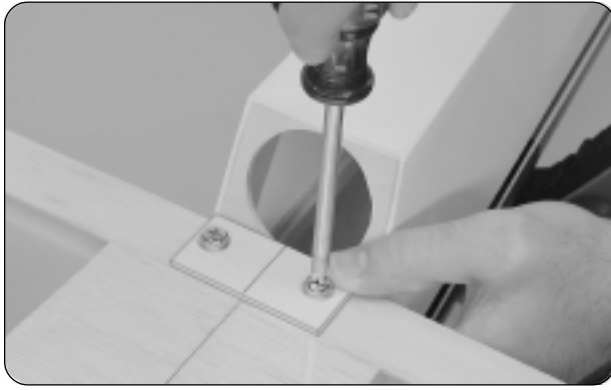
❏   Align the holes in the wing with the preinstalled blind nuts in the wing mounting block inside the fuselage. Secure the wing into place using two M6 x 40 machine screws and two M6 flat washers.

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

Step 3: 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.
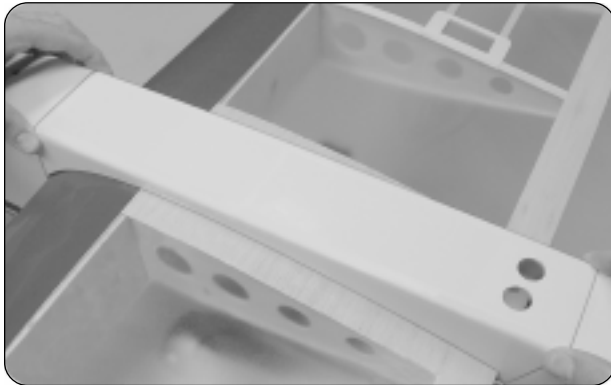
❏   If you didn't leave the wing installed from the last step, mount the wing onto the fuselage at this time.

❏   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.

☞ There should be few or no gaps between the belly pan and the wing. If there are, use 220 grit sandpaper to carefully adjust the curvature of the belly pan to match the curvature of the wing.

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

Step 4: Installing the Belly Pan

❏   Remove the belly pan and set it aside.

❏   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.

☞ To make it easier to cut and remove the covering from the wing, remove the wing from the fuselage first.

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

❏   Reinstall the wing onto the fuselage and 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 9: STABILIZER INSTALLATION

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

❑ (1) Horizontal Stabilizer w/Elevator Halves   ❑ (1) Vertical Stabilizer w/Rudder

YOU'LL NEED THE FOLLOWING TOOLS AND SUPPLIES:

❑ Kwik Bond 30 Minute Epoxy   ❑ 220 Grit Sandpaper w/Sanding Block

❑ Excel Modeling Knife   ❑ Masking Tape

❑ Dubro T-Pins   ❑ Paper Towels

❑ Ernst Airplane Stand   ❑ Rubbing Alcohol

❑ Ruler   ❑ NHP Epoxy Mixing Sticks

❑ Pencil   ❑ NHP Epoxy Mixing Cups

Step 1: Aligning & Installing the Horizontal Stabilizer

❑ Remove the elevator halves and hinges from the horizontal stabilizer and set them aside for now.
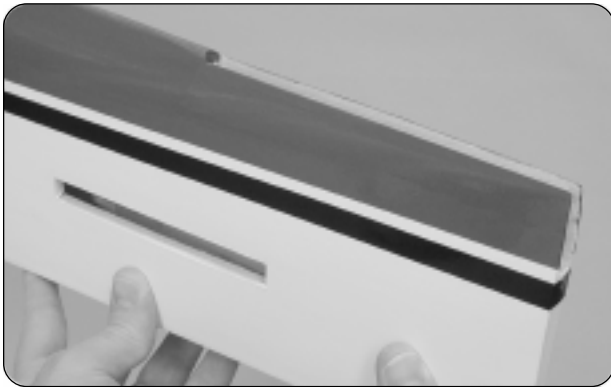
❑ Using a modeling knife, cut away and remove the covering material from over the horizontal and vertical stabilizer mounting slots in the back of the fuselage.

A=A-1
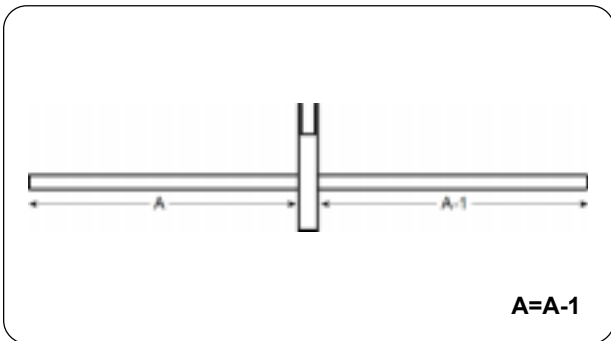
❑ Slide the horizontal stabilizer into the mounting slot and center it by carefully measuring out from each side of the fuselage to each end of the stabilizer (at the trailing edge only for now.) When the stabilizer is centered, both measurements will be equal.

❑ When you're satisfied with the alignment of the trailing edge, draw a mark on each side of the stabilizer (at the trailing edge) where it meets the fuselage sides.

❏   With the marks on the stabilizer lined up with the fuselage sides, hold **only** the trailing edge of the stabilizer in position using a T-Pin.

> **IMPORTANT** The front of the stabilizer should be able to pivot from side to side and the back should stay firmly in place and aligned. The trailing edge should not be allowed to move from side to side.

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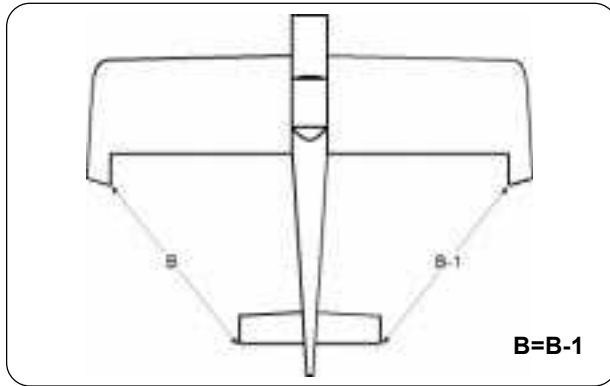
❏   With the wing mounted to the fuselage, use a ruler to measure the distance between the tips of the stabilizer and the tips of the wing. Pivot the front of the stabilizer until both of these measurements are equal.

❏   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.

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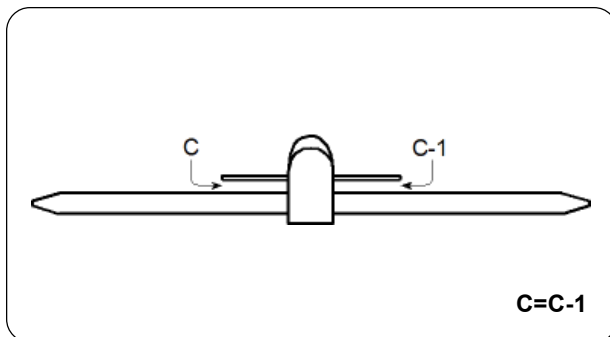
❏   With the stabilizer held firmly in place, look from the front of the airplane at both the wing and the stabilizer. When aligned properly, the stabilizer should be parallel to the wing.

☞ 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.

❏   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 the bottom.
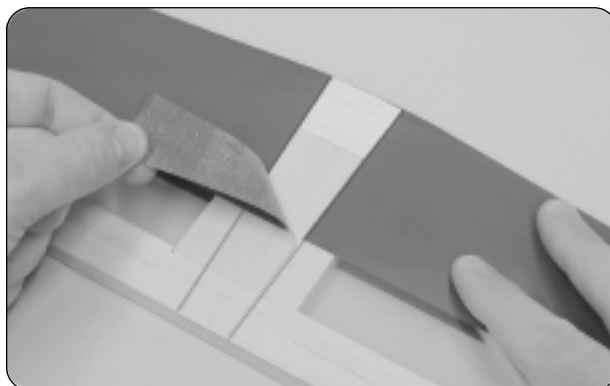
❏   Remove the stabilizer. Using a modeling knife, carefully cut away and remove the covering material from between the lines you drew. Do this on both the top and the bottom.

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 **ONLY the top and bottom** gluing surfaces of the stabilizer.

> **IMPORTANT** Because the stabilizer has to slide into place through the fuselage, apply epoxy only to the stabilizer. This will prevent the epoxy from spreading over the entire length of one half of the stabilizer when you slide it into place.

❏   Slide the stabilizer back into place and realign it, double-checking all of your measurements once more before the epoxy sets up. Quickly remove any 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 2: Aligning & Installing the Vertical Stabilizer

❏ Remove the rudder and hinges from the vertical stabilizer and set them aside for now.
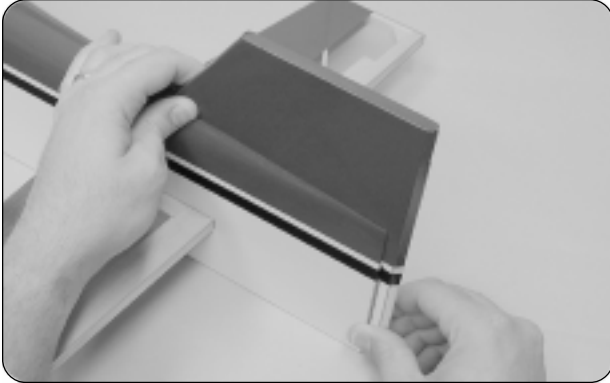
❏ Push the vertical stabilizer down into its mounting slot. To align it properly, the rudder post should be tight against the back of the fuselage and centered between the fuselage sides, and the stabilizer should be pushed down firmly.

❏ While holding the vertical 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.

❏ Now, cut away and remove the covering material from the base of the stabilizer, the front of the rudder post and the back of the fuselage where the rudder post will be glued.

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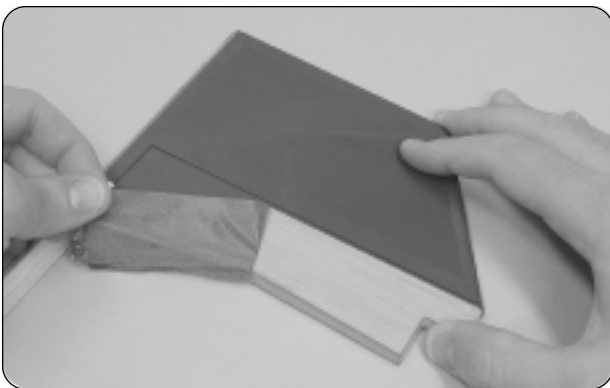
❏ Push the stabilizer down into place and realign it, double-checking all of your measurements once more before the epoxy sets up. Quickly remove the excess epoxy and use pieces of masking tape to hold the stabilizer in place until the epoxy has fully cured.

SECTION 10: CONTROL SURFACE HINGING

YOU'LL NEED THE FOLLOWING PARTS FROM THE KIT:

❏ (17) C/A Style Hinges

YOU'LL NEED THE FOLLOWING TOOLS AND SUPPLIES:

❏ Kwik Bond Thin C/A

❏ Kwik Bond C/A Debonder

❏ Excel Modeling Knife

❏ Ernst Airplane Stand

❏ Paper Towels

Step 1: Hinging the Ailerons

IMPORTANT For flutter-free control surfaces, it is imperative that the hinges be glued in properly. This is achieved by having a tight hinge gap and using plenty of thin C/A glue. Poor hinge installation can lead to flutter which can result in a catastrophic failure of the airframe.

☞ 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 up firmly 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 & Rudder

❏   Hinge the elevator halves and rudder using the same techniques as hinging the ailerons. Each elevator half is hinged using three hinges and the rudder is hinged using three hinges, too. When hinging the elevator halves and the rudder, there should be no more than a 1/16" gap between the counter-balances and the stabilizers. Remember, after allowing the C/A to fully cure, pull on the control surfaces to check the integrity of the hinges.

SECTION 11: TAIL WHEEL INSTALLATION

YOU'LL NEED THE FOLLOWING PARTS FROM THE KIT:

❏ (1) Nylon Tail Wheel Bracket
❏ (1) Nylon Tail Wheel Tiller Arm
❏ (1) Prebent Tail Wheel Wire
❏ (1) Tail Wheel

❏ (2) Wheel Collars w/Set Screws
❏ (1) Nylon Spacer
❏ (1) M2.5 x 12 Wood Screw
❏ (3) M3 x 12 Wood Screws

YOU'LL NEED THE FOLLOWING TOOLS AND SUPPLIES:

❏ # 1 Phillips Head Screwdriver
❏ Electric Drill
❏ 5/64" Drill Bit
❏ Ernst Airplane Stand

❏ Rotary Tool w/Cutting Disc
❏ Pencil
❏ Masking Tape

Step 1: Assembling & Installing the Tail Wheel Bracket

❏   Push one wheel collar into the molded recess in the nylon tiller arm. Carefully rotate the wheel collar until the threaded hole in the wheel collar lines up with the molded hole in the side of the tiller arm.
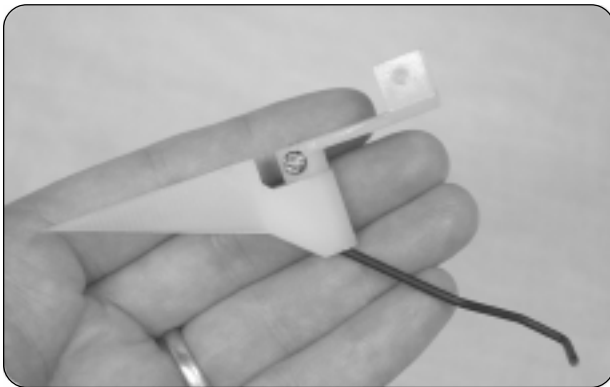
❏   Partially thread one set screw through the tiller arm and into the wheel collar.

❏   Push the tail wheel wire up through the tail wheel bracket, then slide the tiller arm over the wire and push it down against the bracket.

❏   Rotate both the tail wheel wire and the tiller arm so that they face the back of the bracket. While holding everything in alignment, tighten the machine screw.

❏   Using a rotary tool with a cutting disc, carefully cut the excess wire off flush with the nylon tiller arm.
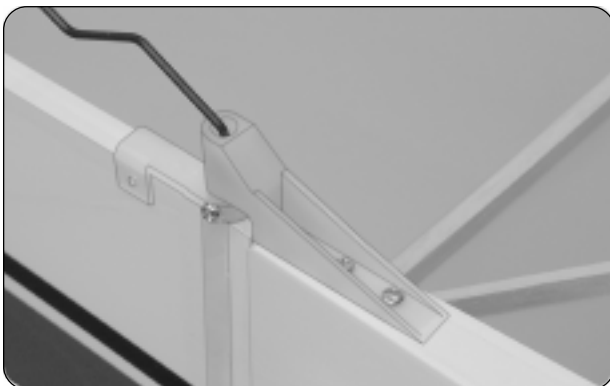
❏   Set the tail wheel bracket into place. To align the assembly, the pivot point of the tiller arm should be even with the rudder hinge line and the bracket should be centered on the bottom of the fuselage.

☞ The clasp of the tiller arm should fit over the bottom edge of the rudder.

❏ When satisfied with the alignment, drill three 5/64" diameter pilot holes through the fuselage for the wood screws.

❏ Mount the tail wheel assembly to the fuselage using three M3 x 12 wood screws.

❏ While holding the tiller arm firmly against the bottom of the rudder, drill a 5/64" diameter pilot hole through both sides of the nylon clasp and through the rudder.

❏ Thread the M2.5 x 12 wood screw into one side of the clasp, through the rudder and into the other side of the clasp.

☞ Do not overtighten the screw or you might strip out the nylon clasp.

❏ Slide the nylon spacer onto the tail wheel wire, followed by the tail wheel. Use one wheel collar and set screw to hold the wheel in place.

❏ Loosen the machine screw in the side of the tiller arm. With the rudder centered, pivot the tail wheel wire until the tail wheel is aligned with the rudder. When satisfied with the alignment, tighten the machine screw firmly.

SECTION 12: MAIN LANDING GEAR INSTALLATION

YOU'LL NEED THE FOLLOWING PARTS FROM THE KIT:

❏ (1) Prebent Aluminum Main Gear Strut
❏ (2) Main Gear Wheels
❏ (2) M4 x 16 Machine Screws

❏ (2) M4 x 35 Smooth-Shank Machine Screws
❏ (8) M4 Flat Washers
❏ (4) M4 Lock Nuts

YOU'LL NEED THE FOLLOWING TOOLS AND SUPPLIES:

❏ Kwik Bond Thin C/A
❏ # 2 Phillips Head Screwdriver
❏ Adjustable Wrench

❏ Needle Nose Pliers
❏ Ernst Airplane Stand

Step 1: Installing the Main Gear Strut

❏ Install the landing gear strut to the bottom of the fuselage using two M4 x 16 machine screws and two M4 flat washers.

☞ Blind nuts have been preinstalled in the bottom of the landing gear mounting block for the machine screws.

IMPORTANT Tighten the machine screws firmly so they won't come loose during flight.

Step 2: Installing the Main Gear Wheels

❏ Slide one main gear wheel onto one M4 x 35 smooth-shank machine screw.

❏ Slide one M4 flat washer up against the wheel and install one M4 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.

IMPORTANT The C/A should be fully cured before proceeding.

❏ After the C/A has fully cured, slide one M4 flat washer up against the lock nut.
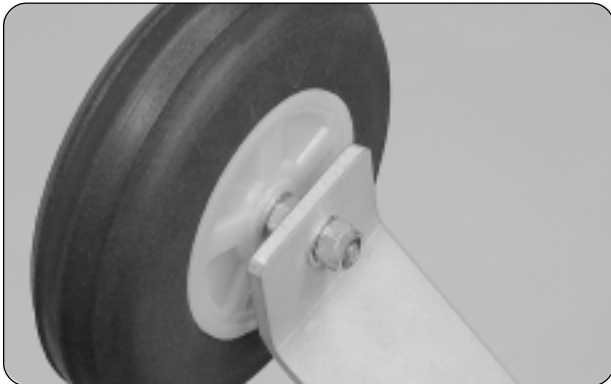
❏ Slide the axle assembly through the predrilled hole in the main gear strut and secure it into place using one M4 flat washer and one M4 lock nut. Tighten the lock nut firmly while holding the inner lock nut in place with a pair of needle nose pliers.

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

❏ Repeat the previous procedures to install the second wheel and axle assembly.

SECTION 13: ENGINE INSTALLATION

YOU'LL NEED THE FOLLOWING PARTS FROM THE KIT:

❏ (2) Engine Mounting Beams
❏ (4) M4 x 20 Socket-Cap Screws
❏ (4) M4 x 25 Socket-Cap Screws

❏ (4) M4 Lock Nuts
❏ (12) M4 Flat Washers

YOU'LL NEED THE FOLLOWING TOOLS AND SUPPLIES:

❏ Pacer Z-42 Threadlocker
❏ 3mm Hex Wrench
❏ Adjustable Wrench
❏ Electric Drill

❏ 3/32" & 11/64" Drill Bits
❏ Ernst Airplane Stand
❏ Ruler
❏ Pencil

Step 1: Installing the Engine Mounting Beams

The references in this section are taken from the consideration that you are looking at the front of the airplane with the airplane right-side up. The airplane is designed for the engine to be mounted inverted.

❏ Install the two engine mounting beams using the four M4 x 20 socket-cap screws and four M4 flat washers. Tighten the screws firmly to hold the beams securely in place.

IMPORTANT Blind nuts have been preinstalled into the back of the firewall to thread the screws into.

IMPORTANT The engine mounting beams are spaced to fit the Magnum XLS .91 two stroke engine. If the width of the engine you choose is not the same, you will have to modify the spacing of the beams. This can be done by removing the blind nuts and gluing pieces of hardwood dowel into the existing holes. You can then redrill the holes to fit your engine's width and reinstall the blind nuts.

Step 2: Aligning & Installing the Engine
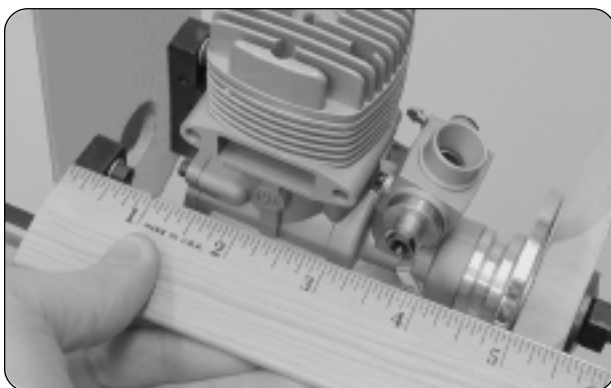
❏ Slide the spinner backplate onto your engine and secure it into place using your engine's prop washer and nut.

❏ Set the engine onto the engine mounting beams.

❏ Using a ruler, measure the distance from the firewall to the back of the spinner backplate. Adjust the depth of the engine so the measurement is 4-3/4".

❏ Using a pencil, carefully mark the locations of the engine mounting holes onto the mounting beams.

❏ Remove the engine and drill 3/32" diameter pilot holes through the engine mounting beams, at the marks you drew.

☞ Be careful that you drill the holes straight down and not at an angle.

❏ Carefully enlarge the pilot holes using an 11/64" diameter drill bit.
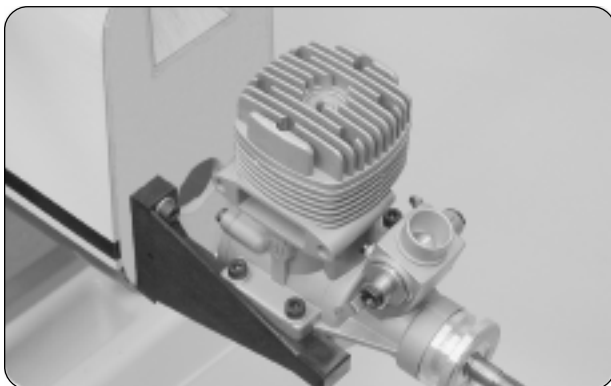
❏ Install the engine using four M4 x 25 socket-cap screws, eight M4 flat washers and four M4 lock nuts.

☞ Tighten the screws and nuts firmly to hold the engine securely in place.

SECTION 14: FUEL TANK ASSEMBLY & INSTALLATION

YOU'LL NEED THE FOLLOWING PARTS FROM THE KIT:

- ❑ (1) 320cc Fuel Tank
- ❑ (1) Large Diameter Metal Plate
- ❑ (1) Small Diameter Metal Plate
- ❑ (1) Rubber Stopper

- ❑ (1) Fuel Pick-Up "Clunk"
- ❑ (1) M3 x 20 Machine Screw
- ❑ (1) Silicon Fuel Tubing
- ❑ (2) Aluminum Tubing

YOU'LL NEED THE FOLLOWING TOOLS AND SUPPLIES:

- ❑ # 1 Phillips Head Screwdriver
- ❑ Excel Modeling Knife
- ❑ Scissors

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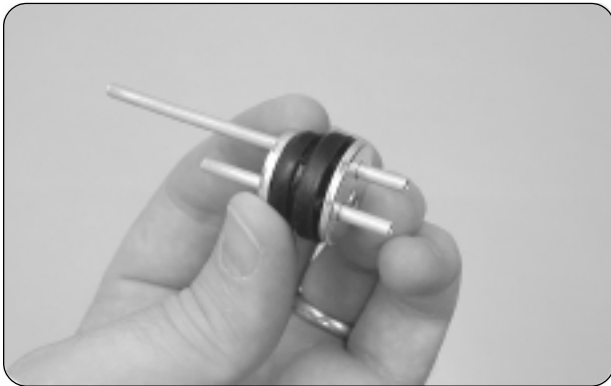
❑   Push the two aluminum tubes through the rubber stopper. Slide the large diameter metal plate over the tubes at the front of the stopper and slide the small diameter metal plate over the tubes at the rear of the stopper.

❑   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 inside the bubble in the top of the tank.
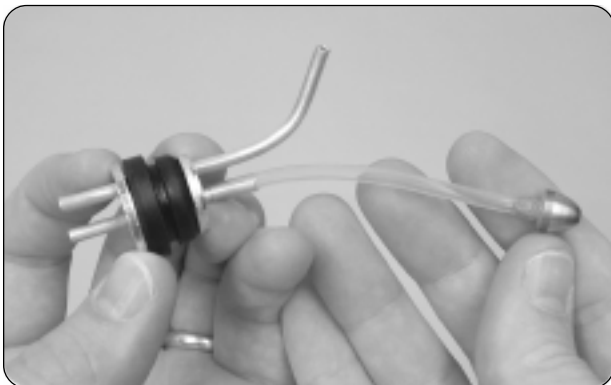
❑   Secure one end of the silicon fuel tubing onto the end of the fuel pick-up "clunk."

❑   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 4-3/8" back from the rear of the stopper assembly.

❑   Push the M3 x 20 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 inside the bubble in the top of the 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.

IMPORTANT Do not overtighten the screw. This could cause the front of the fuel tank to split.

❑ With the stopper assembly in place, double-check to make sure that the fuel pick-up can move freely inside the tank. Ideally, the fuel pick-up should be about 1/4" in front of the back of the tank.

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 into position, making sure that the stopper assembly lines up with, and is pushed into, 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 be parallel with, but about 5/16" higher than, the fuel tank support platform.

IMPORTANT Make sure that the top of the fuel tank is toward the top of the fuselage.
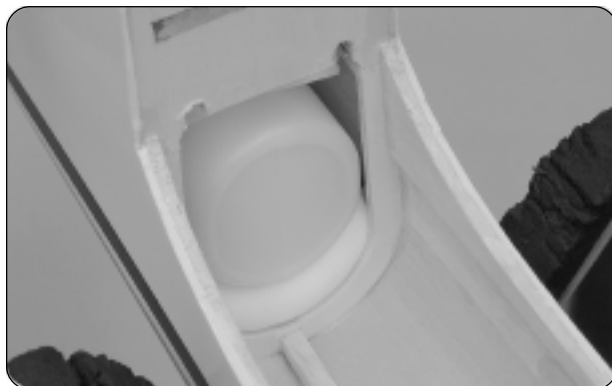
❑ Cut and install several pieces of foam rubber between the bottom of the fuel tank and the top of the fuel tank support platform, and between top of the fuel tank and the top of the fuselage, to wedge the fuel tank securely into place.

☞ Make sure that the foam will not interfere with installation of your engine's throttle pushrod wire.

SECTION 15: SERVO INSTALLATION

YOU'LL NEED THE FOLLOWING TOOLS AND SUPPLIES:

❏ # 1 Phillips Head Screwdriver
❏ Excel Modeling Knife
❏ Electric Drill

❏ 5/64" Drill Bit
❏ Ernst Airplane Stand
❏ 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.
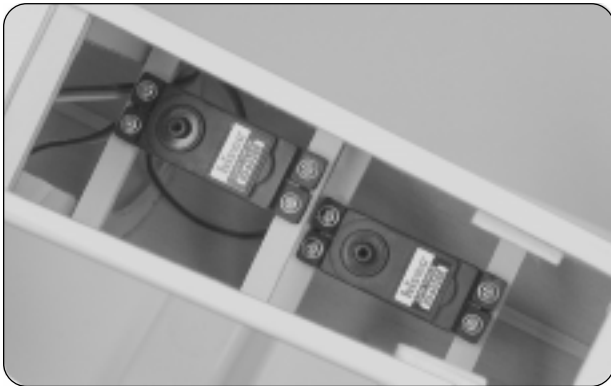
❏   Install the rudder and elevator servos into the fuselage, as shown.

IMPORTANT The rudder servo (rear-most servo) should be centered on the mounting rails. The elevator servo should be offset about 3/8" from center, as shown. Both servos' output shafts should be toward the front of the fuselage.

❏   Install the throttle servo into the servo tray in the wing saddle area. The servo output shaft should be toward the left side of the fuselage, as shown.

❏   Using a modeling knife, cut away and remove the covering material from over the half-round servo lead exit holes in the top of the wing.

❏   Using a modeling knife, cut away and remove the covering material from over the aileron servo cutouts in the bottom of the wing.

❏   Install each aileron servo 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) 21-3/4" 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.
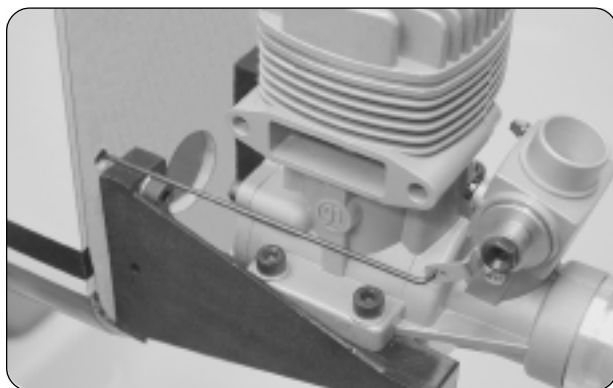
❏ Slide the pushrod wire through the predrilled hole in the firewall.

❏ Reinstall the throttle arm onto your engine.

IMPORTANT So that the pushrod wire doesn't bind, you may need to make a bend in the pushrod wire so that it lines up better with your engine's 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.
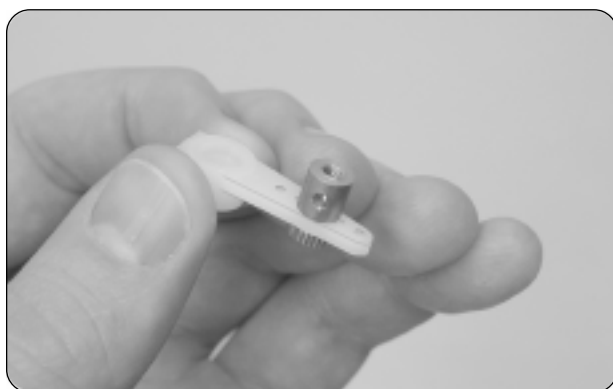
❏ Enlarge the **third hole** out from the center of the servo arm using a 5/64" drill bit.

❏ 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 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 counter-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 to 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: RUDDER CONTROL SYSTEM INSTALLATION

YOU'LL NEED THE FOLLOWING PARTS FROM THE KIT:

❑　(2) 21-1/2" Threaded Wires w/90º Bend
❑　(2) Nylon Control Horns (Large)
❑　(4) M2 x 17 Machine Screws

❑　(4) M2 Hex Nuts
❑　(2) Nylon Clevises
❑　(2) Nylon 90º Snap Keepers

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

❑　5/64" Drill Bit
❑　Ernst Airplane Stand
❑　Ruler
❑　Pencil
❑　Masking Tape

Step 1: Installing the Rudder Pushrod Wires

❑　Using a modeling knife, cut away and remove two arms from a large "4-point" servo horn.
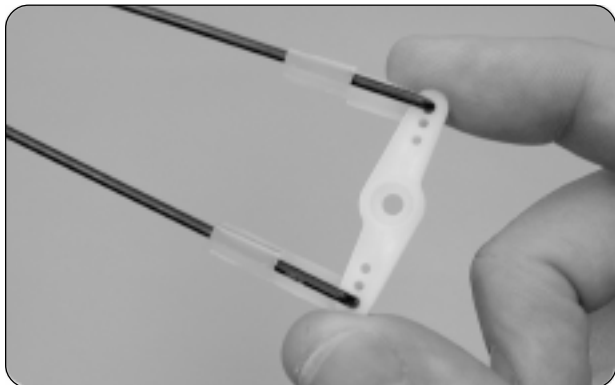
❑　Install the 90º bend in each 21-1/2" long rudder pushrod wire into the **third hole** out in the servo arms, using the snap keepers provided. When installing the snap keepers, make sure they "snap" firmly into place over the pushrod wires.

☞ 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. The holes are located 6-1/4" in front of the rudder hinge line and 2-3/16" above the top of the horizontal stabilizer.

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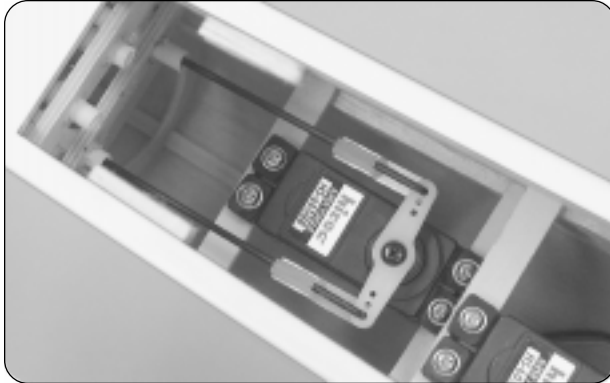
❑   Carefully slide the pushrod wires into the preinstalled pushrod housings in the rear bulkhead and install the servo horn onto the servo, making sure it's centered.

❑   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.

❑   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 onto each side of the rudder using four M2 x 17 machine screws and four M2 hex nuts, being careful not to overtighten them so you don't crush the rudder.

❑   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** in 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 18: ELEVATOR CONTROL SYSTEM INSTALLATION

YOU'LL NEED THE FOLLOWING PARTS FROM THE KIT:

❑ (1) 19-1/8" Threaded Wire w/90º Bend
❑ (1) 18" Threaded Wire
❑ (2) Nylon Control Horns w/Backplates (Small)
❑ (4) M2 x 15 Machine Screws

❑ (2) Nylon Clevises
❑ (1) Nylon 90º Snap Keeper
❑ (2) Wheel Collars w/Set Screws

YOU'LL NEED THE FOLLOWING TOOLS AND SUPPLIES:

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

❑ 5/64" Drill Bit
❑ Ernst Airplane Stand
❑ Ruler
❑ Pencil
❑ 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 **third hole** out from the center of the servo arm using a 5/64" drill bit.
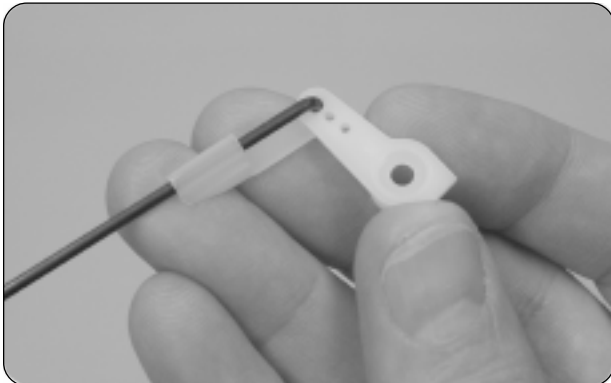
❑ Install the 90º bend in the 19-1/8" long elevator pushrod wire into the hole that you just enlarged, using the snap keeper provided. When installing the snap keeper, make sure it "snaps" firmly into place over the pushrod wire.

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

❑ Partially thread one set screw into each of the two wheel collars, then slide the wheel collars onto the elevator pushrod wire and up against the snap keeper.
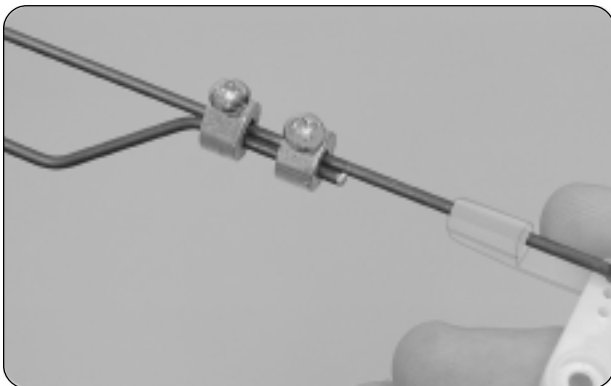
❑ Make a shallow bend 1-1/2" from the **plain end** of the 18" long pushrod wire, then slide the pushrod wire through the wheel collars as shown. The bend in the wire should be deep enough to separate the pushrod wires by 1/2".

❑ Adjust the pushrod wire so both threaded 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. The holes are located 9-1/4" in front of the rudder hinge line and 1/2" below the bottom of the stabilizer.

❏ Connect your radio system and plug the elevator servo into the receiver. Double-check that the elevator trim lever on your transmitter is centered.
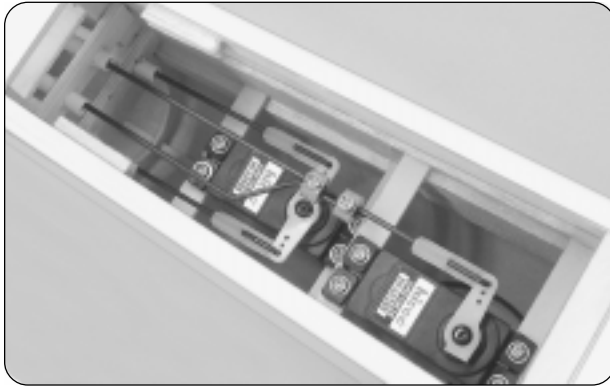
❏ Carefully slide the pushrod wires into the preinstalled pushrod housings.

❏ Install the servo horn, making sure that 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 3/4" 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 M2 x 15 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 **outermost hole** in 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 19: AILERON CONTROL SYSTEM INSTALLATION

YOU'LL NEED THE FOLLOWING PARTS FROM THE KIT:

❑ (2) 3-7/8" Threaded Wires w/Z-Bend   ❑ (4) M2 x 15 Machine Screws

❑ (2) Nylon Control Horns w/Backplates (Small)   ❑ (2) Nylon Clevises

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

❑ Install the Z-bend in one aileron pushrod wire into the enlarged hole in the servo arm.

❑   Center the aileron servo and install the servo arm assembly making sure that the servo arm is centered and points toward the wing tip.

❑   Install and tighten the servo arm retaining screw.

Step 2: Installing the Control Horn & Clevis

❑ 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 M2 x 15 machine screws. Make sure that the control horn is parallel to the hinge line and that the clevis attachment holes are over the hinge line.

☞ The centerline of the control horn should be approximately 8-1/8" out from the inside edge of the aileron.

❏ Thread one clevis onto the pushrod wire and snap it into the **outermost hole** in 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) Prepainted Molded Fiberglass Cowling
❏ (1) Molded Clear Canopy
❏ (2) M2 x 10 Flange-Head Wood Screws

❏ (4) M3 x 5 Wood Screws
❏ (4) M3 Flat Washers
❏ (1) Decal Set

YOU'LL NEED THE FOLLOWING TOOLS AND SUPPLIES:

❏ Kwik Bond Thin C/A
❏ Pacer Formula 560 Canopy Glue
❏ # 1 Phillips Head Screwdriver
❏ Promax Canopy Scissors
❏ Electric Drill
❏ 5/64" & 1/8" Drill Bits

❏ Ernst Airplane Stand
❏ Rotary Tool w/Cutting Disc & Sanding Drum
❏ Ruler
❏ Pencil
❏ 220 Grit Sandpaper w/Sanding Block
❏ Masking Tape

Step 1: Aligning the Cowling

❏ Remove the needle valve and muffler assembly from your engine.

❏ Temporarily slide the cowling over the engine and onto the fuselage. So that the cowling will slide into place, you will need to cut away a portion of the cowling to clear the engine's cylinder head and carburetor. Use a rotary tool with a cutting disc and a sanding drum to make the cutout. Work slowly, checking the fit often so you don't remove too much of the cowling or damage it.

❏ With the cowling temporarily in place, secure your spinner backplate to the engine's crankshaft.

❏ Line up the front of the cowling using the backplate as your guide. When aligned properly, the cowl ring should be centered with the spinner backplate and there should be about a 1/16" - 3/32" gap between the two. The stripes on the sides of the cowling should also be lined up with the stripes on the sides of the fuselage.

❏ When satisfied with the alignment, use pieces of masking tape to hold the cowling securely in place and aligned.

Step 2: Installing the Cowling

❑ With the cowling held firmly in place, drill 5/64" diameter pilot holes into the cowling and through the fuselage for the four wood screws. Locate two holes on each side of the cowling, 1/4" in front of the back edge of the cowling. One hole should be 1/2" up from the bottom of the cowling, and the other hole should be just below the cowling's upper radius.

❑ Remove the cowling and enlarge **only** the holes in the cowling using a 1/8" drill bit.

☞ Enlarging the holes will prevent the fiberglass from being cracked when you install the wood screws.

❑ To strengthen the holes in the fuselage that the wood screws will thread into, carefully apply a couple of drops of thin C/A into the holes and let it dry completely before installing the cowling.

❑ At this time you should make the rest of the cut-outs in the cowling for your engine. These include cut-outs for the high and low speed needle valves, glow igniter, muffler assembly and fueling valve assembly.

> **IMPORTANT** We strongly suggest cutting an air-exit hole in the bottom of the cowling along with the opening needed to clear your muffler. For proper engine cooling, it's important to have about 30 percent more air-exit area than air-intake area.

❑ After making the rest of the necessary cut-outs, install your fueling valve, then slide the cowling partially into place and connect the fuel lines from the fuel tank to the fueling valve, carburetor and muffler pressure tap.

❑ Slide the cowling into position and realign it. Install and tighten the four M3 x 5 wood screws and four M3 flat washers to hold the cowling firmly in place.

❑ Install your spinner assembly and propeller to finish off the installation.

Step 3: Aligning & Installing the Canopy

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

❑ 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.
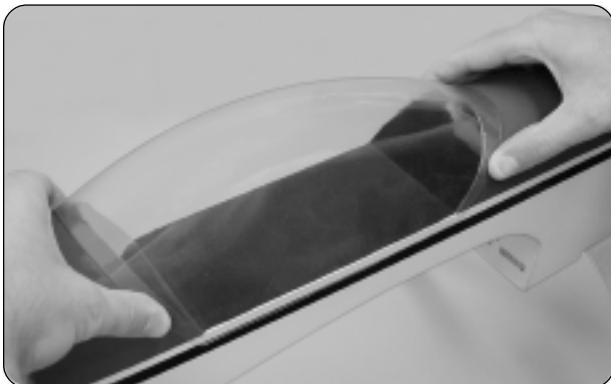
❑ Set the canopy onto the fuselage and align it. The canopy should be centered over the middle of the fuselage when looking from the front and it should be centered over the cockpit area when looking from the side.

❏ When satisfied with the fit and alignment, 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 4: Installing the Hatch Covers

❏ Set each of the two hatch covers into place and align them with the fuselage.
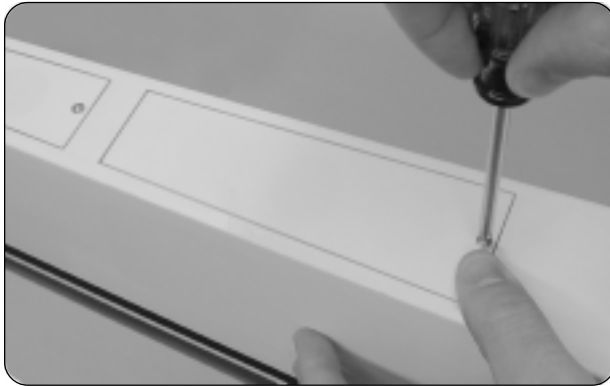
❏ Install each hatch cover using one M2 x 10 flange-head wood screw.

☞ To make it easier to install the wood screws, drill a 5/64" diameter pilot hole through the hatch covers.

Step 5: Installing the Receiver & Battery

IMPORTANT We don't suggest permanently installing the receiver and battery until you have balanced the airplane. 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 well 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.

☞ If necessary, the receiver and/or a square battery pack can be mounted on the platform under the rear hatch cover.
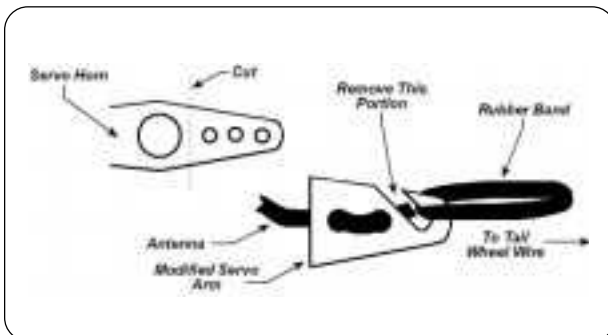
❏ After installing the receiver, drill a 5/64" hole through the fuselage for the antenna to exit. Unwrap the receiver antenna and feed it out through the hole.

❏ 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 side and connect the battery lead to the switch, and the switch and servo leads to the receiver.

SECTION 21: BALANCING THE EXCITE 90L ARF

YOU'LL NEED THE FOLLOWING TOOLS AND SUPPLIES:
❑   # 2 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:

4-3/4" to 6-1/2" back from the leading edge of the wing, measured 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 (5-5/8"), 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 6-1/2".

☞ 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, **5-5/8" back from the leading edge, measured 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 forward far enough 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.

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

SECTION 22: LATERAL BALANCING THE EXCITE 90L ARF

☞ 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). For best mechanical advantage, place the weight as close to the wing tip as possible.

❑   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 Excite 90L ARF 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:	**1" Up**	**1" Down**
Elevator:	**1-1/4" Up**	**1-1/4" Down**
Rudder:	**1" Right**	**1" Left**

☞ The aileron control throw is measured at the tip of the aileron. The elevator and rudder control throws are measured at 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 most aerobatics with ease.

AEROBATIC-FLYING

Ailerons:	**1-1/2" Up**	**1-1/2" Down (Measured at the Tip)**
Elevator:	**1-5/8" Up**	**1-5/8" Down (Measured at the Widest Point)**
Rudder:	**1-1/2" Right**	**1-1/2" Left (Measured at the Widest Point)**

> **IMPORTANT** 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.

> **If you're using a computer radio system and want to set up your Excite 90L ARF to use mixing and be 3D Aerobatics capable , check out the Computer Radio Setup section on the next page. We still recommend setting the control throws to the Test-Flying settings shown above until after your first few test flights.**

SECTION 24: COMPUTER RADIO SETUP

Although you don't have to use a computer radio to enjoy the flying qualities of the Excite 90L ARF, if you're planning on doing extreme 3D aerobatics, it is recommended. Before making any adjustments, please read and understand your radio's setup manual.

Chances are that if you want to set up your Excite 90L ARF with a computer radio to take advantage of mixing capabilities, you probably want an extreme 3D flying machine. In that case, use the 3D Aerobatic control throws listed below.

IMPORTANT - READ THIS BEFORE GOING FURTHER

The 3D aerobatic control throws listed below make the airplane extremely control sensitive. Use these control throws only if you have a computer radio that you can program exponential and dual rates into. Your radio system must have the capability to turn these control throws off during normal flight and turn them on before flying 3D maneuverers. Normal flying does not require this amount of control throw. If you're going to be doing 3D flying, we strongly suggest using the Aerobatic-Flying control throws as your low rate control throws and using the 3D Aerobatic control throws as your high rate control throws. Only switch to high rate control throws when preparing to do 3D Aerobatic maneuvers.

3D AEROBATIC CONTROL THROWS

Ailerons:	**3" Up**	**3" Down** (Measured at the Tip)
Elevator:	**3" Up**	**3" Down** (Measured at the Widest Point)
Rudder:	**3-1/4" Right**	**3-1/4" Left** (Measured at the Widest Point)

EXPONENTIAL:

Expo, as it's more commonly referred to, softens the control feel around neutral. This is especially helpful when flying an airplane that uses a lot of control throw. Softening the neutral point makes the airplane fly more smoothly and makes it more likely that you won't over-control. Obviously, you may want to change the expo settings to suit your flying style, but here are some good starting points:

Ailerons: 50%

Elevator: 60%

Rudder: 50%

We strongly suggest programming exponential into your control surfaces. It will make a huge difference when the control throws are set to the 3D Aerobatics settings. If you don't use exponential with the 3D Aerobatic control throws, the airplane will be so sensitive that you may loose control of it and crash.

FLAPERON AND SPOILERON MIXING:

Plugging the servos separately into the receiver (one into channel 1 and one into channel 6) will allow the use of flaperons (both ailerons down at the same time) and spoilerons (both ailerons up at the same time). These functions can then be mixed with the elevator for extreme pitch changes useful in extreme 3D aerobatic maneuvers.

Elevator:	**3" Up**	**and Spoilerons (up) 3/4"**
Elevator:	**3" Down**	**and Flaperons (down) 3/4"**

IMPORTANT Use of more than 3/4" of flaperons and spoilerons will cause excessive drag, negating any of their useful effects. We do not recommend using flaperon and spoileron with elevator mixing during general flying, especially during takeoff and landing.

SECTION 25: 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's 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 them from 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 26: FLYING THE EXCITE 90L ARF

The Excite 90L 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 Excite 90L ARF 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 - PLEASE READ THIS BEFORE FLYING YOUR EXCITE 90L ARF**
>
> 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 failure and a crash.

TAKE-OFF

Because the Excite 90L ARF 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 Excite 90L ARF very smooth and predictable.

IN THE AIR

In the air the Excite 90L ARF 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, all general aerobatic maneuvers can be performed without hesitation. If you want to fly extreme 3D aerobatic maneuvers, you can increase the control throws even more and the airplane will happily oblige. If you don't plan on flying extreme 3D aerobatic maneuvers, we suggest that you make the "Aerobatic Flying" settings 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 aerobatic flying you can flip to high rates.

LANDING

Just because the Excite 90L ARF 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 27: EXCITE 90L ARF 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"	If A) Adjust linkages to reduce control throws
		B) Controls are not sensitive enough or airplane feels "mushy"	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	If A) Engine thrust angle is correct
		B) Airplane pitches nose up	If B) Decrease engine down thrust
		C) Airplane pitches nose down	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	If A) Center of gravity is correct
		B) Nose pitches up	If B) Add nose weight
		C) Nose pitches down	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	If A) Trim settings are correct
		B) Airplane yaws to right in both inside and outside loops	If B) Add left rudder trim
		C) Airplane yaws to left in both inside and outside loops	If C) Add right rudder trim
		D) Airplane yaws to the right in inside loops and yaws to the left in outside loops	If D) Add left aileron trim
		E) Airplane yaws to the left in inside loops and yaws to the right in outside loops	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	If A) Lateral balance is correct
		B) Airplane falls off to the left. Worsens as loops tighten	If B) Add weight to right wing tip
		C) Airplane falls off to the right. Worsens as loops tighten	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	If A) Trim settings are correct
		B) Nose tends to go toward an inside loop	If B) Raise both ailerons very slightly
		C) Nose tends to go toward an outside loop	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 Excite 90L ARF # 123751**

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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