



HORNET

40-52 ARF ECS

SPORT TRAINER MODEL

WITH POLYCOTE ECS ENHANCED GRAPHICS SYSTEM



ASSEMBLY & OPERATIONS MANUAL

Please review this manual thoroughly before assembling or operating this model.

Proceeding with assembly and use of this product indicates Agreement With & Acceptance of the following Liability Disclaimer.

Model airplanes, model engines, model engine fuel, propellers and related accessories, tools and equipment can be hazardous if improperly used. Be cautious and follow all safety recommendations when using your VMAR model airplane. Keep hands, tools, clothing and all foreign objects well clear of engines when they are operating. Take particular care to safeguard and protect your eyes and fingers and the eyes and fingers of other persons who may be nearby. Use only a good quality propeller that has no cracks or flaws. Stay clear of the propeller and stay clear of the plane of rotation defined by the propeller.

The Manufacturer, Distributor, Retailer and/or other suppliers of this product expressly disclaim any warranties or representations, either expressed or implied, including but not limited to implied warranties of fitness for the purposes of achieving and sustaining remotely controlled flight.

In no event will the Manufacturer, Distributor, Retailer and/or other suppliers of this product have any obligation arising from contract or tort, or for loss of revenue or profit, or for indirect, special, incidental, consequential or other damages arising from the use of this product.

In purchasing and/or using this product, the user accepts all responsibility for its use and accepts all liability associated with such use.

CAUTION

A Remote Control Model Aircraft is not a toy. It is a flying model that functions much like a full size airplane. If you do not assemble and operate this product properly you can cause injury to yourself and others and damage property. **DO NOT FLY** this model if you are not qualified.

You are ultimately responsible for the mechanical, aeronautical and electrical integrity of this model and it's structure, control surfaces, hinges, linkages, covering, engine, radio, wiring, battery and all other components.

Check all components before and after each flight.

Don't fly until it's right!

POLYCOTE™ ECS
ENHANCED COVERING SYSTEM

The Graphics and Detailing are inside the POLYCOTE ECS!

STAGE 1 – WING ASSEMBLY.

JOINING THE WING HALVES

Parts needed

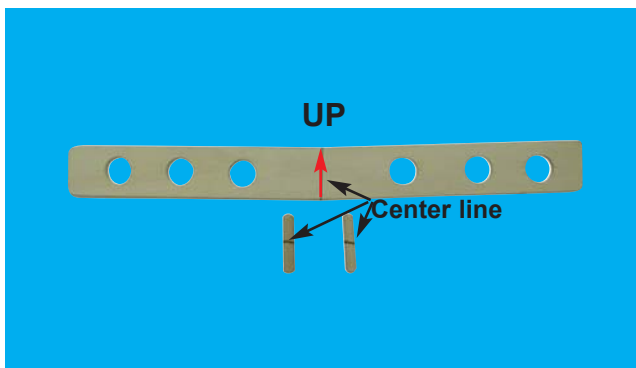
- Roll of wing joiner tape (supplied with kit)
- Right and left wing panels
- Wing joiner (also called dihedral brace)
- Two short dowel guides

Tools and Adhesives needed

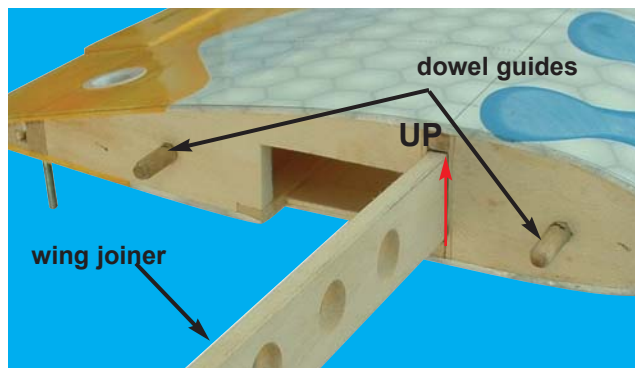
- 30 minute epoxy
- Epoxy brush or stir sticks
- Disposable mixing dish for the epoxy
- Sandpaper (Coarse 240 grit recommended)
- Low tack masking tape
- Pencil
- Knife
- Ruler
- Paper towels.

1.1 Locate the wing joiner (also called Dihedral brace). Using the ruler, determine the center of the wing joiner and mark it with a pencil as illustrated in 1A. Also mark a center line on each of the dowel guides.

1.2 Trial fit the wing joiner into the wing panels. It should insert smoothly up to the center line as illustrated in 1B. Now slide the other wing panel onto the wing joiner until the wing panels meet. If the fit is overly tight, sand the wing joiner slightly and try again. Mark the joiner to indicate which way is UP as illustrated in 1A.



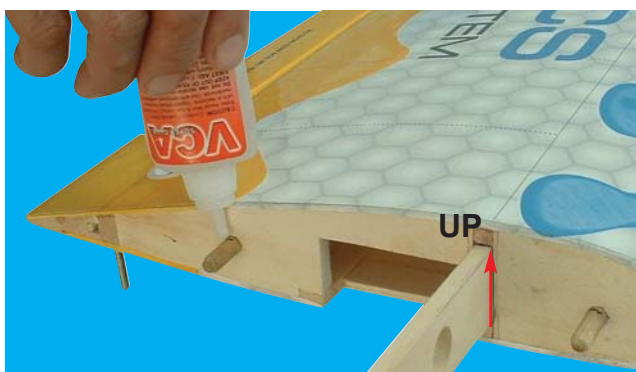
1A- Preparation of wing joiner and dowel guides.



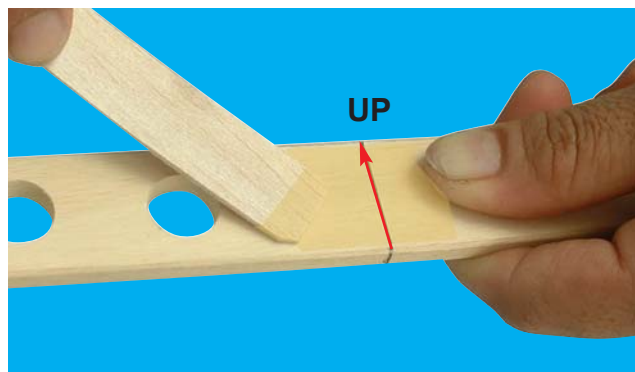
1B- Trial fit the wing joiner and dowel guides

1.3 Insert the dowel guides into one of the wing panels all the way to the center lines. Apply CA glue to secure the dowels into their places as illustrated in 1B and 1C. Do not apply CA glue to the wing joiner.

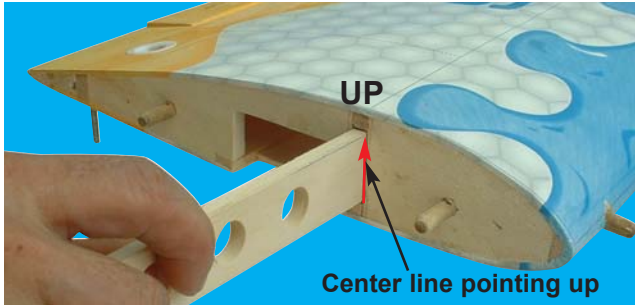
1.4 Apply plenty of 30 minute epoxy to one end of the wing joiner, using a stir stick or epoxy brush. Carefully insert the joiner into the first wing panel as illustrated in 1D, 1E and 1F, then wipe off the excess epoxy that squeezes out of the joint with a cloth or tissue. Repeat this process several times to ensure that the wing joiner and cavity are well coated in epoxy. When the wing joiner & cavity are well coated with 30 minute epoxy, insert the joiner to the center line, wipe away any excess epoxy and let dry. (Note: Do not use 5 minute epoxy or CA to join the wings)



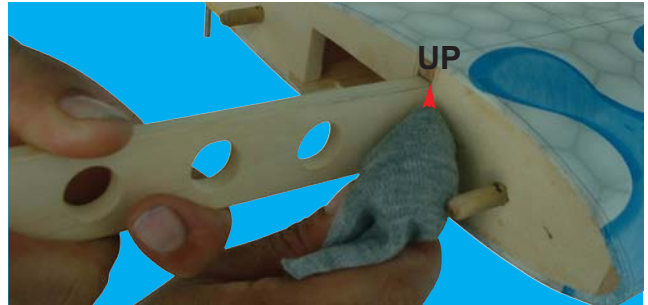
1C- Apply CA glue to secure dowels into their places



1D- Apply plenty of epoxy glue to the wing joiner.

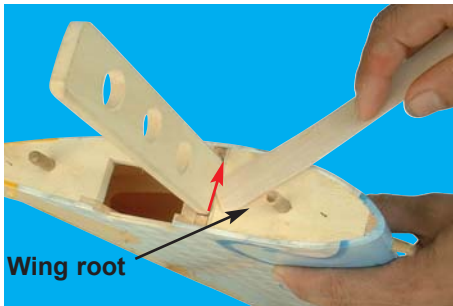


1E- Carefully insert the joiner all the way to the center line



1F - Wipe off the excess epoxy then allow to cure.

STAGE 2 - WING ASSEMBLY - JOINING THE WING HALVES CONTINUED.



2A- Apply plenty of 30 minute epoxy glue to all surfaces.

2.1 When the epoxy has cured in Stage 1, trial fit the second wing panel onto the wing joiner first to ensure that the two panels fit without an excessive gap.

2.2 Now apply plenty of epoxy to the wing joiner and wing root ribs of both wing panels. Use only 30 minute epoxy to ensure a strong bond and give yourself plenty of working time. As described in the Step 1.4, repeatedly apply epoxy and insert into the wing joiner cavity, the epoxy should ooze from the joint and the excess should be cleaned off with a rag or tissue before it cures.

2.3 Use low tack masking tape to hold the two panels together until the glue cures.



2B- Align the two wing panels and slowly close the gap until the wing root ends are firmly in contact with each other



2C- Use low tack masking tape to hold tightly together.

STAGE 3 - WING ASSEMBLY - JOINING THE WING HALVES CONTINUED.

3.1 Once the epoxy has cured completely (allow several hours at least), the tape can be carefully removed from the wing panels. Peel the tape back on itself... do not pull upright away from the wing. To seal and finish the joint in the wings, a roll of wing joiner tape has been supplied. Starting on the bottom side of the wing, stick the tape centrally over the joint ensuring that it is pressed down firmly as you work around the wing. Wrap the tape all the way around the wing joint in one piece, starting and finishing at the wiring harness cavities at the bottom of the wing.



3A- Apply tape over the joint, starting here



3B- Continue applying the tape over the top of the wing, pressing down firmly as you go.

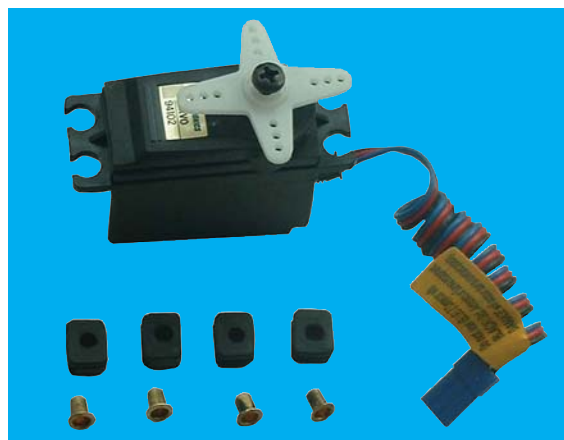


3C- Trim off the excess tape.

STAGE 4 - INSTALLING THE AILERON SERVO INTO THE WING.

To install the aileron servo into the wing you will need the following items :

- Servo
- Servos mounting screws and grommets as supplied with servos.
- Servo control arms as supplied with the servos.
- Two aileron control rod assemblies supplied with the kit. The assemblies consist of a metal rod with a plastic clevis screwed onto both ends.
- Low tack masking tape.
- 2 aileron control horn assemblies



4A- Prepare the servos by fitting the rubber grommets & ferrules supplied with your radio

4.1 Turn the wing upside down.

4.2 Trial fit the aileron servo into the center of the servo mounting cavity. You may have to modify the cavity slightly to provide clearance for the servo and servo wires.

4.3 Use a hobby knife to modify the cavity as required. Most servos have their output shaft closer to one end than the other. We recommend locating the servo so that the output shaft is as close to the front of the wing as possible.

4.4 Screw the servo into place with the screws and grommets supplied. It is important to install the grommets and screws correctly. See the manual that came with your radio for instructions about your particular servo grommets.

4.5 Fasten the screws down according to the manufacturers recommended tightness.



4B- Aileron servo location

STAGE 5 - INSTALLING AILERON CONTROL SYSTEM

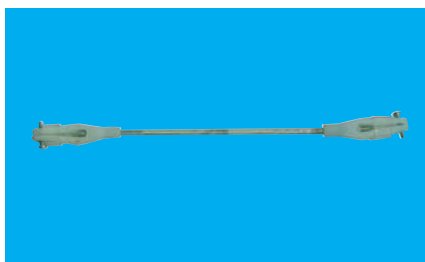
5.1 Consult your radio instruction manual and center the aileron servo by plugging it into the aileron channel in the receiver. Turn on the transmitter and then the receiver. Center the aileron trim lever on the transmitter. Remove the servo arm mounting screw and the servo arm.

5.2 Mount the servo arm back on the servo so that the arm is parallel with the back edge of the wing. Screw the arm into place with the servo arm mounting screw supplied with the servo.

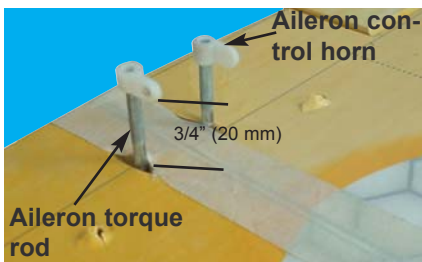
5.3 Locate the two aileron control rods in the hardware bag (see 5A). Ensure the clevises are screwed well onto the threaded portion of the rod. Rotate and tug aggressively on the clevises and ensure that they are not loose on the rods.

5.4 Tape the ailerons into their neutral position so that they are even with the trailing edge of the wing and not pointing either up or down.

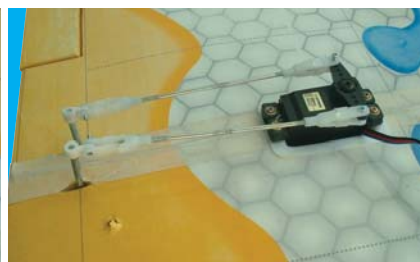
5.5 Ensure that the aileron control horns are screwed onto the threaded aileron torque rods that protrude from the wing and that both control horns are in approximately the same place on their respective torque rods (see 5B).



5A- Aileron control rod assembly



5B- Aileron torque rod with control horn



5C- Aileron servo and control rods installed.

5.6 Connect the aileron servo control rods to the aileron control horns as shown in 5C.

5.7 Carefully remove the masking tape holding the ailerons.

5.8 Turn on your radio and activate the ailerons, using the aileron stick and ensure that a smooth full motion can be achieved.

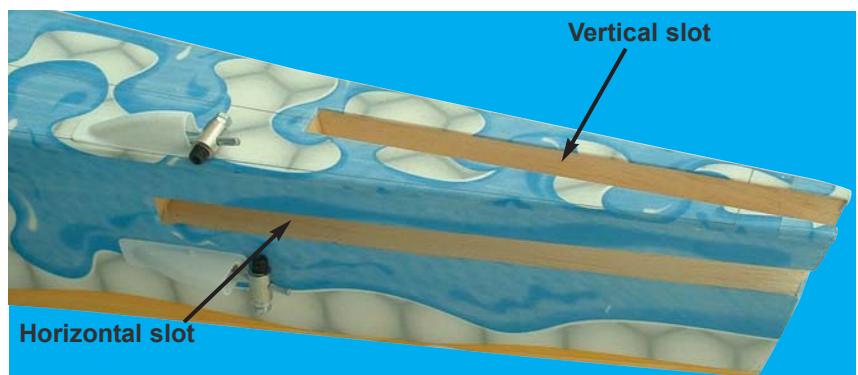
5.9 With the wing top side up and viewed from the back, ensure that moving the transmitter aileron stick to the left raises the left aileron and lowers the right aileron. Movement of the stick to the left will roll the aircraft to the left. (Counterclockwise roll of the wing when viewed from the back).

5.10 With the wing top side up and viewed from the back, ensure that moving the transmitter aileron stick to the right raises the right aileron and lowers the left aileron. Movement of the stick to the right will roll the aircraft to the right. (Clockwise roll of the wing when viewed from the back).

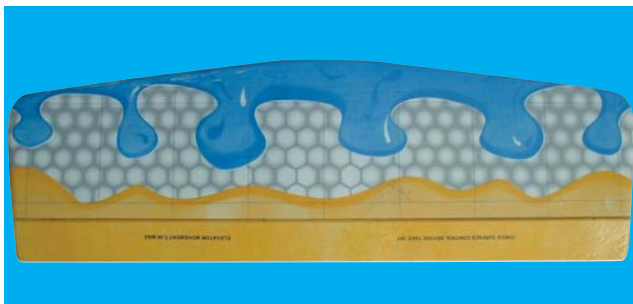
STAGE 6 - FITTING THE HORIZONTAL AND VERTICAL STABILIZERS

To install the stabilizers into the fuselage you will need.

- Fuselage
- Vertical stabilizer with pre-installed rudder
- Horizontal stabilizer with pre-installed elevator



6A- The fuselage slots for the vertical & horizontal stabilizers



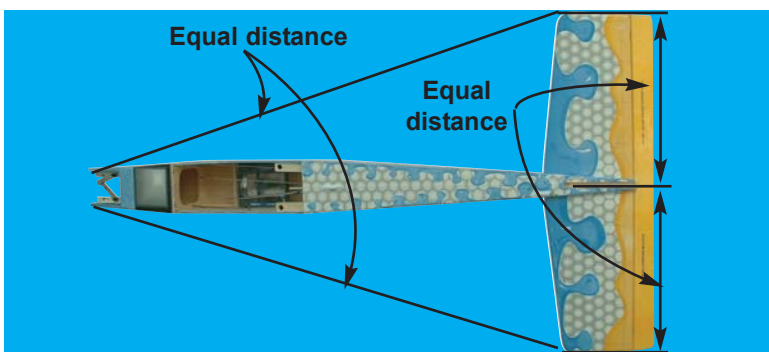
6B- Horizontal stabilizer with pre-installed elevator



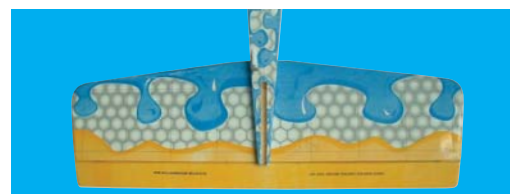
6C- Vertical stabilizer with pre-installed rudder

STAGE 7 - ALIGNMENT OF HORIZONTAL STABILIZER

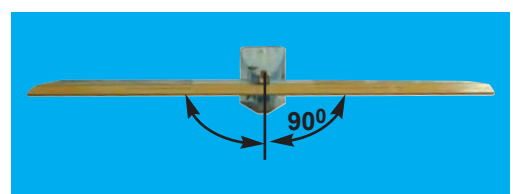
7.1 Check the fit of the horizontal stabilizer in its slot. Make sure the tail is square and centered to the fuselage by taking measurements as shown in pictures 7A, 7B and 7C. **Do not glue anything yet.**



7B- Alignment of horizontal stabilizer top view.



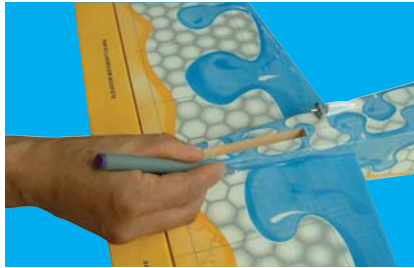
7A- Trial fit the horizontal stabilizer in its slot



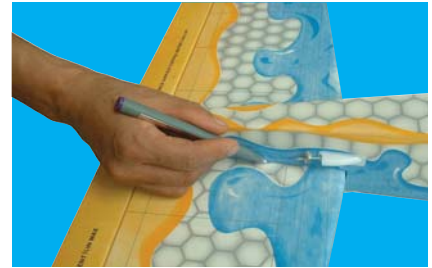
7C- Alignment back view

STAGE 8 - INSTALLING THE HORIZONTAL STABILIZER

8.1 With the horizontal stabilizer aligned correctly, mark the shape of the fuselage on the top & bottom of the horizontal stabilizer using a water soluble non-permanent felt-tip pen as shown here



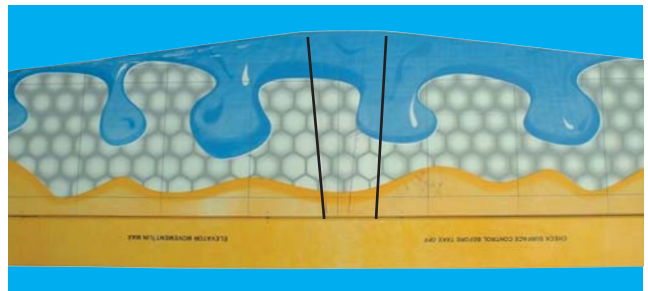
8A- Mark the top of the horizontal stabilizer...



8B- ...and the bottom

STAGE 9 - INSTALLING THE HORIZONTAL STABILIZER CONTINUED

9.1 Now remove the horizontal stabilizer & using a sharp knife & a ruler CAREFULLY cut 1/8" (3 mm) inside the marked lines & remove the covering on the top & bottom of the horizontal stabilizer as illustrated. Make sure you **only cut the film & not the wood**, otherwise the horizontal stabilizer will be severely weakened & fail.



9A- Marked lines on horizontal stab



9B- Cutting inside the lines



9C- Remove the covering from top surface.



9D- Exactly the same underneath



9E- Clean off the pen lines.

STAGE 10 - INSTALLING THE HORIZONTAL STABILIZER CONTINUED

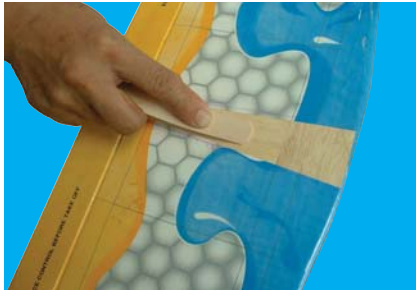
10.1 Now apply sufficient epoxy to the top and bottom of the horizontal stabilizer and horizontal slot. Use 30 minute epoxy to ensure a strong bond and give yourself plenty of working time (see 10A & 10B).

10.2 Insert the horizontal stabilizer in its slot in the fuselage and re-check the alignment as in Stage 7 (see 10C).

10.3 Excess epoxy should be cleaned off with a rag or tissue before it cures (see 10D).



10A- Apply plenty of epoxy



10B- Apply plenty of epoxy



10C- Slide the horizontal stabilizer in place



10D- Wipe off excess epoxy

STAGE 11 - FITTING THE VERTICAL STABILIZER

11.1 Check the fit of the vertical stabilizer in its slot. Make sure that it is square to the horizontal stabilizer and fuselage (see 11A)

11.2 Mark the shape of the fuselage on the left & right sides of the vertical stabilizer using a felt-tip pen (11B)

11.3 Now remove the vertical stabilizer, using a sharp knife & ruler, CAREFULLY cut just 1/8" (3mm) inside the marked lines (see 11C) and remove the covering on both sides of the fin (see 11D), just as you did with the horizontal stabilizer, making sure you only press hard enough to cut the covering, not the vertical stabilizer. **Do not cut the wood.**



11A- Trial fit the vertical stabilizer into fuselage slot.



11B- Mark both sides of the vertical stabilizer



11C- Carefully cut through the covering



11D- Remove covering from both sides

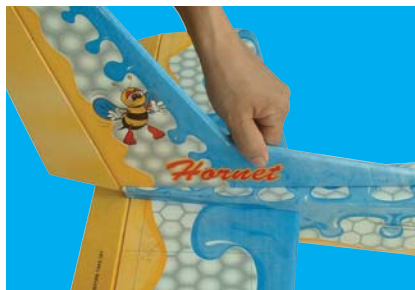
STAGE 12 - FITTING THE VERTICAL STABILIZER CONTINUED

12.1 Now apply sufficient epoxy to both sides & the bottom of the vertical stabilizer as illustrated in 12A. Use 30 minute epoxy to ensure a strong bond and give yourself plenty of working time.

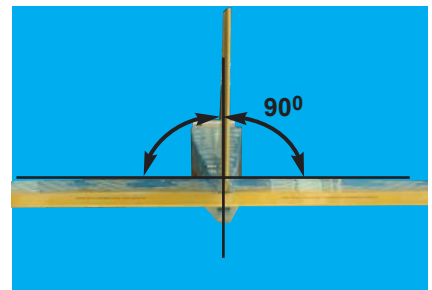
12.2 Insert the vertical stabilizer in its slot in the fuselage and re-check the alignment. Excess adhesive should be cleaned off with a rag or tissue before it cures.



12A- Apply plenty of epoxy



12B- Slide the stab into place & remove excess epoxy



12C- 90 degrees angle between the horizontal and vertical stabs.

STAGE 13 - INSTALLING THE LANDING GEAR

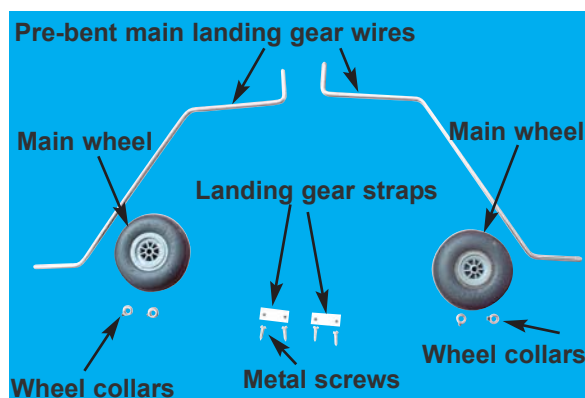
The HORNET has a tricycle gear configuration (trike gear) using a steerable nose wheel and main landing gear. Trike gear is recommended in trainers and makes it much easier to steer your model on the ground and to control it during take off



STAGE 14 - FITTING THE MAIN LANDING GEAR

Identify the main landing gear components shown below

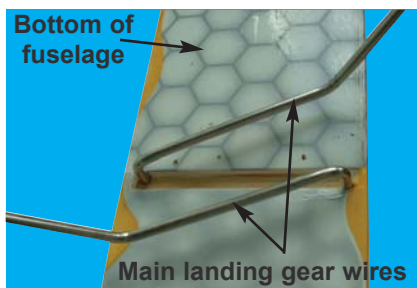
- 2 pre-bent main landing gear wires
- 2 main wheels 2-7/16" (60mm)
- 4 sheet metal screws and 2 straps
- 4 wheel collars



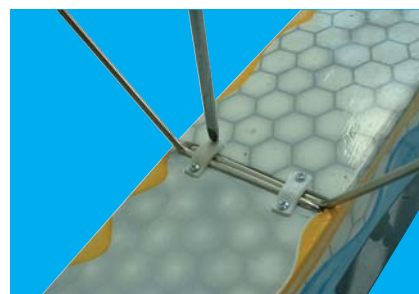
14A- Main landing gear components



14B- Installation of collars and wheel to the pre-bent main landing gear wire.



14C- Insert the main landing gear wires into the fuselage



14D- Use 4 sheet metal screws and 2 straps to mount the main landing gears onto the fuselage

14.1 Place one of the wheel collars on the pre-bent main landing gear wires. Tighten the collar set screw.

14.2 Place one of the main wheels on the pre-bent main landing gear wires

14.3 Install the second wheel collar on to the pre-bent main landing gear wires. Leave enough gap to allow the wheel to rotate freely (see 14B). Tighten the collar set screw.

14.4 Turn over the fuselage, identify the main gear slot.

14.5 Insert the wires into the pre-drilled holes at the ends of the slot.

14.6 Rotate the wires back and forth and wiggle the wires down into the holes until the landing gear is just slightly away from contacting the fuselage. See the illustration 14C

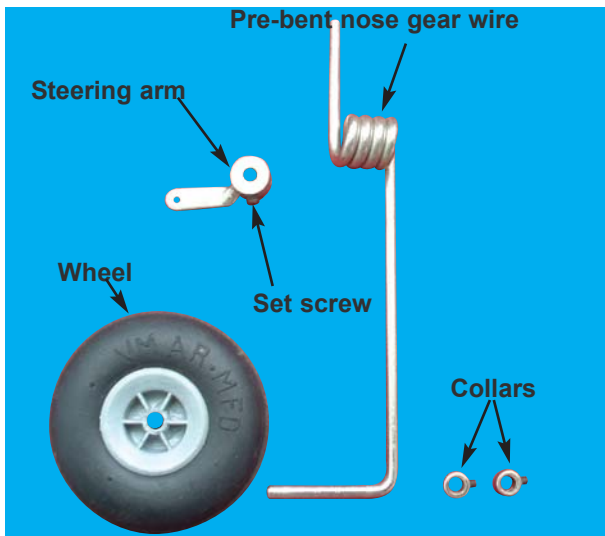
14.7 Rotate the two main landing gear assemblies so that they line up with the slot in the fuselage. Press the wires down firmly into the slot. Tapping with a handle of a screwdriver will help seat the gear wires into the slot.

14.8 Use 4 metal screws and 2 straps to secure the main landing gear assemblies into the slot. See illustration 14D

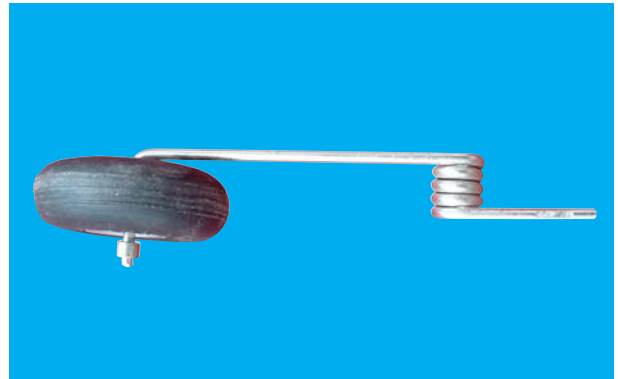
STAGE 15 - INSTALLING THE NOSE GEAR

Identify the nose gear components per illustration 15A:

- 1 pre-bent nose gear wire
- 1 steering arm
- 2 wheel collars
- 1 wheel 2-7/16" (60mm)



15A- Nose gear components



15B- Follow the instruction steps 14.1, 14.2, 14.3 to install the wheel and collars to the pre-bent wire



15C- Insert the end of the pre-installed Z-bend wire into the hole in the steering arm



15D- Place the steering arm into the slot in the nylon nose gear bearing



15E- Insert the nose gear into the bearing, passing through the steering arm. Secure the steering arm to the nose gear by tightening the set screw onto the flat spot on the nose gear wire.



15F- Typical nose gear installation when complete.

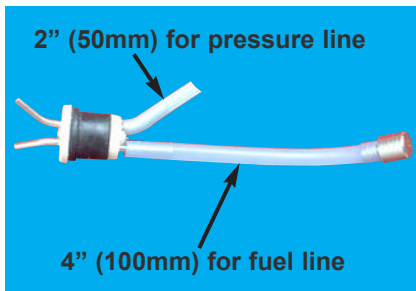
STAGE 16 - FITTING THE FUEL TANK

To assemble the fuel tank you will need the following items:

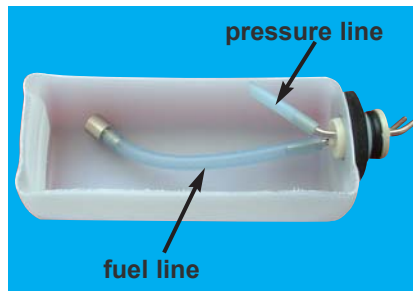
- The fuel tank and fuel stopper assembly (supplied)
- The clunk (supplied)
- About 7" (20 cm) of medium ID silicone fuel line (DUB 197 or DUB-222 or similar)
- Cross head Phillips screw driver



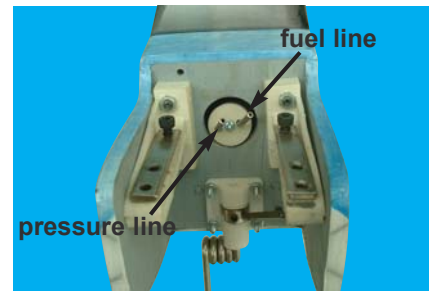
16A - Fuel tank & stopper assembly.



16B - Use 4" (100 mm) for fuel line and 2" (50mm) for pressure line



16C - Illustration of fuel line positioning inside cutaway of the tank

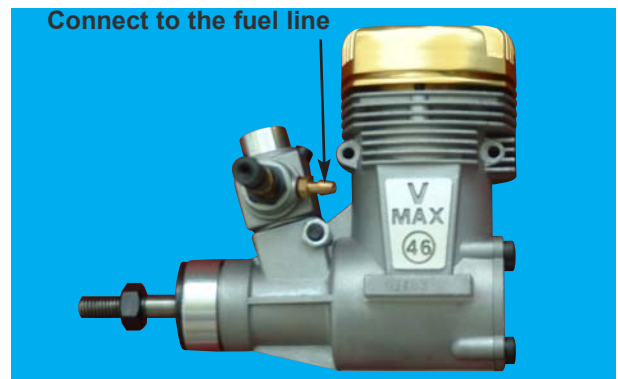


16D - Fuel tank installed into the fuselage

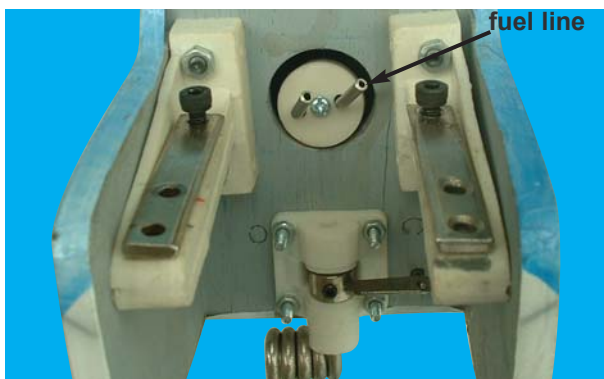
STAGE 17 - INSTALLING THE ENGINE

Engines vary quite a bit in sizes, styles and brands but most have mounting lugs, a carburetor with a throttle (speed) control arm, a prop washer, a prop nut and a muffler.

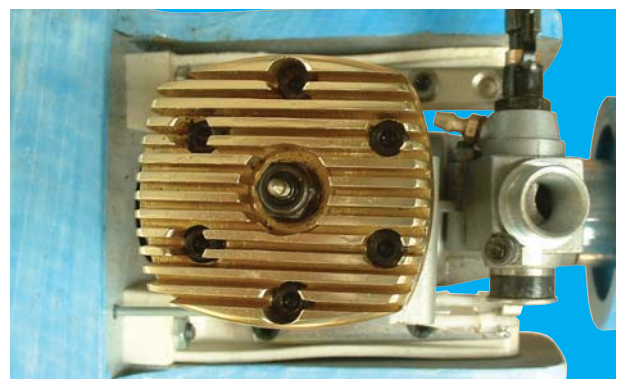
The procedure we describe here assumes that you are mounting a 2-stroke engine that has a side exhaust on the right (when viewed from behind looking forward) and a throttle control arm on the right.



17A- VMAX 46PRO 2 cycle engine recommended



17B- Use a 4mm socket ball wrench or Allen Key to remove the 4 black machine screws that work with the clamping plates on the metal engine mount that has been pre-installed into your Hornet

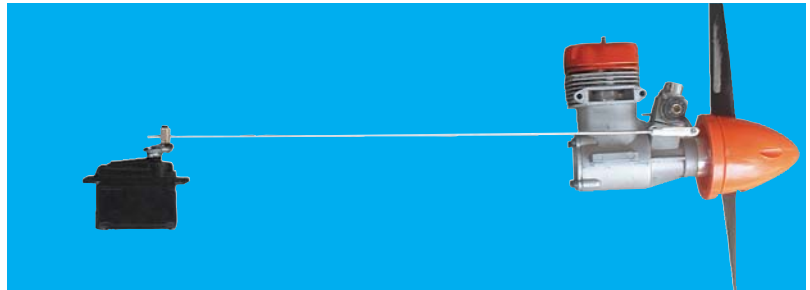


17C- Remove the muffler, position the engine on the engine mount and confirm that the fuel tank metal tubes clear the back of the engine. Trial fit the engine temporarily into place. Tighten the screws only enough to tack the engine into place

STAGE 18 - CONNECTING THE THROTTLE CONTROL ROD TO THE ENGINE.



18A- Clevis attached to engine throttle arm



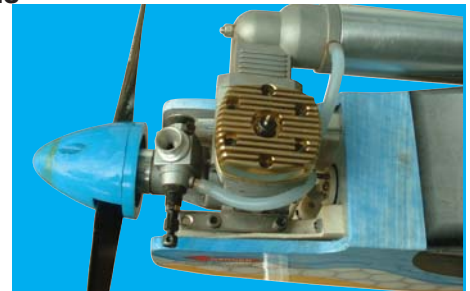
18B- Throttle control rod connected to the engine throttle arm and to the servo arm

STAGE 19 - CONNECTING THE FUEL & PRESSURE LINES

19.1 Install the muffler then connect the fuel tubing from the tank metal pressure lines to the muffler

19.2 Connect the fuel tubing from the tank metal fuel line to the carburetor

19.3 Double check that you have the metal fuel line from the tank connected to the carburetor and that the metal pressure line from the tank to the muffler.



19A- Fuel line connected to the carburetor and pressure line connected to the muffler.

STAGE 20 - INSTALL THE PROPELLER AND THE SPINNER

20.1 Consult your engine manual and select a suitable propeller.

20.2 Install the thrust washer, the spinner backing plate, the propeller, the prop washer, and the prop nut. Ensure that they are all firmly attached.

20.3 Trial fit the spinner cone and spinner cone retaining screws. If necessary enlarge the cutouts in the spinner cone to allow adequate clearance for the propeller. The spinner should not touch the edges of the propeller.

20.4 Double check that the spinner cone retaining screws are firmly attached.



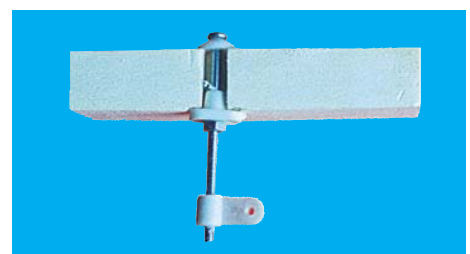
20A- The spinner and propeller attached to the engine.

STAGE 21 - FITTING ELEVATOR AND RUDDER CONTROL HORN

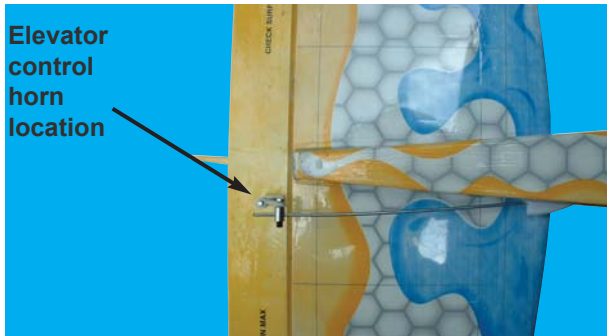
21.1 The elevator control horn is installed through the elevator and protrudes from the bottom of the elevator as shown in 21B and 21C. Pierce the covering over the pre-drilled hole and install the control horns as shown.



21A- Control horn assembly



21B- Typical control horn mounted to the surface control



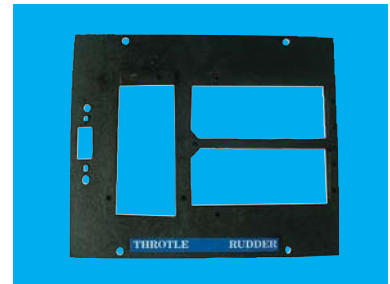
21C- Elevator control horn location



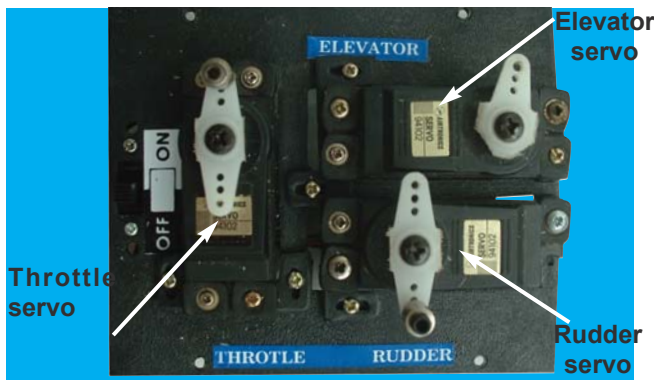
21D- Rudder control horn location

STAGE 22 - INSTALLING THE SERVOS

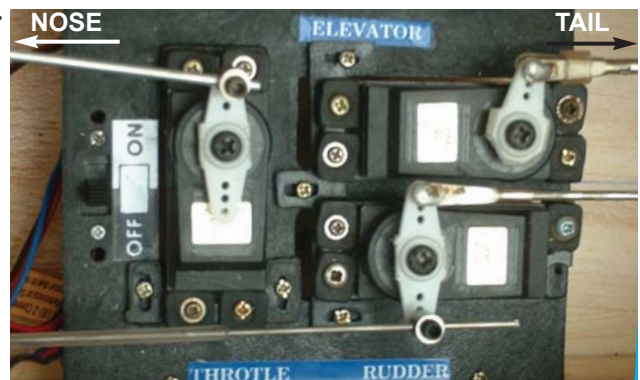
22.1 Install the rubber servo grommets & brass ferrules supplied with your radio equipment. The three servos that control the elevator, rudder and throttle are to be installed in the servo tray mounted in the fuselage. Remove the servo tray from the fuselage, mounting the servos to the servo tray as shown.



22A- Universal servo tray



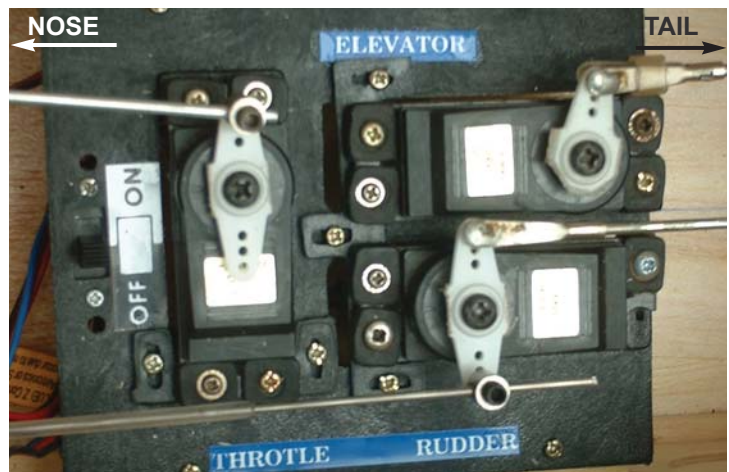
22B- Note the orientation and positions of the three servos in the servo tray



22C- Throttle, rudder and elevator servos connected to their push rods as referenced left to right.

STAGE 23 - CONNECTING THE PUSHRODS TO THE THROTTLE, RUDDER AND ELEVATOR SERVOS

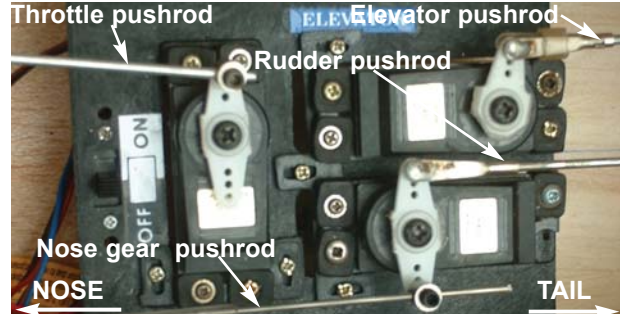
23.1 Consult illustrations 22C & 23A-C showing how the throttle, rudder and elevator servos are positioned and connected to the pushrods.



23A- Throttle (left), elevator (upper) & rudder (lower) servos connected to their respective push rods.



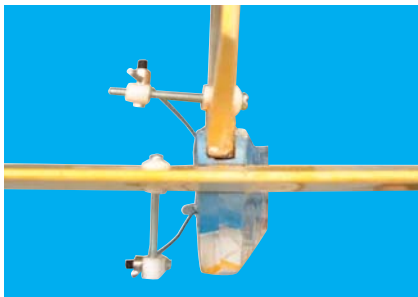
23B- Pre-installed elevator, throttle and rudder pushrod



23C- Center the servos, control surfaces & throttle (carb) then connect the control rods to the servos.

STAGE 24 - CONNECTING THE PUSHRODS TO THE ELEVATOR

24.1 Connect the elevator servo to the receiver and turn on your transmitter. Confirm that the neutral positions of the elevator servo are sustained as per illustration 23C



24A- elevator control horn shown in position



24B- Loosen the set screw to connect the elevator pushrod to the elevator control horn, align the elevator surface so that it is level with the plane of the horizontal stabilizer, then tighten set screw securely.

STAGE 25 - CONNECTING THE PUSHRODS TO THE RUDDER

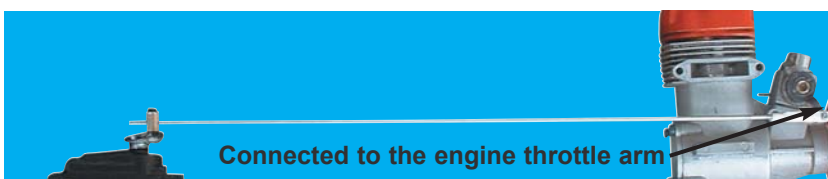
25.1 Connect the rudder servo to the receiver & turn on your transmitter. Confirm that the neutral position of rudder servo is sustained as per illustration 23C



25A - The rudder pushrod is connected to the rudder control horn

STAGE 26 - CONNECTING THE THROTTLE CONTROL

26.1 With the throttle control arm clevis connected to the engine throttle arm, move the throttle arm to roughly half throttle. Look into the throat of the engine carburetor as you rotate the throttle arm and select a position where the throttle opening is about half what it is when fully open.



26A- Throttle control rod connected to the engine throttle arm and to the servo arm



26B- Throttle control rod connected to the engine throttle arm

STAGE 27 - ADJUST CONTROL SURFACE THROW LIMITS

27.1 Adjust the deflection of the control surfaces to match the specifications on page 15

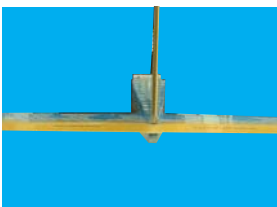
You can reduce the amount of throw by doing either or both of the following:

- From the servo end, move the clevis or EZ connector to a hole in the servo arm that is closer to the servo output shaft.
- From the control horn end, move the horn out further on the threaded bolts. Always confirm that the horn is still thoroughly engaged with the threaded bolt after you have adjusted it.

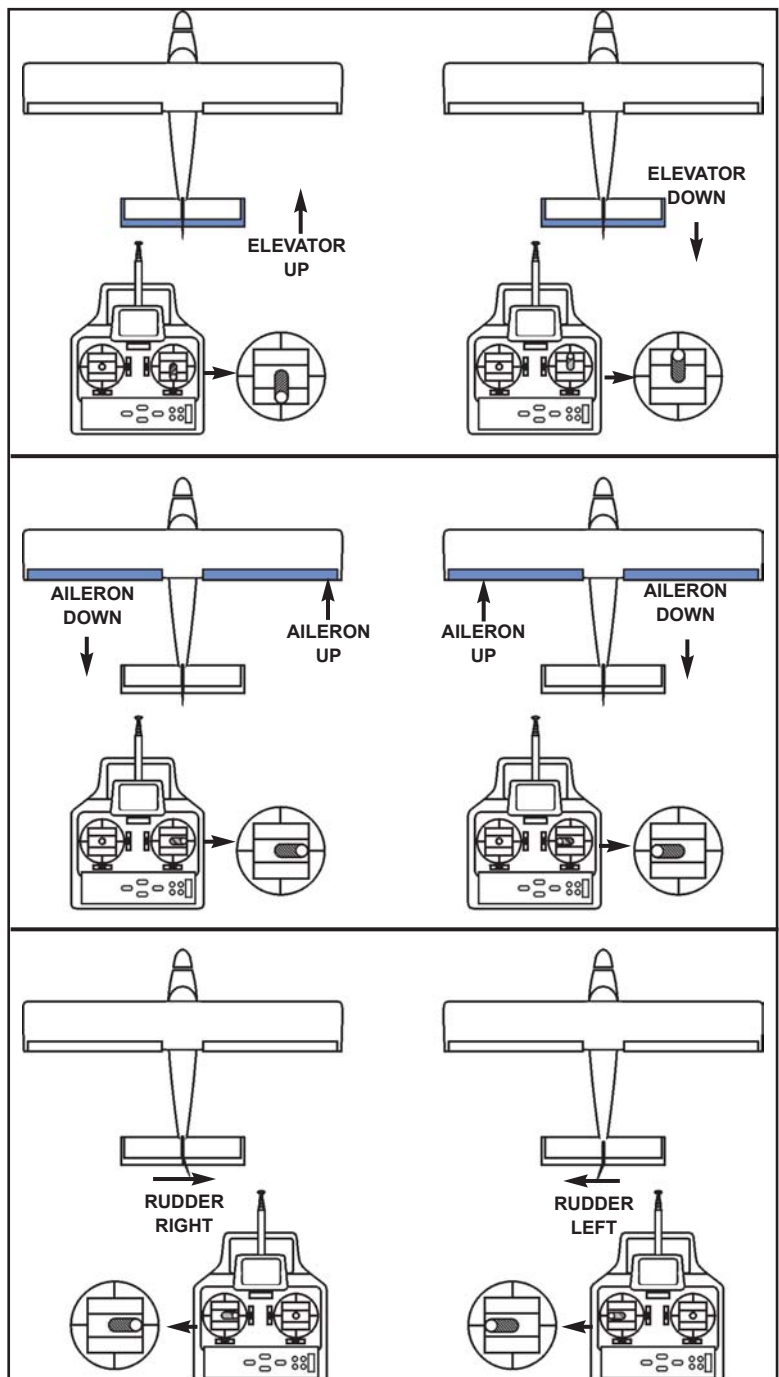
STAGE 28

FINAL RC SET-UP

Before starting the final set-up of the model, switch on the radio and ensure that all trims are in their neutral positions. Check that the ailerons, elevator and rudder are centered. If any adjustments are needed, do these by uncoupling the relevant clevis and turning it clockwise to shorten the linkage or counter-clockwise to lengthen it. Only when each control surface has been centered mechanically in this way should you begin adjusting the surface movement (or throw)



Now confirm that the control surfaces are moving in the correct direction. Use the servo reversing switches on your transmitter to reverse the direction of a servo if necessary. The most popular transmitter mode (with the throttle on the left, with ailerons and elevator on the right) is shown here.



STAGE 30 - INSTALLING THE RECEIVER BATTERY

30.1 Consult your radio manual for instructions about hooking up your receiver battery, receiver and switch harness.

30.2 Wrap the battery pack securely in foam suitable for RC equipment and wrap the foam insulated pack in a plastic bag or cling wrap. Position the battery pack under the fuel tank or nearby.

30.3 Thread the battery pack connector back through from beneath the fuel tank to the radio compartment by passing the battery connector through an opening beside or beneath the fuel tank.

30.4 Connect the battery connector to your radio system according to the radio manual.

STAGE 31 - INSTALLING THE RECEIVER

31.1 Consult your radio manual for instructions about hooking up your receiver.

31.2 Plan where you are going to put the receiver with consideration for routing the antenna safely.

31.3 Wrap the receiver securely in foam suitable for RC equipment and wrap the foam insulated receiver in a plastic bag or cling wrap.

31.4 Generally in the absence of specific instructions from the radio manufacturer, it is recommended that the receiver should be placed where it is least likely to have impact during a crash. Keep the battery pack and other heavy loose items ahead of the receiver.

STAGE 32 - CONFIRM RADIO OPERATION

32.1 Consult your radio manual for instructions about testing and operating your radio system.

32.2 Pay particular attention to charging your radio system batteries and range testing the system before and after each flight.

32.3 Check that all controls are working correctly before and after each flight.

STAGE 33 - BALANCING THE AIRCRAFT

33.1 The CG for your HORNET is located at 3-1/8" to 3-3/8" (80 - 85 mm) back from the leading edge of the wing when the wing has been attached to the fuselage as per illustration 34A.

33.2 For the initial flight, the CG should be located at 3 1/8" (80mm) back from the leading edge of the wing when the wing has been attached to the fuselage.

33.3 The CG is measured with the engine, radio gear and all other components installed but WITH NO FUEL IN THE TANK.

33.4 Set up the CG as it will be when you fly it BUT WITH NO FUEL IN THE TANK.

33.5 It is very important to have the CG correct. Flying your model with the CG too far will likely lead to loss of control and a crash.

If you discover that after you have assembled your model and installed your radio and engine that the CG of your model is incorrect you must bring the CG to the correct location by doing the following BEFORE FLYING :

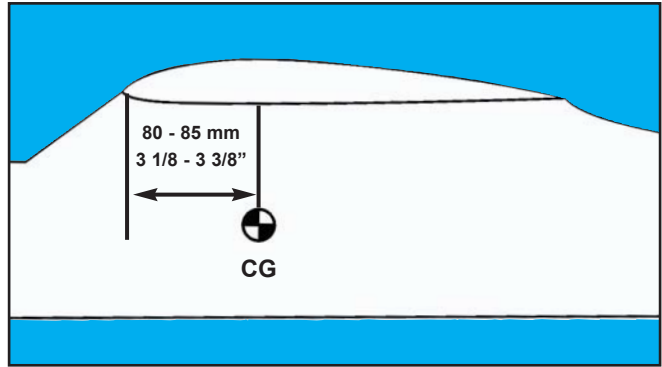
- Move the battery pack fore or aft.
- Move other components fore or aft.
- Change engine to a lighter or heavier model.
- Add weight to the nose or tail. If adding it to the nose, try to make it useful by going to a heavier duty engine or adding a spinner with a heavy metal backing plate. As a last resort, add stick on "dead" weight where appropriate.

STAGE 34 - CONFIRM MECHANICAL INTEGRITY

34.1 Once you have confirmed that the CG is correct, you should do a thorough review of the entire model before your first flight. Check everything twice! Every hook up, every coupling, everything! Do it twice!!

34.2 Before your first flight, have an experienced flyer review your work. Do not fly your model until it has been checked out by a third party who knows how to fly and how to set up a model aircraft. Do not fly alone. Seek experienced help.

34.3 Once you have completed your first flight, get in the habit of checking your model over before and after each flight! Don't fly if you find something that is not right!

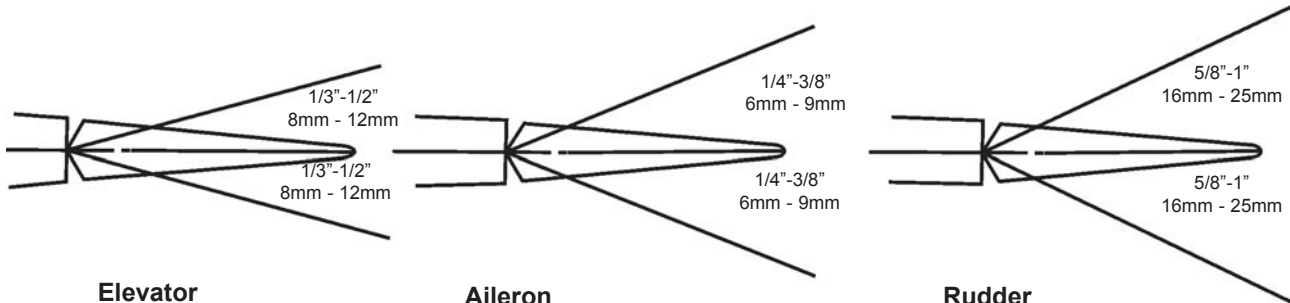


34A- CG location

CONTROL SURFACE THROW SPECIFICATIONS: The throws are measured at the widest part of the control surface. Adjust the position of the pushrods at the control and/or servo horns to control the amount of throw. You may also use ATV's if you radio has them but the mechanical linkages should still be set so that the ATV's are near 100% for best servo resolution.



	Low rate	High rate
ELEVATOR	1/3 " (8mm) up 1/3 " (8mm) down	1/2" (12 mm) up 1/2" (12 mm) down
AILERON	1/4" (6 mm) right 1/4" (6 mm) left	3/8" (9 mm) right 3/8" (9 mm) left
RUDDER	5/8 " (16 mm) up 5/8 " (16 mm) down	1" (25 mm) up 1" (25 mm) down



Parts for this VMAR Model

In the event that you require replacement parts for your VMAR - HORNET 40-52 ARF, you can order parts from your retailer or from the VMAR On - line store at www.richmondrc.com/support.htm.

For aftermarket parts and other information related to this model see the VMAR On - Line store at www.richmondrc.com/support.htm

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The Graphics and Detailing are inside the POLYCOTE ECS!