Before commencing assembly, please read these instructions thoroughly.

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/electric 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 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 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. WING JOINER 6x18x180mm -- 1 pc.
3. FUEL TUBE d2xD4x4mm -- 4 pcs
   CLEVIS -- 2 pcs
   STRAPER -- 2 pcs
   RING Ø2.3mm -- 2 pcs
   PUSHROD Ø1.4x110mm w/ Threads (For Aileron) -- 2 pcs
   PLYWOOD 2x8x22mm (For Aileron Servo) -- 1 pc.
   PLYWOOD 4x8x22mm (For Aileron Servo) -- 1 pc.
4. STABILIZER & ELEVATOR -- 1 set
   FUSELAGE -- 1 pc.
5. VERTICAL FIN & RUDDER -- 1 set
   SCREW PM3x60mm -- 2 pcs
   WASHER d3xD7mm -- 2 pcs
6. MAIN LANDING GEAR -- 1 pair
   COLLAR Ø3.1mm w/ set screw -- 4 sets
   WHEEL Ø55mm -- 2 pcs
   SCREW PA3x10mm -- 4 pcs
   MOUNTING PLATE 12x20mm -- 2 pcs
7. TAIL LANDING GEAR -- 1 set
   COLLAR Ø2.1mm w/ set screw -- 1 set
   WHEEL Ø23mm -- 1 pc.
   STEERING BRACKET -- 1 pc.
   SCREW PA3x8mm -- 2 pcs
   SCREW PM2x10mm -- 1 pc.
   M2 NUT -- 1 pc.
8. SCREW PB2x10mm -- 2 pcs
   FUEL TUBE d2xD4x4mm -- 1 pc.
   CLEVIS -- 1 pc.
   HORN -- 1 set
   PUSHROD Ø1.4x655mm w/ Threads (For Elevator) -- 1 pc.
9. SCREW PB2x10mm -- 2 pcs
   FUEL TUBE d2xD4x4mm -- 1 pc.
   CLEVIS -- 1 pc.
   HORN -- 1 set
   PUSHROD Ø1.4x655mm w/ Threads (For Rudder) -- 1 pc.
10. SPINNER Ø52mm -- 1 pc.
11. STRAPER -- 2 pcs
    FUEL TUBE d2xD4x4mm -- 2 pcs
    SPONGE 10x80x200mm -- 2 pcs
12. SCREW PM2x10mm -- 2 pcs
    WASHER d2xD5mm -- 2 pcs
    M2 NYLON INSERT LOCK NUT -- 2 pcs
    MOUNTING PLATE (PL4114015) -- 2 pcs
    PLYWOOD 2x67.5x94.3mm -- 1 pc.
    PLYWOOD 2x67.4x133mm -- 1 pc.
13. SCREW HM3x25mm -- 2 pcs
    WASHER d3xD7mm -- 2 pcs
    PLASTIC PLATE 1x15x80mm -- 1 pc.
14. CANOPY -- 1 pc.
    SCREW PWA 2.3x8mm -- 4 pcs
15. DECALS: GA029 DEC -- 1 set

COVERING:
- LIGHTEX SGX 201 BLACK
- TOUGHLON STL 100 WHITE
- TOUGHLON STL 311 FERRARI RED
- TOUGHLON STL 330 CADMIUM YELLOW
- TOUGHLON STL 540 PEARL GREEN
- TOUGHLON STL GA029 RED/WHITE
- TOUGHLON STL GA029 RED/YELLOW
- TOUGHLON STL GA029 GREEN/WHITE
1 Main Wing

- Apply epoxy glue to the linkage wire BEFORE applying 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

- Complete the installation of the aileron servo.
4 Stabilizer & Elevator
Temporary install the main wing, adjust leveling of the stabilizer to make it as parallel to the main wing as possible.

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

5 Vertical Fin & Rudder

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

6 Main Landing Gear
7 Tail Landing Gear

- PM2x12mm Screw 1
- M2 Nut 1
- PA3x12mm Screw 2
- 2.1mm Collar 1

8 Elevator Pushrod

- Ø1mm pilot holes for The Wings Maker horn are pre-drilled. Please look for pin-hole marks at under side of control surfaces.

- PB2x10mm Screw 2

9 Rudder Pushrod

- Ø1mm pilot holes for The Wings Maker horn are pre-drilled. Please look for pin-hole marks at side of control surfaces.

- PB2x10mm Screw 2
10A Engine

- This step is for engine powered. Please follow step 10B if your model is electric powered.

- To complete your Wingman II (nitro powered), you need to purchase The Wings Maker GA029GPTS.

- Apply thread locker to screws.

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

Optional parts for nitro powered Wingman II, GA029GPTS.

- Install Balsa 8x8x76mm (For Fuel Tank Position Fixing)
- Fuel Tank 320cc
- Installed Engine Position
- Throttle Pushwire Ø1.4x655mm
- Throttle Servo
- Plastic Tube d2xD3x240mm
- Plastic Tube d2xD3x180mm
- Spinner Ø52mm

This step is for engine powered. Please follow step 10B if your model is electric powered.

To complete your Wingman II (nitro powered), you need to purchase The Wings Maker GA029GPTS.

Optional parts for nitro powered Wingman II, GA029GPTS.
If you want to use electric powered, please follow this step.

To Complete your Wingman II (electric powered), you need to purchase The Wings Maker GA029EPTS.
Install and arrange the servos as shown in the diagram.

**A. Engine Powered**

- Throttle Servo
- Rudder Servo
- Elevator Servo
- Battery
- Fuel Tube d2xD4x4mm
- Charge Receptacles

**B. Electric Powered**

- Throttle Servo
- Rudder Servo
- Elevator Servo
- Battery
- Fuel Tube d2xD4x4mm

**12. Fuselage Cover**

- PM2x10mm Screw 2
- d2xD5mm Washer 2
- M2 Nylon Insert Lock Nut 2

- Plywood 2x67.5x94.3mm
- M2 Nylon Insert Lock Nut

- Plywood 2x67.4x133mm
- M2 Nylon Insert Lock Nut
**13 Main Wing**

- HM3x25mm Screw: 2
- d3xD7mm Washer: 2

**14 Canopy**

- PWA2.3x8mm Screw: 4
**Wing Setting**

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

\[ A = A' \quad B = B' \quad C = C' \quad D = D' \]

**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.

- **Rudder**: 20mm 20mm
- **Elevator**: 15mm 15mm
- **Ailerons**: 6mm 6mm
The ideal C.G. position is 76mm (3 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.

# **Wingman II** is specially designed to be powered by 2C 0.40 engine or 450W motor system.

# Make sure the air field is spacious, never fly the plane too close to people and never get too close to a running propeller. Extreme caution should be exercised when working with electric powered models. Make sure the propeller is cleared of all objects, especially your hands before connecting the battery to the model. Make sure you understand the operation of the ESC (Electronic Speed Control) by studying the ESC manual. Once you plug in the battery for electric powered model, always treat the propeller as a rotating one, as accidental movement of the throttle stick will spin the propeller and could cause injuries.

# 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.

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.
## Optional Parts

### Outrunner 37/48 Deluxe

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>KM0374810</td>
<td>1 pc</td>
</tr>
</tbody>
</table>

- Max speed: 13860 rpm
- $K_v$ (rpm/V): 770
- Operating Power: 450W
- Operating Voltage: 8.5-18V
- Operating Current: 30A
- Peak Current: 38A (max. 15 sec.)
- Internal Resistance: 34 m ohms
- Diameter: 37.2 mm
- Length: 48.5 mm
- Weight: 172 g
- Shaft Diameter: 5 mm
- Shaft Length: 21 mm
- Mounting Screw: M3 (Front) and M2.5 (Back)

### Small Clevis

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

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

### Large Clevis

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>PL8110030</td>
<td>1 x 1 pc</td>
</tr>
</tbody>
</table>

Fuel Filler

### 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 49 mm</td>
<td>1 x 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>

- Voltage Range: 6 – 21 V
- Current: 40A continuous
- Current (Burst, <10 seconds): 55A
- Weight: 33 g
  (with wires and connector )
- $BEC$: 5V / 3A
- Low Voltage Cut-off: /
- Light weight with low internal resistance for high current operation
- $BEC$ function for Li-Ion / Li-poly
- 2 – 5 cells; Nimh / Nicd 5 – 15 cells operation.
- Low battery voltage auto cut off to reserve power to the servos.
- Safe start up motor.

### Standard Servo

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Size</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>SV4031</td>
<td></td>
<td></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 37 mm /
  1.60 x 0.79 x 1.46 in
- Weight: 39.4 g / 1.39 oz

### 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 310 mm</td>
<td>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 37 mm /
  1.60 x 0.79 x 1.46 in
- Weight: 39.4 g / 1.39 oz