### Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wing Span</strong></td>
<td>76 in / 1930 mm</td>
</tr>
<tr>
<td><strong>Wing Area</strong></td>
<td>2100 sq in / 135.5 sq dm</td>
</tr>
<tr>
<td><strong>Flying Weight</strong></td>
<td>23-25 lbs / 10440-11350 g</td>
</tr>
<tr>
<td><strong>Fuselage Length</strong></td>
<td>82 in / 2080 mm</td>
</tr>
</tbody>
</table>

*Specifications are subject to change without notice.*

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**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.

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**Requires:** 100 c.c. engine, 6-channel radio w/ 9 high torque servos.
# 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:

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

1. MAIN WING (Upper Wing) -- 1 pair
   MAIN WING (Lower Wing) -- 1 pair
   METAL HINGES -- 32 pcs

2. SERVO MOUNTING PANEL (For Aileron Servo) -- 2 pcs
   HEAVY DUTY SERVO HORN PL4120350 -- 2 sets
   SCREW PM4x50mm -- 2 pcs
   SCREW PWA2x12mm -- 5 pcs
   M4 NYLON INSERT LOCK NUT -- 2 pcs
   HEAVY DUTY CLEVIS PL412200 -- 4 sets
   SWIVEL CLEVIS HORN FAIRING PL4610010 -- 2 sets
   PUSHROD 0.2x5.05mm w/Threads (For Aileron) -- 2 pcs

3. SERVO MOUNTING PANEL (For Aileron Servo) -- 2 pcs
   HEAVY DUTY SERVO HORN PL4120350 -- 2 sets
   SCREW PM4x50mm -- 2 pcs
   SCREW PWA2x12mm -- 8 pcs
   M4 NYLON INSERT LOCK NUT -- 2 pcs
   HEAVY DUTY HORN BRACKET PL4112400 -- 2 sets
   HEAVY DUTY CLEVIS PL4112200 -- 4 sets
   SWIVEL CLEVIS HORN FAIRING PL4610010 -- 2 sets
   PUSHROD 0.2x5.05mm w/Threads (For Aileron) -- 2 pcs

4. FUSELAGE -- 1 pc.
   STABILIZER & ELEVATOR -- 1 set
   METAL HINGES -- 8 pcs

5. VERTICAL FIN & RUDDER -- 1 set
   METAL HINGES -- 6 pcs

6. TAIL GEAR ASSEMBLY 13-22LBS PL3410021 -- 1 set
   HARDWARE: --
   SCREW PM3x16mm -- 8 pcs
   M3 NYLON INSERT LOCK NUT -- 8 pcs
   WASHER D3x0.7mm -- 16 pcs
   SCREW PWA3x12mm -- 4 pcs
   M4 NYLON INSERT LOCK NUT -- 4 pcs
   SCREW PWA3x16mm -- 1 pc.

7. CENTER WING CABANE -- 1 set
   ALUMINUM PLATE -- 2 pcs
   HARDWARE: --
   SCREW PM3x16mm -- 6 pcs
   WASHER D3x0.7mm -- 12 pcs
   M3 NYLON INSERT LOCK NUT -- 6 pcs

8. MAIN LANDING GEAR -- 1 set
   SOCKET HEAD SCREW M5x20mm -- 4 pcs
   AXLE SHAFT 0.05x63.5mm -- 2 pcs
   SCREW PA3x14mm -- 4 pcs
   SCREW PA3x12mm -- 4 pcs
   COLLAR 0.1mm w/lock screw -- 4 sets
   M8 NYLON INSERT LOCK NUT -- 2 pcs
   MAIN WHEEL Ø102mm -- 2 pcs
   WHEEL PANTS -- 1 pair
   ALUMINUM PLATE -- 2 pcs

9. TABS FOR MAIN WING -- 1 set
   HARDWARE: --
   SCREW M4x8x20mm -- 1 pc.
   SCREW M4x12x20mm -- 1 pc.
   M4 NYLON INSERT LOCK NUT -- 2 pcs
   HEAVY DUTY CLEVIS PL412200 -- 4 sets
   SWIVEL CLEVIS HORN FAIRING PL4610020 -- 1 set
   PLYWOOD 3x0.3x450mm -- 2 pcs

10. PUSHROD 0.2x5.115mm w/Threads (For Rudder) -- 2 pcs
    HEAVY DUTY SERVO HORN PL4120350 -- 2 sets
    SCREW M4x8x20mm -- 1 pc.
    M4 NYLON INSERT LOCK NUT -- 2 pcs
    HEAVY DUTY CLEVIS PL412200 -- 4 sets
    SWIVEL CLEVIS HORN FAIRING PL4610020 -- 1 set
    PLYWOOD 3x0.3x450mm -- 2 pcs

11. SCREW PM4x50mm -- 2 pcs
    M4 NYLON INSERT LOCK NUT -- 2 pcs
    HEAVY DUTY CLEVIS PL412200 -- 4 sets
    SWIVEL CLEVIS HORN FAIRING PL4610020 -- 1 set

12. FUEL TANK 800cc PL111810G (Gasoline Fuel) -- 1 set
    SCREW PM3x12mm -- 1 pc.
    WASHER D3x0.7mm -- 1 pc.
    SPONGE 10x80x200mm -- 1 pc.
    CABLE TIE 400mm -- 2 pcs

13. BLIND NUT M6 -- 4 pcs
    SOCKET HEAD SCREW M6x30mm -- 4 pcs
    WASHER D6x1.5mm -- 4 pcs
    UPPER PLATE Ø143.5x150mm (F11A) -- 1 pc.
    LINKAGE CONNECTOR 2.1mm -- 1 set
    THROTTLE PUSHWIRE Ø1.2x600mm w/Plastic tube Ø2xD3x450mm -- 1 pc.

14. SPONGE 10x80x200mm -- 1 pc.

15. WING TUBE Ø16x274mm -- 1 pc.
    SCREW PM3x16mm -- 1 pc.
    SCREW PA3x16mm -- 1 pc.
    WASHER D3x0.7mm -- 2 pcs

16. WING TUBE Ø16x250mm -- 1 pc.
    SCREW PA3x16mm -- 1 pc.
    WASHER D3x0.7mm -- 2 pcs

17. PLYWOOD (OUTER WING CABANES) -- 1 pair
    HARDWARE: --
    SCREW PM3x16mm -- 1 pc.
    SCREW PA3x16mm -- 1 pc.
    WASHER D3x0.7mm -- 2 pcs
    UPPER PLATE Ø163.5x150mm (F11B) -- 1 pc.
    LINKAGE CONNECTOR 2.1mm -- 1 set
    THROTTLE PUSHWIRE Ø1.2x600mm w/Throttle Tube Ø2xD3x450mm -- 1 pc.

18. CANOPY -- 1 pcs.
    COCKPIT -- 1 pcs.
    PILOT PC101110F -- 1 pc.
    WASHER D3x0.7mm -- 2 pcs
    SILICON GROMMET D2.5xD8.5mm -- 5 pcs

19. COWLING -- 1 pcs.
    SPINNER (w/aluminum back plate) Ø102mm -- 1 pc.
    WASHER D3x0.7mm -- 6 pcs
    SILICON GROMMET D2.5xD8.5mm -- 5 pcs

20. DECALS -- 1 set

21. HAND TAP M3 -- 1 pc.
    HAND TAP M4 -- 1 pc.

COVERING: ---

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

YELLOW COLOR SCHEME:
TOUGHLON STL 100 WHITE
TOUGHLON STL 201 BLACK
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)

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

Main Wing (Lower)

Main Wing (Upper)

- Aileron Servo Lead

P.3
3 Aileron Servo (Lower Wing)

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

4 Stabilizer & Elevator

- Replace CA hinges by metal hinges. Glue the metal hinges to stabilizer and elevator by epoxy.
5 Vertical Fin & Rudder

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

6 Tail Landing Gear

- Bottom View

- PA3 x 14mm Screw 3
- PWA2 x 12mm Screw 3
- PA3 x 14mm
- 2.6mm Collar
- M3 x 3mm Set Screw
- PWA2 x 12mm
7 Engine Box

PM3x16mm Screw 8
M3 Nylon Insert Lock Nut 8
d3xD7mm Washer 16

Please note right thrust angle of firewall.

Use epoxy to glue all parts together.
### 8 Wing Cabane

- **PM3x16mm Screw**: 6
- **d3xD7mm Washer**: 12
- **M3 Nylon Inert Lock Nut**: 6

![Wing Cabane Diagram]

### 9 Main Landing Gear

- **Ø5x63.5mm Axle Shaft**: 2
- **M5x20mm SOCKET HEAD SCREW**: 4
- **PA3x12mm Screw**: 4
- **PA3x14mm Screw**: 4
- **5.1mm Collar**: 4
- **M8 Nylon Inert Lock Nut**: 2

![Main Landing Gear Diagram]
10 Rudder Pushrod

- **M4x80mm Screw**
- **M4 Nylon Insert Lock Nut**

Heavy Duty Horn Bracket
- M2 Nut
- Heavy Duty Clevis

M4 Nylon Insert Lock Nut
- PA1.7x8mm

PM2x8mm
- 3.7mm M4 Tap

Drill and tap the swivel clevis horn locations for M4 machine screw.

Pushrod Ø2.5x115mm

Plywood 3x8x20mm

11 Elevator Pushrod

- **PM 4 x 50mm Screw**
- **M4 Nylon Insert Lock Nut**

Heavy Duty Horn Bracket
- M2 Nut
- PA1.7x8mm
- M4 Nylon Insert Lock Nut

PM2x8mm
- 3.7mm M4 Tap

Heavy Duty Clevis

Pushrod Ø2.5x100mm

PA1.7x8mm
**12 Fuel Tank**

- PM3x12mm Screw 2
- d3xD7mm Washer 2

Plywood 3x128x263mm (F13A)  

Fuel Tank 800cc  

Sponge to cushion fuel tank.  

Make sure that tongue on front of fuel tank hold down plate slides into slot of F2.

**13 Engine**

- M6 Blind Nut 4  
- M6x30mm SOCKET HEAD SCREW 4  
- d6xD15mm Washer 4

Plywood 2x150x143.5mm (F11A)

M6 Blind Nut  

M6x30mm socket head screw  

d6xD15mm Washer
Step 1. Insert the aluminum wing tube (Ø16x724mm) end into the right wing (lower). Locate hard point in top of wing for wing retainer attachment screw. Drill through wing hard point into wing tube. Then tap hard point, aluminum tube and hardwood dowel in tube for PM3x16mm machine screw. Then apply the PM3x16mm machine screw. (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.

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 PA3x16mm 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.
Step 1. Insert the aluminum wing tube (Ø16x665mm) end into the right wing (upper). Locate hard point in top of wing for wing retainer attachment screw. Drill through wing hard point into wing tube. Then tap hard point, aluminum tube and hardwood dowel in tube for PM3x16mm machine screw. Then apply the PM3x16mm machine screw. (Do not over tighten the PM3 screw, the setup is for future removal of the wing.)

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.

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 PA3x16mm 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. Make sure that you triple wrap the wire in both places.

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.
19 Cowling & Spinner

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

- Cowling & Spinner
  - PA3x12mm Screw: 6
  - d3 x D7mm Washer: 6
  - d2.5 x D8.5mm Silicon Grommet: 6

20 Wing Setting

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


## 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.

- **Elevator**
  - 80mm
  - 80mm

- **Rudder**
  - 85mm
  - 85mm

- **Ailerons**
  - 30mm
  - 30mm

The ideal C.G. position is at center of top wing. 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.

- **33% Ultimate** is specially designed to be powered by 100cc 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.
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.

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

After fastening the round nut, make sure that the linkage connector can rotate freely.

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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 Air Borne 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: __________________________

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