

Synapse

ARF



INSTRUCTION MANUAL

Wingspan: 26.5 in [675mm]
Wing Area: 168 sq in [10.8 dm²]
Length: 24 in [610mm]
Weight: 12.5-13.5 oz [350-380g]
Wing Loading: 10.7-11.6 oz/ft² [33-35g/dm²]
Radio: 3-Channel (minimum) with micro receiver and 2 micro servos

WARRANTY

Great Planes® Model Manufacturing Co. guarantees this kit to be free from defects in both material and workmanship at the date of purchase. This warranty does not cover any component parts damaged by use or modification. In no case shall Great Planes' liability exceed the original cost of the purchased kit. Further, Great Planes reserves the right to change or modify this warranty without notice.

In that Great Planes has no control over the final assembly or material used for final assembly, no liability shall be assumed nor accepted for any damage resulting from the use by the user of the final user-assembled product. By the act of using the user-assembled product, the user accepts all resulting liability.

If the buyer is not prepared to accept the liability associated with the use of this product, the buyer is advised to return this kit immediately in new and unused condition to the place of purchase.

To make a warranty claim send the defective part or item to Hobby Services at the address below:

Hobby Services
3002 N. Apollo Dr., Suite 1
Champaign, IL 61822 USA

Include a letter stating your name, return shipping address, as much contact information as possible (daytime telephone number, fax number, e-mail address), a detailed description of the problem and a photocopy of the purchase receipt. Upon receipt of the package the problem will be evaluated as quickly as possible.

READ THROUGH THIS MANUAL BEFORE STARTING CONSTRUCTION. IT CONTAINS IMPORTANT INSTRUCTIONS AND WARNINGS CONCERNING THE ASSEMBLY AND USE OF THIS MODEL.



Champaign, Illinois
(217) 398-8970, Ext 5
airsupport@greatplanes.com

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INTRODUCTION

Welcome to the exciting world of EDF (Electric Ducted Fan) airplanes! Continuing on the great success of the first pair of planes to use the Great Planes EDF unit, the MiGLET and the XPD-8, comes a sleek new design with a racing paint scheme. Molded in finger grips on the underside of the plane will allow you or a partner to launch the plane into the air, while the thrust of the EDF unit immediately increases airspeed to climb to altitude. After the flight, the magnetic canopy hatch removes easily for a fast battery pack change.

For the latest technical updates or manual corrections to the Synapse ARF visit the Great Planes web site at www.greatplanes.com. Open the "Airplanes" link, then select the Synapse ARF. If there is new technical information or changes to this model a "tech notice" box will appear in the upper left corner of the page.

AMA

We urge you to join the AMA (Academy of Model Aeronautics) and a local R/C club. The AMA is the governing body of model aviation and membership is required to fly at AMA clubs. Though joining the AMA provides many benefits, one of the primary reasons to join is liability protection. Coverage is not limited to flying at contests or on the club field. It even applies to flying at public demonstrations and air shows. Failure to comply with the Safety Code (excerpts printed in the back of the manual) may endanger insurance coverage. Additionally, training programs and instructors are available at AMA club sites to help you get started the right way. There are over 2,500 AMA chartered clubs across the country. Contact the AMA at the address or toll-free phone number below.



Academy of Model Aeronautics

5151 East Memorial Drive
Muncie, IN 47302

Tele: (800) 435-9262

Fax (765) 741-0057

Or via the Internet at:

<http://www.modelaircraft.org>

IMPORTANT!!! Two of the most important things you can do to preserve the radio controlled aircraft hobby are to avoid flying near full-scale aircraft and avoid flying near or over groups of people.

PROTECT YOUR MODEL, YOURSELF & OTHERS...FOLLOW THESE IMPORTANT SAFETY PRECAUTIONS

1. Your Synapse ARF should not be considered a toy, but rather a sophisticated, working model that functions very much like a full-size airplane. Because of its performance capabilities, the Synapse, if not assembled and operated correctly, could possibly cause injury to yourself or spectators and damage to property.
2. You must assemble the model **according to the instructions**. Do not alter or modify the model, as doing so may result in an unsafe or unflyable model. In a few cases the instructions may differ slightly from the photos. In those instances the written instructions should be considered as correct.
3. You must take time to build **straight, true and strong**.
4. You must correctly install all R/C and other components so that the model operates correctly on the ground and in the air.
5. You must check the operation of the model before **every** flight to insure that all equipment is operating and that the model has remained structurally sound. Be sure to check pushrod connectors or servo arms often and replace them if they show any signs of wear or fatigue.

6. If you are not an experienced pilot or have not flown this type of model before, we recommend that you get the assistance of an experienced pilot in your R/C club for your first flights. If you're not a member of a club, your local hobby shop has information about clubs in your area whose membership includes experienced pilots.

We, as the kit manufacturer, provide you with a top quality, thoroughly tested kit and instructions, but ultimately the quality and flyability of your finished model depends on how you build it; therefore, we cannot in any way guarantee the performance of your completed model, and no representations are expressed or implied as to the performance or safety of your completed model.

Remember: Take your time and follow the instructions to end up with a well-built model that is straight and true.

LITHIUM BATTERY HANDLING & USAGE

WARNING!! Read the entire instruction sheet included with the battery. Failure to follow all instructions could cause permanent damage to the battery and its surroundings, and cause bodily harm!

- ONLY use a LiPo approved charger. NEVER use a NiCd/NiMH peak charger!
- NEVER charge in excess of 4.20V per cell.
- ONLY charge through the "charge" lead. NEVER charge through the "discharge" lead.
- NEVER charge at currents greater than 1C.
- ALWAYS set charger's output volts to match battery volts.
- ALWAYS charge in a fireproof location.
- NEVER trickle charge.
- NEVER allow battery temperature to exceed 150° F (65° C).
- NEVER disassemble or modify pack wiring in any way or puncture cells.
- NEVER discharge below 2.5V per cell.
- NEVER place on combustible materials or leave unattended during charge or discharge.
- ALWAYS KEEP OUT OF REACH OF CHILDREN.

DECISIONS YOU MUST MAKE

This is a partial list of items required to finish the Synapse ARF that may require planning or decision making before starting to build. Order numbers are provided in parentheses.

Radio Equipment & Electronics

The Synapse ARF requires a transmitter that supports elevon mixing, a micro receiver, and two micro servos (9g or less). If you already have a transmitter you are going to use to fly the Synapse, you can get the receiver and servos separately:

- Futaba R114F 4-channel FM micro receiver w/o crystal (low band - FUTL0442, high band - FUTL0443)
- Futaba FM single conversion receiver crystal for R114F (low band - FUTL62**, high band - FUTL63**)
- Futaba S3114 micro HT servo (FUTM0414)

Or, you can purchase a complete system (including transmitter) specially packaged for park flyers. If purchasing a complete system, the Futaba 3FR Skysport (FUTJ53**) single-stick radio is suitable. It comes with a micro receiver and two Futaba S3108 micro servos. The transmitter is also equipped with a rechargeable NiCd battery pack.

A lithium-polymer battery pack and suitable charger are also required. Although there are different battery packs and chargers available that will work with the Synapse ARF, the economical choices recommended by Great Planes are:

- Great Planes 11.1V 910mAh LiPo 20C Discharge (GPMP0605)
- Great Planes ElectriFly DC Lithium Polymer Charger (GPMM3010)
- Great Planes Equinox™ Cell Balancer (GPMM3160)

Note: The Great Planes 11.1V 1250mAh 20C LiPo with balance connector (GPMP0609) will also fit inside the radio compartment of the Synapse. The 1250mAh pack will result in a forward C.G. position, and the 910mAh pack will provide a more aft C.G. position.

Speed Control

A brushless electronic speed control with BEC (Battery Eliminator Circuitry) is required. The BEC allows both the motor and the radio system to be powered by the same battery (thus eliminating the on-board receiver battery). The Great Planes Silver Series 25A Brushless ESC 5V/2A BEC (GPMM1820) is recommended.

Motor

For optimum performance, the Great Planes 20-40-3500 Ammo Brushless Motor (GPMG5140) is recommended. If you plan to use the Great Planes Silver Series 25A Brushless ESC, you will also need to purchase the Great Planes Bullet Adapters 3.5mm Male/2mm Female (GPMM3122).

ADDITIONAL ITEMS REQUIRED

Adhesives and Building Supplies

Foam safe CA glue can be used anywhere "CA" is called for in the building instructions. Use only foam safe CA where foam safe is specified (regular CA may be used everywhere else). 6-Minute epoxy is also used in the assembly of the Synapse ARF. Order numbers are provided below.

- Great Planes Pro™ Epoxy 6-Minute Formula 4 oz. (GPMR6042)
- Great Planes Pro Foam Safe CA– Thick Glue 1 oz. (GPMR6072)
- Great Planes Pro CA– Thick Glue 1 oz. (GPMR6014)
- 1/16" [1.6 mm] drill bit.
- K&S Round Brass Tube 3/32" (K+SR1268)

Optional Supplies and Tools

Here is a list of optional tools that will help you build the Synapse ARF.

- Great Planes Double-Sided Servo Tape 1"x3' (GPMQ4442)
- 2 oz. [57g] spray CA activator (GPMR6035)
- 4 oz. [113g] aerosol CA activator (GPMR634)
- CA applicator tips (HCAR3780)
- Epoxy brushes (6, GPMR8060)
- Mixing sticks (50, GPMR8055)
- Mixing cups (GPMR8056)
- Rotary tool such as Dremel
- Rotary tool reinforced cut-off wheel (GPMR8020)
- Servo horn drill (HCAR0698)
- AccuThrow Deflection Gauge (GPMR2405)
- CG Machine™ (GPMR2400)
- Hobbico Flexible 18" Ruler Stainless Steel (HCAR0460)

IMPORTANT BUILDING NOTES

- When you see the term **test fit** in the instructions, it means that you should first position the part on the assembly **without using any glue**, then slightly modify or *custom fit* the part as necessary for the best fit.
- Whenever the term **glue** is written you should rely upon your experience to decide what type of glue to use. When a specific type of adhesive works best for that step, the instructions will make a recommendation.
- Whenever just **epoxy** is specified you may use **either** 30-minute (or 45-minute) epoxy **or** 6-minute epoxy. When 30-minute epoxy is specified it is **highly** recommended that you use only 30-minute (or 45-minute) epoxy, because you will need the working time and/or the additional strength.
- **Photos** and **sketches** are placed **before** the step they refer to. Frequently you can study photos in following steps to get another view of the same parts.

ORDERING REPLACEMENT PARTS

Replacement parts for the Great Planes Synapse are available using the order numbers in the Replacement Parts List that follows. The fastest, most economical service can be provided by your hobby dealer or mail-order company.

To locate a hobby dealer, visit the Hobbico web site at www.hobbico.com. Choose "Where to Buy" at the bottom of the menu on the left side of the page. Follow the instructions provided on the page to locate a U.S., Canadian or International dealer.

Parts may also be ordered directly from Hobby Services by calling (217) 398-0007, or via facsimile at (217) 398-7721, but full retail prices and shipping and handling charges will apply. Illinois and Nevada residents will also be charged sales tax. If ordering via fax, include a Visa® or MasterCard® number and expiration date for payment.

Mail parts orders and payments by personal check to:

Hobby Services
3002 N. Apollo Drive, Suite 1
Champaign, IL 61822

Be certain to specify the order number exactly as listed in the **Replacement Parts List**. Payment by credit card or personal check only; no C.O.D.

If additional assistance is required for any reason, contact Product Support by telephone at (217) 398-8970, or by e-mail at productsupport@greatplanes.com.

Replacement Parts List

Order #	Description	How to Purchase
	Missing pieces.....	Contact Product Support
	Instruction manual...	Contact Product Support
	Full-size plans	Not Available

Contact your hobby supplier for the following parts:

- GPMA2744 Canopy
- GPMA2745 Duct Cover
- GPMA2746 Rear Duct Ring
- GPMG3910 HyperFlow Ducted Fan

This model belongs to:

Name	Address	City, State Zip	Phone number	AMA number
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KIT INSPECTION

Before starting to build, take an inventory of this kit to make sure it is complete, and inspect the parts to make sure they are of acceptable quality. If any parts are missing or are not of acceptable quality, or if you need assistance with assembly, contact Product Support. When reporting defective or missing parts, use the part names exactly as they are written in the Kit Contents list.

Great Planes Product Support
3002 N. Apollo Drive, Suite 1
Champaign, IL 61822
Telephone: (217) 398-8970, ext. 5
Fax: (217) 398-7721
E-mail: airsupport@greatplanes.com

KIT CONTENTS



1. Canopy Hatch
2. Fuselage

3. Lower Duct Channel Half
4. Aft Cone

5. Stator Extension
6. Ducted Fan Housing

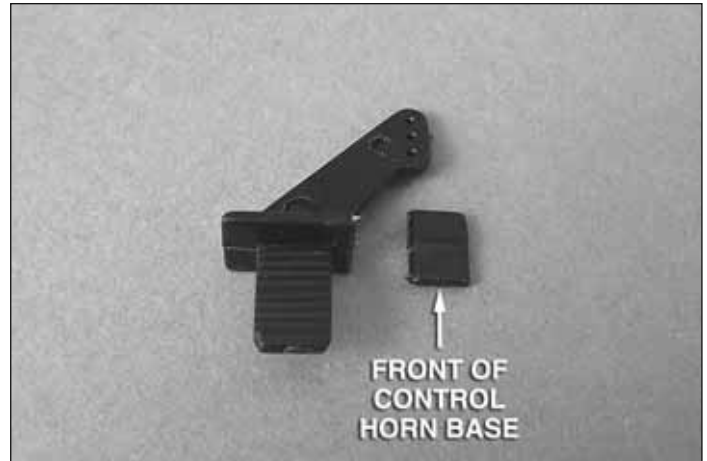
7. Fan Rotor
8. Rotor Cone

BEFORE YOU BEGIN

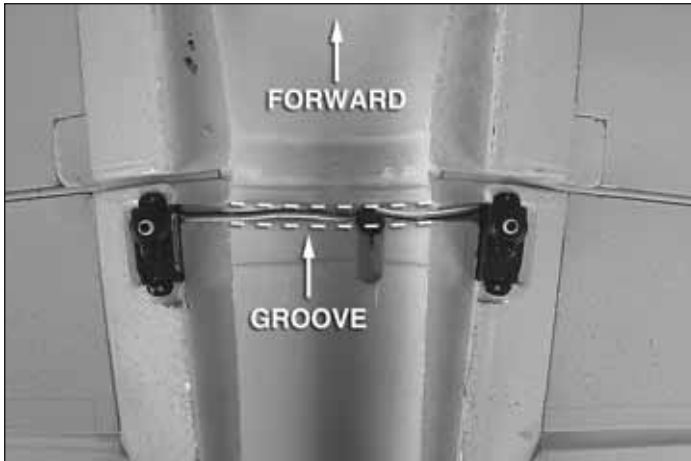


Before building the model, please follow the assembly and break-in instructions that can be found in the manual that accompanies the included ducted fan unit.

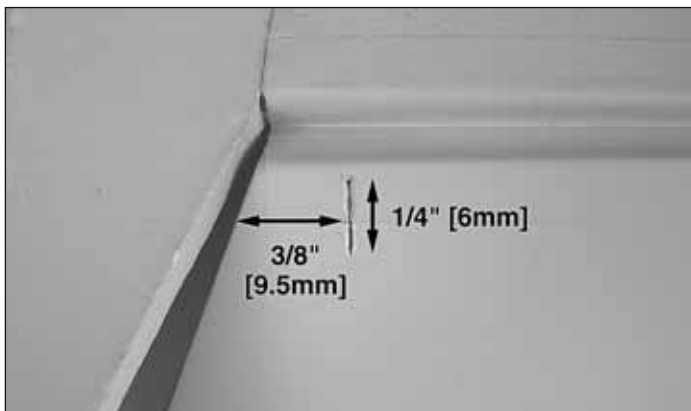
1/4" [6mm] long and approximately 1/32" [0.8mm] to 3/64" [1.2mm] wide and be perpendicular to the hinge line.



ASSEMBLE THE AIRPLANE

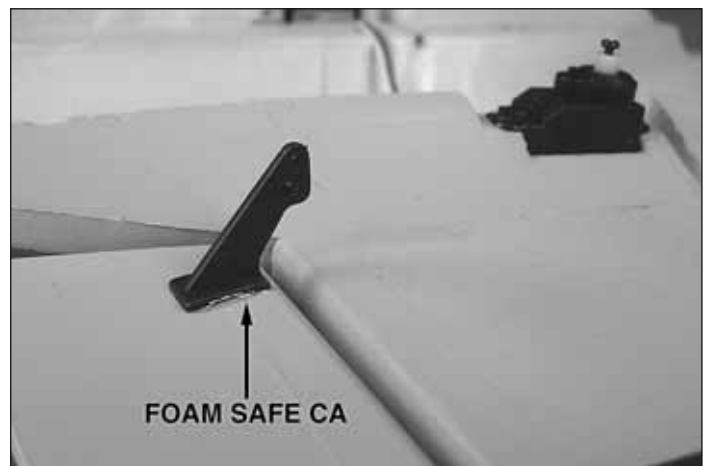


1. Begin by gluing the elevon servos into the servo bays with the servo splines facing forward. Thick foam safe CA glue or epoxy can be used. Guide the servo wires down the grooves molded into the ducted fan channel and through the hole as shown.

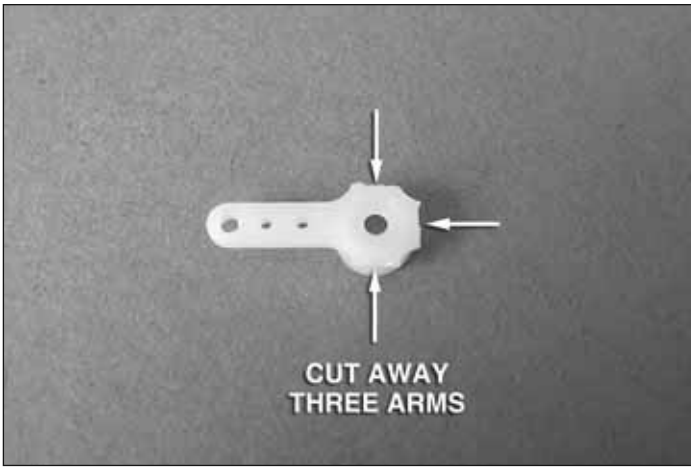


2. Use a sharp hobby knife to cut slots for the control horns 3/8" [9.5mm] from the inside edge of the elevons at the leading edge just behind the bevel. The slots should be

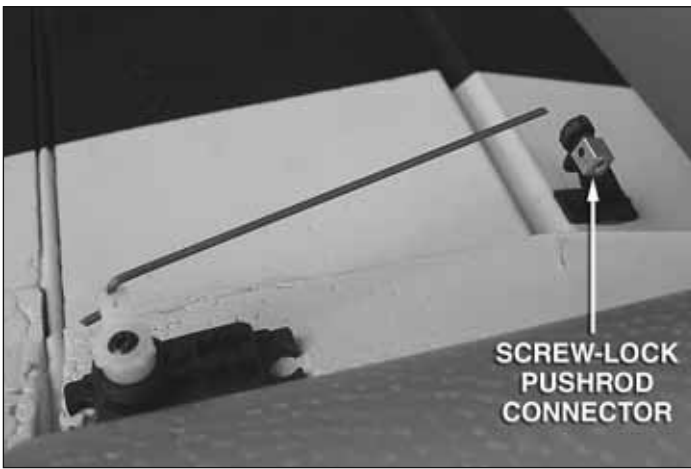
3. Cut away the front of the control horn base at the tab of both control horns. Enlarge the outer holes of the elevon control horns with a 1/16" [1.6mm] drill bit.



4. Install the control horns onto the undersides of the elevons by fitting the control horn tabs into the slots you made. Secure the control horns to the elevons with a couple drops of foam safe CA. Clip the control horn backplates onto the tabs at the tops of the elevons. Add another drop of **foam safe CA** to each backplate to hold it in place.



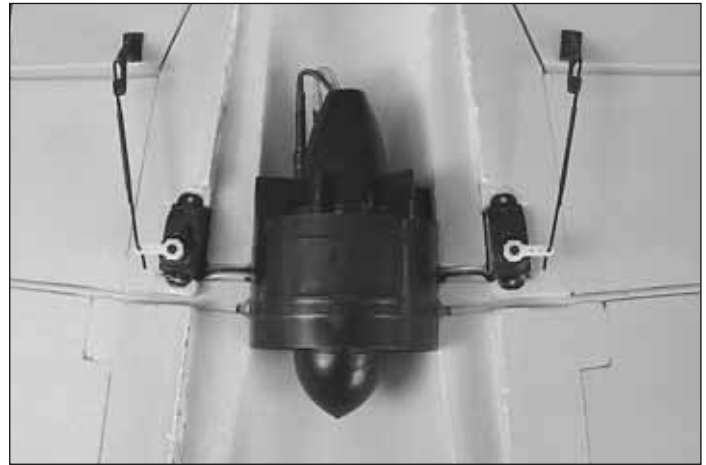
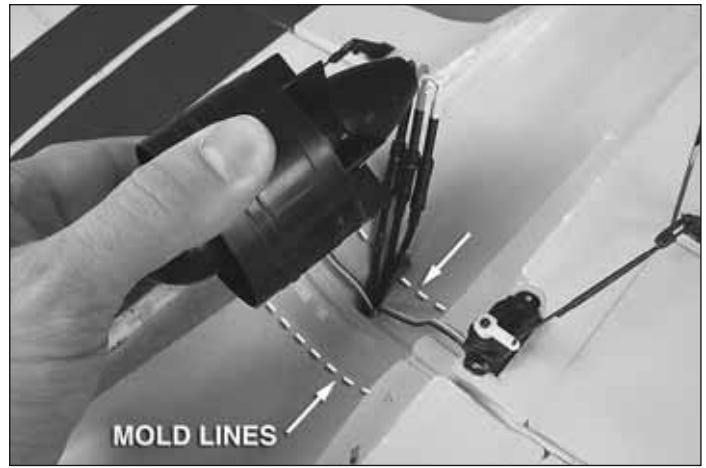
❑ 5. Cut three arms from two four-armed servo arms. Enlarge the outer holes in the servo arms with a 1/16" [1.6mm] drill bit.



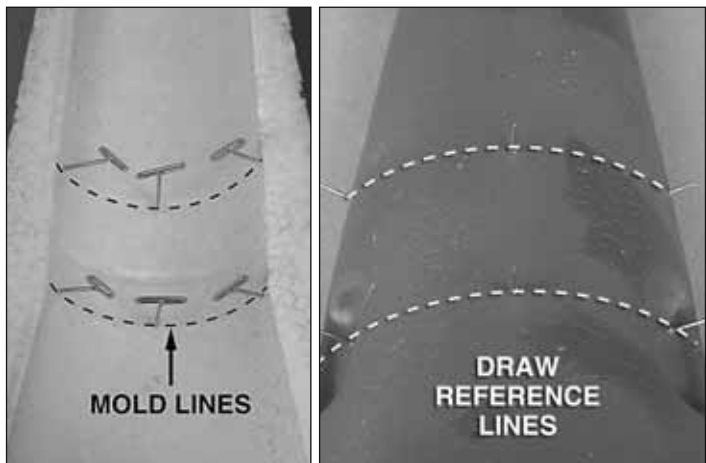
❑ 6. Attach a pushrod wire with a Z-bend at one end to the outer hole of each servo arm. Secure the servo arms to the servos parallel to the elevon hinge line using the servo arm screws included with the servos. Attach a screw-lock pushrod connector to each control horn using a screw-lock pushrod connector retainer.



❑ 7. Insert the other end of the pushrod wires into the screw-lock pushrod connectors. Position the elevons in the neutral position and thread a knurled thumb screw into the screw-lock connectors. Tighten the screws against the pushrod wires.



❑ 8. Attach 2mm female to 3.5mm male bullet adapters (not included) to the leads on the brushless motor. Mix up a small batch of 6-minute epoxy. Brush on a thin coat of epoxy inside the duct channel between the mold lines for the ducted fan unit. From the top of the plane, feed the motor leads on the ESC through the same hole that the servo wires use and connect the leads to the motor. Confirm that the servo leads are still positioned in the grooves in the duct channel. Fit the ducted fan unit into position at the mold lines. The motor leads should fit into the notch just behind the hole that they pass through. We suggest holding the ducted fan unit tightly in place as the epoxy begins the hardening process.



❑ 9. After your model is assembled, the only way to remove the ducted fan unit in case of repair or replacement is to cut

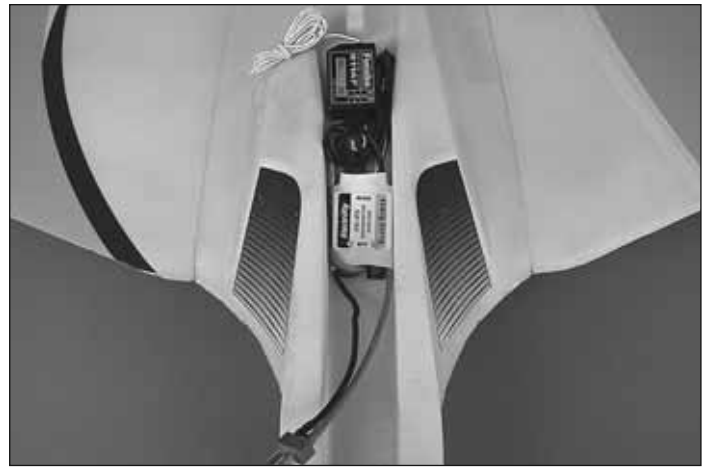
it out from the bottom. Because of this, we suggest marking the location of the ducted fan unit on the underside of the lower duct channel half. You can do this by pushing T-pins through the inside of the duct channel half along the edges of the mold lines. The holes left on the underside of the channel half from the T-pins can be connected with a drawn line for future reference. If at any time you need to remove the fan unit, use a hobby knife to cut along the holes left by the T-pins to extract the unit out of the bottom of the plane.



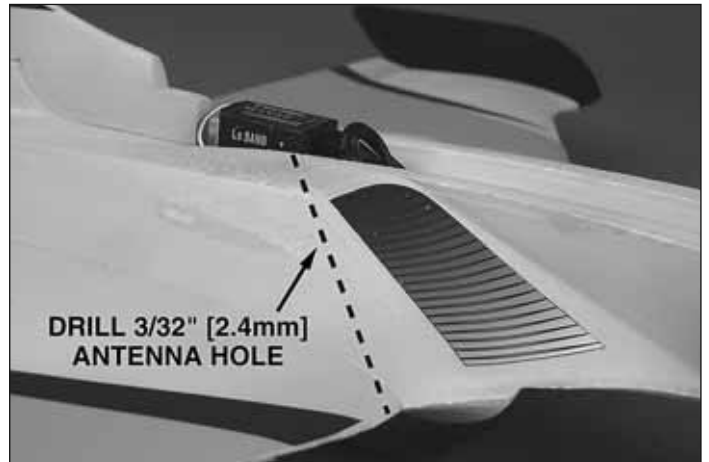
□ 10. Use thick CA glue or mix up approximately 3/8oz [5cc] of epoxy to glue the lower duct channel half onto the fuselage. Coat the area in duct channel half between the fan unit mold lines with a thin coat of glue or epoxy. Coat the edges of the duct channel half (being sure to use enough adhesive along **all** contact surfaces) and press the piece into place aligning the front air intake edges with the underside of the fuselage. Wipe away any excess glue with a dry paper towel.



□ 11. Glue the aft duct channel ring into place with thick CA glue or epoxy.



□ 12. Connect the servos and ESC to the receiver. Install the receiver and ESC in the locations shown. They can be secured using small pieces of the included hook and loop material or double-sided foam servo tape (not included).



□ 13. The receiver antenna can be taped to the side of the fuselage anywhere that it will not interfere with the duct channel or canopy. For a clean look, we drilled a 3/32" [2.4mm] diameter hole from the front of the lower duct channel where it meets the fuselage up to the radio compartment. Be very careful not to drill into the duct channel. Feed the receiver antenna through the hole and out the bottom of the fuselage. The antenna can then be tucked into the seam between the lower duct channel and the fuselage. A few drops of thick CA glue will prevent the antenna from falling out of the seam.

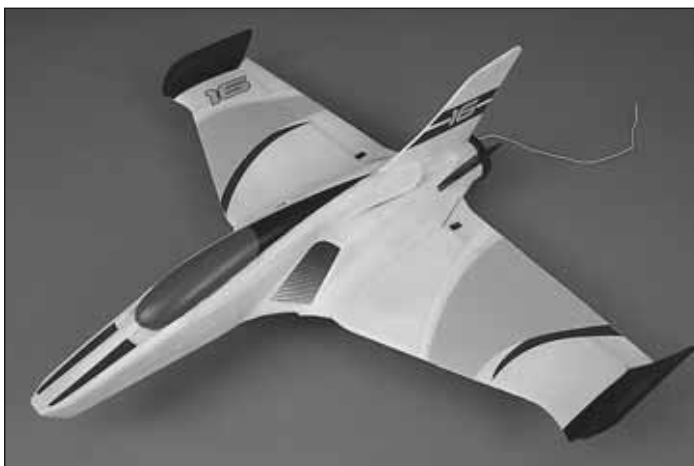
EXPERT TIP
EXPERT TIP

HOW TO CUT HOLES IN FOAM



❑ A. Using a brass or aluminum tube with a diameter of the size hole you wish to make. Use a rotary tool with a cutoff wheel to bevel a sharp edge onto one end of the tube. If you do not have a rotary tool, a hobby knife can also be used to carve the inside of the tube until the edge is sharp.

❑ B. Press the tube into the foam and twist. The sharp end will cut a clean hole through the foam without tear out.

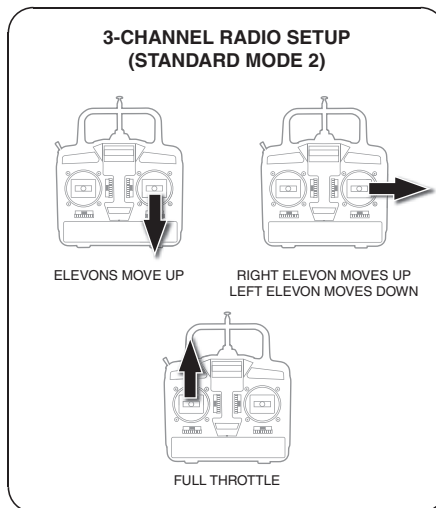


❑ 14. Use the included hook and loop material to secure the battery pack in the front of the radio compartment. Test fit the canopy hatch onto the plane and confirm that it fits well. If any of the electric components interfere with the hatch seating properly, move the components or enlarge the inside of the compartment or hatch as necessary until it fits well.

GET THE MODEL READY TO FLY

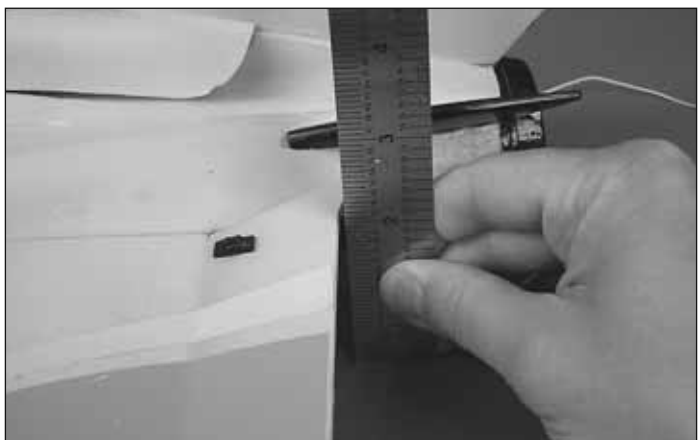
Check the Control Directions

- ❑ 1. Turn on the transmitter and receiver and center the trims.
- ❑ 2. With the transmitter and receiver still on, check all the control surfaces to see if they are centered. If necessary, adjust the pushrods by the knurled thumb screws in the screw-lock pushrod connectors, repositioning the pushrods, and re-tightening the thumb screws.



- ❑ 3. Make certain that the control surfaces and the throttle respond in the correct direction as shown in the diagram. If any of the controls respond in the wrong direction, use the servo reversing in the transmitter to reverse the servos connected to those controls. Be certain the control surfaces have remained centered. Adjust if necessary.

Set the Control Throws

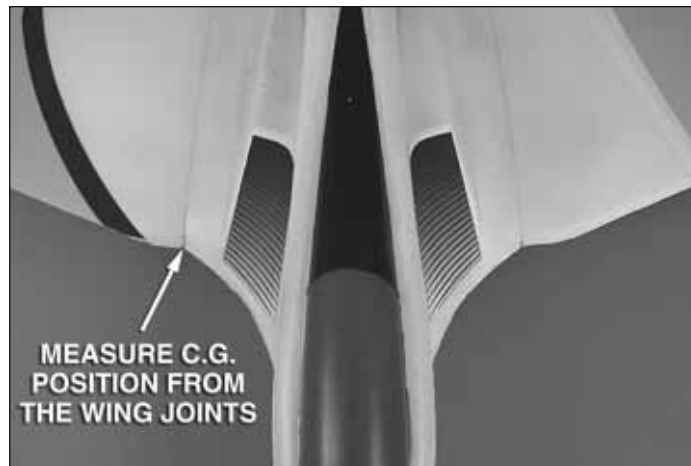


Use a Great Planes AccuThrow (or a ruler) to accurately measure and set the control throw of each control surface as indicated in the chart that follows. If your radio does not have dual rates, we recommend setting the throws at the **low** rate setting.

NOTE: The throws are measured at the **widest part** of the elevons (not including the flared inside tips of the elevons).

These are the recommended control surface throws:

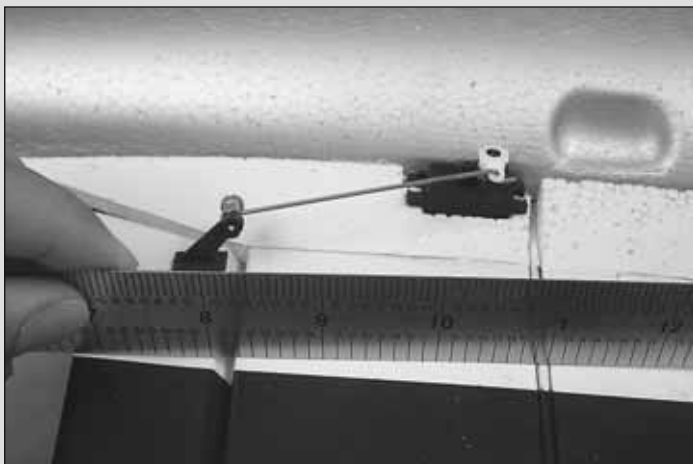
	High Rate	Low Rate
ELEVATOR:	1/4" [6mm] up 1/4" [6mm] down	3/16" [4.8mm] up 3/16" [4.8mm] down
AILERONS:	3/8" [9.5mm] up 3/8" [9.5mm] down	1/4" [6mm] up 1/4" [6mm] down



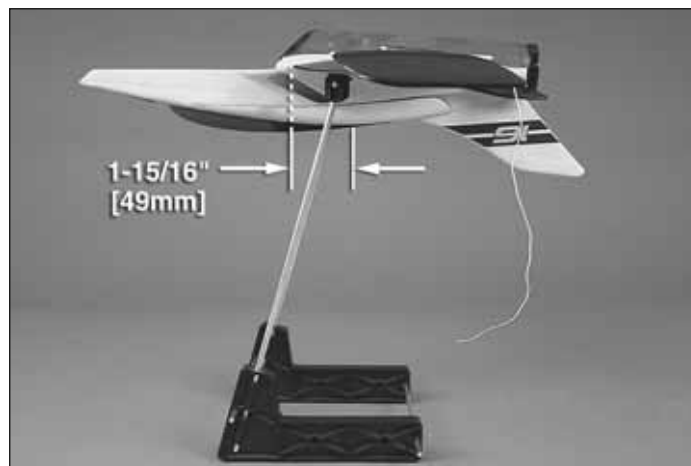
IMPORTANT: The Synapse ARF has been **extensively** flown and tested to arrive at the throws at which it flies best. Flying your model at these throws will provide you with the greatest chance for successful first flights. If, after you have become accustomed to the way the Synapse flies, you would like to change the throws to suit your taste, that is fine. However, too much control throw could make the model difficult to control, so remember, "more is not always better."

- 1. Use a felt-tip pen or 1/8" [3mm]-wide tape to accurately mark the C.G. on the top of the wing on both sides of the fuselage. **The C.G. is located 1-15/16" [49mm] back from the leading edge of the wing at the fuselage (the seam where the wing panels have been joined to the fuselage).**

This is where your model should balance for the first flights. Later, you may wish to experiment by shifting the C.G. up to 1/8" [3mm] forward or 1/8" [3mm] back to change the flying characteristics. Moving the C.G. forward may improve the smoothness and stability, but the model may be more difficult to slow for landing. Moving the C.G. aft makes the model more maneuverable, but could also cause it to become too difficult to control. In any case, start at the recommended balance point and do not at any time balance the model outside the specified range.



Note: When setting the neutral points of the elevons, place a straight edge on the underside of the wings from the carbon tube back to the elevons. For your first few flights, position the neutral points of the elevons level with the wings as shown.



Balance the Model (C.G.)

More than any other factor, the **C.G.** (balance point) can have the **greatest** effect on how a model flies, and may determine whether or not your first flight will be successful. If you value this model and wish to enjoy it for many flights, **DO NOT OVERLOOK THIS IMPORTANT PROCEDURE.** A model that is not properly balanced will be unstable and possibly unflyable.

- 2. With all parts of the model installed (ready to fly), place the model upside-down on a Great Planes CG Machine, or lift it upside down at the balance point you marked.

At this stage the model should be in ready-to-fly condition with all of the systems in place including the receiver, ESC, and battery pack.

- 3. If the tail drops, the model is "tail heavy" and the battery pack and/or receiver must be shifted to balance. If the nose drops, the model is "nose heavy" and the battery pack and/or receiver must be shifted to balance. This model is very weight sensitive. Do not add any weight to achieve the suggested balance point. Instead, shift the battery pack and receiver forward or aft to alter the C.G.

PREFLIGHT

Identify Your Model

No matter if you fly at an AMA sanctioned R/C club site or if you fly somewhere on your own, you should always have your name, address, telephone number and AMA number on or inside your model. It is required at all AMA R/C club flying sites and AMA sanctioned flying events. Fill out the identification tag on page 4 and place it on or inside your model.

Charge the Batteries

Follow the battery charging instructions that came with your radio control system to charge the batteries. You should always charge your transmitter and motor batteries the night before you go flying, and at other times as recommended by the manufacturer.

CAUTION: Unless the instructions that came with your radio system state differently, the **initial** charge on **new** transmitter batteries should be done for 15 hours **using the slow-charger that came with the radio system.** This will "condition" the batteries so that the next charge may be done using the fast-charger of your choice. If the initial charge is done with a fast-charger the batteries may not reach their full capacity and you may be flying with batteries that are only partially charged.

Range Check

Ground check the operational range of your radio before the first flight of the day. With the transmitter antenna collapsed and the receiver and transmitter on, you should be able to walk at least 100 feet away from the model and still have control. Have an assistant stand by your model and, while you work the controls, tell you what the control surfaces are doing. Repeat this test with the motor running at various speeds with an assistant holding the model, using hand signals to show you what is happening. If the control surfaces do not respond correctly, do not fly! Find and correct the problem first. Look for loose servo connections or broken wires, corroded wires on old servo connectors, poor solder joints in your battery pack or a defective cell, or a damaged receiver crystal from a previous crash.

AMA SAFETY CODE (EXCERPTS)

Read and abide by the following excerpts from the Academy of Model Aeronautics Safety Code. For the complete Safety Code refer to Model Aviation magazine, the AMA web site or the Code that came with your AMA license.

General

- 1) I will not fly my model aircraft in sanctioned events, air shows, or model flying demonstrations until it has been proven to be airworthy by having been previously, successfully flight tested.
- 2) I will not fly my model aircraft higher than approximately 400 feet within 3 miles of an airport without notifying the airport operator. I will give right-of-way and avoid flying in the proximity of full-scale aircraft. Where necessary, an observer shall be utilized to supervise flying to avoid having models fly in the proximity of full-scale aircraft.
- 3) Where established, I will abide by the safety rules for the flying site I use, and I will not willfully and deliberately fly my models in a careless, reckless and/or dangerous manner.
- 5) I will not fly my model unless it is identified with my name and address or AMA number, on or in the model. Note: This does not apply to models while being flown indoors.
- 7) I will not operate models with pyrotechnics (any device that explodes, burns, or propels a projectile of any kind).

Radio Control

- 1) I will have completed a successful radio equipment ground check before the first flight of a new or repaired model.
- 2) I will not fly my model aircraft in the presence of spectators until I become a qualified flier, unless assisted by an experienced helper.
- 3) At all flying sites a straight or curved line(s) must be established in front of which all flying takes place with the other side for spectators. Only personnel involved with flying the aircraft are allowed at or in the front of the flight line. Intentional flying behind the flight line is prohibited.
- 4) I will operate my model using only radio control frequencies currently allowed by the Federal Communications Commission.
- 5) **I will not knowingly operate my model within three miles of any pre-existing flying site except in accordance with the frequency sharing agreement listed** [in the complete AMA Safety Code].
- 9) Under no circumstances may a pilot or other person touch a powered model in flight; nor should any part of the model other than the landing gear, intentionally touch the ground, except while landing.

CHECK LIST

During the last few moments of preparation your mind may be elsewhere anticipating the excitement of the first flight. Because of this, you may be more likely to overlook certain checks and procedures that should be performed before the model is flown. To help avoid this, a check list is provided to make sure these important areas are not overlooked. Many are covered in the instruction manual, so where appropriate, refer to the manual for complete instructions. Be sure to check the items off as they are completed.

- 1. Check the C.G. according to the measurements provided in the manual.
- 2. Be certain the battery and receiver are securely mounted in the fuse.
- 3. Confirm that all controls operate in the correct direction and the throws are set up according to the manual.
- 4. Check the operation of the ducted fan unit prior to each flight.
- 5. Make sure that all servo arms are secured to the servos with the screws included with your radio.
- 6. Place your name, address, AMA number and telephone number on or inside your model.
- 7. If you wish to photograph your model, do so before your first flight.
- 8. Range check your radio when you get to the flying field.

FLYING

IMPORTANT: If you are an inexperienced modeler we strongly urge you to seek the assistance of a competent, experienced R/C pilot to check your model for airworthiness AND to teach you how to fly. No matter how stable or “forgiving” the Synapse is, attempting to learn to fly on your own is dangerous and may result in destruction of your model or even injury to yourself and others. Therefore, find an instructor and fly only under his or her guidance and supervision until you have acquired the skills necessary for safe and fully controlled operation of your model.

Launch

We recommend flying the Synapse EDF ARF when the wind is no greater than 16 kmph [10 mph]. Less-experienced flyers should fly the Synapse only in calm (less than five mile per hour) conditions. Frequently, winds are calm in the early morning and early evening. Often these are the most enjoyable times to fly anyway!

Until you have the Synapse properly trimmed for level flight, we recommend having an assistant hand-launch the model instead of launching it yourself.

Turn on the transmitter and plug the battery into the speed control. Turn on the receiver by following the instructions that came with your speed control. Secure the canopy hatch in place.

IMPORTANT: Confirm that the transmitter operates the controls properly by moving the sticks and watching the surfaces respond.

When ready to launch, the assistant should hold the Synapse by the finger grips in the lower duct channel half, with the model in front of him and pointed into the wind. With the pilot (that would be you!) standing behind the plane, fully advance the throttle to start the motor. When the motor is at full power,

the hand launcher should gently give the model a toss into the air with a slightly nose-up attitude. Be certain the model is being launched into the wind and be immediately ready to make corrections to keep the airplane flying straight, level and into the wind.

When the model has gained adequate flying speed under its own power, gently pull the elevator stick back until the airplane starts a gradual climb. Many beginners tend to pull too hard causing the model to stall, so be gentle on the elevator and don't panic. If you do pull too hard and you notice the model losing speed, release the elevator stick and allow the model to regain airspeed.

Continue a gradual climb and establish a gentle turn (away from yourself and others) until the airplane reaches an altitude of 20 to 30 meters [75 to 100 feet].

Flight

The main purpose of the first few flights is to learn how the model behaves and to adjust the trims for level flight. After the model has climbed to a safe altitude, reduce the throttle slightly to slow the model, yet maintain altitude. The Synapse should fly well and maintain adequate airspeed at about 1/4-1/2 throttle.

Adjust the elevator trim so the model flies level at the throttle setting you are using. Adjust the aileron trim to level the wings. It may take a few minutes to get the trims adjusted, but this should be your first priority once at a comfortable altitude. Continue to fly around, executing turns and making mental notes (or having your assistant take notes for you) of what additional adjustments or C.G. changes may be required to fine tune the model so it flies the way you like.

Landing

Begin the landing approach by flying downwind at an altitude of approximately 6 meters [20 feet]. When the airplane is approximately 15 to 30 meters [50 to 100 feet] past you, gradually reduce power and make the “final” 180° turn into the wind aligning the airplane with the runway or landing area. Do not dive the airplane, as it will pick up too much speed. Instead, allow the airplane to establish a gradual descent. Concentrate on keeping it heading into the wind toward the runway. When the plane reaches an altitude of about 3 feet [1 meter], gently apply a little “up elevator” to level the plane, but be careful as too much up elevator will cause it to stall. While holding a slight amount of up elevator the airplane will slow and descend as it loses flying speed, thus touching-down on the runway.

Until you are able to accurately judge how far the Synapse can glide, it may be helpful to reserve some battery power to run the motor so the plane can be flown back to the runway.

Best of luck and happy flying!