Thank you for buying ALIGN products. The **T-REX 600N 3G** is the latest technology in Rotary RC models. Please read this manual carefully before assembling and flying the new **T-REX 600N 3G** helicopter. We recommend that you keep this manual for future reference regarding tuning and maintenance.

承蒙閣下選用亞拓遙控世界系列產品，謹表謝意。進入遙控世界之前必須告訴您許多相關的知識與注意事項，以確保您能夠在學習的過程中較得心應手。在開始操作之前，務必詳閱本說明書，相信一定能夠給您帶來相當大的幫助，也請您妥善保管這本說明書，以作為日後參考。
Thank you for buying ALIGN Products. The T-REX 600N 3G Helicopter is designed as an easy to use, full featured Helicopter R/C model capable of all forms of rotary flight. Please read the manual carefully before assembling the model, and follow all precautions and recommendations located within the manual. Be sure to retain the manual for future reference, routine maintenance, and tuning.

The T-REX 600N 3G is a new product developed by ALIGN. It provides flying stability for beginners, full aerobatic capability for advanced fliers, and unsurpassed reliability for customer support.

The T-REX 600N 3G is by Agusta Westland, a company that produces some of the most advanced helicopters in the world. It is designed to be easy to fly and has a number of features that make it ideal for both beginners and experienced pilots.

**THE MEANING OF SYMBOLS**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>! WARNING</td>
<td>Mishandling due to failure to follow these instructions may result in damage or injury.</td>
</tr>
<tr>
<td>! CAUTION</td>
<td>Mishandling due to failure to follow these instructions may result in danger.</td>
</tr>
<tr>
<td>≠ FORBIDDEN</td>
<td>Do not attempt under any circumstances.</td>
</tr>
</tbody>
</table>

**IMPORTANT NOTES**

R/C helicopters, including the T-REX 600N 3G are not toys. R/C helicopter utilize various high-tech products and technologies to provide superior performance. Improper use of this product can result in serious injury or even death. Please read this manual carefully before using and make sure to be conscious of your own personal safety and the safety of others and your environment when operating all ALIGN products.

Manufacturer and seller assume no liability for the operation or the use of this product. Intended for use only by adults with experience flying remote control helicopters at a legal flying field. After the sale of this product we cannot maintain any control over its operation or usage.

T-REX 600N 3G 旋翼直升機並非玩具，它是結合了許多高科技產品所設計出來的休閒用品，所以商品的使用不當或不熟悉都可能會造成嚴重受傷甚至死亡，使用前請務必詳讀本說明書，勿任意並注意自身安全。

注意：任何遙控直升機的使用，製造商和經銷商無法對使用者或家人的損害或紅外顯示所發生之意外負責，本產品由有操作過小型直升機經驗的成人或年長的老人在旁看護下合法飛行場飛行，以確保安全無虞下操作使用，產品售出後本公司將不負任何操作和使用控制上的任何責任。

We recommend that you obtain the assistance of an experienced pilot before attempting to fly our products for the first time. A local expert is the best way to properly assemble, setup, and fly your model for the first time. The Helicopter requires a certain degree of skill to operate, and is a consumer item. Any damage or dissatisfaction as a result of accidents or modifications are not covered by any warranty and cannot be returned for repair or replacement. Please contact our distributors for free technical consultation and parts at discounted rates when you experience problems during operation or maintenance.

**2. SAFETY NOTES**

**CAUTION**

Fly only in safe areas, away from other people. Do not operate R/C aircraft within the vicinity of homes or crowds of people. R/C aircraft are prone to accidents, failures, and crashes due to a variety of reasons including, lack of maintenance, pilot error, and radio interference. Pilots are responsible for their actions and damage or injury occurring during the operation or as a result of R/C aircraft models.

遙控模型飛機、遙控飛機皆為精密產品，飛行時務必遠離人群，避免操作不當或機件損壞、電子控制設備不良，以及操控上不熟悉，都可能導致飛行失控損傷等不可預期的意外，請飛行者務必注意飛行安全，並將了解自負願所造成之責任。
R/C helicopters fly at high speed, thus posing a certain degree of potential danger. Choose a legal flying field consisting of flat, smooth ground without obstacles.

Do not fly near buildings, high voltage cables, or trees to ensure the safety of yourself, others and your model.

For the first practice, please choose a legal flying field and can use a training skid to fly for reducing the damage. Do not fly your model in inclement weather, such as rain, wind, snow or darkness.

Remote control flying also has a certain speed, and the right wing is also a key factor. Make sure you stay close to the field to control its flight.

Please pay attention to whether there is a person, high voltage, high voltage cable, tree, power, electric wire, building, etc. Avoid operating in case of personnel or damage to the property.

Before each flight, you must choose a remote control technique and a suitable location. Do not land at high speed. You must land in the landing area and慢慢ly turn off the 电源 to land the model safely.

R/C models are composed of many precision electrical components. It is critical to keep the model and associated equipment away from moisture and other contaminants. The introduction of water to the model, or any form, can cause the model to malfunction resulting in loss of control, or a crash. Do not operate or expose to rain or moisture.

Remote control also contains many precision electronic components, so it is necessary to avoid water and high humidity, especially in the bathroom or during use. The introduction of water can cause the model to malfunction and damage the model.

This product is for R/C model, so do not use for other purposes.

Please use the replacement parts on the manual to ensure the safety of instructors.

The guidance provided by an experienced pilot will be invaluable for the assembly, tuning, trimming, and actual first flight. ( Recommend you to practice with computer-based flight simulator.)

During operation of the helicopter, the main rotor and tail rotor will be spinning at a high rate of speed. The blades are capable of inflicting serious bodily injury and damage to the environment. Be conscious of your actions, and keep your face, eyes, hands, and loose clothing away from the blades. Always fly the model a safe distance from yourself and others, as well as surrounding objects. Never take your eyes off the model or leave it unattended while it is turned on. Immediately turn off the model and transmitter when you have landed the model.

R/C models are made up various forms of plastic. Plastic is very susceptible to damage or deformation due to extreme heat and cold climate. Make sure not to store the model near any source of heat such as an oven, or heater. It is best to store the model indoors, in a climate-controlled, room temperature environment.

R/C models are also prone to damage due to the use of incompatible materials. Make sure to use the correct parts and materials to ensure the model's longevity and performance.

CAUTION 注意

Always be aware of the rotating blades.

Keep away from heat.
3. EQUIPMENT REQUIRED FOR ASSEMBLY

RADIO TRANSMITTER AND ELECTRONIC EQUIPMENT REQUIRED FOR ASSEMBLY

- Transmitter (7-channel or more, helicopter system)
- Receiver (7-channel or more)
- Standard-size Hپple servo (minimum speed: 0.10 sec/60°, torque: 8kg.cm or higher)
- ALIGN 50 Engine
- 50 Muffler
- Pitch Gauge x 1 pc
- Super Starter x 1 pc
- Engine Fuel x 1 pc
- Fuel Pump x 1 pc

ADDITIONAL TOOLS REQUIRED FOR ASSEMBLY

- Scissors
- Cutter Knife
- Diagonal Cutting Pliers
- Needle Nose Pliers
- Oil
- CA Glue
- Hexagon Screw Driver (3mm, 2.5mm, 2mm, 1.5mm)
- Philips Screw Driver (φ3.0 x 1.8mm)

4. PACKAGE ILLUSTRATION

- 600D Carbon fiber blade x 1 set
- 600D Blade with Spin x 1 set
- 600FLT3
- 2 in 1 Voltage Regulator combo x 1
- RCE-860 Governor x 1
- RCE-600 Governor x 1
- DS610 Digital Servo x 3
- DS610 Digital Servo x 1
- DS620 Digital Servo x 1
- 600NB2
- 600NB6
- 600NT1
- 600NT2
- 600FLZ
- 600NG
- Flybarless System Set
- 600FLH2
- 600NB1G
- 600NB3
- 600NB4
5. SAFETY CHECK BEFORE FLYING 飛行前安全檢查重要事項

CAREFULLY INSPECT BEFORE REAL FLIGHT 實機飛行前請確保執行飛行前檢查義務

☆ Before flying, please check to make sure no one else is operating on the same frequency for the safety.
☆ Before flight, please check if the batteries of transmitter and receiver are enough for the flight.
☆ Before turn on the transmitter, please check if the throttle stick is in the lowest position. IDLE switch is OFF.
☆ When turn off the motor, please follow the power off/on procedure. Power ON - Please turn on the transmitter first, and then turn on receiver. Power OFF - Please turn off the receiver first and then turn off the transmitter. Improper procedure may cause out of control, so please to have this correct habit.
☆ Before operation, check every movement is smooth and directions are correct. Carefully inspect servo for interference and broken gear.
☆ Check for missing or loose screws and nuts. See if there is any cracked and incomplete assembly of parts. Carefully check main rotor blades and rotor holders. Broken and premature failures of parts possibly cause resulting in a dangerous situation.
☆ Check all ball links to avoid excess play and replace as needed. Failure to do so will result in poor flight stability.
☆ Check the battery and power plug are fastened. Vibration and violent flight may cause the plug loose and result out of control.
☆ 每次飛行前應先確認所使用的頻率是否會干擾他機，以確保自身與他人的安全。
☆ 每次飛行前應確認電池與接收機的電量是否足夠飛行的狀態。
☆ 輸送機時必須確認電機的旋轉方向及輸送機是否失控的可能，影響自身與他人的安全，請養成正確的習慣。
☆ 飛行前應確認各組件的各個動作是否順暢，起飛方向是否正確，並檢查各組件的动作是否有干涉或脫落的情形，使用故障的伺服器將導致不可預期的危険。
☆ 飛行前確認沒有缺少或脫落的螺絲與螺帽，確認沒有組件不完整或損壞的零件，詳細檢查主螺旋是否有損壞，特別是接近主螺旋夾座的部位。損壞或不完整的零件不僅影響飛行，更會造成不可預期的危害。注意，對損壞有裂痕零件需更換及定期保養檢查的重要性。
☆ 檢查所有的連軸器是否有裂痕的情形，過硬的連軸器應先更換，否則會造成電機無法操控的危險。
☆ 確認電池及電源接頭是否固定牢靠，飛行中的震動或激烈的飛行，可能造成電源接頭脫離而產生失控的危険。

Standard Equipment 標準配備

<table>
<thead>
<tr>
<th>600NC</th>
<th>600NB6</th>
<th>600NB1</th>
<th>600NB2</th>
<th>600NB3</th>
<th>600NB4</th>
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<table>
<thead>
<tr>
<th>600NG</th>
<th>600NT1</th>
<th>600NT2</th>
<th>600FLT3</th>
<th>600FLZ</th>
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<tbody>
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<table>
<thead>
<tr>
<th>RCE-G600 Governor</th>
<th>RCE-G600定電器</th>
<th>2 in 1 Voltage Regulator Combo</th>
<th>二合一電壓調節模組</th>
<th>DS610 Digital Servo x 3</th>
<th>DS620 Digital Servo x 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>600Flybarless System FL760</td>
<td>600無平衡系統旋轉棒</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

When you see the marks as below, please use glue or grease to ensure flying safety.

有下記符號之組裝步驟，請配合上膠或上油，以確保使用之安裝度。

CA: Apply CA Glue to fix.
R48: Apply Anaerobic Retainer to fix.
T43: Apply Thread Lock to fix.
OIL: Add Grease.

CA: 使用瞬間膠固定
R48: 使用無氧環氧粘固
T43: 使用螺栓鎖
OIL: 添加潤滑油

When assembling ball links, make sure the "A" character faces outside.

各項塑膠製連接頭組合時，A字朝向外。
600FLH1

- **Thrust bearing**
  - 止推軸承 6x8x14 x 2

- **Spindle bearing spacer**
  - 機軸轉換器 6.0 1X3.9 x 4

- **Bearing**
  - 輸承 6x8x14 x 4

---

600FLH1

- **Feathering shaft sleeve**
  - 模擬支柱 6.0 x 10 x 10

- **Damper rubber-gray 70**
  - 模擬軟管 灰色 5.0 x 10 x 10

- **Damper rubber-black 80**
  - 模擬軟管 黑色 5.0 x 10 x 10

- **Spacer**
  - 模擬支柱 4.0 x 11.5 x 1.3

- **Socket screw**
  - 模擬支柱 4.0 x 12 x 10

- **Washer**
  - 螺絲墊片 4.0 x 12 x 10

---

**CAUTION**

Apply grease on thrust bearing.
止推軸承塗上潤滑油

**CAUTION**

Dip the damper rubber to the 70° suitable to 3D flight for advanced users.
將減震橡膠浸入70°適合於高級用戶的3D飛行。
Main frame assembly point:
First do not fully tighten the screws of main frames and put three bearings through the main shaft to check if the movements are smooth. The bottom bracket must be firmly touched the level table top (glass surface); please keep the smooth movements on main shaft and level bottom bracket, then slowly tighten the screws. This assembly can help for the power and flight performance.

600NB1F
Socket screw
M3 x 6mm x 2
M3 Washer
6x3mm x 2

600NG1
Socket screw
M3 x 6mm x 2
M3 Washer
6x3mm x 2

600NB2
Socket screw
M3 x 8mm x 2
M3 Washer
6x3mm x 2

Fuel line grommet
Ø5.2 x 7.0 x 11.4 x 8.0 mm

Fuel tank sinker
Fuel tank guard
Fuel tube
Fuel tank nipple

Grommet
Fuel line grommet
Ø5.2 x 7.0 x 11.4 x 8.0 mm

M3 Set screw
M3 x 8mm x 2

Landing skid
Skid pipe
Skid pipe end cap

Press two main frames equally.
平放下壓兩側板下端

Apply a little amount of T48 thread lock when fixing a metal part.
当使用螺纹时，请涂少许螺纹锁紧剂

Engine mount (R)
Ø39 x 8 x 6.5 mm

M3 Speciality washer
6.3 x 8 x 2 mm

Socket screw
6x3mm x 2

M3 Set screw
M3 x 6mm x 2

Glow plug plate
23.3 x 8.0 x 8.0 mm

CF Bottom bracket
130 x 29 mm

M3 Washer
6x3mm x 2

M3 Washer
6x3mm x 2

M3 Set screw
M3 x 6mm x 2

M3 Washer
6x3mm x 2

M3 Washer
6x3mm x 2

Stabilizer board
90° 90°
Before fixing the engine fan cover, please use a starter to rotate the fan and move the fan cover. This is to make sure no any interference, and then secure the fan cover with a fixing screw.

风扇固定引擎散热风扇前，请先使用啓动转转运风扇，并移动风扇罩，确认在风扇無碰触风扇罩後才鎖緊風扇罩固定螺絲。
600NT2K

Socket screw 60 x 8 x 5mm x 2
Thrust bearing 直行螺紋 (φ5 x φ0.5mm) x 2
Bearing 旋樞 (φ5 x 10 x 4mm) x 2
Washer 圓片 (φ3 x 0.05 x 0.3mm) x 2
Collar 旋樞 (φ3 x 0.05 x 0.3mm) x 2
M4 Set screw 60 x 8 x 5mm x 2

600NT2C

Linkage ball A(26 x 63.5) 球體 (φ3 x 4.75 x 10mm) x 4
Socket collar screw 鏈接孔 (φ3 x 6.8 x 6mm) x 1
Washer 平片 (φ3 x 6.8 x 6mm) x 1
Data 螺紋 (φ3 x 6.8 x 6mm) x 1
Collar 旋樞 (φ3 x 6.8 x 6mm) x 1

600NT2I

Collar screw 旋樞 (φ3 x 6.8 x 6mm) x 4
Collar A 旋樞 (φ3 x 6.8 x 6mm) x 2
Collar B 旋樞 (φ3 x 6.8 x 6mm) x 2
Linkage ball A(26 x 63.5) 球體 (φ3 x 4.75 x 10mm) x 1
Washer 平片 (φ3 x 6.8 x 6mm) x 1
Bearing 旋樞 (φ3 x 6.8 x 6mm) x 1
Slide shaft 滑軸 (φ3 x 6.8 x 6mm) x 1

CAUTION

Arm tail rotor hub at the concave of tail rotor shaft and fix it, please apply a little glue on the set screw.

When tightening a linkage ball to a plastic part, please note to use a little CA glue and tighten it firmly, but not over tightened, or they will strip.

After complete the tail rotor assembly, please check if it rotates smoothly. (If not, please properly adjust the part gap.)
600NB1D
Socket screw

600NB1E
Socket button head self tapping screw

600NB1F
M3 Specialty washer

600NT1A
Socket button head self tapping screw

High/Low throttle speed setting

Servo horn

High throttle speed

Carburetor lever

Low throttle speed

Linkage rod

48mm

35mm

Gyro Mount

Please assemble the G linkage rods inside the servo horns to avoid any interference caused by the canopy.

G.linkage assembly inside servo horns to avoid any interference caused by the canopy.

Socket button head self tapping screw

Frame mounting bolt

M3 Specialty washer

Socket screw

M3 Specialty washer

Socket button head screw

Apply a little m oil of T40 thread lock when fixing a metal part.

When tightening a screw to a plastic part, please tighten it firmly, but not over tightened, or they will strip.

Important notes: 1. Avoid striping.

Tail boom fixing screw

M3×5mm

- 2.
When tightening the main blade fixing screw, please tighten it firmly, but not over tighten, or it may cause the damage of main blade holder and result in danger.

Please ensure that all parts are securely tightened to avoid any potential hazards.

---

**600NB3**

- Socket collar screw
- M3 Nut

**600FLH2**

- M4 Set screw

**600FLZ1**

- Linkage rod D:
  - Length: 39.5mm x 2

**600FLZ1A**

- Ball link

**600FLH1A**

- Socket collar screw
- M4 Nut

---

**Applying a little amount of T40 thread lock when facing an axial part.**

Ensure that all parts are properly tightened to maintain the integrity of the assembly.

---

**600D Carbon fiber blade**

**Dimensions:**
- 60.5mm x 2
- 30.5mm x 2
- 31.5mm x 2

**Main drive gear set**
Sensor must be installed with arrow pointing to front or rear of the helicopter as shown in diagram. It's very important to avoid vibration sources.

If excess vibration from the helicopter frame is affecting flybarless sensors causing instability, two sensor foams can be used to mount the sensor. If problem persists, attempts should be made to eliminate vibration source, or reduce headspeed.

When connecting the wire harness between control box and sensor, push the connector all the way in, and make sure the connector latch engages the unit with a "click" sound. The connection needs to have sufficient slack to avoid vibrations induced disconnects. Disconnects during flight will result in loss of control and crash of the model.

Sensor mounting foam

Flybarless control unit

2 In 1 Voltage Regulator

Hook and Loop Tape

Receiver Mount

RCE-G600 Governor

Battery of receiver

Hook and Loop Tape (fuzzy)

Hook and Loop Tape (hooked)

Option equipment: 50 Muffler

Warning: Do not use excessive force when connecting or disconnecting the harness to avoid damaging the connectors or sensor.
**11. SERVO SETTING AND ADJUSTMENT**

To set this option is to turn on the transmitter and connect to BEC power.

**JR Transmitter/Servo**

- **Aileron**: CH2, **Pitch**: CH6 [Duality: CH6]
- **Chop**: CH3, **Aileron**: CH2 [Duality: CH2]

**Elevator**: CH3

**Positions of CH2 - CH6 are exchangeable. After assembling as photo (Note: Set the transmitter under CCPM 120 degrees mode), pull throttle stick (pitch) upward. If one swashplate servo (or two servos) moves downward, adjust reverse switch (REV) on the transmitter to make it move upward. If three servos move downward, adjust the travel value (+-) of SWASH CH6 on the transmitter to make them move upward. When the actions of Aileron and Elevator are opposite, adjust travel values of SWASH CH2 and CH3.**

**FUTABA/HITEC Transmitter/Servo**

- **Aileron**: CH1, **Pitch**: CH6
- **Yaw**: CH1, **Elevator**: CH2

**Positions of CH1 - CH6 are exchangeable. After assembling as photo (Note: Set the transmitter under CCPM 720 degrees mode), pull throttle stick (pitch) upward. If one swashplate servo (or two servos) moves downward, adjust reverse switch (REV) on the transmitter to make it move upward. If three servos move downward, adjust the travel value (+-) of SWASH CH6 on the transmitter to make them move upward. When the actions of Aileron and Elevator are opposite, adjust travel values of SWASH CH1 and CH2.**

---

**12. ADJUSTMENTS FOR GYRO AND TAIL NEUTRAL SETTING**

Recommend to choose Head Lock type for Gyro and turn off Revolution mixing (RV/MX) mode on the transmitter, then set the gain switch on the transmitter and the gyro to Head lock mode. The gain setting is about 70%, and after transmitter setting, connect to BEC power to work on tail neutral setting.

**Note**: When turn on BEC power, please do not touch tail rudder stick and the helicopter. Then wait for 3 seconds, make tail servo arm and tail servo at a right angle (90 degrees), tail pitch assembly must be correctly fixed in the middle of the tail of the tail rotor shaft for standard neutral setting.

**Tail Neutral Setting**

After setting Head Lock mode, correct setting position of tail servo and tail pitch assembly is as photo. If the tail pitch assembly is not at the neutral position, please adjust the length of rudder control rod to trim.

**Head Lock Direction Setting of Gyro**

To check the head lock direction of gyro is to move the tail counterclockwise and the tail servo horn will be trimmed clockwise. If it trims in the reverse direction, please switch the gyro to "REVERSE".

After head lock adjustment, set the tail trim to the center position. If the tail trim is not centered, repeat the above steps until the trim is centered.

---

**TAIL NEUTRAL SETTING**

**HEAD LOCK DIRECTION SETTING OF GYRO**
13. PITCH AND THROTTLE SETTING

GENERAL FLIGHT 一般飛行模式

<table>
<thead>
<tr>
<th>Throttle</th>
<th>Pitch</th>
</tr>
</thead>
<tbody>
<tr>
<td>100% High speed</td>
<td>+10°</td>
</tr>
<tr>
<td>80%</td>
<td>+5°</td>
</tr>
<tr>
<td>60% Hovering</td>
<td>0°</td>
</tr>
<tr>
<td>40%</td>
<td>0°</td>
</tr>
<tr>
<td>0% Low speed</td>
<td>0~2°</td>
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</tbody>
</table>

Throttle Curve (Hovering Flight)

<table>
<thead>
<tr>
<th>Throttle</th>
</tr>
</thead>
<tbody>
<tr>
<td>100%</td>
</tr>
<tr>
<td>80%</td>
</tr>
<tr>
<td>60%</td>
</tr>
<tr>
<td>40%</td>
</tr>
<tr>
<td>0%</td>
</tr>
</tbody>
</table>

Throttle range: Approx ±15 degrees.

Hint: Do not exceed ±14 degrees pitch range. Doing so may cause motor overload and binding of certain head components.

CAUTION 注意

1. Pitch range: Approx ±15 degrees.
2. Hint: Do not exceed ±14 degrees pitch range. Doing so may cause motor overload and binding of certain head components.
3. Hint: Do not tilt swashplate more than 9 degrees. Doing so may cause motor overload and binding of certain head components.

3D FLIGHT 3D特技飛行模式

<table>
<thead>
<tr>
<th>Throttle</th>
<th>Pitch</th>
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</thead>
<tbody>
<tr>
<td>100%</td>
<td>+10°</td>
</tr>
<tr>
<td>75%</td>
<td>+10°-12°</td>
</tr>
<tr>
<td>60%</td>
<td>+5°</td>
</tr>
<tr>
<td>65%</td>
<td>-5°</td>
</tr>
</tbody>
</table>

Throttle Curve (Simple Aerobatic Flight)

<table>
<thead>
<tr>
<th>Throttle</th>
</tr>
</thead>
<tbody>
<tr>
<td>100%</td>
</tr>
<tr>
<td>80%</td>
</tr>
<tr>
<td>60%</td>
</tr>
<tr>
<td>40%</td>
</tr>
<tr>
<td>0%</td>
</tr>
</tbody>
</table>

Throttle range: Approx ±15 degrees.

IDLE 1  SPORT FLIGHT

<table>
<thead>
<tr>
<th>Throttle</th>
<th>Pitch</th>
</tr>
</thead>
<tbody>
<tr>
<td>100%</td>
<td>+10°-12°</td>
</tr>
<tr>
<td>75%</td>
<td>+10°-12°</td>
</tr>
<tr>
<td>60%</td>
<td>+5°</td>
</tr>
<tr>
<td>65%</td>
<td>-5°</td>
</tr>
</tbody>
</table>

Throttle Curve (3D Flight)

<table>
<thead>
<tr>
<th>Throttle</th>
</tr>
</thead>
<tbody>
<tr>
<td>100%</td>
</tr>
<tr>
<td>80%</td>
</tr>
<tr>
<td>60%</td>
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<tr>
<td>40%</td>
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<tr>
<td>0%</td>
</tr>
</tbody>
</table>

Throttle range: Approx ±15 degrees.
FEATURES

3-axis gyroscopic flybarless system to simulate the stability of mechanical flybar system, yet at the same time achieving agile 3D performance.

Utilizes Silicon Micro Machine (SMM) sensors for excellent stability.

12-bit processors providing ultra high resolution, resulting in highly precise controls.

Software upgrade through PC interface adapter (sold separately).

Easy setup process without the need of external devices. Setup is done through 5 steps and 2 sensitivity adjustments.

Rudder setup is identical to GP780 gyro, minimizing learning curve.

Flybarless system dramatically improves 3D power output and efficiency, resulting in reduced fuel or electricity consumption.

High sensitivity gyroscopic sensors combined with advanced control detection routine providing higher hovering and aerobatic stability than other flybarless systems.

Suitable for all CCPM and mechanical mixing system.

Completely compatible with all sizes of T-Rex 250 to T-Rex 700.

Innovative pitch gauge as an aid to facilitate pitch adjustments.

High frame rate signal output for faster and higher precision servo response.

Capable of operating between 3V to 8.4V, compatible with high voltage servos.

Small footprint, light weight, minimalist and reliable design.

SETUP PRE-CHECK

1. Connect the receiver and servos to the flybarless control unit as per diagram found on page 22.
2. Digital servos must be used on cyclic to avoid damage to servos. Recommended servos spec: minimum speed 0.10 sec/60°, torque 12kg.cm or higher.
3. Transmitter trim tabs must be centered before entering the setup process. It can be moved after setup is complete to trim the heli.
4. 3G Flybarless contains two independent power circuits to enable the use of different voltage sources through the receiver (for example, 7.4V to the cyclic servos, 5V to the gyro and rudder servos). If there is only one 7.4V power source, a step down voltage regulator is required (available separately) to prevent rudder servo from burning out.
5. Please consult your servo manuals and ensure proper voltage are supplied to the servos.
6. When the 3G flybarless system is installed for the first time, a few simple setup steps and fly tests need to be performed in the flybarless setup mode. These steps need to be performed only during initial setup, and do not need to be repeated for subsequent flights. Just power up the system normally, check the proper servo operations, and fly. The initial setup procedure only need to be repeated after software upgrade, pitch range reset, or subtrims are added in the transmitter.
FLYBARLESS SYSTEM INITIAL SETUP STEPS 無飛輪系統設定

1. DIR: Direct mode to bypass gyro for mechanical travel and neutral point setup

DIR機械行程與中立點設定模式

Step 1.1: Enter the DIR settings 步骤1.1: 进入DIR設定

Press and hold the SET button while powering up the receiver. Release the button when LED 1-5 begin to cycle. The DIR green LED will light up indicating the gyro has been bypassed for neutral and mechanical travel range setup.

⚠️ CAUTION 本步需長按SET按鍵至接收器啟動後才可松開，此時DIR綠色LED會亮起，表示飛輪已設定完成。

If "STATUS" led flashes in red indicating error entering DIR settings, check connections to the sensor and restart the process.

若STATUS紅色閃爍，表示進入DIR模式後，傳感器連接設備已設定錯誤，請重新執行DIR設定。

Step 1.2: Swashplate function check 步骤1.2: 十字盤動作確認

Verify the correct swashplate movements for PIT, AIL, and ELE inputs. 把十字盤推向PIT、AIL、ELE是否正確

In case of incorrect servo movement or no movement at all, please check for proper connection between 3G flybarless connection to servos, as well as proper setup on transmitter.

若伺服器動作無動作，請檢查3G Flybarless伺服器訊號線接頭以及遙控器設定是否正確。

Step 1.3: Mechanical Setup 步骤1.3: 機械結構設定

Adjust the servo neutral point, mixing base position, and main blade pitch.

調整伺服中立點、動態設定位置與主旋翼角度（如圖示）。

Pay extra attention to these setup steps. Incorrect neutral points will affect flight stability, and worse lead to loss of control.

注意此步驟設定，若中立點不正確，不但影響飛行穩定性，更可能造成失控的危機。

A adjust strubris on transmitter so servo horn is horizontally level

調整信號中立點水平（Subtrim）
Step 1.4: Collective pitch setup

Adjust the maximum collective pitch using the transmitter’s swashplate mixing function (pitch swash AFR). Recommended pitch range is 12 degrees. Maximum pitch range for advanced pilot shall not exceed 14 degrees.

Do not adjust individual servos endpoints through the servo ATIAFR function, use only swashplate mixing adjustments. Should any changes made to the endpoints or subtrim on the transmitter in the future, the flybarless system initial setup must be performed again.

CCPM system setup requires adjusting the pitch Swash AFR. Adjust the pitch AFR to match the helicopter’s pitch range.

Example:
- Futaba 12ZH (with three DS610’s)
  - AIL: swash AFR: 60% (12 °)
  - Elevator swash AFR: 50%
  - Pitch swash AFR: 38% (±12 °)

2. E.LIM swashplate mixing type recognition and elevator endpoint setup:

E.LIM十字輪盤控制辨識及升降舵行程量設定方式：
3. E.REV elevator reverse setup mode:

E.REV升降舵後備反向設定模式:

Press the SET button to enter E.REV setup mode. The E.REV LED will light up after E.LIM turns off. This setup mode sets the elevator gyro direction.

1. Tilt the helicopter forward as shown in the diagram, and check if swashplate is tilting correctly toward the back.
2. If the swashplate is tilting at the wrong direction, move the transmitter elevator stick until STATUS LED changes color, and re-check the swashplate tilting direction.

Helicopter tilting
direction
機體傾斜方向

Swashplate correction
direction
十字模修正方向

4. A.LIM aileron endpoints setup:

A.LIM副翼行程量設定模式:

Press the SET button to enter A.LIM setup mode. The A.LIM LED will light up after E.LIM turns off. With all channels stationary, move the transmitter aileron stick to the right, and then back to center position. This completes the aileron endpoint setup process. The control unit will determine the maximum aileron endpoints.

The throttle stick position where main pitch is 0 degree must be maintained through this setup process.

Throttle stick position where main pitch is 0 degree must be maintained through this setup process.
油門摟桿須置於主旋翼角度0度的位置，不可再移動。

E.LIM settings
E.LIM設定

Mode 1

Mode 2

E.LIM settings
E.LIM設定

Mode 1

Mode 2

A.LIM settings
A.LIM設定

AIL

AIL

AIL

AIL

AIL
5. A.REV aileron reverse setup mode:

A.REV 副翼舵機正反向設定模式：

Press the SET button to enter A.REV setup mode. The A.REV LED will light up after ALIM turns off. Tilt the helicopter right as shown in diagram, and check if swashplate is tilting correctly toward the left. If the swashplate is tilting at the wrong direction, move the transmitter aileron stick until STATUS LED changes color, and re-check the swashplate tilting direction. Press the SET button again, and the control unit will reset with all LED's flashing.

This completes the flybarless portion of the setup process.

- Helicopter tilting direction
- Swashplate correction direction
-十字駕修正方向

3G Flybarless system must remain stationary during startup. Do not move the helicopter until the swashplate jumps up and down slightly 3 times, indicating the completion of initialization. (please refer to page 35 step 3)

3G Flybarless 協調螺旋槳在剛啟動時，飛機必須保持靜止。當螺旋槳上下小幅度震動3次，表示初始化完成。

If your transmitter has the following settings, please disable it or set the value to zero.

If your transmitter has the following settings, please disable it or set the value to zero.

ATS
Pilot authority mixing
Throttle to rudder mixing
Revolution mixing

1.1520 μs (standard) or 760 μs (narrow band) servo frame rate setup.

1520 μs (標準) or 760 μs (窄頻) 舵機設定

3G Flybarless system is compatible with both the 760 μs narrow frame rate servos (such as Futaba S9256, S9251, BLS251), as well as the standard 1520 μs frame rate servos (most others). Proper frame rate must be selected based on your servo's specifications. To enter the setup mode: Press and hold the SET button for 2 seconds until STATUS LED flashes. The 1520/760 LED will light up indicating servo frame rate setup mode. Push the transmitter rudder stick left or right to select the frame rate. For example, if rudder is pushed to the left (or right) and STATUS LED turns green, the frame rate is set to 1520 μs. To set it to 760 μs, the rudder stick need to be pushed from the center to the opposite end 3 times for the STATUS LED to turn red, indicating frame rate set to 760 μs.

3G Flybarless panel: Each setting value is labeled on the 3G flybarless control unit with either green or red lettering, which corresponds to the STATUS LED color. Subsequent setup mode is entered by a single press of the SET button. Setup mode will exit if no activity is detected in 10 seconds.

3G Flybarless相容兩種波長控制系統，若妳使用的舵機屬於760 μs系統（如Futaba S9256、S9251、BLS251），則必須將3G Flybarless設定於760 μs模式。否則，請將3G Flybarless設定於1520 μs模式。

進入功能設定模式，按按鈕上的“SET”設定鍵2秒，此時“STATUS”指示燈會開始閃爍，表示進入標準／窄頻閥設定。利用遙控器右側搖桿的左右方向來選擇設定值，例如方向舵搖桿往左（或右）時，則“STATUS”指示燈為綠色，表示設定值為1520 μs系統；若要設定為窄頻760 μs系統時，必須將搖桿由中立點往相反方向連續搖動3次，使“STATUS”指示燈變為紅色，才會進入760 μs系統。

3G Flybarless的面板：面板上已使用綠／紅色的字體標示“STATUS”橙色所代表的設定值，設定完成後按“SET”鍵一次可進入下一設定，或是10秒內不做任何設定，系統會自動離開設定模式。

Green LED: 1520 μs standard band
Red LED: 760 μs narrow band

Mode 1
Mode 2

Select by moving the rudder stick left and right

左右換動方向舵選擇

Standard/Narrow band mode

選按/波長模式
2. DS (digital) / AS (analog) servo selection

DS數位/AS類比伺服選擇

There is a direct correlation between servos' speed to gyro's performance. Faster servos are able to execute commands from the gyro at faster and higher precision. Due to the high performance gyro sensors used in the 3G Flybarless system, premium high speed digital rudder servos are mandatory for optimal tail performance. Some of the recommended rudder servos include Align DS650, DS620, DS520, DS420, Futaba S9257, S9256, S9254, S9253, or other servos with similar specifications.

Setup method: Press and hold the SET button for 2 seconds to enter the setup mode, then press the SET button to select DS/AS setup mode, as indicated by the lighting of DS/AS LED. Using the transmitter's rudder stick, select either digital servo DS mode (STATUS LED is green), or analog servo AS mode (STATUS LED is red).

伺服器動作速率改變陀螺儀的性能，伺服器動作愈快，就能立即反應陀螺儀送出的訊號，關鍵迅速精準的效能；由於3G Flybarless飛機具有高精度的陀螺儀，高級型數位伺服器如Align DS650, DS620, DS520, DS420, Futaba S9257, S9256, S9254, S9253或其他相同等級的伺服器，可獲得最佳效能。

設定方式：持續“SET”按鈕2秒進入設定模式，再按“SET”鍵選擇DS／AS選項，(DS／AS指示燈亮起)，利用方向舵搖桿選擇數位DS（STATUS為綠燈）或類比AS（STATUS為紅燈）伺服器。

3. Rudder servo direction check and link adjustment

檢查尾舵伺服器正逆連接方向及調整連接

Move the transmitter rudder stick left/right, and check for the correct direction of the rudder servo, if needed, servo reverse is done from the transmitter's REV (reverse) function.

For tail pitch adjustment, center the rudder servo by either setting the 3G Flybarless to normal rate mode (non-heading lock), or press and hold the SET button for 2 seconds. With the rudder servo centered and servo horn at 90 degrees, adjust the linkage length until tail pitch slider is centered on the tail output shaft as shown in diagram.

尾舵的連接調整，需確認尾舵伺服器的連接方向是否正確，若不正確請更改連接線上的方向頭部位置及方向。

將3G Flybarless旋鈕至非鎖定模式或持續“SET”按鈕2秒，使尾舵伺服器保持在中立點的位置，調整伺服器，盡可能使其舵角與尾撥臂呈90度，接著調整連接長度使用RUD的控制組合中。

4. Gyro NOR/REV setting

NOR/REV陀螺儀正反向調節設定

Lift up the helicopter by hand, and turn it to the left (yaw). Check if the rudder servo is applying correct compensation to the right. If reversed, set the NOR/REV setting as follow.

Setup method: Press and hold the SET button for 2 seconds to enter the setup mode, then press the SET button to select NOR/REV setup mode, as indicated by the lighting of NOR/REV LED. Using the transmitter's rudder stick, select either NOR (STATUS LED is green) or REV (STATUS LED is red).

提起直昇機，將直昇機左轉，若尾舵伺服器的連接方向與遙控器的方向舵搖桿方向相反時，表示陀螺儀的動作方向設定正確。若不正確請更改正反向設定。設定方式：持續“SET”按鈕2秒進入設定模式，選擇NOR／REV選項，以方向舵選擇NOR (STATUS為綠燈) 或REV (STATUS為紅燈)。
5. LIMIT rudder servo endpoint setting

**LIMIT**尾舵須器行程量調整

Press and hold the SET button for 2 seconds to enter the setup mode, then press the SET button repeatedly to select LIMIT setup mode, as indicated by the lighting of LIMIT LED. Push the transmitter rudder stick left until tail pitch slider reaches the end, then center the rudder stick and wait 2 seconds for the STATUS LED to flash red. Then push the rudder stick right until tail pitch slider reaches the end, then center the rudder stick and wait 2 seconds for the STATUS LED to flash red. This completes the left and right endpoint adjustment of servo travel. Insufficient servo travel will degrade helicopter performance, while excessive travel will cause binding and damage rudder servo.

![Diagram showing rudder endpoint adjustment](image)

- **Mode 1**
- **Mode 2**

Push the transmitter rudder stick left until tail pitch slider reaches the end, then center the rudder stick and wait 2 seconds for the STATUS LED to flash red. This completes the rudder endpoint limit adjustment for the left side.

Push the rudder stick right until tail pitch slider reaches the end, then center the rudder stick and wait 2 seconds for the STATUS LED to flash red. This completes the rudder endpoint limit adjustment for the right side.

6. Helicopter size and DELAY settings

直升机大小和控制延迟或端点调整

This setting includes rudder stick and DELAY settings.

**1.** For small helicopters such as T-Rex 250/450, set this setting to small helicopter (STATUS LED red). For larger helicopters such as T-Rex 500/600/700 set this setting to large helicopter (STATUS LED green).

**End point limit settings**

**2.** The DELAY function is utilized when slower rudder servo causes tail hunting (wagging). This can be observed after a hovering pirouette comes to a stop. If tail hunting occurs, gradually increase DELAY value to eliminate it. For best performance, DELAY value should be kept as low as possible without tail hunting.

**Setup method:** Press and hold the SET button for 2 seconds to enter the setup mode, then press the SET button to select DELAY setup mode, as indicated by the lighting of DELAY LED. The choice of small or large helicopter is done by moving the transmitter rudder stick left or right while observing the color of the STATUS LED. For small helicopters STATUS LED will be red, and large helicopter will be green. The amount of servo DELAY value should be kept as low as possible without tail hunting.

- **Mode 1**
- **Mode 2**
7. Sensitivity Adjustment

For radio with built-in gyro gain settings, gain can be adjusted directly. For example, 50%-100% setting on the radio translates to 0%-100% gain in the heading lock mode; 50%-0% setting on the radio translates to 0%-100% gain in the normal (non-heading) lock mode.

Actual gain value differs amongst servos and helicopters. The goal is to find the maximum gain without tail hunting. This can only be done through actual flight tests.

The recommended starting point for transmitter’s gyro gain setting should be 70%-80% for hovering, 60%-70% for idle-up. Value should be tuned under actual flight conditions by increasing to the maximum gain without tail hunting.

一般具有陀螺儀自調整功能的遙控器, 可直接進入GYRO自動調校進行免調校設定。設定值50%-100%，按設定値50%-100%，則陀螺儀安定為非穩定狀態的0%-100%。

感度越小會隨搭乘的駕駛員及飛行機型的不同而有所差異，一般而言，在不產生轉圈現象（轉圈後飛機出現左右擺動）的情況下感度值愈高愈好，所以可以透過實際飛行的狀況來進行調整。

進入穩定狀態設定的環境時，則依特定的環境設定在70%-80%左右，idle-up飛行時設定在60%-70%左右，之後再依實際飛行的狀況進行修正，若沒有擺動現象發生才可再將感度設定，若發現擺動現象時，請依步驟進行修正。

For radios (IE Futaba) using 0-100% as heading lock gain scales, the recommended gain setting is 30%-35%.

For radio that uses the 50%-100% scale(such as JR and Hitec), the recommended gain setting is 70%-75%.

 Specifications

1. Operating voltage range: DC 3–8.4V
2. Operating current consumption: <80mA @4.8V
3. Thermal detection rate: ±500 oC/sec
4. Servo output signal resolution: 12bit
5. Operating temperature: -20°C ~ 65°C

15. GOVERNOR INSTRUCTION MANUAL

 Features

1. Compact design, easy use, simple setting with great speed control performance.
2. Speed resolution: 0.1 RPM.
3. Speed stability accuracy: within 1% (Steady State).
4. Not apply to S9251 - S9256 and other 760 μ s servos.

 Specifications

1. Operating voltage: DC 4.5V-6V
2. Consumption current: <20mA @4.8V
3. Direct detection of engine rotation speed
4. Speed control range: 10500~21000 RPM
5. Servo PWM output pulse width: 1-2ms
6. Operating temperature range: -20°C ~ 85°C
7. Operating moisture range: 0%-95%
8. Case size (body): 28.5x22.6x2mm
9. Signal wire length: 160mm
10. Sensor wire length: 250mm
11. Weight: 19g (including wires)
12. Accessories: Magnet x2 pcs

 Screw (T2 8x6) x 2 pcs
Governor mount x1pc

Sensor

Throttle servo

Receiver (7 Channel or more)

Serial

Channel 1

Channel 2

Channel 3

Channel 4

Channel 5

Channel 6

Channel 7

Throttle travel setting

0% when DELAY LED begins flashing

DELAY被設定為0%時

Green LED for T-REX600

Green LED for T-REX600

0% when DELAY LED begins flashing

DELAY被設定為0%時

Green LED for T-REX600

Green LED for T-REX600

Gradually move the transmitter rudder stick until DELAY LED begins to flash, the delay value is 0% at this point.

輕推方向舵棒到“DELAY”燈開始閃爍時，延遲值為0%.
**Instruction 安装使用说明书**

1. See Fig. 1, first install two magnets on the mounting hole of the engine fan with CA glue or R48 glue, the north pole of one magnet (mark N) faces up and the south pole of the other magnet faces down. **NOTE:** Magnets must be firmly secured. If the magnet falls from the engine fan during the flight, the governor will automatically cut out the speed control function.

2. See Fig. 2, install the sensor on the main frame, and check if any interference caused by the engine fan.

3. Before connecting to the governor, first check the rotation direction (clockwise/anti-clockwise) of throttle servo and travelrange are correct.

4. Choose an un-used switch for governor ON/OFF switch. Connect the yellow sign wire of the governor to the receiver's channel. Then connect the governor to the power, LED light is on. When the magnet is lapped over the sensor, the LED light will be off. (If the LED isn't off, please check the polarity of the magnet and check if the wire is well connected and check for the distance between the sensor and the magnet.)

5. The adjustment of throttle travel. First place the throttle stick at the lowest position, and then turn on the transmitter. After that turn the receiver. When the LED light is on, press "Throttle Travel Setting" button on the governor for 3 seconds. While the LED light flash, please place the throttle stick at the highest position. Then the LED light will be off and later be on again, it means the setting is completed. **NOTE:** Do not run the engine before completing the throttle limit setting, to avoid the throttle travel error or servo reversal.

6. When normal, the throttle curve is straight (50%/60%/100%). When Idle, the throttle curve cannot be lower than 50%. When the governor fails, it will go back to the governor OFF mode. Therefore, even though you have installed the governor, the throttle curve of transmitter must be set at regular setting.

7. Two conditions-Governor will be enabled
   1. Turn on the governor switch, and LED light is green.
   2. Throttle position > 30% and more.

8. When the governor turns on, the rotation speed of the engine is controlled by the ATV (%), which is the channel chosen on the start step. The governor setting chart is ATV setting and engine rotation speed for Futaba and JR transmitters. The rotation speed of main blade is converted according to the engine ratio of original helicopter.

9. 1. Before first flight, check whether the receiver is powered on or not. (if off, then the receiver is powered off)

10. 1. *Note: Check and inspect the battery cables before each flight, if the connections are loose, replace as necessary.*

11. *Note: The LED light is off, please check if the magnet is lapped over the sensor. Please turn the magnet position of clutch bell to let the LED light on.

<table>
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<tr>
<th>ATV</th>
<th>Engine speed</th>
<th>T-REX 600NSP Main blade speed 8.5:1</th>
<th>Engine speed</th>
<th>T-REX 600NSP Main blade speed 8.5:1</th>
<th>Engine speed</th>
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<td>19700</td>
<td>2318</td>
<td>19700</td>
<td>2318</td>
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<tr>
<td>110%</td>
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<tr>
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<td>21000</td>
<td>2470</td>
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<td>2470</td>
<td>21000</td>
<td>2470</td>
<td>21000</td>
<td>2470</td>
</tr>
</tbody>
</table>

**NOTE:** 1. If the LED light is off, please check if the magnet is lapped over the sensor. Please turn the magnet position of clutch bell to let the LED light on.

2. The safety RPM is up to 2000rpm for OS50 engine.

*Note: The governor setting chart is ATV setting and engine rotation speed for Futaba and JR transmitters. The rotation speed of main blade is converted according to the engine ratio of original helicopter.*
Features

1. Due to the unique 2 in 1 design, the regulator's functions provide power to the receiver, servos, and the internal glow plug ignition system that does not require you to remove the clip lead.
2. The linear regulator design results in no interference to the receiver. The required input power may only consist of a 2 cell Li-ion or Li-Poly battery.
3. When the integrated power switch is moved to the on position, the voltage indicating LED's and ignition indicating LED's will illuminate displaying the status of the battery voltage, and of the plug ignition function.

Specifications

1. Input Voltage: DC 7.4V 2 cell Lithium or Li-Poly battery
2. Output Voltage: DC 5.5V(BEC)/1.5V(Glow Plug)
3. Max. Continuous Current: 6A
4. Weight: 53.5g (including wires)
5. Regulator size: 80x30x13.3mm
   Control board size: 35x24x10mm
6. 1st input: DC 7.4V 2cell
7. 2nd input: DC 5.5V(BEC)/1.5V(Glow Plug)
8. Current: 53.5g (including wires)
9. Dimension: 80x30x13.3mm
10. Control board: 35x24x10mm

Instruction

Receiver and Servo Voltage Regulating Functions:

1. The Auto-detecting voltage LED's will display a series of lights when turned on. If the entire five-light array is illuminated then the battery is fully charged. When the voltage drops below 7.6V the three green lights will turn off.

   USE CAUTION: Once the green lights are no longer illuminated the battery can only be safely used for a single flight. When only the single red LED is lit, DO NOT ATTEMPT TO OPERATE THE MODEL. The battery voltage has been drained too low, and must be recharged before its next use.

2. It is important to note that not all servos are designed to operate on 6 volts, such as Futaba servo models 9241, 9251, 9253, 9254, 9255, 9256, and other digital servos are not capable of handling 6V. Please check with the manufacturer specifications of the servos before attempting to operate. A separate 5.1V inline voltage Step-Down may be purchased and is recommended for use between the gyro and the tail servo, and any servos that are not designed to handle 6V. Please note that some servos are designed for running on 6V and may not require a voltage step-down.

   Receiver voltage regulator circuit:

   1. Not all servos are capable. If the receiver is not designed to operate on 6V, then you may need to use a voltage step-down device.
   2. Components include: Futaba 9241, 9251, 9253, 9254, 9255, 9256 models. These servos are not suggested for use with the 4-in-1 voltage regulator system.

Glow Plug Ignition System Functions:

1. Start by connecting the wires using the included diagram as a reference. Once completed connect the battery and move the power switch to the on position. Depress the "START" button on the control board. The green and the orange lights will illuminate.

   When this happens the glow plug is being ignited for a period of 15 seconds. After 15 seconds, the control board will stop igniting the glow plug. If the engine has not yet been started, the process can be repeated by simply pressing the "START" button.

   The Ignition system is designed to automatically shut off once the engine starts running. To ensure that the system is operating properly, check to make sure that the orange and green lights have shut off once the engine starts running. In the event that the lights are still illuminated once the engine is running, it may be necessary to remove the lead clip from the engine.

2. If the orange light is not illuminated after pressing "START" then the system is not being initiated. Please check to see if the element of the glow plug has burned out, or if the lead clip is not properly connected to the glow plug.

3. If the Glow plug is short-circuited or the lead clip has contacted the outer case of the engine, the red (SHORT) light will be illuminated approx. 1 second after pressing the "START" button. If the "SHORT" light illuminates the system will automatically shut off the power to the output leads.

Glow Plug Ignition System:

1. After installation is complete, connect the receiver and the power switch to the "START" button. If the light is still illuminated, the ignition is not functioning. If the light is not illuminated, the ignition is functioning.

2. If the "SHORT" light is illuminated, please check to ensure that the glow plug is properly connected to the lead clip. If the "SHORT" light is not illuminated, please check to ensure that the glow plug is properly connected to the lead clip.

3. If the glow plug is short-circuited or the lead clip has contacted the outer case of the engine, the red (SHORT) light will be illuminated approx. 1 second after pressing the "START" button. If the "SHORT" light illuminates the system will automatically shut off the power to the output leads.

NOTE: Please use double-sided foam tape or hook & loop tape to fix the regulator on the helicopter. Please do not tighten the wires of regulator hard to avoid the wires loose or broken caused by the vibration during the operation of the helicopter.

注意：请使用双面泡棉或魔术贴将电源器粘至直升机安装牢固。多余的线缆请捆绑牢固，以免接触杆震动造成松脱或断开。
**Step 1**

From the transmitter, and then receiver power.

**Step 2**

3G Flybarless system will go through initialization process, as indicated by flashing of all LED's. Do not move the helicopter or transmitter sticks until initialization process completes.

**Step 3**

The completion of initialization process is indicated by the rapid up and down motion of swashplate 3 times while remaining level. Should the swashplate jumps up and down at a tilted position, the flybarless system initial setup need to be performed again.

(Refer to page 26: Flybarless system initial setup)

The pitch of helicopter will remain locked until successful initialization. If the initialization process is unable to complete, with STATUS LED blinking red, Re-check all connections, and perform another reboot with helicopter remain stationary.

Following successful initialization process, green STATUS LED indicates rudder is in heading lock mode, while red LED indicates normal non-heading mode. (Refer to P.32 Gain Adjustment)

**Step 4**

Tilt the helicopter forward and swashplate should tilt back to compensate. If reversed, perform the flybarless initial setup again and adjust the elevator reverse setting (Refer to P.28: E-REV setup)

Helmet tilting direction

Swashplate correction direction

Swashplate jumps up and down 3 times horizontally

Swashplate jumps up and down 3 times tilted

Green = rudder in heading lock mode
Red = rudder in normal mode

Green LED为尾舵锁定模式
Red LED为尾舵非锁定模式

Helmet tilting direction

Swashplate correction direction

Swashplate jumps up and down 3 times horizontally

Swashplate jumps up and down 3 times tilted

Green = rudder in heading lock mode
Red = rudder in normal mode
**Step 5** 傾斜飛機
Tilt the helicopter to the right and swashplate should tilt left to compensate. If reversed, perform a flybarless initial setup again and adjust the aileron reverse setting (Refer to P.29: A:REV setup)

**Step 6** 總油門設置
With throttle stick all the way up (and down), and cyclic stick all the way left/right and up/down, check for any binding on the swashplate. If binding occurs, perform the flybarless initial setup again and adjust the endpoint limits.

**Step 7** 機體重心設置
Check the center of gravity (CG) and adjust component placement until CG point is right on the main shaft of the helicopter.

**Step 8** 最後
With all above steps checked, restart the system and begin flight test.確認所有步驟正常後，重啟系統，開始進行飛行測試。

---

**HELIbuquerque CHECK PROCEDURE 直昇機機體重心檢視方式**

With a full fuel tank, hold the helicopter as shown. Once the helicopter stops rotating, the helicopter’s CG can be seen at where the head is pointing relative to the main shaft.

Helicopter head should be level with main shaft, or slightly lower than the main shaft to ensure the center of gravity is maintained during flight.

---

**18.FLIGHT ADJUSTMENT AND SETTING 飛行動作調整與設定**

Please practice simulation flight before real flying 飛行前請事先熟練電腦模擬飛行

A safe and effective practice method is to use the transmitter flying on the computer through simulator software sold on the market. Do a simulation flight until you familiarize your fingers with the movements of the rudders, and keep practicing until the fingers move naturally.

1. Place the helicopter in a clear open field (Make sure the power OFF) and the tail of helicopter point to yourself.
2. Practice to operate the throttle stick (as below illustration) and repeat practicing "Throttle high/low", "Aileron left/right", "Rudder left/right", and "Elevator up/down".
3. The simulation flight practice is very important, please keep practicing until the fingers move naturally when you hear operation orders being call out.

In the case of insufficient practice, the instructor will conduct the practice in the next period. It's important to familiarize yourself with the correct movements.

In case of insufficient practice, the instructor will conduct the practice in the next period. It's important to familiarize yourself with the correct movements.
Flight adjustment and notice

**CAUTION**

- Check if the screws are firmly tightened.
- Check if the transmitter and receivers are fully charged.

If there are other radio control aircraft at the field, make sure to check their frequencies and tell them what frequency you are using. Frequency interference can cause your model, or other models to crash and increase the risk of danger.

Engine start preparation

Separate the fuel tube and the joint and start to refuel. Please be careful to avoid the dust entering the tube. When the fuel tank is full, please stop refueling and reconnect the tube and the joint.

Check if the throttle stick is set at the lowest position and check if engine throttle is at low speed. Confirm the throttle is in the highest position, and then start the engine.

Needle valve adjusting suggestion

For a new engine, recommend closing the needle valve completely first, and then open the needle valve 1.5 turns for running-in the first 3 flights. After the first 3 flights, see the flight conditions to adjust the engine to higher speed, recommend closing the needle valve to 1.25 turns. (Please refer to the original instruction manual of the engine for more detail.)

If the engine speed and the temperature are too high, it will seriously affect the engine life.

GLOW PLUG IGNITION METHOD

**Method 1**

- Power switch switch
- Receiver

**Method 2**

- 1.5V Battery for glow plug
- 1.5V電池供電
ENGINE START AND STOP 5. 維守電動機

1. Connect the battery to the starter and check the rotation direction. Insert the starter shaft into the starter completely.
2. Tighten both the main rotor head, and insert the starter shaft into the starter coupling. Then turn the starter to start the engine.
3. When the engine starts, stop the starter and remove it from the starter coupling. Please keep holding the main rotor head tightly.
4. Hold the main rotor head tightly and turn off the power of glow plug or remove the power.
5. Still hold the main rotor head tightly, turn throttle trim at the lowest position, and keeping engine in lowest regular running.
6. If you want to stop the engine, please set the throttle trim (beside the throttle stick) at the lowest position. If the engine cannot stop, please put the Fuel Clip into lock position to stopping refueling.

Rubber skid stoppers installed

If swashplate should tilt prior to lift off, do not try to manually trim the swashplate level. This is due to vibration feedback to the sensor, and will disappear once helicopter lifts off the ground. If manual trim is applied, helicopter will tilt immediately after liftoff. 主要刷獲反時，千是螺旋槳的制動器受到反饋的影響，使千是機翼桿被調成的傾斜，此時應當將千是桿移回水平狀態，此現象只屬臨時現象立即消除，可以緩緩升高；若傾斜將千是桿放回水平，反則會造成制動器過度修正，可造成車身偏軸修正方向的異常。

Main rotor adjustments 主要旋翼平衡調整

1. Before adjusting, apply a red piece of tape on one blade, or paint a red stripe with a marker or paint to identify on blade.
2. Raise the throttle stick slowly and stop just before the helicopter lifts-off ground. Look at the spinning blades from the side of the helicopter.
3. Look at the path of the rotor carefully. If the two blades rotate in the same path, it does not need to adjust. If one blade is higher or lower than the other blade, adjust the tracking immediately.

Tracking adjustment is very dangerous, please keep away from the helicopter at a distance of at least 10m.

Incorrect tracking may cause vibrations. Please repeat adjusting the tracking to make sure the rotor is correctly aligned. After tracking adjustment, please check the pitch angle is correct. 5 when hovering.

During the operation of the helicopter, please stand approximately 10m diagonally behind the helicopter.

Step 1 Throttle Control Practice 拉門控制練習

1. When the helicopter begins to lift-off the ground, slowly reduce the throttle to bring the helicopter back down. Keep practicing this action until you control the throttle smoothly.

Always operate the helicopter in the open, away from any obstacles. When performing a controlled flight, always ensure that the helicopter is operated correctly.

WARNING 警告
Do not attempt until you have some experience with the operation of helicopter.
STEP 2 AILERON AND ELEVATOR CONTROL PRACTICE

1. Raise the throttle stick slowly.
2. Move the helicopter in any direction back, forward, left and right, slowly move the aileron and elevator sticks in the opposite direction to fly back to its original position.

⚠️ CAUTION
- If the nose of the helicopter moves, please lower the throttle stick and land the helicopter. Then move your position diagonally behind the helicopter 10m and continue practicing.
- If the helicopter flies too far away from you, please land the helicopter and move your position behind 10m and continue practicing.
- During the exercise, if the helicopter crashes, please return to the original position and proceed with the exercise.

STEP 3 Rudder Control Practicing

1. Slowly raise the throttle stick.
2. Move the nose of the helicopter to the right or left, and then slowly move the rudder stick in the opposite direction to fly back to its original position.

STEP 4
After you are familiar with all actions from Step 1 to 3, draw a circle on the ground and practice within the circle to increase your accuracy.

STEP 5 DIRECTION CHANGE AND HOVERING PRACTICE

After you are familiar with Step 1 to 4, stand at side of the helicopter and continue practicing Step 1 to 4. Then repeat the Step 1 to 4 by standing right in front of the helicopter.

ADJUSTMENT OF EACH TRIM

Slowly raise the throttle stick and just as the helicopter lift-off the ground, you can use the trim to correct the action if the helicopter leans in a different direction.

1. Adjustment of rudder trim
   - Just before the helicopter lift-off, the nose lean left/right...
   - When leans right, adjust the trim to left side.
   - When leans left, adjust the trim to right side.

2. Adjustment of elevator trim
   - Just before the helicopter lift-off, the nose lean forward/backward...
   - When leans forward, adjust the trim down.
   - When leans backward, adjust the trim up.

3. Adjustment of aileron trim
   - Just before the helicopter lift-off, the body lean left/right...
   - When leans left, adjust the trim to left side.
   - When leans right, adjust the trim to right side.
With the helicopter hovering, observe for any rapid left/right or forward/aft oscillations. If forward/aft oscillation is observed, land the helicopter, turn the ELE gain dial counterclockwise gradually, and test again. Do this until oscillation disappears.

**Set the dial to 12 o'clock position as starting point.**

Elevator gain adjustment dial

Decrease ELE gain

Forward/back oscillation

If left/right oscillation is observed, land the helicopter, turn the AIL gain dial counterclockwise gradually, and test again. Do this until oscillation disappears.

**Set the dial to 12 o'clock position as starting point.**

Aileron gain adjustment dial

Decrease AIL gain

Left/right oscillation

**FORWARD STRAIGHT LINE FLIGHT** 前進直線航線飛行

Put the helicopter into fast forward flight from hovering. If similar oscillation is observed, reduce the elevator gyro gain. If the helicopter pitches up, or responds slowly, increase the elevator gyro gain. Repeat test until the oscillation is eliminated. Similar method is used for aileron gyro gain. After gyro gain adjustments are completed, the helicopter cyclic rate can be tuned using transmitter’s swash AIL and ELE mixing ratio. Higher the percentage, faster the roll/flip rate. Exponential can also be added on the transmitter to soften the sensitivity for stable hover.

**20. SETUP EXAMPLES** 飛行特性設定對照表

```
Using Futaba 12ZH transmitter as an example

<table>
<thead>
<tr>
<th>With emphasis on stability</th>
<th>With emphasis on agility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main blade pitch (Collective Pitch Settings)</td>
<td>Main blade pitch: 10°~12°</td>
</tr>
<tr>
<td>翼片進退調整 (集體偏轉設定)</td>
<td>主翼片變形: 10°~12°</td>
</tr>
<tr>
<td>Cyclic pitch settings (Adjust while in DIR mode using AIL/ELE swash AFR)</td>
<td>Cyclic Pitch 10°</td>
</tr>
<tr>
<td>循環偏轉設定（須在DIR模式下設定）</td>
<td>循環偏轉10°</td>
</tr>
<tr>
<td>Aileron and Elevator swashplate mixing ratio settings</td>
<td>swash Aileron: ±48°</td>
</tr>
<tr>
<td>副翼與升降舵偏轉比例設定</td>
<td>副翼與升降舵比例設定</td>
</tr>
<tr>
<td>Aileron and Elevator gyro gain settings</td>
<td>12 o'clock direction (50%)</td>
</tr>
<tr>
<td>副翼與升降舵角度設定</td>
<td>12點鐘方向 (50%)</td>
</tr>
</tbody>
</table>
```

**CAUTION 注意**

While in DIR setup mode, the transmitter’s CCPM swash mixing values for aileron and elevator represent CYCLIC pitch values. These values affect the cyclic roll rates on the aileron and elevator in flying condition. Higher values translate to faster cyclic roll rates. If cyclic roll rate is not improved with increased swash mixing values, this is due to insufficient cyclic pitch. When this happens, cyclic pitch can be increased through the Flybarless setup procedure. Maximum cyclic pitch should be limited at 14 degrees.

The CCPM system’s swash mixing is operated in the “DIR” mode that ensures a maximum rate of roll. In “DIR” mode, the aileron and elevator have a maximum roll rate of 14° per second. In “DIR” mode, the aileron and elevator have a maximum roll rate of 14° per second. To achieve this, the swash mixing should be set to the maximum value of 14° per second.
<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blade Tracking</td>
<td>Tracking is Off</td>
<td>Pitch linkage rods are not even length</td>
</tr>
<tr>
<td>Hover</td>
<td>Headspeed too low</td>
<td>Excessive pitch</td>
</tr>
<tr>
<td></td>
<td>Hovering throttle curve is too low</td>
<td>Hovering throttle curve at hovering point on transmitter (around 60%)</td>
</tr>
<tr>
<td></td>
<td>Headspeed too high</td>
<td>Not enough pitch</td>
</tr>
<tr>
<td></td>
<td>Hovering throttle curve is too high</td>
<td>Hovering throttle curve at hovering point on transmitter (around 60%)</td>
</tr>
<tr>
<td>Rudder Response</td>
<td>Drifting of tail occurs during hovering, or delay of rudder response when centering rudder stick.</td>
<td>Rudder neutral point improperly set</td>
</tr>
<tr>
<td></td>
<td>Tail oscillates (hunting, or wags) at hover or full throttle</td>
<td>Rudder gyro gain too high</td>
</tr>
<tr>
<td>Oscillation during flight</td>
<td>Forward/after oscillation when elevator is applied</td>
<td>Elevator gyro gain too high.</td>
</tr>
<tr>
<td></td>
<td>Helicopter front bobbles (nod) during forward flight.</td>
<td>Elevator input causes helicopter to drift.</td>
</tr>
<tr>
<td></td>
<td>Left right oscillation when aileron is applied</td>
<td>Aileron gyro gain too high.</td>
</tr>
<tr>
<td></td>
<td>Elevator input causes helicopter to drift.</td>
<td>Aileron gyro gain too low.</td>
</tr>
<tr>
<td>Drifting during flight</td>
<td>Helicopter pitches up during forward flight.</td>
<td>Elevator gyro gain too low.</td>
</tr>
<tr>
<td></td>
<td>Aileron input causes helicopter to drift.</td>
<td>Aileron gyro gain too low.</td>
</tr>
<tr>
<td>Control Response</td>
<td>Slow Forward/AFL/Left/Right input response.</td>
<td>Roll rate too low.</td>
</tr>
<tr>
<td></td>
<td>Sensitive Forward/AFL/Left/Right input response.</td>
<td>Roll rate too high.</td>
</tr>
</tbody>
</table>

If above solution does not resolve your issues, please check with experienced pilots or contact your Align dealer.
Q&A 1

Pitches up during fast forward flight.

1. Elevator gyro gain too low, increase the elevator gain by gradually turning the ELE dial clockwise.
2. Elevator trim not centered. Check if helicopter is lifting backwards during downward flight.

Q&A 2

Insufficient gain during flight, but increasing gain results in oscillation.

1.可能飛機無法穩態起飛，檢查電動機變速盤時針或逆時針是否轉動順時針。
2. Insufficient gain during flight, but increasing gain results in oscillation. Check if elevator gain is too low.
3. Elevator gain is too low. Increase elevator gain slowly.

Q&A 3

Diving during 3D maneuvers.

1. Increase AIL and ELE gain by turning both dials clockwise.
2. Check if cyclic servos are too slow (minimum 0.1sec/60 degrees).

Q&A 4

Decrease the aileron and elevator ATAV(AFRA) value on the transmitter. For CCPM machines, decrease swashplate mixing percentage on the transmitter. In addition, exponential can be added to aileron and elevator channels.

Q&A 5

After increasing the ATP(AFRA) of aileron and elevator, roll rates are still not enough.

Go back through the DRI setup menu and use larger cyclic pitch.

Q&A 6

Helicopter oscillates after fast forward flight or after tumbles.

1. Gradually reduce both AIL and ELE gain by turning them counterclockwise, 10 degrees at a time.
2. Use harder head damper.

Q&A 7

Unstable hover, control inputs are too sensitive.

1. Reduce cyclic control inputs to 10 degrees at a time, to each channel.
2. Adjust exponential on the transmitter.

Q&A 8

While in flybarless mode, unable to complete ELE/AIL endpoint and reverse setting.

1. Disable all trims/subtrims on the transmitter.
2. Enter Flybarless setup, select desired trim and subtrim.

Q&A 9

Incorrect CCPM mixing after initial flybarless setup.

1. Trim/subtrims not zeroed out.
2. Any trim adjustments are done on the transmitter, the final flybarless setup procedure need to be performed again.

Q&A 10

3G flybarless system unable to power up.

1. Check proper voltage source.
2. Check AIL/ELE/FIT mixing between flybarless control unit and receiver.
3. Check for connection between flybarless control unit and sensor.

Q&A 11

3G flybarless system powers up with LED flashing, but swashplate did not jump 3 times, pitch is locked, unable to complete the initialization process.

1. Possible movement during initialization process. Make sure helicopter is absolutely stationary.
2. SWAP LED flashes red, check the connection between flybarless controller and sensor.

Q&A 12

I noticed swashplate tilt slightly at extreme pitch due to servo interactions, should I make efforts to level it out?

No. Level the swashplate at 0 degrees using subtrims ONLY in DIR setup mode. (please refer to page 26 step 1.3)

Q&A 13

I want to trim the heli for different flight conditions.

After initial DRI setup is complete, the trim tabs on your TX can be used to trim the heli. Use your TX's flight condition functions to have multiple trim settings. Do not adjust the subtrims unless you are in the DRI setup mode!

Q&A 14

What adjustments can I make on the transmitter after the DRI setup has been completed?

You can adjust the trim tabs, dual rates, exponential, collective pitch, and all/eleve swash AFRA (for roll rate). Again do NOT adjust the subtrims unless followed by reprogramming of DRI setup steps.

Q&A 15

During step 5 of DRI setup mode, only aileron swash mixing was mentioned. Should I set elevator swash mixing as well?

No. The 3G system automatically calculates a cyclic ring based on the aileron swash mix percentage. Setting of elevator swash mix on the 3G system is left to your personal preference and should be adjusted as needed.
<table>
<thead>
<tr>
<th>No.</th>
<th>Code No.</th>
<th>Name</th>
<th>Specification</th>
<th>Quantity</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50H009</td>
<td>Thrust bearing</td>
<td>€6x ø 14x5mm</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>50H08-1</td>
<td>Spindle bearing spacer</td>
<td>ø10x ø 13x8x4mm</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>50H48-148Z</td>
<td>Bearing</td>
<td>ø8x ø 14x4mm</td>
<td>4</td>
<td></td>
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<tr>
<td>4</td>
<td>50H016</td>
<td>Metal main rotor holder</td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>50N203</td>
<td>Linkage ball (M3x5.5)</td>
<td>ø5x30.7mm</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>T84027</td>
<td>Socket collar screw</td>
<td>M4 ø27mm</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>N1404</td>
<td>M4 Nut</td>
<td>M4防鬆螺絲</td>
<td>2</td>
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Specifications, contents of parts and availability are subject to change. Align RC is not responsible for inadvertent errors in this publications.

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Specifications & Equipment:

Length: 1160mm
Height: 410mm
Main Blade Length: 600mm
Main Rotor Diameter: 1350mm
Tail Rotor Diameter: 240mm
Motor Pinion Gear: 20T
Auto-rotation Tail Drive Gear: 180T
Drive Gear Ratio: 8.5:1:4.5 (E:M:T)
Flying Weight: Approx. 3.1kg