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.

Requirements:
- 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 and 1 low profile retract servo.

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

<table>
<thead>
<tr>
<th>Part Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. MAIN WING</strong></td>
<td>1 pair</td>
</tr>
<tr>
<td><strong>2. RETRACTABLE LANDING GEAR</strong></td>
<td>1 pair</td>
</tr>
<tr>
<td><strong>3. WING JOINER</strong></td>
<td>6x2x0.25mm</td>
</tr>
<tr>
<td><strong>4. PUSHROD Ø 1.8x75mm w/ Threads (For Aileron)</strong></td>
<td>2 pcs</td>
</tr>
<tr>
<td><strong>5. PLASTIC RING</strong></td>
<td>2 pcs</td>
</tr>
<tr>
<td><strong>6. TAIL LANDING GEAR</strong></td>
<td>1 set</td>
</tr>
<tr>
<td><strong>7. VERTICAL FIN &amp; RUDDER</strong></td>
<td>1 set</td>
</tr>
<tr>
<td><strong>8. STABILIZER &amp; ELEVATOR</strong></td>
<td>1 set</td>
</tr>
<tr>
<td><strong>9. PUSHROD Ø 1.8x615mm w/ Threads (For Elevator)</strong></td>
<td>2 pcs</td>
</tr>
<tr>
<td><strong>10. PUSHROD Ø 1.8x740mm w/ Threads (For Rudder)</strong></td>
<td>1 pc.</td>
</tr>
<tr>
<td><strong>11. ENGINE MOUNT</strong></td>
<td>1 set</td>
</tr>
<tr>
<td><strong>12. FUEL TANK</strong></td>
<td>1 pc.</td>
</tr>
<tr>
<td><strong>13. SOCKET HEAD SCREW</strong></td>
<td>1 set</td>
</tr>
<tr>
<td><strong>14. COWLNG</strong></td>
<td>1 pc.</td>
</tr>
<tr>
<td><strong>15. LINKAGE CONNECTOR</strong></td>
<td>1 set</td>
</tr>
<tr>
<td><strong>16. PUSHROD CONNECTOR</strong></td>
<td>1 set</td>
</tr>
<tr>
<td><strong>17. SCREW HM4x40mm</strong></td>
<td>2 pcs</td>
</tr>
<tr>
<td><strong>18. CANOPY</strong></td>
<td>1 pc.</td>
</tr>
<tr>
<td><strong>19. DECALS</strong></td>
<td>1 set</td>
</tr>
</tbody>
</table>

**COVERING:**

- TOUGH LON STL 322F
- TOUGH LON STL 322W
- TOUGH LON STL 203 LIGHT GRAY
- TOUGH LON STL 331 CUB YELLOW
- LIGHT EX SGX 201 BLACK
- LIGHT EX SGX 311 FERRARI RED
1 Main Wing

- **Aileron Servo Lead**

2 Retractable Landing Gear

- **Pre-glued**

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.
Ø 1mm pilot holes for World Models tri-horn are pre-drilled. Please look for pin-hole marks at under side of control surfaces.

\[
\begin{align*}
PB2\times22\text{mm} & \quad \text{Screw} \quad 4 \\
PB2\times18\text{mm} & \quad \text{Screw} \quad 2 \\
PWA2\times8\text{mm} & \quad \text{Screw} \quad 8 \\
\end{align*}
\]&
5 Flap & Retract Servos

Please refer to attached sheet for linkage connector installation.

● Select the servo horn that will give 26mm travel when rotates through 180°.

- Lead to retract servo
- Lead to Flap Servo
- Lead to Aileron Servo

- Fuel Tube Ø6 x 5mm
- Straper
- Y-Type Pushrod Ø1.8 x 92mm
- Plywood 3x38x61mm

- Flaps up Flaps Down
- To L-side To R-side
- Wheels up Position
- Wheels down Position

A322PO27151110
P.5
6 Tail Landing Gear

PA 3x10mm Screw: 2
2.1mm Collar: 1
3mm Set Screw: 1

Bottom View

7 Vertical Fin & Rudder

(A Vertical Fin)

A = A'

Completed

P.6
**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 under 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.

12 Fuel Tank

- Double-side Tape 40x100mm

- Cable Tie 1.5x5x400mm
13 Engine

- **Installed Engine Position**
  - 130mm (5.12in)
  - M3 Nut
  - d3x7mm Washer
  - M3x30mm Socket Head Screw

- **Completed**
  - Plastic Tube d2x3x230mm
  - Throttle Pushwire Ø1.2x320mm
  - M3 Nut

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

14 Cowling

- **Screw**
  - PWA2.6x12mm
  - d1.5x6.5mm Silicon Grommet

- **Completed**
  - d1.5x6.5mm Grommet
  - Cowling
  - Fuselage
  - Spinner Ø76mm

- **L/R**

A322PO27151110 P.9
15 Servo Set

- 3x3 mm Set Screw: 1
- Linkage Connector: 1
- M2 Nut: 1
- 2 mm Washer: 2

Throttle Pushwire

Washer 2 mm

M2 Nut

2 mm

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
Fuel Tube Ø6x5mm
Battery
Charge Receptacles KP0041300
Sponge 70x105x60mm

Front

Bottom View

Elevator Pushrod Ø1.8x615mm
Balsa 5x5x107mm

Rudder Pushrod Ø1.8x740mm
Rudder Servo

Straper
Throttle Servo
Switch

Fuel Tube 6x5mm

J1(Pushrod Ø1.8x655mm)
J2(Pushrod Ø1.8x615mm)

Pushrod Connector
Elevator Servo

Charge Receptacles
KP0041300

Sponge 70x105x60mm

Front

Bottom View
**17 Main Wing**

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

First insert the grommet to the canopy then apply screw.

**18 Canopy**

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

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

- 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.

# When Flaps are lowered, nose of model will rise. The nose-up varies with the speed at which the model is flying when you lower the flaps and the extent to which they are lowered. Check effect of flaps at higher altitude to avoid surprises during landing. You may apply down trim of the elevator to compensate for the nose-up effect when lowering the flaps. Taking off with flaps lowered is not recommended, as the increased drag may require a longer runway and more engine power for the model.

Should you require to bend the landing gear wire, please insert a round metal bar into the spring ring and apply force there as leverage. Bending the wire directly may damage the mounting block structure.

**Landing Gear**

Should you need to bend the landing gear wire, use the radio control to open or close the gear to 25% from fully retracted position and switch off the receiver. It is safe to bend the wire in this position. Bending the wire in fully open position may damage the supporting 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.

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.

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.
### Optional Parts

#### Clevis Wrench
- **Code No.** PL8210010
- **Size**
- **Package** 1 set

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

#### Field Stand
- **Code No.** MS9111450
- **Size** 600 x 240 x 350mm
- **Package** 1 pc

#### Standard Servo
- **Code No.** SV4031
- **Size** 40.6 x 20 x 37mm
- **Package** 1 set

- **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
- **Weight**: 39.4 g / 1.39 oz

#### 180mm Extension
- **Code No.** KW0011800
- **Size** 180mm
- **Package** 1 set

#### 180mm Y-Cord
- **Code No.** KW0021800
- **Size** 180mm
- **Package** 1 pc

#### Charge Receptacles
- **Code No.** KP0041300

#### Fuel Filler
- **Code No.** PL8110030
- **Size** 15 x 22 x 49mm
- **Package** 1 x 1 pc