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.

 Requires: 0.46–0.55 cu.in. displacement 2-stroke
 0.70–0.81 cu.in. displacement 4-stroke
 4- channels radio w/ 5 standard servos

<table>
<thead>
<tr>
<th>Specifications</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Wing Span</td>
<td>56.5 in / 1440 mm</td>
</tr>
<tr>
<td>Wing Area</td>
<td>496 sq in / 32 sq dm</td>
</tr>
<tr>
<td>Flying Weight</td>
<td>5.5 lb / 2500 g</td>
</tr>
<tr>
<td>Fuselage Length</td>
<td>50 in / 1270 mm</td>
</tr>
</tbody>
</table>

* Specifications are subject to change without notice.*
BEFORE YOU BEGIN

1. Read through the manual before you begin, so that you can 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:

- **AB**: Apply epoxy glue.
- **CA**: Apply instant glue (C.A.glue, super glue.)
- **N.I.**: Must be purchased separately!
- **L/R**: Assemble left and right sides the same way.
- **ML**: Apply thread locker
- **3mm**: Ensure smooth non-binding movement while assembling.
- **Cut off shaded portion.**
- **Drill holes with the specified diameter (here: 3mm).**
- **Peel off shaded portion covering film.**
- **Pierce the shaded portion covering film.**
- **Pay close attention here!**
- **Warning!** Do not overlook this symbol!
### Parts List

1. MAIN WING — 1 pc.
2. WING JOINER 6x30x204mm — 1 pc.
3. SCREW PWA2x20mm — 6 pcs
   CLEVIS PL4112103 — 2 sets
   STRAPER PL4112102 — 2 sets
   FUEL TUBE Ø6x5mm — 4 pcs
   TRI-HORN PL4111185 M3x14mm (S) — 2 sets
   PUSHROD Ø1.8x105mm w/ Threads (For Aileron) — 2 pcs
   SERVO MOUNTING PANEL PL5310000 — 1 pair
   SCREW PWA2X8mm — 8 pcs
4. STABILIZER & ELEVATOR — 1 set
   FUSELAGE — 1 pc.
5. VERTICAL FIN & RUDDER — 1 set
6. TAIL LANDING GEAR PL7100001 — 1 set
   SCREW PAx12mm — 2 pcs
   COLLAR 2.1mm w/ set screw — 1 set
   TAIL WHEEL PL7100001 Ø23mm — 1 pc.
7. PUSHROD Ø1.8mx720mm w/ Threads (For Rudder) — 1 pc.
   SCREW PBx16mm — 3 pcs
   CLEVIS PL4112103 — 1 pc.
   FUEL TUBE Ø6x5mm — 1 pc.
   TRI-HORN PL4111185 M3x14mm (S) — 1 set
8. PUSHROD Ø1.8x50mm w/ Threads (For Elevator) — 2 pcs
   SCREW PBx16mm — 6 pcs
   CLEVIS PL4112103 — 2 pcs
   FUEL TUBE Ø6x5mm — 2 pcs
   TRI-HORN PL4111185 M3x14mm (S) — 2 sets
9. MAIN LANDING GEAR HW2402292 — 1 pc.
   COLLAR 4.1mm HW4111401 w/ set screw — 4 sets
   QUICK RELEASE NYLON RIVET PL1208042 — 4 sets
   SCREW KAZ 3x8mm — 4 pcs
   SCREW M3x16mm — 3 pcs
   SCREW PMx38mm — 2 pcs
   WASHER d4x9mm — 4 pcs
   M4 NUT — 2 pcs
   ALUMINIUM PLATE 1mm — 1 pair
   MAIN WHEEL PL3111580 Ø58mm — 2 pcs
   WHEEL PANTS PC198GWPA — 2 pcs
10. FUEL TANK 260cc — 1 set
    DOUBLE-SIDED TAPE 40x100mm — 1 pc.
    TABLE TIE (FOR FUEL TANK) 1.5x5x400mm — 1 pc.
11. ENGINE MOUNT PL5111050 — 1 set
    SCREW M4x25mm — 4 pcs
    WASHER d4x9mm — 4 pcs
12. LINKAGE CONNECTOR HW7111060 Ø2. 1x6mm — 1 set
13. SCREW M3x25mm — 4 pcs
14. M3 NUT — 8 pcs
15. WASHER d3xD7mm — 8 pcs
16. THROTTLE PUSHROD Ø1.2x312mm — 1 pc.
17. PLASTIC TUBE d2x3xd160mm — 1 pc.
18. BALSA 6x6x95, 5mm (For FUSELAGE Servo Stand) — 2 pcs
    PUSHROD Ø1.8x125mm (For Elevator) — 1 pc.
    FUEL TUBE Ø6x5mm — 2 pcs
    STRAPER PL4112102 — 2 pcs
    PUSHROD CONNECTOR PL44110010 — 1 set
    PLYWOOD 3x100, 5x110, 1mm (For FUSELAGE Servo) — 1 pc.
    SPONGE 60x70x122mm (For Radio Equipment) — 1 pc.
19. SCREW HMx30mm — 2 pcs
20. WASHER d4x15mm — 2 pcs
21. PLYWOOD 2x30x88mm (Wing Protection) — 1 pc.
22. COWL WING PL5111050 — 1 pc.
23. TRANSPARENT 3D TEMPLATE — 1 pc.
24. SCREW PWA2, 6x12mm — 4 pcs
25. SILICON GROMMET PL1265035 d1. 5xD6. 5mm — 4 pcs
26. SPINNER PL2111062 Ø26mm — 1 pc.
27. CANOPY — 1 pc.
28. SCREW PWA2, 3x8mm — 4 pcs
29. SILICON GROMMET PL1265035 d1. 5xD6. 5mm — 4 pcs
30. PILOT (PC001085C) — 1 pc.

---

**COVERING:**

TOUGHON STL 100 WHITE
TOUGHON STL 240 GREEN
TOUGHON STL 312 BRIGHT RED
TOUGHON STL 198N FUS
TOUGHON STL 198N WIG
1. **Main Wing**

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

2. **Main Wing**

- Please dry fit wing joiner into left and right wing to make sure they fit with the proper dihedral angle, mark the wing joiner if necessary. Apply epoxy glue to both sides of all surfaces in contact. Use a stick to apply the glue to inner side of wing joiner sleeve, and apply the glue to wing joiner before putting them together. Wing joiner not glued properly will lead to wing failure and plane crash.

3. **Aileron Servo**

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

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

Temporary install the main wing, adjust leveling of the stablizer to make it as parallel to the main wing as possible.

*Also refer to step 18 Wing Setting*

**5 Vertical Fin & Rudder**

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

**6 Tail Landing Gear**

- PA3 x 12mm Screw 2
- 2.1mm Collar 1

*Bottom View*
7 Rudder Pushrod

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

![Diagram of Rudder Pushrod](image)

8 Elevator Pushrod

- Ø1mm pilot holes for World Models tri-horn are pre-drilled.

![Diagram of Elevator Pushrod](image)

9 Main Landing Gear

- Completed

![Diagram of Main Landing Gear](image)
**10 Fuel Tank**

- Fuel Tank 260cc
- Double side Tape 40x100mm
- Cable Tie 1.5x5x400mm

**11 Engine Mount**

- M4x25mm Screw 4
- d4xD9mm Washer 4
- Apply thread locker to screws.

- Engine Mount PL511050
- M4x25mm
- d4xD9mm Washer
- Blind nuts are off-centered to keep the spinner at the fuselage axis.

**12 Servo Set**

- 3 x 3mm Set Screw 1
- Linkage Connector 1
- M2 Nut 1
- 2mm Washer 2
- Throttle pushwire
- 3mm
- 2mm
- Throttle Servo.

- Included with the radio Set.

- Please refer to attached sheet for linkage connector installation.
Install and arrange the servos as shown in the diagram.

13 Engine

- M3x25mm Screw: 4
- M3 Nut: 8
- d3xD7mm Washer: 8

Installed Engine Position

- 132mm (5.2 in.)
- M3 Nut
- d3xD7mm Washer

Throttle Pushwire Ø1.2x312mm

Plastic Tube d2xD3x160mm

14 Radio Equipment

- Elevator Pushrod Ø1.8x485mm
- Elevator Servo
- Plywood 3x100.5x110.1mm
- Charge Receptacles KP0041300
- Elevator Pushrod Ø1.8x125mm
- Pushrod Connector
- KM 2x8mm
- Rudder pushrod Ø1.8x720mm
- Rudder Servo
- Straper
- Fuel Tube Ø8x5mm
- Balsa 6x6x95.5mm
- Rudder Servo N.I.
- Battery N.I.
- Receiver N.I.
- Sponge
15 Main Wing

- HM4x30mm Screw
- d4xD15mm Washer

First insert the grommet to the cowling then apply screw.

Please refer to attached sheet for usage of the transparent 3D template.

16 Cowling

- PWA2.6x12mm Screw
- d1.5xD6.5mm Silicon Grommet

First insert the grommet to the cowling then apply screw.

17 Canopy

- PWA2.3 x 8mm Screw
- d1.5xD6.5mm Silicon Grommet

First insert the grommet to the canopy then apply screw.
18 Wing Setting

- Adjust the wing and fuselage configuration as shown in the diagrams.
19 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.

- **Elevator**: 35mm / 35mm
- **Rudder**: 80mm / 80mm
- **Ailerons**: 12mm / 12mm

---

20 C.G.

The ideal C.G. position is 83mm (3.26 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.
- CAP 232-46N is specially designed to be powered by 2c 0.46–0.55 or 4c 0.70–0.81 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. Don’t use hot iron near the seams or edges, hot iron will melt the glue and shrink the covering at the same time, causing the seams to pull away.
- Check and re-tighten up all factory assembled screws, use thread locker if necessary.
After fastening the round nut, make sure that the linkage connector can rotate freely.

Drill 2mm hole at servo horn.

Insert linkage connector into servo horn.

Make sure shoulder of screw is cleared from servo horn. Add washer to reduce play if necessary.

Shoulder

Tighten up the round nut against the shoulder. Apply CA or permanent thread locker.

A198NPO26411108
Product Registration Form (US Customers)

We would like to share with you any relevant information regarding your model, including product news and free upgrade parts when applicable. Please fill in the following and send to AirBorne Models, 4749-K, Bennett Drive, Livermore, CA 94551 USA.

1. Name:________________________________________
2. Address:_______________________________________
3. Phone #:________________________ E-mail: _______________
4. Model:________________________________________

Wing QC# _________ Fuselage QC# _______________________
(QC numbers are stamped on wing and fuselage)

5. Date of Purchase:_______________________________
6. Store Name:_____________________________________

Please call AirBorne Models at 925 371 0922 for any assistance in filling this form. Thank you very much for purchasing our product.
Usage of the transparent 3D template

This transparent 3D template is used for position guidance of the actual cutting of the pre-painted cowling.

1. Simply cut the transparent 3D template to fit your engine and exhaust pipe, then slide onto the actual cowling and use as template to mark the openings required for final cutting.

2.

3.

4.
Optional Parts (ACCESSORIES)

180mm Extension

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Size</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>KW0011800</td>
<td>180mm</td>
<td>1 set</td>
</tr>
</tbody>
</table>

180mm Y-Cord

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Size</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>KW0021800</td>
<td>180mm</td>
<td>1 pc</td>
</tr>
</tbody>
</table>

Charge Receptacles

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Size</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>KP0041300</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Field Stand

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Size</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS9111450</td>
<td>600 x 240 x 350mm</td>
<td>1 pc</td>
</tr>
</tbody>
</table>

Fuel Filler

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Size</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>PL8110030</td>
<td>15 x 22 x 49mm</td>
<td>1 x 1 pc</td>
</tr>
</tbody>
</table>

Clevis Wrench

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Size</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>PL8210010</td>
<td></td>
<td>1 set</td>
</tr>
</tbody>
</table>

Special tool for clevis installation. Suitable for standard and small (EP) clevis.

Standard Servo

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Size</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>SV4031</td>
<td>40.6 x 20 x 37mm</td>
<td>1 set</td>
</tr>
</tbody>
</table>

Speed: 0.17 sec / 60° @4.8V
0.14 sec / 60° @6.0V
Torque: 3.2kg.cm / 44.8 oz - in @4.8V
4.1kg.cm / 57.4 oz - in @6.0V
Size: 40.6 x 20 x 37mm / 1.60 x 0.79 x 1.46 in
Weight: 39.4 g / 1.39 oz
Ducted Fan Pattern

Warbirds Funfly

Scale Electric

Sports Glider

Trainer Boat

Accessories

Covering
(Lightex / Toughlon)

The World Models Manufacturing Co., Ltd.
www.theworldmodels.com