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.

**Specifications**

- **Wing Span**: 58.5 in / 1485 mm
- **Wing Area**: 539 sq in / 34.8 sq dm
- **Flying Weight**: 6.5 lb / 2970 g
- **Fuselage Length**: 49 in / 1250 mm

*Specifications are subject to change without notice.*

**Requires:**
- 0.46-0.55 cu. in. displacement 2-stroke
- 0.70-0.81 cu. in. displacement 4-stroke
- 6-channel radio w/ 6 standard servos.

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

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

A322PO31941709
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.)**
- **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. M2 NUT -- 8 pcs
   SCREW PM2x6mm -- 8 pcs
   WASHER d2xD5mm -- 16 pcs
   MAIN LANDING GEAR COVERS -- 1 pair
   PVC PLATE 0.5mm 20x60mm -- 2 pcs
   180mm Y-CORD KW0021800 -- 1 pc.

3. WING JOINER 6x20x251mm -- 1 pc.

4. PUSHROD Ø1.8x75mm w/ Threads (For Aileron) -- 2 pcs
   SCREW PB2x22mm -- 4 pcs
   SCREW PB2x18mm -- 2 pcs
   SCREW PWA2x8mm -- 8 pcs
   TRI-HORN M3x14mm (S) PL4111221 -- 2 sets
   STRAPER PL4112102 -- 2 pcs
   CLEVIS PL4112103 -- 2 pcs
   FUEL TUBE Ø6x5mm -- 4 pcs
   SERVO MOUNTING PANEL PL5310000 -- 1 pair

5. PLASTIC RING PL4112023 -- 2 pcs
   Y-TYPE PUSHROD Ø1.8x92mm (For Flap) -- 1 pc.
   STRAPER PL4112102 -- 1 pc.
   CLEVIS PL4112103 -- 2 pcs
   FUEL TUBE Ø6x5mm -- 3 pcs

6. TAIL LANDING GEAR PL7100001 -- 1 set
   FUSELAGE -- 1 pc.
   COLLAR Ø2.1mm w/ set screw -- 1 set
   TAIL WHEEL Ø25mm -- 1 pc.
   SCREW PA3x10mm -- 2 pcs
   WASHER d2xD5mm -- 4 pcs

7. VERTICAL FIN & RUDDER -- 1 set

8. STABILIZER & ELEVATOR -- 1 set

9. PUSHROD Ø1.8x615mm w/ Threads (For Elevator) -- 2 pcs
   SCREW PB2x16mm -- 6 pcs
   TRI-HORN M3x14mm (S) PL4111221 -- 2 sets
   CLEVIS PL4112103 -- 2 pcs
   FUEL TUBE Ø6x5mm -- 2 pcs

10. PUSHROD Ø1.8x740mm w/ Threads (For Rudder) -- 1 pc.
    SCREW PB2x16mm -- 3 pcs
    TRI-HORN M3x22mm (S) PL4111301 -- 1 pc
    CLEVIS PL4112103 -- 1 pc
    FUEL TUBE Ø6x5mm -- 1 pc.

11. ENGINE MOUNT PL5111050 -- 1 set
    SOCKET HEAD SCREW M4x25mm -- 4 pcs
    WASHER d4x0.9mm -- 4 pcs

12. FUEL TANK 380cc PL1111380 -- 1 set
    CABLE TIE 1.5x5x400mm -- 1 pc.
    DOUBLE-SIDE TAPE 40x100mm -- 1 pc.

13. SOCKET HEAD SCREW M3x30mm -- 4 pcs
    M3 NUT -- 8 pcs
    WASHER d3xD7mm -- 8 pcs
    THROTTLE PUSHWIRE Ø1.2x320mm -- 1 pc.
    PLASTIC TUBE d2xD3x250mm -- 1 pc.

14. COWLING -- 1 pc.
    TRANSPARENT 3D TEMPLATE -- 1 pc.
    SCREW PWA2.6x12mm -- 4 pcs
    SILICON GROMMET d1.5xD6.5mm PL1265035 -- 4 pcs
    SPINNER Ø76mm -- 1 set

15. LINKAGE CONNECTOR Ø2.1mm HW7111060 -- 1 set

16. PUSHROD CONNECTOR PL4410001 -- 1 set
    PUSHROD Ø1.8x65mm (For Elevator) -- 1 pc.
    STRAPER PL4112102 -- 2 pcs
    FUEL TUBE Ø6x5mm -- 2 pcs
    SPONGE 70x105x80mm -- 1 pc.
    BALSA 5x5x107mm -- 2 pcs

17. SCREW HM4x40mm -- 2 pcs
    WASHER d4.2xD14.5mm -- 2 pcs

18. CANOPY -- 1 pc.
    SCREW PWA2.3x8mm -- 4 pcs
    SILICON GROMMET d1.5xD6.5mm PL1265035 -- 4 pcs
    PILOT PC001050A -- 1 pc.
    WIRE Ø2mm -- 1 pc.

19. DECALS: A322DEC -- 1 set

COVERING:

TOUGHLON STL 322F
TOUGHLON STL 322W
TOUGHLON STL 203 LIGHT GRAY
TOUGHLON STL 331 CUB YELLOW
LIGHTEX SGX 201 BLACK
LIGHTEX SGX 311 FERRARI RED
1. **Main Wing**

- Aileron Servo Lead

2. **Retractable Landing Gear**

- PM2x6mm Screw 8
- M2 Nut 8
- d2xD5mm Washer 16

3. **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.
4 Aileron Servo & Drop Tank

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

L/R

- PB2x22mm Screw (4)
- PB2x18mm Screw (2)
- PWA2x8 mm Screw (8)

Drop Tank Setup

- Tri-horn M3 x 14mm(s)
- Pushrod Ø1.8x75mm
- Fuel Tube 6x5mm
- Clevis
- PB2x22mm
- PB2x18mm
- PB2x22mm
- Screw 4
- PB2x18mm Screw 2
- Screw 2

- Plywood (A)
- Plywood (B)
- Plywood (A)
- Plywood (B)
- Plywood (A)
- Plywood (B)

- Missle
- Plywood
- M2 Nut
- d2xD5mm Washer
- d2xD5mm Washer
5 Flap

Flaps up
Flaps Down

Lead to Flap Servo
Lead to Aileron Servo

Straper
Fuel Tube Ø6 x 5mm
Clevis

Y-Type Pushrod Ø1.8 x 92mm
Clevis

Lead to Flap Servo
Lead to Aileron Servo

Ring

L/R
6 Tail Landing Gear

- PA3x10mm Screw: 2
- 2.1mm Collar: 1
- 3mm Set Screw: 1

![Bottom View]

7 Vertical Fin & Rudder

![Diagram of Vertical Fin & Rudder]

![Completed]
8 Stabilizer & Elevator

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

9 Elevator Pushrod

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

10 Rudder Pushrod

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

- Apply thread locker to screws

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

M4x25mm Socket Head Screw 4

d4xD9mm Washer 4

12 Fuel Tank

<table>
<thead>
<tr>
<th>Double-side Tape 40x100mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cable Tie 1.5x5x400mm</td>
</tr>
</tbody>
</table>

Fuel Tank 380cc

Completed
**13 Engine**

- **M3x30mm Socket Head Screw** 4
- **d3xD7mm Washer** 8
- **M3 Nut** 8

**Installed Engine Position**

- 130mm (5.12in)
- M3 Nut
- d3xD7 Washer
- M3x30mm Socket Head Screw

**Completed**

**14 Cowling**

- **PWA2.6x12mm Screw** 4
- **d1.5xD6.5mm Silicon Grommet** 4

**First insert the grommet to the cowling then apply screw. Please refer to the attached sheet for usage of the transparent 3D template.**
**15 Servo Set**

- 3x3mm Set Screw 1
- Linkage Connector 1
- M2 Nut 1
- 2mm Washer 2
- Throttle Pushwire
- Washer 2mm
- M2 Nut
- Throttle Servo.

! Please refer to the attached sheet for linkage connector installation.

**16 Radio Equipment**

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

- Elevator Pushrod Ø1.8x615mm
- Elevator Servo
- Receiver
- Throttle Pushwire Ø1.2x320mm
- Plastic Tube d2xD3x230mm
- Balsa 5x5x107mm
- Fuel Tube Ø6x5mm
- Battery
- Charge Receptacles KP0041300
- Rudder Pushrod Ø1.8x740mm
- Rudder Servo
- Straper
- Switch
- Sponge 70x105x60mm

• Bottom View
**17 Main Wing**

- HM4x40mm Screw
  - 2
- d4.2xD14.5mm Washer
  - 2

**Bottom View**

**L/R**

**18 Canopy**

- PWA2.3x8mm Screw
  - 4
- d1.5xD6.5mm Silicon Grommet
  - 4

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

**Bottom View**

**L/R**
Adjust the wing and fuselage configuration as shown in the diagrams.
20 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**
  - 18mm
  - 18mm

- **Rudder**
  - 25mm
  - 25mm

- **Flaps (near fuselage)**
  - 35mm

- **Ailerons (away from fuselage)**
  - 12mm
  - 12mm

21 C.G.

- The ideal C.G. position is 85mm (3.35in.) 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. If you are converting this model to electric, please move the C.G. forward 10% of current C.G. distance from leading edge to compensate for weight of fuel.

- Measure C.G. with the wheels in retracted position

http://www.theworldmodels.com/para/instruction/instructionManuals.hph
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.
- **FOCKE-WULF 190A** 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.

Warning!

Should you require to bend the landing gear wire, please dismantle the retract assembly from the wings and use a vise to clamp the wire for bending. Bending the wire directly with the retract still in the wings will damage the mounting block structure.
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.

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.
Usage of the transparent 3D template

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

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.
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>
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</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.

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>

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>

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>
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</tbody>
</table>

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>

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>

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 patterns

Warbirds

Scale Electric

Sports Glider

Trainer Boat

Accessories

Covering

(Lightex / Toughlon)