

DORNIER DO 27

SEMI SCALE SPORT MODEL

120+ Size



PIRELLI DORNIER DO 27

Assembly
and
Operations Manual

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

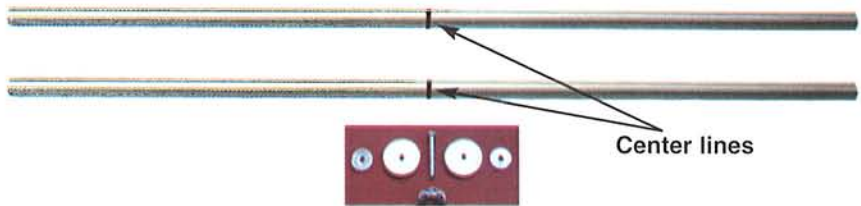


WING ASSEMBLY

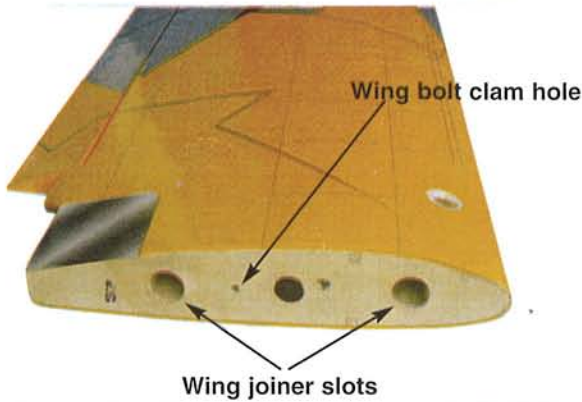
Stage 1

JOINING THE WING HALVES

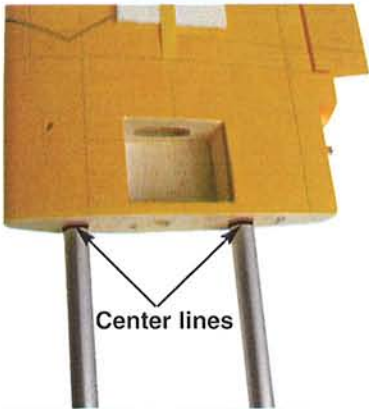
- To join the wing halves you will need the following items :
- 2 aluminium wing joiner tubes supplied with kit (dia. 19mm, 900mm length)
- One 4-30 machine bolt with 1 butterfly nut
- Two 1.5 mm steel washers
- Two 2.5 mm wooden washers



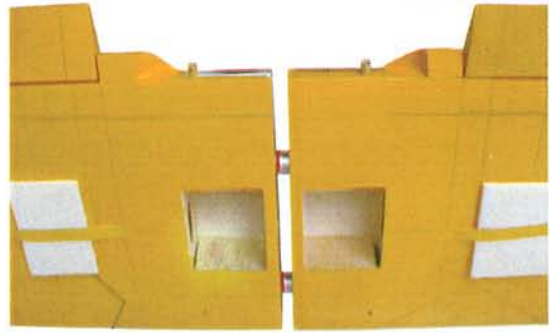
1.1 Two aluminium wing joiner tubes and wing bolt clam set



1.2 Trial fit the aluminium wing joiners



1.3 Push two alu. joiner tubes into the slots of the first wing panel all the way to the center lines



1.4 Pushing slowly the aluminium wing joiner tubes to the second wing panel and slowly close the gap



1.5 Use wing bolt clam set to hold the both wing panels together



1.6 Cut away wing bolt set

FITTING AILERON SERVOS

Stage 2

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

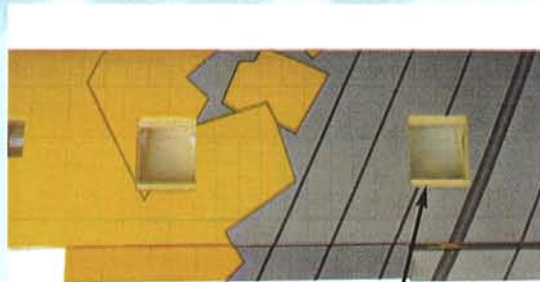
- 2 servos
- Servos mounting screws and grommets as supplied with servos.
- Servo control arms as supplied with the servos.
- Two aileron control rod assemblies supplied with the kit. The assemblies consist of a metal rod with a plastic clevis screwed onto one end.
- Low tack masking tape.
- 2 aileron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

Carefully remove the 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 into each servo cavity end. 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 in each aileron servo cavity and connect the servo wire to the servo extension wires and run the extension wires through wiring harness tubes to the centre of the wing. Install the aileron control horns



2.1 Prepare the servos by fitting the rubber grommets & ferrules supplied with your radio

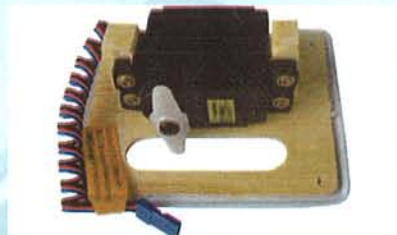


Aileron servos cavity

2.2 Aileron servos location



2.3 Aileron servos mount



2.4 Screw servo in position



2.5 Install aileron control horn

Stage 3

Step 1 Consult your radio instruction manual and center each aileron servos 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.

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 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 Remove the masking tape holding the ailerons.

Step 7 In the case of computer radios 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).

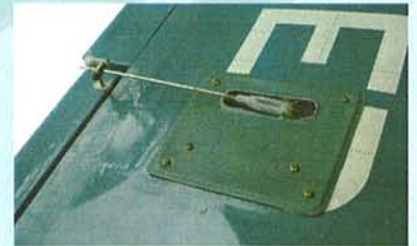
Step 10 With the wing top side up and viewed from the back, ensure that moving the transmitter aileron stick to the right raises the right aileron and lowers the left aileron. Movement of the stick to the right will roll the aircraft to the right.



3.1 Aileron control rod assembly



3.2 Aileron control horn assembly



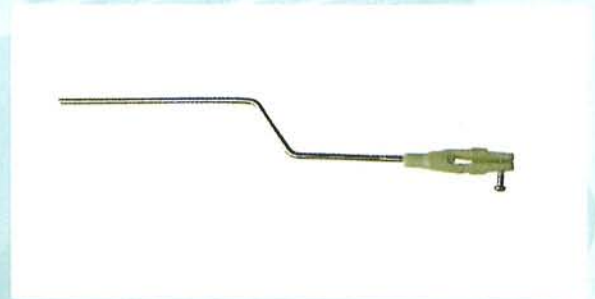
3.3 Aileron control installed

FITTING FLAP SERVOS

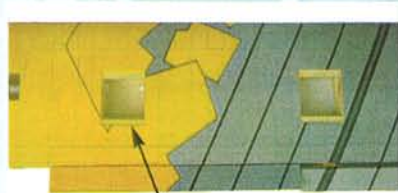
Stage 4

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.



4.1 Flap control rod assembly

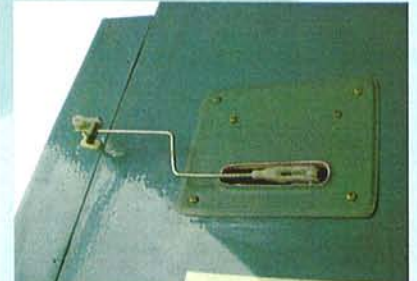


Flap servo location

4.2 Flap servo location



4.3 Flap servo installed in position



4.4 Final flap installation



4.5 Flap down



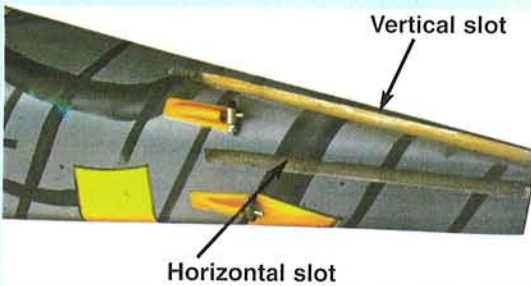
4.6 Flap up

FITTING THE HORIZONTAL AND VERTICAL STABILIZERS

Stage 5

To install the stabilizers to the fuselage you will need.

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



5.2 The completed fuselage slot should look like this



5.1 Horizontal stabilizers with pre-installed elevator



5.3 Vertical stabilizers with pre-installed rudder

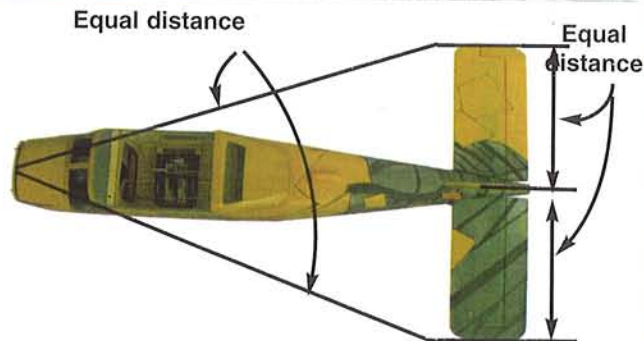
FITTING THE HORIZONTAL STABILIZER WITH ELEVATOR

Stage 6

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.



6.1 Trial fit the horizontal stabilizer in its slot



Stage 7

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.



7.1 Mark the top of the horizontal stabilizer



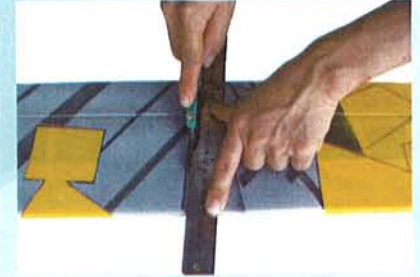
7.2 Followed by the bottom

Stage 8

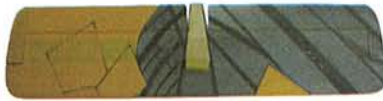
Now remove the horizontal stabilizer, using a sharp knife and a ruler CAREFULLY cut 2mm inside the marked lines and remove the covering on the top and bottom of the tail as shown. Make sure you only cut the film and not the wood, otherwise the horizontal stabilizer will be severely weakened.



8.1 Marked lines on horizontal stab



8.2 Cutting inside the lines



8.3 Removed covering from top surface



8.4 Exactly the same underneath



8.5 Clean off any traces of pen

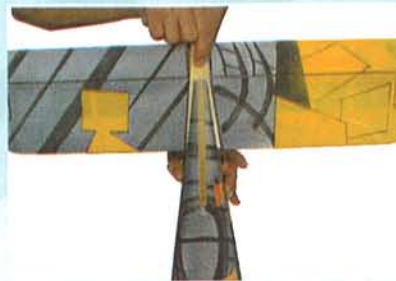
Stage 9

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.



9.1 Apply plenty of epoxy



9.2 Slide the horizontal stabilizer in place



9.3 Wipe off excess epoxy

FITTING THE VERTICAL STABILIZER WITH RUDDER

Stage 10

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



10.1 Trial fit the vertical stabilizer onto fuselage.

Stage 11

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 vertical stabilizer.



11.1 Mark both sides of the vertical stabilizer



11.2 Carefully cut through the covering



11.3 Remove covering from both sides

Stage 12

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.



12.1 Apply plenty of epoxy



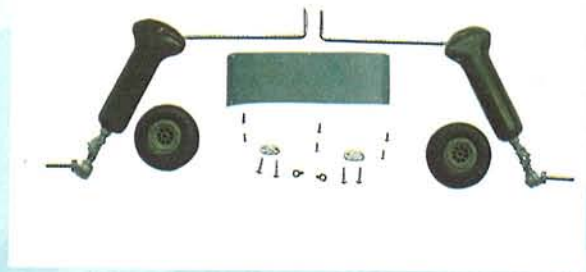
12.2 Slide the fin in place

FITTING THE MAIN LANDING GEAR

Stage 13

Identify the main landing gear components shown below

- 2 main landing gear assemblies
- 2 main wheels
- 1 ABS main landing gear cover (with 6 mounting screws)
- 4 sheet metal screws 5 x 35 mm with traps
- 2 colars



13.1 Main landing gear components



13.2 Turn over the fuselage to locate the pre-drilled main landing gear mounting holes



13.3 Use 4 sheet metal screws and 2 traps to mount the main landing gear onto the fuselage



13.4 Pilot drill drill mounting holes with 1/16 (or 1,6 mm) drill-bit



13.5 Mount the main landing gear fairing with 2x10 screw



13.6 Install the wheel



13.7 Install the main landing gear cover

FITTING THE TAIL WHEEL

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

Stage 14

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.



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



14.2 Screw the tail wheel assembly to the fuselage



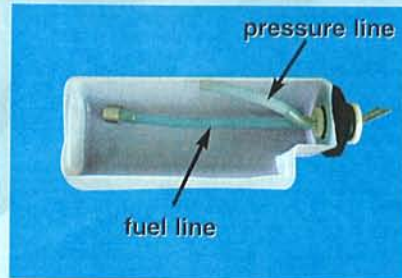
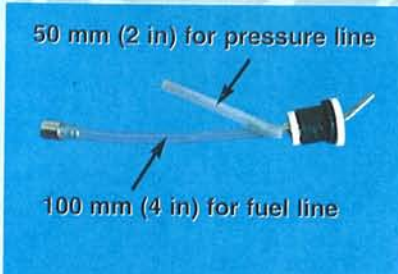
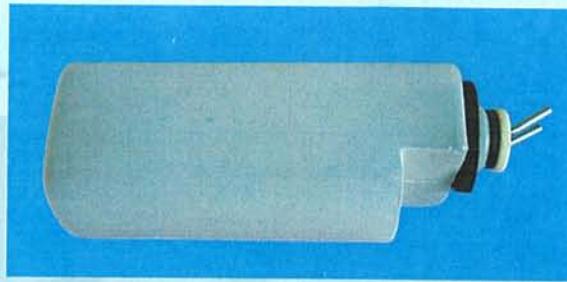
14.3 Trim off the excess tail steering wire

FITTING THE FUEL TANK

Stage 15

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 Phillips screw driver



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

15.2 Illustration of fuel line positioning inside the tank

15.3 Fuel tank installed on the power module

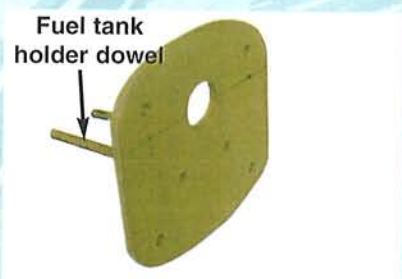
INSTALLING THE ENGINE

Stage 16

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



16.1 Aluminum engine mount



16.2 Power module assembly



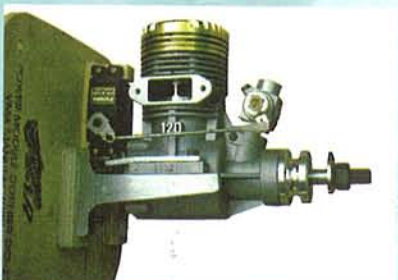
16.3 Engine thrust line



16.4 Engine and engine mount recommendation orientation.



16.5 Engine and fuel tank positioned on the power module



16.6 Throttle control connection to the engine



16.7 Cowl installation



16.8 Install the muffer and connect the fuel and pressure line



16.9 Install the suitable prop and spinner

FITTING ELEVATOR AND RUDDER CONTROL HORN

Stage 17

The elevator control is fitted on the underside of both right and left of the elevator halves. Pierce the covering over the pre-drilled hole for the control horns installation as shown.



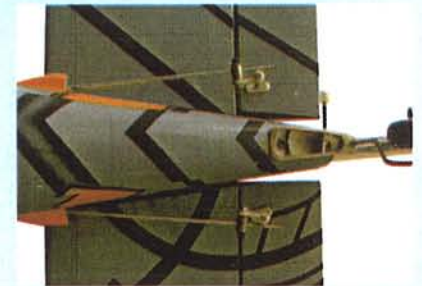
17.1 Control horn assembly



17.2 Elevator control horn location



17.3 Rudder control horns location



17.4 Elevator and rudder control horn connected to the control rod

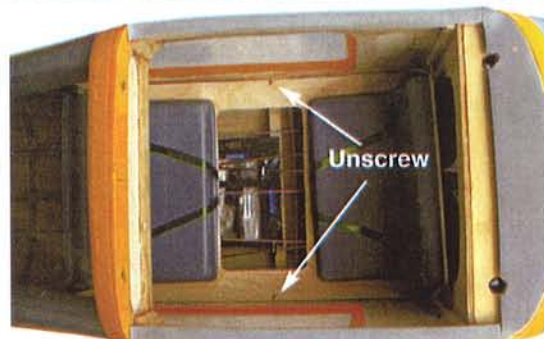
INSTALLING THE SERVOS

Stage 18

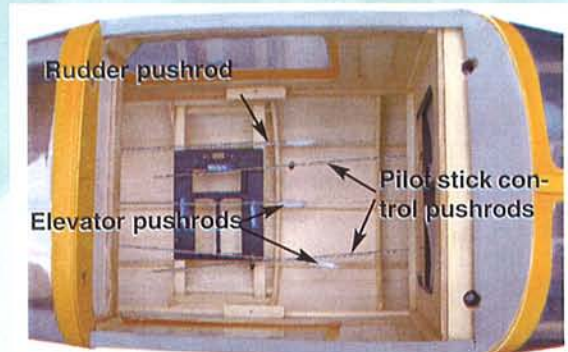
Install the rubber servo grommets and brass ferrules supplied with your radio equipment. The three servos that control the elevator and rudder are installed in the servo tray mounted in the fuselage. Remove servo tray from the fuselage, mounting the servos to the servo tray as shown.



18.1 Universal servo mount



18.2 Servo tray located under the seats. Remove the seats to install servos

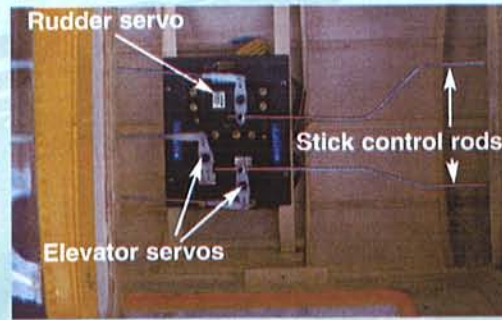


18.3 Pre-installed push rods in the fuselage

CONNECTING THE PUSHRODS TO THE RUDDER AND ELEVATOR SERVOS

Stage 19

19.1 Consult the picture showing how the rudder and elevator servos are positioned and connected to the pushrods.



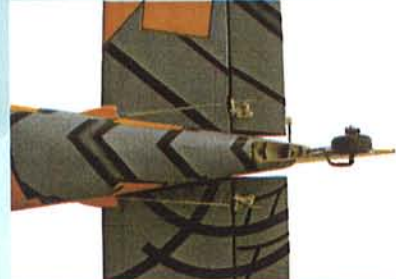
CONNECTING THE PUSHRODS TO THE ELEVATOR

Stage 20

Connect the elevator servos to the receiver and turn on your transmitter. Confirm that the neutral positions of the elevator servo are sustained



20.1 Two independent elevator control horns shown in position



20.2 Connecting the elevator pushrods to the control horns

CONNECTING THE PUSHRODS TO THE RUDDER

Stage 21

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

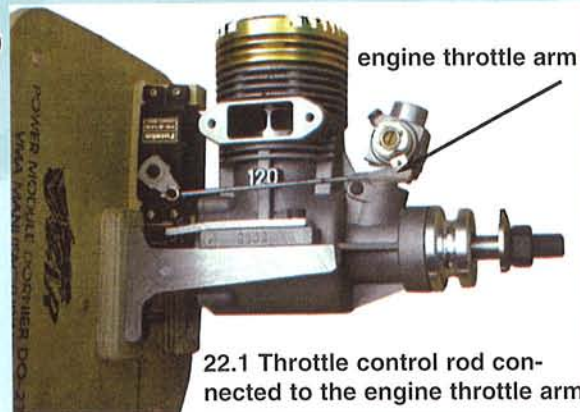


21.1 Connecting the rudder pushrod to the rudder control horn

CONNECTING THE THROTTLE CONTROL

Stage 22

Connect the clevis to the engine throttle arm at 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.



22.1 Throttle control rod connected to the engine throttle arm

ADJUST CONTROL SURFACE THROW LIMITS.

Stage 23

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

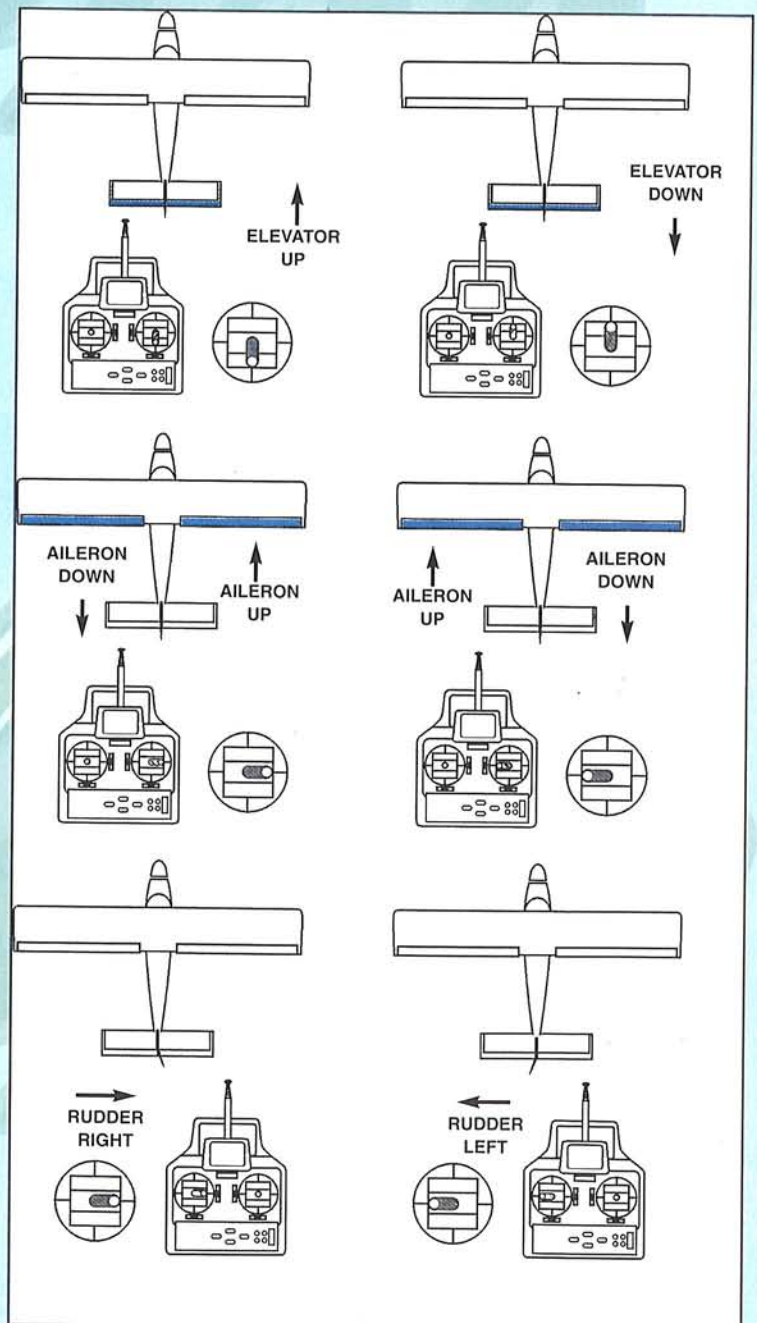
Stage 24

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 25



Stage 26

INSTALLING THE RECEIVER BATTERY

- 26.1 Consult your radio manual for instructions about hooking up your receiver battery, receiver and switch harness.
- 26.2 Wrap the battery pack securely in foam suitable for RC equipment and wrap the foam insulated pack in a plastic bag or cling wrap.
- 26.3 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 the fuel tank.
- 26.4 Connect the battery connector to your radio system according to the radio manual.
-

Stage 27

INSTALLING THE RECEIVER

- 27.1 Consult your radio manual for instructions about hooking up your receiver.
- 27.2 Plan where you are going to put the receiver with consideration for routing the antenna safely.
- 27.3 Wrap the receiver securely in foam suitable for RC equipment and wrap the foam insulated receiver in a plastic bag or cling wrap.
- 27.4 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 28

CONFIRM RADIO OPERATION

- 28.1 Consult your radio manual for instructions about testing and operating your radio system.
- 28.2 Pay particular attention to charging your radio system batteries and range testing the system before and after each flight.
- 28.3 Check that all controls are working correctly before and after each flight.
-

Stage 29

BALANCING THE AIRCRAFT.

The CG for your DO 27 is located at 95 to 100 mm (3.3/4 to 4 inch) 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 3"3/4 (95mm) 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 will likely lead to loss 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 30

CONFIRM MECHANICAL INTEGRITY

30.1 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!!

30.2 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

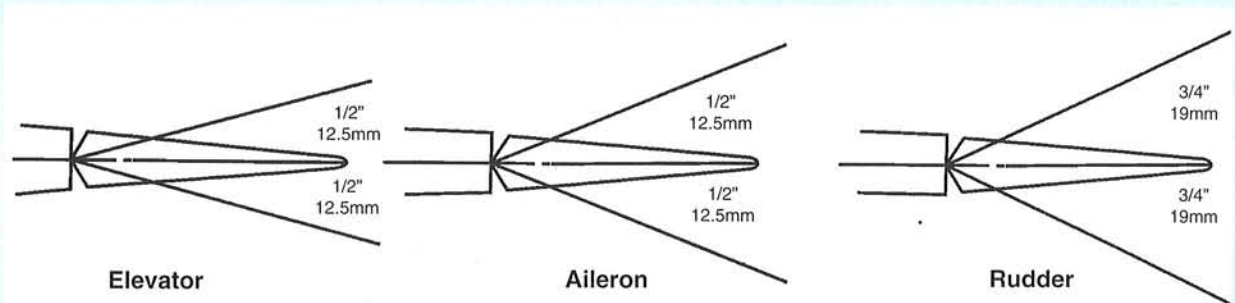
30.3 Once you have completed your first flight, get in the habit of checking your model over before and after each flight! Don't fly if you find something that is not right!



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	3/4 " (19mm) up	1/2" (12.5mm) up
	3/4 " (19mm) down	1/2" (12.5mm) down
RUDDER	1"1/5(30mm) right	3/4" (19mm) right
	1"1/5(30mm) left	3/4" (19mm) left
AILERON	5/8" (14mm) up	1/2" (12.5mm) up
	5/8" (14mm) down	1/2" (12.5mm) 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

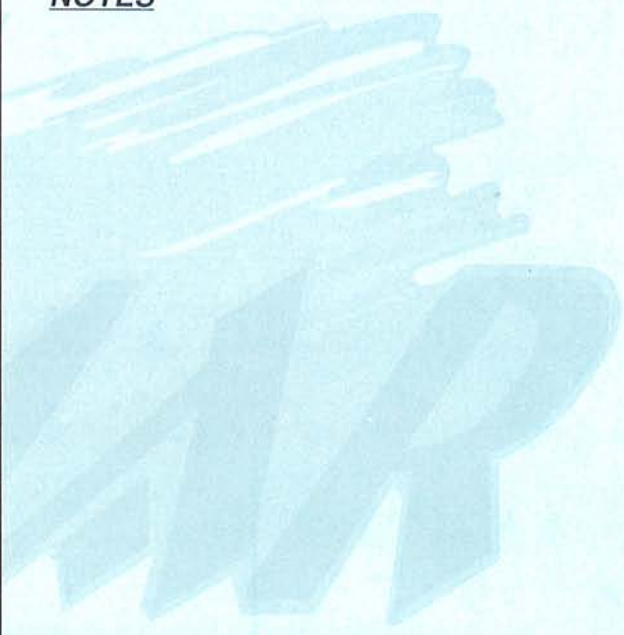
In the event that you require replacement parts for you VMAR DO 27 - 120 PIRELLI, you can order parts from your retailer or from the VMAR On - line store at www.richmondrc.com.

Fuselage	#VA.104H.1202F (with servo tray & all rods)
Wing set	#VA.104H.1202W (a set of left and right with joiner ect)
Tail set	#VA.104H.1202T (contains horizontal and vertical stabilizers)
Cowl	#VA.104H.1202L (fiberglass)
Canopy set	#VA.104H.1202N (canopy and frame)
Main gear	#VA.104H.1202MG (fiberglass main landing gear with axle set)
Wheel pant set	#VA.104H.1202WH (with main gear fairing set)
Covering set	#VA.104H.1202V (POLYCOTE ECS)
Wing parts bag	#VA.104H.1202WP (spar joiner, aileron rods ect)
Master bag	#VA.104H.1202MB (as in kit)

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

NOTES

NOTES



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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



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



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SYSTEM