

42% *Ultimate*



**Requires : 150 cc gasoline engine,
6-channel radio w/ 17 servos.**

Specifications

Wing Span	98 in / 2490mm
Wing Area	3300 sq in / 213 sq dm
Flying Weight	38-40/ lbs / 17250-18160 g
Fuselage Length	104 in / 2640mm

* 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.



TWM
The World Models
Manufacturing Co., LTD.
www.theworldmodels.com

FACTORY PRE-FABRICATED
ALMOST-READY-TO-FLY (ARF) SERIES
MADE IN CHINA

42% Ultimate

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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. Warranty will not cover any parts modified by customer.
- 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!



Warning!

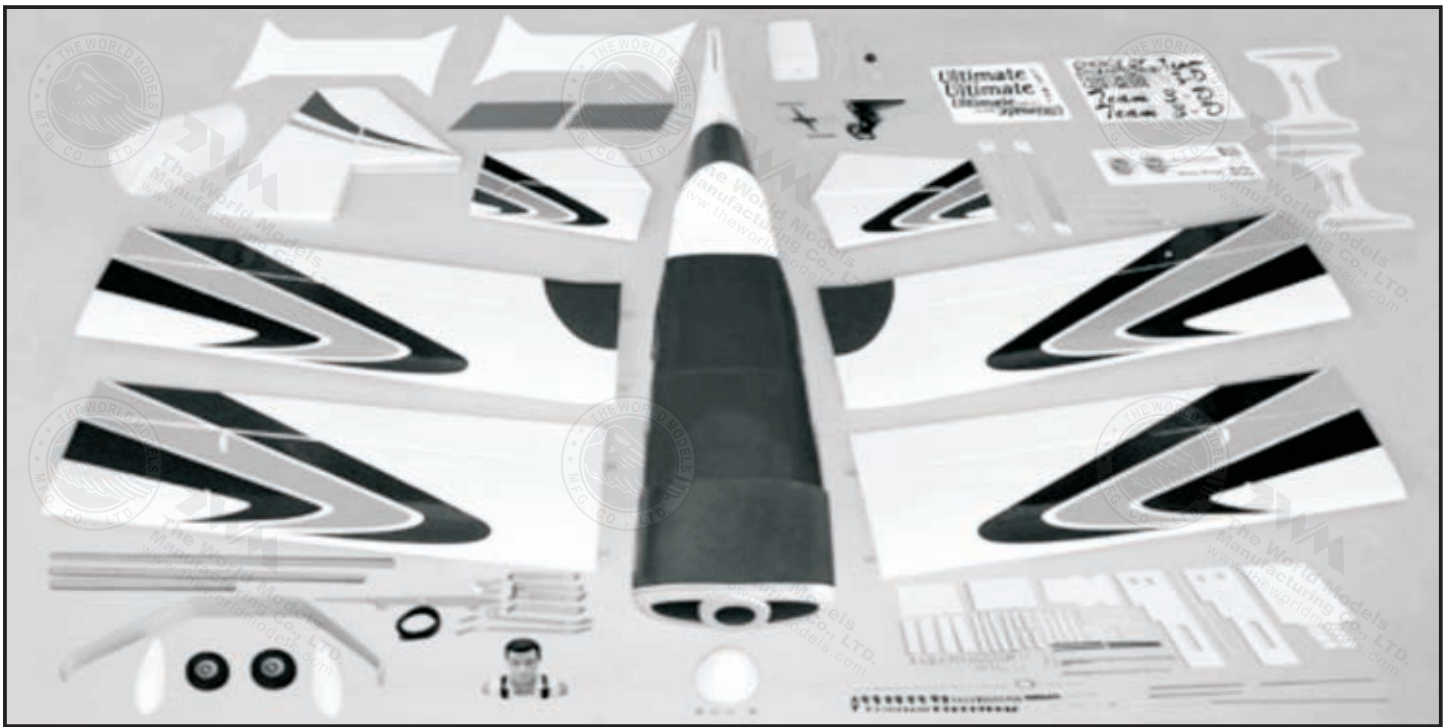
Do not overlook this symbol!



Pierce the shaded portion
covering film.



Apply thread locker



Parts List

1. MAIN WING (Upper Wing) -- 1 pair
MAIN WING (Lower Wing) -- 1 pair
METAL HINGES -- 32 pcs
2. HEAVY DUTY SERVO HORN PL4120300 -- 4 sets
SCREW PM4x50mm -- 4 pcs
M4 NYLON INSERT LOCK NUT -- 4 pcs
HEAVY DUTY HORN BRACKET PL4112400 -- 4 sets
HEAVY DUTY CLEVIS PL4112200 -- 8 sets
SWIVEL CLEVIS HORN FAIRING PL4610010 -- 4 sets
PUSHROD Ø2.5x100mm w/Threads (For Aileron) -- 4 pcs
WOODEN 6x10x21mm (For Aileron Servo Stand) -- 8 pcs
3. HEAVY DUTY SERVO HORN PL4120300 -- 4 sets
SCREW PM4x50mm -- 4 pcs
M4 NYLON INSERT LOCK NUT -- 4 pcs
HEAVY DUTY HORN BRACKET PL4112400 -- 4 sets
HEAVY DUTY CLEVIS PL4112200 -- 8 sets
SWIVEL CLEVIS HORN FAIRING PL4610010 -- 4 sets
PUSHROD Ø2.5x100mm w/Threads (For Aileron) -- 4 pcs
WOODEN 6x10x21mm (For Aileron Servo Stand) -- 8 pcs
4. FUSELAGE -- 1 pc.
STABILIZER & ELEVATOR -- 1 set
METAL HINGES -- 6 pcs
STABILIZER TUBE Ø22x514mm -- 1 pc.
WIRE Ø3x192mm -- 1 pc.
SCREW PWA3x14mm -- 2 pcs
SCREW PM4x65mm -- 4 pcs
M4 NYLON INSERT LOCK NUT -- 4 pcs
HEAVY DUTY SERVO HORN PL4120350 -- 4 sets
HEAVY DUTY HORN BRACKET PL4112400 -- 4 sets
HEAVY DUTY CLEVIS PL4112200 -- 8 sets
SWIVEL CLEVIS HORN FAIRING PL4610010 -- 4 sets
PUSHROD Ø2.5x65mm w/Threads (For Elevator) -- 2 pcs
PUSHROD Ø2.5x118mm w/Threads (For Elevator) -- 2 pcs
WOOD 6x10x21mm (For Elevator Servo Stand) -- 8 pcs
5. VERTICAL FIN & RUDDER -- 1 set
METAL HINGES -- 5 pcs
6. TAIL GEAR WITH SPRING ABSORBER 25-40LBS PL3410022 -- 1 set
7. SCREW PM3x16mm -- 8 pcs
M3 NYLON INSERT LOCK NUT -- 8 pcs
WASHER d3xD7mm -- 16 pcs
PLYWOOD 6x20x123mm (F8A) -- 4 pcs
PLYWOOD 6x20x205mm (F8B) -- 4 pcs
ENGINE BOX SIDE PLATE 8x127x573.4mm (F8R) -- 1 pc.
ENGINE BOX SIDE PLATE 8x127x581mm (F8L) -- 1 pc.
FIRE WALL 12x159.6x164mm (F9) -- 1 pc.
UPPER PLATE 3x159x221mm (F9A) -- 1 pc.
LOWER PLATE 3x159x230mm (F9B) -- 1 pc.
BALSA 9x9x213mm (F9C) -- 2 pcs
BALSA 9x9x221mm (F9D) -- 2 pcs
BALSA 9x9x109mm (F9E) -- 2 pcs
BALSA 9x9x109mm (F9F) -- 1 pc.
BALSA 9x9x109mm (F9H) -- 1 pc.
BALSA 9x9x70mm (F9I) -- 2 pcs
BALSA 9x9x90mm (F9J) -- 2 pcs
WOOD 6.6x25x210mm (F10) -- 4 pcs
BALSA 10x10x143mm (F63C) -- 1 pc.
8. CENTER WING CABANE -- 1 set
ALUMINUM PLATE -- 2 pcs
SCREW PM3x16mm -- 6 pcs
WASHER d3xD7mm -- 12 pcs
M3 NYLON INSERT LOCK NUT -- 6 pcs
BALSA 9x9x411.4mm (F63A) (For Fuselage) -- 2 pcs
BALSA 9x9x402.3mm (F63B) (For Fuselage) -- 2 pcs
9. MAIN LANDING GEAR -- 1 set
SOCKET HEAD SCREW M6x20mm -- 4 pcs
AXLE SHAFT Ø5x47mm -- 2 pcs
SCREW PA3x12mm -- 4 pcs
SCREW PM3x16mm -- 4 pcs
WASHER d3xD7mm -- 4 pcs
COLLAR Ø5.1mm w/set screw -- 4 sets
M8 NYLON INSERT LOCK NUT -- 2 pcs
MAIN WHEEL Ø128mm PL31113127 -- 2 pcs
WHEEL PANTS -- 1 pair
ALUMINUM PLATE -- 2 pcs
10. PUSHROD Ø2.5x180mm w/Threads (For Rudder) -- 2 pcs
PUSHROD M3x35mm w/Threads (For Rudder) -- 2 pcs
HEAVY DUTY SERVO HORN PL4120300 -- 2 sets
HEAVY DUTY SERVO HORN PL4120600 -- 1 set
SCREW M4x130mm -- 1 pc.
SCREW PM2.5x30mm -- 1 pc.
M2.5 NYLON INSERT LOCK NUT -- 1 pc.
M4 NYLON INSERT LOCK NUT -- 2 pcs
HEAVY DUTY HORN BRACKET PL4112400 -- 2 sets
HEAVY DUTY CLEVIS PL4112200 -- 8 sets
SWIVEL CLEVIS HORN FAIRING PL4610020 -- 1 set
SWIVEL CLEVIS HORN SUPPORT PL4610120 -- 1 set
11. SCREW PM3x30mm -- 3 pcs
M3 NYLON INSERT LOCK NUT -- 3 pcs
WIRE Ø1.5x600mm -- 2 pcs
WIRE Ø1.5x500mm -- 2 pcs
COLLAR Ø3.6mm w/set screw -- 4 sets
COPPER TUBE d5xD6.4x10mm -- 4 sets
PLATE (For Stays) 1.5x10x60mm -- 1 pc.
PLATE (For Stays) 1mm -- 6 pcs
12. FUEL TANK 1500cc (Gasoline Fuel) PL1121500G -- 1 set
FUEL TANK HOLD DOWN PLATE 3x130x239mm (F15A) -- 1 pc.
PLYWOOD 6x37x71.5mm (For Throttle Servo) -- 1 pc.
SOCKET HEAD SCREW M3x12mm -- 2 pcs
WASHER d3xD7mm -- 2 pcs
SPONGE 10x80x200mm -- 1 pc.
CABLE TIE 400mm -- 2 pcs
13. BLIND NUT M6 -- 4 pcs
SOCKET HEAD SCREW M6x50mm -- 4 pcs
WASHER d6xD15mm -- 4 pcs
LINKAGE CONNECTOR Ø2.1mm -- 1 set
THROTTLE PUSHWIRE Ø1.2x800mm -- 1 pc.
PLASTIC TUBE d2xD3x600mm -- 1 pc.
14. SPONGE 10x80x200mm -- 1 pc.
15. WING TUBE Ø22x865.5mm -- 1 pc.
SCREW PM3x22mm -- 1 pc.
SCREW PA3x22mm -- 1 pc.
WASHER d3xD7mm -- 2 pcs
16. WING TUBE Ø22x817mm -- 1 pc.
SCREW PM3x22mm -- 1 pc.
SCREW PA3x22mm -- 1 pc.
WASHER d3xD7mm -- 2 pcs
17. PLYWOOD (OUTER WING CABANES) -- 1 pair
PLYWOOD 3x536.6x597.4mm (Wing Incidence Angle Template) -- 2 pcs
FLYING WIRE ASSEMBLY -- 1 set
WIRE Ø1.5x800mm -- 1 pc.
WOODEN ANTI-VIBRATION DOWEL Ø8x120mm -- 4 pcs
18. CANOPY -- 1 pc.
COCKPIT -- 1 pc.
110MM PILOT (Gold/Blue) PC101110E -- 1 pc.
SCREW PM3x25mm -- 4 pcs
SCREW PWA2.3x12mm -- 4 pcs
WASHER d3xD7mm -- 4 pcs
SILICON GROMMET d1.5xD6.5mm -- 4 pcs
19. COWLING -- 1 pc.
TRANSPARENT DUMMY COWLING -- 1 pc.
PLATE (WHITE) Ø150mm PH22W1500 -- 1 pc.
SCREW PWA3x12mm -- 6 pcs
SILICON GROMMET d2.5xD8.5mm -- 6 pcs
20. DECALS -- 1 set

COVERING:--

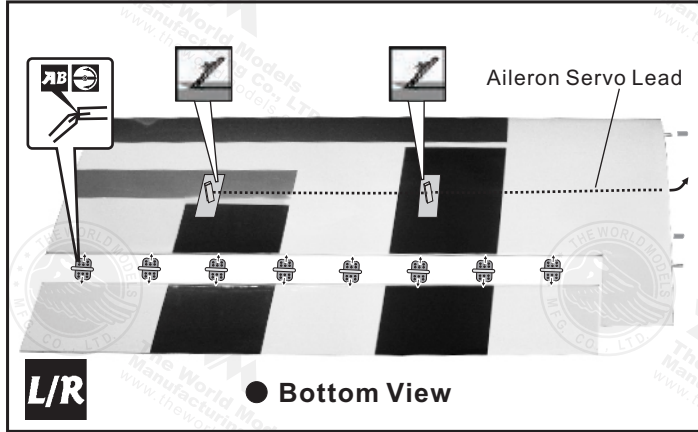
* PURPLE COLOR SCHEME:
TOUGHLON STL 100 WHITE
TOUGHLON STL 201 BLACK
TOUGHLON STL 561 PEARL PURPLE
TOUGHLON STL 370 SILVER

* YELLOW COLOR SCHEME:
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TOUGHLON STL 330 CADMIUM YELLOW
TOUGHLON STL 370 SILVER

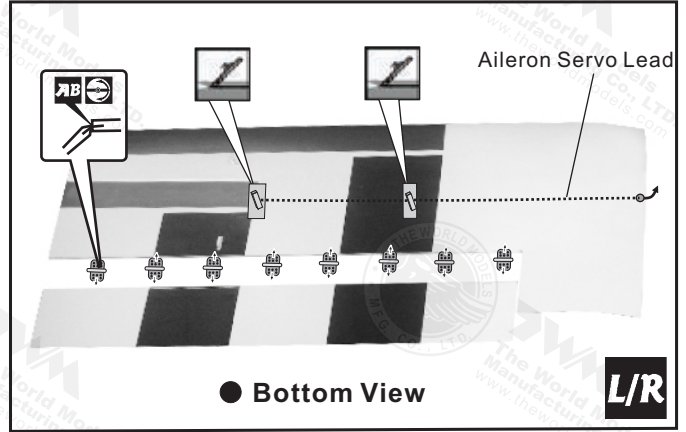
1 Main Wing

● Replace CA hinges by metal hinges. Glue the metal hinges to wing and aileron by epoxy.

Main Wing (Lower)



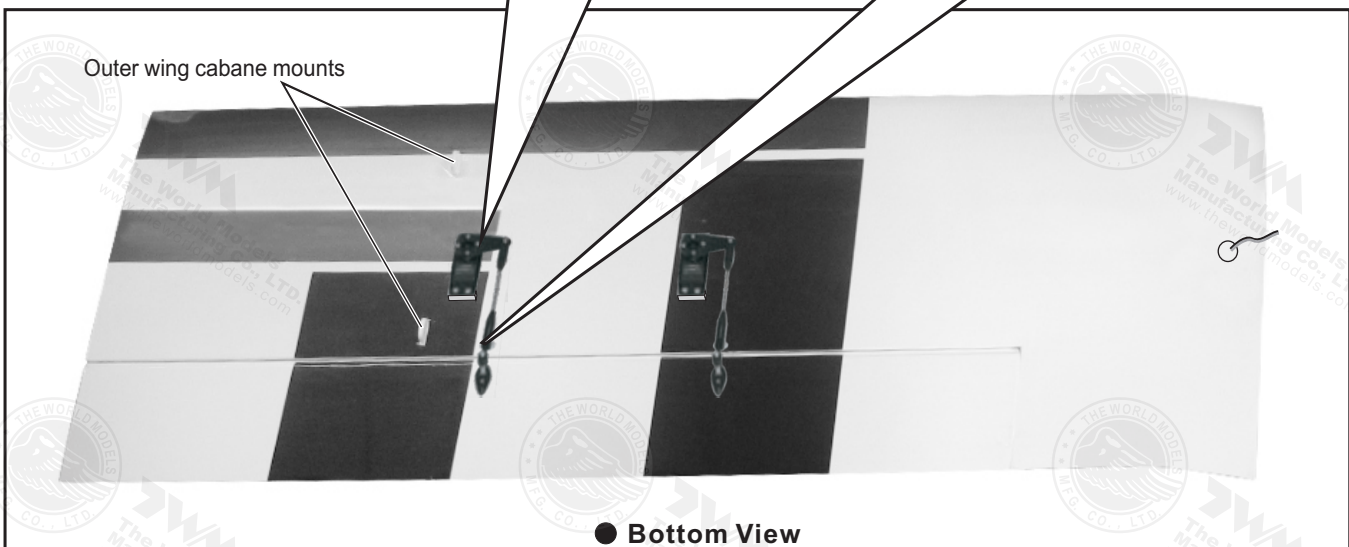
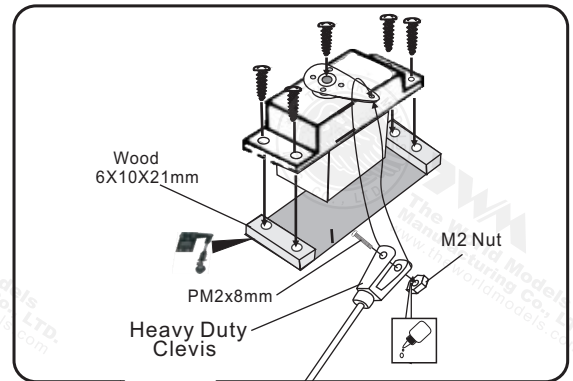
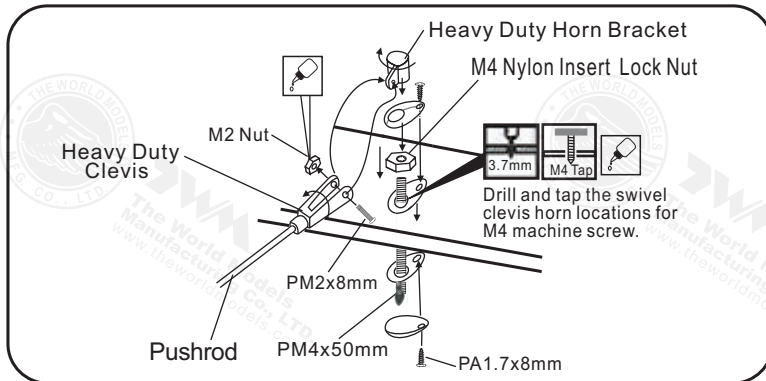
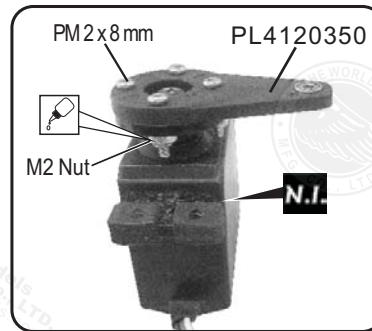
Main Wing (Upper)



2 Aileron Servo (Upper Wing)

PM4x50mm Screw 4

M4 Nylon Insert Lock Nut 4

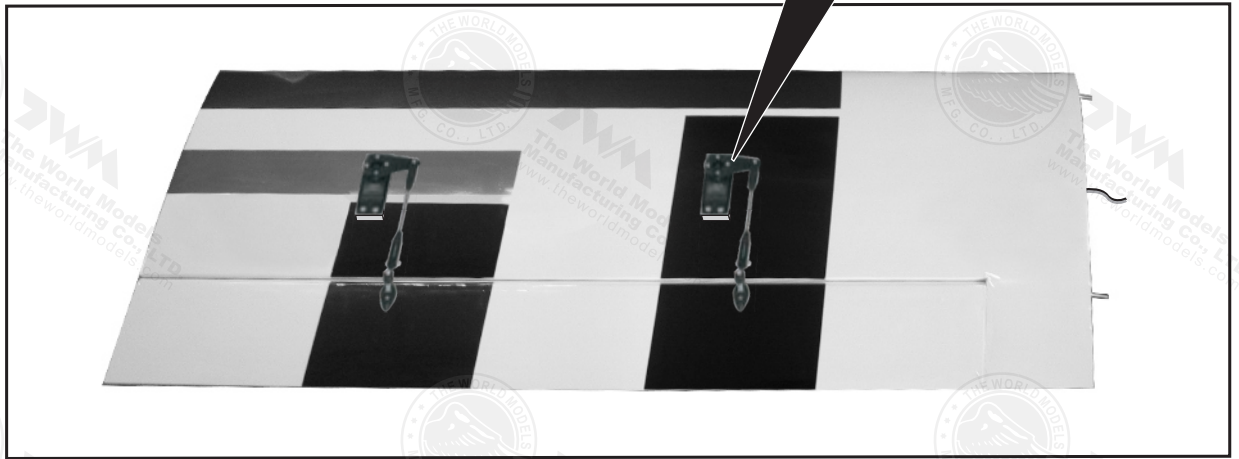
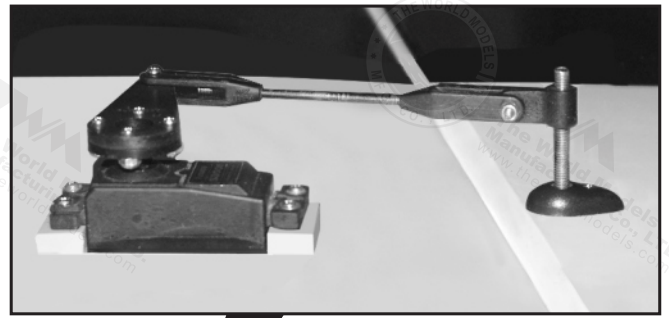


L/R

3 Aileron Servo (Lower Wing)

- PM4x50mm Screw 4
- M4 Nylon Insert Lock Nut 4

Similar installation as upper wing.



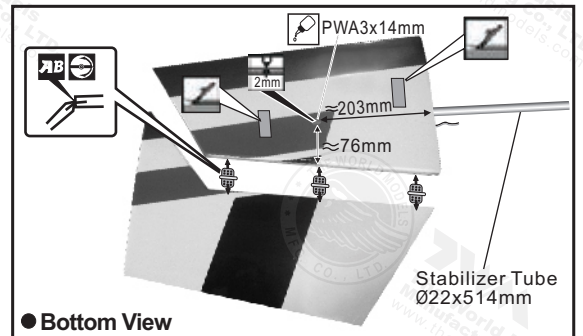
L/R

● Bottom View

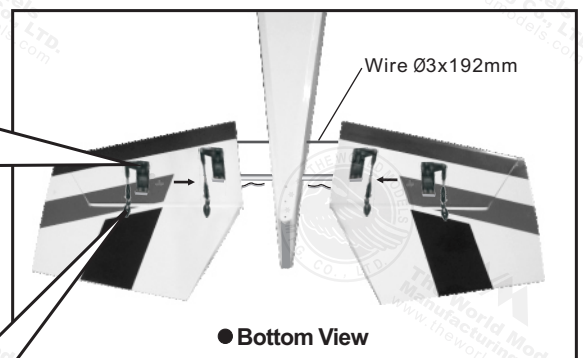
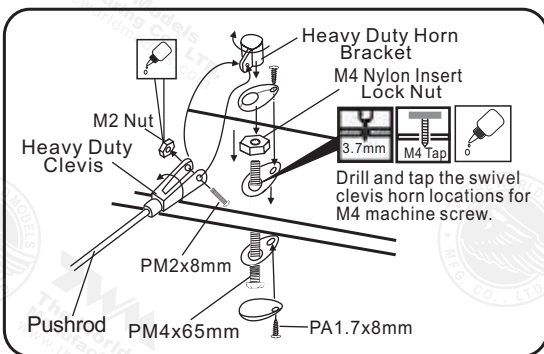
4 Stabilizer & Elevator

- PWA3x14mm Screw 2
- PM4x65mm Screw 4
- M4 Nylon Insert Lock Nut 4

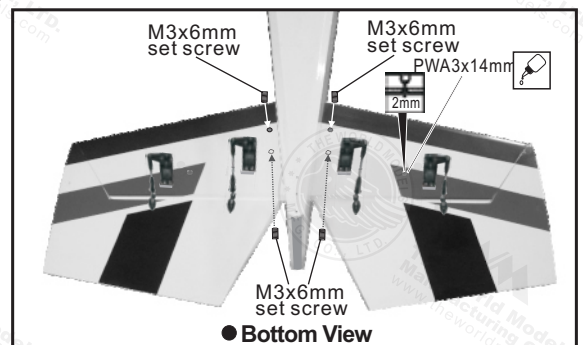
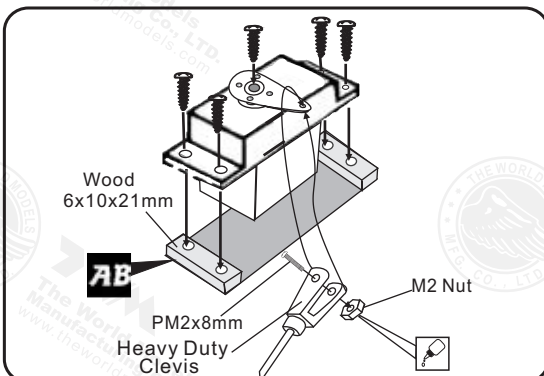
● Replace CA hinges by metal hinges. Glue the metal hinges to stabilizer and elevator by epoxy.



● Bottom View



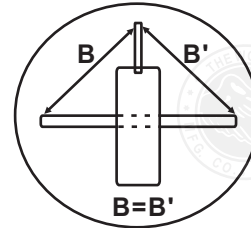
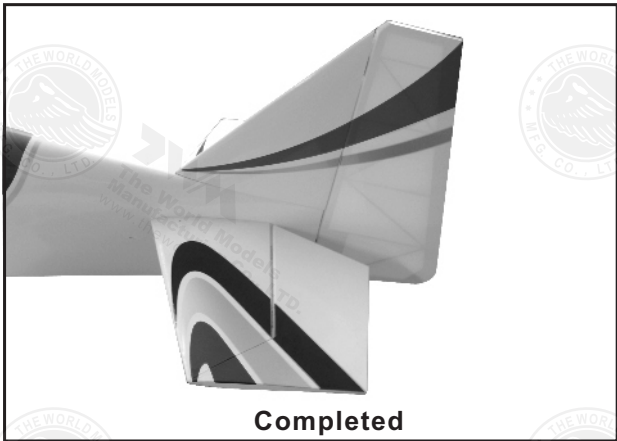
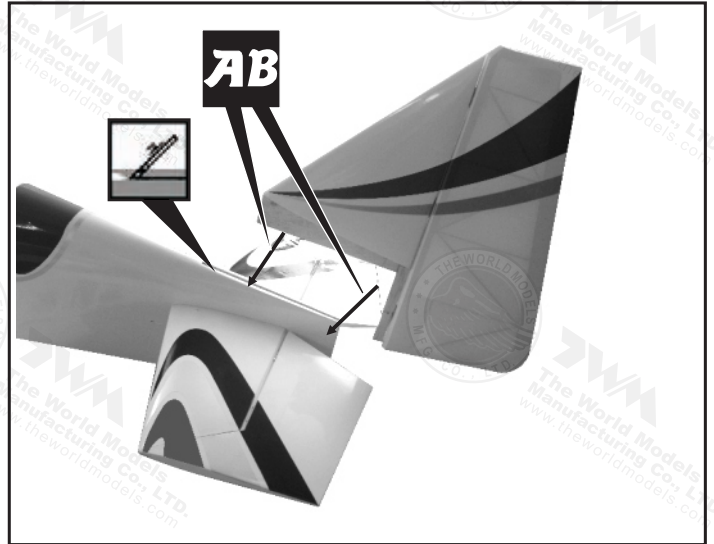
● Bottom View



● Bottom View

L/R

5 Vertical Fin & Rudder



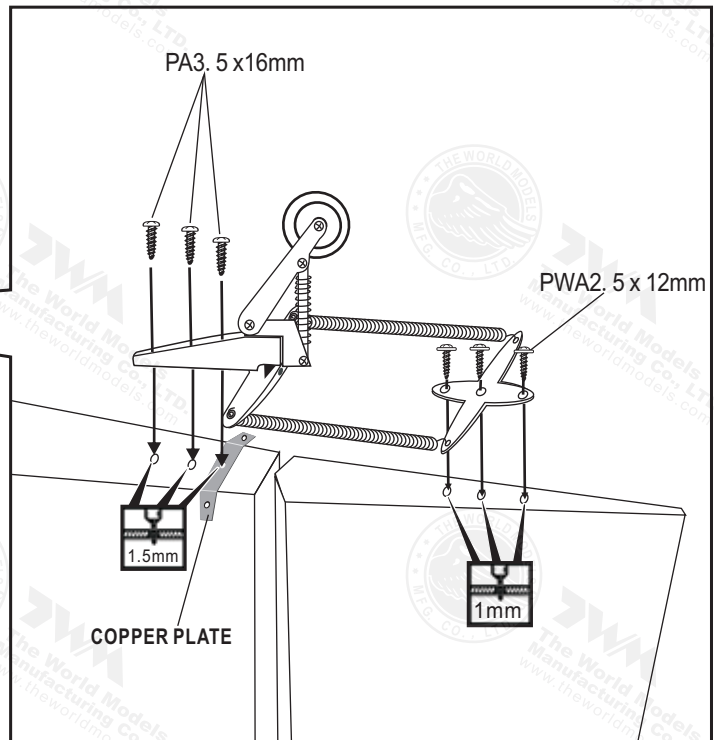
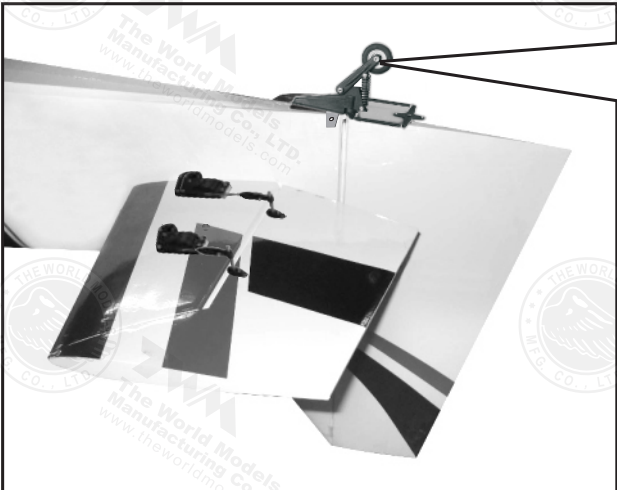
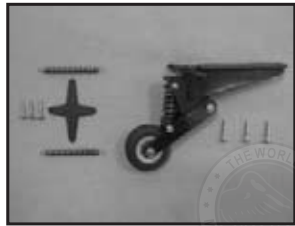
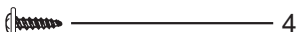
- Replace CA hinges by metal hinges. Glue the metal hinges to vertical and rudder by epoxy.

6 Tail Landing Gear

PA3. 5x16mm Screw



PWA2. 5x12mm Screw



7 Engine Box

PM3x16mm Screw



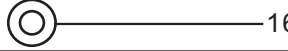
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M3 Nylon Insert Lock Nut

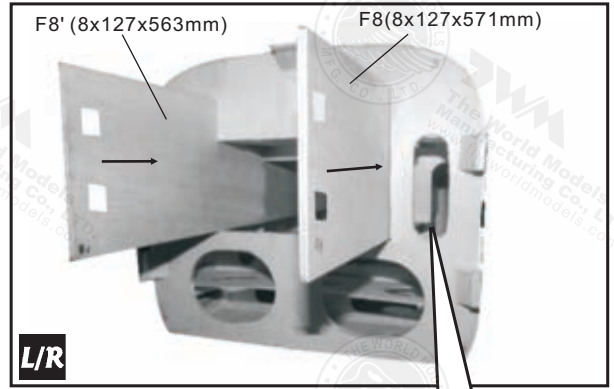
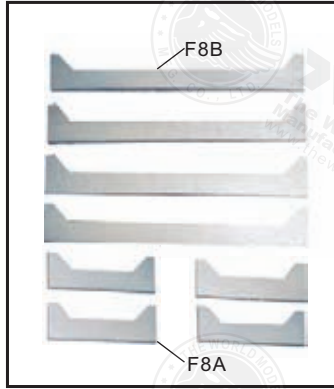


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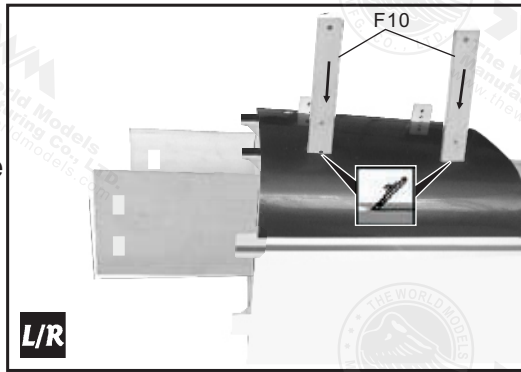
d3xD7mm Washer



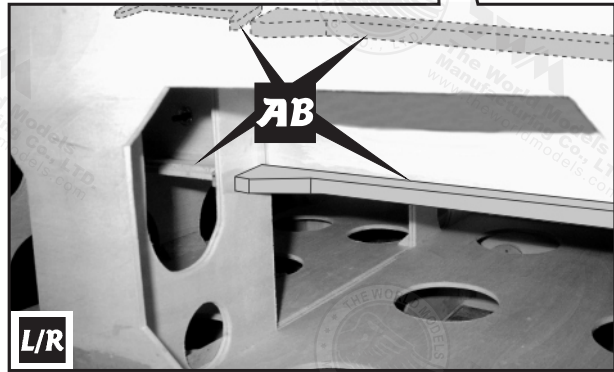
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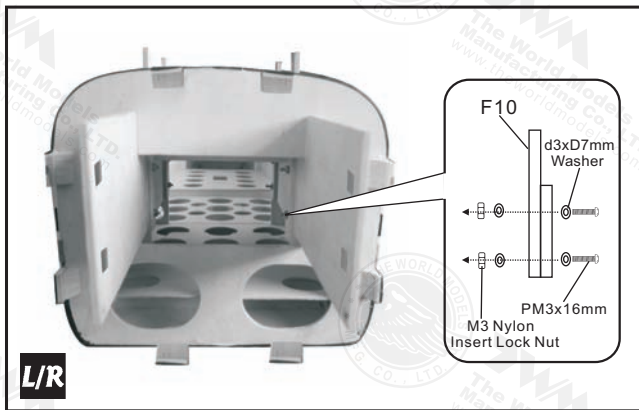


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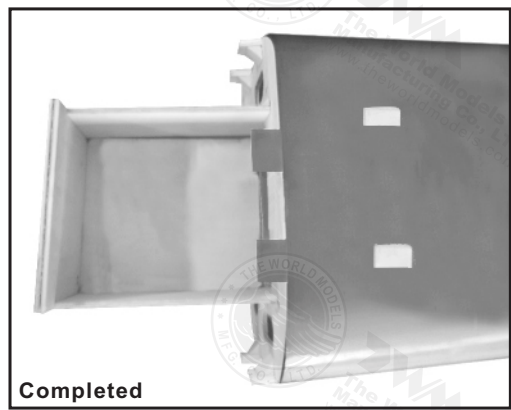


L/R

!
Please note
right thrust
angle of
firewall.

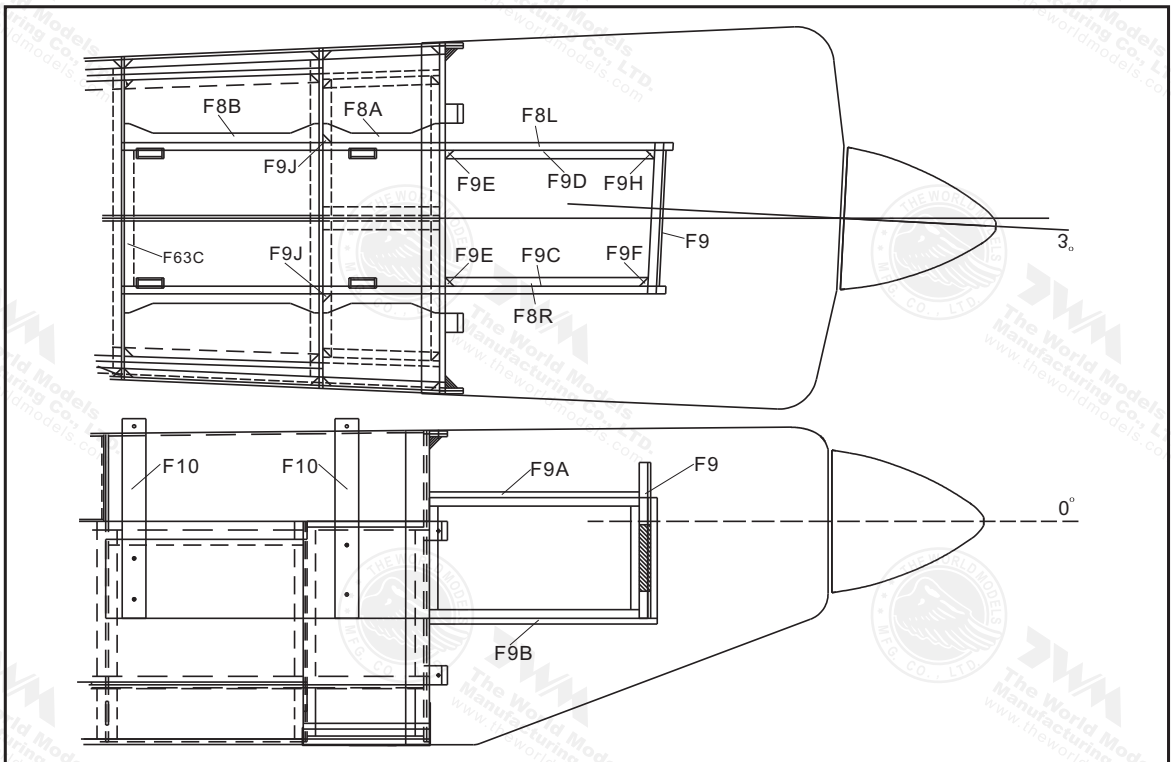


L/R



Completed

● Use epoxy to
glue all parts
together.



8 Wing Cabane

PM3x16mm **Screw**

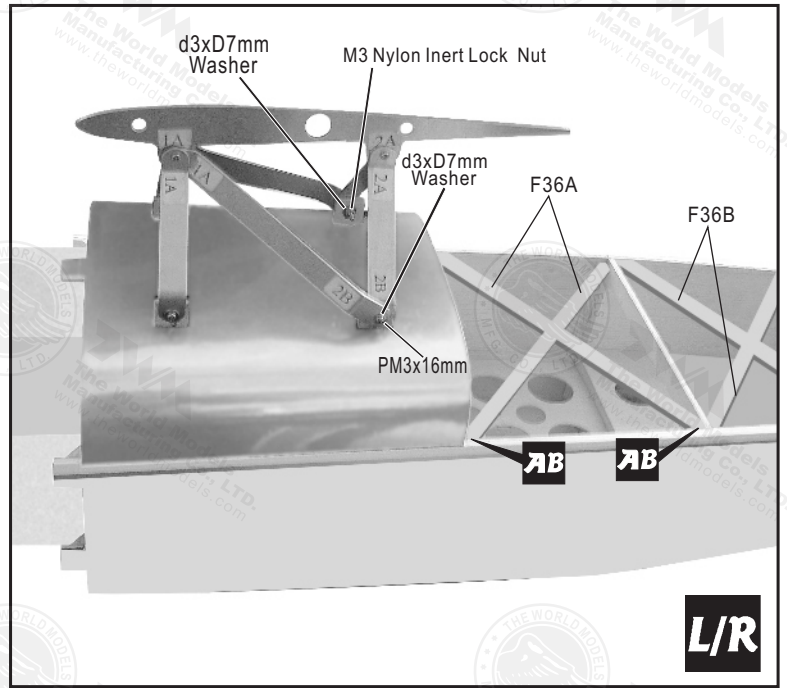
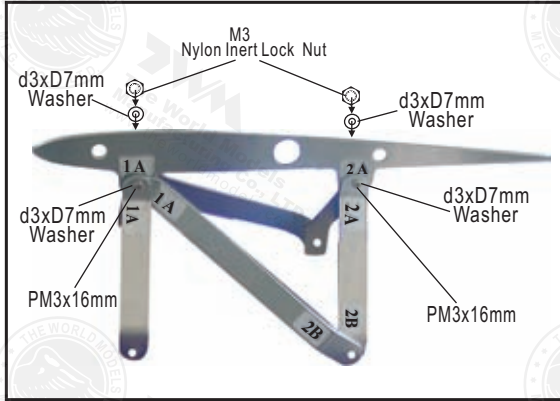
6

M3 Nylon Inert Lock Nut

6

d3xD7mm **Washer**

12



9 Main Landing Gear

Ø5x54.5mm **Axle Shaft**

2

M6x20mm **SOCKET HEAD SCREW**

4

PM3x16mm **Screw**

4

d3xD7mm **Washer**

4

PA3x12mm **Screw**

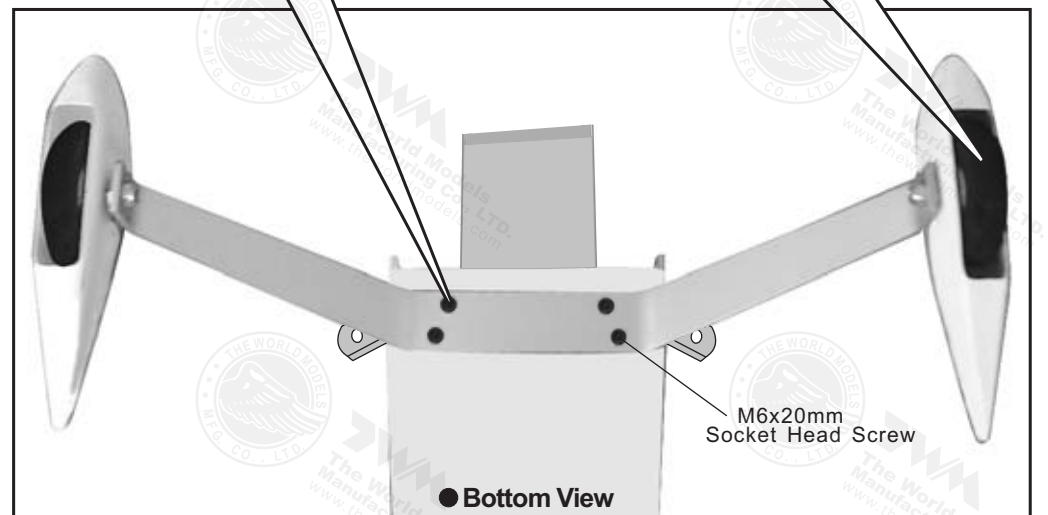
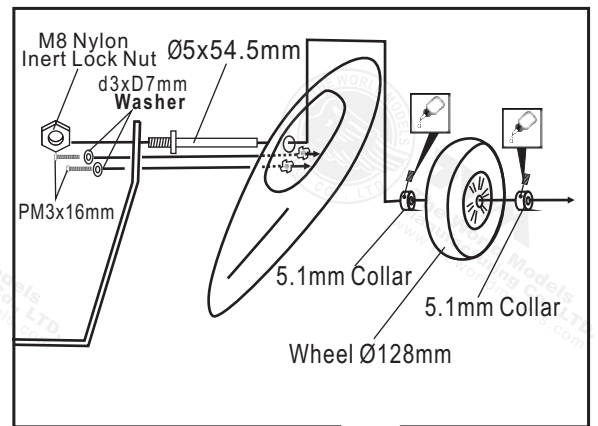
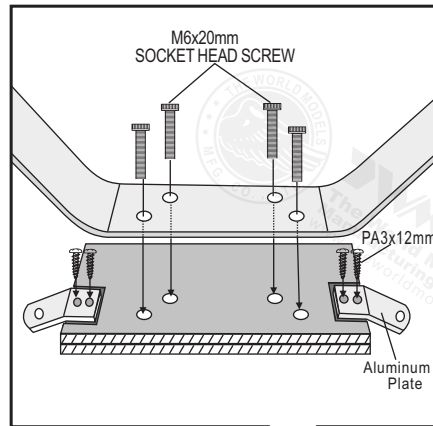
4

M8 Nylon Inert Lock Nut

2

5.1mm **Collar**

4



L/R

10 Rudder Pushrod

M4x130mm Screw

M4 Nylon Insert Lock Nut

PM2x10mm Screw

M4 Nylon Insert Lock Nut

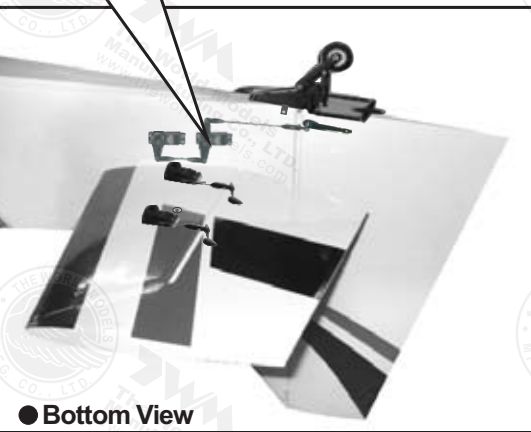
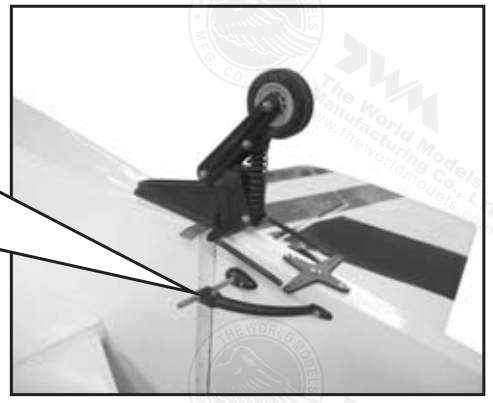
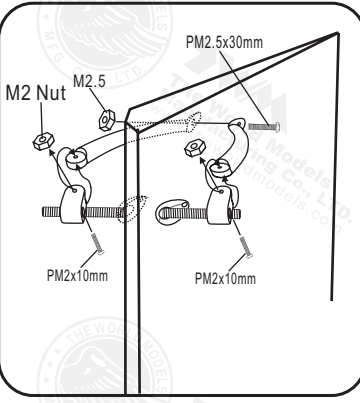
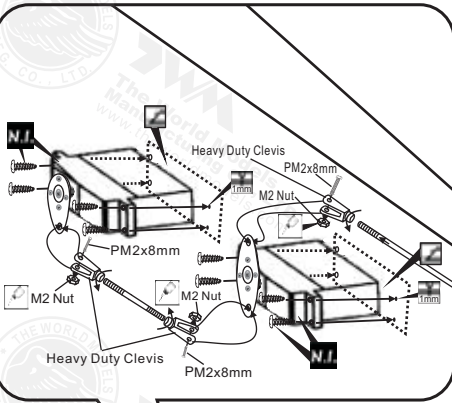
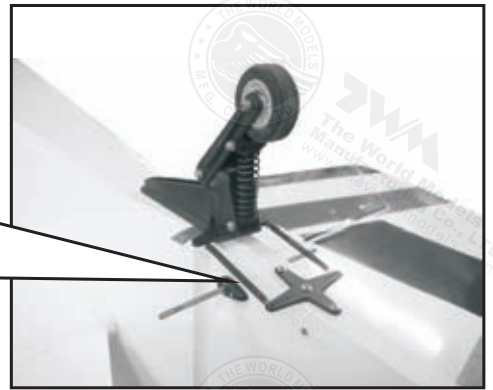
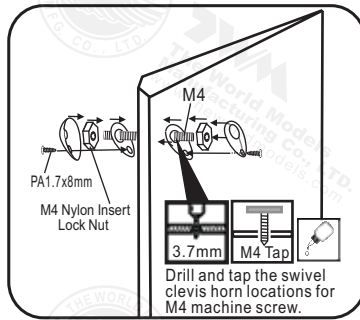
PM2x10mm Screw

M4 Nylon Insert Lock Nut

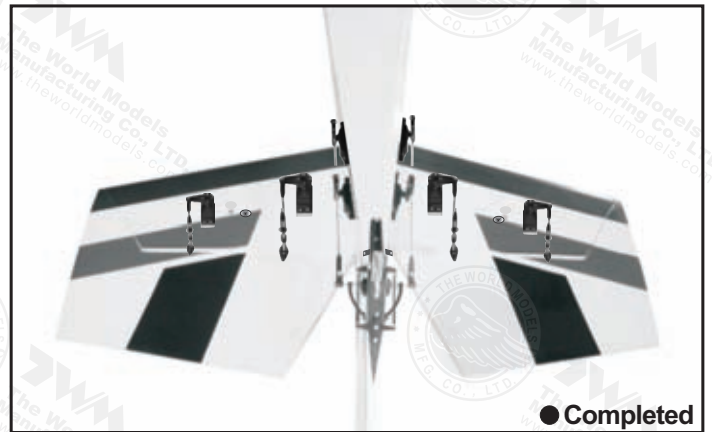
PM2x10mm Screw

M4 Nylon Insert Lock Nut

L/R



L/R



11 Flying Wire

3mm Set Screw

d3. 6mm Collar

PM 3x30mm Screw

M3 NYLON INSERT LOCK NUT

M3x3mm Set Screw

M3 NYLON INSERT LOCK NUT

M3x3mm Set Screw

M3 NYLON INSERT LOCK NUT

M3x3mm Set Screw

M3 NYLON INSERT LOCK NUT

M3x3mm Set Screw

M3 NYLON INSERT LOCK NUT

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M3 NYLON INSERT LOCK NUT

M3x3mm Set Screw

M3 NYLON INSERT LOCK NUT

M3x3mm Set Screw

M3 NYLON INSERT LOCK NUT

M3x3mm Set Screw

PM 3x30mm

M3

PM 3x30mm

D3. 6mm

3mm

3mm

M3

M3

M3

M3

M3

M3

M3

M3

d5xD6. 4x10mm

M3x3mm Set Screw

Copper Tube

Press down the center 1/3 portion



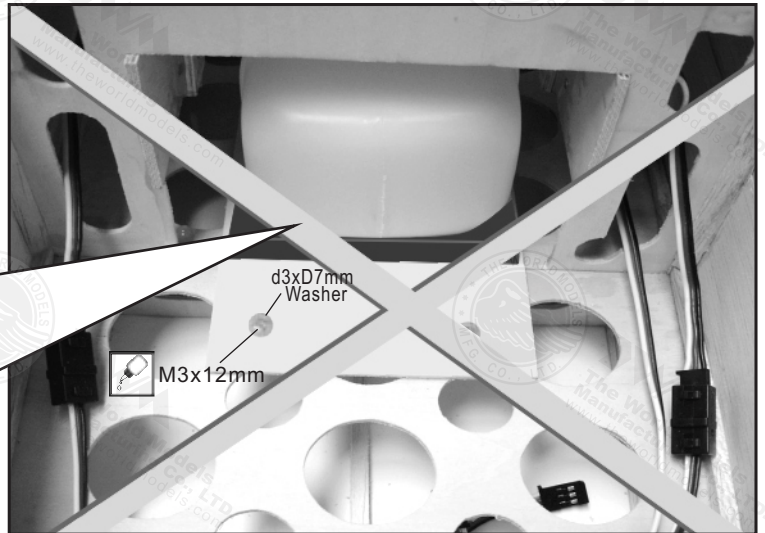
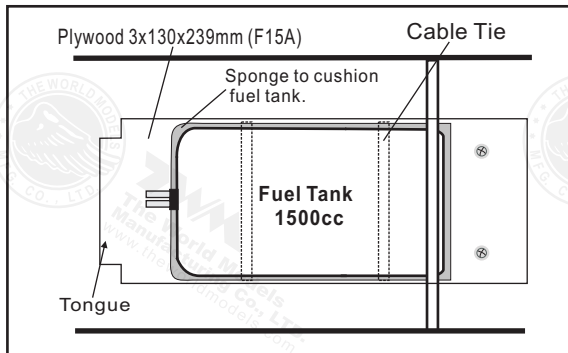
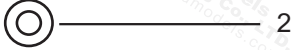
L/R

12 Fuel Tank

M3x12mm SOCKET HEAD SCREW



d3xD7mm Washer

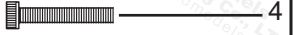


13 Engine

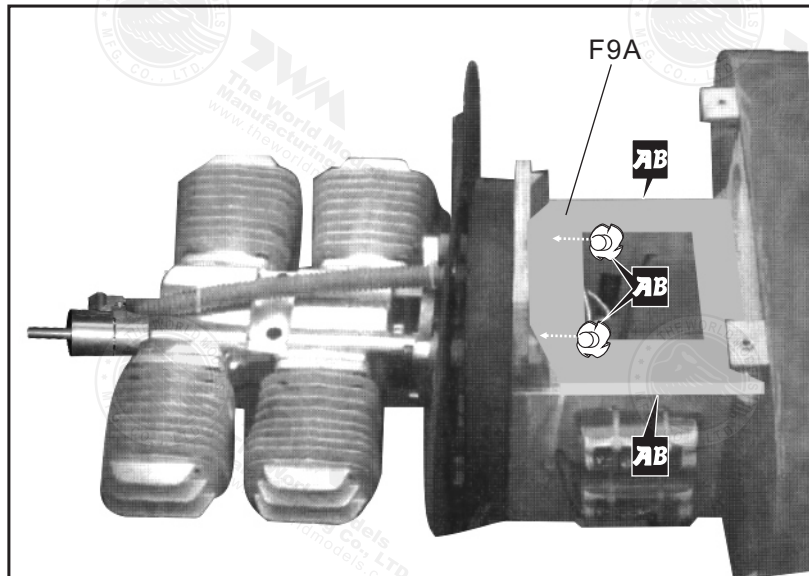
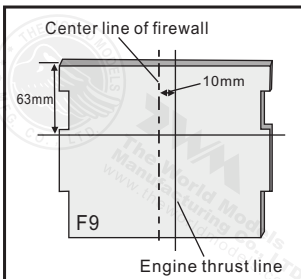
M6 Blind Nut



M6x50mm SOCKET HEAD SCREW

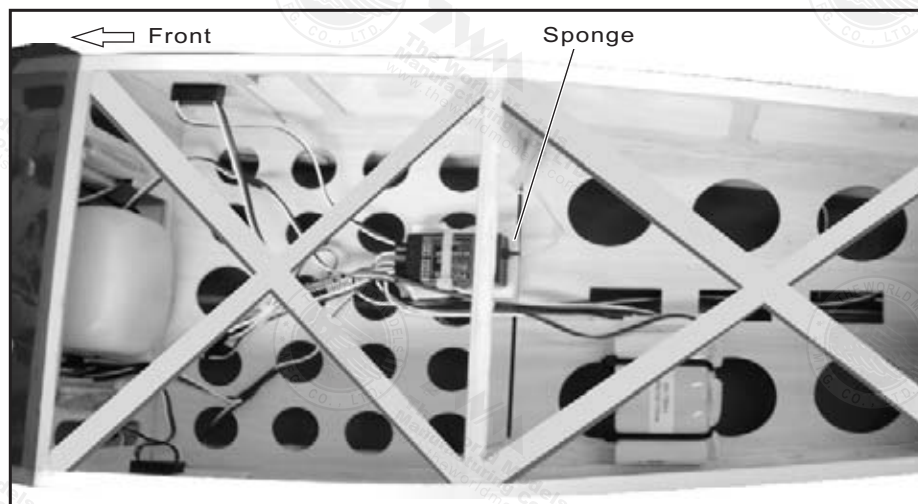


d6xD15mm Washer






14 Radio Equipment

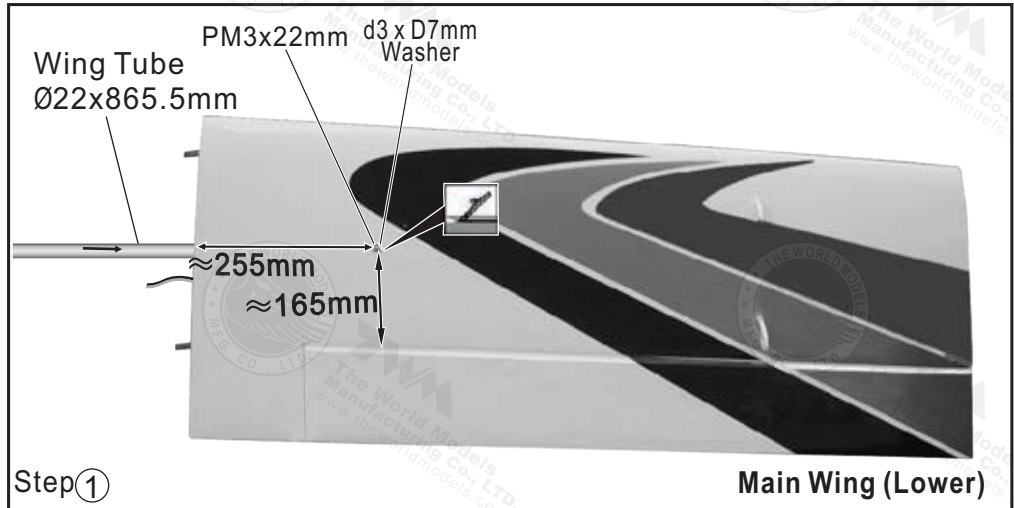
● Install and arrange the receiver and battery as shown in the diagram.



15 Main Wing (Lower)

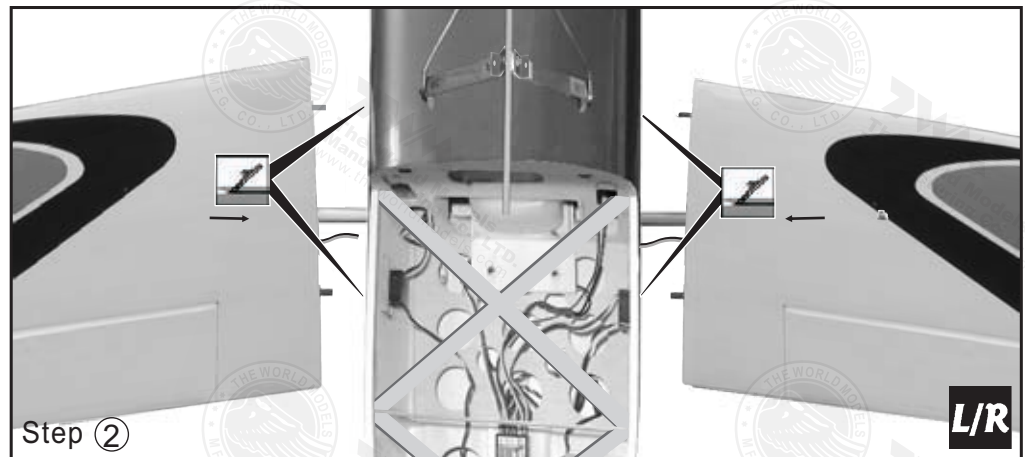
	PM3x22mm Screw	1
	PA3x22mm Screw	1
	d3 x D7mm Washer	2

Step 1. Insert the aluminum wing tube (Ø22x865.5mm) with the pre-drilled hole end into the right wing (lower). Align the lines marked at the wing root and wing tube, then apply the PM3x22mm 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-thread, do not over tighten the PM3 screw, the set up is for future removal of the wing.

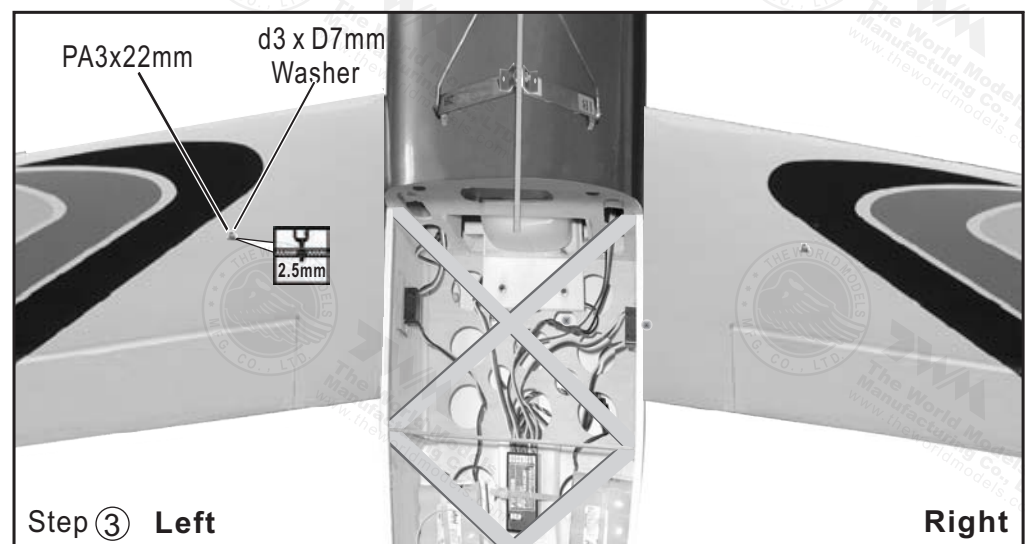


Step 2. Install the right wing to the fuselage by inserting the wing tube (now attached to the right wing) through the fuselage, then install the left wing.

● Top View



● Top View



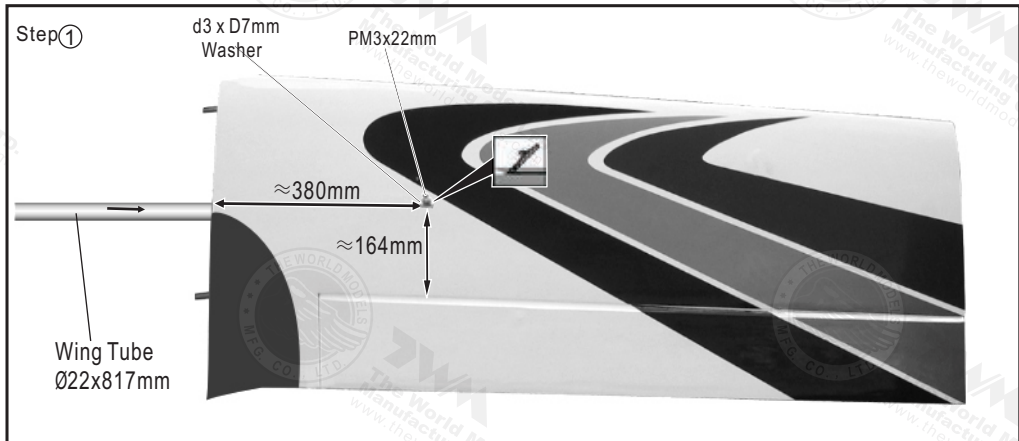
Step 3. Make sure the wings are resting against the fuselage tightly. Locate the pre-drilled 2mm hole at top of left wing, and drill along with 2.5mm drill bit until it passes through the wing tube. Apply the PA3x22mm self-tapping screw.

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.

16 Main Wing (Upper)

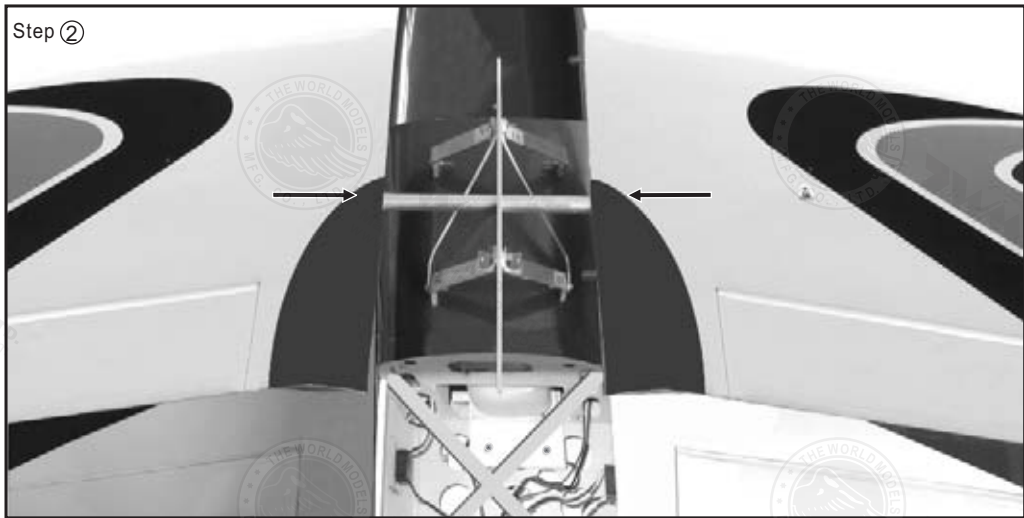
Step 1. Insert the aluminum wing tube ($\varnothing 22 \times 817 \text{mm}$) with the pre-drilled hole end into the right wing (upper). Align the lines marked at the wing root and wing tube, then apply the PM3x22mm machine screw through the pre-drilled hole on top of the wing. (Please confirm the alignment 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-thread, do not over tighten the PM3 screw, the set up is for future removal of the wing.

- PM3x22mm Screw — 1
- PA3x22mm Screw — 1
- d3 x D7mm Washer — 2

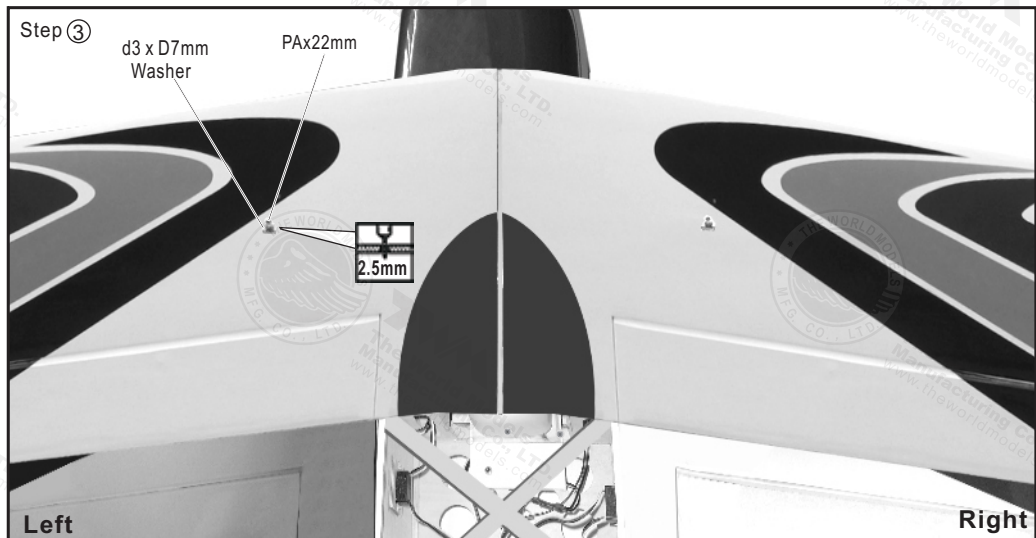


Step 2. Install the right wing to the center wing cabane by inserting the wing tube (now attached to the right wing) through the cabane, then install the left wing.

● Top View



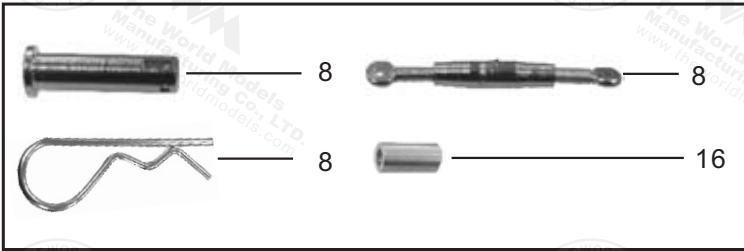
● Top View



Step 3. Make sure the wings are resting against the center wing cabane tightly. Locate the pre-drilled 2mm hole at top of left wing, and drill along with 2.5mm drill bit until it passes through the wing tube. Apply the PA3x22mm self-tapping screw.

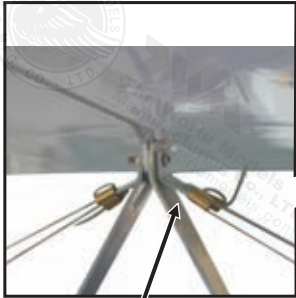
Note : It is recommended that the wing tube stays with the left wing. Removal of the wings could be achieved by removing the right wing machine screw, the right wing then the left wing with wing tube. If removal of wing tube from left wing is also required, it is recommended that instead of applying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

17 Outer Wing Cabanes & Flying Wire

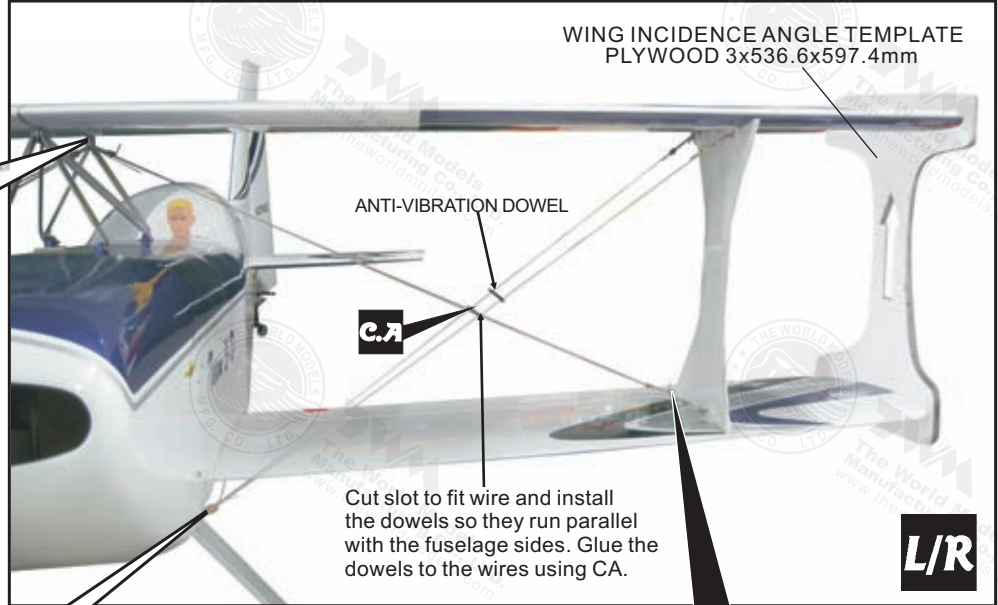


! Outer wing cabane should fit to the outside of outer wing cabane mounts.

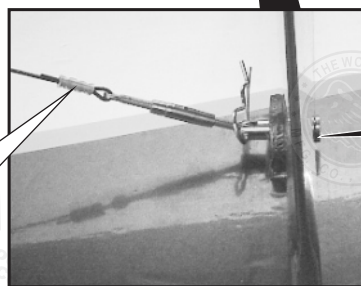
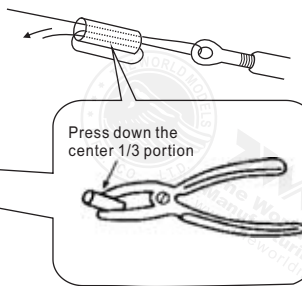
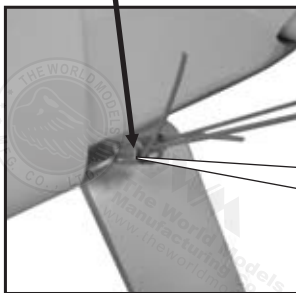
With the wing incidence angle template still in place, position the side cabanes, mark and drill the side cabane mounts and fasten with PM3x18mm screw and nut.



Once assembled, wire will remain permanently attached to center cabane and fuse bracket.



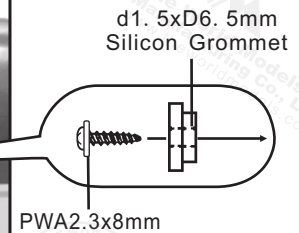
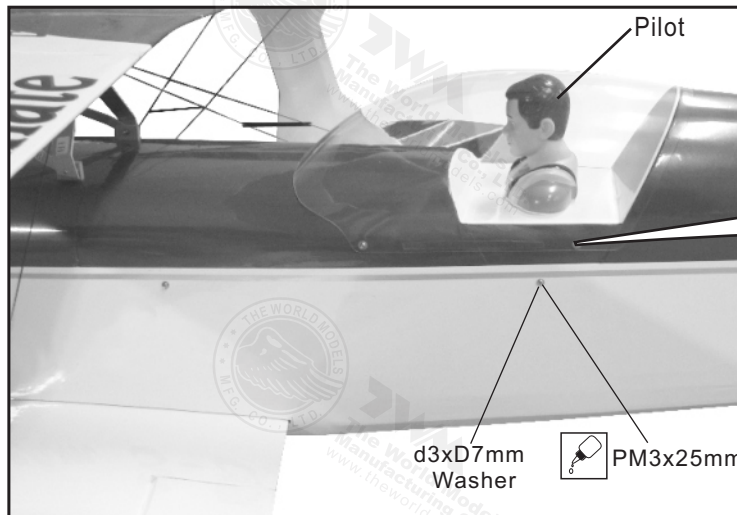
Cut slot to fit wire and install the dowels so they run parallel with the fuselage sides. Glue the dowels to the wires using CA.



18 Canopy

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

- PWA2.3x8mm Screw — 4
- PM3x25mm Screw — 4
- d3 x D7mm Washer — 4
- d1.5 x D6.5mm Silicon Grommet — 4

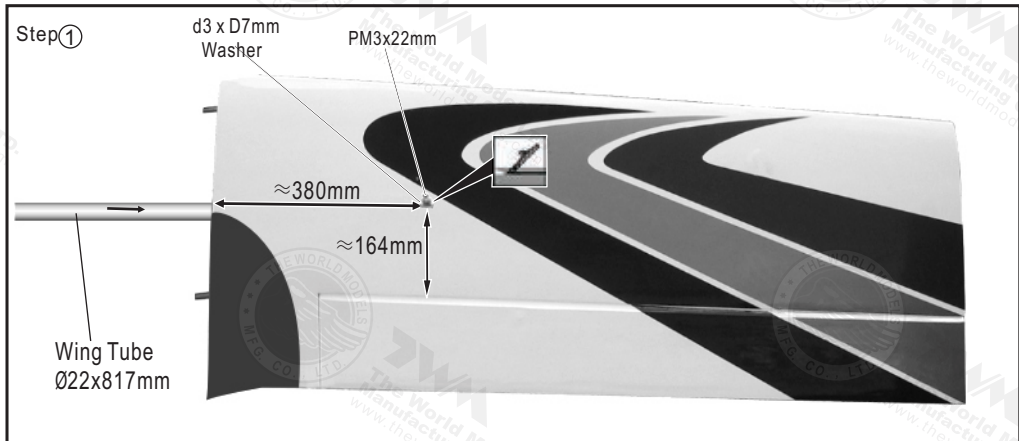


L/R

16 Main Wing (Upper)

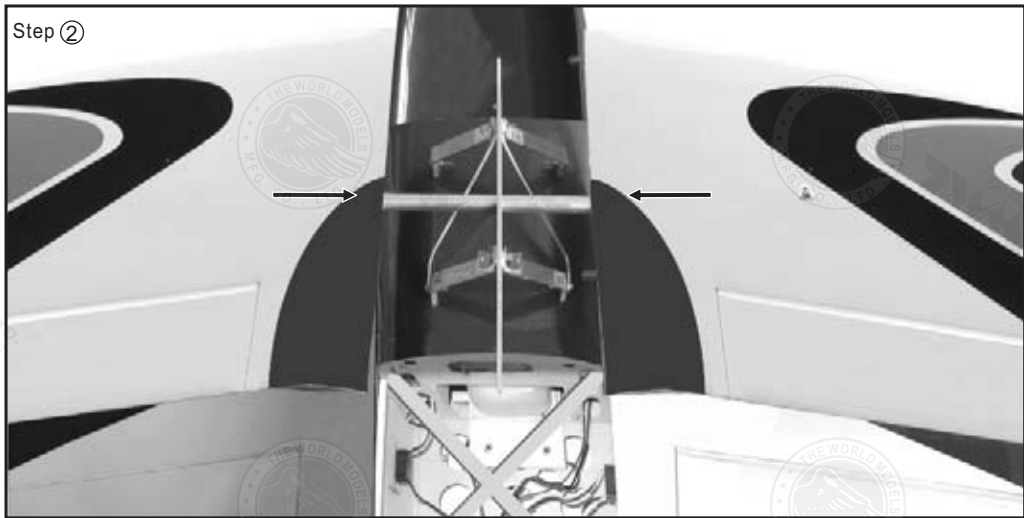
Step 1. Insert the aluminum wing tube ($\varnothing 22 \times 817 \text{mm}$) with the pre-drilled hole end into the right wing (upper). Align the lines marked at the wing root and wing tube, then apply the PM3x22mm machine screw through the pre-drilled hole on top of the wing. (Please confirm the alignment 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-thread, do not over tighten the PM3 screw, the set up is for future removal of the wing.

- PM3x22mm Screw — 1
- PA3x22mm Screw — 1
- d3 x D7mm Washer — 2

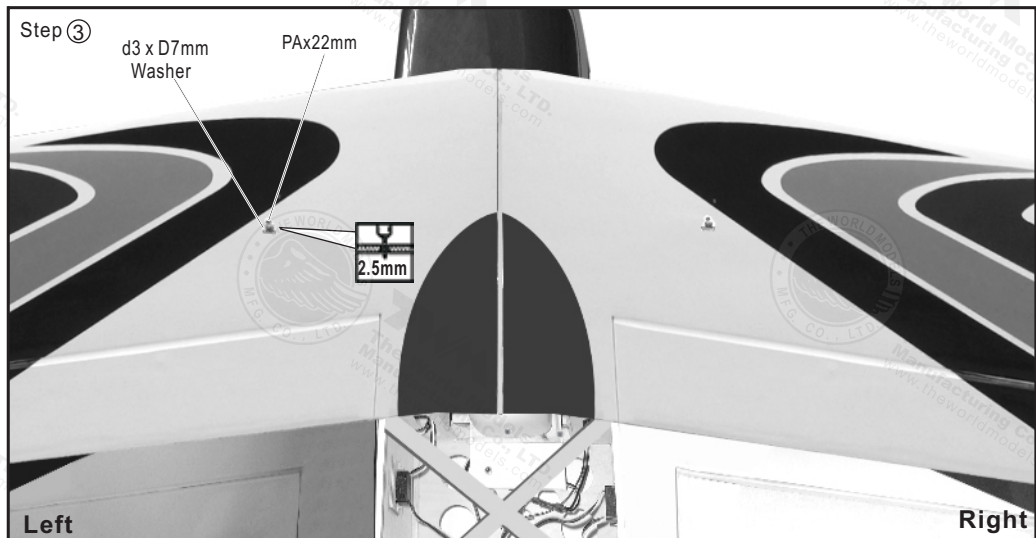


Step 2. Install the right wing to the center wing cabane by inserting the wing tube (now attached to the right wing) through the cabane, then install the left wing.

● Top View



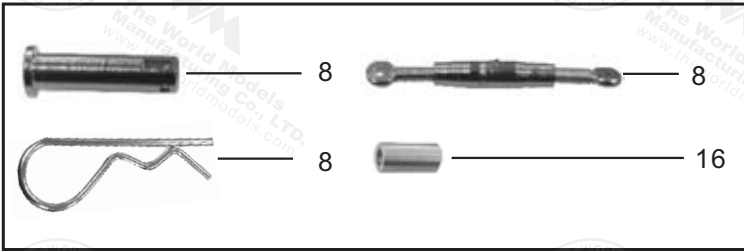
● Top View



Step 3. Make sure the wings are resting against the center wing cabane tightly. Locate the pre-drilled 2mm hole at top of left wing, and drill along with 2.5mm drill bit until it passes through the wing tube. Apply the PA3x22mm self-tapping screw.

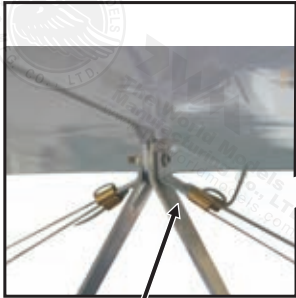
Note : It is recommended that the wing tube stays with the left wing. Removal of the wings could be achieved by removing the right wing machine screw, the right wing then the left wing with wing tube. If removal of wing tube from left wing is also required, it is recommended that instead of applying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

17 Outer Wing Cabanes & Flying Wire

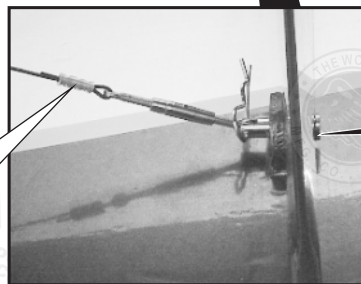
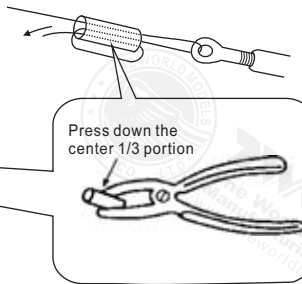
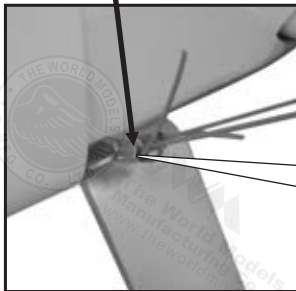
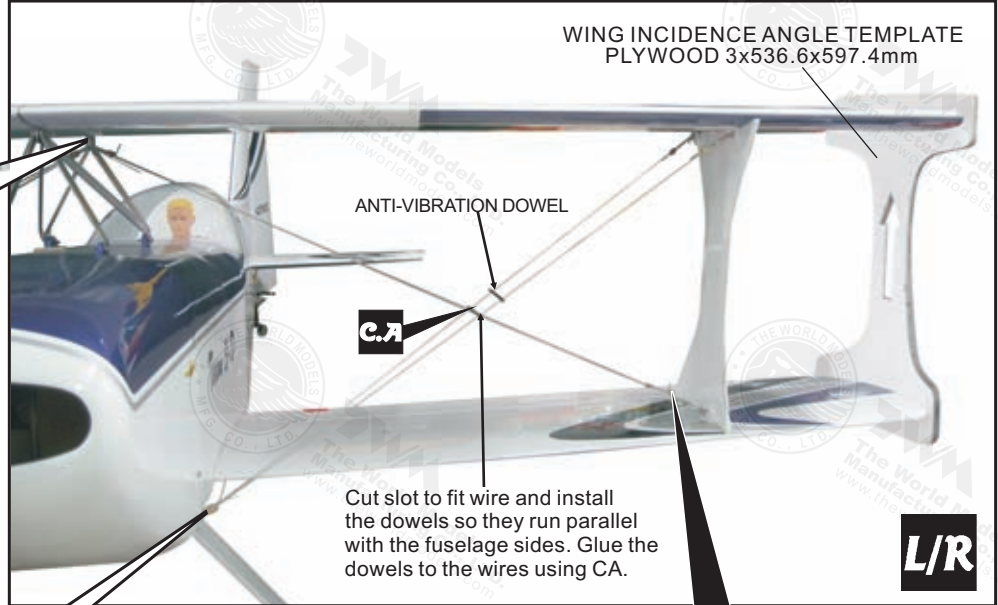


! Outer wing cabane should fit to the outside of outer wing cabane mounts.

With the wing incidence angle template still in place, position the side cabanes, mark and drill the side cabane mounts and fasten with PM3x18mm screw and nut.



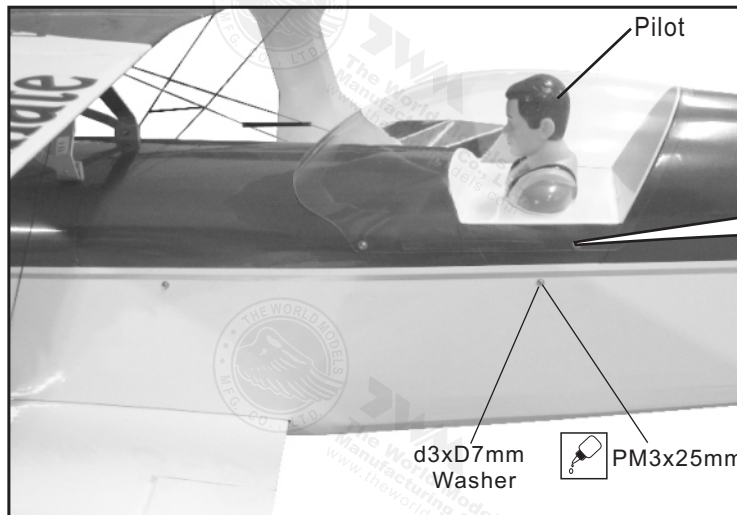
Once assembled, wire will remain permanently attached to center cabane and fuse bracket.



18 Canopy

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

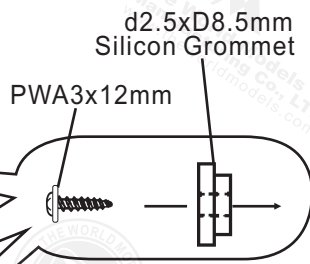
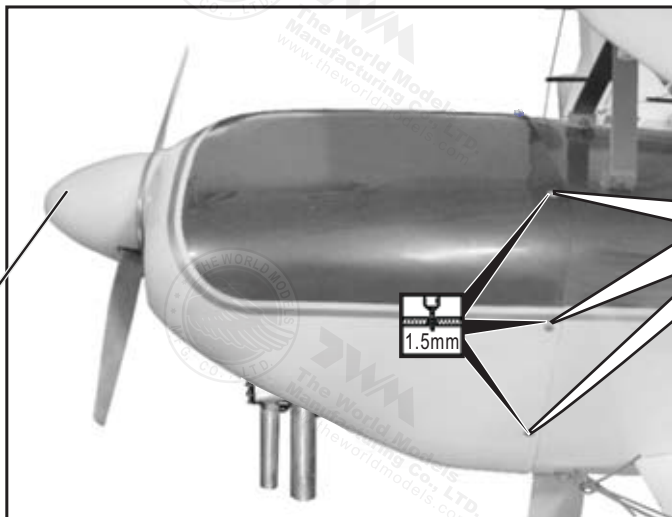
- PWA2.3x8mm Screw — 4
- PM3x25mm Screw — 4
- d3 x D7mm Washer — 4
- d1.5 x D6.5mm Silicon Grommet — 4



19 Cowling & Spinner

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

- PWA3x12mm Screw 6
- d2.5xD8.5mm Silicon Grommet 6

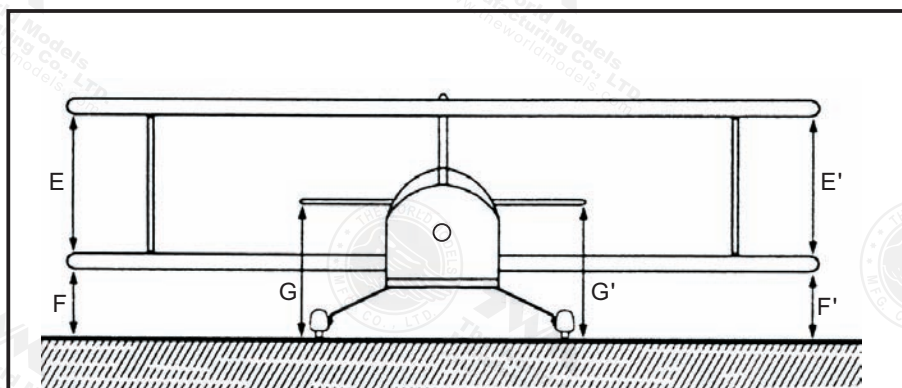
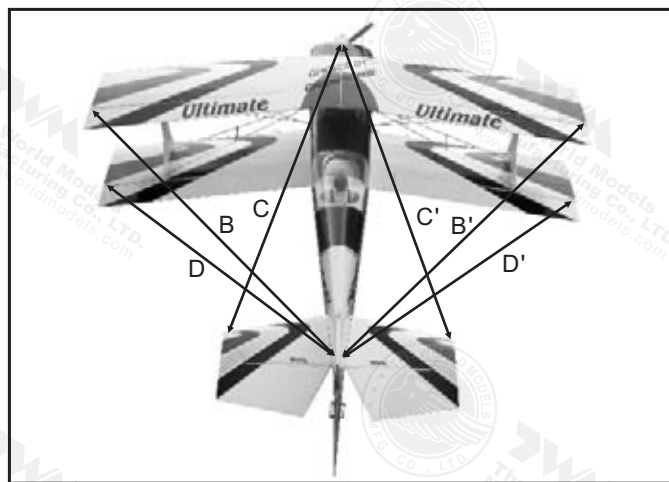
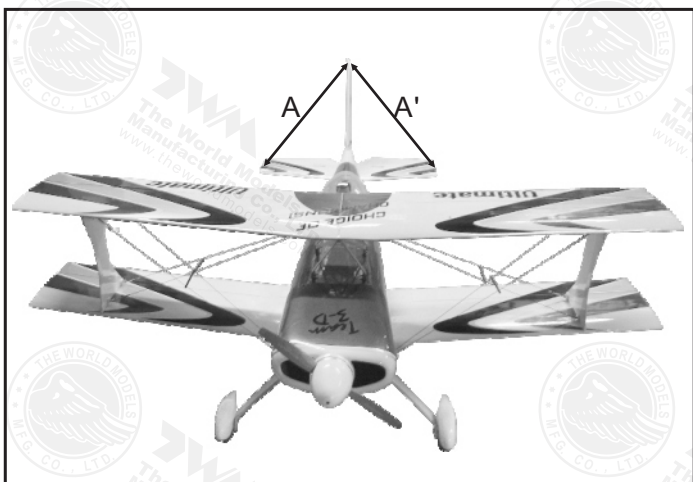


Spinner
Ø150mm

L/R

20 Wing Setting

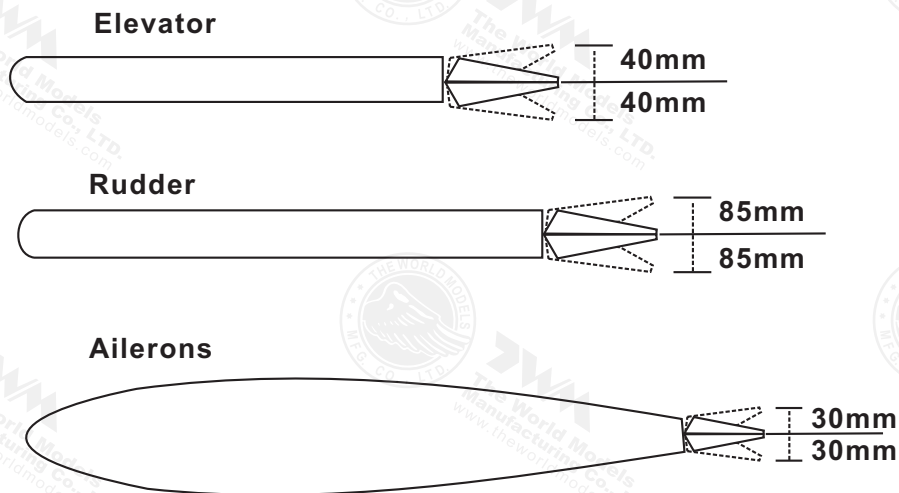
● Adjust the wing and fuselage configuration as shown in the diagrams.



A=A' B=B' C=C' D=D' E=E' F=F' G=G'

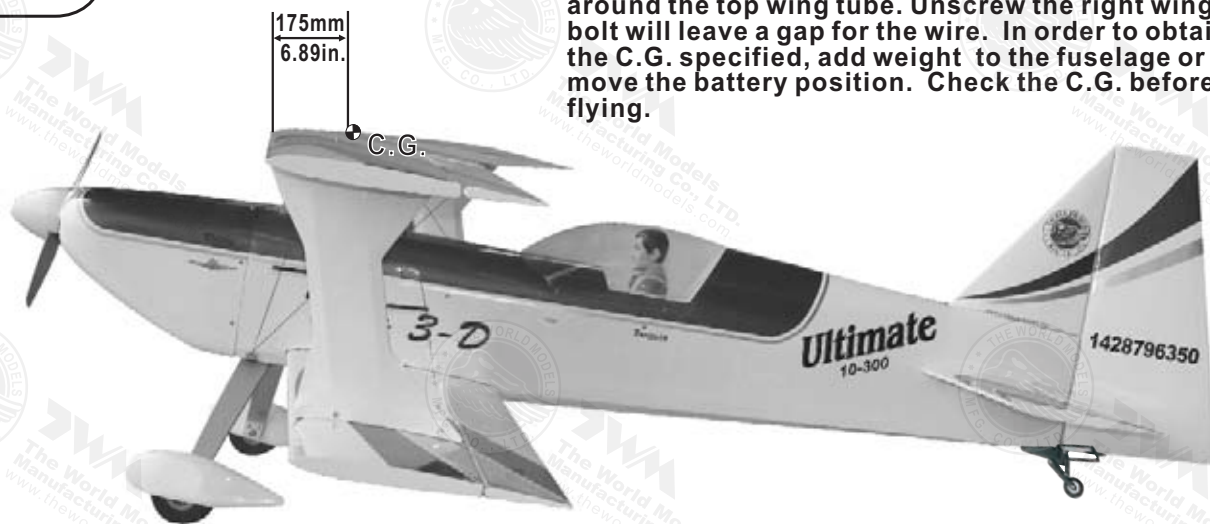
21 Control Throws

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



22 C.G.

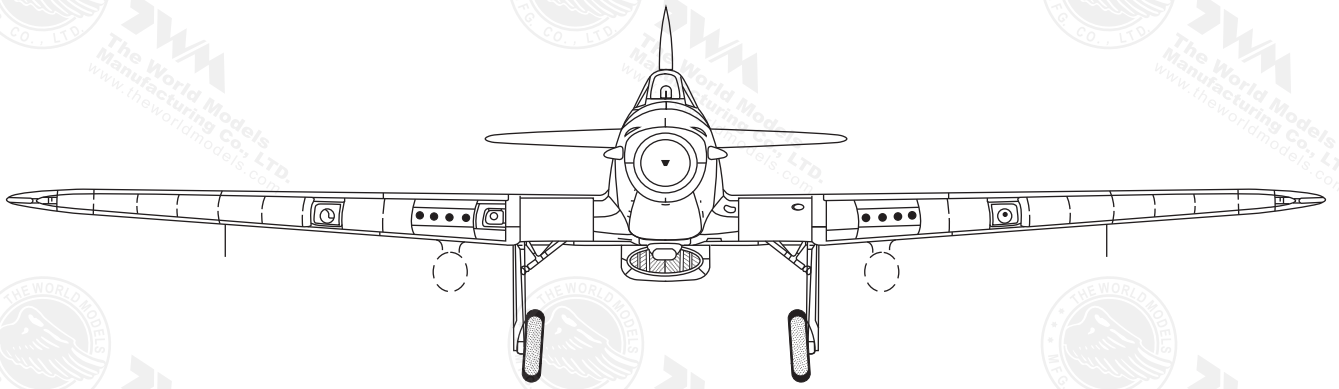
The ideal C.G. position is at center of top wing tube. You can check the C.G. by hanging the plane with wire around the top wing tube. Unscrew the right wing bolt will leave a gap for the wire. In order to obtain the C.G. specified, add weight to the fuselage or move the battery position. Check the C.G. 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.
- # **42% Ultimate** is specially designed to be powered by **150cc-200cc** gasoline 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.



Ducted Fan

Pattern

Warbirds

Funfly

Scale

Electric

Sports

Glider

Trainer Boat

Accessories

Covering

(Light / Tough)



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