

Groovy 90 高飛

3 D



0.90-1.10 cu.in. displacement 4-cycle
Radio required : 4 channels, 5 servos airplane radio

Specifications

Wing Span	67.5in / 1720mm
Wing Area	997 sq in / 64.3 sq dm
Flying Weight	8.9 lbs / 4050g
Fuselage Length	68.5 in / 1740mm

* Specifications are subject to change without notice.*

Warning !This model is not a toy.

It is designed for maximum performance. Please seek advice if one is not familiar with this kind of engine powered precision model. Operating this model without prior preparation may cause injuries. Remember, safety is the most important thing. Always keep this instruction manual at hand for quick reference.



**The World Models
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FACTORY PRE-FABRICATED
 ALMOST-READY-TO-FLY (ARF) SERIES
 MADE IN CHINA

INDEX

BEFORE YOU BEGIN	P. 1
PARTS LIST	P. 2
ASSEMBLY	P. 3 - 11
SAFETY PRECAUTIONS	P. 11

BEFORE YOU BEGIN

- 1 Read through the manual before you begin, so you will have an overall idea of what to do.
- 2 Check all parts. If you find any defective or missing parts contact your local dealer. Please DRY FIT and check for defects for all parts that will require CA or Epoxy for final assembly. Any parts you find to be defective after the gluing process may be difficult to remove for warranty replacement. The manufacturer will replace any defective parts, but will not extend to the parts that are good before gluing to defective parts during assembly.
- 3 Symbols used throughout this instruction manual comprise of the following :-



Apply epoxy glue.



Apply instant glue
(C.A.glue, super glue.)



Assemble left and right
sides the same way.



Ensure smooth non-binding
movement while assembling.



Peel off shaded portion
covering film.



Cut off shaded portion.



Drill holes with the specified
diameter (here: 3mm).



Must be purchased separately!



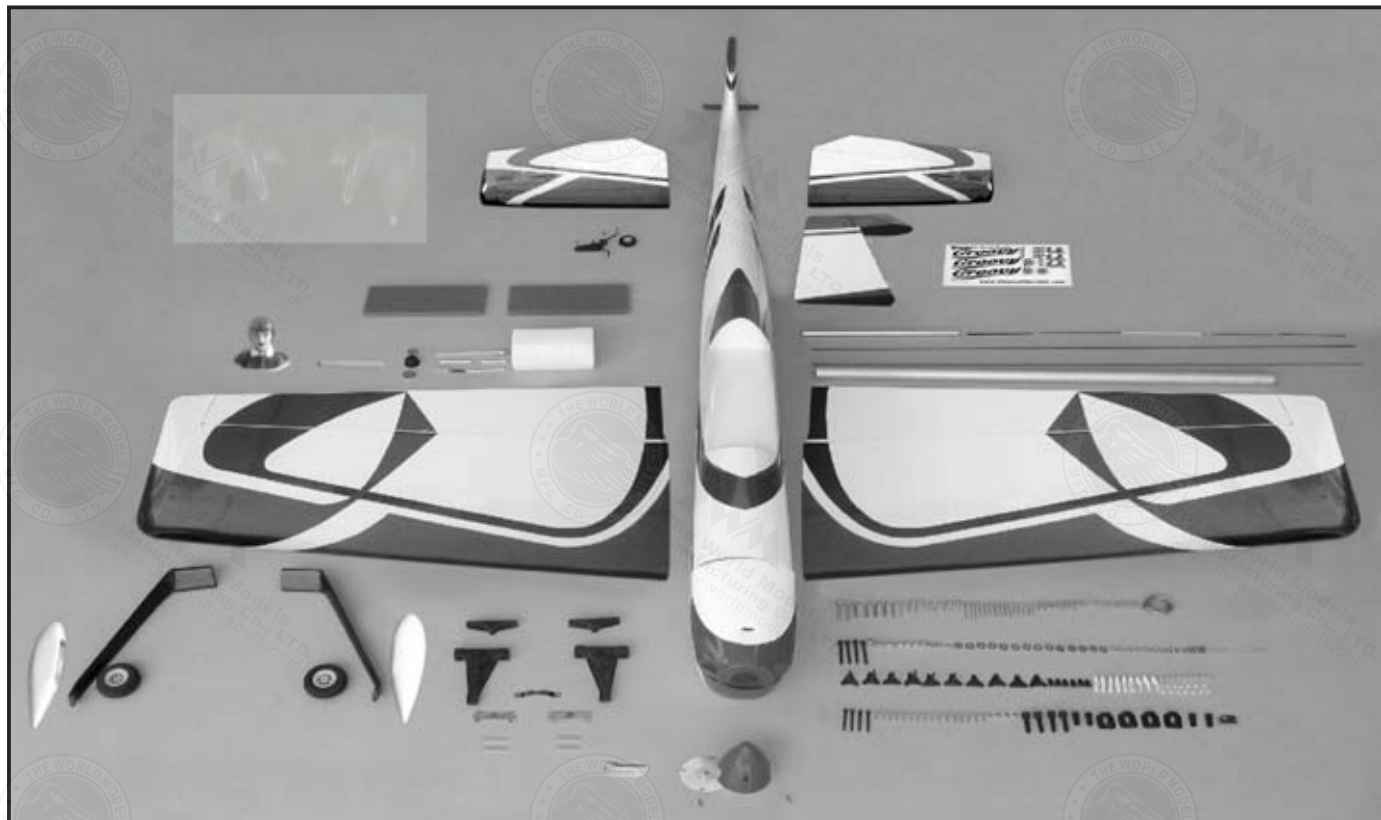
Pay close attention here!



Do not overlook this symbol!



Pierce the shaded portion
covering film.

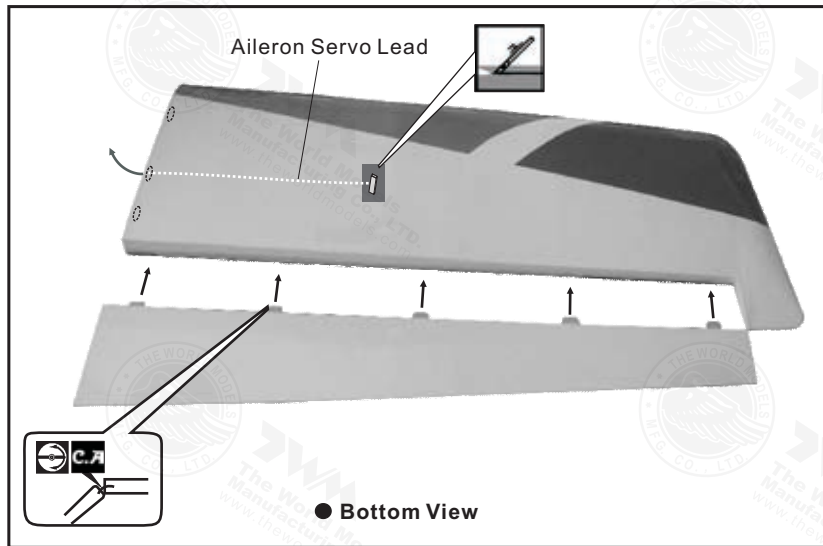


Parts List

1. FUSELAGE -- 1 pc.
2. MAIN WING -- 1 pair.
3. STABILIZER & ELEVATOR -- 1 set
4. VERTICAL FIN & RUDDER -- 1 set
5. CANOPY -- 1 pc.
6. COWLING -- 1 set
TRANSPARENT DUMMY COWLING -- 1 pc.
7. PILOT -- 1 pc.
8. SPINNER (w.alu.back plate) Ø70mm -- 1 set
9. ENGINE MOUNT PL5111080 -- 1 set
10. FUEL TANK 380cc -- 1 set
11. SPONGE (For Radio Equipment) -- 1 pc.
12. CARBON FIBER MAIN LANDING GEAR -- 1 pair
13. TAIL LANDING GEAR -- 1 set
14. WHEEL PANTS -- 1 pair
15. MAIN WHEEL Ø55mm -- 2 pcs
16. TAIL WHEEL Ø30mm -- 1 pc.
17. PUSHROD, PUSHWIRE & PULLWIRE:--
COPPER TUBE d2.5xD3.2x8mm (For Rudder) -- 4 pcs
RIGGING Z BEND Ø1.8x27mm (For Rudder) -- 2 pcs
RIGGING COUPLER Ø1.8x27mm w/Threads (For Rudder) -- 2 pcs
Ø1.8x85mm w/Threads (For Aileron) -- 2 pcs
Ø1.8x900mm w/Threads (For Elevator) -- 2 pcs
Ø1.8x105mm (For Elevator) -- 1 pc.
WIRE Ø1x1080mm (For Rudder) -- 2 pcs
18. THROTTLE PUSH WIRE Ø1.2x270mm w/Plastic tube d2xD3x130mm -- 1 set
19. WOODEN PARTS:--
BALSA 10x10x114mm (For Fixing Fuel Tank) -- 1 pc.
PLYWOOD 5x61x114mm (For Throttle Servo) -- 1 pc.
PLYWOOD 5x61x109.7mm (For Elevator Servo) -- 1 pc.
PLYWOOD 5x61x112mm (For Rudder Servo) -- 1 pc.
BALSA 6x6x61mm (For Fuselage Servo Stand) -- 6 pcs
20. PLASTIC PARTS:--
CLEVIS -- 6 pcs
RUBBER BAND -- 2 pcs
- STRAPER -- 3 pcs
TRI-HORN M3x14(L) -- 4 sets
TRI-HORN M3x14(L) (w/o-Base For Rudder) -- 2 pcs
PUSHROD CONNECTOR -- 1 set
DOUBLE-SIDED TAPE -- 1 pc.
SILICON GROMMET d1.5xD6.5mm -- 14 pcs
WING INCIDENCE ANGLE ADJUSTER -- 4 sets
21. METAL PARTS:--
LINKAGE CONNECTOR 2.1mm -- 1 pc.
COLLAR 4.1mm w/set screw -- 2 sets
COLLAR 2.6mm w/set screw -- 1 set
WING TUBE D22x720 mm -- 1 pc.
STABILIZER TUBE D9.5x254mm -- 1 pc.
ALUMINUM PLATE (For Engine Mount) -- 1 pc.
WIRE Ø3x115mm -- 1 pc.
M2 NUT -- 3 pcs
M4 NUT -- 2 pcs
SCREW PA3x10mm -- 2 pcs
SCREW PA3x12mm -- 4 pcs
SCREW PA3x25mm -- 1 pc.
SCREW PM2x22mm -- 6 pcs
SCREW PM2x25mm -- 9 pcs
SCREW PM3x15mm -- 6 pcs
SCREW PM3x16mm -- 2 pcs
SCREW PM3x25mm -- 1 pc.
SCREW PM4x25mm -- 4 pcs
SCREW PM4x35mm -- 2 pcs
SCREW PWA2.3x8mm -- 10 pcs
SCREW PWA2.6x12mm -- 4 pcs
WASHER d3xD7mm -- 8 pcs
WASHER d3xD12mm -- 6 pcs
WASHER d4xD9mm -- 2 pcs
WASHER d4xD12mm -- 4 pcs
22. ANTI-VIBRATION MOUNT 4C-91 -- 1 set
INCLUDE: SOCKET HEAD SCREW M4x35mm -- 4 pcs
SCREW KM3x20mm -- 8 pcs
WASHER d4xD12mm -- 8 pcs
NYLON INSERT LOCK NUT M3 -- 8 pcs
NYLON INSERT LOCK NUT M4 -- 4 pcs
23. FUEL TUBE Ø6x5mm -- 9 pcs
24. DECALS -- 1 set
25. COVERING:--
TOUGHLON STL100 WHITE
TOUGHLON STL 550 PEARL BLUE
TOUGHLON STL 561 PEARL PURPLE
TOUGHLON STL 361 PURPLE
TOUGHLON STL 511 PEARL FERRARI RED
TOUGHLON STL 360 VIOLET
TOUGHLON STL 251 SKY BLUE

1 Main Wing

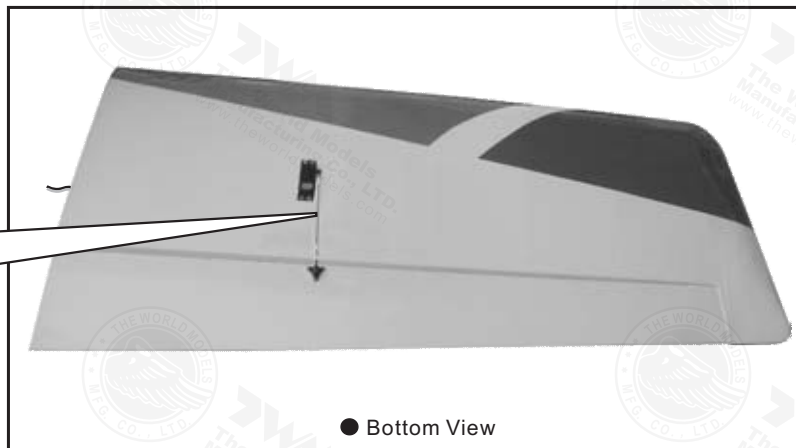
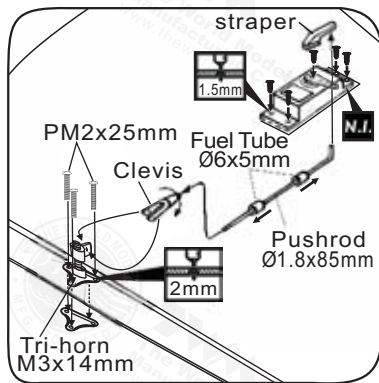
- Apply instant type CA glue to both sides of each hinge.



2 Aileron Servo

- Ø1mm pilot holes for World Models tri-horn are pre-drilled. Please look for pin-hole marks at under side of control surfaces.

PM2x25mm Screw

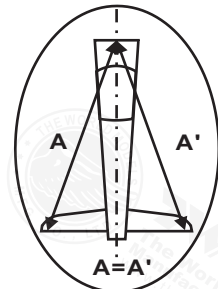
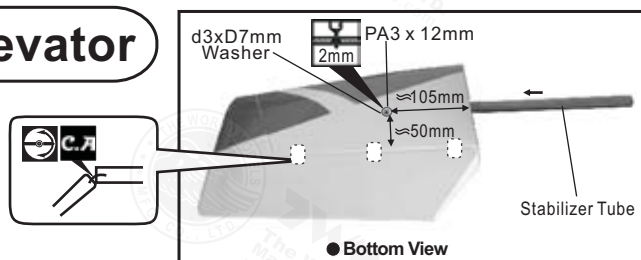


3 Stabilizer / Elevator

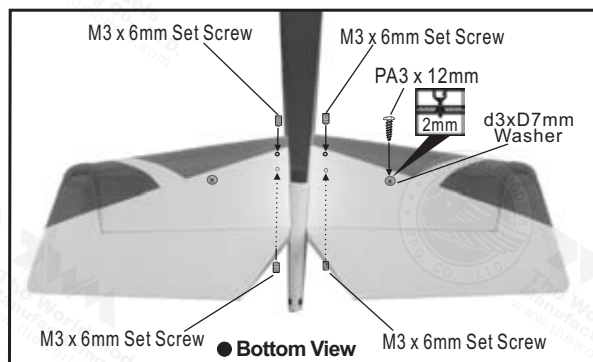
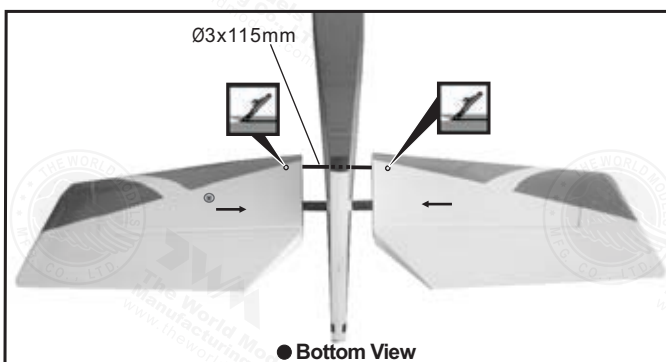
PA3 x 12mm Screw



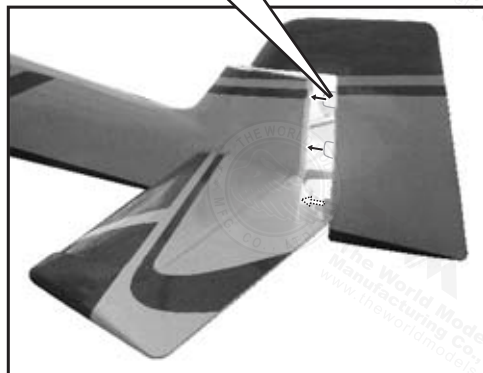
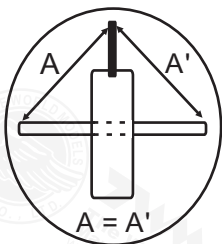
d3 x D7mm Washer



- Apply instant type CA glue to both sides of each hinge.



4 Vertical Fin & Rudder



- Apply instant type CA glue to both sides of each hinge.

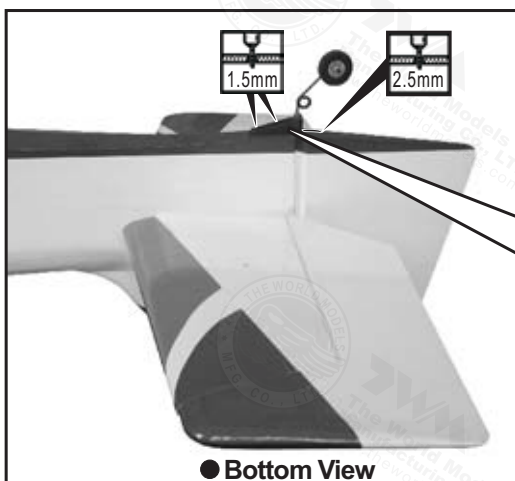


COMPLETED

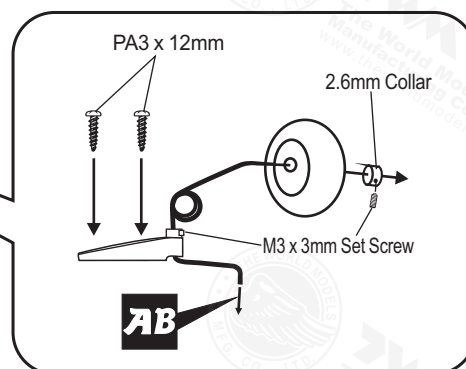
5 Tail Landing Gear

PA3 x 12mm Screw

2.6mm Collar



● Bottom View



6 Main Landing Gear

PM3x15mm Screw

PM4x35mm Screw

PA3 x 10mm Screw

4.1mm Collar

d3xD7mm Washer

d4xD9mm Washer

d3xD12mm Washer

M4 Nut

2

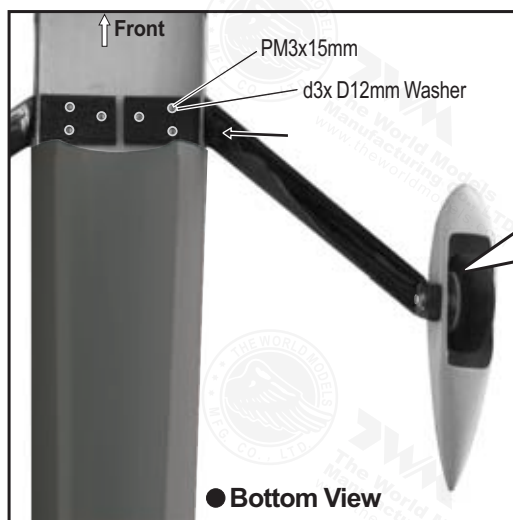
2

2

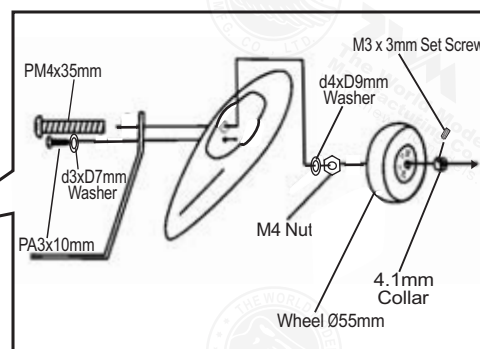
6

2

2



● Bottom View



L/R

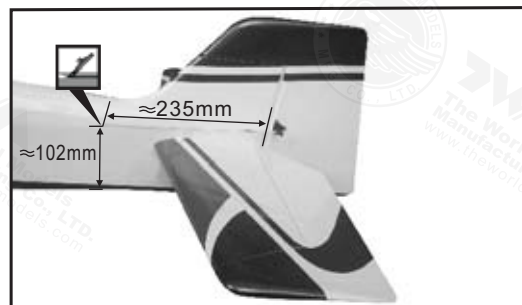
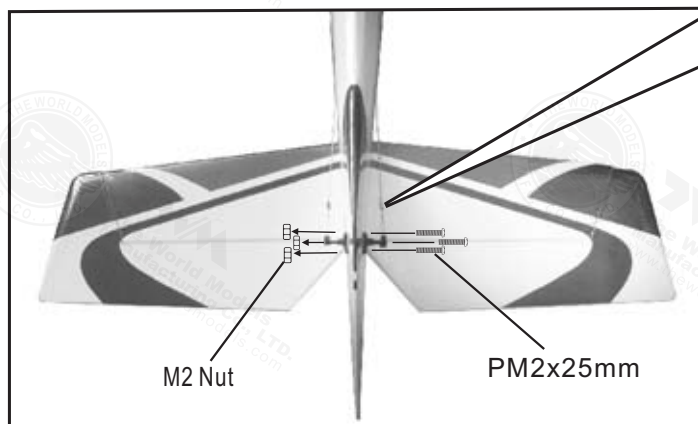
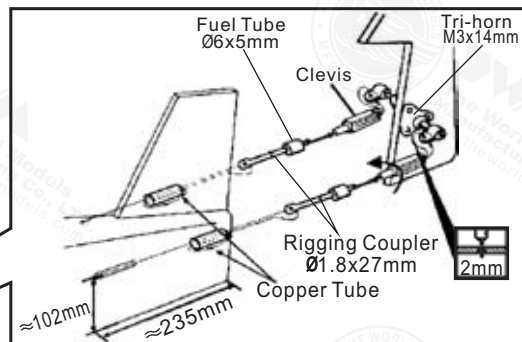
7 Rudder Pullwire

PM2x25mm **Screw**

M2 Nut

3

- Ø 1mm pilot holes for World Models tri-horn are pre-drilled. Please look for pin-hole marks at side of control surfaces.



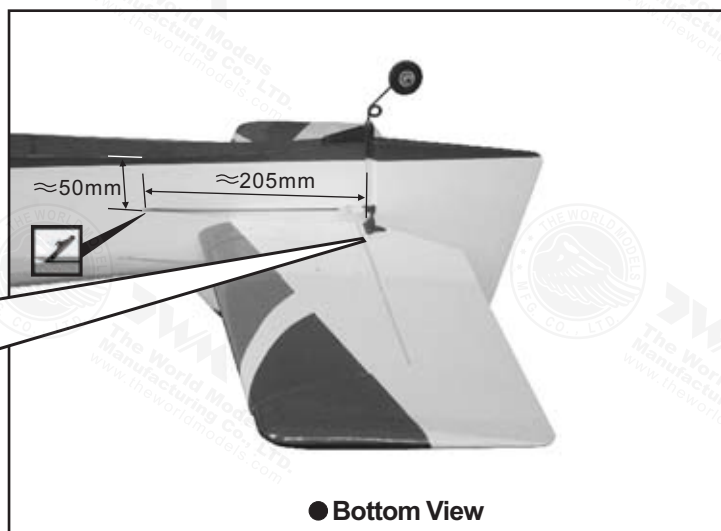
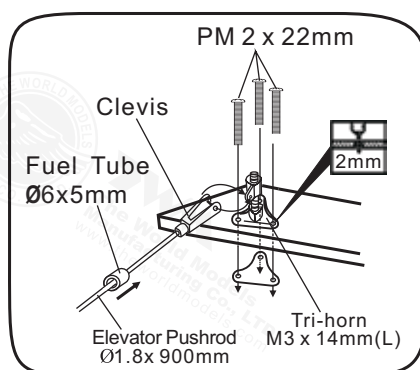
L/R

8 Elevator Pushrod

PM 2 x 22 mm **Screw**

6

- Ø1mm pilot holes for World Models tri-horn are pre-drilled. Please look for pin-hole marks at under side of control surfaces.



● Bottom View

L/R

9 Engine Mount

PM 4x 25mm **Screw**

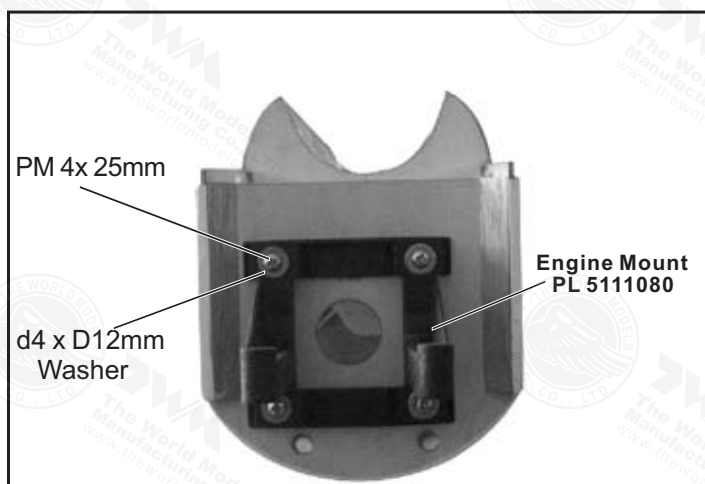
d4 x D12mm **Washer**

4

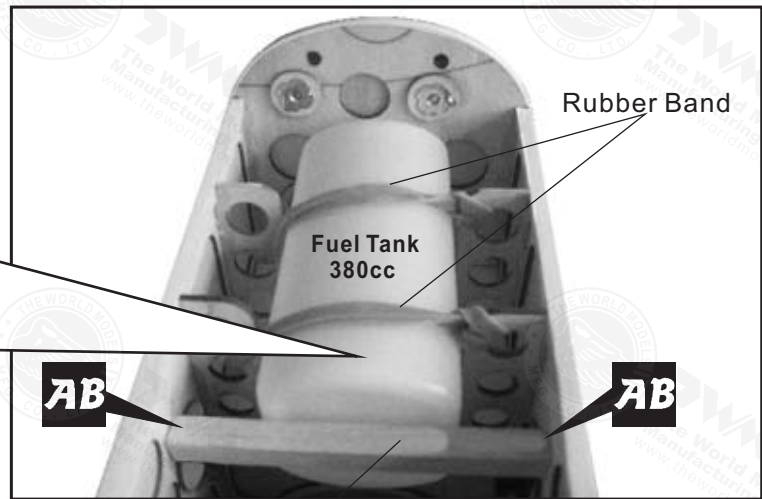
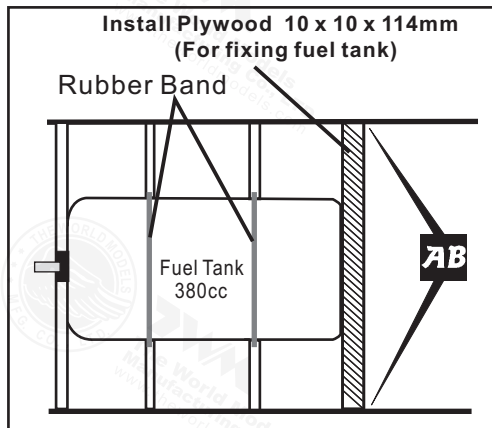
4

- Apply thread locker to screws.

! Blind nuts are off-centered to keep the spinner at the fuselage axis.



10 Fuel Tank



Install Plywood 10 x 10 x 114mm
(For fixing fuel tank)

11 Engine

M4x35mm SOCKET HEAD SCREW



4

KM3x20mm Washer



8

M4 Nylon Insert Lock Nut



4

M3 Nylon Insert Lock Nut

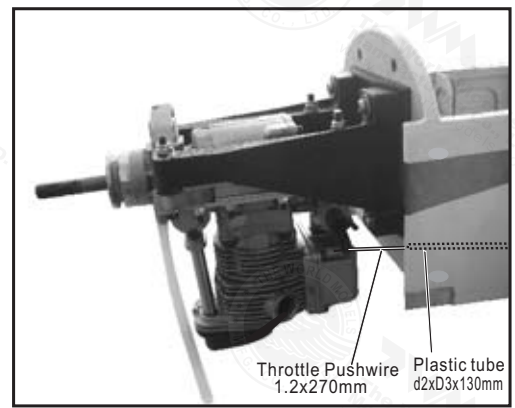
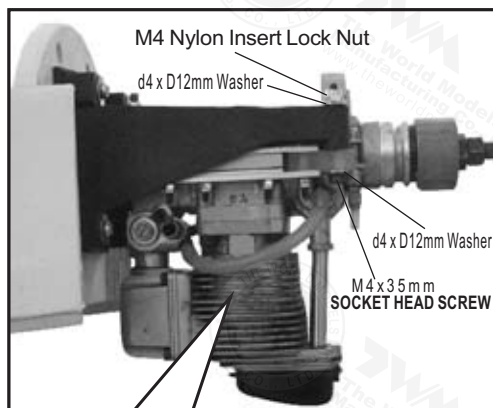


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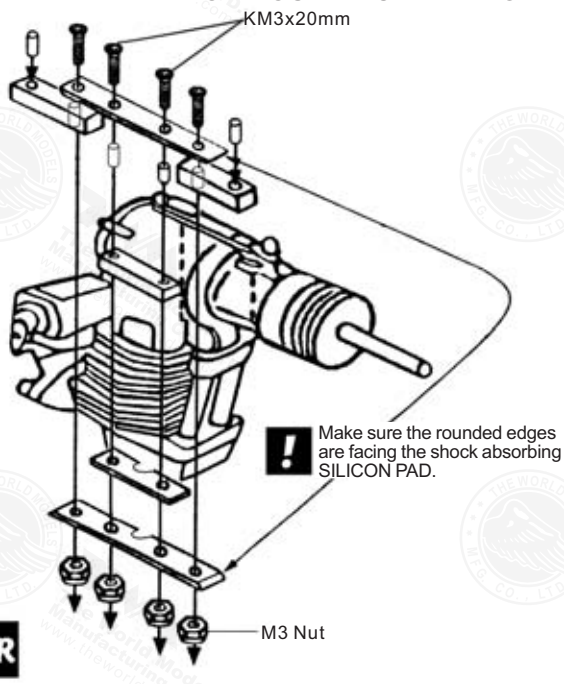
d4 x D12mm Washer



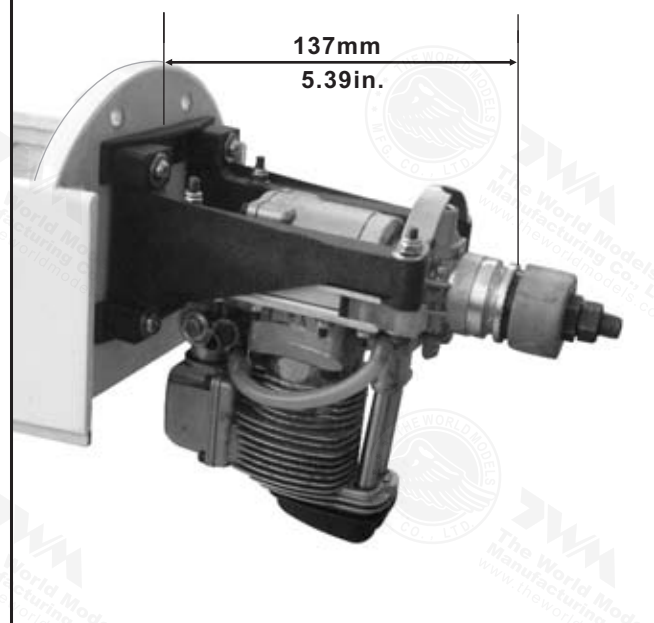
8



ANTI-VIBRATION MOUNT INSTALLATION



● Install Engine position



12 Servo Set

LINKAGE CONNECTOR

3 x 3mm **Set Screw**

 1

Linkage Connector

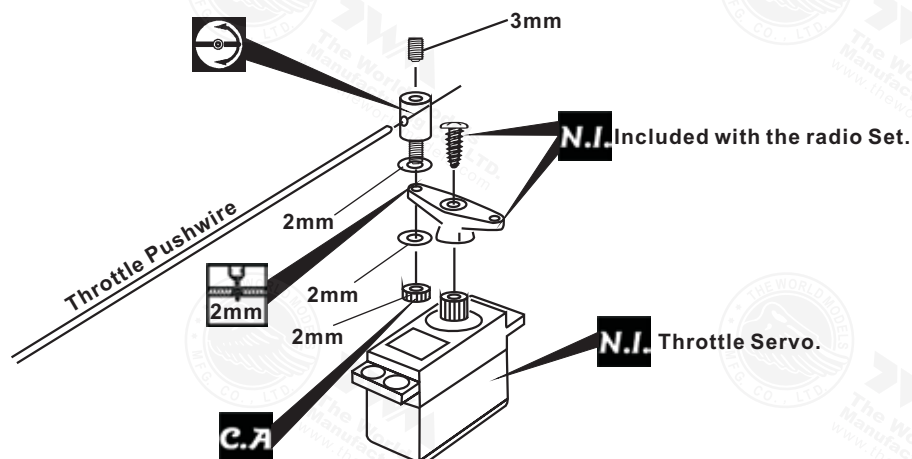
 1

M2 Nut

 1

2mm Washer

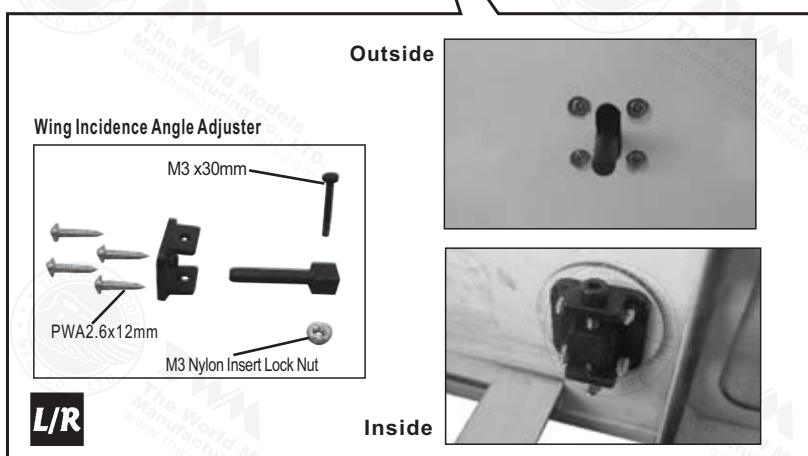
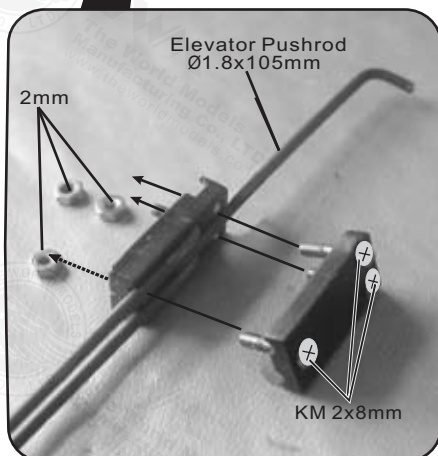
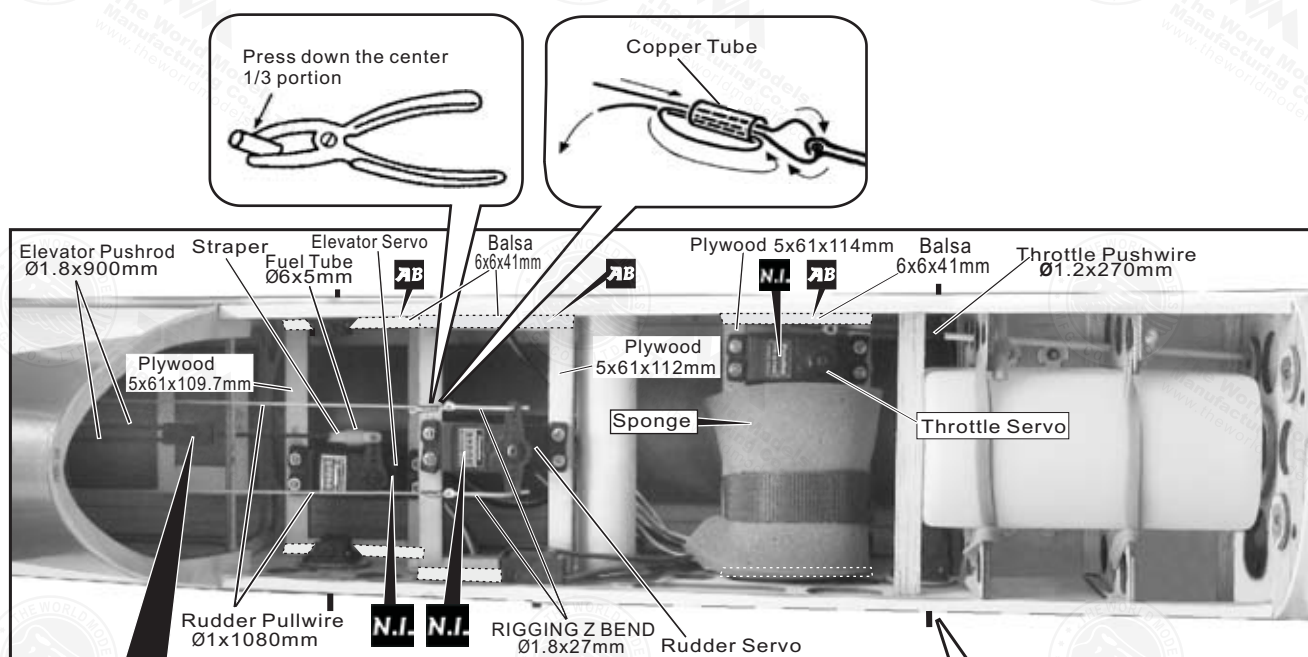
 2



! Please refer to attached sheet for linkage connector installation.

13 Radio Equipment

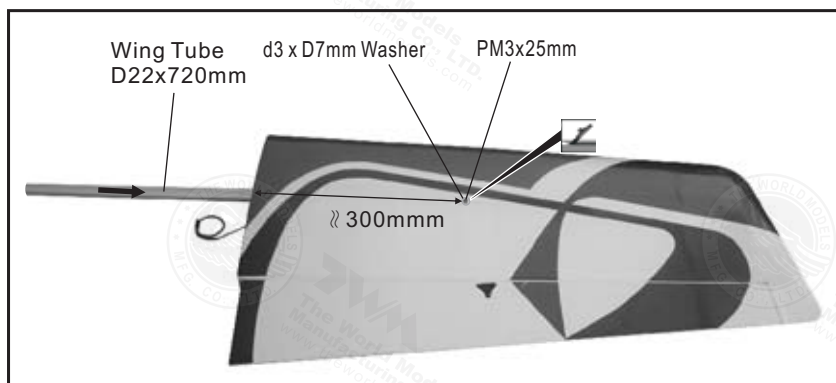
● Install and arrange the servo as shown in the diagram.



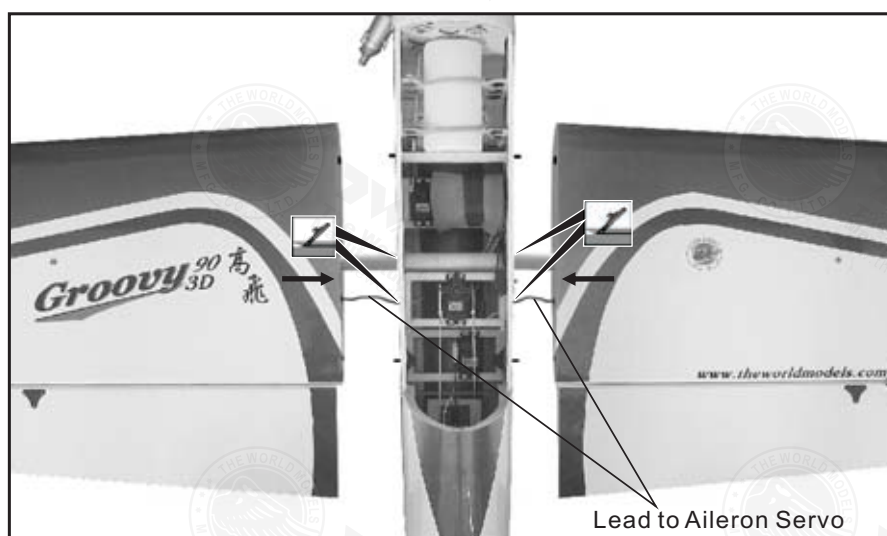
14 Main Wing

PM3x25mm Screw	1
PA3x25mm Screw	1
d3 x D7mm Washer	2

Step 1. Insert the aluminum wing tube with the pre-drilled hole end into the right wing. Align the lines marked at the wing root and wing tube, then apply the PM3 X 25mm machine screw through the pre-drilled hole on top of the wing. (please confirm the alignment of the hole by putting a 2.5mm diameter rod through the pre-drilled wing hole before applying the screw) The hole on the wing tube is pre-threaded, do not over tighten the PM3 screw, the set up is for future removal of the wing.



Step 2. Install the right wing to the fuselage by inserting the wing tube (now attached to the right wing) through the fuselage, then install the left wing.



● Top View

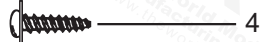


Step 3. Make sure the wings are resting against the fuselage tightly. Locate the pre-drilled 2.5mm hole at top of left wing, and drill along with 2.5mm drill bit until it passes through the wing tube. Apply the PA3 X25mm self-tapping screw.

Note : It is recommended that the wing tube stays with the left wing. Removal of the wings could be achieved by removing the right wing machine screw, the right wing then the left wing with wing tube. If removal of wing tube from left wing is also required, it is recommended that instead of applying self-tapping screw in step 3, you pre-tap with M3 thread cutter and apply M3 machine screw.

15 Canopy & Pilot

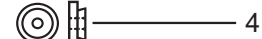
PWA2.3x8mm Screw



PM3x16mm Screw



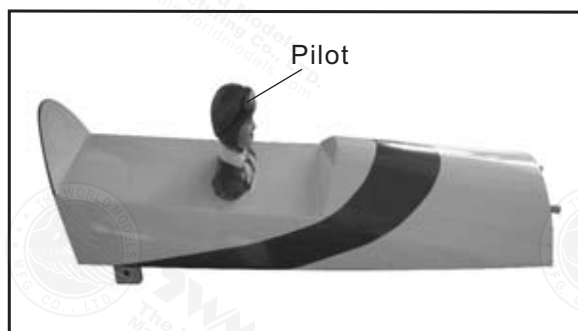
d1.5 x D6.5 mm Silicon Grommet



d3 x D7 mm Washer

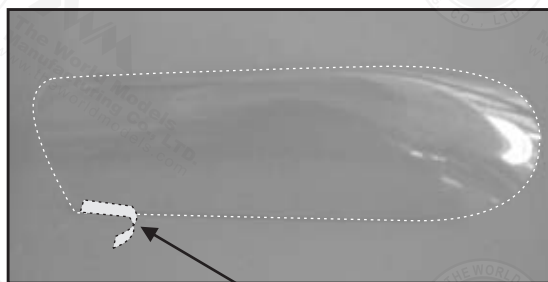


● First insert the grommet to the canopy then apply screw.



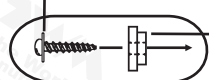
Pilot

L/R

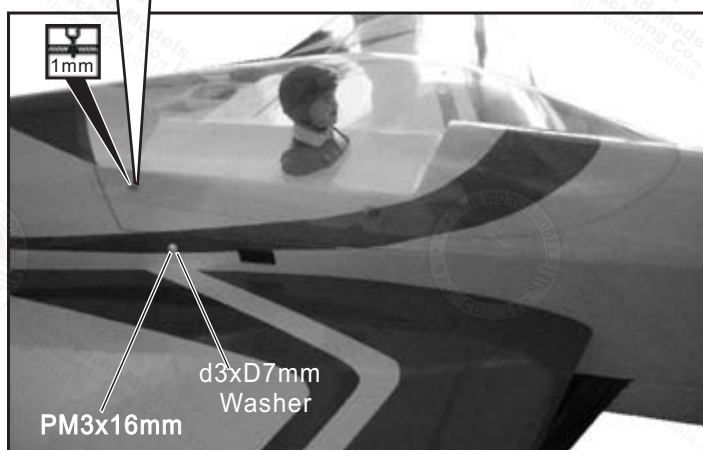


Apply double-sided tape

PWA2.3 x 8mm



d1.5 x D6.5 mm
Silicon Grommet

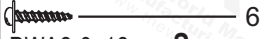


PM3x16mm

d3xD7mm
Washer

16 Cowling

PWA2.3x8mm Screw



PWA2.6x12mm Screw

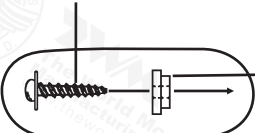


d1.5 x D6.5 mm Silicon Grommet

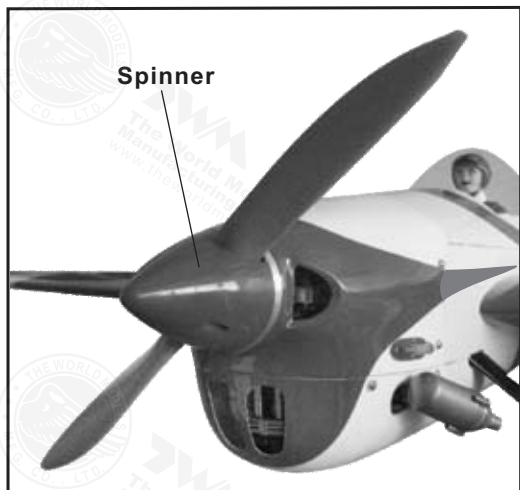


● First insert the grommet to the cowling then apply screw.

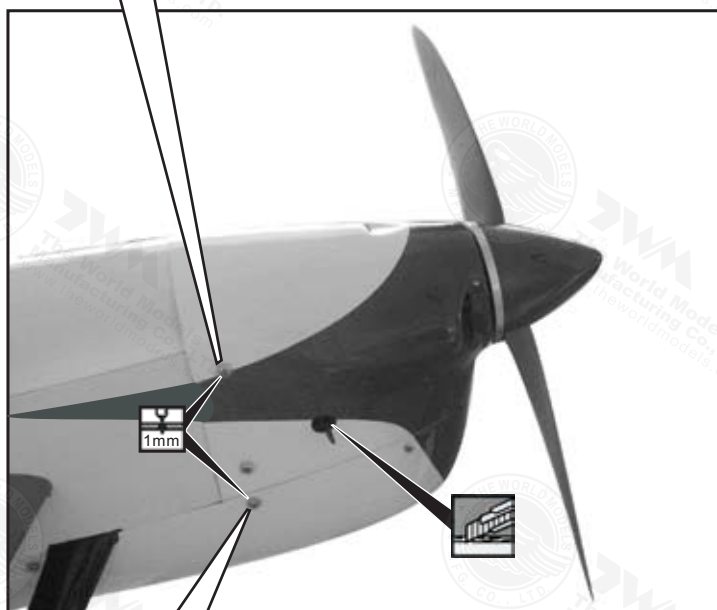
PWA2.6 x 12mm



d1.5 x D6.5 mm
Silicon Grommet



Spinner



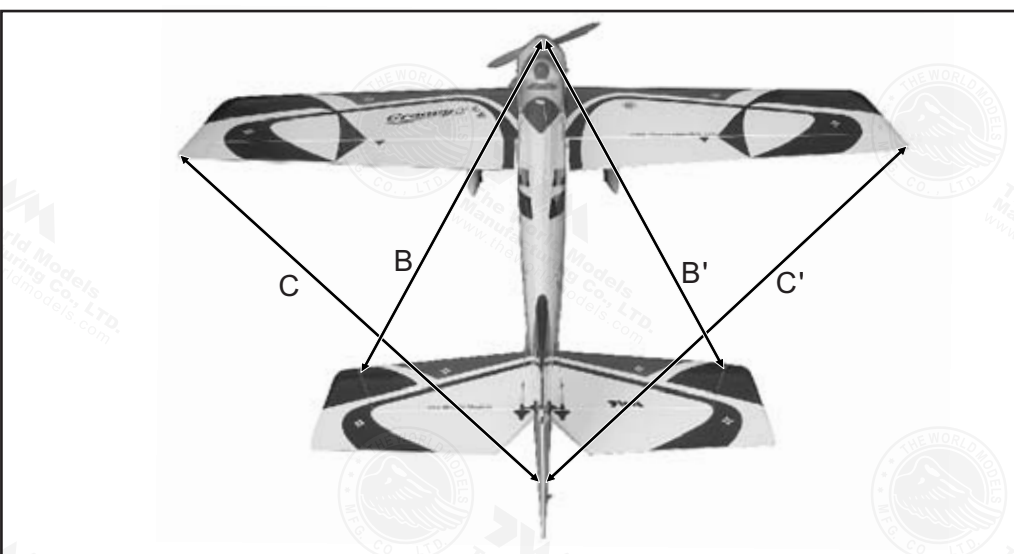
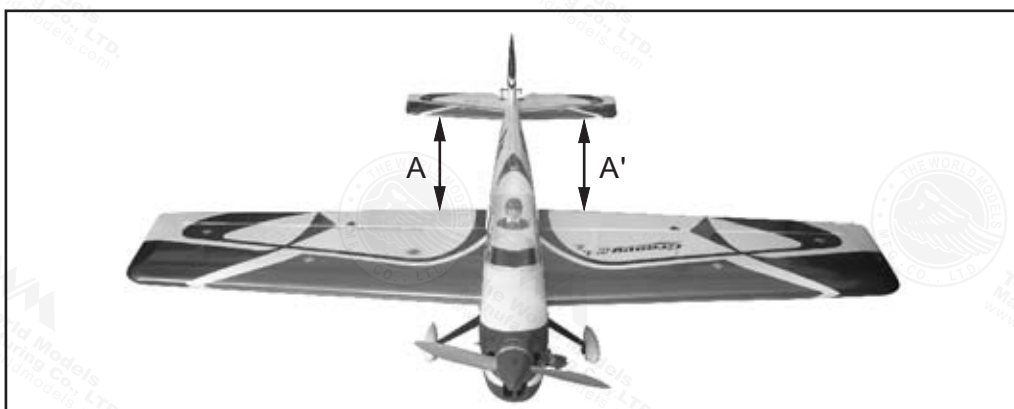
PWA2.3 x 8mm

d1.5 x D6.5 mm
Silicon Grommet

L/R

17 Wing Setting

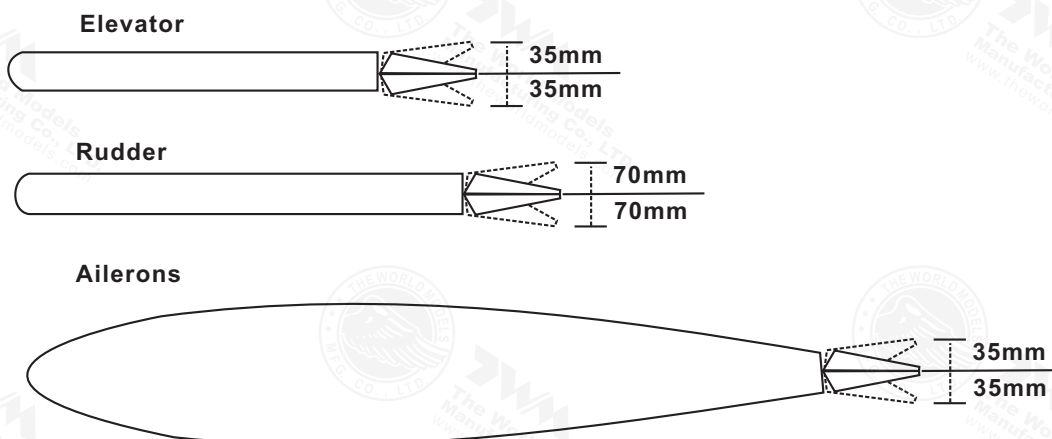
- Adjust the wing and fuselage configuration as in the diagrams.



$$A=A' \quad B=B' \quad C=C'$$

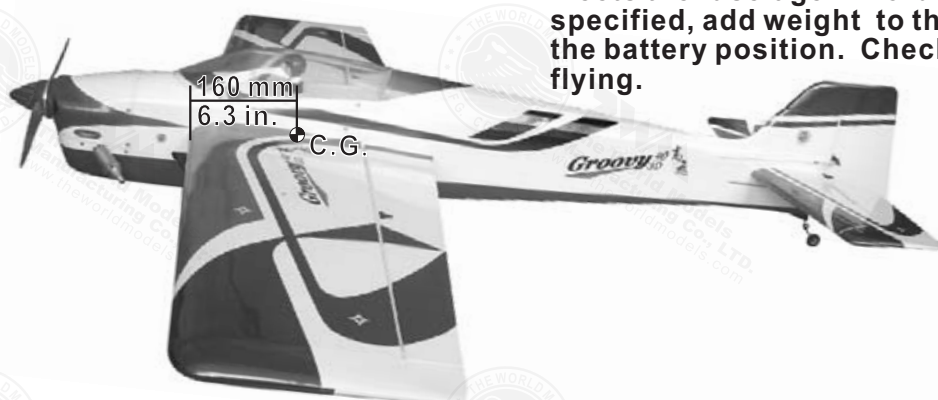
18 Control Throws

Adjust the control throws as shown in the diagram. These throws are good for general flying. You can adjust according to your personal preference.



19 C.G.

The ideal C.G. position is 160mm (6.3 in.) behind the leading edge measured at where the wing meets the fuselage. In order to obtain the C.G. specified, add weight to the fuselage or move the battery position. Check the C.G. before flying.



! Warning!

Important Safety Precautions

- # First time flyer should never fly by himself / herself. Assistance from experienced flyer is absolutely necessary.
- # Pre-flight adjustment must be done before flying, it is very dangerous to fly a badly pre-adjusted aircraft.
- # **Groovy 90** is really designed to be powered by **4c 0.90-1.10** engine, using a more powerful engine does not mean better performance. In fact, over powered engine may cause severe damage and injuries.
- # Make sure the air field is spacious, never fly the plane too close to people and never get too close to a running propeller.
- # If you find wrinkles on the covering as a result of weather changes, you can use hot iron to remove the wrinkles. Please begin with lower temperature setting and gradually raise the temperature until the wrinkles are gone. Too hot an iron may damage the covering.
- # Check and re-tighten up all factory assembled screws, use thread locker if applicable.