Please read this manual carefully before assembling.
We recommend that you keep this manual for future reference regarding tuning and maintenance.

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，請務必詳閱本說明書，相信一定能夠給您帶來相當大的幫助，也請您妥善保管本說明書，以作為日後參考。

Compatible with helicopter of all sizes from T-REX 250 to T-REX 800 3GX Flybarless. Here we use T-REX 800 as an example.

3GX Flybarless電子設備相容小型直昇機至大型直昇機T-REX 250~T-REX800。在此我們以T-REX 800作為操作範例。

<table>
<thead>
<tr>
<th>CONTENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
</tr>
<tr>
<td>1~2</td>
</tr>
<tr>
<td>3~14</td>
</tr>
<tr>
<td>15</td>
</tr>
<tr>
<td>16~17</td>
</tr>
<tr>
<td>17</td>
</tr>
<tr>
<td>20</td>
</tr>
<tr>
<td>21</td>
</tr>
<tr>
<td>22</td>
</tr>
</tbody>
</table>
1. INTRODUCTION

Thank you for buying ALIGN Products. The 3GX Flybarless System is designed as an easy to use,. 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 3GX Flybarless System is a new product developed by ALIGN, providing flying stability for beginners, full aerobatic capability for advanced flyers, and unsurpassed reliability for customer support.

Thank you for choosing ALIGN products. For your easy understandable use of the 3GX Flybarless System, please carefully read and understand this manual before using the product. We hope you enjoy the purchase and use of the product. We are looking forward to your use of the 3GX Flybarless System to provide you with a good flight experience.

WARNING LABEL LEGEND

**FORBIDDEN**
Do not attempt under any circumstances.

**WARNING**
Mishandling due to failure to follow these instructions may result in damage or injury.

**CAUTION**
Mishandling due to failure to follow these instructions may result in danger.

IMPORTANT NOTES

R/C helicopters, including the 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 of the user.

As the user of this product, you are solely responsible for operating it in a manner that does not endanger yourself and others or result in damage to the product or the property of others.

As the user of this product, you are solely responsible for operating it in a manner that does not endanger yourself and others or result in damage to the product or the property of others. Whenever using this product, always keep in mind the importance of your safety and the safety of others and your environment.

As the user of this product, you are solely responsible for operating it in a manner that does not endanger yourself and others or result in damage to the product or the property of others. Whenever using this product, always keep in mind the importance of your safety and the safety of others and your environment.

As the user of this product, you are solely responsible for operating it in a manner that does not endanger yourself and others or result in damage to the product or the property of others. Whenever using this product, always keep in mind the importance of your safety and the safety of others and your environment.

2. SAFETY NOTES

**CAUTION**

- Fly only in safe areas, away from homes. 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 own safety and damage or injury occurring during the operation or as a result of R/C aircraft models.
- Prior to every flight, carefully check rotorhead spindle shaft screws and tail blade grip screws, linkage balls and screws, ensuring they are firmly secured.

- Flies only in safe areas, away from homes. 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 own safety and damage or injury occurring during the operation or as a result of R/C aircraft models.
- Prior to every flight, carefully check rotorhead spindle shaft screws and tail blade grip screws, linkage balls and screws, ensuring they are firmly secured.

- Flies only in safe areas, away from homes. 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 own safety and damage or injury occurring during the operation or as a result of R/C aircraft models.
- Prior to every flight, carefully check rotorhead spindle shaft screws and tail blade grip screws, linkage balls and screws, ensuring they are firmly secured.
LOCATE AN APPROPRIATE LOCATION 遠離障礙物及人群

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.

Do not fly your model in inclement weather, such as rain, wind, snow or darkness.

Lithium Polymer batteries are significantly more volatile than alkaline or Ni-Cd/Ni-MH batteries used in RC applications. All manufacturer's instructions and warnings must be followed closely. Mishandling of Li-Po batteries can result in fire. Always follow the manufacturer's instructions when disposing of Lithium Polymer batteries.

PREVENT MOISTURE 遠離潮濕環境

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 or exposure to water or moisture in any form can cause the model to malfunction resulting in loss of use, or a crash. Do not operate or expose to rain or moisture.

PROPER OPERATION 勿不當使用本產品

Please use the replacement of parts on the manual to ensure the safety of operators. This product is for R/C model, so do not use for other purpose.

Before turning on your model and transmitter, check to make sure one no one else is operating on the same frequency. Frequency interference can cause your model, or other models to crash. The guidance provided by an experienced pilot will be invaluable for the assembly, tuning, trimming, and actual first flight or unforeseen danger may happen. (Recommend you to practice with computer-based flight simulator.)

SAFE OPERATION 安全操作

Operate this unit within your ability. Do not fly under tired condition and improper operation may cause in danger. 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.

ALWAYS BE AWARE OF THE ROTATING BLADES 遠離運轉中零件

During the 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 careful to 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.

KEEP AWAY FROM HEAT 遠離熱源

R/C models are made of 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 in direct sunlight or 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.
FEATURES

"3Axes"

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

"MEMS"

Utilizes MEMS gyro sensors, which feature small footprint, high reliability, and excellent stability.

"12bit"

Sensor with 12-bit ultra high resolution, resulting in highly precise controls.

"APS"

Supports APS Gyro.

"Spektrum"

Supports Spektrum and JR satellite receivers.

"S.BUS"

Supports Futaba S.BUS architecture.

"Software"

Software upgradable through PC interface adapter.

"Easy"

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

"Energy"

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

"Stable"

Highly sensitive gyroscope sensors combined with advanced control detection routine providing higher hovering and aerobatic stability than other flybarless system.

"Suitable"

Suitable for all CCPM and mechanical mixing system.

"Built"

Built in speed governor function.

"Compatible"

Compatible with helicopter of all sizes from T-REX 250 to T-REX 800.

"Capable"

Capable to operate between 3.5V to 8.4V, compatible with high voltage servos.

"Small"

Small footprint, lightweight, minimalist design.

"RoHS"

RoHS certified.

3GX FLYBARLESS SETUP INDICATORS

FLYBARLESS SYSTEM SETUP MODE

RUDDER SET UP MODE
**SETUP PRE-CHECK 設定前注意事項**

1. Connect the receiver and servos to the flybyless control unit as per diagram found on page 4～5.
2. Digital servos must be used on cyclic to avoid damage to servos.

**CAUTION 注意**

- Swash Mix  Swash Mix
- Linkage Compensation  Linkage Compensation
- Acceleration  Acceleration

**3GX CONNECTIVITY METHOD 3GX接線方式**

**METHOD 1: STANDARD RECEIVER CONNECTIVITY METHOD** 方式一: 傳統接線器接線法

1. Connect all wires as shown in diagram. Receiver and 3GX wires are color coded to distinguish the different connections. Care should be taken to ensure proper wire color to channel connection.
2. While using the speed controller that not including BEC, you need to connect the BEC power with 3GX “BATT” port.
3. Receiver power is supplied through 3GX signal wire connected to 3GX’s “S.BUS/BIND” port.
4. The default channel/function mapping when using S.BUS are:
   - 1(AIL) 2(ELE) 3(THR) 4(RUD) 5(GAIN) 6(PIT) 7(GOV)
   - If channel (3) is set as PITCH and channel (6) set as THR on transmitter, such as 0FG, 12Z, 14MZ, and etc, please reprogram the transmitter to utilize channel (3) as THR and channel (6) as PIT.
   - To avoid damage to servos, only digital servos should be used for swashplate. Recommended spec: 0.68s/60 or faster with 12kg or higher torque.
   - 3GX has built in speed governor function, which can be utilized by purchasing the optional speed sensor. Governor setting is done through channel 7 on the receiver.
1. Do not mix satellite receivers of different makes.
2. Even under correct startup sequence, if transmitter is powered off first, LED1~LED5 will also flash. Thus the receiver should always be powered off before the transmitter.
3. 3GX supports satellite receiver models currently available on the market. Should new receiver version comes out with compatibility issues, firmware will be updated to resolve any incompatibility that may arise.
4. 3GX antenna is provided, the main part of the satellite antenna and the receiver will be used as the main part of the firmware.
5. If no antenna is available, the user can use a general-purpose satellite antenna or a multi-purpose satellite antenna.

FAILSAFE (LAST POSITION HOLD) 失控保護(保留最後指令)

When helicopter lost connectivity with your radio under this setting, all channels will hold at the last command position, except throttle channel which goes to a preset position.
1. Push throttle stick to the desired fail safe position.
2. Plug the binding plug into 3GX’s BIND port, and perform radio binding steps.
3. After successful binding, do not power off the 3GX, unplug the binding plug and allow 3GX to enter initializing process. The last position hold function will be active after the 3GX initializes.
4. Test Method: Power off transmitter. The throttle channel should move to preset position, while all other channels should hold in their last position.

FAILSAFE (PRE-SET POSITION HOLD) 失控保護(預設位置)

When helicopter lost connectivity with your radio under this setting, all channels will move to the pre-set position.
1. Plug the binding plug into 3GX’s BIND port, and power up the 3GX. After the rapid flash of satellite’s LEDs, pull the binding plug off.
2. Power up radio transmitter, and perform radio binding steps. After radio is bound, LED on the satellite antennas will end the rapid flash, following by slower flash.
3. Move the transmitter sticks to the desired failsafe position while the LED is flashing in slower mode.
4. Satellite antenna’s LED will lit up after 5 seconds, and 3GX goes through initializing process. The failsafe position will be set after the 3GX initializes.
**FLYBARLESS SYSTEM INITIAL SETUP STEPS**

1. **DIR**: DIRECT MODE TO BYPASS GYRO FOR MECHANICAL TRAVEL AND NEUTRAL POINT SETUP

**STEP 1.1: ENTER THE DIR SETTINGS**

**Step 1.1: 进入DIR设定**

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

Press the "SET" button, followed by pressing the LED 1-5 (DIR to A, REV) in sequence. Once the "DIR" light is illuminated, then press the LED 1-5 (DIR to A, REV) in sequence again. This will enter the 3GX mode.

**Note:** If pressed for more than 2 seconds, 3GX will enter 3GX throttle calibration mode. Re-power and enter DIR setting.

**1. When entering setup mode during power up, 3GX will initiate startup process. Do not move the helicopter at this time, otherwise swashplate will be tilted after start up. Should this occur, restart the setup mode.**

**2. If 3GX was to be mounted inverted, please connect anti-torque compensation section and set it as "reverse" (STATUS LED turns red); to avoid the effect of the performance of gyro lock.**

---

**TRANSMITTER FUNCTION TO SERVO MAPPING**

**STEP 1.2: SWASHPLATE FUNCTION CHECK**

**Step 1.2: 十字翼作动确认**

Verify the correct swashplate movements for PIT, AIL, and ELE inputs. Ensure the servo inputs for PIT, AIL, ELE are correct.

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

Check the 3GX flybarless servo connections and ensure the neutral points are properly set.

**STEP 1.3: MECHANICAL SETUP**

**Step 1.3: 機械結構設定**

Adjust the servo neutral point and main blade pitch. Ensure the servo neutral points are correctly set. Incorrect neutral points will affect flight stability, and worse lead to loss of control.

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

Adjust subtrim on transmitter so servo horn is horizontally level. Ensure the servo neutral points are correctly set.
STEP 1.4: COLLECTIVE PITCH SETUP
步驟1.4：集體螺旋槳設定
Adjust the maximum collective pitch using the transmitter’s swash plate mixing function (pitch swash AFR). Recommended pitch range ±12, maximum pitch range for advanced pilot shall not exceed ±14.

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

Example: cyclic pitch of 8:
Futaba 122H with three BL 700H's
AILeron swash AFR : 53% (8°)
Pitch swash AFR : 37% (±12°)

STEP 1.5: CYCLIC PITCH SETUP
步驟1.5：環迴螺桿設定
Swashplate cyclic pitch setting: With the main blades parallel to helicopter body, throttle stick positioned where main pitch is 0 degrees, move aileron stick all the way to the right, adjust the AIL mixing ratio within radio’s SWASH menu so the main blade pitch is the factory recommended value ±8 degrees. The ELE mixing ratio in SWASH menu can be set to the same value as AIL.

Adjustments to the CCPM servos endpoints should be done through transmitter’s swashplate mixing function (AIL swash AFR). Do not adjust individual servos endpoints through the servo AT/RAF function. Should any changes made to the endpoints or subtrims on the transmitter in the future, the flybarless system initial setup must be performed again.

STEP 2.1: ENTERING E.LIM SETUP MODE
步驟2.1：進入E.LIM設定
While keeping swashplate level and main pitch at zero degrees, press the SET button to register the neutral point and enter E.LIM setup mode. The E.LIM LED will light up after DIR turns off.

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

E.LIM settings
E.LIM設定

2. E.LIM SWASHPLATE MIXING TYPE RECOGNITION AND ELEVATOR ENDPOINT SETUP:
E.LIM十字盤混控辨識及升降舵行程量設定模式：

E.LIM 十字盤混控辨識及升降舵行程量設定模式：
**STEP 2.2: SWASHPLATE MIXING TYPE RECOGNITION AND ELEVATOR ENDPOINT SETUP**

With all channels stationary, move the transmitter elevator stick forward, and then back to center position. This completes the swashplate mixing type recognition process. The control unit will determine the CCPM mixing ratio or traditional mechanical mixing maximum elevator endpoints.

**CAUTION**

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

*油門桿在主螺距角度0°的位置，不可再移動。

---

3. **E.REV ELEVATOR REVERSE SETUP MODE**

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

1. **Helicopter tilting direction**
   - Tilt the helicopter forward as shown in diagram, and check if the swashplate is tilting correctly toward the back.

2. **E.LIM settings E.LIM模式**
   - 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.

---

4. **A.LIM AILERON ENDPOINTS SETUP**

Press the SET button to enter A.LIM setup mode. The A.LIM LED will lit up after E.REV 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.

**CAUTION**

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

*油門桿在主螺距角度0°的位置，不可再移動。

---

8
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 A.LIM 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 restart with all LED's flashing. This completes the flybarless portion of the setup process.

接著按下"SET"鍵，讓設定模式進入"A.REV副翼舵機正反向"設定模式，此時
A.LIM熄燈後，A.REV燈亮起。此模式設定副翼舵機修正方向。若副翼舵機
修正方向錯誤，可將方向調整至正向，重新設定。當方向修正正確後，再按
下"SET"鍵完成所有設定，此時所有LED皆滅，機械開關正常開關。

3GX THROTTLE CALIBRATION 3GX遙控器油門行程校正

While setting throttle calibration, reset throttle curve and pitch curve to default 0-50-100.

將油門行程校正後，將油門/校正電流恢復到預設0-50-100設定。

FLIGHT MODE SETTING 飛行特性設定

Operation Instruction
1. With 3GX in operation mode, push rudder to left or right, and press the SET button for about a second.
2. After entering setting mode, the STATUS LED will flash specific number of times to indicate specific settings.
3. During setting process, LED1 to 5 indicate the rate of setting; flashing LED represents 10%, while steady lit LED represents 20%.

指令說明
1. 請將3GX切換至飛行模式，搖桿往左或右按，然後按SET鍵約一秒。
2. 進入設定後，STATUS LED會閃爍特定次數，表示設定已進入某個選項。
3. 在設定過程中，LED1~5代表設定值，LED熄燈代表10%，LED常亮代表20%，例如LED1~LED2全部熄，LED3常亮，設定值為2×20+10=50%。

The LED flashing frequency indicates setting position.

<table>
<thead>
<tr>
<th>LED Flashing Frequency</th>
<th>Setting Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single flash</td>
<td>Flip rate adjustment</td>
</tr>
<tr>
<td>Double flash</td>
<td>Elevator and point setting</td>
</tr>
<tr>
<td>Flash in group of 3</td>
<td>Aileron end point setting</td>
</tr>
<tr>
<td>Flash in group of 5</td>
<td>Swashplate phasing setting</td>
</tr>
<tr>
<td>Flash in group of 5</td>
<td>Swashplate accelerating setting</td>
</tr>
</tbody>
</table>

Fully lit LED1 indicates 20%
Fully lit LED2 indicates 20%
Fully lit LED3 indicates 10%
So the setting value is 2×20+10=50%
1. AILERON ROLL RATE 滾轉速率調整

Setting Instruction:
1. After entering setting mode, STATUS LED flashes once.
2. Aileron and elevator rate can be adjusted independently.
3. Moving the aileron stick will display aileron rate on the LED. The more LEDs, the faster the roll rate. Moving the aileron stick can increase or decrease the number of LEDs that lights up between LED1 to LED5, which sets the aileron roll rate. Same method is used to adjust the elevator flip rate when elevator stick is moved.
4. Elevator flip rate is adjusted based on aileron roll rate. When the difference between elevator flip rate and aileron roll rate differs by 20% or more, 3GX will automatically adjust until the error rate falls within range. Therefore, we recommend adjustment aileron roll rate first, and then adjust elevator flip rate.
5. Moving the related control stick, LED will automatically jump to the set rate display of the specific stick function. For example, moving the aileron stick, LED1 to LED5 will display aileron set rate. Moving elevator stick, LED to LED5 will display elevator set rate.

設定說明:
1. 進入設定後 STATUS 的燈號閃爍一次。
2. 載翼及升降速率可以分開調整。
3. 滾轉速率調整會顯示副翼滾轉速之 LED 燈號，燈號越多表示滾轉越快，再次滑動載翼搖桿可以增加或減少 LED1~LED5 光亮數量，進而調整副翼滾轉速率，同時滑動升降搖桿會顯示升降滾轉速之 LED 燈號，可以調整前後滾轉速率。
4. 升降雙重速率會依據升降滾轉速度之調整，當升降滾轉速度和副翼滾轉速率相差 20% 以上，3GX 會自動調整至兩者在誤差範圍內，所以建議先調整副翼滾轉速率，再調整升降滾轉速率。
5. 一旦設定後 LED 會自動跳至該設定值，例如當副翼搖桿 LED1~5 會顯示副翼設定值，動升降搖桿，LED1~5 會顯示升降設定值。

2. ELEVATOR END POINT SETTING 升降舵行程極限設定

Setting Instruction:
1. First, end then elevator and aileron limit setting, please switch the transmitter to throttle hold mode and push the throttle down to 6° position to avoid mechanical interference due to excess travel range.
2. After entering setting mode, STATUS LED flashes twice.
3. After entering setting mode, elevator may deviate as much as 8 degrees plus compensating rate either forward or back.
4. Generally 70% is suitable for most helicopter frame. If recommended value is not used, please adjust setting until maximum is reached without mechanical binding.

設定說明:
1. 進入升降舵極限行程極限設定後，請將油門轉換成在怠速模式，並將油門桿設置在 6°的位置，避免行程過大造成機械干涉。
2. 進入設定後 STATUS 的燈號閃爍兩次。
3. 進入設定後，升降舵可能偏離 8°+/- 行程，有可能偏離左或右。升降舵搖桿可以調整升降舵極限行程。例如 LED 顯示設定為 80%，升降舵行程極限為 8°+0.5°*8=12°。
4. 一般而言 70% 可以適用於大部分的直升機框架，如果不作調整建議，請設定至機械結構不干涉之極限值。

3. AILERON END POINT SETTING 副翼行程極限設定

Setting Instruction:
1. After entering setting mode, STATUS LED flashes 3 times.
2. After entering setting mode, aileron may deviate as much as 8 degrees plus compensating rate either forward or back. Moving aileron stick can adjust servo travel limit. For example, if LED shows 50%, total elevator travel range is 8+0.5°*8=12 degrees.
3. Generally 70% is suitable for most helicopter frame. If recommended value is not used, please adjust setting until maximum is reached without mechanical binding.

設定說明:
1. 進入設定後 STATUS 的燈號閃爍三次。
2. 進入設定後，載翼可能偏離 8°+/- 行程，有可能偏離左或右。動載翼搖桿可以調整副翼極限行程。例如 LED 顯示設定為 50%，總行程為 8°+0.5°*8=12°。
3. 一般而言 70% 可以適用於大部分的直升機框架，如果不作調整建議，請設定至機械結構不干涉之極限值。
4. SWASHPLATE DAMPENING SETTING 十字盤柔化設定

Setting Instruction:
1. After entering setting mode, STATUS LED flashes 4 times.
2. Move the aileron stick to adjust cyclic pitch dampening rate; the more LED lights up, the more dampening effect. Please note aileron and elevator dampening cannot be adjusted separately. Moving aileron stick is for adjusting cyclic pitch dampening rate, but moving elevator stick is for adjusting collective pitch dampening rate, NOT elevator dampening rate.
3. The more dampening effect, the smoother helicopter flies, but feels less direct. The rate of dampening should be adjusted to suit pilot’s preferences.

5. SWASHPLATE ACCELERATE SETTING 十字盤加速設定

Setting Instruction:
1. After entering setting mode, STATUS LED flashes 5 times.
2. Move the aileron stick to adjust cyclic pitch acceleration rate; the more LED lights up, the more acceleration effect. Please note aileron and elevator acceleration cannot be adjusted separately. Moving aileron stick is for adjusting cyclic pitch acceleration rate, but moving elevator stick is for adjusting collective pitch acceleration rate, NOT elevator acceleration rate.
3. When cyclic pitch acceleration is active, hovering point fixation ability may be reduced. Beginners or FSC pilots should minimize cyclic pitch acceleration rate value, or set it to zero.

CAUTION: Setting swashplate acceleration may increase the burst amp draw of servos. Therefore, BEC output capability should be confirmed to handle burst current when setting collective pitch acceleration, otherwise insufficient current supply may result in flight accidents. We recommend direct power supply if acceleration is higher than 50%.

Rudder Gyro Setup 尾舵陀螺儀設定

After the system reboots, part of flybarless setup is completed. Now the rudder gyro needs to setup. Push and hold the SET button for 2 seconds to enter the rudder gyro setup mode.

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

ATS
Pilot authority mixing
Throttle to rudder mixing

3GX Flybarless rudder gyro has the factory setting of 1520 μ s and DS digital servo. Double check your servo spec and change the gyro setting as needed to avoid damages to the servo.

3GX Flybarless 尾舵陀螺儀出廠設定值為：1520 μs寬頻DS數位電動器模式，安裝時請確認您的電動器規格，避免設定值不同而造成電動器損壞。

1.1520 μ s (STANDARD) OR 760 μ s (NARROW BAND) SERVO FRAME RATE SETUP. 1520 μ s (標準) OR 760 μ s (狹帶)電動器設定

3GX Flybarless system is compatible with both the 760 μ s narrow frame rate servos (such as Futaba S9256, S9251, BLS251), as well as the standard 1520 μ s 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 collet 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 μ s. To set it to 760 μ s, the rudder stick need to be pushed from the center to the opposing end 3 times for the STATUS LED to turn red, indicating frame rate set to 760 μ s.

3GX Flybarless panel: Each setting value is labeled on the 3GX 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.
2. DS (DIGITAL) / AS (ANALOG) SERVO SELECTION DS數位／AS類比同伺服選擇

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 3GX flybarless system, premium high speed digital rudder servos are mandatory for optimal tail performance. Some of the recommended rudder servos.

Setup method: Press and hold the SET button for 2 seconds to enter the setup mode, then press the SETUP 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).

伺服器動作速度攸關陀螺儀的性能，伺駕動作愈快，就能立即反應陀螺儀送出的指令，發揮更精準的效能。由於3GX Flybarless具有高精準度的陀螺儀設計，建議選用數位型伺服器，以獲得最佳效能。

設定方式：按住“SET”鍵2秒進入功能設定模式，再按“SET”鍵選擇DS／AS選項，(DS／AS指示燈亮起)，利用方向舵駕選擇數位DS（STATUS為綠燈）或類比AS（STATUS為紅燈）伺服器。

3. RUDDER SERVO DIRECTION CHECK AND LINK ADJUSTMENT 檢測尾舵伺服器正反向及調整連接

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 3GX 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.

左右搖動尾舵桿，確認尾舵伺服器動作的方向是否正確，若不正確請再做電盤上的尾舵伺服器正反方向調整。

將3GX Flybarless切換為非鎖定模式或按住“SET”鍵2秒，使電盤伺服器保持在中立點的位置上，調整尾舵片，盡量使尾舵接近與陀螺儀垂直90度，接著調整連桿長度使電Pitch控制組合中。

4. GYRO NOR/REV SETTING NOR／REV陀螺儀正反向開關設定

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 SETUP 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).

搖動電盤，將機體左右傾斜，觀測陀螺儀的動作方向與電盤的動作方向是否正確，若不正確請調整正反向開關設定。

設定方式：按住SET鍵2秒進入功能設定模式，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

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 limit adjustment of servo travel. Insufficient servo travel will degrade helicopter performance, while excessive travel will cause binding and damage rudder servo.

6. HELICOPTER SIZE AND DELAY SETTINGS

This setting includes two functions:
(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 500/550/600/700/800 set this setting to large helicopter (STATUS LED green).
(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 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 is set by how far you push the rudder stick, followed by pushing the SET button.
7. ANTI TORQUE COMPENSATION DIRECTION SETTING 反扭力補償方向設定

To achieve consistent gyro gain on left and right, 3GX has built in anti-torque compensation function. User need to confirm if 3GX is mounted right side up or upside down.

Right side up: Installed with 3GX label facing up, anti-torque compensation set to positive (green STATUS LED).

Upright side down: Installed with 3GX label facing down, anti-torque compensation set to negative (red STATUS LED).

Select by moving the rudder stick left and right.

Anti Torque Compensation direction setting 反扭力補償方向設定

8. SENSITIVITY ADJUSTMENT 感度調整

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.

For radios (IE Futaba) using 0% - 100% as heading lock gain scales, the recommended gain setting is 30% - 33%. 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 3.5V - 8.4V
2. Operating current consumption: <90mA @ 4.8V
3. Rotational detection rate: ± 300°/sec
4. Rudder yaw detection rate: ± 600°/sec
5. Sensor resolution: 12bit
6. Temperature: -20°C to +65°C
7. Dimension/Weight: 35.6x25.2x15.6mm/10g
8. Certifications: RoHS certification stamp
<table>
<thead>
<tr>
<th>LED</th>
<th>設定方法</th>
<th>Setting</th>
<th>程序</th>
<th>Setting</th>
<th>Status</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>LED 1</td>
<td>lit</td>
<td>LED1亮</td>
<td>LED1亮</td>
<td>LED1亮</td>
<td>LED1亮</td>
<td>LED1亮</td>
</tr>
<tr>
<td>LED 2</td>
<td>lit</td>
<td>LED2亮</td>
<td>LED2亮</td>
<td>LED2亮</td>
<td>LED2亮</td>
<td>LED2亮</td>
</tr>
<tr>
<td>LED 3</td>
<td>lit</td>
<td>LED3亮</td>
<td>LED3亮</td>
<td>LED3亮</td>
<td>LED3亮</td>
<td>LED3亮</td>
</tr>
<tr>
<td>LED 4</td>
<td>lit</td>
<td>LED4亮</td>
<td>LED4亮</td>
<td>LED4亮</td>
<td>LED4亮</td>
<td>LED4亮</td>
</tr>
<tr>
<td>LED 5</td>
<td>lit</td>
<td>LED5亮</td>
<td>LED5亮</td>
<td>LED5亮</td>
<td>LED5亮</td>
<td>LED5亮</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LED</th>
<th>設定方法</th>
<th>Setting</th>
<th>程序</th>
<th>Setting</th>
<th>Status</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>LED 1</td>
<td>lit</td>
<td>LED1亮</td>
<td>LED1亮</td>
<td>LED1亮</td>
<td>LED1亮</td>
<td>LED1亮</td>
</tr>
<tr>
<td>LED 2</td>
<td>lit</td>
<td>LED2亮</td>
<td>LED2亮</td>
<td>LED2亮</td>
<td>LED2亮</td>
<td>LED2亮</td>
</tr>
<tr>
<td>LED 3</td>
<td>lit</td>
<td>LED3亮</td>
<td>LED3亮</td>
<td>LED3亮</td>
<td>LED3亮</td>
<td>LED3亮</td>
</tr>
<tr>
<td>LED 4</td>
<td>lit</td>
<td>LED4亮</td>
<td>LED4亮</td>
<td>LED4亮</td>
<td>LED4亮</td>
<td>LED4亮</td>
</tr>
<tr>
<td>LED 5</td>
<td>lit</td>
<td>LED5亮</td>
<td>LED5亮</td>
<td>LED5亮</td>
<td>LED5亮</td>
<td>LED5亮</td>
</tr>
</tbody>
</table>

### 4.3GX SETUP TABLE

#### Enter Setup Mode

- **Swashplate Settings**
  - Turn on transmitter, press/hold SET, power on helicopter, press/hold SET before LEDs stop flashing.

- **3GX throttle calibration**
  - Turn on TX, lower throttle all the way down, press/hold SET, power on before LEDs stop flashing.

- **Rudder Settings**
  - With 3GX powered up, press SET for about one second.

- **Flight Mode Setting**
  - With 3GX powered up, push the rudder stick 1/4 left and hold the SET button for about one second.

#### LED 1

- **Setting**
  - Mechanical Travel and Neutral point setting

- **Method**
  - Set swashplate movement on TX and set neutral point to 8 degrees. The ELE mixer ratio will be set to the same value as AIL.

- **Push button**
  - Push button fully to complete setup, indicated by flashing LED1-1, 6, and then enter normal operation condition.

#### LED 2

- **Setting**
  - Elevator limit setting

- **Method**
  - Push elevator stick forward until limit, and release.

#### LED 3

- **Setting**
  - Elevator gyro setting

- **Method**
  - Tilt hell forward and back while observing gyro correction direction.

#### LED 4

- **Setting**
  - Aileron limit setting

- **Method**
  - Move aileron stick to left/right until aileron at extreme end point, wait until STATUS change from green to red, then release.

#### LED 5

- **Setting**
  - Aileron gyro setting

- **Method**
  - Tilt hell forward and back while observing gyro correction direction.

#### LED 6

- **Setting**
  - Gyro install reverse setting

- **Method**
  - Use rudder stick to set gyro installation.

### Warnings

- After completing setting of 8 degrees SWASH, do not make any adjustments. If adjustment to helicopter’s rudder role is needed, the setting must be made in the roll rate under flight mode’s cyclic pitch section.

- With 3GX powered up, the rudder stick will result in LED1-1, 6, and then enter normal operation condition.

- Move aileron stick to increase/decrease the number of LEDs from 0 to 1.

- Move rudder stick to select digital servo, GREEN LED1-1, 6, and then enter normal operation condition.

- While in this mode, elevator may deviate from forward/tilt by as much as 8 degrees + offset percentage. For example, LED1-1, 6 displays 80% settings, total aileron travel will be 80-5% x 12 degrees. Set to a value with no mechanical binding at extreme end or keep default value at 70%.

- Move rudder stick to adjust collective pitch damper level. Move aileron stick to adjust cyclic pitch damper. Move LED1-1, 6’s position to adjust damper level.

- Move elevator stick to adjust collective pitch damper level. Move aileron stick to adjust cyclic pitch damper. Move LED1-1, 6’s position to adjust damper level.
**5. 3GX FLYBARLESS PREFLIGHT CHECK**

**STEP 1**

Turn on Transmitter, and then receiver power.

先開啓遙控器電源，再開啓接收器電源。

**STEP 2**

3GX 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.

此時3GX Flybarless控制器指示燈STATUS及DIR～A.REV會閃動，
請勿移動直昇機與發動機，以利陀螺儀感應器進入初始化程序。

**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 6 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 page 14 Gain Adjustment)

如未顯示，初始化完成後，十字盤會保持上下小幅度運動三次，表示完成開機程序，如十字盤做極端運動三次，則表示設定錯誤，請進入數位化系統重新設定。（參考P.6 陀螺儀系統設定）

完成開機並自動數位化被固定無法動作，如果一直無法完成開機程序STATUS 紅燈閃動，請重新開機及各部機是否正常及程式完全無誤，確認後重新開機。

正常開機後， STATUS黃燈是表示現在為鎖定模式，紅燈為非鎖定模式。

（請參照P.14 頭頂調整）

**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 page 8 E.REV setup)

將直昇機側頭時，十字盤應將十字盤向後修正，如果反向，重新進入 Flybarless設定模式設定升降舵及陀螺儀修正方向。（請參考第8頁 E.REV 升降舵及陀螺儀修正反向設定模式）
**STEP 5** Tilt the helicopter to the right and swashplate should tilt left to compensate. If reversed, perform the flybarless initial setup again and adjust the aileron reverse setting (Refer to page 9 A.REV setup).

**STEP 6** With throttle stick all the way up (and down) and cyclic stick all the way left/forward and up/down, check for any binding on the swashplate. If binding occurs, perform the flybarless initial setup again and adjust the end point limits.

**STEP 7** Check the center of gravity (CG) and adjust component placement until CG point is right on the main shaft of the helicopter.

**STEP 8** With all above steps checked, restart the system and begin flight test.

---

**HELIICOPTER CG CHECK PROCEDURE**

After installed the battery, 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.

Adjust the frame's CG within +/- 60 degrees from level.

---

**6. FLIGHT ADJUSTMENT AND SETTING**

**PLEASE PRACTICE SIMULATION FLIGHT BEFORE REAL FLYING**

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/forward”, “Rudder left/forward”, 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.

---

1. 將直昇機放在空曠的地方(確認電源為關閉)，並將直昇機的機尾對準自己。
2. 練習操作遙控器的各桿桿(各動作的操作方式如下圖)，並反覆練習油門高/低、副翼左/右、升降舵前/後及方向舵左/右操作方式。
3. 模擬飛行的練習相當重要，請重複練習直到不需思索，手指能自然地作出訓練所用之動作。
<table>
<thead>
<tr>
<th>Mode 1</th>
<th>Mode 2</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Aileron" /> 副翼</td>
<td>Move left 左側 Move right 右側</td>
<td><img src="image2" alt="Illustration" /></td>
</tr>
<tr>
<td><img src="image3" alt="Elevator" /> 升降/前後</td>
<td>Rotate left 左翻 Rotate right 右翻</td>
<td></td>
</tr>
<tr>
<td><img src="image4" alt="Throttle" /> 油門</td>
<td>Fly forward 前進 Fly backward 後退</td>
<td></td>
</tr>
<tr>
<td><img src="image5" alt="Rudder" /> 方向</td>
<td>Forward rotate 前翻 backward rotate 後翻</td>
<td></td>
</tr>
<tr>
<td><img src="image6" alt="Ascent" /> 上升</td>
<td>Descent 下降</td>
<td></td>
</tr>
<tr>
<td><img src="image7" alt="Turn right 右旋" /></td>
<td>Turn left 左旋</td>
<td></td>
</tr>
</tbody>
</table>

**FLIGHT ADJUSTMENT AND NOTICE 飛行調整與注意**

- **CAUTION 注意**
  - Check if the screws are firmly tightened.
  - Check if the transmitter and receivers are fully charged.
  - 須確認螺絲是否牢固安裝。
  - 確認發射器和接收器電池是否充滿。

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.

**STARTING AND STOPPING THE MOTOR 啟動和停止馬達**

**CAUTION 注意**

First check to make sure no one else is operating on the same frequency. Then place the throttle stick at lowest position and turn on the transmitter.

首先確認附近沒有其他相同頻率的使用，然後打開發射器將油門推到最低點。

- **Check the movement. 動作確認**
  - **ON! Step1** First turn on the transmitter.
  - **ON! Step2** Connect to the helicopter power
  - **OFF! Step3** Reverse the above orders to turn off.

- **Check if the throttle stick is set at the lowest position. 確認油門桿是在最低的位置。**

- **Are the rudders moving according to the controls? 方向舵是否按照控制方向移動？**

- **Follow the transmitter's instruction manual to do a range test. 須根據發射器說明書進行距離測試。**
This procedure is best performed on soft surfaces such as grass. The use of rubber skid stopper is recommended on hard surface to prevent vibration feedback from the ground to 3GX, resulting in over-corrections.

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 3GX, and will disappear once helicopter lift off the ground. If manual trim is applied, helicopter will tilt immediately after lift off.

MAIN ROTOR ADJUSTMENTS 主旋翼雙樑平衡調整

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 adjustment. If one blade is higher or lower than the other blade, adjust the tracking immediately.

A. When rotating, the blade with higher path means the pitch too big. Please shorten DFC ball link for regular trim.
B. When rotating, the blade with lower path means the pitch too small. Please lengthen DFC ball link for regular trim.

Tracking adjustment is very dangerous, so 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 approx. +5°-6° when hovering.

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

Make sure that no one or obstructions in the vicinity.

For flying safety, please carefully check if every movement and direction are correct when hovering.

Do not attempt until you have some experiences with the operation of helicopter.

STEP 1 THROTTLE CONTROL PRACTICE 油門控制練習

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.

STEP 2 AILERON AND ELEVATOR CONTROL PRACTICE 副翼和升降控制練習
STEP 3 RUDDER CONTROL PRACTICING 方向舵操作練習

1. Slowly raise the rudder stick.
2. Move the nose of the helicopter to right or left, and then slowly move the rudder stick in the opposite direction to fly back to its original position.
   1. 慢慢升機尾部方向
   2. 將軸向機頭移動左或右，然後慢慢反向移動方向舵桿令直升機飛回原位置。

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.

當您熟悉了step 1-3動作後，於地上畫圈並在這個範圍內練習飛行，以增加操控的準確度。

① You can draw a smaller circle when you get more familiar with the actions.
② 當您更習慣操作動作時，可以畫更小的圓圈。

STEP 5 DIRECTION CHANGE AND HOVERING PRACTICE 改變直升機方向和練習停旋

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.

當您熟悉step 1-4動作後，站在直升機側邊並繼續練習step1-4。之後，站在直升機機頭右邊再練習step1-4。

7. 3GX FLYBARLESS FLIGHT TEST PROCEDURE 飛行測試程序

With the helicopter hovering, observe for any rapid left/right or forward/af oscillations. If forward/af oscillation is observed, land the helicopter, turn the ELE gain dial counterclockwise gradually, and test again. Do this until oscillation disappears.

先將直升機以停機飛行，觀察直升機左右及前後是否有不正常快速抖動現象。如果前後有抖動情形，則應逐漸調整升降舵感度調整旋鈕，以減少陀螺儀後修正感度。

SET THE DIAL TO 12 O’CLOCK POSITION AS STARTING POINT 建議初次飛行設於12點鐘方向

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

如果發現左右抖動，則應逐漸調整副翼感度調整旋鈕，以減少陀螺儀左右修正感度。

SET THE DIAL TO 12 O’CLOCK POSITION AS STARTING POINT 建議初次飛行設於12點鐘方向

FORWARD STRAIGHT LINE FLIGHT 前進直線航道飛行

After hovering, proceed to fast forward flight. Should there be similar oscillation, please reduce elevator gain. Should the helicopter pitch up or experience slow response during flight, increase elevator gain. Repeat this process until ideal gain value is achieved. Similar method is used to set the aileron gain. After adjusting gyro gains, adjust the roll rate in 3GX Flight Mode settings based on your preference. The roll rate, the faster the roll/flips are. The pilot can also adjust the cyclic EXP setting for the preferred stability. After all adjustments are complete, the pilot can enjoy the stability of slow flight and the fast agility from flybarless system.

停機後可快速進跑道，同樣的有不正常動作時，請調整升降舵感度調小，飛行時如果機頭向上仰或反應緩慢要時，請調整感度調大，重複試飛將感度調整至理想值，同樣方式可調整副翼感度調小，調整副翼感度後，可依機飛行習慣進入3GX飛行模式調整滾轉速率，調整越大，前後及左右滾轉速率越大，使用中可依個人習慣調整副翼EXP以增加停機穩定性。完成所有調後，就可享受Flybarless所提供穩定飛行的穩定性及高速時的靈活性。
<table>
<thead>
<tr>
<th>Blade Tracking (雙葉平衡)</th>
<th>Problem</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tracking is Off</td>
<td>雙葉</td>
<td>Pitch linkage rods are not even length</td>
<td>Adjust length of DFC ball link. 調整DFC連桿長度</td>
</tr>
<tr>
<td>Headspeed too low</td>
<td>主旋翼轉速偏低</td>
<td>Excessive pitch 主旋翼的Pitch偏高</td>
<td>Adjust DFC ball link to reduce pitch by 4 to 5 degrees. Hovering headspeed should be around 1450RPM. 調整DFC連桿球頭以減少pitch約4到5度，飛行時速度應該為約1450RPM</td>
</tr>
<tr>
<td>Headspeed too high</td>
<td>主旋翼轉速偏高</td>
<td>Hovering throttle curve is too low 停留點油門過低</td>
<td>Increase throttle curve at hovering point on transmitter (around 60%) 增加停留在油門 curves約60%</td>
</tr>
<tr>
<td>Rudder Response (尾舵反應)</td>
<td>Drifting of tail occurs during hovering or delay of rudder response when centering rudder stick. 尾旋翼飛行中緩慢或當調整尾舵時反應延遲</td>
<td>Rudder neutral point improperly set 離合點設定不當</td>
<td>Reset rudder neutral point 重設離合點</td>
</tr>
<tr>
<td>Oscillation during flight (飛行抖動)</td>
<td>Forward/aft oscillation when elevator is applied 輔助飛行中機頭前後抖動</td>
<td>Elevator gyro gain too high 升降舵穩定器偏高，產生抖動現象</td>
<td>Turn the ELE gain dial on control box counterclockwise, 10 degrees at a time until oscillation is eliminated. 逆時針調整升降舵控制器的ELE旋鈕以每次調至10度，直到消除抖動</td>
</tr>
<tr>
<td>Drifting during flight (飛行漂移)</td>
<td>Helicopter pitches up during forward flight 直飛時機頭上揚</td>
<td>Elevator gyro gain too low 升降舵穩定器偏低</td>
<td>Turn the ELE gain dial on control box clockwise, 10 degrees at a time until drifting is eliminated. 逆時針調整升降舵控制器的ELE旋鈕以每次調至10度，直到消除漂移</td>
</tr>
<tr>
<td>Control Response (動作反應)</td>
<td>Slow Forward/Alt/Left/Right input response 前後左右動作反應延緩</td>
<td>Roll rate too low 滾轉速率偏低</td>
<td>Adjust roll rate within 3GX Flight Mode setting. 調整3GX飛行模式設定中的滾轉速率</td>
</tr>
<tr>
<td></td>
<td>Sensitive Forward/Alt/Left/Right input response 前後左右動作反應過敏</td>
<td>Roll rate too high 滾轉速率偏高</td>
<td>Adjust roll rate within 3GX Flight Mode setting. 調整3GX飛行模式設定中的滾轉速率</td>
</tr>
</tbody>
</table>

若以上解決方案未能解決您的問題，請隨時與有經驗的飛行員或 Align的經銷商聯繫。

*在做完以上調整後，若情況仍未改善，請立即停止飛行並與經銷商聯繫。*
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 hover.

Q&A 1

Insufficient gain during flight, but increasing gain results in oscillation.
(1) Check and resolve possible mechanical vibration from helicopter.
(2) Use softer 3GX mounting foam, or double up the stock 3GX foam.
(3) Relocate the 3GX to location less prone to vibration.

Q&A 2

Drifting during 3D maneuvers.
(1) IncreaseAIL and ELE gain by turning both dials clockwise.
(2) Check if cyclic servos are too slow (minimum 0.02sec / 60 degrees).

Q&A 3

Unstable hover, control inputs are too sensitive.
Can adjust the roll rate within 3GX Flight Mode settings, as well as increase the EXP setting to increase hovering stability. For CCPM machines, decrease swashplate mixing percentage on the transmitter. In addition, exponential can be added to aileron and elevator channels.

Q&A 4

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 5

Unstable elevator setup mode, unable to complete ELE/AIL endpoint and reverse settings.
Enable all trim/trim limits on transmitter.

Q&A 6

Incorrect CCPM mixing after initial flybarless setup.
(1) Trim/trim limits not zeroed out on transmitter.
(2) After any trim adjustments are done on transmitter, the initial flybarless setup procedure need to be performed again.

Q&A 7

While in flybarless setup mode, unable to complete ELE/AIL endpoint and reverse settings.
Enable all trim/trim limits on transmitter.

Q&A 8

3GX flybarless system unable to power up.
(1) Connect proper voltage source.
(2) Check AIL/ELE/PIT connections between flybarless control unit and receiver.
(3) Check the power connection of 3GX and receiver.

Q&A 9

3GX 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) If STATUS LED flashes red, check the connection between controller and receiver.

Q&A 10

I noticed swashplate slips slightly at extreme pitch due to servo interactions, should I make efforts to level it out?
No. The 3GX system automatically calculates a cyclic ring based on the aileron swash mix percentage. Setting of elevator swash mix has no affect on the 3GX system. Set the cyclic pitch by the aileron swash mix & just use the same value for elevator.

Q&A 11

What adjustments can I make on the transmitter after the DIR setup has been completed?
You can adjust the trim tabs, rates, exponential, collective pitch.

Q&A 12