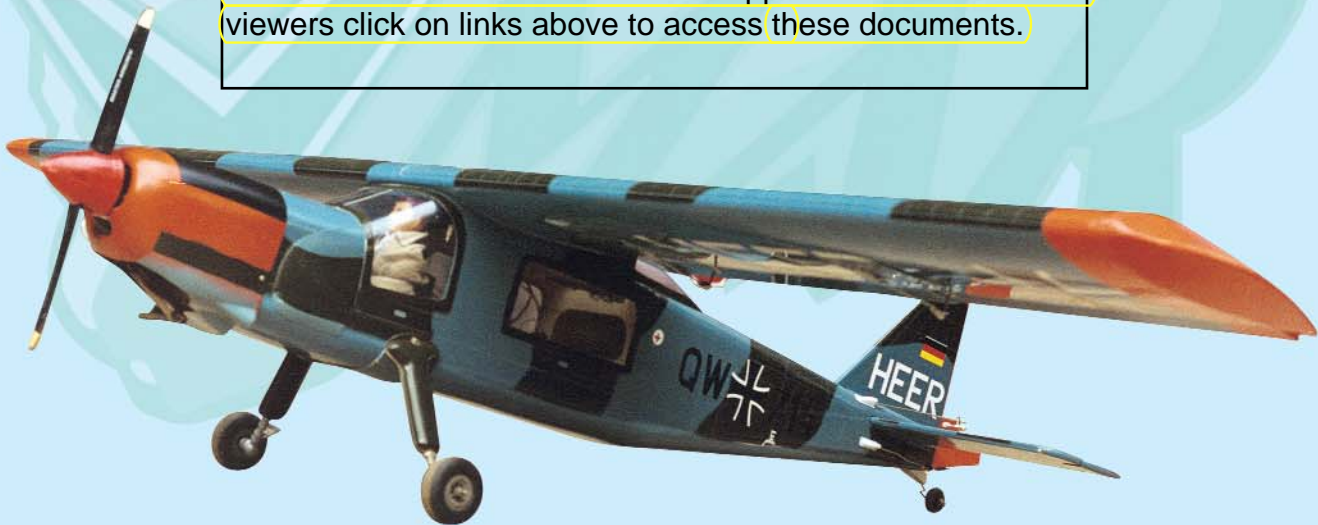


DORNIER DO 27

SEMI SCALE SPORT MODEL

Edited as of 20030221. Highlights and strike outs represent changes from the original factory manual. In addition to this manual, please consult the latest READ ME FIRST and IMPORTANT INFORMATION sheets for this model available at www.richmondrc.com/support.htm. On Line viewers click on links above to access these documents.



DORNIER DO 27

Assembly and Operations Manual

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

Please review this manual throughly
Before **Assembling** or Operating
The
DORNIER DO 27
Semi **Scale Sport Model**

We've used our ULTRA TOUGH POLYCOTE ECS Enhanced Covering System
for this Model



POLYCOTE™ ECS
ENHANCED COVERING SYSTEM

POLYCOTE
ECS
ENHANCED
COVERING
SYSTEM

Stage 1 – WING ASSEMBLY.

JOINING THE WING HALVES

To join the wing halves you will need the following items :

Wing joiner supplied with kit.

Two short dowel guides supplied with kit

Rolled trim strip supplied with kit

30 minute epoxy

Sandpaper (Coarse 240 grit recommended)

Epoxy brush or stir sticks

Disposable mixing dish for the epoxy

Low tack masking tape to hold the wing in position while the epoxy sets

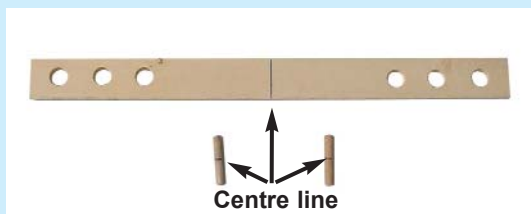
Pencil

Ruler

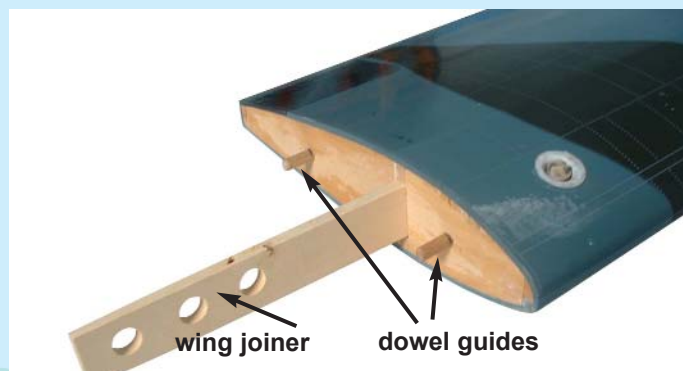
Paper towels.



Locate the wing joiner & dowel guides and insert into one of the wing panels as shown. Mark a centre line on the wing joiner and dowel guides as shown below. Trial fit the second wing panel to ensure a good dry fit before gluing.



1.1 Orientation of wing joiner and dowel guide



1.2 Trial fit the wing joiner and dowel guides

Stage 2



2.1 Apply epoxy to one end of wing joiner

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 shown in the sequence below, then wipe off the excess glue 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** with epoxy. Do not use 5 minute epoxy to join the wings.



2.2 Carefully insert the joiner... Also the dowel guides...



2.3 ... all the way into the centre line



2.4 Wipe off any excess epoxy that squeezes out.

Stage 3

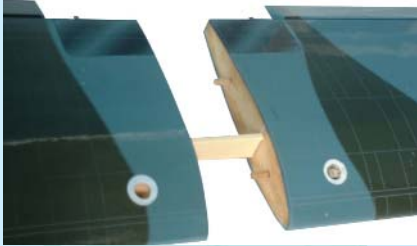


3.1 Apply plenty of glue 30 minute epoxy to joiner & both wing roots.

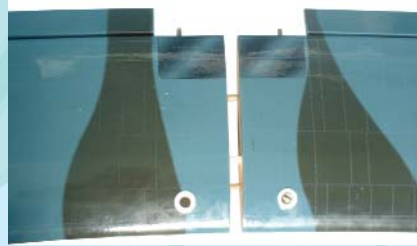
When the epoxy has cured in Stage 2, trial fit the second wing panel onto the first to ensure that the two panels fit without an excessive gap.

Now apply plenty of epoxy to the joiner & both wing roots where the wing panels will meet. Use 30 minute epoxy to ensure a strong bond and give yourself plenty of working time. Now join the wings. The epoxy should ooze from the joint and the excess should be cleaned off with a rag or tissue before it cures.

Use low tack masking tape to hold the two panels tightly together until the epoxy cures.



3.2 Align the two wing panels



3.3 Slowly close the gap



3.4 Use tape to hold tightly together

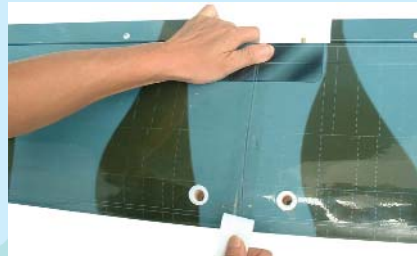
Stage 4

Once the epoxy has cured completely (allow several hours at least) carefully peel back the tape and remove it.

To cover the joint in the wings, a length of wing joiner tape is supplied. Starting from the upperside, 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 in the bottom of the wing.



4.1 Apply tape over the joint, starting here.



4.2 Continue across the top of the wing, pressing down firmly.



4.3 Trim off any excess trim tape.

FITTING AILERON SERVOS

Stage 5

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

- 2 servos
- Servo mounting screws and grommets as supplied with your 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 one end.
- Low tack masking tape.
- 2 aileron control horn assemblies & 2 EZ Connectors.



Prepare the servos by fitting the rubber grommets & ferrules supplied with your servo.

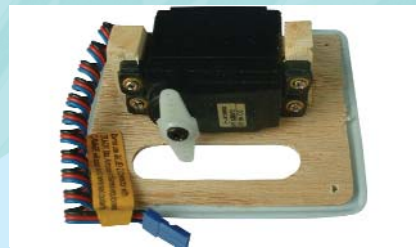
Carefully remove the **white** cover plates from the aileron servo cavities. Ensure you know which cover plate is for the right wing and which is for the left. Remove the **white** cover plates and retain the mounting screws. Notice that there are wooden servo rails pre-installed **onto each cavity plate**. Locate the wiring harness tubes that are protruding slightly into each aileron servo cavity. The tube can be moved slightly at this point. Check out the other end of each tube for a clean position and then using C/A glue secure the wiring harness tubes at the aileron servo cavity end. Install a servo **onto each cavity plate** and connect the servo wire to the servo extension wires and run the extension wires through **the wiring harness tubes to the centre of the wing**. Install the aileron control horns and **EZ Connectors**.



5. Aileron **servo** location



5.1 Aileron **servo** mount



5.2 **Screw** servo **into** position



5.3 Install **horn & EZ Connector**

Stage 6

Step 1 Consult your radio instruction manual and center each aileron **servo** by plugging it into the aileron channel **of** 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.

Step 2 Mount the servo arm back on the servo. Position the arm to be parallel with the back edge of the wing. Screw the arm into place with the servo arm mounting screw supplied with the servo.

Locate the two aileron control rods in the hardware bag. 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.

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.

Step 3 Ensure that the aileron control horns are screwed onto the threaded aileron control horn bolts and that both control horns are in approximately the same place on their respective bolts.

Step 4 Connect the aileron servo rods to the aileron control horns. The **one** end with **the clevis** will be attached to the servo output arm.

Step 5 Connect the other end of the rod to the control horn pre-installed with an EZ connector

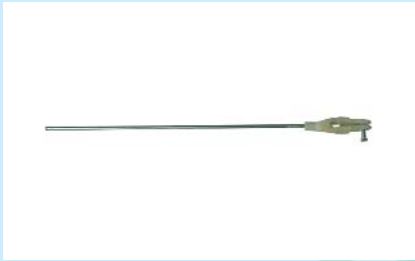
Step 6 **Carefully peel back and** remove the masking tape holding the ailerons.

Step 7 In the case of computer radios **couple** the servos together by connecting them to the appropriate receiver channel. In the case of analog radios couple the servos together using a Y harness

Step 8 Turn on your radio and activate the **ailerons using** the aileron stick and ensure a smooth full motion can be achieved.

Step 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).

Step 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.



6.1 Aileron control rod assembly



6.2 Aileron control horn assembly



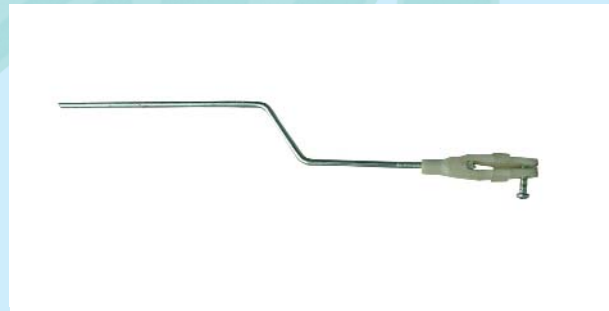
6.3 Aileron control rod installed

FITTING FLAP SERVOS

Stage 7

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

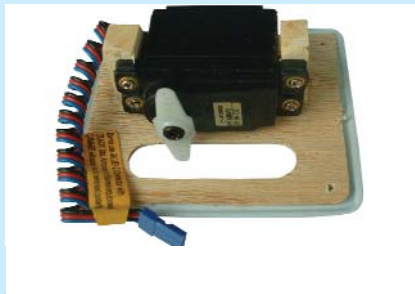
- 2 servos
- Servo mounting screws and grommets as supplied with the servo.
- Servo control arm as supplied with the servo.
- Two flap control rod assemblies
- Low tack masking tape.



7.1 Flap control rod assembly



7.2 Flap servo location



7.3 Flap servo installed in position



7.4 Final flap installation



7.5 Flap down



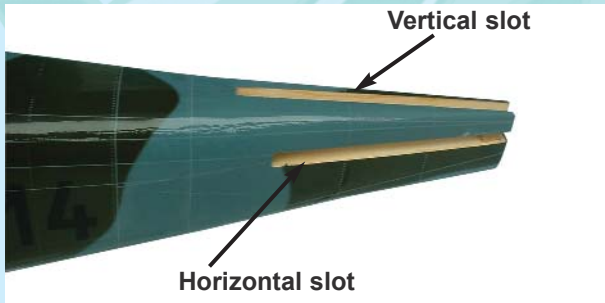
7.6 Flap up

FITTING THE HORIZONTAL AND VERTICAL STABILIZERS

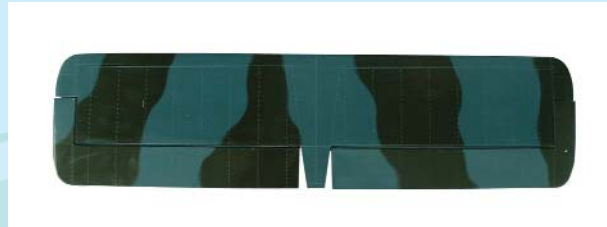
Stage 8

To **mount** the stabilizers to the fuselage you will need.

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



The completed fuselage slots **should** look like this



Horizontal **stabilizer** with pre-installed elevator



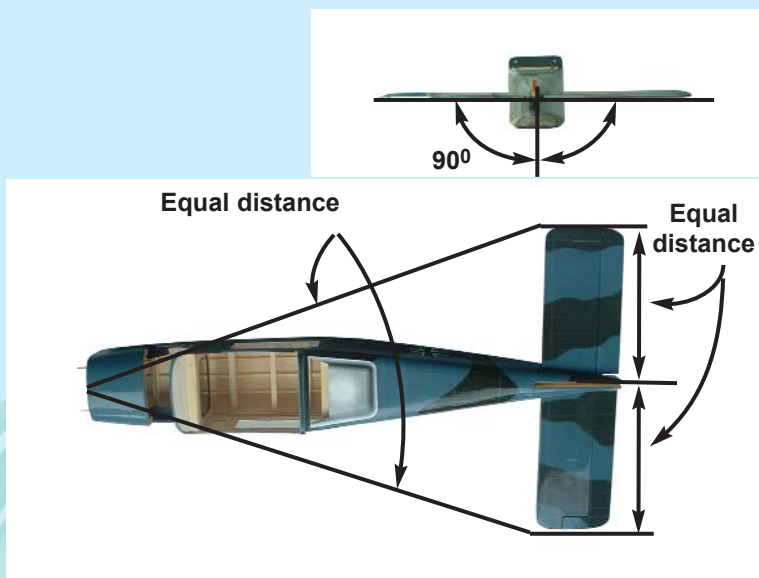
Vertical **stabilizer** with pre-installed rudder

Stage 9

Check the fit of the horizontal stabilizer in its slot. Make sure the tail is square and centred to the fuselage by taking measurements as shown in the diagrams on the right, but don't glue anything yet.

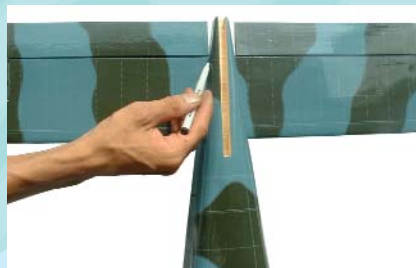


9.1 Trial fit the horizontal stabilizer in its slot



Stage 10

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



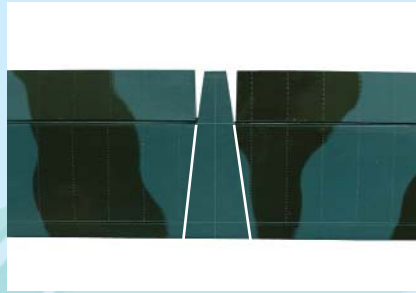
10.1 Mark the top of the horizontal stabilizer



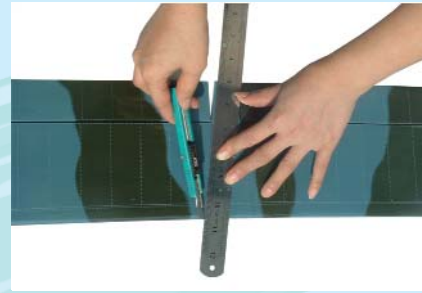
10.2 Followed by the bottom

Stage 11

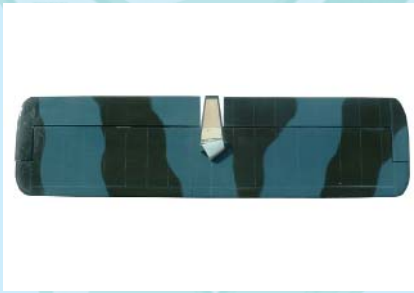
Now remove the horizontal stabilizer. Using a sharp knife and a ruler CAREFULLY cut 2mm inside the marked lines and remove the covering on the top and bottom of the tail as shown. Make sure you only cut the film and not the wood, otherwise the horizontal stabilizer will be severely weakened.



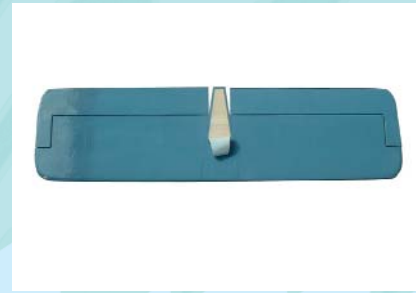
11.1 Marked lines on horizontal stab



11.2 Cutting inside the lines.



11.3 Remove covering from top surface



11.4 Exactly the same underneath



11.5 Clean off any traces of pen

Stage 12

Now apply sufficient epoxy to the top and bottom of the horizontal stabilizer. Use 30 minute epoxy to ensure a strong bond and give yourself plenty of working time.

Insert the horizontal stabilizer in its slot in the fuselage and re-check the alignment as in Stage 9. Excess epoxy should be cleaned off with a rag or tissue before it cures.



12.1 Apply plenty of epoxy



12.2 Slide the horizontal stabilizer into place



12.3 Wipe off excess epoxy

FITTING THE VERTICAL STABILIZER WITH RUDDER

Stage 13

Check the fit of the vertical stabilizer in its slot. Make sure that it is glued square to the horizontal stabilizer and fuselage



13.1 Trial fit the vertical stabilizer into fuselage.

Stage 14

Mark the shape of the fuselage on the left and right sides of the vertical stabilizer using a felt-tip pen. Now remove the vertical stabilizer, using a sharp knife & ruler, CAREFULLY cut just 2mm inside the marked

lines and remove the covering on both sides of the fin, just as you did with the horizontal stabilizer, making sure you **only press hard enough to cut the covering, not the wood of the vertical stabilizer.**



14.1 Mark both sides of the vertical stabilizer



14.2 Carefully cut through the covering. **Do NOT cut the wood.**



14.3 Remove covering from both sides

Stage 15

Now apply sufficient epoxy to both sides and the bottom of the vertical stabilizer. Use 30 minute epoxy to ensure a strong bond and give yourself plenty of working time.

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.



15.1 Apply plenty of epoxy



15.2 Slide the vertical stabilizer into place

FITTING THE MAIN LANDING GEAR

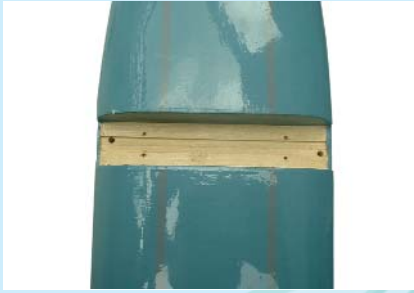
Stage 16

Identify the main landing gear components shown **below** here.

- 2 main landing gear **assemblies**
- 2 main wheels (60mm **x 20mm**)
- 1 ABS main landing gear cover (with 6 mounting screws)
- 4 sheet metal screws 5 x 35 mm & 2 **straps**
- 2 **wheel collars**



16.1 Main landing gear components



16.2 Turn over the fuselage & locate the pre-drilled main landing gear mounting holes



16.3 Use 4 sheet metal screws and 2 straps to mount the main landing gear onto the fuselage



16.4 Drill pilot holes with a 1/16 (or 1,6 mm) drill-bit



16.5 Mount the main landing gear fairing with a 2x10 screw



16.6 Install the wheel



16.7 Install the main landing gear cover using 6 screws.

FITTING THE TAIL WHEEL

Stage 17

Install the tail wheel assembly. Note that the tail wheel assembly has a loose wire end. Slide the loose wire end into the sleeve tube that has been installed into bottom of the rudder. Position the plastic bracket on

the bottom of the fuselage. Mark the location of the screw holes. Tap the holes with the screws and then fasten the plastic bracket to the fuselage. See the illustration below.



17.1 Insert the tail wheel steering wire into the steering guide tube



17.2 Screw the tail wheel assembly to the fuselage



17.3 Trim off the excess tail steering wire

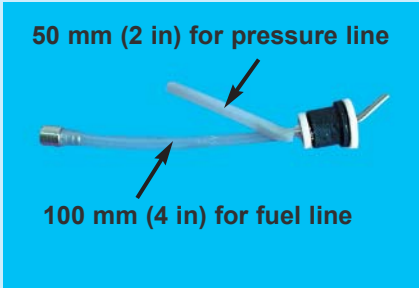
FITTING THE FUEL TANK

Stage 18

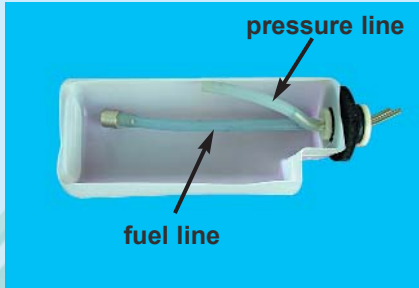
To assemble the fuel tank you will need the following items:

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

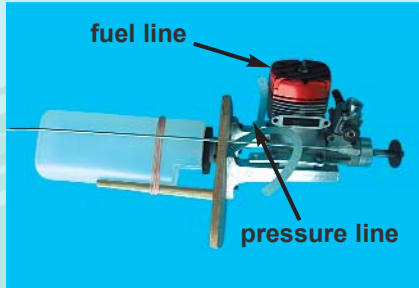




18.1 Use 100 mm (4 in) for fuel line and 50 mm (2 in) for pressure line



18.2 Illustration of fuel line positioning inside the tank



18.3 Fuel tank installed on the power module. Use silicone.

INSTALLING THE ENGINE

Stage 19

The engine and the fuel tank are installed onto the power module. First remove the power module from the fuselage by removing the 4 nuts & washers



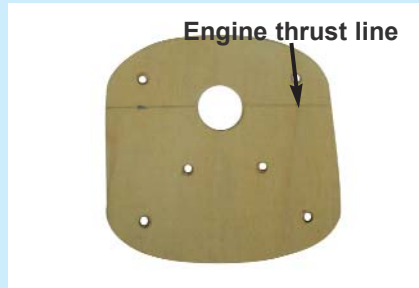
VMAX Pro.46 engine recommended



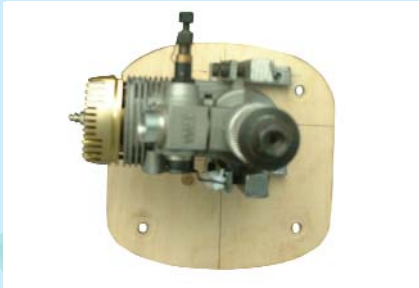
19.1 Aluminum engine mount



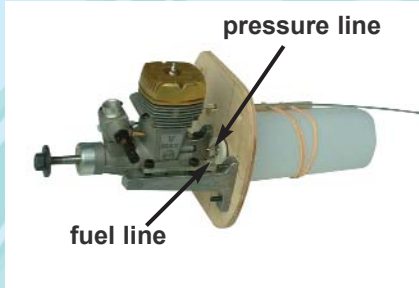
19.2 Power module assembly



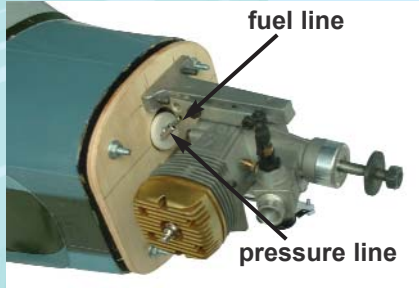
19.3 Engine thrust line



19.4 Engine and engine mount recommended orientation.



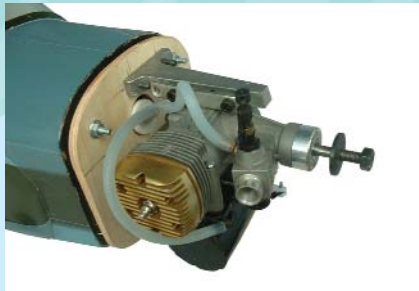
19.5 Engine and fuel tank positioned on the power module



19.6 Throttle control connection to the engine



19.7 Cowl installation



19.7 Install the muffer and connect the fuel and pressure line



19.8 Install a suitable prop and spinner

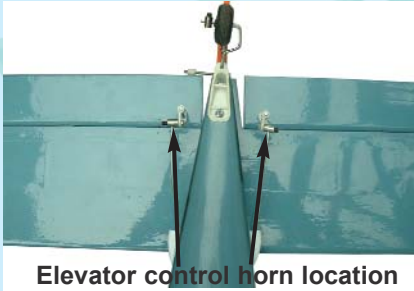
FITTING ELEVATOR AND RUDDER CONTROL HORN

Stage 20

The elevator horns are to be fitted on the underside of both right & left of the elevator halves. Pierce the covering over the pre-drilled hole for the control horn installation as shown.



20.1 Control horn assembly



Elevator control horn location
20.2 Elevator control horn location



20.3 Rudder control horn location

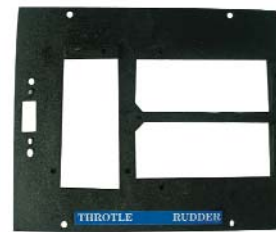


20.4 Elevator and rudder control horn connected to the control rod

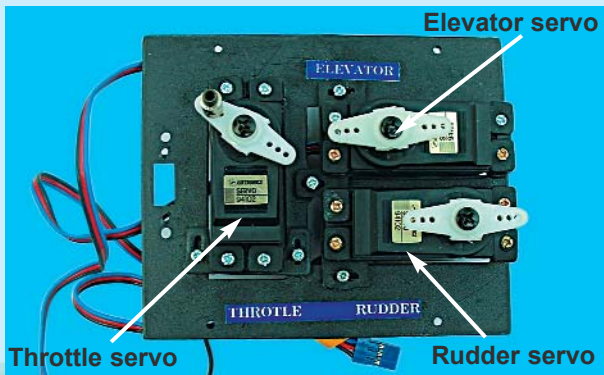
INSTALLING THE SERVOS

Stage 21

Install the rubber servo grommets and brass ferrules supplied with your radio equipment. The three servos that control the elevator, rudder and throttle are 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.



21.1 Universal servo mount



21.2 Note the orientation and positions of the three servos in their tray



21.3 Throttle, elevator and rudder servos connected to their respective push rods

CONNECTING THE PUSHRODS TO THE THROTTLE, RUDDER AND ELEVATOR SERVOS

Stage 22

22.1 Consult the picture showing how the throttle, rudder and elevator servos are positioned and connected to the pushrods.

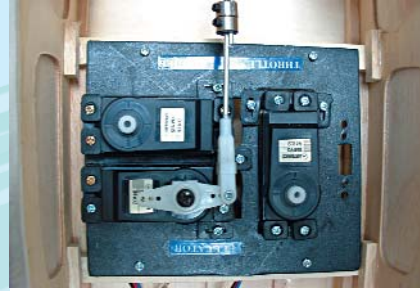




22.2 Pre-installed elevator and rudder pushrod



22.3 Connect a clevis to the servo arm



22.4 Connect the elevator pushrod to the elevator servo arm

CONNECTING THE PUSHRODS TO THE ELEVATOR

Stage 23

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 22.4



23.1 Two independent elevator control horns shown in position



23.2 Connect the elevator pushrods to the control horns



23.3 Loosen collars to align elevator surfaces. Retighten collars securely

CONNECTING THE PUSHROD TO THE RUDDER

Stage 24

Connect the rudder servo to the receiver and turn on your transmitter. Confirm that the neutral positions of the rudder servo are sustained as per illustration 22.4

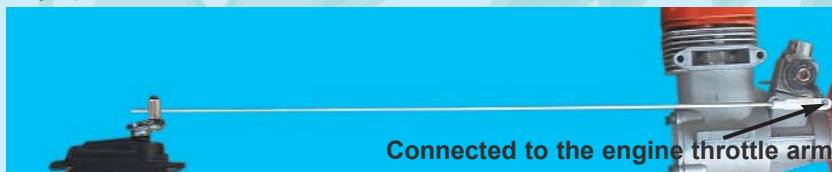


24.2 Connecting the rudder pushrod to the rudder control horn

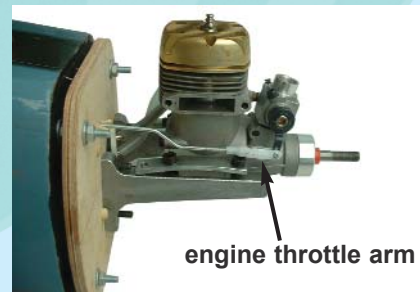
CONNECTING THE THROTTLE CONTROL

Stage 25

Connect the clevis to the engine throttle arm at roughly half throttle. Look into the throat of the engine carburettor as you rotate the throttle arm and select a position where the throttle opening is about half what it is when fully open.



25.1 Throttle control rod



25.2 Throttle control rod connected to the engine throttle arm

ADJUST CONTROL SURFACE THROW LIMITS.

Stage 26

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.

FINAL R/C SET-UP

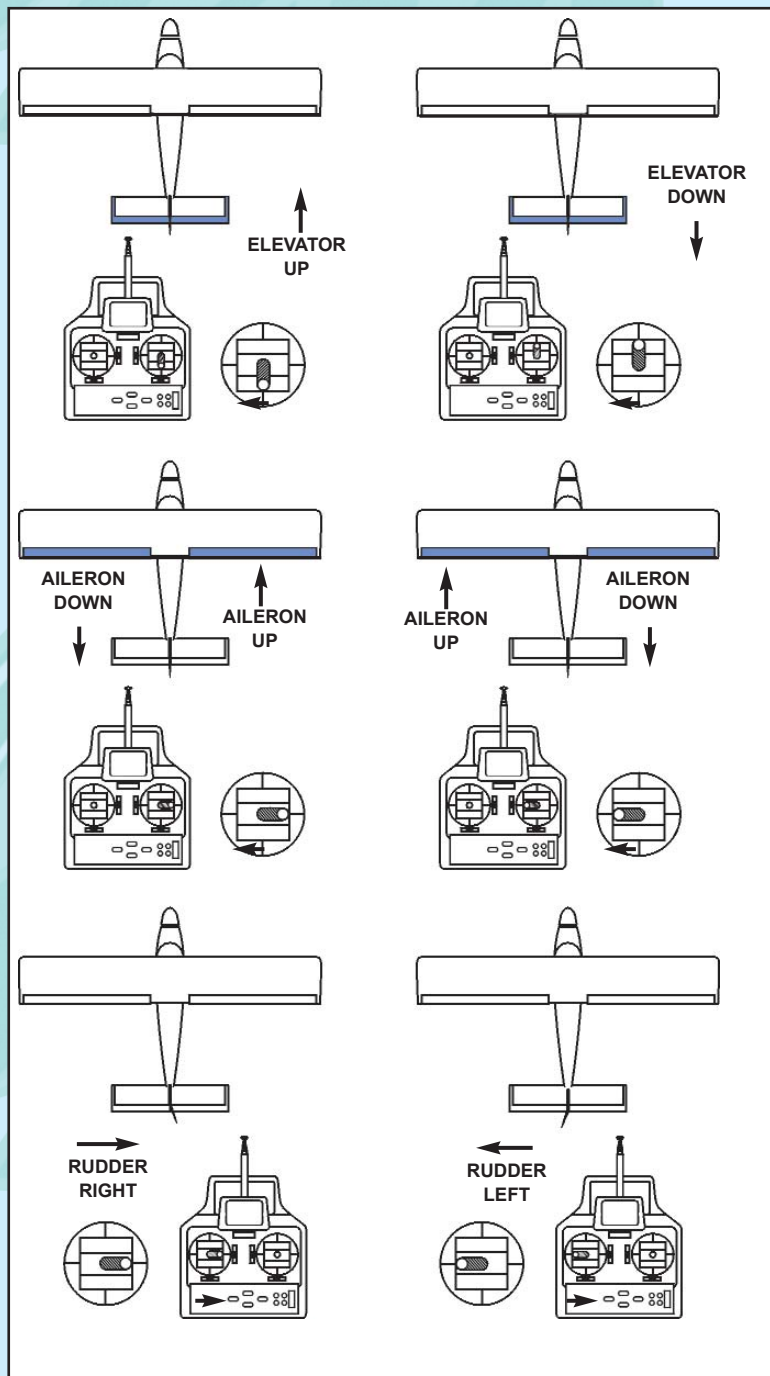
Stage 27

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 centred. 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 centred 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 28



Stage 29

INSTALLING THE RECEIVER BATTERY

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

29.2 Wrap the battery pack securely in foam suitable for RC equipment and wrap the foam insulated pack in a plastic bag or cling wrap.

29.3 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.

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

Stage 30

INSTALLING THE RECEIVER

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

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

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

30.4 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 31

CONFIRM RADIO OPERATION

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

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

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

Stage 32

BALANCING THE AIRCRAFT.

The CG for your DO 27 is located at 75 to 80 mm (**3 to 3-1/4 inches**) back from the leading edge of the wing when the wing has been attached to the fuselage.

For the initial flight, the CG should be located at 75mm (3 inches) back from the leading edge of the wing when the wing has been attached to the fuselage.

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

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

It is very important to have the CG correct. Flying your model with the CG too far back **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 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.

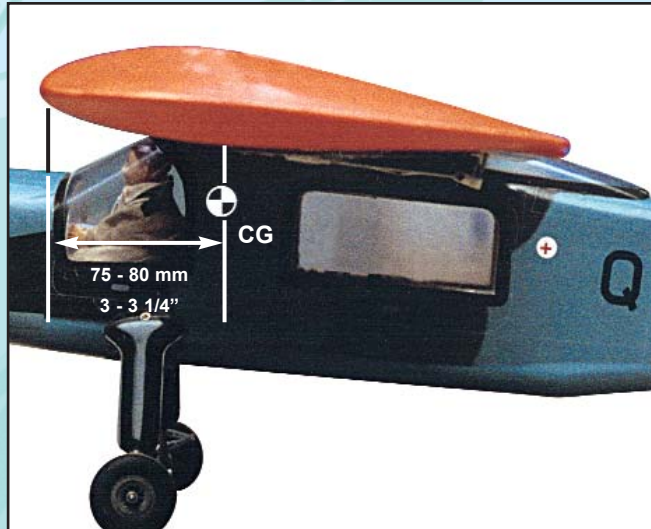
Stage 33

CONFIRM MECHANICAL INTEGRITY

33.1 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!!

33.2 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.

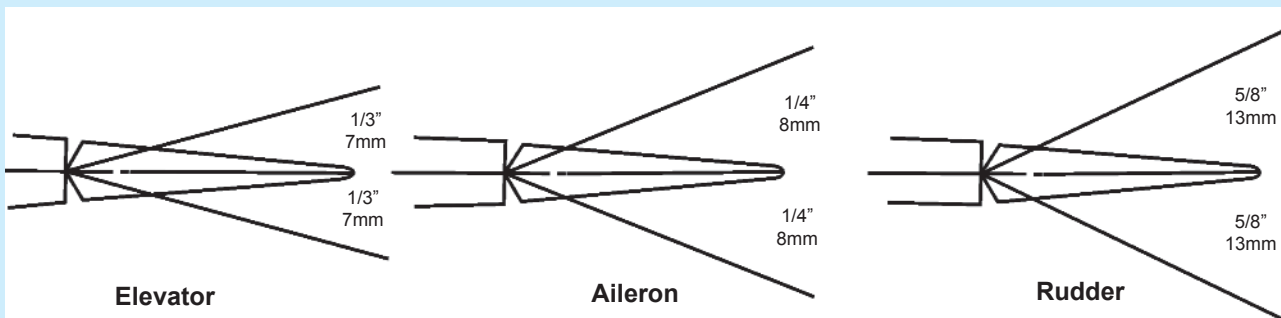
33.3 Once you have completed your first flight, get in the habit of checking your model over before and after each flight! Don't fly if you find something that is not right!



NOTE : The throws are measured at the widest part of the elevator, rudder and aileron. Adjust the position of the pushrods at the control/servo horns to control the amount of throw. You may also use the ATV's if your transmitter has them but the mechanical linkages should still be set so that the ATV's are near 100% for best servo resolution.

	High rate	Low rate
ELEVATOR	1/2 " (12mm) up 1/2 " (12mm) down	1/3" (7mm) up 1/3" (7mm) down
RUDDER	1 " (25mm) right 1" (25mm) left	5/8" (13mm) right 5/8" (13mm) left
AILERON	3/8" (11mm) up 3/8" (11mm) down	1/4" (8mm) up 1/4" (8mm) down.

Note: If your radio does not have dual rates, then set the control surfaces to move at the low rate throws.



Parts for this VMAR Model

In the event that you require replacement parts for you VMAR VAN RV - 4, you can order parts from your retailer or from the VMAR On - line store at www.richmondrc.com. Please see the IMPORTANT INFORMATION sheet for parts for this model.

Fuselage	#VA.104H.0461F (with servo tray & all rods)
Wing set	#VA.104H.0461W (a set of left and right with joiner ect)
Tail set	#VA.104H.0461T (contains horizontal and vertical stabilizers)
Cowl	#VA.104H.0461L (fiberglass)
Canopy set	#VA.104H.0461N (canopy and frame)
Main gear	#VA.104H.0461MG (fiberglass main landing gear with axle set)
Wheel part set	#VA.104H.0461WH (with main gear fairing set)
Covering set	#VA.104H.0461V (POLYCOTE EGS)
Wing parts bag	#VA.104H.0461WP (spar joiner, aileron rods ect)
Master bag	#VA.104H.0461MB (as in kit)

For aftermarket parts and other information related to this model see VMAR On - line at www.richmondrc.com.

POLYCOTE™ ECS

ENHANCED COVERING SYSTEM

Your VMAR DORNIER DO 27 Model is covered in POLYCOTE ECS.
The new ULTRA TOUGH POLYESTER covering from VMAR !



DORNIER DO 27

NEW !!

**WHAT'S IT
ALL ABOUT ?**

POLYCOTE ECS is an Enhanced Covering System Engineered in Canada and Available only from VMAR. With POLYCOTE ECS the graphics are inside the covering... not stuck on top. No Decals! No Layers! No Strips! No Stripes! VMAR Models using POLYCOTE ECS have very few seams and our proprietary SURE SEAL system ensures that the seams stay down! Best of all, POLYCOTE itself is a totally fuel proof ULTRA TOUGH POLYESTER

For more information, Please visit our website:

www.richmondrc.com/support.htm



POLYCOTE™ ECS
ENHANCED COVERING SYSTEM

**POLYCOTE
ECS**
ENHANCED
COVERING
SYSTEM



SUPPORT INFORMATION

[Support Related to VMAR ARF Products](#)



©Richmond RC Supply Ltd. All Rights Reserved. *Unauthorized commercial use strictly prohibited.*

Prices, Specifications, Features and Availability subject to change without notice

Production Colors and Graphic Schemas may differ from that shown.

Artwork, text and information for the use of consumers and Richmond RC customers only

For information contact webmaster@richmondrc.com

2002-10-06 21:00:46 