0.52-0.70 cu.in. displacement 4-stroke
Requires: 4-channel radio w/ 5 standard servos

<table>
<thead>
<tr>
<th>Specifications</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Wing Span</td>
<td>53.5 in / 1360 mm</td>
</tr>
<tr>
<td>Wing Area</td>
<td>536 sq in / 34.6 sq dm</td>
</tr>
<tr>
<td>Flying Weight</td>
<td>5.2 lbs / 2350 g</td>
</tr>
<tr>
<td>Fuselage Length</td>
<td>53.5 in / 1360 mm</td>
</tr>
</tbody>
</table>

* 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.
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.glu, super glue.)
- **Apply thread locker**
- **Must be purchased separately!**
- **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).**
- **Pierce the shaded portion covering film.**
- **Pay close attention here!**
- **Warning!** Do not overlook this symbol!
Parts List

1. MAIN WING -- 1 pair
2. SCREW PB2x22mm -- 6 pcs
   FUEL TUBE Ø6x5mm -- 4 pcs
   CLEVIS -- 2 pcs
   STRAPER -- 2 pcs
   TRI-HORN M3x14mm (S) -- 2 sets
   PUSHROD Ø1.8x130mm w/ Threads (For Aileron) -- 2 pcs
3. STABILIZER & ELEVATOR -- 1 set
   FUESLAGE -- 1 pc.
4. VERTICAL FIN & RUDDER -- 1 set
5. TAIL LANDING GEAR -- 1 set
   SCREW PA3x12mm -- 2 pcs
   COLLAR Ø2.1mm w/ set screw -- 1 set
   WHEEL Ø25mm -- 1 pc.
6. MAIN LANDING GEAR -- 1 pair
   WHEEL PANTS -- 1 pair
   SCREW HM4x35mm -- 2 pcs
   M4 NUT -- 2 pcs
   SCREW PA2.6x6mm -- 4 pcs
   SOCKET HEAD SCREW M2.5x12mm -- 6 pcs
   WASHER d2.5xD8mm -- 6 pcs
   WASHER d4.5xD9mm -- 4 pcs
   WASHER d3xD7mm -- 4 pcs
   WHEEL Ø55mm -- 2 pcs
   COLLAR Ø4.1mm w/ set screw -- 4 sets
   PLATE 1mm -- 1 pair.
7. SCREW PM2x25mm -- 3 pcs
   M2 NUT -- 3 pcs
   FUEL TUBE Ø6x5mm -- 2 pcs
   CLEVIS -- 2 pcs
   TRI-HORN M3x14mm (S) (w/ o-Basa For Rudder) -- 2 sets
   RIGGING COUPLER Ø1.8x27mm w/ Threads (For Rudder) -- 2 pcs
   COPPER TUBE d2.5xD3.2x8mm (For Rudder) -- 2 pcs
   WIRE Ø1x880mm (For Rudder) -- 2 pcs
8. SCREW PB2x20mm -- 6 pcs
   FUEL TUBE Ø6x5mm -- 2 pcs
   CLEVIS -- 2 pcs
   TRI-HORN M3x14mm (S) -- 2 sets
   PUSHROD Ø1.8x680mm w/ Threads (For Elevator) -- 2 pcs
9. ENGINE MOUNT PL511050 -- 1 set
   SOCKET HEAD SCREW M4x22mm -- 4 pcs
   WASHER d4xD9mm -- 4 pcs
10. FUEL TANK 320cc -- 1 set
    BALSAX8x8x8mm (For Fuel Tank Position Fixing) -- 1 pc.
    RUBBER BAND -- 2 pcs
11. SCREW HM3.5x30mm -- 4 pcs
    M3.5 NUT -- 8 pcs
    WASHER d3.5xD8mm -- 8 pcs
    THROTTLE PUSHWIRE Ø1.2x370mm -- 1 set
    PLASTIC TUBE d2xD3x185mm -- 1 pc.
12. LINKAGE CONNECTOR Ø2.1mm -- 1 set
13. FUEL TUBE Ø6x5mm -- 1 pc.
    STRAPER -- 1 pc.
    PUSHROD CONNECTOR -- 1 set
    PSHROD Ø1.8x112mm (For Elevator Servo) -- 1 pc.
    COPPER TUBE d2.5xD3.2x8mm (For Rudder) -- 2 pcs
    RIGGING Z BEND Ø1.8x27mm (For Rudder) -- 2 pcs
    WOOD Ø56x1x8.5mm (For Rudder Servo) -- 1 pc.
    BALSAX6x6x61mm (For Rudder Servo Stand) -- 2 pcs
    SPONGE 10x80x200mm -- 2 pcs
14. SCREW PWA2.6x12mm -- 4 pcs
    SILICON GROMMET d1.5xD6.5mm -- 4 pcs
    COWLING -- 1 set
    TRANSPARENT 3D TEMPLATE -- 1 pc.
    SPINNER Ø57mm -- 1 set
15. SCREW HM3x18mm -- 1 pc.
    SCREW PA2x18mm -- 1 pc.
    WASHER d3xD7mm -- 2 pcs
    WING TUBE d14xD16x595mm -- 1 pc.
16. CANOPY -- 1 pc.
    SCREW PWA2.3x8mm -- 4 pcs
    SCREW HM3x16mm -- 2 pcs
    SILICON GROMMET d1.5xD6.5mm -- 4 pcs
    WASHER d3xD7mm -- 2 pcs
    DOUBLE-SIDED TAPE -- 1pc.
17. DECALS: A189DEC -- 1 set

COVERING:

TOUGHLON STL100 WHITE
TOUGHLON STL360 VIOLET
TOUGHLON STL361 PURPLE
TOUGHLON STL511 PEARL FERRARI RED
TOUGHLON STL550 PEARL BLUE
TOUGHLON STL561 PEARL PURPLE
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.

3 Stabilizer / Elevator

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

Temporary install the main wing, adjust leveling of the stabilizer to make it as parallel to the main wing as possible.
4 Vertical Fin & Rudder

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

5 Tail Landing Gear

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

6 Main Landing Gear

- M2.5 x 12mm Socket Head Screw 6
- HM4 x 35mm Screw 2
- PA2.6 x 6mm Screw 4
- d4.5 x D9mm Washer 4
- d2.5 x D8mm Washer 4
- d3 x D7mm Washer 6
- M4 Nut 2
- 4.1mm Collar 4

Bottom View

Completed
7 Rudder Pullwire

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

8 Elevator Pushrod

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

9 Engine Mount

- Apply thread locker.

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

- Balsa 8 x 8 x 89mm (For Fuel Tank Position Fixing)
- Rubber Band

Fuel Tank 320cc

Top View

Bottom View

11 Engine

- HM3.5x30mm Screw x 4
- M3.5 Nut x 8
- d3.5xD8mm Washer x 8

Plastic tube d2xD3x185mm
Throttle Pushwire 1.2x370mm
**12 Servo Set**

- **3 x 3mm Set Screw**
- **Linkage Connector**
- **M2 Nut**
- **2mm Washer**

Please refer to attached sheet for linkage connector installation.

**13 Radio Equipment**

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

**14 Cowling**

- Please refer to the attached sheet for usage of the transparent 3D template.
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 18mm 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 setup 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.

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 X 18mm 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 Canopy

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

<table>
<thead>
<tr>
<th>Component</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>PWA2.3x8mm Screw</td>
<td>4</td>
</tr>
<tr>
<td>HM3x16mm Screw</td>
<td>2</td>
</tr>
<tr>
<td>d1.5xD6.5mm Silicon Grommet</td>
<td>4</td>
</tr>
<tr>
<td>d3xD7mm Washer</td>
<td>2</td>
</tr>
</tbody>
</table>

Apply double-sided tape

17 Wing Setting

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

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

The ideal C.G. position is 135mm (5.32 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.

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 is specially designed to be powered by 4c 0.52-0.70 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.
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.
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>MS9111430</td>
<td>600 x 240 x 310mm</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

| Code No No SV4031 |       |         |

- **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